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Permitting & Compliance  
Assistance Program

October 15, 2019

Mr. Bradley Buselli  
Florida Department of Environmental Protection  
Hazardous Waste Program & Permitting  
2600 Blair Stone Road, MS 4560  
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Via email: [Bradley.Buselli@dep.state.fl.us](mailto:Bradley.Buselli@dep.state.fl.us)

**Subject: Summary of the Wednesday September 25, 2019 Call between Florida Department of Environmental Protection (FDEP) and Perma-Fix Environmental Services, Inc. (Perma-Fix)**

Dear Mr. Buselli:

Perma-Fix would like to thank you and your colleagues for participating in the subject call to discuss the applicability of RCRA sample treatability regulations at 40 CFR §261.4(f) for the on-site laboratory at the Perma-Fix of Florida facility (PFF) waste treatment facility, FLD 980 711 071 and permit number 17680-011-HO. The following paragraphs are a brief synopsis of the issues discussed and what I believe were the mutually agreed conclusions.

#### Background

In response to a Department of Energy (DOE) request, PFF has proposed to conduct bench scale tests to evaluate and optimize the effectiveness of specific treatment technologies to minimize the concentrations of underlying hazardous constituents in a complex mixed waste for which no disposal pathway currently exists. The study will be limited to the application of those technologies that PFF is already authorized to perform under its RCRA operating permit (permit).

The permit also allows the acceptance and storage of all assigned waste codes. PFF proposes to receive 5 drums selected from the container population, sample them, and combine the samples into a single composite for study. Once samples have been collected, the waste drums will be returned to the generator's facility in Tennessee. The sequential treatment for this study is chemical reduction, chemical oxidation, and stabilization. The permit allows in-container treatment by each of these processes, as further described below.

#### Chemical reduction

The waste profile indicates that the waste contains polychlorinated biphenyls (PCBs) and has been assigned hazardous waste codes for polychlorinated dibenzodioxins (PCDDs)/Polychlorinated dibenzofurans (PCDFs). A process that has been shown to be effective in certain cases in destroying these compounds is reductive dechlorination using the KPEG

process. Waste samples will be treated by one or more cycles of KPEG and then analyzed to determine residual PCB and PCDD/PCDF concentrations. If satisfactory levels of destruction are achieved, residues from this treatment will be subjected to the next stage of treatment.

#### Chemical oxidation

Chemical oxidation will be used to reduce the concentrations of non-chlorinated organic constituents in the waste. Specifically, peroxydisulfate salts, persulfuric acid (Fenton's reagent), and/or hydrogen peroxide will be used at temperatures ranging from room temperature up to about 85° C. Higher temperatures may be employed to dry the samples afterward. Again, after one or more chemical oxidation cycles, samples will be analyzed to determine residual concentrations of organic UHCs and if satisfactory levels are achieved the residues will be subjected to the final stage of treatment.

#### Stabilization

The waste bears hazardous codes for several toxic metals. These constituents will not be destroyed or necessarily immobilized by the previous treatment technologies. PFF will employ its stabilization process to achieve this. One or more reagents may be used to reduce or oxidize metals into the optimum valence state for stabilization. Next, reagents may be added to precipitate metals in the form of highly insoluble salts. Buffers may be used to control the pH of the waste in a range of low solubility for the metals of interest. Complexing agents may also be used to sequester metals. Finally, microencapsulation of the waste in cement or another impermeable matrix may be employed.

Once samples of the final waste form are produced, they will be analyzed for constituents of concern and compared with numerical LDR UTS limits. After results have been reported to the generator and the study concluded, all unused samples, treatment residues, contaminated debris, and analytical wastes that acquired codes from the original waste will be packaged and sent to the generator's facility for storage. Perma-fix expects to further support the DOE in preparation of variance (e.g. an equivalency) petition to EPA to allow for full-scale treatment and land disposal, using the study results as the requisite technical justification.

#### Conclusion

PFF is currently permitted by the FDEP to accept and treat mixed wastes and to utilize its on-site laboratory to evaluate and optimize its treatment technologies as needed. A study is planned that will make use of this capability for a complex mixed waste. If successful, the study results will be used by the waste generator to support a variance petition to EPA for full scale treatment and disposal. All study-generated wastes will be returned back to the DOE for storage. Based on these facts, the requirements for a 40 CFR §261.4(f) Treatability Study are not applicable for this situation.

Thank you for your time and consideration of this matter.

Sincerely,



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