



DEPARTMENT OF THE NAVY
CRANE DIVISION
NAVAL SURFACE WARFARE CENTER
300 HIGHWAY 361
CRANE, INDIANA 47522-5000

N00164.AR.000980
NSWC CRANE
5090.3a

IN REPLY REFER TO:
5090/S4.7.1
Ser RP3/5289

6 SEP 2005

U.S. Environmental Protection Agency, Region V
Waste, Pesticides, & Toxics Division
Waste Management Branch
Corrective Action Section
77 West Jackson Blvd.
Chicago, IL 60604

Dear Mr. Ramanaukas:

Crane Division, Naval Surface Warfare Center submits the work plan addendum for the third phase of investigation at Solid Waste Management Unit (SWMU) 9 South (former Building 55 area). The work plan addendum is submitted as enclosure (1). The permit required Certification Statement is provided as enclosure (2).

If you require any further information, my point of contact is Mr. Thomas J. Brent, Code RP3-TB, at 812-854-6160, email thomas.brent@navy.mil.

Sincerely,

Christine D. Freeman

JAMES M. HUNSICKER
Manager, Environmental Protection
By direction of the Commanding Officer

- Enclosures: 1. SWMU 9 South Work Plan Addendum for Phase 3 Investigation
2. Certification Statement

Copy to:
ADMINISTRATIVE RECORD
SOUTHNAVFACENGCOM (Code ES31) (w/o encl)
IDEM (Doug Griffin)
TTNUS. (Roger Clark) (w/o encl)

Comprehensive Long-term Environmental Action Navy

CONTRACT NUMBER N62467-94-D-0888



Rev. 0
08/05

**WORK PLAN ADDENDUM FOR
PHASE 3 ACTIVITIES
FOR
SWMU 9 SOUTH (PESTICIDE CONTROL AREA)
NAVAL SURFACE WARFARE CENTER CRANE,
INDIANA**

**Comprehensive Long-Term
Environmental Action Navy (CLEAN) Contract**

Naval Air Station Crane, Indiana

Contract Task Order 0376

August 2005



**WORK PLAN ADDENDUM FOR PHASE 3 ACTIVITIES
FOR
SWMU 9 SOUTH (PESTICIDE CONTROL AREA)
NAVAL SURFACE WARFARE CENTER CRANE, INDIANA

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT**

**Submitted to:
Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, South Carolina 29406**

**Submitted by:
Tetra Tech NUS, Inc.
661 Andersen Drive
Foster Plaza 7
Pittsburgh, Pennsylvania 15220**

**CONTRACT NUMBER N62467-94-D-0888
CONTRACT TASK ORDER 0376**

AUGUST 2005

PREPARED UNDER THE SUPERVISION OF:

APPROVED FOR SUBMITTAL BY:

**ROGER A. CLARK, Ph.D.
TASK ORDER MANAGER
TETRA TECH NUS, INC.
PITTSBURGH, PENNSYLVANIA**

**DEBRA M. HUMBERT
PROGRAM MANAGER
TETRA TECH NUS, INC.
PITTSBURGH, PENNSYLVANIA**

WORK PLAN ADDENDUM FOR PHASE 3 ACTIVITIES AT SWMU 9 SOUTH (PESTICIDE CONTROL AREA)

1.0 INTRODUCTION

This document has been prepared as an attachment (Phase 3) to the Work Plan for Risk Assessment at SWMUs 4, 5, 9, and 10 Naval Surface Warfare Center Crane, Indiana, Tetra Tech NUS, August 2000 and two addendums to the Work Plan (TtNUS, February 2005 and May 2005). The location of the current investigation is immediately to the south of the former boundary of SWMU 9 and will be referred to herein and in future documents as SWMU 9 South. The boundary of the SWMU will hereafter be modified to include this additional area. The former SWMU 9 boundary is shown as a red line in the northernmost portion of the investigation area shown in Figure 1 through 3.

2.0 SITE BACKGROUND AND HISTORY

Various environmental investigations have been conducted at SWMU 9 South. Due to the significant concentrations of contaminants, the discovery of unsuspected contaminants during field sampling, and observations from recently acquired facility drawings, the investigation has evolved into multiple field efforts. For ease of discussion; these are referred to herein as Phase 1, 2, and 3.

The objective of the proposed investigation is to fill data gaps from previous investigations and finalize the RFI. Fieldwork for Phase 1 was conducted in March 2005 and consisted of collecting samples from surface and subsurface soil, groundwater and surface water and sediment within the area of assumed historical pesticide operations. Results indicated that pesticides existed beyond the area sampled and an additional area adjacent to the assumed pesticide operations (to the south) showed evidence of PCBs in groundwater.

Phase 2 (May 2005) was implemented and included further delineation of the nature and extent of contamination found in Phase 1. The laboratory results from Phase 1 and 2 can be found on Figures 1 through 10. The overall results of the two phases can be summarized as follows:

- significant pesticide and petroleum contamination was present and confined primarily to an area along a hillside adjacent to a former wash rack,
- petroleum products were detected in sediment within a nearby (downgradient) tributary,

- and very high levels of PCBs were found in surface and subsurface soils in an area immediately to the south of the assumed pesticide operations.

Following these observations and in discussions with the base historian, two additional findings were made:

- (1) Fire training exercises were conducted years ago using burning pans (and possibly transformer oil) in the area where the Phase 2 investigation indicated elevated levels of PCBs in surface and subsurface soils. Other than the presence of an aluminum pan and lid at that location, there is no visual evidence of where the training was actually conducted. The duration of the fire training and the types and volumes of fuel used, is unknown.
- (2) An oil spill occurred on March 6, 2003 at a location immediately to the north of where the current SWMU 9 South investigation is being conducted. The reported 100-gallon spill was related to one of the two above ground tanks located at the northeast side of Building 150 (commonly referred to as the steam plant or boiler house) and flowed from the tank into a nearby drainage ditch which empties into a small tributary on the west side of Building 150 (refer to Figure 11). The spill was reported to IDEM and correspondence and response actions were documented in the NSWC Crane Spill Log. A photograph of the spill (refer to Figure 12) taken in March 2003 shows oil within the drainage ditch located on the northwestern side of Building 150.

A site visit was conducted with the Navy, USEPA and Tetra Tech NUS on August 3, 2005 in preparation for the Phase 3 investigation at SWMU 9 South. The objective of the visit was to familiarize the group with the operational history and physical characteristics of the site and to confirm the sample locations for the upcoming field work. During the visit, three pipes were observed sticking up a few inches above the ground within the pad of former Building 55. One of the pipes contained stained soil with a volatile odor. It was later determined, following a review of drawings prepared on February 5, 1946, that the pipes were part of restroom plumbing within the former building (refer to Figure 13). An additional drawing identified as Utility Plot Plan 1946 (refer to Figure 14) indicated the presence of a gas station and two tanks located approximately 70 feet southeast of the former building. It is unknown if these tanks were above ground or buried tanks that may have been removed. It is also not known what type of fuel they contained or the volumes of the tanks. An existing concrete pad (refer to Figure 15) that may have supported the fuel dispensers was observed during a site visit on August 17, 2005. The pad contained two rectangular-shaped openings where underground piping from the tanks probably entered the dispensers. There was no evidence of the former two tanks or piping that connected them nor was any staining of soil observed within the area.

3.0 PROPOSED ACTIVITIES

Figures 1 through 10 illustrate the selected analytical results from samples collected during Phase 1 and 2. As an outcome of the site visit on August 3, 2005 and a review of analytical data collected to date, it was agreed that additional sampling of surface and subsurface soil, surface water and sediment, and groundwater is required. Phase 3 is designed to delineate the nature and extent of contamination at the site within one field effort.

The planned Phase 3 investigation will therefore focus on six areas:

- (1) Hillside adjacent to the wash rack
- (2) Fuel spill of March 6, 2003
- (3) Tributary downgradient of the site
- (4) Firetraining area
- (5) Restroom piping
- (6) Former gas station

3.1 Hillside Adjacent to the Wash Rack

Figures 1 through 3 show the concentrations of pesticides in surface and subsurface soils. As indicated, most of the contamination is located along a northeast- to southwest-trending hillside located immediately west of the former Building 55. Additionally, two samples collected during Phase 2 were visually stained and had a strong petroleum odor and were therefore analyzed for petroleum products. SB18 was collected at a depth of 2 to 4 feet bgs and contained diesel range organics of 4,000 mg/kg and oil range organics of 10,000 mg/kg. SB25 was collected from a depth of 7 to 9 feet bgs and contained diesel range organics of 110 mg/kg and oil range organics of 270. Groundwater samples collected within this same general area indicated positive detections of pesticides and petroleum products as well (refer to Figure 4). In order to delineate the nature and extent of soil contamination along the hillside adjacent to the wash rack, seven additional soil borings (SB42 through SB45 and SB47 through SB49) will be installed. Soil boring SB46 will be located downgradient of the hillside. Soil contamination is bounded to the east of former Building 55 and therefore no additional soil samples will be collected in that direction. Three permanent groundwater monitoring wells (T8, T11 and T12) will be located downgradient of the hillside and close to a tributary as shown on Figure 11. T10 will be located within the area where pesticides and petroleum products were detected in groundwater during Phase 2. T09 will serve as the upgradient monitoring well.

3.2 Fuel Spill of March 6, 2003

Currently no known sampling and analysis has been conducted as related to the fuel spill of March 6, 2003 at Building 150 tanks. No visual evidence of the spill was observed during the site visit on August 3, 2005. SB36 will be located adjacent to the above ground storage tanks along the northeastern part of the building where the spill reportedly occurred. SB37 and SB38 will be located within the drainage ditch and SB39 will be located along the bank of the parking lot also within the area of the spill. A smaller, above ground storage tank (approximately 250 gallons) is located along the southern wall of Building 150. The soil close to the concrete pad for the tank is stained with petroleum and therefore two soil borings, SB40 and SB41 will be located at this area. Two permanent groundwater monitoring well clusters will be installed within this area; T06 will serve as the upgradient cluster and T07 will be located downgradient of the spill.

3.3 Tributary Downgradient of the Site

A small tributary is located on the western downgradient portion of the SWMU 9 South. Surface water flow within this tributary originates toward the north within area of Mine Fill A and flows in a southwesterly direction along the western side of SWMU 9 South as seen in Figure 11. Pesticides and petroleum products were observed during Phase 1 and 2 within this tributary as shown on Figures 4 and 5. Surface water and sediment samples SW/SD09 to SW/SD14 will be collected within this tributary to delineate the nature and extent of contamination.

3.4 Fire Training Area

During Phase 1, PCBs were detected from a perched water sample collected at a temporary well point within the area of former fire train operations. This area is located approximately 250' southwest of the former Building 55. Groundwater sampling during the Phase 2 from three temporary well points did not confirm the presence of PCBs in the water samples. It should be noted that the sample collected during Phase 1 was unfiltered compared to the filtered samples collected during Phase 2. Five surface soil samples were analyzed for PCBs during Phase 2 and all showed detectable concentrations of PCBs ranging from 42 to 260,000 µg/kg. Because of the high concentrations of PCBs, the area surrounding these sample points was identified with rebar and caution tape. Also, eight additional soil samples (SB50 to SB57) will be collected within this area to determine the nature and extent of PCB contamination. The locations of these borings is shown on Figure 11.

3.5 Restroom Piping

Following a review of the attached Figure 13 which is a February 5, 1946 drawing, it was determined that the three pipes sticking above the ground within the footprint of the former Building 55, are the remains of

plumbing within a former restroom. The pipes are currently plugged with soil, some of which has a volatile odor. No soil staining is present within the area. A surface soil sample (SB64) will be collected from the largest pipe with a flanged head connection.

3.6 Former Gas Station

Figure 14 is a 1946 drawing of the majority of the area referred to herein as SWMU 9 South. The previously described boiler house, wash rack, and head within a portion of former Building 55 (labeled Garage) are identified. Additionally, a former gas station and associated tanks and possibly the piping that connected them, are shown. Soil samples will be collected from the two openings within the existing concrete pad (SB58 and SB59) that may have supported fuel dispensers during former operations (refer to Figure 15). Four additional soil borings (SB60 to SB63) will be collected around the tank. The locations of the proposed borings are shown on Figure 14 and Figure 11. One upgradient groundwater monitoring well (T09) and two downgradient wells (T14 and T15) will be installed as shown on Figure 11.

4.0 FIELD ACTIVITIES

Field activities including methods of sample collection and analysis, will be conducted as described in the approved Work Plan (TtNUS, August 2000) and the Health and Safety Plan (TtNUS, February 2005).

Unless noted differently in the following sections, the media and specific samples collected, will be as follows:

4.1 Soil Borings

Soil samples will be collected using a DPT rig or HSA split spoons, as required. Samples will be collected at four depths (0-2', 2-4', 4-6' and 2' above the top of bedrock, or at a depth based on elevated PID readings, visual staining, or field judgment). It should be noted that in the event bedrock is encountered before reaching 6 feet bgs, three soil samples will still be collected. The depths of sampling will adhere to the above-listed plan if possible or will be determined in the field based on PID readings, visual staining, or field judgment.

4.2 Monitoring Wells

Permanent monitoring wells will be installed as two-well clusters consisting of two monitoring wells at each location; one well to monitor the groundwater in the overburden and the other to monitor water in the shallow bedrock. If water is not found in the overburden, then only a bedrock well will be installed at that location. In the event perched water is encountered but if the quantity of water encountered is insufficient

to yield sufficient water based on field judgement, then a temporary well point will be installed and sampled. Bedrock in the area is typically 15' bgs therefore, the well depths will range from approximately 15' to 25' bgs. The wells will be installed using hollow-stem augering (HSA), rock drilling, and rock coring methods as appropriate.

4.3 Surface Water and Sediment

Samples will be collected from within the tributary. Both surface water and sediment will be collected from each location.

5.0 Laboratory Analyses

The primary objective of the proposed field investigation is to collect field and laboratory data needed to evaluate the potential risks for those human health and ecological receptors identified in this investigation. Based on the results of previous analytical information and the historical operations conducted at SWMU 9, the Navy and the USEPA Region 5 have agreed that pesticides, PCBs, VOCs, Oil and Grease, and TPH-DRO will be analyzed for all samples collected. Because PCBs were found at the former fire training area, a limited number of samples will be analyzed for dioxins. This will include all surface soil samples at the former fire training area. Table 1 summarizes the samples to be collected and the proposed analytical parameters. Table 2 lists the sample analyses, container types and volumes, preservation requirements and holding times.

TABLE 1

CTO 376 SWMU 9 SOUTH PESTICIDE CONTROL AREA
 WORK PLAN ADDENDUM PHASE 3
 SAMPLING PLAN
 PAGE 1 OF 5

LOCATION	MATRIX	DEPTH	SAMPLE ID	VOA	PESTICIDES/PCBs	OIL & GREASE	DRO/GRO	DIOXINS
09SB36	SOIL	0 TO 2'	09SB360002	X	X	X	X	
09SB36	SOIL	2 TO 4'	09SB360204	X	X	X	X	
09SB36	SOIL	4 TO 6'	09SB360406	X	X	X	X	
09SB36	SOIL	FIELD CALL	09SB36xxxx	X	X	X	X	
09SB37	SOIL	0 TO 2'	09SB370002	X	X	X	X	
09SB37	SOIL	2 TO 4'	09SB370204	X	X	X	X	
09SB37	SOIL	4 TO 6'	09SB370406	X	X	X	X	
09SB37	SOIL	FIELD CALL	09SB37xxxx	X	X	X	X	
09SB38	SOIL	0 TO 2'	09SB380002	X	X	X	X	
09SB38	SOIL	2 TO 4'	09SB380204	X	X	X	X	
09SB38	SOIL	4 TO 6'	09SB380406	X	X	X	X	
09SB38	SOIL	FIELD CALL	09SB38xxxx	X	X	X	X	
09SB39	SOIL	0 TO 2'	09SB390002	X	X	X	X	
09SB39	SOIL	2 TO 4'	09SB390204	X	X	X	X	
09SB39	SOIL	4 TO 6'	09SB390406	X	X	X	X	
09SB39	SOIL	FIELD CALL	09SB39xxxx	X	X	X	X	
09SB40	SOIL	0 TO 2'	09SB400002	X	X	X	X	
09SB40	SOIL	2 TO 4'	09SB400204	X	X	X	X	
09SB40	SOIL	4 TO 6'	09SB400406	X	X	X	X	
09SB40	SOIL	FIELD CALL	09SB40xxxx	X	X	X	X	
09SB41	SOIL	0 TO 2'	09SB410002	X	X	X	X	
09SB41	SOIL	2 TO 4'	09SB410204	X	X	X	X	
09SB41	SOIL	4 TO 6'	09SB410406	X	X	X	X	
09SB41	SOIL	FIELD CALL	09SB41xxxx	X	X	X	X	
09SB42	SOIL	0 TO 2'	09SB420002	X	X	X	X	
09SB42	SOIL	2 TO 4'	09SB420204	X	X	X	X	
09SB42	SOIL	4 TO 6'	09SB420406	X	X	X	X	
09SB42	SOIL	FIELD CALL	09SB42xxxx	X	X	X	X	
09SB43	SOIL	0 TO 2'	09SB430002	X	X	X	X	
09SB43	SOIL	2 TO 4'	09SB430204	X	X	X	X	
09SB43	SOIL	4 TO 6'	09SB430406	X	X	X	X	
09SB43	SOIL	FIELD CALL	09SB43xxxx	X	X	X	X	
09SB44	SOIL	0 TO 2'	09SB440002	X	X	X	X	

TABLE 1

CTO 376 SWMU 9 SOUTH PESTICIDE CONTROL AREA
 WORK PLAN ADDENDUM PHASE 3
 SAMPLING PLAN
 PAGE 2 OF 5

LOCATION	MATRIX	DEPTH	SAMPLE ID	VOA	PESTICIDES/PCBs	OIL & GREASE	DRO/GRO	DIOXINS
09SB44	SOIL	2 TO 4'	09SB440204	X	X	X	X	
09SB44	SOIL	4 TO 6'	09SB440406	X	X	X	X	
09SB44	SOIL	FIELD CALL	09SB44xxxx	X	X	X	X	
09SB45	SOIL	0 TO 2'	09SB450002	X	X	X	X	
09SB45	SOIL	2 TO 4'	09SB450204	X	X	X	X	
09SB45	SOIL	4 TO 6'	09SB450406	X	X	X	X	
09SB45	SOIL	FIELD CALL	09SB45xxxx	X	X	X	X	
09SB46	SOIL	0 TO 2'	09SB460002	X	X	X	X	
09SB46	SOIL	2 TO 4'	09SB460204	X	X	X	X	
09SB46	SOIL	4 TO 6'	09SB460406	X	X	X	X	
09SB46	SOIL	FIELD CALL	09SB46xxxx	X	X	X	X	
09SB47	SOIL	0 TO 2'	09SB470002	X	X	X	X	
09SB47	SOIL	2 TO 4'	09SB470204	X	X	X	X	
09SB47	SOIL	4 TO 6'	09SB470406	X	X	X	X	
09SB47	SOIL	FIELD CALL	09SB47xxxx	X	X	X	X	
09SB48	SOIL	0 TO 2'	09SB480002	X	X	X	X	
09SB48	SOIL	2 TO 4'	09SB480204	X	X	X	X	
09SB48	SOIL	4 TO 6'	09SB480406	X	X	X	X	
09SB48	SOIL	FIELD CALL	09SB48xxxx	X	X	X	X	
09SB49	SOIL	0 TO 2'	09SB490002	X	X	X	X	
09SB49	SOIL	2 TO 4'	09SB490204	X	X	X	X	
09SB49	SOIL	4 TO 6'	09SB490406	X	X	X	X	
09SB49	SOIL	FIELD CALL	09SB49xxxx	X	X	X	X	
09SB50	SOIL	0 TO 2'	09SB500002	X	X	X	X	X
09SB50	SOIL	2 TO 4'	09SB500204	X	X	X	X	
09SB50	SOIL	4 TO 6'	09SB500406	X	X	X	X	
09SB50	SOIL	FIELD CALL	09SB50xxxx	X	X	X	X	
09SB51	SOIL	0 TO 2'	09SB510002	X	X	X	X	X
09SB51	SOIL	2 TO 4'	09SB510204	X	X	X	X	
09SB51	SOIL	4 TO 6'	09SB510406	X	X	X	X	
09SB51	SOIL	FIELD CALL	09SB51xxxx	X	X	X	X	
09SB52	SOIL	0 TO 2'	09SB520002	X	X	X	X	X
09SB52	SOIL	2 TO 4'	09SB520204	X	X	X	X	

TABLE 1

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WORK PLAN ADDENDUM PHASE 3
SAMPLING PLAN
PAGE 3 OF 5**

LOCATION	MATRIX	DEPTH	SAMPLE ID	VOA	PESTICIDES/PCBs	OIL & GREASE	DRO/GRO	DIOXINS
09SB52	SOIL	4 TO 6'	09SB520406	X	X	X	X	
09SB52	SOIL	FIELD CALL	09SB52xxxx	X	X	X	X	
09SB53	SOIL	0 TO 2'	09SB530002	X	X	X	X	X
09SB53	SOIL	2 TO 4'	09SB530204	X	X	X	X	
09SB53	SOIL	4 TO 6'	09SB530406	X	X	X	X	
09SB53	SOIL	FIELD CALL	09SB53xxxx	X	X	X	X	
09SB54	SOIL	0 TO 2'	09SB540002	X	X	X	X	X
09SB54	SOIL	2 TO 4'	09SB540204	X	X	X	X	
09SB54	SOIL	4 TO 6'	09SB540406	X	X	X	X	
09SB54	SOIL	FIELD CALL	09SB54xxxx	X	X	X	X	
09SB55	SOIL	0 TO 2'	09SB550002	X	X	X	X	X
09SB55	SOIL	2 TO 4'	09SB550204	X	X	X	X	
09SB55	SOIL	4 TO 6'	09SB550406	X	X	X	X	
09SB55	SOIL	FIELD CALL	09SB55xxxx	X	X	X	X	
09SB56	SOIL	0 TO 2'	09SB560002	X	X	X	X	x
09SB56	SOIL	2 TO 4'	09SB560204	X	X	X	X	
09SB56	SOIL	4 TO 6'	09SB560406	X	X	X	X	
09SB56	SOIL	FIELD CALL	09SB56xxxx	X	X	X	X	
09SB57	SOIL	0 TO 2'	09SB570002	X	X	X	X	X
09SB57	SOIL	2 TO 4'	09SB570204	X	X	X	X	
09SB57	SOIL	4 TO 6'	09SB570406	X	X	X	X	
09SB57	SOIL	FIELD CALL	09SB57xxxx	X	X	X	X	
09SB58	SOIL	0 TO 2'	09SB580002	X	X	X	X	
09SB58	SOIL	2 TO 4'	09SB580204	X	X	X	X	
09SB58	SOIL	4 TO 6'	09SB580406	X	X	X	X	
09SB58	SOIL	FIELD CALL	09SB58xxxx	X	X	X	X	
09SB59	SOIL	0 TO 2'	09SB590002	X	X	X	X	
09SB59	SOIL	2 TO 4'	09SB590204	X	X	X	X	
09SB59	SOIL	4 TO 6'	09SB590406	X	X	X	X	
09SB59	SOIL	FIELD CALL	09SB59xxxx	X	X	X	X	
09SB60	SOIL	0 TO 2'	09SB600002	X	X	X	X	
09SB60	SOIL	2 TO 4'	09SB600204	X	X	X	X	
09SB60	SOIL	4 TO 6'	09SB600406	X	X	X	X	

TABLE 1

**CTO 376 SWMU 9 SOUTH PESTICIDE CONTROL AREA
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SAMPLING PLAN
PAGE 4 OF 5**

LOCATION	MATRIX	DEPTH	SAMPLE ID	VOA	PESTICIDES/PCBs	OIL & GREASE	DRO/GRO	DIOXINS
09SB60	SOIL	FIELD CALL	09SB60xxxx	X	X	X	X	
09SB61	SOIL	0 TO 2'	09SB610002	X	X	X	X	
09SB61	SOIL	2 TO 4'	09SB610204	X	X	X	X	
09SB61	SOIL	4 TO 6'	09SB610406	X	X	X	X	
09SB61	SOIL	FIELD CALL	09SB61xxxx	X	X	X	X	
09SB62	SOIL	0 TO 2'	09SB620002	X	X	X	X	
09SB62	SOIL	2 TO 4'	09SB620204	X	X	X	X	
09SB62	SOIL	4 TO 6'	09SB620406	X	X	X	X	
09SB62	SOIL	FIELD CALL	09SB62xxxx	X	X	X	X	
09SB63	SOIL	0 TO 2'	09SB630002	X	X	X	X	
09SB63	SOIL	2 TO 4'	09SB630204	X	X	X	X	
09SB63	SOIL	4 TO 6'	09SB630406	X	X	X	X	
09SB63	SOIL	FIELD CALL	09SB63xxxx	X	X	X	X	
09T06S	GW	<15'	09GWT006S	X	X	X	X	
09T06D	GW	15 to 25'	09GWT006D	X	X	X	X	
09T07S	GW	<15'	09GWT007S	X	X	X	X	
09T07D	GW	15 to 25'	09GWT007D	X	X	X	X	
09T08S	GW	<15'	09GWT008S	X	X	X	X	
09T08D	GW	15 to 25'	09GWT008D	X	X	X	X	
09T09S	GW	<15'	09GWT009S	X	X	X	X	
09T09D	GW	15 to 25'	09GWT009D	X	X	X	X	
09T10S	GW	<15'	09GWT010S	X	X	X	X	
09T10D	GW	15 to 25'	09GWT010D	X	X	X	X	
09T11S	GW	<15'	09GWT011S	X	X	X	X	
09T11D	GW	15 to 25'	09GWT011D	X	X	X	X	
09T12S	GW	<15'	09GWT012S	X	X	X	X	
09T12D	GW	15 to 25'	09GWT012D	X	X	X	X	
09T13S	GW	<15'	09GWT013S	X	X	X	X	
09T13D	GW	15 to 25'	09GWT013D	X	X	X	X	
09T14S	GW	<15'	09GWT014S	X	X	X	X	
09T14D	GW	15 to 25'	09GWT014D	X	X	X	X	
09T15S	GW	<15'	09GWT015S	X	X	X	X	

TABLE 1

CTO 376 SWMU 9 SOUTH PESTICIDE CONTROL AREA
 WORK PLAN ADDENDUM PHASE 3
 SAMPLING PLAN
 PAGE 5 OF 5

LOCATION	MATRIX	DEPTH	SAMPLE ID	VOA	PESTICIDES/PCBs	OIL & GREASE	DRO/GRO	DIOXINS
09T15D	GW	15 to 25'	09GWT015D	X	X	X	X	
09SW09	SW	GRAB	09SW0901	X	X	X	X	
09SW10	SW	GRAB	09SW1001	X	X	X	X	
09SW11	SW	GRAB	09SW1101	X	X	X	X	
09SW12	SW	GRAB	09SW1201	X	X	X	X	
09SW13	SW	GRAB	09SW1301	X	X	X	X	
09SW14	SW	GRAB	09SW1401	X	X	X	X	
09SD09	SD	0 TO 6"	09SD09006	X	X	X	X	
09SD10	SD	0 TO 6"	09SD10006	X	X	X	X	
09SD11	SD	0 TO 6"	09SD11006	X	X	X	X	
09SD12	SD	0 TO 6"	09SD12006	X	X	X	X	
09SD13	SD	0 TO 6"	09SD13006	X	X	X	X	
09SD14	SD	0 TO 6"	09SD14006	X	X	X	X	

TABLE 2

SUMMARY OF SAMPLE ANALYSES, CONTAINER TYPES AND VOLUMES,
PRESERVATION REQUIREMENTS, AND HOLDING TIMES
SWMU 9 PESTICIDE CONTROL AREA WORK PLAN ADDENDUM PHASE 3
NSWC CRANE, CRANE, INDIANA
PAGE 1 OF 2

Parameter	Analyte/Methodology	Sample Container	Container Volume	Preservation	Maximum Holding Time ⁽¹⁾
Volatile Organic Compounds ⁽²⁾	SW-846 8260B	3 Encore™ samplers	Four 5-gram	Cool to 4 °C	48 hours to preservation ⁽³⁾ ; 14 days to analysis.
Pesticides	SW-846 8081	Wide-mouth jar, Teflon-lined plastic cap	8 ounce	Cool to 4 °C	Extraction within 14 days; analysis within 40 days of extraction.
PCBs	SW-846 8082	Wide-mouth jar, Teflon-lined plastic cap	8 ounce	Cool to 4 °C	Extraction within 14 days; analysis within 40 days of extraction.
Oil & Grease	SW-846 9071B	Wide-mouth jar, Teflon-lined plastic cap	8 ounce	Cool to 4 °C	28 days to analysis.
TPH - DRO	SW-846 8015B	Wide-mouth jar, Teflon-lined plastic cap	8 ounce	Cool to 4 °C	Extraction within 14 days; analysis within 40 days of extraction.
Dioxin	SW-846 8280A	Wide-mouth jar, Teflon-lined plastic cap	8 ounce	Cool to 4 °C	Extraction within 30 days; analysis within 45 days of extraction.

1 All holding times are from date of collection.

2 Sediment samples collected from areas with no standing water will be collected and containerized in this manner. Sediment samples collected from areas under standing water will be containerized using a 4-ounce clear wide mouth glass jar and cooled to 4°C.

3 One Encore™ extruded into 5 mL H₂O and frozen. Second Encore™ frozen as received. Third Encore™ preserved with methanol for medium level analysis.

4 One Encore™ extruded into 5 mL H₂O and frozen. Second Encore™ frozen as received.

°C — Degrees Centigrade.

mL — Milliliters.

PCBs — Polychlorinated biphenyls.

™ — Trade mark.

TABLE 2

**SUMMARY OF SAMPLE ANALYSES, CONTAINER TYPES AND VOLUMES,
PRESERVATION REQUIREMENTS, AND HOLDING TIMES
SWMU 9 PESTICIDE CONTROL AREA WORK PLAN ADDENDUM PHASE 3
NSWC CRANE, CRANE, INDIANA
PAGE 2 OF 2**

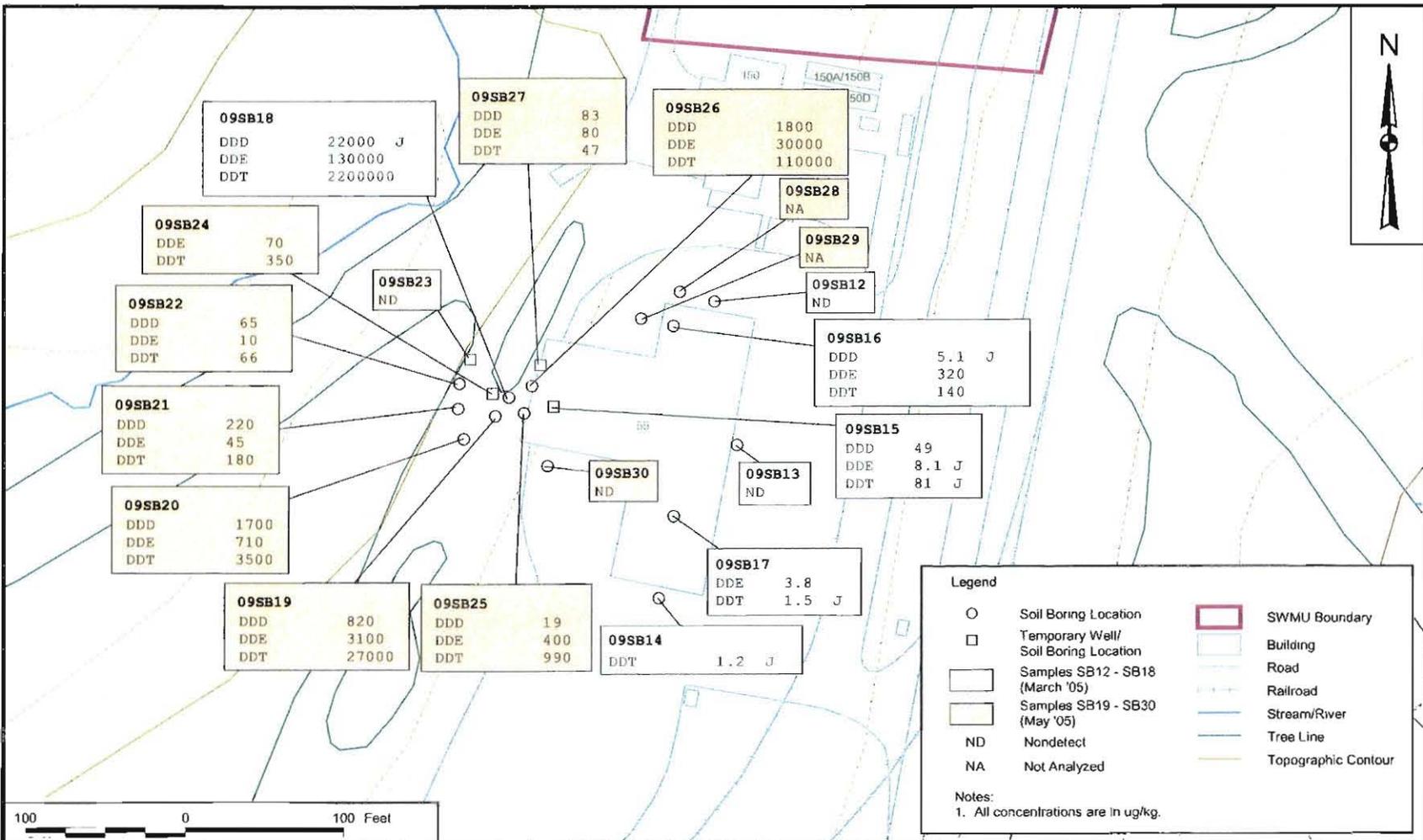
Parameter	Analyte/Methodology	Sample Container	Container Volume ⁽¹⁾	Preservation ⁽²⁾	Maximum Holding Time ⁽³⁾
Volatile Organic Compounds	SW-846 8260B	Glass, black phenolic plastic screw cap, Teflon-lined septum	(3) 40 mL	Cool to 4 °C, dark, zero headspace, HCl to pH <2	14 days to analysis.
Pesticides	SW-846 8081	Amber glass, Teflon-lined cap	(2) 1000 mL	Cool to 4 °C, dark	Extraction within 7 days; analysis within 40 days of extraction.
PCBs	SW-846 8082	Amber glass, Teflon-lined cap	(2) 1000 mL	Cool to 4 °C, dark	Extraction within 7 days; analysis within 40 days of extraction.
Oil & Grease	SW-846 9070 or EPA 1664	Amber glass, Teflon-lined cap	(2) 1000 mL	Cool to 4 °C, dark, HCl to pH <2	28 days to analysis.
TPH - DRO	SW-846 8015B	Amber glass, Teflon-lined cap	(2) 1000 mL	Cool to 4 °C, dark	Extraction within 7 days; analysis within 40 days of extraction.

Note: Aqueous samples include ground water and surface water.

- 1 The number in parenthesis indicates the sample container quantity.
- 2 HCl = Hydrochloric acid
- 3 All holding times are from date of collection.

°C — Degrees centigrade.

mL — Milliliters.



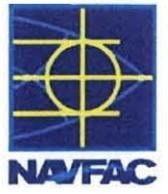
Legend

- Soil Boring Location
- Temporary Well/ Soil Boring Location
- ▭ Samples SB12 - SB18 (March '05)
- ▭ Samples SB19 - SB30 (May '05)
- ND Nondetect
- NA Not Analyzed
- ▭ SWMU Boundary
- ▭ Building
- ▭ Road
- ▭ Railroad
- ▭ Stream/River
- ▭ Tree Line
- ▭ Topographic Contour

Notes:
1. All concentrations are in ug/kg.

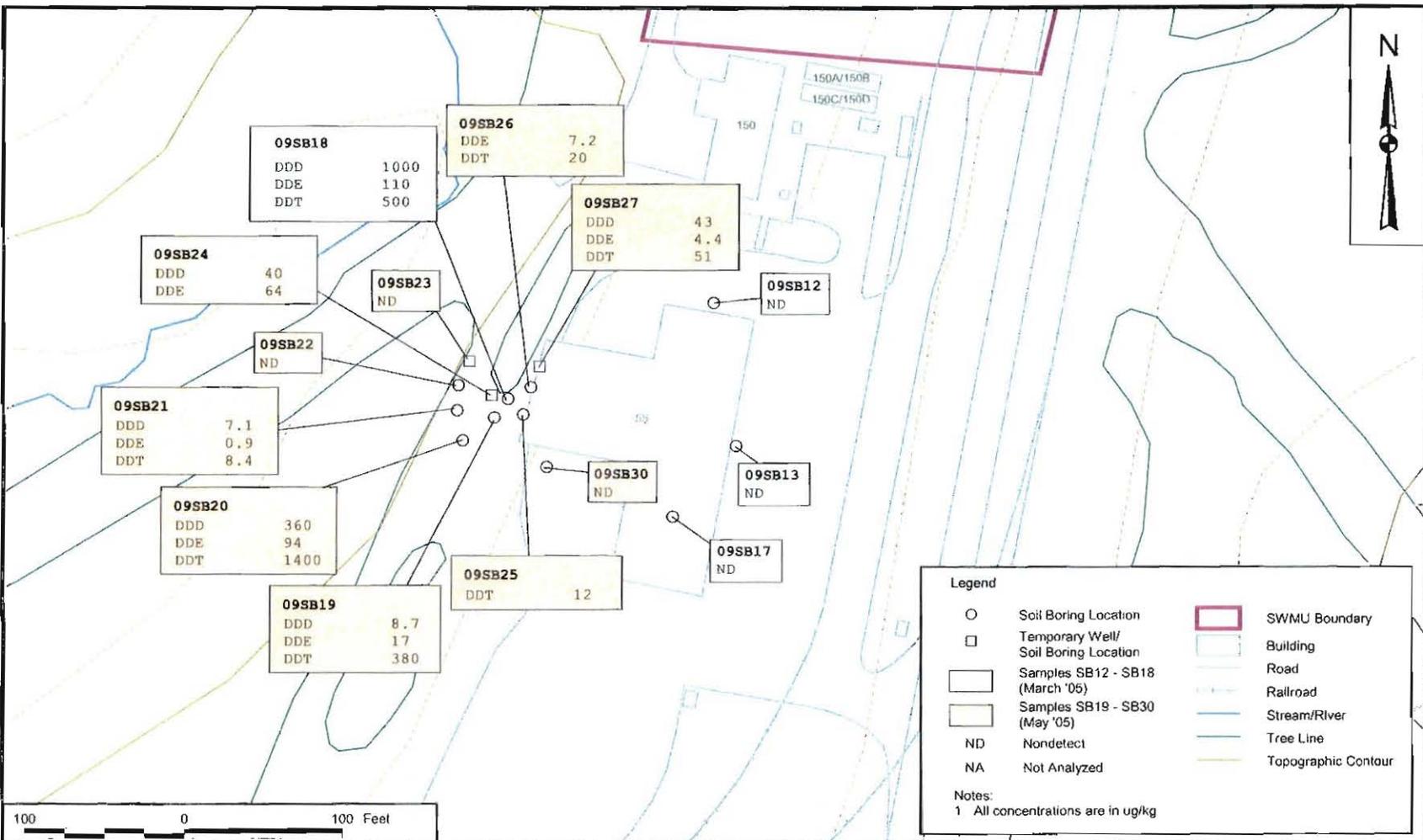


DRAWN BY C. SPEHAR	DATE 8/17/05
CHECKED BY R. CLARK	DATE 8/17/05
COST/SCHEDULE-AREA	
SCALE AS NOTED	



SOIL 0-2" PESTICIDES (ug/kg)
SWMU 9 SOUTH PESTICIDE CONTROL AREA
BUILDING 55
CRANE NSWC
CRANE, INDIANA

CONTRACT NUMBER 0042	
APPROVED BY R. CLARK	DATE 8/17/05
APPROVED BY	DATE
DRAWING NO FIGURE 1	REV 0



Legend

- Soil Boring Location
- Temporary Well/ Soil Boring Location
- ▭ Samples SB12 - SB18 (March '05)
- ▭ Samples SB19 - SB30 (May '05)
- ND Nondetect
- NA Not Analyzed
- ▭ SWMU Boundary
- ▭ Building
- ▭ Road
- ▭ Railroad
- ▭ Stream/River
- ▭ Tree Line
- ▭ Topographic Contour

Notes:
1 All concentrations are in ug/kg

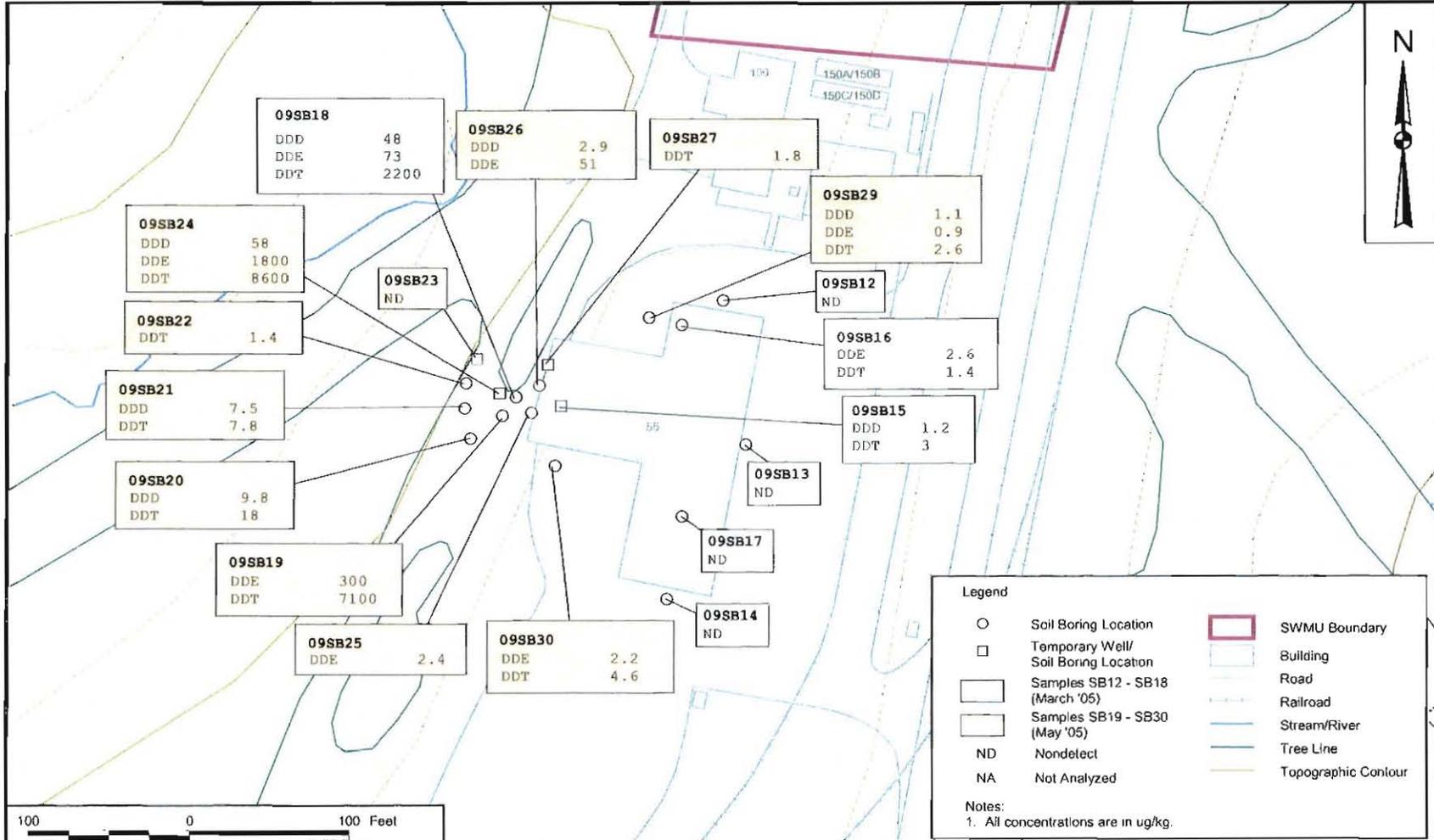


DRAWN BY	DATE
C. SPEHAR	8/17/05
CHECKED BY	DATE
R. CLARK	8/17/05
COST/SCHEDULE-AREA	
SCALE AS NOTED	

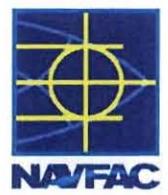


SOIL 2-4' PESTICIDES (ug/kg)
SWMU 9 SOUTH PESTICIDE CONTROL AREA
BUILDING 55
CRANE NSWC
CRANE, INDIANA

CONTRACT NUMBER 0042	
APPROVED BY R. CLARK	DATE 8/17/05
APPROVED BY	DATE
DRAWING NO. FIGURE 2	REV 0

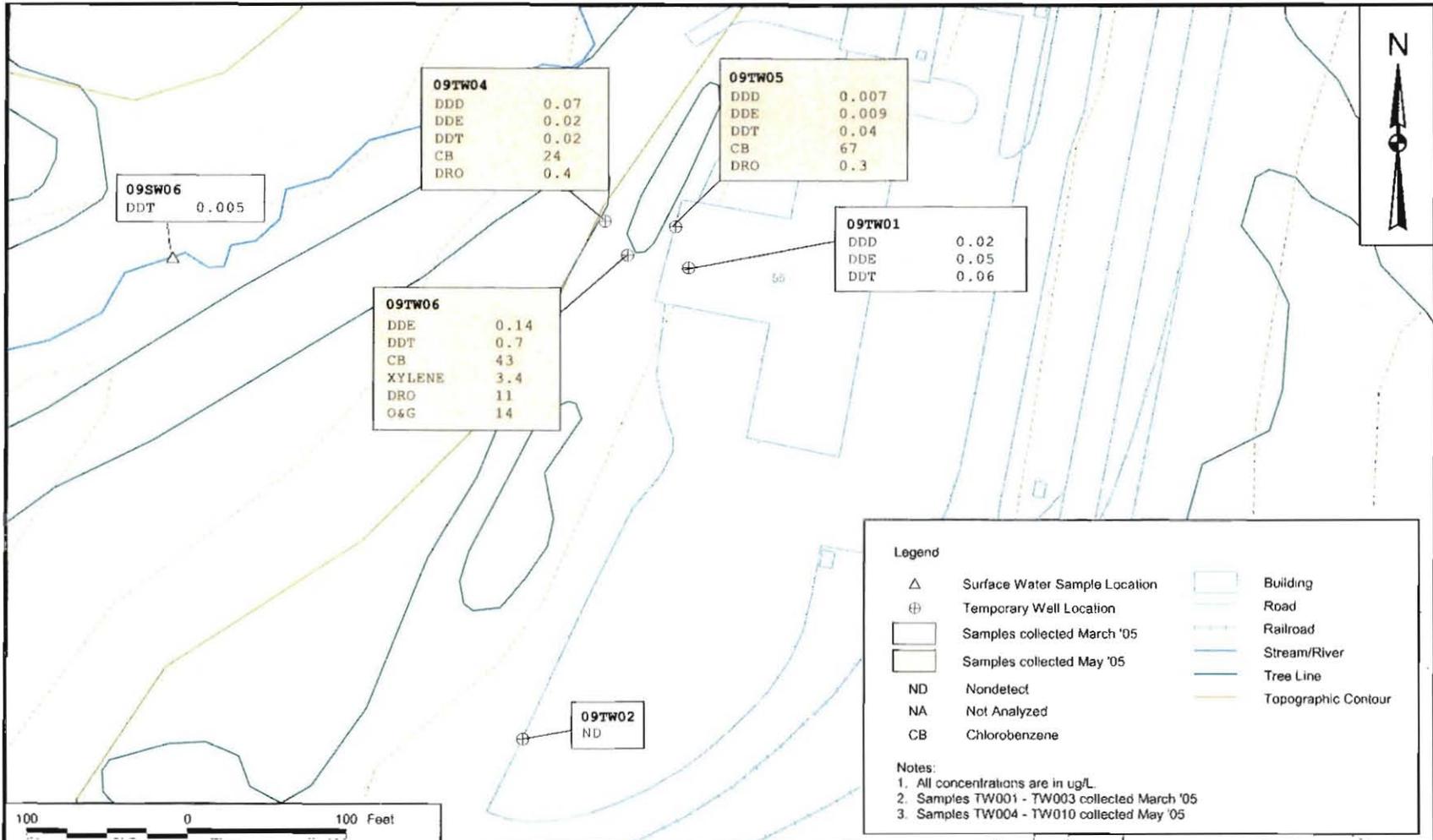


DRAWN BY C. SPEHAR	DATE 8/17/05
CHECKED BY R. CLARK	DATE 8/17/05
COST/SCHEDULE-AREA	
SCALE AS NOTED	



SOIL >4' PESTICIDES (ug/kg)
SWMU 9 SOUTH PESTICIDE CONTROL AREA
BUILDING 55
CRANE NSWC
CRANE, INDIANA

CONTRACT NUMBER 0042	
APPROVED BY R. CLARK	DATE 8/17/05
APPROVED BY	DATE
DRAWING NO FIGURE 3	REV 0



Legend

△	Surface Water Sample Location	□	Building
⊕	Temporary Well Location	—	Road
□	Samples collected March '05	—	Railroad
□	Samples collected May '05	—	Stream/River
ND	Nondetect	—	Tree Line
NA	Not Analyzed	—	Topographic Contour
CB	Chlorobenzene		

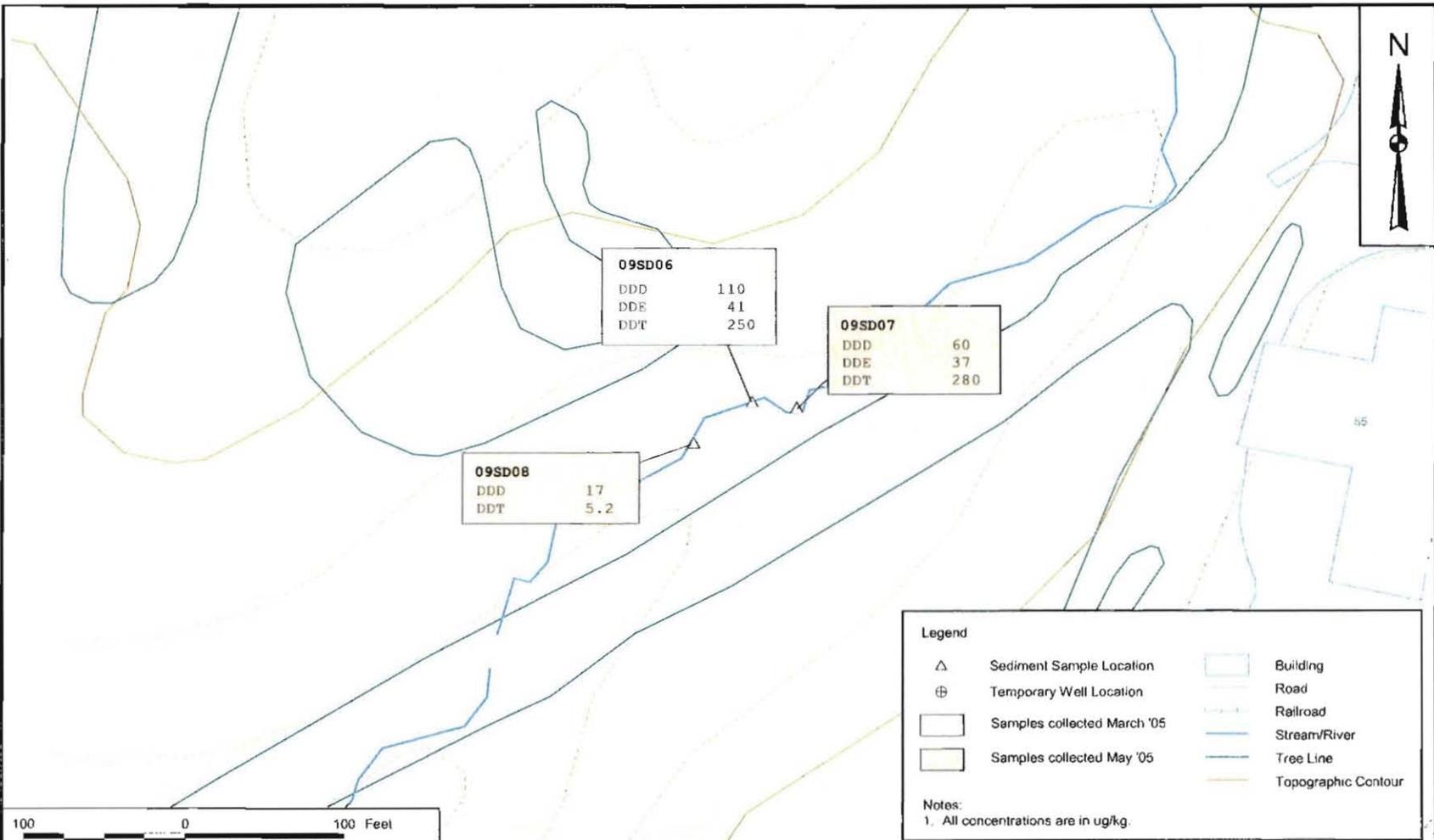
Notes:
 1. All concentrations are in ug/L.
 2. Samples TW001 - TW003 collected March '05
 3. Samples TW004 - TW010 collected May '05

DRAWN BY C. SPEHAR	DATE 8/17/05
CHECKED BY R. CLARK	DATE 8/17/05
COST/SCHEDULE-AREA	
SCALE AS NOTED	



GROUNDWATER/SURFACE WATER PESTICIDES AND VOAs (ug/L)
 SWMU 9 SOUTH PESTICIDE CONTROL AREA
 BUILDING 55
 CRANE NSWC
 CRANE, INDIANA

CONTRACT NUMBER 0042	
APPROVED BY R. CLARK	DATE 8/17/05
APPROVED BY	DATE
DRAWING NO. FIGURE 4	REV 0



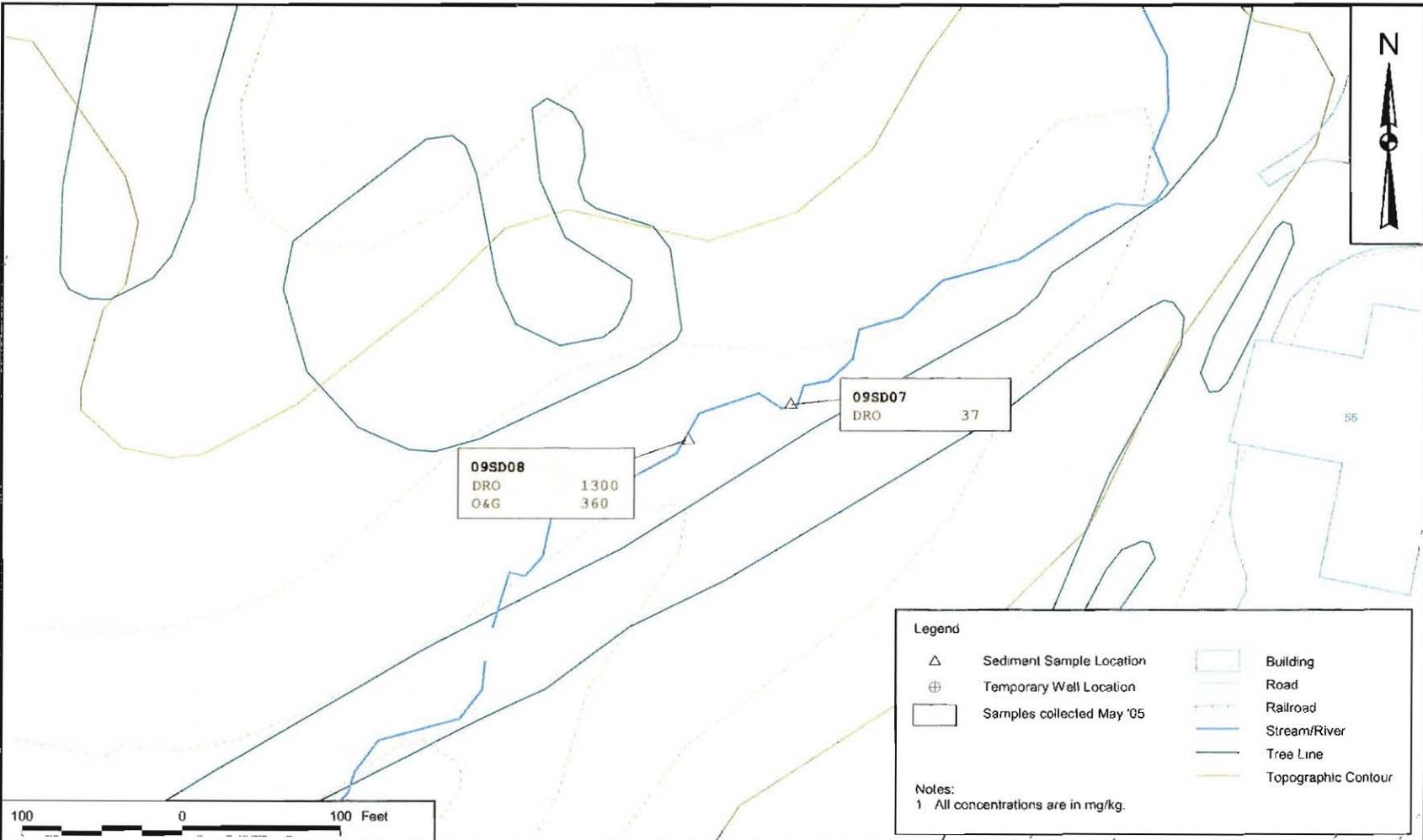
100 0 100 Feet

DRAWN BY	DATE
C. SPEHAR	8/17/05
CHECKED BY	DATE
R. CLARK	8/17/05
COST/SCHEDULE/AREA	
SCALE AS NOTED	



SEDIMENT PESTICIDES (ug/kg)
 SWMU 9 SOUTH PESTICIDE CONTROL AREA
 BUILDING 55
 CRANE NSWC
 CRANE, INDIANA

CONTRACT NUMBER 0042	
APPROVED BY R. CLARK	DATE 8/17/05
APPROVED BY	DATE
DRAWING NO. FIGURE 5	REV 0



09SD08
 DRO 1300
 O&G 360

09SD07
 DRO 37

Legend

	Sediment Sample Location		Building
	Temporary Well Location		Road
	Samples collected May '05		Railroad
			Stream/River
			Tree Line
			Topographic Contour

Notes:
 1 All concentrations are in mg/kg.

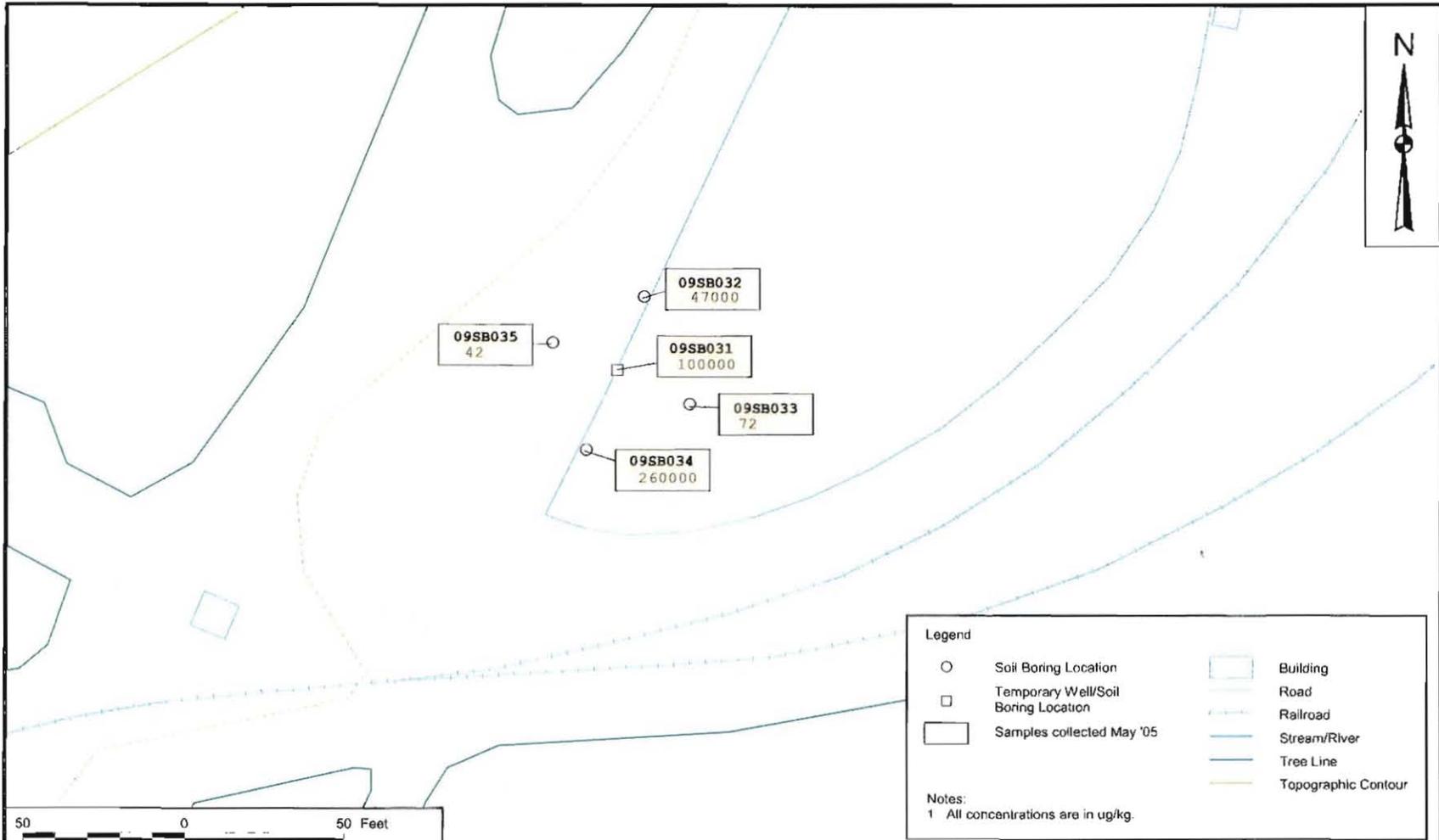


DRAWN BY	DATE
C SPEHR	8/17/05
CHECKED BY	DATE
R CLARK	8/17/05
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	



SEDIMENT PETROLEUM (mg/kg)
 SWMU 9 SOUTH PESTICIDE CONTROL AREA
 BUILDING 55
 CRANE NSWC
 CRANE, INDIANA

CONTRACT NUMBER	
0042	
APPROVED BY	DATE
R. CLARK	8/17/05
APPROVED BY	DATE
DRAWING NO.	REV
FIGURE 5	0



Legend

- Soil Boring Location
- Temporary Well/Soil Boring Location
- ▭ Samples collected May '05
- ▭ Building
- Road
- ⋯ Railroad
- Stream/River
- Tree Line
- - - Topographic Contour

Notes:
 1 All concentrations are in ug/kg.

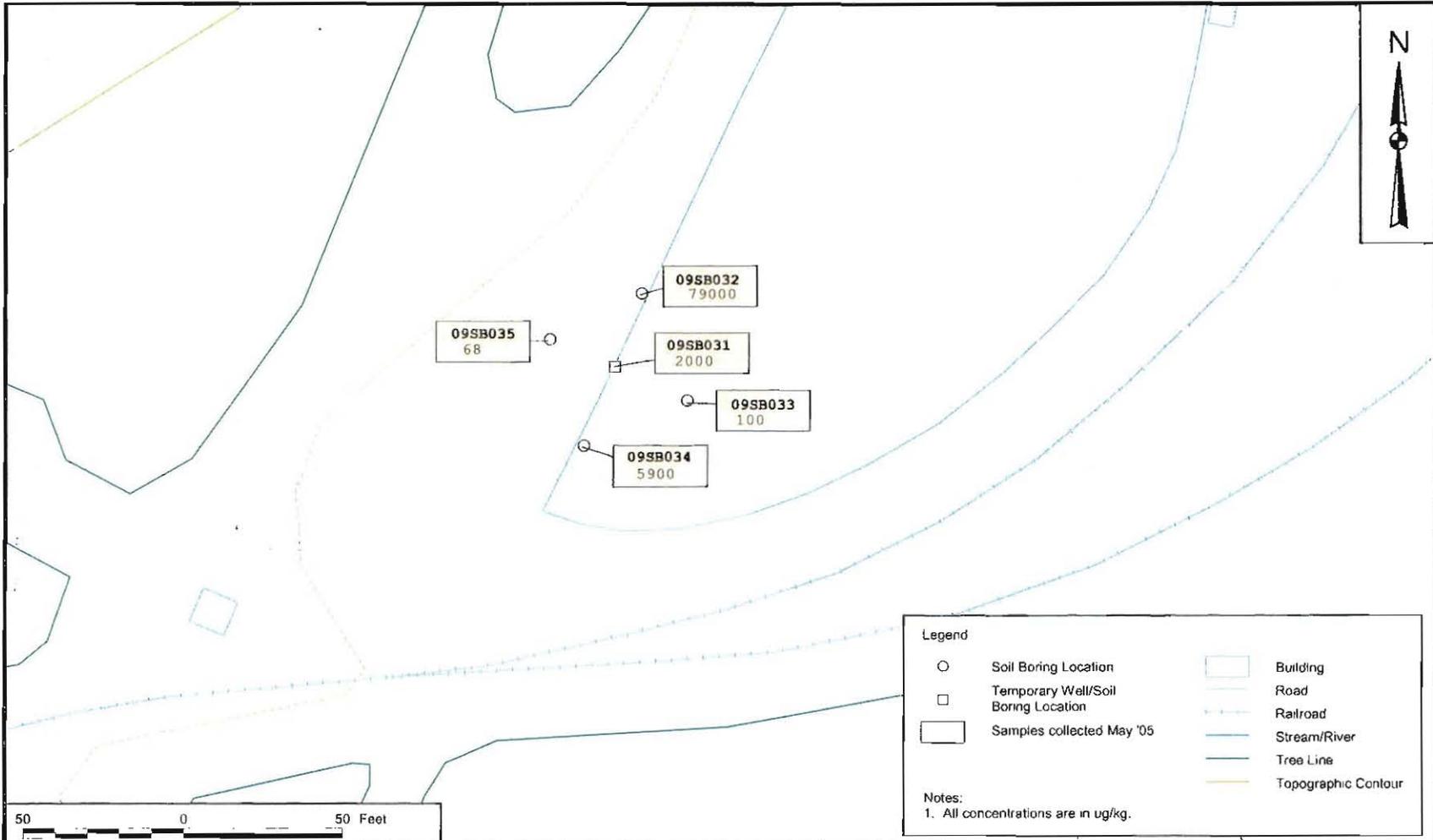


DRAWN BY	DATE
C. SPEHAR	8/17/05
CHECKED BY	DATE
R. CLARK	8/17/05
COST/SCHEDULE-AREA	
SCALE AS NOTED	



SOIL 0-2' PCBs (ug/kg)
 SWMU 9 SOUTH PESTICIDE CONTROL AREA
 BUILDING 55
 CRANE NSWC
 CRANE, INDIANA

CONTRACT NUMBER 0042	
APPROVED BY R. CLARK	DATE 8/17/05
APPROVED BY	DATE
DRAWING NO. FIGURE 7	REV 0

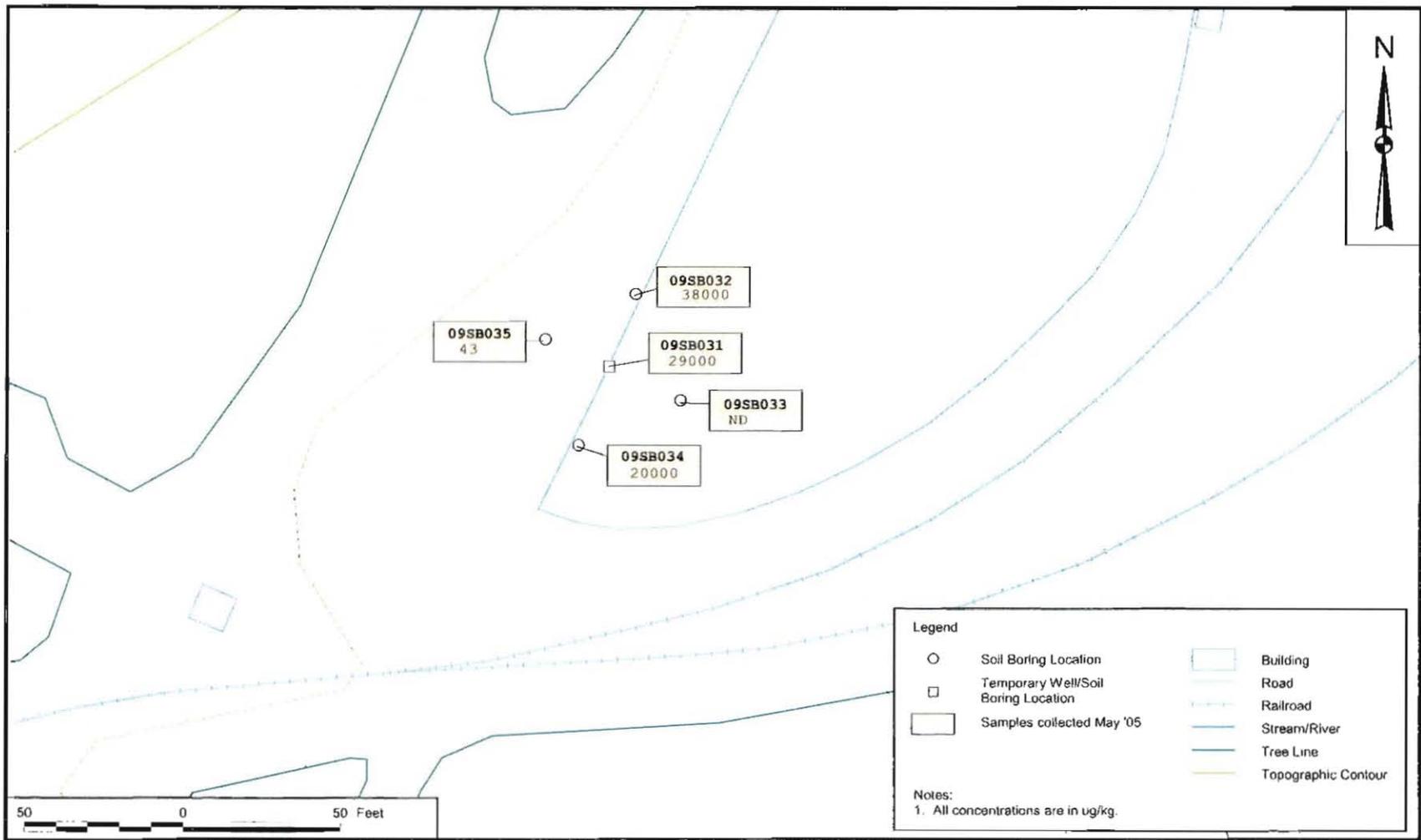


DRAWN BY C. SPEHAR	DATE 8/17/05
CHECKED BY R. CLARK	DATE 8/17/05
COST/SCHEDULE-AREA	
SCALE AS NOTED	

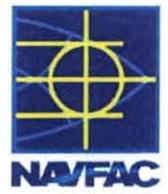


SOIL 2-4' PCBs (ug/kg)
 SWMU 9 SOUTH PESTICIDE CONTROL AREA
 BUILDING 55
 CRANE NSWC
 CRANE, INDIANA

CONTRACT NUMBER 0042	
APPROVED BY R. CLARK	DATE 8/17/05
APPROVED BY	DATE
DRAWING NO. FIGURE 8	REV 0

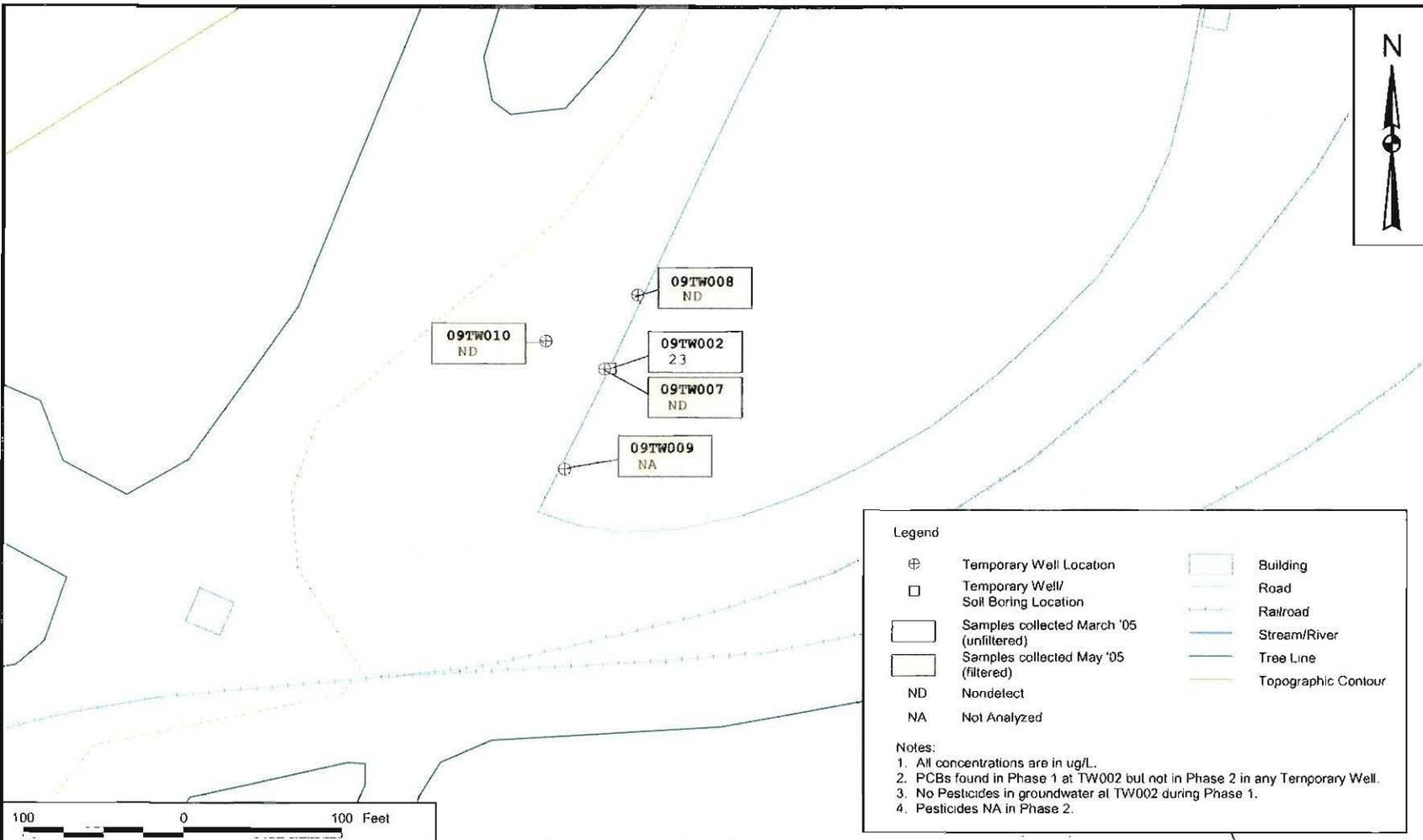


DRAWN BY C. SPEHAR	DATE 8/17/05
CHECKED BY R. CLARK	DATE 8/17/05
COST/SCHEDULE-AREA	
SCALE AS NOTED	



SOIL 4-6' PCBs (ug/kg)
 SWMU 9 SOUTH PESTICIDE CONTROL AREA
 BUILDING 55
 CRANE NSWC
 CRANE, INDIANA

CONTRACT NUMBER 0042	
APPROVED BY R. CLARK	DATE 8/17/05
APPROVED BY	DATE
DRAWING NO FIGURE 9	REV 0

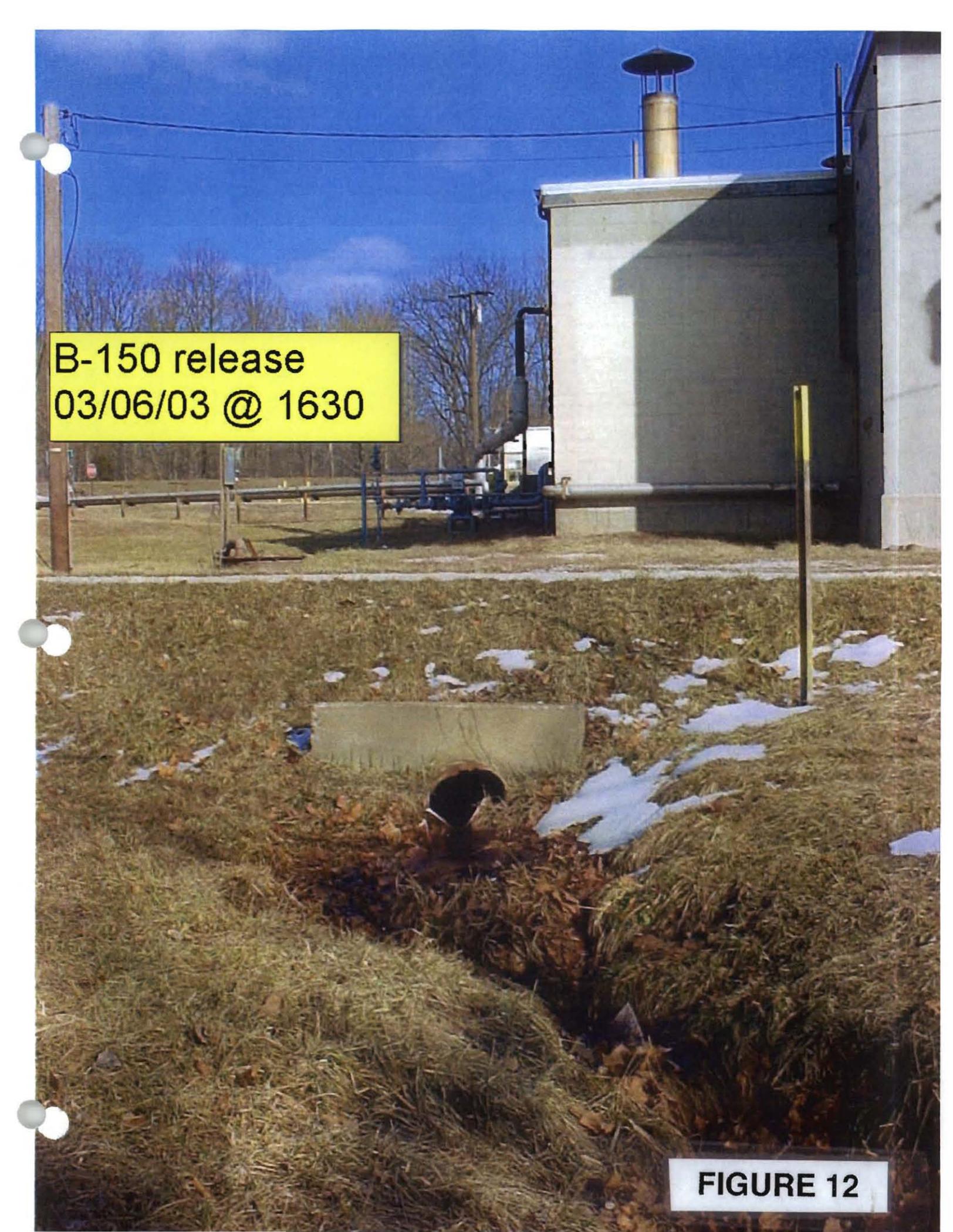


DRAWN BY	DATE
C. SPEHAR	8/17/05
CHECKED BY	DATE
R. CLARK	8/17/05
COST/SCHEDULE/AREA	
SCALE AS NOTED	



GROUNDWATER PCBs (ug/L)
 SWMU 9 SOUTH PESTICIDE CONTROL AREA
 BUILDING 55
 CRANE NSWC
 CRANE, INDIANA

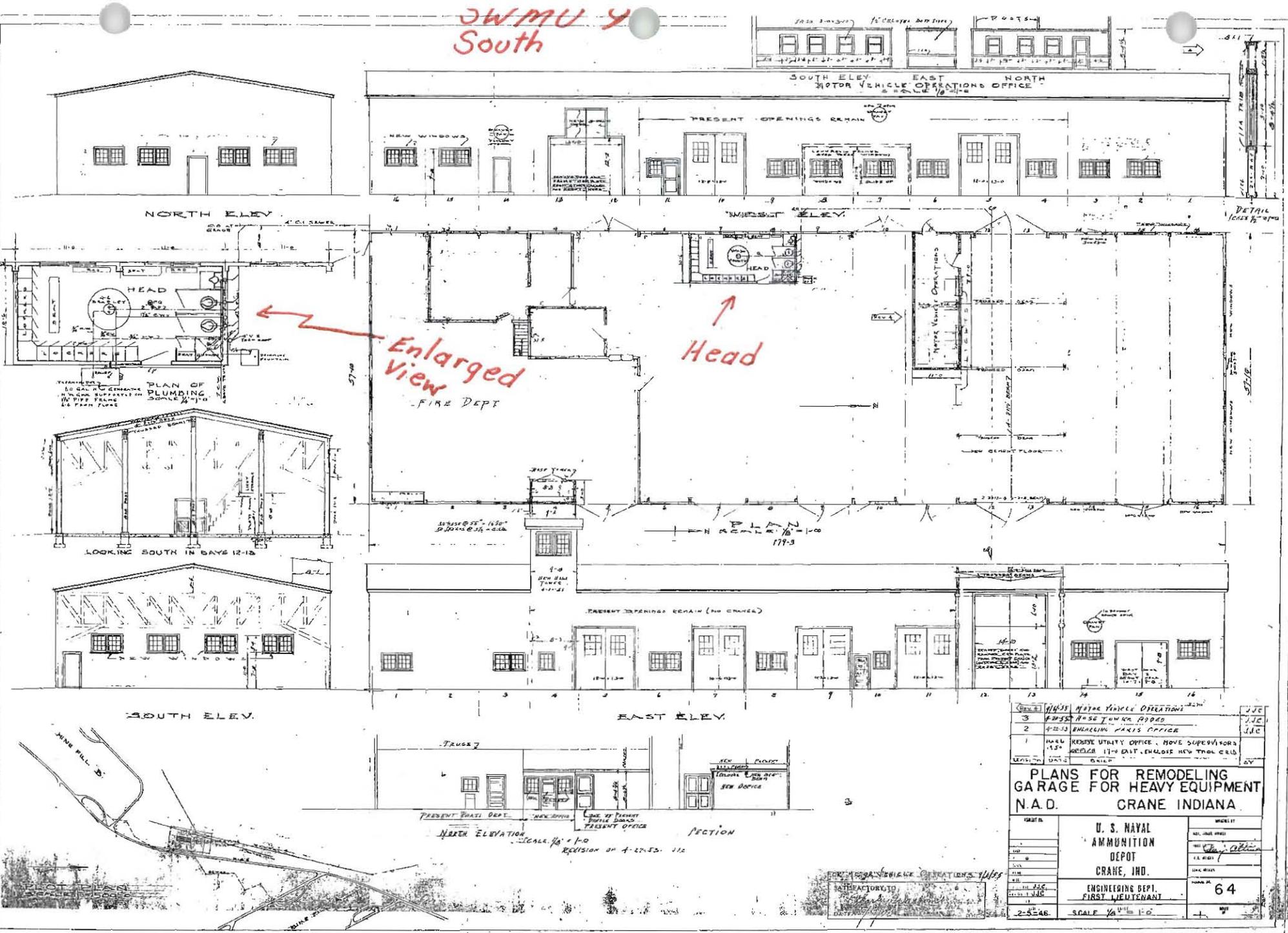
CONTRACT NUMBER 0042	
APPROVED BY R. CLARK	DATE 8/17/05
APPROVED BY	DATE
DRAWING NO. FIGURE 10	REV 0

A photograph of an industrial facility. In the foreground, there is a concrete structure with a circular opening, surrounded by dry grass and some snow. In the background, there is a large white industrial building with a tall chimney stack. A yellow text box is overlaid on the left side of the image.

**B-150 release
03/06/03 @ 1630**

FIGURE 12

JWMU Y
South

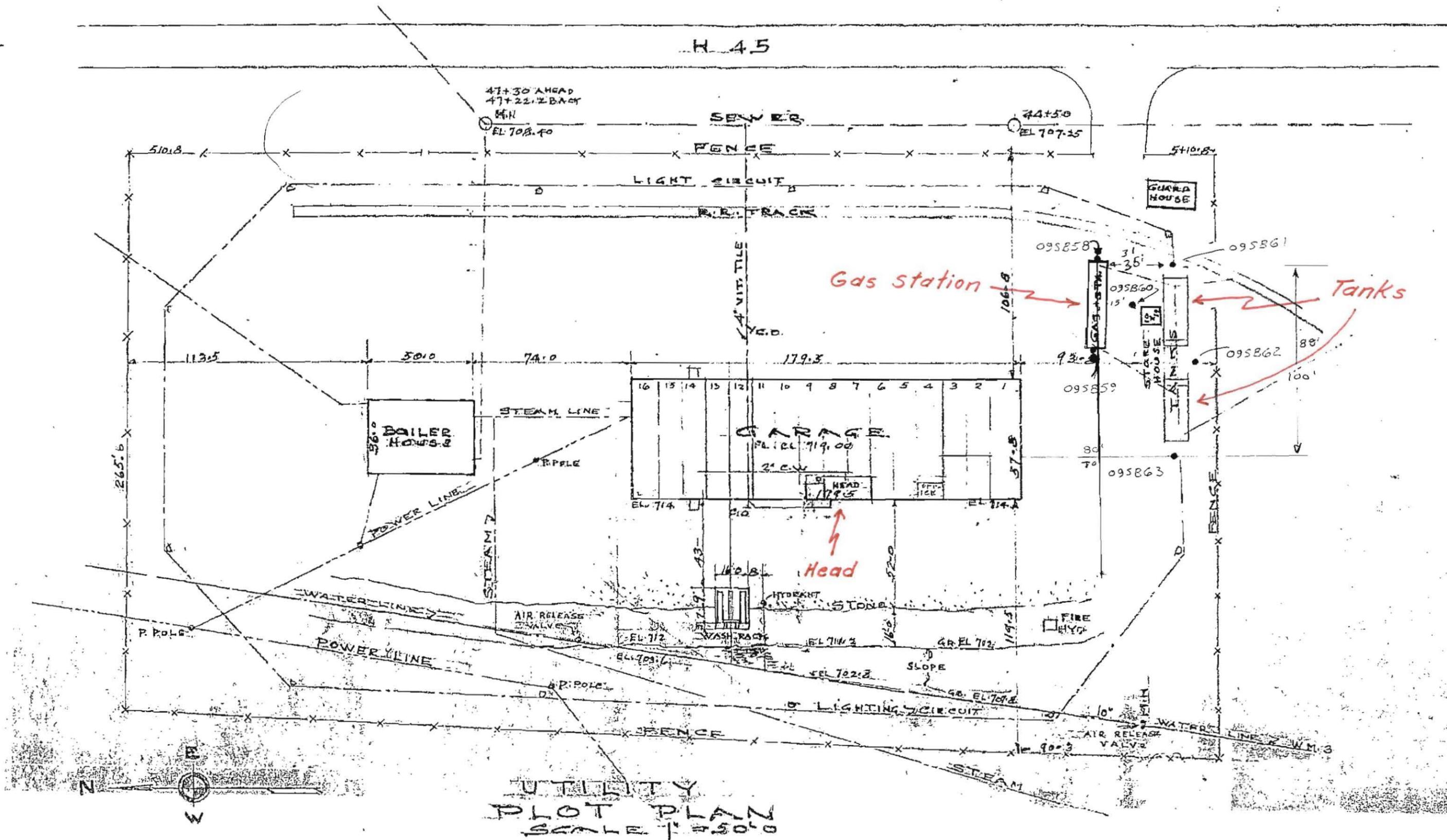


1	11-12	NEW VEHICLE OPERATIONS	JJE
2	11-12	REMOVE UTILITY OFFICE, MOVE SUPERVISORS	JJE
3	11-12	REMOVE UTILITY OFFICE, MOVE SUPERVISORS	JJE
4	11-12	REMOVE UTILITY OFFICE, MOVE SUPERVISORS	JJE
5	11-12	REMOVE UTILITY OFFICE, MOVE SUPERVISORS	JJE
6	11-12	REMOVE UTILITY OFFICE, MOVE SUPERVISORS	JJE
7	11-12	REMOVE UTILITY OFFICE, MOVE SUPERVISORS	JJE
8	11-12	REMOVE UTILITY OFFICE, MOVE SUPERVISORS	JJE
9	11-12	REMOVE UTILITY OFFICE, MOVE SUPERVISORS	JJE
10	11-12	REMOVE UTILITY OFFICE, MOVE SUPERVISORS	JJE
11	11-12	REMOVE UTILITY OFFICE, MOVE SUPERVISORS	JJE
12	11-12	REMOVE UTILITY OFFICE, MOVE SUPERVISORS	JJE
13	11-12	REMOVE UTILITY OFFICE, MOVE SUPERVISORS	JJE
14	11-12	REMOVE UTILITY OFFICE, MOVE SUPERVISORS	JJE
15	11-12	REMOVE UTILITY OFFICE, MOVE SUPERVISORS	JJE
16	11-12	REMOVE UTILITY OFFICE, MOVE SUPERVISORS	JJE

PLANS FOR REMODELING GARAGE FOR HEAVY EQUIPMENT N.A.D. CRANE INDIANA

U. S. NAVAL AMMUNITION DEPOT CRANE, IND.	64
ENGINEERING DEPT. FIRST LIEUTENANT	
SCALE 1/4" = 1'-0"	

FIGURE 13



UTILITY
PLOT PLAN
SCALE 1" = 50' 0"

1946

FIGURE 14



FIGURE 15