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C.M. CHRISTIANSEN, FOUNDER

R.L. CHRISTIANSEN, ~~PRESIDENT~~ Director
P.C. CHRISTIANSEN, ~~EXEC. VICE PRES.~~ PRES. & GEN. MGR.
M.M. SAUCKE, SECRETARY &
~~WHITWATER ASSOC.~~, TREASURER



January 5, 1988

Gary F. Kulibert
Dist. Solid Waste Coordinator
WISCONSIN DEPT. OF NATURAL RESOURCES
BOX 818
Rhineland, WI. 54501

RE: File #4400

Dear Mr. Kulibert:

Following receipt of your letter dated November 3, 1987 and my phone call to your Secretary on December 14, 1987, we have completed a preliminary Phase I of an environmental investigation, including soil analysis for both Pentachlorophenol (PCP) and Fuel Oil, data interpretation (at no small cost), which is enclosed herewith in duplicate. This work was done by competent and qualified people in the area. I guess the next step is the water sampling procedure as outlined in study area and report thereon.

Please advise the procedure we should take under the circumstances.

Sincerely,

C. M. CHRISTIANSEN CO.

P. C. Christiansen
President & C.E.O.

PCC/ms

Encl: Original & one copy analysis from Whitewater & Assoc.

Results of Soil Analysis for
Pentachlorophenol (PCP) and Fuel Oil
at Site of Pole-Dipping Operation
in Phelps, Wisconsin

A Report Submitted to


P.C. Christiansen
President & Chief Executive Officer
C.M. Christiansen Company
Phelps, Wisconsin 54554

on

January 4, 1988

by

White Water Associates, Inc.
P.O. Box 27
Amasa, Michigan 49903



*Ecological Consulting and
Environmental Laboratory Services*

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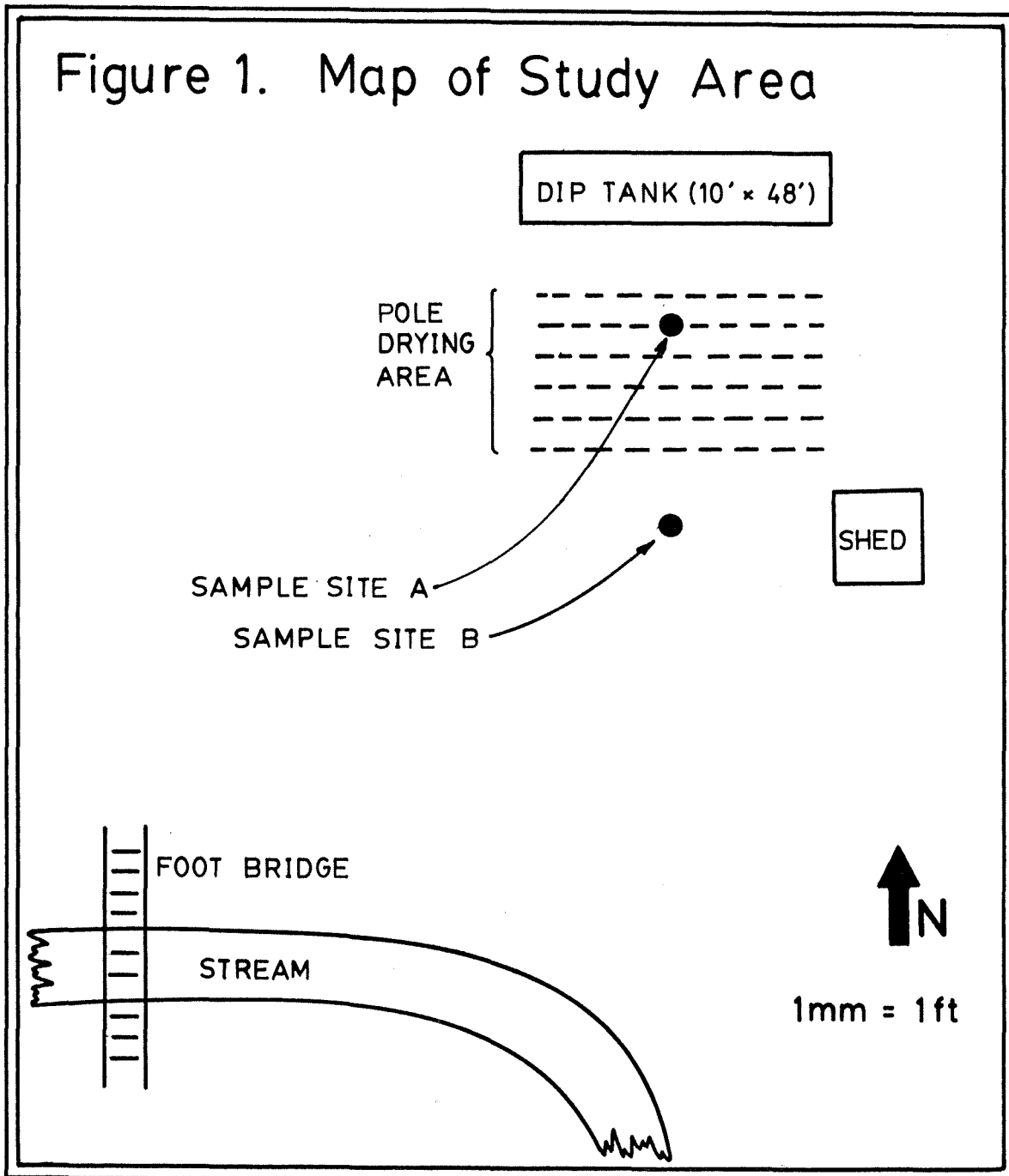
INTRODUCTION

On 14 December 1987 (0900-1130 hours), Dr. Dean Premo of White Water Associates, Inc. took soil samples on a site owned by C. M. Christiansen/^{Co.}near the town of Phelps, Wisconsin. From 1954 through 1978, a pole-dipping business operated at this site where telephone poles were treated in a bath of wood preservative. The wood preservative solution was 5% pentachlorophenol (PCP) in a carrier of AMOCO #2 fuel oil. The soil samples collected were tested for both PCP and #2 fuel oil. This sampling was intended as a preliminary study to determine if soil contamination is present and if further investigation is warranted.

STUDY AREA DESCRIPTION

Figure 1 is a map of the study area. The dip tank is 10 by 48 feet and approximately 4 feet deep. The dip tank is located approximately 120 feet from a stream and wetland area. Immediately south of the dip tank is the drying area where logs were placed after being lifted from the dip tank. Two soil cores (Sample Sites A and B) were taken in the vicinity of the drying area. Sample Site A was located on a perpendicular line from the center of the dip tank and 16 feet south of the dip tank's south wall. Sample Site B was located on the same line 46 feet from the dip tank's south wall. There is approximately 30 inches difference in elevation between sample sites A and B. There was five to six inches of snow on the ground. The surface soil was not frozen.

Figure 1. Map of Study Area



PROCEDURES

Field Procedures:

Field work consisted of site mapping and soil sampling. Soil samples were taken using a stainless steel, hand operated soil corer with 3.25 inch diameter and 6.75 inch length sample tube. Four 500 gram soil samples were taken (two from Sample Site A and two from Sample Site B). Sample Site A soil samples were taken from the 18-24" horizon and the 66-72" horizon. Groundwater level was approximately 40 inches below surface in Sample Site A. Sample Site B soil samples were collected from the 18-24" horizon and the 60-66" horizon. Groundwater level in Sample Site B was approximately 36 inches below surface. At the 24-36" horizon in Sample Site B, some rotting wood (apparently old fill material) was encountered. All samples were placed in organic-cleaned wide-mouthed glass soil jars with a teflon-lined seal.

Laboratory Procedures:

Each soil sample was solvent-extracted and analyzed for levels of pentachlorophenol (PCP) and fuel oil. PCPs were measured according to Environmental Protection Agency (EPA) method #604. Fuel oil was measured using a calibration curve with a test sample of AMOCO #2 fuel oil and an extracted soil sample according to EPA method #602. Lab analyses were performed by SEG Laboratories, Inc., Lansing, Michigan.

RESULTS

There was a slight fuel oil odor in all four samples and a visible oil film observed in the wet samples (taken below the water table). Fuel oil concentrations were below the detectability limit of the

procedure used. Results of the laboratory analyses are summarized in Table 1 (below).

Table 1. Summary of Analyses for Pentachlorophenol (PCP) and AMOCO #2 Fuel Oil (#2FO).

Sample Site and Depth	Concentration PCP	Concentration #2FO
A (18-24")	48 ug/L	< 0.010 mg/L
A (66-72")	56 ug/L	< 0.010 mg/L
B (18-24")	36 ug/L	< 0.010 mg/L
B (60-66")	44 ug/L	< 0.010 mg/L
B (60-66") replicate	40 ug/L	- - -

Note: "ug/L" indicates micrograms per liter;
 "mg/L" indicates milligrams per liter.

DISCUSSION

The U.S. Environmental Protection Agency has set forth criteria pertaining to toxicity of pentachlorophenol (PCP). The following information is referenced from EPA Ambient Water Quality Criteria for PCP (EPA-440/5-86-009), Sept. 1986. The acute toxicity level for aquatic life with ambient pH of 7 is 9.0 ug/l PCP. The chronic toxicity level at pH 7 is 5.7 ug/l PCP. As pH increases to 8, toxicity of PCP decreases with acute levels at 24.8 ug/l PCP and chronic levels at 15.6 ug/l. The levels of PCP found in the soil samples taken at both Study Site A and B are approximately 3 times greater than toxic levels for aquatic life. This could be critical to aquatic life in the adjacent creek if groundwater from the area is discharged into the creek or if natural or beaver-induced flooding would

bring stream water into contact with the contaminated soil or ground water. The pH of the creek water would be an important factor in determining the biological consequences of PCP contamination. In terms of public health consequences, EPA Ambient Water Quality Criteria for PCP October, 1980 (EPA-440/5-80-065) indicates that acceptable daily limit for human consumption is 2 liters of water at levels below 1.05 mg/l PCP (1050 ug/l PCP). From this standpoint, with the given data, no serious threat to human health appears to exist at the study area from PCP.

A primary concern is whether groundwater from the pole-dipping area contaminates the nearby stream in concentrations high enough to constitute a threat to aquatic life. Further sampling could address this concern. The stream should be measured for pH, discharge rate and PCP levels at sampling locations upstream, downstream and at the area where contamination from the study site to the stream is likely to occur. These measurements should be taken a minimum of 4 times during the course of a year to include seasonal differences in stream discharge and runoff. Further, one or two additional samples could be taken at times of major rain events.