FINAL

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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1.0 INTRODUCTION

The National Oceanic and Atmospheric Administration (NOAA), National Ocean Service, Office of Response 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 site characterization activities at the Little Polovina Hill Vehicle Boneyard (TPA Site No. 3). Tetra Tech conducted the work at the Little Polovina Hill Vehicle Boneyard 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 site characterization report to document the field work that was conducted in September and October 1999 at the Little Polovina Hill Vehicle Boneyard, 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 closure confirmation 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 Little Polovina Hill Vehicle Boneyard 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" 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 characterization, 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 and boundaries of the site.
- Verify that all surface debris has been removed.
- Verify that no erosion, seepage, or settlement is occurring over any identified buried debris.
- Verify the thickness of soil over any identified 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, and a site description.

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 northern 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 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, and St. Paul was incorporated in June of that year (Torrey 1978).

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 1999 population included 673 people (Alaska Department of Labor 2000). St. Paul Harbor, which opened in 1990, is reported to be one of Alaska's most important commercial fishery processing and supply ports (CBSFA, undated).

The following subsections discuss the island's climate, geography, geology and hydrogeology, surface water resources, groundwater resources, flora, and fauna.

3.2.1 Climate

The climate at St. Paul Island is classified as subpolar. Maritime weather conditions prevail, with predominantly cloudy, foggy, and windy conditions.

According to the National Climatic Data Center (NCDC 2000), the average annual precipitation for the 30-year period ending in 1998 was 23.32 inches. Average monthly precipitation ranges from a low of 1.22 inches in March to a high of 2.81 inches in October (NCDC 2000). According to NWS, the maximum daily rainfall ever recorded on St. Paul Island is 1.93 inches, which was recorded on October 6, 1949. The maximum annual precipitation ever recorded on the island is 36.61 inches, which was recorded in 1964 (NWS 2000).

Average monthly snowfall (including ice pellets and sleet) ranges from none in the summer months of July and August to a maximum of 11.6 inches in January (NCDC 2000). NWS reports that the maximum daily snowfall ever recorded on the island is 13.8 inches, which was recorded on January 30, 1964. That same year experienced the maximum annual snowfall ever recorded on St. Paul Island—158.6 inches (NWS 2000).

The mean monthly temperature at St. Paul Island ranges from 22.4 °F in February to 47.7 °F in August. The annual mean temperature is 34.7 °F (NCDC 2000). Based on 82 years—1917 through 1999—of meteorological data available for St. Paul Island, temperature extremes include a low of –26 °F and a high of 66 °F.

Because of their location in the Bering Sea, the Pribilof Islands are quite windy. The average monthly wind speed ranges from a low of 12.2 miles per hour (mph) in July to 20.6 mph in December (NCDC 2000). Although calm days are recorded, storms are not uncommon on St. Paul Island, and gale-force winds are recorded fairly often, especially during the winter months. The fastest sustained wind ever recorded on the island was 84 mph, recorded in November 1990 (NWS 2000).

3.2.2 Geography

The terrain on St. Paul Island is quite diverse, consisting of diverse and rocky uplands, rugged hills, and smooth volcanic cones that fade into the sea; into broad expanses of wet, flat tundra; or into dry, drifting sand dunes. The island is surrounded by 42 miles of shoreline. The southern and western shorelines predominantly are characterized by high bedrock cliffs, low bluffs, and rock platforms. Boulder beaches and basalt shelves often are present at the base of cliffs and bluffs. The shoreline along the island's northern and eastern sides consists primarily of sandy beaches; some gravel and rocky beaches also are present. The St. Paul Harbor is protected by breakwater structures composed of boulders, affording the harbor and Salt Lagoon with some protection from the harsh Bering Sea environment (Elliot 1976; NOAA and USCG 1998).

3.2.3 Geology and Hydrogeology

The Bering Sea is a triangular basin between Alaska and Siberia; it is bounded to the south by the Aleutian Island chain. The Pribilof Islands are situated within the triangular basin near the edge of the Bering Sea shelf, a notably flat and shallow (100 fathoms or less) feature in the northeastern part of the basin. The Pribilof Islands area was built up by large fissure volcanic eruptions that occurred in the late Pleistocene (about 100,000 to 10,000 years ago). The geology of the Pribilof Islands consists of lava flows and sills, with lesser amounts of pyroclastic (explosive volcanic ejecta) and tuffaceous (fine-grained volcanic fragments, particularly ash) material, as well as glacial deposits (Barth 1956).

The bedrock geology of St. Paul Island consists primarily of basaltic lava flows and sills. A majority of the flows and sills are porphyritic (containing larger crystals, or phenocrysts in a fine-grained matrix), with primarily olivine phenocrysts and a very fine-grained groundmass of augite, plagioclase, olivine, magnetite and glass. No trace of glaciation is observed on the surface of St. Paul Island. However, glacial sediments have been noted to occur between lava flows and sills in many locations on the island, indicating glaciation between periods of volcanic activity. The most prominent topographic landmarks on the island are relict features related to pyroclastic events, including Bogoslof Hill—a volcanic cone—and Crater Hill—an explosion crater (Barth 1956).

Surface geology consists of weathered volcanic materials and recently-formed alluvial sediments composed primarily of sand. Sand covers about one-seventh of the island (Barth 1956).

At St. Paul Island, groundwater is contained and transmitted within fractures in the volcanic rocks. The absence of streams on the island suggests rapid infiltration of rainwater and snowmelt and implies relatively high permeabilities and porosities in subsurface materials. In the central, upland portion of the island, groundwater occurs in fractured basalt aquifers that are the drinking water resource used on the island (Woodward-Clyde 1994). Groundwater also occurs in the unconsolidated materials on the island. However, because of their low elevation and proximity to the coast, these shallow, localized aquifers may contain nonpotable water, especially toward the sea. In addition, it is unlikely that aquifers in the unconsolidated deposits could provide a sustainable municipal drinking water source, because significant pumping most likely would induce saltwater intrusion.

Depth to groundwater in the regional, fractured basalt aquifer occurs at depths between 38 and 80 feet below ground surface (bgs), based on measurements made in the municipal supply wells. Groundwater elevations range from about 1 to 3 feet above mean sea level (Dames and Moore 1999). The aquifer's transmissivity is estimated at 0.1 to 2.5 million gallons of water per day per foot (URS 1987; Munter and Allely 1994). Based on the island's topography, regional groundwater flow is most likely radial from the central, upland part of the island (groundwater recharge area) toward the coast (groundwater discharge area). Based on geologic conditions, locally differing groundwater flow directions also may exist.

3.2.4 Surface Water Resources

As discussed in Section 3.2.3, no streams exist at St. Paul Island. Surface water on the island generally is contained in small, shallow lakes. Big Lake and Sheep Lake are the two largest lakes on the island and are located in the northeastern part of the island. Smaller lakes are situated near the southeastern coast of the island and typically are located nearer the shoreline than the interior.

3.2.5 Groundwater Resources

The City of St. Paul obtains its water supply from seven municipal wells that are located northeast of Telegraph Hill and about 1.5 miles northeast of the city. The municipal water supply wells are completed within the regional fractured basalt aquifer. Groundwater is pumped from the wells by pipelines to three 200,000-gallon aboveground water storage tanks located on a hill west of the city. The water is treated with chlorine and fluoride prior to distribution.

3.2.6 Flora

The habitat at St. Paul Island is broadly classified as moist tundra (USDA 1972). The island consists of two major geophysical provinces, including the sand dunes most common on the northern and eastern portions of the island, as well as the rocky tundra common throughout most of the remainder of the island. Much of the island contains a variety of grasses, forbs, berries, and low trees that grow prostrate, rarely exceeding 2 to 3 inches in height. Common species include arctic lupine (*Lupinus arcticus*), creeping willow (*Salix* spp.), and mossberry (*Rubus arcticus*), a close relative of salmonberry and raspberry.

3.2.7 Fauna

The Pribilof Islands are considered to be one of the most environmentally sensitive areas in North America, providing a near-pristine environment for a great number of birds and sea mammals that migrate thousands of miles to breed, nest, and raise their young over the summer and fall months.

Marine Mammals. The Pribilof Islands are perhaps best known for the large population of northern fur seals (*Callorhinus ursinus*) that crowd the beach rookeries each summer. The present population at St. Paul Island and adjacent Sea Lion Rock is estimated at 700,000 to 800,000 individuals, the largest concentration in North America (Murie and Scheffer 1959; NOAA and USCG 1998). Other marine mammals found more rarely in waters and near shore areas of the Pribilof Islands include the Pacific walrus (*Odobenus rosmarus*)and harbor seal (*Phoca vitulina*). The Steller sea lion (*Eumetopias jubatus*), a Federally- and State-designated endangered species, also can be found in the near-shore environment at St. Paul Island.

In addition to these smaller mammals that occasionally haul out on the land, several whale species visit the islands occasionally, including the orca (*Grampus rectipinna*), gray (*Eschrichtius glaucus*), and minke

(*Balaenoptera acutorostrata*). Whales may pass by the islands during migration periods or during their summer residence in the North Pacific Ocean or Bering Sea (NOAA and USCG 1998).

During the winter months, pack ice occasionally extends into the Pribilof Islands. During these occurrences, several other mammals may be found in the pack ice or along the ice front , including the bearded seal (*Erignathus barbatus*), ringed seal (*Pusa hispida*), ribbon seal (*Histriophoca fasciata*), and bowhead whale (*Balaena mysticetus*). The bowhead whale is a Federally designated threatened species (NOAA and USCG 1998).

Land Mammals. Few land mammals exist on St. Paul Island. Native to the island are the arctic fox (*Alopex lagopus*) and the Pribilof shrew (*Sorex pribilofensis*), which is considered to be a species of special concern (NOAA and USCG 1998). Reindeer (*Rangifer* sp.) have been introduced to the island, and a herd numbering in the hundreds currently resides on St. Paul Island.

Birds. The Pribilof Islands are seasonal home to several million birds. Murres (*Uria* sp.) have the largest population numbers, followed by auklets , including the parakeet auklet (*Cyclorrhynchus psittacula*), crested auklet (*Aethia cristatella*), and least auklet (*A. pusilla*). A number of pelagic bird species also inhabit St. Paul Island, including the kittiwakes (*Rissa* sp.), fulmar (*Fulmarus* sp.), and tufted and horned puffin (*Fratercula cirrhata* and *F. corniculata*, respectively).

In addition, substantial seasonal populations of shorebirds inhabit St. Paul Island, including turnstones (*Arenaria* sp.), phalaropes (*Phalaropus* sp.), and other sandpipers of the family *Scolopacidae*. A number of waterfowl overwinter on the Pribilof Islands as well.

Most of the marine birds found on the islands generally forage throughout the surrounding waters. However, harlequin ducks (*Histrionicus histrionicus*) generally are found in waters closer to shore. Most species migrate to the islands for breeding during May or June. Murres, auklets, puffins, kittiwakes, fulmars, and cormorants (family *Phalacrocoracidae*) nest in or at the base of the high cliffs surrounding the southern and western portions of St. Paul Island (NOAA and USCG 1998).

Fish and Shellfish. Large fish populations support the enormous numbers of birds and marine mammals found at the Pribilof Islands. No streams or rivers are located on St. Paul Island, so local anadromous and freshwater fisheries are not supported. A variety of important saltwater fish spawn in the waters surrounding the islands from February to June, including the Pacific cod (*Gadus macrocephalus*), walleye pollock (*Theragra chalcogramma*), and Pacific halibut (*Hippoglossus stenolepis*) (NOAA and USCG 1998).

The islands are near major shellfish harvesting areas. Several species of crab occur nearby, including the red, blue, and brown king (*Paralithodes* sp.) and snow (*Chionoecetes* sp.). Although all species are present year-round, the duration of the commercial crab-harvesting season is limited for all species except the brown king crab. Crab spawning and hatching occurs primarily between January and June (NOAA and USCG 1998).

Local fisheries are vital to the economy of St. Paul Island, and the island is located within 65 miles of over 50 percent of the nation's commercial fisheries. The halibut fishery alone is a major source of employment and income for the residents of St. Paul Island, residents, providing crew and baiting jobs for more than 130 people in the summer months. According to the Central Bering Sea Fisherman's Association (CBSFA), the 1999 halibut fishery was expected to contribute at least $1.25 million to the local economy (CBSFA 1998). Other fisheries that historically have contributed to the local economy include pacific cod, sea snails, snow crab, and red and blue king crab (CBSFA, undated).

3.3 SITE DESCRIPTION

The Little Polovina Hill Vehicle Boneyard (TPA Site No. 3) is classified as a debris site under the TPA. It is located at the northern end of the island, east of Little Polovina Hill and about 1 mile south of the Bering Sea shoreline (see Figure 1). The site contains a single, partially buried vehicle frame consisting of an engine, a differential, and a radiator. Tetra Tech also observed a second engine block, a steering column assembly, and miscellaneous vehicle debris near the frame. The area immediately surrounding the vehicle was relatively flat, with common tundra vegetation present.

3.3.1 Soil and Geology

The site is located in a relatively flat, sandy environment near the sand dunes along the northern portion of the island. Surface soils in the area appeared to be a sandy loam. The thickness of the surface soil and the depth to bedrock are not known.

3.3.2 Surface Water

The Little Polovina Hill Vehicle Boneyard is about 1 mile south of the Bering Sea and about 0.6 mile south-southwest of Sheep Lake. No fresh water bodies are located at or adjacent to the site.

3.3.3 Groundwater

Groundwater was not encountered during the 1999 closure confirmation activities, but because of the site's proximity to the Bering Sea, groundwater likely is present at a depth approximating sea level. The depth to water is estimated to be about 40 feet below ground surface (bgs).

4.0 PREVIOUS INVESTIGATIONS AND OTHER ACTIVITIES

In 1992, Ecology and Environment, Inc. (E&E), conducted a preliminary assessment at the Little Polovina Hill Buried Vehicle Boneyard (E&E 1993). During the preliminary assessment, E&E investigators identified one abandoned U.S. Army vehicle and one tire on the ground adjacent to the road flanking the eastern side of Little Polovina Hill. E&E did not observe evidence of other vehicles during the assessment. The area was completely vegetated, with no visible evidence of stressed vegetation (E&E 1993).

5.0 CLOSURE CONFIRMATION STRATEGY

Field procedures for closure confirmation and sampling 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, quality assurance objectives, data review, and analytical methods for this project. Appendix A contains photographs taken during activities conducted at the site. General field and laboratory methodologies that were used during the 1999 field effort at the Little Polovina Hill Vehicle 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 Little Polovina Hill Vehicle Boneyard is located about 30 feet southeast of the dirt road passing along the eastern side of Little Polovina Hill. During the reconnaissance, Tetra Tech observed a single, partially buried vehicle frame with an engine, a differential, and a radiator still attached. Within the vehicle debris area, Tetra Tech also observed a second engine block, a steering column assembly, and other miscellaneous vehicle debris. Tetra Tech observed some staining on the steering column housing and removed the steering column from the site. However, no soil staining existed in the area near either of the engine blocks.

The area immediately surrounding the vehicle was flat, with common tundra vegetation present and no visible evidence of stressed vegetation. About 20 feet southeast of the abandoned vehicle, Tetra Tech observed two small, excavated areas, the first measuring about 4 feet square and 3 feet deep, and the second measuring about 3 by 6 feet in area and 3 feet deep. The excavated areas appeared to have been dug using a backhoe bucket, although obvious vehicle tracks were not present in the tundra. The excavated area's interior was completely vegetated, and Tetra Tech observed no evidence of staining or debris disposal within the hole (see Figure 2). Tetra Tech did not observe the tire mentioned in the 1992 E&E preliminary assessment report. Apparently, the tire was removed prior to the site reconnaissance.

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 within a 30-foot radius of the vehicle carcass using a Schonstedt Model GA-52CX hand-held magnetometer. Magnetic anomalies were marked with pin flags and surveyed. Using shovels, Tetra Tech investigated the three anomalies that were

identified, revealing the presence of a piece of scrap metal, a brake shoe, and a deteriorated truck tailgate. All of this debris was found at a depth of about 6 inches bgs. No other geophysical anomalies were identified at the site.

5.3 DEBRIS REMOVAL

Tetra Tech personnel drained all accessible automotive fluids from vehicle components at the Little Polovina Vehicle Boneyard. One oil filter canister was removed from the isolated engine block; it exhibited a trace of oil, but the valve covers had been removed from the engine block, and it was otherwise dry. Because no soil staining was visible, it appeared that the valve covers were removed and the oil drained before the engine block was placed at the site. Tetra Tech transported the steering column assembly back to the investigation-derived waste management area at the Garco Building located west of the National Marine Mammal Laboratory parking lot, where fluids were drained from the assembly into a bucket. After the steering wheel assembly was emptied, it was filled with sorbent material and placed in the designated debris staging area at Tract 38, located immediately north of Polovina Hill.

The engine mounted to the vehicle frame appeared to be intact, with the valve cover and what appeared to be an oil filter canister still attached. Field personnel removed the oil filter canister and drained the residual oil from it before placing it in the debris staging area. Using a shovel, field personnel unearthed the vehicle's rear differential. The differential appeared intact, and no staining was observed in the soil surrounding it. The engine's oil pan also appeared to be intact. However, both the differential and the oil pan were buried, so field personnel were unable to remove the fluids contained therein before the vehicle frame was removed from the site.

Foster-Wheeler Environmental Corporation, another NOAA contractor, contracted with Bering Sea Eccotech, Inc. to remove large debris, such as vehicle frames, engine blocks, and wheel assemblies, from the Little Polovina Hill Vehicle Boneyard. The vehicle frame and engine blocks were removed to a warehouse, where they were cut into smaller pieces. After the large debris was removed, Tetra Tech picked up small debris remaining at the Little Polovina Hill Vehicle Boneyard. All debris was placed at the debris staging area in accordance with the investigation-derived waste plan (Tetra Tech 1999c). Tetra Tech observed no visible evidence of soil staining beneath the removed vehicle, its components, and other debris at the site.

5.4 SAMPLE COLLECTION

Following metal debris removal activities, Tetra Tech field personnel collected a single soil confirmation sample (03SS01-010) from beneath the former location of the vehicle's engine, the area most likely impacted by fluids that would have been potentially released from the vehicle (see Figure 2). Field personnel used a shovel to dig to a depth about 1 foot bgs and then used a decontaminated, stainless steel trowel to collect soil scraped from the sidewalls. The soil sample was analyzed offsite by Columbia Analytical Services, Inc. (Columbia), an ADEC-approved laboratory, for gasoline range organics (GRO); diesel range organics (DRO); residual range organics (RRO); benzene, toluene, ethylbenzene and total

xylenes (BTEX); polycyclic aromatic hydrocarbons (PAH); chlorinated solvents; and metals (arsenic, cadmium, chromium, and lead).

6.0 ANALYTICAL RESULTS AND DATA EVALUATION

Columbia analyzed one confirmation soil sample (03SS01-010) collected at the Little Polovina Hill Vehicle Boneyard. A copy of the Columbia laboratory data report, including chain-of-custody forms, is provided in Appendix D. A data quality evaluation report is provided in Appendix E.

GRO, 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).

DRO was detected at 23 milligrams per kilogram (mg/kg) in the sample. This concentration was compared to the site-specific Method One Petroleum Hydrocarbon Soil Cleanup Levels specified at 18 AAC 75.341(a). The site-specific information used to determine the applicable Method One soil cleanup levels is presented in Appendix C. Based on this site-specific information, a DRO cleanup level of 2,000 mg/kg is applicable at the site.

Of the four metals analyzed, arsenic was detected at 3.08 mg/kg, cadmium at 1.06 mg/kg, chromium at 80.3 mg/kg, and lead at 2.15 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, organic contaminant concentrations at the Little Polovina Hill Vehicle Boneyard are well below applicable cleanup levels. Petroleum hydrocarbons were detected below all applicable cleanup levels specified at 18 AAC 75.341(a), and other organic chemicals were not 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, drained all accessible fluids, removed potentially stained soil, removed vehicle components, field screened soil potentially impacted by vehicles, and collected soil confirmation samples. Based on the analytical data, no releases have occurred.

- **Evaluate whether additional sampling, corrective action, or no further action is required, pursuant to applicable regulations and stipulations set forth in the TPA.** Tetra Tech instituted interim corrective action by removing fluids and potential sources and by removing small amounts of stained soil. Based on these actions, no further action is necessary.

- **Identify the location and boundaries of the site.** The site's location and approximate boundaries, as well as abandoned vehicle debris locations, have been adequately mapped.

- **Verify that all surface debris has been removed.** Tetra Tech verified that the vehicle chassis, engine, radiator, and differential, as well as associated debris observed at the site, have been removed.

- **Verify that no erosion, seepage, or settlement is occurring over any identified buried debris.** Tetra Tech observed no indications of surface drainage channels, wind erosion, subsidence, or sloughing. Based on visual observations, erosion, seepage, or settlement does not appear to be occurring at the site.

- **Verify the thickness of soil over any ide ntified buried debris.** By conducting a limited geophysical survey, Tetra Tech identified and excavated three pieces of buried metal debris from about 6 inches bgs. Tetra Tech encountered no other buried metal debris at the site.

9.0 RECOMMENDATIONS

Based on previous investigations, as well as field observations and analytical data obtained during the 1999 sampling event at the Little Polovina Hill Vehicle Boneyard, neither further investigative work nor corrective action are warranted at the site. NOAA should request that ADEC grant the site no further action status.

REFERENCES

Alaska Department of Environmental Conservation (ADEC). 1999. *Underground Storage Tanks Procedures Manual, Guidance for Treatment of Petroleum-Contaminated Soil and Water and Standard Sampling Procedures.* March 1.

Alaska Department of Labor. 2000. Internet Site http://www.labor.state.ak.us/research/pop/place1.htm. January 15.

Barth, T.F.W. 1956. "Geology and Petrology of the Pribilof Islands, Alaska." U.S. Geological Survey Bulletin 1028-F.

Central Bering Sea Fisherman's Association (CBSFA). Undated. "St. Paul Harbor, Alaska's Sustainable Opportunity."

CBSFA. 1998. Annual Report.

Ecology and Environment, Inc. (E&E). 1993. "Preliminary Assessment of the National Oceanic and Atmospheric Sites, Pribilof Islands, Alaska." February.

Elliott, H.W. 1976. "The Seal-Islands of Alaska." Limestone Press, Kingston, Ontario, Canada.

Dames and Moore. 1999. "Hydrologic Monitoring Investigation, Fourth Quarterly Sampling Event, September 1998, USCG LORAN Station, St. Paul, Alaska, Final Report." Prepared for U.S. Coast Guard, Juneau, Alaska. January.

Munter, J.A. and R.D. Allely. 1994. "Analysis of an Aquifer Test at St. Paul Island. Pribilof Islands, Alaska." State of Alaska Division of Geological and Geophysical Surveys. Public Data File No. 94-27.

Murie, O.J. and V.B. Scheffer. 1959. "Fauna of the Aleutian Islands and Alaska Peninsula, With Notes On Invertebrates and Fishes Collected in the Aleutians, 1936-38." U.S. Fish and Wildlife Service Publication No. 61. U.S. Government Printing Office. Washington, D.C.

National Climatic Data Center (NCDC). 2000. Internet Site http://www.ncdc.noaa.gov/ol/climate/research/ ushcn/ushcn.html. January 15.

National Oceanic and Atmospheric Administration (NOAA). 1996. "Pribilof Islands Environmental Restoration Two-Party Agreement." AGO File No. 661-95-0126. January 26.

NOAA and U.S. Coast Guard (USCG). 1998. Plate Entitled *Pribilof Islands, Alaska, Environmentally* Sensitive Areas (Seal Islands National Historic Landmark and Part of the Alaska Maritime National Wildlife Refuge). August.

National Weather Service (NWS). 2000. Telephone Conversation Between Robert Van De Graff, NWS, and Debbie Kutsal, Tetra Tech EM Inc. January 13.

Tetra Tech EM Inc. (Tetra Tech). 1999a. "Final Master Health and Safety Plan, Pribilof Islands Site Restoration, St. Paul Island, Alaska." September 22.

Tetra Tech. 1999b. "Final Master Investigation-Derived Waste Plan, Pribilof Islands Site Restoration, St. Paul Island, Alaska." September 22.

Tetra Tech. 1999c. "Final Master Quality Assurance Plan, Pribilof Islands Site Restoration, St. Paul Island, Alaska." September 22.

Tetra Tech. 1999d. "Draft Final Closure Confirmation Sampling Plan, Little Polovina Hill Vehicle Boneyard, Two-Party Agreement Site No. 03, Pribilof Islands Site Restoration, St. Paul Island, Alaska." October 1999.

Tetra Tech. 2000. "Background Metals Concentrations, Pribilof Islands Site Restoration, St. Paul Island, Alaska." December 31.

Torrey, B.B. 1978. "Slaves of the Harvest." Tanadgusix Corporation. St. Paul Island, AK.

URS Corporation (URS). 1987. "City of St. Paul Water Supply Analyses Study – Final Report."

U.S. Department of Agriculture (USDA). 1972. Alaska Trees and Shrubs. Agriculture Handbook No. 410.

Woodward-Clyde Corporation (Woodward-Clyde). 1994. "Site Inspection Report, St. Paul Island, Alaska." Prepared for U.S. Army Corps of Engineers, Seattle, Washington. November.

FIGURES

APPENDIX A

PHOTOGRAPHS

APPENDIX B

FIELD AND LABORATORY METHODOLOGY

APPENDIX C

SITE-SPECIFIC METHOD ONE CLEANUP LEVEL WORKSHEET

APPENDIX D

LABORATORY REPORT

APPENDIX E

DATA QUALITY EVALUATION REPORT

LITTLE POLOVINA HILL VEHICLE BONEYARD
PHOTOGRAPHS

Photograph No. 1 [787160-1A]
Date: September 7, 1999
This photograph shows the chassis engine block, a portion of the steering column assembly, and the miscellaneous vehicle debris at the Little Polovina Hill Vehicle Boneyard.

Photograph No. 2 [787160-2A]
Date: September 7, 1999
This photograph shows a National Oceanic and Atmospheric Administration (NOAA) representative removing soil to access and assess the rear differential. The isolated engine block can be seen at left, the vehicle chassis in the center, and the steering column assembly at the right. Miscellaneous vehicle debris can be seen scattered around the vehicle chassis.

Photograph No. 3 [787160-3A]
Date: September 7, 1999
This photograph shows the partially unearthed rear differential. The differential housing appeared to be intact, and no staining was observed.

Photograph No. 4 [787160-4A]
Date: September 7, 1999
This is believed to be an oil filter cylinder that was removed from the chassis engine block. Tetra Tech EM Inc. (Tetra Tech) found only residual oil on the interior of the canister.

Photograph No. 5 [787160-5A]
Date: September 7, 1999
This is the isolated engine block and other vehicle-oriented metal debris. Tetra Tech removed an oil filter canister from the threaded stem near the top of the engine block. Note that the valve cover had been removed prior to disposal. Field personnel observed no evidence of staining.

Photograph No. 6 [787160-6A]
Date: September 7, 1999
This is the oil filter canister that Tetra Tech removed from the chassis engine block. The oil filter canister was removed intact and exhibited only remnants of residual oil. Field personnel observed no evidence of staining.