



Tetra Tech EM Inc.

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January 13, 2000

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U.S. Department of Commerce
NOAA OR&R CPRD (N/ORR2)
Pribilof Project Office
7600 Sand Point Way NE, Bin CI 5700
Seattle, Washington 98 115-0070

**Subject: Draft Site Characterization Report
Former Gasoline Tank Farm, Two-Party Agreement Site No. 10
Pribilof Islands Site Restoration, St. Paul Island, Alaska
Contract No. 50WCNA906018, Modification No. 56WCNA901077**

Dear Mr. Lindsay:

Tetra Tech EM Inc. (Tetra Tech) has received and addressed your comments dated January 7, 2000, on the preliminary draft version of the above-referenced document. We are pleased to submit one original **and** four copies of the revised document for your review. The original is unbound and single-sided; the copies are unbound and double-sided. As you requested, the enclosed copies of the document do not include figures, tables, or appendixes, because the National Oceanic and Atmospheric Administration did not provide comments on those portions of the preliminary draft report dated December 29, 1999.

If you have any questions or comments about this submittal, please call me at (206) 587-4680.

Sincerely,

Ken Valder
Project Manager

Enclosure

cc: Mamie Wandick, NOAA Contracting Officer (letter only)
David Zimmermann, Tetra Tech Deputy Program Manager

DRAFT

SITE CHARACTERIZATION REPORT

**FORMER GASOLINE TANK FARM
TWO-PARTY AGREEMENT SITE NO. 10
PRIBILOF ISLANDS SITE RESTORATION
ST. PAUL ISLAND, ALASKA**

Prepared for

**NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
Central Administrative Support Center
Kansas City, Missouri 64106**

Prepared by

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NOAA Region	:	Western Administrative Support Center
Date Prepared	:	January 13, 2000
Contract No.	:	50WCNA906018
Modification No.	:	56WCNA901077
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CONTENTS

Section	<u>Page</u>
1.0 INTRODUCTION.....	1
2.0 PROJECT OBJECTIVES.....	1
3.0 BACKGROUND	2
3.1 ISLAND HISTORICAL INFORMATION.....	2
3.2 ISLAND ENVIRONMENTAL SETTING	2
3.2.1 Climate.....	3
3.2.2 Soil and Geology.....	3
3.2.3 Surface Water.....	3
3.2.4 Groundwater.....	3
3.3 SITE DESCRIPTION.....	4
3.3.1 Soil and Geology.....	4
3.3.2 Surface Water.....	4
3.3.3 Groundwater.....	5
4.0 PREVIOUS INVESTIGATIONS AND OTHER ACTIVITIES.....	5
4.1 PRELIMINARY ASSESSMENT (1992)	5
4.2 ABOVEGROUND STORAGE TANK REMOVAL (1997)	5
5.0 SAMPLING STRATEGY.....	6
6.0 ANALYTICAL RESULTS AND DATA EVALUATION	7
6.1 SAMPLE RESULTS	7
6.2 DATA EVALUATION	7
6.2.1 CONCEPTUAL SITE MODEL.....	8
6.2.2 RESIDUAL CONTAMINATION REQUIRING CORRECTIVE ACTION.....	8
7.0 CONCLUSIONS	9
8.0 RECOMMENDATIONS	10
REFERENCES.....	11

Appendix

A	PHOTOGRAPHS
B	BOREHOLE LOGS
C	FIELD AND LABORATORY METHODOLOGY
D	LABORATORY REPORT
E	DATA QUALITY EVALUATION REPORT

FIGURES

Figure

- 1 SITE LOCATION
- 2 FORMER SAMPLING LOCATIONS
- 3 SAMPLING LOCATIONS AND LEAD CONCENTRATIONS
- 4 CONCEPTUAL SITE MODEL

TABLES

Table

- 1 1997 SOIL SAMPLING RESULTS
- 2 1999 SOIL SAMPLING RESULTS



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**Subject: Draft Site Characterization Report
Demolished Diesel Tank Farm, Two-Party Agreement Site No. 11
Pribilof Islands Site Restoration, St. Paul Island, Alaska
Contract No. 50WCNA906018, Modification No. 56WCNA901077**

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SITE CHARACTERIZATION REPORT

**DEMOLISHED DIESEL TANK FARM
TWO-PARTY AGREEMENT SITE NO. 11
PRIBILOF ISLANDS SITE RESTORATION
ST. PAUL ISLAND, ALASKA**

Prepared for

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CONTENTS

<u>Section</u>	<u>Page</u>
1.0 INTRODUCTION.....	1
2.0 PROJECT OBJECTIVE.....	1
3.0 BACKGROUND.....	2
3.1 ISLAND HISTORICAL INFORMATION.....	2
3.2 ISLAND ENVIRONMENTAL SETTING.....	2
3.2.1 Climate.....	3
3.2.2 Geology and Soil.....	3
3.2.3 Surface Water and Groundwater.....	3
3.3 SITE DESCRIPTION.....	3
3.3.1 Soil and Geology.....	4
3.3.2 Surface Water.....	4
3.3.3 Groundwater.....	4
4.0 PREVIOUS INVESTIGATIONS AND OTHER ACTIVITIES.....	4
4.1 PRELIMINARY ASSESSMENT (1992).....	4
4.2 LIMITED ENVIRONMENTAL INVESTIGATION (1992).....	5
4.3 EXPANDED SITE INSPECTION (1996).....	5
5.0 SAMPLING STRATEGY.....	6
6.0 ANALYTICAL RESULTS AND DATA EVALUATION.....	7
6.1 SAMPLE RESULTS.....	7
6.2 DATA EVALUATION.....	7
6.2.1 Conceptual Site Model.....	8
6.2.2 Residual Contamination Requiring Corrective Action.....	9
7.0 CONCLUSIONS.....	9
8.0 RECOMMENDATIONS.....	10
REFERENCES.....	11

Appendix

A	PHOTOGRAPHS
B	BOREHOLE LOGS
C	FIELD AND LABORATORY METHODOLOGY
D	METHOD ONE CLEANUP LEVEL EVALUATION
E	LABORATORY REPORT
F	DATA QUALITY EVALUATION REPORT

FIGURES

Figure

- 1 SITE LOCATION
- 2 PREVIOUS SAMPLING AND TPH CONCENTRATIONS
- 3 SAMPLING LOCATIONS
- 4 DISTRIBUTION OF DRO CONCENTRATIONS
- 5 ESTIMATED AREA REQUIRING CORRECTIVE ACTION
- 6 CONCEPTUAL SITE MODEL

TABLES

Table

- 1 1992 SOIL SAMPLING RESULTS
- 2 1997 SOIL SAMPLING RESULTS – POLYCYCLIC AROMATIC HYDROCARBONS



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**Subject: Draft Closure Confirmation Report
Little Polovina Hill Vehicle Boneyard, Two-Party Agreement Site No. 3
Pribilof Islands Site Restoration, St. Paul Island, Alaska
Contract No. 50WCNA906018, Modification No. 56WCNA901077**

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Ken Valder
Project Manager

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cc: Mamie Wandick, NOAA Contracting Officer (letter only)
David Zimmermann, Tetra Tech Deputy Program Manager

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CLOSURE CONFIRMATION REPORT

**LITTLE POLOVINA HILL VEHICLE BONEYARD
TWO-PARTY AGREEMENT SITE NO. 3
PRIBILOF ISLANDS SITE RESTORATION
ST. PAUL ISLAND, ALASKA**

Prepared for

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CONTENTS

<u>Section</u>	<u>Page</u>
1.0 INTRODUCTION.....	1
2.0 PROJECT OBJECTIVE.....	1
3.0 BACKGROUND.....	2
3.1 ISLAND HISTORICAL INFORMATION.....	2
3.2 ISLAND ENVIRONMENTAL SETTING.....	2
3.2.1 Climate.....	3
3.2.2 Geology and Soil.....	3
3.2.3 Surface Water and Groundwater.....	3
3.3 SITE DESCRIPTION.....	3
3.3.1 Soil and Geology.....	4
3.3.2 Surface Water.....	4
3.3.3 Groundwater.....	4
4.0 PREVIOUS INVESTIGATIONS AND OTHER ACTIVITIES.....	4
5.0 CLOSURE CONFIRMATION STRATEGY.....	4
5.1 SITE RECONNAISSANCE.....	5
5.2 LIMITED GEOPHYSICAL SURVEY.....	5
5.3 DEBRIS REMOVAL.....	5
5.4 SAMPLE COLLECTION.....	6
6.0 ANALYTICAL RESULTS AND DATA EVALUATION.....	6
7.0 CONCLUSIONS.....	7
9.0 RECOMMENDATIONS.....	8
REFERENCES.....	9

Appendix

A	PHOTOGRAPHS
B	FIELD AND LABORATORY METHODOLOGY
C	METHOD ONE PETROLEUM HYDROCARBON SOIL CLEANUP LEVEL WORKSHEET
D	LABORATORY REPORT
E	DATA QUALITY EVALUATION REPORT

FIGURES

Figure

1	SITE LOCATION
2	SITE LAYOUT AND SAMPLING LOCATION



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**Subject: Draft Closure Confirmation Report
Ice House Lake Boneyard, Two-Party Agreement Site No. 14
Pribilof Islands Site Restoration, St. Paul Island, Alaska
Contract No. 50WCNA906018, Modification No. 56WCNA901077**

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CLOSURE CONFIRMATION REPORT

**ICE HOUSE LAKE BONEYARD
TWO-PARTY AGREEMENT SITE NO. 14
PRIBILOF ISLANDS SITE RESTORATION
ST. PAUL ISLAND, ALASKA**

Prepared for

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CONTENTS

<u>Section</u>	<u>Page</u>
1.0 INTRODUCTION	1
2.0 PROJECT OBJECTIVE.....	1
3.0 BACKGROUND.....	2
3.1 ISLAND HISTORICAL INFORMATION.....	2
3.2 ISLAND ENVIRONMENTAL SETTING	2
3.2.1 Climate	3
3.2.2 Geology and Soil.....	3
3.2.3 Surface Water and Groundwater	3
3.3 SITE DESCRIPTION.....	3
3.3.1 Soil and Geology.....	4
3.3.2 Surface Water.....	4
3.3.3 Groundwater.....	4
4.0 PREVIOUS INVESTIGATIONS AND OTHER ACTIVITIES.....	4
4.1 PRELIMINARY ASSESSMENT (1992).....	4
4.2 DEBRIS REMOVAL (1997)	5
5.0 FIELD INVESTIGATION ACTIVITIES.....	5
5.1 SITE RECONNAISSANCE.....	5
5.2 LIMITED GEOPHYSICAL SURVEY	6
5.3 DEBRIS REMOVAL.....	6
5.4 SAMPLE COLLECTION	6
6.0 ANALYTICAL RESULTS AND DATA EVALUATION	7
7.0 CONCLUSIONS	7
8.0 RECOMMENDATIONS	8
REFERENCES	9

Appendix

- A PHOTOGRAPHS
- B FIELD AND LABORATORY METHODOLOGY
- C LABORATORY REPORT
- D DATA QUALITY EVALUATION REPORT

FIGURES

Figure

- 1 SITE LOCATION
- 2 SITE LAYOUT AND SAMPLING LOCATION

1.0 INTRODUCTION

The National Oceanic and Atmospheric Administration (NOAA), Office of Remediation and Restoration, is responsible for site restoration activities at St. Paul Island, Alaska, which is part of a five-island archipelago known as the Pribilof Islands. Petroleum and other contamination have been identified or potentially may exist at a number of properties currently and formerly owned and operated by NOAA. Affected properties are described in a two-party agreement (TPA) between NOAA and the Alaska Department of Environmental Conservation (ADEC) dated January 26, 1996 (NOAA 1996).

Under State of Alaska regulations and in accordance with the TPA, NOAA is required to undertake site characterization and restoration activities at St. Paul Island. Under Contract No. 50WCNA906018, Modification No. 56WCNA901077, NOAA tasked Tetra Tech EM Inc. (Tetra Tech) to implement a plan for closure confirmation activities at the Ice House Lake (TPA Site No. 14). Tetra Tech conducted the work at the Ice House Lake and several other TPA and non-TPA sites on St. Paul Island during the 1999 field season. Site field work requirements are outlined in the closure confirmation sampling plan (Tetra Tech 1999d). General field work requirements are provided in several master documents, including a master health and safety plan (Tetra Tech 1999a), master investigation-derived waste management plan (Tetra Tech 1999b), and master quality assurance plan (Tetra Tech 1999c).

Tetra Tech prepared this closure confirmation sampling report to document the field work that was conducted in September 1999 at Ice House Lake, summarize analytical data obtained during the course of the field work, and provide recommendations for further action at the site.

In addition to this introduction, this report includes a summary of project objectives (Section 2.0), island and site background information (Section 3.0), a discussion of previous investigations and other activities at the site (Section 4.0), the sampling strategy employed at the site (Section 5.0), analytical results and data evaluation (Section 6.0), conclusions (Section 7.0), and recommendations (Section 8.0). Appendixes to the report include photographs taken at the site (Appendix A), the general field and laboratory methodology used for the project (Appendix B), the laboratory report (Appendix C), and a data quality evaluation report (Appendix D).

2.0 PROJECT OBJECTIVE

The overall project objective for the Ice House Lake site closure confirmation was to develop and implement a plan of action resulting in the collection of sufficient data to (1) justify a "no further action" (NFA) request letter or (2) prepare corrective action specifications that will eventually lead to proper site closure. To fulfill the primary objective, historic data was supplemented with information gathered during the site closure confirmation, and the following secondary objectives were addressed:

- Confirm that petroleum hydrocarbons or other potentially hazardous substances have not been released to the environment.
- Evaluate whether additional sampling, corrective action, remedial action, or no further action is required, pursuant to applicable regulations and stipulations set forth in the TPA.

- Identify the location of buried debris and boundaries of the site.
- Verify that all surface debris is removed.
- Verify that no erosion, seepage, or settlement is occurring over buried debris.
- Verify the thickness of soil cover over buried debris.

3.0 BACKGROUND

This section provides a brief discussion of the location and history of the Pribilof Islands, environmental conditions on St. Paul Island, a site description, and a summary of previous investigations conducted at the site.

3.1 ISLAND HISTORICAL INFORMATION

Russia first discovered St. Paul Island in 1786. In the 1820s, Russia established a settlement on St. Paul Island to support fur seal harvesting. The United States acquired the Pribilof Islands in 1867, when Alaska was purchased from Russia. From 1867 to 1907, the United States contracted fur seal harvesting and pelt processing to private companies. In 1869, the United States made the Pribilof Islands a federal reservation. From 1910 to 1979, the federal government was the sole operator and administrator of the Pribilof Islands. In 1971, the Alaska Native Claims Settlement Act provided for the transfer of property and management of the islands to Alaskan Native corporations.

Major landowners on St. Paul Island are the Tanadgusix Corporation and the federal government. The federal government currently retains title to 1,515 acres on St. Paul Island, which consist of seal rookeries managed by the National Marine Fisheries Service, bird rookeries managed by the U.S. Fish and Wildlife Service, a U.S. Coast Guard station, and a National Weather Service station. The island airport, which consists of about 67 acres, was conveyed to the State of Alaska in 1989.

3.2 ISLAND ENVIRONMENTAL SETTING

St. Paul Island is located between latitude 57°06' and 57°15' north and longitude 170°05' and 170°25' west in the Bering Sea, about 800 miles west-southwest of Anchorage and 300 miles north-northwest of Dutch Harbor, Alaska. The island is about 44 square miles in area (see Figure 1). The city of St. Paul is located on the island's southern peninsula; its 1998 population included 761 people (Alaska Department of Labor 1999).

St. Paul Island has many sand dunes and is vegetated with grasses and small forbs over the majority of its area. The vegetation is broadly classified as moist tundra. Some common plant species include blue lupine, arctic poppy, and sea beach sandwort.

St. Paul Island serves as a nesting area for a great number of seabirds and a rookery area for the northern fur seal. Commercial fish and crab fisheries are located within 15 miles of the island. Major harvest species include halibut as well as King and snow crab.

3.2.1 Climate

The island's climate is classified as subpolar. Maritime weather conditions prevail, with predominantly cloudy, foggy, and windy conditions. According to the National Climatic Data Center (1999), total annual precipitation is 23.32 inches, with most occurring between the months of April and October. The mean monthly temperature ranges from 22.4 °F in winter to 47.7 °F in summer, with a mean annual temperature of 34.7 °F. Monthly average wind speeds range from 12.2 to 20.6 miles per hour, with an average of 17.2 miles per hour.

3.2.2 Geology and Soil

St. Paul Island is composed of basaltic lava flows and sills overlain by a thin veneer of tuffaceous and scoriaceous material, glacial sediment, and sandy material that has formed dunes on the northern and eastern portions of the island. A number of cinder cones rise to a maximum elevation of 665 feet. The cones are moderately steep-sided, with several having craters at their summits. A gently rolling topography, averaging 200 feet in elevation, occurs between the cones.

The shoreline along the Bering Sea ranges from rocky sea cliffs and headlands to short, steep beaches and is generally composed of cobbles, gravel, and sand. The shoreline of the western portion of the island is generally rocky sea cliffs and headlands, with beach shoreline and back dunes present in other portions.

3.2.3 Surface Water and Groundwater

Many lakes are located on St. Paul Island, but no streams are known to exist. The largest lake, Big Lake, is located on the northeastern part of the island. Sheep Lake is located west of Big Lake. Other smaller lakes are located in the southern portion of the island. Lakes with direct estuarine connection to the Bering Sea tend to be brackish, and the remaining lakes are fresh.

The city of St. Paul obtains its municipal water supply from seven wells within a reported groundwater recharge area located immediately northeast of Telegraph Hill and about 1.5 miles north-northeast of the city. The municipal water supply wells reportedly are completed within a basalt aquifer and are connected by pipelines that supply three 200,000-gallon water tanks located on a hill above the city.

3.3 SITE DESCRIPTION

In the TPA, the site is denoted as the Ice House Lake Vehicle Boneyard (TPA Site No. 14). However, no information exists to support the idea that vehicles have ever been junked at the site. Therefore, this site is referred to as the Ice House Lake Boneyard in this report.

The TPA classifies the Ice House Lake Boneyard as a debris site. It is located approximately 1 mile north of the city of St. Paul, and on the eastern side of Ice House Lake (see Figure 1). The site consists of an open, graded area adjacent to the lake. An access road leads from Polovina Turnpike into the southern end of the graded area. South of the graded area is a small, bowl-shaped depression, and east of the site is

a low, north-south trending ridge. Further east of the ridge, hilly terrain gradually slopes up to Diamond Hill. Hilly terrain also is located north of the site.

During 1999 closure confirmation activities, Tetra Tech observed miscellaneous small debris scattered throughout the Ice House Lake Boneyard, including wood, plastic, metal, and concrete demolition rubble. The site appeared to be commonly used by island residents for general dumping, especially of wood waste. In the graded area, surface soil consisted of scoriaceous gravel fill with no vegetation. The adjacent bowl area and ridge were heavily vegetated with common tundra grasses.

3.3.1 Soil and Geology

Surface soil data are derived from observations made during shallow subsurface investigation activities conducted along the ridge east of the site during the 1999 field season. Soil on the ridge consists brown, silty, fine- to medium-grained sand to a depth of about 3 feet below ground surface (bgs). Tetra Tech did not install boreholes at the site, so deeper geology was not defined, and the depth to bedrock is unknown.

3.3.2 Surface Water

The nearest surface water body is Ice House Lake, adjacent to and west of the graded area. Lukanin Bay is located beyond Diamond Hill, about 0.4 mile east of the site.

3.3.3 Groundwater

Groundwater was not encountered during 1999 site closure confirmation activities. Because of the site's proximity to Ice House Lake, groundwater likely is present at a depth close to the lake level. The depth to water is estimated to be less than 5 feet bgs at the graded area, and 10 to 15 feet bgs along the low ridge east of the site.

4.0 PREVIOUS INVESTIGATIONS AND OTHER ACTIVITIES

Previous activities conducted at the Ice House Lake Boneyard include a 1992 preliminary assessment by Ecology and Environment, Inc. (E&E), and a 1997 debris removal activity by Aleutian Enterprises.

4.1 PRELIMINARY ASSESSMENT (1992)

In 1992, E&E conducted a preliminary assessment at the Ice House Lake Boneyard (E&E 1993). During the PA, E&E performed a visual inspection of the site, noting one or two abandoned, 500-gallon aboveground storage tanks (AST) and several drums located on the ground, as well as submerged drums and piping in Ice House Lake (E&E 1993). According to the preliminary assessment report, stained soil or stressed vegetation were not observed at the site.

4.2 DEBRIS REMOVAL (1997)

During a Phase I debris removal project conducted in 1997, Aleutian Enterprises removed one abandoned AST of unspecified size, five rusted steel drums, and some submerged piping in Ice House Lake (Aleutian Enterprises 1997). After the debris removal was completed, NOAA personnel inspected the site and identified debris that remained. Specifically, NOAA observed various 55-gallon drums and a 500- to 600-gallon steel AST at the site. NOAA speculated that the tank's interior may have been painted with lead-based paint but did not indicate whether the tanks were empty. NOAA personnel also observed wood debris, pallets, and other materials placed or stored near the site (NOAA 1998).

5.0 FIELD INVESTIGATION ACTIVITIES

Field procedures for closure confirmation activities are described in this section. Field activities were performed in compliance with the closure confirmation sampling plan (Tetra Tech 1999d) as well as the master health and safety plan (Tetra Tech 1999a), investigation-derived waste management plan (Tetra Tech 1999b), and quality assurance plan (Tetra Tech 1999c). The quality assurance plan supplements this report, and includes a detailed discussion of sample handling procedures, QA objectives, data review, and analytical methods for this project. General field and laboratory methodologies that were used during the 1999 field effort at the Ice House Lake Boneyard and other TPA sites are discussed in Appendix B.

The following sections describe strategy employed to conduct closure confirmation activities at the site, including site reconnaissance, limited geophysical survey, debris removal, and sample collection.

5.1 SITE RECONNAISSANCE

The Ice House Lake Boneyard is located about 1.5 miles north of the city of St. Paul, along the eastern side of Ice House Lake. During the reconnaissance, Tetra Tech field personnel observed the presence of wooden pallets, large wood debris, and miscellaneous construction debris within the gravel-covered, graded area that forms the site. Tetra Tech observed obvious signs of open dumping of these materials, as well as open burning of the scrap lumber within the graded area. It appeared that the area is used quite often for bonfires.

Upon arrival on St. Paul Island in August, Tetra Tech observed that the site had been recently graded, with surface soil being scraped from the interior of the site and pushed toward the site perimeter. Tetra Tech noted that open dumping occurred throughout the 1999 field season. Tetra Tech also observed several bonfires at the site during evening and night hours. On at least two occasions, Tetra Tech observed construction equipment being used to move some of the debris offsite, and to push some of the debris toward the graded area's perimeter. Tetra Tech did not observe any stained soil within the graded area. The tanks and drums observed by NOAA (1998) also were not present at the site.

During the reconnaissance, field personnel observed several buried drums in the low ridge east of the site. The ridge was overgrown with common tundra grass and did not appear to have been recently disturbed. Again, Tetra Tech observed no evidence of staining.

A shallow bowl area adjacent to and south of the graded area appeared to have been excavated at least several years ago, based on the thick tundra vegetation currently present. Field personnel observed no debris or evidence of stained soil in the bowl.

Tetra Tech observed no indications of surface drainage channels, wind erosion, subsidence, or sloughing. Based on visual observations made at the site, soil erosion, seepage of petroleum hydrocarbons or other materials, or earth settlement do not appear to be occurring at the site.

5.2 LIMITED GEOPHYSICAL SURVEY

Tetra Tech personnel conducted a limited geophysical survey of the site, the bowl area, and the ridge using a Schonstedt Model GA-52CX hand-held magnetometer. Magnetic anomalies were marked with pin flags and surveyed. The majority of these anomalies were located on the ridge and the sides of the bowl area. Tetra Tech later investigated these anomalies using shovels and hand tools to unearth potential debris. Tetra Tech identified a 4-foot metal pipe on the soil surface but beneath the vegetation on the slope outside the bowl area. As discussed above, the magnetometer survey also identified several drums partially buried in shallow soil along the low ridge east of the site.

All other anomalies were investigated with shovels and determined to be basalt cobbles or boulders. With the exception of the metal pipe, no other significant anomalies were observed.

5.3 DEBRIS REMOVAL

Using a backhoe and hand tools, Tetra Tech unearthed portions of about seven drums from the low ridge along the site's eastern side. The drums were empty, rusty, broken, and dilapidated, and they appeared to have been empty and dented at the time of burial. The soil beneath and around the drums appeared to be native to the immediate area and exhibited no evidence of staining.

As each drum was removed from the excavation, Tetra Tech field personnel swept the excavation and the filled backhoe bucket with the magnetometer and hand tools, identifying and segregating drums and other metal debris. The drums and metallic debris were transported to the designated debris staging area at Tract 38.

The area excavated on the top of the ridge measured about 15 feet square and 3 feet deep. Tetra Tech visually inspected the excavation and observed no evidence of staining beneath the removed drums. After collecting a confirmation soil sample from location 14SS01 beneath the drum location, Tetra Tech backfilled the hole with the excavated soil.

5.4 SAMPLE COLLECTION

Following debris removal activities, Tetra Tech field personnel collected a single confirmation soil sample (14SS01) from the excavation, at a location beneath the removed drums (see Figure 2). Soil was first removed to a depth of about 1 foot beneath the drums, and the sample was collected from the sidewall using a decontaminated, stainless steel trowel. The soil sample was analyzed offsite by

Columbia Analytical Services, Inc. (Columbia), for gasoline range organics (GRO); diesel range organics (DRO); residual range organics (RRO); benzene, toluene, ethylbenzene and total xylenes (BTEX); polycyclic aromatic hydrocarbon (PAH); chlorinated solvents; and metals (arsenic, cadmium, chromium, and lead).

6.0 ANALYTICAL RESULTS AND DATA EVALUATION

Columbia analyzed one confirmation soil sample collected at the Ice House Lake Boneyard. A copy of the Columbia laboratory data report, including chain-of-custody forms, is provided in Appendix C. A data quality evaluation report is provided in Appendix D.

GRO, DRO, RRO, BTEX, chlorinated solvents, and PAHs all were reported below their respective practical quantitation limits, and Columbia achieved the minimum practical quantitation limits (PQL) required by ADEC (1999).

Of the four metals analyzed, arsenic was detected at 5.00 milligrams per kilogram (mg/kg), cadmium at 1.08 mg/kg, chromium at 57.8 mg/kg, and lead at 6.30 mg/kg. Each metal was detected at levels near background concentrations for St. Paul Island (Tetra Tech 2000).

7.0 CONCLUSIONS

Based on analytical data collected by Tetra Tech during the 1999 field effort, none of the organic contaminants analyzed for were detected above their respective PQLs. Naturally occurring, inorganic elements were detected at levels approximating background concentrations on St. Paul Island.

Based on the work completed during the 1999 field effort, Tetra Tech has met the objectives identified in the closure confirmation plan (Tetra Tech 1999d). The following list summarizes each of the project objectives and briefly describes how they were met.

- **Confirm that petroleum hydrocarbons or other potentially hazardous substances have not been released to the environment.** Tetra Tech visually inspected the site, removed partially buried drums and drum remnants, and collected a soil confirmation sample beneath buried drums. Based on the analytical data, no releases have occurred. Releases are not suspected elsewhere at the site.
- **Evaluate whether additional sampling, corrective action, remedial action, or no further action is required, pursuant to applicable regulations and stipulations set forth in the TPA.** Tetra Tech conducted an interim removal action by excavating several rusty, empty drums and drum remnants. No other significant, historical, subsurface debris has been identified. The site currently is used as an open dump and open burning area by various island residents or entities.
- **Identify the location of buried debris and boundaries of the site.** The site's location and approximate boundaries have been adequately mapped. Locations of the removed partially buried drums and miscellaneous surface debris also have been mapped.

- **Verify that all surface debris is removed.** Tetra Tech removed the partially exposed drums and verified that other metallic debris was not present beneath the drums using a hand-held magnetometer. Surface debris was removed from the site at least twice during the 1999 field season by an island entity, but the site is used as an open dump, and additional debris was deposited shortly after the debris had been removed.
- **Verify that no erosion, seepage, or settlement is occurring over buried debris.** Other than debris buried when the site is routinely graded, Tetra Tech did not identify buried debris at the site. Tetra Tech observed no indications of surface drainage channels, wind erosion, subsidence, or sloughing. Erosion, seepage, or settlement does not appear to be occurring at the site.
- **Verify the thickness of soil cover over buried debris.** Other than debris buried when the site is routinely graded, Tetra Tech did not identify buried debris at the site.

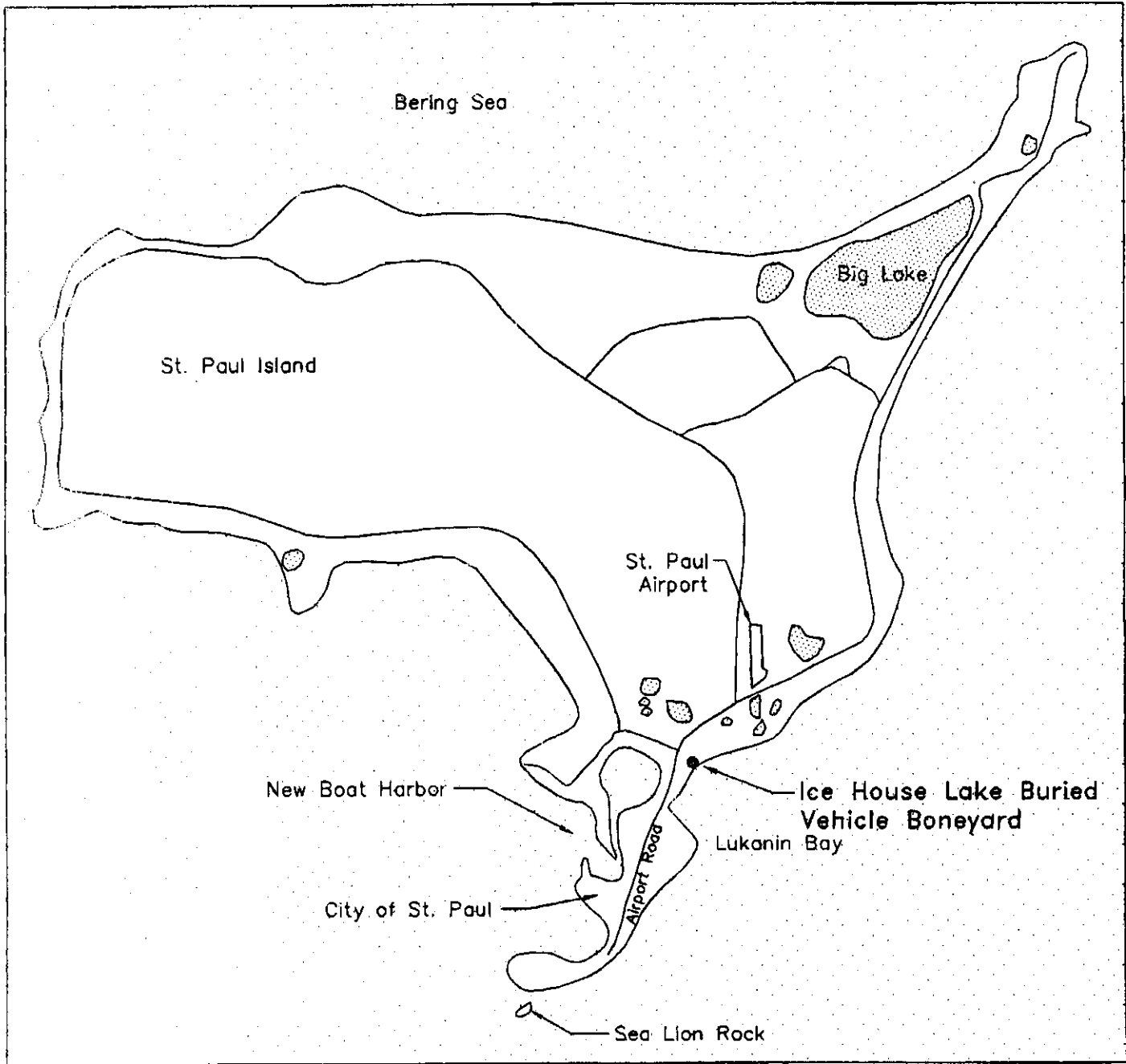
8.0 RECOMMENDATIONS

Based on previous investigations, as well as field observations and analytical data obtained during the 1999 sampling event at the Ice House Lake Boneyard, neither further investigative work nor corrective action are warranted at the site. NOAA should request that ADEC grant the site NFA status.

REFERENCES

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FIGURES



NOT TO SCALE

ICE HOUSE LAKE BONEYARD
ST. PAUL ISLAND, ALASKA

FIGURE 1
SITE LOCATION

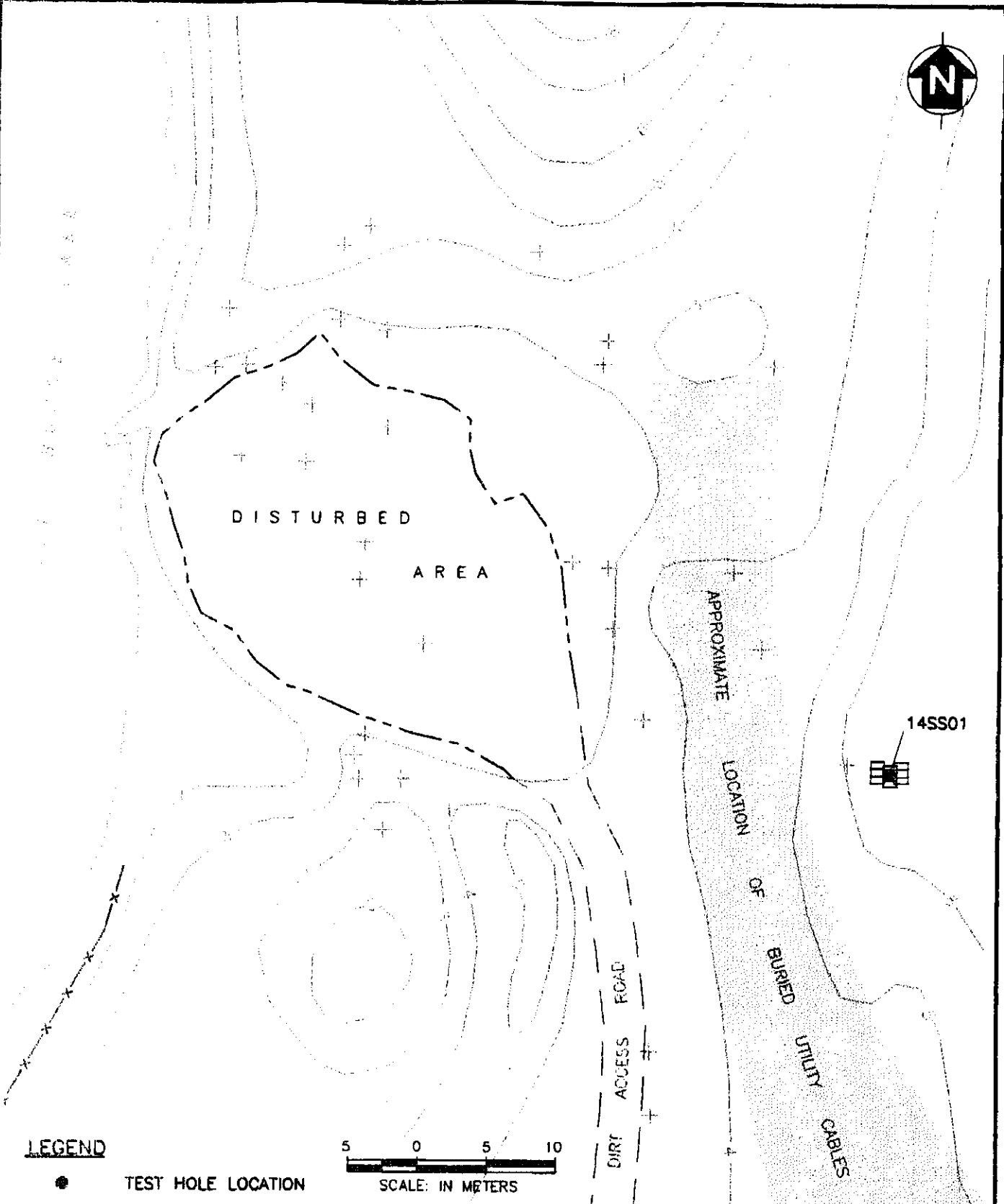


Tetra Tech EM Inc.

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LEGEND

- TEST HOLE LOCATION
- ⊕ MAGNETIC ANOMALY
- LIMITS OF DISTURBED AREA
- x-x- BARBED WIRE FENCELINE
- ▭ PARTIALLY BURIED DRUMS



NOTE: CONTOUR INTERVAL ONE METER

ICE HOUSE LAKE BONEYARD
ST. PAUL ISLAND, ALASKA

FIGURE 2
SITE LAYOUT AND
SAMPLING LOCATION MAP

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