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TREASURE ISLAND
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COMPREHENSIVE LONG-TERM ENVIRONMENTAL ACTION NAVY (CLEAN II)
Northern and Central California, Nevada, and Utah
Contract No. N62474-94-D-7609
Contract Task Order No. 275

Prepared for

U.S. DEPARTMENT OF THE NAVY
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San Bruno, California

FINAL

SITE 12
CONSTRUCTION OVERSIGHT WORK PLAN FOR TIME-CRITICAL REMOVAL OF LEAD-CONTAMINATED SOIL

NAVAL STATION TREASURE ISLAND
SAN FRANCISCO, CALIFORNIA

May 14, 1999

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REVISED FINAL CONSTRUCTION OVERSIGHT WORK PLAN FOR TIME-CRITICAL REMOVAL OF LEAD-CONTAMINATED SOIL SITE 12

DATED 28 MAY 1999

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ABBREVIATIONS AND ACRONYMS

bgs	Below ground surface
CLEAN	Comprehensive Long-Term Environmental Action Navy
CLP	Contract Laboratory Program
COC	Chain of custody
COWP	Construction oversight work plan
CTO	Contract task order
DQO	Data quality objective
DEFT	Decision error feasibility trials
EFA West	Engineering Field Activity West
EPA	U.S. Environmental Protection Agency
HASP	Health and Safety Plan
ID	Identification
IDW	Investigation-derived waste
mg/kg	Milligram per kilogram
Navy	U.S. Department of the Navy
NSTI	Naval Station Treasure Island
PPE	Personal protective equipment
PRC	PRC Environmental Management, Inc.
PRG	Preliminary remediation goal
RAC	Remedial action contractor
RI	Remedial investigation
QA/QC	Quality assurance and quality control
SOP	Standard operating procedure
SOW	Statement of work
TtEMI	Tetra Tech EM Inc.

1.0 INTRODUCTION AND PURPOSE

Tetra Tech EM Inc. (TtEMI), formerly known as PRC Environmental Management, Inc. (PRC), received Contract Task Order (CTO) No. 275 under Comprehensive Long-Term Environmental Action Navy (CLEAN II) Contract No. N62474-94-D-7609 from the U.S. Department of the Navy (Navy), Naval Facilities Engineering Command, Engineering Field Activity West (EFA West). Under this CTO, TtEMI will provide oversight of the time-critical removal of lead-contaminated soil near Buildings 1207 and 1209 in the northern portion of Site 12 at Naval Station Treasure Island (NSTI) in San Francisco, California. In addition, TtEMI will conduct confirmation sampling to determine whether or not soil containing more than 400 milligrams per kilogram (mg/kg) of lead remains. The anticipated schedule, staffing, and costs for this task are presented in the post-negotiation work plan and cost estimate submitted in December 1998 (TtEMI 1998). Other constituents detected in the burn pit area will be removed in conjunction with lead. These constituents include inorganics (antimony, arsenic, and copper) and organics (pentachlorophenol, phenol, dioxins, and total petroleum hydrocarbons [TPH]).

This construction oversight work plan (COWP) describes construction oversight activities, including confirmation sampling activities that will be conducted after the removal action to evaluate whether residual lead concentrations in soil meet cleanup goals. Specifically, the COWP discusses the site background, field oversight activities, data quality objectives (DQO), confirmation sampling activities, decontamination procedures, sample handling procedures, quality assurance and quality control (QA/QC) protocols, and health and safety procedures to be used during laboratory analysis and field sampling activities, respectively. A construction oversight and site visit report form is provided as Appendix A. References used to prepare the COWP are cited at the end of the text.

2.0 SITE BACKGROUND

NSTI is located in San Francisco Bay midway between San Francisco and Oakland, California. The installation consists of two contiguous islands: the north island is Treasure Island, which occupies about 403 acres, and the south island is Yerba Buena Island, which occupies about 147 acres. Treasure Island is a manmade island constructed of sediment dredged from San Francisco Bay, whereas Yerba Buena Island is a natural island. In 1993, NSTI was designated for closure under the Base Realignment and Closure Act of 1990. The installation was closed on September 30, 1997, and is currently in the process of being turned over to the City of San Francisco for reuse.

Site 12, the Old Bunker Area, occupies about 90 acres in the northwestern portion of NSTI on Treasure Island (see Figure 1). Site 12 is a flat, rectangular area containing lawns, paved roads, and housing units that the City of San Francisco plans to lease. The area has been used for military housing since about 1968. Before the housing was constructed in the 1960s, ammunition was stored in bunkers at the site. Historical aerial photographs show that debris was disposed of between the bunkers and in other portions of Site 12 (U.S. Environmental Protection Agency [EPA] 1995a). Trench-type and general disposal areas between and around the bunkers were used for debris disposal. Trench pits were likely excavated to the water table at random locations by bulldozers. Figure 1 shows the location of the lead removal within Site 12 and also shows the location of four debris disposal areas identified in previous investigations.

A preliminary risk assessment (PRC 1992a) prepared as part of a lead management plan (Navy Public Works Center 1996), a remedial investigation (RI) conducted to investigate potential contamination associated with historical site activities (TtEMI 1997), and additional characterization conducted by the remedial action contractor (RAC), IT Corporation, in March 1999 indicate that elevated concentrations of lead are present in soil near Buildings 1207 and 1209 at Site 12. The area of concern is generally within the footprint of a suspected burn pit identified on a 1947 aerial photograph. Soil lead concentrations in this area exceed the EPA Region IX's preliminary remediation goal (PRG) for residential use of 400 mg/kg. Figure 2 shows surface and subsurface concentrations of lead in soil in the vicinity of Buildings 1207 and 1209. As shown in this figure, lead concentrations in Samples No. 12-HP036, 12-HP082, 12-HP083, 12-HP084, and 1209DS004, which were collected from 1.5 to 4.5 feet below ground surface (bgs), were 774, 1410, 1420, 713, and 612 mg/kg, respectively, exceeding the PRG of 400 mg/kg.

3.0 FIELD OVERSIGHT ACTIVITIES

TtEMI will perform oversight of the removal of lead-contaminated soil at Site 12 of NSTI. Oversight activities will include preparing a description of work performed by the RAC and a summary of confirmation sampling activities. TtEMI will observe and photograph soil excavation activities daily. TtEMI will also prepare daily field oversight reports using a standard "Construction Oversight and Site Visit Report" form (see Appendix A). The reports will include the following information:

- General site layout, presented as a simple sketch and narrative
- Site conditions, including wind speed, temperature, humidity, cloud cover, and precipitation
- Names and affiliations of personnel on site
- Time of each field activity performed
- Excavation equipment used
- Characteristics of the excavation area, such as excavation dimensions, slope stability, and depth to groundwater
- Information on excavated soil, including weight (in tons), means of off-site transport, and destination
- Confirmation sampling locations and depths
- Location of utilities and structures that limited excavation
- Health and safety issues, such as personal protective equipment (PPE) used and accidents

TtEMI is not responsible for construction management of the RAC, including ensuring the adherence of the contractor to contractual obligations; Occupational Safety and Health Administration regulations; QC requirements; or site-specific work plans, health and safety plans, and other relevant documents.

4.0 DATA QUALITY OBJECTIVES

TtEMI will conduct confirmation sampling activities after the removal action to evaluate whether residual lead concentrations in soil meet cleanup goals. The DQO process developed by EPA (1994a) provides a systematic procedure for defining criteria that a data collection program should satisfy, including when, where, and how to collect samples; the acceptable level of error for sampling data used for decision-making, and how many samples to collect. EPA's DQO process (1) aims at minimizing costs related to data collection by eliminating unnecessary or duplicate data and (2) establishes criteria for defensible decision-making before sampling and analyses begin. The DQO process consists of the following seven steps:

- **State the Problem.** Concisely describe the problem to be studied.
- **Identify the Decision.** Identify what questions the study will attempt to resolve and actions that may result.

- **Identify the Inputs to the Decision.** Identify the information and measurements needed to support the decision.

- **Define the Boundaries of the Removal.** Specify the time periods and spatial area to which decisions will apply.

- **Develop a Decision Rule.** Define the conditions by which the decision-maker will choose among alternative risk management actions. This is usually specified in the form of an "if... then" statement.

- **Specify Acceptable Limits on Decision Errors.** Define, in statistical terms, the decision-maker's acceptable error rate based on the consequence of making an incorrect decision.

- **Optimize the Sampling Design.** Evaluate the results of previous steps and develop the most resource-efficient design for data collection that meets all DQOs.

The DQO process for lead soil confirmation sampling at Site 12 is discussed below.

Step 1: State the Problem

Soil in the vicinity of Buildings 1207 and 1209 at Site 12 contains lead concentrations exceeding the EPA PRG of 400 mg/kg. This area is located in a part of NSTI that is being considered for residential reuse. Lead-contaminated soil will be excavated and disposed of off site. A confirmation sampling design is needed to ensure that average residual lead concentrations in soil after excavation are below the PRG.

Step 2: Identify the Decision

TtEMI needs to determine whether lead concentrations in the floor and sidewalls of the excavated areas exceed the cleanup level. The proposed confirmation sampling design will address when, where, and how to collect confirmation samples; the acceptable level error for sampling data used for decision-making; and how many samples to collect in order to determine whether further excavation is necessary. Additional excavation will be required if residual lead concentrations in soil exceed the cleanup level.

Step 3: Identify the Inputs to the Decision

Information required to make a decision includes the cleanup level and analytical data for lead in soil samples collected from the sidewalls and floor of the excavation.

Step 4: Define the Boundaries of the Removal

Lead-contaminated soil is located in the footprint of the former burn pit area and in the vicinity of Buildings 1207 and 1209 northwest of the former burn pit area. As shown in Figure 3, the areal extent of the initial excavation will be constrained by Buildings 1207 and 1209 and by the road and berm to the south and north of them, respectively. If confirmation sampling indicates that contaminated soil is located underneath the road and the berm, the soil will be removed and the road or berm repaired. If confirmation sampling indicates that contaminated soil is located underneath Buildings 1207 and 1209 or any other structures, the soil may be removed during a subsequent round of excavation. The decision on whether to demolish structures in order to excavated contaminated soil will be made after further review of the confirmation sampling results.

The estimated excavation area is located along the southeast sides of Buildings 1207 and 1209 and extends most of the way to paved areas southeast of the buildings. A small portion of the excavation area is located in between Buildings 1207 and 1209. Due to the presence of several adjacent structures which are considered "permanent" barriers to the initial excavation, the estimated area has an irregular shape. However, the area can be described as roughly rectangular with a maximum length of 110 feet and a maximum width of 50 feet. TtEMI will determine whether soil is clean or contaminated for each of the nine excavation wall segments and one floor segment that comprise the estimated excavation area. The locations of the wall and floor segments are described Section 5.0.

The values discussed below in Step 6 of the DQO process are required to evaluate data quality for each sidewall and floor segment.

The removal of contaminated soil must be completed by August 1, 1999.

Step 5: Develop a Decision Rule

The cleanup level will be the EPA PRG of 400 mg/kg. The parameter that will be compared to the cleanup level is the mean lead concentration in each excavation sidewall and floor segment.

The decision rule for each sidewall can be stated as follows:

- If the mean lead concentration in a sidewall equals or exceeds the cleanup level of 400 mg/kg, additional amounts of soil will be excavated from the sidewall depending on how much the mean lead concentration exceeds the cleanup level. This process will continue until the mean lead concentration is below 400 mg/kg or a "permanent" barrier such as a building is encountered. Excavation beyond "permanent" barriers will be considered after complete review of confirmation sampling results.

- If the mean lead concentration in a sidewall is below the cleanup level, no further action will be taken.

The decision rule for the excavation floor can be stated as follows:

- If the mean lead concentration in the floor equals or exceeds the cleanup level of 400 mg/kg, additional amounts of soil will be excavated from the floor, depending on how much the mean lead concentration exceeds the cleanup level. This process will continue until the mean lead concentration is below 400 mg/kg or a barrier such as the water table allows no further excavation.

- If the mean lead concentration in the floor is below the cleanup level, no further action will be taken.

A decision will be made separately for each excavation sidewall and each floor segment.

Step 6: Specify Acceptable Limits on Decision Errors

The null hypothesis (H_0) is that the mean lead concentration in an excavation sidewall or floor segment equals or exceeds the 400 mg/kg cleanup level. The alternative hypothesis (H_a) is that the mean lead concentration in a sidewall or floor segment is below the 400 mg/kg cleanup level.

A false positive (") error means that the true concentration in the sidewall or floor segment exceeds the

cleanup level but sample results indicate that the concentration is below the cleanup level. The consequences of this type of error are severe because the future land use is residential and contaminated soil would be left in place. An acceptable " error rate is assumed to be 5 percent (0.05).

A false negative ($) error means that the true concentration in the sidewall or floor segment is below the cleanup level but sample results indicate that the concentration exceeds the cleanup level. The consequences of this type of error are less severe but would result in extra costs associated with the unnecessary excavation of soil. An acceptable $ error rate is assumed to be 20 percent (0.20).

The information presented above will be used in the DQO Decision Error Feasibility Trials (DEFT) software developed by EPA (1994b) to estimate the number of samples to be collected from each sidewall and floor segment. DEFT requires an estimate of the standard deviation of lead concentrations for use in sample size calculations. Some data on lead soil concentrations is available, but these data include results from contaminated soil that will be excavated and may not be representative of lead concentrations in the excavation sidewalls or floor after contaminated soil has been removed. Therefore, these data will not be used to estimate the standard deviation of lead concentrations. As a result, the default standard deviation value recommended by DEFT will be used.

DEFT also requires specifying a lead concentration at which the consequences of making a false negative decision error become severe. DQO guidance (EPA 1994a) refers to the difference between this concentration and the 400 mg/kg cleanup level as the "width of the gray region." The default value in the DEFT program (the cleanup level divided by 2, or 200 mg/kg) will be used to estimate the lower bound of the gray region. In the context of this problem and to be somewhat conservative in protecting future residents from exposure to lead-contaminated soil, this means that if the true mean lead concentration in a sidewall or floor segment is below 200 mg/kg (half the cleanup level), TtEMI will tolerate a 20 percent chance that the area would require further excavation.

Step 7: Optimize the Sampling Design

Based on the parameters described above in Step 6, DEFT results indicate that 11 samples are required for each sidewall and floor segment if a simple random grab sampling design is used. Based on an estimated cost of $15 per lead analysis and an estimated cost of $10 to collect each sample, the total sampling and analysis cost for each sidewall or floor segment is $275.

However, based on a composite sampling design, four composite samples, each consisting of four individual grab samples, would also satisfy the DQOs specified in Step 6. Based on the unit costs specified above, the estimated cost of a composite sampling design would be $220 per sidewall or floor segment, which is less expensive than the simple random grab sampling design. In addition, because the composite sampling design requires 16 sampling locations per sidewall or floor segment to generate the four composite samples (as opposed to the 11 locations for simple random grab sampling), it would provide more complete areal coverage of the excavation. Therefore, the composite sampling design will be used because it satisfies the DQOs and is likely to ensure that analytical results are more representative of mean residual contamination.

5.0 CONFIRMATION SAMPLING ACTIVITIES

Excavation of lead-contaminated soil in the vicinity of Buildings 1207 and 1209 at Site 12 is scheduled to begin in June 1999. Contaminated soil will be disposed of off site. Following the removal action, TtEMI will conduct confirmation sampling activities. The confirmation sampling approach and procedures to be used for the confirmation sampling effort are described below.

5.1 CONFIRMATION SAMPLING APPROACH

Soil confirmation sampling will be conducted after the removal action excavation as an iterative process (as necessary) until the soil cleanup goal for lead is met. The proposed cleanup goal for lead in soil is the EPA Region IX PRG for residential use of 400 mg/kg. If the cleanup goal is not met after the removal action, additional soil will be removed and confirmation sampling will be repeated. Initial and second rounds of the confirmation sampling approach are discussed below.

5.1.1 Initial Confirmation Sampling

Soil will be excavated to remove the full depth and lateral extent of soil containing lead at concentrations exceeding 400 mg/kg. Confirmation sampling at Site 12 will consist of collecting a total of 40 composite soil samples from the excavation area, each comprised of four individual grab samples. Four composite samples will be collected from each of the nine excavation wall segments and one floor segment. Each segment will be divided into four portions that approximately equal in area. Four grab samples will be collected from each area and composited on an equal weight basis. Table 1 lists the wall and floor

segments and describes their locations. The individual wall and floor segments are also identified on Figure 3. Table 2 lists the estimated number of confirmation soil samples to be collected.

TABLE 1

WALL AND FLOOR SEGMENT LOCATIONS
CONFIRMATION SOIL SAMPLING NEAR BUILDINGS 1207 AND 1209 AT SITE 12
NAVAL STATION TREASURE ISLAND, CALIFORNIA

Segment	Segment Type	Location Description
1	Wall	Northeast side of Building 1207
2	Wall	Southeast side of Building 1207
3	Wall	Excavation wall northwest of car port located southeast of Building 1207 and the southwest facing excavation wall between the carport and Building 1207
4	Wall	Excavation wall northeast of car port located southeast of Building 1207
5	Wall	Southeastern most wall of excavation
6	Wall	Excavation wall southwest of car port located southeast of Building 1209
7	Wall	Excavation walls between the carport and Building 1209 including the southeast side of Building 1209
8	Wall	Southwest side of Building 1209
9	Wall	Northwest facing excavation wall located between Buildings 1207 and 1209
10	Floor	Entire floor area divided in to four segments:

TABLE 2

SAMPLE QUANTITY AND TYPE
CONFIRMATION FIELD SAMPLING NEAR BUILDINGS 1207 AND 1209 AT SITE 12
NAVAL STATION TREASURE ISLAND, CALIFORNIA

Initial Soil Sampling Area	Number of Composite Samples[a]	Number of Field Duplicates[b]	Number of Rinsate Samples[c]	Number of QA/QC Samples[d]	Total Number of Samples
Excavation area in vicinity of Buildings 1207 and 1209 (see Figure 3)	40	4	4	3	51

Notes:

QA/QC Quality assurance and quality control

a Each composite sample consists of four individual grab samples.
b One field duplicate will be collected for each 10 samples.
c One equipment rinsate will be collected for each 10 samples.
d One QA/QC water source blank will be collected for each lot of source water used.

5.1.2 Second Round Confirmation Sampling

If concentrations of lead detected in soil samples collected during the initial round of confirmation sampling exceed the screening criterion, additional soil will be removed, and a second round of confirmation samples will be collected to determine average residual lead concentrations. Excavation and sampling will continue following the procedures described below until the cleanup goal is achieved.

5.2 CONFIRMATION SAMPLING PROCEDURES

Confirmation soil samples will be collected in accordance with TtEMI standard operating procedure (SOP) No. 005 using a stainless-steel hand auger, shovel, or trowel. Due to extreme tidal influences on groundwater elevation at the site, the bottom of the excavation may not be accessible for a long enough period to allow for confirmation sampling. If the excavation becomes inaccessible, the excavator will scrape the upper six inches of soil from the intended sampling location and the grab sample will be collected directly from the excavator bucket. Each soil sample will be visually inspected for staining and for lithologic logging purposes and then placed in a clean glass jar for lead analysis. During sample collection, sampling locations will be recorded in the field logbook.

6.0 DECONTAMINATION PROCEDURES

Disposable equipment will be used whenever possible to avoid the potential for cross contamination. All nondedicated and nondisposable sampling equipment will be decontaminated before and after use to prevent sample contamination and cross-contamination between sampling locations. Decontamination procedures will be conducted based on the assumption that all samples collected may contain detectable concentrations of lead. The following procedures will be used to decontaminate sampling equipment:

- Sampling equipment will be scrubbed with a stiff brush in a wash bucket containing a solution of Liquinox, a nonphosphate detergent.
- Sampling equipment will be double-rinsed with potable water and then rinsed with deionized water.

All investigation-derived waste (IDW) such as decontamination water and excess soil will be managed in accordance with the IDW management plan developed for Treasure Island (PRC 1992b). During sampling, IDW will be temporarily stored in covered, U.S. Department of Transportation-approved 55-

gallon drums. The drums will be labeled with the contents, source, generation date, and the TtEMI field personnel collecting the IDW sample. Upon completion of fieldwork, all drums will be moved to an IDW storage area. Analytical results for the IDW will be used to determine the appropriate method of IDW disposal. IDW will be disposed of in accordance with state and federal regulations. IDW sampling activities are discussed in the IDW management plan (PRC 1992b).

7.0 SAMPLE HANDLING PROCEDURES

The following sections describe sample handling procedures, including sample designation and documentation, containerization and preservation, and shipment and chain of custody (COC).

7.1 DESIGNATION AND DOCUMENTATION

Each soil sample will be assigned a unique identification (ID) number to provide a means of tracking the sample from collection through analysis. The sample ID number will indicate the CTO number, the site number, and other descriptive sample information (such as sampling depth and location). The sample ID number for each sample will be entered on sample container labels, in the field logbook, on COC forms, and on other records documenting sampling activities. Examples of sample ID numbers are as follows:

27512nnnxxB
27512nnnxxD

where

275	=	CTO number
12	=	Code for Site 12
nnn	=	A sequential soil sampling location number
xx	=	Sampling depth, if applicable (in feet bgs)
B	=	Blank sample, if applicable
D	=	Duplicate sample, if applicable

The sample label will be affixed to each sample container immediately after sample collection. The label will indicate the CTO number, site name, sample ID number, sample matrix, container type, analysis required, date and time of collection, and preservatives used (if any). The label will be affixed to the sample container, and clear plastic tape will be placed over the label to protect it from damage.

7.2 CONTAINERIZATION AND PRESERVATION

All samples will be properly containerized and packaged to maintain sample integrity and proper custody during delivery to the analytical laboratory. Contaminant-free containers to be used for samples undergoing inorganic analysis will be prepared in accordance with the procedures specified in EPA's "Specifications and Guidance for Obtaining Contaminant-Free Sample Containers" (EPA 1992). All samples will be placed in a sealed storage cooler with ice or blue ice immediately after the samples are collected. The interior of the cooler will be maintained at a temperature of 4 °C ± 2 °C to preserve the samples. Sample containerization and preservation requirements are described in detail in TtEMI SOP No. 017.

7.3 SHIPMENT AND CHAIN OF CUSTODY

Sample custody tracking will begin at the time of sample collection upon placement of packaged and sealed samples into the ice cooler. At the end of each sampling day, completed COC forms will be sealed in plastic bags and taped to the inside lid of each cooler. The cooler will then be sealed shut, and custody seals will be affixed to prevent tampering. When the cooler is picked up for overnight shipment, custody will then be transferred to the sample carrier. Each individual who subsequently assumes responsibility for the cooler will sign the COC form(s). When the analytical laboratory receives the samples, laboratory personnel will assume final custody.

8.0 QUALITY ASSURANCE AND QUALITY CONTROL

QA/QC protocols for confirmation sampling at Site 12 and subsequent sample analysis will be in accordance with the procedures discussed in the basewide quality assurance project plan for NSTI (PRC 1997a). T' following sections describe QA/QC samples to be collected, and laboratory analysis and data review.

8.1 QA/QC SAMPLES

QA/QC field and laboratory samples will be collected to assess sampling and analytical precision and accuracy, and to confirm that sampling equipment was decontaminated properly. QA/QC samples will consist of source blanks and equipment blanks as described below:

- **Source Blanks.** Source blanks will be collected as QA/QC samples during the soil sampling effort to evaluate the purity of the water used to decontaminate sampling equipment. The blanks will consist of source water used to perform the final rinse on all sampling equipment during decontamination activities.

- **Equipment Rinsate Blanks.** Equipment rinsate blanks will be collected as QA/QC samples to evaluate the cleanliness of the sampling equipment. After sampling equipment has been subjected to standard decontamination procedures, equipment rinsate blanks will be obtained by flushing the inside of the sampling equipment with deionized water. The flush water will be collected in a sample container for lead analysis.

- **Field Duplicate Samples.** Field duplicate samples will be collected to assess field and laboratory precision. Duplicate samples will be obtained at the same time, in the same way, and from the same source as environmental samples and are submitted along with environmental samples (under different sample ID numbers) to the same laboratory for analysis.

8.2 LABORATORY ANALYSIS AND DATA REVIEW

Soil samples will be analyzed at a California state-certified and Navy-approved laboratory for lead using procedures discussed in EPA Contract Laboratory Program (CLP) Statement of Work (SOW) ILM04.0 (EPA 1995b). Analytical method requirements for CLP metals are well established and documented in the "CLEAN II SOW for Analytical Services" (PRC 1995b).

The contract laboratory will submit analytical reports to TtEMI in hard copy and electronic formats. CLP metals data will be validated in accordance with EPA guidance (EPA 1994c) and TtEMI guidelines for validation of CLP inorganic analytical results (PRC 1997b)

9.0 HEALTH AND SAFETY

Health and safety procedures during Site 12 confirmation sampling activities will be performed in accordance with the following two applicable health and safety plans (HASP):

- TtEMI's "CLEAN II Program Health and Safety Plan," Revision 1 (PRC 1995a)
- TtEMI's "Final Basewide Health and Safety Plan, NSTI, California" (PRC 1997c)

Special training and certification requirements for field personnel, and hazard analysis and mitigation at Site 12 are discussed below.

9.1 SPECIAL TRAINING AND CERTIFICATION REQUIREMENTS

All TtEMI personnel directly involved in field activities at Site 12 will be trained and certified in accordance with Occupational Safety and Health Administration requirements as specified in Title 29 of the *Code of Federal Regulations* Part 1910.120; the CLEAN II program HASP (PRC 1995a); and the final basewide HASP (PRC 1997c).

9.2 HAZARD ANALYSIS AND MITIGATION

Potential chemical, physical, and general safety hazards may be encountered during sampling activities at Site 12 through (1) dermal contact with contaminated soil and groundwater, (2) heavy equipment use, and (3) exposure to excessive noise. These hazards and their mitigation are briefly discussed below.

9.2.1 Dermal Contact with Contaminated Soil

Chemical hazards during confirmation sampling at Site 12 may be encountered through dermal contact with contaminants in soil. The wearing of proper PPE and the decontamination procedures described in Section 4.0 will minimize dermal contact. PPE will include chemical resistant clothing (for example, Tyvek), steel-toed boots, safety glasses fitted with side shields, hard hats, and sturdy chemical-resistant work gloves.

9.2.2 Heavy Equipment Use

Heavy excavation equipment will be used at Site 12 that poses potential physical hazards. The following precautions should be observed whenever heavy equipment is in use:

- PPE should be worn at all times in site work zones, including steel-toed boots, safety glasses, and hard hats.
- Personnel must be aware of the location and operation of heavy equipment at all times and take precautions to avoid getting in the way of its operation.

- Personnel should never walk directly behind or to the side of heavy equipment without the operator's knowledge.
- Nonessential personnel should not be allowed in excavation areas.

9.2.3 Noise Exposure

Noise is likely to result during excavation activities from concrete and asphalt breaking and other heavy equipment activities. Field personnel should wear ear inserts with a noise reduction rating of at least 26 decibels on the A-weighted scale when conducting confirmation sampling within 25 feet of heavy equipment.

REFERENCES

Navy Public Works Center. 1996. "Lead Management Plan, Naval Station Treasure Island." Norfolk, Virginia. May.

PRC Environmental Management, Inc. (PRC). 1992a. "Final Preliminary Remedial Risk Assessment, Naval Station Treasure Island, Site 12." Prepared for U.S. Department of the Navy (Navy), Naval Facilities Engineering Command, Engineering Field Activity West (EFA West). September 15.

PRC. 1992b. "Remedial Investigation/Feasibility Study Investigation-Derived Waste Management Plan, Naval Station Treasure Island, California." Prepared for Navy, EFA West. November.

PRC. 1995a. "CLEAN II Program Health and Safety Plan." Revision 1. June 19.

PRC. 1995b. "CLEAN II Statement of Work for Standard Analytical Services." Prepared for Navy, EFA West. September 28.

PRC. 1997a. "Draft Basewide Quality Assurance Project Plan, Naval Station Treasure Island, San Francisco, California." Prepared for Navy, EFA West. July 15.

PRC. 1997b. "CLEAN II Statement of Work for Data Validation Services."

PRC. 1997c. "Final Basewide Health and Safety Plan, Naval Station Treasure Island, California." Prepared for Navy, EFA West. July 17.

Tetra Tech EM Inc. (TtEMI). 1997. "Draft Final Onshore Remedial Investigation Report, Naval Station Treasure Island, California." Prepared for U.S. Department of the Navy, Naval Facilities Engineering Command, Engineering Field Activity West. September.

TtEMI. 1998. "Cost Estimate, Site 12 Removal Action Work Plan and Action Memorandum for Lead-Contaminated Soil, Naval Station Treasure Island, San Francisco, California." Prepared for Navy, EFA West. December.

U.S. Environmental Protection Agency (EPA). 1992. "Specifications and Guidance for Obtaining Contaminant-Free Sample Containers." April.

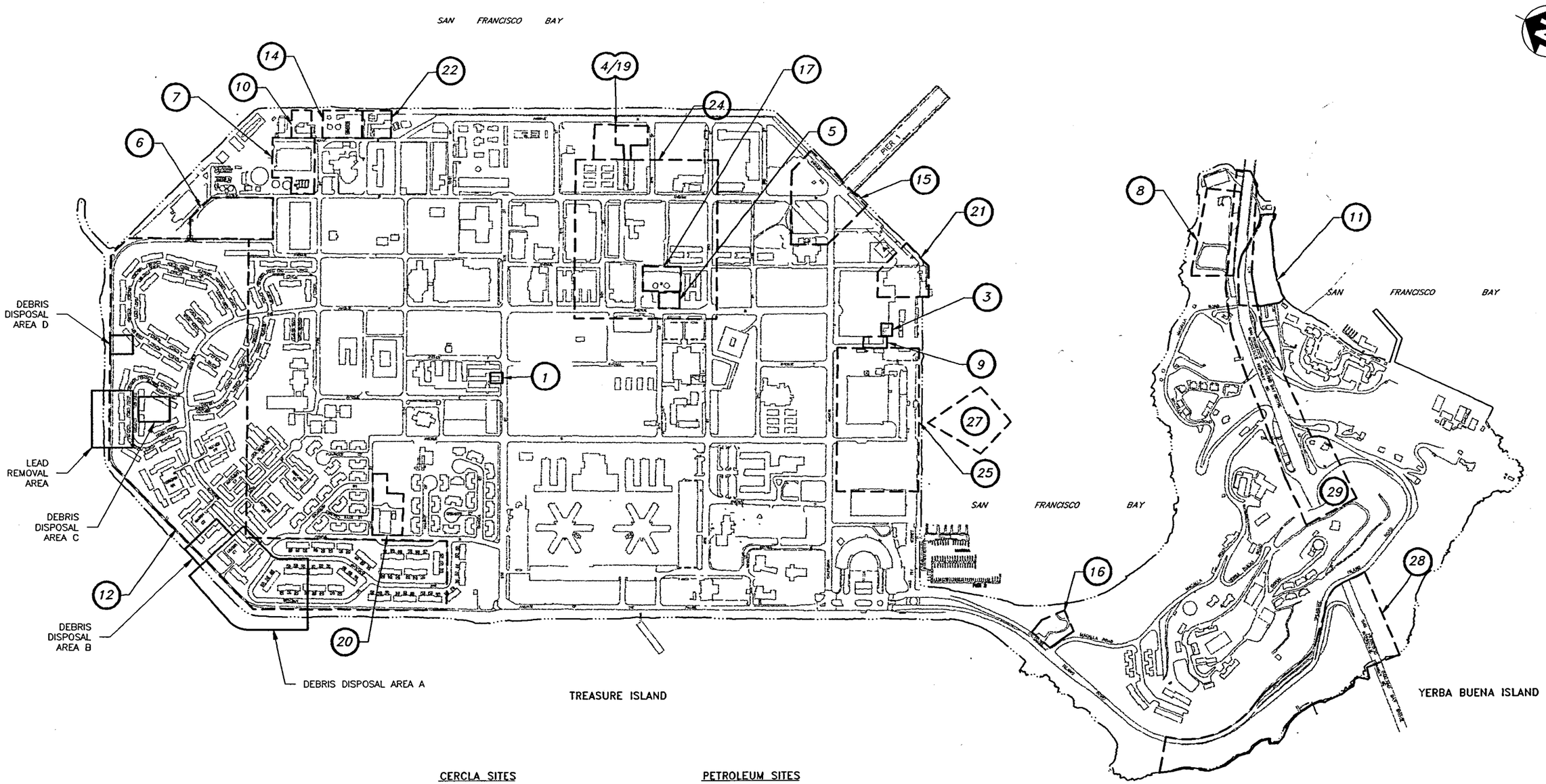
EPA. 1994a. "Guidance for the Data Quality Objectives Process." EPA QA/G-4. September.

EPA. 1994b. "Data Quality Objectives Decision Error Feasibility Trials Software." Version 4.

EPA. 1994c. "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review." EPA 540/R-94/013. February.

EPA. 1995a. "Aerial Photographic Analysis of Naval Station Treasure Island, San Francisco Bay, California." Characterization Research Division. Report No. TS-PIC-95707. June.

EPA. 1995b. "Statement of Work for Inorganic Analyses, Multi-Media, Multi-Concentration." EPA Contract Laboratory Program. Document number ILM04.0.



LEGEND

(10) LOCATION OF IR SITES

— — — APPROXIMATE SITE BOUNDARY

CERCLA SITES

TREASURE ISLAND

1 MEDICAL CLINIC
3 PCB EQUIPMENT STORAGE AREA
5 OLD BOILER PLANT
7 PESTICIDE STORAGE
9 FOUNDRY
10 BUS PAINTING SHOP
12 OLD BUNKER AREA
17 TANKS 103/104
19 REFUSE TRANSFER AREA
21 VESSEL WASTE OIL RECOVERY
24 5TH STREET FUEL RELEASES (DRY CLEANING FACILITY)

YERBA BUENA ISLAND

8 ARMY POINT SLUDGE DISPOSAL AREA, YBI
11 YBI LANDFILL
28 WEST SIDE ON/OFF RAMPS
29 EAST SIDE ON/OFF RAMPS

PETROLEUM SITES

4 HYDRAULIC TRAINING SCHOOL
6 FIRE TRAINING AREA
14 NEW FUEL FARM
15 OLD FUEL FARM
16 CLIPPER COVE TANK FARM
19 REFUSE TRANSFER AREA
20 AUTO HOBBY SHOP/ TRANSPORTATION CENTER
22 NAVY EXCHANGE SERVICE STATION
25 SEAPLANE MAINTENANCE

350 0 350 700
SCALE IN FEET

DEPARTMENT OF THE NAVY — NAVAL FACILITIES ENGINEERING COMMAND

ENGINEERING FIELD ACTIVITY WEST

SAN BRUNO, CALIFORNIA

NAVAL STATION TREASURE ISLAND — SAN FRANCISCO, CALIFORNIA

Figure 1

Installation Restoration Site and Location Map Treasure Island and Yerba Buena Island

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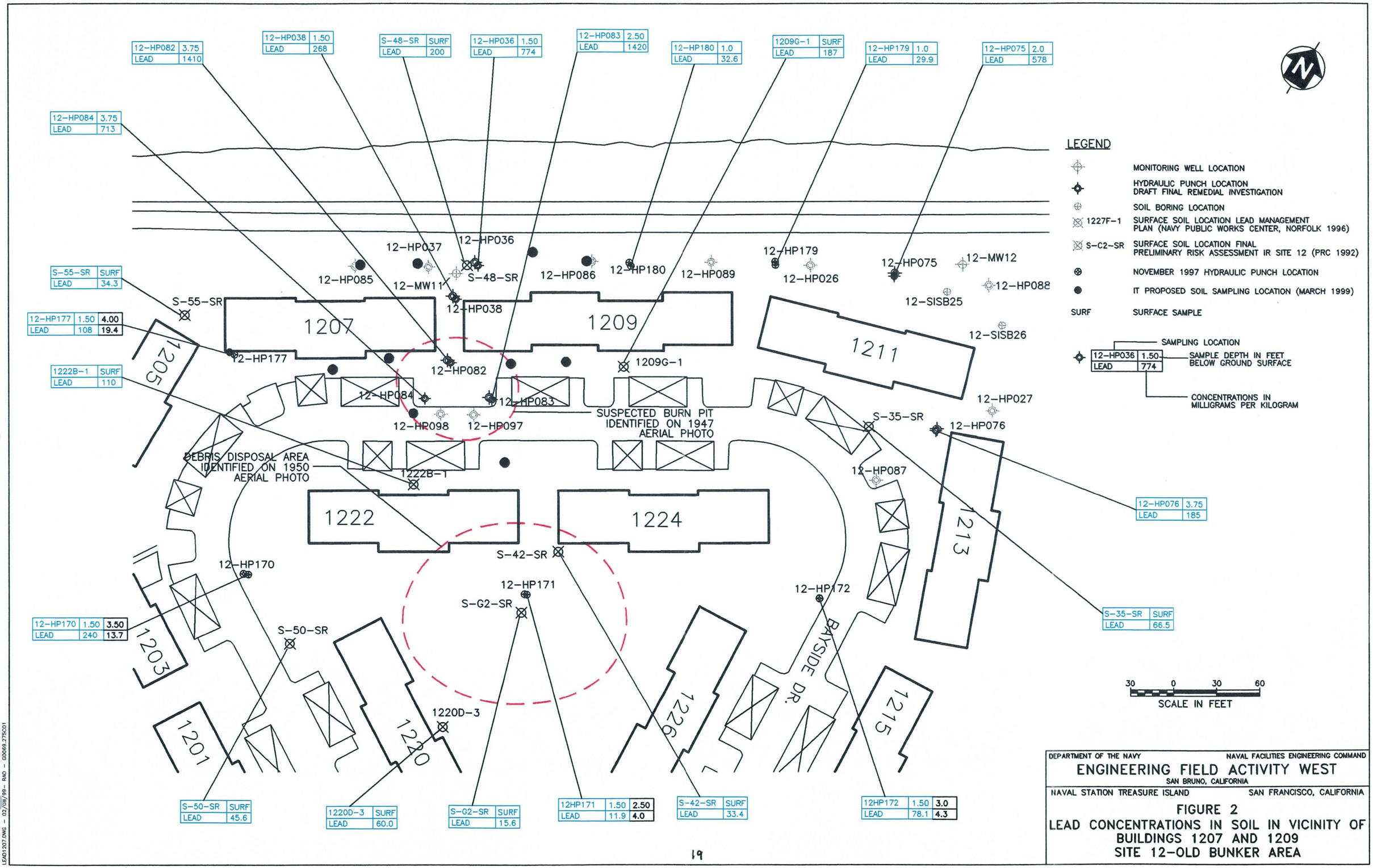

DEPARTMENT OF THE NAVY — NAVAL FACILITIES ENGINEERING COMMAND

ENGINEERING FIELD ACTIVITY WEST

SAN BRUNO, CALIFORNIA

NAVAL STATION TREASURE ISLAND — SAN FRANCISCO, CALIFORNIA

FIGURE 2

LEAD CONCENTRATIONS IN SOIL IN VICINITY OF BUILDINGS 1207 AND 1209 SITE 12-OLD BUNKER AREA

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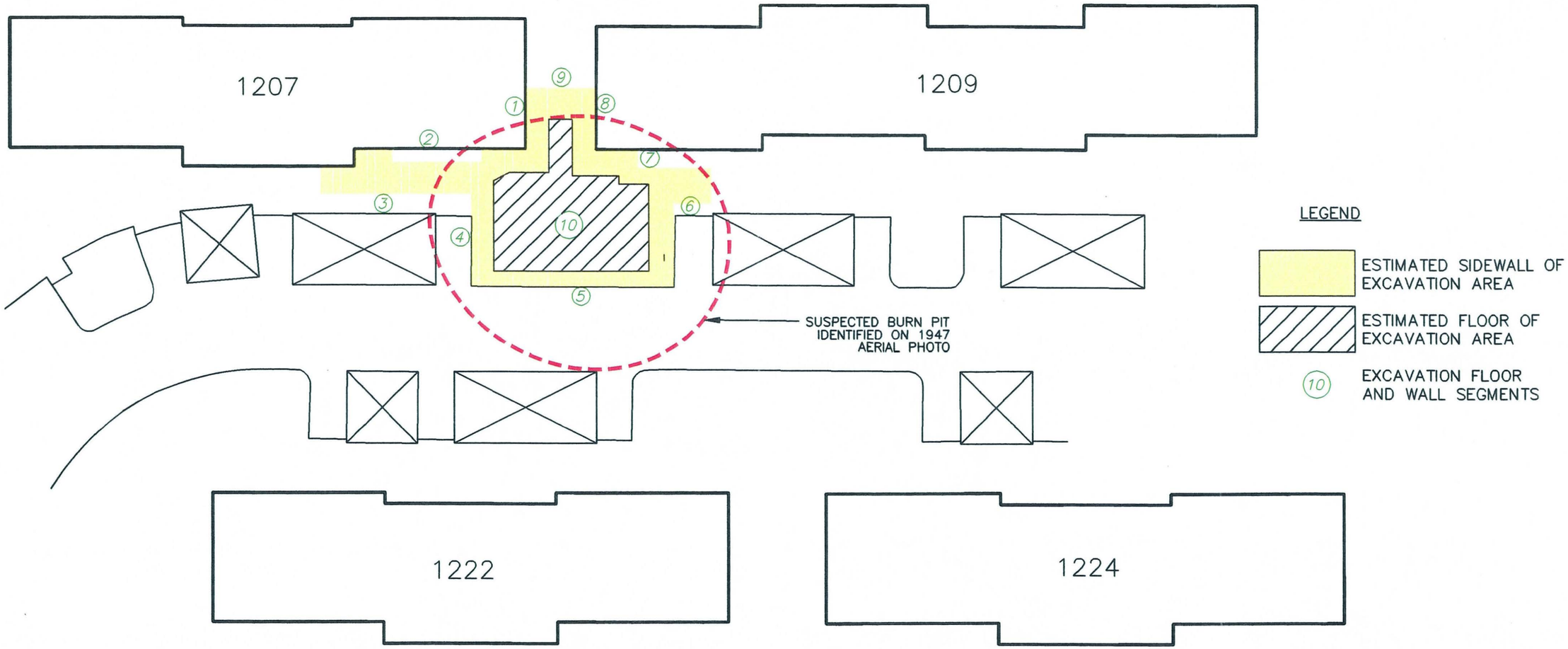

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ENGINEERING FIELD ACTIVITY WEST

SAN BRUNO, CALIFORNIA

NAVAL STATION TREASURE ISLAND — SAN FRANCISCO, CALIFORNIA

FIGURE 3

ESTIMATED SOIL EXCAVATION AREA IN VICINITY OF BUILDINGS 1207 AND 1209
SITE 12–OLD BUNKER AREA

TI–EXCAV–AREA.DWG – 05/14/99 – RAO – G0069.275C01

APPENDIX A

CONSTRUCTION OVERSIGHT AND SITE VISIT REPORT

(Two Pages)

TETRATECH EM INC

DATE: _____
Report # _____
page 1 of ___
attachment: Y/N
sketch _____
comments _____

Construction Oversight & Site Visit Report

M T W Th F S Su

RAC Construction Project information	D.O.: 0119 Location: _____ Title: _____					
Job site conditions	Wind N W E S Strength _____	Temperature:	high	low	Cloud cover:	Precipitation:
		am	___	___	_____	_____
		pm	___	___	_____	_____
		Humidity:	___			
Schedule and drawings	Work IS / IS NOT on schedule per the revised schedule of _____ As-build drawings ARE / ARE NOT up to date.					

Work item	Comment and location section (describe all work or deviations from work plan in detail below or attach additional comment sheet as needed)	Conforms Y	Conforms N

Resources

Construction equipment on-site (% operated)

_____

_____

_____

Workers observed: total workers on site _____ PPE Lvl company

Crew type: _____, # _____, _____, _____

_____, # _____, _____, _____

_____, # _____, _____, _____

_____, # _____, _____, _____

_____, # _____, _____, _____

_____, # _____, _____, _____

_____, # _____, _____, _____

	(name)	present	met
CQC:			
Supt:			
H&S:			
Other:			
Gov't:			

Health and Safety

Containment/exclusion zones established at: _____

PPE (levels and work (refer to work item on front) _____

Other (training, events, accidents) _____

Quality Control Materials and Testing

Submittals available for review? _____

Installed materials meet contract specifications? _____

Samples/tests by RAC	Samples/tests by TtEMI

Project Notes

Differing Site _____

Conditions _____

Problems noted _____

or meetings _____

TtEMI Inspector information

time on-site: _____ time departed: _____

CLEAN CONTRACT Number: _____ CTO: _____

Title: Field Oversight

Inspector: _____ TtEMI Office: San Francisco, CA phone: ( ) _____

fax: ( ) _____

I certify this report to be complete and accurate based upon my observations, knowledge, and review of contract requirements and state/federal environmental requirements. Contract specifications and drawings HAVE/HAVE NOT been reviewed. Any discrepancies from plans or specifications HAVE/HAVE NOT been noted to the ROICC.

_____ / _____

(signature) (date)

Distribution:

Contract file

Field File