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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107-4431

JUL 16 1996

Mr. Richard J. Dulcey
ERM Project Manager - Halby Chemical
855 Springdale Drive
Exton, Pennsylvania 19341

Re: Treatability Study

Dear Mr. Dulcey:

This letter will memorialize our teleconference of yesterday afternoon by highlighting some of the more general issues discussed in outline form.

The EPA and Delaware DNREC have reviewed the July 1996 Laboratory Treatability Study Report and feel that significant progress has been made toward identification of a viable oxidant for use at the Halby Chemical site. We discussed the following issues which the government believes must be addressed prior to scaling up the study.

Cleanup Standards - To date the Agency has not been able to confirm the appropriateness of the clean-up standards for carbon disulfide proposed by Witco Corporation during our meeting on June 29, 1996. An overhead used during your presentation states that a clean-up standard of 2115 mg/kg would represent a hazard quotient of 0.1. It was represented that this concentration was back calculated based on EPA's draft operable unit 2 risk assessment. Since the draft risk assessment calls out a risk-based concentration of 290 mg/kg for carbon disulfide it is unclear to EPA/DNREC how Witco's calculations were run. The draft risk based concentration calculated by EPA represents a hazard quotient of 0.1, therefore it follows that a 0.33 hazard quotient would be achieved by an average carbon disulfide concentration of 968 mg/kg. You agreed to send the supporting calculations utilized by Witco via facsimile.

Preferred Oxidant - Based on the laboratory results, 25% hydrogen peroxide has not achieved sufficient conversion of carbon disulfide to meet the proposed clean-up levels. The maximum carbon disulfide removal efficiency demonstrated in the laboratory was 88%. Generically, it is expected that some efficiency will be lost when scaling up from the laboratory to the field. If we were to achieve 90% removal efficiency and our feed stock contained 34,000 mg/kg carbon disulfide (using the average concentration of Halby site soils used during the

laboratory study for discussion purposes) the proposed clean-up standard would not be met. On the other hand, Witco's laboratory study demonstrated that sodium percarbonate achieved a 97% conversion rate on the Halby soils. If this can be replicated in the field, 34,000 mg/kg carbon disulfide would be reduced to 1,020 mg/kg. Our recommendation is to modify the proposed pilot study to focus on sodium percarbonate as the oxidant. There are several field application techniques which can be refined by utilizing multiple sodium percarbonate test plots. Based on the laboratory results presented to EPA, we believe that proceeding with the hydrogen peroxide is unwarranted and is not the best utilization of Witco's or the government's resources.

Assessment of Off-gas - The Laboratory Report documents that laboratory personnel attempted to collect and analyze off-gas only once. The one study where gases were evaluated utilized hydrogen peroxide as the oxidant with a hydrogen peroxide to carbon disulfide molar ratio of 4:1, a molar ratio which is not expected to be representative of full-scale treatment objectives. Based on the data presented to EPA/DNREC, the question of off-gases has yet to be evaluated for a representative study.

Removal of Other Constituents - Thiocyanate conversion was demonstrated in the laboratory. What are the products of this reaction?

Outstanding Questions - In several instances it is noted in the report that additional testing or study is necessary to resolve the respective issue. In some cases it is stated that the additional testing is ongoing, in others it is stated that the additional testing must be done in the future. At this moment, EPA/DNREC is unaware of on-going studies or planned studies. Accordingly, although we agree with Witco that the additional information is needed we can not speak to the likely efficacy of planned studies without being informed of the specific plans.

Miscellaneous - The forthcoming work plan for the pilot scale study should include provisions for both containment of gases and, if it were to become necessary, absolute containment or excavation of the treatment plot[1].

Pilot study should include a control plot.

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[1] This item was not discussed during the 7/15/96 teleconference

Fate of arsenic should be discussed and its mobility must not increase due to the carbon disulfide treatment.

Sincerely,

Eric Newman, RPM
General Remedial Section (3HW23)

cc: Jane Biggs-Sanger, Delaware DNREC
Michael Towle, EPA OSC
Raj Vyas, Witco Corporation
Bob Root, CH2M Hill