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DEPARTMENT OF THE AIR FORCE

HEADQUARTERS 49TH FIGHTER WING (ACC)
HOLLOMAN AIR FORCE BASE, NEW MEXICO

12 JUN 1995

MEMORANDUM FOR RCRA PERMITS PROGRAM
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FROM: 49 CES/CD
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SUBJECT: Holloman AFB (HAFB) Sewage Lagoons: Site Characterization Report

1. Enclosed please find the Site Characterization Report for the HAFB Sewage Lagoons. This document summarizes data collected in 1994 and 1995, and characterizes the present condition of the lagoons in comparison with past conditions. The document supplements the closure plan submitted in May 1995 by updating the characterization of site conditions. In July 1995, you will receive the Biological Resources Report, which will examine the ecological impacts of various closure alternatives, and the Risk Assessment Update, which will address data gaps and other issues identified in the 1993 risk assessments.

2. Please direct any questions to Dr Fred Fisher of the Civil Engineer Environmental Flight, 49 CES/CEV, (505) 475-3931/5062.

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Attachment:
Site Characterization Report

Attachment
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Headquarters, Air Combat Command
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Draft Final

Site Characterization Report

Sewage Lagoons Closure Project

June 1995

49th FIGHTER WING

49 CES/CEV
Holloman Air Force Base,
New Mexico

PURPOSE OF DOCUMENT

A. The *Site Characterization Report* compiles and summarizes the results of the investigations performed at the Holloman Air Force Base (AFB) sewage lagoons between 1990 and 1994. In addition to presenting the analytical results for each investigation, this report addresses each sewage lagoon by sampling matrix and discusses trends over time for the primary constituents found in the sewage lagoons.

B. This characterization report provides a summary of the 1994 surface water and sludge investigation. The report presents the investigation's objectives, data evaluation criteria, results, and conclusions. This report also describes how the results of the 1994 investigation will support the 1995 risk assessment addendum and the corrective measures study.

C. The appendices of this report present a summary of analytical results for all surface water, sludge, and soil investigations that have occurred at the sewage lagoons between 1990 and 1994. For each investigation, results are presented by medium, sample location, and constituent analyzed. In addition, all analytical flags and reporting limits are provided.

DCN 95-670-008-08

SITE CHARACTERIZATION REPORT

SEWAGE LAGOONS CLOSURE PROJECT
HOLLOMAN AIR FORCE BASE, NM

Draft Final

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ACRONYMS

AFB	Air Force Base
bgl	Below ground level
BLM	Bureau of Land Management
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CMS	Corrective measures study
DERA	Defense Environmental Restoration Account
DoD	Department of Defense
EPA	Environmental Protection Agency
FR	Federal Register
FWS	Fish and Wildlife Service
GC/MS	Gas chromatography/mass spectroscopy
HHSs	Human Health Standards
HQ ACC	Headquarters Air Combat Command
HWMR	Hazardous Waste Management Regulations
HWMU	Hazardous waste management unit
IRP	Installation Restoration Program
LCS	Laboratory control sample
MCLs	Maximum contaminant levels
MDL	Maximum detection limit
NMED	New Mexico Environment Department
NPDES	National Pollutant Discharge Elimination System
ND	Not detected
NSSS	National Sewage Sludge Survey
PCBs	Polychlorinated biphenyls
PCCP	Post-Closure Care Permit
QA/QC	Quality assurance/quality control
RCRA	Resource Conservation and Recovery Act
RL	Reporting limit
SARA	Superfund Amendments and Reauthorization Act
SMCLs	Secondary maximum contaminant levels

ACRONYMS
(Continued)

SQCSR	Sampling quality control summary report
TC	Toxicity characteristic
TCLP	Toxicity Characteristic Leachate Procedure
TDS	Total dissolved solids
TSCA	Toxic Substance Control Act
UTL	Upper tolerance limit

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Section 1
INTRODUCTION

This site characterization report compiles and summarizes the results of investigations performed at the Holloman Air Force Base (AFB) sewage lagoons between 1990 and 1994, with an emphasis on the 1994 investigation. In addition to presenting analytical results for each investigation, the report discusses trends over time for the primary constituents found in the sewage lagoons. The results of the investigations are presented in Section 4 and are compiled so as to allow the results to be reviewed for each sewage lagoon by medium (surface water, sludge, soil). This format will assist in the future preparation of the corrective measures study (CMS).

1.1 Background

The current wastewater treatment facility at Holloman AFB consists of seven sewage lagoons (Ponds A through G) that discharge through a ditch to Lake Holloman, which during low evaporation periods can overflow to Lake Stinky. The configuration of the sewage lagoon system is presented in Figure 1.1-1. This report addresses Ponds A through G.

The sewage lagoons are included in the Installation Restoration Program (IRP) being conducted at Holloman AFB and are referred to as IRP Site 49. The IRP was established to investigate past waste disposal sites at Department of Defense (DoD) installations. Implementation of the IRP generally follows the provisions of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the 1986 statutory amendments to CERCLA (the Superfund Amendments and Reauthorization Act [SARA] Section 9620), which made clear that the provisions of the National Contingency Plan apply to federal facilities.

As a DoD facility, Holloman AFB receives funding for the IRP from the Defense Environmental Restoration Account (DERA). Consequently, many of the activities for the investigation and remediation of the sewage lagoons must be coordinated through the IRP, which, as stated previously, generally follows the provisions of CERCLA.

The sewage lagoons (Ponds A through G) have been identified by both the U.S. Environmental Protection (EPA) and New Mexico Environment Department (NMED) as hazardous waste management units (HWMUs). Because of their identification as HWMUs, they are regulated under the Resource Conservation and Recovery Act (RCRA). This classification is based on the contention that the sewage lagoons allegedly received listed hazardous wastes after the applicable date of the substantive RCRA rules. Ponds A through G are regulated by NMED under the New Mexico Hazardous Waste Management Regulations (HWMR-7), Part V, 40 CFR 264.

1.2 Summary of Previous Investigations

Several investigations have been performed at the sewage lagoons since 1990. These investigations have been conducted on surface water, sludge, and soil. Table 1.2-1 summarizes the sewage lagoons investigated, the number of locations sampled, and the analyses performed on the samples. As can be seen in the table, the investigations were phased in order to best characterize the sewage lagoons. The 1992 investigation was performed to define the nature of contamination in Lagoons C through G; therefore, samples were collected and analyzed for the Appendix IX constituents.

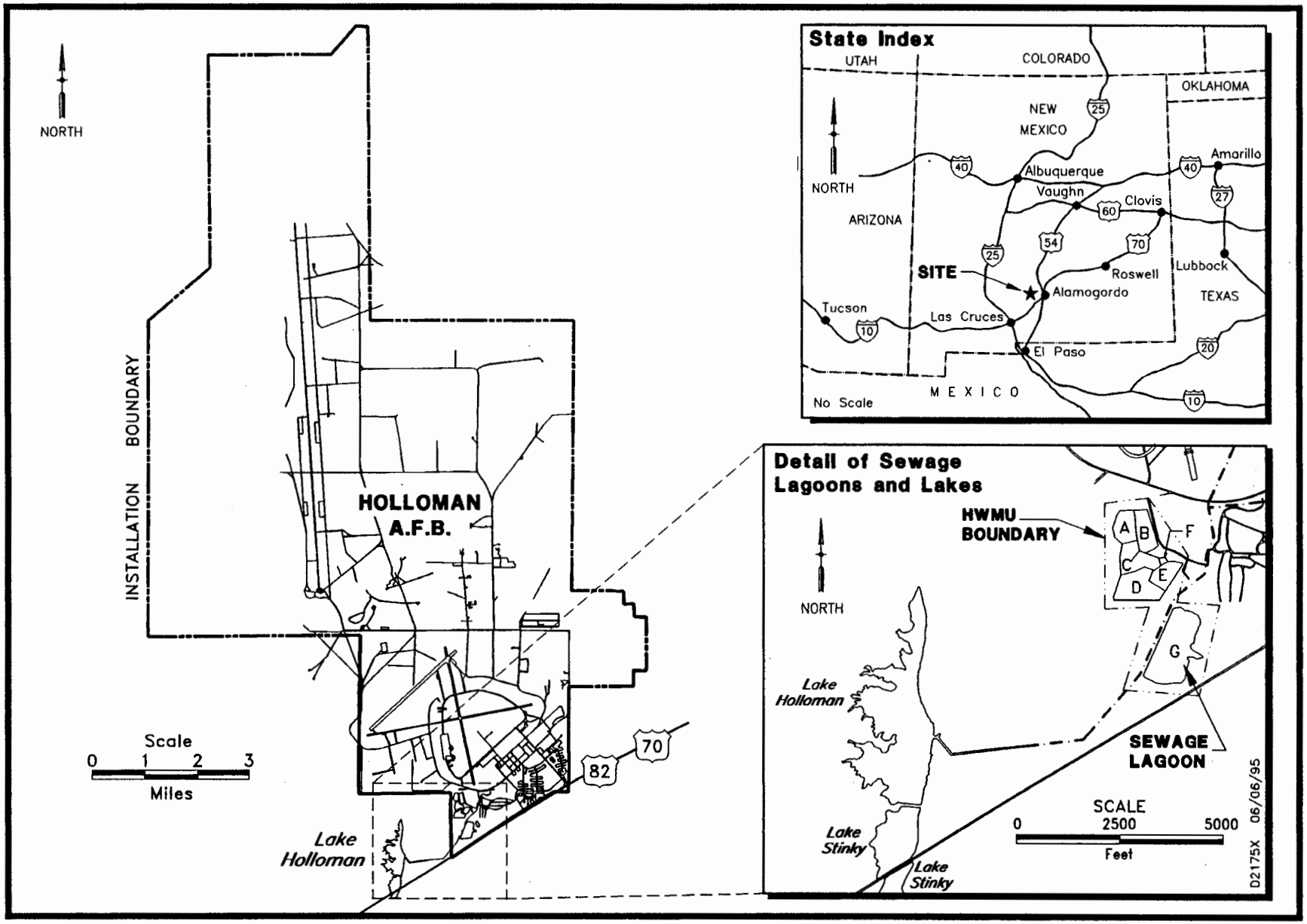

Figure 1.1-1. Location of the Sewage Lagoons at Holloman AFB

Table 1.2-1 Summary of Sewage Lagoon Investigations

Medium	Year	Number of Sample Locations[a] in Each Sewage Lagoon							Analyses Performed
		Pond A	Pond B	Pond C	Pond D	Pond E	Pond F	Pond G	
Surface Water	1990	--	5	5	5	5	--	5	Semivolatiles, Organochlorine Pesticides, PCBs, and Metals
	1993	1	1	--	1	1	1	1	Organochlorine Pesticides
	1994	--	--	3	3	3	--	9	Total Lead and Organic Lead
Sludge	1990	28[b]	37	6	--	--	--	--	Ponds A, B, and C - PCBs; Pond C - VOCs, Semivolatiles, Chlorinated Herbicides, Organochlorine Pesticides, and Metals
	1992	--	--	6	--	5	2	6	Appendix IX Constituents
	1994	6	6	13[c]	16	16	--	19[d]	Ponds A and B - PCBs Ponds A, B, and C - TCLP Metals, and Total and Reactive Sulfides; Ponds C, D, E, and G - Organochlorine Pesticides and Metals; Ponds C and G - Kepone
Sediment[e]	1993	1				1			Semivolatiles, Organochlorine Pesticides, and Metals
Soil	1990	8	6	6	--	--	--	--	Ponds A and B - Appendix IX Constituents Pond C - VOCs, Semivolatiles, Chlorinated Herbicides, Organochlorine Pesticides, PCBs, and Metals
	1992	--	--	8	9	8	1	8	Appendix IX Constituents

[a] This table presents the number of sample locations and not the number of samples collected. At some locations multiple samples were collected.
[b] Originally 25 sludge samples were collected during the 1990 investigation. One sample had questionable data, and three additional samples were collected to verify or disprove the questionable data. Therefore, a total of 28 sludge samples were collected in 1990.
[c] Six samples were analyzed for TCLP metals and for sulfides; eight were analyzed for kepone.
[d] Twelve samples were analyzed for kepone.
[e] For purposes of characterizing the sewage lagoons, the sediment samples were considered as sludge samples. The sediment samples were near surface composite samples collected as part of the biota sampling to correlate constituents found in benthic organisms with the environment in which they lived.

PCBs = Polychlorinated biphenyls.
TCLP = Toxicity characteristic leaching procedure.
VOCs = Volatile organic compounds.

The 1992 investigation determined that the only significant constituents in Ponds C through G were metals and organochlorine pesticides in the sludge. This investigation determined that the migration of organochlorine pesticides and metals to the soil was minimal. The 1994 investigation was performed to define more precisely the extent of these metals and organochlorine pesticides in the sludge. The following sections summarize the investigations.

1.2.1 Surface Water Investigations

In October 1990, surface water samples were collected from the sewage lagoons and analyzed for polychlorinated biphenyls (PCBs), organochlorine pesticides, metals, and semivolatile organic compounds. The objective of this effort was to obtain accurate surface water quality data for input to the risk assessment being prepared. Two samples were collected from the wastewater treatment facility headworks, and five samples each were collected from Ponds B, C, D, E, and G. Sample locations were chosen to represent the areal distribution and variation of water quality within each sewage lagoon.

Organic lead was detected at concentrations less than five times the detection limit during the 1990 investigation. However, its concentration was considered suspect, since similar concentrations were detected in rinsate blank samples and the detected concentration for organic lead exceed that for total lead. Analytical results of the investigation are reported in the *Draft A-E Sampling and Quality Control Summary Report (A-E SQCSR) for Sewage Lagoon Surface Water Sampling* (Radian, 1990). The questionable detections of organic lead were disproved in the 1994 investigation, as described in Section 1.3.

In 1993, surface water samples were collected during the biota sampling event. The samples were analyzed for organochlorine pesticides.

1.2.2 Sludge, Sediment, and Soil Investigations

In 1990, sludge from Ponds A and B was sampled in order to verify that all sludge containing concentrations of PCBs exceeding the Toxic Substances Control Act (TSCA) regulatory level of 25 mg/kg (40 CFR 761.125) had been removed. The results indicated that none of the sludge exceeded the regulatory level.

Soil and sludge from Pond C were sampled in the area around the influent points from Ponds A and B during the 1990 investigation. The objective of collecting these samples was to determine whether PCB-contaminated media had flowed from Ponds A and B into Pond C. No PCBs were detected in any of the samples. Samples were also analyzed for organochlorine pesticides, and detections in two sludge samples were at concentrations ranging from 6 to 16 mg/kg. By analyzing underlying soil samples, it was concluded that these compounds had not migrated to the underlying soil. Kepone was also detected, but the results were suspect because of matrix interferences causing poor recoveries. Heptachlor epoxide and isodrin were analyzed by gas chromatography (GC) and were detected in a single GC column, but were not confirmed by the second column. Therefore, the heptachlor epoxide and isodrin results were also suspect.

In October 1991, a preliminary investigation was performed to determine the depths of sludge and surface water in each of the sewage lagoons. This investigation was used to prepare a conceptual plan for the 1992 investigation. The sampling was required by NMED to support review of the Post-Closure Care Permit (PCCP) application. Its intent was to characterize Ponds C through G, provide a preliminary estimate of the nature and extent of contamination, and determine how the results might affect final closure.

This investigation included sampling and analyzing the sludge and underlying soil for Appendix IX constituents. The investigation indicated that the primary contaminants in the sludge from the sewage lagoons were metals and organochlorine pesticides. The results of the investigation are documented in the *Site Characterization Report, Sewage Lagoon Investigation* (Radian, 1992). Heptachlor epoxide and isodrin again were detected in this investigation, but were still considered suspect for the same reasons cited for the 1990 investigation. The results indicated that concentrations in the soil were significantly lower than those in sludge.

In 1993, near-surface sediment samples were collected during the biota sampling event. The objective was to correlate the constituents found in benthic organisms with the environment in which they live. These samples will be evaluated and reported in the ecological risk assessment report scheduled for submittal in July 1995.

1.3 1994 Investigation

The 1994 investigation was initiated by Holloman AFB to support all data needs for closure of the sewage lagoons. To ensure that all parties were involved in the planning for final investigation, Holloman AFB completed the *Draft Final Conceptual Plan for Additional Sampling, Sewage Lagoons and Lakes Investigation* (Radian, 1994a). This document was submitted to NMED, EPA Region VI, the Fish and Wildlife Service (FWS), Bureau of Land Management (BLM), and Headquarters Air Combat Command (HQ ACC) for their input and review in January 1994. Comments on the sampling plan were not received from these agencies.

Sample locations for the 1994 investigation were determined through geostatistical analysis of the previous data. Plans prepared for the investigation included a quality assurance project plan, field sampling plan, and a health and safety plan. These individual plans are contained in the *Project Plans, Sewage Lagoons and Lakes Closure Plans, October 1994* (Radian 1994b) and *Project Plans, Sewage Lagoons and Lakes Closure Project Addendum, March 1995* (Radian, 1995a). The field sampling plan was previously submitted as Appendix B in the *Sewage Lagoons Closure Plan* (Radian, 1995b).

1.3.1 1994 Investigation Objectives

The overall objective of the 1994 sampling was to gather data to support closure of the sewage lagoons. Data are necessary to conduct an accurate and complete risk assessment and to provide sufficient information needed to evaluate remedial alternatives in the CMS. The specific objectives for support of the risk assessment and CMS are discussed below.

Support of the Risk Assessment— Uncertainties in the 1993 risk assessment included the suspect results for heptachlor epoxide, isodrin, kepone, and organic lead found in previous investigations.

As mentioned above, in the previous investigations heptachlor epoxide and isodrin were detected, but were not confirmed using the GC methodology. Heptachlor epoxide and isodrin had been reported on only one of the two GC columns used to analyze pesticides. These unconfirmed results indicated potential risks to human receptors at the sewage lagoons. To overcome the analytical problems, the GC methodology was supplemented during the 1994 investigation with gas chromatography/mass spectroscopy (GC/MS) (Method SW8270). All of the samples submitted for organochlorine pesticide analyses were also extracted for analysis by GC/MS. Samples with unconfirmed hits for isodrin or heptachlor epoxide were then analyzed by Method SW8270 to confirm or disprove their presence without question.

During investigations prior to the 1994 investigation, the presence of kepone was uncertain. For example, in the 1992 investigation,

kepone was not detected in any of the samples. However, the laboratory control sample (LCS) recoveries were zero percent. This indicated that if kepone had been present in the sewage lagoons, it may not have been detected. For the 1994 investigation, a different laboratory was contracted to analyze these samples because of its proven capabilities in analyzing for kepone in difficult matrices. The laboratory performed the analysis with quadropole mass spectroscopy using gas chromatography/electron capture negative ion mass spectrometry. Kepone was quantitated using isotope dilution. This method was specific to kepone and enabled the laboratory to determine its presence or absence with a high degree of certainty.

In previous investigations, organic lead was detected below the reporting limit. However, the detection limits for organic lead exceeded the total lead detection limits by more than 50 times, and organic lead was detected at similar concentrations in the equipment rinsate samples. Therefore, the results for organic lead were considered suspect. These questionable results caused organic lead to be identified as a risk driver for the sewage lagoons. To resolve this uncertainty, the extraction procedure for organic lead was modified in 1994 so that a larger sample size was used, which resulted in lower detection limits.

Support of the Corrective Measures Study—The 1994 investigation generated additional sludge data required for the CMS and for the closure of the sewage lagoons. Also, data regarding the sludge depths and volumes were needed. The sludge was characterized by analyzing for reactive sulfides and for Toxicity Characteristic Leachate Procedure (TCLP) metals. This would determine whether the sludge exhibited any hazardous characteristics that would have to be considered during the CMS.

The depths and quantities of sludge in the sewage lagoons were determined during the 1994 investigation. The depths of sludge in the sewage lagoons were also determined in the 1992 investigation, but only in a few locations. The 1992 data were not (and were not expected to be) adequate for estimating volumes of sludge accurately. Also, it was necessary to evaluate the change in sludge volume with time. Therefore, each sample location in the 1994 investigation was measured for sludge depth. These results were used to construct contour maps of the distribution and thickness of sludge in each sewage lagoon. Sludge volumes were then calculated using the contoured thickness.

1.3.2 Summary of 1994 Investigation Results

The 1994 investigation involved collecting sludge samples at 70 locations and surface water samples at 18 locations throughout the sewage lagoons. Soil samples were not collected because there was no need to better define soil conditions for the CMS. The following subsections summarize the results of the investigation. Table 1.3-1 presents the quantity and locations of samples collected during the 1994 investigation. The investigation and results are discussed in greater detail in Section 4.

Surface Water Results

Surface water samples were collected from Ponds C, D, E, and G for the 1994 investigation. The samples were analyzed for organic lead. Analysis of the surface water samples did not yield detections of organic lead. Therefore, there is no indication of lead contamination in the surface water.

Sludge Results

Sludge samples were collected from Ponds A, B, C, D, E, and G. The nature and extent of metals and organochlorine pesticides in Ponds C, D, E, and G were defined by collecting samples at 58 locations from the sewage lagoons. The results of the investigation indicated that 4,4'-DDD and 4,4'-DDE were the primary constituents present in the system. The results also indicated an order of

magnitude reduction in the concentrations of these constituents since the previous investigations.

Samples from the sewage lagoons that indicated a suspect presence of heptachlor epoxide or isodrin were reanalyzed specifically for those constituents using GC/MS. The results of this analysis indicated that neither heptachlor epoxide nor isodrin was present in the samples. Therefore, it is concluded that they are not present in the sludge within the sewage lagoon system.

Several sludge samples from Ponds C and G also were analyzed for kepone. The results indicated that kepone was detected in one sample from each of the two sewage lagoons. However, it was detected at concentrations significantly below its reporting limit.

Sludge samples were collected from Ponds A, B, and C and analyzed for leachable metals by TCLP, and for total and reactive sulfides. The results of the investigation showed that none of the concentrations in the samples exceeded the regulatory levels for TC metals or reactivity. Therefore, the sludge in the sewage lagoons is not considered characteristically hazardous.

Sludge samples in Ponds A and B were also analyzed for PCBs. The PCB results indicated that none of the samples exceeded the TSCA regulatory level of 25 mg/kg.

Table 1.3-1
Summary of Analyses Performed on the Sewage Lagoons During the 1994 Investigation

Analysis	Numbers of Analyses for Each Sewage Lagoon					
	A	B	C	D	E	G
Total Metals (sludge)			13	16	16	19
Organochlorine pesticides (sludge)			13	16	16	19
Kepone (sludge)			8			12
PCBs (sludge)	6	6	6			
TCLP metals (sludge)	6	6	6			
Total and reactive sulfides (sludge)	6	6	6			
Total and organic lead (surface water only)			3	3	3	9

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Section 2
ENVIRONMENTAL SETTING

This section presents a summary of the environmental setting of the Holloman AFB sewage lagoon system. The discussion is limited to information about the location, geology, hydrology, and groundwater quality at the Base, with particular emphasis on the sewage lagoons.

2.1 Location and Site Description

Holloman AFB is situated in south-central New Mexico in the northwest-central portion of Otero County. The Base is located about 75 miles northeast of El Paso, Texas, and about 7 miles west of Alamogordo, New Mexico. The sewage lagoons are located in the southwestern corner of the Base.

The sewage lagoon system consists of seven aeration/evaporation lagoons that receive approximately 1.2 million gallons of residential and industrial wastewater per day. More than 90% of this flow consists of residential wastewater. The first three sewage lagoons, Ponds A, B, and C, are aerated. Ponds A and B are generally operated in parallel fashion and occasionally operated in sequence to increase residence time. After leaving Ponds A and B, the wastewater flows in series from Pond C through Ponds D, E, and G. Pond F is a sump that recirculates wastewater from Pond E back to the headworks of the system. Discharge from the last sewage lagoon (Pond G) flows via an open ditch to Lake Holloman.

Lake Holloman was formed by constructing a nonengineered dam to collect surface water drainage and wastewater discharge. The original dam was constructed in 1968. The 166-acre lake was intended to be the final impoundment for evaporation; however, because of seasonally low evaporation and increased wastewater generation from Base activities, water from Lake Holloman occasionally overflows into Lake Stinky, a small salina. Any overflow into Lake Stinky eventually dissipates through evaporation.

2.2 Soils and Geology

The soils are either Holloman-Gypsum Land-Yesum, Complex, or Mead silty clay loam soil. The Mead silty clay loam is found in low-lying areas, is less permeable, and sometimes is associated with wetlands as described in *Soil Survey of Otero County, New Mexico* (USDA Soil Conservation Service, 1981). The surface soils grade into the upper sand unit, which consists of 6 to 40 ft of sand, silt, or silty sand. Clay lenses are common in the upper sand unit. A discontinuous middle clay unit underlies the upper sand. The middle clay is reddish brown with abundant gypsum crystals and ranges from 10 to 40 ft thick where present. A lower sand unit consisting of interbedded sand, clay, and silt lies beneath the middle clay. This unit is lithologically heterogeneous and ranges from 10 to 20 ft thick.

The subsurface conditions at the sewage lagoons were defined by direct sampling and observation of the drilling operations of soil and/or monitor well borings drilled between 1987 and 1993. Figures 2.2-1 and 2.2-2 illustrate and describe, respectively, the general stratigraphy of the site.

The sediments consist of sand, silt, and clay, and are subdivided into six very broadly definable units that appear to be continuous across the site (Figure 2.2-1). This interpretation is supported by available data; however, irregularities exist on a smaller scale because of the discontinuous nature of alluvial and lacustrine deposits.

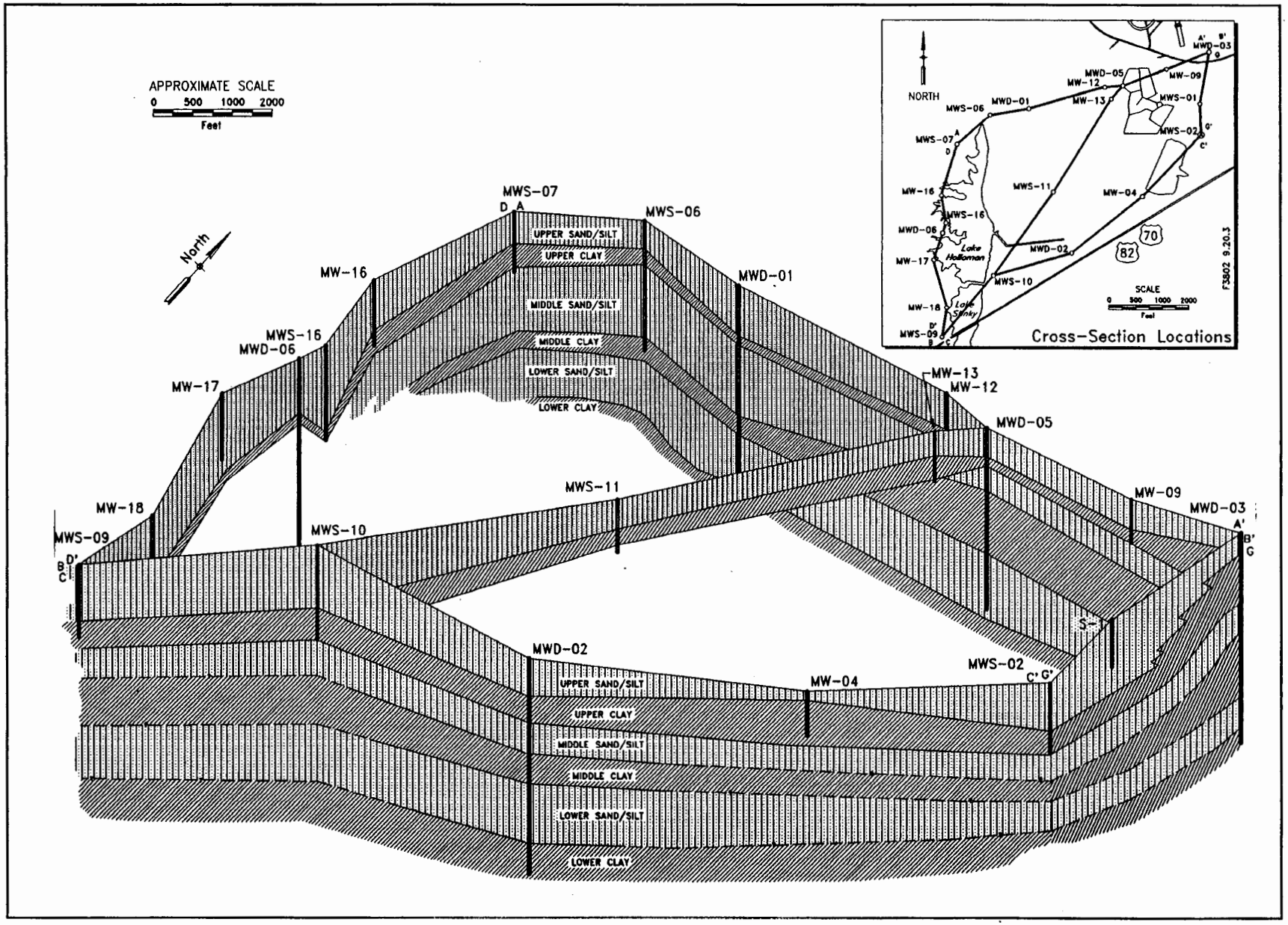

Figure 2.2-1. Stratigraphic Fence Diagram

Approximate Feet BGL	General Stratigraphic Section	Unit	Average Thickness (feet)	Lithologic Description
		UPPER SAND/SILT	12	SAND AND SILT – light tan to dark brown, poorly graded quartzose, minor gypsum crystals, dark accessory minerals, loose, dry to moist, rare green staining near base of unit
12		UPPER CLAY	6	CLAY – reddish–brown to greenish–gray, slightly silty, poorly graded, plastic, firm to friable, contains scattered pockets of small gypsum crystals, semi–continuous, becoming thinner in the north portion of site
18		MIDDLE SAND/SILT	10	SAND AND SILT – reddish–brown to light gray, moderately to poorly graded, slightly clayey in zones, minor dark accessory minerals, loose, wet to saturated, minor gypsum crystals, rare pockets of carbon coated material
28		MIDDLE CLAY	25	CLAY – reddish–brown to greenish–gray, poorly graded, becoming more greenish–gray westward, medium to high plasticity, slightly to moderately sandy, common pockets of medium to large gypsum crystals, moderately stiff to firm, wet to saturated
53		LOWER SAND/SILT	15	SAND AND SILT – brown to grayish–green, fine to medium grained, moderately to poorly graded, becoming more clayey near base, minor gypsum crystals, common dark accessory minerals, wet to saturated
68		LOWER CLAY	>8	CLAY – grayish–green, silty, poorly graded moderate to high plasticity, thin interbedded layers of fine grained silty sand, minor gypsum crystals, wet to saturated

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Figure 2.2-2. Generalized Description of Stratigraphic Section

2.3 Hydrology

2.3.1 Surface Water

Holloman AFB is located in the Tularosa Basin, which is a closed basin with no surface water drainage. Lake Lucero, the lowest point in the basin, is approximately 20 miles southwest of Holloman AFB. The lake does not receive surface water from the east side of the Tularosa basin.

The Base is crossed by several southwest-trending arroyos that control surface drainage in the undeveloped part of the Base. All of the arroyos terminate in the gypsum dune fields located in the western portion of the Base with the exception of Lost River. Lost River continues into the larger dunes of White Sands National Monument before it terminates.

Most drainage from the main Base (developed portion) runs off through a drainage ditch that bypasses the sewage lagoons and flows to Lake Holloman. Because of the high water table, the ditch flows most of the year to Lake Holloman. Other Base drainage flows to Dillard Draw and to undrained depressions, some of which are jurisdictional wetlands.

Lake Holloman is a playa lake and is considered "waters of the U.S." as defined in 40 CFR 122.2. Holloman AFB submitted a National Pollution Discharge Elimination System (NPDES) permit application in 1991 that is currently being revised to reflect the realignment of the Base in 1992 and the final design of the new wastewater treatment plant.

2.3.2 Groundwater

Groundwater occurs in unconfined conditions in the unconsolidated bolson deposits beneath Holloman AFB. The primary source of recharge for groundwater in the bolson aquifer is percolation of rainfall and stream runoff through the coarse, unconsolidated alluvial fan deposits located near the base of the mountains upgradient of Holloman AFB. Groundwater discharge occurs through evapotranspiration, springs or seeps along steep-sided arroyos, or into closed playa lakes such as Lake Lucero, the regional groundwater discharge area.

Regional groundwater flow is to Lake Lucero. Local groundwater flow is seasonally variable and is affected by the relationship between the water table elevation and the elevation of the bottom of the local arroyo channels. In the southeastern portion of the Base, regional groundwater flows southwest, following the Dillard Draw surficial drainage system. In the northern portion of the Base, groundwater flows to the west, following the Rita Draw, Malone Draw, and Lost River drainages.

The groundwater elevation at the sewage lagoons was surveyed in March, April, and August 1993 to determine seasonal variation associated with precipitation and evaporation rates at Holloman AFB. As part of that survey, surface water elevations were measured in Ponds A, D, and G and in Lakes Holloman and Stinky to provide data necessary to characterize local relationships between surface water and groundwater. Results of this evaluation are presented in Radian, 1993. A groundwater contour map is presented in Figure 2.3-1.

Near the wastewater treatment facility, the depth to groundwater ranges from 2 ft below ground level (bgl) near the sewage lagoons to 13 ft bgl near Lakes Holloman and Stinky. Under an average hydraulic gradient of 0.3, the groundwater flows consistently from northeast to southwest. However, surface water in the unlined lakes causes groundwater mounding. Immediately to the east of Lakes Holloman and Stinky, groundwater flows to the southeast if the elevation of surface water in Lake Holloman is higher than the water table, which occurs most of the time.

2.4 Groundwater Quality

Groundwater directly upgradient of the Base (approximately 10 miles) at the recharge zone at the foot of LaLuz canyon is slightly saline, with total dissolved solids (TDS) ranging from 1000 to 3000 ppm. Groundwater becomes progressively more mineralized as it flows downgradient toward the interior of the basin. This decrease in water quality can be attributed to slow groundwater migration from recharge to discharge areas and the presence of readily soluble minerals in the bolson sediments. TDS exceed 100,000 mg/L in groundwater in some portions of the Tularosa Basin (USGS, 1986).

The groundwater beneath Holloman AFB is designated as unfit for human consumption based on New Mexico Water Quality Control Commission Regulations (NM WQCC 82-1, as amended through 12 October 1993 Parts 3-100 through 3-103), because it exceeds New Mexico human health standards (HHSs) for TDS and sulfate. Average values of other groundwater quality parameters measured at Holloman AFB (chloride, fluoride, and nitrate-nitrite) also exceed HHSs and, except for fluoride, also exceed federal primary and secondary drinking water maximum contaminant levels (MCLs; SMCLs). Water quality parameters reflect the fact that the groundwater in this area is not potable under natural conditions.

Although EPA guidelines for groundwater classification are not recognized by the State of New Mexico, the EPA guidelines (*Guidelines for Groundwater Classification Under the EPA Groundwater Protection Strategy* [EPA, 1986]) classify the groundwater beneath Holloman AFB as a Class III B aquifer. Class III groundwater, characterized by having a TDS concentration greater than 10,000 mg/L, is not considered a source or a potential source of drinking water. Class III B groundwater is characterized by a low degree of interconnection to adjacent surface waters or groundwater of a higher class. The average measured TDS value of groundwater at Holloman AFB is greater than 10,000 mg/L (Radian, 1992). Because the Tularosa Basin is a closed basin, its groundwater does not discharge or connect to any adjacent aquifers. Adjacent surface waters include groundwater surfacing in Malone Draw and Lakes Holloman and Stinky. The TDS concentration in Lake Holloman ranges from a winter low of 12,400 mg/L to a summer high of 17,000 mg/L (Cole et al., 1981); therefore, groundwater at Holloman AFB is not interconnected with surface water of a higher class. In the 1993 investigation, TDS concentrations were found to range from 11,000 to 12,000 mg/L in Lake Holloman and were 14,000 mg/L in Lake Stinky.

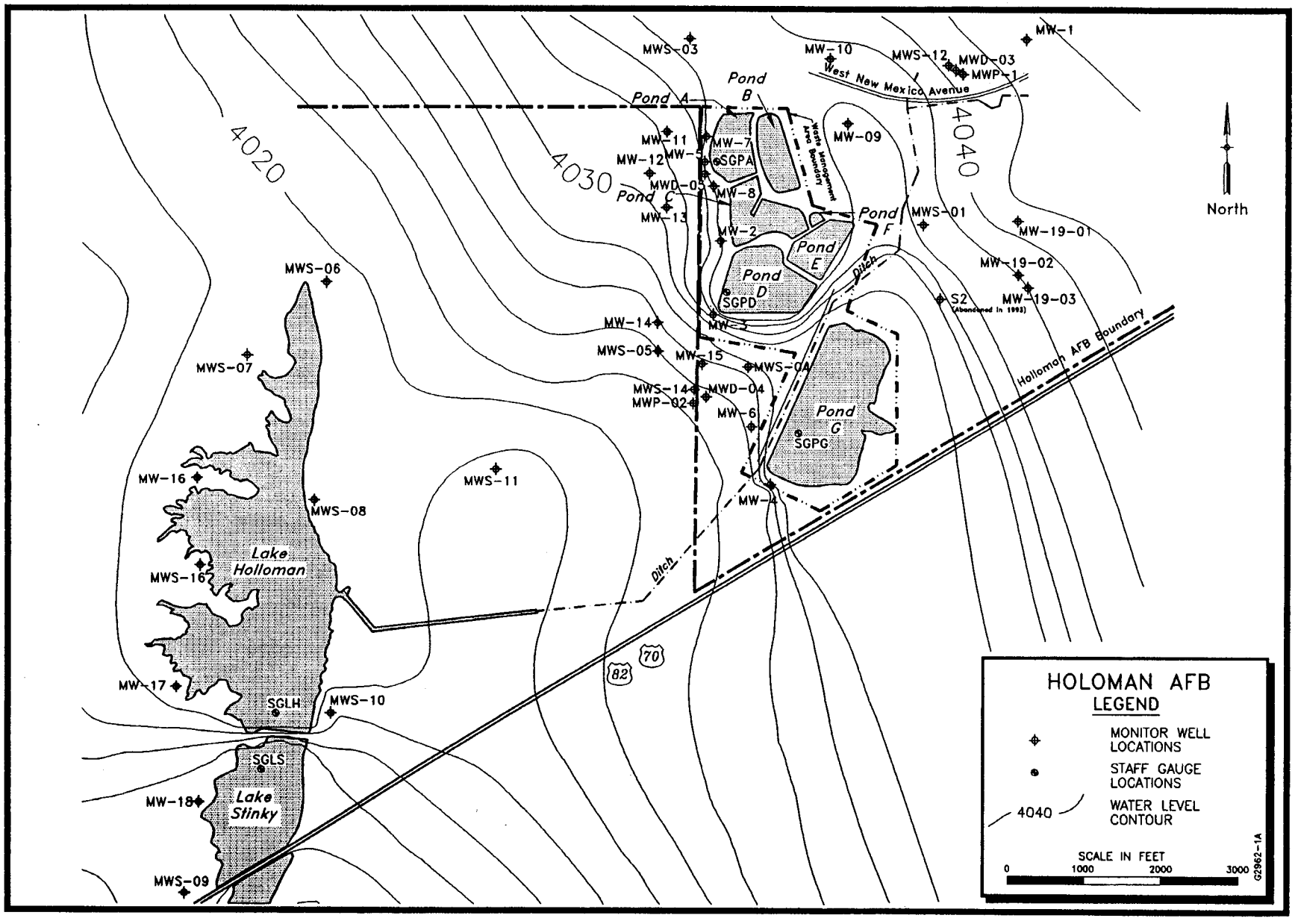

Figure 2.3-1. Groundwater Contour Map

Section 3
DATA EVALUATION

This section presents the objectives of the 1994 investigation and the criteria used to evaluate data and develop conclusions. Analytical results of the investigation are presented in Section 4.

3.1 Investigation Objectives

The primary objectives of the investigation were to:

- Better define the nature and extent of organochlorine pesticide and metal constituents in Ponds C, D, E, and G;
- Resolve uncertainties associated with heptachlor epoxide, isodrin, and kepone in the sewage lagoon sludge and organic lead in surface water;
- Determine the current concentrations of PCBs in Ponds A and B;
- Determine whether the sewage lagoon sludge is characteristically hazardous for the toxicity or reactivity characteristics; and
- Estimate the total volume and distribution of sludge present in each sewage lagoon.

To support these objectives, surface water and sludge samples were collected from the sewage lagoons in 1994 and analyzed for a variety of constituents. The results of the 1994 investigation were combined with the results of historical investigations to develop overall conclusions regarding the nature and extent of contamination in each sewage lagoon.

3.2 Evaluation Criteria

Evaluation criteria used to support the objectives of the 1994 investigation are discussed below.

3.2.1 Reporting Limits

Reporting limits (RLs) were used to support the overall objective of determining the nature and extent of contamination in the sewage lagoons.

RLs are values generated for each analyte that provide an indication of the degree of confidence that the analyte is actually present in the matrix and the degree of confidence that the measured analyte concentration is the actual concentration. Method detection limits (MDLs) are calculated from laboratory studies and indicate levels below which the identification and quantitation are uncertain. RLs are specified to be greater than or equal to the MDL.

3.2.2 Toxicity and Reactivity Characteristics

A solid waste is considered characteristically hazardous if it exhibits one or more of the following characteristics: ignitability, corrosivity, reactivity, or toxicity. The sludge collected during the 1994 sampling event was composed largely of soil and/or water, and was not ignitable or corrosive. However, the toxicity and reactivity characteristics of the sludge were uncertain.

As an initial step in determining whether the sludge from the sewage lagoons is toxicity characteristic (TC) hazardous, as defined in 40 CFR 261.24, total concentrations of samples collected during the historical and 1994 investigations were divided by 20 and compared to TC regulatory levels. This approach follows guidance provided in Section 1.2 and 2.2 of Method 1311 TCLP (40 CFR Part 261, Appendix II) that states if the total detected concentration of an analyte is less than 20 times the TC regulatory levels, then the analyte may be considered not to be a TC hazardous waste. The number 20 is based on the mass-volume ratio prevailing during a TCLP extraction (assuming 100% leaching). The calculated result is considered to be the maximum possible concentration of each analyte that could exist in a TCLP leachate sample.

Using this approach, silver and chromium were identified in Pond C sludge samples as potentially exceeding their TC regulatory levels of 5 mg/L. Because this approach is very conservative (i.e., assumes 100% leaching), sludge samples were collected from Ponds A, B, and C and analyzed for TCLP metals to determine the actual TCLP concentrations.

To determine whether the sludge is hazardous for the reactivity characteristic, samples were collected from the sewage lagoons and analyzed for reactive sulfides. Analytical results were then compared with the regulatory level of 500 mg/kg as cited in *Test Methods for Evaluating Solid Waste* (EPA, 1986b).

3.2.3 Constituent Concentrations for Land-Applied Sludge

Analytical results for inorganic constituents detected in the sludge from the sewage lagoons were compared with the allowable constituent concentrations for land-applied sewage sludge. These concentrations were established by EPA for secondary sewage sludge and are defined in 40 CFR 503.13. Table 3.2-1 presents the monthly average allowable concentrations for inorganic constituents in sewage sludge that is disposed of through land application. The table also provides the percentage of surveyed facilities with sludge containing a given inorganic constituent and the log mean concentration of the constituent at those facilities.

The allowable concentrations provided by 40 CFR 503.13 are standards for secondary sludge and not primary sludge, as is found in the sewage lagoons. Therefore the concentrations are not directly comparable, since the inorganic concentrations in secondary sludges typically become more concentrated through the treatment process; however, the concentrations in the sewage lagoon sludge are significantly below the regulatory limits and should not exceed the limits given secondary treatment. Therefore a qualitative comparison demonstrates that the concentrations of inorganic constituents in the sludge from Ponds A through G are well below the allowable concentrations for similar constituents found in land-applied sewage sludge.

Results from the comparison of the sewage lagoon sludge with the 40 CFR 503.13 limits will be discussed further in Section 4. Similar 40 CFR 503.13 concentrations are proposed for organic constituents but have not been developed. Therefore, a comparison of the organic constituent concentrations in the sewage lagoon sludge was not performed.

3.2.4 TSCA Industrial Cleanup Levels for PCBs

During a 1988 investigation, PCBs were detected in sludge samples from Ponds A and B at levels exceeding the TSCA regulatory limit of 25 mg/kg. In 1990, sludge was removed from areas surrounding the locations. Subsequent confirmation sampling detected no PCB levels in excess of the regulatory limit. To support the risk assessment and CMS, more recent samples from Ponds A and B were collected for PCB analysis to confirm that PCBs are not present in the sludge at concentrations above the 25-mg/kg regulatory level (40 CFR 761.125(c)(3)(v), restricted area standard).

3.2.5 Drinking Water Standards

The concentrations of constituents in the surface water were compared with drinking water standards established by EPA and NMED. The surface water concentrations, which were based on analytical results from investigations between 1990 and 1994, were compared with a combination of the following regulatory levels: EPA's MCLs as defined in the "Drinking Water Regulations and Health Advisories," May 1993; NMED's HHSs as defined in the "Water Quality Control Commission Regulations," as amended through

Table 3.2-1
Constituent Concentrations for Land-Applied Sludge

Inorganics	40 CFR 503.13 (mg/kg)[a]	Percentage of Detection[b,c]	Log Mean Value[b,d]
Arsenic	41	80	9.9
Cadmium	39	69	6.94
Chromium	1200	91	119
Copper	1500	100	741
Lead	300	80	134
Mercury	17	63	5.2
Molybdenum	18	53	9.2
Nickel	420	66	42.7
Selenium	36	65	5.2
Zinc	2800	100	1202

[a] Average monthly constituent concentrations (dry weight basis) for contaminants in land applied municipal sewage sludge as found in 40 CFR 503.13, Table 3.
[b] These results are cited in 55 FR 47210, National Sewage Sludge Survey (NSSS).
[c] Percent of facilities at which the constituent was detected.
[d] Log mean of the constituent concentrations detected at the facilities used to prepare the 40 CFR 503.13 limits.

Table 3.2-2
Drinking Water Standards

Constituents	Drinking Water Standards (mg/L)	Standard Source
Metals		
Arsenic	0.05	DWRHA
Barium	2	DWRHA
Beryllium	0.004	DWRHA
Cadmium	0.005	DWRHA
Chromium III	0.1	DWRHA
Cobalt	0.05	NMED
Copper	1.3	EPA-OW
Lead	0.015	EPA-OW
Manganese	0.2	NMED
Mercury	0.002	DWRHA
Nickel	0.1	DWRHA
Selenium	0.05	NMED
Silver	0.05	NMED
Thallium	0.002	DWRHA
Organochlorine Pesticides and PCBs		
Aldrin	NA	NA
alpha-BHC	0.0002[a]	DWRHA
beta-BHC	0.0002[a]	DWRHA
delta-BHC	0.0002[a]	DWRHA
gamma-BHC	0.0002[a]	DWRHA
alpha-Chlordane	0.003	DWRHA
gamma-Chlordane	0.002	DWRHA
Chlordane	NA	NA
4,4'-DDD	NA	NA
4,4'-DDE	NA	NA
4,4'-DDT	NA	NA
Dieldrin	NA	NA
Endosulfan I	NA	NA
Endosulfan Sulfate	NA	NA
Endrin aldehyde	0.002[b]	DWRHA
Heptachlor epoxide	0.0002	DWRHA
Kepone (Mirex)	NA	NA
Chlorinated Herbicides		
Dichloroprop	NA	NA
2,4,5-T	NA	NA

Table 3.2-2
(Continued)

Constituents	Drinking Water Standards (mg/L)	Standard Source
Volatile Organic Compounds		
Acetone	NA	NA
Benzene	0.005	DWRHA
Carbon disulfide	NA	NA
Ethyl benzene	0.7	DWRHA
Methyl ethyl ketone	NA	NA
Methylene chloride	0.005	DWRHA
Tetrachloroethene	0.005	DWRHA
Toluene	1	DWRHA
Xylenes	10	DWRHA
Semivolatile Organic Compounds		
Acetophrenone	NA	NA
Di-n-octylphthalate	NA	NA
Dibenzofuran	NA	NA
Dibutylphthalate	NA	NA
bis(2-ethylhexyl)phthalate	0.006	DWRHA
Fluoranthene	0.03	NMED
2-Methylnaphthalene	0.03	NMED
Phenanthrene	0.03	NMED
Phenol	0.005	NMED
Pyrene	0.03	NMED

DWRHA = EPA "Drinking Water Regulations and Health Advisories," May 1993.
NMED = State of New Mexico "Water Quality Control Commission Regulations," as amended through 12 October 1993.
EPA-OW = EPA Office of Water, action level.
NA = Not analyzed.

[a] MCL for lindane are used for all isomers.
[b] Values for endrin are used as proxy values for endrin aldehyde.

12 October 1993, and the EPA Office of Water action levels. Table 3.2-2 summarizes the action levels to which the surface water was compared. Several drinking water standards were combined in this table to allow the surface water to be compared with the lowest drinking water standards. Also some of the standards did not include action levels for all the constituents.

The comparison demonstrates that beta-BHC, bis(2-ethylhexyl)phthalate, and phenols have been detected with concentrations above the action levels listed in Table 3.2-2. Section 4 will discuss the results of this comparison further.

3.2.6 Background Upper Tolerance Limits (UTLs)

To determine whether metal concentrations in underlying soils were different than background soils, analytical data collected were compared with the 1993 background UTLs listed in Table 3.2-3. The UTL study is documented in the *Phase 1 Groundwater Assessment Monitoring Report, Sewage Lagoons and Lakes Investigation*, (Radian, 1993).

Since sludge is not a naturally occurring matrix, no background material exists for the sludge. For this reason, analytical results for sludge were not directly comparable with the background UTLs generated for soils, and only soil data were compared with the background UTLs.

3.3 Trends Over Time

Analytical results from all historical sampling events were examined in order to identify trends over time. Analytical results were compared with RLs in order to determine which analytes consistently exceeded their respective RLs during all investigations. Concentrations of analytes measured during multiple sampling events over time were examined to determine whether levels were increasing or decreasing. Through such observations, system dynamics, such as any entry of additional contamination into the sewage lagoons or degradation of constituents, could be observed. Trends over time can also be examined as a way of estimating future constituent levels and projecting the condition of the site at the time of closure.

3.4 Data Validation Conclusions

Data were validated according to the requirements specified in the *Project Plans* (Radian, 1994b).

The quality control (QC) data associated with this investigation indicate that chemical measurement data are acceptable. Furthermore, an independent review found the data to be reliable, defensible, and usable for the purposes of the project. The majority of the QC results associated with the investigation were within the specifications outlined in the *Project Plans*, (Radian, 1994b). Overall data completeness for this project was calculated at 99 percent. Results of the data validation show that the project objectives have been met.

Table 3.2-3
Upper Tolerance Limits (UTLs) for Background Soils at Holloman AFB

Analyte	Analytical Method	Upper Tolerance Limit (mg/kg)
Antimony	SW6010	7.28
Antimony	SW7041	0.25
Arsenic	SW7060	6.88
Barium	SW6010	84.36
Beryllium	SW6010	0.4
Cadmium	SW6010	0.56
Chromium	SW6010	6.6
Cobalt	SW6010	2.49
Copper	SW6010	4.84
Lead	SW7421	8[a]
Mercury	SW7471	NS[b]
Nickel	SW6010	5.61
Selenium	SW7740	10.53
Silver	SW6010	0.73
Thallium	SW6010	0.16
Tin	SW6010	3.17
Vanadium	SW6010	15.46
Zinc	SW6010	20.24

[a] The UTL for lead was calculated using data from the 29 Sites Investigation.
[b] The UTL for mercury is not specified because the UTL result was a negative value.

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Section 4
INVESTIGATIONS, RESULTS, AND CONCLUSIONS

This section contains the results and conclusions of investigations conducted at Ponds A through G between 1990 and 1994. Subsections 4.1 through 4.7 address each sewage lagoon individually and discuss the following:

- Executive summary for each sewage lagoon;
- Physical description of the sewage lagoon;
- Summary of the 1994 investigation;
- Summary of analytical results; and
- Overall conclusions.

The analytical results and conclusions sections are further subdivided on the basis of sampling matrix (surface water, sludge, and soil). This approach should allow for maximum usability of the data as different remedial alternatives are evaluated for each medium during the CMS. Summary data tables for investigations conducted between 1990 and 1994 are provided in chronological order in Appendices A through F.

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4.1 Pond A

Pond A was previously investigated in 1988, 1990, and 1993. These investigations are summarized in Table 4.4-1. The results indicated that PCBs and metals were the primary constituents present in the sludge and that no confirmed constituents were present in the surface water. Summaries of the analytical results from Pond A are contained in Appendices A, B, and D of this report.

To define the current conditions in Pond A for the upcoming CMS, sludge samples were collected in 1994 and analyzed for PCBs, TCLP metals, and total and reactive sulfides. The objectives of this sampling were 1) to define the current concentrations of PCBs, and 2) to determine whether metals and sulfides were present in the sludge at concentrations that exceed regulatory levels. The results of the historical and 1994 investigations at Pond A are summarized below:

- No PCB concentrations above 25 mg/kg were detected in 1994 sludge samples;
- No constituents were detected at concentrations above TC regulatory levels in sludge from Pond A; therefore, the sludge is not TC hazardous; and
- Reactive sulfides were not detected in the sludge at concentrations above regulatory levels in 1994; therefore, the sludge is not hazardous for the reactive characteristic.

4.1.1 Site Description

Pond A covers an area of approximately 10 acres and is one of seven impoundments in the wastewater treatment system. After leaving the headworks, wastewater flows in parallel into Ponds A and B. Discharge from Pond A flows into Pond C (Figure 4.1-1). Pond A has an average water depth of approximately 6 ft and is aerated and unlined.

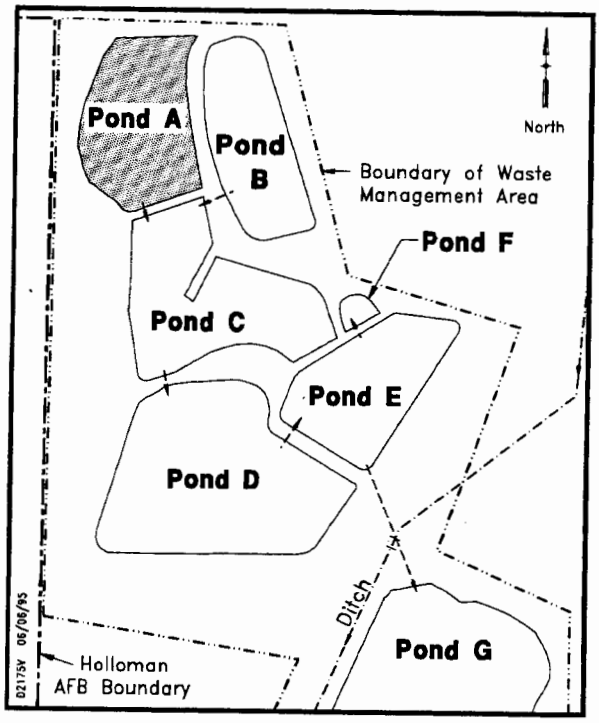

Figure 4.1-1 - Location of Pond A

4.1.2 1994 Investigation Summary and Results

Sludge

Six sludge samples were collected in 1994 (Figure 4.1-2) and analyzed for PCBs, TCLP metals, and total and reactive sulfides. A summary of the analytical results for this investigation are contained in Appendix E of this report. Summary statistics (i.e., frequency of detection, maximum detected concentrations, and location of maximum concentrations) are provided in Appendix F of this report.

PCB-1254 was detected in the sludge at concentrations ranging from 0.3 to 7.1 mg/kg. The highest concentration was detected at location PA-04 in the middle portion of the sewage lagoon near the 1988 sludge removal zone. No locations sampled in 1994 had PCB concentrations above the TSCA industrial cleanup level of 25 mg/kg.

Table 4.1-1
Summary of Sampling at Pond A

Matrix	Investigation	Investigation Summary	Results Summary
Surface Water	1993	• One sample collected for analysis of organochlorine pesticides.	• None of the organochlorine pesticides were detected and confirmed.
Sludge	May 1988	• Nine samples collected for analysis of Appendix IX constituents to determine presence/absence of contamination in sludge.	• PCBs detected as the primary organic constituent; concentration range from 24 to 63 mg/kg (TSCA industrial cleanup level is 25 mg/kg).
	August 1988	• Forty-six samples collected for analysis of Appendix IX constituents to define areal extent of PCB-contaminated (> 25 mg/kg) sludge mounds.	• PCBs detected as the primary organic constituent; concentrations range from 3.0 to 101 mg/kg. • Areal extent of PCB contamination (>25 mg/kg) identified.
	1990	• 2663 tons of PCB-contaminated sludge removed from Pond A. • Thirty-seven verification samples collected for analysis of PCBs to confirm removal of PCBs above 25 mg/kg. • Three additional samples to verify a detected PCB concentration of 27 mg/kg.	• One sample from 37-point grid found to contain 27 mg/kg PCBs; however, concentration not confirmed. • Additional sampling shows PCB concentrations to be 9.1 to 13 mg/kg. • Removal of PCB-contaminated soil complete.
	1993	• One sample collected for analysis of semivolatile organic compounds, organochlorine pesticides, and metals.	• Metals were the primary constituents detected. • All metals detected below TC regulatory levels and constituent concentrations for land-applied sludge.
	1994	• Six samples collected for analysis of TCLP metals, PCBs, and total and reactive sulfides to define current conditions for CMS.	• PCB-1254 detected at concentrations from 0.3 to 7.1 mg/kg. • All metals below TC regulatory levels. Sludge is not TC hazardous. • Reactive sulfides below regulatory levels. Sludge is not hazardous for the reactive characteristic.
Soil	1990	• Eighteen samples collected for analysis of Appendix IX constituents to determine whether contaminants from sludge have migrated to soil.	• PCBs detected at maximum concentration of 0.022 mg/kg. No evidence of migration.

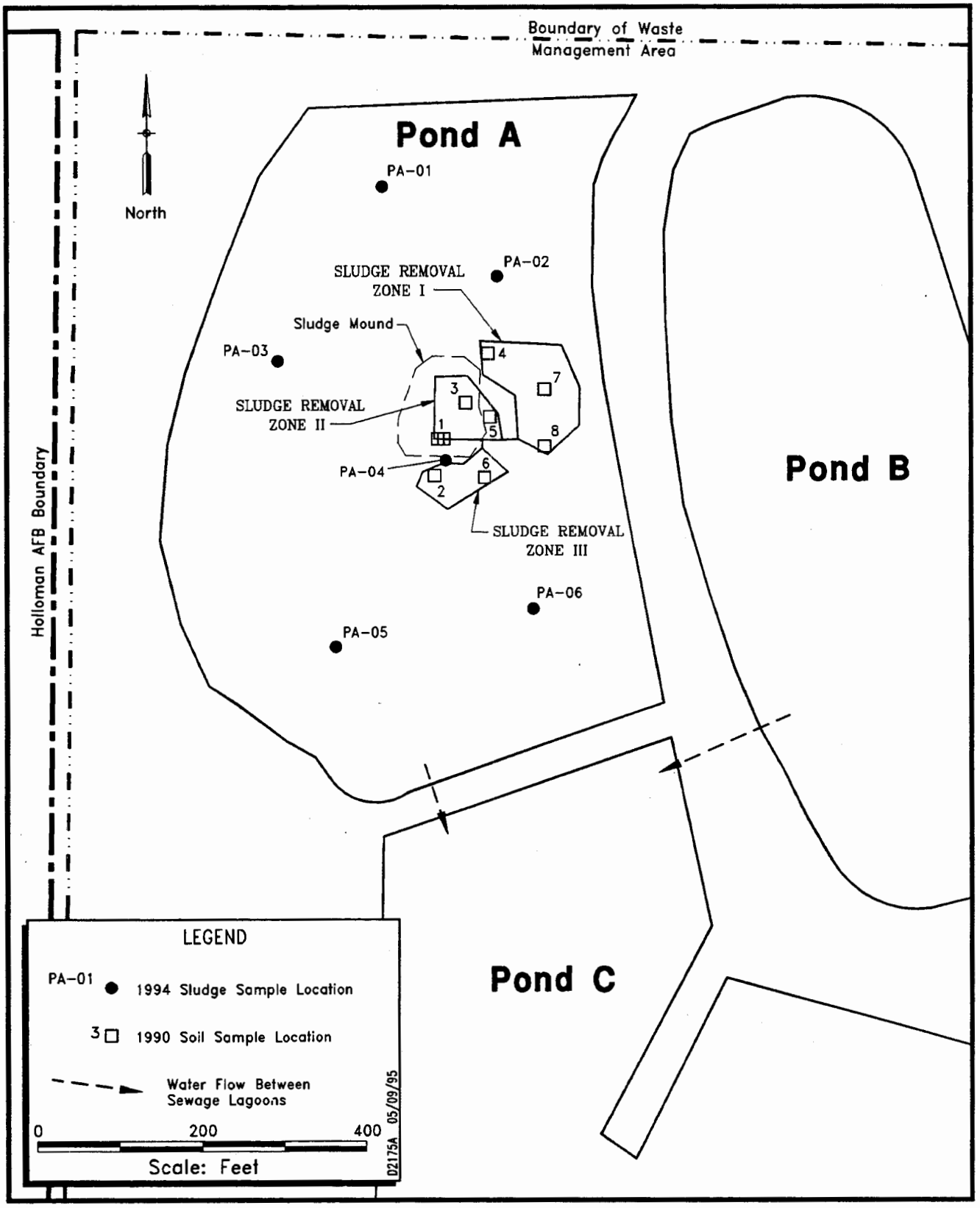

Figure 4.1-2. Sludge Sampling Locations at Pond A

Through TCLP metals analysis, it was confirmed that none of the metals in the sludge are present at concentrations that exceed TC regulatory levels; therefore, the sludge is not TC hazardous. In addition, the detected range of reactive sulfides (2.6 to 48.3 mg/kg) is well below the regulatory level of 500 mg/kg; therefore the sludge is not hazardous for the reactive characteristic.

The 1994 field measurements were used to construct a contour map of the sludge thickness in Pond A (Figure 4.1-3). The results show that sludge thickness is greatest (approximately 13 in.) in the south-central portion of the pond and that approximately 7930 yd^3 of sludge are present in the sewage lagoon. The average measured moisture content of the sludge is 70%, which indicates that a large proportion of the sludge is actually water.

4.1.3 Conclusions

This section presents the overall results and conclusions of analytical sampling conducted at Pond A from 1990 to 1994. Conclusions regarding the distribution and significance of contamination in the sewage lagoons are addressed with respect to data evaluation criteria presented in Section 3 of this report. The discussion presented below focuses on those constituents that have consistently been detected in Pond A.

Surface Water

One surface water sample was collected from Pond A in 1993 and analyzed for organochlorine pesticides. No constituents were detected and confirmed, and none exceeded the drinking water standards.

Sludge

Historical and 1994 sampling results indicate that PCBs and metals are the primary constituents present in the sludge from Pond A. PCBs have consistently been detected at concentrations above the RL in the sludge. However, the results of verification sampling conducted in 1990, in addition to the 1994 sampling, indicate that sludge removal efforts in 1990 were successful in removing all PCB-contaminated sludge above the TSCA industrial cleanup level of 25 mg/kg. The highest confirmed concentration of PCBs detected during the 1994 investigation was 7.1 mg/kg. In general, PCB concentrations detected in 1994 were uniformly distributed throughout the sewage lagoon and no areas of elevated concentrations were noted.

All of the metals detected were confirmed to be below the TC regulatory levels through TCLP metals analysis conducted in 1994. Therefore, the sludge is not TC hazardous for metals. The concentrations of reactive sulfides are below regulatory levels and, therefore, the sludge is not hazardous for the reactive characteristic. In addition, all metals were below the allowable constituent concentrations for land-applied sludge.

Soil

Following removal of PCB-contaminated sludge, soil sampling was conducted at Pond A in 1990 to determine whether the contaminants in the sludge had migrated to the underlying soil. Soil samples were collected from six locations and analyzed for Appendix IX constituents. The primary constituents in the soil were PCB-1254 and metals.

PCB-1254 was detected at a maximum concentration of 13 mg/kg, which is below the TSCA cleanup level of 25 mg/kg.

Barium, beryllium, chromium, cobalt, copper, lead, nickel, thallium, vanadium, and zinc were detected in Pond A soils at concentrations above the 1993 background UTLs in 1990. A comparison of the results with the maximum possible TCLP concentrations, however, indicates that all of the metals are below TC regulatory levels. Therefore, the soil is not TC hazardous.

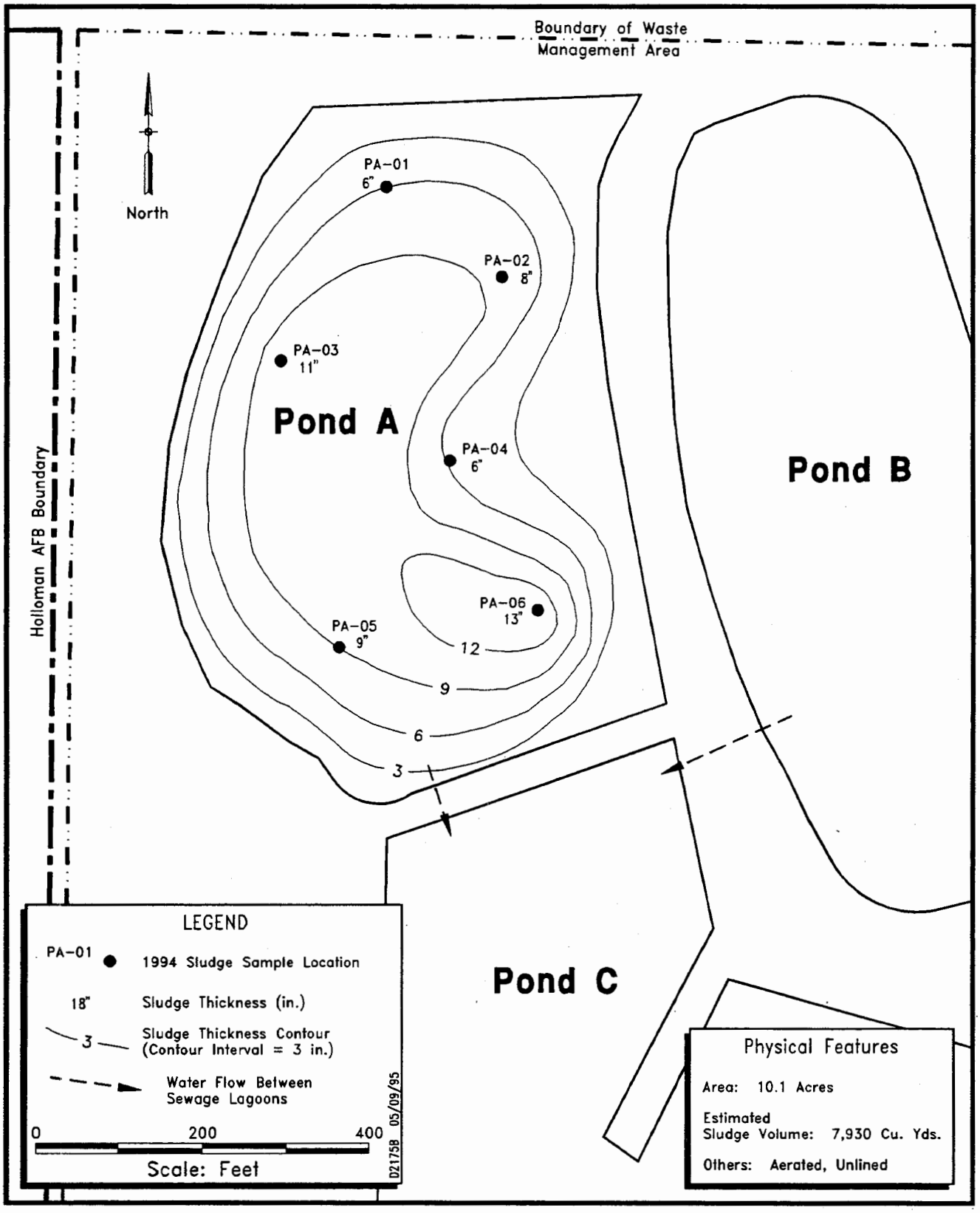

Figure 4.1-3. Sludge Thickness in Pond A

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4.2 Pond B

Pond B was previously investigated in 1988, 1990, and 1993. These investigations are summarized in Table 4.2-1. The results of these investigations indicated that the primary constituents present in the sewage lagoons were PCBs and metals. Summaries of the analytical results are contained in Appendices A, B, and D of this report.

To define the current conditions in Pond B for the upcoming CMS, sludge samples were collected in 1994 and analyzed for PCBs, TCLP metals, and total and reactive sulfides. The objectives of this sampling were 1) to define the current concentrations of PCBs in the sludge and 2) to determine whether the sludge is hazardous for the toxic or reactive characteristics. The results of the historical and 1994 investigations at Pond B are summarized below:

- No PCB concentrations above 25 mg/kg were detected in 1994 sludge samples;
- No metal constituents were detected at concentrations above TC regulatory levels in Pond B sludge; therefore, the sludge is not TC hazardous; and
- Reactive sulfides in the sludge were not detected at concentrations above regulatory levels in 1994; therefore, the sludge is not hazardous for the reactive characteristic.

4.2.1 Site Description

Pond B covers an area of approximately 11 acres and is the second of seven impoundments in the wastewater treatment system. After leaving the headworks, wastewater flows in parallel into Ponds A and B. Discharge from Pond B flows into Pond C (Figure 4.2-1). Pond B has an average water depth of approximately 6.5 ft and is aerated and unlined.

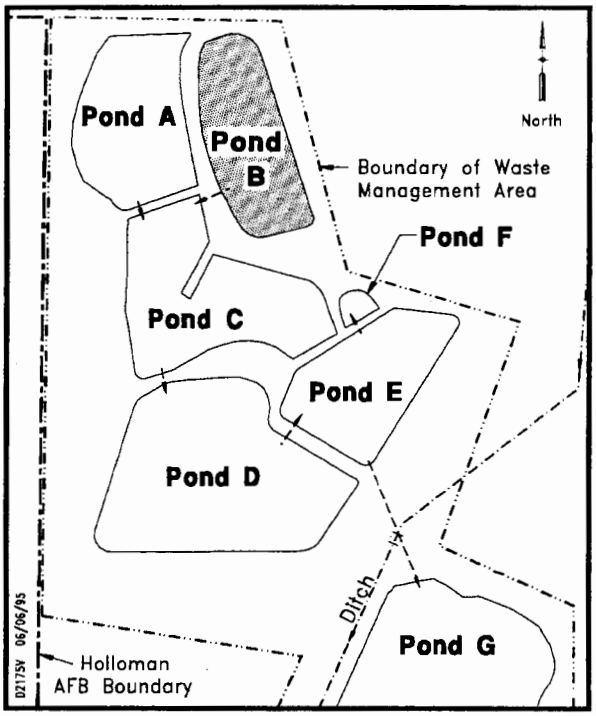

Figure 4.2-1 - Location of Pond B

4.2.2 1994 Investigation Summary and Results

Sludge

Six sludge samples were collected in 1994 (Figure 4.2-2) and analyzed for PCBs, TCLP metals, and total and reactive sulfides. A summary of the analytical results of this investigation are contained in Appendix E of this report. Summary statistics (i.e., frequency of detection, maximum detected concentration, and location of the maximum concentration) are provided in Appendix F of this report.

PCB-1254 was detected in the sludge at concentrations ranging from 0.062 to 5.6 mg/kg. The highest concentration was detected at location PB-02 in the western portion of the sewage lagoon. No locations sampled in 1994 contained PCB concentrations above the TSCA industrial cleanup level of 25 mg/kg.

Table 4.2-1
Summary of Sampling at Pond B

Matrix	Investigation	Investigation Summary	Results Summary
Surface Water	1990	• Six samples collected for analysis of semivolatile organic compounds, organochlorine pesticides, PCBs, and metals.	• Metals identified as the primary consituents. • Bis(2-ethylhexyl)phthalate detected above the drinking water standards. Result was below reporting limit; therefore uncertain. • Organic lead concentrations were reported to be 100 times greater than those of total lead; however, similar concentrations were detected in equipment rinsate samples.
	1993	• One sample collected for analysis of organochlorine pesticides.	• No constituents were detected and confirmed above reporting limits.
Sludge	May 1988	• Nine samples collected for analysis of Appendix IX constituents to determine presence/absence of contamination in sludge.	• PCBs detected as the primary organic constituent; concentrations range from 24 to 63 mg/kg (TSCA industrial cleanup level is 25 mg/kg).
	August 1988	• Forty samples collected for analysis of Appendix IX constituents to define areal extent of PCB-contaminated (> 25 mg/kg) sludge mounds.	• PCBs detected as the primary organic constituent; concentrations range from 1.8 to 190 mg/kg. • Areal extent of PCB contamination (>25 mg/kg) identified.
	1990	• 1316 tons of PCB-contaminated sludge removed from Pond B. • Thirty-seven verification samples collected for analysis of PCBs to confirm removal of PCBs above 25 mg/kg.	• Removal of PCB-contaminated soil complete. • Verification samples all below 25 mg/kg.
	1994	• Six samples collected for analysis of TCLP metals, PCBs, and total and reactive sulfides to define current conditions for CMS.	• PCB-1254 detected at concentrations from 0.62 to 5.3 mg/kg. • All metals below TC regulatory levels. Sludge is not TC hazardous. • Reactive sulfides below regulatory levels. Sludge is not hazardous for the reactive characteristic.
Soil	1990	• Fourteen samples collected for analysis of Appendix IX constituents to determine whether contaminants from sludge have migrated to soil.	• PCBs not detected in any samples. No evidence of migration. • Arsenic, barium, beryllium, chromium, cobalt, copper, nickel, vanadium, and zinc above 1993 background UTLs. • All metals below TC regulatory levels. Soil is not TC hazardous.

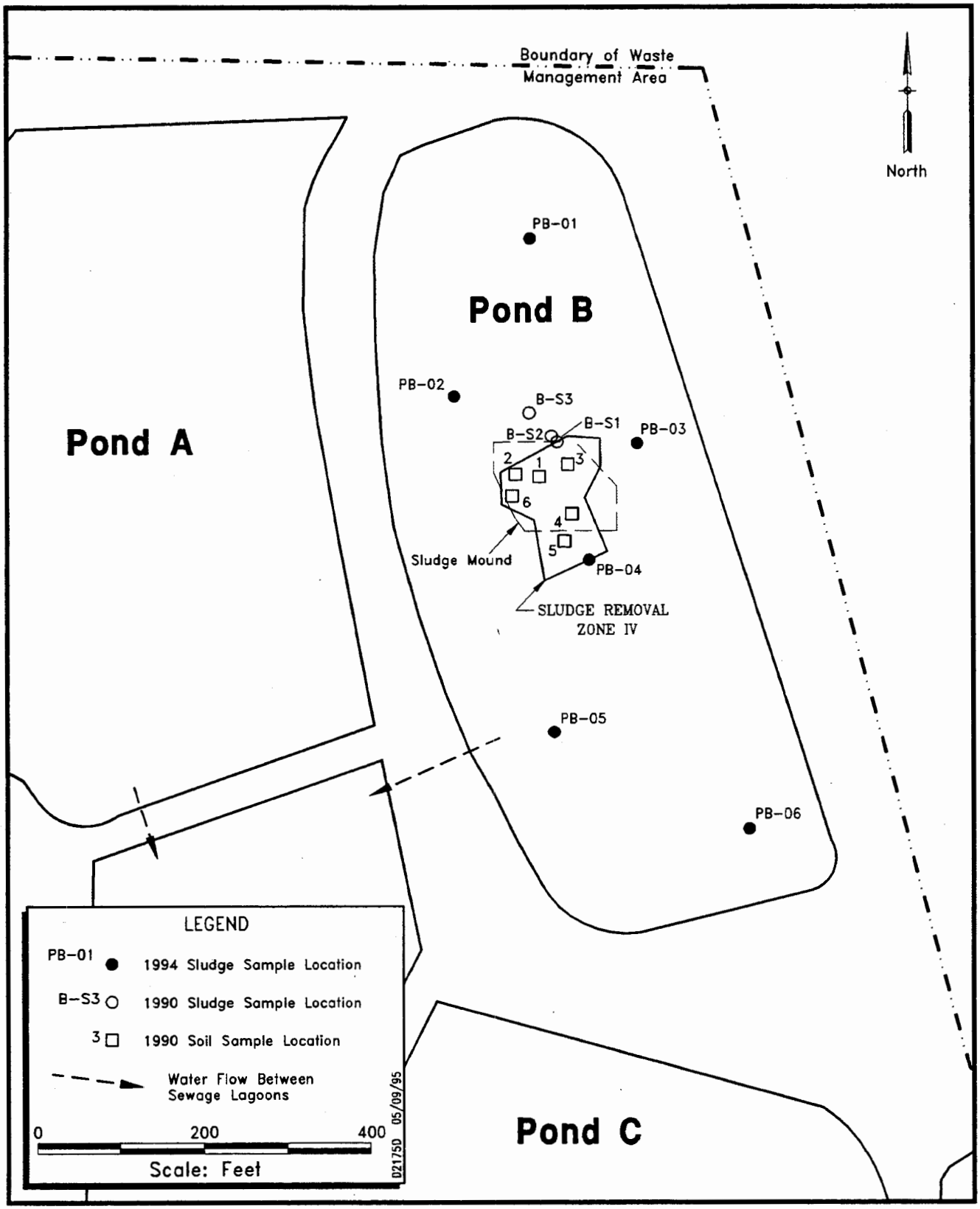

Figure 4.2-2. Sludge Sampling Locations at Pond B

The results of TCLP metals analysis indicate that none of the metals in the sludge are present at concentrations that exceed TC regulatory levels; therefore, the sludge is not TC hazardous. In addition, the detected range of reactive sulfides (5.6 to 77.7 mg/kg) is well below the regulatory level of 500 mg/kg; therefore, the sludge is not hazardous for the reactive characteristic.

The 1994 field measurements were used to construct a contour map of the sludge thickness in Pond B (Figure 4.2-3). The results show that sludge thickness is greatest (approximately 30 in.) in the central portion of the sewage lagoon and that approximately 13,770 yd^3 of sludge are present. The average measured moisture content of the sludge is 70 percent.

4.2.3 Conclusions

This section presents the overall results and conclusions of analytical sampling conducted at Pond B from 1990 and 1994. Conclusions regarding the distribution and significance of contamination in the sewage lagoon are addressed with respect to data evaluation criteria presented in Section 3 of this report. The discussion presented below focuses on those constituents that have consistently been detected in Pond B.

Surface Water

Six surface water samples were collected from Pond B in 1990 (Figure 4.2-4) and analyzed for semivolatile organic compounds, organochlorine pesticides, PCBs, and metals. In addition, one sample was collected in 1993 (location not shown) and analyzed for organochlorine pesticides. The only constituents detected above the RLs in the surface water during these investigations were barium and zinc. With the exception of bis(2-ethylhexyl)phthalate, all of the constituents analyzed were below the drinking water standards (Table 3.2-2). Phenol, alpha-BHC, beta-BHC, delta-BHC, and gamma-BHC were not detected in any of the samples collected between 1990 and 1994; however, the method detection limits for these constituents were slightly above the drinking water standards. For this reason, the possibility exists that these constituents could be slightly above drinking water standards. However, it should be reemphasized that surface water from the sewage lagoons does not serve as a drinking water source nor does it connect to any potable aquifers.

Sludge

Historical and 1994 sampling results indicate that PCBs and metals are the primary constituents present in sludge from Pond B. PCBs have consistently been detected at concentrations above the reporting limit in the sludge. However, the results of verification sampling conducted in 1990 and the 1994 investigation indicate that sludge removal efforts in 1990 were successful in removing all PCB-contaminated sludge above the TSCA industrial cleanup level of 25 mg/kg. The highest confirmed concentration of PCBs detected during the 1994 investigation was 5.3 mg/kg. In general, PCB concentrations detected in 1994 were uniformly distributed throughout the sewage lagoon. No areas of elevated concentrations were noted.

All of the metals are below the allowable constituent concentrations for land-applied sludge. In addition, none of the metals in the sludge are present at concentrations that exceed TC regulatory levels; therefore, the sludge is not TC hazardous.

The detected concentrations of the reactive sulfides are below the regulatory level of 500 mg/kg; therefore, the sludge is not hazardous for the reactive characteristic.

Soil

Following removal of PCB-contaminated sludge, soil sampling was conducted at Pond B in 1990 to determine whether the contaminants in the sludge had migrated to the underlying soil. Soil samples were collected from six locations and analyzed for Appendix IX constituents. The

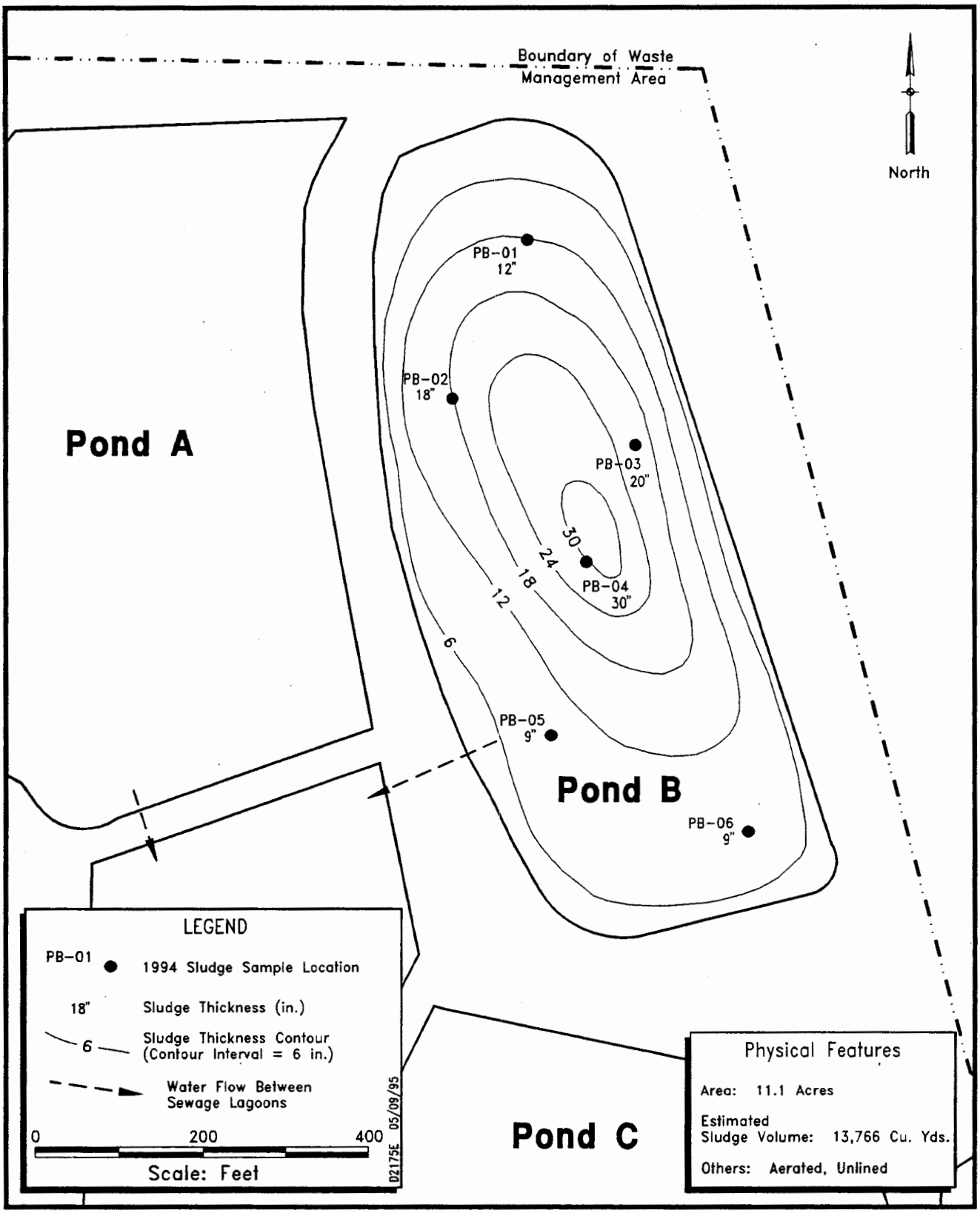

Figure 4.2-3. Sludge Thickness in Pond B

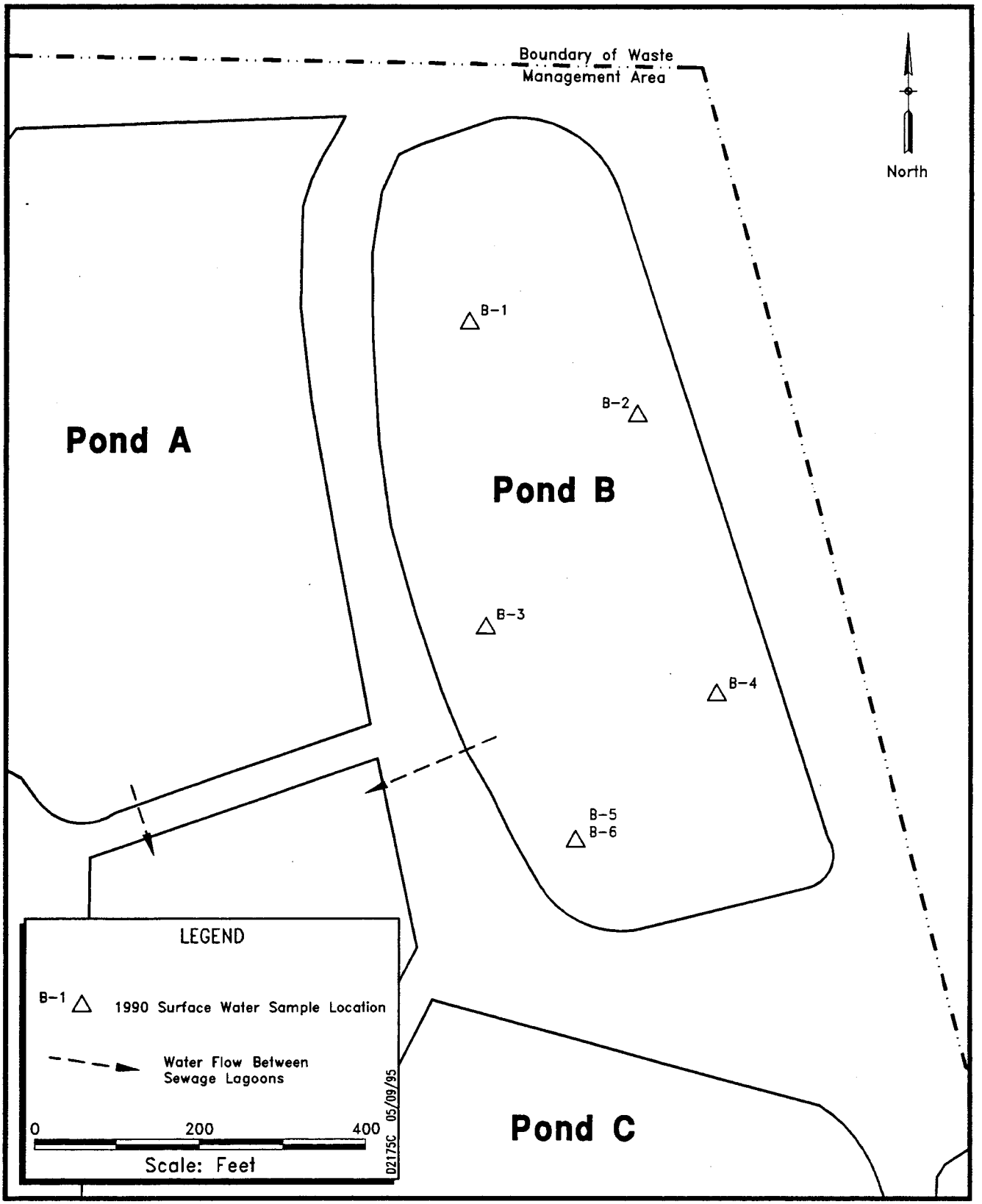

Figure 4.2-4. Surface Water Sampling Locations at Pond B

results indicated that the primary constituents detected in the soil were PCB-1254 and total metals.

A comparison of the 1990 analytical results for inorganic compounds with the 1993 background UTLs indicated that arsenic, barium, beryllium, chromium, cobalt, copper, nickel, vanadium, and zinc were above background levels. However, a comparison of the results to the maximum possible TCLP concentrations indicates that all of the metals are below TC regulatory levels; therefore, the soil is not TC hazardous.

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4.3 Pond C

Pond C was previously investigated in 1990, 1992, and 1993. These investigations are summarized in Table 4.3-1. The results of these investigations indicated that slightly elevated concentrations of organochlorine pesticides and metals were present in the sludge and soil. Summary of the analytical results are presented in Appendices A, B, C, and D.

To define the current conditions in Pond C for the upcoming CMS, sludge samples were collected in 1994 and analyzed for organochlorine pesticides, kepone, and total metals. Certain locations were also sampled for TCLP metals and total and reactive sulfides. Surface water samples were analyzed for total lead and organic lead. The objectives of this investigation were to: 1) define more precisely the extent of organochlorine pesticides and metals in the sludge; 2) resolve the uncertainties associated with kepone and heptachlor epoxide in the sludge and with organic lead in the surface water; and 3) determine whether metals and sulfides are present in the sludge at concentrations that exceed regulatory levels. The results of the 1994 investigation, combined with the results of historical sampling at Pond C, are summarized below:

- Heptachlor epoxide was not detected in the sludge.
- Kepone was not detected above the RL in the sludge.
- Total lead and organic lead were not detected in the surface water.
- 4,4'-DDD and 4,4'-DDE have been detected consistently in the sludge. Concentrations of these constituents have decreased by approximately two orders of magnitude since 1990.

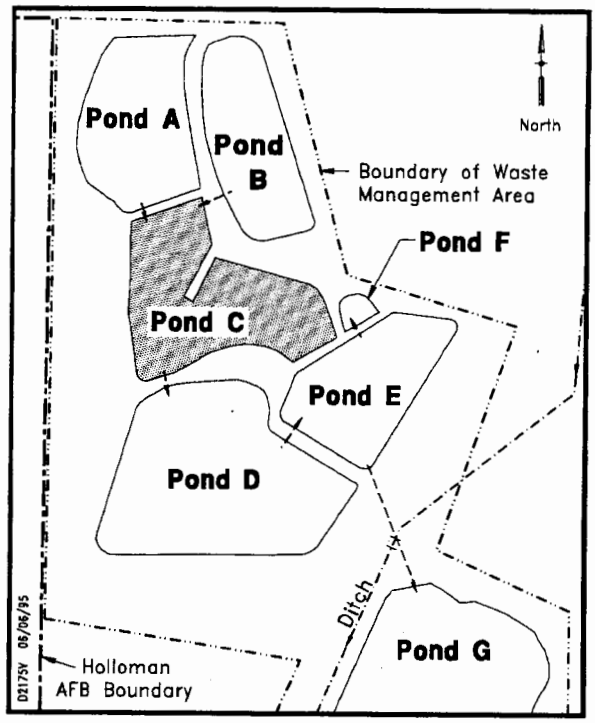

Figure 4.3-1 - Location of Pond C

- No constituents have been detected at concentrations above TC regulatory levels at Pond C. Therefore, the sludge is not considered TC hazardous.
- Reactive sulfides were not detected in the sludge at concentrations above regulatory levels in 1994; therefore, the sludge is not hazardous for the reactive characteristic.

4.3.1 Site Description

Pond C covers an area of approximately 12.5 acres and is the third of seven impoundments in the wastewater treatment system. The sewage lagoon receives wastewater from Ponds A and B and discharges into Pond D (Figure 4.3-1). It has an average water depth of approximately 5 ft and is aerated and unlined. The aerator is located in the northeastern portion of the sewage lagoon near the influent point from Pond B.

Table 4.3-1
Summary of Sampling at Pond C

Matrix	Investigation	Investigation Summary	Results Summary
Surface Water	1990	• Six samples collected for analysis of semivolatile organic compounds, organochlorine pesticides, PCBs, and metals. • One sample collected for analysis of hardness and total dissolved soils.	• Metals were the primary constituents detected. • All constituents detected and confirmed below drinking water standards. • Organic lead was not detected.
	1994	• Three samples collected for analysis of total lead and organic lead.	• Total lead and organic lead not detected in any sample.
Sludge	1990	• Six samples collected for analysis of Appendix IX constituents to determine presence/absence of contamination at influent points from Ponds A and B.	• Organochlorine pesticides and metals were the primary constituents detected. • 4,4'-DDD, 4,4'-DDE, and endosulfan I detected in 1000- to 20,000-µg/kg range. • Twenty metals detected. All were below the TC regulatory levels and allowable constituent concentrations for land applied sludge.
	1992	• Six samples collected for analysis of Appendix IX constituents to provide preliminary estimate of extent of contamination.	• Organochlorine pesticides and metals were the primary constituents detected. • 4,4'-DDD and 4,4'-DDE detected and confirmed in 1000-µg/kg range. • Thirteen metals detected. Silver and chromium potentially above TC regulatory levels. • All metals detected below allowable constituent concentrations for land applied sludge.
	1994	• Thirteen samples collected for analysis of organochlorine pesticides and metals to define areal extent more precisely. • Six samples collected for analysis of TCLP metals and total and reactive sulfides to determine whether sludge is hazardous for toxic or reactive characteristics.	• Heptachlor epoxide not detected. • Kepone not detected above reporting limit. • 4,4'-DDD and 4,4'-DDE detected above reporting limits in the 100-µg/kg range. • Fifteen metals detected. All below TC regulatory levels and allowable constituent concentrations for land-applied sludge. • Reactive sulfides detected below regulatory levels.
Soil	1990	• Six samples collected for analysis of Appendix IX constituents to determine presence/absence of contamination near influent points from Ponds A and B.	• Organochlorine pesticides and metals were the primary constituents detected. • 4,4'-DDD, 4,4'-DDE, and endosulfan I detected in 100-µg/kg range. • Nineteen metals detected. All below TC regulatory levels.
	1992	• Eight samples collected for analysis of Appendix IX constituents to determine areal extent of contamination.	• Organochlorine pesticides and metals were the primary constituents detected. • 4,4-DDD detected in 10-µg/kg range. • Six metals detected, all below TC regulatory levels.

4.3.2 1994 Investigation Summary and Results

Surface Water

Three surface water samples (Figure 4.3-2) were collected in October 1994 and analyzed for total lead and organic lead. Analytical results are presented in Appendix F of this report. The results indicate that lead was not detected in the surface water at Pond C.

Sludge

Thirteen sludge samples were collected at Pond C in 1994 (Figure 4.3-3) and analyzed for organochlorine pesticides and metals. Samples for analysis of semivolatile organics were also collected to confirm any positive detections of isodrin and/or heptachlor epoxide. A summary of the analytical results of this investigation are contained in Appendix E of this report. Summary statistics are provided in Appendix F of this report.

4,4'-DDD and 4,4'-DDE were detected in Pond C at concentrations above the RL. The highest concentrations of 4,4'-DDD (640 μg/kg) and 4,4'-DDE (550 μg/kg) were detected at location PC-11. No other organochlorine pesticides, including isodrin or heptachlor epoxide, was detected in any of the samples collected from the sewage lagoon.

With the exception of antimony and thallium, all of the metals analyzed were detected in the sludge. However, the results of TCLP sampling indicate that none of the metals present in the sludge exceeds TC regulatory levels and that the sludge is, therefore, not TC hazardous for metals. In addition, all of the inorganic constituents were detected below the allowable constituent concentrations for land-applied sludge.

A preliminary investigation at Pond C was conducted in October 1991 to determine the sludge thickness. Results of this investigation are documented in the *Conceptual Plan for Sludge and Soil Sampling: Sewage Lagoon Investigation* (Radian, 1991). Similar measurements were conducted during the 1994 sampling event. Measurement results, used to construct a contour map of the sludge thickness in Pond C (Figure 4.3-4), indicate that approximately 17,000 yd^3 of sludge are present in the sewage lagoon. The average measured moisture content in the sludge is 75 percent.

4.3.3 Conclusions

This section presents the overall results and conclusions of the investigations conducted at Pond C from 1990 through 1994. Conclusions regarding the distribution and significance of contamination in the sewage lagoon are addressed with respect to data evaluation criteria presented in Section 3 of this report. The discussion presented below focuses on those constituents that have consistently been detected in surface water, sludge, and soil in Pond C during all of the investigations.

Surface Water

Six surface water samples were collected from Pond C in 1990 (Figure 4.3-2) and analyzed for semivolatile organic compounds, organochlorine pesticides, PCBs, and metals. In addition, three samples were collected in 1994 and analyzed for total and organic lead. None of the constituents analyzed during these investigations were detected above the RLs or the drinking water standards (Table 3.2-2). Phenol, alpha-BHC, beta-BHC, bis(2-ethylhexyl)phthalate, delta-BHC, gamma-BHC, heptachlor epoxide, and lead were not detected in any of the samples collected between 1990 and 1994. However, the method detection limits for these constituents were slightly above the drinking water standards. For this reason, the possibility exists that these constituents could be slightly above drinking water standards.

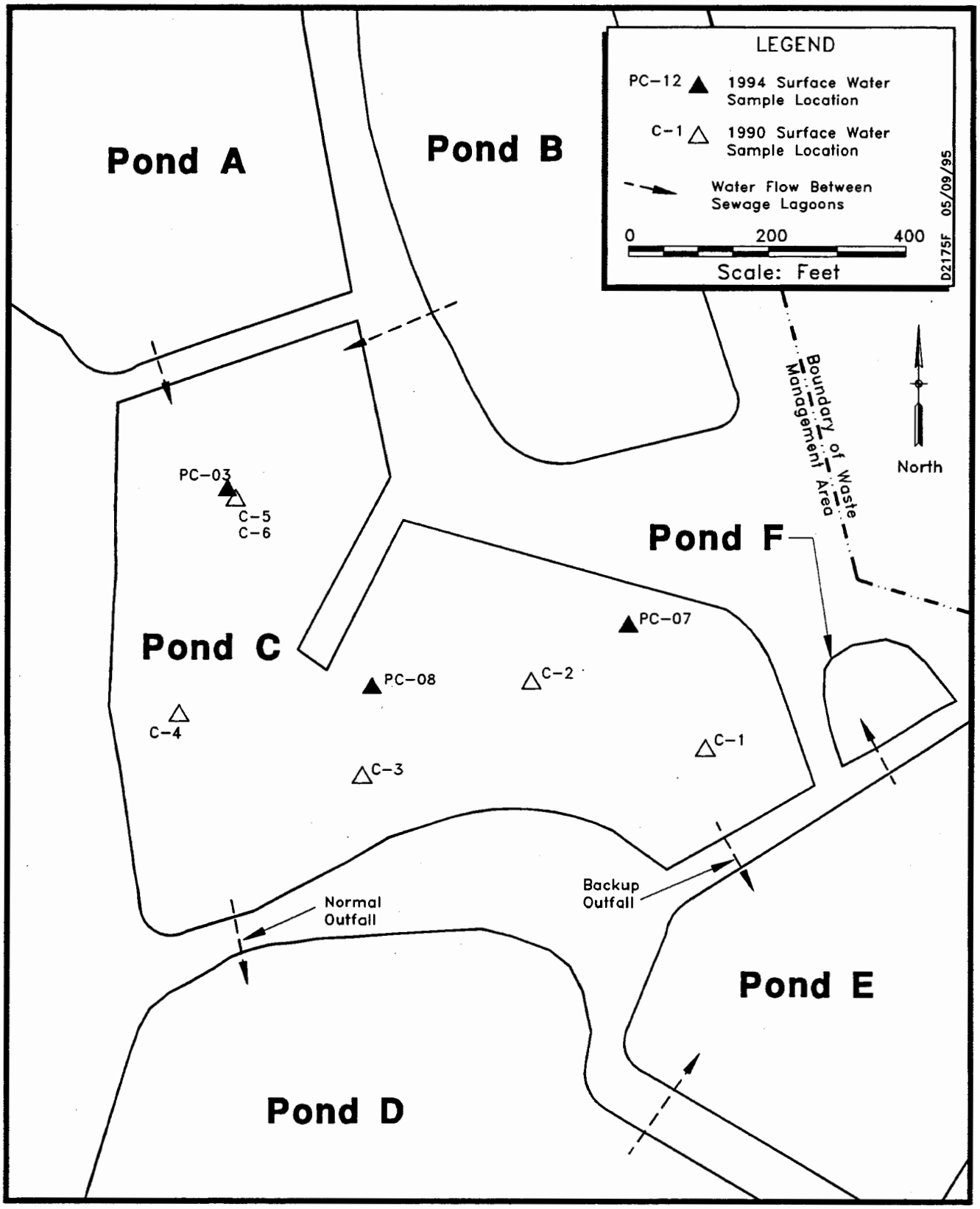

Figure 4.3-2. Surface Water Sampling Locations at Pond C

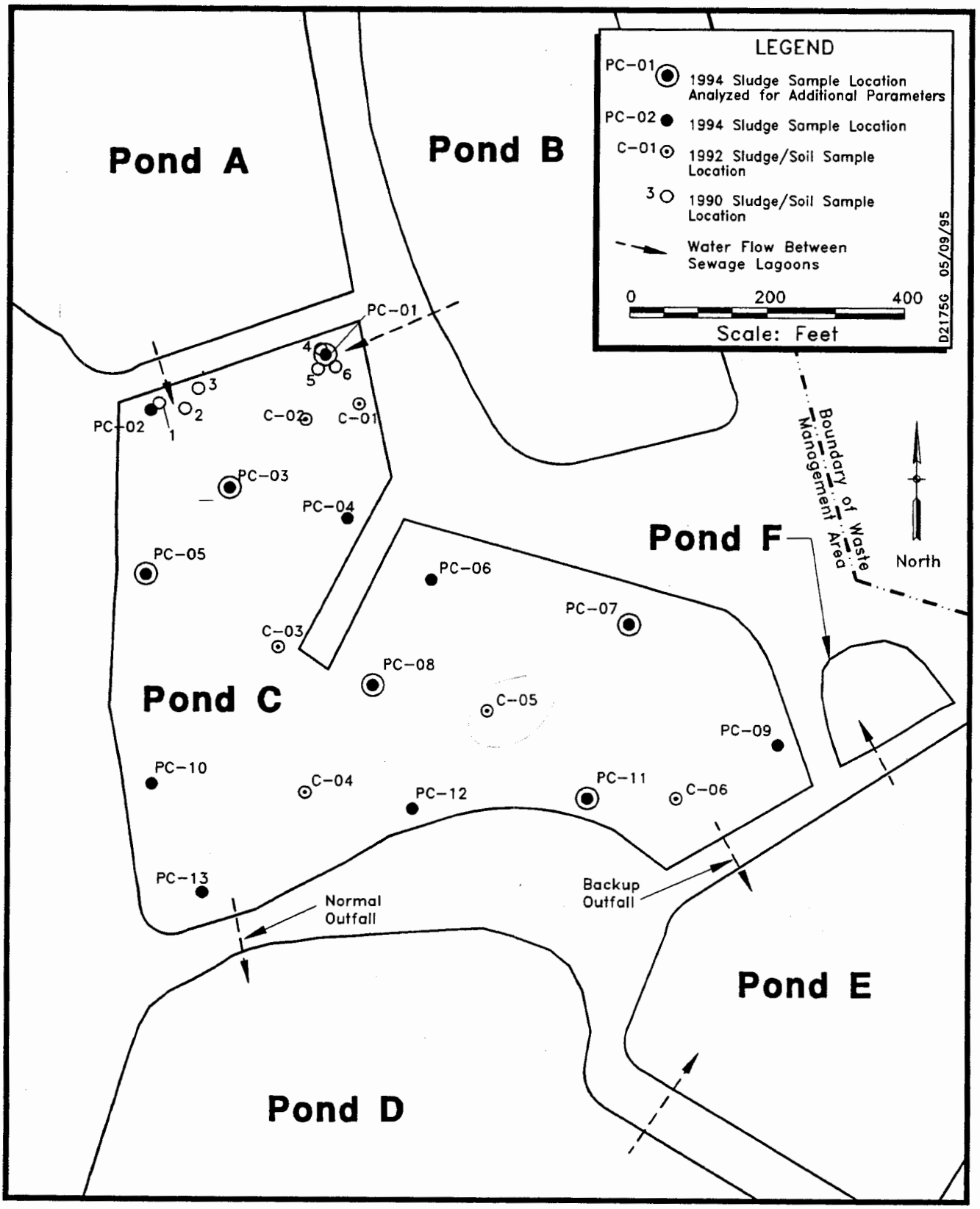

Figure 4.3-3. Sludge Sampling Locations at Pond C

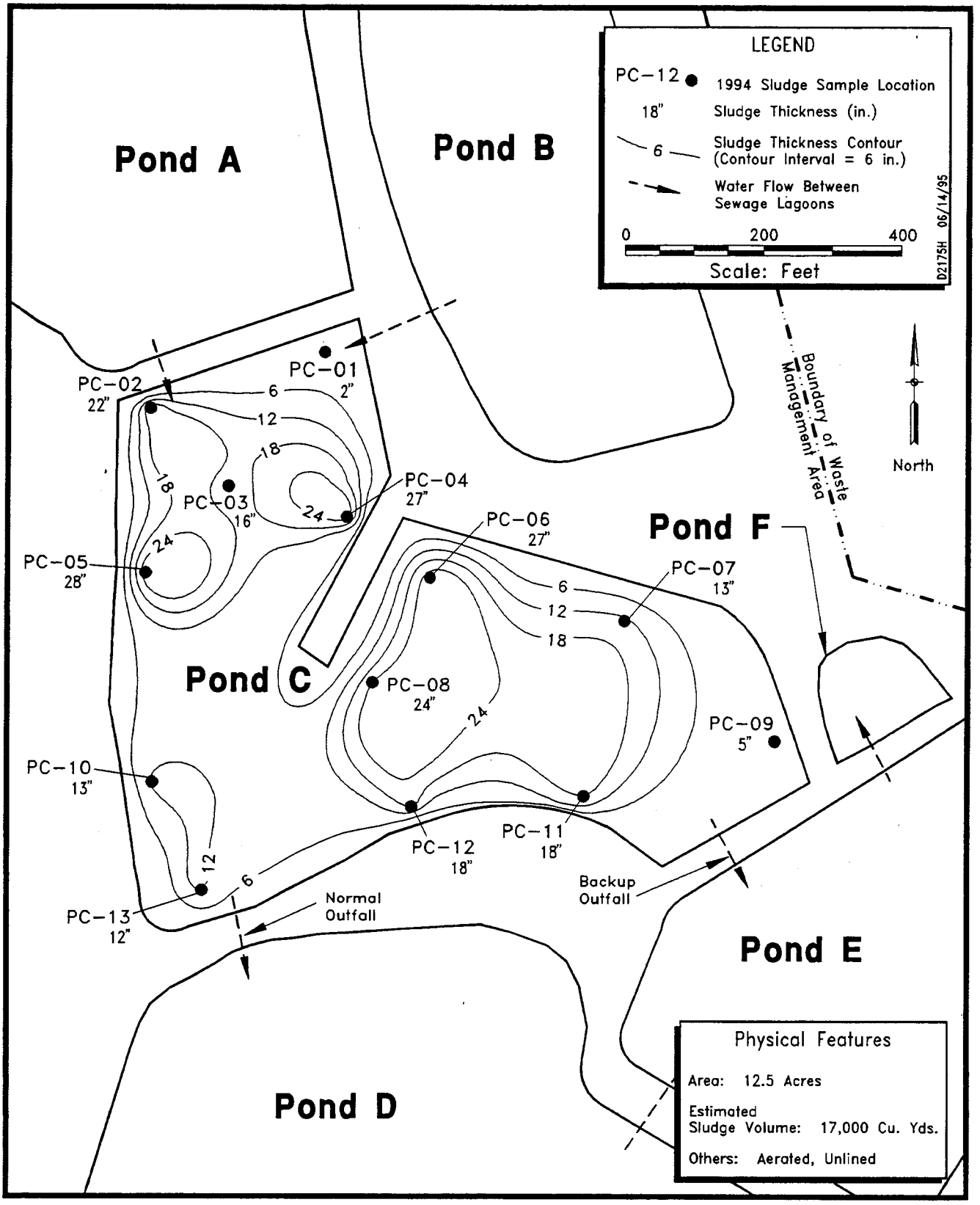

Figure 4.3-4. Sludge Thickness in Pond C

However, it should be reemphasized that surface water from the sewage lagoons does not serve as a drinking water source, nor does it connect to any potable aquifers.

Sludge

The primary organic constituents present in the sludge at Pond C are 4,4'-DDD and 4,4'-DDE; these constituents were detected in the investigations conducted in 1990, 1992, and 1994. The maximum concentrations of these constituents (16,000 μg/kg and 8100 μg/kg, respectively) were detected in 1990 at location C-5 in the northeastern portion of the sewage lagoon. Since 1990, detected concentrations of these two constituents have decreased by more than an order of magnitude (Table 4.3-2).

Other organochlorine pesticides that have been detected above the RL in the sludge during one or more of the investigations include endosulfan I and delta-BHC. In general, these contaminants were detected at the highest concentrations at sampling locations in the northern and southern areas of the sewage lagoon near the influent and effluent points. An overall, general decrease of these constituent concentrations has been noted during each subsequent sampling event conducted since 1990.

With the exception of antimony and thallium, all of the metal constituents have consistently been detected in the sludge; however, the detected concentrations are below allowable constituent concentrations for land-applied sludge. The 1990 through 1994 metals concentrations were initially compared with calculated maximum possible TCLP concentrations. Results indicated that the concentrations of chromium and silver were possibly above TC regulatory levels. However, TCLP analysis of sludge samples collected at Pond C in 1994 (Figure 4.3-2) indicated that these constituents are below TC regulatory levels and that the sludge, therefore, is not TC hazardous for metals.

In general, metal concentrations in Pond C have remained fairly consistent over time. One exception to this is the apparent increase in the concentration of silver between 1990 (nondetect, or ND) and 1992 (320 mg/kg). This increase was attributed to the recovery units associated with the on-Base photography. To address this, a new program of regular sampling and maintenance was initiated in 1993. As indicated by the results of the 1994 investigation, silver concentrations are decreasing. The maximum concentration of silver detected in 1994 was 179 mg/kg.

Soil

The only organic constituent present in the soil at concentrations above the RL is 4,4'-DDD. A maximum concentration of 160 μg/kg was detected in 1990 at location C-1 in the northwestern portion of the sewage lagoon. Since 1990, detected concentrations of 4,4'-DDD have decreased by approximately one order of magnitude (Table 4.3-2).

Other organochlorine pesticides that have been detected in the soil at concentrations above the RL include 4,4'-DDE and endosulfan I. Both of these constituents were detected during the 1990 investigation, but neither was detected in the 1992 investigation.

Barium, beryllium, chromium, cobalt, copper, nickel, vanadium, and zinc were detected above the 1993 background UTLs in 1990. However, only barium, chromium, and vanadium were detected above the 1993 UTLs in 1992. Comparison of the results with the maximum possible TC concentrations indicates that all of the metals are below TC regulatory levels and that the soil, therefore, is not TC hazardous for metals.

Table 4.3-2
Maximum Concentrations of Organochlorine Pesticides Detected Above the Reporting Limits at Pond C

Investigation Date	Constituents Above the Reporting Limits in Sludge (μg/kg)			
	4,4'-DDD	4,4'-DDE	Endosulfan I	delta-BHC
1990	16,000 C	8100 CG	4400 X	< RL
1992	1600 C	1300 C	< RL	5000 X
1994	640	550	< RL	< RL

Investigation Date	Constituents Above the Reporting Limits in Soil (μg/kg)		
	4,4'-DDD	4,4'-DDE	Endosulfan I
1990	180 C	240 C	440 X
1992	98 C	< RL	< RL

RL = Reporting limit.

1990 Sampling Event
C = Confirmed on second column or by GC/MS.
G = Indicates an estimated GC value due to interference.
X = Not confirmed on second column.

1992 Sampling Event
C = Presence and quantitation of analyte confirmed by second-column analysis.
X = Qualitative confirmation of analyte on both columns. Quantification differed by a factor of two or more between columns. Value determined by the first column is reported.

4.4 Pond D

Pond D was previously investigated in 1990, 1992, and 1993. These investigations are summarized in Table 4.4-1. The results of these investigations indicated that slightly elevated concentrations of organochlorine pesticides and metals were present in the soil and that total lead and organic lead were present, but uncertain, in the surface water.

To define the current conditions in Pond D for the upcoming CMS, sludge samples were collected in 1994 and analyzed for organochlorine pesticides and total metals. Surface water samples were analyzed for total lead and organic lead. The objectives of this sampling were to 1) define more precisely the extent of organochlorine pesticides and metals in the sludge, and 2) resolve the uncertainties associated with heptachlor epoxide in the sludge and with organic lead in the surface water. The results of the 1994 investigation, combined with the results of historical sampling at Pond D, are summarized below:

- Heptachlor epoxide was not detected in the sludge;
- Total lead and organic lead, detected at very low concentrations in 1990, were not detected in the surface water in 1994;
- 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT were detected in the sludge above the RL;
- 4,4'-DDT, beta-BHC, delta-BHC, and gamma-BHC have historically been detected in the soil above the RL;
- No constituents have been detected at concentrations above TC regulatory levels at Pond D; therefore, the sludge and soil are not TC hazardous.

4.4.1 Site Description

Pond D covers an area of approximately 18 acres and is the fourth of seven impoundments in the wastewater treatment system. The sewage lagoon receives wastewater from Pond C and discharges into Pond E (Figure 4.4-1). It has an average water depth of approximately 5.5 ft and is unlined.

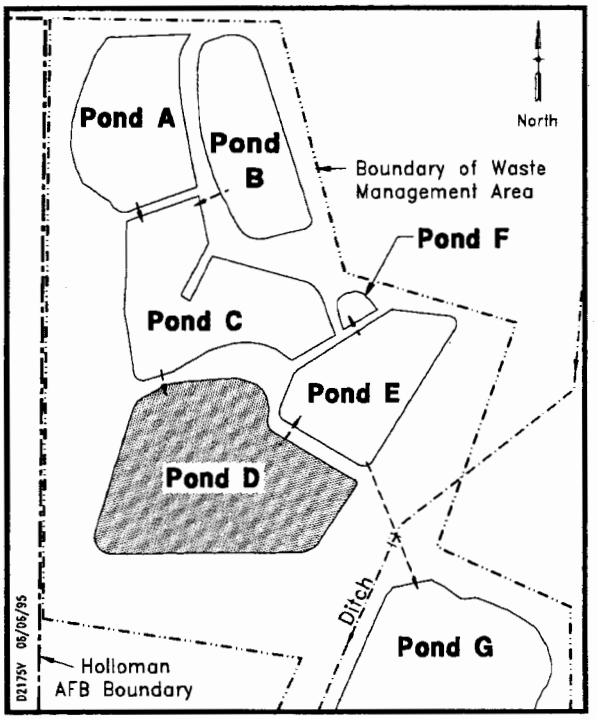

Figure 4.4-1 - Location of Pond D

4.4.2 1994 Investigation Summary and Results

Surface Water

Three surface water samples (Figure 4.4-2) were collected from Pond D during the 1994 investigation and analyzed for total lead and organic lead. Analytical results are presented in Appendix F of this report. Neither total lead nor organic lead was detected in the surface water; therefore, there is no evidence of lead contamination in Pond D from Base activities.

Sludge

Sixteen sludge samples were collected at Pond D during the 1994 investigation (Figure 4.4-3) and analyzed for organochlorine pesticides and metals. Samples for analysis of semivolatile organic compounds were also collected to confirm any positive detections of isodrin or

Table 4.4-1
Summary of Sampling at Pond D

Matrix	Investigation	Investigation Summary	Results Summary
Surface Water	1990	• Six samples collected for analysis of semivolatile organic compounds, organochlorine pesticides, PCBs, and metals to define presence/absence and nature/extent of contamination.	• Metals were the primary constituents detected. • Phenol and bis(2-ethylhexyl)phthalate were detected above the drinking water standards; both were below reporting limits and are therefore considered uncertain. • Organic lead was reported to be 100 times greater than that of total lead; however, similar concentrations were detected in equipment rinsate samples.
	1993	• One sample collected for analysis of organochlorine pesticides.	• Several organochlorine pesticides detected but unconfirmed.
	1994	• Three samples collected for analysis of total lead and organic lead to confirm concentrations detected in 1990.	• Total lead and organic lead not detected.
Sludge	1994	• Sixteen samples collected for analysis of organochlorine pesticides metals to determine nature and areal extent of contamination.	• Heptachlor epoxide not detected. • 4,4'-DDD detected in the 100-µg/kg range. • 4,4'-DDE, and 4,4'-DDT detected in the 10-µg/kg range. • Thirteen metals detected. All below TC regulatory levels and allowable constituent concentrations for land-applied sludge.
Soil	1992	• Six samples collected for analysis of Appendix IX constituents to determine nature and areal extent of contamination.	• Organochlorine pesticides and metals were the primary constituents. • 4,4'-DDD detected in 100-μg/kg range; beta-BHC, delta-BHC, and gamma-BHC detected in the 10-μg/kg range. • Chromium, nickel, vanadium, and zinc detected above 1993 background UTLs. • All below the TC regulatory levels.

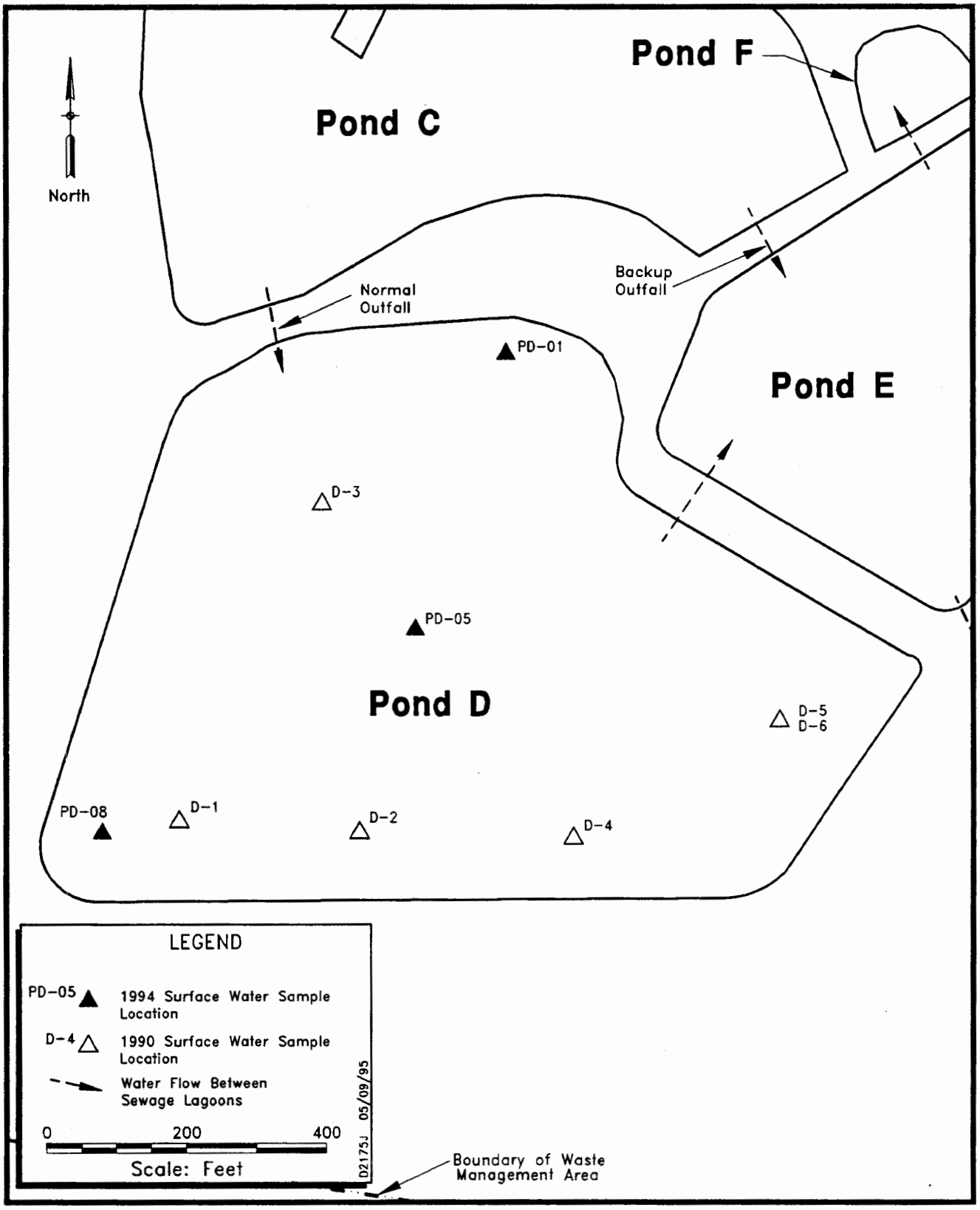

Figure 4.4-2. Surface Water Sampling Locations at Pond D

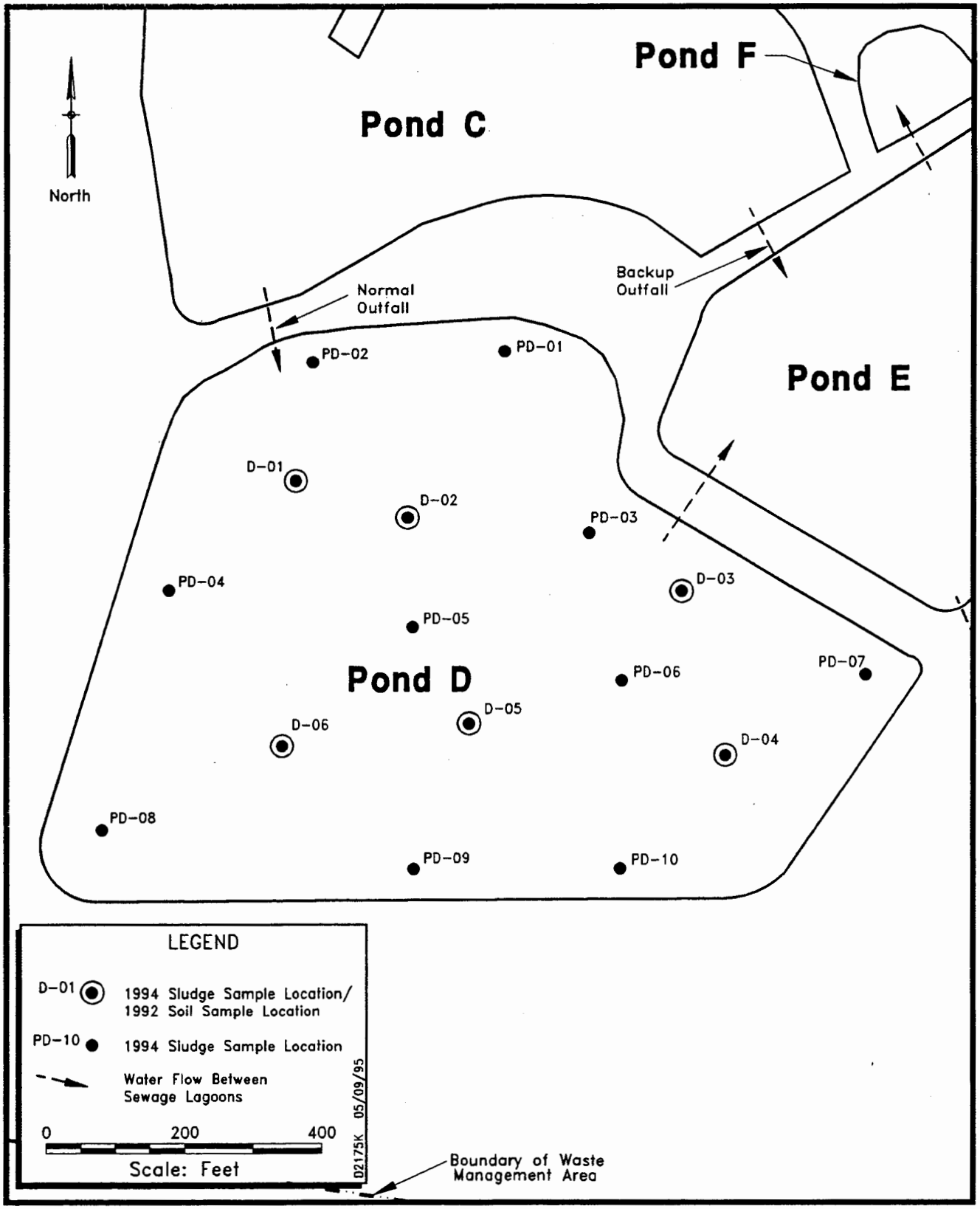

Figure 4.4-3. Sludge Sampling Locations at Pond D

heptachlor epoxide. A summary of the analytical results of this investigation is contained in Appendix E of this report. Summary statistics of this investigation are provided in Appendix F.

The results indicate that 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT were detected in the sludge at at concentrations above the RL. The highest concentrations of 4,4'-DDD (130 μg/kg) and 4,4'-DDE (33 μg/kg) were detected at location PD-03 near the effluent point to Pond E. 4,4'-DDT was detected at only one location (PD-04) in the southeastern portion of the sewage lagoon at a concentration of 51 μg/kg.

No other organochlorine pesticides, including isodrin and heptachlor epoxide, were detected above their respective RL.

With the exception of antimony, cadmium, and mercury, all of the metals analyzed were detected in the sludge in Pond D; however, none of the metals was detected above the allowable constituent concentrations for land-applied sludge. Comparison of the results with the maximum possible TCLP concentrations indicate that all of the metals are below TC regulatory levels; therefore, the sludge is not TC hazardous.

A preliminary investigation at Pond D was conducted in October 1991 to determine sludge thickness. Results of this investigation are documented in Radian, 1992. Similar measurements were conducted during the 1994 sampling event. Measurement results, used to construct a contour map of the sludge thickness in Pond D (Figure 4.4-4), indicate that approximately 4500 yd^3 of sludge are present in the sewage lagoon. The average measured moisture content in the sludge is 70 percent.

4.4.3 Conclusions

This section presents the overall results and conclusions of analytical sampling conducted at Pond D from 1990 through 1994. Conclusions regarding the distribution and significance of contamination in the sewage lagoon are addressed with respect to data evaluation criteria presented in Section 3 of this report.

Surface Water

Six surface water samples were collected from Pond D (Figure 4.4-2) and analyzed for semivolatile organic compounds, organochlorine pesticides, PCBs, and metals. In addition, one sample was collected in 1993 (location not shown) and analyzed for organochlorine pesticides, and three samples were collected in 1994 and analyzed for total and organic lead. Although none of the constituents analyzed were detected above the RLs, phenol and bis(2-ethylhexyl)phthalate were detected at levels slightly above the drinking water standards (Table 3.2-2). Alpha-BHC, beta-BHC, delta-BHC, gamma-BHC, and lead were not detected in any of the samples collected between 1990 and 1994. However the MDLs for these constituents were slightly above the drinking water standards. For this reason, the possibility exists that these constituents could be slightly above drinking water standards. However, it should be reemphasized that surface water from the sewage lagoons does not serve as a drinking water source nor does it connect to any potable aquifers.

Sludge

As discussed in Section 4.4.2, 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT were detected at concentrations above the RL in the sludge in 1994. Prior to the 1994 investigation, sludge had not been present in Pond D. Therefore, conclusions as to the trends of these constituents over time in the sludge are not possible.

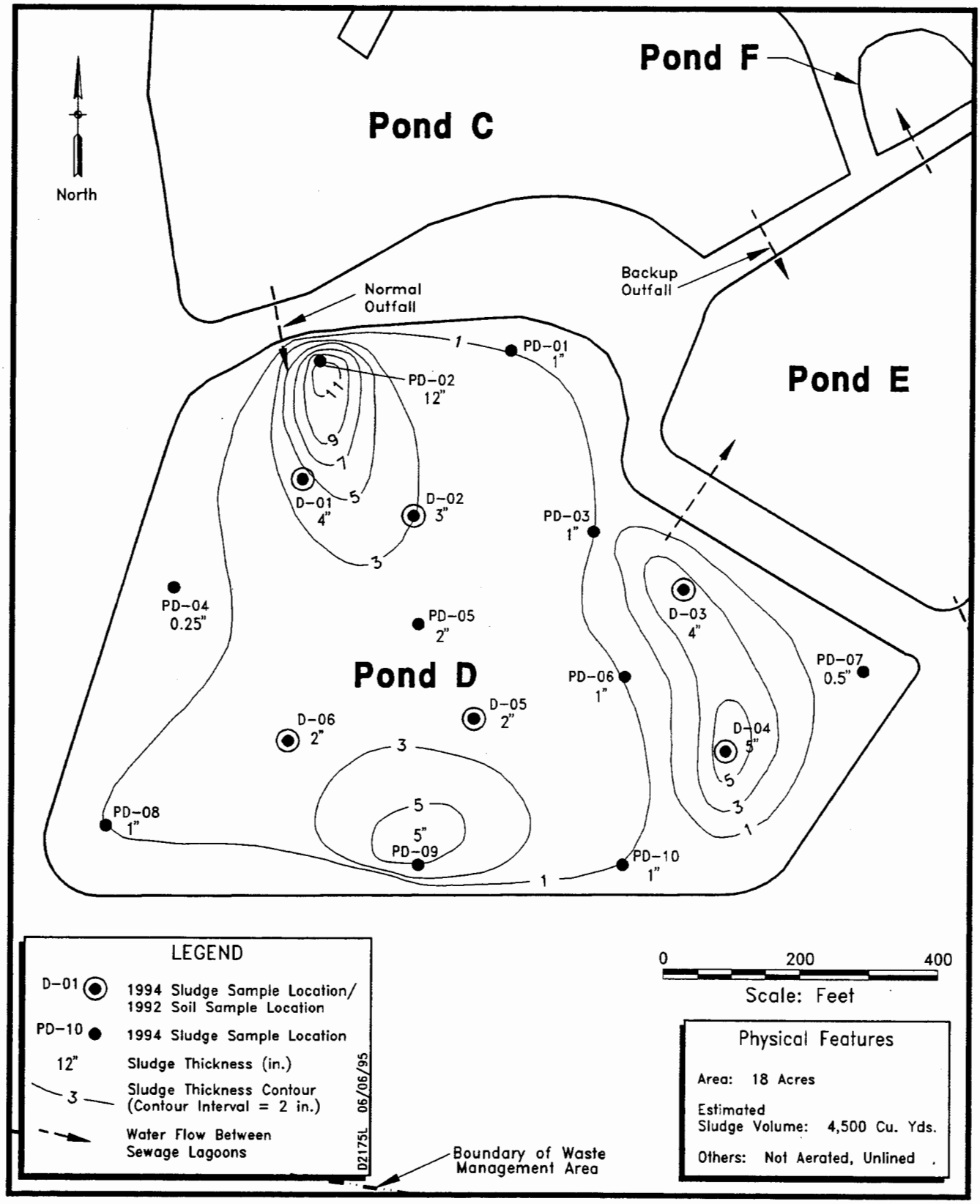

Figure 4.4-4. Sludge Thickness in Pond D

Table 4.4-2
Maximum Concentrations of Organochlorine Pesticides Detected Above the Reporting Limits at Pond D

Investigation Date	Constituents Above the Reporting Limits in Sludge (μg/kg)			
	4,4'-DDD	4,4'-DDE	4,4'-DDT	NA
1994	130	33	51	NA
Investigation Date	**Constituents Above the Reporting Limits in Soil (μg/kg)**			
	4,4'-DDD	beta-BHC	delta-BHC	gamma-BHC
1992	240 C	26 X	17 X	21 X

NA = Not applicable.

1992 Sampling Event
C = Presence and quantitation of analyte confirmed by second column analysis.
X = Qualitative confirmation of analyte on both columns. Quantification differed by a factor of two or more between columns. Value determined by the first column is reported.

Soil

The primary organic constituents present in the soil are 4,4'-DDD, beta-BHC, delta-BHC, and gamma-BHC, all of which have been detected at concentrations above their RL. The maximum detected concentrations of 4,4'-DDD (240 μg/kg at D-04) and of beta-BHC and delta-BHC (26 and 17 μg/kg, respectively, at D-03) were detected in the southeastern portion of the sewage lagoon. The highest concentration of gamma-BHC (21 μg/kg) was detected at location D-01 in the northwestern portion of the sewage lagoon.

Chromium, nickel, vanadium, and zinc were detected above the 1993 background UTLs in 1992. However, calculation of maximum possible TCLP concentrations for the metal constituents in the soil indicates that the metals are below the TC regulatory levels; therefore the soil is not TC hazardous.

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4.5 Pond E

Pond E was previously investigated in 1990, 1992, and 1993. These investigations are summarized in Table 4.5-1. The results of these investigations indicated that slightly elevated concentrations of organochlorine pesticides and metals were present in the sludge and soil and that total lead and organic lead were present, but uncertain, in the surface water.

To define the current conditions in Pond E for the upcoming CMS, sludge samples were collected in 1994 and analyzed for organochlorine pesticides and total metals. Surface water samples were analyzed for total lead and organic lead. The objectives of this sampling were to 1) define more precisely the extent of organochlorine pesticides and metals in the sludge; and 2) resolve the uncertainties associated with heptachlor epoxide in the sludge and with organic lead in the surface water. The results of the 1994 investigation, combined with the results of historical sampling at Pond E, are summarized below:

- Heptachlor epoxide was not detected in the sludge.
- Total lead and organic lead, which were detected at very low concentrations in 1990, were not detected in the surface water in 1994.
- 4,4'-DDD and 4,4'-DDE have consistently been detected in the sludge above the RLs. Concentrations of these constituents have decreased by one order of magnitude since 1992.
- 4,4'-DDD, 4,4'-DDE, beta-BHC, and gamma-BHC were detected in the soil above the RLs in 1992. Concentrations of these constituents are lower in the soil than in the sludge by approximately one order of magnitude.
- No constituents have been detected at concentrations above TC regulatory levels at Pond E. Therefore, the Pond E sludge is not TC hazardous.

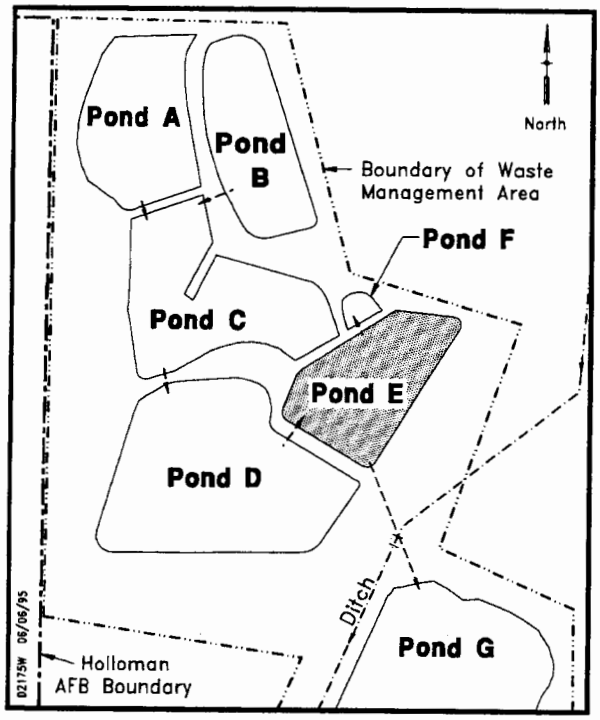

Figure 4.5-1 - Location of Pond E

4.5.1 Site Description

Pond E covers an area of approximately nine acres and is the fifth of seven impoundments in the wastewater treatment system. The sewage lagoon receives wastewater from Ponds C (only occasionally) and D and discharges into Ponds F and G (Figure 4.5-1). It has an average water depth of approximately 5 ft and is unlined.

4.5.2 1994 Investigation Summary and Results

Surface Water

Three surface water samples (Figure 4.5-2) were collected in 1994 and analyzed for total lead and organic lead. Analytical results are presented in Appendix F of this report. Neither total lead nor organic lead was detected in the surface water. Therefore, there is no evidence of lead contamination in Pond E.

Table 4.5-1
Summary of Sampling at Pond E

Matrix	Investigation	Investigation Summary	Results Summary
Surface Water	1990	• Six samples collected for analysis of semivolatile organic compounds, organochlorine pesticides, PCBs, and metals to define presence/absence and nature/extent of contamination.	• Metals were the primary constituents. • Bis(2-ethylhexyl)phthalate detected above drinking water standards; the detected concentration was below reporting limits and is therefore considered uncertain. All other constituents were below drinking water standards. • Organic lead concentrations reported to be 100 times greater than those of total lead; however, similar concentrations were detected in equipment rinsate samples.
	1993	• One sample collected for analysis of organochlorine pesticides.	• All constituents were below drinking water standards. • Several organochlorine pesticides detected but unconfirmed.
	1994	• Three samples collected for analysis of total lead and organic lead to confirm concentrations detected in 1990.	• Total lead and organic lead not detected.
Sludge	1992	• Five samples collected for analysis of Appendix IX constituents to provide preliminary estimate of extent of contamination.	• Organochlorine pesticides and metals were the primary constituents. • 4,4-DDD and 4,4'-DDE detected in the 1000-µg/kg range; gamma-chlordane detected in the 100-µg/kg range. • Thirteen metals detected. All below TC regulatory levels and allowable constituent concentrations for land applied sludge.
	1993	• One sample collected for analysis of semivolatile organic compounds, organochlorine pesticides, and metals.	• All metals below TC regulatory levels and allowable constituent concentrations for land applied sludge.
	1994	• Sixteen samples collected for analysis of organochlorine pesticides and metal constituents to define the areal extent more precisely.	• Heptachlor epoxide not detected. • 4,4'-DDD and 4,4'-DDE detected in the 100-µg/kg range; 4,4'-DDT detected in the 10-µg/kg range. • Fifteen metals detected. All below TC regulatory levels and allowable constituent concentrations for land applied sludge.
Soil	1992	• Five samples collected for analysis of Appendix IX constituents to define nature and extent of contamination.	• Organochlorine pesticides and metals were the primary constituents. • 4,4'-DDD, 4,4'-DDE, beta-BHC, and gamma-BHC detected in the 10-µg/kg range. • Barium, cobalt, and vanadium detected above 1993 background UTLs. • All below TC regulatory levels.

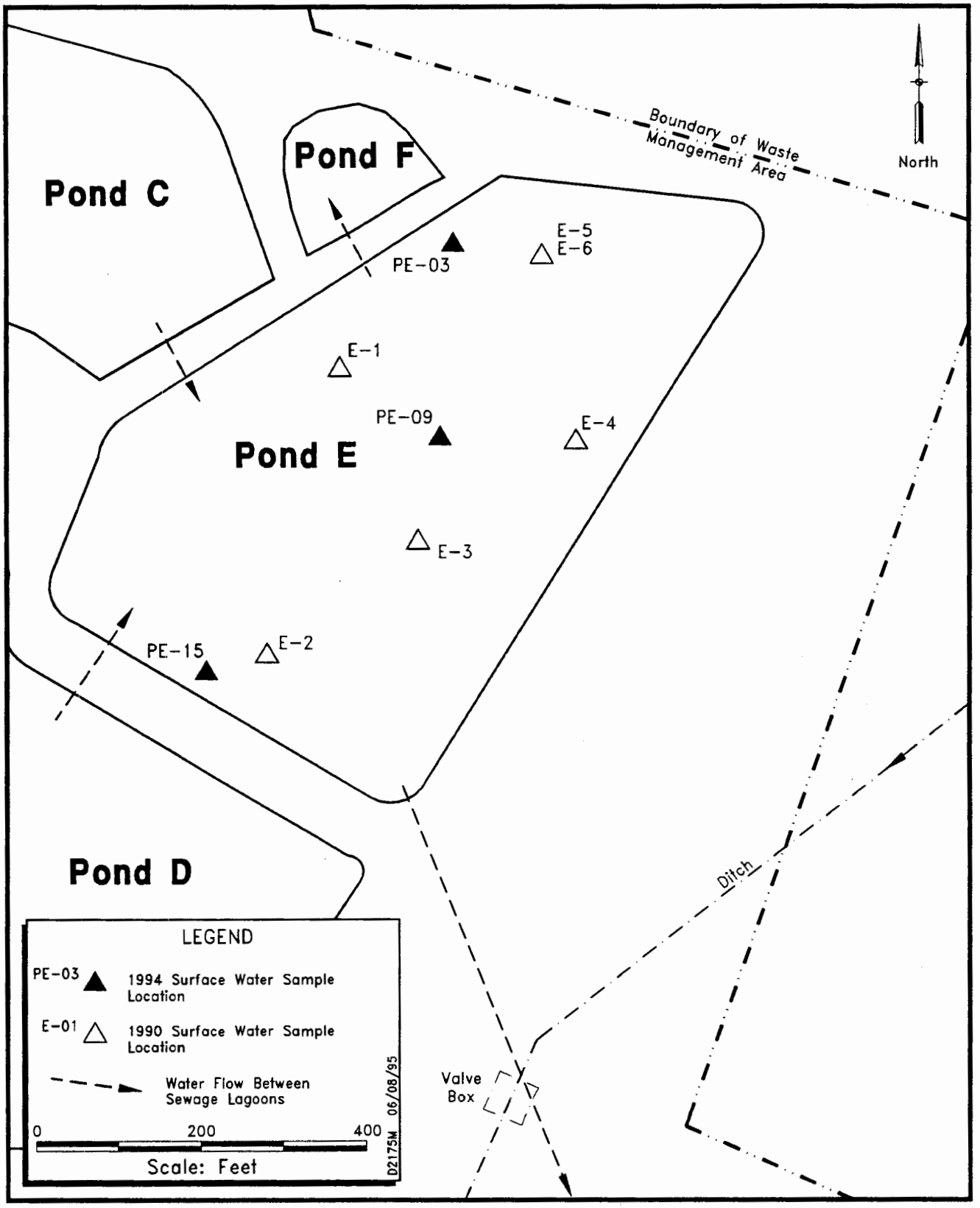

Figure 4.5-2. Surface Water Sampling Locations at Pond E

Sludge

Sixteen sludge samples were collected at Pond E in 1994 (Figure 4.5-3) and analyzed for organochlorine pesticides and metals. Samples for analysis of semivolatile organics were also collected to confirm any positive detections of isodrin or heptachlor epoxide. A summary of the analytical results of this investigation is contained in Appendix E of this report. Summary statistics of this investigation are provided in Appendix F.

4,4'-DDD, 4,4'-DDE, and 4,4'-DDT were detected at concentrations above their RL. The highest concentrations of 4,4'-DDD (130 μg/kg) and 4,4'-DDT (46 μg/kg) were detected at location PE-08 in the western portion of the sewage lagoon near the backup influent point from Pond C. The maximum concentration of 4,4'-DDE (150 μg/kg) was detected in the southeastern portion of the sewage lagoon near the influent point from Pond D. No other organochlorine pesticides, including isodrin and heptachlor epoxide, were detected above RLs.

All metals in the sludge are below the allowable constituent concentration for land-applied sludge. Calculation of the maximum possible TCLP concentrations indicates that none of the metals in the sludge are present at concentrations that exceed TC regulatory levels. Therefore, the sludge is not TC hazardous for metals.

A preliminary investigation at Pond E was conducted in October 1991 to determine the sludge thickness. Results of this investigation are documented in Radian, 1992. Similar measurements were conducted during the 1994 sampling event. Measurement results, used to construct a contour map of the sludge thickness in Pond E (Figure 4.5-4), indicate that approximately 9200 yd^3 of sludge are present in the sewage lagoon. The average measured moisture content of the sludge is 60 percent.

4.5.3 Conclusions

This section presents the overall results and conclusions of analytical sampling conducted at Pond E from 1990 and 1994. Conclusions regarding the distribution and significance of contamination in the sewage lagoon are addressed with respect to data evaluation criteria presented in Section 3 of this report. The discussion presented below focuses on those constituents that have consistently been detected in Pond E in the surface water, sludge, and soil during all of the investigations.

Surface Water

Five surface water samples were collected from Pond E in 1990 (Figure 4.5-2) and analyzed for semivolatile organic compounds, organochlorine pesticides, PCBs, and metals. In addition, one sample was collected in 1993 and analyzed for organochlorine pesticides, and three samples were collected in 1994 and analyzed for organic lead and total lead. Although none of the constituents analyzed were detected above the RLs, bis(2-ethylhexyl)phthalate was detected at levels slightly above the drinking water standards (Table 3.2-2). Phenol, alpha-BHC, beta-BHC, delta-BHC, gamma-BHC, and lead were not detected in any of the samples collected between 1990 and 1994; however, the MDLs for these constituents were slightly above the drinking water standards. For this reason, the possibility exists that these constituents could be slightly above drinking water standards. However, it should be reemphasized that surface water from the sewage lagoons does not serve as a drinking water source nor does it connect to any potable aquifers.

Sludge

The primary organic constituents present in the sludge at Pond E are 4,4'-DDD and 4,4'-DDE. These constituents were detected in both of the investigations conducted in 1992 and 1994.

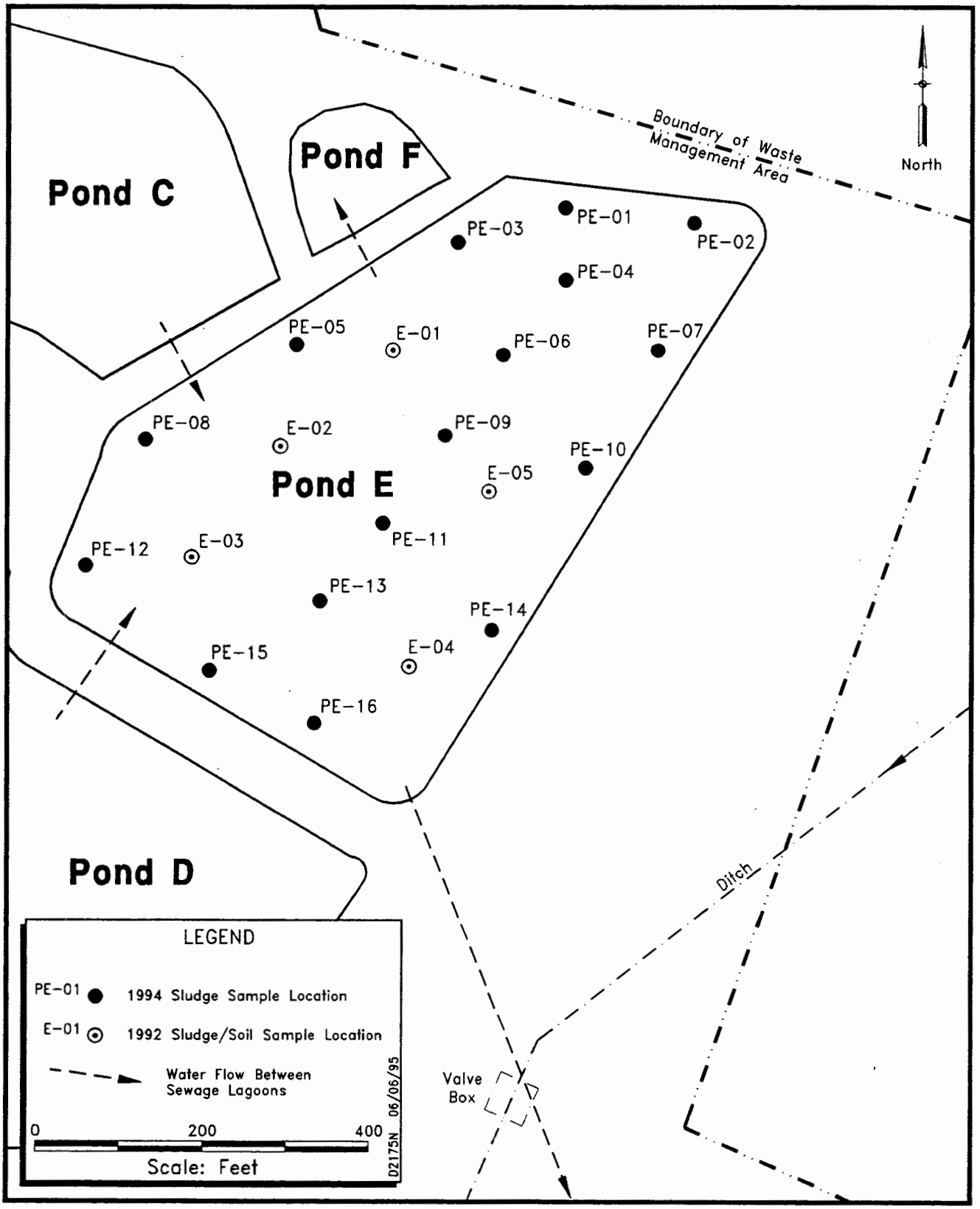

Figure 4.5-3. Sludge Sampling Locations at Pond E

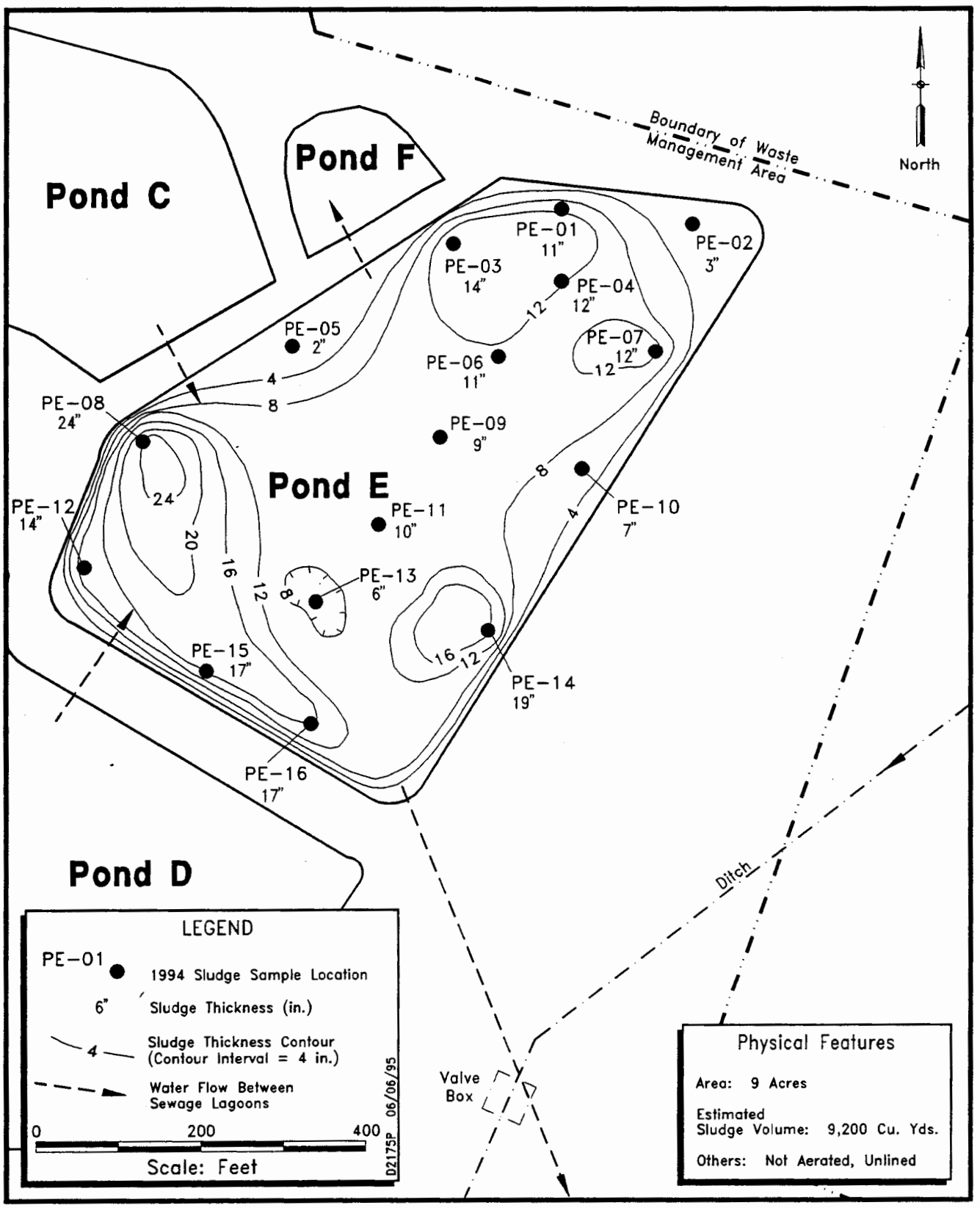

Figure 4.5-4. Sludge Thickness in Pond E

Table 4.5-2
Maximum Concentrations of Organochlorine Pesticides Detected Above the Reporting Limits at Pond E

Investigation Date	Constituents Above the Reporting Limits in Sludge (μg/kg)			
	4,4'-DDD	4,4'-DDE	4,4'-DDT	gamma-Chlordane
1992	7300 CD	1800 CD	< RL	230 X
1994	130	150	46	< RL
Investigation Date	**Constituents Above the Reporting Limits in Soil (μg/kg)**			
	4,4'-DDD	4,4'-DDE	beta-BHC	gamma-BHC
1992	83 C	7.3 C	9.6 C	11 X

RL = Reporting limit.

1992 Sampling Event
C = Presence and quantitation of analyte confirmed by second column analysis.
D = Secondary dilution required for this analyte.
X = Qualitative confirmation of analyte on both columns. Quantification differed by a factor of two or more between columns. Value determined by the first column is reported.

The maximum concentrations of these constituents (7300 and 1800 μg/kg, respectively) were detected in 1992 at location E-3 in the southwestern portion of the sewage lagoon about midway between the influent points from Ponds C and D. Since 1992, detected concentrations of these two constituents have decreased by approximately one order of magnitude (Table 4.5-2).

Other organochlorine pesticides detected in the sludge, during one or both of the two investigations, include 4,4'-DDT and gamma-chlordane. In general, the concentrations of these contaminants were detected in the southern portion of the sewage lagoon.

All of the metals detected are below the allowable constituent concentrations for land-applied sludge. Calculations of the maximum possible TCLP concentrations based on 1992 and 1994 metals concentrations indicate that all of the detected metals are below TC regulatory levels.

Soil

The primary organic constituents detected in the soil at Pond E are 4,4'-DDD, 4,4'-DDE, beta-BHC, and gamma-BHC. Each of these constituents was detected above the RL during the 1992 investigation (Table 4.5-2). In general, the concentrations of these constituents were highest in the southwestern portion of the sewage lagoon near the influent points from Ponds C and D.

Barium, cobalt, and vanadium were detected above the 1993 background UTLs in 1992. However, calculations of the maximum TCLP concentrations for metals indicate that none of the metals exceeds TC regulatory levels. Therefore, the soil is not TC hazardous for metals.

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4.6 Pond F

Pond F was investigated in 1992 and 1993. The scope and results of these investigations are presented in this section and are summarized in Table 4.6-1.

4.6.1 Site Description

Pond F covers an area of approximately 0.5 acres and is the sixth of seven impoundments in the wastewater treatment system. The sewage lagoon receives wastewater from Pond E and recirculates water back to the headworks of the treatment system (Figure 4.6-1). It has an average water depth of approximately 5 ft and is unlined.

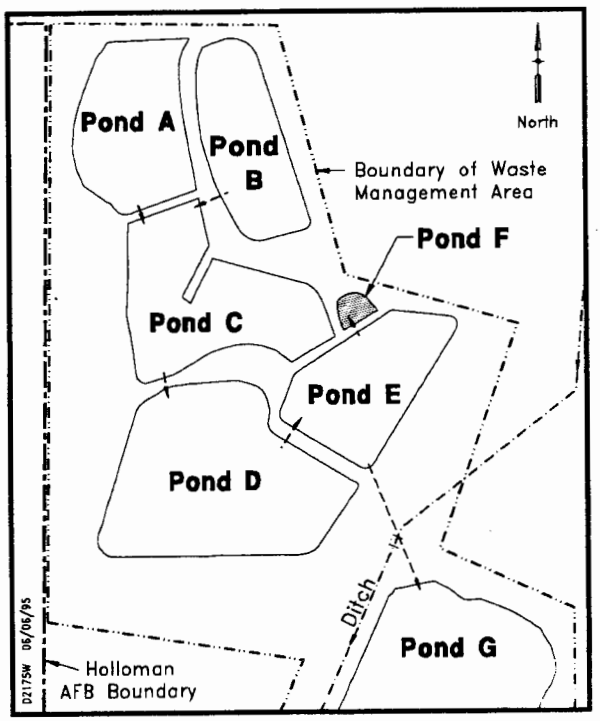

Figure 4.6-1 - Location of Pond F

4.6.2 Conclusions

This subsection discusses the analytical results and conclusions of the 1992 sludge and soil sampling and the 1993 surface water sampling conducted at Pond F.

Surface Water

One surface water sample was collected from Pond F in 1993 and analyzed for organochlorine pesticides. The results of this sampling indicated that several organochlorine pesticide constituents were present in the parts per trillion range and that all metals are below the drinking water standards. One surface water sample was collected from Pond F in 1993 (location not shown) and analyzed for organochlorine pesticides. None of the constituents analyzed were detected above the RLs or the drinking water standards.

Sludge

Two sludge samples were collected from Pond F in 1992 (Figure 4.6-2) and analyzed for Appendix IX constituents. A summary of the analytical results of this investigation is contained in Appendix C of this report.

The results indicate that 4,4'-DDD, 4,4'-DDE, and beta-BHC are the primary constituents present in the sludge. Each of these constituents was detected above its RL at both locations sampled in 1992. Concentrations of these constituents ranged from 1900 to 11,000 μg/kg and were highest in the sludge from location F-01, which is located near the overflow from Pond E.

The results of a preliminary investigation conducted at Pond F in October 1991 have been used to construct a contour map of the sludge thickness in Pond F (Figure 4.6-3). The results of this investigation indicate that approximately 300 yd^3 of sludge are present in the pond. The average measured moisture content of the sludge is 60 percent.

All metals detected are below the allowable constituent concentration for land-applied sludge. Calculations of the maximum TCLP concentrations indicate that none of the metals are above TC regulatory levels. Therefore, the sludge is not TC hazardous for metals.

Table 4.6-1
Summary of Sampling at Pond F

Matrix	Investigation	Investigation Summary	Results Summary
Surface Water	1993	• One sample collected for analysis of organochlorine pesticides to determine presence/absence of contamination.	• Several organochlorine pesticides were detected, but unconfirmed. • All were below drinking water standards.
Sludge	1992	• Two samples collected for analysis of Appendix IX constituents to determine nature and extent of contamination.	• Organochlorine pesticides and metals were the primary constituents detected. • 4,4-DDD, 4,4'-DDE, and delta-BHC detected in the 1000-μg/kg range. • Eleven metals detected. All below the TC regulatory levels and the allowable constituent concentrations for land-applied sludge.
Soil	1992	• One sample collected for analysis of Appendix IX constituents to determine presence/absence of contamination.	• Organochlorine pesticides and metals were the primary constituents detected. • 4,4'-DDD and 4,4'-DDE detected in the 10-μg/kg range. • All metals detected were below the TC regulatory levels and the 1993 background UTLs.

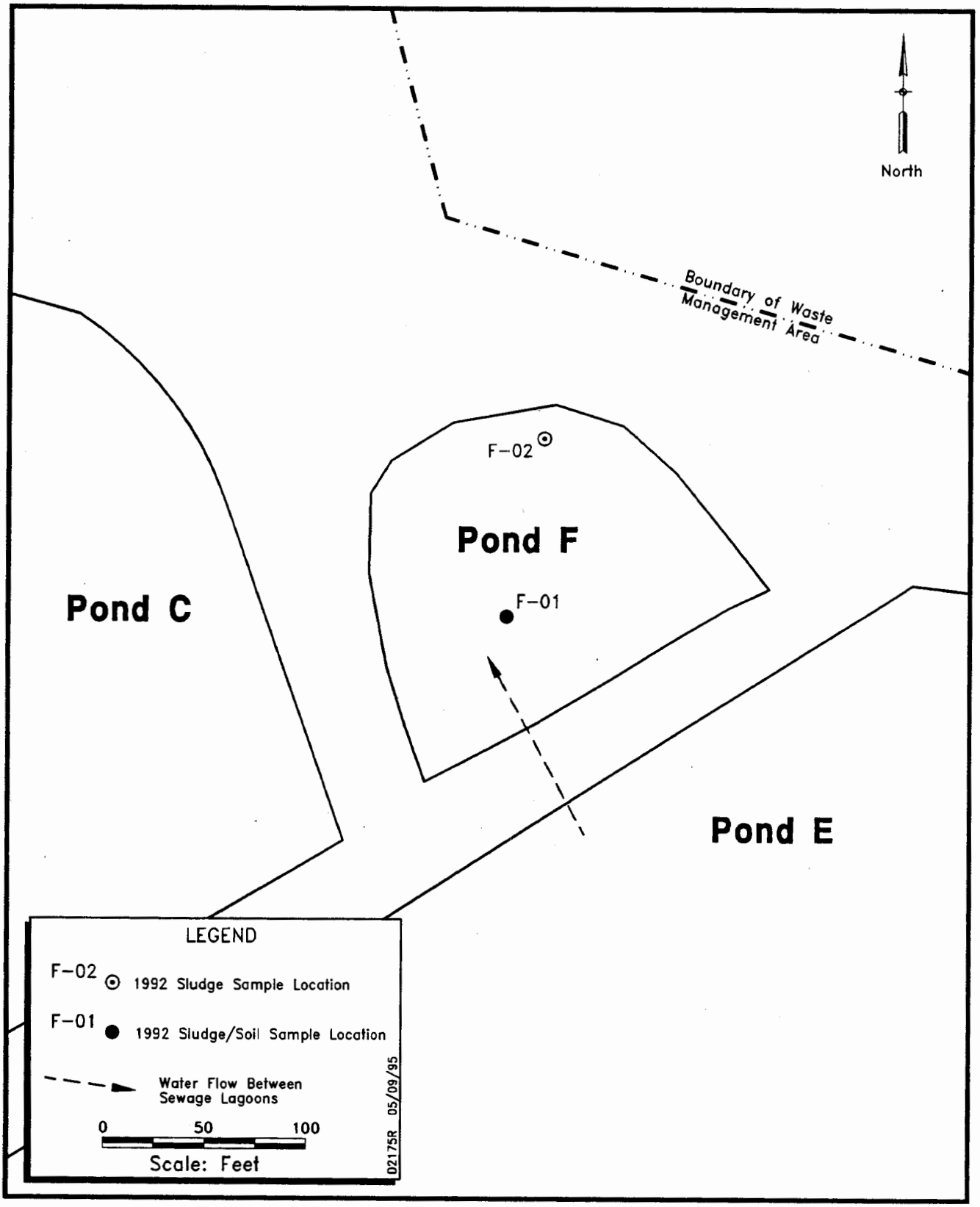

Figure 4.6-2. Sludge Sampling Locations at Pond F

Table 4.6-2
Maximum Concentrations of Organochlorine Pesticides Detected Above the Reporting Limits at Pond F

Investigation Date	Constituents Above the Reporting Limits in Sludge (µg/kg)		
	4,4'-DDD	4,4'-DDE	delta-BHC
1992	11,000 C	1900 CG	5000 X
Investigation Date	**Constituents Above the Reporting Limits in Soil (µg/kg)**		
	4,4'-DDD	4,4'-DDE	NA
1992	37 C	15 X	NA

NA = Not applicable.

1992 Sampling Event
C = Presence and quantitation of analyte confirmed by second-column analysis.
G = Indicates an estimated GC value due to interference.
X = Qualitative confirmation of analyte on both columns. Quantification differed by a factor of two or more between columns. Value determined by the first column is reported.

Soil

One soil sample was collected from Pond F in 1992 (Figure 4.6-2) and analyzed for Appendix IX constituents. A summary of the analytical results is presented in Appendix C of this report.

4,4'-DDD and 4,4'-DDE were detected above the RL in the soil (Table 4.6-2).

All metals detected in the soil at Pond F were below the 1993 background UTLs. Calculations of the maximum possible TCLP concentrations indicate that none of the metals are above TC regulatory levels. Therefore, the soil is not TC hazardous for metals.

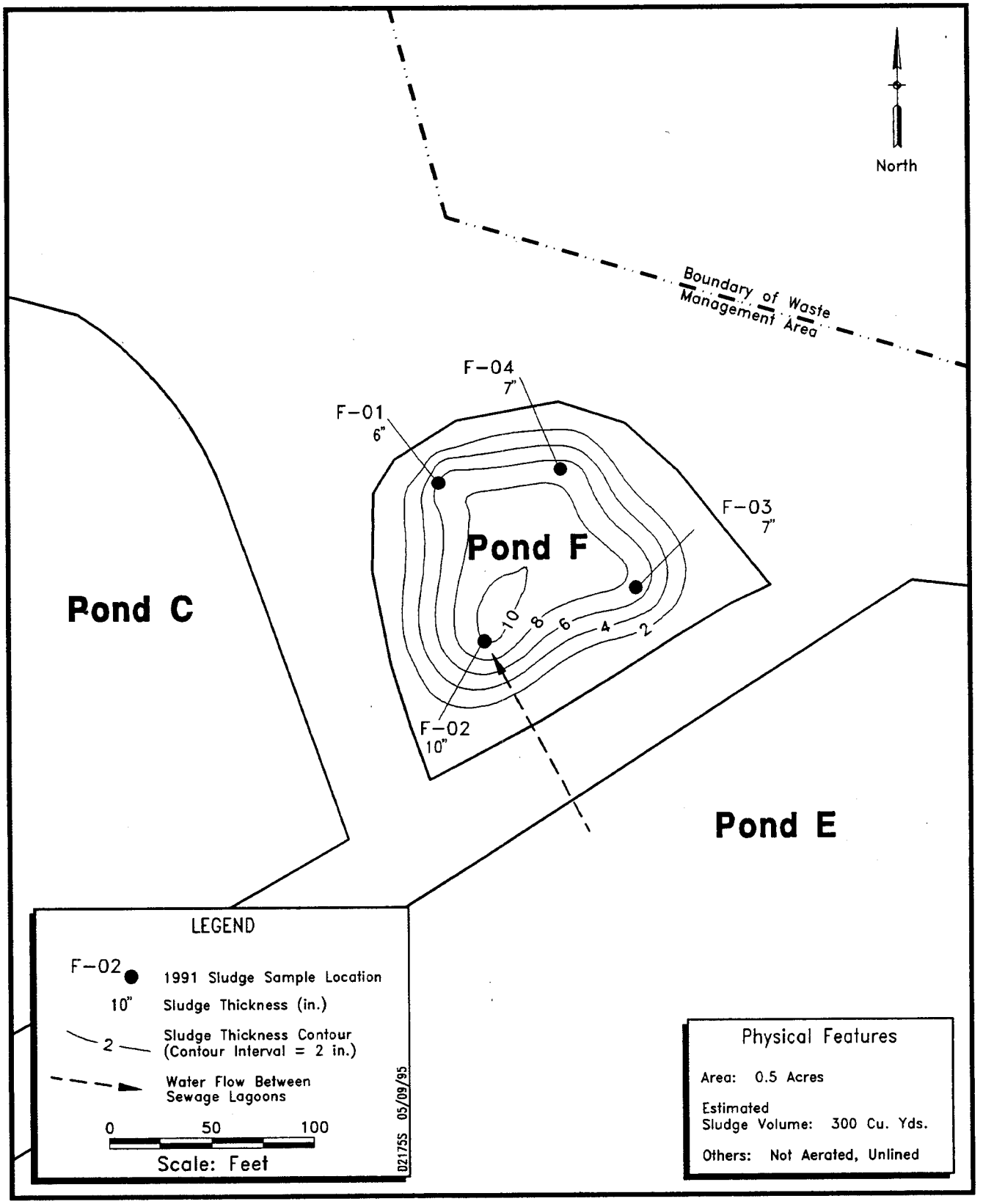

Figure 4.6-3. Sludge Thickness in Pond F

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4.7 Pond G

Pond G was previously investigated in 1990, 1992, and 1993. These investigations are summarized in Table 4.7-1. The results of these investigations indicated that slightly elevated concentrations of organochlorine pesticides and metals were present in the sludge and soil and that total lead and organic lead were present, but uncertain, in the surface water at slightly elevated concentrations.

To define the current conditions in Pond G for the upcoming CMS, sludge samples were collected in 1994 and analyzed for organochlorine pesticides and total metals. Surface water samples were analyzed for total lead and organic lead. The objectives of this sampling were to 1) define more precisely the extent of organochlorine pesticides and metals in the sludge and 2) resolve the uncertainties associated with heptachlor epoxide and kepone in the sludge and with organic lead in the surface water. The results of the 1994 investigation, combined with the results of historical sampling at Pond D, are summarized below:

- Heptachlor epoxide was not detected in the sludge.
- Kepone was not detected in the sludge above the RL.
- Total lead and organic lead, which were detected in the surface water at very low concentrations in 1990, were not detected during the 1994 investigation.
- 4,4'-DDD and 4,4'-DDE have been detected consistently in the sludge. Concentrations of these constituents have decreased by one order of magnitude since 1992.
- No constituents have been detected above TC regulatory levels at Pond G. Therefore, the sludge and soil present at Pond G are not TC hazardous.

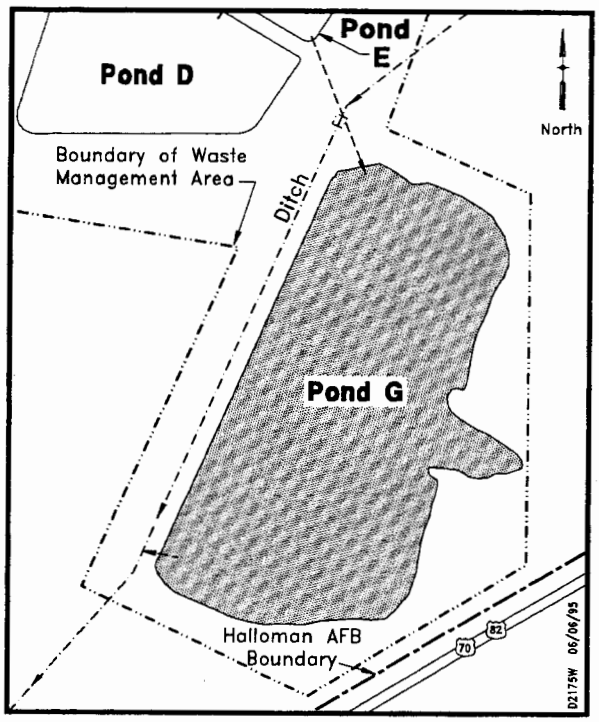

Figure 4.7-1 - Location of Pond G

4.7.1 Site Description

Pond G covers an area of approximately 48 acres and is the last of seven impoundments in the wastewater treatment system. The sewage lagoon receives wastewater from Pond E through an open ditch (Figure 4.7-1). Overflow from Pond G flows via an open ditch to Lake Holloman. It has an average water depth of approximately 3.5 ft and is unlined.

4.7.2 1994 Investigation Summary and Results

Surface Water

Three surface water samples (Figure 4.7-2) were collected in October 1994 and analyzed for total lead and organic lead. Analytical results are presented in Appendix F of this report. Neither lead nor organic lead was detected in the surface water; therefore, there is no evidence of lead contamination in Pond G.

Table 4.7-1
Summary of Sampling at Pond G

Matrix	Investigation	Investigation Summary	Results Summary
Surface Water	1990	• Six samples collected for analysis of semivolatile organic compounds, organochlorine pesticides, PCBs, and metals to define presence/absence and nature/extent of contamination.	• Metals were the primary constituents detected. • Beta-BHC and bis(2-ethylhexyl)phthalate detected above drinking water standards; detected concentrations were below reporting limits, and are therefore uncertain. All other constituent concentrations were below the drinking water standards. • Organic lead concentration reported to be 100 times greater than of total lead.
	1993	• One sample collected for analysis of organochlorine pesticides.	• Several organochlorine pesticides were detected, but not confirmed.
	1994	• Nine samples collected for analysis of total lead and organic lead to confirm concentrations detected in 1990.	• Total lead and organic lead not detected.
Sludge	1992	• Six samples collected for analysis of Appendix IX constituents to provide preliminary estimate of extent of contamination.	• Organochlorine pesticides and metals were the primary constituents detected. • 4,4'-DDD detected in the 1000-µg/kg range; 4,4'-DDE and gamma-Chlordane detected in the 100-µg/kg range. • Twelve metals detected. All below TC regulatory levels and the allowable constituent concentration for land-applied sludge.
	1994	• Nineteen samples collected for analysis of organochlorine pesticide and metal constituents to more precisely define areal extent.	• Heptachlor epoxide not detected. • Kepone was not detected above the reporting limit. • 4,4'-DDD detected in the 100-µg/kg range and 4,4'-DDE and 4,4'-DDT detected in the 10 µg/kg range. • Thirteen metals detected.; all below TC regulatory levels and the allowable constituent concentrations for land-applied sludge.
Soil	1992	• Six samples collected for analysis of Appendix IX constituents to define nature and extent of contamination.	• Organochlorine pesticides and metals were the primary constituents detected. • 4,4'-DDD and delta-BHC detected in the 10 µg/kg range. • All below the TC regulatory levels. • Barium, chromium, cobalt, copper, lead, nickel, vanadium, and zinc were detected above the 1993 background UTLs.

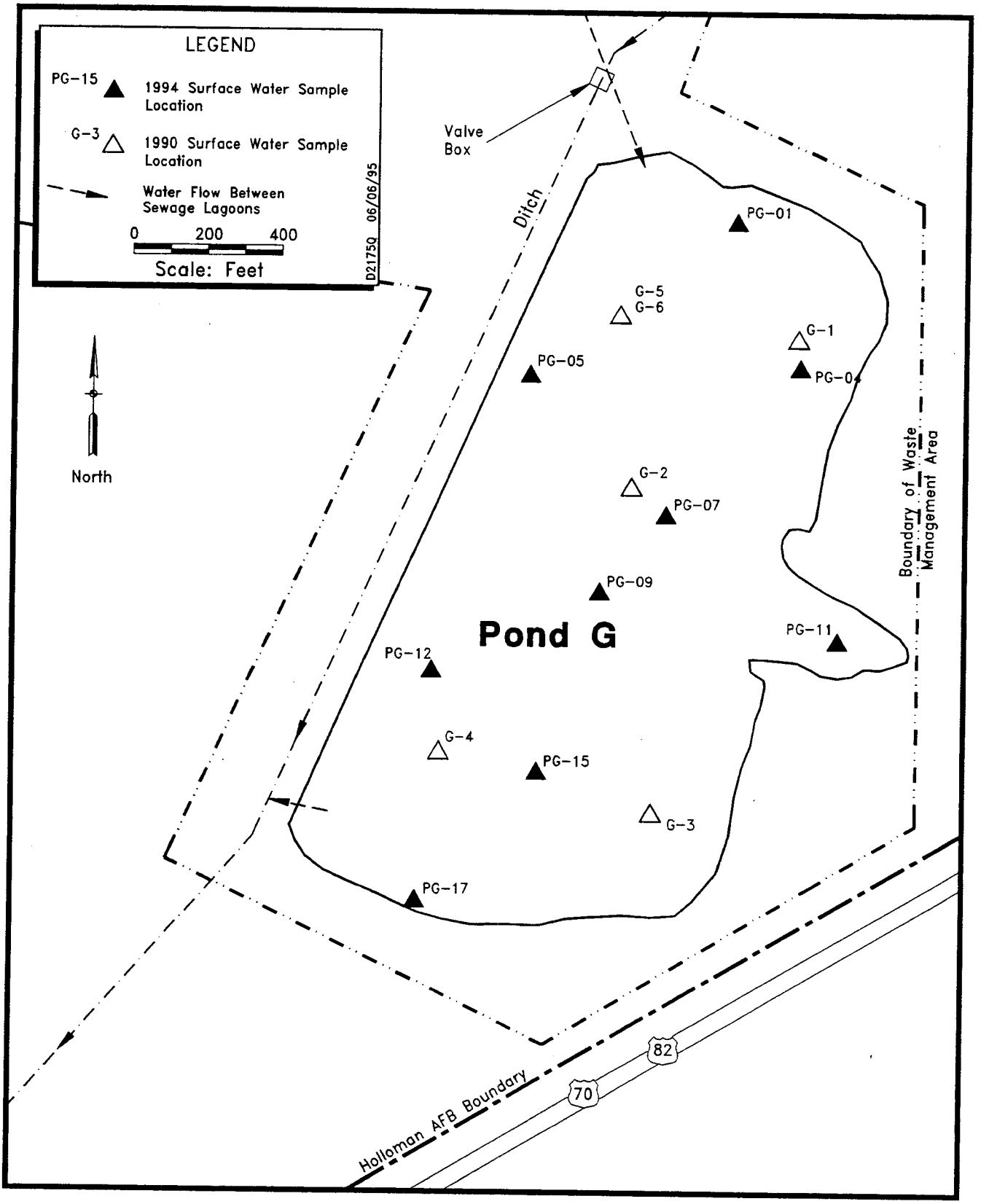

Figure 4.7-2. Surface Water Sampling Locations at Pond G

Sludge

Nineteen sludge samples were collected at Pond G in 1994 (Figure 4.7-3) and analyzed for organochlorine pesticides and metals. Samples for analysis of semivolatile organics were also collected to confirm any positive detections of isodrin and/or heptachlor epoxide. A summary of the analytical results of this investigation is contained in Appendix E of this report. A summary of statistics of this investigation is given in Appendix F of this report.

4,4'-DDD, 4,4'-DDE, and 4,4'-DDT were detected at concentrations above the RL. The highest concentrations of 4,4'-DDD (430 μg/kg), 4,4'-DDE (97 μg/kg), and 4,4'-DDT (26 μg/kg) were all detected at different sampling locations. No particular areas of elevated concentrations could be identified. No other organochlorine pesticides, including isodrin and heptachlor epoxide, were detected above RLs.

All metals detected in the sludge were below the allowable constituent concentration for land applied sludge. Calculations of the maximum possible TCLP concentrations based on the 1992 and 1994 metals results indicate that none of the metals is present in the sludge at concentrations that exceed TC regulatory levels. Therefore, the sludge is not TC hazardous for metals.

A preliminary investigation at Pond G was conducted in October 1991 to determine the sludge thickness. Results of this investigation are documented in Radian, 1992. Similar measurements were conducted during the 1994 sampling event. Measurement results, used to construct a contour map of the sludge thickness in Pond G (Figure 4.7-4), indicate that approximately 27,000 yd^3 of sludge are present in the sewage lagoon. The average measured moisture content of the sludge is approximately 55 percent.

4.7.3 Conclusions

This section presents the overall results and conclusions of analytical sampling conducted at Pond G from 1990 and 1994. Conclusions regarding the distribution and significance of contamination in the sewage lagoon are addressed with respect to data evaluation criteria presented in Section 3 of this report. The discussion presented below focuses on those constituents that have consistently been detected in Pond G during surface water, sludge, and soil in all of the investigations.

Surface Water

Five surface water samples were collected from Pond G in 1990 (Figure 4.7-2) and analyzed for semivolatile organic compounds, organochlorine pesticides, PCBs, and metals. In addition, one sample was collected in 1993 and analyzed for organochlorine pesticides, and three samples were collected in 1994 and analyzed for organic lead and total lead. Although none of the constituents analyzed were detected above the RLs, beta-BHC and bis(2-ethylhexyl)phthalate were detected at levels slightly above the drinking water standards (Table 3.2-2). Phenol, alpha-BHC, delta-BHC, gamma-BHC, and lead were not detected in any of the samples collected between 1990 and 1994; however, the MDLs for these constituents were slightly above the drinking water standards. For this reason, the possibility exists that these constituents could be slightly above drinking water standards. However, it should be reemphasized that surface water from the sewage lagoons does not serve as a drinking water source nor does it connect to any potable aquifers.

Sludge

The primary organic constituents present in the sludge at Pond G are 4,4'-DDD and 4,4'-DDE. These constituents were detected above the RLs in both the 1992 and 1994 investigations. The maximum concentrations of these two constituents (3100 and 450 μg/kg, respectively) were detected

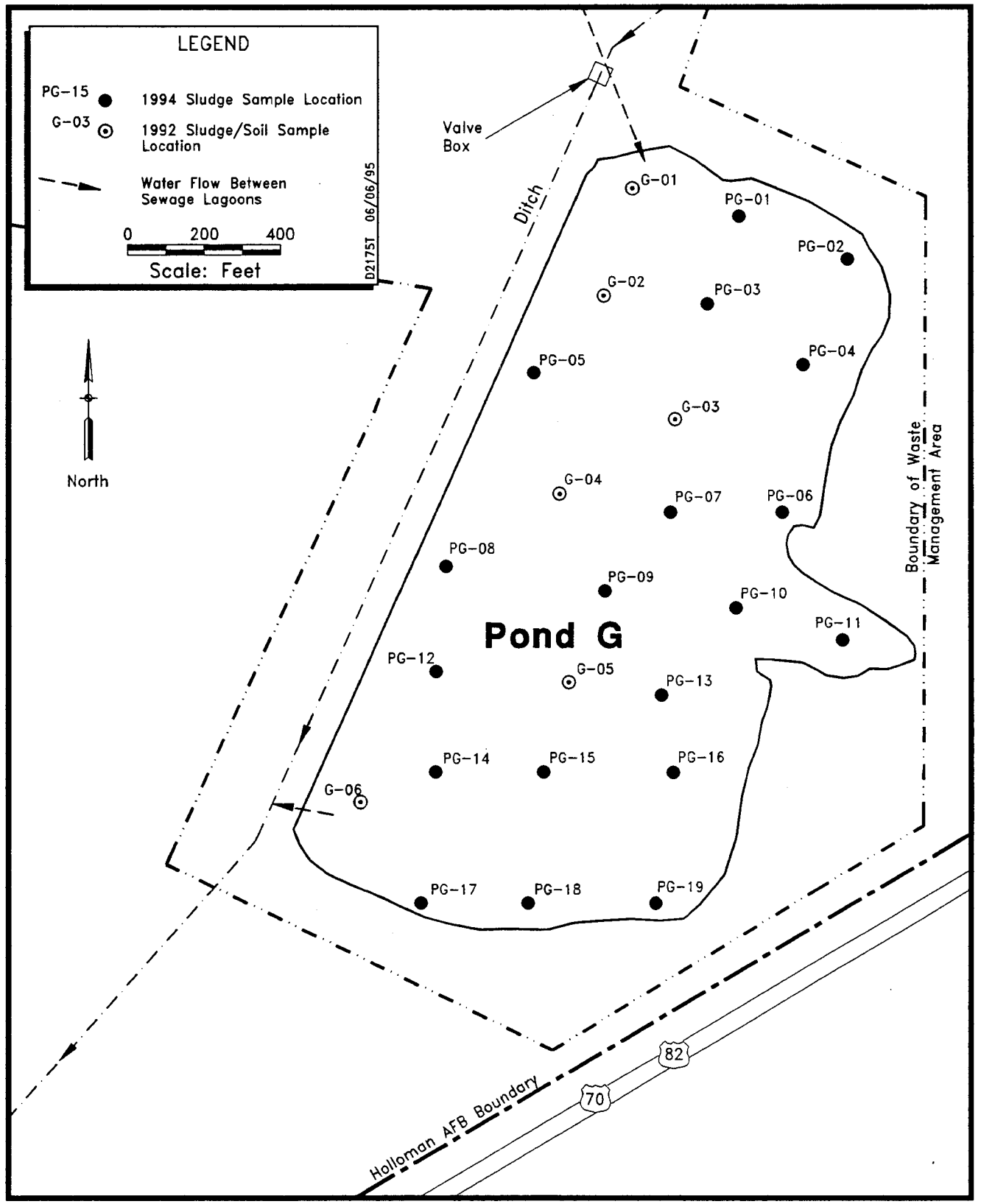

Figure 4.7-3. Sludge Sampling Locations at Pond G

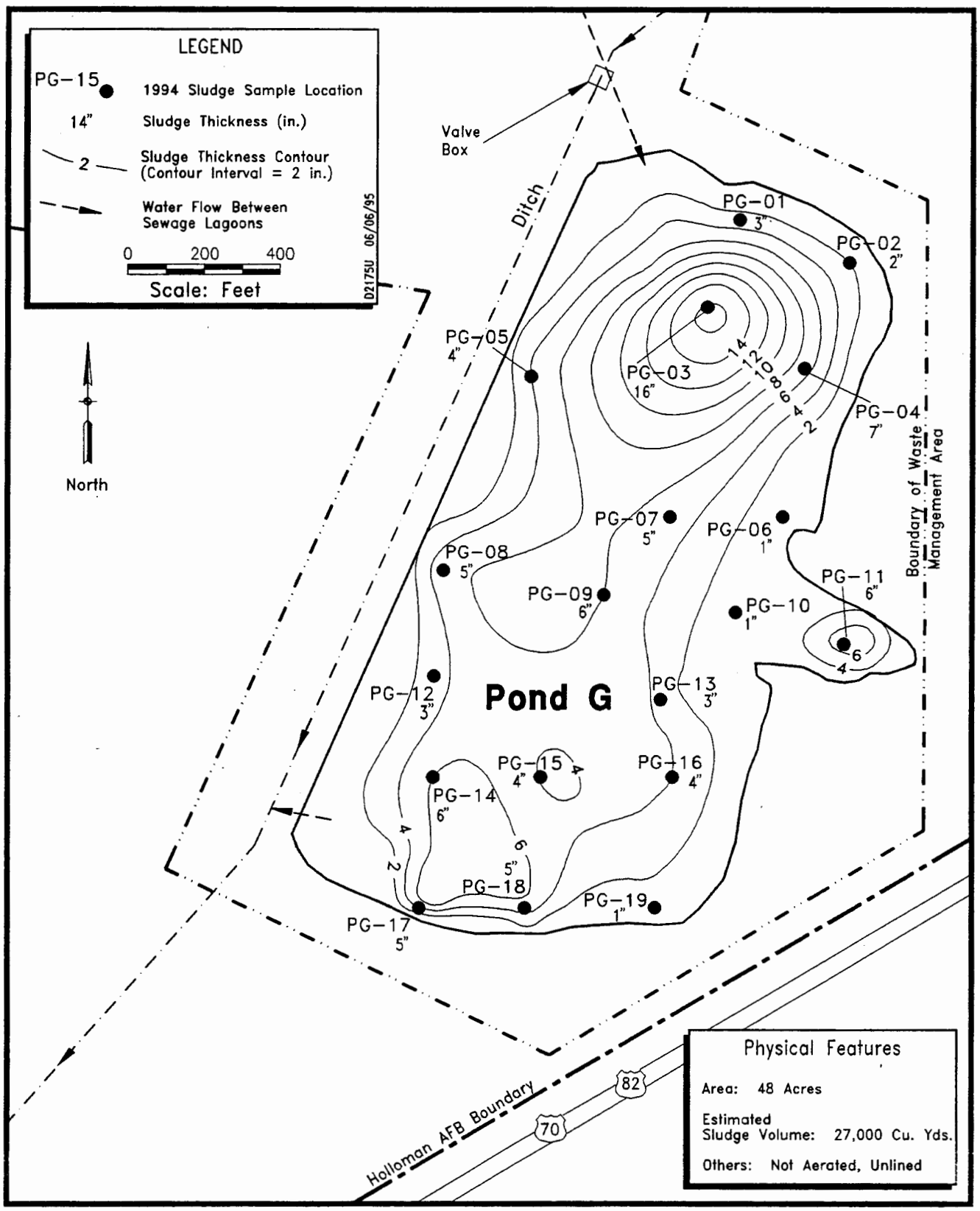

Figure 4.7-4. Sludge Thickness in Pond G

in 1992 at location G-02 in the northwestern portion of the sewage lagoon near the influent point from Pond E. Since 1992, detected concentrations of these two constituents have decreased by approximately one order of magnitude (Table 4.7-2). Other organochlorine pesticides detected in the sludge, but during only one of the two investigations conducted in 1990 and 1994, consist of 4,4-DDT and gamma-chlordane.

In general, the concentrations of the organochlorine pesticides do not appear to be elevated in any particular area of the sewage lagoon, but rather appear to be randomly scattered throughout Pond G. An overall general decrease of these constituent concentrations, however, has been noted between the 1992 and 1994 investigations.

All of the detected metals were below the allowable constituent concentrations for land-applied sludge. Calculations of the maximum possible TCLP concentrations based on the 1992 and 1994 metals results indicate that all of the detected metals are below TC regulatory levels. Therefore, the sludge is not TC hazardous for metals.

Soil

Organic constituents present in the soil at concentrations above the RL consist of 4,4'-DDD and beta-BHC (Table 4.7-2). The maximum concentrations of these two constituents (7.5 and 11.0 μg/kg, respectively) were detected in the northern and southern portions of the sewage lagoon, respectively. No other organochlorine pesticide was detected in the soil at a concentration above the RL during either investigation.

Barium, chromium, cobalt, copper, lead, nickel, vanadium, and zinc were detected above the 1993 background UTLs in 1992. However, calculations of the maximum possible TCLP concentrations based on the 1992 metals results indicate that none of the metals detected is above TC regulatory levels. Therefore, the soil is not TC hazardous for metals.

Table 4.7-2
Maximum Concentrations of Organochlorine Pesticides Detected Above the Reporting Limits at Pond G

Investigation Date	Constituents Above the Reporting Limits in Sludge (μg/kg)			
	4,4'-DDD	4,4'-DDE	4,4'-DDT	gamma-Chlordane
1992	3,100 C	450 X	< RL	310 X
1994	430	97	26	< RL
Investigation Date	**Constituents Above the Reporting Limits in Soil (μg/kg)**			
	4,4'-DDD	beta-BHC	NA	NA
1992	7.5 C	11 XB	NA	NA

RL = Reporting limit.
NA = Not applicable.

1992 Sampling Event
B = Analyte detected in laboratory blank analysis, no blank substraction performed.
C = Presence and quantitation of analyte confirmed by second-column analysis.
X = Qualitative confirmation of analyte on both columns. Quantification differed by a factor of two or more between columns. Value determined by the first column is reported.

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Section 5
SUMMARY OF DATA

This section summarizes the results of the sewage lagoons investigations conducted between 1990 and 1994. The summary discusses the surface water, sludge, and soil results separately.

5.1 Surface Water

Surface water samples were collected from the sewage lagoons in 1990, 1993, and 1994. Summaries of the analytical results of these investigations are presented in Appendices A, C, and E, respectively. The results of the 1990 and 1993 investigations indicated that metals were the primary constituents of concern in the surface water and organochlorine pesticides existed in the parts per trillion range. Although metals were determined to be the primary constituents of concern, the measured concentrations were consistent with naturally occurring concentrations in drinking and waste waters. The 1990 investigation resulted in suspect concentrations for organic lead; concentrations of organic lead exceeded those for total lead, and similar concentrations were detected in the equipment rinsate samples. The 1994 investigation confirmed that the 1990 results for organic lead were not reliable. Organic lead was not detected even though a methodology with a lower detection limit was used. All detected constituents in the surface water are below MCLs.

The surface water concentrations in the sewage lagoons were compared with drinking water standards established by EPA and NMED. The drinking water standards with which the investigation results were compared are shown in Table 3.2-2. The comparison demonstrated that bis(2-ethylhexyl)phthalate (Ponds B, D, E, and G), phenol (Pond D), and beta-BHC (Pond G) were detected below their RLs but above the drinking water standards. Constituents such as bis(2-ethylhexyl)phthalate, phenol, alpha-BHC, beta-BHC, delta-BHC, gamma-BHC, heptachlor epoxide, and lead were not detected in the ponds (other than those listed above) but their method detection limits were slightly above the drinking water standards. This comparison demonstrates that the sewage lagoon's surface water nearly meets the drinking water standards for the parameters listed in Table 3.2-2. It should be reemphasized that the sewage lagoons do not serve as a drinking water source nor do they connect to any potable aquifers. Therefore, the drinking water standards are merely used as a means of comparison.

5.2 Sludge

Sludge samples were collected from the sewage lagoons in 1990, 1992, 1993, and 1994. Summaries of the analytical results of these investigations are contained in Appendices B through E. Because of the apparent differences in the character of the sludge contained in Ponds A and B from that contained in Ponds C through G, the overall conclusions for these sewage lagoons are discussed separately.

5.2.1 Ponds A and B

Sludge from Ponds A and B has been investigated primarily for PCBs. Sludge found to have PCB concentrations above the TSCA action level of 25 mg/kg in Ponds A and B during the 1988 investigation was removed in 1990. Subsequent to the sludge removal, confirmation sampling was performed in 1990 to determine the effectiveness of the removal. The confirmation sampling, along with the 1994 investigation of Ponds A and B, confirmed that sludge PCB concentrations were below the TSCA action level. These investigations also indicated that metal concentrations in the sludge are below the TC regulatory levels and that the sludge is not characteristically hazardous due to reactivity (i.e., it contains less than 500-mg/kg reactive sulfides).

In addition, metal concentrations are below regulatory limits for land-applied sludge.

5.2.2 Ponds C, D, E, F, and G

Sludge in Ponds C, D, E, F, and G was investigated in 1990 (Pond C only), 1992, and 1994. The sludge was analyzed for Appendix IX constituents in 1990 and 1992. These investigations indicated that organochlorine pesticides and metals were the primary constituents in the sludge. Therefore, the 1994 investigation focused on these constituents.

The only organochlorine pesticides that have been detected above their reporting limits in all of the investigations are 4,4'-DDD and 4,4'-DDE. The concentrations of 4,4'-DDD and 4,4'-DDE, as well as the other constituents that were sporadically detected, have decreased over time. To illustrate this decrease in concentration, the maximum and mean concentrations for 4,4'-DDD in Pond C are shown in Figure 5.2-1. The mean concentrations were calculated using only the detected concentrations. Therefore, the means represent worst-case scenarios. The figure shows that both the maximum and mean concentrations have decreased by at least one order of magnitude.

The investigations also show that 4,4'-DDT, gamma-chlordane, and delta-BHC were detected in the sludge during one or more sampling events. However, these constituents were not detected in all of the investigations, and also appear to have decreased over time. Generally, concentrations of 4,4'-DDT have decreased from approximately 100 µg/kg in 1992 to approximately 10 µg/kg in 1994. Concentrations of gamma-chlordane have decreased to either nondetect or to below the RL.

These reductions in 4,4'-DDT, 4,4'-DDD, and 4,4'-DDE can be explained as having occurred through both biological and physical processes. Biologically, 4,4-DDT can be reduced to 4,4'-DDD and eventually to 4,4'-DDE by anaerobic bacteria (Atlas and Bartha, 1987). Bacteria used the energy associated with the constituent's chemical bonds for growth and reproduction. Physically, dechlorination of 4,4'-DDE may result through photolysis (Wolfe, 1990).

Investigations conducted at Pond C prior to the 1994 investigation indicated that, based on the calculated maximum TCLP concentrations, the sludge may contain silver and chromium at concentrations that could potentially exceed the TC regulatory levels. The 1994 investigation showed that the TCLP concentrations for these constituents (as well as for all other metals) were well below the TC regulatory levels. Therefore the sludge is not considered TC hazardous. The 1994 investigation also indicated that the Pond C sludge is not characteristically hazardous due to reactivity. On the basis of the calculated maximum potential TCLP concentrations, Ponds D, E, and G do not contain metal constituents in concentrations that could potentially exceed the TC regulatory levels. Therefore, no samples from these sewage lagoons were analyzed for TCLP because the sludge is not TC hazardous. In addition, metals concentrations are below pollutant concentration for land-applied sludge.

Analytical results for inorganic constituents in the lagoon's sludge were compared with allowable constituent concentrations for the land application of sewage sludge. The allowable concentrations are standards for secondary sludge and not primary sludge, as is found in the sewage lagoons. Even though inorganic concentrations typically increase in secondary sludges, the allowable concentrations are greater than four times the concentrations found in the sewage lagoon sludge and should not exceed regulatory limits given secondary treatment. Therefore, a qualitative comparison indicates that metal concentrations in the sewage lagoon sludge does not exceed the allowable concentrations for land-applied sewage sludge.

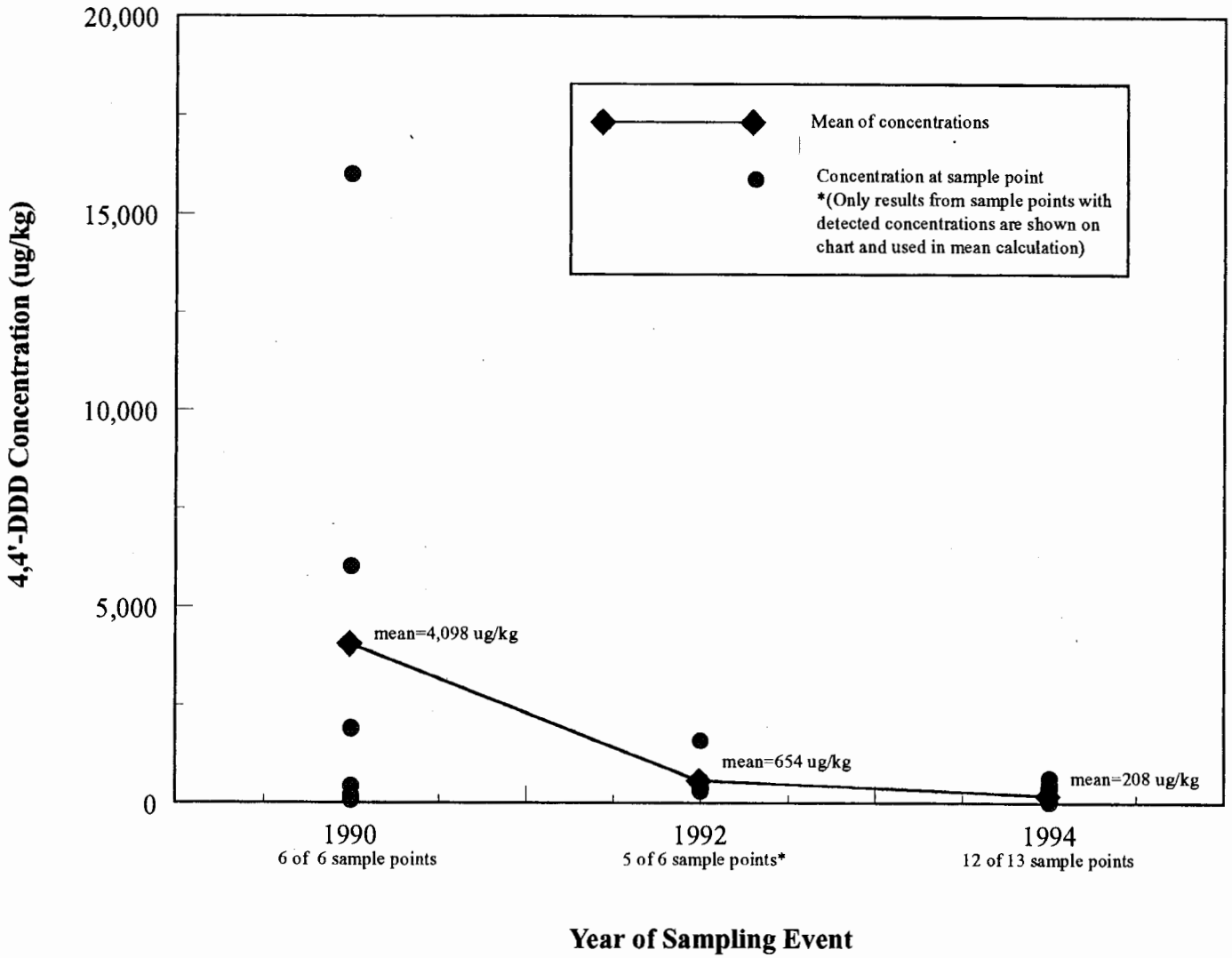

Figure 5.2-1. Concentration Decrease for 4,4'-DDD, Pond C

Sludge samples collected in 1994 from Ponds C and G were analyzed for kepone because a previous investigation indicated that it may be present in the sewage lagoons. Eight samples from Pond C and 12 samples from Pond G were analyzed for kepone. Only one sample from each of the two sewage lagoons contained a detectable concentration of kepone. However, both detections were below the 70-μg/kg RL.

Samples for Ponds C, D, E, and G collected during the 1994 investigation were also analyzed to determine whether heptachlor epoxide or isodrin was present. As described previously, GC/MS analysis was used to confirm that no heptachlor epoxide or isodrin was present in the sludge samples. These constituents were not detected in any of the samples. Therefore, it is concluded that the sludge in the sewage lagoons does not contain heptachlor epoxide or isodrin.

Although there are some areas in each sewage lagoon with elevated concentrations, it is difficult to define any "hot spot" areas. Ponds C and E have elevated constituent concentrations in the areas of the influent and effluent points. Ponds D, E, and G generally have one or two sample locations with elevated concentrations. However, these locations do not always have the highest concentrations for each of the constituents. For example, relatively high concentrations of 4,4'-DDD may be present in one sample location, while high concentrations of 4,4'-DDT are present in another location. This is also the case for the metals and other pesticides in the sewage lagoons.

The predominant contaminants, metals and organochlorine pesticides, do not indicate a trend of increasing or decreasing concentrations downstream in the series of sewage lagoons. Concentrations of some constituents, for example, are higher in the sludge in Pond G than the corresponding concentrations in the sludge in Pond D or E.

5.3 Soils

Soil samples were collected from Ponds A, B, and C in 1990, and from Ponds C, D, E, F, and G in 1992. Similar to the sludge, the predominant contaminants found in the soil were organochlorine pesticides and metals. However, soil concentrations were significantly lower than those in sludge. 4,4'-DDD and 4,4'-DDE were detected in Ponds C, D, E, F, and G but not in Ponds A and B. Other organochlorine pesticides detected in the soil include 4,4'-DDT, gamma-chlordane, beta-BHC, gamma-BHC, delta-BHC, aldrin, endosulfan sulfate, endosulfan II, and heptachlor epoxide, but many of these constituents were detected below their RLs during one or more investigations. The concentrations of these contaminants are typically at least one order of magnitude lower in the soil than in the sludge.

A comparison of the results of inorganic analyses for soil samples indicates that several of the metals were detected at concentrations above the 1993 background UTL. However, calculations of the maximum possible TCLP concentrations indicate that none of the metals exceed TC regulatory levels. Therefore, it is concluded that the soil in the sewage lagoons is not TC hazardous.

Section 6
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APPENDIX A

SUMMARY OF ANALYTICAL RESULTS FOR THE 1990 SURFACE WATER INVESTIGATION

APPENDIX A
SUMMARY OF ANALYTICAL RESULTS FOR THE 1990 SURFACE WATER INVESTIGATION

This appendix summarizes the analytical results for the 1990 surface water investigation. Thirty surface water samples were collected during this investigation from Ponds B, C, D, E, and G (six samples from each sewage lagoon). No samples were collected from Pond A or F. Pond A was dry at the time of the investigation; therefore, no surface water samples were collected. This appendix presents a summary of analytical results (detections) for the investigations; consequently, if an analyte was not detected, it will not appear in this appendix.

Below is a list of the analytical flags associated with this investigation.

B - Parameter was also detected in the blank sample; result is uncorrected.

C - Confirmed on second column or by gas chromatography/mass spectroscopy (GC/MS).

G - Indicates an estimated GC value due to interference.

H - Sample analyzed four days past allowable holding time.

J - Result is less than the method detection limit (MDL). These results should be considered approximate.

@ - Result is less than five times the MDL. Studies have shown that the uncertainty of the analysis will increase exponentially as the MDL is approached. These results should be considered approximate.

X - Not confirmed on second column.

ND - Not detected.

NR - Not reported.

( ) - Detection limit.

Table A-1
Summary of Analytical Results for 1990 Surface Water Samples - Pond B

Location ID	B-1		B-2		B-3		B-4		B-5		B-6	
Sample ID	B-1		B-2		B-3		B-4		B-5		B-6	
E239.1 - Organic Lead (mg/L)												
Lead (organic)[a]	0.11 @	(NR)	0.13 @	(NR)	0.12 @	(NR)	ND	(0.1)	ND	(0.1)	ND	(0.1)
SW6010 - Metals (mg/L)												
Aluminum	ND	(0.024)	ND	(0.024)	ND	(0.024)	ND	(0.024)	0.032 @	(NR)	0.029 @	(NR)
Antimony	ND	(0.028)	ND	(0.028)	ND	(0.028)	ND	(0.028)	0.078 @	(NR)	ND	(0.028)
Barium	0.035 @	(NR)	0.028 @	(NR)	0.03 @	(NR)	0.037 @	(NR)	0.037 @	(NR)	0.04	(NR)
Boron	0.35 @	(NR)	0.24 @	(NR)	0.3 @	(NR)	0.31 @	(NR)	0.27 @	(NR)	0.33 @	(NR)
Calcium	390	(NR)	310	(NR)	340	(NR)	380	(NR)	380	(NR)	410	(NR)
Chromium	ND	(0.004)	ND	(0.004)	ND	(0.004)	ND	(0.004)	0.0046 @	(NR)	ND	(0.004)
Copper	ND	(0.005)	ND	(0.005)	ND	(0.005)	0.0052 @	(NR)	ND	(0.005)	ND	(0.005)
Iron	0.11	(NR)	0.077	(NR)	0.084	(NR)	0.072	(NR)	0.085	(NR)	0.095	(NR)
Magnesium	200	(NR)	160	(NR)	170	(NR)	190	(NR)	190	(NR)	200	(NR)
Manganese	0.055	(NR)	0.038 @	(NR)	0.044	(NR)	0.086	(NR)	0.086	(NR)	0.092	(NR)
Potassium	13	(NR)	10	(NR)	11	(NR)	12	(NR)	12	(NR)	13	(NR)
Silicon	17	(NR)	12	(NR)	13	(NR)	16	(NR)	16	(NR)	17	(NR)
Sodium	580	(NR)	450	(NR)	50	(NR)	570	(NR)	570	(NR)	580	(NR)
Vanadium	0.0084 @	(NR)	0.0059 @	(NR)	0.0079 @	(NR)	0.0092 @	(NR)	0.0096 @	(NR)	0.01 @	(NR)
Zinc	0.013 @	(NR)	0.0055 @	(NR)	0.011 @	(NR)	0.0042 @	(NR)	0.018	(NR)	0.025	(NR)
SW7060 - Arsenic (mg/L)												
Arsenic	ND	(0.006)	ND	(0.006)	ND	(0.006)	ND	(0.006)	0.0037 @	(NR)	0.0038 @	(NR)
SW7196 - Chromium VI (mg/L)												
Chromium VI	ND	(0.01)	ND	(0.01)	ND	(0.01)	0.0004 @	(NR)	ND	(0.0002)	ND	(0.0002)
SW7421 - Lead (mg/L)												
Lead	ND	(0.01)	ND	(0.002)	ND	(0.002)	0.0074 @	(NR)	0.0041 @	(NR)	0.0057 @	(NR)
SW7470 - Mercury (mg/L)												
Mercury	0.0006 @	(NR)	0.0004 @	(NR)	0.0006 @	(NR)	ND	(0.0002)	ND	(0.0002)	ND	(0.0002)
SW7740 - Selenium (mg/L)												
Selenium	ND	(0.002)	0.0038 @	(NR)	0.0032 @	(NR)	ND	(0.004)	ND	(0.002)	ND	(0.002)

Table A-1 (Continued)

Location ID	B-1		B-2		B-3		B-4		B-5		B-6	
Sample ID	B-1		B-2		B-3		B-4		B-5		B-6	
SW8080 - Organochlorine Pesticides and PCBs (μg/L)												
4,4'-DDE	0.4 J	(NR)	ND	(0.6)	ND	(6)	ND	(1.5)	ND	(1.5)	ND	(1.5)
Chlordane	0.2 J	(NR)	ND	(28)	ND	(28)	0.05 J	(NR)	0.05 J	(NR)	0.05 J	(NR)
alpha-BHC	ND	(0.5)	ND	(0.2)	0.04 J	(NR)	ND	(0.5)	ND	(0.5)	ND	(0.5)
gamma-BHC	ND	(1.5)	ND	(0.6)	ND	(0.6)	0.01 J	(NR)	0.01 J	(NR)	0.01 J	(NR)
SW8270 - Semivolatile Organic Compounds (mg/L)												
Benzoic acid	0.005 J	(NR)	ND	(0.1)	ND	(0.1)	ND	(0.05)	ND	(0.05)	ND	(0.1)
bis(2-Ethylhexyl)phthalate	0.007 JB	(NR)	0.015 JB	(NR)	0.008 JB	(NR)	0.004 JB	(NR)	0.014 @	(NR)	ND	(0.02)

[a] Organic lead was detected in equipment rinsate samples at a concentration of greater than 0.1 mg/L.
B - Parameter was also detected in the blank sample; result is uncorrected.
C - Confirmed on second column or by GC/MS.
G - Indicates an estimated GC value due to interference.
H - Sample analyzed 4 days past allowable holding time.
J - Result is less than the method detection limit. These results should be considered approximate.
@ - Result is less than five times the method detection limit. Studies have shown that the uncertainty of the analysis will increase exponentially as the MDL is approached. These results should be considered approximate.
X - Not confirmed on second column.
ND = Not detected
NR = Not reported
() = Detecting limit

Table A-2
Summary of Analytical Results for 1990 Surface Water Samples - Pond C

Location ID	C-1		C-2		C-3		C-4		C-5	
Sample ID	C-1		C-2		C-3		C-4		C-5	
SW6010 - Metals (mg/L)										
Aluminum	ND	(0.024)	0.053 @	(NR)	ND	(0.024)	ND	(0.024)	ND	(0.024)
Barium	0.038 @	(NR)	0.038 @	(NR)	0.027 @	(NR)	ND	(0.026)	0.03 @	(NR)
Boron	0.3 @	(NR)	0.26 @	(NR)	0.18 @	(NR)	0.17 @	(NR)	0.21 @	(NR)
Calcium	350	(NR)	350	(NR)	250	(NR)	240	(NR)	290	(NR)
Iron	0.053 @	(NR)	0.076	(NR)	0.057 @	(NR)	0.036 @	(NR)	0.041 @	(NR)
Magnesium	170	(NR)	170	(NR)	120	(NR)	120	(NR)	140	(NR)
Manganese	0.076	(NR)	0.077	(NR)	0.056	(NR)	0.053	(NR)	0.063	(NR)
Potassium	11	(NR)	12	(NR)	7.8	(NR)	7.7	(NR)	9.3	(NR)
Silicon	16	(NR)	16	(NR)	11	(NR)	11	(NR)	13	(NR)
Sodium	490	(NR)	520	(NR)	350	(NR)	340	(NR)	410	(NR)
Vanadium	0.0062 @	(NR)	0.0078 @	(NR)	0.0056 @	(NR)	0.0049 @	(NR)	0.0054 @	(NR)
Zinc	0.012 @	(NR)	0.013 @	(NR)	ND	(0.003)	ND	(0.003)	ND	(0.003)
SW7060 - Arsenic (mg/L)										
Arsenic	0.0041 @	(NR)	ND	(0.003)	ND	(0.003)	ND	(0.003)	0.0035 @	(NR)
SW7196 - Chromium VI (mg/L)										
Chromium VI	ND	(0.0002)	0.014	(NR)	0.013	(NR)	ND	(0.0002)	ND	(0.0002)
SW7421 - Lead (mg/L)										
Lead	0.0045 @	(NR)	0.0045 @	(NR)	0.0073 @	(NR)	0.0051 @	(NR)	0.0058 @	(NR)
SW8080 - Organochlorine Pesticides and PCBs (μg/L)										
beta-BHC	0.03 J	(NR)	ND	(1.5)	ND	(1.5)	ND	(1.5)	ND	(1.5)
SW8270 - Semivolatile Organic Compounds (mg/L)										
bis(2-Ethylhexyl)phthalate	0.004 J	(NR)	0.004 J	(NR)	ND	(0.02)	ND	(0.02)	ND	(0.02)

B - Parameter was also detected in the blank sample; result is uncorrected.
C - Confirmed on second column or by GC/MS.
G - Indicates an estimated GC value due to interference.
H - Sample analyzed 4 days past allowable holding time.
J - Result is less than the method detection limit. These results should be considered approximate.
@ - Result is less than five times the method detection limit. Studies have shown that the uncertainty of the analysis will increase exponentially as the MDL is approached. These results should be considered approximate.
X - Not confirmed on second column.
ND = Not detected
NR = Not reported
() = Detection limit

Table A-3
Summary of Analytical Results for 1990 Surface Water Samples - Pond D

Location ID	D-1		D-2		D-3		D-4		D-5		D-6	
Sample ID	D-1		D-2		D-3		D-4		D-5		D-6	
E239.1 - Organic Lead (mg/L)												
Lead (organic)*	ND	(0.1)	ND	(0.1)	ND	(0.1)	0.11 @	(NR)	0.12 @	(NR)	ND	(0.1)
SW6010 - Metals (mg/L)												
Barium	0.038 @	(NR)	0.038 @	(NR)	0.039 @	(NR)	0.036 @	(NR)	0.035 @	(NR)	0.035 @	(NR)
Boron	0.28 @	(NR)	0.25 @	(NR)	0.25 @	(NR)	0.3 @	(NR)	0.3 @	(NR)	0.3 @	(NR)
Calcium	330	(NR)	330	(NR)	340	(NR)	340	(NR)	330	(NR)	330	(NR)
Iron	0.028 @	(NR)	0.031 @	(NR)	0.042 @	(NR)	0.02 @	(NR)	0.034 @	(NR)	0.054 @	(NR)
Magnesium	170	(NR)	170	(NR)	180	(NR)	170	(NR)	170	(NR)	170	(NR)
Manganese	0.074	(NR)	0.072	(NR)	0.074	(NR)	0.04	(NR)	0.039 @	(NR)	0.04	(NR)
Potassium	12	(NR)	12	(NR)	12	(NR)	12	(NR)	12	(NR)	12	(NR)
Silicon	17	(NR)	17	(NR)	16	(NR)	14	(NR)	14	(NR)	14	(NR)
Sodium	500	(NR)	500	(NR)	520	(NR)	490	(NR)	480	(NR)	480	(NR)
Vanadium	0.0051 @	(NR)	0.006 @	(NR)	0.0063 @	(NR)	ND	(0.005)	ND	(0.005)	ND	(0.005)
Zinc	0.0038 @	(NR)	ND	(0.003)	ND	(0.003)	0.0052 @	(NR)	0.0081 @	(NR)	0.0076 @	(NR)
SW7060 - Arsenic (mg/L)												
Arsenic	0.0039 @	(NR)	0.0056 @	(NR)	0.0062 @	(NR)	ND	(0.006)	ND	(0.006)	ND	(0.006)
SW7421 - Lead (mg/L)												
Lead	0.0038 @	(NR)	0.0047 @	(NR)	0.0041 @	(NR)	0.0027 @	(NR)	0.0054 @	(NR)	0.0044 @	(NR)
SW7470 - Mercury (mg/L)												
Mercury	ND	(0.0002)	ND	(0.0002)	ND	(0.0002)	0.0005 @	(NR)	0.0007 @	(NR)	0.0006 @	(NR)
SW7740 - Selenium (mg/L)												
Selenium	ND	(0.002)	ND	(0.002)	ND	(0.002)	0.0025 @	(NR)	0.003 @	(NR)	ND	(0.002)
SW8080 - Organochlorine Pesticides and PCBs (μg/L)												
Methoxychlor	ND	(25)	ND	(25)	ND	(25)	ND	(10)	0.02 J	(NR)	ND	(10)

Table A-3 (Continued)

Location ID	D-1		D-2		D-3		D-4		D-5		D-6	
Sample ID	D-1		D-2		D-3		D-4		D-5		D-6	
SW8270 - Semivolatile Organic Compounds (mg/L)												
Benzoic acid	ND	(0.1)	ND	(0.05)	ND	(0.05)	0.028 J	(NR)	ND	(0.05)	ND	(0.05)
Butylbenzylphthalate	ND	(0.02)	ND	(0.01)	ND	(0.01)	0.004 J	(NR)	ND	(0.01)	ND	(0.01)
Dibutylphthalate	ND	(0.02)	ND	(0.01)	ND	(0.01)	0.004 J	(NR)	ND	(0.01)	ND	(0.01)
Diethylphthalate	ND	(0.02)	ND	(0.01)	ND	(0.01)	0.002 J	(NR)	ND	(0.01)	ND	(0.01)
Phenol	ND	(0.02)	ND	(0.01)	ND	(0.01)	0.007 J	(NR)	ND	(0.01)	ND	(0.01)
bis(2-Ethylhexyl)phthalate	0.004 J	(NR)	ND	(0.01)	0.013 @B	(NR)	0.02 @	(NR)	0.01 @B	(NR)	0.01 @B	(NR)

[a] Organic lead was detected in equipment rinsate samples at a concentration of greater than 0.1 mg/L.
B - Parameter was also detected in the blank sample; result is uncorrected.
C - Confirmed on second column or by GC/MS.
G - Indicates an estimated GC value due to interference.
H - Sample analyzed 4 days past allowable holding time.
J - Result is less than the method detection limit. These results should be considered approximate.
@ - Result is less than five times the method detection limit. Studies have shown that the uncertainty of the analysis will increase exponentially as the MDL is approached. These results should be considered approximate.
X - Not confirmed on second column.

Table A-4
Summary of Analtical Results for 1990 Surface Water Samples - Pond E

Location ID	E-1		E-2		E-3		E-4		E-5		E-6	
Sample ID	E-1		E-2		E-3		E-4		E-5		E-6	
E239.1 - Organic Lead (mg/L)												
Lead (organic)[a]	ND	(0.1)	ND	(0.1)	0.1 @	(NR)	ND	(0.1)	ND	(0.1)	ND	(0.1)
SW6010 - Metals (mg/L)												
Barium	0.037 @	(NR)	0.027 @	(NR)	0.034 @	(NR)	0.036 @	(NR)	0.035 @	(NR)	0.037 @	(NR)
Boron	0.33 @	(NR)	0.24 @	(NR)	0.29 @	(NR)	0.32 @	(NR)	0.28 @	(NR)	0.3 @	(NR)
Calcium	340	(NR)	250	(NR)	310	(NR)	350	(NR)	330	(NR)	35	(NR)
Iron	0.017 @	(NR)	0.016 @	(NR)	0.024 @	(NR)	0.02 @	(NR)	0.022 @	(NR)	0.035 @	(NR)
Magnesium	170	(NR)	130	(NR)	160	(NR)	170	(NR)	160	(NR)	170	(NR)
Manganese	0.039 @	(NR)	0.021 @	(NR)	0.033 @	(NR)	0.038 @	(NR)	0.034 @	(NR)	0.037 @	(NR)
Potassium	12	(NR)	8.6	(NR)	11	(NR)	12	(NR)	11	(NR)	12	(NR)
Silicon	14	(NR)	10	(NR)	14	(NR)	15	(NR)	14	(NR)	15	(NR)
Sodium	490	(NR)	360	(NR)	450	(NR)	500	(NR)	470	(NR)	500	(NR)
SW7421 - Lead (mg/L)												
Lead	0.0029 @	(NR)	0.0028 @	(NR)	0.0048 @	(NR)	ND	(0.002)	ND	(0.002)	ND	(0.002)
SW7470 - Mercury (mg/L)												
Mercury	0.0006	(NR)	0.0005 @	(NR)	0.0005 @	(NR)	0.0005 @	(NR)	0.0004 @	(NR)	0.0004 @	(NR)
SW7740 - Selenium (mg/L)												
Selenium	0.0055 @	(NR)	0.0025 @	(NR)	0.0042 @	(NR)	0.0035 @	(NR)	0.0024 @	(NR)	ND	(0.002)
SW8080 - Organochlorine Pesticides and PCBs (μg/L)												
4,4'-DDE	0.4 J	(NR)	ND	(1.5)	ND	(1.5)	ND	(0.6)	ND	(0.6)	ND	(1.5)
SW8270 - Semivolatile Organic Compounds (mg/L)												
Benzoic acid	0.01 J	(NR)	ND	(0.1)	ND	(0.1)	ND	(0.1)	ND	(0.1)	ND	(0.1)
bis(2-Ethylhexyl)phthalate	0.011 JB	(NR)	0.007 JB	(NR)	0.005 JB	(NR)	0.015 JB	(NR)	0.003 JB	(NR)	0.005 JB	(NR)

[a] Organic lead was detected in equipment rinsate samples at a concentration of greater than 0.1 mg/L.
B - Parameter was also detected in the blank sample; result is uncorrected.
C - Confirmed on second column or by GC/MS.
G - Indicates an estimated GC value due to interference.
H - Sample analyzed 4 days past allowable holding time.
J - Result is less than the method detection limit. These results should be considered approximate.
@ - Result is less than five times the method detection limit. Studies have shown that the uncertainty of the analysis will increase exponentially as the MDL is approached. These results should be considered approximate.
X - Not confirmed on second column.
ND = Not detected
NR = Not reported
() = Detection limit

Table A-5
Summary of Analytical Results for 1990 Surface Water Samples - Pond G

Location ID	G-1		G-2		G-3		G-4		G-5	
Sample ID	G-1		G-2		G-3		G-4		G-5	
E239.1 - Organic Lead (mg/L)										
Lead (organic)[a]	0.31 @	(NR)	0.27 @	(NR)	ND	(0.1)	0.14 @	(NR)	0.14 @	(NR)
SW6010 - Metals (mg/L)										
Barium	0.033 @	(NR)	0.04 @	(NR)	0.036 @	(NR)	0.036 @	(NR)	0.035 @	(NR)
Boron	0.33 @	(NR)	0.36 @	(NR)	0.36 @	(NR)	0.33 @	(NR)	0.27 @	(NR)
Calcium	37	(NR)	440	(NR)	390	(NR)	400	(NR)	390	(NR)
Magnesium	200	(NR)	240	(NR)	220	(NR)	220	(NR)	210	(NR)
Manganese	0.064	(NR)	0.071	(NR)	0.064	(NR)	0.072	(NR)	0.061	(NR)
Potassium	14	(NR)	17	(NR)	14	(NR)	15	(NR)	14	(NR)
Silicon	14	(NR)	16	(NR)	16	(NR)	15	(NR)	15	(NR)
Sodium	620	(NR)	740	(NR)	660	(NR)	660	(NR)	630	(NR)
Vanadium	ND	(0.002)	0.0045 @	(NR)	ND	(0.003)	0.0047 @	(NR)	0.0033 @	(NR)
Zinc	0.0062 @	(NR)	0.0057 @	(NR)	0.0063 @	(NR)	0.014 @	(NR)	0.0072 @	(NR)
SW7060 - Arsenic (mg/L)										
Arsenic	0.0072 @	(NR)	0.0055 @	(NR)	0.0052 @	(NR)	ND	(0.003)	ND	(0.006)
SW7421 - Lead (mg/L)										
Lead	0.0027	(NR)	0.0032 @	(NR)	0.003 @	(NR)	0.0029 @	(NR)	0.0026 @	(NR)
SW7470 - Mercury (mg/L)										
Mercury	0.0002 @	(NR)	0.0002 @	(NR)	0.0002 @	(NR)	0.0002 @	(NR)	0.0002 @	(NR)
SW8080 - Organochlorine Pesticides and PCBs (μg/L)										
alpha-BHC	ND	(0.5)	ND	(0.5)	0.2 J	(NR)	ND	(0.5)	ND	(0.5)
beta-BHC	ND	(1.5)	ND	(1.5)	0.6 J	(NR)	ND	(1.5)	ND	(1.5)
SW8270 - Semivolatile Organic Compounds (mg/L)										
bis(2-Ethylhexyl)phthalate	0.006 JB	(NR)	0.008 JB	(NR)	0.005 JB	(NR)	0.005 JB	(NR)	0.01 JB	(NR)

[a] Organic lead was detected in equipment rinsate samples at a concentration of greater than 0.1 mg/L.
B - Parameter was also detected in the blank sample; result is uncorrected.
C - Confirmed on second column or by GC/MS.
G - Indicates an estimated GC value due to interference.
H - Sample analyzed 4 days past allowable holding time.
J - Result is less than the method detection limit. These results should be considered approximate.
@ - Result is less than five times the method detection limit. Studies have shown that the uncertainty of the analysis will increase exponentially as the MDL is approached. These results should be considered approximate.
X - Not confirmed on second column.
ND = Not detected
NR = Not reported
() = Detection limit

APPENDIX B

SUMMARY OF ANALYTICAL RESULTS FOR THE 1990 SLUDGE AND SOIL INVESTIGATION

APPENDIX B
SUMMARY OF ANALYTICAL RESULTS FOR THE 1990 SLUDGE AND SOIL INVESTIGATION

During the 1990 sludge and soil investigation, 18 soil samples were collected from Pond A, 14 soil samples from Pond B and six soil samples from Pond C. In addition, three sludge samples were collected from Pond B, and six from Pond C. No sludge samples were collected from Pond A during this investigation. This appendix presents a summary of analytical results (detections) for the investigation; therefore, if an analyte was not detected, it will not appear in this appendix.

Below is a list of the analytical flags associated with this investigation.

B - Parameter was also detected in the blank sample; result is uncorrected.

C - Confirmed on second column or by GC/MS.

G - Indicates an estimated GC value due to interference.

H - Sample analyzed four days past allowable holding time.

J - Result is less than the method specified detection limit. These results should be considered approximate.

@ - Result is less than five times the MDL. Studies have shown that the uncertainty of the analysis will increase exponentially as the MDL is approached. These results should be considered approximate.

X - Not confirmed on second column.

ND - Not detected.

NR - Not reported.

( ) - Detection limit.

Table B-1
Summary of Analytical Results for 1990 Soil Samples - Pond A

Location ID	A-1		A-1		A-1		A-2	
Sample ID	A-1-A-0		A-1-B-0		A-1-C-0		A-2-A-0	
Total Depth (ft.)	2-4.9		7.5-9.5		20-24.75		0.5-2.5	
SW6010 - Metals (mg/kg)								
Aluminum	12000	(NR)	6400	(NR)	79000	(NR)	ND	(4.8)
Barium	110	(NR)	71	(NR)	100	(NR)	100	(NR)
Beryllium	0.75 @	(NR)	0.81 @	(NR)	0.99 @	(NR)	0.55 @	(NR)
Calcium	14000	(NR)	15000	(NR)	100000	(NR)	120000	(NR)
Chromium	9.8	(NR)	8.2	(NR)	11	(NR)	10	(NR)
Cobalt	4.6 @	(NR)	5.2 @	(NR)	5 @	(NR)	4.4 @	(NR)
Copper	6.9 @	(NR)	15	(NR)	8.3	(NR)	5.4 @	(NR)
Iron	9200	(NR)	6400	(NR)	8600	(NR)	8300	(NR)
Magnesium	51000	(NR)	26000	(NR)	49000	(NR)	46000	(NR)
Manganese	240	(NR)	130	(NR)	250	(NR)	230	(NR)
Nickel	6.5 @	(NR)	8.6 @	(NR)	7.6 @	(NR)	7.7 @	(NR)
Potassium	2200	(NR)	1800	(NR)	1700	(NR)	2200	(NR)
Silicon	210 @	(NR)	310	(NR)	240 @	(NR)	410	(NR)
Sodium	3100	(NR)	3200	(NR)	5900	(NR)	770	(NR)
Thallium	56 @	(NR)	41 @	(NR)	85 @	(NR)	69 @	(NR)
Vanadium	19	(NR)	15	(NR)	20	(NR)	18	(NR)
Zinc	35	(NR)	39	(NR)	34	(NR)	32	(NR)
SW7060 - Arsenic (mg/kg)								
Arsenic	5 @	(NR)	4.2 @	(NR)	3.3 @	(NR)	3.6 @	(NR)
SW7421 - Lead (mg/kg)								
Lead	26	(NR)	17	(NR)	4.8	(NR)	29	(NR)
SW7740 - Selenium (mg/kg)								
Selenium	ND	(0.56)	ND	(0.51)	0.85	(NR)	1.3	(NR)
SW8080 - Organochlorine Pesticides and PCBs (µg/kg)								
PCB-1254	ND	(110)	ND	(42)	22 J	(NR)	ND	(49)
SW8150 - Chlorinated Herbicides (µg/kg)								
2,4,5-T	ND	(0.81)	ND	(0.78)	ND	(0.89)	ND	(0.9)
2,4-D	ND	(4.1)	ND	(3.9)	ND	(4.4)	ND	(4.5)
SW8240 - Volatile Organic Compounds (µg/kg)								
1,1,2-Trichloroethane	ND	(6)	ND	(6)	ND	(7)	ND	(7)
Acetone	72	(NR)	33 @	(NR)	80	(NR)	71 @	(NR)
Methylene chloride	11 @	(NR)	14 @	(NR)	11 @	(NR)	14 @	(NR)
SW8270 - Semivolatile Organic Compounds (mg/kg)								
Dibutylphthalate	ND	(0.45)	ND	(0.43)	ND	(0.49)	ND	(0.5)
bis(2-Ethylhexyl)phthalate	ND	(0.45)	0.26 J	(NR)	0.24 J	(NR)	ND	(0.5)

Table B-1 (Continued)

Location ID	A-2		A-2		A-3		A-3	
Sample ID	A-2-B-0		A-2-C-0		A-3-A-0		A-3-B-0	
Total Depth (ft.)	7.5-9.5		14.25-19		2-4.75		7.5-9.5	
SW6010 - Metals (mg/kg)								
Aluminum	10000	(NR)	5400	(NR)	9400	(NR)	6800	(NR)
Barium	78	(NR)	25	(NR)	120	(NR)	77	(NR)
Beryllium	0.57 @	(NR)	ND	(0.24)	0.76 @	(NR)	0.33 @	(NR)
Calcium	130000	(NR)	32000	(NR)	140000	(NR)	130000	(NR)
Chromium	11	(NR)	7.4	(NR)	7.6	(NR)	6.5	(NR)
Cobalt	4 @	(NR)	ND	(1.4)	2.5 @	(NR)	3.6 @	(NR)
Copper	2.3 @	(NR)	21	(NR)	8.9	(NR)	5.4 @	(NR)
Iron	8100	(NR)	4900	(NR)	7100	(NR)	6500	(NR)
Magnesium	27000	(NR)	11000	(NR)	52000	(NR)	38000	(NR)
Manganese	180	(NR)	82	(NR)	230	(NR)	180	(NR)
Nickel	10 @	(NR)	5.4 @	(NR)	ND	(4)	10 @	(NR)
Potassium	2900	(NR)	1000 @	(NR)	1200 @	(NR)	1300 @	(NR)
Silicon	230 @	(NR)	170 @	(NR)	270 @	(NR)	210 @	(NR)
Sodium	2100	(NR)	2800	(NR)	3100	(NR)	3000	(NR)
Thallium	45 @	(NR)	47 @	(NR)	36 @	(NR)	ND	(30)
Vanadium	26	(NR)	14	(NR)	18	(NR)	18	(NR)
Zinc	26	(NR)	19	(NR)	31	(NR)	28	(NR)
SW7060 - Arsenic (mg/kg)								
Arsenic	4.9 @	(NR)	2.7 @	(NR)	4.6 @	(NR)	5.7 @	(NR)
SW7421 - Lead (mg/kg)								
Lead	9.7	(NR)	1.5	(NR)	25	(NR)	3.5	(NR)
SW7740 - Selenium (mg/kg)								
Selenium	0.69	(NR)	ND	(0.48)	0.65	(NR)	0.54	(NR)
SW8080 - Organochlorine Pesticides and PCBs (μg/kg)								
PCB-1254	ND	(42)	ND	(40)	ND	(44)	ND	(41)
SW8150 - Chlorinated Herbicides (μg/kg)								
2,4,5-T	ND	(0.78)	ND	(0.6)	ND	(0.82)	ND	(0.77)
2,4-D	ND	(3.9)	ND	(3)	ND	(4.1)	ND	(3.9)
SW8240 - Volatile Organic Compounds (μg/kg)								
1,1,2-Trichloroethane	ND	(6)	5 J	(NR)	ND	(7)	ND	(6)
Acetone	60 @	(NR)	52 @	(NR)	25 @	(NR)	7 J	(NR)
Methylene chloride	ND	(6)	10 @	(NR)	8 @	(NR)	5 J	(NR)
SW8270 - Semivolatile Organic Compounds (mg/kg)								
Dibutylphthalate	ND	(0.43)	ND	(0.33)	ND	(0.45)	ND	(0.43)
bis(2-Ethylhexyl)phthalate	0.14 J	(NR)	ND	(0.33)	0.26 J	(NR)	ND	(0.43)

Table B-1 (Continued)

Location ID	A-4		A-4		A-5		A-5	
Sample ID	A-4-A-0		A-4-B-0		A-5-A-0		A-5-B-0	
Total Depth (ft.)	9.5-14		14-18.5		2-4.75		7.5-9.5	
SW6010 - Metals (mg/kg)								
Aluminum	8700	(NR)	3500	(NR)	130000	(NR)	7100	(NR)
Barium	79	(NR)	39	(NR)	100	(NR)	71	(NR)
Beryllium	0.62 @	(NR)	0.39 @	(NR)	0.77 @	(NR)	0.58 @	(NR)
Calcium	87000	(NR)	43000	(NR)	90000	(NR)	110000	(NR)
Chromium	8.9	(NR)	4.7	(NR)	11	(NR)	7.1	(NR)
Cobalt	1.8 @	(NR)	ND	(1.5)	3.6 @	(NR)	3.2 @	(NR)
Copper	4.5 @	(NR)	3.6 @	(NR)	10	(NR)	4.2 @	(NR)
Iron	7200	(NR)	3200	(NR)	9500	(NR)	6900	(NR)
Magnesium	31000	(NR)	15000	(NR)	48000	(NR)	31000	(NR)
Manganese	170	(NR)	84	(NR)	240	(NR)	150	(NR)
Nickel	ND	(11)	4.4 @	(NR)	8.2 @	(NR)	9.8 @	(NR)
Potassium	2000	(NR)	620 @	(NR)	2500	(NR)	1800	(NR)
Silicon	240 @	(NR)	180 @	(NR)	170 @	(NR)	390	(NR)
Sodium	2100	(NR)	1600	(NR)	2100	(NR)	3000	(NR)
Thallium	ND	(30)	ND	(28)	64 @	(NR)	56 @	(NR)
Vanadium	19	(NR)	7.2	(NR)	20	(NR)	15	(NR)
Zinc	27	(NR)	15	(NR)	44	(NR)	27	(NR)
SW7060 - Arsenic (mg/kg)								
Arsenic	4.4 @	(NR)	2.4 @	(NR)	3.6 @	(NR)	6 @	(NR)
SW7421 - Lead (mg/kg)								
Lead	2.3	(NR)	3.4	(NR)	39	(NR)	9.8	(NR)
SW7740 - Selenium (mg/kg)								
Selenium	ND	(0.55)	ND	(0.5)	1.2	(NR)	ND	(0.51)
SW8080 - Organochlorine Pesticides and PCBs (µg/kg)								
PCB-1254	ND	(45)	ND	(43)	ND	(220)	ND	(40)
SW8150 - Chlorinated Herbicides (µg/kg)								
2,4,5-T	ND	(0.84)	ND	(0.8)	ND	(0.81)	ND	(0.75)
2,4-D	ND	(4.2)	ND	(4)	ND	(4.1)	ND	(3.7)
SW8240 - Volatile Organic Compounds (µg/kg)								
1,1,2-Trichloroethane	ND	(7)	ND	(6)	3 J	(NR)	ND	(6)
Acetone	85	(NR)	97	(NR)	77	(NR)	23 @	(NR)
Methylene chloride	8 @	(NR)	8 @	(NR)	7 @	(NR)	7 @	(NR)
SW8270 - Semivolatile Organic Compounds (mg/kg)								
Dibutylphthalate	ND	(0.46)	0.02 J	(NR)	ND	(0.9)	ND	(0.41)
bis(2-Ethylhexyl)phthalate	0.098 J	(NR)	0.085 J	(NR)	0.39 J	(NR)	0.22 J	(NR)

Table B-1 (Continued)

Location ID	A-6		A-6		A-7		A-7	
Sample ID	A-6-A-0		A-6-B-0		A-7-A-0		A-7-B-0	
Total Depth (ft.)	0.5-4.75		7.5-9.5		2-4.75		7.5-9.5	
SW6010 - Metals (mg/kg)								
Aluminum	8400	(NR)	11000	(NR)	7000	(NR)	5500	(NR)
Barium	95	(NR)	92	(NR)	78	(NR)	72	(NR)
Beryllium	0.65 @	(NR)	0.64 @	(NR)	0.5 @	(NR)	0.46 @	(NR)
Calcium	110000	(NR)	99000	(NR)	90000	(NR)	140000	(NR)
Chromium	7.3	(NR)	10	(NR)	4.2	(NR)	5.2	(NR)
Cobalt	3.2 @	(NR)	3.4 @	(NR)	2.4 @	(NR)	3.6 @	(NR)
Copper	7.1 @	(NR)	5.5 @	(NR)	6.6 @	(NR)	3.6 @	(NR)
Iron	6500	(NR)	8600	(NR)	4400	(NR)	5500	(NR)
Magnesium	40000	(NR)	44000	(NR)	32000	(NR)	38000	(NR)
Manganese	180	(NR)	200	(NR)	143	(NR)	160	(NR)
Nickel	5 @	(NR)	9.3 @	(NR)	ND	(3.9)	8.2 @	(NR)
Potassium	1300 @	(NR)	2100	(NR)	320 @	(NR)	850 @	(NR)
Silicon	220 @	(NR)	120 @	(NR)	79 @	(NR)	150 @	(NR)
Sodium	1800	(NR)	2200	(NR)	1300	(NR)	2800	(NR)
Thallium	94 @	(NR)	60 @	(NR)	42 @	(NR)	ND	(30)
Vanadium	17	(NR)	20	(NR)	12	(NR)	20	(NR)
Zinc	32	(NR)	36	(NR)	21	(NR)	20	(NR)
SW7060 - Arsenic (mg/kg)								
Arsenic	5.4 @	(NR)	6 @	(NR)	4.1 @	(NR)	5.8 @	(NR)
SW7421 - Lead (mg/kg)								
Lead	2.4	(NR)	13	(NR)	5.6	(NR)	8.7	(NR)
SW7740 - Selenium (mg/kg)								
Selenium	1.1	(NR)	0.63	(NR)	0.7	(NR)	0.92	(NR)
SW8080 - Organochlorine Pesticides and PCBs (μg/kg)								
PCB-1254	ND	(110)	ND	(45)	ND	(43)	ND	(42)
SW8150 - Chlorinated Herbicides (μg/kg)								
2,4,5-T	ND	(0.86)	0.27 J	(NR)	ND	(0.81)	ND	(0.78)
2,4-D	ND	(4.3)	6.1 @	(NR)	ND	(4.1)	ND	(3.9)
SW8240 - Volatile Organic Compounds (μg/kg)								
1,1,2-Trichloroethane	ND	(7)	ND	(7)	ND	(7)	ND	(7)
Acetone	74	(NR)	34 @	(NR)	8 J	(NR)	6 J	(NR)
Methylene chloride	11 @	(NR)	12 @	(NR)	5 J	(NR)	5 J	(NR)
SW8270 - Semivolatile Organic Compounds (mg/kg)								
Dibutylphthalate	ND	(0.47)	ND	(0.46)	ND	(0.45)	ND	(0.43)
bis(2-Ethylhexyl)phthalate	ND	(0.47)	ND	(0.46)	0.082 J	(NR)	ND	(0.43)

Table B-1 (Continued)

Location ID	A-8		A-8	
Sample ID	A-8-A-0		A-8-B-0	
Total Depth (ft.)	0.5-2		7.5-9.5	
SW6010 - Metals (mg/kg)				
Aluminum	6000	(NR)	5100	(NR)
Barium	79	(NR)	57	(NR)
Beryllium	0.51 @	(NR)	0.46 @	(NR)
Calcium	120000	(NR)	130000	(NR)
Chromium	4.6	(NR)	5.5	(NR)
Cobalt	ND	(1.7)	2.3 @	(NR)
Copper	4.8 @	(NR)	3.9 @	(NR)
Iron	4300	(NR)	4900	(NR)
Magnesium	32000	(NR)	30000	(NR)
Manganese	140	(NR)	150	(NR)
Nickel	6.3 @	(NR)	7.4 @	(NR)
Potassium	370 @	(NR)	620 @	(NR)
Silicon	83 @	(NR)	120 @	(NR)
Sodium	2400	(NR)	2700	(NR)
Thallium	55 @	(NR)	ND	(29)
Vanadium	12	(NR)	17	(NR)
Zinc	20	(NR)	18	(NR)
SW7060 - Arsenic (mg/kg)				
Arsenic	4.1 @	(NR)	4.9 @	(NR)
SW7421 - Lead (mg/kg)				
Lead	21	(NR)	2	(NR)
SW7740 - Selenium (mg/kg)				
Selenium	0.97	(NR)	ND	(0.53)
SW8080 - Organochlorine Pesticides and PCBs (μg/kg)				
PCB-1254	ND	(43)	ND	(42)
SW8150 - Chlorinated Herbicides (μg/kg)				
2,4,5-T	ND	(0.81)	ND	(0.78)
2,4-D	ND	(4.1)	ND	(3.9)
SW8240 - Volatile Organic Compounds (μg/kg)				
1,1,2-Trichloroethane	ND	(7)	ND	(6)
Acetone	6 J	(NR)	7 J	(NR)
Methylene chloride	5 J	(NR)	5 J	(NR)
SW8270 - Semivolatile Organic Compounds (mg/kg)				
Dibutylphthalate	ND	(0.45)	ND	(0.43)
bis(2-Ethylhexyl)phthalate	0.12 J	(NR)	0.11 J	(NR)

B = Parameter was also detected in the blank sample; result is uncorrected.
C = Confirmed on second column or by GC/MS.
G = Indicates an estimated GC value due to interference.
H = Sample analyzed 4 days past allowable holding time.
J = Result is less than the method detection limit. These results should be considered approximate.
@ = Result is less than five times the method detection limit. Studies have shown that the uncertainty of the analysis will increase exponentially as the MDL is approached. These results should be considered approximate.
X = Not confirmed on second column.
ND = Not detected.
NR = Not reported
() = Detection limit.

Table B-2
Summary of Analytical Results for 1990 Sludge Samples - Pond B

Location ID	B-S1		B-S2		B-S3	
Sample ID	B-S1-SAC		B-S2-SAC		B-S3-SAC	
EPA Method 8080 - Pesticides and PCBs (mg/kg)						
PCB-1254	13000	C@	13000	C@	9100	C@

B = Parameter was also detected in the blank sample; result is uncorrected.
C = Confirmed on second column or by GC/MS.
G = Indicates an estimated GC value due to interference.
H = Sample analyzed 4 days past allowable holding time.
J = Result is less than the method detection limit. These results should be considered approximate.
@ = Result is less than five times the method detection limit. Studies have shown that the uncertainty of the analysis will increase exponentially as the MDL is approached. These results should be considered approximate.
X = Not confirmed on second column.
ND = Not detected.
NR = Not reported.
() = Detection limit.

Table B-3
Summary of Analytical Results for 1990 Soil Samples - Pond B

Location ID	B-1		B-1		B-1		B-2		B-2		B-2		B-3		B-3	
Sample ID	B-1-A-0		B-1-B-0		B-1-C-0		B-2-A-0		B-2-B-0		B-2-C-0		B-3-A-0		B-3-B-0	
Total Depth (ft.)	0.5-2.5		8-10		17-19		0.5-2.5		9-11		18-20		0.5-2.5		8-10	
SW6010 - Metals (mg/kg)																
Aluminum	7800	(NR)	14000	(NR)	9100	(NR)	11000	(NR)	11000	(NR)	7500	(NR)	9000	(NR)	16000	(NR)
Barium	45	(NR)	52	(NR)	49	(NR)	47	(NR)	61	(NR)	49	(NR)	46	(NR)	82	(NR)
Beryllium	0.29 @	(NR)	0.66 @	(NR)	0.49 @	(NR)	0.65 @	(NR)	0.59 @	(NR)	0.41 @	(NR)	0.4 @	(NR)	0.82 @	(NR)
Calcium	91000	(NR)	76000	(NR)	85000	(NR)	82000	(NR)	83000	(NR)	65000	(NR)	53000	(NR)	82000	(NR)
Chromium	7	(NR)	14	(NR)	9.7	(NR)	10	(NR)	12	(NR)	9	(NR)	8.4	(NR)	16	(NR)
Cobalt	2.9 @	(NR)	5 @	(NR)	3.4 @	(NR)	4 @	(NR)	4.6 @	(NR)	4 @	(NR)	3.2 @	(NR)	6.2	(NR)
Copper	6.4 @	(NR)	6.2 @	(NR)	5.5 @	(NR)	5.5 @	(NR)	5.8 @	(NR)	8.1 @	(NR)	6.4 @	(NR)	5.4 @	(NR)
Iron	5000	(NR)	10000	(NR)	7800	(NR)	7900	(NR)	8400	(NR)	7300	(NR)	6200	(NR)	12000	(NR)
Magnesium	18000	(NR)	23000	(NR)	26000	(NR)	22000	(NR)	27000	(NR)	18000	(NR)	18000	(NR)	30000	(NR)
Manganese	81	(NR)	140	(NR)	150	(NR)	89	(NR)	160	(NR)	120	(NR)	64	(NR)	220	(NR)
Nickel	5.1 @	(NR)	9.3 @	(NR)	5.3 @	(NR)	7.2 @	(NR)	7.7 @	(NR)	6.5 @	(NR)	6.8 @	(NR)	11 @	(NR)
Potassium	1700 @	(NR)	3200	(NR)	1800	(NR)	2300	(NR)	2300	(NR)	1400 @	(NR)	2000	(NR)	3600	(NR)
Silicon	2100	(NR)	540 @	(NR)	2600	(NR)	3100	(NR)	2200	(NR)	3900	(NR)	520 @	(NR)	460 @	(NR)
Sodium	770	(NR)	1400	(NR)	3200	(NR)	520 @	(NR)	1600	(NR)	4300	(NR)	420 @	(NR)	1800	(NR)
Vanadium	20	(NR)	27	(NR)	21	(NR)	37	(NR)	22	(NR)	35	(NR)	25	(NR)	27	(NR)
Zinc	16	(NR)	29	(NR)	23	(NR)	24	(NR)	26	(NR)	20	(NR)	19	(NR)	34	(NR)
SW7060 - Arsenic (mg/kg)																
Arsenic	3.5 @	(NR)	1.3 @	(NR)	1.2 @	(NR)	3.8 @	(NR)	ND	(1)	10	(NR)	3.4 @	(NR)	ND	(2.6)
SW7421 - Lead (mg/kg)																
Lead	3.2	(NR)	3.5	(NR)	2.8	(NR)	2.6	(NR)	4.3	(NR)	2.7	(NR)	2.8	(NR)	7.3	(NR)
SW8080 - Organochlorine Pesticides and PCBs (µg/kg)																
Endosulfan I	ND	(1.4)	ND	(1.4)	ND	(1.3)	1.94 X@	(NR)	180 X	(NR)	ND	(1.3)	ND	(1.4)	ND	(1.4)
SW8240 - Volatile Organic Compounds (µg/kg)																
Acetone	ND	(14)	ND	(14)	ND	(12)	ND	(13)	ND	(13)	ND	(13)	20 @	(NR)	ND	(13)
Carbon disulfide	ND	(7.1)	ND	(7.2)	ND	(6.2)	ND	(6.4)	ND	(6.7)	1.6 J	(NR)	ND	(6.9)	ND	(6.5)
Methylene chloride	ND	(7.1)	ND	(7.2)	2.1 JB	(NR)	ND	(6.4)	ND	(6.7)	ND	(6.4)	2.6 JB	(NR)	2.6 JB	(NR)
SW8270 - Semivolatile Organic Compounds (mg/kg)																
Dibutylphthalate	ND	(0.22)	ND	(0.23)	ND	(0.21)	ND	(0.22)	ND	(0.23)	ND	(0.21)	ND	(0.22)	ND	(0.21)
bis(2-Ethylhexyl)phthalate	ND	(0.45)	ND	(0.45)	0.1 J	(NR)	ND	(0.43)	1.1 @	(NR)	ND	(0.42)	ND	(0.45)	ND	(0.43)

Table B-3 (Continued)

Location ID	B-4		B-4		B-5		B-5		B-6		B-6	
Sample ID	B-4-B-0		B-4-A-0		B-5-A-0		B-5-B-0		B-6-A-O		B-6-B-O	
Total Depth (ft.)	7.5-9.5		0.5-2.5		0.5-2.5		8-10					
SW6010 - Metals (mg/kg)												
Aluminum	20000	(NR)	18000	(NR)	13000	(NR)	12000	(NR)	12000	(NR)	13000	(NR)
Barium	160	(NR)	78	(NR)	86	(NR)	57	(NR)	15	(NR)	95	(NR)
Beryllium	1.1 @	(NR)	0.78 @	(NR)	0.54 @	(NR)	0.61 @	(NR)	0.59 @	(NR)	0.6 @	(NR)
Calcium	160000	(NR)	98000	(NR)	59000	(NR)	200000	(NR)	86000	(NR)	120000	(NR)
Chromium	17	(NR)	16	(NR)	12	(NR)	12	(NR)	11	(NR)	12	(NR)
Cobalt	6	(NR)	5.7 @	(NR)	4.4 @	(NR)	4 @	(NR)	4 @	(NR)	3.6 @	(NR)
Copper	6.4 @	(NR)	9.1 @	(NR)	8.2 @	(NR)	6.8 @	(NR)	5.4 @	(NR)	4.8 @	(NR)
Iron	14000	(NR)	13000	(NR)	9200	(NR)	8600	(NR)	7800	(NR)	7800	(NR)
Magnesium	49000	(NR)	12000	(NR)	18000	(NR)	9900	(NR)	12000	(NR)	7800	(NR)
Manganese	150	(NR)	250	(NR)	130	(NR)	180	(NR)	99	(NR)	140	(NR)
Nickel	13	(NR)	10 @	(NR)	7.9 @	(NR)	8 @	(NR)	9 @	(NR)	8.2 @	(NR)
Potassium	4600	(NR)	5200	(NR)	3500	(NR)	2800	(NR)	2700	(NR)	2700	(NR)
Silicon	400 @	(NR)	420 @	(NR)	460 @	(NR)	500 @	(NR)	6000	(NR)	6000	(NR)
Sodium	1400	(NR)	760	(NR)	520 @	(NR)	1200	(NR)	430 @	(NR)	870	(NR)
Vanadium	39	(NR)	29	(NR)	33	(NR)	23	(NR)	34	(NR)	24	(NR)
Zinc	40	(NR)	40	(NR)	32	(NR)	26	(NR)	22	(NR)	23	(NR)
SW7060 - Arsenic (mg/kg)												
Arsenic	5.5 @	(NR)	ND	(2.1)	2.5 @	(NR)	2.3 @	(NR)	66	(NR)	ND	(1.1)
SW7421 - Lead (mg/kg)												
Lead	5	(NR)	7.4	(NR)	4.3	(NR)	4.1	(NR)	3.2	(NR)	3.1	(NR)
SW8080 - Organochlorine Pesticides and PCBs (μg/kg)												
Endosulfan I	ND	(1.3)	ND	(1.3)	ND	(2.6)	ND	(1.3)	ND	(1.4)	ND	(1.4)
SW8240 - Volatile Organic Compounds (μg/kg)												
Acetone	4.5 JB	(NR)	11 JB	(NR)	39 B@	(NR)	8.9 JB	(NR)	19 @	(NR)	ND	(14)
Carbon disulfide	ND	(6.4)	ND	(6.5)	ND	(6.7)	ND	(6.8)	43 J	(NR)	ND	(7.1)
Methylene chloride	3.3 JB	(NR)	2.9 JB	(NR)	2.4 JB	(NR)	6.7 JB	(NR)	ND	(6.9	2 J	(NR0
SW8270 - Semivolatile Organic Compounds (mg/kg)												
Dibutylphthalate	ND	(0.22)	ND	(0.21)	ND	(0.21)	ND	(0.22)	170 J	(NR)	ND	(23)
bis(2-Ethylhexyl)phthalate	ND	(0.43)	ND	(0.42)	0.17 J	(NR)	0.31 J	(NR)	ND	(460)	ND	(470)

Table B-3 (Continued)

B = Parameter was also detected in the blank sample; result is uncorrected.
C = Confirmed on second column or by GC/MS.
G = Indicates an estimated GC value due to interference.
H = Sample analyzed 4 days past allowable holding time.
J = Result is less than the method detection limit. These results should be considered approximate.
@ = Result is less than five times the method detection limit. Studies have shown that the uncertainty of the analysis will increase exponentially as the MDL is approached. These results should be considered approximate.
X = Not confirmed on second column.
ND = Not detected.
NR = Not reported.
() = Detection limit.

Table B-4
Summary of Analytical Results for 1990 Sludge Samples - Pond C

Location ID	C-1		C-2		C-3		C-4		C-5		C-6	
Sample ID	C-1-A-0		C-2-A-0		C-3-A-0		C-4-A-0		C-5-A-0		C-6-A-0	
SW6010 - Metals (mg/kg)												
Aluminum	11000	(NR)	8900	(NR)	13000	(NR)	6800	(NR)	9500	(NR)	10000	(NR)
Barium	93	(NR)	74	(NR)	92	(NR)	69	(NR)	100	(NR)	92	(NR)
Beryllium	0.46 @	(NR)	ND	(0.27)	0.43 @	(NR)	ND	(0.34)	ND	(0.52)	0.38 @	(NR)
Calcium	110000	(NR)	74000	(NR)	120000	(NR)	110000	(NR)	120000	(NR)	110000	(NR)
Chromium	34	(NR)	18	(NR)	27	(NR)	7.9 @	(NR)	25	(NR)	9.3	(NR)
Cobalt	3.8 @	(NR)	3.3 @	(NR)	4.2 @	(NR)	2.7 @	(NR)	3.6 @	(NR)	3.3 @	(NR)
Copper	28	(NR)	16	(NR)	31	(NR)	15 @	(NR)	44	(NR)	7.4 @	(NR)
Iron	8500	(NR)	6400	(NR)	9000	(NR)	4900	(NR)	7200	(NR)	6900	(NR)
Magnesium	13000	(NR)	10000	(NR)	13000	(NR)	7200	(NR)	11000	(NR)	8200	(NR)
Manganese	210	(NR)	120	(NR)	180	(NR)	92	(NR)	170	(NR)	110	(NR)
Nickel	7.5 @	(NR)	6.2 @	(NR)	9.1 @	(NR)	4.4 @	(NR)	7.9 @	(NR)	6 @	(NR)
Potassium	2700 @	(NR)	2100	(NR)	2700	(NR)	1500 @	(NR)	1700 @	(NR)	2600	(NR)
Silicon	800 @	(NR)	2400	(NR)	820 @	(NR)	3900	(NR)	8200	(NR)	500 @	(NR)
Silver	4.9 @	(NR)	ND	(1.4)	ND	(1.8)	1.8 @	(NR)	ND	(2.6)	ND	(1.4)
Sodium	1300	(NR)	750	(NR)	1400	(NR)	1000	(NR)	2300	(NR)	640 @	(NR)
Vanadium	27	(NR)	15	(NR)	28	(NR)	15 @	(NR)	24 @	(NR)	18	(NR)
Zinc	66	(NR)	37	(NR)	65	(NR)	34	(NR)	130	(NR)	25	(NR)
SW7060 - Arsenic (mg/kg)												
Arsenic	ND	(1.6)	1.5 @	(NR)	ND	(1.5)	ND	(0.7)	ND	(1.2)	1.2 @	(NR)
SW7421 - Lead (mg/kg)												
Lead	12	(NR)	6.4	(NR)	17	(NR)	4.7	(NR)	12	(NR)	5.6	(NR)
SW8080 - Organochlorine Pesticides and PCBs (µg/kg)												
4,4'-DDD	6000 C	(NR)	80 C@	(NR)	1900 C	(NR)	430 C	(NR)	16000 C	(NR)	180 C	(NR)
4,4'-DDE	240 C@	(NR)	ND	(69)	400 XG	(NR)	95 C@	(NR)	8100 CG	(NR)	57 C@	(NR)
Endosulfan I	ND	(160)	1500 X	(NR)	ND	(76)	850 X	(NR)	4400 X	(NR)	ND	(27)
SW8240 - Volatile Organic Compounds (µg/kg)												
Acetone	45 B@	(NR)	ND	(14)	21 B@	(NR)	9 J	(NR)	32 J	(NR)	4.5 JB	(NR)
Carbon disulfide	ND	(8.8)	7.1 @	(NR)	ND	(8)	14 @	(NR)	14 J	(NR)	ND	(7.3)
Methyl ethyl ketone	ND	(18)	ND	(14)	ND	(16)	ND	(16)	16 J	(NR)	ND	(15)
Methylene chloride	4.5 JB	(NR)	1.9 J	(NR)	2.2 JB	(NR)	ND	(7.8)	7.3 J	(NR)	2.7 JB	(NR)
Xylenes	2.4 J	(NR)	ND	(7)	2.6 JB	(NR)	ND	(7.8)	ND	(17)	ND	(7.3)

Table B-4 (Continued)

Location ID	C-1		C-2		C-3		C-4		C-5		C-6	
Sample ID	C-1-A-0		C-2-A-0		C-3-A-0		C-4-A-0		C-5-A-0		C-6-A-0	
SW8270 - Semivolatile Organic Compounds (mg/kg)												
2-Methylnaphthalene	1.1 @	(NR)	ND	(0.36)	ND	(0.42)	ND	(0.4)	14 @	(NR)	ND	(0.38)
Dibenzofuran	0.31 @	(NR)	ND	(0.18)	ND	(0.21)	ND	(0.2)	ND	(6.3)	ND	(0.19)
Phenanthrene	1.8 @	(NR)	ND	(0.48)	0.3 J	(NR)	ND	(0.54)	11 @	(NR)	ND	(0.52)
Phenol	ND	(0.3)	ND	(0.23)	ND	(0.27)	ND	(0.26)	ND	(8.2)	0.15 J	(NR)
Pyrene	ND	(0.24)	ND	(0.19)	ND	(0.22)	ND	(0.21)	ND	(6.6)	0.2 @	(NR)
bis(2-Ethylhexyl)phthalate	1.2 @	(NR)	0.75 @	(NR)	0.65 @	(NR)	0.91 @	(NR)	6.2 J	(NR)	ND	(0.48)

B = Parameter was also detected in the blank sample; result is uncorrected.
C = Confirmed on second column or by GC/MS.
G = Indicates an estimated GC value due to interference.
H = Sample analyzed 4 days past allowable holding time.
J = Result is less than the method detection limit. These results should be considered approximate.
@ = Result is less than five times the method detection limit. Studies have shown that the uncertainty of the analysis will increase exponentially as the MDL is approached. These results should be considered approximate.
X = Not confirmed on second column.
ND = Not detected.
NR = Not reported.
() = Detection limit.

Table B-5
Summary of Analytical Results for 1990 Soil Samples - Pond C

Location ID	C-1		C-2		C-3		C-4		C-5		C-6	
Sample ID	C-1-B-0		C-2-B-0		C-3-B-0		C-4-B-0		C-5-B-0		C-6-B-0	
Total Depth (ft.)	0.5-1.5		0.5-1.5		0.5-1.5		0.5-1.5		0.5-1.5		0.5-1.5	
SW6010 - Metals (mg/kg)												
Aluminum	10000	(NR)	11000	(NR)	11000	(NR)	9200	(NR)	11000	(NR)	9200	(NR)
Barium	84	(NR)	110	(NR)	160	(NR)	94	(NR)	96	(NR)	160	(NR)
Beryllium	0.42 @	(NR)	0.41 @	(NR)	0.44 @	(NR)	0.3 @	(NR)	0.38 @	(NR)	0.37 @	(NR)
Calcium	81000	(NR)	110000	(NR)	190000	(NR)	98000	(NR)	100000	(NR)	120000	(NR)
Chromium	9.6	(NR)	15	(NR)	10	(NR)	8.2	(NR)	11	(NR)	8.9	(NR)
Cobalt	3.6 @	(NR)	3.9 @	(NR)	3.9 @	(NR)	3 @	(NR)	3.5 @	(NR)	3.4 @	(NR)
Copper	7.6 @	(NR)	18	(NR)	7 @	(NR)	6.6 @	(NR)	8.1 @	(NR)	5.1 @	(NR)
Iron	7300	(NR)	8200	(NR)	7500	(NR)	6100	(NR)	7000	(NR)	6500	(NR)
Magnesium	9700	(NR)	11000	(NR)	7000	(NR)	8000	(NR)	25000	(NR)	5400	(NR)
Manganese	150	(NR)	140	(NR)	77	(NR)	97	(NR)	88	(NR)	78	(NR)
Molybdenum	ND	(6)	12 @	(NR)	ND	(6.4)	ND	(6.1)	ND	(6.3)	ND	(6.4)
Nickel	6.2 @	(NR)	8.3 @	(NR)	6.1 @	(NR)	5 @	(NR)	5.8 @	(NR)	5.6 @	(NR)
Potassium	2700	(NR)	2700	(NR)	2800	(NR)	2400	(NR)	2700	(NR)	2300	(NR)
Silicon	460 @	(NR)	1700	(NR)	490 @	(NR)	4000	(NR)	1800	(NR)	530 @	(NR)
Sodium	600	(NR)	1000	(NR)	740	(NR)	480 @	(NR)	1200	(NR)	380 @	(NR)
Vanadium	20	(NR)	23	(NR)	30	(NR)	18	(NR)	25	(NR)	20	(NR)
Zinc	26	(NR)	210	(NR)	24	(NR)	21	(NR)	22	(NR)	20	(NR)
SW7060 - Arsenic (mg/kg)												
Arsenic	1.7 @	(NR)	ND	(1.2)	ND	(1)	1.1 @	(NR)	ND	(1.1)	1.2 @	(NR)
SW7421 - Lead (mg/kg)												
Lead	3.9	(NR)	5.3	(NR)	4	(NR)	3.5	(NR)	3.2	(NR)	4.4	(NR)
SW8080 - Organochlorine Pesticides and PCBs (μg/kg)												
4,4'-DDD	160 CG	(NR)	180 C@	(NR)	160 CG	(NR)	78 C	(NR)	ND	(52)	74 CG	(NR)
4,4'-DDE	14 C@	(NR)	240 C@	(NR)	ND	(24)	21 C@	(NR)	ND	(52)	ND	(5.1)
Endosulfan I	ND	(13)	440 X	(NR)	ND	(24)	170 X	(NR)	440 X	(NR)	ND	(5.1)
SW8150 - Chlorinated Herbicides (μg/kg)												
Dichloroprop	ND	(85)	153 C@	(NR)	ND	(85)	ND	(91)	ND	(85)	ND	(78)

Table B-5 (Continued)

Location ID	C-1		C-2		C-3		C-4		C-5		C-6	
Sample ID	C-1-B-0		C-2-B-0		C-3-B-0		C-4-B-0		C-5-B-0		C-6-B-0	
Total Depth (ft.)	0.5-1.5		0.5-1.5		0.5-1.5		0.5-1.5		0.5-1.5		0.5-1.5	
SW8240 - Volatile Organic Compounds (μg/kg)												
Acetone	7.3 JB	(NR)	19 @	(NR)	7.8 JB	(NR)	ND	(15)	8 J	(NR)	9.1 JB	(NR)
Carbon disulfide	ND	(6.7)	27 @	(NR)	ND	(6.3)	19 @	(NR)	27 @	(NR)	ND	(6.4)
Methylene chloride	4.9 JB	(NR)	ND	(7.4)	3.3 JB	(NR)	1.7 J	(NR)	1.5 J	(NR)	4.8 JB	(NR)
SW8270 - Semivolatile Organic Compounds (mg/kg)												
Dibutylphthalate	ND	(0.22)	ND	(0.24)	ND	(0.2)	0.26 @	(NR)	0.21 J	(NR)	ND	(0.21)
Phenanthrene	ND	(0.47)	0.37 J	(NR)	ND	(0.44)	ND	(0.53)	ND	(0.47)	ND	(0.45)
Pyrene	ND	(0.18)	ND	(0.2)	ND	(0.17)	ND	(0.2)	ND	(0.18)	0.12 J	(NR)
bis(2-Ethylhexyl)phthalate	ND	(0.43)	0.5 @	(NR)	ND	(0.41)	0.21 J	(NR)	0.14 J	(NR)	ND	(0.42)

B = Parameter was also detected in the blank sample; result is uncorrected.
C = Confirmed on second column or by GC/MS.
G = Indicates an estimated GC value due to interference.
H = Sample analyzed 4 days past allowable holding time.
J = Result is less than the method detection limit. These results should be considered approximate.
@ = Result is less than five times the method detection limit. Studies have shown that the uncertainty of the analysis will increase exponentially as the MDL is approached. These results should be considered approximate.
X = Not confirmed on second column.
ND = Not detected.
NR = Not reported.
() = Detection limit.

APPENDIX C

SUMMARY OF ANALYTICAL RESULTS FOR THE 1992 SLUDGE AND SOIL INVESTIGATION

APPENDIX C
SUMMARY OF ANALYTICAL RESULTS FOR THE 1992 SLUDGE AND SOIL INVESTIGATION

During the 1992 sludge and soil investigation, samples were collected from Ponds C, D, E, F, and G. No samples were collected from Pond A or B. Sludge and soil samples were taken from each sewage lagoon sampled, with the exception of Pond D, where only soil samples were collected because of the lack of sludge. This appendix presents a summary of analytical results (detections) for the investigation; therefore, if an analyte was not detected, it will not appear in this appendix.

Below is a list of the analytical flags associated with this investigation.

X - Qualitative confirmation of analyte on both columns. Quantification differed by a factor of two or more between columns. Value determined by the first column is reported.

@ - Measured result is less than five times the detection limit.

C - Presence and quantitation of the analyte confirmed by second-column analysis.

D - Secondary dilution required for this analyte.

J - Detected below the MDL.

B - Analyte detected in laboratory blank analysis; no blank subtraction performed.

Z - SW6010, SW7421—Analyte detected in method blank.

ND - Not detected.

( ) - Detection limit.

Table C-1
Summary of Analytical Results for 1992 Soil Samples - Pond C

Location ID	C-01		C-02		C-03		C-03		C-04		C-05		C-06		C-06	
Sample ID	C-01-02		C-02-02		C-03-02		C-03-03		C-04-02		C-05-02		C-06-02		C-06-03	
Total Depth (ft.)	0-2		0-2		0-2		2-4		0-2		0-2		0-2		2-4	
SW6010 - Metals (mg/kg)																
Barium	110	(3.8)	63	(3.9)	54	(4.4)	61	(4)	44	(4.2)	64	(4.2)	59	(4.4)	88	(4.2)
Chromium	4.4 @	(3.8)	4.7 @	(3.9)	5 @	(4.4)	6.9 @	(4)	ND	(4.2)	ND	(4.2)	8.5 @	(4.4)	6.7 @	(4.2)
Vanadium	19 @	(7.7)	16 @	(7.8)	11 @	(8.8)	12 @	(8.1)	ND	(8.4)	ND	(8.4)	20 @	(8.9)	14 @	(8.4)
Zinc	14 @	(7.7)	10 @	(7.8)	11 @	(8.8)	12 @	(8.1)	ND	(8.4)	ND	(8.4)	17 @	(8.9)	13 @	(8.4)
SW7060 - Arsenic (mg/kg)																
Arsenic	2.4	(0.38)	2.2 @	(0.51)	0.79 @	(0.42)	1.3 @	(0.36)	1.1 @	(0.45)	1 @	(0.39)	2.6	(0.39)	2.4	(0.42)
SW7421 - Lead (mg/kg)																
Lead	2.2 Z	(0.29)	1.6 @	(0.38)	1.7	(0.31)	2.6	(0.27)	1.6 @	(0.34)	0.51 @	(0.29)	2.3	(0.29)	3.3	(0.31)
SW8080 - Organochlorine Pesticides and PCBs (μg/kg)																
4,4'-DDD	61 X@	(21)	ND	(1.4)	98 C	(2.7)	ND	(1.3)	ND	(1.4)	7.5 C	(1.4)	2.3 C@	(1.3)	ND	(1.3)
4,4'-DDE	62 C@	(21)	ND	(1.4)	18 C	(2.7)	ND	(1.3)	ND	(1.4)	14 X	(1.4)	5.5 X@	(1.3)	ND	(1.3)
4,4'-DDT	ND	(42)	ND	(2.7)	5.7 X@	(5.5)	ND	(2.6)	ND	(2.7)	ND	(2.7)	2.4 JC	(2.6)	ND	(2.5)
Aldrin	ND	(21)	ND	(1.4)	ND	(2.7)	ND	(1.3)	2 C@	(1.4)	ND	(1.4)	2.2 C@	(1.3)	1.5 C@	(1.3)
Endosulfan Sulfate	1.1 JX	(110)	1.4 JC	(6.8)	ND	(14)	0.52 JX	(6.5)	ND	(6.8)	ND	(6.8)	ND	(6.5)	ND	(6.3)
Endrin Aldehyde	ND	(42)	ND	(2.7)	ND	(5.5)	ND	(2.6)	ND	(2.7)	ND	(2.7)	ND	(2.6)	2.6 C@	(2.5)
Heptachlor epoxide	ND	(21)	ND	(1.4)	ND	(2.7)	ND	(1.3)	ND	(1.4)	ND	(1.4)	1.4 C@	(1.3)	0.83 JX	(1.3)
beta-BHC	63 X@	(21)	2 C@	(1.4)	ND	(2.7)	ND	(1.3)	ND	(1.4)	ND	(1.4)	ND	(1.3)	ND	(1.3)
delta-BHC	ND	(21)	ND	(1.4)	ND	(2.7)	ND	(1.3)	ND	(1.4)	ND	(1.4)	2.3 X@	(1.3)	ND	(1.3)
SW8240 - Volatile Organic Compounds (μg/kg)																
Acetone	430 J	(1100)	56 J	(140)	30 J	(140)	12 J	(130)	ND	(140)	ND	(140)	8.4 J	(130)	31 J	(130)
Carbon disulfide	ND	(53)	7.6 @	(6.8)	8.5 @	(7)	2.9 J	(6.5)	6.7 J	(6.8)	1.6 J	(6.8)	ND	(6.7)	ND	(6.4)
Ethyl benzene	ND	(53)	ND	(6.8)	0.66 J	(7)	ND	(6.5)	ND	(6.8)	ND	(6.8)	ND	(6.7)	ND	(6.4)
Methylene chloride	ND	(53)	ND	(6.8)	ND	(7)	0.25 J	(6.5)	ND	(6.8)	ND	(6.8)	4 JB	(6.7)	ND	(6.4)
Toluene	2.3 JB	(53)	1.3 JB	(6.8)	0.5 JB	(7)	0.43 JB	(6.5)	1.7 JB	(6.8)	ND	(6.8)	0.49 J	(6.7)	0.45 JB	(6.4)
Xylenes	ND	(53)	ND	(6.8)	3.3 J	(7)	ND	(6.5)	ND	(6.8)	ND	(6.8)	ND	(6.7)	ND	(6.4)

Table C-1 (Continued)

Location ID	C-01	C-02	C-03	C-03	C-04	C-05	C-06	C-06
Sample ID	C-01-02	C-02-02	C-03-02	C-03-03	C-04-02	C-05-02	C-06-02	C-06-03
Total Depth (ft.)	0-2	0-2	0-2	2-4	0-2	0-2	0-2	2-4
SW8270 - Semivolatile Organic Compounds (mg/kg)								
Di-n-octylphthalate	ND (11)	0.22 J (1.4)	ND (1.4)	ND (1.3)	ND (1.4)	ND (1.4)	ND (1.3)	ND (1.3)
bis(2-Ethylhexyl)phthalate	1.8 JB (11)	0.16 JB (1.4)	0.16 JB (1.4)	0.38 JB (1.3)	ND (1.4)	0.18 JB (1.4)	7.9 B (1.3)	0.28 JB (1.3)
SW9012 - Total Cyanide (mg/kg)								
Cyanide	0.37 @ (0.31)	0.59 @ (0.33)	0.75 @ (0.31)	1.2 @ (0.32)	ND (0.34)	ND (0.33)	ND (0.31)	ND (0.3)
SW9030 - Sulfides (mg/kg)								
Sulfide	130 @ (31)	60 @ (34)	ND (34)	ND (31)	ND (34)	ND (34)	ND (33)	ND (32)

X - Qualitative confirmation of analyte on both columns. Quantification differed by a factor of two or more between columns. Value determined by the first column is reported.
@ - Measured result is less than five times the detection limit.
C - Presence and quantitation of the analyte confirmed by second column analysis.
D - Secondary dilution required for this analyte.
J - Detected below the method detection limit.
B - Analyte detected in laboratory blank analysis, no blank subtraction performed.
Z - SW6010, SW7421 -- Analyte detected in method blank.
ND - Not detected.
() - Detection limit.

Table C-2
Summary of Analytical Results for 1992 Sludge Samples - Pond C

Location ID	C-01		C-02		C-03		C-04		C-05		C-06	
Sample ID	C-01-01		C-02-01		C-03-01		C-04-01		C-05-01		C-06-01	
SW6010 - Metals (mg/kg)												
Barium	130	(9.2)	110	(5.9)	61	(5.6)	80	(7.1)	100	(10)	85	(4)
Cadmium	ND	(4.6)	4.2 @	(2.9)	4 @	(2.8)	4.2 @	(3.6)	6 @	(5)	ND	(2)
Chromium	120	(9.2)	86	(5.9)	46	(5.6)	91	(7.1)	76	(10)	63	(4)
Cobalt	ND	(9.2)	ND	(5.9)	ND	(5.6)	ND	(7.1)	ND	(10)	4.3 @	(4)
Copper	220	(18)	190	(12)	250	(11)	130	(14)	260	(20)	67	(8)
Nickel	ND	(18)	15 @	(12)	ND	(11)	ND	(14)	ND	(20)	12 @	(8)
Silver	320	(9.2)	200	(5.9)	190	(5.6)	170	(7.1)	160	(10)	95	(4)
Vanadium	55 @	(18)	48 @	(12)	40 @	(11)	37 @	(14)	47 @	(20)	32 @	(8)
Zinc	330	(18)	240	(12)	250	(11)	170	(14)	240	(20)	110	(8)
SW7060 - Arsenic (mg/kg)												
Arsenic	ND	(3.4)	ND	(2.6)	ND	(2.5)	ND	(2.5)	ND	(3.8)	3.5 @	(1.7)
SW7421 - Lead (mg/kg)												
Lead	48 Z	(2.6)	36	(1.9)	27	(1.9)	22	(1.9)	64	(11)	13	(1.3)
SW7471 - Mercury (mg/kg)												
Mercury	1.6 @	(0.5)	0.83 @	(0.35)	0.84 @	(0.35)	0.94 @	(0.37)	1 @	(0.56)	0.54 @	(0.25)
SW7740 - Selenium (mg/kg)												
Selenium	6.3 @	(4.3)	3.9 @	(3.2)	ND	(3.2)	ND	(3.2)	6.3 @	(4.7)	3 @	(2.2)
SW8080 - Organochlorine Pesticides and PCBs (μg/kg)												
4,4'-DDD	ND	(13)	360 C@	(75)	310 C@	(77)	580 C	(86)	420 C@	(120)	1600 C	(54)
4,4'-DDE	49 X@	(13)	570 C	(75)	320 C@	(77)	460 C	(86)	290 C@	(120)	1300 C	(54)
4,4'-DDT	23 JC	(26)	130 JC	(150)	ND	(150)	210 X@	(170)	360 X@	(240)	140 C@	(110)
Endosulfan I	ND	(13)	ND	(75)	ND	(77)	ND	(86)	380 X@	(120)	ND	(54)
alpha-Chlordane	ND	(13)	ND	(75)	66 JC	(77)	ND	(86)	ND	(120)	ND	(54)
delta-BHC	ND	(13)	ND	(750)	ND	(77)	1600 X	(86)	5000 X	(120)	1600 X	(54)
gamma-Chlordane	ND	(13)	ND	(75)	140 C@	(77)	150 C@	(86)	210 C@	(120)	51 JX	(54)

Table C-2 (Continued)

Location ID	C-01		C-02		C-03		C-04		C-05		C-06	
Sample ID	C-01-01		C-02-01		C-03-01		C-04-01		C-05-01		C-06-01	
SW6010 - Metals (mg/kg)												
SW8150 - Chlorinated Herbicides (μg/kg)												
2,4,5-T	ND	(220)	ND	(150)	ND	(150)	ND	(170)	300 X@	(250)	ND	(110)
SW8240 - Volatile Organic Compounds (μg/kg)												
Acetone	310 @	(130)	1500 @	(760)	2300 @	(760)	560 J	(870)	1900 @	(1200)	720 @	(550)
Benzene	ND	(6.5)	ND	(38)	ND	(38)	ND	(43)	ND	(60)	1 J	(27)
Carbon disulfide	ND	(6.5)	24 J	(38)	47 @	(38)	50 @	(43)	110 @	(60)	71 @	(27)
Ethyl benzene	3.9 J	(6.5)	15 J	(38)	16 J	(38)	43 @	(43)	20 J	(60)	25 J	(27)
Methyl ethyl ketone	43 J	(130)	190 J	(760)	290 J	(760)	72 J	(870)	310 J	(1200)	130 J	(550)
Tetrachloroethene	ND	(6.5)	ND	(38)	ND	(38)	ND	(43)	ND	(60)	0.81 J	(27)
Toluene	7.2 B@	(6.5)	6.9 JB	(38)	8.6 JB	(38)	6.5 JB	(43)	13 JB	(60)	15 JB	(27)
Xylenes	17 @	(6.5)	82 @	(38)	77 @	(38)	71 @	(43)	130 @	(60)	45 @	(27)
SW8270 - Semivolatile Organic Compounds (mg/kg)												
Acetophenone	0.1 J	(1.3)	ND	(7.5)	ND	(7.4)	3.2 J	(8.6)	ND	(12)	ND	(5.4)
Dibutylphthalate	0.046 J	(1.3)	0.35 J	(7.5)	ND	(7.4)	ND	(8.6)	ND	(12)	ND	(5.4)
Fluoranthene	0.085 J	(1.3)	0.34 J	(7.5)	ND	(7.4)	ND	(8.6)	ND	(12)	ND	(5.4)
Phenanthrene	0.097 J	(1.3)	1 J	(7.5)	0.74 J	(7.4)	1.1 J	(8.6)	0.76 J	(12)	1.3 J	(5.4)
Pyrene	0.092 J	(1.3)	0.57 J	(7.5)	ND	(7.4)	ND	(8.6)	ND	(12)	ND	(5.4)
bis(2-Ethylhexyl)phthalate	11 B	(1.3)	36 B@	(7.5)	25 B@	(7.4)	ND	(8.6)	21 B@	(12)	6.3 B@	(5.4)
SW9012 - Total Cyanide (mg/kg)												
Cyanide	330	(13)	ND	(1.6)	6.5 @	(1.6)	ND	(1.7)	ND	(2.6)	ND	(1.1)
SW9030 - Sulfides (mg/kg)												
Sulfide	2800	(250)	1100	(190)	ND	(190)	1600	(210)	2100	(310)	1400	(140)

X - Qualitative confirmation of analyte on both columns. Quantification differed by a factor of two or more between columns. Value determined by the first column is reported.
@ - Measured result is less than five times the detection limit.
C - Presence and quantitation of the analyte confirmed by second column analysis.
D - Secondary dilution required for this analyte.
J - Detected below the method detection limit.
B - Analyte detected in laboratory blank analysis, no blank subtraction performed.
Z - SW6010, SW7421 -- Analyte detected in method blank.
ND - Not detected.
() - Detection limit.

Table C-3
Summary of Analytical Results for 1992 Soil Samples - Pond D

Location ID	D-01	D-01	D-02	D-03	D-03	D-04	D-05	D-05	D-06
Sample ID	D-01-02	D-01-03	D-02-02	D-03-02	D-03-03	D-04-02	D-05-02	D-05-03	D-06-02
Total Depth (ft.)	0-2	2-4	0-2	0-2	2-4	0-2	0-2	2-4	0-2
SW6010 - Metals (mg/kg)									
Barium	31 (4.8)	52 (4.3)	23 (4.5)	21 (4.1)	64 (3.8)	44 (3.5)	38 (5.1)	31 (5.6)	82 (4.5)
Chromium	ND (4.8)	9.4 @ (4.3)	ND (4.5)	ND (4.1)	7.9 @ (3.8)	3.6 @ (3.5)	ND (5.1)	ND (5.6)	ND (4.5)
Nickel	ND (9.5)	9 @ (8.6)	ND (9)	ND (8.2)	ND (7.5)	ND (7)	ND (10)	ND (11)	ND (9)
Vanadium	ND (9.5)	26 @ (8.6)	ND (9)	ND (8.2)	15 @ (7.5)	9.4 @ (7)	ND (10)	ND (11)	11 @ (9)
Zinc	12 @ (9.5)	23 @ (8.6)	ND (9)	ND (8.2)	18 @ (7.5)	10 @ (7)	ND (10)	ND (11)	11 @ (9)
SW7060 - Arsenic (mg/kg)									
Arsenic	0.92 @ (0.51)	2.9 (0.42)	0.8 @ (0.47)	0.78 @ (0.41)	0.78 @ (0.43)	0.9 @ (0.43)	0.9 @ (0.38)	1.2 @ (0.48)	2.1 @ (0.44)
SW7421 - Lead (mg/kg)									
Lead	1.7 @ (0.38)	4.5 (0.32)	0.89 @ (0.35)	1.1 @ (0.31)	2.9 (0.32)	2.2 (0.32)	1.7 (0.28)	1.8 (0.36)	1.5 @ (0.33)
SW7740 - Selenium (mg/kg)									
Selenium	ND (0.64)	ND (0.53)	ND (0.59)	ND (0.52)	ND (0.53)	ND (0.53)	0.59 @ (0.47)	ND (0.6)	ND (0.55)
SW8080 - Organochlorine Pesticides and PCBs (μg/kg)									
4,4'-DDD	ND (1.5)	ND (1.3)	ND (1.4)	ND (1.3)	ND (1.3)	240 C (13)	3.6 C@ (1.4)	ND (1.4)	ND (1.3)
4,4'-DDE	ND (1.5)	ND (1.3)	ND (1.4)	ND (1.3)	ND (1.3)	35 X@ (13)	ND (1.4)	ND (1.4)	ND (1.3)
4,4'-DDT	ND (3)	ND (2.6)	ND (2.8)	ND (2.6)	5.2 X@ (2.7)	52 C@ (26)	ND (2.7)	3.4 X@ (2.7)	ND (2.7)
Endosulfan Sulfate	ND (7.4)	ND (6.4)	2.4 JC (7)	0.53 JX (6.6)	ND (6.7)	ND (64)	ND (6.8)	ND (6.9)	ND (6.7)
Heptachlor	ND (1.5)	ND (1.3)	ND (1.4)	ND (1.3)	1.8 X@ (1.3)	ND (13)	ND (1.4)	ND (1.4)	ND (1.3)
alpha-Chlordane	ND (1.5)	ND (1.3)	ND (1.4)	ND (1.3)	1.5 X@ (1.3)	ND (13)	ND (1.4)	ND (1.4)	ND (1.3)
beta-BHC	ND (1.5)	ND (1.3)	ND (1.4)	ND (1.3)	26 X (1.3)	ND (13)	8.1 C (1.4)	3.3 X@ (1.4)	ND (1.3)
delta-BHC	ND (1.5)	ND (1.3)	ND (1.4)	ND (1.3)	17 X (1.3)	ND (13)	ND (1.4)	ND (1.4)	ND (1.3)
gamma-BHC	ND (1.5)	21 X (1.3)	ND (1.4)	ND (1.3)	ND (1.3)	ND (13)	ND (1.4)	ND (1.4)	ND (1.3)
SW8240 - Volatile Organic Compounds (μg/kg)									
Acetone	ND (150)	22 J (130)	ND (140)	ND (130)	ND (130)	ND (130)	50 J (140)	ND (140)	35 J (130)

Table C-3 (Continued)

Location ID	D-01	D-01	D-02	D-03	D-03	D-04	D-05	D-05	D-06
Sample ID	D-01-02	D-01-03	D-02-02	D-03-02	D-03-03	D-04-02	D-05-02	D-05-03	D-06-02
Total Depth (ft.)	0-2	2-4	0-2	0-2	2-4	0-2	0-2	2-4	0-2
SW8270 - Semivolatile Organic Compounds (mg/kg)									
bis(2-Ethylhexyl)phthalate	ND (1.5)	1.3 B@ (1.3)	ND (1.4)	0.64 J (1.3)	ND (1.3)	1.1 J (1.3)	ND (1.4)	ND (1.4)	0.82 JB (1.3)
SW9030 - Sulfides (mg/kg)									
Sulfide	ND (34)	ND (31)	ND (31)	ND (33)	ND (30)	82 @ (32)	ND (34)	ND (34)	ND (32)

X - Qualitative confirmation of analyte on both columns. Quantification differed by a factor of two or more between columns. Value determined by the first column is reported.
@ - Measured result is less than five times the detection limit.
C - Presence and quantitation of the analyte confirmed by second column analysis.
D - Secondary dilution required for this analyte.
J - Detected below the method detection limit.
B - Analyte detected in laboratory blank analysis, no blank subtraction performed.
ND - Not detected.
() - Detection limit.

Table C-4
Summary of Analytical Results for 1992 Soil Samples - Pond E

Location ID	E-01		E-01		E-02		E-02		E-03		E-03		E-04		E-05		E-05	
Sample ID	E-01-02		E-01-03		E-02-02		E-02-03		E-03-02		E-03-03		E-04-02		E-05-02		E-05-03	
Total Depth (ft.)	0-2		2-4		0-2		2-4		0-2		2-4		0-2		0-2		2-4	
SW6010 - Metals (mg/kg)																		
Barium	94	(4.3)	74	(4.5)	86	(3.9)	45	(4.3)	31	(4.4)	61	(4.7)	67	(4.2)	47	(3.9)	130	(4.1)
Chromium	ND	(4.3)	ND	(4.5)	5 @	(3.9)	ND	(4.3)	ND	(4.4)	5.9 @	(4.7)	ND	(4.2)	4.2 @	(3.9)	4.2 @	(4.1)
Cobalt	ND	(4.3)	ND	(4.5)	7 @	(3.9)	ND	(4.3)	ND	(4.4)	ND	(4.7)	ND	(4.2)	ND	(3.9)	ND	(4.1)
Vanadium	9.9 @	(8.6)	ND	(9)	13 @	(7.8)	ND	(8.5)	ND	(8.9)	16 @	(9.3)	9.5 @	(8.4)	11 @	(7.8)	13 @	(8.2)
Zinc	12 @	(8.6)	14 @	(9)	14 @	(7.8)	12 @	(8.5)	9 @	(8.9)	19 @	(9.3)	15 @	(8.4)	11 @	(7.8)	11 @	(8.2)
SW7060 - Arsenic (mg/kg)																		
Arsenic	1.1 @	(0.34)	1.1 @	(0.38)	2.4	(0.41)	2.6	(0.43)	0.7 @	(0.39)	3.6	(0.55)	1 @	(0.41)	1.2 @	(0.39)	2	(0.35)
SW7421 - Lead (mg/kg)																		
Lead	ND	(0.25)	0.87 @	(0.28)	1.6	(0.31)	1.3 @	(0.32)	1.9	(0.29)	4.5	(0.41)	0.89 @	(0.31)	2.7	(0.29)	2.3	(0.27)
SW7740 - Selenium (mg/kg)																		
Selenium	ND	(0.85)	1 @	(0.95)	ND	(0.51)	ND	(0.54)	ND	(0.49)	ND	(0.68)	ND	(0.51)	ND	(0.49)	ND	(0.44)
SW8080 - Organochlorine Pesticides and PCBs (μg/kg)																		
4,4'-DDD	ND	(1.4)	ND	(1.4)	ND	(1.4)	ND	(1.4)	83 C	(1.3)	36 C	(1.4)	3.6 X@	(1.4)	ND	(1.3)	ND	(1.3)
4,4'-DDE	ND	(1.4)	ND	(1.4)	ND	(1.4)	ND	(1.4)	7.5 C	(1.3)	7.4 C	(1.4)	ND	(1.4)	ND	(1.3)	ND	(1.3)
4,4'-DDT	ND	(2.7)	ND	(2.8)	ND	(2.8)	4 X@	(2.9)	2.7 X@	(2.6)	2.4 JX	(2.8)	ND	(2.7)	ND	(2.6)	ND	(2.5)
Aldrin	ND	(1.4)	ND	(1.4)	ND	(1.4)	2.4 X@	(1.4)	ND	(1.3)	ND	(1.4)	ND	(1.4)	ND	(1.3)	ND	(1.3)
Endosulfan II	0.69 JX	(4.1)	ND	(4.2)	ND	(4.2)	1.7 JX	(4.3)	ND	(4)	ND	(4.2)	ND	(4.1)	ND	(3.9)	ND	(3.8)
Endosulfan Sulfate	ND	(6.8)	0.89 JX	(7)	1.1 JC	(7)	ND	(7.2)	ND	(6.6)	ND	(7)	1.9 JC	(6.8)	1.6 JC	(6.5)	0.92 JX	(6.3)
Heptachlor	ND	(1.4)	ND	(1.4)	2.1 X@	(1.4)	0.86 JX	(1.4)	ND	(1.3)	ND	(1.4)	ND	(1.4)	ND	(1.3)	ND	(1.3)
alpha-BHC	ND	(1.4)	ND	(1.4)	ND	(1.4)	ND	(1.4)	2.3 C@	(1.3)	2.4 C@	(1.4)	ND	(1.4)	ND	(1.3)	ND	(1.3)
alpha-Chlordane	ND	(1.4)	ND	(1.4)	ND	(1.4)	ND	(1.4)	1.3 X@	(1.3)	ND	(1.4)	ND	(1.4)	ND	(1.3)	0.52 JX	(1.3)
beta-BHC	4.1 X@	(1.4)	1.3 JX	(1.4)	4.4 C@	(1.4)	9.6 C	(1.4)	1.4 X@	(1.3)	6.8 X@	(1.4)	ND	(1.4)	ND	(1.3)	2.7 X@	(1.3)
delta-BHC	ND	(1.4)	ND	(1.4)	ND	(1.4)	11 X	(1.4)	ND	(1.3)	ND	(1.4)	ND	(1.4)	ND	(1.3)	ND	(1.3)
gamma-Chlordane	ND	(1.4)	ND	(1.4)	ND	(1.4)	ND	(1.4)	5.6 X@	(1.3)	ND	(1.4)	ND	(1.4)	ND	(1.3)	ND	(1.3)
SW8240 - Volatile Organic Compounds (μg/kg)																		
Acetone	ND	(140)	ND	(140)	ND	(140)	ND	(140)	ND	(130)	ND	(140)	62 JB	(140)	ND	(130)	ND	(130)
Carbon disulfide	ND	(6.8)	ND	(7)	ND	(7)	ND	(7.2)	14 @	(6.6)	11 @	(7)	6.9 @	(6.9)	ND	(6.6)	ND	(6.3)
Methylene chloride	ND	(6.8)	ND	(7)	ND	(7)	ND	(7.2)	ND	(6.6)	ND	(7)	2.4 J	(6.9)	ND	(6.6)	ND	(6.3)
Toluene	ND	(6.8)	ND	(7)	0.12 J	(7)	ND	(7.2)	ND	(6.6)	ND	(7)	1.8 J	(6.9)	0.27 J	(6.6)	ND	(6.3)
SW8270 - Semivolatile Organic Compounds (mg/kg)																		
bis(2-Ethylhexyl)phthalate	ND	(1.3)	ND	(1.4)	ND	(1.4)	5.4 @	(1.4)	0.51 J	(1.3)	0.24 J	(1.4)	ND	(1.4)	ND	(1.3)	ND	(1.3)

Table C-4 (Continued)

Location ID	E-01	E-01	E-02	E-02	E-03	E-03	E-04	E-05	E-05
Sample ID	E-01-02	E-01-03	E-02-02	E-02-03	E-03-02	E-03-03	E-04-02	E-05-02	E-05-03
Total Depth (ft.)	0-2	2-4	0-2	2-4	0-2	2-4	0-2	0-2	2-4
SW9012 - Total Cyanide (mg/kg)									
Cyanide	ND (0.33)	0.93 @ (0.35)	0.69 @ (0.35)	0.88 @ (0.35)	ND (0.32)	ND (0.33)	2.9 (0.32)	1.2 @ (0.3)	0.72 @ (0.3)
SW9030 - Sulfides (mg/kg)									
Sulfide	59 @ (31)	ND (33)	90 @ (33)	ND (34)	59 @ (31)	120 @ (32)	ND (34)	ND (33)	ND (31)

X - Qualitative confirmation of analyte on both columns. Quantification differed by a factor of two or more between columns. Value determined by the first column is reported.
@ - Measured result is less than five times the detection limit.
C - Presence and quantitation of the analyte confirmed by second column analysis.
D - Secondary dilution required for this analyte.
J - Detected below the method detection limit.
B - Analyte detected in laboratory blank analysis, no blank subtraction performed.
ND - Not detected.
() - Detection limit.

Table C-5
Summary of Analytical Results for 1992 Sludge Samples - Pond E

Location ID	E-01		E-02		E-03		E-04		E-05	
Sample ID	E-01-01		E-02-01		E-03-01		E-04-01		E-05-01	
SW6010 - Metals (mg/kg)										
Barium	81	(4.8)	61	(3.8)	42	(3.9)	83	(4.3)	110	(4.5)
Cadmium	2.9 @	(2.4)	ND	(1.9)	ND	(2)	ND	(2.2)	ND	(2.3)
Chromium	28	(4.8)	26	(3.8)	11 @	(3.9)	23	(4.3)	21 @	(4.5)
Cobalt	ND	(4.8)	ND	(3.8)	ND	(3.9)	ND	(4.3)	5.2 @	(4.5)
Copper	75	(9.5)	28 @	(7.7)	22 @	(7.8)	48	(8.7)	45 @	(9.1)
Nickel	12 @	(9.5)	ND	(7.7)	ND	(7.8)	ND	(8.7)	ND	(9.1)
Silver	39	(4.8)	27	(3.8)	14 @	(3.9)	34	(4.3)	18 @	(4.5)
Vanadium	34 @	(9.5)	24 @	(7.7)	18 @	(7.8)	28 @	(8.7)	33 @	(9.1)
Zinc	86	(9.5)	48	(7.7)	38 @	(7.8)	63	(8.7)	67	(9.1)
SW7060 - Arsenic (mg/kg)										
Arsenic	ND	(1.9)	ND	(1.4)	1.3 @	(0.79)	1.9 @	(1.6)	2.3 @	(1.8)
SW7421 - Lead (mg/kg)										
Lead	13	(1.4)	8.2	(1.1)	7.4	(0.59)	10	(1.2)	11	(1.3)
SW7471 - Mercury (mg/kg)										
Mercury	0.31 @	(0.3)	0.29 @	(0.22)	ND	(0.12)	0.44 @	(0.25)	ND	(0.26)
SW7740 - Selenium (mg/kg)										
Selenium	2.7 @	(2.4)	ND	(1.8)	ND	(0.99)	ND	(2)	ND	(2.2)
SW8080 - Organochlorine Pesticides and PCBs (μg/kg)										
4,4'-DDD	380 C	(66)	240 C@	(50)	7300 CD	(51)	150 X@	(54)	160 X@	(59)
4,4'-DDE	250 X@	(66)	170 X@	(50)	1800 CD	(51)	160 X@	(54)	ND	(59)
4,4'-DDT	ND	(130)	ND	(100)	50 JX	(51)	93 JX	(110)	ND	(120)
gamma-BHC	110 C@	(66)	82 X@	(50)	ND	(26)	ND	(54)	ND	(59)
gamma-Chlordane	ND	(66)	ND	(50)	230 X	(26)	ND	(54)	62 X@	(59)
SW8240 - Volatile Organic Compounds (μg/kg)										
Toluene	ND	(660)	ND	(500)	74 J	(260)	ND	(540)	ND	(590)
Xylenes	250 J	(660)	ND	(500)	ND	(260)	ND	(540)	ND	(590)
SW8270 - Semivolatile Organic Compounds (mg/kg)										
Dibutylphthalate	ND	(6.5)	ND	(5)	0.23 J	(2.6)	ND	(5.4)	ND	(5.9)
Phenanthrene	0.81 J	(6.5)	0.54 J	(5)	ND	(2.6)	0.34 J	(5.4)	ND	(5.9)
bis(2-Ethylhexyl)phthalate	9 @	(6.5)	3.6 J	(5)	8.2 @	(2.6)	6.6 @	(5.4)	12 @	(5.9)
SW9012 - Total Cyanide (mg/kg)										
Cyanide	180	(5)	6.1	(0.87)	ND	(0.5)	2.5 @	(1.2)	3 @	(1.3)
SW9030 - Sulfides (mg/kg)										
Sulfide	ND	(160)	720	(120)	470	(63)	ND	(130)	850	(150)

X - Qualitative confirmation of analyte on both columns. Quantification differed by a factor of two or more between columns. Value determined by the first column is reported.
@ - Measured result is less than five times the detection limit.
C - Presence and quantitation of the analyte confirmed by second column analysis.
D - Secondary dilution required for this analyte.
J - Detected below the method detection limit.
B - Analyte detected in laboratory blank analysis, no blank subtraction performed.
ND - Not detected.
() - Detection limit.

Table C-6
Summary of Analytical Results for 1992 Soil Samples - Pond F

Location ID	F-01	
Sample ID	F-01-02	
Total Depth	0-2	
SW6010 - Metals (mg/kg)		
Barium	28	(4.1)
SW7060 - Arsenic (mg/kg)		
Arsenic	0.96 @	(0.41)
SW7421 - Lead (mg/kg)		
Lead	0.5 @	(0.31)
SW8080 - Organochlorine Pesticides and PCBs (μg/kg)		
4,4'-DDD	37 C	(1.4)
4,4'-DDE	15 X	(1.4)
4,4'-DDT	5.8 X@	(2.9)
delta-BHC	2.7 X@	(1.4)
gamma-Chlordane	0.45 JC	(1.4)
SW8240 - Volatile Organic Compounds (μg/kg)		
Toluene	0.94 JB	(7.3)
SW9030 - Sulfides (mg/kg)		
Sulfide	60 @	(34)

X - Qualitative confirmation of analyte on both columns. Quantification differed by a factor of two or more between columns. Value determined by the first column is reported.
@ - Measured result is less than five times the detection limit.
C - Presence and quantitation of the analyte confirmed by second column analysis.
D - Secondary dilution required for this analyte.
J - Detected below the method detection limit.
B - Analyte detected in laboratory blank analysis, no blank subtraction performed.
ND - Not detected.
() - Detection limit.

Table C-7
Summary of Analytical Results for 1992 Sludge Samples - Pond F

Location ID	F-01		F-02	
Sample ID	F-01-01		F-02-01	
SW6010 - Metals (mg/kg)				
Barium	59	(5.3)	39	(4.2)
Chromium	33	(5.3)	26	(4.2)
Copper	75	(11)	42	(8.3)
Nickel	13 @	(11)	ND	(8.3)
Silver	59	(5.3)	38	(4.2)
Vanadium	36 @	(11)	19 @	(8.3)
Zinc	98	(11)	57	(8.3)
SW7060 - Arsenic (mg/kg)				
Arsenic	4 @	(2.3)	2.3 @	(1.7)
SW7421 - Lead (mg/kg)				
Lead	17	(1.7)	9.6	(1.3)
SW7471 - Mercury (mg/kg)				
Mercury	0.43 @	(0.3)	0.28 @	(0.24)
SW7740 - Selenium (mg/kg)				
Selenium	ND	(2.8)	2.5 @	(2.2)
SW8080 - Organochlorine Pesticides and PCBs (µg/kg)				
4,4'-DDD	11000 C	(65)	1400 C	(53)
4,4'-DDE	1900 C	(65)	870 X	(53)
4,4'-DDT	160 C@	(130)	110 X@	(110)
Heptachlor	50 JC	(65)	ND	(53)
alpha-Chlordane	250 X@	(65)	ND	(53)
delta-BHC	5000 X	(65)	2200 X	(53)
gamma-BHC	ND	(65)	76 C@	(53)
gamma-Chlordane	64 JX	(65)	48 JX	(53)
SW8240 - Volatile Organic Compounds (µg/kg)				
Acetone	1400 @	(650)	410 J	(530)
Carbon disulfide	37 @	(33)	38 @	(27)
Ethyl benzene	ND	(33)	12 J	(27)
Methyl ethyl ketone	220 J	(650)	53 J	(530)
Toluene	5 JB	(33)	10 JB	(27)
Xylenes	14 J	(33)	38 @	(27)
SW8270 - Semivolatile Organic Compounds (mg/kg)				
Dibenzofuran	0.86 J	(6.4)	ND	(5.2)
Fluorene	0.82 J	(6.4)	ND	(5.2)
Phenanthrene	4.6 J	(6.4)	0.55 J	(5.2)
bis(2-Ethylhexyl)phthalate	5.4 JB	(6.4)	3.6 JB	(5.2)
SW9030 - Sulfides (mg/kg)				
Sulfide	1800	(160)	1100	(130)

X - Qualitative confirmation of analyte on both columns. Quantification differed by a factor of two or more between columns. Value determined by the first column is reported.
@ - Measured result is less than five times the detection limit.
C - Presence and quantitation of the analyte confirmed by second column analysis.
D - Secondary dilution required for this analyte.
J - Detected below the method detection limit.
B - Analyte detected in laboratory blank analysis, no blank subtraction performed.
ND - Not detected.
() - Detection limit.

Table C-8
Summary of Analytical Results for 1992 Soil Samples - Pond G

Location ID	G-01		G-02		G-02		G-03		G-04		G-05		G-05		G-06	
Sample ID	G-01-02		G-02-02		G-02-03		G-03-02		G-04-02		G-05-02		G-05-03		G-06-02	
Total Depth (ft.)	0-2		0-2		2-4		0-2		0-2		0-2		2-4		0-2	
SW6010 - Metals (mg/kg)																
Barium	100	(4.5)	130	(4.3)	130	(4.8)	140	(5.4)	180	(4.3)	120	(4.5)	180	(4.2)	100	(4)
Chromium	10 @	(4.5)	9.3 @	(4.3)	14 @	(4.8)	11 @	(5.4)	14 @	(4.3)	8.5 @	(4.5)	16 @	(4.2)	11 @	(4)
Cobalt	ND	(4.5)	ND	(4.3)	ND	(4.8)	ND	(5.4)	4.4 @	(4.3)	ND	(4.5)	4.6 @	(4.2)	ND	(4)
Copper	ND	(9)	ND	(8.7)	ND	(9.6)	ND	(11)	ND	(8.6)	ND	(9)	9.8 @	(8.3)	ND	(8)
Nickel	9.7 @	(9)	ND	(8.7)	ND	(9.6)	ND	(11)	9 @	(8.6)	ND	(9)	9.3 @	(8.3)	ND	(8)
Vanadium	20 @	(9)	17 @	(8.7)	22 @	(9.6)	23 @	(11)	29 @	(8.6)	16 @	(9)	29 @	(8.3)	18 @	(8)
Zinc	29 @	(9)	24 @	(8.7)	32 @	(9.6)	29 @	(11)	44	(8.6)	23 @	(9)	43	(8.3)	24 @	(8)
SW7060 - Arsenic (mg/kg)																
Arsenic	1.7 @	(0.51)	1.9 @	(0.45)	2.6 @	(0.53)	1.6 @	(0.49)	3.1 @	(0.91)	1.6 @	(0.51)	1.5 @	(0.94)	1.3 @	(0.38)
SW7421 - Lead (mg/kg)																
Lead	3.9	(0.38)	3.4	(0.33)	5.2	(0.4)	4.5	(0.37)	120	(13)	3.9	(0.38)	5.7	(0.35)	4.8	(0.29)
SW8080 - Organochlorine Pesticides and PCBs (µg/kg)																
4,4'-DDD	7.5 C	(1.5)	3.8 C@	(1.4)	ND	(1.5)	4.8 C@	(1.6)	6.9 C@	(1.5)	ND	(1.6)	ND	(1.4)	ND	(1.3)
4,4'-DDE	ND	(1.5)	ND	(1.4)	ND	(1.5)	ND	(1.6)	3.1 X@	(1.5)	ND	(1.6)	ND	(1.4)	2.5 X@	(1.3)
Endosulfan Sulfate	0.19 JX	(7.4)	0.7 JX	(7.2)	2.1 JC	(7.7)	1.2 JC	(7.8)	1.2 JC	(7.5)	1.2 JC	(7.9)	0.75 JX	(7.2)	0.9 JC	(6.6)
Heptachlor	ND	(1.5)	ND	(1.4)	ND	(1.5)	ND	(1.6)	3.3 X@	(1.5)	ND	(1.6)	ND	(1.4)	ND	(1.3)
Isodrin	ND	(1.5)	ND	(1.4)	ND	(1.5)	ND	(1.6)	ND	(1.5)	4.7 X@	(1.6)	ND	(1.4)	ND	(1.3)
alpha-BHC	ND	(1.5)	3.3 X@	(1.4)	ND	(1.5)	ND	(1.6)	2.7 X@	(1.5)	ND	(1.6)	ND	(1.4)	2.4 C@	(1.3)
beta-BHC	1.9 X@	(1.5)	ND	(1.4)	ND	(1.5)	ND	(1.6)	4.6 CB@	(1.5)	11 XB	(1.6)	ND	(1.4)	1.3 CB@	(1.3)
gamma-BHC	ND	(1.5)	3.1 X@	(1.4)	2.7 X@	(1.5)	3 C@	(1.6)	ND	(1.5)	ND	(1.6)	ND	(1.4)	ND	(1.3)
SW8240 - Volatile Organic Compounds (µg/kg)																
Acetone	140 J	(150)	96 J	(150)	ND	(150)	ND	(160)	47 J	(150)	ND	(160)	63 J	(140)	ND	(130)
Carbon disulfide	ND	(7.5)	14 @	(7.3)	ND	(7.7)	3.4 J	(7.9)	2 J	(7.5)	ND	(8)	ND	(7.2)	13 @	(6.7)
Methylene chloride	ND	(7.5)	32 @	(7.3)	37 @	(7.7)	31 @	(7.9)	15 @	(7.5)	20 @	(8)	ND	(7.2)	31 @	(6.7)
Toluene	ND	(7.5)	ND	(7.3)	ND	(7.7)	4.4 J	(7.9)	2.6 J	(7.5)	4.1 J	(8)	0.58 J	(7.2)	2.8 J	(6.7)

Table C-8 (Continued)

Location ID	G-01		G-02		G-02		G-03		G-04		G-05		G-05		G-06	
Sample ID	G-01-02		G-02-02		G-02-03		G-03-02		G-04-02		G-05-02		G-05-03		G-06-02	
Total Depth (ft.)	0-2		0-2		2-4		0-2		0-2		0-2		2-4		0-2	
SW8270 - Semivolatile Organic Compounds (mg/kg)																
Butylbenzylphthalate	ND	(1.5)	ND	(1.4)	0.88 J	(1.5)	ND	(1.6)	ND	(1.5)	ND	(1.6)	ND	(1.4)	ND	(1.3)
Di-n-octylphthalate	ND	(1.5)	ND	(1.4)	0.23 J	(1.5)	ND	(1.6)	ND	(1.5)	ND	(1.6)	ND	(1.4)	ND	(1.3)
bis(2-Ethylhexyl)phthalate	0.29 JB	(1.5)	2.1 @	(1.4)	ND	(1.5)	3.6 @	(1.6)	ND	(1.5)	0.31 J	(1.6)	ND	(1.4)	0.15 J	(1.3)
SW9012 - Total Cyanide (mg/kg)																
Cyanide	0.59 @	(0.27)	ND	(0.28)	ND	(0.33)	ND	(0.3)	0.61 @	(0.36)	ND	(0.31)	ND	(0.29)	0.61 @	(0.29)
SW9030 - Sulfides (mg/kg)																
Sulfide	46 @	(36)	ND	(36)	48 @	(38)	47 @	(37)	100 @	(36)	82 @	(39)	45 @	(35)	92 @	(32)

X - Qualitative confirmation of analyte on both columns. Quantification differed by a factor of two or more between columns. Value determined by the first column is reported.
@ - Measured result is less than five times the detection limit.
C - Presence and quantitation of the analyte confirmed by second column analysis.
D - Secondary dilution required for this analyte.
J - Detected below the method detection limit.
B - Analyte detected in laboratory blank analysis, no blank subtraction performed.
ND - Not detected.
() - Detection limit.

Table C-9
Summary of Analytical Results for 1992 Sludge Samples - Pond G

Location ID	G-01		G-02		G-03		G-04		G-05		G-06	
Sample ID	G-01-01		G-02-01		G-03-01		G-04-01		G-05-01		G-06-01	
SW6010 - Metals (mg/kg)												
Barium	81	(4.8)	120	(2.4)	92	(3)	85	(3)	65	(1.8)	83	(6.2)
Beryllium	ND	(0.95)	0.68 @	(0.49)	ND	(0.61)	ND	(0.61)	ND	(0.36)	ND	(1.2)
Chromium	9 @	(4.8)	18	(2.4)	15	(3)	15	(3)	10	(1.8)	16 @	(6.2)
Cobalt	ND	(4.8)	5.4 @	(2.4)	3.4 @	(3)	3.6 @	(3)	2.7 @	(1.8)	ND	(6.2)
Copper	ND	(9.5)	24 @	(4.9)	20 @	(6.1)	21 @	(6.1)	19	(3.6)	23 @	(12)
Nickel	ND	(9.5)	12 @	(4.9)	6.9 @	(6.1)	10 @	(6.1)	5.6 @	(3.6)	ND	(12)
Vanadium	15 @	(9.5)	30	(4.9)	25 @	(6.1)	26 @	(6.1)	15 @	(3.6)	24 @	(12)
Zinc	26 @	(9.5)	66	(4.9)	49	(6.1)	53	(6.1)	30	(3.6)	50 @	(12)
SW7060 - Arsenic (mg/kg)												
Arsenic	1.4 @	(0.47)	2 @	(0.91)	2.3 @	(1.1)	1.8 @	(1.3)	1.3 @	(0.83)	2.4 @	(2.1)
SW7421 - Lead (mg/kg)												
Lead	5.8	(0.36)	31	(2.7)	23	(1.7)	38	(1.9)	15	(1.2)	27	(1.6)
SW7471 - Mercury (mg/kg)												
Mercury	ND	(0.071)	0.15 @	(0.15)	ND	(0.19)	0.18 @	(0.17)	ND	(0.11)	ND	(0.32)
SW7740 - Selenium (mg/kg)												
Selenium	ND	(0.59)	1.3 @	(1.1)	ND	(1.4)	ND	(1.6)	ND	(1)	ND	(2.6)
SW8080 - Organochlorine Pesticides and PCBs (µg/kg)												
4,4'-DDD	400 C	(1.6)	3100 C	(32)	300 C	(41)	980 C	(37)	100 C@	(25)	ND	(70)
4,4'-DDE	36 C	(1.6)	450 X	(32)	140 C@	(41)	290 X	(37)	83 C@	(25)	ND	(70)
4,4'-DDT	27 C	(3.2)	120 C@	(64)	ND	(83)	ND	(74)	ND	(49)	ND	(140)
Kepone (Mirex)	1.7 X@	(1.6)	ND	(32)	ND	(41)	ND	(37)	ND	(25)	ND	(70)
alpha-BHC	ND	(1.6)	ND	(32)	79 C@	(41)	77 C@	(37)	ND	(25)	ND	(70)
alpha-Chlordane	9.6 X	(1.6)	110 X@	(32)	ND	(41)	ND	(37)	11 JX	(25)	ND	(70)
gamma-Chlordane	28 X	(1.6)	310 X	(32)	60 X@	(41)	ND	(37)	ND	(25)	ND	(70)
SW8240 - Volatile Organic Compounds (µg/kg)												
Acetone	87 J	(160)	ND	(6400)	ND	(8300)	ND	(7500)	ND	(4900)	ND	(14000)
Carbon disulfide	37 @	(7.9)	ND	(320)	ND	(410)	ND	(370)	ND	(250)	ND	(700)

Table C-9 (Continued)

Location ID	G-01		G-02		G-03		G-04		G-05		G-06	
Sample ID	G-01-01		G-02-01		G-03-01		G-04-01		G-05-01		G-06-01	
SW8270 - Semivolatile Organic Compounds (mg/kg)												
Acetophenone	ND	(1.6)	0.85 J	(3.2)	ND	(4.1)	ND	(3.7)	ND	(2.4)	ND	(6.9)
bis(2-Ethylhexyl)phthalate	0.69 JB	(1.6)	1.3 J	(3.2)	0.58 J	(4.1)	3.9 @	(3.7)	1.7 J	(2.4)	3.8 J	(6.9)
SW9012 - Total Cyanide (mg/kg)												
Cyanide	1.1 @	(0.28)	ND	(0.66)	ND	(0.91)	ND	(0.81)	ND	(0.5)	5.6 @	(1.6)
SW9030 - Sulfides (mg/kg)												
Sulfide	50 @	(39)	780	(77)	540	(100)	2000	(91)	ND	(61)	1300	(170)

X - Qualitative confirmation of analyte on both columns. Quantification differed by a factor of two or more between columns. Value determined by the first column is reported.
@ - Measured result is less than five times the detection limit.
C - Presence and quantitation of the analyte confirmed by second column analysis.
D - Secondary dilution required for this analyte.
J - Detected below the method detection limit.
B - Analyte detected in laboratory blank analysis, no blank subtraction performed.
ND - Not detected.
() - Detection limit.

APPENDIX D

SUMMARY OF ANALYTICAL RESULTS FOR THE 1993 BIOTA INVESTIGATION

APPENDIX D
SUMMARY OF ANALYTICAL RESULTS FOR THE 1993 BIOTA INVESTIGATION

Although the 1993 investigation focused on biological sampling, surface water and sediment samples were also collected from the sludge lagoons. Sampling consisted of a single surface water sample from each sewage lagoon, along with two sediment samples from Ponds A and E (one each). The sediment samples were collected from near the surface (upper few inches of sludge) to compare the constituents found in the sewage lagoons' benthic organisms with their immediate environment. These sediment samples are classified as sludge samples in this appendix. This appendix presents a summary of analytical results (detections) for the investigation; therefore, if an analyte was not detected, it will not appear in this appendix.

Below is a list of the analytical flags associated with this investigation.

B - Analyte was also detected in the associated laboratory method blank.

J - Estimated value because the analyte was detected at a concentration less than the reported detection limit.

G - Analyte was not confirmed. Analyte was detected using both primary and secondary columns; however, the concentrations differ by more than a factor of two.

X - Analyte was not confirmed. Analyte was detected using primary column only.

@ - Measured result is less than five times the detection limit.

NA - Not analyzed.

NR - Not reported.

( ) - Detection limit.

Table D-1
Summary of Analytical Results for 1993 Surface Water Samples - Pond A

Location ID	A-01	
Sample ID	9303-WA-01-01	
E130.2 - Hardness (mg/L)		
Hardness, as CaC03	2400	(83)
E160.1 - Total Dissolved Solids (mg/L)		
Total dissolved solids	5500	(10)
SW8080 - Organochlorine Pesticides and PCBs (μg/L)		
4,4'-DDD	0.028 X@	(0.0095)
4,4'-DDT	0.02 X@	(0.019)
Dieldrin	0.015 X@	(0.0095)
Endosulfan Sulfate	0.013 JB	(0.048)
Endrin	0.0095 X@	(0.0095)
Heptachlor	0.012 X@	(0.0095)
Heptachlor epoxide	0.01 G@	(0.0095)
delta-BHC	0.037 X@	(0.0095)

B - Analyte was also detected in the associated laboratory method blank.
J - Estimated value because the analyte was detected at a concentration less than the reported detection limit.
G - Analyte was not confirmed. Analyte was detected using both primary and secondary columns; however, the concentrations differ by more than a factor of two.
X - Analyte was not confirmed. Analyte was detected using primary column only.
@ - Measured result is less than five times the detection limit.
() - Detection limit.

Table D-2
Summary of Analytical Results for 1993 Sludge Samples - Pond A

Location ID	A-01	
Sample ID	9303-SEDA-01-01	
SW6010 - Metals (mg/kg)		
Antimony	5.7 @	(11)
Barium	64	(1.1)
Beryllium	0.17 @	(0.22)
Cadmium	0.68 @	(0.55)
Chromium	24	(1.1)
Cobalt	2 @	(1.1)
Copper	40	(2.2)
Nickel	4.4 @	(2.2)
Silver	14	(1.1)
Thallium	0.61 @	(11)
Tin	3.9 @	(66)
Vanadium	13	(2.2)
Zinc	68	(2.2)
SW7060 - Arsenic (mg/kg)		
Arsenic	4.5 @	(1)
SW7421 - Lead (mg/kg)		
Lead	12	(0.78)
SW7471 - Mercury (mg/kg)		
Mercury	0.38	(0.064)
SW7740 - Selenium (mg/kg)		
Selenium	0.73 @	(0.65)
SW7841 - Thallium (mg/kg)		
Thallium	0.065 @	(0.65)
SW8080 - Organochlorine Pesticides and PCBs (μg/kg)		
4,4'-DDE	630 X@	(560)
Endosulfan I	530 XJ	(560)
Endosulfan II	1100 XJ	(1700)
Endosulfan Sulfate	420 XJB	(2800)
Heptachlor	230 XJ	(560)
Heptachlor epoxide	180000 X	(560)
gamma-Chlordane	490 JX	(560)

Table D-2 (Continued)

Location ID	A-01	
Sample ID	9303-SEDA-01-01	
SW8270 - Semivolatile Organic Compounds (mg/kg)		
4-Chloroaniline	1.7 J	(5.6)
Benzo(a)pyrene	0.11 J	(5.6)
Benzo(b)fluoranthene	0.14 JX	(5.6)
Benzo(k)fluoranthene	0.14 JX	(5.6)
Diethylphthalate	0.12 J	(5.6)
Fluoranthene	0.12 J	(5.6)
Molecular sulfur	62	(NR)
Pyrene	0.12 J	(5.6)
bis(2-Ethylhexyl)phthalate	6.5 @	(5.6)
SW8280 - Dioxans and Furans (μg/kg)		
OCDD	0.76	(0.44)

B - Analyte was also detected in the associated laboratory method blank.
J - Estimated value because the analyte was detected at a concentration less than the reported detection limit.
G - Analyte was not confirmed. Analyte was detected using both primary and secondary columns; however, the concentrations differ by more than a factor of two.
X - Analyte was not confirmed. Analyte was detected using primary column only.
@ - Measured result is less than five times the detection limit.
NR - Not reported.
() - Detection limit.

Table D-3
Summary of Analytical Results for 1993 Surface Water Samples - Pond B

Location ID	B-01	
Sample ID	9303-WB-01-01	
E130.2 - Hardness (mg/L)		
Hardness, as CaC03	1600	(62)
E160.1 - Total Dissolved Solids (mg/L)		
Total dissolved solids	3800	(10)
SW8080 - Organochlorine Pesticides and PCBs (μg/L)		
4,4'-DDD	0.043 X@	(0.0095)
4,4'-DDE	0.015 X@	(0.0095)
4,4'-DDT	0.018 JX	(0.019)
Dieldrin	0.022 X@	(0.0095)
Endosulfan Sulfate	0.012 JB	(0.048)
Endrin	0.0093 JX	(0.0095)
Heptachlor epoxide	0.01 G@	(0.0095)
alpha-Chlordane	0.0034 JX	(0.0095)
delta-BHC	0.017 X@	(0.0095)
gamma-BHC	0.01 @	(0.0095)

B - Analyte was also detected in the associated laboratory method blank.
J - Estimated value because the analyte was detected at a concentration less than the reported detection limit.
G - Analyte was not confirmed. Analyte was detected using both primary and secondary columns; however, the concentrations differ by more than a factor of two.
X - Analyte was not confirmed. Analyte was detected using primary column only.
@ - Measured result is less than five times the detection limit.
() - Detection limit.

Table D-4
Summary of Analytical Results for 1993 Surface Water Samples - Pond C

Location ID	C-01	
Sample ID	9303-WC-01-01	
E130.2 - Hardness (mg/L)		
Hardness, as CaC03	1900	(83)
E160.1 - Total Dissolved Solids (mg/L)		
Total dissolved solids	4400	(10)

B - Analyte was also detected in the associated laboratory method blank.
J - Estimated value because the analyte was detected at a concentration less than the reported detection limit.
G - Analyte was not confirmed. Analyte was detected using both primary and secondary columns; however, the concentrations differ by more than a factor of two.
X - Analyte was not confirmed. Analyte was detected using primary column only.
@ - Measured result is less than five times the detection limit.
() - Detection limit.

Table D-5
Summary of Analytical Results for 1993 Surface Water Samples - Pond D

Location ID	D-01	
Sample ID	9303-WD-01-01	
E130.2 - Hardness (mg/L)		
Hardness, as CaC03	2100	(120)
E160.1 - Total Dissolved Solids (mg/L)		
Total dissolved solids	4600	(10)
SW8080 - Organochlorine Pesticides and PCBs (µg/L)		
4,4'-DDD	0.03 X@	(0.0095)
Dieldrin	0.015 X@	(0.0095)
Endosulfan Sulfate	0.013 JB	(0.048)
Endrin	0.0097 X@	(0.0095)
Heptachlor epoxide	0.01 X@	(0.0095)
delta-BHC	0.021 X@	(0.0095)
gamma-BHC	0.01 @	(0.0095)
gamma-Chlordane	0.0058 J	(0.0095)

B - Analyte was also detected in the associated laboratory method blank.
J - Estimated value because the analyte was detected at a concentration less than the reported detection limit.
G - Analyte was not confirmed. Analyte was detected using both primary and secondary columns; however, the concentrations differ by more than a factor of two.
X - Analyte was not confirmed. Analyte was detected using primary column only.
@ - Measured result is less than five times the detection limit.
() - Detection limit.

Table D-6
Summary of Analytical Results for 1993 Surface Water Samples - Pond E

Location ID	E-01		E-01	
Sample ID	9303-WE-01-01		9303-WE-01-01 AD	
E130.2 - Hardness (mg/L)				
Hardness, as CaC03	2100	(83)	2100	(83)
E160.1 - Total Dissolved Solids (mg/L)				
Total dissolved solids	4600	(10)	4700	(10)
SW8080 - Organochlorine Pesticides and PCBs (µg/L)				
4,4'-DDD	0.026 X@	(0.0095)	NA	
Dieldrin	0.014 X@	(0.0095)	NA	
Endosulfan Sulfate	0.014 JB	(0.048)	NA	
Endrin	0.01 X@	(0.0095)	NA	
Heptachlor epoxide	0.01 @	(0.0095)	NA	
alpha-BHC	0.009 J	(0.0095)	NA	
delta-BHC	0.021 X@	(0.0095)	NA	
gamma-BHC	0.01 @	(0.0095)	NA	
gamma-Chlordane	0.0053 J	(0.0095)	NA	

B - Analyte was also detected in the associated laboratory method blank.
J - Estimated value because the analyte was detected at a concentration less than the reported detection limit.
G - Analyte was not confirmed. Analyte was detected using both primary and secondary columns; however, the concentrations differ by more than a factor of two.
X - Analyte was not confirmed. Analyte was detected using primary column only.
@ - Measured result is less than five times the detection limit.
NA - Not analyzed.

Table D-7
Summary of Analytical Results for 1993 Sludge Samples - Pond E

Location ID	E-01	
Sample ID	9303-SEDE-01-01	
SW6010 - Metals (mg/kg)		
Antimony	6.6 @	(11)
Barium	36	(1.1)
Beryllium	0.082 @	(0.22)
Cadmium	0.082 @	(0.56)
Chromium	2.9 @	(1.1)
Cobalt	1.8 @	(1.1)
Copper	5.2 @	(2.2)
Nickel	3.1 @	(2.2)
Silver	0.8 @	(1.1)
Thallium	1.3 @	(11)
Tin	0.27 @	(67)
Vanadium	7.1 @	(2.2)
Zinc	8.3 @	(2.2)
SW7060 - Arsenic (mg/kg)		
Arsenic	2.7 @	(1.2)
SW7421 - Lead (mg/kg)		
Lead	21	(0.45)
SW7471 - Mercury (mg/kg)		
Mercury	0.0076 @	(0.068)
SW7740 - Selenium (mg/kg)		
Selenium	0.67 @	(0.76)
SW7841 - Thallium (mg/kg)		
Thallium	0.061 @	(0.76)
SW8080 - Organochlorine Pesticides and PCBs (µg/kg)		
Heptachlor	590 J	(670)
Heptachlor epoxide	78000 X	(670)
gamma-Chlordane	540 J	(670)
SW8270 - Semivolatile Organic Compounds (mg/kg)		
Diethylphthalate	0.12 J	(6.7)
Molecular sulfur	53	(NR)
bis(2-Ethylhexyl)phthalate	0.66 J	(6.7)

B - Analyte was also detected in the associated laboratory method blank.
J - Estimated value because the analyte was detected at a concentration less than the reported detection limit.
G - Analyte was not confirmed. Analyte was detected using both primary and secondary columns; however, the concentrations differ by more than a factor of two.
X - Analyte was not confirmed. Analyte was detected using primary column only.
@ - Measured result is less than five times the detection limit.
NR - Not reported.
() - Detection limit.

Table D-8
Summary of Analytical Results for 1993 Surface Water Samples - Pond F

Location ID	F-01	
Sample ID	9303-WF-01-01	
E130.2 - Hardness (mg/L)		
Hardness, as CaC03	1800	(120)
E160.1 - Total Dissolved Solids (mg/L)		
Total dissolved solids	4200	(10)
SW8080 - Organochlorine Pesticides and PCBs (μg/L)		
4,4'-DDD	0.035 @	(0.0095)
4,4'-DDE	0.12 G	(0.0095)
Endosulfan Sulfate	0.016 JB	(0.048)
Endrin	0.02 X@	(0.0095)
alpha-Chlordane	0.03 G@	(0.0095)
delta-BHC	0.029 X@	(0.0095)
gamma-BHC	0.012 X@	(0.0095)
gamma-Chlordane	0.01 @	(0.0095)

B - Analyte was also detected in the associated laboratory method blank.
J - Estimated value because the analyte was detected at a concentration less than the reported detection limit.
G - Analyte was not confirmed. Analyte was detected using both primary and secondary columns; however, the concentrations differ by more than a factor of two.
X - Analyte was not confirmed. Analyte was detected using primary column only.
@ - Measured result is less than five times the detection limit.
() - Detection limit.

Table D-9
Summary of Analytical Results for 1993 Surface Water Samples - Pond G

Location ID	G-01	
Sample ID	9303-WG-01-01	
E130.2 - Hardness (mg/L)		
Hardness, as CaC03	2000	(120)
E160.1 - Total Dissolved Solids (mg/L)		
Total dissolved solids	4600	(10)
SW8080 - Organochlorine Pesticides and PCBs (μg/L)		
Endosulfan II	0.0009 J	(0.029)
alpha-BHC	0.0076 J	(0.0095)
gamma-BHC	0.0099 @	(0.0095)

B - Analyte was also detected in the associated laboratory method blank.
J - Estimated value because the analyte was detected at a concentration less than the reported detection limit.
G - Analyte was not confirmed. Analyte was detected using both primary and secondary columns; however, the concentrations differ by more than a factor of two.
X - Analyte was not confirmed. Analyte was detected using primary column only.
@ - Measured result is less than five times the detection limit.
() - Detection limit.

APPENDIX E

SUMMARY OF ANALYTICAL RESULTS FOR THE 1994 SURFACE WATER AND SLUDGE INVESTIGATION

APPENDIX E

SUMMARY OF ANALYTICAL RESULTS FOR THE 1994 SURFACE WATER AND SLUDGE INVESTIGATION

During the 1994 investigation, surface water samples were collected from Ponds C, D, E, and G and sludge samples from Ponds A, B, C, D, E, and G. A total of 21 surface water and 83 sludge samples were collected during the investigation. Since this appendix presents a summary of analytical detections, the results of the surface water sampling are not included since no detections occurred.

Below is a list of the analytical flags associated with the investigation.

J - Result is detected below the reporting limit or is an estimated concentration.

T - Preferred values unless footnoted on secondary column test.

V - Secondary column result is the preferred value.

NA - Not analyzed.

ND - Not detected.

( ) - Reporting limit.

Table E-1
Summary of Analytical Results for 1994 Sludge Samples - Pond A

Location ID	PA-01		PA-02		PA-03		PA-04		PA-05		PA-06	
Sample ID	95-PA-SL-01A-01		95-PA-SL-02A-01		95-PA-SL-03A-01		95-PA-SL-04A-01		95-PA-SL-05A-01		95-PA-SL-06A-01	
E376.2 - (mg/kg)												
Sulfide, Total	2.6	(1.3)	20	(2.6)	2.7	(1.2)	16.6	(1.5)	33.6	(3.4)	6.2	(2.8)
SW8080 - Organochlorine Pesticides and PCBs (μg/kg)												
PCB-1254	300	(86)	1600	(700)	1200	(410)	7100	(2000)	2800	(1100)	3200	(1800)
SW9030 - Sulfides (mg/kg)												
Sulfide, Reactive	3.9	(1.3)	5.8	(2.6)	4.7	(1.2)	2	(1.5)	48.3	(3.4)	19.6	(2.8)

J - Result is detected below the reporting limit or is an estimated concentration.
T - Preferred values unless footnoted on secondary column test.
V - Secondary column result is the preferred value.
() - Detection limit.

Table E-2
Summary of Analytical Results for 1994 Sludge Samples - Pond B

Location ID	PB-01		PB-02		PB-03		PB-04		PB-05		PB-06	
Sample ID	95-PB-SL-01B-01		95-PB-SL-02B-01		95-PB-SL-03B-01		95-PB-SL-04B-01		95-PB-SL-05B-01		95-PB-SL-06B-01	
E376.2 - (mg/kg)												
Sulfide, Total	5	(2.5)	3.3	(3.1)	ND	(1.2)	ND	(3)	ND	(0.83)	11.6	(3.4)
SW8080 - Organochlorine Pesticides and PCBs (μg/kg)												
PCB-1254	2400	(1600)	5300	(2100)	1300	(780)	1100	(1000)	62	(55)	3000	(2200)
SW9030 - Sulfides (mg/kg)												
Sulfide, Reactive	8	(2.5)	5.6	(3.1)	ND	(1.2)	ND	(3)	ND	(0.83)	77.7	(6.8)

J - Result is detected below the reporting limit or is an estimated concentration.
T - Preferred values unless footnoted on secondary column test.
V - Secondary column result is the preferred value.
ND - Not detected.
() - Detection limit.

Table E-3
Summary of Analytical Results for 1994 Sludge Samples - Pond C

Location ID	PC-01		PC-01		PC-02		PC-03		PC-03		PC-04		PC-05		PC-06	
Sample ID	94-PC-SL-01C-01		95-PC-SL-01C-01		94-PC-SL-02C-01		94-PC-SL-03C-01		95-PC-SL-03C-01		94-PC-SL-04C-01		94-PC-SL-05C-01		94-PC-SL-06C-01	
E376.2 - (mg/kg)																
Sulfide, Total	NA		131	(13.8)	NA		NA		43	(5.1)	NA		NA		NA	
MRI-SOP - Kepone (mg/kg)																
Kepone	ND	(0.07)	NA		NA		ND	(0.07)	NA		NA		ND	(0.07)	ND	(0.07)
SW6010 - Metals (mg/kg)																
Barium	116	(2.4)	NA		98.9	(2.7)	121	(8.3)	NA		51.2	(1.7)	159	(8.5)	89.3	(9.5)
Beryllium	0.41 J	(0.47)	NA		0.39 J	(0.54)	ND	(1.7)	NA		0.2 J	(0.34)	ND	(1.7)	ND	(1.9)
Cadmium	1.8	(1.2)	NA		1.4	(1.4)	ND	(4.2)	NA		ND	(0.86)	ND	(4.2)	ND	(4.7)
Chromium	62.5	(2.4)	NA		39.1	(2.7)	84.2	(8.3)	NA		6.3	(1.7)	71.1	(8.5)	54.8	(9.5)
Cobalt	3.8	(2.4)	NA		3.9	(2.7)	3.6 J	(8.3)	NA		1.9	(1.7)	5.9 J	(8.5)	5.9 J	(9.5)
Copper	104	(4.7)	NA		107	(5.4)	164	(16.7)	NA		9.3	(3.4)	88.4	(17)	126	(19)
Nickel	12.1	(9.5)	NA		13.6	(10.8)	14.9 J	(33.4)	NA		3.8 J	(6.9)	16.6 J	(34)	12.3 J	(37.9)
Silver	117	(2.4)	NA		94.6	(2.7)	179	(8.3)	NA		2.1	(1.7)	131	(8.5)	84.3	(9.5)
Tin	12.1 J	(23.7)	NA		8.9 J	(27.1)	27.9 J	(83.4)	NA		ND	(93.1)	24 J	(85)	26.3 J	(94.8)
Vanadium	31.8	(2.4)	NA		34.4	(2.7)	47.4	(8.3)	NA		16.9	(1.7)	49.4	(8.5)	44	(9.5)
Zinc	121	(4.7)	NA		145	(5.4)	218	(16.7)	NA		22.6	(3.4)	149	(17)	155	(19)
SW7060 - Arsenic (mg/kg)																
Arsenic	0.88 J	(1.2)	NA		1.7 J	(2.7)	2 J	(4.2)	NA		2	(0.86)	3.1 J	(4.2)	3.3 J	(4.7)
SW7421 - Lead (mg/kg)																
Lead	31.5	(5.9)	NA		20.5	(1.4)	19.8	(4.2)	NA		0.55 J	(1.7)	18.1	(4.2)	16.5	(4.7)
SW7471 - Mercury (mg/kg)																
Mercury	0.44	(0.24)	NA		0.49	(0.27)	1	(0.83)	NA		ND	(0.17)	1.2	(0.85)	ND	(0.95)
SW7740 - Selenium (mg/kg)																
Selenium	0.92 J	(1.2)	NA		1.3 J	(1.4)	2.7 J	(4.2)	NA		0.31 J	(1.7)	2.4 J	(4.2)	3.6 J	(4.7)
SW8080 - Organochlorine Pesticides and PCBs (μg/kg)																
4,4'-DDD	110 V	(16)	NA		480 V	(180)	130 V	(55)	NA		36 V	(11)	360 V	(56)	34 V	(31)
4,4'-DDE	49 V	(16)	NA		550 V	(180)	370 V	(55)	NA		11 V	(11)	290 V	(56)	40 V	(31)
4,4'-DDT	ND	(16)	NA		23 J	(180)	ND	(55)	NA		1 J	(11)	ND	(56)	ND	(31)
Dieldrin	2.9 J	(16)	NA		ND	(180)	2.8 J	(55)	NA		ND	(11)	4.3 J	(56)	ND	(31)
Endosulfan I	ND	(8.1)	NA		ND	(92)	ND	(28)	NA		ND	(5.9)	ND	(29)	4.9 J	(16)
alpha-BHC	ND	(8.1)	NA		ND	(92)	0.37 J	(28)	NA		0.12 J	(5.9)	ND	(29)	ND	(16)
delta-BHC	0.53 J	(8.1)	NA		ND	(92)	3.8 J	(28)	NA		ND	(5.9)	ND	(29)	ND	(16)
gamma-BHC	0.61 VJ	(8.1)	NA		ND	(92)	ND	(28)	NA		ND	(5.9)	1.2 J	(29)	ND	(16)
SW9030 - Sulfides (mg/kg)																
Sulfide, Reactive	NA		72.9	(5.5)	NA		NA		134	(10.2)	NA		NA		NA	

Table E-3 (Continued)

Location ID	PC-07		PC-07		PC-08		PC-08		PC-09		PC-10		PC-10		PC-11	
Sample ID	94-PC-SL-07C-01		95-PC-SL-07C-01		94-PC-SL-08C-01		95-PC-SL-08C-01		94-PC-SL-09C-01		94-PC-SL-10C-01		95-PC-SL-10C-01		94-PC-SL-11C-01	
E376.2 - (mg/kg)																
Sulfide, Total	NA		66.1	(5.6)	NA		4.5	(2.9)	NA		NA		23.9	(3)	NA	
MRI-SOP - Kepone (mg/kg)																
Kepone	NA		NA		ND	(0.07)	NA		NA		ND	(0.07)	NA		ND	(0.07)
SW6010 - Metals (mg/kg)																
Barium	99.3	(7.2)	NA		72.8	(3.8)	NA		76.7	(2.8)	108	(5.8)	NA		133	(3.9)
Beryllium	ND	(1.4)	NA		ND	(0.76)	NA		ND	(0.56)	ND	(1.2)	NA		0.47 J	(0.78)
Cadmium	ND	(3.6)	NA		ND	(1.9)	NA		ND	(1.4)	ND	(2.9)	NA		ND	(2)
Chromium	57.7	(7.2)	NA		22.7	(3.8)	NA		15.7	(2.8)	82	(5.8)	NA		23	(3.9)
Cobalt	5.4 J	(7.2)	NA		1.8 J	(3.8)	NA		3.3	(2.8)	4.2 J	(5.8)	NA		4.3	(3.9)
Copper	109	(14.5)	NA		37.4	(7.6)	NA		88.4	(5.6)	129	(11.7)	NA		38.2	(7.8)
Nickel	10.4 J	(29)	NA		5.2 J	(15.2)	NA		7.6 J	(11.3)	16.1 J	(23.4)	NA		8.4 J	(15.6)
Silver	116	(7.2)	NA		40.4	(3.8)	NA		26.5	(2.8)	154	(5.8)	NA		31.2	(3.9)
Tin	18.8 J	(72.4)	NA		ND	(38.1)	NA		ND	(28.2)	19.7 J	(58.5)	NA		ND	(39.1)
Vanadium	47.8	(7.2)	NA		23.6	(3.8)	NA		32.3	(2.8)	47.6	(5.8)	NA		43.6	(3.9)
Zinc	143	(14.5)	NA		58.3	(7.6)	NA		91.3	(5.6)	175	(11.7)	NA		55.6	(7.8)
SW7060 - Arsenic (mg/kg)																
Arsenic	2.2 J	(3.6)	NA		1.1 J	(1.9)	NA		1.4 J	(1.4)	1.2 J	(2.9)	NA		1.8 J	(2)
SW7421 - Lead (mg/kg)																
Lead	15.4	(3.6)	NA		7.2 J	(9.5)	NA		7.5	(1.4)	12.9 J	(29.2)	NA		9.2 J	(9.8)
SW7471 - Mercury (mg/kg)																
Mercury	ND	(0.72)	NA		ND	(0.38)	NA		0.32	(0.28)	1.2	(0.58)	NA		0.55	(0.39)
SW7740 - Selenium (mg/kg)																
Selenium	1.8 J	(3.6)	NA		0.84 J	(1.9)	NA		1 J	(1.4)	1.5 J	(2.9)	NA		1.4 J	(2)
SW8080 - Organochlorine Pesticides and PCBs (μg/kg)																
4,4'-DDD	220 V	(48)	NA		390	(63)	NA		55 V	(19)	26 V	(19)	NA		640 V	(130)
4,4'-DDE	140 V	(48)	NA		220 V	(63)	NA		36 V	(19)	44 V	(19)	NA		270 V	(130)
4,4'-DDT	ND	(48)	NA		ND	(63)	NA		ND	(19)	ND	(19)	NA		36 J	(130)
Dieldrin	ND	(48)	NA		ND	(63)	NA		ND	(19)	ND	(19)	NA		ND	(130)
Endosulfan I	ND	(25)	NA		ND	(32)	NA		ND	(9.6)	ND	(9.9)	NA		ND	(66)
alpha-BHC	ND	(25)	NA		ND	(32)	NA		0.13 J	(9.6)	ND	(9.9)	NA		1 J	(66)
delta-BHC	2.4 J	(25)	NA		ND	(32)	NA		ND	(9.6)	ND	(9.9)	NA		ND	(66)
gamma-BHC	ND	(25)	NA		ND	(32)	NA		0.44 VJ	(9.6)	1.3 J	(9.9)	NA		ND	(66)
SW9030 - Sulfides (mg/kg)																
Sulfide, Reactive	NA		7.8	(2.8)	NA		32.3	(2.9)	NA		NA		57.3	(6)	NA	

Table E-3 (Continued)

Location ID	PC-09		PC-10		PC-10		PC-11		PC-11		PC-12		PC-13	
Sample ID	94-PC-SL-09C-01		94-PC-SL-10C-01		95-PC-SL-10C-01		94-PC-SL-11C-01		95-PC-SL-11C-01		94-PC-SL-12C-01		94-PC-SL-13C-01	
E376.2 - (mg/kg)														
Sulfide, Total	NA		NA		23.9	(3)	NA		473	(30.8)	NA		NA	
MRI-SOP - Kepone (mg/kg)														
Kepone	NA		ND	(0.07)	NA		ND	(0.07)	NA		NA		0.0036 J	(0.07)
SW6010 - Metals (mg/kg)														
Barium	76.7	(2.8)	108	(5.8)	NA		133	(3.9)	NA		55.2	(2.5)	39.6	(2.9)
Beryllium	ND	(0.56)	ND	(1.2)	NA		0.47 J	(0.78)	NA		ND	(0.5)	0.47 J	(0.58)
Cadmium	ND	(1.4)	ND	(2.9)	NA		ND	(2)	NA		ND	(1.2)	ND	(1.4)
Chromium	15.7	(2.8)	82	(5.8)	NA		23	(3.9)	NA		17.5	(2.5)	3.9	(2.9)
Cobalt	3.3	(2.8)	4.2 J	(5.8)	NA		4.3	(3.9)	NA		2.2 J	(2.5)	1.7 J	(2.9)
Copper	88.4	(5.6)	129	(11.7)	NA		38.2	(7.8)	NA		39.6	(5)	3.3 J	(5.8)
Nickel	7.6 J	(11.3)	16.1 J	(23.4)	NA		8.4 J	(15.6)	NA		4.4 J	(10)	3.3 J	(11.5)
Silver	26.5	(2.8)	154	(5.8)	NA		31.2	(3.9)	NA		26.2	(2.5)	ND	(2.9)
Tin	ND	(28.2)	19.7 J	(58.5)	NA		ND	(39.1)	NA		ND	(112)	ND	(173)
Vanadium	32.3	(2.8)	47.6	(5.8)	NA		43.6	(3.9)	NA		23.6	(2.5)	14.8	(2.9)
Zinc	91.3	(5.6)	175	(11.7)	NA		55.6	(7.8)	NA		53.9	(5)	12.8	(5.8)
SW7060 - Arsenic (mg/kg)														
Arsenic	1.4 J	(1.4)	1.2 J	(2.9)	NA		1.8 J	(2)	NA		1 J	(1.2)	1.4	(0.72)
SW7421 - Lead (mg/kg)														
Lead	7.5	(1.4)	12.9 J	(29.2)	NA		9.2 J	(9.8)	NA		5.2 J	(6.2)	1.3 J	(2.9)
SW7471 - Mercury (mg/kg)														
Mercury	0.32	(0.28)	1.2	(0.58)	NA		0.55	(0.39)	NA		0.13 J	(0.25)	0.09 J	(0.14)
SW7740 - Selenium (mg/kg)														
Selenium	1 J	(1.4)	1.5 J	(2.9)	NA		1.4 J	(2)	NA		0.55 J	(1.2)	ND	(2.9)
SW8080 - Organochlorine Pesticides and PCBs (μg/kg)														
4,4'-DDD	55 V	(19)	26 V	(19)	NA		640 V	(130)	NA		23 V	(8.2)	0.36 VJ	(4.8)
4,4'-DDE	36 V	(19)	44 V	(19)	NA		270 V	(130)	NA		11 V	(8.2)	ND	(4.8)
4,4'-DDT	ND	(19)	ND	(19)	NA		36 J	(130)	NA		3.4 J	(8.2)	ND	(4.8)
Dieldrin	ND	(19)	ND	(19)	NA		ND	(130)	NA		ND	(8.2)	ND	(4.8)
Endosulfan I	ND	(9.6)	ND	(9.9)	NA		ND	(66)	NA		ND	(4.2)	ND	(2.4)
alpha-BHC	0.13 J	(9.6)	ND	(9.9)	NA		1 J	(66)	NA		0.044 J	(4.2)	ND	(2.4)
delta-BHC	ND	(9.6)	ND	(9.9)	NA		ND	(66)	NA		ND	(4.2)	ND	(2.4)
gamma-BHC	0.44 VJ	(9.6)	1.3 J	(9.9)	NA		ND	(66)	NA		ND	(4.2)	ND	(2.4)
SW9030 - Sulfides (mg/kg)														
Sulfide, Reactive	NA		NA		57.3	(6)	NA		88.8	(6.2)	NA		NA	

J - Result is detected below the reporting limit or is an estimated concentration.

Table E-3 (Continued)

T - Preferred values unless footnoted on secondary column test.
V - Secondary column result is the preferred value.
NA - Not analyzed.
ND - Not detected.
() - Detection limit.

Table E-4
Summary of Analytical Results for 1994 Sludge Samples - Pond D

Location ID	PD-01		PD-01		PD-02		PD-02		PD-03		PD-03		PD-04		PD-04	
Sample ID	94-PD-S-01D-01		95-D-SL-01D-01		94-PD-S-02D-01		95-D-SL-02D-01		94-PD-S-03D-01		95-D-SL-03D-01		94-PD-S-04D-01		95-D-SL-04D-01	
SW6010 - Metals (mg/kg)																
Barium	44.2	(2.2)	32.7	(3.2)	55.5	(2)	50.3	(4.7)	18.9	(2)	47.2	(2.5)	38.1	(3.5)	74	(5.4)
Beryllium	ND	(0.45)	0.42 J	(0.64)	0.23 J	(0.4)	0.63 J	(0.94)	ND	(0.4)	0.33 J	(0.51)	ND	(0.69)	0.71 J	(1.1)
Chromium	4.1	(2.2)	3.6	(3.2)	5.1	(2)	5.3	(4.7)	1.2 J	(2)	5.2	(2.5)	2.4 J	(3.5)	9.8	(5.4)
Cobalt	1.2 J	(2.2)	2.5 J	(3.2)	2.1	(2)	2.3 J	(4.7)	ND	(2)	2.5	(2.5)	1.1 J	(3.5)	5.3 J	(5.4)
Copper	6.3	(4.5)	15	(6.4)	9.2	(4)	18.8	(9.4)	2.8 J	(4)	11.6	(5.1)	14	(6.9)	44.4	(10.8)
Nickel	3.4 J	(9)	ND	(12.7)	4.9 J	(8.1)	ND	(18.8)	2 J	(7.9)	3.3 J	(10.2)	3 J	(13.8)	ND	(21.6)
Silver	ND	(2.2)	2.6 J	(3.2)	1.4 J	(2)	4.4 J	(4.7)	1 J	(2)	2.3 J	(2.5)	3.3 J	(3.5)	12.4	(5.4)
Thallium	ND	(2.2)	NA		ND	(2)	NA		ND	(2)	NA		ND	(3.5)	NA	
Tin	ND	(117)	ND	(31.8)	ND	(90.6)	ND	(47.1)	ND	(65.3)	ND	(25.5)	ND	(135)	12.9 J	(54.1)
Vanadium	15.7	(2.2)	12.3	(3.2)	19.5	(2)	16.5	(4.7)	4.3	(2)	15.3	(2.5)	11.3	(3.5)	27.5	(5.4)
Zinc	14	(4.5)	24.5	(6.4)	20.6	(4)	32.8	(9.4)	7.4	(4)	27.2	(5.1)	25.5	(6.9)	60.7	(10.8)
SW7060 - Arsenic (mg/kg)																
Arsenic	0.83 J	(1.1)	1.5 J	(1.6)	0.85 J	(1)	2 J	(2.4)	1.3 J	(2)	1.7	(1.3)	1.7 J	(3.5)	2.3 J	(2.7)
SW7421 - Lead (mg/kg)																
Lead	1.2 J	(4.5)	2.4 J	(3.2)	0.44 J	(4)	3.1 J	(4.7)	0.93 J	(2)	3.1 J	(6.4)	1.3 J	(3.5)	31.4	(2.7)
SW7740 - Selenium (mg/kg)																
Selenium	0.36 J	(1.1)	0.64 J	(1.6)	0.26 J	(2)	0.52 J	(2.4)	ND	(2)	ND	(1.3)	0.73 J	(3.5)	1.1 J	(2.7)
SW8080 - Organochlorine Pesticides and PCBs (μg/kg)																
4,4'-DDD	1 VJ	(7.4)	0.65 J	(10)	2.4 VJ	(6.6)	3.1 J	(16)	6.3 J	(6.5)	130	(34)	ND	(11)	54	(18)
4,4'-DDE	0.31 J	(7.4)	0.31 J	(10)	0.88 J	(6.6)	1.5 J	(16)	3.8 J	(6.5)	33 J	(34)	ND	(11)	9.8 J	(18)
4,4'-DDT	ND	(7.4)	ND	(10)	6.1 J	(6.6)	3.6 VJ	(16)	7.6	(6.5)	1 J	(34)	ND	(11)	51	(18)
Aldrin	ND	(3.8)	0.26 TJ	(5.4)	ND	(3.4)	ND	(8)	ND	(3.4)	ND	(17)	ND	(5.9)	ND	(9.2)
Chlordane	ND	(7.4)	ND	(54)	ND	(6.6)	ND	(80)	ND	(6.5)	1.4 VJ	(170)	ND	(11)	8.1 VJ	(92)
Endosulfan II	ND	(7.4)	ND	(10)	ND	(6.6)	ND	(16)	ND	(6.5)	ND	(34)	ND	(11)	2.9 J	(18)
Endosulfan Sulfate	ND	(7.4)	ND	(10)	ND	(6.6)	ND	(16)	ND	(6.5)	ND	(34)	ND	(11)	ND	(18)
alpha-BHC	ND	(3.8)	0.38 J	(5.4)	ND	(3.4)	ND	(8)	ND	(3.4)	ND	(17)	ND	(5.9)	0.38 J	(9.2)
delta-BHC	0.51 J	(3.8)	ND	(5.4)	0.63 VJ	(3.4)	ND	(8)	ND	(3.4)	ND	(17)	0.2 JV	(5.9)	ND	(9.2)

Table E-4 (Continued)

Location ID	PD-05		PD-05		PD-06		PD-06		PD-07		PD-08		PD-09		PD-10	
Sample ID	94-PD-S-05D-01		95-D-SL-05D-01		94-PD-S-06D-01		95-D-SL-06D-01		94-PD-S-07D-01		94-PD-S-08D-01		94-PD-S-09D-01		94-PD-S-10D-01	
SW6010 - Metals (mg/kg)																
Barium	53.1	(2.9)	88.9	(5.7)	61.6	(8.9)	56.9	(6.1)	31.9	(1.7)	91.7	(5.7)	67.1	(6)	47.3	(5.8)
Beryllium	ND	(0.58)	0.74 J	(1.1)	ND	(1.8)	0.81 J	(1.2)	ND	(0.33)	ND	(1.1)	ND	(1.2)	ND	(1.2)
Chromium	2.5 J	(2.9)	7.4	(5.7)	ND	(8.9)	4.9 J	(6.1)	1.8	(1.7)	6.9	(5.7)	5 J	(6)	ND	(5.8)
Cobalt	1.3 J	(2.9)	3.4 J	(5.7)	3.5 J	(8.9)	2.6 J	(6.1)	1.2 J	(1.7)	4.4 J	(5.7)	4.3 J	(6)	ND	(5.8)
Copper	10.1	(5.8)	19.2	(11.3)	35.5	(17.9)	23.6	(12.1)	4.9	(3.3)	28.4	(11.5)	33.1	(12.1)	28.1	(11.6)
Nickel	2.7 J	(11.6)	4.6 J	(22.7)	6.4 J	(35.8)	ND	(24.3)	2.2 J	(6.6)	8.1 J	(22.9)	6 J	(24.2)	ND	(23.3)
Silver	2.4 J	(2.9)	ND	(5.7)	6 J	(8.9)	6.8	(6.1)	0.99 J	(1.7)	5.1 J	(5.7)	7.5	(6)	7.3	(5.8)
Thallium	1.2 J	(2.9)	NA		ND	(8.9)	NA		ND	(1.7)	ND	(5.7)	ND	(6)	ND	(5.8)
Tin	ND	(162)	ND	(56.7)	ND	(89.4)	14 J	(60.6)	ND	(76.4)	ND	(57.3)	ND	(60.4)	ND	(58.2)
Vanadium	10.6	(2.9)	27	(5.7)	21.4	(8.9)	20.5	(6.1)	6.8	(1.7)	24.9	(5.7)	20.6	(6)	15.8	(5.8)
Zinc	17.5	(5.8)	36.4	(11.3)	49.5	(17.9)	42.2	(12.1)	10	(3.3)	53.6	(11.5)	49.7	(12.1)	40.2	(11.6)
SW7060 - Arsenic (mg/kg)																
Arsenic	2.9	(2.9)	2.5 J	(2.8)	3.7 J	(4.5)	1.8 J	(3)	1.1 J	(1.7)	2.6 J	(5.7)	ND	(3)	ND	(5.8)
SW7421 - Lead (mg/kg)																
Lead	1.2 J	(2.9)	3.3	(2.8)	3.4 J	(4.5)	3.4 J	(6.1)	1.1 J	(3.3)	6 J	(14.3)	4.1 J	(12.1)	4.3 J	(5.8)
SW7740 - Selenium (mg/kg)																
Selenium	ND	(2.9)	0.79 J	(2.8)	1.3 J	(4.5)	0.73 J	(3)	0.18 J	(0.83)	1.8 J	(5.7)	1.3 J	(3)	1.6 J	(5.8)
SW8080 - Organochlorine Pesticides and PCBs (μg/kg)																
4,4'-DDD	0.97 J	(9.5)	15 J	(19)	32 V	(30)	5.6 J	(20)	3.6 VJ	(5.5)	2.7 J	(19)	7.5 VJ	(20)	19 V	(19)
4,4'-DDE	ND	(9.5)	4 J	(19)	14 VJ	(30)	4.1 J	(20)	1.2 J	(5.5)	2.9 VJ	(19)	4.4 J	(20)	7.4 J	(19)
4,4'-DDT	2.2 J	(9.5)	1.6 VJ	(19)	97	(30)	1 J	(20)	1.8 J	(5.5)	ND	(19)	ND	(20)	26	(19)
Aldrin	ND	(4.9)	ND	(9.6)	ND	(15)	ND	(10)	ND	(2.8)	ND	(9.7)	ND	(10)	ND	(9.9)
Chlordane	ND	(9.5)	ND	(96)	ND	(30)	ND	(100)	ND	(5.5)	ND	(19)	ND	(20)	ND	(19)
Endosulfan II	ND	(9.5)	2 J	(19)	ND	(30)	ND	(20)	ND	(5.5)	ND	(19)	ND	(20)	ND	(19)
Endosulfan Sulfate	ND	(9.5)	ND	(19)	ND	(30)	ND	(20)	0.0012 J	(5.5)	ND	(19)	ND	(20)	ND	(19)
alpha-BHC	ND	(4.9)	1.6 J	(9.6)	ND	(15)	1.7 J	(10)	ND	(2.8)	ND	(9.7)	ND	(10)	ND	(9.9)
delta-BHC	ND	(4.9)	ND	(9.6)	0.7 VJ	(15)	ND	(10)	ND	(2.8)	ND	(9.7)	0.65 VJ	(10)	2.7 VJ	(9.9)

J - Result is detected below the reporting limit or is an estimated concentration.
T - Preferred values unless footnoted on secondary column test.
V - Secondary column result is the preferred value.
NA - Not analyzed.
ND - Not detected.
() - Detection limit.

Table E-5
Summary of Analytical Results for 1994 Sludge Samples - Pond E

Location ID	PE-01		PE-02		PE-03		PE-04		PE-05		PE-06		PE-07	
Sample ID	94-PE-SL-01E-01		94-PE-SL-02E-01		94-PE-SL-03E-01		94-PE-SL-04E-01		94-PE-SL-05E-01		94-PE-SL-06E-01		94-PE-SL-07E-01	
SW6010 - Metals (mg/kg)														
Barium	45	(1.6)	32.8	(1.8)	67.5	(4.9)	104	(4.4)	85.8	(2)	179	(4.9)	115	(3.3)
Beryllium	0.2 J	(0.32)	ND	(0.36)	ND	(0.98)	0.53 J	(0.89)	0.38 J	(0.41)	ND	(0.97)	ND	(0.65)
Chromium	3.7	(1.6)	2.8	(1.8)	17.6	(4.9)	26.4	(4.4)	10.6	(2)	7.1	(4.9)	19.9	(3.3)
Cobalt	1.4 J	(1.6)	0.7 J	(1.8)	4.1 J	(4.9)	5.3	(4.4)	2.9	(2)	3.2 J	(4.9)	4.2	(3.3)
Copper	5.6	(3.2)	5.8	(3.6)	34.2	(9.8)	35.5	(8.9)	19.8	(4.1)	7.1 J	(9.7)	31.3	(6.5)
Nickel	2.1 J	(6.5)	ND	(7.3)	3.2 J	(19.6)	9.2 J	(17.7)	5.2 J	(8.2)	5.1 J	(19.4)	10.5 J	(13.1)
Silver	1.2 J	(1.6)	1.2 J	(1.8)	21.3	(4.9)	29.1	(4.4)	8.1	(2)	2 J	(4.9)	22.4	(3.3)
Thallium	ND	(1.6)	ND	(1.8)	ND	(4.9)	ND	(4.4)	ND	(2)	ND	(2.4)	ND	(3.3)
Tin	ND	(74.5)	ND	(67.2)	ND	(49.1)	ND	(44.3)	ND	(20.5)	ND	(182)	ND	(32.7)
Vanadium	12.9	(1.6)	9.9	(1.8)	34.4	(4.9)	52.7	(4.4)	26.3	(2)	50.7	(4.9)	39.2	(3.3)
Zinc	12.9	(3.2)	10.2	(3.6)	59	(9.8)	64.5	(8.9)	33.5	(4.1)	23.4	(9.7)	45.7	(6.5)
SW7060 - Arsenic (mg/kg)														
Arsenic	1.3	(0.81)	0.78 J	(0.91)	2.9	(2.5)	2.9 J	(4.4)	1.9 J	(2)	6.6	(1.2)	2	(1.6)
SW7421 - Lead (mg/kg)														
Lead	0.58 J	(1.6)	0.67 J	(1.8)	4.5 J	(4.9)	6.2	(4.4)	5	(2)	ND	(12.2)	6.7 J	(8.2)
SW7471 - Mercury (mg/kg)														
Mercury	ND	(0.16)	ND	(0.18)	0.36 J	(0.49)	0.3 J	(0.44)	0.11 J	(0.2)	ND	(0.24)	ND	(0.33)
SW7740 - Selenium (mg/kg)														
Selenium	0.19 J	(1.6)	0.24 J	(0.91)	1.3 J	(2.5)	1.3 J	(2.2)	0.72 J	(1)	ND	(2.4)	1.1 J	(1.6)
SW8080 - Organochlorine Pesticides and PCBs (μg/kg)														
4,4'-DDD	4.5 J	(5.3)	11 V	(6)	15 VJ	(16)	51 V	(15)	52	(14)	92 V	(16)	85 V	(22)
4,4'-DDE	0.99 VJ	(5.3)	4.6 VJ	(6)	13 VJ	(16)	24 V	(15)	15 V	(14)	15 VJ	(16)	30 V	(22)
4,4'-DDT	ND	(5.3)	ND	(6)	4.7 J	(16)	ND	(15)	ND	(14)	ND	(16)	ND	(22)
Dieldrin	ND	(5.3)	ND	(6)	ND	(16)	ND	(15)	ND	(14)	ND	(16)	ND	(22)
alpha-BHC	ND	(2.8)	ND	(3.1)	ND	(8.3)	ND	(7.5)	ND	(7)	ND	(8.3)	ND	(11)
delta-BHC	ND	(2.8)	ND	(3.1)	2.5 J	(8.3)	ND	(7.5)	ND	(7)	ND	(8.3)	ND	(11)
gamma-BHC	ND	(2.8)	ND	(3.1)	ND	(8.3)	ND	(7.5)	ND	(7)	ND	(8.3)	ND	(11)

Table E-5 (Continued)

Location ID	PE-09		PE-10		PE-11		PW-12		PE-13		PE-14		PW-15	
Sample ID	94-PE-SL-09E-01		94-PE-SL-10E-01		94-PE-SL-11E-01		94-PE-SL-12E-01		94-PE-SL-13E-01		94-PE-SL-14E-01		94-PE-SL-15E-01	
SW6010 - Metals (mg/kg)														
Barium	143	(3.1)	51.4	(1.5)	90.4	(2.3)	81.2	(3.6)	82.1	(2.9)	77.2	(1.9)	91.8	(10.3)
Beryllium	0.43 J	(0.62)	ND	(0.3)	0.52	(0.46)	ND	(0.72)	0.36 J	(0.58)	ND	(0.37)	ND	(2.1)
Chromium	20.8	(3.1)	3.6	(1.5)	15.4	(2.3)	26.5	(3.6)	14.4	(2.9)	7.8	(1.9)	72.4	(10.3)
Cobalt	4.6	(3.1)	1 J	(1.5)	3.4	(2.3)	3.1 J	(3.6)	2.3 J	(2.9)	1.9	(1.9)	5.9 J	(10.3)
Copper	23.1	(6.2)	3.5	(3)	17.6	(4.6)	30.4	(7.2)	16.9	(5.8)	9.7	(3.7)	67.1	(20.6)
Nickel	11.7 J	(12.5)	2.4 J	(5.9)	7 J	(9.3)	7.2 J	(14.4)	3.7 J	(11.5)	3.4 J	(7.5)	9.4 J	(41.2)
Silver	18.4	(3.1)	1.6	(1.5)	15.9	(2.3)	34.7	(3.6)	21.5	(2.9)	4.5	(1.9)	87.1	(10.3)
Thallium	ND	(3.1)	ND	(1.5)	ND	(2.3)	ND	(3.6)	ND	(2.9)	1.8 J	(1.9)	ND	(10.3)
Tin	ND	(31.2)	ND	(37.1)	ND	(23.2)	ND	(36)	ND	(28.8)	ND	(31.8)	41.7 J	(103)
Vanadium	35.4	(3.1)	11.3	(1.5)	25.7	(2.3)	28.7	(3.6)	24.1	(2.9)	18.7	(1.9)	43.9	(10.3)
Zinc	47.7	(6.2)	10.7	(3)	38.7	(4.6)	55.8	(7.2)	31.7	(5.8)	19.8	(3.7)	118	(20.6)
SW7060 - Arsenic (mg/kg)														
Arsenic	1.2 J	(1.6)	0.97	(0.74)	1.3 J	(2.3)	0.83 J	(3.6)	0.66 J	(2.9)	1.2	(0.94)	2.2 J	(5.1)
SW7421 - Lead (mg/kg)														
Lead	4.7	(1.6)	1.2 J	(3)	9.5 J	(11.6)	5.6 J	(9)	4.9 J	(7.2)	3.4 J	(9.4)	9.7	(5.1)
SW7471 - Mercury (mg/kg)														
Mercury	ND	(0.31)	0.14 J	(0.15)	0.12 J	(0.23)	ND	(0.36)	ND	(0.29)	0.099 J	(0.19)	ND	(1)
SW7740 - Selenium (mg/kg)														
Selenium	0.75 J	(3.1)	0.34 J	(0.74)	0.63 J	(1.2)	0.97 J	(1.8)	0.72 J	(1.4)	0.36 J	(0.94)	3 J	(5.1)
SW8080 - Organochlorine Pesticides and PCBs (μg/kg)														
4,4'-DDD	9.3 J	(10)	27	(20)	96	(15)	120	(48)	9.3 VJ	(9.5)	33	(6.2)	54	(34)
4,4'-DDE	16 V	(10)	63 V	(20)	27 V	(15)	150 V	(48)	30 V	(9.5)	13 V	(6.2)	98 V	(34)
4,4'-DDT	ND	(10)	4.9 J	(20)	6.4 J	(15)	ND	(48)	2.6 J	(9.5)	4.7 J	(6.2)	35	(34)
Dieldrin	0.31 J	(10)	ND	(20)	ND	(15)	ND	(48)	ND	(9.5)	ND	(6.2)	ND	(34)
alpha-BHC	0.21 J	(5.3)	0.082 J	(10)	0.092 J	(7.9)	ND	(24)	0.051 VJ	(4.9)	0.42 J	(3.2)	0.55 J	(18)
delta-BHC	1.9 J	(5.3)	ND	(10)	ND	(7.9)	ND	(24)	ND	(4.9)	ND	(3.2)	ND	(18)
gamma-BHC	ND	(5.3)	ND	(10)	ND	(7.9)	0.58 J	(24)	ND	(4.9)	ND	(3.2)	ND	(18)

J - Result is detected below the reporting limit or is an estimated concentration.
T - Preferred values unless footnoted on secondary column test.
V - Secondary column result is the preferred value.
ND - Not detected.
() - Detection limit.

Table E-6
Summary of Analytical Results for 1994 Sludge Samples - Pond G

Location ID	PG-01		PG-02		PG-03		PG-04		PG-05		PG-06		PG-07	
Sample ID	94-PG-SL-01G-01		94-PG-SL-02G-01		94-PG-SL-03G-01		94-PG-SL-04G-01		94-PG-SL-05G-01		94-PG-SL-06G-01		94-PG-SL-07G-01	
MRI-SOP - Kepone (mg/kg)														
Kepone	ND	(0.07)	NA		ND	(0.07)	ND	(0.07)	NA		NA		ND	(0.07)
SW6010 - Metals (mg/kg)														
Barium	34.7	(3.3)	63.8	(3.2)	93.2	(1.9)	59.8	(1.6)	95.5	(2.7)	51.9	(3.1)	119	(1.9)
Beryllium	ND	(0.67)	ND	(0.63)	0.38	(0.38)	0.28 J	(0.32)	0.3 J	(0.54)	ND	(0.63)	0.49	(0.38)
Chromium	ND	(3.3)	1.3 J	(3.2)	8.3	(1.9)	4.1	(1.6)	9.8	(2.7)	ND	(3.1)	10.1	(1.9)
Cobalt	ND	(3.3)	1.2 J	(3.2)	3.7	(1.9)	1.9	(1.6)	4.2	(2.7)	1.1 J	(3.1)	4.3	(1.9)
Copper	1.2 J	(6.7)	2.9 J	(6.3)	11.3	(3.8)	6.3	(3.2)	21.3	(5.4)	2.1 J	(6.3)	12	(3.8)
Nickel	ND	(13.3)	ND	(12.7)	7.5 J	(7.6)	3.5 J	(6.4)	7.9 J	(10.7)	2.9 J	(12.6)	9	(7.5)
Silver	ND	(3.3)	ND	(3.2)	0.96 J	(1.9)	ND	(1.6)	3.7	(2.7)	ND	(3.1)	ND	(1.9)
Vanadium	3.5	(3.3)	5	(3.2)	17.4	(1.9)	10.7	(1.6)	22.1	(2.7)	10.2	(3.1)	21.3	(1.9)
Zinc	4.9 J	(6.7)	9.3	(6.3)	44.2	(7.6)	24.7	(6.4)	67.3	(5.4)	11.3	(6.3)	51.6	(3.8)
SW7060 - Arsenic (mg/kg)														
Arsenic	0.6 J	(0.83)	0.62 J	(0.79)	2.4	(0.95)	2.1	(0.8)	4.2 J	(6.7)	2.4 J	(3.9)	3.2	(0.94)
SW7421 - Lead (mg/kg)														
Lead	0.62 J	(1.7)	0.62 J	(1.6)	26.6	(4.7)	4.6 J	(8)	28.7	(2.7)	0.57 J	(1.6)	12.5	(4.7)
SW7471 - Mercury (mg/kg)														
Mercury	ND	(0.18)	ND	(0.16)	ND	(0.19)	ND	(0.16)	ND	(0.27)	ND	(0.16)	ND	(0.19)
SW7740 - Selenium (mg/kg)														
Selenium	ND	(1.7)	0.35 J	(0.79)	0.55 J	(0.95)	0.19 J	(0.8)	1.2 J	(2.7)	0.22 J	(0.79)	0.73 J	(1.9)
SW8080 - Organochlorine Pesticides and PCBs (μg/kg)														
4,4'-DDD	ND	(5.5)	0.61 J	(5.2)	430 V	(63)	4 VJ	(5.3)	50 V	(8.8)	ND	(5.2)	150 V	(31)
4,4'-DDE	ND	(5.5)	ND	(5.2)	77 V	(63)	1.2 J	(5.3)	44 V	(8.8)	ND	(5.2)	97 V	(31)
4,4'-DDT	ND	(5.5)	ND	(5.2)	ND	(63)	ND	(5.3)	ND	(8.8)	ND	(5.2)	ND	(31)
Chlordane	ND	(28)	ND	(27)	ND	(320)	ND	(27)	36 J	(46)	ND	(27)	10 J	(160)
Dieldrin	ND	(5.5)	ND	(5.2)	ND	(63)	ND	(5.3)	ND	(8.8)	ND	(5.2)	ND	(31)
Heptachlor epoxide	ND	(2.8)	ND	(2.7)	ND	(32)	ND	(2.7)	0.79 VJ	(4.6)	ND	(2.7)	ND	(16)
alpha-BHC	ND	(2.8)	ND	(2.7)	ND	(32)	ND	(2.7)	ND	(4.6)	ND	(2.7)	ND	(16)
delta-BHC	ND	(2.8)	ND	(2.7)	ND	(32)	ND	(2.7)	ND	(4.6)	ND	(2.7)	ND	(16)
gamma-BHC	ND	(2.8)	ND	(2.7)	ND	(32)	ND	(2.7)	0.15 J	(4.6)	ND	(2.7)	ND	(16)

Table E-6 (Continued)

Location ID	PG-08		PG-09		PG-10		PG-11		PG-12		PG-13		PG-14	
Sample ID	94-PG-SL-08G-01		94-PG-SL-09G-01		94-PG-SL-10G-01		94-PG-SL-11G-01		94-PG-SL-12G-01		94-PG-SL-13G-01		94-PG-SL-14G-01	
MRI-SOP - Kepone (mg/kg)														
Kepone	ND	(0.07)	NA		ND	(0.07)	ND	(0.07)	ND	(0.07)	ND	(0.07)	NA	
SW6010 - Metals (mg/kg)														
Barium	76.2	(4)	120	(3.8)	70.1	(1.8)	94.4	(2.7)	124	(4.3)	90.2	(1.8)	60.5	(3.6)
Beryllium	0.46 J	(0.8)	0.54 J	(0.75)	0.26 J	(0.36)	0.39 J	(0.53)	ND	(0.85)	0.25 J	(0.36)	ND	(0.73)
Chromium	14	(4)	14.1	(3.8)	4.8	(1.8)	6.1	(2.7)	12.9	(4.3)	6.9	(1.8)	6	(3.6)
Cobalt	4.4	(4)	5	(3.8)	2.3	(1.8)	2.4 J	(2.7)	4.9	(4.3)	2.6	(1.8)	2.8 J	(3.6)
Copper	28.3	(8)	25	(7.5)	7.8	(3.6)	12.6	(5.3)	29.3	(8.5)	7.9	(3.6)	16.4	(7.3)
Nickel	10.9 J	(16)	11.3 J	(15)	4.9 J	(7.2)	5.5 J	(10.7)	10.8 J	(17.1)	6.4 J	(7.2)	7.6 J	(14.5)
Silver	5.8	(4)	5.8	(3.8)	ND	(1.8)	1.7 J	(2.7)	6.6	(4.3)	ND	(1.8)	3 J	(3.6)
Vanadium	25.8	(4)	26.7	(3.8)	12.6	(1.8)	16.1	(2.7)	31.2	(4.3)	17	(1.8)	17.4	(3.6)
Zinc	68.2	(8)	68.4	(7.5)	32.3	(7.2)	24.1	(5.3)	67.8	(8.5)	35.1	(7.2)	37	(7.3)
SW7060 - Arsenic (mg/kg)														
Arsenic	5.2 J	(10)	3.1 J	(3.8)	4.6	(1.8)	1.8 J	(2.7)	2 J	(4.3)	4	(0.9)	3.4 J	(3.6)
SW7421 - Lead (mg/kg)														
Lead	28.1	(2)	26.3	(3.8)	10.5	(9.1)	6.3	(2.7)	25.6	(4.3)	7.8	(4.5)	12.5	(9.1)
SW7471 - Mercury (mg/kg)														
Mercury	ND	(0.4)	ND	(0.38)	ND	(0.18)	ND	(0.27)	ND	(0.43)	ND	(0.18)	0.32 J	(0.36)
SW7740 - Selenium (mg/kg)														
Selenium	2.1	(2)	2.2	(1.9)	0.45 J	(0.91)	1 J	(2.7)	2 J	(4.3)	0.2 J	(0.9)	ND	(3.6)
SW8080 - Organochlorine Pesticides and PCBs (μg/kg)														
4,4'-DDD	73 V	(13)	57 V	(12)	140 V	(30)	1.9 J	(8.8)	24 V	(14)	20	(6)	6 J	(12)
4,4'-DDE	57 V	(13)	97 V	(12)	34 V	(30)	1.1 J	(8.8)	27	(14)	27 V	(6)	11 VJ	(12)
4,4'-DDT	ND	(13)	ND	(12)	ND	(30)	ND	(8.8)	ND	(14)	ND	(6)	ND	(12)
Chlordane	ND	(68)	ND	(64)	ND	(150)	ND	(45)	ND	(73)	ND	(31)	34 J	(62)
Dieldrin	ND	(13)	ND	(12)	ND	(30)	ND	(8.8)	ND	(14)	ND	(6)	0.52 VJ	(12)
Heptachlor epoxide	1.6 VJ	(6.8)	ND	(6.4)	ND	(15)	ND	(4.5)	ND	(7.3)	ND	(3.1)	0.62 J	(6.2)
alpha-BHC	ND	(6.8)	ND	(6.4)	ND	(15)	ND	(4.5)	ND	(7.3)	ND	(3.1)	ND	(6.2)
delta-BHC	ND	(6.8)	ND	(6.4)	ND	(15)	ND	(4.5)	ND	(7.3)	ND	(3.1)	ND	(6.2)
gamma-BHC	ND	(6.8)	ND	(6.4)	ND	(15)	ND	(4.5)	0.17 J	(7.3)	ND	(3.1)	ND	(6.2)

Table E-6 (Continued)

Location ID	PG-15		PG-15		PG-17		PG-18		PG-19	
Sample ID	94-PG-SL-15G-01		94-PG-SL-16G-01		94-PG-SL-17G-01		94-PG-SL-18G-01		94-PG-SL-19G-01	
MRI-SOP - Kepone (mg/kg)										
Kepone	ND	(0.07)	NA		ND	(0.07)	NA		0.007 J	(0.07)
SW6010 - Metals (mg/kg)										
Barium	54.3	(8.4)	85.1	(3.4)	54.9	(4.9)	156	(4.1)	69.7	(4)
Beryllium	ND	(1.7)	ND	(0.68)	ND	(0.98)	ND	(0.83)	ND	(0.79)
Chromium	21.2	(8.4)	9.6	(3.4)	7.6	(4.9)	20.2	(4.1)	2 J	(4)
Cobalt	3.7 J	(8.4)	3.2 J	(3.4)	2 J	(4.9)	5.8	(4.1)	ND	(4)
Copper	36.8	(16.8)	15.3	(6.8)	20	(9.8)	26.5	(8.3)	4.5 J	(7.9)
Nickel	8 J	(33.6)	7.5 J	(13.5)	6.4 J	(19.5)	14.2 J	(16.5)	ND	(15.8)
Silver	5.1 J	(8.4)	1.8 J	(3.4)	2.2 J	(4.9)	4.3	(4.1)	ND	(4)
Vanadium	33	(8.4)	19.6	(3.4)	19.8	(4.9)	38.3	(4.1)	14.4	(4)
Zinc	59.4	(16.8)	36.7	(6.8)	39.7	(9.8)	65.5	(8.3)	10.5	(7.9)
SW7060 - Arsenic (mg/kg)										
Arsenic	3.6 J	(4.2)	2.6	(1.7)	2.7 J	(4.9)	3.2 J	(4.1)	1.3 J	(2)
SW7421 - Lead (mg/kg)										
Lead	29.4	(21)	20.1	(8.5)	16.6	(12.2)	14.5	(2.1)	0.55 J	(4)
SW7471 - Mercury (mg/kg)										
Mercury	ND	(0.84)	ND	(0.34)	ND	(0.49)	ND	(0.41)	ND	(0.2)
SW7740 - Selenium (mg/kg)										
Selenium	1.9 J	(4.2)	1.1 J	(1.7)	1.5 J	(2.4)	1.3 J	(2.1)	0.45 J	(0.99)
SW8080 - Organochlorine Pesticides and PCBs (μg/kg)										
4,4'-DDD	2 J	(28)	15 V	(11)	3.2 VJ	(16)	12 VJ	(14)	0.13 J	(6.5)
4,4'-DDE	ND	(28)	39	(11)	1.8 J	(16)	8.5 J	(14)	ND	(6.5)
4,4'-DDT	ND	(28)	26	(11)	ND	(16)	ND	(14)	ND	(6.5)
Chlordane	ND	(28)	ND	(11)	ND	(16)	ND	(14)	ND	(6.5)
Dieldrin	ND	(28)	ND	(11)	ND	(16)	ND	(14)	ND	(6.5)
Heptachlor epoxide	ND	(14)	0.022 J	(5.7)	ND	(8.3)	ND	(7)	ND	(3.4)
alpha-BHC	ND	(14)	0.19 J	(5.7)	ND	(8.3)	0.023 J	(7)	ND	(3.4)
delta-BHC	ND	(14)	ND	(5.7)	0.83 VJ	(8.3)	0.51 J	(7)	ND	(3.4)
gamma-BHC	ND	(14)	ND	(5.7)	ND	(8.3)	ND	(7)	ND	(3.4)

J - Result is detected below the reporting limit or is an estimated concentration.
T - Preferred values unless footnoted on secondary column test.
V - Secondary column result is the preferred value.
NA - Not analyzed. ND - Not detected. () - Detection limit.

APPENDIX F

SUMMARY STATISTICS FOR THE 1994 SURFACE WATER AND SLUDGE INVESTIGATION

APPENDIX F
SUMMARY STATISTICS FOR THE
1994 SURFACE WATER AND SLUDGE INVESTIGATION

This appendix presents the summary statistics for the 1994 surface water and sludge investigation. Tables F-1 through F-10 summarize the surface water and sludge samples collected from Ponds A through E and Pond G. Sludge samples were collected from all six of these ponds and surface water samples were collected from Ponds C, D, E, and G. The tables present the frequency of detection, the median detection value, the maximum reporting limit, the maximum detection value, and the location of the maximum detection value for each constituent analyzed. If no detected value existed for the median value, the median reporting limit was used. Median reporting limits are indicated by ( ) (e.g., (36)).

Below is a list of the analytical flags and footnotes associated with the 1994 investigation.

J - Result is detected below the reporting limit or is an estimated concentration.

T - Preferred values unless footnoted on secondary column test.

V - Secondary column result is the preferred value.

( ) - Median value represents a reporting limit or a value calculated by averaging two reporting limits.

( )* - Median value represents a value calculated by averaging a reporting limit with a detected value.

ND - Not detected.

NA - Not applicable.

Table F-1
Analytical Summary for Sludge at Pond A

Analyte	Frequency of Detections	Median	Maximum Reporting Limit	Maximum Detection	Location of Maximum Detection
E376.2 - Sulfides (mg/kg)					
Sulfide, Total	6/6	11.4	3.4	33.6	PA-05
SW8080 - PCBs (ug/kg)					
PCB-1016	0/6	ND	2000	ND	NA
PCB-1221	0/6	ND	2000	ND	NA
PCB-1232	0/6	ND	2000	ND	NA
PCB-1242	0/6	ND	2000	ND	NA
PCB-1248	0/6	ND	2000	ND	NA
PCB-1254	6/6	2200	2000	7100	PA-04
PCB-1260	0/6	ND	2000	ND	NA
SW9030 - Sulfides (mg/kg)					
Sulfide, Reactive	6/6	5.25	3.4	48.3	PA-05

ND = Not detected.
NA = Not applicable.

Table F-2
Analytical Summary for Sludge at Pond B

Analyte	Frequency of Detections	Median	Maximum Reporting Limit	Maximum Detection	Location of Maximum Detection
E376.2 - Sulfides (mg/kg)					
Sulfide, Total	3/6	3.15*	3.4	11.6	PB-06
SW8080 - PCBs (ug/kg)					
PCB-1016	0/6	ND	2200	ND	NA
PCB-1221	0/6	ND	2200	ND	NA
PCB-1232	0/6	ND	2200	ND	NA
PCB-1242	0/6	ND	2200	ND	NA
PCB-1248	0/6	ND	2200	ND	NA
PCB-1254	6/6	1850	2200	5300	PB-02
PCB-1260	0/6	ND	2200	ND	NA
SW9030 - Sulfides (mg/kg)					
Sulfide, Reactive	3/6	4.3*	6.8	77.7	PB-06

ND = Not detected.
NA = Not applicable.

Table F-3
Analytical Summary for Surface Water at Pond C

Analyte	Frequency of Detections	Median	Maximum Reporting Limit	Maximum Detection	Location of Maximum Detection
SOP - Organic Lead (mg/L)					
Organic Lead	0/3	ND	0.01	ND	NA
SW7421 - Lead (mg/L)					
Lead	0/3	ND	0.01	ND	NA

ND = Not detected.
NA = Not applicable.

Table F-4
Analytical Summary for Sludge at Pond C

Analyte	Frequency of Detections	Median	Maximum Reporting LImit	Maximum Detection	Location of Maximum Detection
E376.2 - Sulfides (mg/kg)					
Sulfide, Total	6/6	54.55	30.8	473	PC-11
MRI-SOP - Kepone (mg/kg)					
Kepone	1/8	(0.07)	0.07	0.0036 J	PC-13
SW6010 - Metals (mg/kg)					
Antimony	0/13	ND	56.9	ND	NA
Barium	13/13	98.9	9.5	159	PC-05
Beryllium	5/13	(0.56)	1.9	0.47 J	PC-11
Cadmium	2/13	(1.9)	4.7	1.8	PC-01
Chromium	13/13	39.1	9.5	84.2	PC-03
Cobalt	13/13	3.8	9.5	5.9 J	PC-05
Copper	13/13	88.4	19	164	PC-03
Nickel	13/13	10.4 J	37.9	16.6 J	PC-05
Silver	12/13	84.3	9.5	179	PC-03
Thallium	0/13	ND	9.5	ND	NA
Tin	7/13	27.9	173	27.9 J	PC-03
Vanadium	13/13	34.4	9.5	49.4	PC-05
Zinc	13/13	121	19	218	PC-03
SW7060 - Arsenic (mg/kg)					
Arsenic	13/13	1.7 J	4.7	3.3 J	PC-06
SW7421 - Lead (mg/kg)					
Lead	13/13	12.9 J	29.2	31.5	PC-01
SW7471 - Mercury (mg/kg)					
Mercury	9/13	0.49	0.95	1.2	PC-05
SW7740 - Selenium (mg/kg)					
Selenium	12/13	1.4 J	4.7	3.6 J	PC-06
SW8080 - Organochlorine Pesticides (ug/kg)					
Aldrin	0/13	ND	92	ND	NA

Table F-4
(Continued)

Analyte	Frequency of Detections	Median	Maximum Reporting LImit	Maximum Detection	Location of Maximum Detection
alpha-BHC	5/13	(8.1)	92	1 J	PC-11
beta-BHC	0/13	ND	92	ND	NA
delta-BHC	3/13	(9.6)	92	3.8 J	PC-03
gamma-BHC	4/13	(5.9)	92	1.3 J	PC-10
Chlordane	0/13	ND	180	ND	NA
4,4'-DDD	13/13	110 V	180	640 V	PC-11
4,4'-DDE	12/13	49 V	180	550 V	PC-02
4,4'-DDT	4/13	23 J	180	36 J	PC-11
Diallate	0/13	ND	1800	ND	NA
Dieldrin	3/13	(19)	180	4.3 J	PC-05
Endosulfan I	1/13	(9.9)	92	4.9 J	PC-06
Endosulfan II	0/13	ND	180	ND	NA
Endosulfan Sulfate	0/13	ND	180	ND	NA
Endrin	0/13	ND	180	ND	NA
Endrin Aldehyde	0/13	ND	180	ND	NA
Heptachlor	0/13	ND	92	ND	NA
Heptachlor epoxide	0/13	ND	92	ND	NA
Isodrin	0/13	ND	180	ND	NA
Methoxychlor	0/13	ND	920	ND	NA
Toxaphene	0/13	ND	9200	ND	NA
SW8270 - Semivolatile Organic Compounds (mg/kg)					
Heptachlor epoxide	0/3	ND	39	ND	NA
Isodrin	0/3	ND	39	ND	NA
SW9030 - Sulfides (mg/kg)					
Sulfide, Reactive	6/6	65.1	10.2	134	PC-03

J = Result is detected below the reporting limit or is an estimated concentration.
T = Preferred values unless footnoted on secondary column test.
V = Secondary column result is the preferred value.

Table F-4
(Continued)

()= Median value represents a reporting limit or a value calculated by averaging two reporting limits.
()* = Median value represents a value calculated by averaging a reporting limit with a detected value.
ND = Not detected.
NA = Not applicable.

Table F-5
Analytical Summary for Surface Water at Pond D

Analyte	Frequency of Detections	Median	Maximum Reporting Limit	Maximum Detection	Location of Maximum Detection
SOP - Orgainc Lead (mg/L)					
Organic Lead	0/3	ND	0.01	ND	NA
SW7421 - Lead (mg/L)					
Lead	0/3	ND	0.01	ND	NA

ND = Not detected.
NA = Not applicable.

Table F-6
Analytical Summary for Sludge at Pond D

Analyte	Frequency of Detections	Median	Maximum Reporting Limit	Maximum Detection	Location of Maximum Detection
SW6010 - Metals (mg/kg)					
Antimony	0/16	ND	53.7	ND	NA
Barium	16/16	51.7	8.9	91.7	PD-08
Beryllium	7/16	(0.66)*	1.8	0.81 J	PD-06
Cadmium	0/16	ND	4.5	ND	NA
Chromium	14/16	5.05	8.9	9.8	PD-04
Cobalt	14/16	2.5	8.9	5.3 J	PD-04
Copper	16/16	16.9	17.9	44.4	PD-04
Nickel	11/16	5.45 J	35.8	8.1 J	PD-08
Silver	14/16	3.85 J	8.9	12.4	PD-04
Thallium	1/10	(2.85)	8.9	1.2 J	PD-05
Tin	2/16	(59.3)	162	14 J	PD-06
Vanadium	16/16	16.15	8.9	27.5	PD-04
Zinc	16/16	30	17.9	60.7	PD-04
SW7060 - Arsenic (mg/kg)					
Arsenic	14/16	1.9 J	5.8	3.7 J	PD-06
SW7421 - Lead (mg/kg)					
Lead	16/16	3.1 J	14.3	31.4	PD-04
SW7471 - Mercury (mg/kg)					
Mercury	0/16	ND	0.89	ND	NA
SW7740 - Selenium mg/kg)					
Selenium	13/16	0.945 J	5.8	1.8 J	PD-08
SW8080 - Organochlorine Pesticides (ug/kg)					
Aldrin	1/16	(8.6)	17	0.26 TJ	PD-01
alpha-BHC	4/16	(4.35)	17	1.7 J	PD-06
beta-BHC	0/16	ND	17	ND	NA
delta-BHC	6/16	(4.15)	17	2.7 VJ	PD-10
gamma-BHC	0/16	ND	17	ND	NA

Table F-6
(Continued)

Analyte	Frequency of Detections	Median	Maximum Reporting Limit	Maximum Detection	Location of Maximum Detection
Chlordane	2/16	(15)	170	8.1 VJ	PD-04
Chlorobenzilate	0/6	ND	34	ND	NA
4,4'-DDD	15/16	5.95 J	34	130	PD-03
4,4'-DDE	14/16	4.05 J	34	33 J	PD-03
4,4'-DDT	11/16	(7.5)*	34	97	PD-06
Diallate	0/16	ND	340	ND	NA
Dieldrin	0/16	ND	34	ND	NA
Endosulfan I	0/16	ND	17	ND	NA
Endosulfan II	2/16	(10.5)	34	2.9 J	PD-04
Endosulfan Sulfate	1/16	(17)	34	0.0012 J	PD-07
Endrin	0/16	ND	34	ND	NA
Endrin Aldehyde	0/16	ND	34	ND	NA
Heptachlor	0/16	ND	17	ND	NA
Heptachlor epoxide	0/16	ND	17	ND	NA
Isodrin	0/16	ND	34	ND	NA
Kepone	0/6	ND	340	ND	NA
Methoxychlor	0/16	ND	170	ND	NA
Toxaphene	0/16	ND	1700	ND	NA
SW8270 - Semivolatile Organic Compounds (mg/kg)					
Heptachlor epoxide	0/2	ND	1.5	ND	NA
Isodrin	0/2	ND	1.5	ND	NA

J = Result is detected below the reporting limit or is an estimated concentration.
T = Preferred values unless footnoted on secondary column test.
V = Secondary column result is the preferred value.
( ) = Median value represents a reporting limit or a value calculated by averaging two reporting limits.
( )* = Median value represents a value calculated by averaging a reporting limit with a detected value.
ND = Not detected.
NA = Not applicable.

Table F-7
Analytical Summary for Surface Water at Pond E

Analyte	Frequency of Detections	Median	Maximum Reporting Limit	Maximum Detection	Location of Maximum Detection
SOP - Organic Lead (mg/L)					
Organic Lead	0/3	ND	0.01	ND	NA
SW7421 - Lead (mg/L)					
Lead	0/3	ND	0.01	ND	NA

ND = Not detected.
NA = Not applicable.

Table F-8
Analytical Summary for Sludge at Pond E

Analyte	Frequency of Detections	Median	Maximum Reporting Limit	Maximum Detection	Location of Maximum Detection
SW6010 - Metals (mg/kg)					
Antimony	0/16	ND	61.8	ND	NA
Barium	16/16	81.65	10.3	179	PE-06
Beryllium	7/16	0.475 J	2.1	0.53 J	PE-04
Cadmium	0/16	ND	5.1	ND	NA
Chromium	16/16	14.9	10.3	72.4	PE-15
Cobalt	16/16	3.15 J	10.3	5.9 J	PE-15
Copper	16/16	18.7	20.6	67.1	PE-15
Nickel	14/16	6.1 J	41.2	11.7 J	PE-09
Silver	16/16	17.15	10.3	87.1	PE-15
Thallium	1/16	(2.65)	10.3	1.8 J	PE-14
Tin	1/16	(39.4)*	182	41.7 J	PE-15
Vanadium	16/16	27.5	10.3	52.7	PE-04
Zinc	16/16	36.1	20.6	118	PE-15
SW7060 - Arsenic (mg/kg)					
Arsenic	16/16	1.4 J	5.1	6.6	PE-06
SW7421 - Lead (mg/kg)					
Lead	15/16	4.95 J	12.2	9.7	PE-15
SW7471 - Mercury (mg/kg)					
Mercury	8/16	(0.265)	1	0.59 J	PE-16
SW7740 - Selenium (mg/kg)					
Selenium	15/16	0.735 J	5.1	3 J	PE-15
SW8080 - Organochlorine Pesticides (ug/kg)					
Aldrin	0/16	ND	24	ND	NA
alpha-BHC	7/16	(2.95)	24	0.55 J	PE-15
beta-BHC	0/16	ND	24	ND	NA
delta-BHC	2/16	(7.7)	24	2.5 J	PE-03
gamma-BHC	1/16	(7.7)	24	0.58 J	PE-12

Table F-8
(Continued)

Analyte	Frequency of Detections	Median	Maximum Reporting Limit	Maximum Detection	Location of Maximum Detection
Chlordane	0/16	ND	48	ND	NA
4,4'-DDD	16/16	42 V	48	130 V	PE-08
4,4'-DDE	16/16	21 VJ	48	150 V	PE-12
4,4'-DDT	7/16	(12)	48	46	PE-08
Diallate	0/16	ND	480	ND	NA
Dieldrin	1/16	(15.5)	48	0.31 J	PE-09
Endosulfan I	0/16	ND	24	ND	NA
Endosulfan II	0/16	ND	48	ND	NA
Endosulfan Sulfate	0/16	ND	48	ND	NA
Endrin	0/16	ND	48	ND	NA
Endrin Aldehyde	0/16	ND	48	ND	NA
Heptachlor	0/16	ND	24	ND	NA
Heptachlor epoxide	0/16	ND	24	ND	NA
Isodrin	0/16	ND	48	ND	NA
Methoxychlor	0/16	ND	240	ND	NA
Toxaphene	0/16	ND	2400	ND	NA
SW8270 - Semivolatile Organic Compounds (mg/kg)					
Heptachlor epoxide	0/8	ND	3.4	ND	NA
Isodrin	0/8	ND	3.4	ND	NA

J = Result is detected below the reporting limit or is an estimated concentration.
T = Preferred values unless footnoted on secondary column test.
V = Secondary column result is the preferred value.
( ) = Median value represents a reporting limit or a value calculated by averaging two reporting limits.
( )* = Median value represents a value calculated by averaging a reporting limit with a detected value.
ND = Not detected.
NA = Not applicable.

Table F-9
Analytical Summary for Surface Water at Pond G

Analyte	Frequency of Detections	Median	Maximum Reporting Limit	Maximum Detection	Location of Maximum Detection
SOP - Organic Lead (mg/L)					
Organic Lead	0/9	ND	0.01	ND	NA
SW7421 - Lead (mg/L)					
Lead	0/9	ND	0.02	ND	NA

ND = Not detected.
NA = Not applicable.

Table F-10
Analytical Summary for Sludge at Pond G

Analyte	Frequency of Detections	Median	Maximum Reporting Limit	Maximum Detection	Location of Maximum Detection
MRI-SOP - Kepone (mg/kg)					
Kepone	1/12	(0.07)	0.07	0.007 J	PG-19
SW6010 - Metals (mg/kg)					
Antimony	0/19	ND	50.4	ND	NA
Barium	19/19	76.2	8.4	156	PG-18
Beryllium	9/19	(0.63)	1.7	0.54 J	PG-09
Cadmium	0/19	ND	4.2	ND	NA
Chromium	17/19	7.6	8.4	21.2	PG-15
Cobalt	17/19	(3.3)	8.4	5.8	PG-18
Copper	19/19	12.6	16.8	36.8	PG-15
Nickel	16/19	7.9 J	33.6	14.2 J	PG-18
Silver	11/19	(3.1)	8.4	6.6	PG-12
Thallium	0/19	ND	8.4	ND	NA
Tin	0/19	ND	181	ND	NA
Vanadium	19/19	17.4	8.4	38.3	PG-18
Zinc	19/19	37	16.8	68.4	PG-09
SW7060 - Arsenic (mg/kg)					
Arsenic	19/19	2.7 J	10	5.2 J	PG-08
SW7421 - Lead (mg/kg)					
Lead	19/19	12.5	21	29.4	PG-15
SW7471 - Mercury (mg/kg)					
Mercury	1/19	(0.27)	0.84	0.32 J	PG-14
SW7740 - Selenium (mg/kg)					
Selenium	17/19	1.1 J	4.3	2.2	PG-09
SW8080 - Organochlorine Pesticides (ug/kg)					
Aldrin	0/19	ND	32	ND	NA
alpha-BHC	2/19	(4.6)	32	0.19 J	PG-16
beta-BHC	0/19	ND	32	ND	NA

Table F-10
(Continued)

Analyte	Frequency of Detections	Median	Maximum Reporting Limit	Maximum Detection	Location of Maximum Detection
delta-BHC	2/19	(4.6)	32	0.83 VJ	PG-17
gamma-BHC	2/19	(5.7)	32	0.17 J	PG-12
Chlordane	3/19	(28)	320	36 J	PG-05
4,4'-DDD	17/19	12 VJ	63	430 V	PG-03
4,4'-DDE	14/19	27	63	97 V	PG-07
4,4'-DDT	1/19	(12)	63	26	PG-16
Diallate	0/19	ND	630	ND	NA
Dieldrin	1/19	(11)	63	0.52 VJ	PG-14
Endosulfan I	0/19	ND	32	ND	NA
Endosulfan II	0/19	ND	63	ND	NA
Endosulfan Sulfate	0/19	ND	63	ND	NA
Endrin	0/19	ND	63	ND	NA
Endrin Aldehyde	0/19	ND	63	ND	NA
Heptachlor	0/19	ND	32	ND	NA
Heptachlor epoxide	4/19	(3.4)	32	1.6 VJ	GP-08
Isodrin	0/19	ND	63	ND	NA
Methoxychlor	0/19	ND	320	ND	NA
Toxaphene	0/19	ND	3200	ND	NA

J = Result is detected below the reporting limit or is an estimated concentration.
T = Preferred values unless footnoted on secondary column test.
V = Secondary column result is the preferred value.
( ) = Median value represents a reporting limit or a value calculated by averaging two reporting limits.
( )* = Median value represents a value calculated by averaging a reporting limit with a detected value.
ND = Not detected.
NA = Not applicable.