Missouri Department of Health and Senior Services
P O Box 570, Jefferson City, MO 65102-0570 Phone 573-751-6400 FAX 573-751-6010

Richard C. Dunn
Director

Bob Holden
Governor

RECEIVED
FEB 25 2003
SUPERFUND DIVISION

February 21, 2003

Bruce Morrison
Project Manager
USEPA Region VII
901 North 5th
Kansas City, KS 66101

40328438
Superfund

Re: Phosphate Treatment of Herculaneum Soils for Reducing Lead Bioavailability

Dear Mr. Morrison,

I am writing in response to your request that the Missouri Department of Health & Senior Services (DHSS) in cooperation with the Agency for Toxic Substances and Disease Registry (ATSDR) provide a public health opinion concerning Doe Run's request to use phosphate application as a means for soil remediation of Herculaneum residential soils. In a letter to your agency, dated December 17, 2002, Doe Run requested permission to utilize surface applied or tilled in phosphate chemistry as a remedy in those areas of Herculaneum yards having lead concentrations up to 1600 ppm in the soil.

In addressing your request, DHSS and ATSDR considered the following:

- Doe Run has proposed to remediate lead contaminated soil in Herculaneum with a phosphate treatment that was previously tested in Joplin, MO soil by the Missouri Department of Natural Resources (DNR). Doe Run has provided multiple references which support the efficacy of this remedial action (in letter from Dan Vornberg to Bruce Morrison, December 17, 2002.) The proposed methodology has both theoretical and empirical support. The proposal calls for phosphate to be added to the soil as 85% phosphoric acid. This drops the soil pH to 1.5-2.5, which, in the presence of chloride ions, forms highly insoluble lead chloropyromorphite.

- Bioavailability studies in swine indicate that the bioavailability of lead in the treated soil from Joplin was reduced for the duration of the studies (32 months). It is not known if the bioavailabilty will change (increase or decrease) for longer durations.

- DHSS and ATSDR have not been provided remediation or health and safety plans for implementing this technology in the Herculaneum community.

We recognize that the proposed remedial technology has been successfully tested in Joplin, Missouri, and in other experimental studies; however, DHSS and ATSDR need more in-depth information on how this technology will be implemented, how the residents' health and safety will be protected during implementation of this technology and how short- and long-term effectiveness of this technology will be monitored.

Foremost, the health agencies feel that more information is needed showing that the use of this technology will reduce levels of bioavailable lead at the Herculaneum site significantly enough to reduce exposures below levels of health concern.

Since there is a lack of sufficient information to assess the safety and long-term protectiveness of this technology, DHSS and ATSDR need to review the following prior to making a public health determination:

- A study utilizing this process on a limited number of properties owned by The Doe Run Company to determine if the use of this technology will reduce levels of bioavailable lead at the Herculaneum site significantly enough to reduce exposures below levels of health concern. Also, we recommend that wide scale use of this technology not be implemented until the safety and effectiveness of this limited use study are understood.

- A Site Remediation and Health & Safety plan that ensures community members are not exposed to phosphoric acid, lead-contaminated soils, or other contaminants during remediation.

- A form of notification that alerts anyone disturbing the soil about the depth of treatment if this technology is applied on properties where depth of contamination is greater than effective treatment.

- A plan to regularly monitor the short- and long-term stability of the immobilized lead complex in soil. This can include chemical speciation (x-ray diffraction), *in vitro* and *in vivo* bioavailability studies, and other appropriate studies.

Once we receive this information, we will develop a health consultation documenting our final health opinion.

If you have any questions or need additional information, please feel free to contact me at (573) 751-6160.

Sincerely,

Scott A. Clardy, Administrator
Section for Environmental Public Health

SAC:GMC:RLK:amh

cc: Roberta Erlwein, ATSDR, Atlanta, GA
Alan Parham, ATSDR, Atlanta, GA
Denise Jordan-Izaguirre, ATSDR, Kansas City, KS
David Mosby, MDNR, Jefferson City, MO