Health Assessment for

ZELLWOOD GROUNDWATER CONTAMINATION SITE

ZELLWOOD, ORANGE COUNTY, FLORIDA

CERCLIS NO. FLD049985302

AUGUST 21, 1986

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
Agency for Toxic Substances and Disease Registry

August 21, 1986

Acting Director
Office of Health Assessment

Zellwood Groundwater Contamination (SI-86-142B)
Zellwood, Florida

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EXECUTIVE SUMMARY

The Zellwood Groundwater Contamination Site, located in Orange County, Florida, is the site of several operations which have added contaminants to the surface and subsurface soil, sediments in nearby streams, and to the surficial aquifer. An emergency removal operation in 1983 transferred empty drums and waste piles away from the site. A Remedial Investigation/ Feasibility Study (RI/FS) has been conducted to characterize the site in preparation for making a decision on how to remove the contaminants.

BACKGROUND

This site consists of 57 acres in northwestern Orange County, Florida. Since the 1960s the site has been, at various times, the location of a steel drum recycling facility, a blended liquid fertilizer facility, a producer of cleaning products for the citrus industry, and a vegetable washing and packing facility.

The drum recycling company discharged its wastewater into two unlined evaporation/percolation ponds until 1980. The ponds were cleaned out and the sludge temporarily stored on the surface of the ground. The wastewater from the fertilizer company, generated by washdown from in-house

cleaning, was discharged to three unlined evaporation/percolation ponds. The washwater from the vegetable washing facility is discharged to a nearby ditch.

An empty field in the northern portion of the site was used as a disposal site for empty drums. In 1983, an emergency removal operation was conducted at the drum site and the drums were assembled and transported to a recycling company. The waste piles in the abandoned drum area were not a RCRA waste and were disposed of in a sanitary landfill.

The Zellwood Groundwater Contamination Site was evaluated in September 1981 as part of the nationwide EPA program to rank hazardous waste sites under the mandate of the Comprehensive Environmental Response, Compensation and Liability Act. The site was proposed for inclusion on the National Priority List in December 1982.

LIST OF DOCUMENTS REVIEWED

"Final Remedial Investigation, Zellwood Groundwater Contamination Site, Orange County, Florida," Volumes I and II, Sections 1-7, NUS Corporation, May 1986, Revision 1.

"Draft Feasibility Study, Zellwood Groundwater Contamination Site, Orange County, Florida," NUS Corporation, April 1986, Revision 0.

"Draft Endangerment Assessment, Zellwood Groundwater Contamination Site, Orange County, Florida," NUS Corporation, June 1986, Revision 0.

CONTAMINANTS OF CONCERN

Arsenic
Benzo(a)pyrene
Chlordane

Chromium
Nitrate-nitrogen
Cyanide

DISCUSSION

This site has been characterized by extensive surface, sub-surface, and groundwater sampling. The data show that there has been significant contamination of the surface soil, sediments in nearby ditches, and of the surficial aquifer. The Floridan aquifer, which is separated from the surficial aquifer by the low permeability Hawthorn formation, has been sampled through nearby drinking water supply wells and by monitoring wells. Initial samples showed some contamination of this aquifer; however, resampling did not reveal any contaminants which exceeded the EPA drinking water standards.

The contaminated surface soil areas include the abandoned drum area, the drum service covered ponds, the temporary sludge storage area, and sediment in the northern, middle, and southern ditches which drain the site. The sediments contain levels of arsenic, chlordane, and chromium at levels of concern. The surface soil contains chlordane and chromium at levels of concern.

The groundwater contamination is in the surficial aquifer, which is the uppermost aquifer. The levels of contaminants in this aquifer render it unsuitable for consumption. At this time, the surficial aquifer is not being used by anyone as a drinking water source. Contaminants of concern found in the surficial aquifer are arsenic, chlordane, chromium, lead, nitrate-nitrite nitrogen, and cyanide. Cyanide is found at a maximum concentration of 200 mg/l. At this concentration, ingestion of 4.8 ounces of this water would be lethal to a child weighing 10 kilograms. (lethal dose = 2857 ug/kg.) The primary concern with cyanide is that any excavation below the water table may expose a nearby population to cyanide

in the contaminated groundwater in the excavation at acutely toxic levels. Should the contaminated plume of groundwater move off-site, the possibility of exposure during soil excavation would become more likely.

The subsurface soil contains several of the indicator chemicals; however, the levels are not significant from the standpoint of exposure. This soil may serve as a reservoir for contaminants leaching into the surficial aquifer.

The Draft Feasibility Study described eight alternatives for addressing the contamination at this site. The alternatives were developed in accordance with the methodology in the National Contingency Plan. The alternatives vary from "no-action," with monitoring of the surficial and Floridan aquifer, to complete removal of contaminated groundwater and soil with off-site disposal. ATSDR's concern with the selection of an alternative is that it must address the issue of protecting public health. At this time there is no one exposed to the media of highest concern, the groundwater, since it is not used as a drinking water source. However, it is possible that persons may come in contact with this water under certain conditions, such as during excavation. The subsurface soil, as well as the surface soil and sediment, may serve as a reservoir for contaminants to move into the surficial aquifer. The levels of contaminants in the surface soil are marginal in terms of a health concern. An alternative which addresses the above concerns would be acceptable.

Alternative 1 would clearly not meet the above objective. Alternative 2, likewise, would not meet the above objective, since the contaminated groundwater would be left in place. Alternatives 3 through 8 would all meet the objective of removing the material containing the contaminants of concern from exposure to humans except that Alternative 3 would leave the sediment in place. Removal of soil, other than the waste pile, would

possibly expose the surrounding population to contamination from fugitive dust. The technical and economic feasibility of these alternatives will likely control the selection.

CONCLUSIONS

1. The surface of the site is only marginally contaminated from the public health standpoint at this time, and there is little likelihood of a health problem due to exposure to surface soil.

2. The subsurface soil and the sediment are possibly serving as reservoirs for contaminants reaching the surficial aquifer. The sediment contains concentrations of contaminants high enough to be of concern if exposure to humans occurs.

3. The surficial aquifer is contaminated with levels of chemicals, primarily arsenic, chromium, cyanide, and nitrate, which are of a public health concern if ingested.

4. There is the possibility of the contamination of the Floridan aquifer with chemicals from the surficial aquifer; however, at this time there appears to be no indication that this is happening.

5. Alternatives 3 through 8 appear to meet the criteria of removing the contaminants from possible contact with humans.

RECOMMENDATIONS

1. An alternative which meets the criteria of protecting public health should be selected immediately and implemented due to the possibility of the movement of the contaminants in the groundwater.

2. The alternatives should consider the removal of the sediments since the levels of arsenic, chlordane, and chromium are high enough to be

of concern. This is considered in Alternative 4; however, Alternative 3, which is said to satisfy public health concerns, does not include this action.

3. The impact of soil removal, other than the sediments, should be carefully evaluated, since the levels of contaminants on the surface are minimal. If an alternative is chosen which involves soil removal, provisions for control of fugitive dust must be made.

4. Any water treatment processes should be evaluated for possible release of contaminants to the air and subsequent inhalation of these chemicals by the nearby population.

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