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FINAL PRELIMINARY ASSESSMENT WORK PLAN FOR MUNITIONS LOADING PIER NWS
EARLE NJ
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CH2M HILL



Final

Preliminary Assessment Work Plan Munitions Loading Pier

Naval Weapons Station Earle
Sandy Hook Bay, Monmouth County, New Jersey
November 2011

Contract No. N62470-11-D-8012 | CTO-WE06

prepared by **CH2MHILL.**

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**Preliminary Assessment Work Plan
Munitions Loading Pier**

**Naval Weapons Station Earle
Sandy Hook Bay, Monmouth County, New Jersey**

Contract Task Order WE06

November 2011

Prepared for

**Department of the Navy
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Mid-Atlantic**

Under the

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Contract N62470-11-D-8012**

Prepared by



Virginia Beach, Virginia

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Acronyms and Abbreviations

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CHE	Chemical Warfare Material Hazard Evaluation
CLEAN	Comprehensive Long-term Environmental Action – Navy
CSM	conceptual site model
CWM	chemical warfare materiel
DERP	Defense Environmental Restoration Program
DMM	discarded military munitions
DoD	Department of Defense
EHE	Explosive Hazard Evaluation
EOD	explosive ordnance disposal
ESQD	explosive safety quantity distance
FY	fiscal year
GIS	geographic information system
HHE	Health Hazard Evaluation
MC	munitions constituents
MEC	munitions and explosives of concern
MLW	mean low water
MMRP	Military Munitions Response Program
MRP	Munitions Response Program
MRS	munitions response site
MRSP	Munitions Response Site Prioritization Protocol
NAD	Naval Ammunition Depot
NAVFAC	Naval Facilities Engineering Command
NAVSEA	Naval Sea Systems Command
Navy	United States Navy
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NIRIS	Navy Installation Restoration Information System
NOAA	National Oceanic and Atmospheric Administration
NOSSA	Naval Ordnance Safety and Security Activity
NWS	Naval Weapons Station
PA	Preliminary Assessment
SI	Site Investigation
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
UXO	unexploded ordnance
WWII	World War II

Background

1.1 Introduction

This Work Plan presents the approach for conducting the Preliminary Assessment (PA) for the Munitions Loading Pier located on Naval Weapons Station (NWS) Earle, New Jersey. This PA Work Plan has been prepared under the United States Navy (Navy), Naval Facilities Engineering Command (NAVFAC) Atlantic Division, Comprehensive Long-term Environmental Action – Navy (CLEAN) 8012, Contract No. N62470-11-D-8012, Contract Task Order WE06. It provides guidance and procedures that will be followed to ensure sufficient and appropriate data are collected and presented during the PA. The NWS Earle Munitions Loading Pier PA will be used to determine if munitions and explosives of concern (MEC), including unexploded ordnance (UXO), discarded military munitions (DMM), and munitions constituents (MC), are potentially present because of previous site operations in the area of Sandy Hook Bay that surrounds the Piers. In addition, the PA will provide recommendations for additional investigations, including a Site Investigation (SI), if necessary. This Work Plan also presents the preliminary conceptual site model (CSM) for the NWS Earle Munitions Loading Pier, which will assist the team in planning, interpreting data, and communicating throughout the PA process.

1.2 Preliminary Assessment Guidance

Munitions response activities, including this PA, will be performed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). Guidance documents that will be used to perform the PA include: *Guidance for Performing Preliminary Assessments under CERCLA* (USEPA, 1991), *Handbook on the Management of Munitions Response Actions* (USEPA, 2005), *Environmental Restoration Program Manual* (Navy, 2006), *Recommendation for USEPA Regional Offices on PAs and SIs for the DoD Military Munitions Response Program (MMRP)* (OSWER Directive 9200.3-60) (USEPA, 2010), and *New Jersey Administrative Code 7:26E-3.1* (New Jersey Department of Environmental Protection, 2011).

1.3 Facility Background and Description

NWS Earle is located in Monmouth County, New Jersey, approximately 47 miles south of New York City. The station consists of two areas, the 10,160-acre Main Base (Mainside area), located inland, and the 706-acre Waterfront area, which includes the NWS Earle Munitions Loading Pier (**Figure 1-1**). The Navy commissioned the Mainside portion of the facility in 1943 as the Naval Ammunition Depot (NAD) Earle. The base was originally utilized as a transshipment depot that allowed the movement of munitions from east coast production facilities to the military forces engaged in Europe during World War II (WWII) (USACE, 2004). NAD Earle continued to develop after WWII, keeping pace with the changing needs of the Navy. In 1974, the facility's name was officially changed to NWS Earle (Navy, 2011).

Presently, NWS Earle's mission is to receive, store, segregate, and issue ordnance for all Carrier and Expeditionary Strike Groups of the United States Atlantic Fleet. An estimated 1,600 people either work or live at NWS Earle.

The Mainside area is located approximately 10 miles inland from the Atlantic Ocean, in Colts Neck, Howell, and Wall Townships, and Tinton Falls Borough. The combined population of these municipalities is approximately 100,000 people. The surrounding area includes agricultural land, vacant land, and low-density housing. The Mainside area consists of a large, undeveloped portion associated with ordnance operations, production, and storage; this portion of the Base is encumbered by explosive safety quantity distance (ESQD) arcs that restrict use and development. Other land use in the Mainside area consists of residences, offices, workshops, warehouses, recreational space, open space, and undeveloped land.

The Waterfront area, which is approximately 10 miles north of the Mainside area, is located in Middletown Township. Land use at the Waterfront area includes residences, office buildings, recreational areas, open space, and undeveloped land. Approximately 20 percent of the Waterfront area is marshland. The area around the Waterfront includes commercial and single-family residential use land. Normandy Road, which is a government-owned military highway, is used for transporting munitions and other military materials between the Mainside and Waterfront areas. The Road has seven crossings to facilitate east-west passage by the civilian population. Munitions and other supplies pass from the Mainside area along the railroad and Normandy Road to the Waterfront area to reach the ships located at the NWS Earle Munitions Loading Pier. The NWS Earle Munitions Loading Pier extends into Sandy Hook Bay from the Waterfront area of NWS Earle.

1.4 NWS Earle Munitions Loading Pier Background and Description

Ammunition and military supply ships are homeported or resupplied at the NWS Earle Munitions Loading Pier, located in Sandy Hook Bay, Monmouth County, New Jersey (**Figure 1-2**). Sandy Hook Bay is located on the north shore of the New Jersey coast, west of the Sandy Hook peninsula, and borders the communities of Leonardo and Atlantic Highlands to the east and Belford to the west. The Sandy Hook Channel entrance leads to Terminal Channel and the NWS Earle Munitions Loading Pier. Terminal Channel, entered from Sandy Hook Channel, approximately 1 mile west-southwest of the northern tip of Sandy Hook, leads to a turning basin and two deepwater ammunition handling piers of the NWS Earle Munitions Loading Pier (**Figure 1-2**) (USACE, 2004).

The NWS Earle Munitions Loading Pier stretches 2.9 miles into the Sandy Hook bay. It presently comprises a 2-mile-long trestle that connects to three finger piers (Piers 2, 3, and 4). One mile from the shore, the trestle branches off to the old Trestle 2 and Pier 1. At the junction of Piers 2, 3, and 4, there is a concrete platform that supports a forklift and battery recharging shop and the port operations building. This area is known as the "wye." All of the existing structures, with the exception of Pier 3, Pier 4, and the wye, were constructed in the early 1940s. Repairs known to have been conducted at the pier area include, but are not limited to:

- construction of the wye in 1981
- completion of Pier 4 in 1990
- construction of the “new” main approach in 1993
- demolition and replacement of Pier 3 from 2005 to 2007

Trestle 1A is the 2-mile-long rail and road causeway that leads to Trestles 2, 3, and 4. There are no docking or berthing facilities along Trestle 1A. Pier 1 runs parallel to Trestle 1A and is not currently used for cargo loading.

Trestle 2 leads to Pier 2 and berths 2N1 on the west side and 2N2 on the east side. Berth lengths on Pier 2 are 600 feet. A 500-foot-long elevated loading platform is located along each side of the pier. Pier deck height is 13 feet above mean low water (MLW), and the loading platform height is 18 feet above MLW. Pier 2 is not currently used for cargo loading. According to a 2004 Environmental Assessment (USACE, 2004), Pier 2 was scheduled for demolition in fiscal year (FY) 2007; however, the pier remains intact.

Trestle 3 leads to Pier 3. The original Pier 3 was demolished and subsequently replaced with a new Pier, starting in 2005. The new Pier was built within the footprint of the demolished Pier 3 but is approximately 342 feet shorter in length. The current Pier 3 is 945 feet long and 161 feet wide. The pier is configured with a partial double deck system providing below-deck utility galleys, loading platforms, and access ramps. The structure has six railroad tracks and two vehicle traffic lanes (USACE, 2004). Pier 3 is currently the ordnance handling pier within the NWS Earle Munitions Loading Pier.

Trestle 4 leads to Pier 4 and berths 4W (west side) and 4E (east side). The berth length along Pier 4 is 800 feet. A 600-foot-long elevated loading platform is located along each side of the pier. Pier deck height is 13 feet above MLW, and the loading platform height is 18 feet above MLW (USACE, 2004).

Piers 1 and 2 are no longer active for any loading or unloading operations. Munitions were handled at these piers in the past, however. The areas around the Pier and the Terminal Channel are restricted, as defined in the Code of Federal Regulations (CFR), Title 33, Paragraph 334.102 (**Figure 1-2**). Additionally, NWS Earle has established ESQD arcs for current ordnance loading and unloading operations around the active Pier areas. These arcs are shown on **Figure 1-3**. The water depth for the terminal channel and turning basin that serve the NWS Earle Munitions Loading Pier is approximately 45 feet MLW (NOAA, 2009).



- Legend**
- NWS Earle
 - Normandy Road
 - Monmouth County, NJ

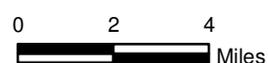


Figure 1-1
 Installation Location Map
 Preliminary Assessment Work Plan
 NWS Earle
 Sandy Hook Bay, Monmouth County, New Jersey



Legend

- NWS Earle
- NWS Earle Restricted Zone (33CFR334.102)
- Turning Basin and Terminal Channel

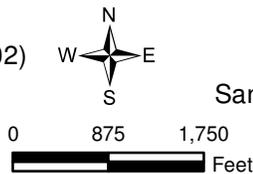
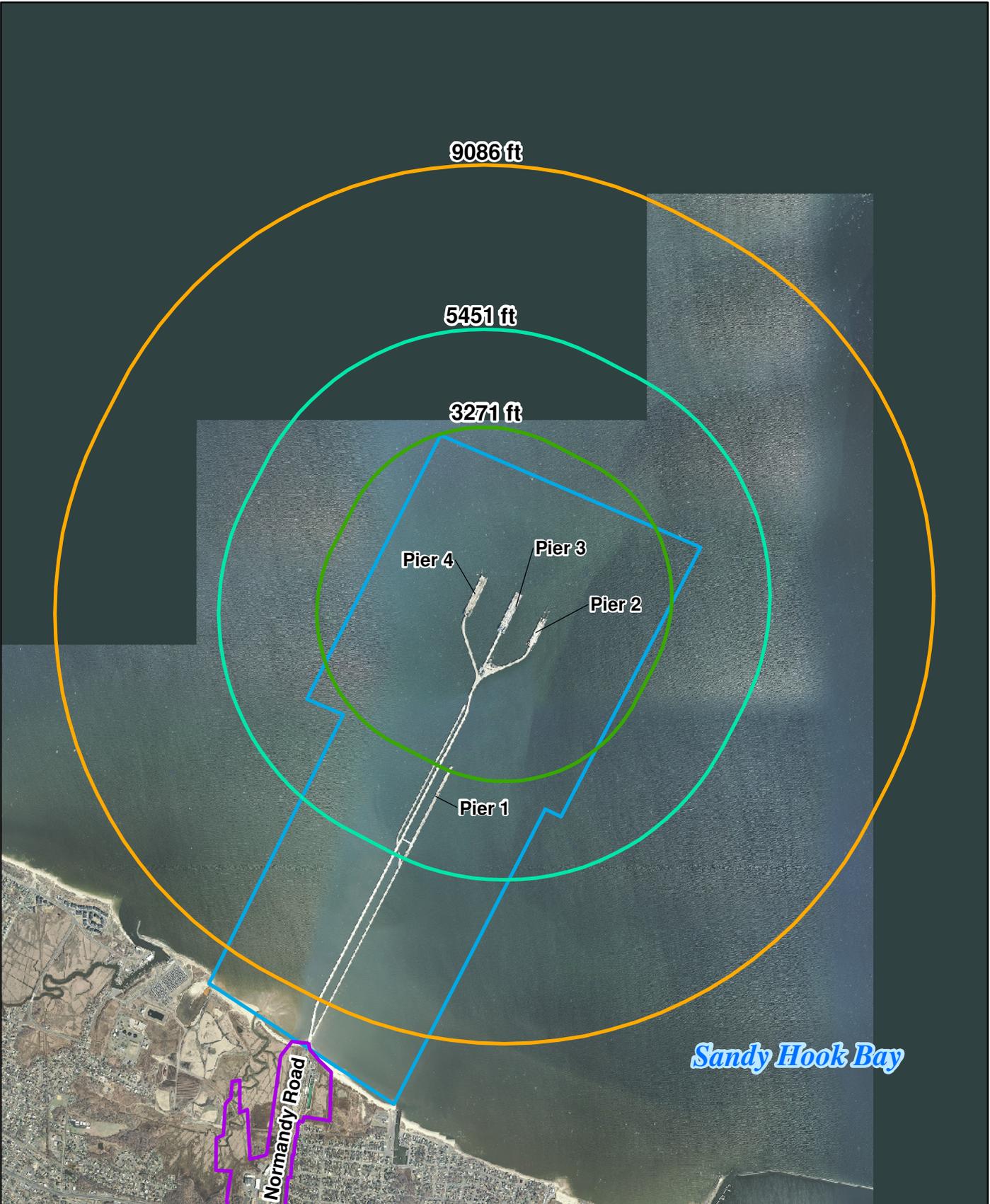


Figure 1-2
 Munitions Loading Pier
 Preliminary Assessment Work Plan
 NWS Earle
 Sandy Hook Bay, Monmouth County, New Jersey



- Legend**
- NWS Earle
 - NWS Earle Restricted Zone (33CFR334.102)
 - Pier Area Explosives Safety Quantity Distance Arcs
 - Intraline distance
 - Public Transportation Route distance
 - Inhabited Building distance

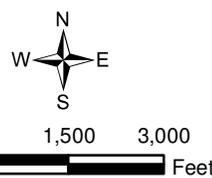


Figure 1-3
Explosives Safety Quantity Distance Arcs
Preliminary Assessment Work Plan
NWS Earle
Sandy Hook Bay, Monmouth County, New Jersey

Objectives and Scope

This PA Work Plan presents the procedures for conducting the PA for the NWS Earle Munitions Loading Pier. It provides guidance that must be followed to ensure sufficient and appropriate data are collected and presented in the PA Report. It also presents the preliminary CSM, which will assist the team in planning, with data interpretation, and in communicating throughout the PA. It will also help the team draw logical conclusions about the potential presence of MEC in the vicinity of the NWS Earle Munitions Loading Pier. The CSM will be treated as a living document and will be revised as new information is identified at the site. This Work Plan will establish the methods to be used to accomplish these objectives.

The general objectives of the PA are to:

- Eliminate from further consideration those areas that pose no threat to public health or the environment
- Identify areas requiring further investigation prior to arriving at decisions on the need (or lack of need) for munitions response actions
- Identify the need for an accelerated remedial action or removal action due to an imminent threat to human health or the environment, if identified
- Evaluate available site data to prioritize or sequence with other sites for further action, and estimate costs to complete cleanup (if any is required)

To accomplish these objectives, the scope of work includes a desktop review of all available data and interviews. The findings will be compiled into a PA Report for evaluating and determining the appropriate response actions required (if any) to address explosive safety or risk to human health and the environment. Certain elements that may be evaluated as part of the PA include estimates for the depth of potential MEC, locations of potential MEC, and density of MEC. The need for sampling of sediment or visual inspections of munitions in the vicinity of the NWS Earle Munitions Loading Pier will be determined based on the findings of the PAs and the potential presence of MEC that may release MC at the site.

Data Collection

The PA process will involve collecting and reviewing existing and available information associated with munitions activities that may have resulted in MEC being present at the NWS Earle Munitions Loading Pier. Data collection activities will include offsite and onsite archival research and interviews. When possible, data collection will be conducted from CH2M HILL office locations, using internet-based data sources.

3.1 Desktop Data

Desktop data consists of data collected from file sources, historical records reviews, and site-specific in-house files. NAVFAC and NWS Earle security guidelines pertaining to document duplication and removal will be followed. The majority of information gathered will be accessed through national and local archive and file searches and desktop information collection and analysis.

Local archive and desktop data sources may include the internet, Navy Installation Restoration Information System (NIRIS) database, United States Environmental Protection Agency (USEPA) website, New Jersey Department of Environmental Protection website, Middletown Township website, Monmouth County website, previous investigation reports, local libraries (Monmouth County Public Library System and Middletown Township Public Library), newspapers, Monmouth County and Middletown Township public records, and NWS Earle Facilities Operations records.

National archive data sources and data repositories may include the Navy Range Inventory Database, the National Archives and Historical Information facilities (Washington, D.C., and College Park, Maryland), NAVFAC real estate archives, the United States Army Corps of Engineers (USACE) New York Division, and the current Naval Explosive Ordnance Disposal (EOD) Operations Database. The appropriate data-handling processes will be followed for each type of datum.

The following information will be gathered and reviewed during the archive search where available:

- Maps and aerial photographs, including photogrammetry and orthophotos of the NWS Earle Munitions Loading Pier
- Environmental, cultural, and historical conditions
- Environmental surveys, studies, or assessments, including:
 - Physical investigations
 - Chemical sample results
 - Results from previous surface clearances and maintenance, geophysical surveys, and sampling programs

- Identification of potential risk assessment pathways and receptors
- Munitions-related operations records:
 - Munitions handling and storage procedures
 - Types and quantities of munitions handled
 - Dates and durations of munitions related operations
- Reports of MEC being discovered
- EOD reports
- Real estate records
- Environmental cleanup records
- Newspaper articles
- Ordnance inventory records
- Explosive Safety Submissions
- Property reuse, transfer plans (zoning plans, deeds), and installation Master Plans
- Available geographic information system (GIS) data

Additional resources and information may also be used, if identified, during the desktop study.

3.1.1 Desktop Data Documenting

Copies of all pertinent data will be kept and filed, as allowed. A Document Log Sheet (**Attachment 1**) entry will be made at the time of collection. This log will include the following information:

- Employee name
- Facility and activity
- Date and time collected
- Data source
- Document title
- Nature of Document and Title
- Notes

All documentation collected will be scanned (if hard copy), uploaded, and stored in specified file folders on CH2M HILL's internal server.

3.1.2 GIS and Spatial Data Documenting

GIS and spatial data that have been collected will be uploaded and verified for spatial correctness. Metadata will be kept to identify any adjustments made to collected spatial data. Adjustments can include:

- Geographic coordinate adjustments
- Data set reduction and extraction
- File structure changes

A Document Log Sheet (**Attachment 1**) entry will be made at the time of data collection.

3.2 Interview Data

Interviews will be conducted with current NWS Earle personnel and active and retired Department of Defense (DoD) civilian and government personnel capable of providing pertinent information regarding the NWS Earle Munitions Loading Pier. The goal of these interviews is to validate and verify data collected during the desktop data collection and review and to identify other potential information not previously identified. Personnel to be interviewed will be identified through several sources:

- Referred to by base personnel
- Identified by name during archival records review
- Solicited through approved base resources

Names of potential interviewees will be provided to the Navy Technical Representative for approval before any interviews are conducted. No contact will be made with potential interviewees until proper approval has been received.

3.2.1 Interview Data Documentation

Each interview session will be logged using an Interview Log Sheet (**Attachment 2**). To expedite the interview process, log entrees may be transcribed from recordings collected during the interview or notes taken during the interview. Interview records will be uploaded and stored in specified file folders on CH2M HILL's internal server.

Conceptual Site Model

The preliminary CSM (**Figure 4-1**) generated for this Work Plan is a description of the area and the environment based on existing knowledge of the NWS Earle Munitions Loading Pier. The PA investigation and desktop review will likely generate a large amount of information and references that will be used to update the preliminary CSM. This section summarizes the information that is currently represented in the CSM, which will serve as a planning instrument, a modeling and data interpretation aid, and a communication device among team members and between team members and the general public. The CSM will be continually updated and refined throughout the PA development as data are collected and additional information becomes available.

4.1 Profile Development

The following profiles have been defined to develop the CSM:

- **Facility Profile** – Describes the man-made features and potential sources for munitions at or near the NWS Earle Munitions Loading Pier
- **Physical Profile** – Describes factors that may affect release, fate, transport, and access to potential items of concern
- **Release Profile** – Describes the movement, possible migration, and extent of contaminants in the environment
- **Land Use and Exposure Profile** – Provides information used to identify and evaluate the applicable exposure scenarios, receptors, and receptor locations
- **Ecological Profile** – Describes the natural habitats and ecological receptors in the vicinity of the NWS Earle Munitions Loading Pier

These profiles will continue to be reviewed and revised throughout the iterative development of the CSM. An updated CSM will be included as part of the PA.

The preliminary profiles for the NWS Earle Munitions Loading Pier are presented in the following subsections.

4.1.1 Facility Profile

Detailed descriptions of NWS Earle and the NWS Earle Munitions Loading Pier are provided in **Sections 1.3** and **1.4**, respectively.

4.1.2 Physical Profile

The NWS Earle Munitions Loading Pier is located in Sandy Hook Bay, Monmouth County, New Jersey. Historically, the depth was 35 below feet MLW within the channel and turning basin. However, a recent survey (September 2009) indicated the areas to be as deep as

45 feet below MLW. The NWS Earle Munitions Loading Pier is connected to the shore by a trestle that extends nearly 2 miles across the mud flats from the Waterfront area of NWS Earle. The pier stretches 2.2 miles into the Sandy Hook bay and comprises 2.9 miles of pier and trestle.

NWS Earle maintains a restricted area surrounding the NWS Earle Munitions Loading Pier in Sandy Hook Bay. This zone is a large rectangular area that encompasses the piers and trestles from the shoreline to a point approximately 686 meters from the seaward end of the piers (**Figure 1-2**). Buoys identify this restricted area, and this zone is marked on nautical charts (USACE, 2004). The following restrictions are enforced at the Pier, as detailed in 33 CFR 334.102:

- No persons, unauthorized vessels, or other unauthorized craft may enter the restricted area at any time
- Vessels are authorized to cross the Terminal Channel provided that there are no Naval vessels transiting the Channel

4.1.3 Release Profile

Because the PA has not yet been conducted, the release profile is not yet fully developed. It is currently assumed that the areas of potential concern at the NWS Earle Munitions Loading Pier are located along the piers, where historical ordnance loading and unloading activities may have resulted in the presence of MEC at Sandy Hook Bay.

The exact number and type of MEC that may have been released along the NWS Earle Munitions Loading Pier are not currently known. Although the probable location for the items that may have been released is local to the Pier areas, the potential for migration of the ordnance exists due to underwater currents, tide, and flooding. These migration methods may result in a change in location or additional sediment covering the MEC. The possibility also exists for physical processes to have caused the movement or relocation of MEC. While fishing and recreational boating are not permitted in the NWS Restriction Zone, entanglement in fishing nets and gear, construction activities, dredging, and investigation activities may result in human contact with MEC that may be present outside of the restricted area. Therefore, these potential exposure pathways cannot be eliminated at this point.

4.1.4 Land Use and Exposure Profile

Currently, Piers 3 and 4 are still active and used for munitions loading. Piers 1 and 2 are no longer active for any munitions loading or unloading operations, although munitions were historically handled at these piers. The NWS Earle Munitions Loading Pier is accessible from the Waterfront area of NWS Earle and by boat; however, there is a restriction zone enforced by the Navy that surrounds the NWS Earle Munitions Loading Pier that limits accessibility (**Figure 1-2**). Potential future human receptors may include Navy personnel and future construction workers (workers possibly involved in future maintenance activities at the pier or vessels or engaged in demolition of portions of the pier). Additionally, due to the potential for MEC migration beyond the NWS Earle Restriction Zone, fishermen and recreational users of Sandy Hook Bay (such as boaters and divers) will also be considered

potential human receptors. Release of MC through corrosion of underwater munitions or accidental detonations may affect ecological receptors.

4.1.5 Ecological Profile

The NWS Earle Munitions Loading Pier lies in Sandy Hook Bay, approximately 2 miles from shore. The Sandy Hook Bay shoreline is characterized by intermittent smaller embayments of Sandy Hook to the east, separated by beach, back beach, and primary dune uplands or headlands. To the south, the Bay shoreline is characterized by marinas and other developed areas within intermittent salt marsh systems at the mouth of various drainages.

Due to its location in the Bay, the NWS Earle Munitions Loading Pier is removed from the terrestrial environment and therefore not dominated by terrestrial ecosystem processes. However, the NWS Earle Munitions Loading Pier does lie within the region of Sandy Hook Bay that is recognized as a regionally significant estuarine habitat for its populations of shellfish and marine, estuarine, and anadromous fish, as well as for its concentrations of significant migratory and wintering waterfowl. The Environmental Assessment specifically lists vegetation, invertebrate resources, fisheries resources, herpetofauna, avifauna, and mammals that exist in Sandy Hook Bay (USACE, 2004).

Potential MC release and future activities at or near the areas of concern, such as investigations, maintenance dredging, and MEC removal actions, may impact ecological receptors.

4.2 Pathway Analysis

Potential source-receptor interactions are defined in this section to identify the potential for exposure to the possibility of MEC at the NWS Earle Munitions Loading Pier. The following three key components are to be considered during pathway analysis:

4.2.1 Source

The source of the potential MEC was previously defined as the loading and unloading operations, during which ordnance items may have been dropped or mishandled and released into Sandy Hook Bay from all of the piers associated with the NWS Earle Munitions Loading Pier. As previously discussed, the exact location, quantity, and depth of items potentially released are currently unknown. It is anticipated that munitions that may have been dropped from the various piers are either on the surface of the seafloor or are partially or completely buried in the sediment.

4.2.2 Receptors

Current and future receptors are identified in the previous sections. Reasonably anticipated human receptors include construction workers, military personnel, fishermen, and recreational swimmers and divers. Ecological receptors near the NWS Earle Munitions Loading Pier include aquatic vegetation (wetlands), benthic organisms, estuarine and marine fish, and wildlife.

4.2.3 Interaction

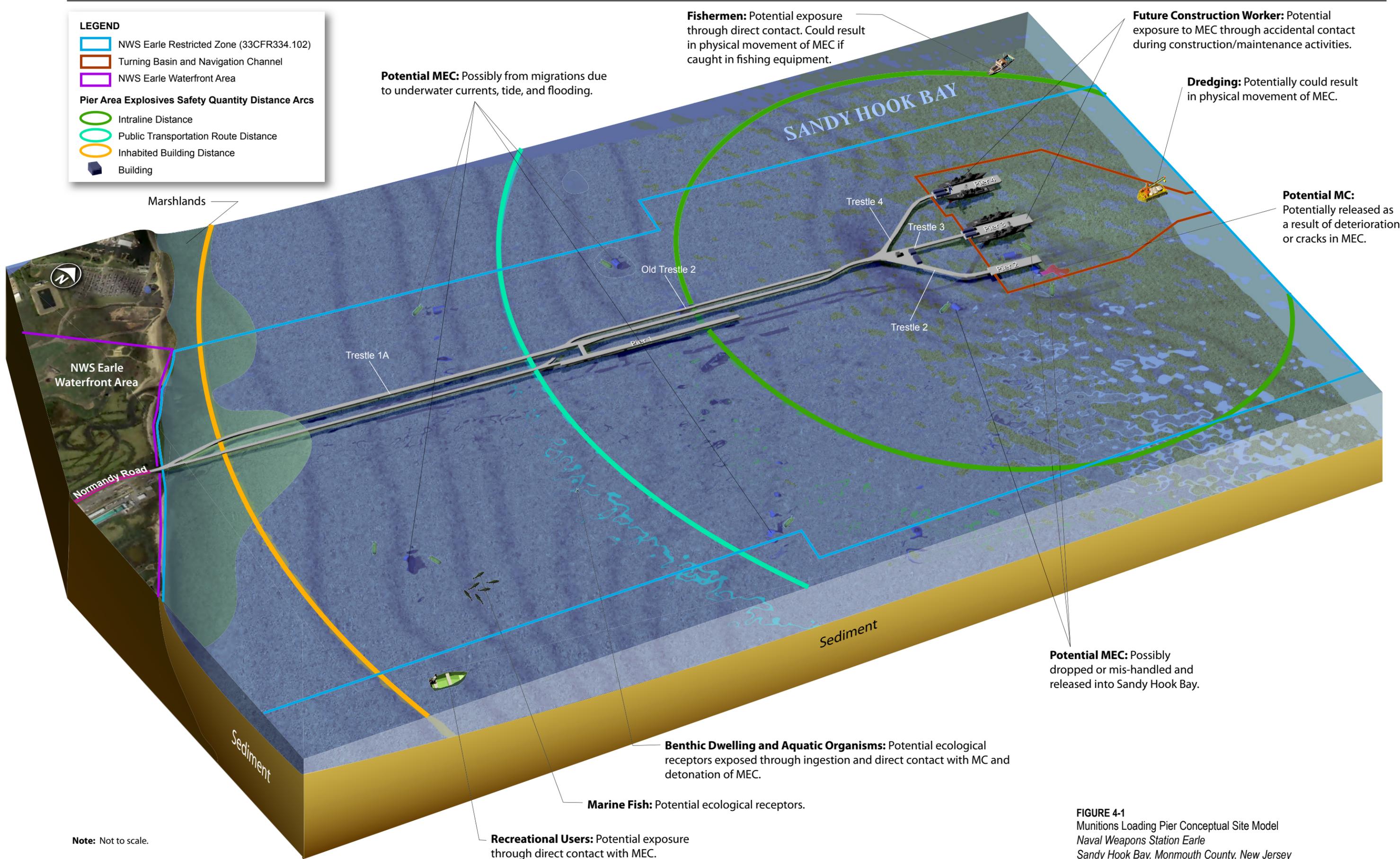
Source-receptor interaction at NWS Earle Munitions Loading Pier could occur through the following activities:

- Construction workers encountering MEC during pier or vessel maintenance, repairs, demolition, or during future construction activities in or around the piers (such as digging or dredging)
- Fishermen contacting MEC (while fishing, trolling, crabbing, and so forth) or by munitions items becoming entangled in fishing nets or gear
- Recreational swimmers and divers encountering MEC during swimming and diving
- Site workers encountering MEC during investigations, sampling activities, ecological studies, or emergency responses
- Ecological receptors exposed to MC released from deteriorated MEC items
- Ecological receptors exposed to MC and other dangers during the detonation of MEC

Access of human receptors to the locations of the potential MEC is limited both by the depth of the water near the pier areas and turning basin, where the water depth can reach up to 45 feet below MLW, and the enforcement of the restricted zone surrounding the NWS Earle Munitions Loading Pier (USACE, 2004). Ecological receptors such as fish and other aquatic species have unrestricted access to potential MC through direct contact (sediment and water) of lower trophic-level species (such as benthic and aquatic organisms). Wildlife may be exposed to these constituents through ingestion of chemicals that have accumulated in prey, ingestion of surface water, and incidental ingestion of sediment while foraging or grooming. The activity associated with each source-receptor interaction is presented in the previously bulleted items.

LEGEND

- NWS Earle Restricted Zone (33CFR334.102)
- Turning Basin and Navigation Channel
- NWS Earle Waterfront Area
- Pier Area Explosives Safety Quantity Distance Arcs**
- Intraline Distance
- Public Transportation Route Distance
- Inhabited Building Distance
- Building



Fishermen: Potential exposure through direct contact. Could result in physical movement of MEC if caught in fishing equipment.

Future Construction Worker: Potential exposure to MEC through accidental contact during construction/maintenance activities.

Dredging: Potentially could result in physical movement of MEC.

Potential MC: Potentially released as a result of deterioration or cracks in MEC.

Potential MEC: Possibly from migrations due to underwater currents, tide, and flooding.

Potential MEC: Possibly dropped or mis-handled and released into Sandy Hook Bay.

Benthic Dwelling and Aquatic Organisms: Potential ecological receptors exposed through ingestion and direct contact with MC and detonation of MEC.

Marine Fish: Potential ecological receptors.

Recreational Users: Potential exposure through direct contact with MEC.

Note: Not to scale.

FIGURE 4-1
Munitions Loading Pier Conceptual Site Model
Naval Weapons Station Earle
Sandy Hook Bay, Monmouth County, New Jersey

MRSP Protocol Development

In 2001, Congress directed that DoD identify and then prioritize their munitions response sites (MRSs). The MRS Prioritization Protocol (MRSP) is an approach used by the DoD as a tool for assigning a relative priority for munitions response activities at MRSs. The protocol provides a uniform procedure for assessing explosives safety risk at MRSs and is comprised of three hazard evaluation modules: the Explosive Hazard Evaluation (EHE) module, the Chemical Warfare Material Hazard Evaluation (CHE) module, and the Health Hazard Evaluation (HHE) module. An MRS priority is determined based on the ratings from the EHE, CHE, and HHE modules. The EHE module's data elements include explosive hazard (munitions type and source of hazard), accessibility (location of munitions, ease of access, and status of property), and receptors (population density, population near hazard, types of activities and structures, and ecological and/or cultural resources). The CHE module's data elements include the chemical warfare materiel (CWM) hazard, accessibility, and receptors. The HHE module's data elements include a contaminant hazard ranking, migration pathway ranking, and receptor ranking.

If the PA research identifies the potential presence of MEC or MC at the site, the MRSP scoring will be completed and included as part of the PA report. For each of the three modules, data elements for the NWS Earle Munitions Loading Pier will be assigned a numeric value, and the sum of these values will be used to determine the MRS rating. An MRS priority will be determined based on the ratings from the EHE, CHE, and HHE modules. The NWS Earle Munitions Loading Pier will be assigned to one of eight MRS priorities based on the ratings of the three modules, where Priority 1 indicates the highest potential hazard and Priority 8 the lowest potential hazard. This priority will be compared against all other Navy Munitions Response Program (MRP) sites for response prioritization of future actions.

Preliminary Assessment Report

A PA Report will be prepared to summarize the results of the PA. At a minimum, the PA report will contain six sections, which will be organized as follows:

- **Section 1, Introduction:** Details the purpose of the PA Report and the Report structure.
- **Section 2, Summary of Data Collected and Review of Information:** Reviews and summarizes data collection activities, MEC inventory and classification, and Defense Environmental Restoration Program (DERP) Management Guidance (MRP eligibility).
- **Section 3, NWS Earle Munitions Loading Pier Description, Operational History, and Waste Characteristics:** Describes the history, location, and operations conducted at NWS Earle, including the NWS Earle Munitions Loading Pier. It will also provide detail for the physical setting of the areas of concern, including boundaries, climate, terrain, access restrictions, vegetation, geology, hydrology, hydrogeology, soil characteristics, and adjacent land use. Additionally, a narrative on natural and cultural resources within NWS Earle and a summary of relevant previous investigations completed will be included.
- **Section 4, Pathway and Hazard Assessment:** Presents the CSM, discusses the MEC and explosive hazards, identifies potential MC of concern, presents the population summary (demographics), and summarizes the development of the MRSPP. Tables 1 through 28 of the MRSPP will be completed, to the maximum extent possible, and included as an appendix to the PA Report.
- **Section 5, Conclusions and Recommendations:** Identifies the potential MEC present, potential explosive safety risks, and potential human health and ecological risks associated with MC. It also provides recommendations for next steps.
- **Section 6, References:** Lists documents and sources cited or used in the development of the PA Report.

SECTION 7

Schedule

The following schedule is anticipated for PA activities. Based on the proposed document submission and review schedule, the start date for the records search is anticipated to be in October 2011.

Event	Complete Date
Draft PA Work Plan and CSM	08/31/11
Draft PA Work Plan Review	10/25/11
Final PA Work Plan	11/30/11
Records Search	01/25/12
Draft PA Report	04/16/12
Draft PA Report Review	06/11/12
Final PA Report	06/25/12

SECTION 8

References

The following references were consulted during the preparation of this PA Work Plan. Not all are cited in the text.

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Attachment 1
Document Log Sheet

Attachment 2
Example Interview Log Sheet

EXAMPLE INTERVIEW LOG SHEET

Interviewee:

Date and Location:

Interviewer:

Note: This record was not transcribed from a recorded conversation. It was reconstructed from interview notes, so the conversation is paraphrased.

What is/was your affiliation with the site?

What is/was your position?

What activities were you involved with?

What types of ordnance or military munitions were used?

Do you know of any areas of concern, possible drop points, or areas where MEC may have been released?

Do you know of any previous incidents involving MEC at or near the site?

Do you know of any disposal operations or dumping that may have occurred at or near the site?

Other information?