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FINAL ADDENDUM TO RESOURCE CONSERVATION AND RECOVERY ACT FACILITY INVESTIGATION REPORT FOR SOLID WASTE MANAGEMENT UNIT 16 (SWMU 16) CAST HIGH EXPLOSIVES FILL/B146 INCINERATOR (B146) NSA CRANE IN

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TETRA TECH

Final
Addendum to
Resource Conservation and Recovery Act Facility Investigation Report
for
SWMU 16 - Cast High Explosives Fill/B146 Incinerator (B146)

Naval Support Activity Crane
Crane, Indiana

Naval Facilities Engineering Command
Mid-Atlantic

Contract Number N62470-08-D-1001

Contract Task Order F27R

September 2015

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SEPTEMBER 2015

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RESOURCE CONSERVATION AND RECOVERY ACT
FACILITY INVESTIGATION REPORT
FOR
SWMU 16 - CAST HIGH EXPLOSIVES FILL/
B146 INCINERATOR (B146)

NAVAL SUPPORT ACTIVITY CRANE
CRANE, INDIANA

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

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SWMU 16 RFI REPORT ADDENDUM

This Addendum to the Final Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Report for Solid Waste Management Unit (SWMU) 16 - Cast High Explosives Fill/B146 Incinerator (B146), located at Naval Support Activity Crane (NSA), in Crane, Indiana, was prepared by Tetra Tech, Inc. for the Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic, under Contract Task Order (CTO) F27R, Comprehensive Long-Term Environmental Action Navy (CLEAN), Contract Number N62470-08-D-1001. This RFI Report Addendum, which is an update to the Executive Summary found in the RFI Report (Tetra Tech, March 2011), is based on the conclusions provided in the SWMU 16 Interim Measures (IM) Report (IMR) (Tetra Tech, September 2014). Based on discussions between the Navy and United States Environmental Protection Agency (USEPA), it was agreed that the March 2011 RFI Report would be considered final and that this Addendum would provide an update to the RFI conclusions based on completion of the IM in 2013 and 2014 at SWMU 16.

PURPOSE OF RFI REPORT AND RFI REPORT ADDENDUM

The RFI Report (Tetra Tech, March 2011) summarizes RFI fieldwork (Rounds 1, 2, and 3) conducted from February 2003 through January 2004, describes the nature and extent of contamination, presents a conceptual site model (CSM) of contamination transport and attenuation, and presents the results of the baseline human health and ecological risk assessments. The RFI risk assessments identified unacceptable ecological risks for exposure to metals in surface soil and unacceptable human health risks for exposure to chlorinated volatile organic compounds (VOCs), explosives, and metals in groundwater.

The Navy determined that IM actions would be conducted to mitigate unacceptable ecological risks and to remediate soil outside of the Building 146 footprint containing trichloroethene (TCE) and metals. The IM was completed in 2014 and the IMR (Tetra Tech, September 2014) documents that ecological risks have been mitigated and that no further action (NFA) is required for soil outside of the Building 146 footprint. This RFI Report Addendum further documents an updated CSM and revised ecological risk assessment conclusions based on completion of the IM.

POST-RFI SITE INVESTIGATIONS AND INTERIM MEASURES

A toxicity study and soil delineation sampling were conducted to support the 2013/2014 IM (Tetra Tech, October 2013 and September 2014) and a second Indoor Air Quality (IAQ) study was completed in 2014 in conjunction with a sub-slab vapor intrusion (VI) study. Actions related to the IM are summarized herein. The VI study results are discussed in a separate report (Tetra Tech, November 2014).

Toxicity Study

The RFI Screening Level Ecological Risk Assessment (SERA) for SWMU 16 concluded that terrestrial plants and/or invertebrates at SWMU 16 could be impacted from exposure to antimony, copper, lead, and zinc in soil and birds could be impacted from lead and zinc in soil. These conclusions were based on conservative screening levels and food-chain models using literature-derived soil-to-earthworm bioaccumulation factors. The NSA Crane Project Team decided that site-specific preliminary remediation goals (PRGs) protective of ecological receptors should be developed. Therefore, toxicity/bioaccumulation tests using surface soil collected from SWMU 16 in 2010 were used to develop Media Cleanup Standards (MCSs) for the IM (Tetra Tech, October 2013). The PRGs were then used as the MCSs for copper, lead, and zinc [253, 652, and 1950 milligram per kilogram (mg/kg), respectively]. For antimony, the plant PRG of 6.3 mg/kg was lower than the base-wide background concentration of 6.9 mg/kg. Therefore, 6.9 mg/kg was used as the MCS for antimony.

Interim Measures Soil Delineation Sampling

Additional soil samples were collected in 2011 and 2012 to determine the extent of TCE and metals contamination for implementation of the IM. TCE soil contamination was delineated, both horizontally and vertically (to top of bedrock), in the TCE Contamination Area of SWMU 16. The extent of metals concentrations greater than the MCSs also was delineated horizontally in the surface soil within the Metals Contamination Areas. Figure 1 presents the boundaries of the TCE- and metals-contaminated soil excavation areas that were addressed during the IM at SWMU 16.

Interim Measures

The IM action was conducted to remove contaminated soil from the TCE Contamination Area, where soil was impacted from former degreaser operations, and from the three discrete Metals Contamination Areas (with antimony, copper, lead, and zinc contamination) where incinerator ash piles were formerly located. The purpose of the removal action for TCE-contaminated soil was to remove sources of chlorinated solvents, primarily TCE, migrating from the soil into groundwater and resulting in TCE contamination of groundwater. The purpose of the removal of the metals-contaminated soil was to remove surface soil containing antimony, copper, lead, and zinc in concentrations greater than the metals MCSs, so that remaining surface soil did not present an unacceptable ecological risk. An IM Work Plan (IMWP) was prepared that presented the plan to excavate and remove soil from specific areas around Building 146 and dispose of it off-site (Tetra Tech, August 2013). The IM at SWMU 16 was completed December 2013 through February 2014 and the two project objectives were achieved: (1) the removal of soil presenting an unacceptable ecological risk in the Metals Contamination Areas and (2) the removal of TCE-contaminated soil outside the footprint of Building 146. The SWMU 16 excavations were backfilled with gravel or were

restored with topsoil, grass seed, or asphalt pavement, as necessary, to match the pre-removal action site conditions. The SWMU 16 IM also included removal and disposal of an underground storage tank, abandonment of a shallow monitoring well, and demolition and disposal of the three settling tanks. The IMR (Tetra Tech, September 2014) describes the IM activities.

UPDATE TO CONCEPTUAL SITE MODEL

With the completion of the IM in 2014, TCE-contaminated soil outside the Building 146 footprint serving as a source of TCE contamination to groundwater and metals-contaminated soil, presenting ecological risk have been removed. Therefore, the only contaminated soil remaining at the site is the chlorinated VOC (TCE)-contaminated soil remaining beneath the Building 146 floor slab, which is a potential future source for migration to groundwater or air if the floor slab was removed or compromised. Removal of the settling tanks also eliminated these as potential sources for chlorinated VOC and explosives contamination to groundwater. Contaminated groundwater remains at the site.

HUMAN HEALTH RISK ASSESSMENT

As discussed in the 2011 RFI Report, potentially unacceptable risks to current/future occupational workers, future child/adult recreational users, and future recreational users were identified for exposure to groundwater. Chemicals of concern included chlorinated VOCs, explosives, and metals. Potentially unacceptable risk to a future child resident exposed to lead in sediment in gullies at more than one day per week also was identified.

ECOLOGICAL RISK

The SERA described in the 2011 RFI Report identified potentially unacceptable ecological risk from antimony, copper, lead, and zinc in surface soil for terrestrial plants and invertebrates and lead and zinc in surface soil for birds. These risks were addressed by the 2013/2014 IM.

CONCLUSIONS

As discussed in the 2011 RFI Report, risks were acceptable for ecological exposure to sediment and surface water. Potential unacceptable risks for ecological exposure to metals in surface soil identified in the 2011 RFI Report were addressed by the 2013/2014 IM. Site-specific MCSs were developed for the metals presenting ecological risk. Surface soil containing metals concentrations in excess of the MCSs was excavated and replaced with clean soil. With the completion of the IM at SWMU 16, residual metals concentrations in surface soil do not present an unacceptable ecological risk (Tetra Tech, September 2014). Therefore there are no unacceptable ecological risks for soil, surface water, and sediment.

As discussed in the 2011 RFI Report, risks are acceptable for human receptor exposure to surface soil, subsurface soil, and surface water. Potential risks are unacceptable for the current and future occupational worker, hypothetical future recreational user (child, adult, and lifelong), and hypothetical future resident (child, adult, and lifelong) exposed to contaminated groundwater that need to be addressed in a Corrective Measures Study (CMS). VOC-contaminated soil outside the Building 146 footprint, which was a potential current and future source of contamination to groundwater, was removed as part of the IM. VOC-contaminated soil remains under the Building 146 floor slab, which is a potential future source of contamination to groundwater if the soil was exposed to surface water run off or precipitation such that contamination could migrate to groundwater. The residual contamination may be a potential future VI concern, which will also be addressed in the CMS.

REFERENCES

Tetra Tech, March 2011. Final Resource Conservation and Recovery Act Facility Investigation Report for the Cast High Explosives Fill/B146 Incinerator (SWMU 16), Naval Support Activity Crane, Crane, Indiana. King of Prussia, Pennsylvania.

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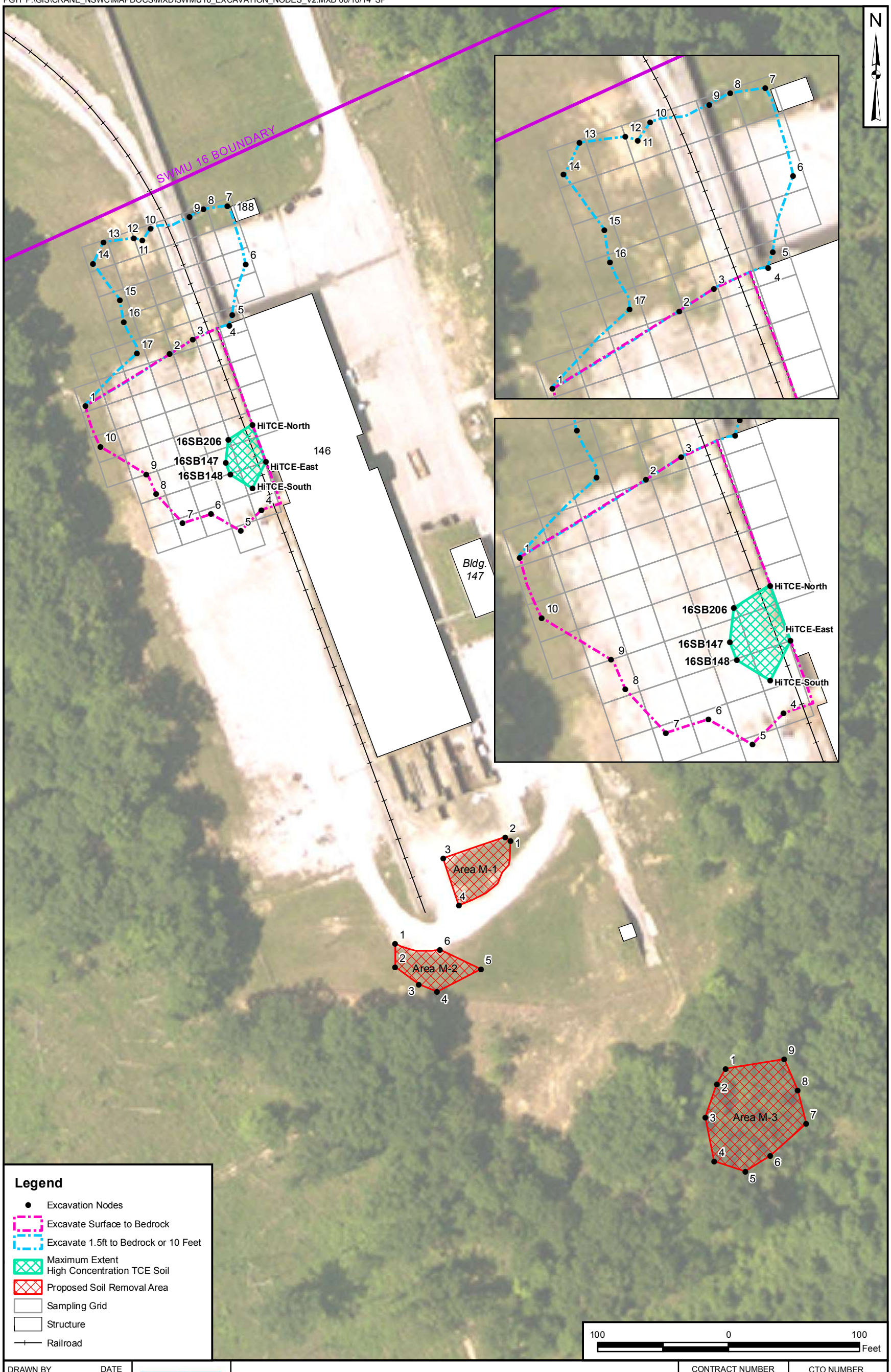

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SCALE	
AS NOTED	

NAVFAC

SOIL EXCAVATION NODES
SWMU 16 - CAST HIGH EXPLOSIVES FILL/BLDG. 146 INCINERATOR
NSA CRANE
CRANE, INDIANA

CONTRACT NUMBER	CTO NUMBER
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FIGURE NO. 1	REV 0