

Mr. C.A. Vuitel  
Criterion Catalysts and Technologies  
16825 Northchase Drive  
Suite 1000  
Houston, Texas 77060

Dear Mr. Vuitel:

Thank you for your letter of July 9, 2001 regarding the enhancement by Criterion Catalysts and Technologies L.P. (Criterion) of regenerated hydroprocessing catalysts for reuse in petroleum refining operations. In your letter, you asked the Environmental Protection Agency (EPA) to concur with your statement that regenerated hydroprocessing catalysts are products, and that enhancement or augmentation of these catalysts does not constitute reclamation.

According to the facts stated in your letter, regulatory requirements in the United States and abroad for lower sulfur levels in fuel will cause the petroleum refining industry to employ increased temperatures and pressures in its hydroprocessing operations. These more severe operational conditions will reduce the life cycle of hydroprocessing catalysts, resulting in a demand for the development of higher activity catalysts. On August 6, 1998 (63 FR 42110), EPA listed certain spent hydroprocessing catalysts (i.e., K171 and K172) as hazardous wastes under the Resource Conservation and Recovery Act (RCRA). Prior to reclamation or regeneration, these materials are therefore considered spent listed wastes and are subject to all applicable RCRA hazardous waste management requirements. After regeneration, however, they would be considered excluded from RCRA regulation pursuant to 40 CFR 261.2(e)(1)(ii), including use of the hazardous waste manifest, if they are reused at a petroleum refinery as an effective substitute for a commercial product (i.e., as a substitute for a new catalyst).

You have stated that Criterion has developed an enhancement technology which is designed to significantly increase the activity of hydroprocessing catalysts. According to your letter, the enhancement process is a controlled batch operational step performed during conventional catalyst manufacturing operations, involving the use of reagents and raw materials when used during initial

manufacturing. The enhancement process adds complex metal compounds to the support material of the catalyst, which in turn are reacted with sulfur

2

compounds to form highly dispersed metal sulfide crystallites. The unique properties of these crystallites result in significantly increased catalytic activity.

You further stated that this enhancement technology can also be utilized to significantly increase the catalytic activity of regenerated hydroprocessing catalysts. Under such an option, you stated that the regenerated catalysts would be augmented using Criterion's enhancement technology under controlled batch operations similar to those used to process newly manufactured catalysts.

Based on Criterion's need to utilize its enhancement technology to augment regenerated catalysts, you requested EPA's concurrence with your view that the use of this enhancement process to augment regenerated catalysts does not constitute reclamation or partial reclamation. The presence of such reclamation could mean that the regenerated catalyst (and subsequently, the enhanced catalyst) would be regulated under RCRA.

As stated above, the spent catalysts would be considered listed wastes before reclamation or regeneration, and therefore would be subject to all applicable RCRA hazardous waste management requirements. After regeneration, however, they would be excluded from RCRA regulation pursuant to 40 CFR 261.2(e)(1)(ii), including use of the hazardous waste manifest, if they are reused at a petroleum refinery as an effective substitute for a commercial product (i.e., as a substitute for a new catalyst). The enhancement process as you described it is used to augment regenerated catalysts that are already viable commercial chemical products; in this case, EPA agrees that the process does not constitute further reclamation.

We note that the regulatory determination presented in this letter applies to the federal hazardous waste program. Most State regulatory agencies are authorized to implement the hazardous waste program in lieu of the federal program, and State regulations may be more stringent than the federal regulations. You should therefore contact your State regulatory agency to ascertain their requirements.

Thank you for your interest in this matter. If you have any more questions, please contact Marilyn Goode of my staff at 703-308-8800.

Sincerely yours,

Elizabeth A. Cotsworth, Director  
Office of Solid Waste

