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## INTEROFFICE CORRESPONDENCE

DATE: July 3, 1991

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FROM: *etc*  
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SUBJECT: EPA'S THIRD FORUM ON INNOVATIVE HAZARDOUS WASTE TECHNOLOGIES:  
DOMESTIC AND INTERNATIONAL - CDC-006-91

The purpose of this memorandum is to relay some of the information obtained from the Environmental Protection Agency's (EPA) most recent forum on new waste treatment technologies. The forum consisted of presentations by vendors of innovative technology, poster sessions, case studies, and EPA presentations on the Superfund Innovative Technology Evaluation (SITE) program. The content of the forum focused mainly on SITE projects in the United States and innovative technologies in use in Northern Europe and Canada.

Concurrent with the forum, the EPA issued a new policy memorandum concerning the SITE program. In essence, the EPA is going to push SITE projects even harder at the regional level, particularly at Federal facilities. Because these technologies are innovative, the EPA will allow a dual track Record of Decision (ROD). This would allow the innovative technology to be implemented on one track and, if it were not productive, a proven technology on the second track could be utilized under the same ROD.

Listed below are technologies that I felt were relevant to remediation work at Rocky Flats:

**UV/Hydrogen Peroxide:** Emery Froelich of Peroxidation Systems, Inc. (PSI) was present, so I had the opportunity to talk to him directly about bench-scale test we are trying to perform at their laboratory.

Two other UV/oxidation firms, Solarchem and Ultrox, were also present: These vendors indicated that they use low pressure lamps as opposed to PSI's high pressure lamps. It was indicated in Solarchem's presentation that the best absorption frequency for the destruction of organics is much closer to that of the low pressure lights than the high pressure ones; however, the high pressure lights compensate for this through higher intensity.

I discussed with a number of people, including a research chemist with Shell, whether these systems produce by-products when used on organic solvents. Basically, the response from the Ultrox was that the destruction of the by-products had very fast kinetics so that by products had short life spans in this sort of oxidizing environments.

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David Cook of Kleinfelder, Inc. did a presentation on a PSI system. He indicated that no cooling water was used and no by-products were detected, although the analytical methods used were not capable of detecting oxidation intermediates. Even though their tests were performed on many of the chlorinated solvents that we have present at OU 1, the concentrations were a magnitude lower. One promising note was that the system performed better in the field than the bench-scale test indicated, and they were able to reduce the UV input to the water.

**Electron Beam Irradiation:** This technology is a little exotic, but it was of interest because it forms hydroxyl radicals just as the UV/peroxide process does. The paper on this process had the oxidation mechanisms for the destruction of some of the solvents present at OU 1. This was important because it should allow Dr. John Dick to predict potential by-products and the methods of analysis to predict those by-products, since these by-products have low volatilities and will not be detected by standard EPA methods.

**Vapor Controlled Excavation:** The EPA is probably going to apply more pressure on excavators to control vapors during excavation. The techniques presented included negative pressure enclosures and foam. Both of which are very cumbersome.

**In-Situ Vitrification:** This was of interest because of its close links to the Department of Energy (DOE). Nothing very new was present; however, there was some discussion on a new fume hood which recovered over 90 percent of the volatiles.

**Soil Washing and Thermal Treatment:** The technology for ex-situ soil treatment is predominantly European. Of particular interest was the Phonix system which was modular and involved solvent extraction followed by steam stripping. Another system screened the materials and treated the larger size material separately. This material was easier to clean with pressurized washing technique and this method reduced the overall cost of the project. Due to the alluvial nature of Rocky Flats soils, this methodology probably should be considered for any ex-situ treatment operations. Also of interest were some of the thermal treatment methods.

**Immobilized Algae:** This method was of interest since it could be used absorb metals from groundwater. Since it has an organic base, it is possible that it could be used to adsorb organic also.

There were numerous other technologies presented including solidification and bioremediation. I brought back information on many of these.

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The EPA was also on hand to explain the Alternative Treatment Technology Information Center (ATTIC). This shows a lot of promise in identifying technologies for treatability studies. The EPA is working on a database in diskette form that would yield information on innovative technologies based on contaminant type and the type of matrix on which it is found. It also includes treatability study vendors.

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