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NSA CRANE
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TECHNICAL MEMORANDUM REGARDING RCRA FACILITY INVESTIGATION
SUMPLEMENTAL SAMPLING RESULTS/PROPOSED INTERIM REMOVAL ACTION TO
ACHIEVE RISK REDUCTION UNEXPLODED ORDNANCE 7 (UXO 7) SMALL ARMS RANGE
NSA CRANE IN
3/1/2012
TETRA TECH

Resource Conservation and Recovery Act (RCRA)

Technical Memorandum – RCRA Facility Investigation Supplemental Sampling Results/- Proposed Interim Removal Action to Achieve Risk Reduction

UXO 7 – Small Arms Ranges

Naval Support Activity Crane Crane, Indiana



Naval Facilities Engineering Command Midwest

Contract Number N62472-03-D-0057

Contract Task Order F272

March 2012



TECHNICAL MEMORANDUM

(for Internal Technical Discussion Purposes)

DATE: March 16, 2012

TO: Mr. Tom Brent, NSA Crane

FROM: Ralph Basinski, Tetra Tech; Pittsburgh, PA

cc: Mr. Howard Hickey, NAVFAC MW

Mr. Rick Barringer, Tetra Tech

Mr. Jim Goerdts, Tetra Tech

Project File – CTO F272

SUBJECT: NSA Crane UXO 7 Supplemental Soil Sampling Results/Proposed Path Forward

1.0 **BACKGROUND**

UXO 7 is located in the central portion of the Naval Support Activity (NSA) Crane installation, in a small valley that drains east into Turkey Creek ([Figure 1-1](#)). UXO 7 is an area at NSA Crane consisting of several small arms ranges including a 500-yard rifle range, pistol range, east trap range, and west trap range ([Figure 1-2](#)). These former small arms ranges have been the subject of two investigations for contaminants commonly associated with rifle and pistol range ammunition, primarily lead and copper; and also trap range contaminants, which is primarily PAHs and lead. The source of PAHs detected on former trap ranges is the tar pitch/bitumen binder materials which were used in manufacture of the clay pigeon targets. Lead detected on trap ranges originated from the lead shot fired from the shotguns. These sites were all initially investigated as part of an RFI in 2007, and additional information regarding the site history can be found in the UXO 7 RFI Report (Tetra Tech, 2009). During these investigations PAHs were found to present excess risk to human health in areas of the former trap ranges and lead was found to present excess risk to ecological receptors on the 500-yard Rifle Range ([Figures 1-3](#) and [1-4](#)) respectively. Supplemental sampling was conducted in November 2011 to more fully delineate the soil contamination, in order to support prescriptive removal action (Tetra Tech, 2011). Following is a discussion of the combined results of the RFI and supplemental sampling and recommendations for future actions.

To better evaluate the human health and ecological risk at UXO 7, the former small arms ranges were grouped into three exposure units (northern zone, central zone, and southern zone) ([Figure 1-2](#)). The lead risks associated with portions of the 500-yard Rifle Range (Rifle Range) located in the northern zone are a result of lead bullets fired at the Rifle Range, and the PAH risks associated with the East and West Trap Ranges located in the central zone are a result of the tar pitch/bitumen binder materials which were used in the clay pigeons.

Based on these risks, supplemental sampling was conducted in November 2011 to more fully delineate the lead and PAH contamination in order to support a prescriptive removal action (Tetra Tech, 2011). The majority of soil samples collected during the supplemental sampling at UXO 7 were collected by hand auger from 0 to 2 feet below ground surface (bgs) (see [Table 1-1](#)). Additional samples, at depths greater than 2 feet bgs, were collected utilizing DPT. All soil samples collected in the northern zone of the Rifle Range were analyzed in the field for lead via X-Ray Fluorescence (XRF). Based on the XRF results, additional "step-out" samples were collected until the site lead contamination was bounded laterally. Select samples were then shipped to the fixed-base laboratory (FBL) for lead analysis. PAH analysis at the FBL was conducted on samples collected from the East and West Trap Ranges because clay targets were only used within those two areas.

All field work performed for the 2007 RFI was performed in accordance with the procedures and methodologies described in the United States Environmental Protection Agency (USEPA)-approved QAPP Addendum No. 2 (TtNUS, 2007). The 2011 supplemental soil sampling at UXO 7 was conducted in accordance with the Technical Memorandum Work Plan for Proposed Supplemental Sampling Activities at UXO 7, approved by the USEPA on October 21, 2011.

Appendix A of this Technical Memorandum contains a complete set of the validated analytical results from both the RFI sampling in 2007 and the RFI supplemental sampling Round 1 in 2011. **Appendix B** contains all supporting field forms and documentation, and **Appendix C** contains site photographs.

TABLE 1-1

**SAMPLE COLLECTION AND ANALYSIS SUMMARY
UXO 07 - SUPPLEMENTAL SOIL SAMPLING (ROUND 1)
NSA CRANE
CRANE, INDIANA**

SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE METHOD	SAMPLE DEPTH (ft bgs)	XRF (LEAD)	FBL ANALYSIS	
					LEAD	PAHs
X7SS200-0001	11/10/2011	HA	0-1			X
X7SS200-0102	11/10/2011	HA	1-2			X
X7SS201-0001	11/10/2011	HA	0-1			X
X7SS201-0102	11/10/2011	HA	1-2			X
X7SS202-0001	11/10/2011	HA	0-1			X
X7SS202-0102	11/10/2011	HA	1-2			X
X7SS203-0001	11/10/2011	HA	0-1			X
X7SS203-0102	11/10/2011	HA	1-2			X
X7SS204-0001	11/10/2011	HA	0-1			X
X7SS204-0102	11/10/2011	HA	1-2			X
X7SS205-0001	11/10/2011	HA	0-1			X
X7SS205-0102	11/10/2011	HA	1-2			X
X7SS206-0001	11/10/2011	HA	0-1			X
X7SS206-0102	11/10/2011	HA	1-2			X
X7SS207-0001	11/10/2011	HA	0-1			X
X7SS207-0102	11/10/2011	HA	1-2			X
X7SS208-0001	11/10/2011	HA	0-1			X
X7SS208-0102	11/10/2011	HA	1-2			X
X7SS209-0001	11/10/2011	HA	0-1			X
X7SS209-0102	11/10/2011	HA	1-2			X
X7SS210-0001	11/10/2011	HA	0-1			X
X7SS210-0102	11/10/2011	HA	1-2			X
X7SS211-0001	11/10/2011	HA	0-1			X
X7SS211-0102	11/10/2011	HA	1-2			X
X7SS212-0001	11/10/2011	HA	0-1			X
X7SS212-0102	11/10/2011	HA	1-2			X
X7SS213-0001	11/10/2011	HA	0-1			X
X7SS213-0102	11/10/2011	HA	1-2			X
X7SS214-0001	11/10/2011	HA	0-1			X
X7SS214-0102	11/10/2011	HA	1-2			X
X7SS215-0001	11/10/2011	HA	0-1			X
X7SS215-0102	11/10/2011	HA	1-2			X
X7SS216-0001	11/10/2011	HA	0-1			X
X7SS216-0102	11/10/2011	HA	1-2			X
X7SS217-0001	11/10/2011	HA	0-1			X
X7SS217-0102	11/10/2011	HA	1-2			X

TABLE 1-1

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CRANE, INDIANA

SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE METHOD	SAMPLE DEPTH (ft bgs)	XRF (LEAD)	FBL ANALYSIS	
					LEAD	PAHs
X7SS218-0001	11/10/2011	HA	0-1			X
X7SS218-0102	11/10/2011	HA	1-2			X
X7SS219-0001	11/10/2011	HA	0-1			X
X7SS219-0102	11/10/2011	HA	1-2			X
X7SS220-0001	11/10/2011	HA	0-1			X
X7SS220-0102	11/10/2011	HA	1-2			X
X7SS221-0001	11/10/2011	HA	0-1			X
X7SS221-0102	11/10/2011	HA	1-2			X
X7SS222-0001	11/10/2011	HA	0-1			X
X7SS222-0102	11/10/2011	HA	1-2			X
X7SS223-0001	11/10/2011	HA	0-1			X
X7SS223-0102	11/10/2011	HA	1-2			X
X7SS224-0001	11/10/2011	HA	0-1			X
X7SS225-0001	11/10/2011	HA	0-1			X
X7SS225-0102	11/10/2011	HA	1-2			X
X7SS226-0001	11/10/2011	HA	0-1			X
X7SS226-0102	11/10/2011	HA	1-2			X
X7SS227-0001	11/10/2011	HA	0-1			X
X7SS228-0001	11/10/2011	HA	0-1			X
X7SS228-0102	11/10/2011	HA	1-2			X
X7SS229-0001	11/10/2011	HA	0-1			X
X7SS229-0102	11/10/2011	HA	1-2			X
X7SS230-0001	11/10/2011	HA	0-1			X
X7SS230-0102	11/10/2011	HA	1-2			X
X7SS231-0001	11/10/2011	HA	0-1			X
X7SS232-0001	11/10/2011	HA	0-1			X
X7SS232-0102	11/10/2011	HA	1-2			X
X7SS233-0001	11/10/2011	HA	0-1			X
X7SS233-0102	11/10/2011	HA	1-2			X
X7SS234-0001	11/10/2011	HA	0-1			X
X7SS234-0102	11/10/2011	HA	1-2			X
X7SS237-0001	11/10/2011	HA	0-1			X
X7SS238-0001	11/10/2011	HA	0-1			X
X7SS239-0001	11/10/2011	HA	0-1			X
X7SS240-0001	11/10/2011	HA	0-1			X
X7SS240-0102	11/10/2011	HA	1-2			X

TABLE 1-1

SAMPLE COLLECTION AND ANALYSIS SUMMARY
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SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE METHOD	SAMPLE DEPTH (ft bgs)	XRF (LEAD)	FBL ANALYSIS	
					LEAD	PAHs
X7SS241-0001	11/10/2011	HA	0-1			X
X7SS241-0102	11/10/2011	HA	1-2			X
X7SS242-0001	11/9/2011	HA	0-1			X
X7SS242-0102	11/9/2011	HA	1-2			X
X7SS243-0001	11/9/2011	HA	0-1			X
X7SS243-0102	11/9/2011	HA	1-2			X
X7SS244-0001	11/9/2011	HA	0-1			X
X7SS244-0102	11/9/2011	HA	1-2			X
X7SS245-0001	11/9/2011	HA	0-1			X
X7SS245-0102	11/9/2011	HA	1-2			X
X7SS246-0001	11/9/2011	HA	0-1			X
X7SS246-0102	11/9/2011	HA	1-2			X
X7SS247-0001	11/9/2011	HA	0-1			X
X7SS247-0102	11/9/2011	HA	1-2			X
X7SS248-0001	11/9/2011	HA	0-1			X
X7SS248-0102	11/9/2011	HA	1-2			X
X7SS249-0001	11/9/2011	HA	0-1			X
X7SS249-0102	11/9/2011	HA	1-2			X
X7SS250-0001	11/9/2011	HA	0-1			X
X7SS250-0102	11/9/2011	HA	1-2			X
X7SS251-0001	11/9/2011	HA	0-1			X
X7SS251-0102	11/9/2011	HA	1-2			X
X7SS252-0001	11/9/2011	HA	0-1			X
X7SS252-0102	11/9/2011	HA	1-2			X
X7SS253-0001	11/9/2011	HA	0-1			X
X7SS253-0102	11/9/2011	HA	1-2			X
X7SS254-0001	11/9/2011	HA	0-1			X
X7SS254-0102	11/9/2011	HA	1-2			X
X7SS255-0001	11/9/2011	HA	0-1			X
X7SS255-0102	11/9/2011	HA	1-2			X
X7SS256-0001	11/9/2011	HA	0-1			X
X7SS256-0102	11/9/2011	HA	1-2			X
X7SS257-0001	11/9/2011	HA	0-1			X
X7SS257-0102	11/9/2011	HA	1-2			X
X7SS258-0001	11/9/2011	HA	0-1			X
X7SS258-0102	11/9/2011	HA	1-2			X

TABLE 1-1

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CRANE, INDIANA

SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE METHOD	SAMPLE DEPTH (ft bgs)	XRF (LEAD)	FBL ANALYSIS	
					LEAD	PAHs
X7SS259-0001	11/9/2011	HA	0-1			X
X7SS259-0102	11/9/2011	HA	1-2			X
X7SS260-0001	11/9/2011	HA	0-1			X
X7SS260-0102	11/9/2011	HA	1-2			X
X7SS261-0001	11/9/2011	HA	0-1			X
X7SS261-0102	11/9/2011	HA	1-2			X
X7SS262-0001	11/9/2011	HA	0-1			X
X7SS262-0102	11/9/2011	HA	1-2			X
X7SS263-0001	11/9/2011	HA	0-1			X
X7SS263-0102	11/9/2011	HA	1-2			X
X7SS265-0001	11/9/2011	HA	0-1			X
X7SS265-0102	11/9/2011	HA	1-2			X
X7SS266-0001	11/9/2011	HA	0-1			X
X7SS266-0102	11/9/2011	HA	1-2			X
X7SS267-0001	11/9/2011	HA	0-1			X
X7SS267-0102	11/9/2011	HA	1-2			X
X7SS270-0001	11/9/2011	HA	0-1			X
X7SS270-0102	11/9/2011	HA	1-2			X
X7SS271-0001	11/9/2011	HA	0-1			X
X7SS271-0102	11/9/2011	HA	1-2			X
X7SS272-0001	11/9/2011	HA	0-1			X
X7SS272-0102	11/9/2011	HA	1-2			X
X7-SS274-0001	11/8/2011	HA	0-1	X		
X7-SS274-0102	11/8/2011	HA	1-2	X		
X7-SS275-0001	11/8/2011	HA	0-1	X		
X7-SS275-0102	11/8/2011	HA	1-2	X		
X7-SS276-0001	11/8/2011	HA	0-1	X		
X7-SS276-0102	11/8/2011	HA	1-2	X		
X7-SS277-0001	11/8/2011	HA	0-1	X		
X7-SS277-0102	11/8/2011	HA	1-2	X		
X7-SS278-0001	11/8/2011	HA	0-1	X		
X7-SS278-0102	11/8/2011	HA	1-2	X		
X7-SS279-0001	11/8/2011	HA	0-1	X		
X7-SS279-0102	11/8/2011	HA	1-2	X		
X7-SB279-0203	11/12/2011	DPT	2-3	X	X	
X7-SS280-0001	11/8/2011	HA	0-1	X		

TABLE 1-1

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UXO 07 - SUPPLEMENTAL SOIL SAMPLING (ROUND 1)
NSA CRANE
CRANE, INDIANA

SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE METHOD	SAMPLE DEPTH (ft bgs)	XRF (LEAD)	FBL ANALYSIS	
					LEAD	PAHs
X7-SS280-0102	11/8/2011	HA	1-2	X	X	
X7-SS281-0001	11/8/2011	HA	0-1	X		
X7-SS281-0102	11/8/2011	HA	1-2	X		
X7-SS282-0001	11/8/2011	HA	0-1	X		
X7-SS282-0102	11/8/2011	HA	1-2	X		
X7-SB282-0203	11/12/2011	HA	2-3	X		
X7-SS283-0001	11/8/2011	HA	0-1	X		
X7-SS283-0102	11/8/2011	HA	1-2	X		
X7-SS284-0001	11/8/2011	HA	0-1	X		
X7-SS284-0102	11/8/2011	HA	1-2	X		
X7-SS285-0001	11/8/2011	HA	0-1	X		
X7-SS286-0001	11/8/2011	HA	0-1	X		
X7-SS287-0001	11/8/2011	HA	0-1	X	X	
X7-SS288-0001	11/8/2011	HA	0-1	X	X	
X7-SS289-0001	11/8/2011	HA	0-1	X		
X7-SS290-0001	11/8/2011	HA	0-1	X		
X7-SS290-0102	11/8/2011	HA	1-2	X		
X7-SS291-0001	11/8/2011	HA	0-1	X		
X7-SS291-0102	11/8/2011	HA	1-2	X		
X7-SB291-0203	11/11/2011	HA	2-3	X	X	
X7-SS292-0001	11/8/2011	HA	0-1	X		
X7-SS292-0102	11/8/2011	HA	1-2	X		
X7-SS293-0001	11/8/2011	HA	0-1	X		
X7-SS294-0001	11/8/2011	HA	0-1	X		
X7-SS294-0102	11/8/2011	HA	1-2	X		
X7-SS295-0001	11/8/2011	HA	0-1	X		
X7-SS295-0102	11/8/2011	HA	1-2	X		
X7-SB295-0203	11/11/2011	HA	0-1	X		
X7-SS296-0001	11/8/2011	HA	1-2	X		
X7-SS296-0102	11/8/2011	HA	1-2	X		
X7-SB296-0203	11/11/2011	HA	2-3	X		
X7-SS297-0001	11/7/2011	HA	0-1	X		
X7-SS297-0102	11/7/2011	HA	1-2	X		
X7-SB297-0203	11/11/2011	HA	2-3	X		
X7-SS298-0001	11/7/2011	HA	0-1	X		
X7-SS298-0102	11/7/2011	HA	1-2	X		

TABLE 1-1

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SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE METHOD	SAMPLE DEPTH (ft bgs)	XRF (LEAD)	FBL ANALYSIS	
					LEAD	PAHs
X7-SS299-0001	11/7/2011	HA	0-1	X		
X7-SS299-0102	11/7/2011	HA	1-2	X		
X7-SB299-0203	11/11/2011	HA	2-3	X		
X7-SS300-0001	11/7/2011	HA	0-1	X		
X7-SS300-0102	11/7/2011	HA	1-2	X		
X7-SS301-0001	11/7/2011	HA	0-1	X		
X7-SS301-0102	11/7/2011	HA	1-2	X		
X7-SB301-0203	11/11/2011	HA	2-3	X		
X7-SS302-0001	11/7/2011	HA	0-1	X		
X7-SS302-0102	11/7/2011	HA	1-2	X		
X7-SS303-0001	11/7/2011	HA	0-1	X		
X7-SS303-0102	11/7/2011	HA	1-2	X		
X7-SS304-0001	11/7/2011	HA	0-1	X		
X7-SS305-0001	11/8/2011	HA	0-1	X		
X7-SS305-0102	11/8/2011	HA	1-2	X		
X7-SS306-0001	11/8/2011	HA	0-1	X		
X7-SS306-0102	11/8/2011	HA	1-2	X		
X7-SB306-0203	11/11/2011	HA	2-3	X		
X7-SS307-0001	11/8/2011	HA	0-1	X		
X7-SS307-0102	11/8/2011	HA	1-2	X		
X7-SS308-0001	11/7/2011	HA	0-1	X		
X7-SS308-0102	11/7/2011	HA	1-2	X		
X7-SB308-0203	11/11/2011	HA	2-3	X		
X7-SS309-0001	11/7/2011	HA	0-1	X		
X7-SS310-0001	11/7/2011	HA	0-1	X		
X7-SS310-0102	11/7/2011	HA	1-2	X	X	
X7-SB310-0203	11/12/2011	HA	2-3	X	X	
X7-SS311-0001	11/7/2011	HA	0-1	X		
X7-SS312-0001	11/7/2011	HA	0-1	X		
X7-SS312-0102	11/7/2011	HA	1-2	X	X	
X7-SS313-0001	11/7/2011	HA	0-1	X	X	
X7-SS313-0102	11/7/2011	HA	1-2	X		
X7-SB313-0203	11/12/2011	HA	2-3	X		
X7-SS314-0001	11/7/2011	HA	0-1	X		
X7-SS314-0102	11/7/2011	HA	1-2	X		
X7-SS315-0001	11/7/2011	HA	0-1	X	X	

TABLE 1-1

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UXO 07 - SUPPLEMENTAL SOIL SAMPLING (ROUND 1)
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CRANE, INDIANA**

SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE METHOD	SAMPLE DEPTH (ft bgs)	XRF (LEAD)	FBL ANALYSIS	
					LEAD	PAHs
X7-SS315-0102	11/7/2011	HA	1-2	X		
X7-SS316-0001	11/7/2011	HA	0-1	X		
X7-SS316-0102	11/7/2011	HA	1-2	X		
X7-SS317-0001	11/7/2011	HA	0-1	X		
X7-SS318-0001	11/7/2011	HA	0-1	X		
X7-SS319-0001	11/7/2011	HA	0-1	X		
X7-SS320-0001	11/7/2011	HA	0-1	X		
X7-SS320-0102	11/7/2011	HA	1-2	X		
X7-SB320-0203	11/12/2011	HA	2-3	X		
X7-SS321-0001	11/12/2011	HA	0-1	X	X	
X7-SS321-0102	11/12/2011	HA	1-2	X		
X7-SS323-0001	11/12/2011	HA	0-1	X	X	
X7-SS323-0102	11/12/2011	HA	1-2	X		
X7-SS325-0001	11/12/2011	HA	0-1	X		
X7-SS325-0102	11/11/2011	HA	1-2	X		
X7-SS327-0001	11/12/2011	HA	0-1	X	X	
X7-SS329-0001	11/12/2011	HA	0-1	X	X	
X7-SS331-0001	11/12/2011	HA	0-1	X	X	
X7-SS331-0102	11/12/2011	HA	1-2	X		
X7-SS333-0001	11/12/2011	HA	0-1	X	X	
X7-SS333-0102	11/12/2011	HA	1-2	X		
X7-SS336-0001	11/12/2011	HA	0-1	X	X	
X7-SS336-0102	11/12/2011	HA	1-2	X		
X7-SS337-0001	11/12/2011	HA	0-1	X	X	
X7-SS342-0102	11/12/2011	HA	1-2	X	X	
X7-SS344-0001	11/12/2011	HA	0-1	X	X	
X7-SS344-0102	11/12/2011	HA	1-2	X		
X7-SS345-0001	11/11/2011	HA	0-1	X		
X7-SS345-0102	11/11/2011	HA	1-2	X	X	
X7-SS347-0001	11/11/2011	HA	0-1	X		
X7-SS347-0102	11/11/2011	HA	1-2	X	X	
X7-SS349-0001	11/11/2011	HA	0-1	X		
X7-SS349-0102	11/11/2011	HA	1-2	X		
X7-SS351-0001	11/11/2011	HA	0-1	X	X	
X7-SS351-0102	11/11/2011	HA	1-2	X	X	
X7-SS353-0001	11/11/2011	HA	0-1	X	X	

TABLE 1-1

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UXO 07 - SUPPLEMENTAL SOIL SAMPLING (ROUND 1)
NSA CRANE
CRANE, INDIANA

SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE METHOD	SAMPLE DEPTH (ft bgs)	XRF (LEAD)	FBL ANALYSIS	
					LEAD	PAHs
X7-SS355-0001	11/11/2011	HA	0-1	X	X	
X7-SS355-0102	11/11/2011	HA	1-2	X		
X7-SS357-0001	11/11/2011	HA	0-1	X		
X7-SS357-0102	11/11/2011	HA	1-2	X		
X7-SS358-0001	11/11/2011	HA	0-1	X		
X7-SS358-0102	11/11/2011	HA	1-2	X		
X7-SS360-0001	11/11/2011	HA	0-1	X		
X7-SS360-0102	11/11/2011	HA	1-2	X		
X7-SS361-0001	11/11/2011	HA	0-1	X		
X7-SS361-0102	11/11/2011	HA	1-2	X		
X7-SS363-0001	11/11/2011	HA	0-1	X	X	
X7-SS363-0102	11/11/2011	HA	1-2	X		
X7-SS365-0001	11/11/2011	HA	0-1	X		
X7-SS365-0102	11/11/2011	HA	1-2	X		
X7-SS368-0001	11/11/2011	HA	0-1	X		
X7-SS368-0102	11/11/2011	HA	1-2	X		
X7-SS369-0001	11/11/2011	HA	0-1	X		
X7-SS369-0102	11/11/2011	HA	1-2	X	X	
X7-SS371-0001	11/12/2011	HA	0-1	X	X	
X7-SS373-0001	11/12/2011	HA	0-1	X		
X7-SS376-0001	11/12/2011	HA	0-1	X		
X7-SS376-0102	11/12/2011	HA	1-2	X	X	
X7-SS377-0001	11/12/2011	HA	0-1	X		
X7-SS377-0102	11/12/2011	HA	1-2	X	X	
X7-SS379-0001	11/12/2011	HA	0-1	X		
X7-SS383-0001	11/12/2011	HA	0-1	X		
X7-SS385-0001	11/12/2011	HA	0-1	X	X	
X7-SS385-0102	11/12/2011	HA	1-2	X		
X7-SS387-0001	11/12/2011	HA	0-1	X		
X7-SS391-0001	11/8/2011	HA	0-1	X		
X7-SS391-0102	11/8/2011	HA	1-2	X		
X7-SB391-0203	11/11/2011	HA	2-3	X		
X7-SS392-0001	11/8/2011	HA	0-1	X	X	
X7-SS393-0001	11/8/2011	HA	0-1	X		
X7-SS393-0102	11/8/2011	HA	1-2	X	X	
X7-SB393-0203	11/11/2011	HA	2-3	X		

TABLE 1-1

**SAMPLE COLLECTION AND ANALYSIS SUMMARY
UXO 07 - SUPPLEMENTAL SOIL SAMPLING (ROUND 1)
NSA CRANE
CRANE, INDIANA**

SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE METHOD	SAMPLE DEPTH (ft bgs)	XRF (LEAD)	FBL ANALYSIS	
					LEAD	PAHs
X7-SS394-0001	11/8/2011	HA	0-1	X		
X7-SS394-0102	11/8/2011	HA	1-2	X		
X7-SB394-0203	11/11/2011	HA	2-3	X		
X7-SS395-0001	11/8/2011	HA	0-1	X		
X7-SS395-0102	11/8/2011	HA	1-2	X		
X7-SB395-0203	11/11/2011	HA	2-3	X		
X7-SS396-0001	11/8/2011	HA	0-1	X		
X7-SS396-0102	11/8/2011	HA	1-2	X		
X7-SB396-0203	11/11/2011	HA	2-3	X		
X7-SS398-0001	11/11/2011	HA	0-1	X		
X7-SS398-0102	11/11/2011	HA	1-2	X		
X7-SS400-0001	11/11/2011	HA	0-1	X		
X7-SS401-0001	11/11/2011	HA	0-1	X	X	
X7-SS401-0102	11/11/2011	HA	1-2	X		
X7-SS402-0001	11/11/2011	HA	0-1	X	X	
X7-SS404-0001	11/11/2011	HA	0-1	X		
X7-SS404-0102	11/11/2011	HA	1-2	X		
X7-SS406-0001	11/11/2011	HA	0-1	X		
X7-SS407-0001	11/14/2011	HA	0-1	X	X	
X7-SS408-0001	11/14/2011	HA	0-1	X	X	
X7-SS408-0102	11/14/2011	HA	1-2	X		
X7-SB409-0304	11/14/2011	DPT	3-4	X		
X7-SS410-0001	11/14/2011	HA	0-1	X	X	
X7-SB411-0304	11/14/2011	DPT	3-4	X		
X7-SS412-0001	11/14/2011	HA	0-1	X	X	
X7-SS412-0102	11/14/2011	HA	1-2	X		
X7-SB413-0304	11/14/2011	DPT	3-4	X		
X7-SS414-0001	11/14/2011	HA	0-1	X	X	
X7-SS414-0102	11/14/2011	HA	1-2	X		
X7-SS415-0001	11/14/2011	HA	0-1	X	X	
X7-SS415-0102	11/14/2011	HA	1-2	X		
X7-SS416-0001	11/14/2011	HA	0-1	X	X	
X7-SB417-0304	11/14/2011	DPT	3-4	X		
X7-SB417-0405	11/14/2011	DPT	4-5	X		
X7-SB417-0506	11/14/2011	DPT	5-6	X		
X7-SS418-0001	11/14/2011	HA	0-1	X		

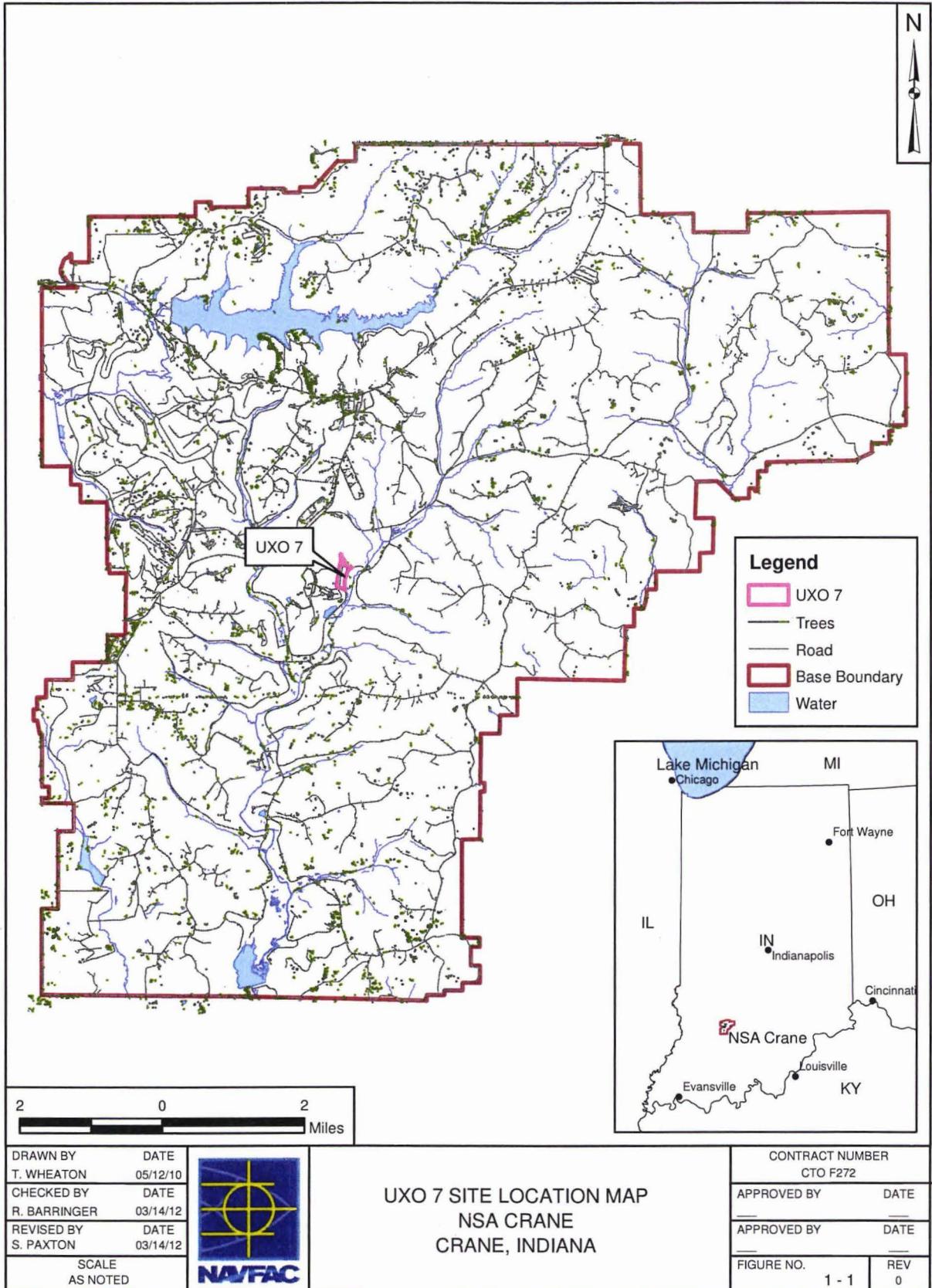
TABLE 1-1

SAMPLE COLLECTION AND ANALYSIS SUMMARY
UXO 07 - SUPPLEMENTAL SOIL SAMPLING (ROUND 1)
NSA CRANE
CRANE, INDIANA

SAMPLE ID	SAMPLE COLLECTION DATE	SAMPLE METHOD	SAMPLE DEPTH (ft bgs)	XRF (LEAD)	FBL ANALYSIS	
					LEAD	PAHs
X7-SS420-0001	11/14/2011	HA	0-1	X		
X7-SS420-0102	11/14/2011	HA	1-2	X		
X7-SS420-0203	11/14/2011	HA	2-3	X		
X7-SS421-0001	11/14/2011	HA	0-1	X		
X7-SS421-0102	11/14/2011	HA	1-2	X		
X7-SS422-0001	11/14/2011	HA	0-1	X		
X7-SS422-0102	11/14/2011	HA	1-2	X	X	
X7-SS422-0203	11/14/2011	HA	2-3	X	X	
X7-SS423-0001	11/14/2011	HA	0-1	X	X	
X7-SS423-0102	11/14/2011	HA	1-2	X		
X7-SS424-0001	11/14/2011	HA	0-1	X	X	
X7-SS424-0102	11/14/2011	HA	1-2	X	X	
X7-SS425-0001	11/14/2011	HA	0-1	X	X	
X7-SS425-0102	11/14/2011	HA	1-2	X		
X7-SB426-0304	11/14/2011	DPT	3-4	X		
X7-SB427-0304	11/14/2011	DPT	3-4	X	X	
X7-SB428-0304	11/14/2011	DPT	3-4	X		
X7-SS429-0001	11/14/2011	HA	0-1	X	X	
X7-SB430-0304	11/15/2011	DPT	3-4	X		
X7-SB430-0405	11/15/2011	DPT	4-5	X		
X7-SB430-0506	11/15/2011	DPT	5-6	X		
X7-SB431-0304	11/15/2011	DPT	3-4	X		
X7-SB431-0405	11/15/2011	DPT	4-5	X	X	
X7-SB432-0304	11/15/2011	DPT	3-4	X		
X7-SB432-0405	11/15/2011	DPT	4-5	X		
X7-SS434-0001	11/15/2011	HA	0-1	X	X	
X7-SS434-0102	11/15/2011	HA	1-2	X		

DPT = Direct-push technology

HA = Hand auger



DRAWN BY	DATE
T. WHEATON	05/12/10
CHECKED BY	DATE
R. BARRINGER	03/14/12
REVISED BY	DATE
S. PAXTON	03/14/12

SCALE
AS NOTED



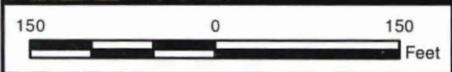
**UXO 7 SITE LOCATION MAP
NSA CRANE
CRANE, INDIANA**

CONTRACT NUMBER
CTO F272

APPROVED BY _____ DATE _____

APPROVED BY _____ DATE _____

FIGURE NO.	REV
1 - 1	0

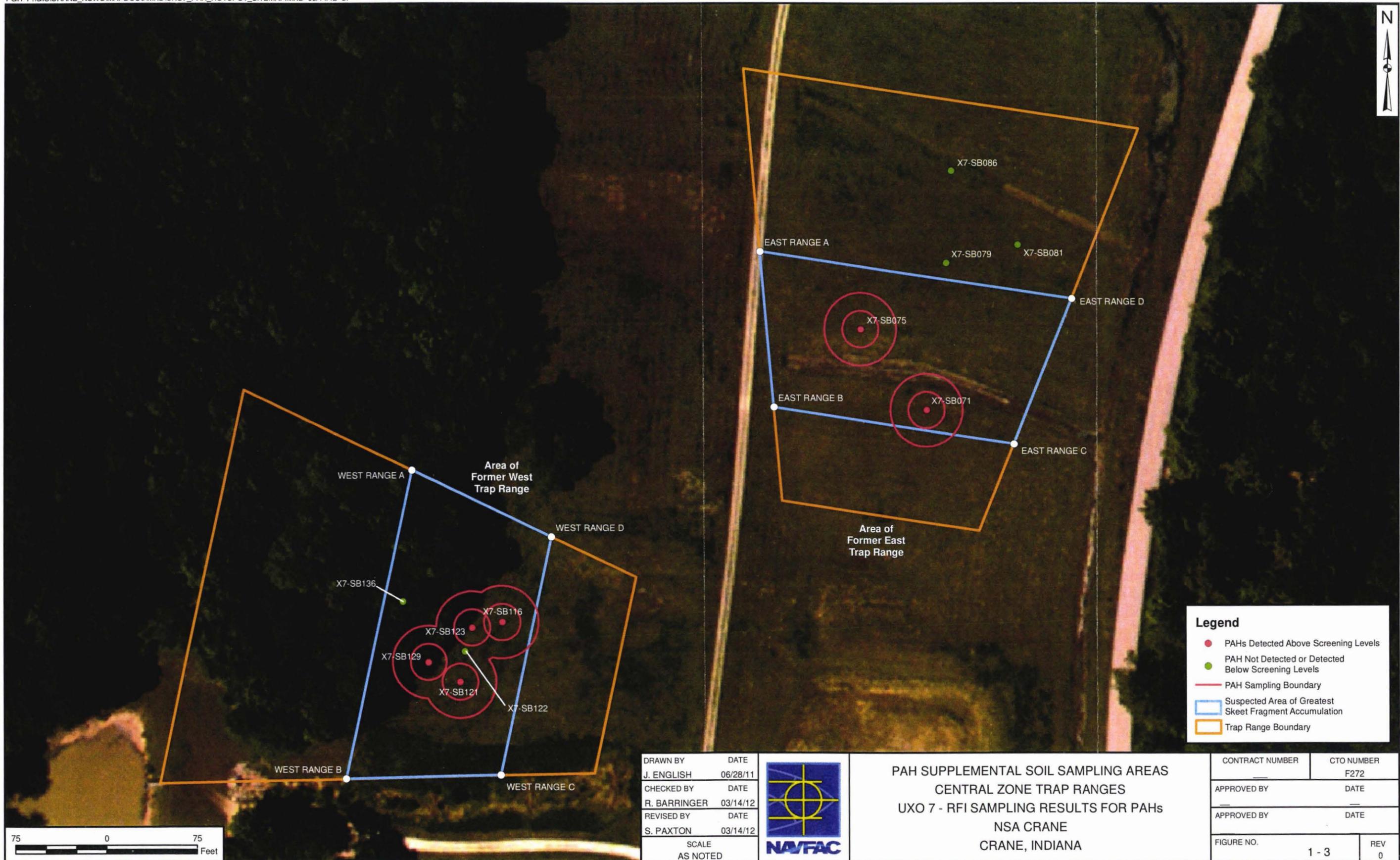


DRAWN BY	DATE
J. ENGLISH	07/07/11
CHECKED BY	DATE
R. BARRINGER	03/14/12
REVISED BY	DATE
S. PAXTON	03/14/12
SCALE AS NOTED	



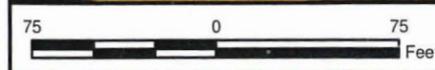
UXO 7 SMALL ARMS RANGES
NSA CRANE
CRANE, INDIANA

CONTRACT NUMBER	CTO NUMBER
	F272
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO.	REV
1 - 2	0

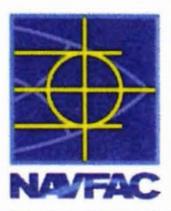


Legend

- PAHs Detected Above Screening Levels
- PAH Not Detected or Detected Below Screening Levels
- PAH Sampling Boundary
- Suspected Area of Greatest Skeet Fragment Accumulation
- Trap Range Boundary



DRAWN BY	DATE
J. ENGLISH	06/28/11
CHECKED BY	DATE
R. BARRINGER	03/14/12
REVISED BY	DATE
S. PAXTON	03/14/12
SCALE AS NOTED	



**PAH SUPPLEMENTAL SOIL SAMPLING AREAS
CENTRAL ZONE TRAP RANGES
UXO 7 - RFI SAMPLING RESULTS FOR PAHs
NSA CRANE
CRANE, INDIANA**

CONTRACT NUMBER	CTO NUMBER
	F272
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO.	REV
1 - 3	0

2.0 **RESULTS**

This section presents the combined results of the initial 2007 RFI and the 2011 Round 1 supplemental sampling for the East and West Trap Ranges and the areas within the northern portion of the Rifle Range. **Table 1-1** provides a summary of the samples collected during the Round 1 supplemental sampling event and the full analytical results from the RFI and the Round 1 supplemental sampling event can be found in **Appendix A**.

2.1 **Trap Ranges**

During the initial UXO 7 RFI sampling event, samples were collected and analyzed for both PAHs and metals. The analytical results indicated an excess human health risk from the PAHs. The United States Environmental Protection Agency (USEPA) has identified seven PAHs as potentially carcinogenic: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno-(1,2,3-cd)-pyrene. Of these PAHs, benzo(a)pyrene has been subjected to the most toxicological study and the USEPA has used the toxicological data to establish quantitative toxicological parameters (cancer slope factors and inhalation unit risks) for benzo(a)pyrene. All seven of these PAHs have a similar chemical structure and similar chemical properties. Laboratory studies suggest that these chemicals act similarly from the perspective of carcinogenicity and that the carcinogenic potency of the individual PAHs can be evaluated with reference to the carcinogenic potency of benzo(a)pyrene. Therefore, the USEPA has developed a toxicity equivalency factor (TEF) for each potentially carcinogenic PAH that can be used to convert the concentration of that PAH to an equivalent concentration of benzo(a)pyrene. Since benzo(a)pyrene is often abbreviated BaP, this process is known as determining the BaP equivalent concentration.

Therefore, in addition to a direct comparison to individual PAH PALs, a total for calculated BaP equivalents was also done. The calculated screening value for BaP is 0.015 milligrams per kilogram (mg/kg) at a human health risk screening level of 1×10^{-6} .

2.1.1 **PAHs**

Table 2-1 lists the BaP equivalent results for all samples collected at the UXO 7 West Trap Range during the RFI and the supplemental investigation. **Figure 2-1** identifies the soil samples with exceedences of the BaP human health screening criteria for the West Trap Range. **Table 2-2** lists the BaP equivalent results for all samples collected at the UXO 7 East Trap Range during the RFI and the supplemental investigation. **Figure 2-2** identifies the soil samples with exceedences of the BaP human health

screening criteria for the East Trap Range. Based on the collected soil samples from the UXO 7 trap ranges and the BaP equivalent concentrations calculated for those soil samples, there is PAH contamination present within the footprints of the former East and West Trap Ranges above the human health screening level of 0.015 mg/kg BaP equivalents (See [Figures 2-1](#) and [2-2](#)). Because the primary screening level of 0.015 mg/kg BaP equivalents for the human health screening level of 1×10^{-6} is particularly low (15 parts per billion), many of the soil samples collected from the former trap ranges that contain detectable levels of PAHs will likely exceed this screening level established for the human health risk level of 1×10^{-6} .

On the West Trap Range additional soil sampling for PAHs will be needed in the east, south, and north portions of the skeet accumulation area to confirm that the lateral and vertical extent of the BaP equivalent concentrations in soil where analytical samples have not been collected and where potential contamination has not been fully delineated. Additional samples are proposed to confirm the lateral and vertical extent of the BaP equivalent concentrations identified in soil samples on the West Trap Range, and is further discussed in [Section 3.0](#).

On the East Trap Range additional soil sampling will be needed in the north and south, as well as the east and west portions of the skeet accumulation area to confirm the BaP equivalent concentrations in soil where analytical samples have not been collected and where potential contamination has not been fully delineated. Additional samples are proposed to confirm the lateral and vertical extent of the BaP equivalent concentrations identified in soil samples on the East Trap Range, and is further discussed in [Section 3.0](#).

2.2 Rifle Range

During the initial UXO 7 RFI sampling event, samples were collected from various locations at the Rifle Range including the main target area, the impact hill behind the main target area, the 100-, 200-, 300-, 400-, and 500-yard firing positions (berms), the open areas between the firing positions, and the dirt mound located between the 300- and 400-yard firing positions. All samples were initially analyzed in the field for lead via XRF with a subset of those samples selected for metals analysis at the FBL. Based on the analytical results, various concentrations of lead existed at the 500-yard Rifle Range.

2.2.1 Lead

Per an e-mail from Mr. Peter Ramanauskas, dated June 24, 2011, the EPA agreed upon a preliminary remediation goal (PRG) concentration of 192 mg/kg as an acceptable benchmark to be applied as a site-wide arithmetic average soil lead concentration for UXO 7. Lead concentrations greater than the Navy/EPA agreed upon average concentration of 192 mg/kg remain in the northern zone of UXO 7 ([Table 2-3](#)). Specifically, these areas include the 400-yard firing berm ([Figure 2-3](#)), a small drainageway

area located between the 400 and 500-yard firing berms ([Figure 2-4](#)), and a dirt mound whose origin is currently unknown ([Figure 2-5](#)).

TABLE 2-1

**SOIL SAMPLE RESULTS SUMMARY - WEST TRAP RANGE
UXO 7 - RFI AND SUPPLEMENTAL SOIL SAMPLES (PAHs)
NSA CRANE
CRANE, INDIANA**

SAMPLE ID	BaP EQUIVALENTS (mg/kg)
X7SS116-0002	1.2016
X7SS121-0002	11.2544
X7SS122-0002	0.0181
X7SS123-0002	2.2173
X7SS129-0002	0.1115
X7SS136-0002	0.0010
X7SS200-0001	0.0707
X7SS200-0102	0.0254
X7SS201-0001	85.2068
X7SS201-0102	0.0068
X7SS202-0001	0.8697
X7SS202-0102	0.0080
X7SS203-0001	2.3358
X7SS203-0102	0.1940
X7SS204-0001	0.2854
X7SS204-0102	0.0040
X7SS205-0001	0.0330
X7SS205-0102	0.0055
X7SS206-0001	0.0043
X7SS206-0102	0.0069
X7SS207-0001	0.6108
X7SS207-0102	0.0095
X7SS208-0001	1.3137
X7SS208-0102	0.0111
X7SS209-0001	0.2545
X7SS209-0102	0.0169
X7SS210-0001	0.4863
X7SS210-0102	0.0099
X7SS211-0001	1.7173
X7SS211-0102	0.0133
X7SS212-0001	0.0048
X7SS212-0102	0.0041
X7SS213-0001	0.0300
X7SS213-0102	0.0040
X7SS214-0001	35.0757
X7SS214-0102	0.0037
X7SS215-0001	0.0055
X7SS215-0102	0.0042

TABLE 2-1

**SOIL SAMPLE RESULTS SUMMARY - WEST TRAP RANGE
UXO 7 - RFI AND SUPPLEMENTAL SOIL SAMPLES (PAHs)
NSA CRANE
CRANE, INDIANA**

SAMPLE ID	BaP EQUIVALENTS (mg/kg)
X7SS216-0001	0.0043
X7SS216-0102	0.0040
X7SS217-0001	1.4685
X7SS217-0102	0.0498
X7SS218-0001	1.4477
X7SS218-0102	0.0092
X7SS219-0001	0.1290
X7SS219-0102	0.0039
X7SS220-0001	0.2844
X7SS220-0102	0.0100
X7SS221-0001	0.0047
X7SS221-0102	0.0040
X7SS222-0001	0.2461
X7SS222-0102	0.0093
X7SS223-0001	0.1068
X7SS223-0102	0.0063
X7SS224-0001	0.0211
X7SS225-0001	0.0563
X7SS225-0102	0.0046
X7SS226-0001	0.2964
X7SS226-0102	0.0039
X7SS227-0001	0.1679
X7SS228-0001	0.1189
X7SS228-0102	0.0129
X7SS229-0001	5.4938
X7SS229-0102	0.0087
X7SS230-0001	0.2924
X7SS230-0102	0.0161
X7SS231-0001	0.0100
X7SS232-0001	9.0937
X7SS232-0102	0.0045
X7SS233-0001	0.1361
X7SS233-0102	0.0038
X7SS234-0001	0.1377
X7SS234-0102	0.0285
X7SS237-0001	0.0082
X7SS238-0001	0.0163
X7SS239-0001	0.0144

TABLE 2-1

**SOIL SAMPLE RESULTS SUMMARY - WEST TRAP RANGE
 UXO 7 - RFI AND SUPPLEMENTAL SOIL SAMPLES (PAHs)
 NSA CRANE
 CRANE, INDIANA**

SAMPLE ID	BaP EQUIVALENTS (mg/kg)
X7SS240-0001	0.0726
X7SS240-0102	0.0061
X7SS241-0001	0.6665
X7SS241-0102	0.0328
X7SS242-0001	0.2570
X7SS242-0102	0.2163
X7SS243-0001	0.0210
X7SS243-0102	0.3438
X7SS244-0001	0.0585
X7SS244-0102	0.0313
X7SS245-0001	0.0269
X7SS245-0102	0.0492
X7SS246-0001	0.0404
X7SS246-0102	0.1050
X7SS247-0001	0.1532
X7SS247-0102	5.6961
X7SS248-0001	0.0085
X7SS248-0102	0.0414
X7SS249-0001	0.0130
X7SS249-0102	0.0266
X7SS250-0001	0.0089
X7SS250-0102	0.1319
X7SS251-0001	0.0189
X7SS251-0102	0.0196
X7SS252-0001	0.0117
X7SS252-0102	0.0362
X7SS253-0001	0.0094
X7SS253-0102	0.0629
X7SS254-0001	0.6998
X7SS254-0102	0.2654
X7SS255-0001	1.7376
X7SS255-0102	9.4851
X7SS256-0001	0.0278
X7SS256-0102	0.1665
X7SS257-0001	0.0359
X7SS257-0102	0.3454
X7SS258-0001	0.0103
X7SS258-0102	0.0042

TABLE 2-1

**SOIL SAMPLE RESULTS SUMMARY - WEST TRAP RANGE
UXO 7 - RFI AND SUPPLEMENTAL SOIL SAMPLES (PAHs)
NSA CRANE
CRANE, INDIANA**

SAMPLE ID	BaP EQUIVALENTS (mg/kg)
X7SS259-0001	0.0044
X7SS259-0102	0.0042
X7SS260-0001	0.0122
X7SS260-0102	0.1475
X7SS261-0001	0.0298
X7SS261-0102	0.2931
X7SS262-0001	0.4981
X7SS262-0102	0.0902
X7SS263-0001	0.4152
X7SS263-0102	0.0058
X7SS265-0001	0.0184
X7SS265-0102	0.0058
X7SS266-0001	0.0135
X7SS266-0102	0.0428
X7SS267-0001	0.0139
X7SS267-0102	0.0222
X7SS270-0001	0.0118
X7SS270-0102	0.0040
X7SS271-0001	0.0834
X7SS271-0102	0.1533
X7SS272-0001	0.1396

TABLE 2-2

**SOIL SAMPLE RESULTS SUMMARY - EAST TRAP RANGE
UXO 7 - RFI AND SUPPLEMENTAL SOIL SAMPLES (PAHs)
NSA CRANE
CRANE, INDIANA**

SAMPLE ID	BaP EQUIVALENTS (mg/kg)
X7SS071-0002	0.0213
X7SS075-0002	0.2321
X7SS079-0002	0.0010
X7SS081-0002	0.0010
X7SS086-0002	0.0010
X7SS200-0001	0.0707
X7SS200-0102	0.0254
X7SS201-0001	85.2068
X7SS201-0102	0.0068
X7SS202-0001	0.8697
X7SS202-0102	0.0080
X7SS203-0001	2.3358
X7SS203-0102	0.1940
X7SS204-0001	0.2854
X7SS204-0102	0.0040
X7SS205-0001	0.0330
X7SS205-0102	0.0055
X7SS206-0001	0.0043
X7SS206-0102	0.0069
X7SS207-0001	0.6108
X7SS207-0102	0.0095
X7SS208-0001	1.3137
X7SS208-0102	0.0111
X7SS209-0001	0.2545
X7SS209-0102	0.0169
X7SS210-0001	0.4863
X7SS210-0102	0.0099
X7SS211-0001	1.7173
X7SS211-0102	0.0133
X7SS212-0001	0.0048
X7SS212-0102	0.0041
X7SS213-0001	0.0300
X7SS213-0102	0.0040
X7SS214-0001	35.0757
X7SS214-0102	0.0037
X7SS215-0001	0.0055
X7SS215-0102	0.0042
X7SS216-0001	0.0043

TABLE 2-2

**SOIL SAMPLE RESULTS SUMMARY - EAST TRAP RANGE
UXO 7 - RFI AND SUPPLEMENTAL SOIL SAMPLES (PAHs)
NSA CRANE
CRANE, INDIANA**

SAMPLE ID	BaP EQUIVALENTS (mg/kg)
X7SS216-0102	0.0040
X7SS217-0001	1.4685
X7SS217-0102	0.0498
X7SS218-0001	1.4477
X7SS218-0102	0.0092
X7SS219-0001	0.1290
X7SS219-0102	0.0039
X7SS220-0001	0.2844
X7SS220-0102	0.0100
X7SS221-0001	0.0047
X7SS221-0102	0.0040
X7SS222-0001	0.2461
X7SS222-0102	0.0093
X7SS223-0001	0.1068
X7SS223-0102	0.0063
X7SS224-0001	0.0211
X7SS225-0001	0.0563
X7SS225-0102	0.0046
X7SS226-0001	0.2964
X7SS226-0102	0.0039
X7SS227-0001	0.1679
X7SS228-0001	0.1189
X7SS228-0102	0.0129
X7SS229-0001	5.4938
X7SS229-0102	0.0087
X7SS230-0001	0.2924
X7SS230-0102	0.0161
X7SS231-0001	0.0100
X7SS232-0001	9.0937
X7SS232-0102	0.0045
X7SS233-0001	0.1361
X7SS233-0102	0.0038
X7SS234-0001	0.1377
X7SS234-0102	0.0285
X7SS237-0001	0.0082
X7SS238-0001	0.0163
X7SS239-0001	0.0144
X7SS240-0001	0.0726

TABLE 2-2

**SOIL SAMPLE RESULTS SUMMARY - EAST TRAP RANGE
UXO 7 - RFI AND SUPPLEMENTAL SOIL SAMPLES (PAHs)
NSA CRANE
CRANE, INDIANA**

SAMPLE ID	BaP EQUIVALENTS (mg/kg)
X7SS240-0102	0.0061
X7SS241-0001	0.6665
X7SS241-0102	0.0328
X7SS242-0001	0.2570
X7SS242-0102	0.2163
X7SS243-0001	0.0210
X7SS243-0102	0.3438
X7SS244-0001	0.0585
X7SS244-0102	0.0313
X7SS245-0001	0.0269
X7SS245-0102	0.0492
X7SS246-0001	0.0404
X7SS246-0102	0.1050
X7SS247-0001	0.1532
X7SS247-0102	5.6961
X7SS248-0001	0.0085
X7SS248-0102	0.0414
X7SS249-0001	0.0130
X7SS249-0102	0.0266
X7SS250-0001	0.0089
X7SS250-0102	0.1319
X7SS251-0001	0.0189
X7SS251-0102	0.0196
X7SS252-0001	0.0117
X7SS252-0102	0.0362
X7SS253-0001	0.0094
X7SS253-0102	0.0629
X7SS254-0001	0.6998
X7SS254-0102	0.2654
X7SS255-0001	1.7376
X7SS255-0102	9.4851
X7SS256-0001	0.0278
X7SS256-0102	0.1665
X7SS257-0001	0.0359
X7SS257-0102	0.3454
X7SS258-0001	0.0103
X7SS258-0102	0.0042
X7SS259-0001	0.0044

TABLE 2-2

**SOIL SAMPLE RESULTS SUMMARY - EAST TRAP RANGE
UXO 7 - RFI AND SUPPLEMENTAL SOIL SAMPLES (PAHs)
NSA CRANE
CRANE, INDIANA**

SAMPLE ID	BaP EQUIVALENTS (mg/kg)
X7SS259-0102	0.0042
X7SS260-0001	0.0122
X7SS260-0102	0.1475
X7SS261-0001	0.0298
X7SS261-0102	0.2931
X7SS262-0001	0.4981
X7SS262-0102	0.0902
X7SS263-0001	0.4152
X7SS263-0102	0.0058
X7SS265-0001	0.0184
X7SS265-0102	0.0058
X7SS266-0001	0.0135
X7SS266-0102	0.0428
X7SS267-0001	0.0139
X7SS267-0102	0.0222
X7SS270-0001	0.0118
X7SS270-0102	0.0040
X7SS271-0001	0.0834
X7SS271-0102	0.1533
X7SS272-0001	0.1396

TABLE 2-3

**SOIL SAMPLE RESULTS SUMMARY - RIFLE RANGE
UXO 7 - SUPPLEMENTAL SOIL SAMPLES (LEAD)
NSA CRANE
CRANE, INDIANA**

SAMPLE ID	LEAD - XRF (ppm)	LEAD - CALCULATED (mg/kg)	LEAD - FBL (mg/kg)
X7-SS274-0001	735.00	670.00	---
X7-SS274-0102	433.00	397.00	---
X7-SS275-0001	451.00	413.00	---
X7-SS275-0102	675.00	616.00	---
X7-SS276-0001	135.00	128.00	---
X7-SS276-0102	94.33	91.00	---
X7-SS277-0001	417.00	382.00	---
X7-SS277-0102	342.00	315.00	---
X7-SS278-0001	507.00	464.00	---
X7-SS278-0102	342.00	315.00	---
X7-SS279-0001	445.00	408.00	---
X7-SS279-0102	410.00	376.00	---
X7-SB279-0203	19.67	---	20.1
X7-SS280-0001	661.00	603.00	---
X7-SS280-0102	103.00	---	94.3
X7-SS281-0001	669.00	611.00	---
X7-SS281-0102	101.00	96.60	---
X7-SS282-0001	612.00	559.00	---
X7-SS282-0102	329.00	303.00	---
X7-SB282-0203	92.00	88.80	---
X7-SS283-0001	584.00	534.00	---
X7-SS283-0102	572.00	522.00	---
X7-SS284-0001	550.00	503.00	---
X7-SS284-0102	90.33	87.30	---
X7-SS285-0001	428.00	392.00	---
X7-SS286-0001	203.00	189.00	---
X7-SS287-0001	66.33	---	44.8
X7-SS288-0001	81.67	---	63.8
X7-SS289-0001	80.00	78.00	---
X7-SS290-0001	152.00	143.00	---
X7-SS290-0102	25.67	29.00	---
X7-SS291-0001	1306.00	1186.00	---
X7-SS291-0102	397.00	365.00	---
X7-SB291-0203	304.00	---	203
X7-SS292-0001	244.00	226.00	---
X7-SS292-0102	94.00	90.60	---
X7-SS293-0001	73.00	71.60	---
X7-SS294-0001	157.00	148.00	---
X7-SS294-0102	62.00	61.70	---

TABLE 2-3

SOIL SAMPLE RESULTS SUMMARY - RIFLE RANGE
 UXO 7 - SUPPLEMENTAL SOIL SAMPLES (LEAD)
 NSA CRANE
 CRANE, INDIANA

SAMPLE ID	LEAD - XRF (ppm)	LEAD - CALCULATED (mg/kg)	LEAD - FBL (mg/kg)
X7-SS295-0001	369.00	339.00	---
X7-SS295-0102	420.00	386.00	---
X7-SB295-0203	521.00	477.00	---
X7-SS296-0001	899.00	818.00	---
X7-SS296-0102	330.00	304.00	---
X7-SB296-0203	303.00	280.00	---
X7-SS297-0001	708.00	646.00	---
X7-SS297-0102	398.00	366.00	---
X7-SB297-0203	250.00	232.00	---
X7-SS298-0001	388.00	356.00	---
X7-SS298-0102	452.00	414.00	---
X7-SS299-0001	367.00	338.00	---
X7-SS299-0102	522.00	478.00	---
X7-SB299-0203	129.00	122.00	---
X7-SS300-0001	248.00	230.00	---
X7-SS300-0102	246.00	228.00	---
X7-SS301-0001	176.00	164.00	---
X7-SS301-0102	388.00	357.00	---
X7-SB301-0203	566.00	517.00	---
X7-SS302-0001	170.00	159.00	---
X7-SS302-0102	78.00	76.20	---
X7-SS303-0001	283.00	261.00	---
X7-SS303-0102	583.00	532.00	---
X7-SS304-0001	91.00	87.90	---
X7-SS305-0001	338.00	311.00	---
X7-SS305-0102	69.00	68.00	---
X7-SS306-0001	530.00	484.00	---
X7-SS306-0102	171.00	160.00	---
X7-SB306-0203	85.00	82.50	---
X7-SS307-0001	622.00	568.00	---
X7-SS307-0102	46.33	47.50	---
X7-SS308-0001	512.33	469.00	---
X7-SS308-0102	253.33	235.00	---
X7-SB308-0203	20.00	23.70	---
X7-SS309-0001	66.67	65.90	---
X7-SS310-0001	408.00	374.00	---
X7-SS310-0102	381.00	---	374
X7-SB310-0203	198.00	---	209
X7-SS311-0001	91.67	88.50	---

TABLE 2-3

**SOIL SAMPLE RESULTS SUMMARY - RIFLE RANGE
UXO 7 - SUPPLEMENTAL SOIL SAMPLES (LEAD)
NSA CRANE
CRANE, INDIANA**

SAMPLE ID	LEAD - XRF (ppm)	LEAD - CALCULATED (mg/kg)	LEAD - FBL (mg/kg)
X7-SS312-0001	152.00	143.00	---
X7-SS312-0102	212.00	---	249
X7-SS313-0001	167.00	---	187
X7-SS313-0102	216.00	201.00	---
X7-SB313-0203	509.00	466.00	---
X7-SS314-0001	133.00	126.00	---
X7-SS314-0102	192.00	179.00	---
X7-SS315-0001	216.00	---	220
X7-SS315-0102	65.33	64.70	---
X7-SS316-0001	350.00	322.00	---
X7-SS316-0102	31.33	34.00	---
X7-SS317-0001	76.67	74.90	---
X7-SS318-0001	94.33	90.90	---
X7-SS319-0001	72.00	70.70	---
X7-SS320-0001	303.00	279.00	---
X7-SS320-0102	173.00	162.00	---
X7-SB320-0203	21.33	24.90	---
X7-SS321-0001	173.00	---	156
X7-SS321-0102	38.00	40.00	---
X7-SS323-0001	434.00	---	448
X7-SS323-0102	49.33	50.20	---
X7-SS325-0001	457.00	419.00	---
X7-SS325-0102	35.00	37.30	---
X7-SS327-0001	54.33	---	66.4
X7-SS329-0001	66.33	---	46.3
X7-SS331-0001	138.00	---	138
X7-SS331-0102	37.33	39.40	---
X7-SS333-0001	184.00	---	198
X7-SS333-0102	37.33	39.40	---
X7-SS336-0001	273.00	---	236
X7-SS336-0102	72.33	71.00	---
X7-SS337-0001	65.00	---	63.1
X7-SS342-0102	284.00	---	263
X7-SS344-0001	144.00	---	111
X7-SS344-0102	19.00	22.80	---
X7-SS345-0001	567.00	518.00	---
X7-SS345-0102	96.33	---	78.4
X7-SS347-0001	592.00	541.00	---
X7-SS347-0102	81.33	---	91.5

TABLE 2-3

**SOIL SAMPLE RESULTS SUMMARY - RIFLE RANGE
UXO 7 - SUPPLEMENTAL SOIL SAMPLES (LEAD)
NSA CRANE
CRANE, INDIANA**

SAMPLE ID	LEAD - XRF (ppm)	LEAD - CALCULATED (mg/kg)	LEAD - FBL (mg/kg)
X7-SS349-0001	177.00	166.00	---
X7-SS349-0102	659.00	601.00	---
X7-SS351-0001	223.00	---	191
X7-SS351-0102	280.00	---	290
X7-SS353-0001	118.00	---	157
X7-SS355-0001	128.00	---	136
X7-SS355-0102	115.00	110.00	---
X7-SS357-0001	445.00	408.00	---
X7-SS357-0102	70.30	69.20	---
X7-SS358-0001	403.00	370.00	---
X7-SS358-0102	497.00	455.00	---
X7-SS360-0001	251.00	232.00	---
X7-SS360-0102	327.00	302.00	---
X7-SS361-0001	325.00	299.00	---
X7-SS361-0102	316.00	291.00	---
X7-SS363-0001	190.00	---	180
X7-SS363-0102	5.00	10.20	---
X7-SS365-0001	450.00	412.00	---
X7-SS365-0102	440.00	403.00	---
X7-SS368-0001	201.00	187.00	---
X7-SS368-0102	724.00	660.00	---
X7-SS369-0001	955.00	869.00	---
X7-SS369-0102	356.00	---	245
X7-SS371-0001	258.00	---	244
X7-SS373-0001	50.00	50.80	---
X7-SS376-0001	197.00	184.00	---
X7-SS376-0102	151.00	---	136
X7-SS377-0001	414.00	380.00	---
X7-SS377-0102	130.00	---	98.6
X7-SS379-0001	48.67	49.60	---
X7-SS383-0001	65.00	64.40	---
X7-SS385-0001	164.00	---	200
X7-SS385-0102	61.00	60.80	---
X7-SS387-0001	79.33	77.40	---
X7-SS391-0001	162.00	152.00	---
X7-SS391-0102	620.00	566.00	---
X7-SB391-0203	51.67	52.30	---
X7-SS392-0001	117.00	---	107
X7-SS393-0001	157.00	147.00	---

TABLE 2-3

**SOIL SAMPLE RESULTS SUMMARY - RIFLE RANGE
UXO 7 - SUPPLEMENTAL SOIL SAMPLES (LEAD)
NSA CRANE
CRANE, INDIANA**

SAMPLE ID	LEAD - XRF (ppm)	LEAD - CALCULATED (mg/kg)	LEAD - FBL (mg/kg)
X7-SS393-0102	283.00	---	226
X7-SB393-0203	200.00	186.00	---
X7-SS394-0001	151.00	142.00	---
X7-SS394-0102	309.00	285.00	---
X7-SB394-0203	33.00	35.50	---
X7-SS395-0001	266.00	246.00	---
X7-SS395-0102	586.00	535.00	---
X7-SB395-0203	348.00	321.00	---
X7-SS396-0001	154.00	145.00	---
X7-SS396-0102	418.00	384.00	---
X7-SB396-0203	329.00	303.00	---
X7-SS398-0001	317.00	293.00	---
X7-SS398-0102	501.00	458.00	---
X7-SS400-0001	109.00	104.00	---
X7-SS401-0001	172.00	---	97.4
X7-SS401-0102	367.00	337.00	---
X7-SS402-0001	117.00	---	89.7
X7-SS404-0001	317.00	292.00	---
X7-SS404-0102	86.00	83.40	---
X7-SS406-0001	82.67	80.60	---
X7-SS407-0001	78.67	---	73.7
X7-SS408-0001	311.00	---	246
X7-SS408-0102	29.00	31.90	---
X7-SB409-0304	1196.00	1087.00	---
X7-SS410-0001	5.00	---	12.3
X7-SB411-0304	51.33	52.00	---
X7-SS412-0001	187.00	---	189
X7-SS412-0102	29.00	31.90	---
X7-SB413-0304	955.00	869.00	---
X7-SS414-0001	188.00	---	199
X7-SS414-0102	108.00	104.00	---
X7-SS415-0001	182.00	---	105
X7-SS415-0102	34.00	36.40	---
X7-SS416-0001	82.67	---	78.2
X7-SB417-0304	208.00	194.00	---
X7-SB417-0405	170.00	159.00	---
X7-SB417-0506	785.00	715.00	---
X7-SS418-0001	47.33	48.40	---
X7-SS420-0001	125.00	119.00	---

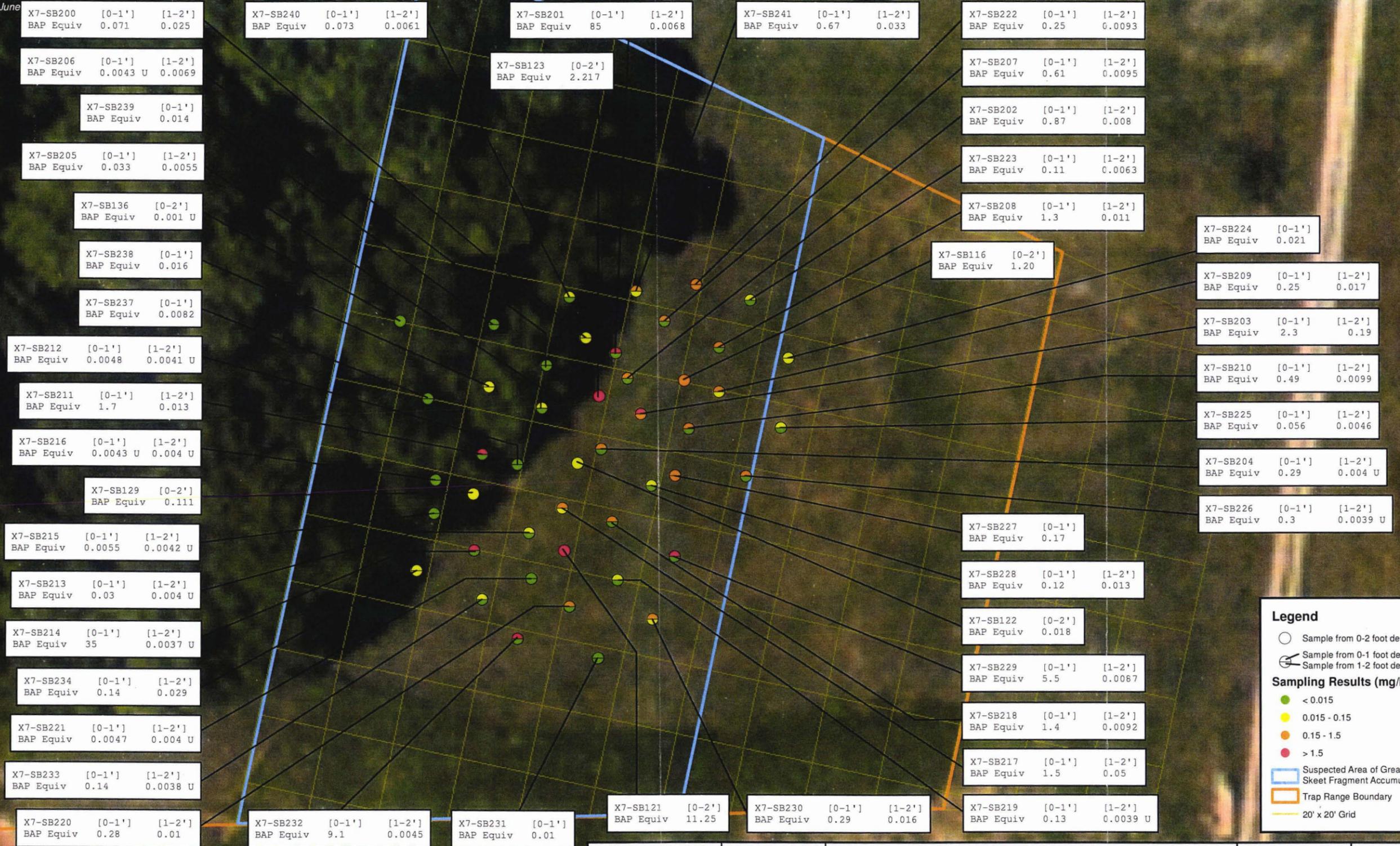
TABLE 2-3

**SOIL SAMPLE RESULTS SUMMARY - RIFLE RANGE
UXO 7 - SUPPLEMENTAL SOIL SAMPLES (LEAD)
NSA CRANE
CRANE, INDIANA**

SAMPLE ID	LEAD - XRF (ppm)	LEAD - CALCULATED (mg/kg)	LEAD - FBL (mg/kg)
X7-SS420-0102	486.00	445.00	---
X7-SS420-0203	78.33	76.50	---
X7-SS421-0001	747.33	681.00	---
X7-SS421-0102	15.67	19.80	---
X7-SS422-0001	435.00	399.00	---
X7-SS422-0102	362.00	---	343
X7-SS422-0203	48.00	---	44.5
X7-SS423-0001	299.00	---	340
X7-SS423-0102	22.33	25.80	---
X7-SS424-0001	212.00	---	193
X7-SS424-0102	108.00	91.00	91
X7-SS425-0001	174.00	---	160
X7-SS425-0102	12.00	16.50	---
X7-SB426-0304	11.67	16.20	---
X7-SB427-0304	17.67	---	22.7
X7-SB428-0304	23.33	26.70	---
X7-SS429-0001	107.00	---	125
X7-SB430-0304	10.67	15.30	---
X7-SB430-0405	5.00	10.20	---
X7-SB430-0506	5.00	10.20	---
X7-SB431-0304	46.00	47.20	---
X7-SB431-0405	30.00	---	21.3
X7-SB432-0304	19.67	23.40	---
X7-SB432-0405	5.00	10.20	---
X7-SS434-0001	103.00	---	162
X7-SS434-0102	26.33	29.40	---

Red font indicates an exceedence of the 192 mg/kg screening value.

Aerial photograph taken in June



Legend

- Sample from 0-2 foot depth bgs
- ⊖ Sample from 0-1 foot depth bgs
- ⊕ Sample from 1-2 foot depth bgs

Sampling Results (mg/kg)

- < 0.015
- 0.015 - 0.15
- 0.15 - 1.5
- > 1.5

- ▭ Suspected Area of Greatest Skeet Fragment Accumulation
- ▭ Trap Range Boundary
- ▭ 20' x 20' Grid

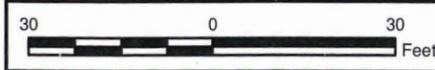
Notes:
 1) BAP Equiv = Benzo(a)pyrene equivalent concentration (includes half-concentrations for non-detects).
 2) U = non-detect.

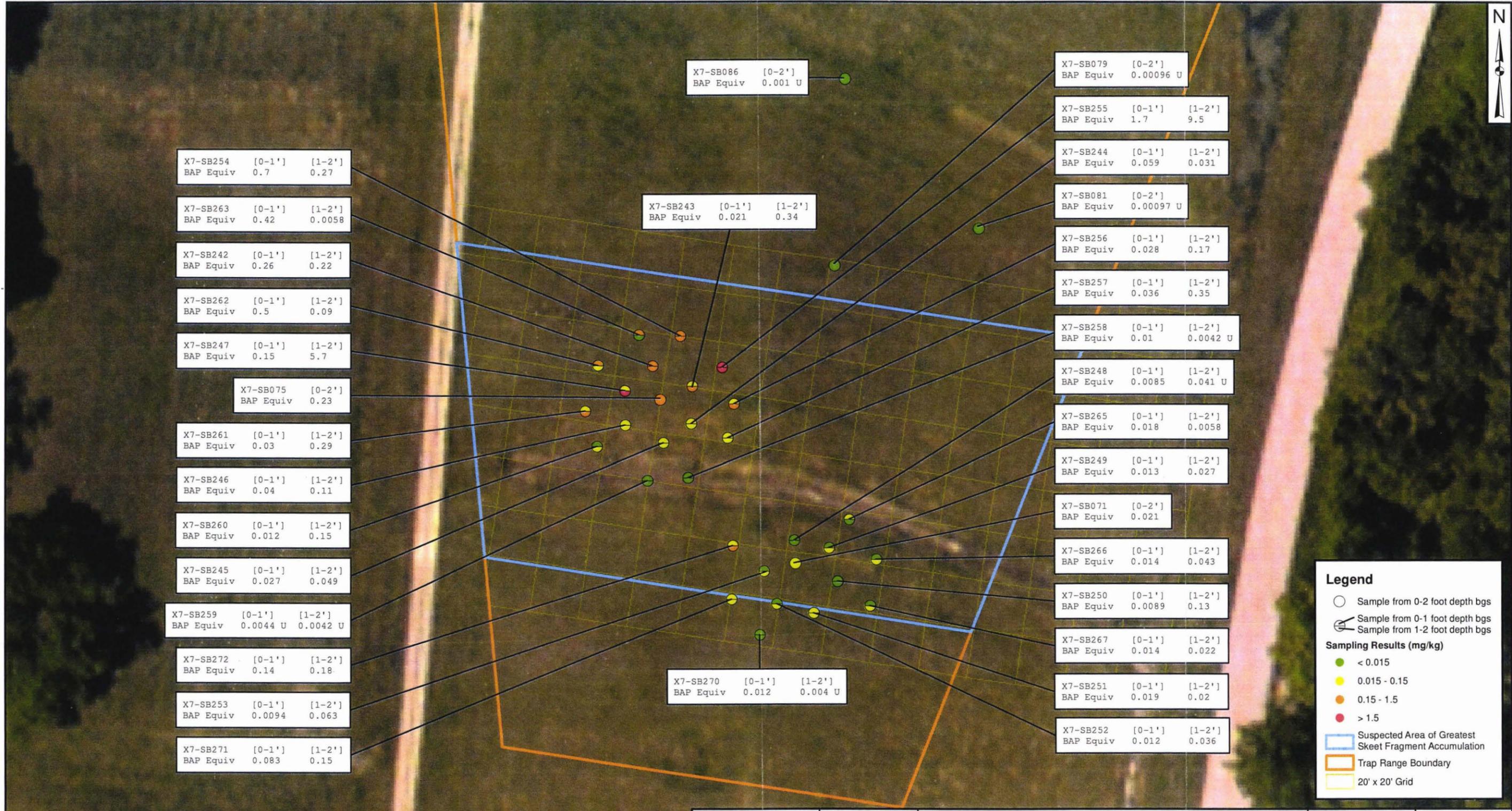
DRAWN BY	DATE
J. ENGLISH	03/01/12
CHECKED BY	DATE
R. BARRINGER	03/14/12
REVISED BY	DATE
S. PAXTON	03/14/12
SCALE AS NOTED	



**BAP EQUIVALENT SAMPLING RESULTS
 WEST TRAP RANGE
 UXO 7 - SUPPLEMENTAL SAMPLING RESULTS
 NSA CRANE
 CRANE, INDIANA**

CONTRACT NUMBER	CTO NUMBER
	F272
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO.	REV
2 - 1	0





X7-SB254 [0-1'] [1-2']
BAP Equiv 0.7 0.27

X7-SB263 [0-1'] [1-2']
BAP Equiv 0.42 0.0058

X7-SB242 [0-1'] [1-2']
BAP Equiv 0.26 0.22

X7-SB262 [0-1'] [1-2']
BAP Equiv 0.5 0.09

X7-SB247 [0-1'] [1-2']
BAP Equiv 0.15 5.7

X7-SB075 [0-2']
BAP Equiv 0.23

X7-SB261 [0-1'] [1-2']
BAP Equiv 0.03 0.29

X7-SB246 [0-1'] [1-2']
BAP Equiv 0.04 0.11

X7-SB260 [0-1'] [1-2']
BAP Equiv 0.012 0.15

X7-SB245 [0-1'] [1-2']
BAP Equiv 0.027 0.049

X7-SB259 [0-1'] [1-2']
BAP Equiv 0.0044 U 0.0042 U

X7-SB272 [0-1'] [1-2']
BAP Equiv 0.14 0.18

X7-SB253 [0-1'] [1-2']
BAP Equiv 0.0094 0.063

X7-SB271 [0-1'] [1-2']
BAP Equiv 0.083 0.15

X7-SB086 [0-2']
BAP Equiv 0.001 U

X7-SB243 [0-1'] [1-2']
BAP Equiv 0.021 0.34

X7-SB270 [0-1'] [1-2']
BAP Equiv 0.012 0.004 U

X7-SB079 [0-2']
BAP Equiv 0.00096 U

X7-SB255 [0-1'] [1-2']
BAP Equiv 1.7 9.5

X7-SB244 [0-1'] [1-2']
BAP Equiv 0.059 0.031

X7-SB081 [0-2']
BAP Equiv 0.00097 U

X7-SB256 [0-1'] [1-2']
BAP Equiv 0.028 0.17

X7-SB257 [0-1'] [1-2']
BAP Equiv 0.036 0.35

X7-SB258 [0-1'] [1-2']
BAP Equiv 0.01 0.0042 U

X7-SB248 [0-1'] [1-2']
BAP Equiv 0.0085 0.041 U

X7-SB265 [0-1'] [1-2']
BAP Equiv 0.018 0.0058

X7-SB249 [0-1'] [1-2']
BAP Equiv 0.013 0.027

X7-SB071 [0-2']
BAP Equiv 0.021

X7-SB266 [0-1'] [1-2']
BAP Equiv 0.014 0.043

X7-SB250 [0-1'] [1-2']
BAP Equiv 0.0089 0.13

X7-SB267 [0-1'] [1-2']
BAP Equiv 0.014 0.022

X7-SB251 [0-1'] [1-2']
BAP Equiv 0.019 0.02

X7-SB252 [0-1'] [1-2']
BAP Equiv 0.012 0.036

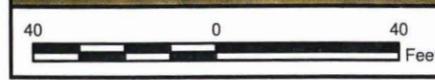
Legend

- Sample from 0-2 foot depth bgs
- ⊗ Sample from 0-1 foot depth bgs
- ⊗ Sample from 1-2 foot depth bgs

Sampling Results (mg/kg)

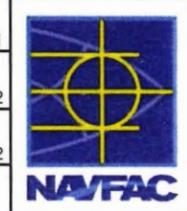
- < 0.015
- 0.015 - 0.15
- 0.15 - 1.5
- > 1.5

- ▭ Suspected Area of Greatest Skeet Fragment Accumulation
- ▭ Trap Range Boundary
- ▭ 20' x 20' Grid



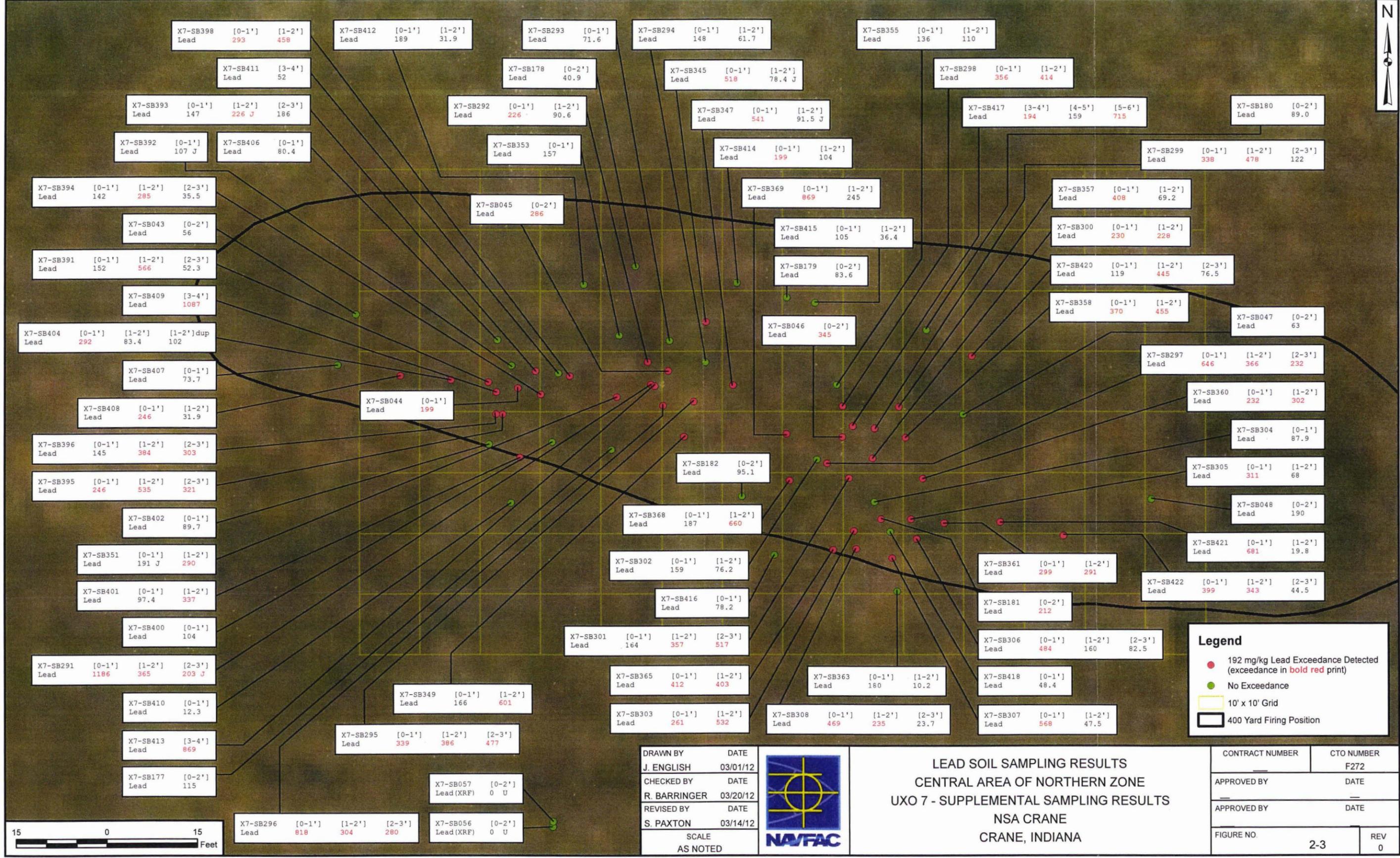
Notes:
1) BAP Equiv = Benzo(a)pyrene equivalent concentration (includes half-concentrations for non-detects).
2) U = non-detect.

DRAWN BY	DATE
J. ENGLISH	03/02/11
CHECKED BY	DATE
R. BARRINGER	03/14/12
REVISED BY	DATE
S. PAXTON	03/14/12
SCALE AS NOTED	



**BAP EQUIVALENT SAMPLING RESULTS
EAST TRAP RANGE
UXO 7 - SUPPLEMENTAL SAMPLING RESULTS
NSA CRANE
CRANE, INDIANA**

CONTRACT NUMBER	CTO NUMBER
	F272
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO.	REV
2 - 2	0

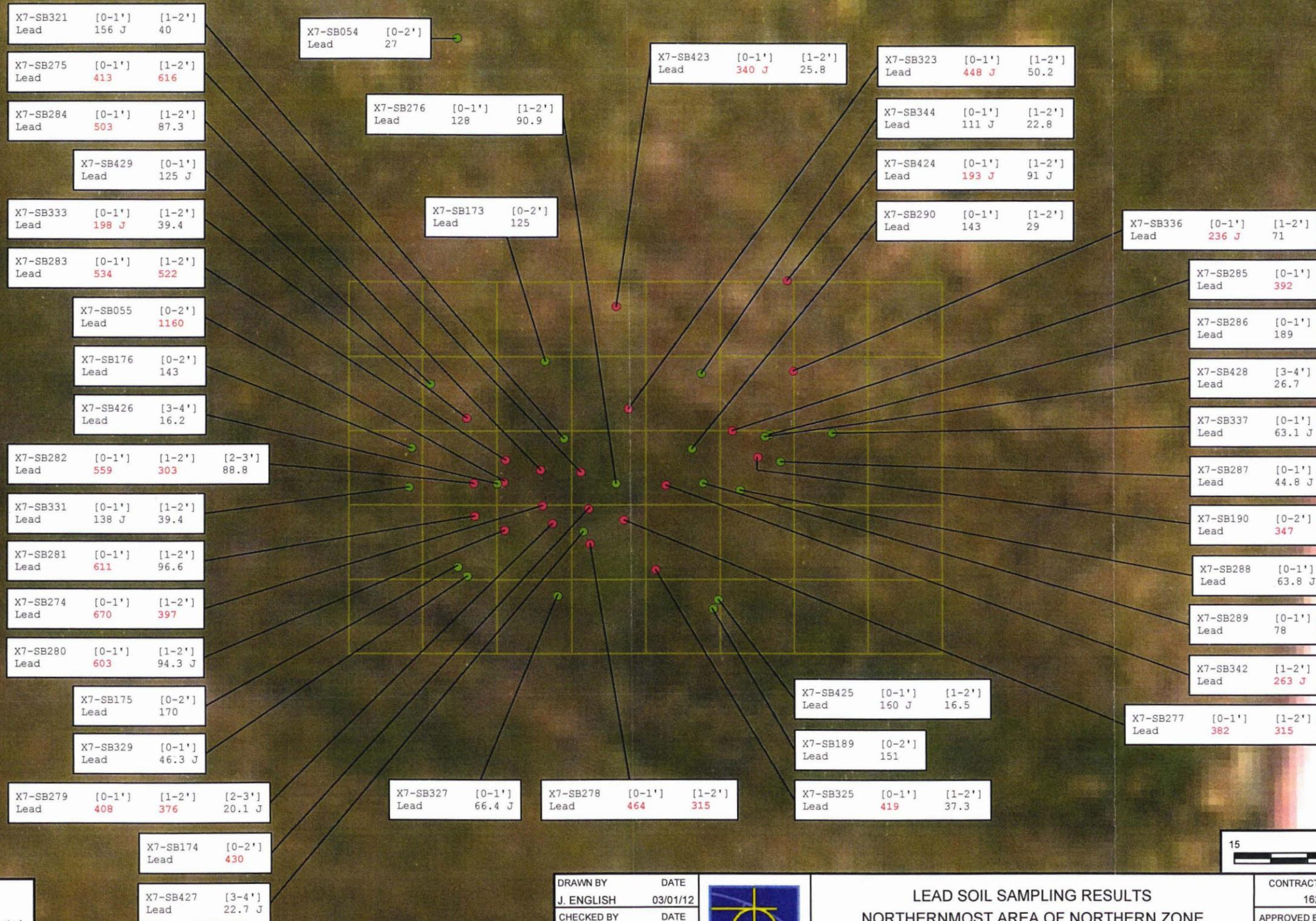


DRAWN BY	DATE
J. ENGLISH	03/01/12
CHECKED BY	DATE
R. BARRINGER	03/20/12
REVISED BY	DATE
S. PAXTON	03/14/12
SCALE	
AS NOTED	



LEAD SOIL SAMPLING RESULTS
CENTRAL AREA OF NORTHERN ZONE
UXO 7 - SUPPLEMENTAL SAMPLING RESULTS
NSA CRANE
CRANE, INDIANA

CONTRACT NUMBER	CTO NUMBER
	F272
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO.	REV
2-3	0



Legend

- 192 mg/kg Lead Exceedance Detected (exceedance in **bold red** print)
- No Exceedance
- 10' x 10' Grid

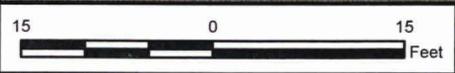
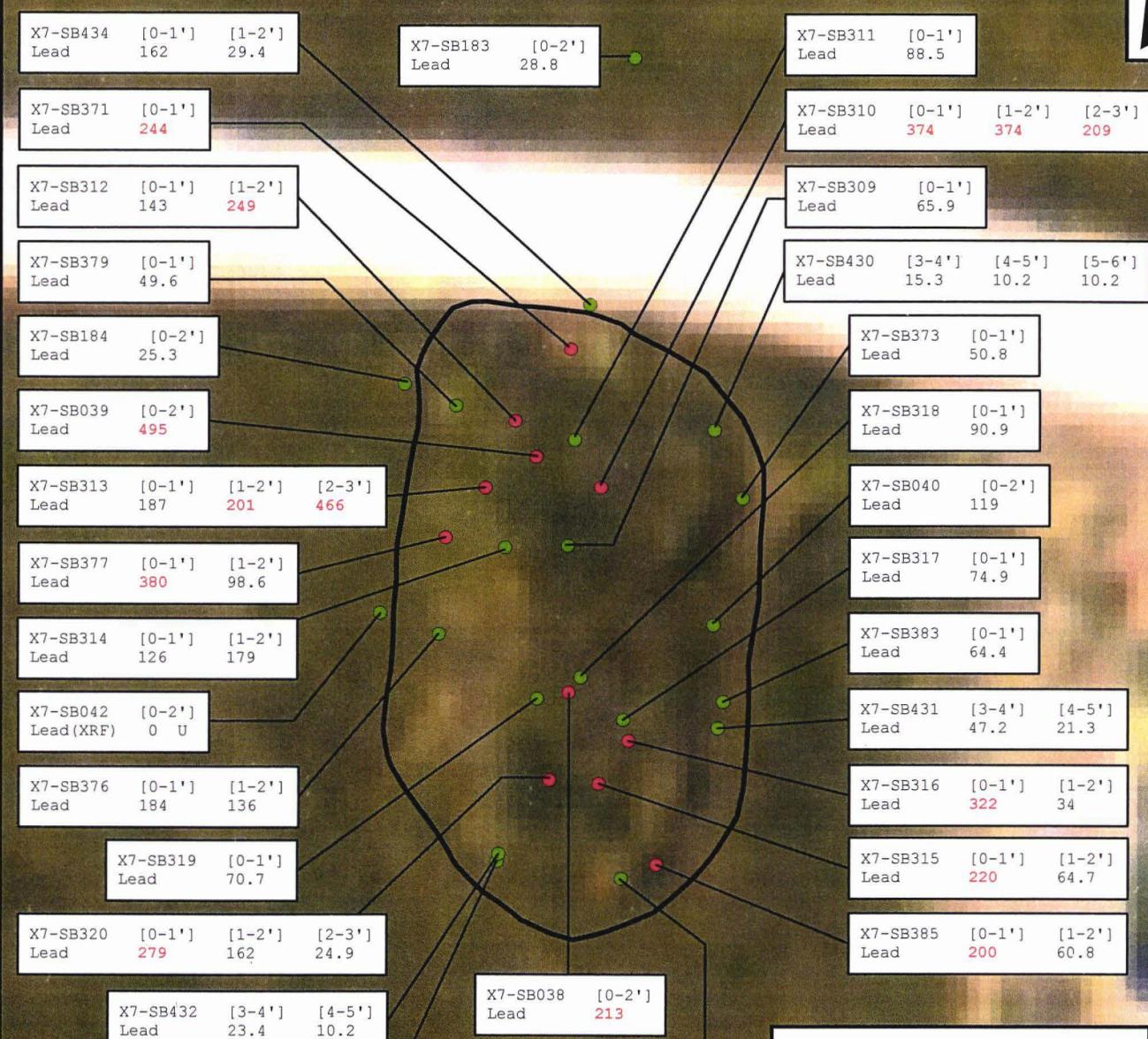
DRAWN BY	DATE
J. ENGLISH	03/01/12
CHECKED BY	DATE
R. BARRINGER	03/20/12
REVISOR BY	DATE
S. PAXTON	03/14/12
SCALE AS NOTED	



LEAD SOIL SAMPLING RESULTS
NORTHERNMOST AREA OF NORTHERN ZONE
UXO 7 - SUPPLEMENTAL SAMPLING RESULTS
NSA CRANE
CRANE, INDIANA



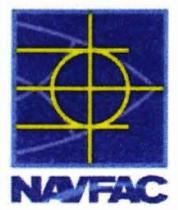
CONTRACT NUMBER	CTO NUMBER
1621	
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO.	REV
2-4	0



Legend

- 192 mg/kg Lead Exceedance Detected (exceedance in bold red print)
- No Exceedance
- Perimeter of Dirt Mound at Ground Surface

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S. PAXTON	03/14/12
SCALE AS NOTED	



LEAD SOIL SAMPLING RESULTS
SOUTHERNMOST AREA OF NORTHERN ZONE
UX07 - SUPPLEMENTAL SAMPLING RESULTS
NSA CRANE
CRANE, INDIANA

CONTRACT NUMBER	CTO NUMBER
	F272
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO.	REV
2-5	0

3.0 ROUND 2 SUPPLEMENTAL SAMPLING

3.1 PAHs

Additional sampling will be required at the two Trap Range sites to more completely bound and delineate the limits of the PAH soil contamination at these sites. The proposed supplemental soil samples will extend to a depth of 4 feet bgs, and should provide confirmation that the PAH contamination in soil is typically not expected to be present at depths of more than two feet bgs. Several proposed supplemental soil sampling locations to improve our understanding of the nature and extent of PAH contamination in the trap ranges soils are identified in [Table 3-1](#) and indicated on [Figures 3-1](#) and [3-2](#), and the approach for supplemental sampling in the former trap range soil is summarized below:

1) West Trap Range ([Figure 3-1](#)):

- a. Collection of approximately 105 soil samples from 35 new sample locations at depths to 4 feet bgs (0-1, 1-2, 2-4). Utilize the extract and hold methodology.
- b. Collection of approximately 15 soil samples at depth (~2-4 feet bgs) at former sample locations that exhibited PAH contamination at the 1-2 ft depth.
- c. Sample collection could be completed during two 10-12 hour days, depending on conditions.

2) East Trap Range ([Figure 3-2](#)):

- a. Collection of approximately 120 soil samples from 40 new sample locations at depths to 4 feet bgs (0-1, 1-2, 2-4). Utilize the extract and hold methodology.
- b. Collection of approximately 20 soil samples at depth (~2-4 feet bgs) at former sample locations that exhibited PAH contamination at the 1-2 ft depth.
- c. Sample collection could be completed during three 10-12 hour days, depending on conditions.

3.2 Lead

Since the initial RFI and supplemental sampling activities have identified the boundaries of lead contamination at the areas within the Rifle Range, no additional supplemental samples are proposed.

TABLE 3-1

**ROUND 2 PROPOSED SUPPLEMENTAL SOIL SAMPLING
 UXO 07 – EAST AND WEST TRAP RANGES
 NSA CRANE
 CRANE, INDIANA**

Sample Location⁽¹⁾	Sample ID⁽²⁾	PAHs (SW 846-8270C)
X7-SB435	X7-SS435-0204	1
X7-SB436	X7-SS436-0204	1
X7-SB437	X7-SS437-0204	1
X7-SB438	X7-SS438-0204	1
X7-SB439	X7-SS439-0204	1
X7-SB440	X7-SS440-0204	1
X7-SB441	X7-SS441-0204	1
X7-SB442	X7-SS442-0204	1
X7-SB443	X7-SS443-0204	1
X7-SB444	X7-SS444-0204	1
X7-SB445	X7-SS445-0204	1
X7-SB446	X7-SS446-0204	1
X7-SB447	X7-SS447-0204	1
X7-SB448	X7-SS448-0204	1
X7-SB449	X7-SS449-0204	1
X7-SB450	X7-SS450-0204	1
X7-SB451	X7-SS451-0204	1
X7-SB452	X7-SS452-0204	1
X7-SB453	X7-SS453-0204	1
X7-SB454	X7-SS454-0204	1
X7-SB455	X7-SS455-0204	1
X7-SB456	X7-SS456-0204	1
X7-SB457	X7-SS457-0204	1
X7-SB458	X7-SS458-0204	1
X7-SB459	X7-SS459-0204	1
X7-SB460	X7-SS460-0204	1
X7-SB461	X7-SS461-0204	1
X7-SB462	X7-SS462-0204	1

Sample Location⁽¹⁾	Sample ID⁽²⁾	PAHs (SW 846-8270C)
X7-SB463	X7-SS463-0204	1
X7-SB464	X7-SS464-0204	1
X7-SB465	X7-SS465-0204	1
X7-SB466	X7-SS466-0204	1
X7-SB467	X7-SS467-0204	1
X7-SB468	X7-SS468-0204	1
X7-SB469	X7-SS469-0204	1
X7-SB470	X7-SB470-0001	1
	X7-SB470-0102	1
	X7-SB470-0204	1
X7-SB471	X7-SB471-0001	1
	X7-SB471-0102	1
	X7-SB471-0204	1
X7-SB472	X7-SB472-0001	1
	X7-SB472-0102	1
	X7-SB472-0204	1
X7-SB473	X7-SB473-0001	1
	X7-SB473-0102	1
	X7-SB473-0204	1
X7-SB474	X7-SB474-0001	1
	X7-SB474-0102	1
	X7-SB474-0204	1
X7-SB475	X7-SB475-0001	1
	X7-SB475-0102	1
	X7-SB475-0204	1
X7-SB476	X7-SB476-0001	1
	X7-SB476-0102	1
	X7-SB476-0204	1
X7-SB477	X7-SB477-0001	1
	X7-SB477-0102	1
	X7-SB477-0204	1
X7-SB478	X7-SB478-0001	1
	X7-SB478-0102	1
	X7-SB478-0204	1

Sample Location⁽¹⁾	Sample ID⁽²⁾	PAHs (SW 846-8270C)
X7-SB479	X7-SB479-0001	1
	X7-SB479-0102	1
	X7-SB479-0204	1
X7-SB480	X7-SB480-0001	1
	X7-SB480-0102	1
	X7-SB480-0204	1
X7-SB481	X7-SB481-0001	1
	X7-SB481-0102	1
	X7-SB481-0204	1
X7-SB482	X7-SB482-0001	1
	X7-SB482-0102	1
	X7-SB482-0204	1
X7-SB483	X7-SB483-0001	1
	X7-SB483-0102	1
	X7-SB483-0204	1
X7-SB484	X7-SB484-0001	1
	X7-SB484-0102	1
	X7-SB484-0204	1
X7-SB485	X7-SB485-0001	1
	X7-SB485-0102	1
	X7-SB485-0204	1
X7-SB486	X7-SB486-0001	1
	X7-SB486-0102	1
	X7-SB486-0204	1
X7-SB487	X7-SB487-0001	1
	X7-SB487-0102	1
	X7-SB487-0204	1
X7-SB488	X7-SB488-0001	1
	X7-SB488-0102	1
	X7-SB488-0204	1
X7-SB489	X7-SB489-0001	1
	X7-SB489-0102	1
	X7-SB489-0204	1
X7-SB490	X7-SB490-0001	1

Sample Location⁽¹⁾	Sample ID⁽²⁾	PAHs (SW 846-8270C)
	X7-SB490-0102	1
	X7-SB490-0204	1
X7-SB491	X7-SB491-0001	1
	X7-SB491-0102	1
	X7-SB491-0204	1
X7-SB492	X7-SB492-0001	1
	X7-SB492-0102	1
	X7-SB492-0204	1
X7-SB493	X7-SB493-0001	1
	X7-SB493-0102	1
	X7-SB493-0204	1
X7-SB494	X7-SB494-0001	1
	X7-SB494-0102	1
	X7-SB494-0204	1
X7-SB495	X7-SB495-0001	1
	X7-SB495-0102	1
	X7-SB495-0204	1
X7-SB496	X7-SB496-0001	1
	X7-SB496-0102	1
	X7-SB496-0204	1
X7-SB497	X7-SB497-0001	1
	X7-SB497-0102	1
	X7-SB497-0204	1
X7-SB498	X7-SB498-0001	1
	X7-SB498-0102	1
	X7-SB498-0204	1
X7-SB499	X7-SB499-0001	1
	X7-SB499-0102	1
	X7-SB499-0204	1
X7-SB500	X7-SB500-0001	1
	X7-SB500-0102	1
	X7-SB500-0204	1
X7-SB501	X7-SB501-0001	1
	X7-SB501-0102	1

Sample Location⁽¹⁾	Sample ID⁽²⁾	PAHs (SW 846-8270C)
	X7-SB501-0204	1
X7-SB502	X7-SB502-0001	1
	X7-SB502-0102	1
	X7-SB502-0204	1
	X7-SB503-0001	1
X7-SB503	X7-SB503-0102	1
	X7-SB503-0204	1
	X7-SB504-0001	1
X7-SB504	X7-SB504-0102	1
	X7-SB504-0204	1
	X7-SB505-0001	1
X7-SB505	X7-SB505-0102	1
	X7-SB505-0204	1
	X7-SB506-0001	1
X7-SB506	X7-SB506-0102	1
	X7-SB506-0204	1
	X7-SB507-0001	1
X7-SB507	X7-SB507-0102	1
	X7-SB507-0204	1
	X7-SB508-0001	1
X7-SB508	X7-SB508-0102	1
	X7-SB508-0204	1
	X7-SB509-0001	1
X7-SB509	X7-SB509-0102	1
	X7-SB509-0204	1
	X7-SB510-0001	1
X7-SB510	X7-SB510-0102	1
	X7-SB510-0204	1
	X7-SB511-0001	1
X7-SB511	X7-SB511-0102	1
	X7-SB511-0204	1
	X7-SB512-0001	1
X7-SB512	X7-SB512-0102	1
	X7-SB512-0204	1

Sample Location⁽¹⁾	Sample ID⁽²⁾	PAHs (SW 846-8270C)
X7-SB513	X7-SB513-0001	1
	X7-SB513-0102	1
	X7-SB513-0204	1
X7-SB514	X7-SB514-0001	1
	X7-SB514-0102	1
	X7-SB514-0204	1
X7-SB515	X7-SB515-0001	1
	X7-SB515-0102	1
	X7-SB515-0204	1
X7-SB516	X7-SB516-0001	1
	X7-SB516-0102	1
	X7-SB516-0204	1
X7-SB517	X7-SB517-0001	1
	X7-SB517-0102	1
	X7-SB517-0204	1
X7-SB518	X7-SB518-0001	1
	X7-SB518-0102	1
	X7-SB518-0204	1
X7-SB519	X7-SB519-0001	1
	X7-SB519-0102	1
	X7-SB519-0204	1
X7-SB520	X7-SB520-0001	1
	X7-SB520-0102	1
	X7-SB520-0204	1
X7-SB521	X7-SB521-0001	1
	X7-SB521-0102	1
	X7-SB521-0204	1
X7-SB522	X7-SB522-0001	1
	X7-SB522-0102	1
	X7-SB522-0204	1
X7-SB523	X7-SB523-0001	1
	X7-SB523-0102	1
	X7-SB523-0204	1
X7-SB524	X7-SB524-0001	1

Sample Location⁽¹⁾	Sample ID⁽²⁾	PAHs (SW 846-8270C)
	X7-SB524-0102	1
	X7-SB524-0204	1
X7-SB525	X7-SB525-0001	1
	X7-SB525-0102	1
	X7-SB525-0204	1
X7-SB526	X7-SB526-0001	1
	X7-SB526-0102	1
	X7-SB526-0204	1
X7-SB527	X7-SB527-0001	1
	X7-SB527-0102	1
	X7-SB527-0204	1
X7-SB528	X7-SB528-0001	1
	X7-SB528-0102	1
	X7-SB528-0204	1
X7-SB529	X7-SB529-0001	1
	X7-SB529-0102	1
	X7-SB529-0204	1
X7-SB530	X7-SB530-0001	1
	X7-SB530-0102	1
	X7-SB530-0204	1
X7-SB531	X7-SB531-0001	1
	X7-SB531-0102	1
	X7-SB531-0204	1
X7-SB532	X7-SB532-0001	1
	X7-SB532-0102	1
	X7-SB532-0204	1
X7-SB533	X7-SB533-0001	1
	X7-SB533-0102	1
	X7-SB533-0204	1
X7-SB534	X7-SB534-0001	1
	X7-SB534-0102	1
	X7-SB534-0204	1
X7-SB535	X7-SB535-0001	1
	X7-SB535-0102	1

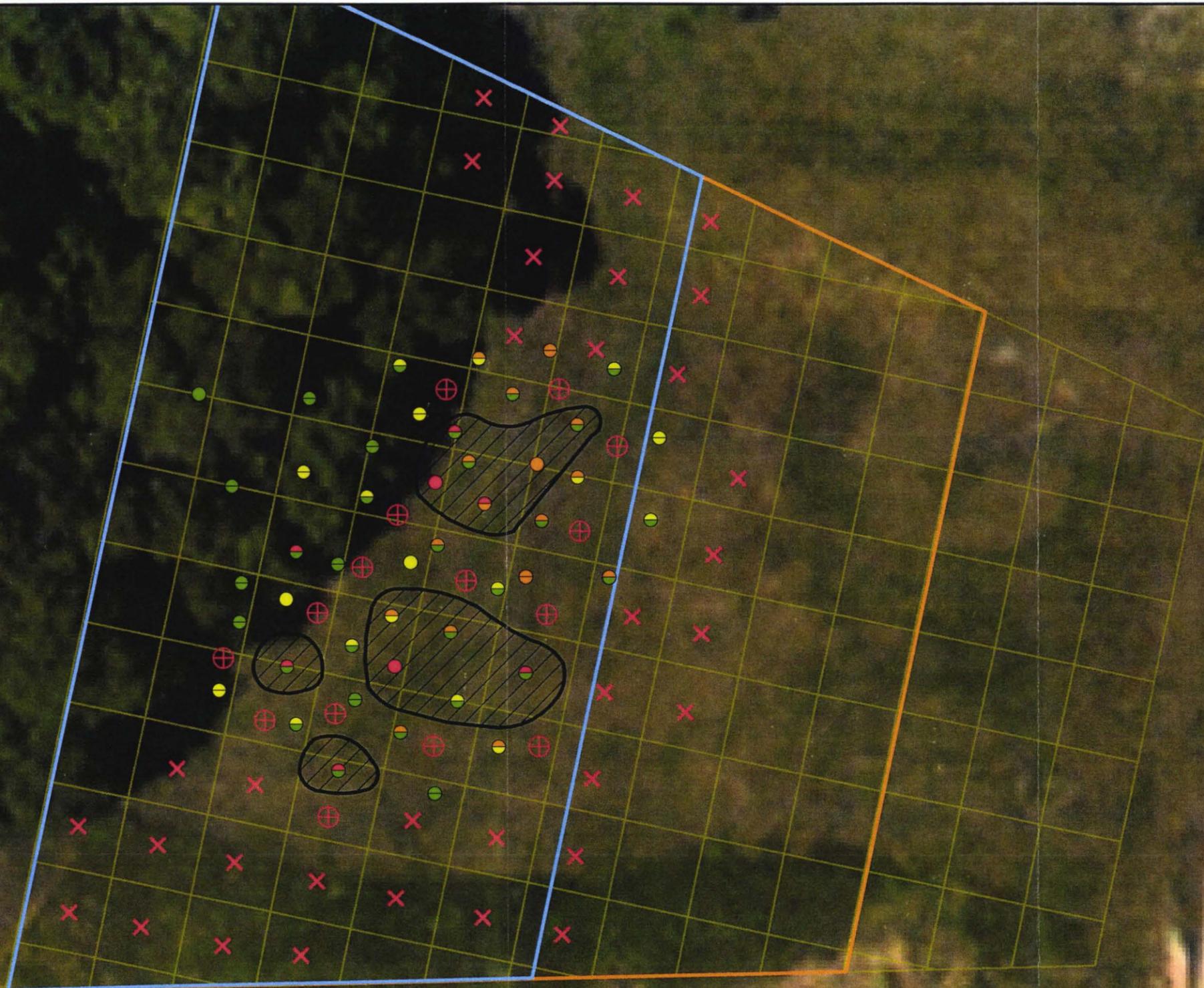
Sample Location ⁽¹⁾	Sample ID ⁽²⁾	PAHs (SW 846-8270C)
	X7-SB535-0204	1
X7-SB536	X7-SB536-0001	1
	X7-SB536-0102	1
	X7-SB536-0204	1
X7-SB537	X7-SB537-0001	1
	X7-SB537-0102	1
	X7-SB537-0204	1
X7-SB538	X7-SB538-0001	1
	X7-SB538-0102	1
	X7-SB538-0204	1
X7-SB539	X7-SB539-0001	1
	X7-SB539-0102	1
	X7-SB539-0204	1
X7-SB540	X7-SB540-0001	1
	X7-SB540-0102	1
	X7-SB540-0204	1
X7-SB541	X7-SB541-0001	1
	X7-SB541-0102	1
	X7-SB541-0204	1
X7-SB542	X7-SB542-0001	1
	X7-SB542-0102	1
	X7-SB542-0204	1
X7-SB543	X7-SB543-0001	1
	X7-SB543-0102	1
	X7-SB543-0204	1
X7-SB544	X7-SB544-0001	1
	X7-SB544-0102	1
	X7-SB544-0204	1
Total Soil Samples		260

PAH = Polynuclear aromatic hydrocarbons

1 X7 = UXO 7. SB = Soil boring.

2 SS = Surface soil. Last four digits of sample ID indicate depth below ground surface in feet.

Aerial photograph taken in June of 2009.



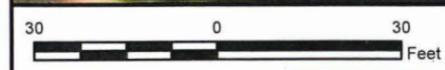
Legend

- X New Soil Sample
- + Confirmation Soil Sample
- Sample from 0-2 foot depth bgs
- ⊖ Sample from 0-1 foot depth bgs
- ⊕ Sample from 1-2 foot depth bgs

Sampling Results (mg/kg)

- < 0.015
- 0.015 - 0.15
- 0.15 - 1.5
- > 1.5

- / Soil Area Proposed for Removal
- Suspected Area of Greatest Skeet Fragment Accumulation
- Trap Range Boundary
- 20' x 20' Grid



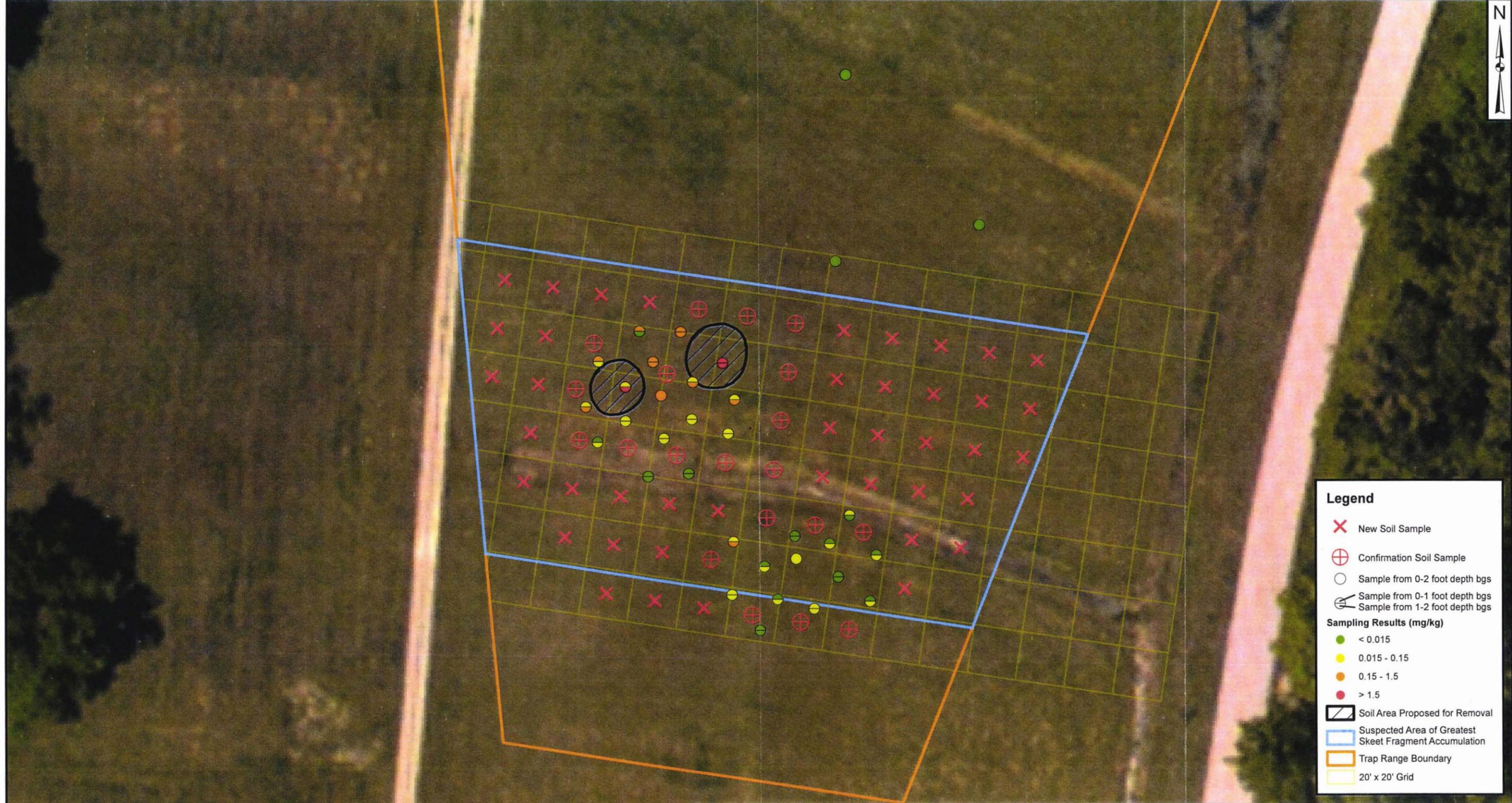
Notes:
 1) BAP Equiv = Benzo(a)pyrene equivalent concentration (includes half-concentrations for non-detects).

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R. BARRINGER	03/20/12
REVISED BY	DATE
S. PAXTON	03/14/12
SCALE AS NOTED	



**BAP EQUIVALENT SAMPLING APPROACH
 AND PROPOSED SOIL REMOVALS
 UXO 7 WEST TRAP RANGE
 NSA CRANE
 CRANE, INDIANA**

CONTRACT NUMBER	CTO NUMBER
	F272
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO.	REV
3-1	0



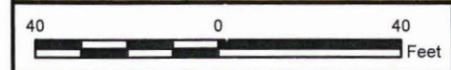
Legend

- X New Soil Sample
- + Confirmation Soil Sample
- Sample from 0-2 foot depth bgs
- ◐ Sample from 0-1 foot depth bgs
- ◑ Sample from 1-2 foot depth bgs

Sampling Results (mg/kg)

- < 0.015
- 0.015 - 0.15
- 0.15 - 1.5
- > 1.5

- / Soil Area Proposed for Removal
- Suspected Area of Greatest Skeet Fragment Accumulation
- Trap Range Boundary
- 20' x 20' Grid



Notes:
 1) BAP Equiv = Benzo(a)pyrene equivalent concentration (includes half-concentrations for non-detects).

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REVISED BY	DATE
J. NOVAK	03/14/12
SCALE AS NOTED	



**BAP EQUIVALENT SAMPLING RESULTS APPROACH
 AND PROPOSED SOIL REMOVALS
 UXO 7 EAST TRAP RANGE
 NSA CRANE
 CRANE, INDIANA**

CONTRACT NUMBER	CTO NUMBER
	F272
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO.	REV
3-2	0

4.0 INTERIM MEASURES

The RFI and Round 1 supplemental sampling have shown the presence of PAH contamination at the East and West Trap Ranges which present excess risk to human receptors, and the presence of lead contamination at areas within the Rifle Range which present ecological risk. Based on this information, the following sections discuss remedial action options for these areas.

4.1 Trap Ranges

The PAH contamination at the West and East Trap Ranges has not been fully delineated. However, sections of the former trap ranges with more highly contaminated soils (with respect to BaP equivalents) appear to have been identified. Therefore, the available data can be used to estimate extent of soil removal to reduce risks to levels within a more acceptable risk range (1E-6 to 1E-4). The 95% upper confidence level (UCL) BaP equivalent concentration for the West Trap Range is 9.265 mg/kg ([Table 4-1](#)). The 95% UCL BaP equivalent concentration for the East Trap Range is 1.572 mg/kg ([Table 4-2](#)). Both of the former West and East Trap Ranges present BaP equivalent concentrations in soil that carry human health risks in excess of the acceptable risk range of 1E-6. The screening level of 0.015 mg/kg is equivalent to a risk of 1E-6. Remedial measures must be designed to reduce risk to the acceptable risk range. This can be accomplished by a focused remedial action to eliminate the major sources of PAH contaminated soil. This would reduce average soil PAH concentration and thereby reduce the associated risk to more acceptable levels.

On the West Trap Range there are eight discrete samples with soil BaP equivalent concentrations above the 1.5 mg/kg level with more than an excess human lifetime cancer risk of 10^{-4} . Focusing a limited removal action on all or most of these specific locations (indicated in red on [Figure 3-1](#)) will reduce the site-wide human health cancer risk to a level between the 10^{-4} to 10^{-5} screening levels. The ranked listing of the calculated BaP equivalent concentrations for the West Trap Range soil samples are presented in [Table 4-1](#), and show a significant decrease in the BaP equivalents that will remain in the West Trap Range soil samples when the top nine (shown in red font) concentrations (excluding X7-SS211-0001) are removed from the data set and replaced with clean soil. The location of X7-SS211-0001 in the forested area to the west physically limits the amount of excavation that may be performed without extensive vegetation removal and tree damage. It is proposed that the next two highest BaP equivalent concentration soil locations listed in [Table 4-1](#) (X7-SS217-0001 and X7-SS218-0001) be selectively removed to achieve the desired site-wide BaP equivalent reduction instead of disturbing the forested habitat at soil location X7-SS211-0001.

On the East Trap Range there are three discrete samples with soil BaP equivalent concentrations above the 1.5 mg/kg level (indicated in red on [Figure 3-2](#)) with more than an excess human lifetime cancer risk of 10^{-4} . Additional soil sampling will be needed in the north and east portions of the skeet accumulation

area to confirm that the lateral and vertical extent of the BaP equivalent concentrations in soil has been fully delineated. Focusing a limited removal action on these two specific locations will do much to reduce the site-wide human health cancer risk to a level between the 10^{-4} to 10^{-5} screening levels. The ranked listing of the calculated BaP equivalent concentrations for the East Trap Range soil samples are presented in [Table 4-2](#), and show a major decrease in the BaP equivalents in East Trap Range soil samples when the top three are removed from the data set and replaced with clean soil.

Preliminary Soil Volumes Proposed for Removal to Address PAH Contamination in Soils

The volumes of soil proposed for removal on the former West Trap Range ([Figure 3-1](#)) and the former East Trap Range ([Figure 3-2](#)) are preliminary at this time because the PAH contamination in soil has not been fully delineated with respect to lateral extent or depth. It is presumed that the total depth of PAH contamination above relevant health risk screening levels would not likely extend to more than 3 feet bgs; therefore, a removal depth of three feet has been assumed. In the West Trap Range, the soil volume proposed for removal (based on the current data set and indicated in [Figure 3-1](#)) is approximately 6,285 cubic feet or nearly 233 cubic yards. The collection of the supplemental soil samples will either confirm this proposed volume or indicate the need for an expanded removal action with additional volumes of soil (based on the supplemented data set).

For the East Trap Range, the soil volume proposed for removal (based on the current data set and indicated in [Figure 3-2](#)) is much smaller (based on only two locations with an excess human lifetime cancer risk greater than 1×10^{-4}) and covers approximately 1,021 cubic feet or about 38 cubic yards. The collection of the supplemental soil samples will either confirm this proposed volume or indicate the need for an expanded removal action with additional volumes of soil (based on the supplemented data set).

If the preliminary calculation of soil to be removed from both of the trap range areas (a total of 271 cubic yards) is successful and the BaP equivalent concentrations remaining on the ranges reduce the site-wide human health cancer risk to a calculated BaP concentration to a level between the 10^{-4} to 10^{-5} screening levels, then this activity may be adequate to permit the West Trap Range and the East Trap Range at UXO 7 to proceed to a no further action recommendation (NFA).

4.2 Rifle Range

Various concentrations of lead have been detected at UXO 7. Lead concentrations greater than the Navy/EPA agreed upon concentration of 192 mg/kg remain in the northern zone of UXO 7 ([Table 2-3](#)). Specifically, these areas include the 400 yard firing berm ([Figure 2-3](#)), a small drainageway area located between the 400- and 500-yard firing berms ([Figure 2-4](#)), and a dirt mound whose origin is unknown ([Figure 2-5](#)). The lead contamination at these three locations has been bounded laterally, and for the most part, vertically with a few exceptions. In areas where XRF lead concentrations exceeded 192 mg/kg

at 2-foot bgs, additional samples were collected at depth to determine the vertical extent of lead contamination and are discussed below.

400-Yard Firing Berm

In the southwest corner of the 400-yard firing berm, several sample locations exhibited a lead concentration greater than 192 mg/kg at the 1 to 2-foot depth (**Figure 2-3**). Five additional samples were collected in this area at a depth of 2 to 3-foot bgs with only locations X7-SB395 and X7-SB396 exhibiting lead concentrations greater than 192 mg/kg at 321 and 303 mg/kg, respectively. Due to these exceedences, two additional samples were collected at 3 to 4-foot bgs and while sample location X7-SB411 exhibited a lead concentration of 52 mg/kg, sample location X7-SB409 exhibited a lead concentration of 1,087 mg/kg.

In the central portion of the 400-yard firing berm, several sample locations exhibited a lead concentration greater than 192 mg/kg at the 1 to 2-foot depth (**Figure 2-3**). Three additional samples were collected in this area at a depth of 2 to 3-foot bgs with two locations slightly exceeding 192 mg/kg (X7-SB291 at 203 mg/kg and X7-SB296 at 280 mg/kg); and the other sample location (X7-SB295) exhibited a lead concentration of 477 mg/kg.

In the southeast area of the berm, several sample locations exhibited a lead concentration greater than 192 mg/kg at the 1 to 2-foot depth (**Figure 2-3**). Seven additional samples were collected in this area at a depth of 2 to 3-foot bgs with five of those locations exhibiting lead concentrations below 192 mg/kg. Sample X7-SB301 had a lead concentration of 517 mg/kg at the 2 to 3-foot depth, and sample location X7-SB297 had a lead concentration of 232 mg/kg at the 2 to 3-foot depth. It should also be noted that sample location X7-SB417, which is located centrally to most of the above mentioned samples, had a lead concentration of 159 mg/kg at 4 to 5-foot bgs; however, the 5 to-6 foot sample at this location, exhibited a lead concentration of 715 mg/kg.

Drainageway between 400 and 500-Yard Berm

Eight sample locations within the drainageway between the 400 and 500-yard firing berm exhibited lead concentrations greater than 192 mg/kg at the 1 to 2-foot depth with the highest being 616 mg/kg (**Figure 2-4**). Five additional samples were then collected in this area at depths of either 2 to 3-foot bgs or 3 to 4-foot bgs, with all samples exhibiting lead concentrations less than 90 mg/kg.

Dirt Mound

The dirt mound exists along the gravel road between the 300 and 400-yard firing berm (**Figure 2-5**). The history of the mound is unknown; however, the height of the mound (estimated at approximately 10 feet above ground surface) would have partially blocked the shooters view of the main target area from the 400 and 500-yard firing positions and therefore is presumed to have been placed there after the Rifle Range was no longer operational. It appears as though the dirt mound sits atop a thick black plastic liner.

Three samples located on top of the dirt mound exhibited lead concentrations greater than 192 mg/kg at the 1 to 2-foot depth. These included locations X7-SB310 (374 mg/kg), X7-SB312 (249 mg/kg), and X7-SB313 (201 mg/kg). Three additional samples were then collected at 2 to 3-feet bgs with location X7-SB310 exhibiting a lead concentration of 209 mg/kg and location X7-SB313 having a lead concentration of 466 mg/kg.

To determine if lead contamination was reaching the base of the mound, a DPT rig was utilized to collect three samples along the base of the mound angled into the side of the mound to approximate depths of 2 to 4-feet below the interface of the dirt mound and the natural topography of the site. All three sample locations presented lead concentrations less than 25 mg/kg.

Based on this information there are options available for remediation of the Rifle Range (northern zone) and include the following:

- 1) The first and most efficient option would include the removal of a specific amount of soil from three locations (two at the 400-yard firing berm and one within the drainage area), down to a maximum depth of 2-feet bgs which would meet the agreed upon site average lead concentration of 192 mg/kg. This would include the removal of approximately 53 yds³ of soil from the 400 yd berm (**Figure 4-1**) and approximately 22 yds³ of soil from the drainage area (**Figure 4-2**). This would lower the overall lead concentration within the northern zone of UXO 7 from 231 mg/kg down to 127 mg/kg (**Table 4-3**). This option would:
 - a. Remove the majority of the highest lead concentrations detected at the sites.
 - b. Would include the backfilling of all excavated areas with clean soil.
 - c. Would not require further soil sample collection/analysis.
 - d. Soil removal and backfilling could be completed during two 10-12 hour days, depending on conditions.

- 2) The second option includes the complete removal of the 400-yard firing berm bringing the area down to grade with the surrounding area. The approximate amount of soil removed is estimated at 1,000 yds³. This would lower the overall lead concentration within the northern zone of UXO 7 from 238 mg/kg down to 91 mg/kg (**Table 4-4**). This option would:
 - a. Remove the entire 400-yard firing berm to grade.
 - b. Remove the majority of the highest lead concentrations detected at the sites.

- c. Would require further soil analysis to ensure lead contamination does not exist in base soil.
- d. Soil removal and additional soil samples field analyzed and collected could be completed during four 10-12 hour. days, depending on conditions.

TABLE 4-1
BaP EQUIVALENT SAMPLING RESULTS - WEST TRAP RANGE
UXO 7 - SOIL SAMPLES
NSA CRANE
CRANE, INDIANA

Samples	BAP EQUIVALENT-HALFND (Pre-excavation Concentration)	Location Proposed for Focused Soil Removal (Yes or No)	BAP EQUIVALENT-HALFND (Post-excavation Concentration)
X7SS201-0001	85.2068	Yes	0.015
X7SS214-0001	35.0757	Yes	0.015
X7SS1210002	11.2544	Yes	0.015
X7SS232-0001	9.09369	Yes	0.015
X7SS229-0001	5.49382	Yes	0.015
X7SS203-0001	2.33583	Yes	0.015
X7SS1230002	2.2173	Yes	0.015
X7SS211-0001	1.71729	No (in forested area)	1.71729
X7SS217-0001	1.46853	Yes	0.015
X7SS218-0001	1.44773	Yes	0.015
X7SS208-0001	1.313653	Yes	0.015
X7SS1160002	1.20163	Yes	0.015
X7SS202-0001	0.869733	Yes	0.015
X7SS241-0001	0.666454	No	0.666454
X7SS207-0001	0.610751	No	0.610751
X7SS210-0001	0.486324	No	0.486324
X7SS226-0001	0.296375	No	0.296375
X7SS230-0001	0.292371	No	0.292371
X7SS204-0001	0.285403	No	0.285403
X7SS220-0001	0.284408	No	0.284408
X7SS209-0001	0.254496	No	0.254496
X7SS222-0001	0.246147	No	0.246147
X7SS203-0102	0.193952	Yes	0.015
X7SS227-0001	0.1679384	No	0.1679384
X7SS234-0001	0.1377372	No	0.1377372
X7SS233-0001	0.1361289	No	0.1361289
X7SS219-0001	0.1289741	Yes	0.015
X7SS228-0001	0.1188853	No	0.1188853
X7SS1290002	0.111506	No	0.111506
X7SS223-0001	0.1068119	No	0.1068119
X7SS240-0001	0.0725538	No	0.0725538
X7SS200-0001	0.0707296	No	0.0707296
X7SS225-0001	0.0563147	No	0.0563147
X7SS217-0102	0.0498275	Yes	0.015
X7SS205-0001	0.033011	No	0.033011
X7SS241-0102	0.0327628	No	0.0327628
X7SS213-0001	0.0300218	No	0.0300218
X7SS234-0102	0.0285492	No	0.0285492
X7SS200-0102	0.0254277	No	0.0254277
X7SS224-0001	0.0210992	No	0.0210992
X7SS1220002	0.018147	No	0.018147
X7SS209-0102	0.0168599	No	0.0168599

TABLE 4-1
BaP EQUIVALENT SAMPLING RESULTS - WEST TRAP RANGE
UXO 7 - SOIL SAMPLES
NSA CRANE
CRANE, INDIANA

Samples	BAP EQUIVALENT-HALFND (Pre-excavation Concentration)	Location Proposed for Focused Soil Removal (Yes or No)	BAP EQUIVALENT-HALFND (Post-excavation Concentration)
X7SS238-0001	0.01633047	No	0.01633047
X7SS230-0102	0.01612403	No	0.01612403
X7SS239-0001	0.01440258	No	0.01440258
X7SS211-0102	0.01332254	No	0.01332254
X7SS228-0102	0.01292909	No	0.01292909
X7SS208-0102	0.01112955	Yes	0.015
X7SS220-0102	0.01000452	No	0.01000452
X7SS231-0001	0.009980445	No	0.009980445
X7SS210-0102	0.00987185	No	0.00987185
X7SS207-0102	0.00945462	No	0.00945462
X7SS222-0102	0.0093202	No	0.0093202
X7SS218-0102	0.00922198	Yes	0.015
X7SS229-0102	0.00871382	Yes	0.015
X7SS237-0001	0.00820309	No	0.00820309
X7SS202-0102	0.00804713	Yes	0.015
X7SS206-0102	0.00687933	No	0.00687933
X7SS201-0102	0.00679759	Yes	0.015
X7SS223-0102	0.006265615	No	0.006265615
X7SS240-0102	0.00611772	No	0.00611772
X7SS215-0001	0.00552012	No	0.00552012
X7SS205-0102	0.00549734	No	0.00549734
X7SS212-0001	0.00480744	No	0.00480744
X7SS221-0001	0.004702725	No	0.004702725
X7SS225-0102	0.00455182	No	0.00455182
X7SS232-0102	0.00454212	Yes	0.015
X7SS216-0001	0.00429	No	0.00429
X7SS206-0001	0.00425	No	0.00425
X7SS215-0102	0.00417	No	0.00417
X7SS212-0102	0.00407	No	0.00407
X7SS216-0102	0.00404	No	0.00404
X7SS213-0102	0.00401	No	0.00401
X7SS221-0102	0.00401	No	0.00401
X7SS204-0102	0.004	No	0.004
X7SS226-0102	0.00393	No	0.00393
X7SS219-0102	0.00385	Yes	0.015
X7SS233-0102	0.00384	No	0.00384
X7SS214-0102	0.00369	Yes	0.015
X7SS1360002	0.001	No	0.001
Pre-removal action data BaP concentrations 95% UCL =	<u>9.265</u> mg/kg	Post-removal action data BaP concentrations 95% UCL =	<u>0.196</u> mg/kg

TABLE 4-1
BaP EQUIVALENT SAMPLING RESULTS - WEST TRAP RANGE
UXO 7 - SOIL SAMPLES
NSA CRANE
CRANE, INDIANA

Samples	BAP EQUIVALENT-HALFND (Pre-excavation Concentration)	Location Proposed for Focused Soil Removal (Yes or No)	BAP EQUIVALENT-HALFND (Post-excavation Concentration)
---------	---------------------------------------------------------	--------------------------------------------------------------	-------------------------------------------------------------

Red font indicates soil locations included in the volume (6,771 cubic feet or 251 cubic yards) proposed for removal to address excess risk due to BaP equivalent concentrations in soil. It is presumed that the materials used for excavation backfill would have a BaP concentration no greater than the 0.015 mg/kg RSL.

TABLE 4-2

**BaP EQUIVALENT SAMPLING RESULTS - EAST TRAP RANGE
UXO 7 - SOIL SAMPLES
NSA CRANE
CRANE, INDIANA**

Samples	BAP EQUIVALENT-HALFND (Pre-excavation Concentration)	Location Proposed for Focused Soil Removal (Yes or No)	BAP EQUIVALENT- HALFND (Post-excavation Concentration)
X7SS0710002	0.021323	No	0.021323
X7SS0750002	0.23208	No	0.23208
X7SS242-0001	0.257016	No	0.257016
X7SS242-0102	0.216257	No	0.216257
X7SS243-0001	0.02104697	No	0.02104697
X7SS243-0102	0.343813	No	0.343813
X7SS244-0001	0.0585138	No	0.0585138
X7SS244-0102	0.0312892	No	0.0312892
X7SS245-0001	0.02692587	No	0.02692587
X7SS245-0102	0.04922175	No	0.04922175
X7SS246-0001	0.0403678	No	0.0403678
X7SS246-0102	0.1050083	No	0.1050083
X7SS247-0001	0.153165	Yes	0.015
X7SS247-0102	5.69607	Yes	0.015
X7SS248-0001	0.00852177	No	0.00852177
X7SS248-0102	0.0414	No	0.0414
X7SS249-0001	0.0130093	No	0.0130093
X7SS249-0102	0.026633465	No	0.026633465
X7SS250-0001	0.00891996	No	0.00891996
X7SS250-0102	0.1319451	No	0.1319451
X7SS251-0001	0.0188676	No	0.0188676
X7SS251-0102	0.0196466	No	0.0196466
X7SS252-0001	0.01173673	No	0.01173673
X7SS252-0102	0.0361849	No	0.0361849
X7SS253-0001	0.009351665	No	0.009351665
X7SS253-0102	0.0629458	No	0.0629458
X7SS254-0001	0.699799	No	0.699799
X7SS254-0102	0.265358	No	0.265358
X7SS255-0001	1.7376	Yes	0.015
X7SS255-0102	9.4851	Yes	0.015
X7SS256-0001	0.0278143	No	0.0278143
X7SS256-0102	0.166454	No	0.166454
X7SS257-0001	0.0358926	No	0.0358926
X7SS257-0102	0.345399	No	0.345399
X7SS258-0001	0.01029953	No	0.01029953
X7SS258-0102	0.0042	No	0.0042

TABLE 4-2

**BaP EQUIVALENT SAMPLING RESULTS - EAST TRAP RANGE
UXO 7 - SOIL SAMPLES
NSA CRANE
CRANE, INDIANA**

Samples	BAP EQUIVALENT-HALFND (Pre-excavation Concentration)	Location Proposed for Focused Soil Removal (Yes or No)	BAP EQUIVALENT- HALFND (Post-excavation Concentration)
X7SS259-0001	0.00442	No	0.00442
X7SS259-0102	0.00422	No	0.00422
X7SS260-0001	0.012248975	No	0.012248975
X7SS260-0102	0.1474503	No	0.1474503
X7SS261-0001	0.0298196	No	0.0298196
X7SS261-0102	0.293087	No	0.293087
X7SS262-0001	0.498052	No	0.498052
X7SS262-0102	0.0902324	No	0.0902324
X7SS263-0001	0.41523	No	0.41523
X7SS263-0102	0.00583354	No	0.00583354
X7SS265-0001	0.01841824	No	0.01841824
X7SS265-0102	0.005849825	No	0.005849825
X7SS266-0001	0.01353646	No	0.01353646
X7SS266-0102	0.0428044	No	0.0428044
X7SS267-0001	0.013894585	No	0.013894585
X7SS267-0102	0.0221614	No	0.0221614
X7SS270-0001	0.01184303	No	0.01184303
X7SS270-0102	0.004	No	0.004
X7SS271-0001	0.0833637	No	0.0833637
X7SS271-0102	0.153328	No	0.153328
X7SS272-0001	0.1395715	No	0.1395715
X7SS272-0102	0.177108	No	0.177108
Pre-removal action data BaP concentrations 95% UCL =	<u>1.572 mg/kg</u>	Post-removal action data BaP concentrations 95% UCL =	<u>0.177 mg/kg</u>

Red font indicates soil locations included in the volume (6,771 cubic feet or 251 cubic yards) proposed for removal to address excess risk due to BaP equivalent concentrations in soil. It is presumed that the materials used for excavation backfill would have a BaP concentration no greater than the 0.015 mg/kg RSL.

TABLE 4-3

**LIMITED SOIL REMOVAL AT 400 YARD BERM AND DRAINAGE AREA
SOIL LEAD CONCENTRATIONS - NORTHERN ZONE
UXO 7 - RIFLE RANGE
NSA CRANE
CRANE, INDIANA**

Sample ID	Parameter	Analysis	Result	Removal Result
X7-SS291-0001	LEAD	Lead-Calc	1186	20
X7-SS0550002	LEAD	FBL	1160	20
X7-SS0460002	LEAD	FBL	1100	20
X7-SS369-0001	LEAD	Lead-Calc	869	20
X7-SS296-0001	LEAD	Lead-Calc	818	20
X7-SS421-0001	LEAD	Lead-Calc	681	681
X7-SS274-0001	LEAD	Lead-Calc	670	20
X7-SS368-0102	LEAD	Lead-Calc	660	20
X7-SS297-0001	LEAD	Lead-Calc	646	20
X7-SS275-0102	LEAD	Lead-Calc	616	20
X7-SS281-0001	LEAD	Lead-Calc	611	20
X7-SS280-0001	LEAD	Lead-Calc	603	20
X7-SS349-0102	LEAD	Lead-Calc	601	20
X7-SS307-0001	LEAD	Lead-Calc	568	568
X7-SS391-0102	LEAD	Lead-Calc	566	566
X7-SS282-0001	LEAD	Lead-Calc	559	20
X7-SS347-0001	LEAD	Lead-Calc	541	20
X7-SS395-0102	LEAD	Lead-Calc	535	535
X7-SS283-0001	LEAD	Lead-Calc	534	20
X7-SS303-0102	LEAD	Lead-Calc	532	532
X7-SS283-0102	LEAD	Lead-Calc	522	20
X7-SS345-0001	LEAD	Lead-Calc	518	20
X7-SS284-0001	LEAD	Lead-Calc	503	20
X7-SS0390002	LEAD	FBL	495	495
X7-SS306-0001	LEAD	Lead-Calc	484	484
X7-SS299-0102	LEAD	Lead-Calc	478	20
X7-SS308-0001	LEAD	Lead-Calc	469	469
X7-SS278-0001	LEAD	Lead-Calc	464	20
X7-SS398-0102	LEAD	Lead-Calc	458	458
X7-SS358-0102	LEAD	Lead-Calc	455	20
X7-SS323-0001	LEAD	FBL	448	448
X7-SS420-0102	LEAD	Lead-Calc	445	445
X7-SS1740002	LEAD	FBL	430	20
X7-SS325-0001	LEAD	Lead-Calc	419	419
X7-SS298-0102	LEAD	Lead-Calc	414	20
X7-SS275-0001	LEAD	Lead-Calc	413	20
X7-SS365-0001	LEAD	Lead-Calc	412	412
X7-SS279-0001	LEAD	Lead-Calc	408	20

TABLE 4-3

LIMITED SOIL REMOVAL AT 400 YARD BERM AND DRAINAGE AREA
 SOIL LEAD CONCENTRATIONS - NORTHERN ZONE
 UXO 7 - RIFLE RANGE
 NSA CRANE
 CRANE, INDIANA

Sample ID	Parameter	Analysis	Result	Removal Result
X7-SS357-0001	LEAD	Lead-Calc	408	20
X7-SS365-0102	LEAD	Lead-Calc	403	403
X7-SS422-0001	LEAD	Lead-Calc	399	399
X7-SS274-0102	LEAD	Lead-Calc	397	20
X7-SS285-0001	LEAD	Lead-Calc	392	392
X7-SS295-0102	LEAD	Lead-Calc	386	20
X7-SS396-0102	LEAD	Lead-Calc	384	384
X7-SS277-0001	LEAD	Lead-Calc	382	382
X7-SS377-0001	LEAD	Lead-Calc	380	380
X7-SS279-0102	LEAD	Lead-Calc	376	20
X7-SS310-0001	LEAD	Lead-Calc	374	374
X7-SS310-0102	LEAD	FBL	374	374
X7-SS358-0001	LEAD	Lead-Calc	370	20
X7-SS297-0102	LEAD	Lead-Calc	366	20
X7-SS291-0102	LEAD	Lead-Calc	365	20
X7-SS301-0102	LEAD	Lead-Calc	357	20
X7-SS298-0001	LEAD	Lead-Calc	356	20
X7-SS1900002	LEAD	Lead-Calc	347	347
X7-SS422-0102	LEAD	FBL	343	343
X7-SS423-0001	LEAD	FBL	340	340
X7-SS295-0001	LEAD	Lead-Calc	339	20
X7-SS299-0001	LEAD	Lead-Calc	338	20
X7-SS401-0102	LEAD	Lead-Calc	337	337
X7-SS316-0001	LEAD	Lead-Calc	322	322
X7-SS277-0102	LEAD	Lead-Calc	315	315
X7-SS278-0102	LEAD	Lead-Calc	315	20
X7-SS305-0001	LEAD	Lead-Calc	311	311
X7-SS296-0102	LEAD	Lead-Calc	304	20
X7-SS282-0102	LEAD	Lead-Calc	303	20
X7-SS360-0102	LEAD	Lead-Calc	302	20
X7-SS361-0001	LEAD	Lead-Calc	299	299
X7-SS398-0001	LEAD	Lead-Calc	293	293
X7-SS404-0001	LEAD	Lead-Calc	292	292
X7-SS361-0102	LEAD	Lead-Calc	291	291
X7-SS351-0102	LEAD	FBL	290	290
X7-SS0450002	LEAD	FBL	286	20
X7-SS394-0102	LEAD	Lead-Calc	285	285
X7-SS320-0001	LEAD	Lead-Calc	279	279

TABLE 4-3

LIMITED SOIL REMOVAL AT 400 YARD BERM AND DRAINAGE AREA
 SOIL LEAD CONCENTRATIONS - NORTHERN ZONE
 UXO 7 - RIFLE RANGE
 NSA CRANE
 CRANE, INDIANA

Sample ID	Parameter	Analysis	Result	Removal Result
X7-SS342-0102	LEAD	FBL	263	263
X7-SS303-0001	LEAD	Lead-Calc	261	261
X7-SS312-0102	LEAD	FBL	249	249
X7-SS395-0001	LEAD	Lead-Calc	246	246
X7-SS408-0001	LEAD	FBL	246	246
X7-SS369-0102	LEAD	FBL	245	20
X7-SS371-0001	LEAD	FBL	244	244
X7-SS336-0001	LEAD	FBL	236	236
X7-SS308-0102	LEAD	Lead-Calc	235	235
X7-SS360-0001	LEAD	Lead-Calc	232	20
X7-SS300-0001	LEAD	Lead-Calc	230	20
X7-SS300-0102	LEAD	Lead-Calc	228	20
X7-SS292-0001	LEAD	Lead-Calc	226	20
X7-SS393-0102	LEAD	FBL	226	226
X7-SS315-0001	LEAD	FBL	220	220
X7-SS0380002	LEAD	Lead-Calc	213	213
X7-SS1810002	LEAD	FBL	212	212
X7-SS313-0102	LEAD	Lead-Calc	201	201
X7-SS385-0001	LEAD	FBL	200	200
X7-SS0440002	LEAD	FBL	199	199
X7-SS414-0001	LEAD	FBL	199	199
X7-SS333-0001	LEAD	FBL	198	198
X7-SS424-0001	LEAD	FBL	193	193
X7-SS351-0001	LEAD	FBL	191	191
X7-SS0480002	LEAD	FBL	190	190
X7-SS286-0001	LEAD	Lead-Calc	189	189
X7-SS412-0001	LEAD	FBL	189	189
X7-SS313-0001	LEAD	FBL	187	187
X7-SS368-0001	LEAD	Lead-Calc	187	20
X7-SS376-0001	LEAD	Lead-Calc	184	184
X7-SS363-0001	LEAD	FBL	180	180
X7-SS314-0102	LEAD	Lead-Calc	179	179
X7-SS1750002	LEAD	FBL	170	170
X7-SS349-0001	LEAD	Lead-Calc	166	20
X7-SS301-0001	LEAD	Lead-Calc	164	20
X7-SS320-0102	LEAD	Lead-Calc	162	162
X7-SS434-0001	LEAD	FBL	162	162
X7-SS306-0102	LEAD	Lead-Calc	160	160

TABLE 4-3

**LIMITED SOIL REMOVAL AT 400 YARD BERM AND DRAINAGE AREA
SOIL LEAD CONCENTRATIONS - NORTHERN ZONE
UXO 7 - RIFLE RANGE
NSA CRANE
CRANE, INDIANA**

Sample ID	Parameter	Analysis	Result	Removal Result
X7-SS425-0001	LEAD	FBL	160	160
X7-SS302-0001	LEAD	Lead-Calc	159	20
X7-SS353-0001	LEAD	FBL	157	157
X7-SS321-0001	LEAD	FBL	156	20
X7-SS391-0001	LEAD	Lead-Calc	152	152
X7-SS1890002	LEAD	FBL	151	151
X7-SS294-0001	LEAD	Lead-Calc	148	20
X7-SS393-0001	LEAD	Lead-Calc	147	147
X7-SS396-0001	LEAD	Lead-Calc	145	145
X7-SS1760002	LEAD	Lead-Calc	143	143
X7-SS290-0001	LEAD	Lead-Calc	143	143
X7-SS312-0001	LEAD	Lead-Calc	143	143
X7-SS394-0001	LEAD	Lead-Calc	142	142
X7-SS331-0001	LEAD	FBL	138	138
X7-SS355-0001	LEAD	FBL	136	136
X7-SS376-0102	LEAD	FBL	136	136
X7-SS276-0001	LEAD	Lead-Calc	128	128
X7-SS314-0001	LEAD	Lead-Calc	126	126
X7-SS1730002	LEAD	FBL	125	125
X7-SS429-0001	LEAD	FBL	125	125
X7-SS0400002	LEAD	Lead-Calc	119	119
X7-SS420-0001	LEAD	Lead-Calc	119	119
X7-SS1770002	LEAD	FBL	115	115
X7-SS344-0001	LEAD	FBL	111	111
X7-SS355-0102	LEAD	Lead-Calc	110	110
X7-SS392-0001	LEAD	FBL	107	107
X7-SS415-0001	LEAD	FBL	105	105
X7-SS400-0001	LEAD	Lead-Calc	104	104
X7-SS414-0102	LEAD	Lead-Calc	104	104
X7-SS377-0102	LEAD	FBL	98.6	98.6
X7-SS401-0001	LEAD	FBL	97.4	97.4
X7-SS281-0102	LEAD	Lead-Calc	96.6	20
X7-SS1820002	LEAD	FBL	95.1	95.1
X7-SS280-0102	LEAD	FBL	94.3	20
X7-SS347-0102	LEAD	FBL	91.5	20
X7-SS276-0102	LEAD	Lead-Calc	91	91
X7-SS424-0102	LEAD	FBL	91	91
X7-SS318-0001	LEAD	Lead-Calc	90.9	90.9

TABLE 4-3

**LIMITED SOIL REMOVAL AT 400 YARD BERM AND DRAINAGE AREA
SOIL LEAD CONCENTRATIONS - NORTHERN ZONE
UXO 7 - RIFLE RANGE
NSA CRANE
CRANE, INDIANA**

Sample ID	Parameter	Analysis	Result	Removal Result
X7-SS292-0102	LEAD	Lead-Calc	90.6	20
X7-SS402-0001	LEAD	FBL	89.7	89.7
X7-SS1800002	LEAD	FBL	89	89
X7-SS311-0001	LEAD	Lead-Calc	88.5	88.5
X7-SS304-0001	LEAD	Lead-Calc	87.9	20
X7-SS284-0102	LEAD	Lead-Calc	87.3	20
X7-SS1790002	LEAD	FBL	83.6	83.6
X7-SS404-0102	LEAD	Lead-Calc	83.4	83.4
X7-SS406-0001	LEAD	Lead-Calc	80.6	80.6
X7-SS345-0102	LEAD	FBL	78.4	20
X7-SS416-0001	LEAD	FBL	78.2	78.2
X7-SS289-0001	LEAD	Lead-Calc	78	78
X7-SS387-0001	LEAD	Lead-Calc	77.4	77.4
X7-SS302-0102	LEAD	Lead-Calc	76.2	20
X7-SS317-0001	LEAD	Lead-Calc	74.9	74.9
X7-SS407-0001	LEAD	FBL	73.7	73.7
X7-SS293-0001	LEAD	Lead-Calc	71.6	20
X7-SS336-0102	LEAD	Lead-Calc	71	71
X7-SS319-0001	LEAD	Lead-Calc	70.7	70.7
X7-SS357-0102	LEAD	Lead-Calc	69.2	20
X7-SS305-0102	LEAD	Lead-Calc	68	68
X7-SS327-0001	LEAD	FBL	66.4	66.4
X7-SS309-0001	LEAD	Lead-Calc	65.9	65.9
X7-SS315-0102	LEAD	Lead-Calc	64.7	64.7
X7-SS337-0001	LEAD	Lead-Calc	64.4	64.4
X7-SS383-0001	LEAD	Lead-Calc	64.4	64.4
X7-SS288-0001	LEAD	FBL	63.8	63.8
X7-SS337-0001	LEAD	FBL	63.1	63.1
X7-SS0470002	LEAD	Lead-Calc	63	63
X7-SS294-0102	LEAD	Lead-Calc	61.7	20
X7-SS385-0102	LEAD	Lead-Calc	60.8	60.8
X7-SS0500002	LEAD	Lead-Calc	57	57
X7-SS0430002	LEAD	Lead-Calc	56	56
X7-SS373-0001	LEAD	Lead-Calc	50.8	50.8
X7-SS323-0102	LEAD	Lead-Calc	50.2	50.2
X7-SS379-0001	LEAD	Lead-Calc	49.6	49.6
X7-SS418-0001	LEAD	Lead-Calc	48.4	48.4
X7-SS307-0102	LEAD	Lead-Calc	47.5	47.5

TABLE 4-3

LIMITED SOIL REMOVAL AT 400 YARD BERM AND DRAINAGE AREA
 SOIL LEAD CONCENTRATIONS - NORTHERN ZONE
 UXO 7 - RIFLE RANGE
 NSA CRANE
 CRANE, INDIANA

Sample ID	Parameter	Analysis	Result	Removal Result
X7-SS329-0001	LEAD	FBL	46.3	46.3
X7-SS287-0001	LEAD	FBL	44.8	44.8
X7-SS1780002	LEAD	FBL	40.9	40.9
X7-SS321-0102	LEAD	Lead-Calc	40	20
X7-SS331-0102	LEAD	Lead-Calc	39.4	39.4
X7-SS333-0102	LEAD	Lead-Calc	39.4	39.4
X7-SS325-0102	LEAD	Lead-Calc	37.3	37.3
X7-SS415-0102	LEAD	Lead-Calc	36.4	36.4
X7-SS0520002	LEAD	Lead-Calc	34	34
X7-SS316-0102	LEAD	Lead-Calc	34	34
X7-SS0530002	LEAD	Lead-Calc	32	32
X7-SS408-0102	LEAD	Lead-Calc	31.9	31.9
X7-SS412-0102	LEAD	Lead-Calc	31.9	31.9
X7-SS0510002	LEAD	Lead-Calc	30	30
X7-SS434-0102	LEAD	Lead-Calc	29.4	29.4
X7-SS290-0102	LEAD	Lead-Calc	29	29
X7-SS1830002	LEAD	FBL	28.8	28.8
X7-SS0540002	LEAD	Lead-Calc	27	27
X7-SS0410002	LEAD	Lead-Calc	26	26
X7-SS423-0102	LEAD	Lead-Calc	25.8	25.8
X7-SS1840002	LEAD	FBL	25.3	25.3
X7-SS0490002	LEAD	Lead-Calc	24	24
X7-SS344-0102	LEAD	Lead-Calc	22.8	22.8
X7-SS421-0102	LEAD	Lead-Calc	19.8	19.8
X7-SS425-0102	LEAD	FBL	16.5	16.5
X7-SS410-0001	LEAD	FBL	12.3	12.3
X7-SS363-0102	LEAD	Lead-Calc	10.2	10.2
X7-SS0420002	LEAD	Lead-Calc	0	0
X7-SS0560002	LEAD	Lead-Calc	0	0
X7-SS0570002	LEAD	Lead-Calc	0	0
NORTHERN ZONE LEAD AVERAGE			231.24	126.94

Shading indicates sample area to be excavated and replaced with clean backfill.

Red font indicates lead concentration > 192 mg/kg

TABLE 4-3

LIMITED SOIL REMOVAL AT 400 YARD BERM AND DRAINAGE AREA
 SOIL LEAD CONCENTRATIONS - NORTHERN ZONE
 UXO 7 - RIFLE RANGE
 NSA CRANE
 CRANE, INDIANA

Sample ID	Parameter	Analysis	Result	Removal Result
X7-SS291-0001	LEAD	Lead-Calc	1186	20
X7-SS0550002	LEAD	FBL	1160	20
X7-SS0460002	LEAD	FBL	1100	20
X7-SS369-0001	LEAD	Lead-Calc	869	20
X7-SS296-0001	LEAD	Lead-Calc	818	20
X7-SS421-0001	LEAD	Lead-Calc	681	681
X7-SS274-0001	LEAD	Lead-Calc	670	20
X7-SS368-0102	LEAD	Lead-Calc	660	20
X7-SS297-0001	LEAD	Lead-Calc	646	20
X7-SS275-0102	LEAD	Lead-Calc	616	20
X7-SS281-0001	LEAD	Lead-Calc	611	20
X7-SS280-0001	LEAD	Lead-Calc	603	20
X7-SS349-0102	LEAD	Lead-Calc	601	20
X7-SS307-0001	LEAD	Lead-Calc	568	568
X7-SS391-0102	LEAD	Lead-Calc	566	566
X7-SS282-0001	LEAD	Lead-Calc	559	20
X7-SS347-0001	LEAD	Lead-Calc	541	20
X7-SS395-0102	LEAD	Lead-Calc	535	535
X7-SS283-0001	LEAD	Lead-Calc	534	20
X7-SS303-0102	LEAD	Lead-Calc	532	532
X7-SS283-0102	LEAD	Lead-Calc	522	20
X7-SS345-0001	LEAD	Lead-Calc	518	20
X7-SS284-0001	LEAD	Lead-Calc	503	20
X7-SS0390002	LEAD	FBL	495	495
X7-SS306-0001	LEAD	Lead-Calc	484	484
X7-SS299-0102	LEAD	Lead-Calc	478	20
X7-SS308-0001	LEAD	Lead-Calc	469	469
X7-SS278-0001	LEAD	Lead-Calc	464	20
X7-SS398-0102	LEAD	Lead-Calc	458	458
X7-SS358-0102	LEAD	Lead-Calc	455	20
X7-SS323-0001	LEAD	FBL	448	448
X7-SS420-0102	LEAD	Lead-Calc	445	445
X7-SS1740002	LEAD	FBL	430	20
X7-SS325-0001	LEAD	Lead-Calc	419	419
X7-SS298-0102	LEAD	Lead-Calc	414	20
X7-SS275-0001	LEAD	Lead-Calc	413	20
X7-SS365-0001	LEAD	Lead-Calc	412	412
X7-SS279-0001	LEAD	Lead-Calc	408	20

TABLE 4-3

**LIMITED SOIL REMOVAL AT 400 YARD BERM AND DRAINAGE AREA
SOIL LEAD CONCENTRATIONS - NORTHERN ZONE
UXO 7 - RIFLE RANGE
NSA CRANE
CRANE, INDIANA**

Sample ID	Parameter	Analysis	Result	Removal Result
X7-SS357-0001	LEAD	Lead-Calc	408	20
X7-SS365-0102	LEAD	Lead-Calc	403	403
X7-SS422-0001	LEAD	Lead-Calc	399	399
X7-SS274-0102	LEAD	Lead-Calc	397	20
X7-SS285-0001	LEAD	Lead-Calc	392	392
X7-SS295-0102	LEAD	Lead-Calc	386	20
X7-SS396-0102	LEAD	Lead-Calc	384	384
X7-SS277-0001	LEAD	Lead-Calc	382	382
X7-SS377-0001	LEAD	Lead-Calc	380	380
X7-SS279-0102	LEAD	Lead-Calc	376	20
X7-SS310-0001	LEAD	Lead-Calc	374	374
X7-SS310-0102	LEAD	FBL	374	374
X7-SS358-0001	LEAD	Lead-Calc	370	20
X7-SS297-0102	LEAD	Lead-Calc	366	20
X7-SS291-0102	LEAD	Lead-Calc	365	20
X7-SS301-0102	LEAD	Lead-Calc	357	20
X7-SS298-0001	LEAD	Lead-Calc	356	20
X7-SS1900002	LEAD	Lead-Calc	347	347
X7-SS422-0102	LEAD	FBL	343	343
X7-SS423-0001	LEAD	FBL	340	340
X7-SS295-0001	LEAD	Lead-Calc	339	20
X7-SS299-0001	LEAD	Lead-Calc	338	20
X7-SS401-0102	LEAD	Lead-Calc	337	337
X7-SS316-0001	LEAD	Lead-Calc	322	322
X7-SS277-0102	LEAD	Lead-Calc	315	315
X7-SS278-0102	LEAD	Lead-Calc	315	20
X7-SS305-0001	LEAD	Lead-Calc	311	311
X7-SS296-0102	LEAD	Lead-Calc	304	20
X7-SS282-0102	LEAD	Lead-Calc	303	20
X7-SS360-0102	LEAD	Lead-Calc	302	20
X7-SS361-0001	LEAD	Lead-Calc	299	299
X7-SS398-0001	LEAD	Lead-Calc	293	293
X7-SS404-0001	LEAD	Lead-Calc	292	292
X7-SS361-0102	LEAD	Lead-Calc	291	291
X7-SS351-0102	LEAD	FBL	290	290
X7-SS0450002	LEAD	FBL	286	20
X7-SS394-0102	LEAD	Lead-Calc	285	285
X7-SS320-0001	LEAD	Lead-Calc	279	279

TABLE 4-3

LIMITED SOIL REMOVAL AT 400 YARD BERM AND DRAINAGE AREA
 SOIL LEAD CONCENTRATIONS - NORTHERN ZONE
 UXO 7 - RIFLE RANGE
 NSA CRANE
 CRANE, INDIANA

Sample ID	Parameter	Analysis	Result	Removal Result
X7-SS342-0102	LEAD	FBL	263	263
X7-SS303-0001	LEAD	Lead-Calc	261	261
X7-SS312-0102	LEAD	FBL	249	249
X7-SS395-0001	LEAD	Lead-Calc	246	246
X7-SS408-0001	LEAD	FBL	246	246
X7-SS369-0102	LEAD	FBL	245	20
X7-SS371-0001	LEAD	FBL	244	244
X7-SS336-0001	LEAD	FBL	236	236
X7-SS308-0102	LEAD	Lead-Calc	235	235
X7-SS360-0001	LEAD	Lead-Calc	232	20
X7-SS300-0001	LEAD	Lead-Calc	230	20
X7-SS300-0102	LEAD	Lead-Calc	228	20
X7-SS292-0001	LEAD	Lead-Calc	226	20
X7-SS393-0102	LEAD	FBL	226	226
X7-SS315-0001	LEAD	FBL	220	220
X7-SS0380002	LEAD	Lead-Calc	213	213
X7-SS1810002	LEAD	FBL	212	212
X7-SS313-0102	LEAD	Lead-Calc	201	201
X7-SS385-0001	LEAD	FBL	200	200
X7-SS0440002	LEAD	FBL	199	199
X7-SS414-0001	LEAD	FBL	199	199
X7-SS333-0001	LEAD	FBL	198	198
X7-SS424-0001	LEAD	FBL	193	193
X7-SS351-0001	LEAD	FBL	191	191
X7-SS0480002	LEAD	FBL	190	190
X7-SS286-0001	LEAD	Lead-Calc	189	189
X7-SS412-0001	LEAD	FBL	189	189
X7-SS313-0001	LEAD	FBL	187	187
X7-SS368-0001	LEAD	Lead-Calc	187	20
X7-SS376-0001	LEAD	Lead-Calc	184	184
X7-SS363-0001	LEAD	FBL	180	180
X7-SS314-0102	LEAD	Lead-Calc	179	179
X7-SS1750002	LEAD	FBL	170	170
X7-SS349-0001	LEAD	Lead-Calc	166	20
X7-SS301-0001	LEAD	Lead-Calc	164	20
X7-SS320-0102	LEAD	Lead-Calc	162	162
X7-SS434-0001	LEAD	FBL	162	162
X7-SS306-0102	LEAD	Lead-Calc	160	160

TABLE 4-3

**LIMITED SOIL REMOVAL AT 400 YARD BERM AND DRAINAGE AREA
SOIL LEAD CONCENTRATIONS - NORTHERN ZONE
UXO 7 - RIFLE RANGE
NSA CRANE
CRANE, INDIANA**

Sample ID	Parameter	Analysis	Result	Removal Result
X7-SS425-0001	LEAD	FBL	160	160
X7-SS302-0001	LEAD	Lead-Calc	159	20
X7-SS353-0001	LEAD	FBL	157	157
X7-SS321-0001	LEAD	FBL	156	20
X7-SS391-0001	LEAD	Lead-Calc	152	152
X7-SS1890002	LEAD	FBL	151	151
X7-SS294-0001	LEAD	Lead-Calc	148	20
X7-SS393-0001	LEAD	Lead-Calc	147	147
X7-SS396-0001	LEAD	Lead-Calc	145	145
X7-SS1760002	LEAD	Lead-Calc	143	143
X7-SS290-0001	LEAD	Lead-Calc	143	143
X7-SS312-0001	LEAD	Lead-Calc	143	143
X7-SS394-0001	LEAD	Lead-Calc	142	142
X7-SS331-0001	LEAD	FBL	138	138
X7-SS355-0001	LEAD	FBL	136	136
X7-SS376-0102	LEAD	FBL	136	136
X7-SS276-0001	LEAD	Lead-Calc	128	128
X7-SS314-0001	LEAD	Lead-Calc	126	126
X7-SS1730002	LEAD	FBL	125	125
X7-SS429-0001	LEAD	FBL	125	125
X7-SS0400002	LEAD	Lead-Calc	119	119
X7-SS420-0001	LEAD	Lead-Calc	119	119
X7-SS1770002	LEAD	FBL	115	115
X7-SS344-0001	LEAD	FBL	111	111
X7-SS355-0102	LEAD	Lead-Calc	110	110
X7-SS392-0001	LEAD	FBL	107	107
X7-SS415-0001	LEAD	FBL	105	105
X7-SS400-0001	LEAD	Lead-Calc	104	104
X7-SS414-0102	LEAD	Lead-Calc	104	104
X7-SS377-0102	LEAD	FBL	98.6	98.6
X7-SS401-0001	LEAD	FBL	97.4	97.4
X7-SS281-0102	LEAD	Lead-Calc	96.6	20
X7-SS1820002	LEAD	FBL	95.1	95.1
X7-SS280-0102	LEAD	FBL	94.3	20
X7-SS347-0102	LEAD	FBL	91.5	20
X7-SS276-0102	LEAD	Lead-Calc	91	91
X7-SS424-0102	LEAD	FBL	91	91
X7-SS318-0001	LEAD	Lead-Calc	90.9	90.9

TABLE 4-3

**LIMITED SOIL REMOVAL AT 400 YARD BERM AND DRAINAGE AREA
SOIL LEAD CONCENTRATIONS - NORTHERN ZONE
UXO 7 - RIFLE RANGE
NSA CRANE
CRANE, INDIANA**

Sample ID	Parameter	Analysis	Result	Removal Result
X7-SS292-0102	LEAD	Lead-Calc	90.6	20
X7-SS402-0001	LEAD	FBL	89.7	89.7
X7-SS1800002	LEAD	FBL	89	89
X7-SS311-0001	LEAD	Lead-Calc	88.5	88.5
X7-SS304-0001	LEAD	Lead-Calc	87.9	20
X7-SS284-0102	LEAD	Lead-Calc	87.3	20
X7-SS1790002	LEAD	FBL	83.6	83.6
X7-SS404-0102	LEAD	Lead-Calc	83.4	83.4
X7-SS406-0001	LEAD	Lead-Calc	80.6	80.6
X7-SS345-0102	LEAD	FBL	78.4	20
X7-SS416-0001	LEAD	FBL	78.2	78.2
X7-SS289-0001	LEAD	Lead-Calc	78	78
X7-SS387-0001	LEAD	Lead-Calc	77.4	77.4
X7-SS302-0102	LEAD	Lead-Calc	76.2	20
X7-SS317-0001	LEAD	Lead-Calc	74.9	74.9
X7-SS407-0001	LEAD	FBL	73.7	73.7
X7-SS293-0001	LEAD	Lead-Calc	71.6	20
X7-SS336-0102	LEAD	Lead-Calc	71	71
X7-SS319-0001	LEAD	Lead-Calc	70.7	70.7
X7-SS357-0102	LEAD	Lead-Calc	69.2	20
X7-SS305-0102	LEAD	Lead-Calc	68	68
X7-SS327-0001	LEAD	FBL	66.4	66.4
X7-SS309-0001	LEAD	Lead-Calc	65.9	65.9
X7-SS315-0102	LEAD	Lead-Calc	64.7	64.7
X7-SS337-0001	LEAD	Lead-Calc	64.4	64.4
X7-SS383-0001	LEAD	Lead-Calc	64.4	64.4
X7-SS288-0001	LEAD	FBL	63.8	63.8
X7-SS337-0001	LEAD	FBL	63.1	63.1
X7-SS0470002	LEAD	Lead-Calc	63	63
X7-SS294-0102	LEAD	Lead-Calc	61.7	20
X7-SS385-0102	LEAD	Lead-Calc	60.8	60.8
X7-SS0500002	LEAD	Lead-Calc	57	57
X7-SS0430002	LEAD	Lead-Calc	56	56
X7-SS373-0001	LEAD	Lead-Calc	50.8	50.8
X7-SS323-0102	LEAD	Lead-Calc	50.2	50.2
X7-SS379-0001	LEAD	Lead-Calc	49.6	49.6
X7-SS418-0001	LEAD	Lead-Calc	48.4	48.4
X7-SS307-0102	LEAD	Lead-Calc	47.5	47.5

TABLE 4-3

**LIMITED SOIL REMOVAL AT 400 YARD BERM AND DRAINAGE AREA
SOIL LEAD CONCENTRATIONS - NORTHERN ZONE
UXO 7 - RIFLE RANGE
NSA CRANE
CRANE, INDIANA**

Sample ID	Parameter	Analysis	Result	Removal Result
X7-SS329-0001	LEAD	FBL	46.3	46.3
X7-SS287-0001	LEAD	FBL	44.8	44.8
X7-SS1780002	LEAD	FBL	40.9	40.9
X7-SS321-0102	LEAD	Lead-Calc	40	20
X7-SS331-0102	LEAD	Lead-Calc	39.4	39.4
X7-SS333-0102	LEAD	Lead-Calc	39.4	39.4
X7-SS325-0102	LEAD	Lead-Calc	37.3	37.3
X7-SS415-0102	LEAD	Lead-Calc	36.4	36.4
X7-SS0520002	LEAD	Lead-Calc	34	34
X7-SS316-0102	LEAD	Lead-Calc	34	34
X7-SS0530002	LEAD	Lead-Calc	32	32
X7-SS408-0102	LEAD	Lead-Calc	31.9	31.9
X7-SS412-0102	LEAD	Lead-Calc	31.9	31.9
X7-SS0510002	LEAD	Lead-Calc	30	30
X7-SS434-0102	LEAD	Lead-Calc	29.4	29.4
X7-SS290-0102	LEAD	Lead-Calc	29	29
X7-SS1830002	LEAD	FBL	28.8	28.8
X7-SS0540002	LEAD	Lead-Calc	27	27
X7-SS0410002	LEAD	Lead-Calc	26	26
X7-SS423-0102	LEAD	Lead-Calc	25.8	25.8
X7-SS1840002	LEAD	FBL	25.3	25.3
X7-SS0490002	LEAD	Lead-Calc	24	24
X7-SS344-0102	LEAD	Lead-Calc	22.8	22.8
X7-SS421-0102	LEAD	Lead-Calc	19.8	19.8
X7-SS425-0102	LEAD	FBL	16.5	16.5
X7-SS410-0001	LEAD	FBL	12.3	12.3
X7-SS363-0102	LEAD	Lead-Calc	10.2	10.2
X7-SS0420002	LEAD	Lead-Calc	0	0
X7-SS0560002	LEAD	Lead-Calc	0	0
X7-SS0570002	LEAD	Lead-Calc	0	0
NORTHERN ZONE LEAD AVERAGE			231.24	126.94

Shading indicates sample area to be excavated and replaced with clean backfill.

Red font indicates lead concentration > 192 mg/kg

TABLE 4-4

**TOTAL SOIL REMOVAL AT THE 400 YARD BERM
SOIL LEAD CONCENTRATIONS - NORTHERN ZONE
UXO 7 - RIFLE RANGE
NSA CRANE
CRANE, INDIANA**

Sample ID	Parameter	Analysis	Result	Removal Result
X7-SS0380002	LEAD	Lead-Calc	213	213
X7-SS0390002	LEAD	FBL	495	495
X7-SS0400002	LEAD	Lead-Calc	119	119
X7-SS0410002	LEAD	Lead-Calc	26	26
X7-SS0420002	LEAD	Lead-Calc	0	0
X7-SS0430002	LEAD	Lead-Calc	56	0
X7-SS0440002	LEAD	FBL	199	0
X7-SS0450002	LEAD	FBL	286	0
X7-SS0460002	LEAD	FBL	1100	0
X7-SS0470002	LEAD	Lead-Calc	63	0
X7-SS0480002	LEAD	FBL	190	0
X7-SS0490002	LEAD	Lead-Calc	24	24
X7-SS0500002	LEAD	Lead-Calc	57	57
X7-SS0510002	LEAD	Lead-Calc	30	30
X7-SS0520002	LEAD	Lead-Calc	34	34
X7-SS0530002	LEAD	Lead-Calc	32	32
X7-SS0540002	LEAD	Lead-Calc	27	27
X7-SS0550002	LEAD	FBL	1160	1160
X7-SS0560002	LEAD	Lead-Calc	0	0
X7-SS0570002	LEAD	Lead-Calc	0	0
X7-SS1730002	LEAD	FBL	125	125
X7-SS1740002	LEAD	FBL	430	430
X7-SS1750002	LEAD	FBL	170	170
X7-SS1760002	LEAD	Lead-Calc	143	143
X7-SS1770002	LEAD	FBL	115	115
X7-SS1780002	LEAD	FBL	40.9	0
X7-SS1790002	LEAD	FBL	83.6	0
X7-SS1800002	LEAD	FBL	89	0
X7-SS1810002	LEAD	FBL	212	0
X7-SS1820002	LEAD	FBL	95.1	0
X7-SS1830002	LEAD	FBL	28.8	28.8
X7-SS1840002	LEAD	FBL	25.3	25.3
X7-SS1890002	LEAD	FBL	151	151
X7-SS1900002	LEAD	Lead-Calc	347	347
X7-SS274-0001	LEAD	Lead-Calc	670	670
X7-SS274-0102	LEAD	Lead-Calc	397	397
X7-SS275-0001	LEAD	Lead-Calc	413	413
X7-SS275-0102	LEAD	Lead-Calc	616	616

TABLE 4-4

TOTAL SOIL REMOVAL AT THE 400 YARD BERM
 SOIL LEAD CONCENTRATIONS - NORTHERN ZONE
 UXO 7 - RIFLE RANGE
 NSA CRANE
 CRANE, INDIANA

Sample ID	Parameter	Analysis	Result	Removal Result
X7-SS276-0001	LEAD	Lead-Calc	128	128
X7-SS276-0102	LEAD	Lead-Calc	91	91
X7-SS277-0001	LEAD	Lead-Calc	382	382
X7-SS277-0102	LEAD	Lead-Calc	315	315
X7-SS278-0001	LEAD	Lead-Calc	464	464
X7-SS278-0102	LEAD	Lead-Calc	315	315
X7-SS279-0001	LEAD	Lead-Calc	408	408
X7-SS279-0102	LEAD	Lead-Calc	376	376
X7-SS280-0001	LEAD	Lead-Calc	603	603
X7-SS280-0102	LEAD	FBL	94.3	94.3
X7-SS281-0001	LEAD	Lead-Calc	611	611
X7-SS281-0102	LEAD	Lead-Calc	96.6	96.6
X7-SS282-0001	LEAD	Lead-Calc	559	559
X7-SS282-0102	LEAD	Lead-Calc	303	303
X7-SS283-0001	LEAD	Lead-Calc	534	534
X7-SS283-0102	LEAD	Lead-Calc	522	522
X7-SS284-0001	LEAD	Lead-Calc	503	503
X7-SS284-0102	LEAD	Lead-Calc	87.3	87.3
X7-SS285-0001	LEAD	Lead-Calc	392	392
X7-SS286-0001	LEAD	Lead-Calc	189	189
X7-SS287-0001	LEAD	FBL	44.8	44.8
X7-SS288-0001	LEAD	FBL	63.8	63.8
X7-SS289-0001	LEAD	Lead-Calc	78	78
X7-SS290-0001	LEAD	Lead-Calc	143	143
X7-SS290-0102	LEAD	Lead-Calc	29	29
X7-SS291-0001	LEAD	Lead-Calc	1186	0
X7-SS291-0102	LEAD	Lead-Calc	365	0
X7-SS291-0203	LEAD	FBL	203	0
X7-SS292-0001	LEAD	Lead-Calc	226	0
X7-SS292-0102	LEAD	Lead-Calc	90.6	0
X7-SS293-0001	LEAD	Lead-Calc	71.6	0
X7-SS294-0001	LEAD	Lead-Calc	148	0
X7-SS294-0102	LEAD	Lead-Calc	61.7	0
X7-SS295-0001	LEAD	Lead-Calc	339	0
X7-SS295-0102	LEAD	Lead-Calc	386	0
X7-SS295-0203	LEAD	Lead-Calc	477	0
X7-SS296-0001	LEAD	Lead-Calc	818	0
X7-SS296-0102	LEAD	Lead-Calc	304	0

TABLE 4-4

**TOTAL SOIL REMOVAL AT THE 400 YARD BERM
SOIL LEAD CONCENTRATIONS - NORTHERN ZONE
UXO 7 - RIFLE RANGE
NSA CRANE
CRANE, INDIANA**

Sample ID	Parameter	Analysis	Result	Removal Result
X7-SS296-0203	LEAD	Lead-Calc	280	0
X7-SS297-0001	LEAD	Lead-Calc	646	0
X7-SS297-0102	LEAD	Lead-Calc	366	0
X7-SS297-0203	LEAD	Lead-Calc	232	0
X7-SS298-0001	LEAD	Lead-Calc	356	0
X7-SS298-0102	LEAD	Lead-Calc	414	0
X7-SS299-0001	LEAD	Lead-Calc	338	0
X7-SS299-0102	LEAD	Lead-Calc	478	0
X7-SS299-0203	LEAD	Lead-Calc	122	0
X7-SS300-0001	LEAD	Lead-Calc	230	0
X7-SS300-0102	LEAD	Lead-Calc	228	0
X7-SS301-0001	LEAD	Lead-Calc	164	0
X7-SS301-0102	LEAD	Lead-Calc	357	0
X7-SS301-0203	LEAD	Lead-Calc	517	0
X7-SS302-0001	LEAD	Lead-Calc	159	0
X7-SS302-0102	LEAD	Lead-Calc	76.2	0
X7-SS303-0001	LEAD	Lead-Calc	261	0
X7-SS303-0102	LEAD	Lead-Calc	532	0
X7-SS304-0001	LEAD	Lead-Calc	87.9	0
X7-SS305-0001	LEAD	Lead-Calc	311	0
X7-SS305-0102	LEAD	Lead-Calc	68	0
X7-SS306-0001	LEAD	Lead-Calc	484	0
X7-SS306-0102	LEAD	Lead-Calc	160	0
X7-SS306-0203	LEAD	Lead-Calc	82.5	0
X7-SS307-0001	LEAD	Lead-Calc	568	0
X7-SS307-0102	LEAD	Lead-Calc	47.5	0
X7-SS308-0001	LEAD	Lead-Calc	469	0
X7-SS308-0102	LEAD	Lead-Calc	235	0
X7-SS308-0203	LEAD	Lead-Calc	23.7	0
X7-SS309-0001	LEAD	Lead-Calc	65.9	65.9
X7-SS310-0001	LEAD	Lead-Calc	374	374
X7-SS310-0102	LEAD	FBL	374	374
X7-SS311-0001	LEAD	Lead-Calc	88.5	88.5
X7-SS312-0001	LEAD	Lead-Calc	143	143
X7-SS312-0102	LEAD	FBL	249	249
X7-SS313-0001	LEAD	FBL	187	187
X7-SS313-0102	LEAD	Lead-Calc	201	201
X7-SS314-0001	LEAD	Lead-Calc	126	126

TABLE 4-4

TOTAL SOIL REMOVAL AT THE 400 YARD BERM
 SOIL LEAD CONCENTRATIONS - NORTHERN ZONE
 UXO 7 - RIFLE RANGE
 NSA CRANE
 CRANE, INDIANA

Sample ID	Parameter	Analysis	Result	Removal Result
X7-SS314-0102	LEAD	Lead-Calc	179	179
X7-SS315-0001	LEAD	FBL	220	220
X7-SS315-0102	LEAD	Lead-Calc	64.7	64.7
X7-SS316-0001	LEAD	Lead-Calc	322	322
X7-SS316-0102	LEAD	Lead-Calc	34	34
X7-SS317-0001	LEAD	Lead-Calc	74.9	74.9
X7-SS318-0001	LEAD	Lead-Calc	90.9	90.9
X7-SS319-0001	LEAD	Lead-Calc	70.7	70.7
X7-SS320-0001	LEAD	Lead-Calc	279	279
X7-SS320-0102	LEAD	Lead-Calc	162	162
X7-SS321-0001	LEAD	FBL	156	156
X7-SS321-0102	LEAD	Lead-Calc	40	40
X7-SS323-0001	LEAD	FBL	448	448
X7-SS323-0102	LEAD	Lead-Calc	50.2	50.2
X7-SS325-0001	LEAD	Lead-Calc	419	419
X7-SS325-0102	LEAD	Lead-Calc	37.3	37.3
X7-SS327-0001	LEAD	FBL	66.4	66.4
X7-SS329-0001	LEAD	FBL	46.3	46.3
X7-SS331-0001	LEAD	FBL	138	138
X7-SS331-0102	LEAD	Lead-Calc	39.4	39.4
X7-SS333-0001	LEAD	FBL	198	198
X7-SS333-0102	LEAD	Lead-Calc	39.4	39.4
X7-SS336-0001	LEAD	FBL	236	236
X7-SS336-0102	LEAD	Lead-Calc	71	71
X7-SS337-0001	LEAD	Lead-Calc	64.4	64.4
X7-SS337-0001	LEAD	FBL	63.1	63.1
X7-SS342-0102	LEAD	FBL	263	263
X7-SS344-0001	LEAD	FBL	111	111
X7-SS344-0102	LEAD	Lead-Calc	22.8	22.8
X7-SS345-0001	LEAD	Lead-Calc	518	0
X7-SS345-0102	LEAD	FBL	78.4	0
X7-SS347-0001	LEAD	Lead-Calc	541	0
X7-SS347-0102	LEAD	FBL	91.5	0
X7-SS349-0001	LEAD	Lead-Calc	166	0
X7-SS349-0102	LEAD	Lead-Calc	601	0
X7-SS351-0001	LEAD	FBL	191	0
X7-SS351-0102	LEAD	FBL	290	0
X7-SS353-0001	LEAD	FBL	157	0

TABLE 4-4

**TOTAL SOIL REMOVAL AT THE 400 YARD BERM
SOIL LEAD CONCENTRATIONS - NORTHERN ZONE
UXO 7 - RIFLE RANGE
NSA CRANE
CRANE, INDIANA**

Sample ID	Parameter	Analysis	Result	Removal Result
X7-SS355-0001	LEAD	FBL	136	0
X7-SS355-0102	LEAD	Lead-Calc	110	0
X7-SS357-0001	LEAD	Lead-Calc	408	0
X7-SS357-0102	LEAD	Lead-Calc	69.2	0
X7-SS358-0001	LEAD	Lead-Calc	370	0
X7-SS358-0102	LEAD	Lead-Calc	455	0
X7-SS360-0001	LEAD	Lead-Calc	232	0
X7-SS360-0102	LEAD	Lead-Calc	302	0
X7-SS361-0001	LEAD	Lead-Calc	299	0
X7-SS361-0102	LEAD	Lead-Calc	291	0
X7-SS363-0001	LEAD	FBL	180	180
X7-SS363-0102	LEAD	Lead-Calc	10.2	10.2
X7-SS365-0001	LEAD	Lead-Calc	412	0
X7-SS365-0102	LEAD	Lead-Calc	403	0
X7-SS368-0001	LEAD	Lead-Calc	187	0
X7-SS368-0102	LEAD	Lead-Calc	660	0
X7-SS369-0001	LEAD	Lead-Calc	869	0
X7-SS369-0102	LEAD	FBL	245	0
X7-SS371-0001	LEAD	FBL	244	244
X7-SS373-0001	LEAD	Lead-Calc	50.8	50.8
X7-SS376-0001	LEAD	Lead-Calc	184	184
X7-SS376-0102	LEAD	FBL	136	136
X7-SS377-0001	LEAD	Lead-Calc	380	380
X7-SS377-0102	LEAD	FBL	98.6	98.6
X7-SS379-0001	LEAD	Lead-Calc	49.6	49.6
X7-SS383-0001	LEAD	Lead-Calc	64.4	64.4
X7-SS385-0001	LEAD	FBL	200	200
X7-SS385-0102	LEAD	Lead-Calc	60.8	60.8
X7-SS387-0001	LEAD	Lead-Calc	77.4	77.4
X7-SS391-0001	LEAD	Lead-Calc	152	0
X7-SS391-0102	LEAD	Lead-Calc	566	0
X7-SS391-0203	LEAD	Lead-Calc	52.3	0
X7-SS392-0001	LEAD	FBL	107	0
X7-SS393-0001	LEAD	Lead-Calc	147	0
X7-SS393-0102	LEAD	FBL	226	0
X7-SS393-0203	LEAD	Lead-Calc	186	0
X7-SS394-0001	LEAD	Lead-Calc	142	0
X7-SS394-0102	LEAD	Lead-Calc	285	0

TABLE 4-4

TOTAL SOIL REMOVAL AT THE 400 YARD BERM
 SOIL LEAD CONCENTRATIONS - NORTHERN ZONE
 UXO 7 - RIFLE RANGE
 NSA CRANE
 CRANE, INDIANA

Sample ID	Parameter	Analysis	Result	Removal Result
X7-SS394-0203	LEAD	Lead-Calc	35.5	0
X7-SS395-0001	LEAD	Lead-Calc	246	0
X7-SS395-0102	LEAD	Lead-Calc	535	0
X7-SS395-0203	LEAD	Lead-Calc	321	0
X7-SS396-0001	LEAD	Lead-Calc	145	0
X7-SS396-0102	LEAD	Lead-Calc	384	0
X7-SS396-0203	LEAD	Lead-Calc	303	0
X7-SS398-0001	LEAD	Lead-Calc	293	0
X7-SS398-0102	LEAD	Lead-Calc	458	0
X7-SS400-0001	LEAD	Lead-Calc	104	0
X7-SS401-0001	LEAD	FBL	97.4	0
X7-SS401-0102	LEAD	Lead-Calc	337	0
X7-SS402-0001	LEAD	FBL	89.7	0
X7-SS404-0001	LEAD	Lead-Calc	292	0
X7-SS404-0102	LEAD	Lead-Calc	83.4	0
X7-SS406-0001	LEAD	Lead-Calc	80.6	0
X7-SS407-0001	LEAD	FBL	73.7	0
X7-SS408-0001	LEAD	FBL	246	0
X7-SS408-0102	LEAD	Lead-Calc	31.9	0
X7-SS409-0304	LEAD	Lead-Calc	1087	0
X7-SS410-0001	LEAD	FBL	12.3	12.3
X7-SS411-0304	LEAD	Lead-Calc	52	0
X7-SS412-0001	LEAD	FBL	189	0
X7-SS412-0102	LEAD	Lead-Calc	31.9	0
X7-SS413-0304	LEAD	Lead-Calc	869	0
X7-SS414-0001	LEAD	FBL	199	0
X7-SS414-0102	LEAD	Lead-Calc	104	0
X7-SS415-0001	LEAD	FBL	105	0
X7-SS415-0102	LEAD	Lead-Calc	36.4	0
X7-SS416-0001	LEAD	FBL	78.2	78.2
X7-SS417-0304	LEAD	Lead-Calc	194	0
X7-SS417-0405	LEAD	Lead-Calc	159	0
X7-SS417-0506	LEAD	Lead-Calc	715	0
X7-SS418-0001	LEAD	Lead-Calc	48.4	0
X7-SS420-0001	LEAD	Lead-Calc	119	0
X7-SS420-0102	LEAD	Lead-Calc	445	0
X7-SS420-0203	LEAD	Lead-Calc	76.5	0
X7-SS421-0001	LEAD	Lead-Calc	681	0

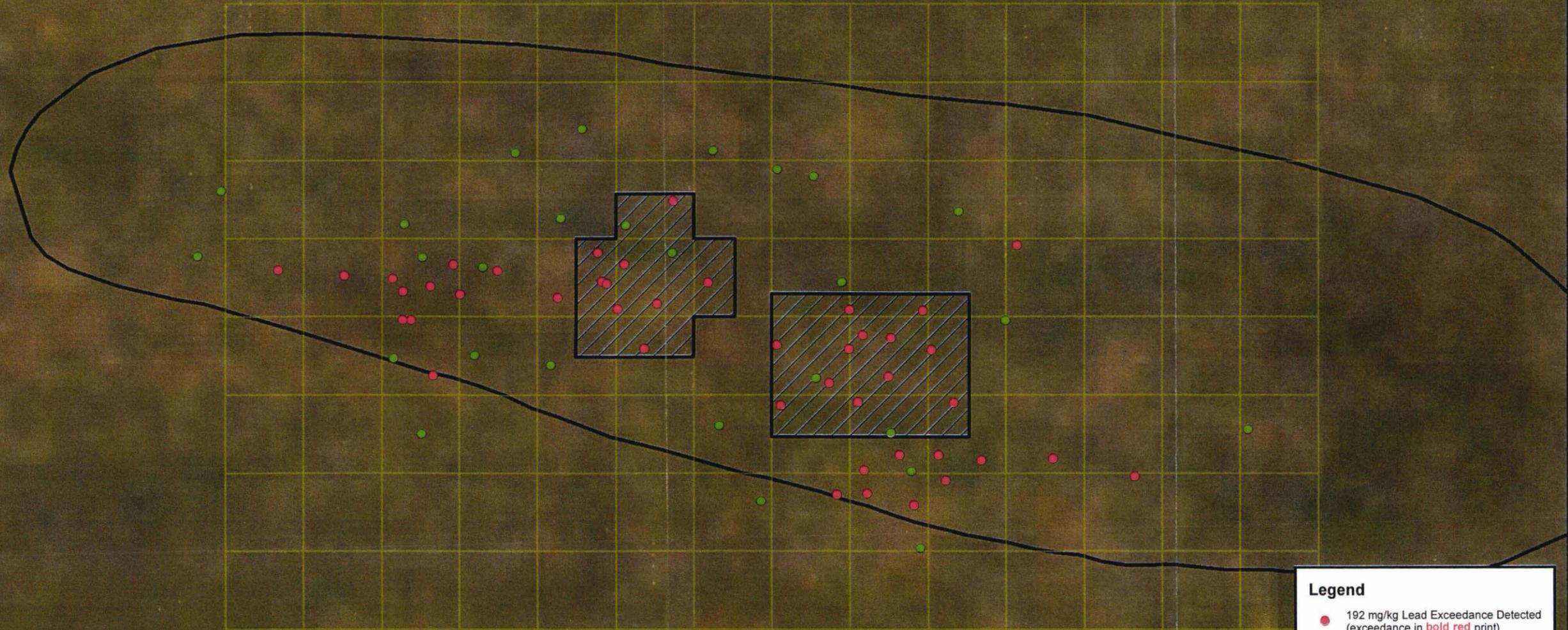
TABLE 4-4

**TOTAL SOIL REMOVAL AT THE 400 YARD BERM
SOIL LEAD CONCENTRATIONS - NORTHERN ZONE
UXO 7 - RIFLE RANGE
NSA CRANE
CRANE, INDIANA**

Sample ID	Parameter	Analysis	Result	Removal Result
X7-SS421-0102	LEAD	Lead-Calc	19.8	0
X7-SS422-0001	LEAD	Lead-Calc	399	0
X7-SS422-0102	LEAD	FBL	343	0
X7-SS422-0203	LEAD	Lead-Calc	49	0
X7-SS423-0001	LEAD	FBL	340	340
X7-SS423-0102	LEAD	Lead-Calc	25.8	25.8
X7-SS424-0001	LEAD	FBL	193	193
X7-SS424-0102	LEAD	FBL	91	91
X7-SS425-0001	LEAD	FBL	160	160
X7-SS425-0102	LEAD	FBL	16.5	16.5
X7-SS429-0001	LEAD	FBL	125	125
X7-SS434-0001	LEAD	FBL	162	162
X7-SS434-0102	LEAD	Lead-Calc	29.4	29.4
NORTHERN ZONE LEAD AVERAGE			238.05	91.14

Shading indicates sample would be completely removed as part of the 400-yard berm excavation.

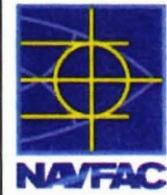
Red font indicates lead concentration > 192 mg/kg



Legend

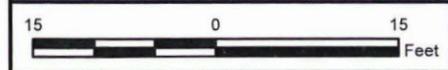
- 192 mg/kg Lead Exceedance Detected (exceedance in **bold red print**)
- No Exceedance
- Excavation Area to 2 feet
- 400 Yard Firing Position
- 10' x 10' Grid

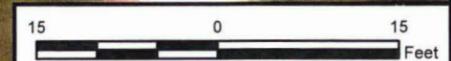
DRAWN BY	DATE
J. ENGLISH	03/01/12
CHECKED BY	DATE
R. BARRINGER	03/20/12
REVISED BY	DATE
S. PAXTON	03/14/12
SCALE AS NOTED	



PROPOSED SOIL REMOVAL ACTION
UXO 7 CENTRAL AREA OF NORTHERN ZONE
NSA CRANE
CRANE, INDIANA

CONTRACT NUMBER	CTO NUMBER
	F272
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO.	REV
4-1	0





Legend

- 192 mg/kg Lead Exceedance Detected (exceedance in **bold red** print)
- No Exceedance
- Excavation Area to 2 feet
- 10' x 10' Grid

DRAWN BY	DATE
J. ENGLISH	03/01/12
CHECKED BY	DATE
R. BARRINGER	03/20/12
REVISED BY	DATE
S. PAXTON	03/14/12
SCALE AS NOTED	



PROPOSED SOIL REMOVAL ACTION
UXO 7 NORTHERNMOST AREA OF NORTHERN ZONE
NSA CRANE
CRANE, INDIANA

CONTRACT NUMBER	CTO NUMBER
1621	
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO.	REV
4-2	0

**APPENDICES A, B, and C
ARE LOCATED ON ENCLOSED CD**