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FINAL REMOVAL ACTION WORK PLAN FOR MUNITIONS RESPONSE PROGRAM RANGES
TSA RANGES NS GREAT LAKES IL
9/1/2012
TETRA TECH

FINAL
Removal Action Work Plan

for

Munitions Response Program
Range – TSA Ranges

Naval Station Great Lakes
Great Lakes, Illinois



Naval Facilities Engineering Command Midwest
Contract Number N62472-03-D-0057
Contract Task Order F274

September 2012

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ACRONYMS

| | |
|--------|---|
| AA | anti-aircraft |
| AHA | Activity Hazard Analysis |
| ASTM | American Society for Testing and Materials |
| bgs | below ground surface |
| BaP EQ | benzo(a)pyrene equivalent |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| CLEAN | Comprehensive Long-term Environmental Action Navy |
| CPR | cardiopulmonary resuscitation |
| CTO | Contract Task Order |
| cy | cubic yards |
| DoD | Department of Defense |
| EMAC | Environmental Multiple Award Contract |
| EPA | Environmental Protection Agency |
| FBL | fixed base laboratory |
| HERO | Hazards of Electromagnetic Radiation to Ordnance |
| HTRW | hazardous, toxic and radioactive waste |
| IAC | Illinois Administrative Code |
| ILCS | Illinois Compiled Statutes |
| NAVSTA | Naval Station |
| NELAC | National Environmental Laboratory Accreditation Conference |
| NFA | no further action |
| NSGL | Naval Station Great Lakes |
| NTC | Naval Training Center |
| OICC | Officer in Charge of Construction |
| OSHA | Occupational Safety and Health Administration |
| PAHs | polycyclic aromatic hydrocarbons |
| QA/QC | quality assurance/quality control |
| QCP | Quality Control Plan |
| RAWP | Removal Action Work Plan |
| RV | recreational vehicle |
| SHSS | Site Health and Safety Specialist |
| SI | Site Inspection |
| SSC | Service School Command |

| | |
|-------|---|
| SSHSP | Site Specific Health and Safety Plan |
| TACO | Tiered Approach to Corrective Action Objectives |
| TAL | Target Analyte List |
| TCL | Target Compound List |
| TSA | Trap, Skeet and Archery |
| USDOT | United States Department of Transportation |
| XRF | x-ray fluorescence |

1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

The purpose of this document is to present the Removal Action Work Plan (RAWP) for the Trap, Skeet and Archery Ranges (TSA Ranges) at Naval Station Great Lakes (NSGL) located in Great Lakes, Illinois. The proposed removal action consists of the excavation and offsite disposal of soil contaminated with lead and polycyclic aromatic hydrocarbons (PAHs) located within the former TSA Ranges site. This RAWP was prepared for the United States Navy, Naval Facilities Engineering Command, Midwest (NAVFAC MW) by Tetra Tech, Inc. (Tetra Tech) under Contract Task Order (CTO) F274 of the Comprehensive Long-term Environmental Action Navy (CLEAN) IV Contract Number N62467-04-D-0055.

Environmental Site Inspection (SI) activities were performed at the TSA Ranges site in 2010 and 2011. The removal actions described in this work plan are based on the results of these investigations. The RAWP is part of the formal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process.

1.2 FACILITY DESCRIPTION

1.2.1 NS Great Lakes

NSGL is the largest active duty Department of Defense (DoD) training center in the United States. NSGL is home to enlisted people training and officer accession training. The installation is one of Illinois' largest employers with over 25,000 military and civilian personnel. The Great Lakes Naval Hospital trains 4,000 Navy Corpsmen annually and is the Navy Regional Processing Site for several hundred reservists.

NSGL provides support for the Navy through its intense training and specialized itinerary for enlisted personnel preparing for the fleet. Major commands at NSGL include Naval Station (NAVSTA); a shore activity reporting command; the Recruit Training Command, which trains sailors, and the Service School Command (SSC), which provides initial technical training. The SSC consists of combat systems schools, engineering systems schools, and a training department. Figure 1-1 shows the location of NSGL in relation to the surrounding area.

1.2.2 TSA Ranges

The site is the former location of a trap range, a skeet range, and an archery range. The former TSA Ranges site (both the land and water portions) encompasses approximately 30.5 acres. The land portion of the TSA Ranges is a small area (approximately 1.1 acre), located east of the bluff on the beachfront of Lake Michigan. The shotfall zone, which is defined as the maximum extent that lead shot would have traveled, extends into Lake Michigan. This encompasses an area of approximately 29.4 acres [consisting of overlapping areas for the skeet range (29 acres) and the trap range (6.6 acres)] located over Lake Michigan. Figure 1-2 shows the location of the TSA Ranges within NSGL. Only the skeet and trap ranges are addressed in this RAWP.

The site originally consisted of only the trap range (constructed in the early 1940s), which was used in conjunction with the Naval Training Center (NTC) Lakefront, where Navy personnel first learned to experience targeting a moving object before handling the large caliber anti-aircraft (AA) guns. The use of the trap range in conjunction with the AA training center ended with the closing of the NTC Lakefront site in October 1945; however, the trap range was likely used recreationally afterward, which was a common practice to offset costs for maintenance. Based on the construction drawings for the site, the skeet and archery ranges were added to the site in 1968. The skeet and archery ranges were likely used for recreational purposes and for military practice sessions. Munitions use was limited to small arms ammunition, primarily shotgun ammunition. Structures associated with the skeet and trap ranges and firing lines were located on land at the site.

The equipment storage building and trap/skeet houses that were originally located at the site were demolished, and the ranges were decommissioned, at an undetermined time. When a recreational vehicle (RV) park (consisting of RV sites, ten tent sites, and one group camping site) was constructed in July 2000 within the TSA Ranges site, all visible signs of the ranges and associated structures (such as the trap house) were removed. Prior to the SI, no site investigations had been conducted at the NSGL TSA Ranges.

1.3 REPORT ORGANIZATION

The following are the sections contained in the remainder of this document:

- Section 2.0 presents the general site conditions and site inspection summary.
- Section 3.0 presents the RAWP.
- Section 4.0 presents report references.

- Appendix A presents site photographs.
- Appendix B presents the RAWP Supplemental Specifications.



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 Installation Area

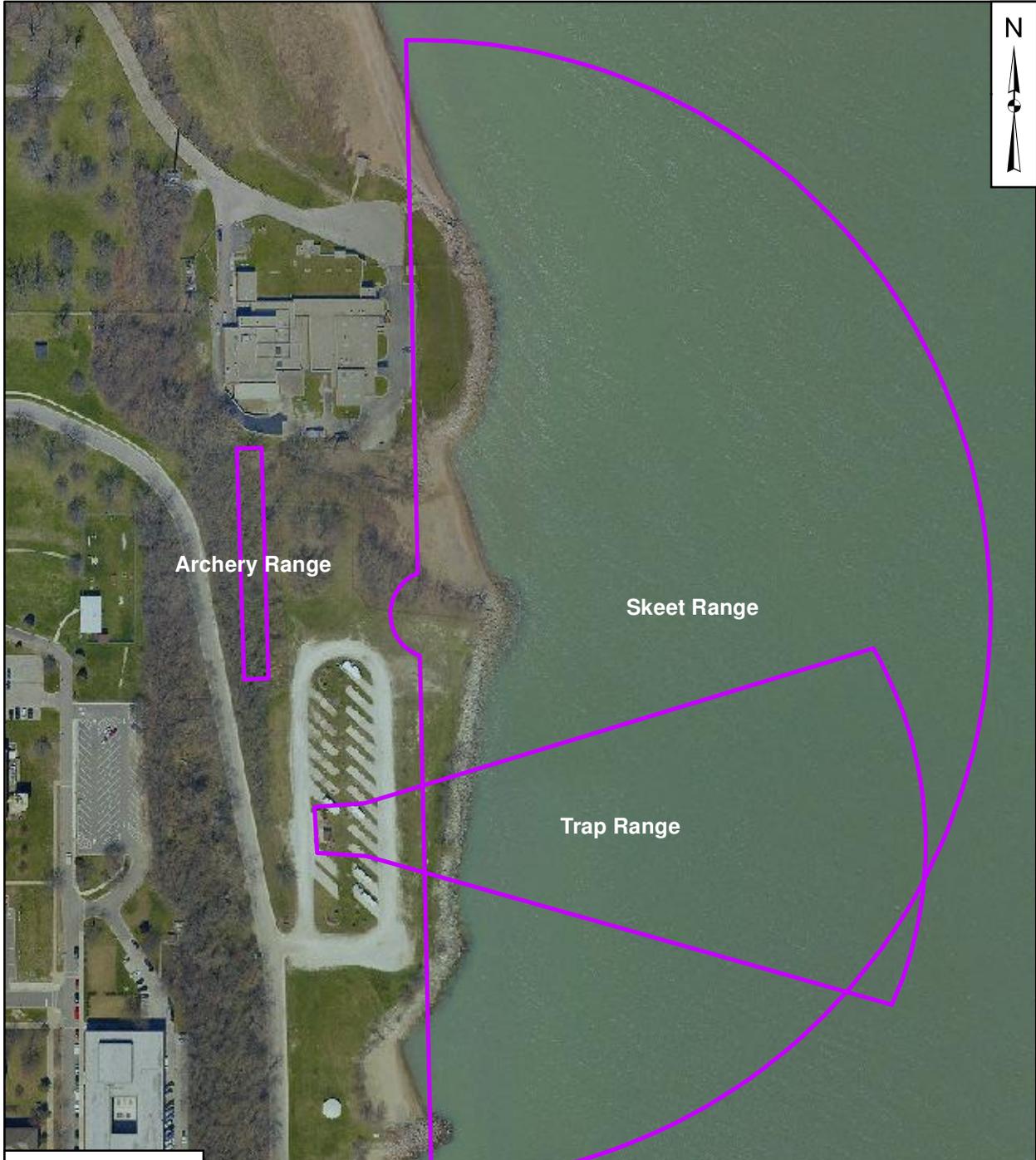
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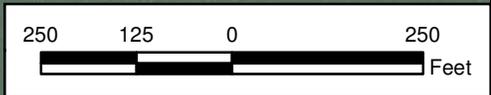


FACILITY LOCATION
 NAVAL STATION GREAT LAKES
 GREAT LAKES, ILLINOIS

| | |
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| CONTRACT NUMBER CTO F274 | |
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| FIGURE NO. FIGURE 1-1 | REV 0 |



Legend
 Range Boundary



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SITE LOCATION
 TSA RANGES
 NAVAL STATION GREAT LAKES
 GREAT LAKES, ILLINOIS

| | |
|-----------------------------|----------|
| CONTRACT NUMBER CTO F274 | |
| OWNER NUMBER — | |
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| FIGURE NO. FIGURE 1 - 2 | REV 0 |

2.0 SITE CONDITIONS AND INVESTIGATION SUMMARY

2.1 SITE SUMMARY

This section describes the general physical and geophysical conditions for the TSA Ranges site. These descriptions were excerpted from the SI Report for Munitions Response Program Ranges at NSGL (Tetra Tech, 2010).

2.1.1 Topography

Lakeshore bluffs rise from 20 to 75 feet in height above Lake Michigan and continue this trend beyond the west coast of the lake. Perpendicular to the bluff are ravines that discharge surface runoff to Lake Michigan. The topography of NSGL is similar to the surrounding area. There are buildings located along the bluff ravines and beachfront.

2.1.2 Soil and Vegetation

The soil predominately found at NSGL is located on top of morainic ridges. Silt deposits overlay a calcareous glacial till of a silty, sandy, clay soil, which has moderate to poor draining capacity. Soil of the first 5 feet below ground surface (bgs) is relatively uniform in grain size distribution, liquid limit, and plasticity. The shoreline at NSGL has eroded over the centuries; however, fill material was placed to extend the shoreline in the early 1940s. The TSA Range generally has well drained fill material consisting of sandy clays, sands, and gravels with pieces of brick, concrete, and asphalt from 0 to 4 feet bgs. Below 4 feet bgs coarser gravel and large pieces of concrete and asphalt were used as fill. The lakefront area is composed of fill material (soil, concrete, and various consolidated materials), which serve as a foundation for the sandy beach and adjacent structures on-site. The majority of the land acquired by NSGL was cleared of buildings to accommodate housing and classroom needs; however, some native woodland remains. Terrestrial vegetation in the undeveloped sections of NSGL consists predominately of woodland species. The individual stand compositions are the result of a combination of natural seeding, forest management, and planting. The majority of trees in the area are oak, maple, hickory, and other hardwoods. Native shrubbery consists of blackberry, black oak, blueberry, huckleberry, maple, osier, sassafras, and willow. Beach-grass, Kentucky bluegrass, Canada bluegrass, creeping red fescue, sheep fescue, tall fescue, and clover are all turf vegetation found in this location.

2.1.3 Regional Geology

The Wheaton Morainal Complex characterizes the geology of the area around NSGL. NSGL is listed as part of the Bluff-Ravine Complex of the Central Lowland Providence consisting of the flat land cut by ravines and edged on the east with the bluff overlooking Lake Michigan. Pettibone Creek ravine runs perpendicular to the shoreline of Lake Michigan, dividing NSGL. This land formation is the result of the Pleistocene continental glacial deposits that released unconsolidated glacial drift along the bedrock. The glacial till is composed of varying proportions of clay, sand, silt, pebbles, and boulders, and ranges from 40 to 200 feet in thickness because of the numerous glacial events that took place. The lakeshore presents the sandy phase of this formation. Underneath the glacial till are layers of dolomites, sand, stones, and shale from sea deposits. The bedrock is Precambrian granite that is relatively horizontal.

2.1.4 Regional Hydrology

Lake County has a surplus of water available from the surface waters of Lake Michigan. Communities near Lake Michigan, including Great Lakes, utilize this source for potable water rather than groundwater aquifers. NSGL consumes lake water because of its close proximity. NSGL has two drainage basins: Skokie Ditch and Pettibone Creek ravine; water from these sources is not potable. There are two storm water discharges to Skokie Ditch: a storm sewer discharge from Forrestal Village (a residential area of the base), and a storm sewer located underneath the Willow Glen Golf Course that discharges to the headwaters of Skokie Ditch. Pettibone Creek receives runoff from the main area of the installation, and this water discharges into Lake Michigan from the inner harbor location of the installation.

2.1.5 Regional Hydrogeology

Groundwater in the Lake County area consists of four aquifers: the Glacial Drift Aquifer, the Silurian Dolomite Formation, the Cambrian-Ordovician Aquifer, and the Mount Simon Sandstone. The Glacial Drift and Silurian Dolomite are shallow aquifers reaching depths of 150 to 500 feet. The shallow aquifer located along the shoreline at the installation has a depth to groundwater between 2 and 5 feet bgs due to the proximity of the lake. This water is not potable and is not utilized at NSGL or by the surrounding area. The remaining aquifer system is known as the deep aquifer system, with depths ranging from 900 to 1,900 feet bgs. The shallow aquifer system recharges from local rainfall infiltration, while the deep aquifer system recharges from sources in areas of central Wisconsin.

2.2 SITE INVESTIGATION SUMMARY

Environmental investigation work was performed at the TSA Ranges site in 2010 and 2011. A more detailed history of the site activities are presented in the SI Report (Tetra Tech, 2010) and the Addendum to the SI Report (Tetra Tech, 2012).

2.2.1 SI Sampling Results

The SI was initiated in April 2010 to investigate the TSA Ranges site. The field work included collection of surface and shallow subsurface soil samples. All soil samples collected in 2010 were analyzed in the field utilizing x-ray fluorescence (XRF), and a subset of those samples was selected for submittal to a fixed-base laboratory (FBL) for select metals (lead, antimony, and arsenic) and PAHs analysis.

The SI identified a limited area of the TSA Ranges site where concentrations of lead and PAH benzo(a)pyrene equivalent (BaP EQ) were greater than respective screening criteria and the Illinois Environmental Protection Agency (EPA) background surface soil concentrations. Based on the SI findings, it was determined that further actions were required.

Additional focused sampling (horizontally and vertically) was recommended at the TSA Ranges site to further characterize and quantify the contaminated soil areas, and to identify discrete areas where removal actions could address the contaminated soils that pose a threat to human health or the environment.

2.2.2 Supplemental SI Sampling Results

Supplemental SI field sampling activities for the TSA Ranges site were conducted in September 2011, which consisted of additional surface and subsurface soil sampling for the analysis of select metals and PAHs. The Supplemental SI results identified a limited area where concentrations of contaminants in soil exceeded with lead concentrations greater than the screening criteria (400 milligrams per kilogram [mg/kg] human health screening criterion for lead and 2,100 micrograms per kilogram [$\mu\text{g}/\text{kg}$] Tiered Approach to Corrective Action Objectives [TACO] Background Criterion for PAH BaP EQ).

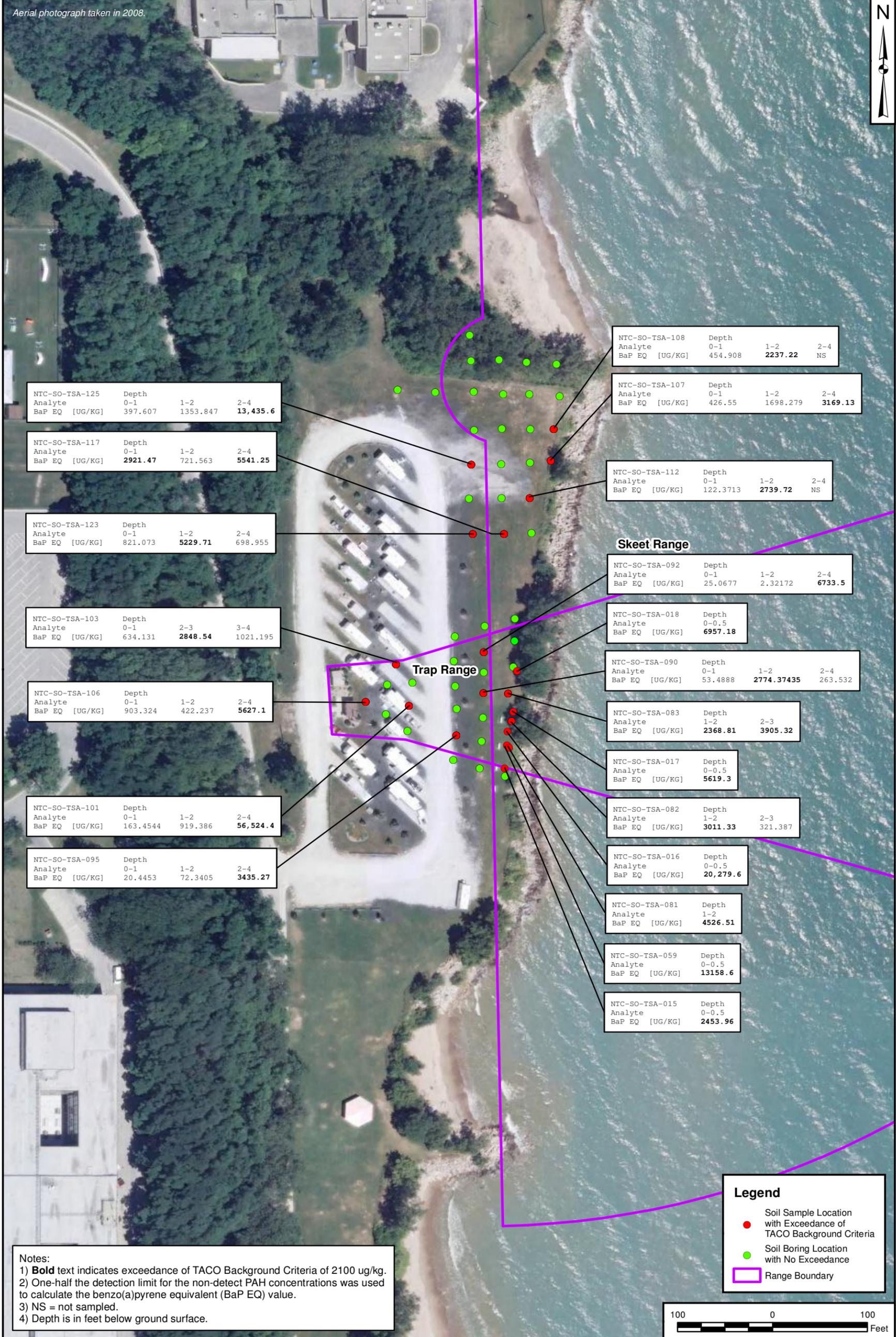
Figure 2-1 presents the sample locations with BaP EQ concentrations in excess of the screening criterion for both the SI and Supplemental SI sampling events. Figures 2-2 and 2-3 present the sample locations with lead concentrations in surface soil and subsurface soil, respectively, in excess of the screening

criteria for both the SI and Supplemental SI sampling events. The combined findings from the SI and supplemental SI indicate that further actions are required.

2.2.3 SI Recommendations

A prescriptive removal of soil with concentrations of lead exceeding human health screening criteria and PAH BaP EQ exceeding TACO background screening criteria in the area east of the RV park is recommended at the TSA Ranges site.

The removal of select lead and PAH-contaminated soil from 0 to 2 and 2 to 4 feet bgs will reduce the potential risk and exposure to human receptors to acceptable risk levels between 10^{-4} and 10^{-6} in those areas, which will then support a no further action (NFA) determination for the site.

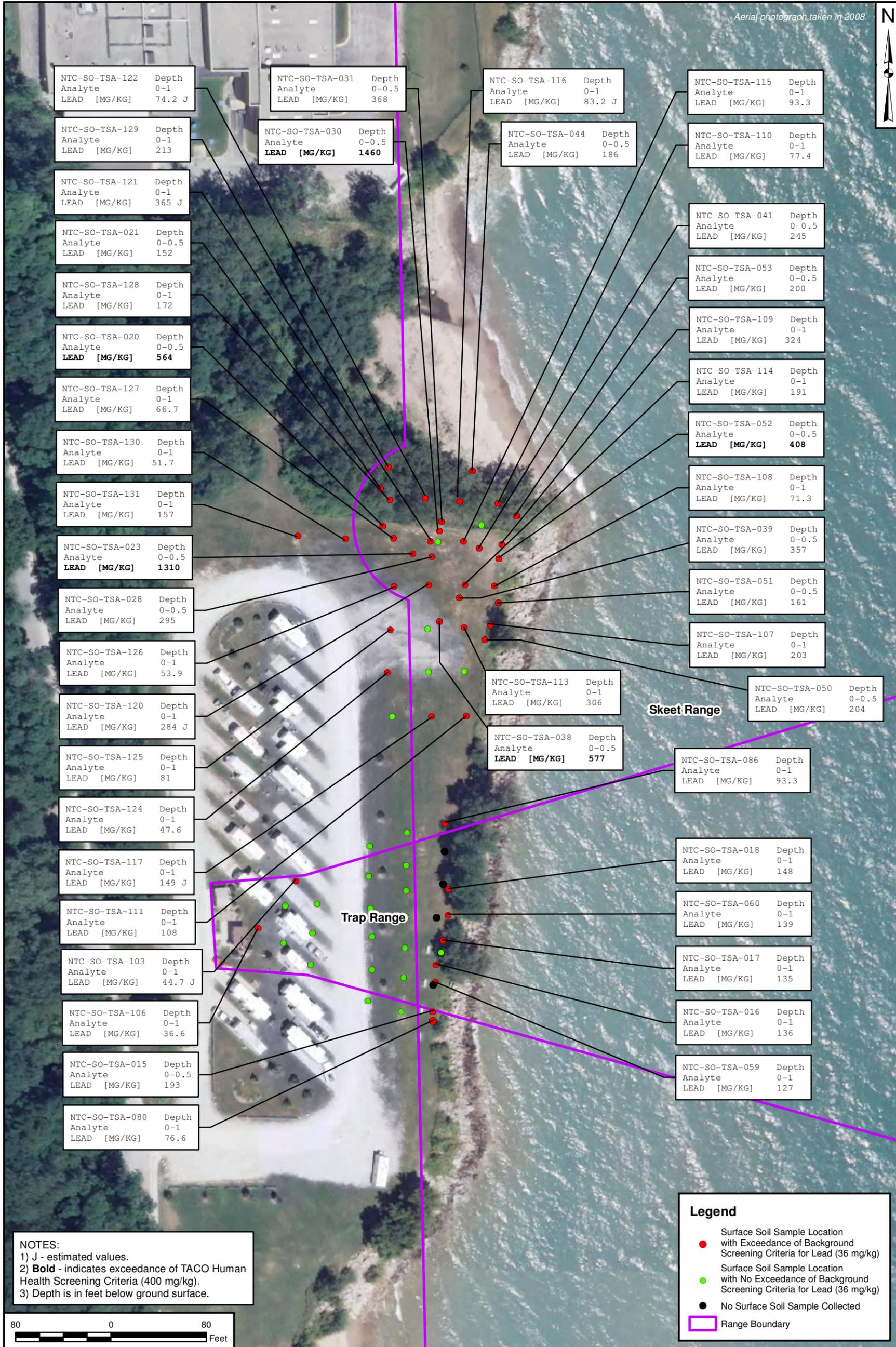


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| SCALE | |
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**SOIL SAMPLE EXCEEDANCES - BaP EQUIVALENT
TSA RANGES
NAVAL STATION GREAT LAKES
GREAT LAKES, ILLINOIS**

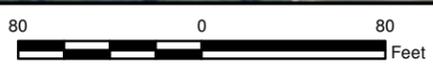
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| FIGURE NO. | REV |
| FIGURE 2 - 1 | 0 |



NOTES:
 1) J - estimated values.
 2) **Bold** - indicates exceedance of TACO Human Health Screening Criteria (400 mg/kg).
 3) Depth is in feet below ground surface.

Legend

- Surface Soil Sample Location with Exceedance of Background Screening Criteria for Lead (36 mg/kg)
- Surface Soil Sample Location with No Exceedance of Background Screening Criteria for Lead (36 mg/kg)
- No Surface Soil Sample Collected
- Range Boundary



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| REVISED BY | DATE |
| S. PAXTON | 09/19/12 |
| SCALE | |
| AS NOTED | |



**SURFACE SOIL SAMPLE EXCEEDANCES - LEAD
 TSA RANGES
 NAVAL STATION GREAT LAKES
 GREAT LAKES, ILLINOIS**

| | |
|-----------------|------------|
| CONTRACT NUMBER | CTO NUMBER |
| APPROVED BY | DATE |
| APPROVED BY | DATE |
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| FIGURE 2 - 2 | 0 |

Aerial photograph taken in 2008.



| | | | |
|----------------|-------|--------------|-------|
| NTC-SO-TSA-121 | Depth | | |
| Analyte | 0-1 | 1-2 | 2-4 |
| LEAD [MG/KG] | 365 J | 433 J | 250 J |

| | | | |
|----------------|-------|------------|-----|
| NTC-SO-TSA-110 | Depth | | |
| Analyte | 0-1 | 1-2 | 2-4 |
| LEAD [MG/KG] | 77.4 | 427 | NS |

| | | | |
|----------------|-------|-------------|------------|
| NTC-SO-TSA-109 | Depth | | |
| Analyte | 0-1 | 1-2 | 2-4 |
| LEAD [MG/KG] | 324 | 1110 | 858 |

| | | | |
|----------------|-------|------------|------------|
| NTC-SO-TSA-107 | Depth | | |
| Analyte | 0-1 | 1-2 | 2-4 |
| LEAD [MG/KG] | 203 | 419 | 481 |

| | | | |
|----------------|-------|------------|------------|
| NTC-SO-TSA-113 | Depth | | |
| Analyte | 0-1 | 1-2 | 2-4 |
| LEAD [MG/KG] | 306 | 463 | 603 |

| | | | |
|----------------|-------|------------|-----|
| NTC-SO-TSA-112 | Depth | | |
| Analyte | 0-1 | 1-2 | 2-4 |
| LEAD [MG/KG] | 31.9 | 630 | NS |

| | | | |
|----------------|-------|-----|------------|
| NTC-SO-TSA-111 | Depth | | |
| Analyte | 0-1 | 1-2 | 2-4 |
| LEAD [MG/KG] | 108 | 381 | 469 |

Skeet Range

Trap Range



NOTES:
 1) J = estimated value.
 2) NS = not sampled.
 3) **Bold** - indicates exceedance of Human Health Screening Criteria (400 mg/kg).
 4) Depth is in feet below ground surface.

Legend

- Soil Sample Location with Exceedance of Human Health Screening Criteria for Lead
- Soil Sample Location with No Exceedance of Human Health Screening Criteria for Lead
- Range Boundary

| | |
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| DRAWN BY | DATE |
| C. TULLEY | 12/15/11 |
| CHECKED BY | DATE |
| J. DUCAR | 09/19/12 |
| REVISED BY | DATE |
| S. PAXTON | 09/19/12 |
| SCALE AS NOTED | |



SOIL SAMPLE EXCEEDANCES - LEAD
 TSA RANGES
 NAVAL STATION GREAT LAKES
 GREAT LAKES, ILLINOIS

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| CONTRACT NUMBER | CTO NUMBER |
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| FIGURE NO. | REV |
| FIGURE 2 - 3 | 0 |

3.0 SOIL REMOVAL ACTION MEASURES

The removal actions described in this RAWP involve the removal of soils contaminated with metals (primarily lead) and PAH within the TSA Ranges site, and will be performed under a Navy Environmental Multiple Award Contract (EMAC). The intent of this RAWP is to describe the performance standards and associated requirements for the removal and off-site disposal of contaminated soil from the land portion of the TSA Ranges. The areas where removal actions are to be performed are presented on Figure 3-1. Table 3-1 presents the volumes of soils to be removed. Figure 3-2 presents the areas of excavation with each corner identified by a location node. Table 3-2 presents the corresponding coordinates (NAD 83 State Plane Illinois East) for each excavation node.

The extent of the soil removal actions are based on the results of the environmental investigations. The removal action work to be performed will consist of the following major components, and is further discussed in the supplemental specifications presented in Appendix B.

- Planning and Permitting
- Site Preparation and Support Activities
- Soil Excavation
- Soil Dewatering
- Decontamination Pad Installation
- Transportation and Off-site Disposal of Soil
- Backfill and Restoration
- Construction documentation

The EMAC contractor will be required to perform all removal action implementation activities in accordance with the EMAC Basic Contract. The EMAC contractor will be required to submit planning documents (including a detailed Work Plan) and obtain Navy approval prior to performing the work.

3.1 PLANNING AND PERMITTING

The EMAC contractor will prepare planning documents and obtain necessary site permits prior to performing the work. The planning documents will include:

- Work Plan
- Site-Specific Health and Safety Plan (SSHSP) and Activity Hazard Analysis (AHA)
- Project Quality Control Plan (QCP)

The EMAC contractor shall obtain all required permits, including but not limited to the following:

- Safety and Building Availability Permit
- Digging Permit

3.2 SITE PREPARATION AND SUPPORT ACTIVITIES

Prior to, during, and after soil removal, site preparation and other support activities will be performed including:

- Erosion and Sediment Control
- Site Support Measures Implementation
- Traffic Control
- Obtaining and Protecting Utilities

These items will be addressed in the Temporary Environmental Control Plan, as well as the Work Plan.

Erosion and Sediment Control: Before excavation activities commence, erosion and sediment controls will be established to prevent impacts to surface water (Lake Michigan) downgradient of the disturbed areas. For example, this will include installing a silt fence downgradient of the disturbed area, temporarily stabilizing the surface, and other measures. Erosion and sediment control measures will remain in place until soil excavation, backfilling, and restoration activities are completed. Completed restoration activities will include establishment of permanent vegetation, where applicable. The disturbed area to be vegetated will be regularly inspected and maintained until the area is stabilized. Once the area has been restored and stabilized, the EMAC contractor will remove temporary erosion and sediment control structures such as the silt fences. Erosion and sediment control measures will be in accordance with the Illinois Urban Manual (2012).

Site Support Measures: Site support measures may include installation of access controls such as fencing, and other measures to support the work. A temporary decontamination pad may be required to clean equipment used to remove, excavate and transport contaminated material. If required, the pad will be sized to accommodate all the equipment to be used at the site, and will be constructed in a manner

that contains all the contaminated materials removed from equipment and the liquids used to clean the equipment. Contaminated materials removed from the equipment will be disposed of off-site with the removed soil. Wash water will be managed as described in the approved water management plan. Waste water will be filtered and then characterized and managed accordingly. The EMAC contractor must clean all equipment prior to mobilizing to NSGL and keep his equipment clean to minimize the spread of contaminated material and soil to adjacent areas and roads.

Traffic Control: The EMAC contractor shall submit a Traffic Control Plan as part of the Work Plan. The Traffic Control Plan shall present details about travel routes within NSGL, and describe compliance with security inspection requirements in a way that minimizes interruptions to facility operations. The EMAC contractor vehicles will travel on the roads and use the weighing facilities as determined by the Navy. The Traffic Control Plan will function in accordance with the Access and Security requirements and the Traffic and Entry Plan. The EMAC contractor will not be permitted to travel within restricted areas of the facility. All waste hauling vehicles will be weighed upon arrival and at time of departure using the certified weight scale as determined by the Navy.

Utilities: The EMAC is responsible for obtaining utility locations, and adequately protecting any utilities located in the active work areas before any earth-disturbing activities begin. If it is necessary to disturb utilities during the site excavations, arrangements for necessary utility shutoffs will be made prior to initiation of earth disturbing activities. Following completion of soil excavations, utilities will be restored to their former condition. A utility map will be provided in the Scope of Work provided to the EMAC contractor.

3.3 SOIL EXCAVATION

This work will consist of removing the defined areas of surface soil (0 to 2 feet bgs) and subsurface soil (2 to 4 feet bgs) with contamination that exceeds the TACO criteria for lead and/or the PAH BaP EQ. The areas to be excavated are shown on Figure 3-1, and the volumes of soil to be removed are presented in Table 3-1. The volume estimates presented in Table 3-1 are in-situ estimates. Actual volumes of the soils are expected to be larger once the soils are removed from the excavation. The site RA area has been divided into two discrete areas: the trap range (T) and the skeet range (S). As shown on Figure 3-1, there are five separate RA areas within the trap range (T1 – T5), and five separate RA areas within the skeet range (S1 – S5).

Trap Range

Within the Trap Range (T1 – T5), the total area to be excavated is approximately 6,451 square feet (sf). The depth of the excavation within Area T1 will be 2 feet (0 to 2 ft bgs). In addition, within the T1 area, an additional 2 feet of soil will be removed from Area T2 (2 to 4 ft bgs). Areas T3, T4, and T5 will have the top 2 feet of soil removed and temporarily stockpiled, pending placement back into the excavations as backfill. Soil in these three areas will be removed from the 2 to 4 ft bgs interval, and transported off-site for disposal. The estimated quantity of contaminated soil to be removed from the trap range area is approximately 477 cubic yards (cy).

Skeet Range

Within the Skeet Range (S1 – S5), the total area to be excavated is approximately 14,628 sf. The depth of the excavation within Area S1 will be 2 feet (0 to 2 feet bgs). In addition, within the S1 area, an additional 2 feet of soil will be removed from Areas S2, S3, and S4 (2 to 4 ft bgs). Area S5 will have the top 2 feet of soil removed and temporarily stockpiled, pending placement back into the excavation as backfill. Soil from the 2 to 4 ft bgs interval will be removed and transported off-site for disposal. The estimated quantity of contaminated soil to be removed from the skeet range area is approximately 1,084 cy.

Tetra Tech will mark the limits to the excavation areas prior to removal of the soil. The EMAC contractor will be responsible to excavate within the defined limits. The actual method to remove the contaminated soil will be determined by the EMAC contractor. However, the work is expected to be performed with an excavator or backhoe. The excavated soil may be temporarily staged on-site pending final approval and/or scheduling with the disposal facility. Approval may require obtaining and analyzing a representative sample or samples of the material before and/or after excavation.

All work will be performed in accordance with the Work Plan, QCP and the HASP. This will include dust control and compliance with Occupational Safety and Health Administration (OSHA) requirements. The EMAC contractor will also be required to perform some site preparation work prior to excavation and other support activities.

3.4 DEWATERING

When necessary to remove free liquids, excavated soil and sediments will be placed on a dewatering pad and allowed to drain by gravity.

The EMAC Contractor will be responsible to cover and maintain covers at the excavation sites to minimize dewatering requirements. Additionally, excavation during periods of "heavy precipitation" will be avoided. A heavy precipitation is any precipitation event that would require dewatering of the excavated materials.

Water removed during the dewatering process will be filtered to remove solids. The solids will be placed with the dewatered soils. The filtered waters will be characterized and managed in accordingly.

3.5 TRANSPORTATION AND OFF-SITE DISPOSAL OF SOIL

The EMAC contractor will be responsible for transportation and offsite disposal of the contaminated soil. The waste disposal facility will be approved the Navy. Soils will be sampled for waste disposal characterization as determined by the approved waste disposal facility. All onsite transportation shall be performed on the roads determined by the Navy.

The EMAC contractor will submit the name of the proposed disposal facility to the Navy. The proposal will include facility name, contact information, permit number, and documentation/certification of the facility to accept the TSA Ranges soil. After selection, the EMAC contractor will provide transportation, treatment and disposal details in the Work Plan.

Disposal requirements vary with each disposal facility. The EMAC contractor will be responsible to notify the selected disposal facility of the classification of material to be disposed.

The EMAC contractor shall be responsible for providing and carrying waste manifests, bills of lading, placards, labeling, markings, licensing, and any other transportation/disposal documentation as required by federal, state, and local regulations. The Navy will supply a USEPA Generator ID number for this documentation. The EMAC contractor shall prepare all transportation documentation, including bills of lading, manifests, etc. for approval and signature by the Navy. A representative of the Navy will sign completed shipping manifests and bills of lading.

The EMAC contractor shall provide the Navy a 2-week notice prior to mobilization to the Site, and a minimum of 48 hours notice (2 business days) prior to shipping materials from the Site.

3.7 BACKFILL AND RESTORATION

The excavation will be backfilled after the contaminated soil is removed from the Site. The area will be backfilled to match the existing grade. To the extent possible, the excavated clean soil will be used as backfill.

Fill soil to be brought into NSGL must be sampled to confirm compliance with Illinois EPA TACO Tier 1 residential property use scenario for the ingestion, inhalation and migration to groundwater exposure pathways criteria [35 Illinois Administrative Code (IAC) Part 742]. If documentation is available from the borrow site vendor, the data can be submitted for a Navy sufficiency review. If the borrow site vendor does not have analytical data that documents the condition of the soils, the EMAC contractor shall collect representative samples from the proposed borrow area. All fill soils data provided by the site owner or contractor must be certified by an Illinois Licensed Professional Engineer using Illinois EPA Form LPC-663 as uncontaminated soil in accordance with the Environmental Protection Act [415 Illinois Compiled Statutes (ILCS) 5/22.51 (f)(2)(B)]. Regardless of source site use, the EMAC contractor shall analyze samples for all Target Analyte List (TAL) and Target Compound List (TCL) constituents using U.S. EPA SW846 methods with detection limits appropriate for comparison to the Illinois EPA Tier 1 TACO residential criteria. All laboratory analysis must be performed by an Illinois EPA/National Environmental Laboratory Accreditation Conference (NELAC) certified laboratory. Sample frequency shall be, at a minimum, one sample per 500 tons of soil. No soils shall be brought into NSGL until the Navy has reviewed and accepted the analytical data.

Backfill material will include common fill and topsoil.

Common Fill. Common fill will be used to backfill the excavations to a depth of 6 inches below final grade. This material will be placed into the excavation in maximum 9-inch-thick lifts, and compacted to 90 percent of standard proctor density. Common fill will meet the following physical characteristics:

- American Society for Testing and Materials (ASTM) D 2487, Classifications GW, GP, GM, SW, SP, or SM.
- ASTM D 4318, Liquid limit, 35 maximum.
- ASTM D 4318, Plasticity index, 12 maximum.
- Maximum of 25 percent by weight passing ASTM D 1140, No. 200 sieve.
- Maximum particle size of 1 inch.

Topsoil. The uppermost 6 inches of backfill used to establish final grades will be medium-textured loam suitable for establishing vegetation.

Following backfilling, the disturbed area (grass areas only) will be restored using permanent seeding. Restoration will consist of surface preparation, fertilizing, seeding, and mulching. Activities to establish permanent seeding will be implemented as soon as possible following the construction of final grades. Permanent vegetation activities will include site/seed bed preparation, seeding, and mulching of the restored excavation areas, and the surface soils located underneath support facilities.

The procedures and requirements for permanent seeding activities are presented in the Illinois Urban Manual (2012). The seed mixture recommended for use at the TSA Ranges site will be a standard Illinois seed mixture for open and disturbed areas. The seed mixture will include perennial ryegrass and tall fescue. Planting rates and optimum soil pH for this mixture are presented in the Illinois Urban Manual. Following seeding, the seeded areas will be covered with mulch and tack (e.g., coconut fiber matting) to provide additional stabilization until vegetation is established.

3.8 STORMWATER CONTROLS

The TSA Range surface hydrology, grading, and cover will not be altered as a result of removal action implementation activities. Pre- and post-development runoff from the limits of the disturbance will be the same; therefore, permanent stormwater detention capacity is not required, and pre- and post-construction stormwater runoff calculations were not prepared.

3.9 SUBMITTALS DURING CONSTRUCTION

The EMAC contractor must submit construction and quality assurance/quality control (QA/QC) documents during construction. These will include, but are not limited to the following:

- Field work reports in accordance with EMAC Basic Contract.
- Erosion and Sediment Control installation and inspection logs.
- Copies of NSGL-specific permits.
- Site plan showing limits of excavation. The site plan shall be stamped by a licensed surveyor.

- Certification and analytical results for backfill material. A minimum of one sample per 500 tons of material is required and must be submitted and approved before material can be brought on-site.
- Waste profiles, waste characterization results, and any waste disposal facility pre-approval or approval documentation.
- Work Site Decontamination Certificates (verification that all vehicles, equipment, and containers were properly decontaminated prior to leaving the work site).
- Disposal Site Decontamination Certificates (verification that vehicles and containers were decontaminated prior to leaving the disposal facility).
- Shipment Manifests (manifests and other documents required to ship waste).
- Weight tickets.
- Delivery and Disposal Certificates (verification that waste was received and disposed at identified disposal facility).
- Decontamination Log.

The EMAC contractor shall compile the above documentation in a Construction Completion Report and provide it to the Navy, or their representative.

TABLE 3-1

SUMMARY OF TSA RANGE EXCAVATION AREAS
NSGL - TSA RANGES SITE
GREAT LAKES, ILLINOIS

| Area Number | Description | | | Area | Depth | Volume | Volume | Average PAH Concentration | Average Lead Concentration | Removal Description | Other Costs |
|--------------|-------------|-----------------|-----------|-----------------|-------|-------------|-------------|---------------------------|----------------------------|---|--|
| | | | | ft ² | ft | cy | tons | (ug/kg) | (mg/kg) | | |
| T1 | Trap Range | Surface Soil | shoreline | 2931 | 2 | 217 | 326 | 6492 | 114 | Remove 0 to 2 feet | Restore site to original condition; replace removed shrubs/trees with NSGL-approved vegetation; revegetate remaining area with NSGL approved grass. |
| T2 | Trap Range | Surface Soil | shoreline | 262 | 2 | 19 | 29 | 3905 | 110 | Removal of 2 to 4 feet | -- |
| T3 | Trap Range | Subsurface Soil | north | 769 | 2 | 57 | 85 | 6734 | 24 | Scrape 0 to 2 foot and retain. Remove 2 to 4 feet | -- |
| T4 | Trap Range | Subsurface Soil | south | 449 | 2 | 33 | 50 | 3435 | 56 | Scrape 0 to 2 foot and retain. Remove 2 to 4 feet | Possible tree removal - may be able to work around it. If required, Restore site to original condition; replace removed trees with NSGL-approved vegetation. |
| T5 | Trap Range | Subsurface Soil | west | 2040 | 2 | 151 | 227 | 13446 | 159 | Scrape 0 to 2 foot and retain. Remove 2 to 4 feet | Removal and replacement of 2-3 RV spaces including utilities (electric, water). Replacement of stone parking spaces and grass medians. |
| S1 | Skeet Range | Surface Soil | shoreline | 10487 | 2 | 777 | 1165 | 946 | 524 | Remove 0 to 2 feet | Restore site to original condition; replace removed shrubs/trees with NSGL-approved vegetation; revegetate remaining area with NSGL approved grass. |
| S2 | Skeet Range | Subsurface Soil | south | 1134 | 2 | 84 | 126 | 3716 | 420 | Removal of 2 to 4 feet | -- |
| S3 | Skeet Range | Subsurface Soil | Mid | 1255 | 2 | 93 | 139 | 2246 | 542 | Removal of 2 to 4 feet | -- |
| S4 | Skeet Range | Subsurface Soil | north | 522 | 2 | 39 | 58 | 222 | 858 | Remove 2 to 4 feet | -- |
| S5 | Skeet Range | Subsurface Soil | west | 1230 | 2 | 91 | 137 | 13436 | 119 | Scrape 0 to 2 foot and retain. Removal of 2 to 4 feet | -- |
| Total | | | | | | 1561 | 2342 | -- | -- | -- | -- |

cy - cubic yards
ft - feet
ft² - square feet
mg/kg - miligrams per kilograms
PAH - polycyclic aromatic hydrocarbons
ug/kg - micrograms per kilograms
-- - not applicable

TABLE 3-2

TSA RANGE EXCAVATION NODE COORDINATES
 NSGL - TSA RANGES SITE
 GREAT LAKES, ILLINOIS
 PAGE 1 OF 2

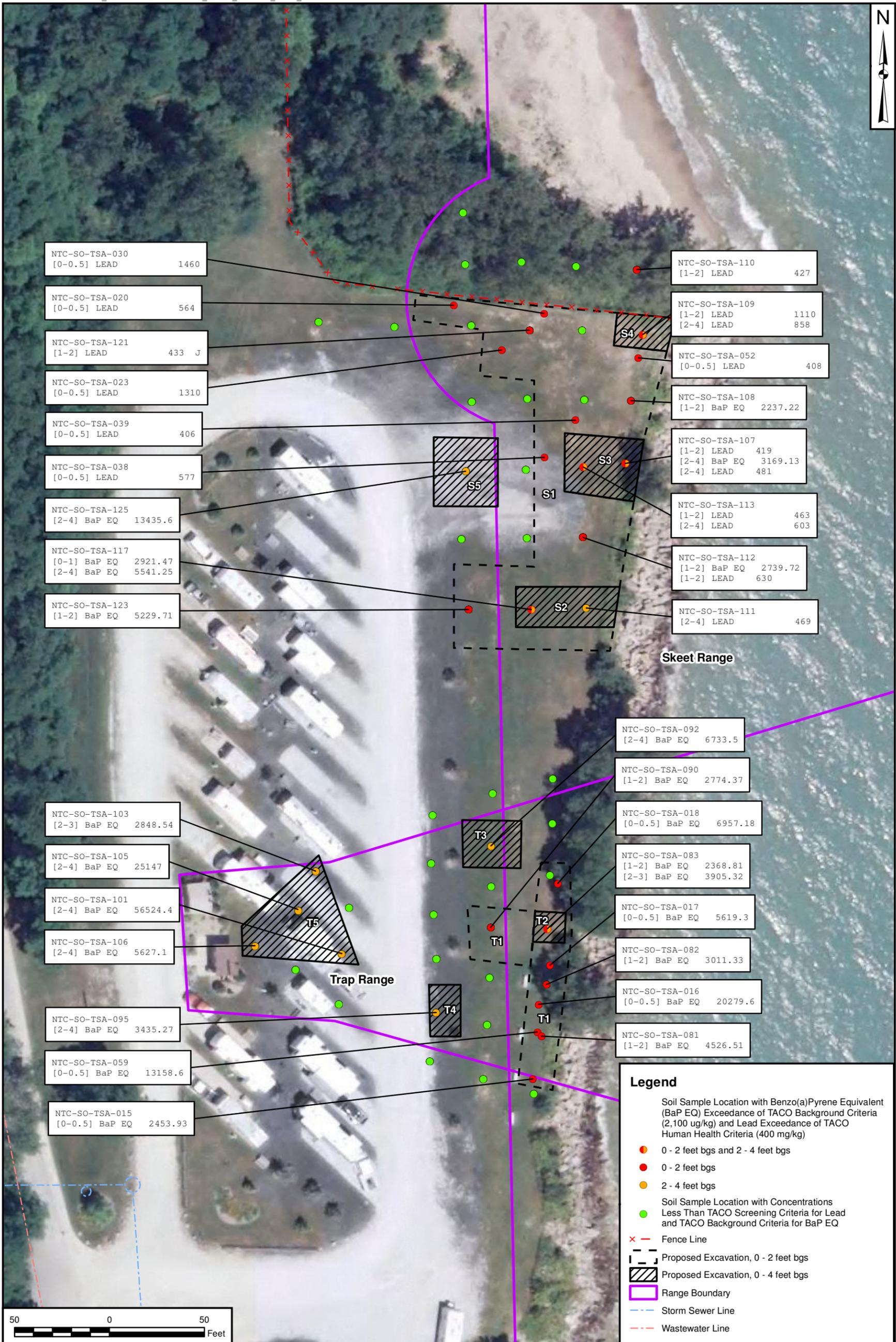
| Excavation | Excavation Node ID | Easting | Northing | Comments |
|------------|--------------------|---------------|---------------|--------------------------------|
| S1 | S1a | 1120186.44568 | 2059735.99994 | |
| | S1b | 1120104.41455 | 2059737.56262 | |
| | S1c | 1120104.41455 | 2059781.83344 | |
| | S1d | 1120146.60193 | 2059780.53125 | |
| | S1e | 1120146.60193 | 2059878.96869 | |
| | S1f | 1120117.95618 | 2059881.57306 | |
| | S1g | 1120120.03937 | 2059905.79175 | |
| | S1h | 1120082.79999 | 2059911.00006 | |
| | S1i | 1120084.36243 | 2059924.28125 | |
| | S4b | 1120221.08118 | 2059912.04175 | Shared node with excavation S4 |
| S2 | S2a | 1120136.96637 | 2059769.85419 | |
| | S2b | 1120191.65399 | 2059769.85419 | |
| | S2c | 1120188.45807 | 2059748.51160 | |
| | S2d | 1120136.96637 | 2059748.50012 | |
| S3 | S3a | 1120162.74774 | 2059851.10419 | |
| | S3b | 1120204.41443 | 2059847.71881 | |
| | S3c | 1120199.14520 | 2059814.95795 | |
| | S3d | 1120162.48724 | 2059820.37500 | |
| S4 | S4a | 1120190.29547 | 2059914.79791 | |
| | S4b | 1120221.08118 | 2059912.04175 | |
| | S4c | 1120216.53333 | 2059894.49017 | |
| | S4d | 1120188.52887 | 2059897.45837 | |
| S5 | S5a | 1120093.60708 | 2059849.02083 | |
| | S5b | 1120127.48110 | 2059848.50234 | |
| | S5c | 1120127.48110 | 2059812.33828 | |
| | S5d | 1120093.60708 | 2059812.56250 | |
| T1 | T1a | 1120156.23730 | 2059503.44806 | |
| | T1b | 1120138.00812 | 2059506.83344 | |
| | T1c | 1120144.70245 | 2059569.02521 | |
| | T1d | 1120113.00818 | 2059572.71881 | |
| | T1e | 1120111.44574 | 2059601.10431 | |
| | T2a | 1120147.12268 | 2059597.97919 | Shared node with excavation T2 |
| | T1f | 1120150.21887 | 2059623.88427 | |
| | T1g | 1120165.35187 | 2059623.50006 | |
| T2 | T2a | 1120147.12268 | 2059597.97919 | |
| | T2b | 1120163.22602 | 2059597.23548 | |
| | T2c | 1120162.48724 | 2059581.31244 | |
| | T2d | 1120146.08124 | 2059581.83344 | |

TABLE 3-2

TSA RANGE EXCAVATION NODE COORDINATES
NSGL - TSA RANGES SITE
GREAT LAKES, ILLINOIS
PAGE 2 OF 2

| Excavation | Excavation Node ID | Easting | Northing | Comments |
|------------|--------------------|---------------|---------------|----------|
| T3 | T3a | 1120108.71125 | 2059646.41667 | |
| | T3b | 1120139.96125 | 2059645.89583 | |
| | T3c | 1120139.44042 | 2059620.89583 | |
| | T3d | 1120109.23208 | 2059621.41667 | |
| T4 | T4a | 1120091.10013 | 2059559.21387 | |
| | T4b | 1120107.81877 | 2059559.21387 | |
| | T4c | 1120107.81877 | 2059531.75626 | |
| | T4d | 1120091.83234 | 2059531.75626 | |
| T5 | T5a | 1120033.19042 | 2059627.66667 | |
| | T5b | 1120054.02375 | 2059569.85417 | |
| | T5c | 1119993.08625 | 2059574.54167 | |
| | T5d | 1119992.56542 | 2059590.16667 | |

Note: Coordinates are based on NAD 83 State Plane Illinois East



| | |
|--|--------------------|
| NTC-SO-TSA-030 [0-0.5] LEAD | 1460 |
| NTC-SO-TSA-020 [0-0.5] LEAD | 564 |
| NTC-SO-TSA-121 [1-2] LEAD | 433 |
| NTC-SO-TSA-023 [0-0.5] LEAD | 1310 |
| NTC-SO-TSA-039 [0-0.5] LEAD | 406 |
| NTC-SO-TSA-038 [0-0.5] LEAD | 577 |
| NTC-SO-TSA-125 [2-4] BaP EQ | 13435.6 |
| NTC-SO-TSA-117 [0-1] BaP EQ [2-4] BaP EQ | 2921.47 5541.25 |
| NTC-SO-TSA-123 [1-2] BaP EQ | 5229.71 |

| | |
|--|-----------------------|
| NTC-SO-TSA-110 [1-2] LEAD | 427 |
| NTC-SO-TSA-109 [1-2] LEAD [2-4] LEAD | 1110 858 |
| NTC-SO-TSA-052 [0-0.5] LEAD | 408 |
| NTC-SO-TSA-108 [1-2] BaP EQ | 2237.22 |
| NTC-SO-TSA-107 [1-2] LEAD [2-4] BaP EQ [2-4] LEAD | 419 3169.13 481 |
| NTC-SO-TSA-113 [1-2] LEAD [2-4] LEAD | 463 603 |
| NTC-SO-TSA-112 [1-2] BaP EQ [1-2] LEAD | 2739.72 630 |
| NTC-SO-TSA-111 [2-4] LEAD | 469 |

| | |
|----------------------------------|---------|
| NTC-SO-TSA-103 [2-3] BaP EQ | 2848.54 |
| NTC-SO-TSA-105 [2-4] BaP EQ | 25147 |
| NTC-SO-TSA-101 [2-4] BaP EQ | 56524.4 |
| NTC-SO-TSA-106 [2-4] BaP EQ | 5627.1 |
| NTC-SO-TSA-095 [2-4] BaP EQ | 3435.27 |
| NTC-SO-TSA-059 [0-0.5] BaP EQ | 13158.6 |
| NTC-SO-TSA-015 [0-0.5] BaP EQ | 2453.93 |

| | |
|--|--------------------|
| NTC-SO-TSA-092 [2-4] BaP EQ | 6733.5 |
| NTC-SO-TSA-090 [1-2] BaP EQ | 2774.37 |
| NTC-SO-TSA-018 [0-0.5] BaP EQ | 6957.18 |
| NTC-SO-TSA-083 [1-2] BaP EQ [2-3] BaP EQ | 2368.81 3905.32 |
| NTC-SO-TSA-017 [0-0.5] BaP EQ | 5619.3 |
| NTC-SO-TSA-082 [1-2] BaP EQ | 3011.33 |
| NTC-SO-TSA-016 [0-0.5] BaP EQ | 20279.6 |
| NTC-SO-TSA-081 [1-2] BaP EQ | 4526.51 |

Legend

Soil Sample Location with Benzo(a)Pyrene Equivalent (BaP EQ) Exceedance of TACO Background Criteria (2,100 ug/kg) and Lead Exceedance of TACO Human Health Criteria (400 mg/kg)

- 0 - 2 feet bgs and 2 - 4 feet bgs
- 0 - 2 feet bgs
- 2 - 4 feet bgs

Soil Sample Location with Concentrations Less Than TACO Screening Criteria for Lead and TACO Background Criteria for BaP EQ

- × - Fence Line
- - - Proposed Excavation, 0 - 2 feet bgs
- ▨ Proposed Excavation, 0 - 4 feet bgs
- ▭ Range Boundary
- - - Storm Sewer Line
- - - Wastewater Line

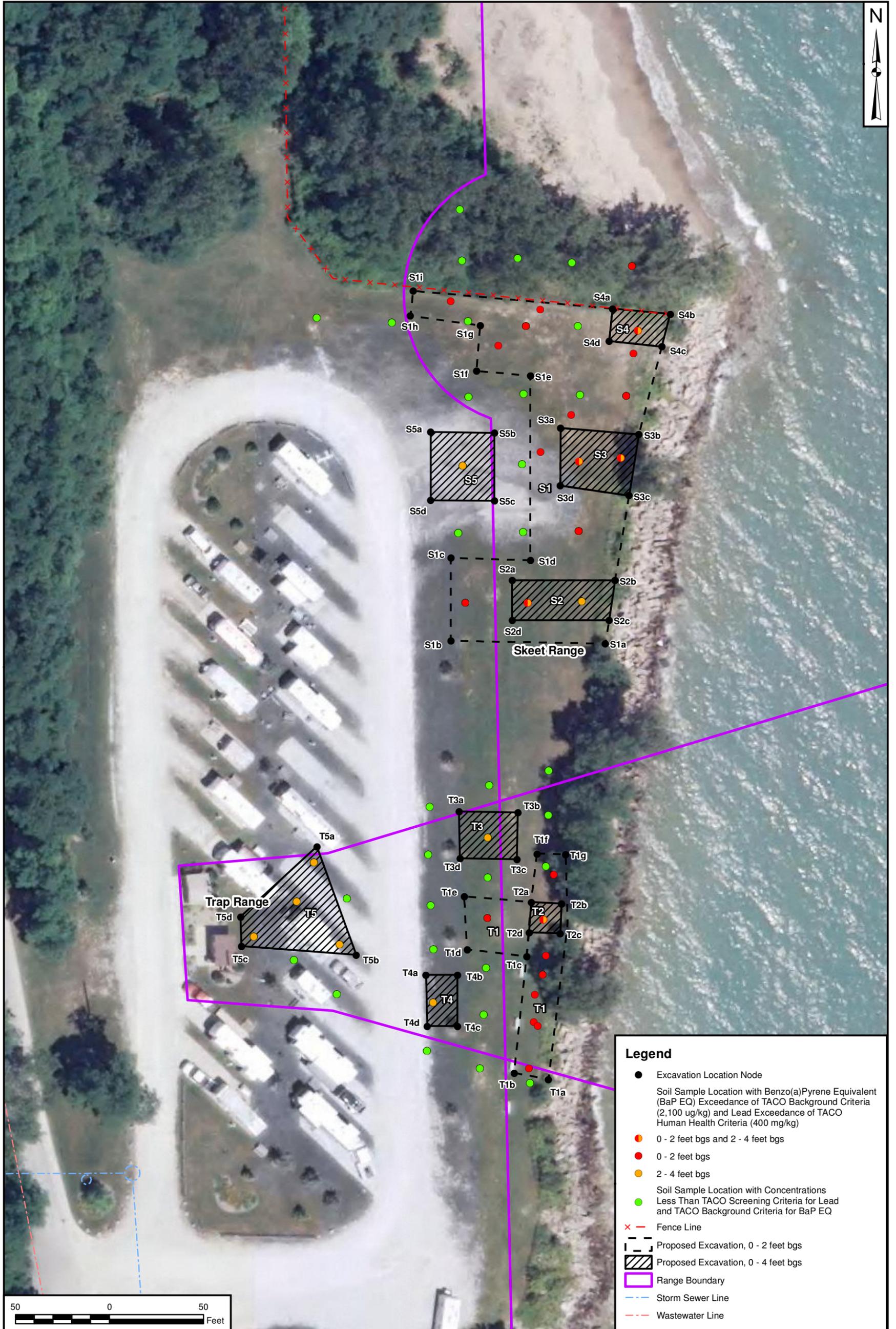


| | |
|------------|----------|
| DRAWN BY | DATE |
| J. ENGLISH | 01/16/12 |
| CHECKED BY | DATE |
| J. DUCAR | 09/05/12 |
| REVISED BY | DATE |
| S. PAXTON | 09/05/12 |
| SCALE | |
| AS NOTED | |



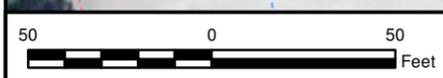
**PROPOSED SOIL EXCAVATION AREAS WITH TACO EXCEEDANCES
TSA RANGES
NAVAL STATION GREAT LAKES
GREAT LAKES, ILLINOIS**

| | |
|-----------------|------------|
| CONTRACT NUMBER | CTO NUMBER |
| | F274 |
| APPROVED BY | DATE |
| | |
| APPROVED BY | DATE |
| | |
| FIGURE NO. | REV |
| FIGURE 3 - 1 | 0 |



Legend

- Excavation Location Node
- Soil Sample Location with Benzo(a)Pyrene Equivalent (BaP EQ) Exceedance of TACO Background Criteria (2,100 ug/kg) and Lead Exceedance of TACO Human Health Criteria (400 mg/kg)
- 0 - 2 feet bgs and 2 - 4 feet bgs
- 0 - 2 feet bgs
- 2 - 4 feet bgs
- Soil Sample Location with Concentrations Less Than TACO Screening Criteria for Lead and TACO Background Criteria for BaP EQ
- × - - - Fence Line
- - - Proposed Excavation, 0 - 2 feet bgs
- ▨ Proposed Excavation, 0 - 4 feet bgs
- ▭ Range Boundary
- - - Storm Sewer Line
- - - Wastewater Line



| | |
|----------------|----------|
| DRAWN BY | DATE |
| S. PAXTON | 09/19/12 |
| CHECKED BY | DATE |
| J. DUCAR | 09/19/12 |
| REVISED BY | DATE |
| | |
| SCALE AS NOTED | |



PROPOSED SOIL EXCAVATION AREAS WITH LOCATION NODES
TSA RANGES
NAVAL STATION GREAT LAKES
GREAT LAKES, ILLINOIS

| | |
|-----------------|------------|
| CONTRACT NUMBER | CTO NUMBER |
| | F274 |
| APPROVED BY | DATE |
| | |
| APPROVED BY | DATE |
| | |
| FIGURE NO. | REV |
| FIGURE 3 - 2 | 0 |

4.0 REFERENCES

Illinois Urban Manual (2012).

Tetra Tech, 2010. Site Inspection Report Munition Response Program Ranges Naval Station Great Lakes Great Lakes, Illinois. November.

Tetra Tech, 2012, Addendum to: Site Inspection Report Munition Response Program Ranges Naval Station Great Lakes Great Lakes, Illinois. May.

APPENDIX A

SITE PHOTOGRAPHS



A-1

The former Trap Range is now an RV park. The firing line for the former Trap Range is located behind the camper in the foreground.



A-2

The northern sampling locations at the Trap Range. Note the large concrete pieces at the water's edge used for erosion control.



A-3

View from north to south of the Lake Michigan beachfront, showing concrete slabs along the border of the TSA Ranges.



A-4

The south central sampling locations at the Trap Range. Note the large concrete pieces at the water's edge used for erosion control.



A-5

The southern sampling locations at the Trap Range. Note the large concrete pieces at the water's edge used for erosion control.

APPENDIX B

SUPPLEMENTAL SPECIFICATIONS

SUPPLEMENTAL SPECIFICATIONS
REMOVAL ACTION WORK PLAN
TSA RANGES
NAVAL STATION GREAT LAKES
GREAT LAKES, ILLINOIS

Contractor Requirements

The Contractor will be responsible for performing the following work:

1. Attend pre-Remedial Action Work Plan (RAWP) implementation conference.
2. Submit documentation in accordance with the 'Basic Contract' 30 days prior to beginning work to allow the Navy sufficient time to review and comment. The Contractor will then incorporate Navy comments into the documents. These documents include the following:
 - Work Plan
 - Excavation and Handling Plan
 - Hazardous/Waste Management Plan
 - Environmental Protection Plan
 - Erosion and Sediment Control Plan
 - Stormwater Pollution Prevention Plan
 - Transportation and Disposal Plan
 - Site Specific Health and Safety Plan (SSHSP) and Activity Hazard Analysis
 - Project Quality Control Plan (QCP)
3. Acquire Facility-specific permits, including but not limited to the following:
 - Safety and Building Availability Permit.
 - Digging Permit.
 - Flame Tool/Hot Work Permit.
 - Hazards of Electromagnetic Radiation to Ordnance (HERO) (approval for portable radios).
4. Mobilize required equipment and personnel to excavate the indicated contaminated soil.
5. Construct and maintain the required erosion and sediment control devices for the duration of the project.
6. Construct required support facilities including, but not limited to, temporary gravel construction entrance, temporary access trails, dewatering pad, decontamination pad(s), and material storage areas.
7. Excavate, transport, and dispose contaminated surface and subsurface soils.
8. Stabilize and restore surface soil excavation area to meet surrounding grades.
9. Remove all temporary support facilities, leaving perimeter erosion and sediment controls in place until revegetation is complete and as instructed by the Navy.
10. Restore areas used for temporary support facilities (regrade and revegetate).
11. Demobilize equipment and personnel.

In addition to the QC submittals and Safety and Health submittals required by the NSGL Contractor's Operations Manual and the Basic Contract, the Contractor shall submit the following to the Navy:

- Field work reports in accordance with Part 6.4 Section C of the Basic Contract.
- Contractor 40 CFR 1910.120 Employee Training Certificates for all Contractor employees scheduled to be on-site.
- Erosion and Sediment Control installation and inspection logs.
- Copies of NSGL-specific permits.
- Certification and sampling results for backfill material and topsoil.
- Waste transportation subcontractor name, address, contact name, telephone number, and United States Department of Transportation (USDOT) number.
- Hazardous waste disposal facility name, address, contact name, telephone number, and USEPA and State identification numbers, if required.

- Solid waste disposal facility name, address, contact name, telephone number, USEPA and State identification numbers.
- Copies of Treatment/Disposal Facility Permits.
- Waste profiles, complete waste characterization results, and any waste disposal facility pre-approval or approval documentation.
- Work Site Decontamination Certificates (verification that all vehicles, equipment, and containers were properly decontaminated prior to leaving the work site).
- Disposal Site Decontamination Certificates (verification that vehicles and containers were decontaminated prior to leaving the disposal facility).
- Shipment Manifests (manifests and other documents required to ship waste).
- Delivery Certificates (verification that waste was received at identified waste disposal facility).
- Treatment and Disposal Certificates (verification that waste was successfully received and disposed).
- Decontamination Log.

The Contractor-provided information will be compiled in the project CTO Closure Report to be prepared by the Navy.

Supplemental Specifications

In addition to the performance specifications presented in the NSGL Contractor's Operation Manual and in the Basic Contract, the Contractor shall perform the activities in accordance with the supplemental specifications provided below.

General Requirements

The Contractor is advised that this project is subject to federal, state, and local regulatory agency inspections and review for compliance with environmental laws and regulations. The Contractor shall fully cooperate with any representative from any federal, state, or local regulatory agency who may visit the job site, and shall provide immediate notification to the Officer in Charge of Construction (OICC), who shall accompany them on any subsequent site inspections. The Contractor shall complete, maintain, and make available to the OICC, Facility, or regulatory agency personnel all documentation relating to environmental compliance under applicable federal, state, and local laws and regulations. The Contractor shall immediately notify the OICC if a Notice of Violation, Notice of Deficiency, or similar regulatory notice is issued to the Contractor.

The Contractor shall be responsible for all damages to persons or property resulting from Contractor fault or negligence, as well as for the payment of any civil fines or penalties which may be assessed by any federal, state, or local regulatory agency as a result of the Contractor's or any subcontractor's violation of an applicable federal, state, or local environmental law or regulation. Should a Notice of Violation, Notice of Noncompliance, Notice of Deficiency, or similar regulatory agency notice be issued to the Government or Facility owner/operator on account of the actions or inactions of the Contractor or one of its subcontractors in the performance of work under this contract, the Contractor shall fully cooperate with the Government in defending against regulatory assessment of any civil fines or penalties arising out of such actions or inactions.

After approval of the Contractor's Work Plan and before commencement of work, the Contractor shall submit to the OICC the required certifications. As requested by the OICC, the Navy Representative for this project may review and provide surveillance for the OICC to determine if the Contractor's submittals comply with the contract requirements.

The Contractor shall be required to commence work on the approved Contractor's Work Plan within 5 calendar days after receiving the notice to proceed, and to prosecute the work diligently after receiving the notice to proceed.

NSGL will remain in operation during the entire construction period. The Contractor shall schedule the work as to cause the least amount of interference with the Facility. Work schedules shall be subject to the approval of the OICC. Permission to interrupt Facility road services shall be requested in writing a minimum of 15 calendar days prior to the desired date of interruption. The OICC shall be notified 48 hours prior to starting excavation activities.

Regular work hours shall consist of an 8.5 hour daily period established by the OICC, Monday through Friday, excluding Government holidays. The Contractor should assume an 8.5 hour daily period. Working outside of the 8.5 hour daily period will require approval by the OICC. Work hours shall be established during the pre-RAWP implementation conference.

On-site storage, laydown, material handling, and decontamination activities shall be limited to areas approved by the OICC.

During the progress of construction activities, the work area and adjacent areas shall be kept clean and free of rubbish, surplus materials, and unneeded construction equipment. No material or debris shall be allowed to flow or wash into watercourses, ditches, gutters, drains, or pipes. Upon completion of the work, the Contractor shall sweep paved areas and rake clean landscaped areas, and remove waste and surplus materials, rubbish, and construction facilities from the site.

Work Restrictions

Contractor personnel employed at the Facility shall become familiar with and obey Facility regulations and keep within the limits of the work and avenues of ingress and egress as directed. Personnel shall not enter any restricted areas unless required to do so and until cleared for such entry. The Contractor's equipment shall be clearly marked for identification.

The Contractor shall indicate on the construction schedule any activity that could potentially interrupt Facility operations. The Contractor shall notify the OICC in writing 15 calendar days prior to the required interruption.

Facilities and Services

Provide utility permits in accordance with Part 4.13 Section C of the Basic Contract.

NSGL shall make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies, as indicated. The amount of each utility service consumed shall be charged to or paid for by the Contractor at the prevailing rates charged to NSGL, or shall be furnished at no charge as indicated. The Contractor shall carefully conserve any utilities furnished without charge.

The point at which NSGL will deliver such utilities or services and the quantity available will be identified by NSGL.

The Contractor, at its expense and in a workmanlike manner satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections and distribution lines, and all meters required to measure the amount of each utility used for the purpose of determining charges. Before final acceptance of the work by the Government, the Contractor shall remove all the temporary connections, distribution lines, meters, and associated paraphernalia.

Electric – Electrical power available: primary voltage is 2400 volt 3 phase, 3 wire, 60 cycle AC; secondary voltages may be 120/208 or 120/240 volts. Final taps and tie-ins to the NSGL utility grid will be made by the NSGL electric shop.

Potable Water – Potable water is not available. Contractor shall provide potable water for use by all personnel.

Water – A reasonable quantity of water is available at [to be determined] at no charge. Provide backflow preventer devices on connections to potable water supplies. Under no circumstances will taps to NSGL fire hydrants be allowed for obtaining water.

Telephone – Telephone service is not available.

Sanitary Facilities - Provide temporary sanitary facilities for use by all personnel in accordance with Part 3.10 Section C of the Basic Contract.

Municipal Waste – Municipal waste storage and disposal is not available.

Sewer – Water resulting from personnel and equipment decontamination, excavation dewatering, and water from materials handling pad may be discharged to the NSGL sanitary sewer system, subject to approval of the NSGL based on characterization samples of water to be discharged.

Site Personnel Qualifications

Site Superintendent - The Contractor shall designate a Site Superintendent who shall have responsibility and authority to direct work performed. The Site Superintendent shall be responsible for the management and execution of all site activities in accordance with the RAWP, approved Contractor's Work Plan, and all federal, state, and local laws and regulations. The Site Superintendent may not act in the dual role as the Project Quality Control Manager or Site Health and Safety Specialist (SHSS). The Site Superintendent shall have, as a minimum, the following qualifications:

- A minimum of 6 years site superintendent experience.
- A minimum of 3 years experience on hazardous, toxic and radioactive waste (HTRW) projects.
- Familiarity with the requirements of the U.S. Army Corps of Engineers Safety - Safety and Health Requirements (EM 385-1-1).
- Experience in the areas of hazard identification and safety compliance.

Project Quality Control Manager - The Contractor shall designate a Project Quality Control (QC) Manager who shall assist and represent the QC Program Manager in continued implementation and enforcement of the approved Project QC Plan. The QC Program Manager or Project QC Manager shall be physically present at the project site whenever work is in progress. The Project QC Manager may act in the dual role as the SHSS if qualified. The Project QC Manager shall have, as a minimum, the following qualifications:

- A minimum 2 years experience as a Project QC Manager.
- A minimum of 10 years combined experience in the following positions: project superintendent, QC manager, project manager, project engineer or construction manager on similar size and type of construction contracts which included the major trades that are part of this RA.
- Alternatively, the above 10-year combined experience requirement may be satisfied by providing a professional engineer registered in the State of Illinois having at least 2 years experience as a Project QC Manager.
- Familiar with the requirements of the U.S. Army Corps of Engineers Safety - Safety and Health Requirements (EM 385-1-1).
- Experience in the areas of hazard identification and safety compliance.

Site Health and Safety Specialist - The Contractor shall designate a SHSS who shall assist and represent the Contractor's Health and Safety (H/S) Manager in continued implementation and enforcement of the approved Site-Specific Health and Safety Plan (SSHSP). The SHSS shall have the on-site responsibility and authority to modify and stop work, or remove personnel from the site if working conditions change which may affect on-site and off-site health and safety. The SHSS shall be physically present at the project site at all times. The SHSS act in the dual roles as the Project QC Manager. The SHSS shall have, as a minimum, the following qualifications:

- A minimum of 5 years safety work on similar projects.

- 30-hour OSHA construction safety class or equivalent within the last 5 years.
- An average of at least 24 hours of formal safety training each year for the last 5 years.
- Competent person status for at least the following:
 - Excavation.
 - Health hazard recognition, evaluation and control of chemical, physical and biological agents.
 - Personal protective equipment and clothing to include selection, use and maintenance.
- First aid and cardiopulmonary resuscitation (CPR) qualified.

Quality Control

Approval of the QC Plan is required prior to the start of construction. The OICC reserves the right to require changes in the QC Plan and operations as necessary to ensure the specified quality of work. The Contracting Officer reserves the right to interview the QC Manager at any time in order to verify his/her submitted qualifications.

The OICC shall be notified, in writing, of any proposed changes to the QC Plan, at a minimum of 7 calendar days prior to the implementation of the proposed change. Proposed changes must be approved by the OICC.

A combined Contractor Production Report/Contractor Quality Control Report (CPR/CQCR) is required for each day that work is performed. CPR/CQCRs are to be prepared, signed, and dated by the Project QC Manager.

Safety and Occupational Health Requirements

The SHSS and Contractor representatives who have a responsibility or significant role in accident prevention shall attend the pre-RAWP implementation conference. The purpose of the conference is for the Contractor and the OICC to become acquainted and explain the functions and operating procedures of their respective organizations, and to reach mutual understanding relative to the administration of the overall project before the initiation of work. The Contractor shall discuss the details of the work identified in the approved Contractor's Work Plan, and discuss which construction phases will require significant or additional activity hazard analysis. In addition, a schedule for the preparation, submittal, review, and acceptance of additional hazard analysis shall be established to preclude project delays. Lastly, deficiencies in the submitted accident prevention report will be brought to the attention of the Contractor at the conference. The Contractor shall revise the plan to correct deficiencies and resubmit the plan for acceptance.

New employees (prime or subcontractor) will be informed of specific site hazards before they begin work. Documentation of this orientation shall be kept on file at the project site.

If unforeseen materials hazardous to human health are encountered during operations, that portion of the work shall be stopped and the OICC shall be notified immediately. Within 14 days, the Navy will determine if the material is hazardous. If the material is not hazardous or poses no danger, the OICC will direct the Contractor to proceed without change. If the material is determined to be hazardous or to pose danger, and handling of the material is necessary to accomplish the work, the Contracting Officer will issue modifications to the proposed work.

Equipment shall be operated by designated qualified operators. Proof of qualifications shall be kept on the project site for review. Manufacturer's specifications or owner's manual for the equipment shall be on site and reviewed for additional safety precautions or requirements. Such additional safety precautions or requirements shall be incorporated into the activity hazard analysis. Mechanized equipment shall be inspected in accordance with manufacturer's recommendations for safe operations by a competent person prior to being placed into use. Daily checks or tests shall be conducted and documented on mechanized equipment by designated competent persons.

The competent person for excavations performed as a result of contract work shall be on-site when excavation work is being performed, and shall inspect and document the excavations daily prior to entry by workers. The competent person must evaluate all hazards, including atmospheric, that may be associated with the work, and shall have the resources necessary to correct hazards promptly.

Environmental Controls

An Erosion and Sediment Control Plan will be developed by the contractor. The Erosion and Sediment Control Plan describes the location and description of all erosion and sediment control measures, a sequence of construction to be followed, graphic details of all erosion and sediment control measures to be used, and an approval sign-off block containing the names of the Facility and Contractor contacts, whose signatures indicate plan acceptance/approval.

The Contractor shall strictly follow the Erosion and Sediment Control Plan and maintain all measures used during construction. Modifications to the Erosion and Sediment Control Plan shall be submitted to the OICC for approval. No modifications to the Erosion and Sediment Control Plan will be allowed until these changes have been approved by the OICC and three copies of the approved modifications have been submitted to the OICC.

Transportation and Disposal of Contaminated Material

The Contractor shall be solely responsible for complying with all federal, state, and local requirements for decontamination of vehicles, equipment, and containers, and shall bear all responsibility and cost for any noncompliance. In addition to these requirements, the Contractor shall perform the following:

- Visually inspect all vehicles, equipment, and containers leaving the work site for proper decontamination.
- Prepare and maintain a written decontamination log.

The Contractor shall be solely responsible for complying with all federal, state, and local requirements for transporting contaminated materials through the applicable jurisdictions, and shall bear all responsibility and cost for any noncompliance. In addition to these requirements, the Contractor shall perform the following:

- Inspect and document all vehicles and containers for proper operation and covering.
- Inspect all vehicles and containers for proper markings, manifest documents, and other requirements for waste shipment.

All contaminated materials removed from the site shall be disposed in a treatment/disposal facility permitted to accept such material.

The Contractor shall properly dispose of investigation derived waste, personnel protective equipment, and miscellaneous wastes associated with implementation of the RAWP, including sampling and analysis that are generated by the Navy representatives.