

APPENDIX G
HAZARDOUS, TOXIC OR RADIOACTIVE WASTE
(HTRW)

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MEMORANDUM

TO: Rick Nevulis, Project Manager, Water Supply

FROM: Robert Taylor, Lead Environmental Engineer, Land Acquisition Support
Robert Kukleski, Lead Environmental Engineer, Land Acquisition Support

DATE: October 23, 2003

SUBJECT: Confirmation Soil Sampling within the ASR Pilot Project Boundary
Hillsboro Site 1
Palm Beach County

This memo is in reference to questions raised by Mark Shafer of the US Army Corp of Engineers, Jacksonville, concerning the necessity of soil sampling in the vicinity of the Hillsboro Site 1 Aquifer Storage and Recovery (ASR) pilot project area. The District is currently in the process of preparing an Environmental Impact Statement (EIS) for the Hillsboro ASR pilot project. Based on the figure provided (copy attached), the ASR Pilot Study project area consists of an approximately 5-acre area located in the western section of the property. WCA-1 is located on the adjacent property to the north; WCA-2 is located on the adjacent property to the southwest.

A Phase I and Phase II Environmental Site Assessment (ESA) of the entire 1,660-acre Hillsboro Site 1 property was completed by Foster Wheeler Environmental Corporation (FW). The Phase I ESA was completed in April 1995 and the Phase II ESA was completed in July 1995.

The FW Phase I ESA identified obvious potential point source areas of concern across the site. These point source areas included: (1) cattle live stock pens (2) an ornamental nursery (3) former mining operations, and (4) suspected dumping.

The FW Phase I/II ESA Report referenced a 1991 Geraghty & Miller (G&M) Phase I/II ESA that was conducted of the property. FW reported that the 1991 Phase I/II ESA conducted by G&M identified detectable concentrations of 4', 4'-DDE and Gamma-BHC (Lindane) in soil samples collected adjacent to the former nursery shade house. Additionally, the G&M Phase I/II ESA identified petroleum impacted soils in the vicinity of Aboveground Storage Tanks (ASTs) associated with the former mining area.

Based on the results of the FW Phase I ESA Report, a Phase II ESA was conducted by FW to evaluate the potential impacts associated with the four areas of concern, as well as the suspected areas of concern identified in the G&M

report. The Phase II ESA included the installation of soil borings and groundwater monitor wells to evaluate soils and groundwater quality in the vicinity of the suspected areas of concern.

Cattle Live Stock Pen

The former live stock pens are located approximately 1 mile southeast of the proposed ASR project area compound. One groundwater and one soil sample were collected from the location of the cattle live stock pen area. The soil and ground water samples were analyzed for organochlorine and organophosphorus pesticides. The results of the analysis indicated that none of the constituents analyzed were present. **Based on the distance of the ASR compound to the cattle pen and the past assessment, no additional investigation or corrective action is warranted.**

Ornamental Nursery

The former ornamental nursery occupied the northwest section of the property. The proposed compound for the ASR project is partially located within the boundary of the former nursery. However, the section of the property proposed for the ASR compound is not currently utilized for agricultural cultivation.

The G&M Phase I/II ESA stated that ten shallow (0-2 feet) soil samples were collected adjacent to the former shade house/potted plant area. Please note that the location of the previous samples in proximity to the shade house is approximately 1 mile from the proposed ASR project compound. The results of the G&M report indicated that two of the ten samples contained detectable concentration of 4,4,-DDE and Lindane. The 4,4-DDE was detected at a concentration of 26 ug/kg and the Lindane was detected at a concentration of 18 ug/kg.

In light of the potential inundation/flooding of soils at the ASR compound, soil and sediment sample results from the FW and G&M Phase I/II ESAs were evaluated with respect to the Sediment Quality Assessment Guidelines (SQAG) using the values established in the *Consensus-Based Sediment Quality Guidelines for Freshwater*, published by McDonald Environmental Service Ltd. in 2000 as adopted by the Florida Department of Environmental Protection (FDEP). Groundwater samples were also compared to the Florida Administrative Code Chapter 62-777 Groundwater Cleanup Target Levels (GCTL).

The detected concentration of 4,4, -DDE (26 ug/kg) is above the SQAG Threshold Effect Concentration (TEC) of 3.2 ug/kg, but was below the Probable

Effect Concentration (PEC) of 31ug/kg. The Lindane concentration of 18 ug/kg is above the TEC concentration of 2.4 ug/kg and the PEC concentration of 5 ug/kg. In an effort to evaluate the G&M Phase II ESA, FW conducted a follow-up assessment of the ornamental nursery. During the FW Phase II ESA one sediment sample, two soil samples and seven groundwater samples were collected from various locations throughout the suspected area. The sediment sample was analyzed for organochlorine and organophosphorus pesticides. The results of the sediment sample analysis indicated that none of the constituents analyzed were detected. The two soil samples were analyzed for priority pollutant organics and no constituents analyzed for were detected. The FW soil assessment was not able to duplicate the G&M Phase II ESA detection of 4,4,-DDE and Lindane. The inability to duplicate the pesticide detections in the vicinity of the shade house indicates that those impacts previously detected were of such limited areal extent as to result in no significant consequence.

The seven groundwater samples collected were analyzed for one or more of the following analysis depending on the sample location: organochlorine and organophosphorus pesticides, glyphosate, priority pollutant organics, purgeable aromatic hydrocarbons and polynuclear aromatic hydrocarbons. The results of the groundwater analysis identified the presence of the dissolved petroleum constituent, Methyl tert butyl ether (MTBE) at 2.8 ug/l in the temporary monitor Well-4 located adjacent to the former kerosene heaters. The concentration of MTBE detected in the groundwater samples was less than the GCTL of (50 ug/l) and no other impacts were reported.

Based on the past use of this component of the property as an ornamental nursery, there exists the potential that relatively low concentrations of residual pesticides may be present in the surficial soil. Therefore, it would appear prudent to conduct a limited soil assessment at the location of the ASR system's proposed above-ground impoundment.

Former Mining Operation

The FW and G&M Phase I ESA identified an Aboveground Storage Tank (AST) compound as a potential area of environmental concern on the property. The former AST compound was located on the western central section of the property, approximately 3500 feet from the proposed ASR project compound. The G&M ESA included a soil assessment of the former AST area and the results identified petroleum impacted soils in the vicinity of the former AST. Additionally, the FW Phase II ESA included the assessment of groundwater quality in the vicinity of the former AST. The results of the Phase II ESA indicated that dissolved petroleum constituent (purgeable aromatic hydrocarbon/polynuclear aromatic hydrocarbons) were not detected in the

groundwater **Based on the results of the Phase II EA and the proximity to the proposed ASR compound to the former AST no additional assessment is warranted.**

Trash /Debris

The FW ESA identified obvious trash and debris on site. The majority of trash and debris was located east of the proposed ASR compound. It is the understanding of the Environmental Engineering Unit that the solid waste has or will be removed from the site. **Based on the results of the Phase II and the proximity of the trash/debris piles to the ASR compound, no additional assessment is warranted.**

Conclusion and Recommendation

Based on the proximity of the ASR system's proposed aboveground impoundment to the former nursery additional assessment and evaluation is recommended. The Environmental Engineering Unit (EEU) recommends the collection of 4 discrete soil samples within the proposed aboveground impoundment area. A soil sampling grid should be developed to overlay the approximately 4-acre impoundment. The purpose of the grid is to assure samples are evenly spaced throughout the proposed impoundment. The soil samples should be collected from a depth interval of 0-6 inches. During the collection of samples, care should be taken to assure that an equal volume of soil is collected from the six-inch interval. Organic material such as debris from the trees, roots, weeds or grass should not be collected with the samples. Soil samples should be submitted to a State certified laboratory for analysis of the following parameters:

EPA Method 8141	Organophosphorus Pesticides
EPA Method 8151	Herbicides
EPA Method 8081	Organochlorine Pesticides
EPA Method 6010	arsenic
EPA Method 6010	Copper
EPA Method 6010	Chromium
EPA Method 6010	Lead
EPA Method 6010	Selenium
EPA Method 6010	Mercury
EPA Method 6010	Zinc
	Total Organic Carbon

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Upon receipt of the analytical results, the detected parameters should be compared with the FDEP SCTLs and SQAGs.

Additional information concerning the previous sampling is available within the FW Phase I/II ESA reports. Please contact Bob Kukleski (ext. 2265) or Bob Taylor (ext. 2264) if you have questions or require a copy of the FW reports.

RT/mem
Attachment

c: Tom Olliff
Ruth Clements
Tom McCracken
Jim Bridgeman

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MEMORANDUM

TO: Robert Verrastro, Project Manager, Water Supply Department

FROM : Robert Taylor, Lead Environmental Engineer, Land Acquisition Support
Robert Kukleski, Lead Environmental Engineer, Land Acquisition Support

DATE : September 15, 2003

SUBJECT: Confirmation Soil Sampling within the ASR Project Boundary
Berry Groves, Hendry County

This memo is in reference to the U.S. Fish & Wildlife Service (USFWS) comments concerning the necessity of soil sampling in the vicinity of the Caloosahatchee River Aquifer Storage and Recovery (ASR) proposed Pilot Study Project compound. Based on the figures provided, the ASR Pilot Study project area consist of approximately 10 acres, measures 300 feet by 1,500 feet, and will be located within the Berry Groves citrus farm, south of the header canal and east of the Townsend Canal.

Caloosahatchee ASR Site

As part of the NEPA review of a federal project, a survey of the project lands is performed to ensure that there is no HTRW contamination on the property. In addition, the past use of the lands is studied in terms of the potential that the future project related land use will not negatively impact fish and wildlife. The Caloosahatchee ASR project includes the construction of a pond with a sub-surface filter that will be used to provide the treatment of surface waters prior to delivery to the ASR wellhead. The lands used for the project site were formerly used as a citrus grove.

For the Caloosahatchee Pilot ASR

potential for HTRW contamination

The construction of storage ponds on lands formally used for agriculture can result in adverse impacts to fish and wildlife as a result of bioaccumulation of pollutants such as heavy metals and pesticides that are

A Phase I and Phase II Environmental Site Assessment (ESA) of the Berry Groves site was completed by URS Corporation Inc. in December 1999.

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Additionally, a Phase III Ecological Risk Assessment (ERA) was recently completed by URS in January 2002.

The Phase II ESA identified 17 point source areas across the site. The point source areas were generally comprised of chemical storage areas, maintenance areas, dump sites and fuel storage areas. Excluding the main pump station located on the Townsend Canal there are no documented point source areas located in close proximity to the proposed ASR Pilot Study Project compound. The Phase I ESA indicated that the main pump station was electrically operated and therefore was not considered a concern to soil or ground water quality. In addition to the point source areas, the Phase II EA identified residual concentrations of copper in cultivated areas of the site. The site wide average for copper across the site was calculated at 45.65 milligrams per kilogram (mg/kg).

Two soil samples and one sediment sample were collected in the general vicinity of the proposed ASR Pilot Study compound during the Phase II EA. Soil Samples collected during the Phase II EA were analyzed for Environmental Protection Agency methods (EPA) 531 Aldicarb, 525.2 N/P Pesticides, 504 EDB, 8141 Organophosphorus Pesticides, 8081 Chlorinated Pesticides, 8151 Herbicides, 8260 Volatiles, Benomyl, Arsenic, Boron, Chromium, Copper, Lead, Zinc. The results of the two soil samples indicated low levels of chromium detected at 5.8 mg/kg, copper (8 mg/kg and 16 mg/kg), and zinc (11 mg/kg and 17 mg/kg) in the surficial soil. However the concentrations were below the Florida Department of Environmental Protection (FDEP) Soil Cleanup Target Concentration (SCTL) as well as FDEP Sediment Quality Assessment Guidelines (SQAG). The one sediment sample was collected from the western end of the header canal for the analysis of copper. The results of the sediment analysis indicated that the concentration of copper was 6.45 mg/kg, also below the SCTL and the SQAG.

Additionally, two composite soil samples were collected in the vicinity of the proposed ASR Pilot Study compound for the analysis of copper during the Phase III ERA. The results of the composite samples analysis indicated detectable concentration of copper at 33.6 mg/kg and 27.2 mg/kg. These concentrations of copper were also less than the FDEP SCTL and the SQAG for copper.

The results of the Phase II EA indicate that there is little likelihood that the 10-acre project site poses a HTRW risk since there were no soil or sediment samples that had concentrations of pollutants in excess of the FDEP SCTL and SQAGs.

The conceptual plan for water treatment at this site includes a "natural subsurface filter" as the primary treatment unit. This subsurface filter will be constructed using the available soil as a filtration material. As a precaution, additional soil testing is underway to ensure that this filter material does not contain any pollutants in concentrations that would result in either excessive bioaccumulation or pollutant levels in filtered water that exceed primary drinking

water standards. The additional samples will be collected from a depth interval of 0-6 inches. Care will be used to assure that an equal volume of soil is collected from the six-inch interval. The soil samples will be analyzed for the following compounds by a state certified laboratory.

EPA Method 531.1	Carbamates
EPA Method 8141	Organophosphorus Pesticide
EPA Method 8151	Herbicides
EPA Method 8081	Organochlorine Pesticides
EPA Method 6010	arsenic
EPA Method 6010	copper
EPA Method 6010	chromium
EPA Method 6010	lead
EPA Method 6010	selenium
EPA Method 6010	mercury
EPA Method 6010	zinc
	Total Organic Carbon

Upon receipt of the analytical results the detected parameters will be compared with the FDEP SCTLs and SQAGs. It is not likely that the results of the additional sampling will indicate that there is a contamination problem; however, in the event that concentrations exceed the limits; the clean sands will be brought to the site for use as filtration material.

Additional information concerning the previous sampling is available within the URS reports. Please contact Bob Kukleski (ext. 2265) or Bob Taylor (ext. 2264) if you have questions or require a copy of the URS reports.

- c: Tom Olliff
Ruth Clements
Tom McCracken
Jim Bridgeman
Agnes Ramsey