MEMO

To: Le Thai, Maheyar Bilimoria, Bruce Fidler

From: Jennifer Higgins

Subject: Update of Technology Evaluation

Date: March 21, 2000

Job No.: 5910-

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As requested, I contacted both Mel Bernstein of X-19 and Paul Linanne of the Pennsylvania Mine Reclamation Project to confirm their technology status and any updates since the Fall of 1999 when I was last in touch with both of them.

Following is a summarization of the discussion I had with each vendor:

X-19 contact: Mel Bernstein (650-494-0182)

With Mel Bernstein I discussed the present status of the X-19 technology and any results from the pilot study that was to be conducted in October' 99 on PCB contaminated soil in Texas. This pilot study has yet to begin. Mel Bernstein informed me that the reason for the set back is due to the EPA's lack of approval on this project. EPA has yet to permit this pilot study thus preventing it from starting. He says he believes the problem is due to the fact that the soil is considered a RCRA waste with concentrations greater than 50 ppm causing confrontation amongst those responsible for the permitting of this project. He was strong to state that the EPA has not made a decision, meaning they have never said "No" to this pilot study. The EPA have yet to give the go ahead on this project thus resulting in the set back of the commencement of the pilot study. EPA is apparently reluctant to approve this pilot study using bioremediation with X-19 to treat PCB contaminated soil with concentrations greater than 50 ppm. In asking what the average PCB concentration to be treated at this site is, I was told it to be about 4,000 ppm where PCBs in the soil are a result of spills at utility locations.

However, since I last spoke with Mel Bernstein in the Fall' 99, a test has been run involving remediation with X-19 on PCB contaminated soil in Toronto, Canada. The soil was said to be sandy-loam with an average PCB concentration of 344 ppm. The test has run for 90 days and a 50% reduction in PCB concentrations has been observed. Concentrations at 90 days measure 175 ppm of PCBs. Mr. Bernstein stated that usually 9 months is required for full treatment of the media during warmer weather. He suggested that the average time to remediate in NY state would most likely be from 6-7 months in warm weather.

As well, a bench scale study has been conducted on PCBs in soil. Specifically, the bench scale test was run to test Aroclor 1260 at the Batell Laboratory in Ohio. The study was run for less than

2 months due to the lack of funding. The results from this bench scale study are presently being sent.

In final comments, Mel Bernstein believes X-19 to be capable of treating PCBS since they have had success at treating more complex and difficult to remove chemicals such as Pesticides and PCP. (This information can be found in the Bioremediation folder on my shelf in my cubicle).

Along with results from the bench scale study, Mel Bernstein will be sending minutes of our conversation. They will be sent to the NJO in my name but care of Bruce Fidler.

Pennsylvania Mine Reclamation Project contact: Paul Linanne (717-783-2267)

In the Fall' 99 when I was last in touch with Paul Linanne regarding the use of dredged material as mine reclamation fill, the project was at Pilot scale and permitted dredged material with PCB concentrations of less than 4 ppm only. This is still the case. The project is still at demonstration scale and only dredged material with concentrations of less than 4 ppm PCBs is permitted. This project has involved the use of 20,000 cy of dredged material. Results from groundwater monitoring show no PCBs or heavy metals. However, until this pilot project is complete, this is the only site capable of receiving dredged material to use as mine reclamation fill. In April, 2 large projects involving dredged material from NY harbor (200,000-250,000 cy of material) are to be used in this pilot study.

In regards to using an area adjacent to the mine to be reclaimed for bioremediation treatment of dredged material, this is not known at the present time. Until using dredged material as mine reclamation fill is permitted, this issue can not be considered. As well, the location of the present pilot study would not provide and area where bioremediation could take place. This is due to the topography of the site. The present pilot study is located on steep terrain in a wooded area. In regards to mines that need to be reclaimed in more open, flat areas, Paul Linanne explained that in eastern Pennsylvania there are barren, non-forested areas that will require reclamation at some point. This area would be have the possibility of being used as a bioremdiation area but he is not sure if it would be permitted. The topography would not limit the bioremediation in this area but he is not sure if the state would permit this due to the initial high concentrations of PCBs that would be encountered. If the material to be bioremediated prior to being used as a mine fill was considered a hazardous waste, it would not be permitted most likely. I was referred to speak with Bill Pounds, the Chief of the Division of residual Management, to determine if such a project would be permitted. Bill Pounds was unavailable and I will try to contact him tomorrow (3/22/00). However, regardless if the bioremdiation is permitted, the results of the present pilot study will dictate whether or not dredged material will be used as mine reclamation fill at a full-scale level.