

Request for Conditional Closure

Site: Icehouse Lake Site, also known as National Oceanic and Atmospheric Administration (NOAA) Site 36/Two-Party Agreement (TPA) Site 14. The site will be referred to as the site herein.

Location: St. Paul Island, Alaska is approximately 800 miles southwest of Anchorage in the Bering Sea (Figure 1). The site is located on the east shore of Icehouse Lake, approximately one mile north of the City of St. Paul, adjacent a prominent bend in Polovina Turnpike which passes west of the site (Figure 2).

Legal Property Description: The site is located in Township 35 south, Range 131 west, Section 19, of the Seward Meridian, Alaska as shown on the plat of rectangular survey officially filed May 14, 1986 (Figure 2). The Aleut Corporation owns the subsurface estate. The surface estate is owned by the St. Paul Village Corporation.

Type of Release: Petroleum products likely powered and lubricated a diesel water pump that was located at the site. Five 100-gallon aboveground storage tanks (AST) and several drums were removed from the surface of the site in 1992, along with some buried drums and piping. These items may have been associated with fuel storage and transfer, and may have leaked or spilled petroleum products in the past. Igniter materials, such as gasoline, used for community recreational bonfires at the site may also have contributed to soil and groundwater contamination.

History and Background:

The United States government used lake water from Icehouse Lake as a freshwater source for the Village of St. Paul from the 1920s to the late 1950s. Initially a windmill, and later a diesel powered pump operated on the site to transport the water. Thereafter, water was drawn from Pumphouse Lake located near the National Weather Service Station, and then from wells placed east of Telegraph Hill. Third parties demolished the Icehouse Lake pumphouse and other structures in the early 1990s and added the current scoria pad. Until the access road was blocked in the summer of 2004, the site had been used by members of the community to accumulate scrap wood items such as pallets, which were periodically burned on the site as a community recreational event. Igniters, such as gasoline and diesel fuel, were used to light the bonfires.

Summary of Site Investigations:

Preliminary Assessment by Ecology and Environment, Inc (E&E): E&E, conducted a preliminary assessment (PA) for NOAA at several sites on St. Paul Island in 1992 (E&E 1993). The PA provided the framework for the TPA. During the PA, E&E conducted a visual assessment of the site, noting one or two abandoned 500-gallon ASTs, several drums on the ground, and submerged drums and piping. In 1996, the TPA identified the Icehouse Lake Site as Site 14 classifying it as a debris site.

Debris Removal by Aleutian Enterprises: In 1997, Aleutian Enterprises removed an abandoned AST, five steel drums, and submerged piping from the site (Aleutian Enterprises 1997).

Final Closure Confirmation by Tetra Tech EM Inc.: In 1999, Tetra Tech EM Inc. (Tetra Tech) conducted an electromagnetic survey, locating and then removing the remains of approximately seven rusted, empty, steel drums (Tetra Tech 2000). They did not find any contamination associated with the drums. NOAA subsequently identified TPA Site 14 as Site 36 on a list of sites on St. Paul Island.

Reconnaissance Sampling by Columbia Environmental Sciences Inc. (CESI): In 2000, CESI conducted reconnaissance sampling for subsurface contamination at the site that was expected to be limited in extent (CESI 2001). CESI excavated a test pit 20 ft long by 15 ft wide by 5 ft deep adjacent to the former pumphouse and fuel tank location. CESI also installed four hand-operated Geoprobe boreholes, as well as four hollow-stem auger borings that were completed as monitoring wells. PetroFlag[®] screening, a semi-quantitative field analytical method for total petroleum hydrocarbons (TPH), and fixed laboratory analyses indicated that soil was locally contaminated with petroleum-related hydrocarbons [gasoline-range organics (GRO), diesel-range organics (DRO), residual-range organics (RRO), toluene, xylenes, and the trimethylbenzene isomers] in the vicinity of the gravel pad. The excavation revealed visible contamination from about 3 ft bgs to the water table at approximately 6 ft bgs. CESI noted a heavy sheen on groundwater in the excavation (CESI 2001). The soil removed from the test pit was returned to the pit. Analytical results from CESI's soil sampling did not indicate any soil exceeding the ADEC Method Two cleanup level. The four monitoring wells were not developed or sampled until IT Alaska Inc.'s (IT Alaska's) work at the site in 2001, which is discussed below.

Site Characterization by IT Alaska Inc.: NOAA contracted with IT Alaska to conduct characterization activities for the site, resulting in a site characterization report ultimately completed by NOAA (NOAA 2004a). IT Alaska performed the fieldwork between June 23 and July 21, 2001. They conducted follow-up site work between September 4 and 6, 2001, after reviewing the initial fixed laboratory results. IT Alaska performed the following site characterization activities at the site:

- Conducted soil sampling on a systematic grid-based pattern using hand augers, screening 131 soil samples for petroleum hydrocarbons by using PetroFlag[®] (Figure 3). A total of 15 samples from nine of the soil borings exceeded the selected 200 ppm TPH cut off value. These borings suggested an elongated zone of mostly low-level contamination (greater than 200 ppm TPH) extending approximately 90 feet from east to west, and up to 20 feet north to south.
- Collected 32 samples from additional hand auger borings, which were submitted to a fixed laboratory for analysis to verify the results of the screening samples. Results from all 32 of the samples were well below the ADEC Table A1, B2, and Method Three soil cleanup levels for DRO and RRO (the only two analytes measured in these samples).
- Collected five characterization samples to characterize the chemical constituents present. The samples were submitted to a fixed laboratory for analysis after being collected from soil at locations where high levels of contamination was suspected from observation or from high screening sample results. The samples were analyzed for GRO, DRO, RRO, volatile organic compounds, polynuclear aromatic hydrocarbons, and metals. The samples did not exceed

cleanup levels under ADEC Method Three (the cleanup method selected for this site as discussed below) for any of these contaminants. Moderate levels of DRO and RRO exceeding ADEC Method Two were present.

- Collected 15 follow-up samples from soil borings within the area excavated by CESI in 2000. The samples were submitted to a fixed laboratory for analysis. One of these samples exceeded the ADEC Method Three cleanup level for DRO, and two exceeded the Method Three cleanup level for benzene. However, none of the samples exceeded the 18 AAC 65 cleanup level for benzene (ADEC 1991), the cleanup level selected for this site as discussed below.
- Installed two groundwater monitoring wells to determine the vertical and lateral extent of contamination and its impact on groundwater.
- Developed four monitoring wells previously installed by CESI, along with the two new monitoring wells, collected groundwater samples for laboratory analysis, and performed slug testing at one well. The groundwater in well MWIHL-2 exceeded the GRO cleanup level for groundwater under 18 AAC 65.345, Table C, and the groundwater in well MWIHL-4 exceeded the GRO and DRO cleanup levels for groundwater under 18 AAC 65.345, Table C (IT Alaska 2002; Figure 4).
- Collected two lake sediment samples from near the shoreline of Icehouse Lake adjacent to the zone of contaminated soil. Neither of these samples exceeded any ADEC cleanup levels.
- Collected seven samples for general chemical and physical analysis to characterize total organic carbon, grain size, and bulk density for potential application of ADEC Method Three procedures.

Figure 3 shows the location of historical soil samples at the site. Some sample locations were only analyzed by screening analysis using PetroFlag® test kits. Where these samples exceeded the cleanup levels, additional samples were collected and analyzed by off site laboratories. As a result of the site characterization fieldwork, NOAA found only four samples where soil exceeded ADEC soil cleanup standards under Method One or Two (Figure 3). Only one soil sample exceeded the Method Three cleanup level calculated by NOAA in the Final Site Characterization Report (NOAA 2004a). The only contaminant in that sample that exceeded the Method Three cleanup level was DRO, for which NOAA calculated the Method Three cleanup level to be 1,260 mg/kg. NOAA determined that the area where soil exceeded the Method Three cleanup level was very small and warranted the removal of a small amount of soil at the location of the sample exceeding the cleanup level.

NOAA also identified a plume of groundwater contaminated with DRO and GRO above ADEC Table C cleanup standards (NOAA 2005). Figure 4 shows the groundwater sampling results exceeding ADEC Table C and the apparent groundwater gradient at the site derived from groundwater elevation measurements made during the site characterization (NOAA 2004a). Groundwater under the site flows away from Icehouse Lake in an easterly direction. NOAA recommended that the groundwater be monitored semi-annually at four monitoring wells

(MWIHL 2,3,4, and 5) to verify that contamination exceeding the Table C levels is not migrating off site, and that over time, natural attenuation will stabilize or reduce the level of contamination currently observed.

Summary of Applied Cleanup Levels:

The TPA allows NOAA to apply cleanup levels using the methods described in the 1991 non-underground storage tank (UST) regulations (ADEC 1991). However with ADEC approval, NOAA elected to use current regulations (ADEC 2003) to address soil cleanup, except for benzene for which NOAA applied the 1991 cleanup level. NOAA presented the applied cleanup methods in the Icehouse Lake Corrective Action Plan (NOAA 2004b). In summary, the current State of Alaska Oil and Hazardous Substances Pollution Control Regulations (Title 18 of the *Alaska Administration Code* [AAC] 75) provides four methods to determine soil cleanup levels at petroleum-contaminated sites. Method One involves the use of Table A1 of 18 AAC 75.341(a) to calculate a cleanup level and can only be applied to sites where the groundwater does not contain hazardous substances associated with the site. Method Two, discussed at 18 AAC 75.341(c), employs two separate tables, including one for individual contaminants (Table B1) and one for petroleum hydrocarbon contaminants (Table B2). Method Three, discussed at 18 AAC 75.340(e), allows substitution of site-specific data for selected parameters used in the Method Two equations. Method Four, discussed at 18 AAC 75.340(f), requires the development and subsequent ADEC approval of a site-specific risk assessment (ADEC 2003).

NOAA applied Method Three for the Icehouse Lake Site because contaminants above Table C levels occurred in groundwater at the site, precluding the use of Method 1. Also, site-specific parameters measured at the site, such as soil type and organic content, allow the calculation of site specific cleanup levels under Method Three that are protective of human health and the environment. NOAA calculated the Method Three cleanup levels in the Final Site Characterization Report (NOAA 2005b). Under Method Three, DRO remained as the only contaminant of concern in soil. A single soil sample exceeded the Method Three DRO migration to groundwater pathway cleanup level at 1,260 mg/kg.

Summary of Cleanup Actions:

Tetra Tech conducted corrective action activities on July 2, 2004, removing approximately 72 cubic yards of soil. Two confirmation samples (Figure 5) confirmed that the remaining soil was not contaminated above the ADEC Method Three cleanup level. The excavation was backfilled to original grade.

NOAA obtained a burn permit from the City of St. Paul on September 22, 2004 to burn wood waste previously accumulated at the site by members of the community. NOAA burned the wood that day and recovered the ash and disposed it at the Tract 42 landfill. The entrance road to the site was blocked with old crab pots to prevent continued dumping at the site.

Recommended Action:

In accordance with paragraph 59 of the TPA (NOAA 1996), NOAA requests written confirmation that NOAA completed all appropriate corrective action to the maximum extent practicable in accordance with the TPA at the Icehouse Lake Site, NOAA Site 36, TPA Site 14, St. Paul Island, Alaska, and further ADEC grant a conditional closure that will not require further

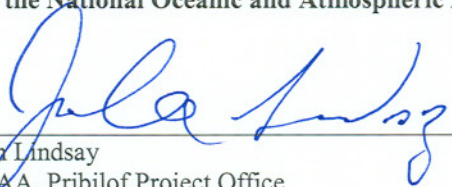
remedial action from NOAA. ADEC will require additional containment, investigation, or cleanup if subsequent information indicates that the level of residual contamination does not protect human health, safety, or welfare, or the environment.

References:

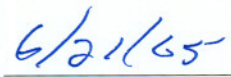
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St. Paul Island, Alaska

For the National Oceanic and Atmospheric Administration



John Lindsay
NOAA, Pribilof Project Office



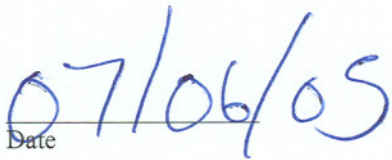
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Approvals: In accordance with Paragraph 59 of the Two Party Agreement, this is to confirm that all corrective action has been completed to the maximum extent practicable at the Icehouse Lake Site, NOAA Site 36, TPA Site 14, St. Paul Island, Alaska, in accordance with the Agreement and that no further remedial action is required for soils as a part of this conditional closure granted by ADEC.

For the Alaska Department of Environmental Conservation



Louis Howard
Alaska Department of Environmental Conservation
Remedial Project Manager



Date

Figures

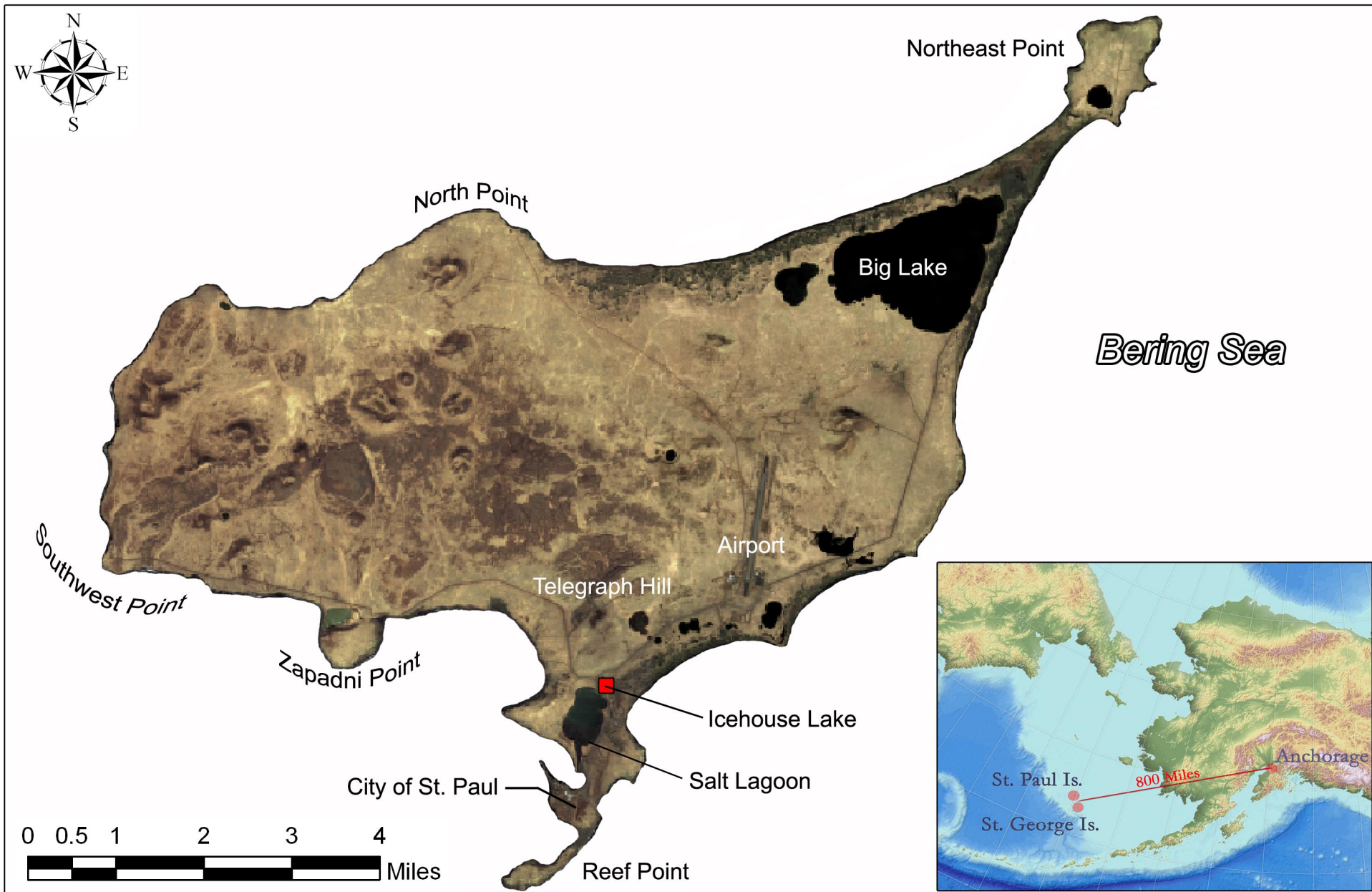


Figure
1

St. Paul Island Vicinity Map
Icehouse Lake
Site 36/TPA Site 14
St. Paul Island, Alaska

Source: Ikonos Satellite
Imagery, 2001





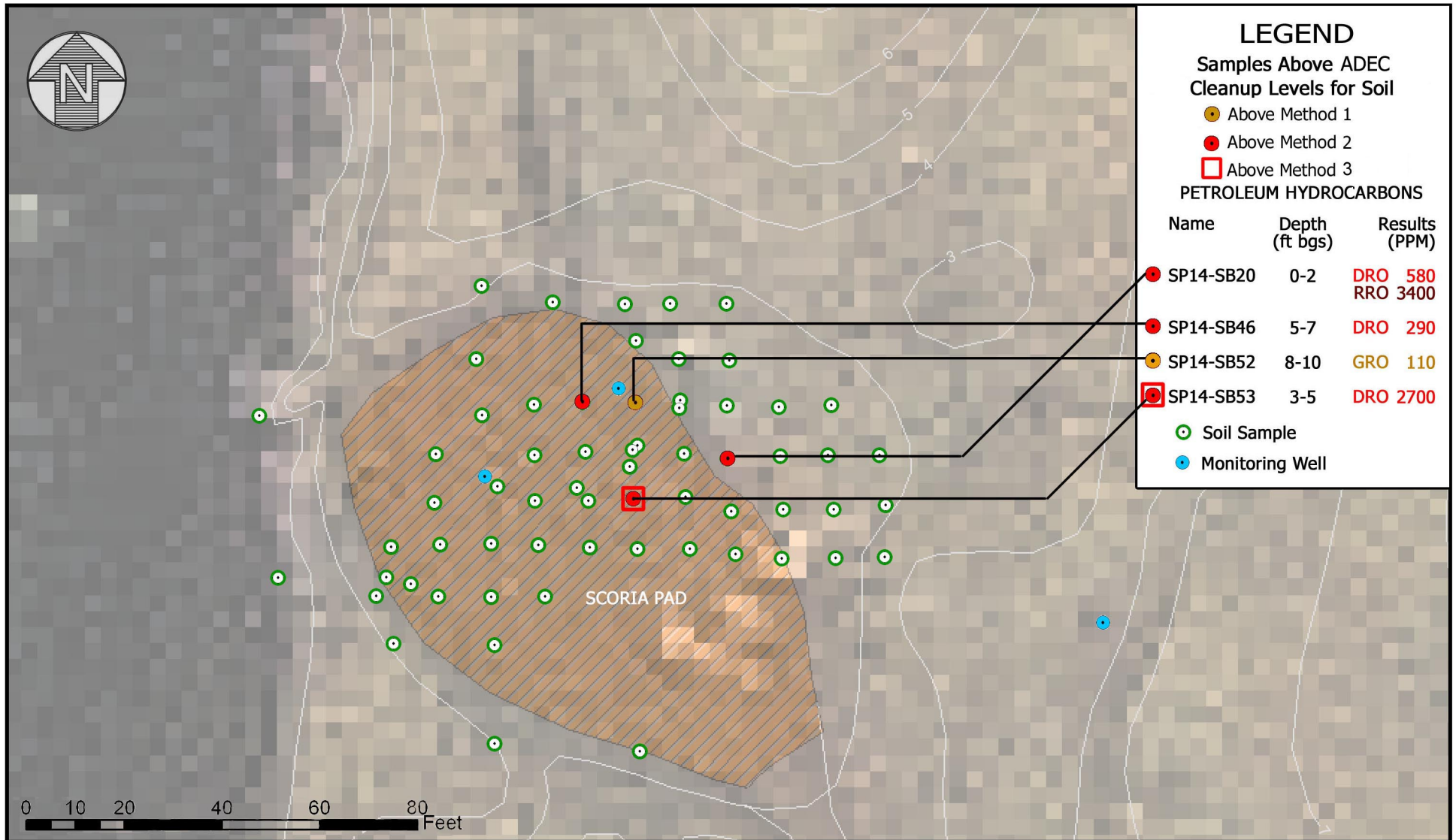
Figure

2

Site Area Map
Icehouse Lake
Site 36/TPA Site 14
St. Paul Island, Alaska

Source: Ikonos
Satellite Imagery,
2001.





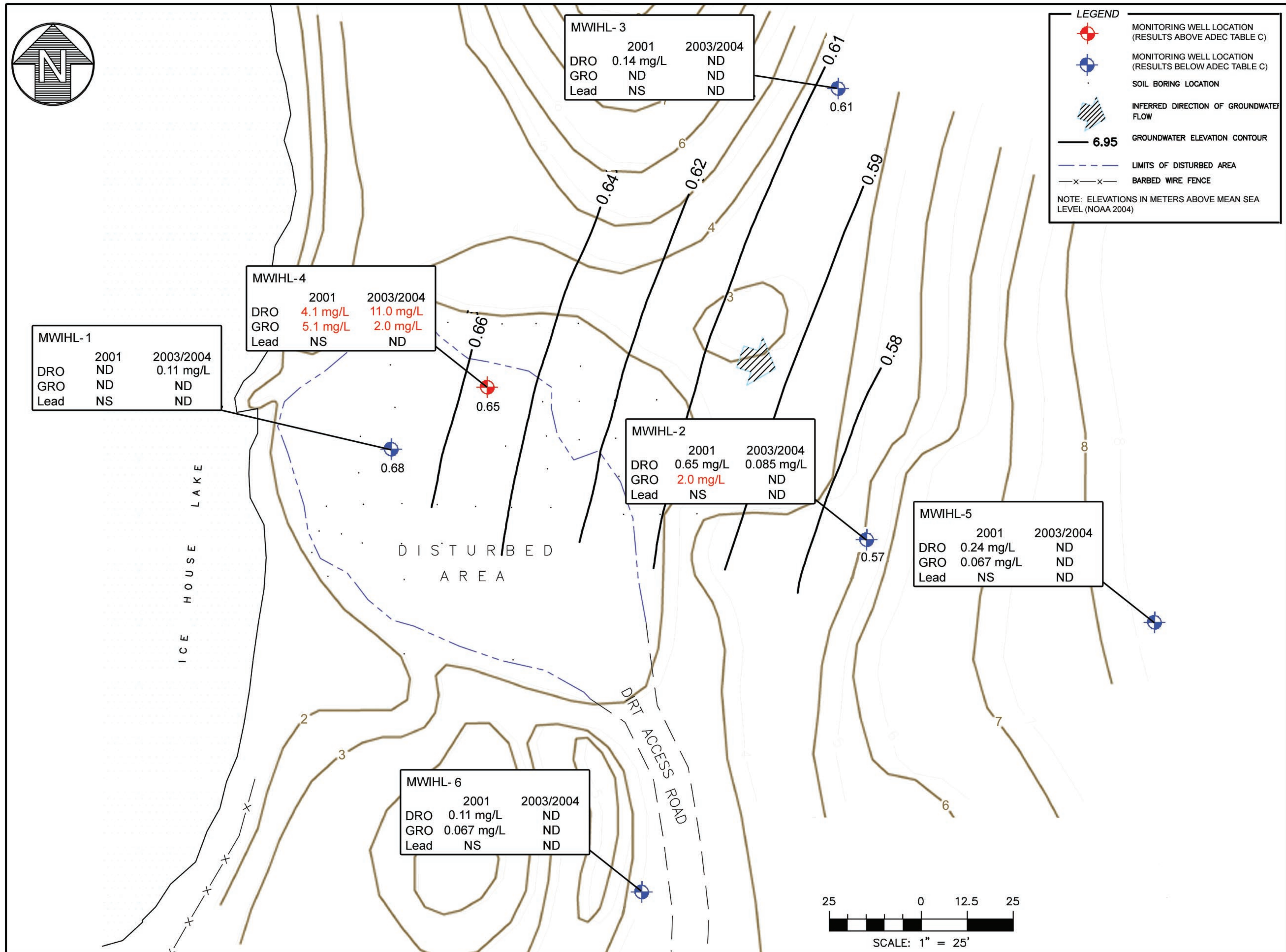
Figure

3

Historic Soil Samples
Icehouse Lake
Site 36/TPA Site 14
St. Paul Island, Alaska

Sources: Pribilof Project GIS Database, IT Alaska, Inc. (2001), CESI (2000), Ikonos Satellite Imagery (2001).



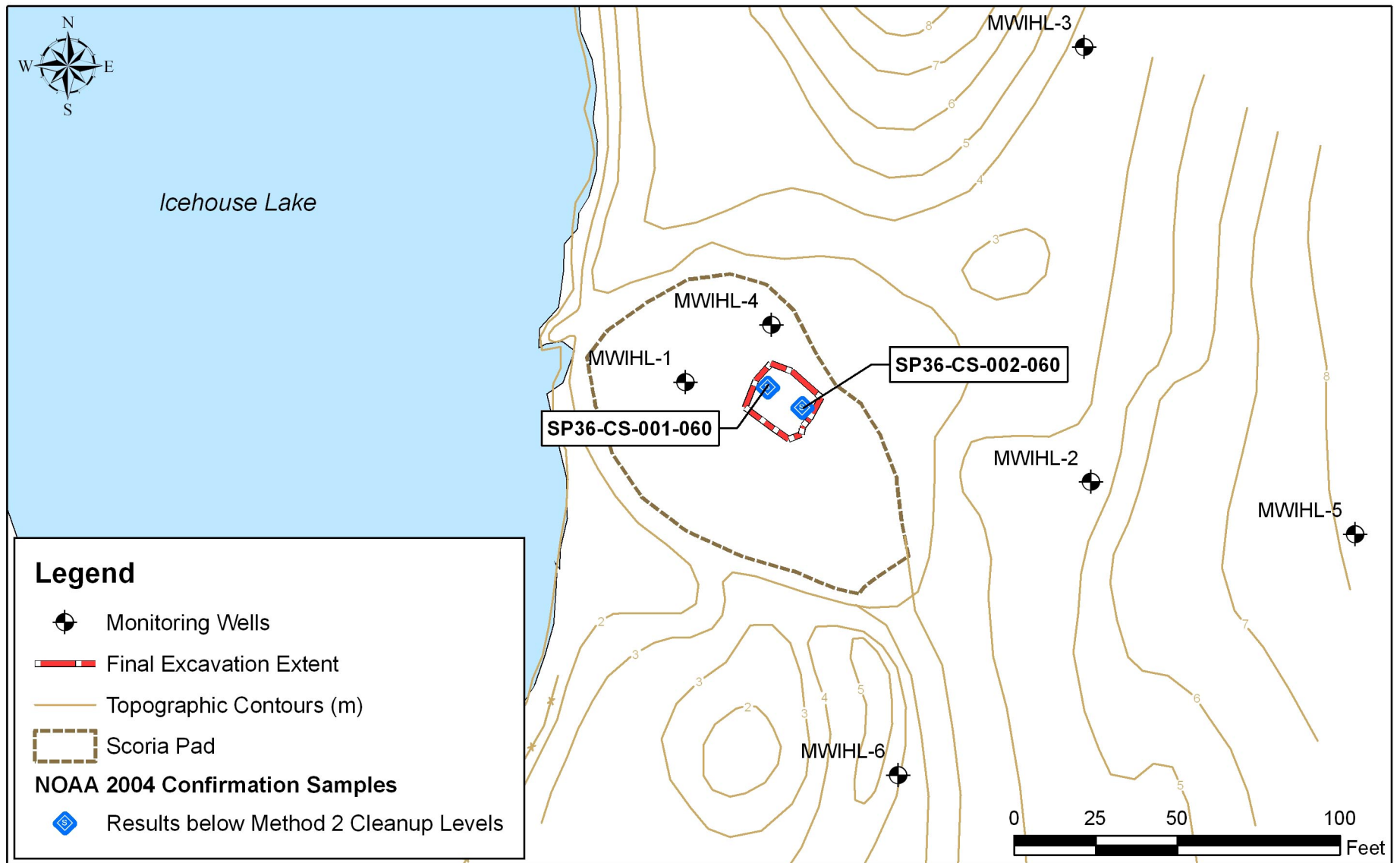


Figure

Monitoring Well Locations and Groundwater Contour Map
Icehouse Lake
Site 36/TPA Site 14
St. Paul Island, Alaska

Sources: Spatial data (IT Alaska, Inc, 2001), Well Results (NOAA 2005).





Figure

5

Extent of 2004 Excavation and Confirmation Sampling Locations
Icehouse Lake
Site 36/TPA Site 14
St. Paul Island, Alaska

Sources: Topographic Contours (IT Alaska, Inc. 2001), Wells, Excavation Extent, Lake, and Scoria Pad (NOAA GIS 2005).

