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NSWC INDIAN HEAD  
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TECHNICAL MEMORANDUM PHASE 2 SITE SCREENING PROCESS INVESTIGATION  
SUMMARY FOR SITE 37 CAUSEWAY ON THE STUMP NECK ANNEX NSWC INDIAN HEAD

MD

10/17/2011

TETRA TECH NUS

## TECHNICAL MEMORANDUM

**DATE:** October 17, 2011  
**TO:** Indian Head Installation Restoration Team (IHIRT)  
**FROM:** Tetra Tech NUS, Inc.  
**SUBJECT:** **Phase 2 Site Screening Process (SSP) Investigation Summary**  
**Site 37 – Causeway on the Stump Neck Annex**  
Naval Support Facility, Indian Head, Maryland  
CLEAN Contract No. N62470-08-D-1001, CTO JU11

### 1.0 INTRODUCTION

This document summarizes the results of the second phase of the Site Screening Process (SSP) effort at Navy Installation Restoration Site 37 – Causeway on the Stump Neck Annex of Naval Support Facility, Indian Head (NSF-IH) located in Indian Head, Maryland (Figures 1 and 2). The goal of the Phase 2 SSP investigation was to identify and, if present, characterize waste at Site 37 in order to determine whether the site should enter the Remedial Investigation (RI) phase. No waste was observed during the Phase 1 SSP effort performed in 2002.

### 2.0 SITE CHARACTERISTICS

Site 37 is a causeway on the northern side of Stump Neck Annex, along the Potomac River, adjacent to Mattawoman Creek and about 150 feet (ft) northeast of Building 2075. Archer Avenue runs along the top of the causeway. The road crosses a narrow neck of land that has been built up with fill materials (Figure 3). The top of the Causeway is relatively flat with steep banks marking the southern boundary, giving way to the marshy headwaters of Chicamuxen Creek. The site is bounded to the north by gabion baskets that separate the graded road area from the sandy beach shoreline of Mattawoman Creek and the outlying Potomac River. The land surface elevation across the site ranges from approximately 1 foot (ft) above mean sea level (msl) along the southern and northern edges to approximately 5 to 7 ft msl on the Archer Avenue road surface.

The Causeway was constructed of fill materials (date unknown). It is thought to have been reported that the fill also may contain hazardous materials and torpedo ‘casings’ or ‘cases’ (source unknown). However, there has been no visual evidence of waste or hazardous materials during any prior investigation (Naval Energy and Environmental Support Activity [NEESA], 1983; Tetra Tech, 2003 and

2011; IHIRT meetings in March/April 2010, May 2010, and August 2011), nor during this Phase 2 SSP investigation (see below), and there are no records of potentially hazardous fill materials or torpedo materials used in the Causeway's construction.

Observations from soil borings and test pits indicate shallow geologic conditions consist primarily of brown and gray silty sands with some gravel and clays. The soil borings and test pits during Phase 2 encountered a basal silty clay layer at approximately 8 ft bgs. Test pits also showed concrete rubble near the surface and throughout the subsurface on the north side of Archer Avenue. Groundwater at the site was encountered at approximately 6 ft below ground surface (bgs) in the shallow unconfined surficial aquifer. No waste material was encountered and there were no elevated organic vapor readings during subsurface investigations.

### **3.0 PRIOR INVESTIGATIONS**

#### **Initial Assessment Study (1983)**

Site 37 was identified by the Initial Assessment Study (IAS) of multiple sites at NSF-IH in 1982 (NEESA, 1983). The IAS report references anecdotal information that the Causeway may contain hazardous materials in addition to known rubble. Observation of the area in 1982 indicated the presence of a raised land area and use of concrete blocks and rock to protect the shoreline side of the roadway from erosion for a distance of 300 to 400 ft. The shoreline consisted of a small beach rimmed with rip-rap in wire mesh (similar to gabion baskets). The IAS did not recommend additional study at Site 37.

#### **RCRA Facility Assessment (1990)**

A Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA) was conducted by the U.S. Environmental Protection Agency (EPA) at the Stump Neck Annex in 1989 to 1990, identifying the Causeway as a Solid Waste Management Unit (SWMU) (i.e., "Stump Neck SWMU 24") (EPA, 1990). However, the subsequent 1990 RCRA Corrective Action Permit stated that no further action was necessary at the time for SWMU 24. EPA was prioritizing other SWMU corrective actions at the facility and anticipated that NSF-IH would be placed on the National Priorities List (NPL) (EPA, 1993). NSF-IH was placed on the NPL in September 1995. In 2000, the NSF-IH Federal Facility Agreement (FFA) specified that SWMU 24 would be subsumed by Navy Installation Restoration Site 37, which would undergo the SSP (EPA & Navy, 2000).

#### **Site Screening Assessment (2002)**

Now termed Phase 1 of the SSP at Site 37, the site screening effort in 2002 was conducted along with other sites at both the NSF-IH main area and the Stump Neck Annex (Tetra Tech, 2003 and 2011). The Phase 1 SSP field investigation at Site 37 included the collection of three groundwater, five subsurface

soil, and three collocated sediment and surface water samples (Figure 4). All samples were analyzed for Target Compound List (TCL) volatile organic compounds (VOCs), TCL semivolatile organic compounds (SVOCs), TCL pesticides and polychlorinated biphenyls (PCBs), Target Analyte List (TAL) metals, and explosives.

No waste was identified during the Phase 1 SSP investigation. The Phase 1 analytical data were evaluated and subjected to preliminary human health and ecological risk evaluations. Both risk evaluations identified chemicals of potential concern (COPCs) based on a comparison of analytical data to conservative screening levels. Subsequent risk calculations suggested potentially unacceptable risks associated with various receptor exposure to groundwater, surface water, and/or sediment (none for soil). Risk drivers in one or more media included several metals, two SVOCs (naphthalene and benzo[a]pyrene), one explosive (1,3,5-trinitroperhydro-1,3,5-triazine [“RDX” for Research Development Explosive]), and one pesticide (4-4'-dichlorodiphenyldichloroethane [DDD]). The SSP report noted it was uncertain if the COPCs present were a result of any waste management activity at Site 37 or if some were ancillary and/or naturally occurring (Tetra Tech, 2003). However, considering the potentially unacceptable human health and ecological risks determined from the limited number of environmental sample data, the report recommended an RI for the site.

### **Phase 2 SSP (2011)**

During the initial RI scoping session at the March/April 2010 IHIRT meeting, the team discussed the lack of waste identified during the Phase 1 SSP. Revisiting the CERCLA regulatory framework, Maryland Department of Environment (MDE) stated that if no waste was used in the causeway, there is no CERCLA release. The team agreed and decided to perform a second phase SSP to determine if waste was present (i.e., if an RI was necessary) or if the site could be closed out from the FFA.

During the May 2010 IHIRT meeting, the team visited the site to evaluate potential new sample and test pitting locations considering vehicular traffic on Archer Avenue and both underground and overhead utilities along the Causeway. Subsequent team discussions and scoping provided for the Phase 2 SSP work plan (Tetra Tech, 2011), which specified installation of seven exploratory soil borings and two test pits (i.e., trenches). The team revisited the work plan again in May 2011 prior to the June 2011 fieldwork to review potential deviations (i.e., changes to locations and/or number of borings and test pits) due to excessive utility density and possible presence of munitions and explosives of concern (MEC).

## **4.0 PHASE 2 SSP INVESTIGATION (2011)**

The Phase 2 SSP field work was performed in June 2011 in accordance with the Tetra Tech (2011) work plan, the post-work plan Explosive Safety Submission (ESS) Determination Request from Naval

Ordnance Safety and Security Activity (NOSSA), and the IHIRT discussion in May 2011. Per the ESS, MEC avoidance procedures (magnetic and visual anomaly avoidance) were used during intrusive activities due to the potential presence of torpedo casings. Utility location and mark out along with careful, methodical boring and digging procedures were utilized to avoid damaging utilities. Several boring and test pit locations had to be moved due to surface detections of utilities and/or metallic anomalies. Seven exploratory soil borings (S37SB004 through S37SB010) and two test pit trenches (Test Pit 1 and Test Pit 2) were installed as shown on Figure 4. The Phase 2 SSP boring and test pit logs are provided as Attachment A.

No evidence of waste or contaminated material was encountered in the borings or test pit trenches (no visual evidence or photoionization detection [PID] responses). Subsequently, no environmental samples were collected for analysis. There was no refusal at any of the boring locations. Soil core and test pit trench soils showed a similar geology throughout the Causeway: silty-, fine-, and medium-sands down to 10 ft bgs, natural gray sands encountered below fill materials, and the basal olive-gray silty clay at approximately 8 to 10 ft bgs. Test pit trenches exposed the clean fill, concrete rubble, brick, gravel, and cobbles. Groundwater was encountered at 6 to 7 ft bgs throughout the Causeway.

The borings and trenches were abandoned (soil cores placed back in borings and completed at surface with bentonite seal; trenches backfilled with excavated soil and concrete rubble) and the ground surface was reseeded.

No torpedo casings were identified in the Causeway during the SSP investigations. If present, the material likely would have originated from the Torpedo Station near Blue Plains in Washington, D.C. (possibly the old Naval Torpedo Station in Alexandria, Virginia, which is across the Potomac River from the Blue Plains area of Washington, D.C.). The items would have been brought to Stump Neck and buried in the late 1940s and 1950s in unknown quantities. It's possible that over time since the 1983 IAS and 2002 Phase 1 SSP, Site 37 may have been confused with Site 35 – Buried Torpedoes.

## **5.0 CONCLUSION**

No waste or torpedo casings were identified during the Phase 1 and 2 SSP investigations. Therefore, a CERCLA response action is not warranted at Site 37 – Causeway. After reviewing the Phase 2 SSP results at the August 2011 IHIRT Meeting, the team agreed and determined Site 37 may be closed out from the FFA with a no-action decision document.

## REFERENCES

EPA (U.S. Environmental Protection Agency), 1990. RCRA SWMU Investigation at NAVEDOTEHCEN, NSWC-Indian Head Division, Indian Head, Maryland. EPA Office of RCRA Programs. Draft. July.

EPA, 1993. Letter reply to Navy (K. Morin, Director, Environmental Division, NSWC Indian Head) regarding Additional SWMUs at Stump Neck Annex and NSWC Indian Head, Maryland. D. Zielinski, Acting Chief, General States Permits Section, EPA Region 3. January 7.

EPA and Navy, 2000. *Federal Facility Agreement for Naval Surface Warfare Center, Indian Head Division, Indian head, Maryland*, under CERCLA Section 120. Administrative Docket No. III-FCA-CERC-018. EPA Region 3 Regional Administrator and Deputy Assistant Secretary of the Navy (Environment and Safety) signatories. December 9.

NEESA (Naval Energy and Environmental Support Agency), 1983. *Initial Assessment Study of Naval Ordinance Station, Indian Head, Maryland*. Prepared by Fred C. Hart Associates, Inc. May.

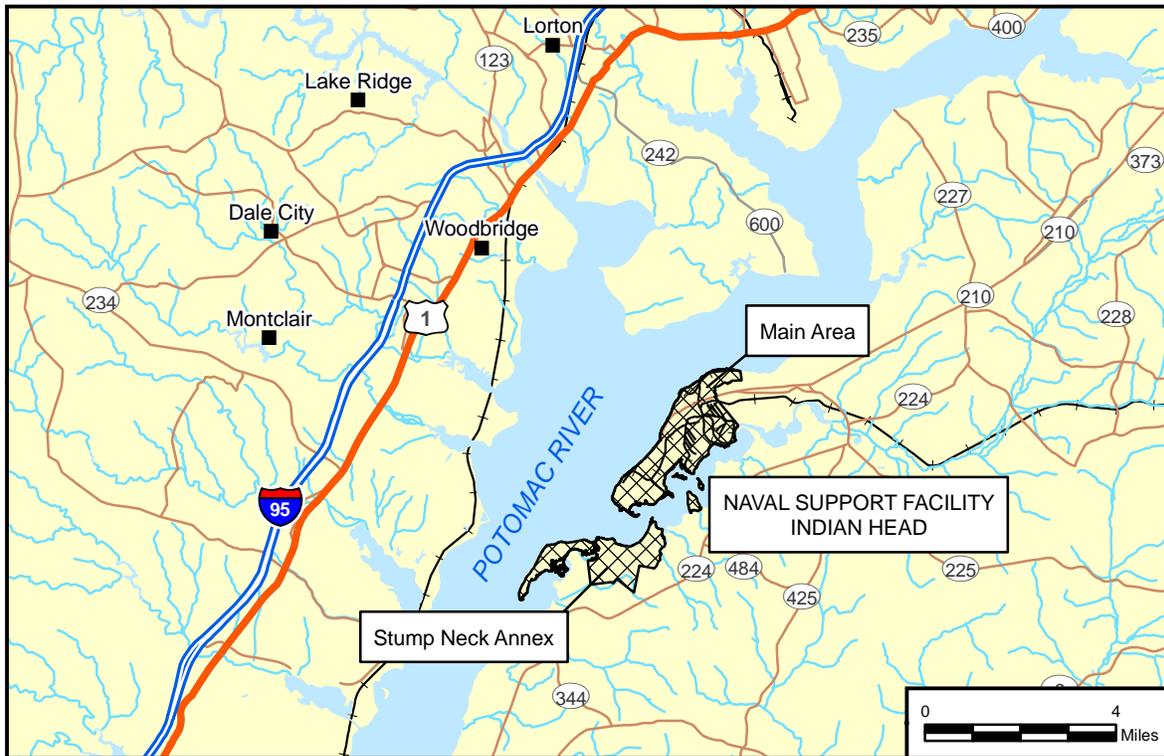
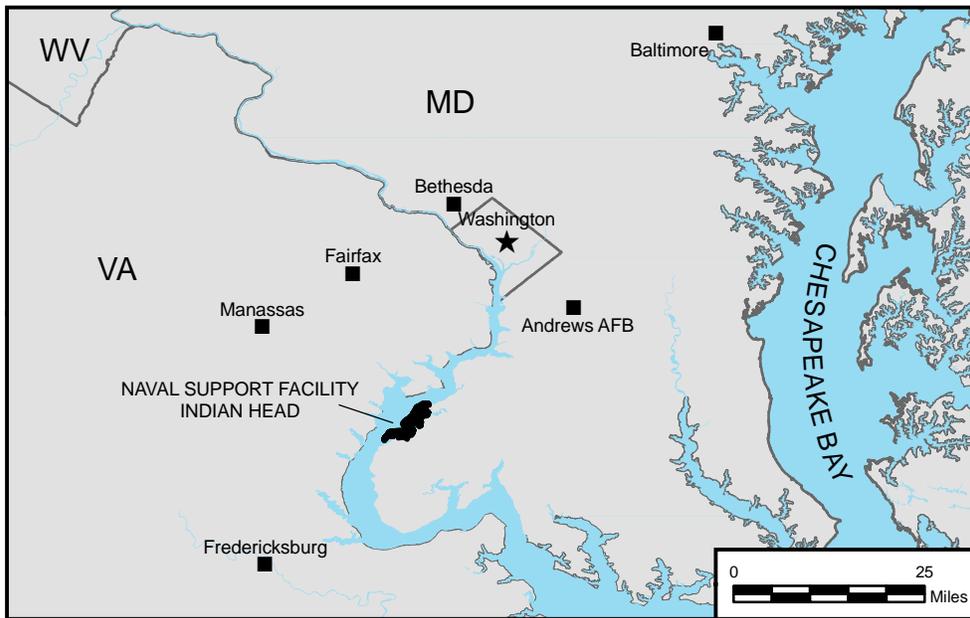
Tetra Tech, 2003. *Site Screening Process Report for Site 32 – Suspected Tool Burial, Site 33 – Scrap Metal Pit, Site 34 – Tool Burial, Site 36 – Closed Landfill, Site 37 – Causeway, Site 51 – Building 101 Dry Well, and Site 52 – Building 102 Dry Well, Indian Head Division, Naval Surface Warfare Center, Indian Head, Maryland*. March.

Tetra Tech, 2009. *Master Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) for Installation Restoration Program and Munitions Response Program Environmental Investigations, Naval Support Facility, Indian Head, Indian Head, Maryland*. (Includes Facility Standard Operating Procedures). May.

Tetra Tech, 2011. *Work Plan for Phase 2 Site Screening Process Investigation at Site 37 – Causeway, Naval Support Facility, Indian Head, Maryland*. Technical Memorandum. March 24.

## ENCLOSURES

- Figure 1 Facility Location Map
- Figure 2 Site Location
- Figure 3 Site Plan – Aerial
- Figure 4 Site Screening Process Sample Locations
- Attachment A Phase 2 SSP Boring Logs and Test Pit Logs



DRAWN BY K. MOORE	DATE 03/20/09		CONTRACT NUMBER CTO JU11	
CHECKED BY E. CORACK	DATE 06/20/11		APPROVED BY E. CORACK	DATE 07/14/11
DRAWN BY J. ENGLISH	DATE 07/14/11	FACILITY LOCATION MAP NAVAL SUPPORT FACILITY INDIAN HEAD INDIAN HEAD, MARYLAND	APPROVED BY _____	DATE _____
SCALE AS NOTED			FIGURE NO. FIGURE 1	REV 0

Aerial photograph taken in 2009.



**Legend**

- Site Boundary
- Facility Boundary

DRAWN BY	DATE
J. ENGLISH	07/14/11
CHECKED BY	DATE
E. CORACK	07/19/11
REVISED BY	DATE



**SITE LOCATION**  
**SITE 37 SITE SCREENING PROCESS**  
**NAVAL SUPPORT FACILITY INDIAN HEAD**  
**INDIAN HEAD, MARYLAND**

CONTRACT NUMBER	CTO NUMBER
02622	JU11
APPROVED BY	DATE
_____	_____
APPROVED BY	DATE
_____	_____
FIGURE NO.	REV
FIGURE 2	0

SCALE  
AS NOTED



**Legend**

Site Boundary

DRAWN BY	DATE
J. ENGLISH	07/14/11
CHECKED BY	DATE
E. CORACK	07/19/11
REVISED BY	DATE
SCALE AS NOTED	



**SITE PLAN - AERIAL**  
**SITE 37 SITE SCREENING PROCESS**  
**NAVAL SUPPORT FACILITY INDIAN HEAD**  
**INDIAN HEAD, MARYLAND**

CONTRACT NUMBER 02622	CTO NUMBER JU11
APPROVED BY —	DATE —
APPROVED BY —	DATE —
FIGURE NO. FIGURE 3	REV 0



**Legend**

- Phase 1 Soil Boring / Temporary Well (2002)
- ▲ Phase 1 Surface Water / Sediment Location (2002)
- Phase 2 Soil Boring (2011)
- Phase 2 Test Pit
- ▭ Site Boundary
- ▭ Road or Sidewalk
- Topographic Contour (1-ft interval)
- ▭ Facility Boundary
- Stream
- Surface Water
- ▨ Wetland

DRAWN BY	DATE
J. ENGLISH	07/15/11
CHECKED BY	DATE
E. CORACK	07/19/11
REVISED BY	DATE



SCALE  
AS NOTED

**SITE 37 - CAUSEWAY**  
**SITE SCREENING PROCESS SAMPLE LOCATIONS**  
**NAVAL SUPPORT FACILITY INDIAN HEAD**  
**INDIAN HEAD, MARYLAND**

CONTRACT NUMBER 02622	CTO NUMBER JU11
APPROVED BY —	DATE —
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FIGURE NO. FIGURE 4	REV 0

**Attachment A**

**Phase 2 SSP**

**Boring and Test Pit Logs**











# BORING LOG

PROJECT NAME: INDIAN HEAD  
 PROJECT NUMBER: 1126-02622  
 DRILLING COMPANY: GROUND ZERO  
 DRILLING RIG: GEO PROBE

BORING No.: S37 SB00  
 DATE: 6.13.11  
 GEOLOGIST: K. SIMPSON  
 DRILLER: COREY GAMMELL

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION			U S C S *	Remarks	PID/FID Reading (ppm)				
					Soil Density/ Consistency or Rock Hardness	Color	Material Classification			Sample	Sampler BZ	Borehole**	Driller BZ**	
							GRASS							
S1 1329	0/4		2/4		SOFT BRN		SILT SOME F SAND & CLAY		MOIST	0	0	0	0	
							TR GRAVEL & ROCK FRAGS							
					MED-STIFF		TR ASPHALT					0.1		
S2 1338	4/8		3/4				F-C SAND TR F GRAVEL					0.2		
									WET			0		
S3	8/10		1.5/2				CLAY SOME SILT SOME ORGANIC MATERIAL (PEAT)	OL						
				TD										
							TD 10'							
							NO FILL NOTED TR ASPHALT @ 3' ONLY							

\* When rock coring, enter rock brokenness.

\*\* Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated response read.

Remarks: \_\_\_\_\_

Drilling Area Background (ppm): 0

Converted to Well: Yes \_\_\_\_\_ No X Well I.D. #: \_\_\_\_\_

SOUTH SIDE OF ROAD



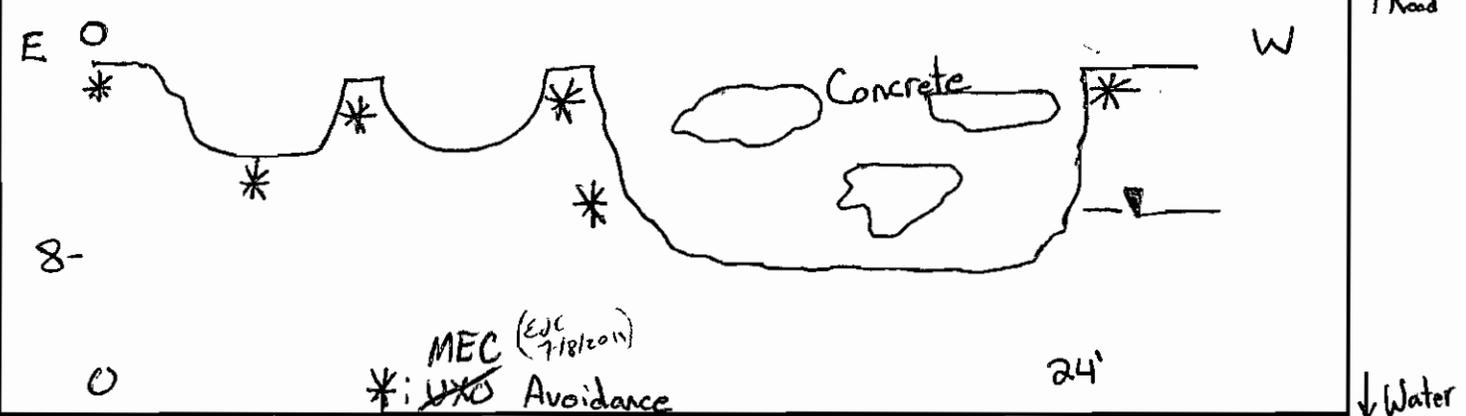




PROJECT NAME: Indian Head TEST PIT No.: Trench 01  
 PROJECT NUMBER: 112G02622 DATE: 6-14-11  
 LOCATION: Site 37 Causeway GEOLOGIST: Jacob Birkett and Keith Simpson

Depth (Ft.)	Lithology Change (Depth/Ft.)	MATERIAL DESCRIPTION Soil/Waste Characteristics (lithology, density, color, etc.)	U S C S	Remarks 1530-1640	PID/FID READING	
					Source (ppm)	BZ (ppm)
0		Silt, sand trace clay, gravel, cobbles, brick, concrete (some large pieces)		Brown	↓ 0.1	○
5					↓ 0.1	
				✓	↓	↓
10	TD 8' bgs	Clean Fill, - 1 piece of glass 1 piece of plastic				

### TEST PIT CROSS SECTION AND / OR PLAN VIEW



REMARKS: Trench Location: North side of road - west side of site

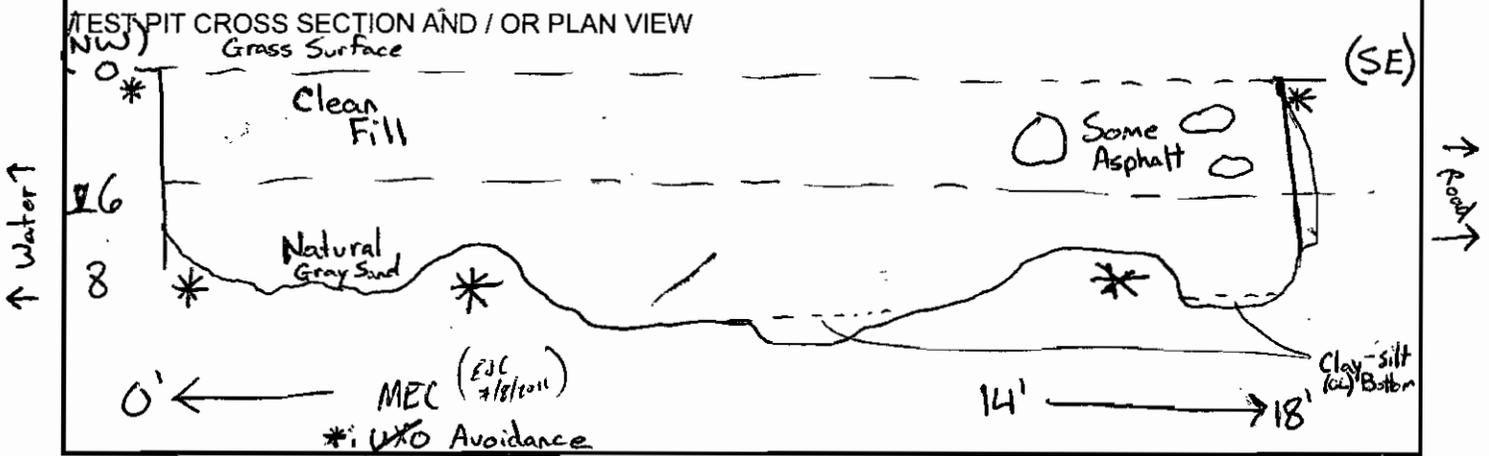
PHOTO LOG: See photos for more details - GPS'd location

*Jacob Birkett*  
for KS



PROJECT NAME: Indian Head TEST PIT No.: Trench 02  
 PROJECT NUMBER: 112G02622 DATE: 6-14-11  
 LOCATION: Site 37- Causeway GEOLOGIST: Jacob Birkett and Keith Simpson

Depth (Ft.)	Lithology Change (Depth/Ft.)	MATERIAL DESCRIPTION  Soil/Waste Characteristics (lithology, density, color, etc.)	U S C S	Remarks	PID/FID READING	
					Source (ppm)	BZ (ppm)
0		Grass				
		Silt/Sand trace clay with gravel, concrete, some wood, trace trash "clean" fill		Brown	0.1	0
					0	0
					0	0
					0.2	0
5					0	0
					0	0
					0.1	0
		Sand		Gray	0	0
				Gray	0	0
10		Clay some silt/organic material	OL	Olive brown		
		Cobbles, concrete debris mixed with silt/sand, FILL, trace wood, trace/minimal trash (similar to trash found on shore of Potomac River) in top 6 feet				



REMARKS: Trench Location: North side of road. East side of site

PHOTO LOG: See photos for more details, GPS'd Location  
Sun belt rental - John Deere 310J  
2' wide bucket

*Jacob Birkett*  
for KS