St. Paul Island Operable Unit

Completion of Two-Party Agreement Activities

Volume 1

National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Pribilof Islands Environmental Restoration Project

August 2008

U.S. DEPARTMENT OF COMMERCE
Carlos M. Guttierrez, Secretary

National Oceanic and Atmospheric Administration
Vice Admiral Conrad C. Lautenbacher, Jr., U.S. Navy (Ret.),
Under Secretary for Oceans and Atmosphere

National Ocean Service
John H. Dunnigan, Assistant Administrator
for Ocean Services and Coastal Zone Management

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U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Pribilof Project Office
7600 Sand Point Way N.E.
Seattle, Washington 98115

June 4, 2008

Jennifer Roberts
Federal Facilities Program Manager
Alaska Department of Environmental Conservation
Division of Spill Prevention and Response
Contaminated Sites Program
555 Cordova Street
Anchorage, AK 99501-2617

Subject: Closure of the St. Paul Island, Alaska Operable Unit.

Dear Ms. Roberts:

In accordance with paragraph 59 of the Pribilof Islands Environmental Restoration Agreement (Two-Party Agreement or TPA) January 1996 by designated officials of the State of Alaska and the National Oceanic and Atmospheric Administration (NOAA), NOAA requests Alaska Department of Environmental Conservation (ADEC), as the duly authorized representative of the State of Alaska, certification of NOAA's completion of corrective action for the St. Paul Island Operable Unit (OU).

NOAA and the ADEC identified a total of sixty (60) sites at St. Paul Island (Table 1). This number (60) exceeded the number (15) of source areas identified in the TPA (Attachment A, St. Paul Island) due to agreed upon changes in the manner of site designation and the discovery of new sites during various phases of site investigation. Site 1 listed in TPA Attachment A and Table 1, and Sites 48 and 56 (Table 1), Windmill Wells and ATCO/Radio Building Barrel Storage Area, respectively, were subsequently recognized as formerly used defense sites (FUDS) in accordance with Public Law 106-562 legislated in 2000. While NOAA had conducted soil and groundwater assessments at these sites, PL106-562 precluded NOAA from undertaking any corrective action. Also, Site 57, Tract 46 Sheet Metal Garage (Table 1), did not include any hazardous materials, and general building demolition does not fall under the purview of ADEC regulations applicable to NOAA environmental restoration activities on the Pribilof Islands (TPA paragraph 2). Consequently, NOAA did not request a conditional closure or a no further action determination from ADEC for Sites 1, 48, 56, or 57. Appendix I contains copies of closure documents appropriate to each site in accordance with TPA paragraphs 42-47. Appendix II includes copies of NOAA's long-term groundwater monitoring plan approved by ADEC in 2005. NOAA considers groundwater and surface water corrective actions complete per TPA paragraph 59 with ADEC's approval of the plan and NOAA's on-going compliance with the plan.

NOAA asserts that it has completed in accordance with the TPA all investigations and corrective actions approved by ADEC, to the extent practicable by:

- removing drums and debris,
- removing underground storage tanks (USTs) and above ground storage tanks (ASTs),
- removing fuel pipelines,
- removing contaminated soil,
- closing solid waste sites, and
- characterizing and monitoring groundwater
-

Table 1 summarizes specific environmental quality parameters at each site. Parameters in Table 1 include type of contamination (drums, surface debris and solid wastes), media contaminated (soil, surface water, and groundwater), presence or absence of residual contamination with succinct comments regarding land use (a.k.a. institutional) controls, as appropriate, the date ADEC signed its conditional closure or a no further remedial action planned (NFRAP) determination, as appropriate, per TPA paragraph 59, and the current property owner.

Appendix I also includes copies of deed notices recorded with the Alaska Recorder's Office, Aleutian District for ten sites where contamination and or buried debris remains in-situ. In addition, notice of residual contamination or buried solid waste will be identified in quitclaim deeds NOAA is drafting as it continues to transfer real property to St. Paul Island entities in accordance with the Transfer of Property Agreement signed by NOAA and various Pribilof Islands' entities in 1984.

Appendix II includes copies of the following and related documents: a St. Paul Village groundwater use and classification study; the long-term groundwater monitoring plan; ADEC's acceptance of the groundwater use and classification study and NOAA's request to apply the ten times rule; the ADNR critical water management area determination; and a summary of in-situ residual soil and groundwater contamination.

In addition to the attached documentation and pursuant to TPA paragraph 57, NOAA maintains an administrative record (AR) for the St. Paul Island OU at the following four locations: St. Paul Island Tribal Government Center; Alaska Resources Library and Information Services, Anchorage, AK; NOAA Sand Point, Seattle, WA; and the National Archives and Records Administration, Seattle, WA. Currently, the AR is complete through calendar 2007. Calendar year 2008 documents will be added to the AR by the end of January 2009.

Per this submission, including Appendices I and II, NOAA requests ADEC concurrence that all corrective actions pursuant to the TPA between ADEC and NOAA signed in 1996 for the St. Paul Island Operable Unit are complete. Enclosed are two copies of a signature page attesting no further remedial action is planned ("conditional closure status") for the St. Paul Island Operable Unit. I have signed both copies as NOAA's project manager pursuant to TPA paragraph 42.

If you concur, please sign both copies on behalf of ADEC, returning one signed copy to me and retaining the other copy for ADEC's records.

If you have any questions, please do not hesitate to contact me either in writing, or at (206) 526-4560.

Sincerely,

John A. Lindsay, Manager
Pribilof Islands Environmental Restoration Project Office

Appendices: I and II

cc: St. Paul RAB Members (DVD only)
David Kennedy, Pribilof Program Director
William Broglie, NOAA OCAO
James Barrows, NOAA CAO
Nancy Briscoe, NOAA GCNR
Craig O'Connor, NOAA GCNR
Robert Taylor, NOAA GC

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
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7600 Sand Point Way N.E.
Seattle, Washington 98115

For the National Oceanic and Atmospheric Administration

John A. Lindsay
NOAA, Manager, Pribilof Islands Environmental Restoration Project Office

June 4, 2008
Date

Approvals:

In accordance with Paragraph 59 of the Two Party Agreement (TPA), my signature confirms that all corrective action has been completed to the maximum extent practicable for all environmental media at NOAA's TPA and Non-TPA sites comprising the St. Paul Island Operable Unit, in accordance with the Agreement and that no further remedial action is required as a part of this conditional closure granted by ADEC.

For the Alaska Department of Environmental Conservation

Jennifer Roberts
Alaska Department of Environmental Conservation
Federal Facilities Program Manager

June 4 2008
Date

Table 1 – Summary of NOAA Sites on St. Paul Island, Alaska. June 4, 2008

			Type of Contamination								
NOAA Site No.	**TPA Site No.**	**Site Name**	**Drums**	**Surface Debris**	**Solid Waste**	**Soil**	**Sediment**	**Surface Water**	**Building Demolition**	**UST/AST/ Pipeline**	**Clean Closure**
1	1	Oil Drum Dump	X	X	X	X					
2	2	Vehicle Boneyard	X	X	X						
3	3	Little Polovina Boneyard		X							X
4	4	Dune Vehicle Boneyard		X							X
5	5a	St. Paul Landfill (active Cell C)	X		X	X					
6	5b	Cell A	X		X	X					
7	5c	Cell B drum dump	X			X					
8	5d	Cell B solid waste			X						X
9	6	Pumphouse Lake		X							X
10	7a	NMFS Fuel Barge: North End Lagoon		X		X					X
11	7b	NMFS Fuel Barge: Lagoon Channel		X							X
12	7c	NMFS Fuel Barge: Black Bluff		X							X
13	7d	NMFS Fuel Barge: East Landing		X							X
14	8a	NOAA (NMFS) Reef Point Landfill		X							X
15	8b	NOAA (Village) Landfill		X	X	X					
16	9a	Old Movie Theater								X	X
17	9b	Former Power Plant (Former Post Office)				X				X	
18	9c	Decommissioned Power Plant				X			X	X	
19	9d	Decommissioned Power Plant Annex				X			X	X	
20	9e	Municipal Garage/Machine Shop (a.k.a. Municipal Garage UST vent fill/pipe TPA 9c, and Municipal Garage Drum Staging Area (Tract 41) 9d per TPA Attachment A)				X			X	X	
21	9f	Old Coal Shed (Cascade Bldg)				X				X	
22	9g	Former Fouke Bunkhouse				X				X	X
23	9h	Former Alaska Dormitory				X				X	
24	9i	E-Shop/Radio Building and Duplex				X				X	
25	9j	5 Car Garage and Anderson Bldg				X				X	X
26	9k	AST Saddle Complex				X				X	
27	9l	Old Sealing Plant (a.k.a. Barreling Shed)				X			X		X
28	9m	Salt Water Wells (a.k.a. Contaminated Salt Water Wells, TPA 9e; TPA Attachment A)							X		X
29	10	Former Gasoline Tank Farm								X	X

			Type of Contamination								
NOAA Site No.	**TPA Site No.**	**Site Name**	**Drums**	**Surface Debris**	**Solid Waste**	**Soil**	**Sediment**	**Surface Water**	**Building Demolition**	**UST/AST/ Pipeline**	**Clean Closure**
30	11	Diesel Tank Farm				X				X	
31	12a	Lukanin Bay Debris Area A	X	X	X						X
32	12b	Lukanin Bay Debris Area B			X						X
33	12c	Lukanin Bay petroleum contaminated soil			X	X					X
34	13a	Salt Lagoon Diesel Seep (uplands)	X			X				X	
35	13b	Salt Lagoon D. Seep Channel				X	X	X			X
36	14	Icehouse Lake (a.k.a. Icehouse Lake Buried Vehicle Bone-yard; TPA Attachment A)	X	X	X	X				X	
37	15a	Scoria Pit – Telegraph Hill	X	X							X
38	15b	Scoria Pit – Lake Hill	X	X	X						X
39	15c	Scoria Pit – Ridge Wall	X	X							X
40	NTPA	Aleut Bunkhouse		X							X
41	NTPA	Bulldozer in Bog		X							X
42	NTPA	Explosives Storage Bunker									X
43	NTPA	Barrels at North End of Salt Lagoon	X	X		X					X
44	NTPA	Big Polovina Debris		X							X
45	NTPA	SW Point Former LORAN		X		X					X
46	NTPA	Blubber Dump Debris		X	X						X
47	NTPA	Petroleum Contaminated Stockpile (Blubber Dump PCS removal and Polovina Hill Stockpile)				X					X
48	NTPA	Windmill Wells									X
49	9n	Gas Station and Garage				X				X	X
50	9o	Former Gasoline/Diesel Drum Storage Area	X			X				X	
51	9p	Fuel Transfer Station and Pipeline (Receiving Warehouse)				X				X	
52	NTPA	Tract 50 asbestos in soil		X							X
53	9q	Tract A Lot 101				X				X	
54	9r	Tract A Lot 102				X				X	
55	9s	Tract A Lot 103				X				X	X
56	NTPA	ATCO/Radio Bldg Barrel Staging Area		X		X				X	
57	NTPA	Tract 46 Sheet Metal Garage							X		X
58	NTPA	Tract 50 Foundation DRO Combine Shop UST	X			X				X	
59	NTPA	Big Polovina Debris Stockpile		X							X
60	NTPA	Lead Contaminated Soils				X					

NOAA Site No.	TPA Site No.	Site Name	Site Conditions as of June 4, 2007	Within CWMA[1]	Site Status as of April 2, 2008	Property Owner as of November 6, 2007
1	1	Oil Drum Dump	DRO and RRO exceed Method Two levels in an estimated 2,300 cubic yards of soil. Groundwater contaminated with DRO. Buried debris exists, but extent and quantity is unknown.		FUDS	TDX/TAC
2	2	Vehicle Boneyard	Buried solid wastes, such as metallic debris and an asbestos monofill capped by vegetated soil cover; post-closure cap monitoring until June 20, 2010; deed notice.		NFRAP 06/20/05	TDX/TAC
3	3	Little Polovina Boneyard			NFRAP 03/03/00	TDX/TAC
4	4	Dune Vehicle Boneyard			NFRAP 02/20/01	TDX/TAC
5	5a	St. Paul Landfill (active Cell C)	Municipal solid waste (MSW), lead-based paint abatement waste (including building renovation waste), demolition debris, and lead soil from other sites consolidated at this location; vegetated cap; cap consists of petroleum-contaminated soil; post-closure cap monitoring until January 24, 2013; groundwater monitoring (potential DRO and lead contamination) until spring 2013 pending regulatory review; deed notice.		NFRAP 10/04/05 Solid Waste Closure 10/27/05 Reopened by NOAA in September 2006 to dispose of abatement and demolition wastes; re-closure approved by ADEC Solid Waste on 01/24/08.	NOAA
6	5b	Cell A	Residual soil DRO or RRO contamination remains in at least one limited area among construction and demolition debris. All buried debris and MSW has been capped with a minimum of two feet of clean scoria; the cap side walls are vegetated; post-closure cap monitoring until November 2010 pending regulatory review; deed notice.		NFRAP 11/15/04	City of St. Paul/TAC
7	5c	Cell B drum dump	Residual soil contaminated with DRO and RRO remains beneath City of St. Paul working pad circa 25 ft bgs; long-term groundwater monitoring at least until spring 2013 as part of the Cell C monitoring effort; deed notice.		NFRAP 04/11/05	City of St. Paul/TAC
8	5d	Cell B solid waste			NFRAP 02/11/05	City of St. Paul/TAC
9	6	Pumphouse Lake			NFRAP 04/11/01	TDX/TAC
10	7a	NMFS Fuel Barge: North End Lagoon			NFRAP 01/02/02	TDX/TAC
11	7b	NMFS Fuel Barge: Lagoon Channel			NFRAP 01/02/02	TDX/TAC
12	7c	NMFS Fuel Barge: Black Bluff			NFRAP 01/02/02	TDX/TAC
13	7d	NMFS Fuel Barge: East Landing			NFRAP 01/02/02	TDX/TAC

NOAA Site No.	TPA Site No.	Site Name	Site Conditions as of June 4, 2007	Within CWMA[1]	Site Status as of April 2, 2008	Property Owner as of November 6, 2007
14	8a	NOAA (NMFS) Reef Point Landfill	TPA Figure 4-2 depicts a "landfill" along the northern shoreline of Reef Point; the "landfill" site was purportedly used two or three times to burn wood debris, and the ash was buried at the site. Tetra Tech (December 2000) identified other disposal locations and removed debris at Reef Point. Nortech (2001) surveyed the area removed some surface debris.		NFRAP 12/19/01	NOAA (Seal Rookery)
15	8b	NOAA (Village) Landfill	De minimis quantities (<1 yd^3) of residual lead contaminated soil lies within basaltic rock fractures, and buried solid waste remains on a vegetated steep slope; deed notice.		NFRAP 12/19/01	TDX
16	9a	Old Movie Theater			NFRAP 10/11/04	TDX/TAC
17	9b	Former Power Plant (Former Post Office)	Residual soil contaminated with DRO remains beyond practical excavation limits and underneath the concrete slab that extends northerly beyond the north end of the former post office building; DRO exceeds the 10x Rule criterion at one location by the building foundation; long term groundwater monitoring (DRO contamination). (Note: Tribal Government installed a UST at Former Post Office in 1972; decommissioning of this UST is outside NOAA's authorization and the Two-Party Agreement); deed notice.	XX	NFRAP 10/11/04	Tribal Government/ TAC
18	9c	Decommissioned Power Plant	Residual soil contaminated with DRO and GRO remains greater than 15 feet bgs and under the roadway; long term groundwater monitoring (DRO contamination); benzene does not exceed 1991 criterion of 0.5 mg/kg, but it does exceed the current criterion of 0.02 mg/kg; deed notice.	XX	NFRAP 02/11/05	NOAA
19	9d	Decommissioned Power Plant Annex	Residual soil contaminated with DRO remains on north side of the Annex; GRO and DRO remain on the eastside of the Annex along buried utilities and potentially below the concrete pad; east side soils exceed CWMA criterion in limited areas. Residual soil benzene remains along buried utilities; benzene does not exceed 1991 criterion of 0.5 mg/kg; long term groundwater monitoring (DRO contamination); deed notice.	XX	NFRAP 09/14/04 NFRAP 04/08/08	NOAA
20	9e	Municipal Garage/ Machine Shop (a.k.a. Municipal Garage UST vent fill/pipe TPA 9c, and Municipal Garage Drum Staging Area (Tract 41) 9d per TPA Attachment A)	No contamination is known to exist under the Machine Shop. However, soil contamination at the water table remains below the former Municipal Garage which was demolished during 2007. Residual soil contaminated with DRO, GRO, benzene, toluene, and ethyl benzene, remain along utilities, beneath the roadway, and underneath a concrete pad tied to the Machine Shop; total xylenes above Method Two in soil remain in limited areas at the water table; DRO, GRO, toluene, and ethyl benzene in soils at the water table exceed the 10x Rule criteria in some areas; benzene exceeds the 1991 benzene criterion of 0.5 mg/kg in some areas; long term groundwater monitoring (DRO, GRO, toluene, and benzene contamination); deed notice.	XX	NFRAP 10/11/04 NFRAP 04/16/08	NOAA

NOAA Site No.	TPA Site No.	Site Name	Site Conditions as of June 4, 2007	Within CWMA[1]	Site Status as of April 2, 2008	Property Owner as of November 6, 2007
21	9f	Old Coal Shed (Cascade Bldg)	This site is contiguous with a former gasoline station. Residual soil contaminated with DRO, GRO, benzene, toluene, and ethylbenzene remain along utilities, in the water table, and beneath the roadway; total xylenes remain in limited areas at the water table; DRO, GRO, toluene, and ethylbenzene in soils at the water table exceed the 10x Rule criteria in most areas; benzene exceeds the 1991 benzene criterion of 0.5 mg/kg in most areas; long term groundwater monitoring (DRO, GRO, benzene, and ethylbenzene contamination); deed notice.	XX	NFRAP 04/01/05	NOAA
22	9g	Former Fouke Bunkhouse	DRO exceeded Method Two at the water table but soil DRO concentrations were below 10x Rule criterion; deed notice.	X	NFRAP 09/14/04	NOAA
23	9h	Former Alaska Dormitory	Residual soil contaminated with DRO remains in the water table, beneath the building and near water service line; DRO in these soils exceeds the 10x Rule criterion; long term groundwater monitoring (DRO contamination); deed notice.	XX	NFRAP 09/17/04	NOAA
24	9i	E-Shop/Radio Building and Duplex	Residual lead soil 2 ft.+ bgs point of compliance along the southeast side of the Duplex (see Site 60 below) and 5 ft+ along eastside of E-Shop; residual soil contaminated with DRO remains along the northwest corner of the E-Shop, and extends beneath the road and near electric and sewer lines. DRO above 10x Rule criterion remains along the northwest corner of the Duplex; additional removal is hindered by electric, water, telephone and sewer trunk and service lines. DRO above 10x Rule criterion remains along a water line approx. 15 ft. from the northeast section of the E-Shop at 5 ft. bgs; deed notice.	X	NFRAP 02/11/05 FUDS	NOAA
25	9j	5 Car Garage and Anderson Bldg	One sample equaled Method Two DRO cleanup level of 250 mg/kg. Residual benzene in some soils exceeded Method Two level of 0.02, but not above 1991 level of 0.5.	X	NFRAP 11/05/04	NOAA
26	9k	AST Saddle Complex	Residual soil contaminated with DRO remains beyond practical limits of excavation (rock) and likely beneath the road; DRO above 10x Rule criterion remains in the area of the former AST saddles. Benzene above the criterion of 0.02 mg/kg remains in limited areas; benzene concentrations did not exceed the 1991 criterion of 0.5 mg/kg; long term groundwater monitoring (DRO and benzene contamination); deed notice.	XX	NFRAP 11/05/04	TDX/TAC
27	9l	Old Sealing Plant (a.k.a. Barreling Shed)			NFRAP 09/14/04	NOAA
28	9m	Salt Water Wells (a.k.a. Contaminated Salt Water Wells, TPA 9e; TPA Attachment A)	One of three well pump houses was demolished in October 2007, along with the Decommissioned Power Plant building (Site 18). The five wells were decommissioned in 2003 and 2004; contaminated groundwater underlies the sites; deed notice.	X	NFRAP 03/22/05	NOAA

NOAA Site No.	TPA Site No.	Site Name	Site Conditions as of June 4, 2007	Within CWMA[1]	Site Status as of April 2, 2008	Property Owner as of November 6, 2007
29	10	Former Gasoline Tank Farm			NFRAP 02/24/00	NOAA
30	11	Diesel Tank Farm	Residual soil DRO remains beyond practical limits of excavation, near a water main, and beneath the road; deed notice.		NFRAP 11/05/04	NOAA
31	12a	Lukanin Bay Debris Area A			NFRAP 05/05/05	TDX/TAC
32	12b	Lukanin Bay Debris Area B			NFRAP 05/05/05	TDX/TAC
33	12c	Lukanin Bay petroleum contaminated soil	Vegetated soil cap over excavation.		NFRAP 05/05/05	TDX/TAC
34	13a	Salt Lagoon Diesel Seep (uplands)	Residual soil contaminated with DRO and GRO (at one location the level was 310 mg/kg) remains within the smear zone and in the east area among buried concrete rubble associated with the former By-Products Plant; two granular activated carbon reactive permeable walls installed; groundwater monitoring (DRO contamination) until at least October 2008 pending regulatory review; deed notice.		NFRAP 02/13/06)	TDX/TAC
35	13b	Salt Lagoon D. Seep Channel			NFRAP 02/13/06	State of Alaska
36	14	Icehouse Lake (a.k.a. Icehouse Lake Buried Vehicle Boneyard; TPA Attachment A)	Long term groundwater monitoring (DRO, GRO, and lead contamination, although in the 2007 sampling round lead fell below the cleanup criterion) until at least October 2008 pending regulatory review; deed notice.		NFRAP 07/06/05	TDX/TAC
37	15a	Scoria Pit – Telegraph Hill	Potential exists for exposure of buried 55 gallon drums.		NFRAP 08/24/04, FUDS	NOAA
38	15b	Scoria Pit – Lake Hill			NFRAP 04/03/03	TDX/TAC
39	15c	Scoria Pit – Ridge Wall			NFRAP 04/03/03	TDX/TAC
40	NTPA	Aleut Bunkhouse			NFRAP 03/02/01)	TDX/TAC
41	NTPA	Bulldozer in Bog			NFRAP 04/13/01	TDX/TAC
42	NTPA	Explosives Storage Bunker	Blasting caps in a bunker were removed and detonated.		NFRAP 04/13/01	TDX/TAC
43	NTPA	Barrels at North End of Salt Lagoon			NFRAP 01/02/02	TDX/TAC
44	NTPA	Big Polovina Debris			NFRAP 02/01/00	NOAA

NOAA Site No.	TPA Site No.	Site Name	Site Conditions as of June 4, 2007	Within CWMA[1]	Site Status as of April 2, 2008	Property Owner as of November 6, 2007
45	NTPA	SW Point Former LORAN			NFRAP 05/24/01	TDX/TAC
46	NTPA	Blubber Dump Debris	Vegetated soil cap over solid wastes; deed notice.		NFRAP 03/02/01	TDX/TAC and possibly NOAA (the disposal area may have crossed property boundaries)
47	NTPA	Petroleum Contaminated Stockpile (Blubber Dump PCS removal and Polovina Hill Stockpile)			NFRAP 10/08/04 (Blubber Dump Stockpile) NFRAP 02/11/05 (Polovina Hill Stockpile)	NOAA and TDX/TAC (site crosses two properties at Blubber Dump) TDX/TAC (Polovina Hill Stockpile)
48	NTPA	Windmill Wells			NFRAP 07/05/05, FUDS	TDX/TAC
49	9n	Gas Station and Garage	Deed notice to future landowner.	X	NFRAP 10/11/04	NOAA
50	9o	Former Gasoline/ Diesel Drum Storage Area	Residual soil contaminated with DRO and benzene remain, further removal limited by rock and/or slope grade. DRO exceeds 10x rule criterion in certain areas. Residual benzene in soils exceeded Method Two level of 0.02, but not above 1991 level of 0.5; long term groundwater monitoring (DRO contamination); deed notice.	XX	NFRAP 10/11/04	TDX
51	9p	Fuel Transfer Station and Pipeline (Receiving Warehouse)	Residual soil contaminated with DRO and benzene remain along buried utilities south of the transfer pump station; benzene does not exceed 1991 criterion of 0.5 mg/kg; DRO exceeds 10x rule criterion in limited areas; deed notice.	X	NFRAP 09/14/04	NOAA
52	NTPA	Tract 50 asbestos in soil			NFRAP 05/03/04	NOAA
53	9q	Tract A Lot 101	Residual soil contaminated with DRO remains beneath the building and beyond practical limits of removal in soil; deed notice.		NFRAP 10/11/04	NOAA
54	9r	Tract A Lot 102	Residual soil contaminated with DRO remains beneath the building and beyond practical limits of removal; deed notice.		NFRAP 11/01/04	NOAA
55	9s	Tract A Lot 103			NFRAP 10/11/04	NOAA
56	NTPA	ATCO/Radio Bldg Barrel Staging Area	Soil contaminated with DRO, LNAPL, and groundwater contamination remains. Potential landowner liability and/or FUDS; no NOAA liability for soils or LNAPL and groundwater.	XX	FUDS	TDX/TAC
57	NTPA	Tract 46 Sheet Metal Garage	Building demolition only; concrete pad left in place, but partially removed along with the Municipal Garage (Site 9e) demolition and soil removal during 2007.	X	RAC [DOES NOT REQUIRE NFRAP]	NOAA

NOAA Site No.	TPA Site No.	Site Name	Site Conditions as of June 4, 2007	Within CWMA[1]	Site Status as of April 2, 2008	Property Owner as of November 6, 2007
58	NTPA	Tract 50 Foundation DRO Combine Shop UST	Residual soil contaminated with DRO remains beneath the east end of the Combine Shop by former UST and at the water table; Tract 50 soils at the water table exceed Method Two cleanup levels for DRO. Tract 50 soils at the water table exceed Method Two cleanup level of 0.02 mg/kg for benzene, but not the 1991 level of 0.5 mg/kg. Groundwater with dissolved petroleum at Tract 50 foundation; long term groundwater monitoring (DRO contamination) using Site 13a wells until at least 2008 pending regulatory review; deed notice.		NFRAP 07/25/05 (Tract 50 Foundation DRO) NFRAP 11/30/05 (Combine Shop UST)	NOAA and TDX/ TAC (site crosses two properties)
59	NTPA	Big Polovina Debris Stockpile			NFRAP 01/06/06	NOAA
60	NTPA	Lead Contaminated Soils	Lead-based paint abated; Duplex (parcel 6f) residual lead soil remains along southeast end of building 2ft+ bgs point of compliance; deed notice to future landowner of the Duplex; other two locations (Teacher House 101 and Teacher House 103) clean closed.		NFRAP 02/16/07	NOAA

Notes:

[1] X- denotes the site is within the Critical Water Management Area (CWMA); XX – denotes that contaminated soils exceed the CWMA 10x criterion for DRO at the site. Note, DRO and other analytes exceed the CWMA 10x criteria at Site 9f.

AST: Above ground storage tank
BGS: Below ground surface
DRO: Diesel-range organics
FUDS: Formerly Used Defense Site
NFRAP: No Further Remedial Action Planned (received from State of Alaska Department of Environmental Conservation)
NMFS: National Marine Fisheries Service
NOAA: National Oceanic and Atmospheric Administration
NTPA: Non Two-Party Agreement site
PCS: Petroleum-contaminated soil
TAC: The Aleut Corporation (subsurface estate)
TDX: Tanadgusix Corporation (surface estate)
TPA: Two-Party Agreement
UST: Underground storage tank
CWMA: Critical Water Management Area

Appendix I

APPENDIX I TO THE JUNE 4, 2008 REQUEST FOR CLOSURE OF THE ST. PAUL ISLAND, ALASKA, OPERABLE UNIT UNDER THE TWO-PARTY AGREEMENT BETWEEN THE ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION AND THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION SIGNED JANUARY 1996

In accordance with paragraph 59 of the Pribilof Islands Environmental Restoration Agreement (Two-Party Agreement or TPA) signed in January 1996 by designated officials of the State of Alaska and the National Oceanic and Atmospheric Administration (NOAA), NOAA requested Alaska Department of Environmental Conservation (ADEC), as the duly recognized representative of the State of Alaska, certification of NOAA's completion of corrective action for the St. Paul Island Operable Unit (OU). NOAA asserted in its June 4, 2008 cover letter to ADEC that it had completed in accordance with the TPA all investigations and corrective actions approved by ADEC, to the extent practicable by:

- removing drums and debris,
- removing underground storage tanks (USTs) and above ground, storage tanks (ASTs),
- removing fuel pipelines,
- removing contaminated soil,
- closing solid waste sites, and
- characterizing and monitoring groundwater.

Appendix I of two attachments to the request (cover letter) includes portable document format (PDF) versions of closure documents prepared in accordance with TPA paragraphs 42-47 for the fifty-six sites within the St. Paul Island OU. This number (56) exceeded the number (15) of source areas identified in TPA Attachment A concerning St. Paul Island, due to agreed upon changes in the manner of site designation and the discovery of new sites during various phases of site investigation. Appendix I herein does not include formal closure documents for the Oil Drum Dump, Windmill Wells or the ATCO/Radio Building Barrel Storage Area (Sites, 1, 48, and 56, respectively), as they are formerly used defense sites, and precluded from cleanup by NOAA in accordance with Public Law 106-562. Similarly, no formal closure document exists for Tract 46 Sheet Metal Garage (Site 57) as the site did not include any hazardous materials, and general building demolition does not fall under the purview of ADEC regulations applicable to NOAA environmental restoration activities on the Pribilof Islands (TPA paragraph 2).

Conversion of the original documents to PDF resulted in a slight size reduction of the original document format (8.5 x 11 inches); this reduction was necessary to provide this bound printed copy created for archiving and future reference. The cleanup sites are presented in numerical order in accordance with Table 1 accompanying the cover letter. The documents herein generally exclude report appendices which include such items as final laboratory data deliverables, and contractor daily logs. These items are available to ADEC with NOAA's initial site submittals, such as corrective action plans and reports.

NOAA recorded ten deed notices with the Alaska Recorder's Office, Aleutian District located in Anchorage. Copies of these documents are included within Appendix A. Each deed notice accompanies the appropriate closure document for the applicable site. Notice of residual contamination or buried solid waste to be included with federal property transfer documents under a 1984 Transfer of Property Agreement between NOAA and St. Paul Island entities are not included herein as quitclaim deeds have not been issued at the time of this submission.

Appendix II includes copies of a St. Paul Island groundwater and use classification study, ADEC's approval of NOAA's request to apply the ten times rule, ADNR's critical water management area determination, the St. Paul Island long-term groundwater monitoring plan, and a summary of in-situ residual soil and groundwater contamination.

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FINAL
Site Characterization Report

Oil Drum Dump Site
(Two-Party Agreement Site No. 1
and Formerly Used Defense Site B-1)

Pribilof Islands Environmental Restoration Project
St. Paul Island, Alaska

November 2004

Prepared By:

National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Pribilof Project Office
7600 Sand Point Way NE
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EXECUTIVE SUMMARY

This site characterization report (SCR) is intended to present a comprehensive evaluation of the status of a site known as the Oil Drum Dump Site on St. Paul Island, Alaska. Under Public Law No. 104-91 of 1995 and Public Law 106-562 of 2000 (Pribilofs Transition Act), the National Oceanic and Atmospheric Administration (NOAA), Office of Response and Restoration is responsible for restoration activities on St. Paul Island, Alaska, which is part of a five-island archipelago known as the Pribilof Islands. The United States acquired the Pribilof Islands in 1867, when Alaska was purchased from Russia. The federal government was the sole operator and administrator of the islands, including northern fur seal (*Callorhinus ursinus*) harvesting activities, from 1910 until 1983. Petroleum and other contaminants have been identified or potentially may exist at a number of island properties currently and formerly owned by the federal government. Affected properties are described in a two-party agreement (TPA) between NOAA and the Alaska Department of Environmental Conservation (ADEC) dated January 26, 1996. The TPA provides the framework for this SCR.

The Oil Drum Dump Site was used as a disposal area for drums and debris during the 1940s and later decades. Cleanup of the site began in 1986 and continued through 1994. A central pad, now known as TPA Site No. 1, was created and initially used when the Department of Defense (DOD) conducted drum and debris removal and cleanup activities at Formerly Used Defense Site (FUDS) B-1. For purposes of this SCR, the Oil Drum Dump Site refers to the area encompassing both TPA Site No. 1 and FUDS B-1.

A NOAA contractor, Columbia Environmental Science, Inc. (CESI), conducted a field investigation at the Oil Drum Dump Site during the 2000 field season. This SCR presents the objectives, methodologies, and results of the CESI investigation, and synthesizes the results with data from prior investigations. During the 2000 field investigation, 46 soil samples from 39 locations, nine groundwater samples from six wells, and three surface water samples from three locations were collected and analyzed at a fixed laboratory. When prior investigations are considered, a total of approximately 127 soil samples from 84 locations at the Oil Drum Dump Site have been collected and analyzed in a fixed laboratory for gasoline range organics (GRO), diesel range organics (DRO), residual range organics (RRO), benzene, toluene, ethylbenzene, and total xylenes (BTEX), and in some cases semivolatile organic compounds (SVOCs), volatile organic compounds (VOCs), heavy metals, and polynuclear aromatic hydrocarbons (PAHs). A total of approximately 17 groundwater samples from 14 wells have been collected and analyzed for GRO, DRO, VOCs, and in some cases SVOCs and heavy metals. Based on these investigations, the following conclusions can be made:

- The primary sources of contamination (*i.e.*, drums) have been removed from the Oil Drum Dump Site.
- DRO is the most extensively found soil contaminant at the site.
- DRO, RRO, As, and Cr were found in soil above ADEC Method Two cleanup levels. DRO and RRO are considered contaminants of concern. As and Cr are not considered contaminants of concern.
- RRO exceedances were only found at soil sampling locations were DRO also exceeded cleanup criteria.
- DRO and GRO were the only contaminants found in groundwater above the ADEC Table C cleanup criteria.
- The estimated maximum volume of soil removal required to meet ADEC standards is 5761 cubic yards.

The fact that some of the FUDS Program sites on the Pribilof Islands are contiguous with NOAA TPA sites complicates cleanup issues. Under current legislation, Public Law 106-562 Section 107, NOAA is prohibited from further expending Pribilof Project funds for cleanup or remediation of FUDS.

Based on data and other information presented in this SCR, NOAA finds and recommends the following regarding the Oil Drum Dump Site:

- Approximately 5761 cubic yards of contaminated soil should be considered for removal.
- The extent of groundwater contamination is limited. Future groundwater monitoring may be warranted.
- NOAA is prohibited from further expending Pribilof Project funds for clean up or remediation of FUDS.

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ACRONYMS AND ABBREVIATIONS

AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
ADT	Alaska Daylight Time
ATV	All Terrain Vehicle
bgs	Below ground surface
BTEX	Benzene, toluene, ethylbenzene, and total xylenes
°C	Degrees Celcius
CBSFA	Central Bering Sea Fisherman's Association
CESI	Columbia Environmental Sciences, Inc.
Chase	Chase Construction, Inc.
COPC	Contaminant of potential concern
DPP	Decommissioned Power Plant
DQI	Data quality indicators
DQO	Data quality objective
DO	Dissolved oxygen
DOD	Department of Defense
DRO	Diesel range organics
E&E	Ecology and Environment, Inc.
EPA	U.S. Environmental Protection Agency
ETC	Enhanced thermal conduction
°F	Degrees Fahrenheit
F&BI	Friedman & Bruya, Inc.
FIELDS	Fully integrated environmental location decision support
FoC	Fraction of organic carbon
ft.	feet
FUDS	Formerly used defense site
GIS	Geographic information system
GPS	Global positioning system
GRO	Gasoline range organics
HLA	Harding and Lawson Associates
i	Hydraulic gradient
IDW	Investigation-derived waste
ICP-MS	Inductively coupled plasma-mass spectroscopy
in.	inches
K	conductivity
LCS	Laboratory control sample
LCSD	Laboratory control sample duplicate
m	meters
MEK	methyl ethyl ketone
µg/L	Microgram per liter
mg/kg	Milligram per kilogram
MHSA	Mobile hollow stem auger
MLLW	Mean lower-low water
mph	Miles per hour
MS	Matrix spike
MSD	Matrix spike duplicate
MWODDs	Monitoring well- Oil Drum Dump Site
n	Total porosity
NCDC	National Climatic Data Center
NFRAP	No Further Remedial Action Planned
no.	Number
NOAA	National Oceanic and Atmospheric Administration
NOS	National Ocean Service
NWS	National Weather Service
PAH	Polynuclear aromatic hydrocarbons
PCS	Petroleum-contaminated soil
PPE	Personal protective equipment
PQL	Practical quantitation limit
PVC	Polyvinyl chloride
RBC	Risk-based concentration
RCRA	Resource Conservation and Recovery Act
RPS	Relative percent difference
RRO	Residual range organics
s	seconds
SCR	Site characterization report
SDG	Sample delivery group
SVOC	Semivolatile organic compound
TDX	Tanadgusix
Tetra Tech	Tetra Tech EM Inc.
TOC	Total organic carbon
TPA	Two-Party Agreement
TPH	Total petroleum hydrocarbons
TRPH	Total recoverable petroleum hydrocarbons
USACE	U.S. Army Corp of Engineers
USCG	U.S. Coast Guard
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
UST	Underground storage tank
v	Pore water velocity
VOA	Volatile organic analysis
VOC	Volatile organic compound
WGS	World Geodetic System
Woodward-Clyde	Woodward-Clyde Consultants, Inc.
y	yard
yr	year

1 INTRODUCTION

The National Oceanic and Atmospheric Administration (NOAA), Office of Response and Restoration is responsible for restoration activities at St. Paul Island, Alaska, which is part of a five-island archipelago known as the Pribilof Islands (Figure 1). Petroleum and other contaminants have been identified or potentially may exist at a number of island 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). NOAA is conducting site characterization, remediation, and restoration in accordance with the TPA and State of Alaska regulations. Public Law No. 104-91 of 1995 and Public Law No. 106-562 of 2000 (Pribilof Transition Act) provide the mandate for these activities.

Among the sites identified for action under the TPA is TPA Site No. 1, also known as the Oil Drum Dump Site. For purposes of this report, the Oil Drum Dump Site refers to the area encompassing not only TPA Site No. 1 but also Formerly Used Defense Site (FUDS) B-1. The Oil Drum Dump Site was used as a disposal area for drums and debris during the 1940s and later decades. This site characterization report (SCR) presents the methodologies and results of site characterization activities performed by Columbia Environmental Sciences, Inc. (CESI), under contract to NOAA, at the Oil Drum Dump Site in 2000. Data from other investigations at this site are also summarized and synthesized as part of this SCR.

1.1 REPORT OBJECTIVES

The overall objective of this report is to present information pertinent to a finding that a No Further Remedial Action Planned (NFRAP) designation decision for TPA Site No. 1 should be issued as regards NOAA's responsibilities. This report details the methodologies and results of a 2000 field investigation, summarizes and synthesizes available data, and discusses the division of site cleanup responsibility between the Department of Defense (DOD) and NOAA. It is intended to 1) take a comprehensive look at previous investigations and activities at the Oil Drum Dump Site; 2) present information on the site's current status; and 3) make recommendations on the future of the site.

1.2 REPORT ORGANIZATION

In addition to this introduction, this report includes background information (Section 2); a summary of previous investigations and other activities at the site (Section 3); field methodologies (Section 4); results of 2000 site characterization activities (Section 5); a synthesis and evaluation of data for site characterization (Section 6); site characterization summary and conclusions (Section 7); a discussion of remaining debris and associated liability (Section 8); findings and recommendations (Section 9); and references (Section 10). Appendices to the report include A) site history, B) project photography, C) boring logs, D) laboratory analysis, E) wellhead elevations, F) water level measurements, G) slug tests, H) GPS data, I) Data Quality Evaluation Report, J) Chase Construction *Daily Quality Control Inspection Reports*, K) correspondence regarding the Oil Drum Dump Site. Appendices A-H were prepared by CESI.

2 BACKGROUND

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

2.1 ISLAND HISTORICAL INFORMATION

Russia first discovered St. Paul Island in 1787. During the 1820s, Russia established a settlement on the island to support northern fur seal harvesting operations. The United States acquired the Pribilof Islands, consisting of St. Paul, St. George, Walrus, and Otter Islands and Sea Lion Rock, when it purchased Alaska from Russia in 1867, and the islands became a federal reservation in 1869. From 1870 to 1910, the United States contracted seal harvesting and pelt processing on the islands to private companies. Then from 1910 to 1983, the federal govern-

ment was the sole operator and administrator of the Pribilof Islands' natural resources. In 1971, the Alaska Native Claims Settlement Act provided for the gradual 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 (TDX) and the federal government. The federal government currently retains title to 1,515 acres on St. Paul Island, consisting primarily 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 (NWS) station. The island's airport, consisting of about 67 acres, was conveyed to the State of Alaska in 1989.

2.2 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 250 miles north-northwest of Dutch Harbor, Alaska (Figure 1). The island is about 44 square miles in area.

The City of St. Paul is located on the island's southern peninsula. Its 2000 population included 532 people (Alaska Department of Labor, 2000 census). St. Paul Harbor, which opened in 1990, is reported to be one of Alaska's most important commercial fishery processing and supply ports (Central Bering Sea Fisherman's Association (CBSFA) undated).

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

2.2.1 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, recorded on October 6, 1949. The maximum annual precipitation ever recorded on the island is 36.61 inches, 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, 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.

The Pribilof Islands are quite windy because of their location in the Bering Sea. 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).

2.2.2 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, affording the harbor and Salt Lagoon some protection from the harsh Bering Sea environment (Elliot 1976; NOAA and USCG 1998).

2.2.3 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 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 about 2.1 million to 3,200 years ago (Cox *et al.* 1966, Winer 2001).

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 phenocryts 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 Corp. 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.

2.2.4 Surface Water Resources

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 to the shoreline than the interior.

2.2.5 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.

2.2.6 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 nagoonberry (*Rubus arcticus*), a close relative of salmonberry and raspberry.

2.2.7 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-designated endangered species (west of 144° W Longitude) and state of Alaska species of special concern, 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* spp.) have the largest population numbers, followed by auklets, including the parakeet auklet (*Cyclorrhynchus psittacula*), crested auklet (*Aethia cristatella*), and least auklet (*A. pusill*a). A number of pelagic bird species also inhabit St. Paul Island, including the kittiwakes (*Rissa* spp.), fulmar (*Fulmarus* spp.), 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* spp.), phalaropes (*Phalaropus* spp.), and other sandpipers of the family *Scolopacidae*. A number of waterfowl overwinter on the Pribilof Islands, including the Steller eider (*Polysticta stelleri*), a Federally-designated threatened species (V. Byrd, pers. comm.).

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, although a single species of freshwater stickleback occurs in several island lakes. 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* spp.) and snow (*Chionoectes* 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; the island is located within 65 miles of the nation's largest commercial fishing grounds. 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).

2.3 SITE DESCRIPTION

For purposes of this report, the area containing TPA Site No. 1 and FUDS B-1 is referred to as the Oil Drum Dump Site. TPA Site No. 1 is comprised of an oil-stained, gravel pad (also referred to as the central pad) measuring about 2,700 square feet at the end of an unimproved road about 1,000 feet south of Airport Road. The pad is devoid of vegetation, and a strong petroleum odor is obvious in the area. FUDS B-1 is comprised of lands located on the east and west sides of the unimproved road.

The approximate latitude and longitude of Oil Drum Dump Site are 57º 09' 33" and 170º 12' 06" (World Geodetic System (WGS) 1984). The site is located about 3.5 miles northeast of the City of St. Paul, about 1.5 miles east of the St. Paul airport, and approximately 800 feet north-northwest of the Bering Sea (Figure 1). Several dune ridges separate the Oil Drum Dump Site from the sea, and undeveloped lands border the site. The most prominent features near the site are the small lake to the southeast and a larger lake to the north. The site is served by the unimproved, unmarked road running north/south that terminates at the central pad. No access control or on-site facility operator is present.

2.3.1 Site History

The Oil Drum Dump Site has never been in any developed use. The site was used as a disposal area for drums and debris during the 1940s and later decades. Cleanup of the site began in 1986 and continued through 1997. The central pad, now known as TPA Site No. 1, was created and initially used when DOD conducted drum and debris removal and cleanup activities at FUDS B-1 (see Section 3.2). The site currently is not in use. The land is zoned as open space (City of Saint Paul 1995).

Figure 2 is a photograph of the site taken around 1950. It shows the thousands of drums that were present prior to cleanup efforts.

2.3.2 Soil and Geology

Based on observations made during the August and September 1999 site characterization effort, the land surface within and surrounding the Oil Drum Dump Site consists of hummocky sand dunes, with many small, circular basins separated from adjacent basins by dune ridges. The entire site and surrounding area are contained within a larger dune basin isolating the site from Airport Road and the Bering Sea.

Site soil consists of 4 to 12 feet of dark brown to black, fine-to medium-grained, poorly graded sand. In some locations, gray, silty sand occurs about 4 feet bgs. Within the southwestern portion of the site, basalt boulders protrude from the sand. These boulders may be representative of the upper, weathered basalt bedrock, or they may be glacial erratics that were deposited during glacial episodes. Because shallow bedrock was not encountered in other portions of the site during the 1999 field effort, the boulders most likely are a local glacial feature.

2.3.3 Surface Water

A small, marshy area is located about 50 feet northwest and down slope from the central pad. The water level in the marshy area ranged from several inches deep to slightly more than 1 foot deep during the 3-month period that Tetra Tech EM Inc. (Tetra Tech) conducted site characterization activities on St. Paul Island.

Across the dune ridge south of the central pad lies a larger pond that is situated within a similar marsh area. Due to the dune ridge, no clear surface water runoff pathway connects the site to the offsite marsh. The Bering Sea is located beyond the offsite marsh, about 800 feet south-southeast of the pad. Dune ridges also prevent overland flow from the site from reaching the sea.

2.3.4 Groundwater

Groundwater was encountered at the Oil Drum Dump Site during the 1999 field season at depths approximating the water level in the onsite marsh. Near the marsh, groundwater was encountered several inches bgs. Beneath the central pad, groundwater was encountered at a depth of about 12 feet bgs.

2.4 CONCEPTUAL SITE MODEL

Conceptual site models are used to identify pathways by which human and ecological receptors may be exposed to contamination. Each exposure pathway has four fundamental components: 1) a source and mechanism of chemical release, 2) an affected environmental medium and potential chemical migration process, 3) an exposure point, and 4) an exposure route by which receptors come in contact with site contaminants. If any one of these does not exist, the potential exposure pathway is incomplete. Components of exposure pathways that could exist at the Oil Drum Dump Site and potential receptors are described in the following sections and summarized in Table 1.

2.4.1 Source and Mechanism of Chemical Release

Drums containing fuels and used oil were previously staged or abandoned at this site. Associated leaks or spills of fuel and oil occurred.

2.4.2 Affected Environmental Medium and Potential Chemical Migration Process

The land surface within and surrounding the Oil Drum Dump Site consists of hummocky sand dunes, with many small, circular basins separated from adjacent basins by dune ridges. The pad at the site, previously used to store drums, is comprised of gravel and is devoid of vegetation. Over the years, drum contents spilled and leaked to the ground surface, resulting in contaminated surface and subsurface soil. Some of the spilled material migrated down slope from the pad into a small, marshy area located northwest of the pad, and into a small depression immediately northeast of the pad. Low levels of contamination have been detected in surface water and sediment. Dune ridges prevent the overland flow of site material from reaching the Bering Sea.

Subsurface transport pathways are vertical migration through the vadose zone and lateral migration through groundwater. Contaminants have reached groundwater beneath the pad. At the pad, groundwater was encountered at a depth of about 12 feet bgs, and near the marsh, groundwater was encountered several inches bgs. Groundwater resources used by the City of St. Paul are located about 1.75 miles from the site, are most likely up gradient from the site, and are completed in the basalt aquifer. Thus, under current circumstances, a complete groundwater exposure pathway is not suspected.

2.4.3 Exposure Points

Potential exposure points are the soils at the Oil Drum Dump Site and the surface water contained in ponds and marshy areas at the site.

2.4.4 Receptors and Exposure Routes

Currently, the primary, potential human receptors at the Oil Drum Dump Site are recreational users. The Oil Drum Dump Site is located on property zoned as open space. An all-terrain vehicle (ATV) trail leading to the Bering Sea beach is located south of the site. As zoned, the site's land cannot be developed except for camp

houses, informal recreation facilities, environmental education and research, and essential public facilities. If construction activities were undertaken on the site for these purposes, temporary workers would also be potential receptors. Potential exposure routes for humans include dermal contact, incidental ingestion of soil, ingestion of surface water, and inhalation of particulates.

Fox, shrews, sea birds, passerine birds, and reindeer are potential ecological receptors. Potential exposure routes for these animals include dermal contact, inadvertent ingestion of soil, ingestion of surface water, and inhalation of particulates.

Table 2.1. Conceptual Site Model for the Oil Drum Dump Site

Source/mechanism of release	Environmental Exposure Medium	Exposure Point	Exposure Route	Receptors
Petroleum constituents from leaking oil drums	Soil	Oil Drum Dump Site	Dermal contact, incidental ingestion of soil, inhalation of particulates	Recreational users, temporary workers, foxes, shrews, sea birds, reindeer
Petroleum constituents from leaking oil drums	Surface water	Pond and marsh areas at the Oil Drum Dump Site	Ingestion of surface water	Recreational users, temporary workers, foxes, shrews, sea birds, reindeer

3 PREVIOUS INVESTIGATIONS AND OTHER ACTIVITIES

Previous activities conducted at the Oil Drum Dump Site included the 1983 ADEC site inspection (Harmon 1983); 1986 removal of drums and debris (Chase Construction, Inc. 1986); 1991 preliminary assessment (ADEC 1991b); 1992 preliminary assessment (Ecology & Environment, Inc. 1993); 1992 inventory and removal of drums (Harding Lawson Associates 1993); 1994 site inspection (Woodward-Clyde 1994); 1994 drum removal (Oil Spill Consultants 1995); 1996 limited surface soil sampling; 1997 debris removal (Aleutian Enterprises 1997); and 1999 site characterization (Tetra Tech 2000a). These investigations and activities are summarized in the following sections.

3.1 SITE INSPECTION (1983)

ADEC conducted a site inspection of St. Paul Island in October 1983 that included the Oil Drum Dump Site (Harmon 1983). The site was listed as a suspected contaminated site in a survey of waste disposal practices on St. Paul Island. Thousands of drums were estimated to be present, some with leaking contents.

3.2 DRUM AND DEBRIS REMOVAL (1986)

The DOD conducted an island-wide debris removal project in 1986. Chase Construction, Inc., under contract to the U.S. Army Corps of Engineers (USACE), removed debris and drums from FUDS on St. Paul Island (Chase Construction, Inc. 1986). Approximately 4,000 rusted drums with petroleum product and antifreeze markings were removed from FUDS B-1. The empty drums were crushed and placed in a burial trench near the Vehicle Boneyard (TPA Site 2). Drums judged to be non-military in origin, approximately 350 drums, were placed atop the central pad and left in place without further action being taken.

3.3 PRELIMINARY ASSESSMENT (1991)

ADEC conducted a preliminary assessment of the Oil Drum Dump Site in July 1991 (ADEC 1991b). Approximately 200 to 300 drums were observed still present on the site, most appearing to be at least partially full. Soil staining was evident, and a strong benzene odor was present. Investigators observed crushed, partially buried drums, fine metal debris in the soil, and larger drum parts in the sand dune around the marsh.

3.4 PRELIMINARY ASSESSMENT (1992)

In October 1992, Ecology & Environment, Inc. (E&E) performed a preliminary assessment of the Oil Drum Dump Site (E&E 1993). Approximately 350 rusted drums were observed on the central pad. The drums reportedly contained petroleum products. Ponded water was observed on the north side of the pad, and drums were scattered in a depression on the south side of the pad. In some areas at the site, the soil appeared to be saturated with oil.

3.5 DRUM INVENTORY AND REMOVAL (1992)

Harding and Lawson Associates (HLA), under contract to USACE, inventoried and removed drums at the Oil Drum Dump Site in 1992 following the preliminary assessment (HLA 1993). The contents of 310 drums were inventoried. Seven of the inventoried drums were empty or contained solid material. The other drums were field categorized for waste material compatibility. The content of 203 drums was nonflammable oil or nonflammable fuel/oil mixed with water. Fifty-one drums contained flammable fuel, flammable oil, or flammable fuel/oil mixed with water. Chlorinated compounds were identified in eight of the drums. The remaining drums contained water or other waste types. Contents from 201 of the 310 drums were bulked into 154 new drums. The newly bulked drums and the 201 emptied drums were transferred to a lined containment area (staging area) located west of the Vehicle Boneyard (TPA Site 2) where bulked drums were sampled for waste management profile and energy recovery testing. The remaining inventoried drums, including those found empty, were left at the site.

3.6 SITE INSPECTION (1994)

In June 1994, Woodward-Clyde conducted a site inspection at the Oil Drum Dump Site (Woodward-Clyde 1994). Woodward-Clyde found about 100 drums in a group on top of a mound in the middle of the site (*i.e.*, the central pad) at the time of inspection. They observed stained soils and leaking drums. Six soil samples, six sediment sediment samples, and one surface water sample were analyzed for pesticides and polychlorinated biphenyls, volatile organic compounds (VOCs), semivolatile organic compounds, and target analyte list metals. Results were compared to human health, risk-based concentrations (RBCs) developed by U.S. Environmental Protection Agency (USEPA) Region III. Organic compounds were not detected in any media at concentrations exceeding the USEPA screening criteria. Arsenic (As), beryllium (Be), and manganese (Mn) were detected in soil and sediment samples at concentrations exceeding USEPA screening criteria.

Chromium (Cr) and nickel (Ni) concentrations exceeded their Method Two soil cleanup levels of 26 mg/kg and 87 mg/kg, respectively. No analytes other than those metals exceeded the ADEC Method Two cleanup levels.

The samples were not analyzed for gasoline range organics (GRO), diesel range organics (DRO), residual range organics (RRO) or benzene, toluene, ethylbenzene, and total xylenes (BTEX). However, Woodward-Clyde identified these compounds as contaminants of potential concern (COPCs) due to their expected presence at the site.

3.7 DRUM REMOVAL (1994)

In September 1994, Oil Spill Consultants inspected the Oil Drum Dump Site and found 174 drums and heavy soil staining. The tops and sides of the drums were covered with oil. Each drum contained a 6- to 8-inch layer of water, which likely resulted from precipitation that entered the drums through punctures. Drums were sampled for onsite field screening. Based on field screening results, drum contents were consolidated and shipped to Basin Oil Company in Seattle, Washington (Oil Spill Consultants 1995).

3.8 LIMITED SURFACE SOIL SAMPLING (1996)

NOAA collected two composite surface soil samples in October 1996 from stained areas of the central pad (*i.e.*, TPA Site No. 1) at the Oil Drum Dump Site. Samples were analyzed for DRO, RRO, and total recoverable petroleum hydrocarbons (TRPH). SPCOMP 1, a sample composited from the southwest half of the pad, contained 4,400 mg/kg DRO, 38,000 mg/kg RRO, and 51,000 mg/kg TRPH. SPCOMP-2, a sample composited from the

northeast half of the pad, contained 7,300 mg/kg DRO, 43,000 mg/kg RRO, and 50,000 mg/kg TRPH. ADEC Method Two soil cleanup levels for DRO and RRO are 250 mg/kg and 10,000 mg/kg, respectively.

3.9 DEBRIS REMOVAL (1997)

In 1997, Bering Sea Eccotech removed the majority of the remaining bulk surface debris, as part of Phase I co-operative agreement with NOAA (Aleutian Enterprises 1997). Soil samples were not collected during the debris removal.

3.10 SITE CHARACTERIZATION (1999)

Tetra Tech conducted a preliminary investigation at the Oil Drum Dump Site in August and September 1999 (Tetra Tech 2000a). Tetra Tech collected 77 soil samples, 36 from TPA Site No. 1 and 41 from FUDS B-1 (Figure 3), and analyzed them for GRO, DRO, RRO, and BTEX. Some samples were also analyzed for PAHs and VOCs.

In soil, GRO, BTEX, PAHs, and VOCs were sporadically detected but never above ADEC Method Two cleanup levels. DRO was detected above its Method Two cleanup level of 250 mg/kg at eight locations, with a maximum detection of 18,000 mg/kg at sample location 01SS02-020 (Figure 3, Table 2). RRO was detected above its Method Two cleanup level of 10,000 mg/kg at four locations, with a maximum detection of 110,000 mg/kg at sample location 01SS23-020 (Figure 3, Table 2). Exceedances occurred both on land considered to be part of TPA Site No. 1 and land considered part of the FUDS.

Seven groundwater samples, including one duplicate, were also collected. Only one sample, 01GW18, contained fuels or other organic compounds above ADEC Table C cleanup levels (Figure 4, Table 3). This sample, collected from beneath the central pad, contained DRO at 10,400 µg/L. The cleanup level for DRO in groundwater is 1,500 µg/L.

Surface water and sediment samples were collected from two locations each in the ephemeral marsh area down slope from areas containing obvious soil staining. The maximum DRO concentrations detected in sediment and surface water were 94 mg/kg and 320 µg/L, respectively. RRO was detected in sediment, with a maximum concentration of 340 mg/kg. The state of Alaska does not have sediment quality standards; however, the DRO and RRO concentrations in the sediment are below the most stringent ADEC cleanup levels for soil, 100 mg/kg and 2000 mg/kg, respectively. The only quantitative state standards for petroleum in fresh surface water are for total aqueous hydrocarbons and total aromatic hydrocarbons for which analyses were not conducted. GRO, BTEX, PAHs, and VOCs were not detected in surface water or sediment samples above their respective practical quantitation limits (PQLs).

Table 3.1. Soil Analytical Laboratory Results for Samples Containing Detectable Levels of Contaminants, Oil Drum Dump Site, St. Paul Island, Alaska

Sample Information						Petroleum Hydrocarbons			Volatile Organics (VOCs)						
						mg/kg (PPM)									
Contractor	SAMPLE	Sample Date	Start Depth (feet bgs)	End Depth (feet bgs)	Method 2 Cleanup Level	C6-C10 GRO	C10-C25 DRO	C25-C36 RRO	95-63-6 1,2,4-Trimethylbenzene	108-67-8 1,3,5-Trimethylbenzene	75-15-0 Carbon disulfide	108-90-7 Chlorobenzene	100-41-4 Ethylbenzene	108-88-3 Toluene	1330-20-7 Xylenes (total)
						300	250	10000	92.2	25	17	0.6	5.5	5.4	78
CESI	MWODDS-1	6/12/2000	4	6	**Above Method 2**		**4100**	**13000**							
					Below Method 2	7.9			0.074**d**						0.21**d**
			8	10	**Above Method 2**										
					Below Method 2		98	350							
			15	17	**Above Method 2**										
					Below Method 2		67	320							
	MWODDS-1d	11/2/2000	5	6	**Above Method 2**										
					Below Method 2		16	240							
			9	10	**Above Method 2**										
					Below Method 2			70							
			15	16	**Above Method 2**										
					Below Method 2										
			35	36	Below Method 2										
	MWODDS-2	6/13/2000	2	4	**Above Method 2**										
					Below Method 2										
	MWODDS-3	6/14/2000	3	5	**Above Method 2**										
					Below Method 2										
	MWODDS-4	7/5/2000	14	15	**Above Method 2**										
					Below Method 2		27	89							
		7/4/2000	25	26	**Above Method 2**										
					Below Method 2		11								
	MWODDS-5	9/30/2000	10	11	**Above Method 2**										
					Below Method 2										
	ODDSSB-1	9/22/2000	2	4	Below Method 2		56	140							
	ODDSSB-3	9/22/2000	2	4	**Above Method 2**		**580**								
	ODDSSB-4	9/22/2000	2	4	Below Method 2		16	150							
	ODDSSB-5	9/22/2000	0	2	**Above Method 2**		**1400**	**12000**							
	ODDSSB-6	9/22/2000	0	2	**Above Method 2**		**2400**								
					Below Method 2			260							
	ODDSSB-12	9/25/2000	2	4	**Above Method 2**										
					Below Method 2										
	ODDSSB-18	9/26/2000	10	12	**Above Method 2**		**960**								
					Below Method 2			4600							
	ODDSSB-19	9/26/2000	10	12	**Above Method 2**										
					Below Method 2										
	ODDSSB-20	9/27/2000	4	6	**Above Method 2**										
					Below Method 2		81	240							

Sample Information						Petroleum Hydrocarbons			Volatile Organics (VOCs)						
						mg/kg (PPM)									
Contractor	SAMPLE	Sample Date	Start Depth (feet bgs)	End Depth (feet bgs)		C6-C10 GRO	C10-C25 DRO	C25-C36 RRO	95-63-6 1,2,4-Trimethylbenzene	108-67-8 1,3,5-Trimethylbenzene	75-15-0 Carbon disulfide	108-90-7 Chlorobenzene	100-41-4 Ethylbenzene	108-88-3 Toluene	1330-20-7 Xylenes (total)
					Method 2 Cleanup Level	**300**	**250**	**10000**	**92.2**	**25**	**17**	**0.6**	**5.5**	**5.4**	**78**
CESI	ODDSSB-21	9/27/2000	14	16	**Above Method 2**		**1200**	**18000**							
					Below Method 2										
	ODDSSB-22	9/29/2000	14	16	**Above Method 2**										
					Below Method 2										
	ODDSSB-23	9/27/2000	4	6	**Above Method 2**										
					Below Method 2										
	ODDSSB-24	9/27/2000	4	6	**Above Method 2**										
					Below Method 2										
	ODDSSB-25	9/27/2000	4	6	**Above Method 2**										
					Below Method 2										
	ODDSSB-32	9/29/2000	12	14	**Above Method 2**										
					Below Method 2										
	ODDSSB-33	9/29/2000	2	4	**Above Method 2**										
					Below Method 2										
	ODDSSB-34	10/4/2000	10	12	**Above Method 2**										
					Below Method 2										
	ODDSSB-37	9/11/2000	2	3	**Above Method 2**										
					Below Method 2										
	ODDSSB-50	9/26/2000	3	5	**Above Method 2**										
					Below Method 2										
	ODDSSB-53	9/26/2000	3	5	**Above Method 2**										
					Below Method 2										
	ODDSSB-56	9/26/2000	2	4	**Above Method 2**		**3700**								
					Below Method 2			130							
	ODDSSB-58	9/26/2000	2	4	**Above Method 2**										
					Below Method 2										
	ODDSSB-60	9/26/2000	2	4	**Above Method 2**										
					Below Method 2		240	70							
	ODDSSB-61	9/29/2000	3	5	**Above Method 2**										
					Below Method 2										
	ODDSSB-63	9/29/2000	3	5	**Above Method 2**		**2300**								
					Below Method 2			130							
	ODDSSB-64	9/29/2000	3	5	**Above Method 2**										
					Below Method 2										
	ODDSSB-65	9/29/2000	3	5	**Above Method 2**										
					Below Method 2										
	ODDSSB-66	9/29/2000	3	5	**Above Method 2**										
					Below Method 2										
	ODDSTP-28	9/29/2000	7	9	**Above Method 2**										
					Below Method 2		26	77							

Sample Information						Petroleum Hydrocarbons			Volatile Organics (VOCs)						
						mg/kg (PPM)									
Contractor	SAMPLE	Sample Date	Start Depth (feet bgs)	End Depth (feet bgs)		C6-C10 GRO	C10-C25 DRO	C25-C36 RRO	95-63-6	108-67-8	75-15-0	108-90-7	100-41-4	108-88-3	1330-20-7
									1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Carbon disulfide	Chlorobenzene	Ethylbenzene	Toluene	Xylenes (total)
					Method 2 Cleanup Level	300	250	10000	92.2	25	17	0.6	5.5	5.4	78
CESI	ODDSTP-30	9/29/2000	0	2	Below Method 2	25			0.64	0.24					
	ODDSTP-31	9/29/2000	0	2	**Above Method 2**		**480**								
					Below Method 2	1		230							
Tetra Tech EM	01SS02	no date	2	2	**Above Method 2**		**1520**								
					Below Method 2	12		3400	0.17					0.008	
	01SS04	no date	1	1	Below Method 2		40								
	01SS05	no date	15	15	Below Method 2							0.009			
	01SS10	no date	1	1	**Above Method 2**		**3600**								
					Below Method 2			200							
			5	5	Below Method 2		10								
			10	10	**Above Method 2**		**3200**								
					Below Method 2			170							
	01SS13	no date	1	1	Below Method 2		16								
	01SS14	no date	1	1	**Above Method 2**		**6300 d**	**33000 d**							
					Below Method 2								0.07		
	01SS15		1	1	**Above Method 2**		**3900 d**	**43000 d**							
					Below Method 2	9									0.08
			5	5	Below Method 2		25	170							
	01SS16	no date	1	1	**Above Method 2**		**3200 d**								
					Below Method 2	21 J		3000 d					0.14		
			5	5	**Above Method 2**		**2600 d**								
					Below Method 2			5400 d							
	01SS17	no date	1	1	**Above Method 2**		**990 d**								
					Below Method 2			8600 d							
			5	5	**Above Method 2**		**1400 d**	**11000 d**							
					Below Method 2	54 J							0.61	0.07 J	0.97
			10	10	Below Method 2	26 J							0.06	0.1 J	1.01
	01SS18	no date	10	10	Below Method 2										0.25
	01SS20	no date	1	1	Below Method 2		128	230							
	01SS21	no date	1	1	Below Method 2		10								
	01SS22	no date	1	1	Below Method 2						0.005				
	01SS23	no date	2	2	**Above Method 2**		**17000 d**	**110000 d**							
					Below Method 2	27 J									
	01SS24	no date	3	3	Below Method 2		68	90 J							0.07
	01SS40	no date	2	2	Below Method 2		55	323							
	01SS44	no date	2	2	Below Method 2	10									
	01SS45	no date	2	2	**Above Method 2**		**18000**								
					Below Method 2			1850							
	01SD25				Below Method 2		94	240 X							
	01SD25D				Below Method 2		54	140							
	01SD26				Below Method 2		85 X	340 JX							

Sample Information					Semivolatile Organics (SVOCs)										Metals					
					mg/kg (PPM)															
					2-Methylnaph-thalene	Bis(2-ethylhexyl) phthalate	Butyl benzyl phthalate	Chrysene	Dimethyl phthalate	Di-n-butyl phthalate	Fluorene	Naphthalene	Phenanthrene	Pyrene	Arsenic	Barium	Cadmium	Chromium (Total)	Lead	Selenium	Silver
Contractor	SAMPLE	Sample Date	Start Depth (feet bgs)	End Depth (feet bgs)	91-57-6	117-81-7	85-68-7	218-01-9	131-11-3	84-74-2	86-73-7	91-20-3	85-01-8	129-00-0	7440-38-2	7440-39-3	7440-43-9	7440-47-3	7439-92-1	7782-49-2	7440-22-4
				Method 2 Cleanup Level	43	590	5600	620	1400	1700	270	21	4300	1500	2	1100	5	26	400	3.5	21
CESI	MWODDS - 1	6/12/2000	4	6											**3.5**			**44.1**			
						0.5d										26.1			1.3		
			8	10											**3.5**			**51.8**			
																48.2			1.6		
			15	17											**3.6**			**69**			
						0.04										58.3			3.1		
	MWODDS - 1d	11/2/2000	5	6											**2.3**			**66.2**			
																28.5			1.35		
			9	10											**2.32**			**62**			
						0.15										46.6			1.49		
			15	16											**2.64**			**58.3**			
						0.09										70.7	0.6		2.36	0.51	
			35	36												16.3		25.6	0.69	0.4	
	MWODDS - 2	6/13/2000	2	4											**4.4**			**48.8**			
																37			1.6		
	MWODDS - 3	6/14/2000	3	5											**5.1**			**43.9**			
																33.2			1.8		
	MWODDS - 4	7/5/2000	14	15											**5.6**			**29**			
						0.9			0.07							91.8			4		
		7/4/2000	25	26														**26.3**			
						0.09										9.9					
	MWODDS - 5	9/30/2000	10	11											**3.5**			**57.1**			
						2.2fb	0.75fb			0.98fb						84.8			2		
	ODDSSB - 1	9/22/2000	2	4																	
	ODDSSB - 3	9/22/2000	2	4																	
	ODDSSB - 4	9/22/2000	2	4																	
	ODDSSB - 5	9/22/2000	0	2																	

Sample Information						Semivolatile Organics (SVOCs)										Metals						
						mg/kg (PPM)																
Contractor	SAMPLE	Sample Date	Start Depth (feet bgs)	End Depth (feet bgs)		91-57-6	117-81-7	85-68-7	218-01-9	131-11-3	84-74-2	86-73-7	91-20-3	85-01-8	129-00-0	7440-38-2	7440-39-3	7440-43-9	7440-47-3	7439-92-1	7782-49-2	7440-22-4
						2-Methylnaph-thalene	Bis(2-ethylhexyl) phthalate	Butyl benzyl phthalate	Chrysene	Dimethyl phthalate	Di-n-butyl phthalate	Fluorene	Naphthalene	Phenanthrene	Pyrene	Arsenic	Barium	Cadmium	Chromium (Total)	Lead	Selenium	Silver
					Method 2 Cleanup Level	43	590	5600	620	1400	1700	270	21	4300	1500	2	1100	5	26	400	3.5	21
CESI	ODDSSB - 6	9/22/2000	0	2	**Above Method 2**											**3.6**			**38**			
					Below Method 2												52.1			3		
	ODDSSB - 12	9/25/2000	2	4	**Above Method 2**											**3.3**			**59**			
					Below Method 2												66.3			2		
	ODDSSB - 18	9/26/2000	10	12	**Above Method 2**											**2.7**			**38**			
					Below Method 2		0.35										55.2			2		
	ODDSSB - 19	9/26/2000	10	12	**Above Method 2**											**3.8**			**42**			
					Below Method 2		0.03										156			3		
	ODDSSB - 20	9/27/2000	4	6	**Above Method 2**											**3**			**39.5**			
					Below Method 2		0.08										96.8			6		
	ODDSSB - 21	9/27/2000	14	16	**Above Method 2**											**2.9**			**37.4**			
					Below Method 2		1.1										70			2		
	ODDSSB - 22	9/29/2000	14	16	**Above Method 2**											**3.6**			**78**			
					Below Method 2			0.12**fb**			2**fb**						47.6			2		
	ODDSSB - 23	9/27/2000	4	6	**Above Method 2**											**3.3**			**36**			
					Below Method 2												190			3		0.6
	ODDSSB - 24	9/27/2000	4	6	**Above Method 2**											**3.8**			**44**			
					Below Method 2												236			3		
	ODDSSB - 25	9/27/2000	4	6	**Above Method 2**											**4.4**			**29**			
					Below Method 2												165			4		
	ODDSSB - 32	9/29/2000	12	14	**Above Method 2**											**3.4**			**61.4**			
					Below Method 2												94.9			2		
	ODDSSB - 33	9/29/2000	2	4	**Above Method 2**											**3.6**			**66.6**			
					Below Method 2												35.6			2		
	ODDSSB - 34	10/4/2000	10	12	**Above Method 2**											**3.1**			**61**			
					Below Method 2		0.09										77.1			2		

Sample Information					Semivolatile Organics (SVOCs)										Metals					
					mg/kg (PPM)															
Contractor	SAMPLE	Sample Date	Start Depth (feet bgs)	End Depth (feet bgs)	Method 2 Cleanup Level	2-Methylnaph-thalene	Bis(2-ethylhexyl) phthalate	Butyl benzyl phthalate	Chrysene	Dimethyl phthalate	Di-n-butyl phthalate	Fluorene	Naphthalene	Phenanthrene	Pyrene	Arsenic	Barium	Cadmium	Chromium (Total)	Lead	Selenium	Silver
						91-57-6	117-81-7	85-68-7	218-01-9	131-11-3	84-74-2	86-73-7	91-20-3	85-01-8	129-00-0	7440-38-2	7440-39-3	7440-43-9	7440-47-3	7439-92-1	7782-49-2	7440-22-4
						43	590	5600	620	1400	1700	270	21	4300	1500	2	1100	5	26	400	3.5	21
CESI	ODDSSB - 37	9/11/2000	2	3	**Above Method 2**											**2.2**						
					Below Method 2												1.5		1.2	3	0.7	
	ODDSSB - 50	9/26/2000	3	5	**Above Method 2**											**3.5**			**42.3**			
					Below Method 2												26.6			1.4		
	ODDSSB - 53	9/26/2000	3	5	**Above Method 2**											**4**			**55.3**			
					Below Method 2												35.5			1		
	ODDSSB - 56	9/26/2000	2	4	**Above Method 2**							0.57	0.11	0.62	0.08	**3.5**			**63**			
					Below Method 2	0.22											79.2			3		
	ODDSSB - 58	9/26/2000	2	4	**Above Method 2**											**3.9**			**58**			
					Below Method 2												105			3		0.7
	ODDSSB - 60	9/26/2000	2	4	**Above Method 2**											**2.8**			**64**			
					Below Method 2												75.2			1		
	ODDSSB - 61	9/29/2000	3	5	**Above Method 2**											**4.2**			**71**			
					Below Method 2												76.6			3		
	ODDSSB - 63	9/29/2000	3	5	**Above Method 2**							0.14		0.14		**3.7**			**66**			0.8
					Below Method 2												116			4		
	ODDSSB - 64	9/29/2000	3	5	**Above Method 2**											**5**			**55.3**			
					Below Method 2												63.1			3		
	ODDSSB - 65	9/29/2000	3	5	**Above Method 2**											**4.9**			**48.4**			
					Below Method 2												57.3			5		
	ODDSSB - 66	9/29/2000	3	5	**Above Method 2**											**2.7**			**58**			
					Below Method 2												153			4		0.7
	ODDSTP - 28	9/29/2000	7	9	**Above Method 2**											**3.6**			**51**			
					Below Method 2												303			5		
	ODDSTP - 30	9/29/2000	0	2	Below Method 2								0.24									
	ODDSTP - 31	9/29/2000	0	2	**Above Method 2**											**3.3**			**66.5**			
					Below Method 2							0.09		0.15			59.5			2		

Sample Information						Semivolatile Organics (SVOCs)										Metals						
						mg/kg (PPM)																
Contractor	SAMPLE	Sample Date	Start Depth (feet bgs)	End Depth (feet bgs)		91-57-6	117-81-7	85-68-7	218-01-9	131-11-3	84-74-2	86-73-7	91-20-3	85-01-8	129-00-0	7440-38-2	7440-39-3	7440-43-9	7440-47-3	7439-92-1	7782-49-2	7440-22-4
						2-Methylnaph-thalene	Bis(2-ethylhexyl) phthalate	Butyl benzyl phthalate	Chrysene	Dimethyl phthalate	Di-n-butyl phthalate	Fluorene	Naphthalene	Phenanthrene	Pyrene	Arsenic	Barium	Cadmium	Chromium (Total)	Lead	Selenium	Silver
					Method 2 Cleanup Level	**43**	**590**	**5600**	**620**	**1400**	**1700**	**270**	**21**	**4300**	**1500**	**2**	**1100**	**5**	**26**	**400**	**3.5**	**21**
Tetra Tech EM	01SS02	no date	2	2	**Above Method 2**																	
					Below Method 2				0.08			0.08		0.4								
	01SS04	no date	1	1	Below Method 2																	
	01SS05	no date	15	15	Below Method 2																	
	01SS10	no date	1	1	**Above Method 2**																	
					Below Method 2																	
			5	5	Below Method 2																	
			10	10	**Above Method 2**																	
					Below Method 2																	
	01SS13	no date	1	1	Below Method 2																	
	01SS14	no date	1	1	**Above Method 2**																	
					Below Method 2																	
	01SS15		1	1	**Above Method 2**																	
					Below Method 2																	
			5	5	Below Method 2																	
	01SS16	no date	1	1	**Above Method 2**																	
					Below Method 2																	
			5	5	**Above Method 2**																	
					Below Method 2																	
	01SS17	no date	1	1	**Above Method 2**																	
					Below Method 2																	
			5	5	**Above Method 2**																	
					Below Method 2																	
			10	10	Below Method 2																	
	01SS18	no date	10	10	Below Method 2																	
	01SS20	no date	1	1	Below Method 2																	
	01SS21	no date	1	1	Below Method 2																	

Sample Information						Semivolatile Organics (SVOCs)										Metals						
						mg/kg (PPM)																
Contractor	SAMPLE	Sample Date	Start Depth (feet bgs)	End Depth (feet bgs)		91-57-6	117-81-7	85-68-7	218-01-9	131-11-3	84-74-2	86-73-7	91-20-3	85-01-8	129-00-0	7440-38-2	7440-39-3	7440-43-9	7440-47-3	7439-92-1	7782-49-2	7440-22-4
						2-Methylnaph-thalene	Bis(2-ethylhexyl) phthalate	Butyl benzyl phthalate	Chrysene	Dimethyl phthalate	Di-n-butyl phthalate	Fluorene	Naphthalene	Phenanthrene	Pyrene	Arsenic	Barium	Cadmium	Chromium (Total)	Lead	Selenium	Silver
					Method 2 Cleanup Level	**43**	**590**	**5600**	**620**	**1400**	**1700**	**270**	**21**	**4300**	**1500**	**2**	**1100**	**5**	**26**	**400**	**3.5**	**21**
Tetra Tech EM	01SS22	no date	1	1	Below Method 2																	
	01SS23	no date	2	2	**Above Method 2**																	
					Below Method 2				0.9													
	01SS24	no date	3	3	Below Method 2																	
	01SS40	no date	2	2	Below Method 2																	
	01SS44	no date	2	2	Below Method 2																	
	01SS45	no date	2	2	**Above Method 2**																	
					Below Method 2																	
	01SD25				Below Method 2																	
	01SD25D				Below Method 2																	
	01SD26				Below Method 2																	

Qualifiers/Lab Notes

d = The sample was diluted due to matrix effects (foaming) or high levels or interfering compunds. Detection limits are raised due to dilution.

fb = The analyte indicated was found in the blank. Its presence may be due to laboratory contamination.

J = Estimated value.

X = The method reporting limit is elevated due to matrix interference.

Note: The precise geographic location of CESI soil sample ODDSSB-37 is unknown. It is listed in this table but does not appear in soil sample figures.

Table 3.2. Groundwater Analytical Laboratory Results for Samples Containing Detectable Levels of Contaminants, Oil Drum Dump Site, St. Paul Island, Alaska

Sample Information				Petroleum Hydrocarbons mg/L (PPM)	
Contractor	**Sample**	**Sample Date**		**DRO**	**GRO**
			Method 2 Cleanup Level	**1.5**	**1.3**
Tetra Tech EM	01GW18	(no date)	**Above Method 2**	**10.4**	
			Below Method 2		
	01SW25	(no date)	Below Method 2	0.32	
	01SW26	(no date)	Below Method 2	0.11	
CESI	MWODDS - 1	11/14/2000	**Above Method 2**	**15**	**4.7 d**
			Below Method 2		
		9/11/2000	**Above Method 2**	**7.7**	**6.1**
			Below Method 2		
	MWODDS - 1d	11/14/2000	**Above Method 2**		
			Below Method 2	0.05	0.11
	MWODDS - 2	9/11/2000	**Above Method 2**		
			Below Method 2	0.05	0.05
	MWODDS - 3	9/11/2000	**Above Method 2**	**6.1**	**5.9**
			Below Method 2	0.05	0.05
	MWODDS - 4	11/17/2000	**Above Method 2**		
			Below Method 2	0.05	0.05
		9/11/2000	**Above Method 2**		
			Below Method 2	0.05	0.05
	MWODDS - 5	10/3/2000	**Above Method 2**		
			Below Method 2	0.12	0.05
	SWODDS - 1	10/3/2000	**Above Method 2**		
			Below Method 2	0.19	0.05
	SWODDS - 2	10/3/2000	**Above Method 2**		
			Below Method 2	0.15	0.05
	SWODDS - 3	10/3/2000	**Above Method 2**		
			Below Method 2	0.11	0.05

Qualifiers/Lab notes

d = The sample was diluted die to matrix effects (foaming) or high levels or interfering compounds. Detection limits are raised due to dilution.

4 FIELD METHODOLOGIES FOR SITE CHARACTERIZATION

Several methods were used to during the 2000 site characterization conducted by CESI. These are summarized in the following sections. Methods for soil, groundwater, and geohydrologic characterization were taken from industry standard operating procedures (Butler 1998, Fetter 1988, Keith 1988, and Kresic 1997) and ADEC guidance (ADEC 1999a). The remote location of St. Paul Island and limited facilities required some modifications to procedures for utility location, handling of investigation-derived waste (IDW), and sample packaging and shipping.

4.1 GEOPHYSICAL METHODS

CESI (2002) used a Fisher TW-6 inductive locator to locate buried metallic objects. The instrument's transmitter induces an electromagnetic field around buried metallic objects and the resulting signal is transmitted to the receiver. The inductive locator was tuned and tested to ensure that it was not responding to metallic surface debris. The TW-6 operator made numerous traverses across the study area. When a strong tone and meter reading were observed, the location of the subsurface anomaly was recorded using Trimble XR/XRS GPS. Anomalies in selected areas were confirmed by hand probing or digging test pits.

4.2 SOIL METHODS

CESI collected soil samples using multiple methods: hand augering, hand-held Geoprobe, mobile hollow-stem auger (MHSA), test pitting, and air-rotary drilling. A total of 59 boreholes and three (3) test pits were completed across the site. The following sections discuss the methods in detail.

4.2.1 Hand Augering

A 6-in. diameter hand auger was used to construct several shallow borings. The auger was advanced into the ground by rotation. Samples were collected from the center of the auger bucket. The soil samples were taken directly from the auger and placed into 4-oz soil sampling jars and the jars were then labeled. The samples needed for VOC and GRO analysis were placed into tared jars with Teflon septa lids and field preserved with 25 mL of surrogate methanol according to the ADEC sampling procedures in ADEC (1999a). The aliquot of surrogate methanol was carefully added to the soil in the jar using a Brinkman repipet set to deliver 25 mL. All soil jars were then placed into a cooler where they were kept at a temperature of 4 ±2°C. The auger was decontaminated between each sample interval (see Section 4.2.6).

4.2.2 Hand-held Geoprobe

Most of the soil samples were collected with a Geoprobe direct-push sampler. The Geoprobe sampler consists of a stainless steel drive shoe and an acetate liner that screws into a 2-ft stainless steel core barrel that is nominally 2 in. inside diameter. The sampler was driven into the ground with a drop hammer, and samples were collected continuously in 2-ft intervals from the ground surface to the bottom of the boring.

The soil samples were taken directly from the acetate liner, photo-documented with an Olympus 2500L digital camera, and placed into 4-oz soil sampling jars and the jars were then labeled. The samples needed for VOC and GRO analysis were placed into tared jars with Teflon septa lids and field preserved with 25 mL of surrogate methanol according to the ADEC sampling procedures in ADEC (1999a). The aliquot of surrogate methanol was carefully added to the soil in the jar using a Brinkman pipet set to deliver 25 mL. All soil jars were then placed into a cooler where they were kept at a temperature of 4 ±2°C. The acetate liner was then discarded and the stainless sampler tube and drive shoe were decontaminated before collecting the next sample (see Section 4.2.6).

4.2.3 Mobile Hollow-Stem Auger

The MHSA was used to construct three of the Oil Drum Dump Site monitoring wells, and occasionally used to recover soil borings. An 8-in. diameter hollow stem auger string was used to construct monitoring wells and a four-inch solid-stem auger string was used to sample soils. Soil samples were collected by removing the drill string (solid-stem auger) or by removing the plug and center rod assembly (hollow-stem auger). All soil samples were collected ahead of the drill string using the direct-push sampler (see Section 4.2.2). The Geoprobe sampler was decontaminated after each sample and the augers were decontaminated between soil borings according to the methods outlined in Section 4.2.6.

4.2.4 Test Pitting

Three test pits were constructed using a backhoe in conjunction with searches for drum remnants. Soil samples were collected from the center of the backhoe bucket or directly from the walls of the excavation using disposable or stainless sampling spoons and placed into 4-oz soil sampling jars and the jars were then labeled. The samples needed for VOC and GRO analysis were placed into tared jars with Teflon septa lids and field preserved with 25

mL of surrogate methanol according to the ADEC sampling procedures in ADEC (1999a). The aliquot of surrogate methanol was carefully added to the soil in the jar using a Brinkman repipet set to deliver 25 mL. All soil jars were then placed into a cooler where they were kept at a temperature of 4 ± 2°C. Sampling utensils and the backhoe bucket were decontaminated using the methods outlined in Section 4.2.6.

4.2.5 Air-Rotary Drilling

A Foremost Mobile B-61 air rotary drill rig was used to install deep soil borings in association with installation of three (3) monitoring wells. Air rotary borings were advanced to at least 7 ft below the groundwater table and were completed as monitoring wells (see Section 4.3.1).

The borings were drilled using the TUBEX method. In this method a carbon, steel casing was advanced into the boring behind a concentric over-reaming bit. The rotary borings were nominally 5.25-in. diameter. The carbon steel casing was removed from the boring during well completion (see Section 4.3.1). The project geologist documented drilling and well completion information in field notebooks and log forms.

The air rotary sampling method utilized a 2.5-in.-diameter split-spoon sampler consisting of a 24-in. long carbon steel tubular section split longitudinally into two equal semi-cylindrical halves. The split-spoon sampler screwed onto a connector head, which was attached to the drive rod. A drive shoe was screwed onto the other end of the split-spoon sampler. The split spoon sampler was driven into the ground using a 300-lb hammer dropped from a height of 30 in. Split-spoon samples were always collected ahead of the drill string.

The carbon steel split-spoon sampler was used to collect soil samples in unconsolidated materials; 2-ft long soil samples were collected every 5 to 10 ft in deep soil borings. The split spoon was opened, phot-documented with an Olympus 2500L digital camera, and immediately put into labeled soil sampling jars with a stainless steel trowel or disposable spatula. The samples needed for VOC and GRO analysis were placed into tared jars with Teflon septa lids and field preserved with 25 mL of surrogate methanol according to the ADEC sampling procedures in ADEC (1999a). The aliquot of surrogate methanol was carefully added to the soil in the jar using a Brinkman repipet set to deliver 25 mL. All soil jars were then placed into a cooler where they were kept at a temperature of 4 ± 2°C. The project geologist then logged each sample into a field notebook or logbook. The split spoon and stainless steel trowel was decontaminated between each sample (see Section 4.2.6).

4.2.6 Soil Decontamination Procedures

All soil sampling equipment was either decontaminated or disposed of after taking each sample. All reusable sampling equipment was scrubbed with a nylon or stainless brush in a solution of Alconox followed by two tap water rinses between samples (distilled and deionized water was not available in sufficient quantity on the island for equipment rinses). The acetate sample collection sleeve for the Geoprobe sampler was discarded and replaced with a new one. All of the Geoprobe threaded rods were decontaminated between boreholes in a solution of Alconox and rinsed twice in tap water.

The MHSA augers and tooling, air-rotary drill rig, and drill rig casing and tooling were driven to the decontamination pad west of the Decommissioned Power Plant (DPP) in the Village of Saint Paul and cleaned after each soil boring and/or well installation. High-pressure hot water (200°F) was used to clean the drilling rig, augers, backhoe bucket, and associated drilling equipment. All soil and water from the decontamination pad were collected and placed into drums.

4.2.7 Soil Investigation Derived Waste

Four types of IDW were created during the soils investigation: 1) soil cuttings created by the air-rotary drill rig and MHSA, 2) soil collected by Geoprobe and split-spoon sampling, 3) used decontamination water, and 4) miscellaneous plastic waste byproducts such as the visqueen associated with the decontamination pad, used acetate Geoprobe sleeves, personal protective equipment (PPE), and disposable sample scoops.

All IDW soil cuttings were placed into 55-gal drums and taken to the IDW staging area located to the west of the DPP. After laboratory analyses were available and the material found suitable for on-island treatment, all IDW was transported to the Enhanced Thermal Conduction (ETC) facility on Saint Paul Island. Once at the ETC facility, the IDW soil cuttings were placed on the petroleum contaminated soils (PCS) stockpile awaiting treat-

ment. Samples not chosen for laboratory analysis were left in the soil sampling jars with the lids and labels intact. These soils were then archived on shelves inside the DPP, which served as a field workstation, and subsequently disposed on the PCS stockpile by NOAA personnel.

All decontamination water was contained in 55-gal drums. After laboratory analyses were available and the material found suitable for on-island treatment, the water was transported to the ETC facility on Saint

Paul Island. Once at the ETC facility, the IDW was poured on the stockpile of contaminated soil awaiting treatment.

All waste byproducts were thrown into garbage bags on the project site. At the end of the project, all of the trash as well as the pressure-washed decontamination pad was transported to the Saint Paul landfill for disposal.

4.2.8 Field Analytical Methods

Standard ADEC sampling protocol requires the use of field screening devices to assess areas of suspected or obvious contamination. The requirements (ADEC 1999a) include performing surveys of potentially contaminated areas to determine the approximate locations containing contaminants (qualitative screening) and screening for semiquantitative estimates of the amount of contamination present at a specific location (semiquantitative screening).

The method used for field screening soils was the Dexsil Petroflag Hydrocarbon Analyzer field screening kit. The Petroflag is a broad-spectrum field analytical tool for petroleum hydrocarbons (EPA Method 9074). The system uses an extractant to remove hydrocarbon from a soil sample, a developer solution that precipitates an opaque solid, and a nephelometer/computer to measure solution opacity and report the results.

CESI selected samples for laboratory confirmation analysis based on the Petroflag field screening results and the following criteria:

- **Elevated screening results from an entire depth interval:** This criterion was met by selecting soil with the largest screening values for total petroleum hydrocarbons (TPH) measured in a borehole. Application of this criterion meets the semiquantitative ADEC requirement. Confirmation analysis using this criterion provided the quantitative measure of the actual TPH concentration in the intervals with the highest screening value.
- **Deepest intervals with suspected contamination based on the highest screening value:** This criterion was used to confirm the location of the bottom of soil contamination in a borehole, which meets both the ADEC qualitative and semiquantitative requirements.
- **Borehole bottoms independent of the screening value:** This criterion was applied to the shallower boreholes that did not reach the water table or that met with refusal. It was used to confirm that the bottom of the borehole was/was not contaminated. If the bottom of the borehole was clean, the nominal depth to the bottom of soil contamination was confirmed. If the bottom of the borehole was contaminated, the level of contamination was confirmed. Application of this criterion meets both the qualitative and semiquantitative ADEC requirements.
- **Intervals near the water table independent of the screening value:** This criterion was applied to the air rotary boreholes that were completed as monitoring wells. This criterion was used to determine if soil in the capillary fringe was contaminated. If the bottom of the borehole was clean, then vertical movement of contamination to the water table most likely did not impact groundwater. If the bottom of the borehole was contaminated, the level of contamination in the capillary fringe was confirmed.

4.2.9 Soil Laboratory Analytical Methods

Soil samples chosen for fixed environmental laboratory analyses were sent to Friedman & Bruya, Inc. The analytical protocol used the most complete, accurate, and sensitive methods available to ensure that all COPCs were identified.

The following methods were used by the laboratory for soil analysis:

- AK 101, extraction method 5035, for GRO;
- AK 102/AK 103, extraction method 3550B, for DRO and RRO;
- EPA Method 8260B, extraction method 5035, for VOCs;
- EPA Method 8270C, extraction method 3550B, for semivolatile organic compounds (SVOCs);
- EPA Method 6020, extraction method 3050, inductively coupled plasma - mass spectroscopy (ICP-MS), and 7470A (used for mercury), for the Resources Conservation and Recovery Act (RCRA) metals; and
- EPA Method 9060, for determination of the fraction of organic carbon.

4.3 GROUNDWATER METHODS

All of the groundwater methods were completed with the objective of obtaining accurate data on the groundwater quality, extent of contamination, direction of groundwater flow, and the rate of transport within the study area. CESI used standard industry operating procedures for groundwater well installation and monitoring while gathering groundwater data within the study area (Butler, 1998; Fetter, 1988; Keith, 1988; and Kresic, 1997) and ADEC guidance (ADEC 1992 and 1999a).

4.3.1 Monitoring Well Construction

Groundwater monitoring wells were installed in soil borings that were drilled to a minimum of 7 ft below groundwater using the air-rotary or MHSA methods (see Section 2.3.3 and 2.3.5). Wells were completed using 2-in.-diameter Schedule 40 polyvinyl chloride (PVC) pipe and slotted PVC screen. At least 10 feet of 10-slot PVC screen was used in each well. Colorado silica sand (8 x 12 mesh) was placed from the bottom of the hole to 5 ft above the top of the screen. A tremie rod was used to occasionally tamp the sand pack to prevent sand bridging in the borehole; 5 ft of bentonite chips were then placed on top of the sand pack and tamped using a tremie rod. The remainder of the annulus to approximately 2 ft bgs was filled with bentonite grout using a tremie tube. The bentonite chips and grout were used to plug the annulus, which prevented the infiltration of surface contaminants to the water table. All of the wells were completed above the ground surface (stickups) with a galvanized steel well cover cemented into place (to a depth of 2 ft bgs). The steel well cover had a locking hasp that was closed over the PVC stickup. The PVC well casing was capped with a J-plug sealed cap, and the steel cover was secured with a lock.

4.3.2 Monitoring Well Development

Wells were developed using the purge and surge method (ADEC 1992). A 1-L polyethylene bailer was used to pull groundwater in and out of the sand pack throughout the water column (surge). Then water was removed from the well with the bailer (purge) and placed into a 5-gal bucket. This process was repeated until the groundwater in the well was clear, and no sediment was inside the bailer. The purge and surge method utilized disposable bailers that were dedicated to each well. For purge water disposal methods, see Section 4.3.7.

4.3.3 Water Level Measurements

Water level measurements were recorded from a mark on the north side of the top of each PVC well casing. The measurements were taken using a Solinst 101 water level meter, Solinst 122 interface probe, or Heron H.01L interface probe and recorded to the nearest 0.01 ft in a field notebook. All water level measurement equipment was decontaminated after each water level measurement using the methods outlined in Section 4.3.6.

4.3.4 Groundwater Sampling

Groundwater samples were collected using either 1-L polyethylene bailers or by low-flow sampling methods. Bailing was the preferred method for the deepest wells.

The bailer method used a 1-L polyethylene bailer. Prior to sampling the well, depth to water measurements were recorded and the total volume of the well water column was calculated. A minimum of three well casing volumes

was removed from the well prior to collecting a groundwater sample. Groundwater samples were collected in appropriate sample containers, documented, and then labeled and stored at 4 ±2°C in a cooler with gel packs. Purge water disposal practices are discussed in Section 4.3.7.

The low-flow sampling method or micropurging method (Puls and Barcelona 1995) involved using a low-flow submersible pump and pumping the wells at low flow rates (*i.e.*, <250 mL/min) until the water quality parameters stabilized. Stabilization of the water quality parameters indicated when formation water was flowing into the well and minimized the amount of purge water generated. The parameters measured included temperature, pH, conductivity, salinity, and dissolved oxygen (DO) concentration. Groundwater samples were collected after each well stabilized to the tolerances listed in Puls and Barcelona (1995). The submersible pumps were decontaminated using the procedures outlined in Section 4.3.6. Purge water disposal practices are discussed in Section 4.3.7.

Groundwater samples for VOCs/GRO were collected in 40-mL volatile organic analysis (VOA) vials pre-preserved with HCl, metals were collected in 500-mL polyethylene bottles pre-preserved with HNO_3, and SVOCs/DRO were collected in unpreserved 1-L amber bottles. VOA vials for VOC analysis were filled completely until an inverted meniscus formed at the top of the vial. Each VOA vial was inverted to ensure that there was no airspace in VOA samples. The samples were then labeled and stored at 4 ± 2°C in a cooler with gel packs.

4.3.5 Slug Tests

Slug tests were performed on monitoring wells across the study area to estimate the hydraulic conductivity of subsurface aquifer materials. The design and performance of slug tests used the methods outlined in Butler (1998). Slug tests were performed in series using two slugs of different volume. Each slug test consisted of a positive head displacement ("slug in") measurement and a negative head displacement ("slug out") measurement. Each slug test was duplicated after the water level returned to its initial value.

A water level meter was installed in the well to obtain an initial reading of the depth to water. Slugs of known volume were lowered into the well to a depth approximately 1 ft above the depth to water. From this position, the slugs were rapidly lowered into the water ("slug in" test) and the groundwater rate of recovery was recorded with the water level meter. Water level measurements continued throughout the slug test until the well recovered. After the initial groundwater level had recovered, the slug was rapidly removed ("slug out" test) and the recovery rate of the groundwater was recorded again with the water level meter. The time, date, location, and slugs used were all recorded in a field notebook (Appendix G).

The water level data were reduced using commercial software (Waterloo Hydrogeologic 1998). The data reduction procedure used the Bouwer and Rice (1976) method for unconfined aquifers and fully or partially penetrating wells. The slug test water displacement data were then used to estimate the hydraulic conductivity.

4.3.6 Water Decontamination Procedures

The water level meters, slugs, and water level loggers were washed in an Alconox solution and tap water rinse whenever the instruments were moved from one well to another. The submersible pumps were decontaminated by pumping an Alconox solution through the pump for about 10 minutes followed by pumping two tap water rinses through the pump for another ten minutes. Aliquots of the second tap water rinse were dispensed into sample bottles and submitted as decontamination blanks to the analytical laboratory. Decontamination blanks from the submersible pumps were submitted each time the pump was used to sample more than one well.

4.3.7 Water Investigation-Derived Waste

Three types of IDW were produced during the groundwater characterization fieldwork: 1) purge water, 2) decontamination water, and 3) waste byproducts such as disposable bailers, rope, pump tubing, used PPE, and plastic sheeting associated with the decontamination pad. All IDW associated with cleaning the MHSA and air-rotary drill rigs was contained at the decontamination pad located to the west of the DPP. Once the IDW was contained, it was pumped into 55-gal drums and placed in the IDW staging area located to the west of the DPP. Well purge water was also contained in 55-gal drums at the IDW staging area. After laboratory analyses were available and the material found suitable for on-island treatment, all IDW was transported to the ETC facility on Saint Paul Island. Once at the ETC facility, the IDW was poured on the stockpile of contaminated soil awaiting treatment.

All solid waste byproducts were stored in garbage bags on the project site. At the end of the project, all trash as well as the pressure-washed decontamination pad was transported to the Saint Paul landfill for disposal.

4.3.8 Groundwater Laboratory Analytical Methods

Groundwater samples were sent to Friedman & Bruya, Inc. The analytical protocol used the most complete, accurate, and sensitive methods available to ensure that all COPCs were identified. Special attention was given to selecting analytical methods requiring little to no dilution of groundwater samples caused by high salinities that were encountered in the field.

The following methods were used by the laboratory for groundwater analysis:

- AK 101, extraction method 5030B, for GRO;
- AK 102, extraction method 3510C, for DRO;
- EPA Method 8260B, extraction method 5030B, for VOCs;
- EPA Method 8270C, extraction method 3510C, for SVOCs; and
- EPA Method 6020), extraction method 3005A using inductively coupled plasma-mass spectroscopy (ICP-MS), and 7471A (used for mercury), for the Resource Conservation and Recovery Act (RCRA) metals.

4.4 LABORATORY QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

Friedman & Bruya, Inc. implemented approved ADEC and EPA methods for all quality assurance/quality control (QA/QC) requirements. The QA/QC measurements included a laboratory control sample and laboratory control sample duplicate, laboratory surrogate and field surrogate, matrix spike and matrix spike duplicate, and the use of a method blank. The laboratory implemented other QA/QC requirements in accordance with ADEC guidance, including calibration verification, a second source standard, a retention-time window standard, and documented curve calibration.

4.5 SAMPLE HANDLING, PACKAGING, AND SHIPPING

The following procedure outlines the methods used to handle, package, and ship groundwater and soil samples:

1. Each sample container was labeled with a unique sample identification number, the time and date of sample collection, the analytical method, and the method of preservation. All sample containers were placed in a cooler containing gel packs to maintain the samples at 4 ±2°C during field sampling.
2. Each sample was logged on the Chain-of-Custody form.
3. The samples were transferred to a refrigerator maintained at 4 ±2°C at the field laboratory until they could be shipped off island.
4. Soil samples were transported to the fixed analytical laboratory in a shipping cooler packed with absorbent material and gel packs to maintain the cooler at 4 ±2°C during shipment.
5. The signed Chain-of-Custody form was taped on the underside of the cooler lid in a sealed plastic bag.
6. The lid of the cooler was secured with strapping tape and custody seals were affixed across the lid/cooler interface. Appropriate waybills were taped to the top of the cooler.
7. The samples were transported to the Saint Paul Airport and shipped via commercial carrier to Friedman & Bruya, Inc., an ADEC-accredited laboratory in Seattle, Washington for chemical analysis.

4.6 SURVEYING METHODS

Surveying was completed using two methods: GPS mapping using the Trimble XR/XRS GPS (for horizontal positioning) and optical leveling (for wellhead elevations) using the Leica total station.

4.6.1 GPS Mapping

The GPS was used to provide accurate locations of soil borings and to create geographic information system (GIS) maps of soil and groundwater contamination. Taking GPS data of the soil sample locations also ensured that the locations could be easily found again if corrective actions were required.

All soil sampling and monitoring well locations were determined using a Trimble XR/XRS GPS with differential correction. A data dictionary for Saint Paul 2000 was created to identify data points and was loaded into the Trimble rover unit. Once the data points were taken and saved, the file was differentially corrected using the Pathfinder Office® software and the data from the Trimble base station. The position of the Village Hill benchmark was used to check GPS positioning during the 2000 field season. The GPS data for the Oil Drum Dump Site are located in Appendix H.

4.6.2 Optical Leveling

All well elevations were surveyed using a Leica total station with 3-arc second resolution. After setting up and leveling the instrument, one or more known reference points such as benchmarks or existing wellheads were surveyed (backsights). The backsight process established the height of the instrument on the tripod. Then new wellheads were surveyed (foresights). Finally, the survey was closed by backsighting to the original reference points. The backsights and foresights were reduced by least-squares to establish the wellhead elevations. The elevations of the wellheads were determined to within 0.01 ft (root mean-square error). Wellhead elevations are tabulated in Appendix E.

Absolute wellhead elevations needed to be established to within 0.01 ft in the mean lower-low water (MLLW) reference system. The most stable and best-documented tidal benchmark was located at the base of the flagpole at the Former Post Office in Tract 46. The published elevation of this benchmark was used to establish the MLLW reference system (NOS 1991) that was transferred to the study area using a leveling transect.

4.7 FIELD QUALITY PROCEDURES

Three pieces of field equipment required field calibration: the Dexsil® Petroflag® hydrocarbon analyzer; the WTW Multiline P4 water quality meter; and the Trimble XR/XRS GPS.

The Dexsil Petroflag hydrocarbon analyzer was calibrated before each use according to the operating manual by taking a temperature reading and analyzing a solution blank and a 1000-ppm standard solution provided by the manufacturer.

The WTW Multiline P4 water quality meter consisted of temperature, pH, dissolved oxygen (DO), and conductivity probes and was calibrated before each use according to the operating manual. The pH probe was calibrated using pH 4.01 and 7.00 buffers, the conductivity probe was calibrated using a 1413-µS/cm conductivity standard, and the DO probe was calibrated in water-saturated air using the factory calibration beaker.

The Trimble XR/XRS GPS was calibrated 34 times by taking the Village Hill benchmark as a data point. The measured mean northing of 20,771,997 ft and mean easting of 1,783,004 feet were within 1 ft of the actual Village Hill benchmark northing of 20,771,998.0 ft and easting of 1,783,003.6 ft. The standard deviation for the calibration points was 1.8 ft for northings and 0.6 ft for eastings.

Field duplicates of groundwater samples were collected for approximately 10% of all groundwater samples collected. Trip blanks accompanied each of the sample delivery groups and were prepared using deionized water (DIW) from the analytical laboratory. Decontamination blanks from the use of submersible pumps to collect water samples were submitted each time a submersible pump was used in a different well.

Field duplicates for soil samples were more problematic because of the small volume of the soil sampling equipment. Duplicates were submitted for about 1% of the soil samples collected. Sample volumes required to meet the analytical protocol were large enough that recovery of duplicate samples from the sampling equipment was not practical, and no alternative approach was taken by CESI. The analytical results for laboratory sample duplicates were relied upon as a reasonable measure of the precision of the analyses for soil.

5 RESULTS OF 2000 SITE CHARACTERIZATION ACTIVITIES

The 2000 site characterization activities conducted by CESI included a potential source survey, soil sampling, and groundwater well installation and sampling (CESI 2002). The following sections discuss the results of field activities and laboratory analyses (raw data may be found in Appendices C through H). Results of soil and groundwater analyses are compared to the most stringent ADEC Method Two cleanup levels (18 AAC 75.341, ADEC 2003) and ADEC Table C cleanup levels (18 AAC 75.345, ADEC 2003), respectively. Cleanup levels are summarized in Tables 4 and 5.

5.1 DATA QUALITY

An assessment of data quality was performed by CESI in 2002. NOAA evaluated CESI's data quality assessment. NOAA's evaluation is documented in a Data Evaluation Report (Appendix I). In general, NOAA and CESI found the data from 2000 activities adequate for project decision-making relative to determining the presence, nature, and extent of contamination at the Oil Drum Dump Site. Limitations on the data, in the context of usability, are discussed both in Appendix I.

5.2 POTENTIAL SOURCE SURVEY

Buried debris was relatively deep (typically 4 to 6 ft bgs) and located at the base of sand dunes on the west side of the site. Across the center of the site, the buried debris was at shallower depths and located primarily along the margins of a bog and the road. In the eastern portion of the site, the debris was located in topographic lows with varying depths of burial. These observations suggest that eolian processes were the primary burial mechanism on the east and west portions of the site.

No identifying marks or stampings were observed on any drum fragments. All drums were highly corroded and contained no product.

5.3 SOIL CHARACTERIZATION

A total of 46 soil samples from 39 locations (Figure 5) were collected by CESI at the Oil Drum Dump Site and analyzed at a fix laboratory. At the fixed laboratory, samples were analyzed for petroleum hydrocarbons, VOCs, SVOCs, and heavy metals. A summary of all results can be found in Appendix D.

Nine samples exceeded the ADEC Method Two cleanup level of 250 mg/kg for DRO, with a maximum concentration of 4100 mg/kg (Figure 5, Table 2). RRO was detected above its Method Two cleanup level of 10,000 mg/kg in three samples, with a maximum concentration of 18,000 mg/kg (Figure 5, Table 2). GRO was not detected above its Method Two cleanup level.

Arsenic was detected above its Method Two cleanup level of 2 mg/kg in 35 samples, with a maximum concentration of 5.6 mg/kg (Table 2). Thirty-six samples contained Cr above the Method Two cleanup level of 26 mg/kg, with a maximum concentration of 78 mg/kg (Table 2). Other metals were not detected above Method Two levels.

No VOCs or SVOCs were detected above Method Two levels.

5.4 GROUNDWATER CHARACTERIZATION

5.4.1 Groundwater Contamination

Nine groundwater samples were collected from six wells at the Oil Drum Dump Site in 2000 (Figure 4). Three surface water samples were also collected. All water samples were analyzed for GRO, DRO, VOCs, SVOCs, and heavy metals.

GRO was detected in three of the wells above its ADEC Table C cleanup level of 1.3 mg/L, with a maximum concentration of 6.1 mg/L. DRO was detected in two wells above its ADEC Table C cleanup level of 1.5 mg/L,

with a maximum concentration of 15 mg/L. Table 3 lists results for samples exceeding Table C cleanup levels, and Figure 4 depicts the locations of exceedances.

SVOCs and VOCs were not detected above their PQLs (Appendix D) [Note: in the cases of benzo(a)pyrene, dibenzo(a,h)anthracene, n-Nitrosodi-n-propylamine, Pentachlorophenol, 1,2,3-trichloropropane, and ethylene dibromide (1,2-dibromoethane), PQLs were higher than Table C cleanup levels]. Heavy metals were not detected above Table C cleanup levels.

5.4.2 Hydrogeology

5.4.2.1 Aquifer Material Properties

The site-specific value for the fraction of organic carbon (f_{oc}) at the Oil Drum Dump Site was determined to be 0.0015 (g of organic carbon/g of soil) based on a measurement from ODDSSB-19. The f_{oc} in aquifer materials is important because it directly relates to the retardation of organic contaminants dissolved in groundwater. The ADEC default value for f_{oc} is 0.001 (ADEC 1999b).

The hydraulic conductivity (K) of aquifer materials was measured by slug tests in selected wells across the study area. The geometric mean value for the site-specific K was 4.51×10^{-5} m/s (1,422 m/yr). The distribution of hydraulic conductivity for a porous medium is typically log-normally distributed and the geometric mean of the conductivity is the proper statistical representation (de Marsily 1986).

5.4.2.2 Groundwater Elevation and Flow

Water levels were measured using two methods: 1) electronic water level meters or interface probes and 2) water level loggers. For the first method, measurements were typically made in round-robin monitoring events during which water levels were measured in the study area in a short period of time. These data provided time snapshots of water table elevations. For the second method, water level loggers in selected wells continuously logged water levels over time. Loggers were deployed in individual wells for a period of 30-days to continuously log water levels during the 2000 field season.

Based on the water elevation data for the phreatic surface during diurnal tidal cycles, phreatic or water table conditions were found to exist throughout the study area. The data analysis indicated that the primary feature of the potentiometric surface in the study area is a west to east trending ridge of high water centered over monitoring well Oil Drum Dump Site (MWODDS) -2.

Under phreatic conditions, groundwater flow directions are represented by flow lines that are perpendicular to the equipotential contour lines (de Marsily; 1986; Freeze and Cherry, 1979, particularly the discussion on the Dupuit-Forscheimer principle) constructed from the water table elevations. The water table elevations and flow lines are shown in Figure 6. A linear flow pattern is evident towards MWODDS-5.

The hydraulic gradient (i) is equivalent to the change in water table elevation divided by the length of the flow line. The mean water table gradient between MWODDS - 2 and MWODDS - 5 is about 0.001 m/m. The gradient of the water table at Oil Drum Dump Site is relatively flat, limiting the transport of contaminants in groundwater.

The pore water velocity (v) was also calculated for the study area; v is equal to K divided by total porosity (n). The estimated v for the study area is ~3.3 m/yr.

In summary, groundwater beneath the most contaminated area of Oil Drum Dump Site, the central pad, is generally moving to the north. The center of the mass of the contaminant plume will move at a velocity somewhat slower than the v of 3.3 m/yr depending on the retardation factor. Retardation factors are proportional to the f_{oc} in soil.

6 SYNTHESIS OF DATA FOR SITE CHARACTERIZATION

The following sections evaluate the nature and extent of contamination in soil and groundwater at the Oil Drum Dump Site. Analytical data from CESI's 2000 investigation and data from Tetra Tech's 1999 investigation (Section 3.10) are synthesized. Tetra Tech data were previously provided to ADEC for review and approval. The quality of CESI's data is discussed in Section 5.1 and in Appendix I.

NOAA compared available data with information related to fur sealing operational practices, site background concentrations for heavy metals (soils only, see Section 6.1), potential laboratory cross-contamination, data quality standards, and state of Alaska cleanup levels to determine the contaminants of concern.

GIS tools were used for data interpolation, and interpretation and visualization of the nature and extent of contamination. For purposes of the interpolation, it was assumed that the vertical extent of soil contamination does not extend deeper than 1) the deepest interval containing a contaminant of concern at a concentration greater than the Method Two cleanup level; 2) the depth of refusal as found during investigation test pit excavation or direct-push explorations; or 3) the bottom of the vadose zone (*i.e.*, excavation stops at the groundwater table).

6.1 REGULATORY LEVELS FOR SCREENING PURPOSES

The methods for establishing soil and groundwater cleanup levels for the Pribilof Environmental Restoration Project are described in the TPA (NOAA 1996). For petroleum-contaminated soil, the TPA allows the establishment of cleanup levels using the methods described in the 1991 non-underground storage tank (UST) regulations (ADEC 1991a). ADEC, however, allows NOAA the use of the most recently promulgated regulations (ADEC 2003) at NOAA's discretion. For non-petroleum contamination, the agreement allows the use of the latest Risk-Based Concentration Table published by the USEPA. Alternatively, the agreement also allows a risk assessment to be conducted by NOAA, which involves exposure assessment, toxicity assessment, and risk characterization. Acceptance of such a risk assessment is at the sole discretion of the ADEC and has not been pursued by NOAA.

For groundwater, the current *Oil and Other Hazardous Substance Pollution Control* regulations (ADEC 2003) are the basis for establishing screening levels. The current regulations provide promulgated groundwater cleanup levels in ADEC's Table C, which are protective of drinking water sources.

For purposes of this site characterization, NOAA screened analyte concentrations against the most stringent ADEC Method Two cleanup levels for soil (18 AAC 75.341; ADEC 2000) and ADEC Table C cleanup levels for groundwater (18 AAC 75.345; ADEC 2001a). Tables 4 and 5 summarize cleanup levels for select petroleum-related compounds.

Table 6.1. Cleanup Levels for Select Petroleum-related Compounds in Soil, ADEC (2003) Method Two Tables B1 and B2

Compound	Cleanup Level (mg/kg)
Gasoline Range Organics (GRO)	300
Diesel Range Organics (DRO)	250
Residual Range Organics (RRO)	10,000
Benzo(a)anthracene	6
Benzo(b)fluoranthene	11
Benzo(k)fluoranthene	110
Benzo(a)pyrene	1
Chrysene	620
Dibenzo(a,h)anthracene	1
Fluorene	270
Indeno(1,2,3-c,d)pyrene	11
Naphthalene	43
Benzene	0.02
Ethylbenzene	5.5
Toluene	5.4
Total Xylenes	78

Table 6.2. Cleanup Levels for Select Petroleum-related Compounds in Groundwater, ADEC (2003) Table C

Compound	Cleanup Level (mg/L)
Gasoline Range Organics (GRO)	1.3*
Diesel Range Organics (DRO)	1.5
Residual Range Organics (RRO)	1.1
Benzo(a)anthracene	0.001
Benzo(b)fluoranthene	0.001
Benzo(k)fluoranthene	0.01
Benzo(a)pyrene	0.0002
Chrysene	0.1
Dibenzo(a,h)anthracene	0.0001
Fluorene	1.46
Indeno(1,2,3-c,d)pyrene	0.001
Naphthalene	1.46
Benzene	0.005
Ethylbenzene	0.7
Toluene	1.0
Total Xylenes	10.0

*standards based on estimated solubility

6.2 SOIL BACKGROUND LEVELS OF HEAVY METALS

Background concentrations of a hazardous substance can be used to distinguish site-related contamination from naturally occurring or pre-existing concentrations of a hazardous substance. According to ADEC guidance, if the statistical mean concentration is below the approved background concentration, then the applicable cleanup standard for that hazardous substance has been achieved under 18 AAC 75.340(e)(1) (ADEC 1998).

Hart Crowser (1997) and Tetra Tech (2000b) established background values for metals in soil on St. Paul Island. Hart Crowser analyzed soil samples collected from depths of 0.5 ft bgs at 10 locations. Each soil sample was analyzed for As, cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), and mercury (Hg). Tetra Tech collected 22 soil samples from 7 soil borings and analyzed them for As, Cd, Cr, and Pb. These samples were collected from intervals of 0 to 2 ft bgs, 4 to 6 ft bgs, and 12 ft bgs (or refusal). In the Hart Crowser and Tetra Tech studies, the soil samples were described as being collected from either sand or scoria. For purposes of this site characterization, data from both studies have been combined to determine the approved background concentration according to ADEC guidance. The approved background concentration is the 95th upper confidence limit of the arithmetic mean from normal distributions.

Table 6 presents the mean background concentrations of metals in soil with their 95th percentile upper confidence limit. In the cases of Cd and Pb, it was not possible to calculate means or the upper confidence limits because concentrations were below their PQLs.

Table 6.3. Statistical Results of St. Paul Island, Alaska Soil Metal Background Concentration Studies

No. of Samples	Metal	Method Two Cleanup level	Minimum Detected Concentration (mg/kg)	Maximum Detected Concentration (mg/kg)	Mean (mg/kg)	Std. Deviation (mg/kg)	UCL_{95} (mg/kg)
32	As	2	<0.58	6.2	3.1	8.6	3.7
32	Cd	5	<0.62	<7.2	--	--	--
32	Cr	26	7	84	38	101	44
32	Pb	400*	<0.44	5.7	--	--	--

*Alaska residential cleanup standard for lead (18 AAC)

6.3 NATURE AND EXTENT OF SOIL CONTAMINATION

Approximately 123 soil samples from 84 locations at the Oil Drum Dump Site were collected and analyzed by CESI and Tetra Tech. Based on these investigations, soil contaminants of concern are DRO and RRO. DRO was found above its Method Two clean up level (250 mg/kg) at 17 locations and RRO was found above its cleanup level (10,000 mg/kg) at seven locations (Figure 7, Table 2). NOAA also found Method Two exceedances for DRO and RRO in two composite surface soil samples from the central pad.

Concentrations of As and Cr exceeding Method Two cleanup levels were widespread. There are, however, no known anthropogenic sources of As or Cr on St. Paul Island, and their presence appears ubiquitous rather than related to sealing operations. The average As concentration in soil at the Oil Drum Dump Site based on 73 samples was 3.4 mg/kg. This is below the background level of 3.7 mg/kg established for St. Paul Island (see Section 6.2, Table 6); thus, As is not considered a contaminant of concern. The average Cr concentration based on 73 samples was 51 mg/kg. This is above the background level of 44 mg/kg established for St. Paul Island. Groundwater data from October 2003 indicate that nearly all the Cr in groundwater is present in the trivalent form (Cr^{3+}) rather than the hexavalent form (Cr^{6+}) on which the cleanup level for total Cr is based (NOAA unpublished data). Assuming the same is true in soil and given that no known anthropogenic source of Cr^{6+} exists on St. Paul Island, the Method Two cleanup level for Cr^{3+} (100,000 mg/kg) may be a more appropriate cleanup level. The average Cr concentration at the Oil Drum Dump Site is orders of magnitude below this level; Cr is not considered a contaminant of concern.

GRO, VOCs, SVOCs, and other heavy metals not discussed above were detected below cleanup levels at this site.

The estimated maximum volume of soil requiring excavation is 5761 cubic yards (Figure 8). DRO is the primary contaminant of concern at the Oil Drum Dump Site. RRO is only present above cleanup level where DRO also exceeds cleanup level, and thus, the excavation estimate is based on DRO concentrations. (The volume estimate was computed by comparing two Triangulated Irregular Network (TIN) models of the Oil Drum Dump Site created in ArcScene and based on a US Geological Survey 5-meter Digital Elevation Model. One model represents the topography before excavation. The other represents topography after excavation of a 10-meter buffer around samples exceeding the cleanup level for DRO, excavated to the deepest depth below ground surface at which it occurs.

6.4 NATURE AND EXTENT OF GROUNDWATER CONTAMINATION

Groundwater samples from 12 wells at the Oil Drum Dump Site were collected and analyzed by CESI and Tetra Tech (Figure 4). Contaminants of concern in groundwater above ADEC Table C cleanup levels are DRO and GRO. DRO and GRO were each detected above their ADEC Table C cleanup levels in three wells, with two wells in common (Figure 4, Table 3). Well 01GW18 is located upgradient of the known disposal areas. Consequently, NOAA considers contamination at this well suspect pending further investigation by other parties. An estimated extent of groundwater contamination above Table C is shown in Figure 9. [Note: the extent of contamination was calculated using EPA's fully integrated environmental location decision support (FIELDS) program, a GIS-based program designed to assist in the interpolation of analytical sample data. The interpolation is based three working assumptions: 1) levels of contamination in groundwater vary inversely with distance away from a monitoring well; 2) all groundwater samples represent the same continuous aquifer; and 3) groundwater flow at the site is essentially static.]

It should be noted that in the case of several SVOCs and VOCs, PQLs were higher than Table C cleanup levels. In this scenario, it is possible that a contaminant could be above Table C and go undetected. However, there are no indications that SVOCs or VOCs are contaminants of concern in groundwater at this site.

6.5 REVISIONS TO THE CONCEPTUAL SITE MODEL

There were no updates to the Oil Drum Dump Site conceptual site model presented in Section 2.4. The model is considered valid for this site.

7 SITE CHARACTERIZATION SUMMARY AND CONCLUSIONS

During CESI's 2000 site characterization efforts, 46 soil samples from 39 locations, nine groundwater samples from six wells, and three surface water samples from three locations were collected and analyzed at a fixed laboratory. In this SCR, data from CESI's investigation were synthesized with other available analytical data, primarily from Tetra Tech, to comprehensively evaluate the condition of the Oil Drum Dump Site regarding concentrations of hazardous substances. A total of approximately 123 soil samples from 84 locations at the Oil Drum Dump Site have been collected and analyzed in a fixed laboratory for GRO, DRO, RRO, and BTEX, and in some cases SVOCs, VOCs, heavy metals, and PAHs. A total of approximately 16 groundwater samples from 12 wells and three surface water samples from three locations have also been collected and analyzed for GRO, DRO, VOCs, and in some cases SVOCs and heavy metals. Based on data from these sample analyses, the following conclusions can be made:

- The primary sources of contamination (*i.e.*, drums) have been removed from the Oil Drum Dump Site.
- DRO is the most extensively found soil contaminant at the site.
- DRO, RRO, As, and Cr were found in soil above ADEC Method Two cleanup levels. DRO and RRO are considered contaminants of concern. As and Cr are not considered contaminants of concern.
- RRO exceedances were only found at soil sampling locations were DRO also exceeded cleanup criteria.

- DRO and GRO were found in groundwater above their ADEC Table C cleanup criteria.
- The estimated maximum volume of soil removal required to meet ADEC standards is 5761 cubic yards.

8 DISCUSSION OF REMAINING DEBRIS AND ASSOCIATED CLEANUP RESPONSIBILITY

The fact that some of the Pribilof sites under the FUDS Program are contiguous with NOAA TPA sites complicates cleanup issues. Section 3(f)(2) of Public Law 104-91, as amended by Public Law 106-562, which authorizes the funding for NOAA's Pribilof Islands cleanup activities, stipulates: "None of the funds authorized by this subsection may be expended for the purpose of cleaning up or remediating any landfills, wastes, dumps, debris, storage tanks, property, hazardous or unsafe conditions, or contaminants, including petroleum products and their derivatives, left by the Department of Defense or any of its components on lands on the Pribilof Islands, Alaska." In an effort to meet its legal obligations to clean up contamination and debris at this site consistently with these statutory constraints, NOAA has reviewed available information on cleanup and disposal actions at TPA 1 to determine the extent of agency responsibility for any remaining cleanup required for the site. The following paragraphs summarize correspondence, agreements, and activities related to the cleanup of the Oil Drum Dump Site.

Before the enactment of Public Law 106-562 in December 2002, which enacted the previously mentioned spending limitation, both NOAA and the USACE had conducted efforts related to the cleanup of the Oil Drum Dump Site. Prior to 1985, FUDS B-1 was described as having approximately 4,000 rusted 55-gallon barrels with gasoline, diesel oil, antifreeze and motor oil markings; 60 steel tanks (300- to 600-gallons each); and 300 cubic yards of miscellaneous metal debris (U.S. Army 1991). Representatives from USACE examined the site debris and noted debris they judged as being non-military in origin. According to a Chase Construction *Daily Quality Control Inspection Report* dated May 23, 1986 (Appendix J), "Barrels containing used oil (not DOD) are being segregated. There are approximately 650 by COE [USACE] rep. and my count. About 160 contain oil, most of which are full." Debris categorized as non-military, including the segregated 'non-DOD' barrels, were gathered by the USACE's contractor and apparently assembled on a small (less than an acre) pad at the site (*i.e.*, the central pad), which became TPA Site No. 1. With the exception of the debris judged to be non-military, Chase Construction reportedly removed the drums, steel tanks, and miscellaneous debris noted above in 1986. The USACE's contractor consolidated the remaining debris on the central pad at the Oil Drum Dump Site. Additionally, newer barrels from FUDS C (Telegraph Hill) considered by DOD to be non-military were moved to FUDS B-1 and stockpiled. These drums contained petroleum, oil, and lubrication products (Chase Construction *Daily Quality Control Inspection Report* dated May 20, 1986, Appendix J).

Available information does not indicate where soil or water samples were taken during debris removal operations. Consequently, it is unknown whether present contamination occurred prior to the USACE's staging on the central pad, or resulted as a consequence of the staging activity, or resulted from unauthorized drum disposal activities by unknown parties following bulking and removal activities in 1992 (HLA 1993). A copy of a Chase Construction *Daily Quality Control Inspection Report* dated May 13, 1986 (Appendix J) suggests that the sampling report that included site B-1 cannot be verified because some of the sample labels appeared to be missing. The copy is of relatively poor quality, and pending clarification either soil or barrel contents data should be considered suspect, if they exist. According to a June 4, 1986 Chase Construction *Daily Quality Control Inspection Report* (Appendix J), contaminated "dirt" was removed from the site and disposed at the permitted disposal site. A similar document dated June 20, 1986 commented that Chase Construction began to spread soil conditioner at B-1. These documents imply that contamination was present, but NOAA is unaware of any other reporting or monitoring of the soil conditioner action.

Modest soil sampling was executed in June 1994 (Woodward-Clyde 1994) prior to additional removal activities in September 1994 (Oil Spill Consultants 1995). Samples were not analyzed for GRO, DRO, RRO, and BTEX because these compounds were expected to be present and were considered contaminants of potential concern. No other analytes were found to be present above ADEC Method Two cleanup levels.

The most recent debris removal activities were conducted in 1997 under a NOAA contract. The majority of remaining bulk surface debris were removed.

In 1999, NOAA directed its contractor, Tetra Tech, to conduct a site characterization and undertake an interim removal action (remnants of 30 barrels excavated). Tetra Tech collected and analyzed soil, groundwater, surface water, and sediment samples from TPA Site No. 1 as well as FUDS B-1 as part of NOAA's attempt to expedite the overall site characterization and cleanup process (see Section 3.10). Soil taken in 1999 found widespread petroleum contamination throughout TPA Site No. 1 and the former B-1 Site. NOAA presumes that the small area of contamination located approximately 35 yards to the northeast of the pad resulted from the dislodging of stacked barrels left behind by the USACE's contractor that rolled down into a shallow depression and leaked fuel products. CESI conducted additional site characterization activities for NOAA in 2000. Results of soil and groundwater analyses corroborate the results of 1999 sampling indicating widespread petroleum contamination.

ADEC issued a letter to Chase Construction, Inc. on June 5, 1986 that invoked Permit No. 8521-BA019 (date issued: June 6, 1986). The letter stated that the applicant must comply with conditions in appendices A and B of the permit. Appendix A, section C 2 requires the permitee to take a groundwater sample at "three different locations surround site B, the main barrel dump, and analyze for hazardous waste contamination. If no groundwater is found above the bedrock layer, then water samples are not required." Chase acknowledged in a *Daily Quality Control Inspection Report* dated May 24, 1986 (Appendix J) that the "B-1 barrel dump elevation is very close to the water table. Water table has been penetrated in a few places." This statement indicates that groundwater is present above bedrock, and thus, as specified in the permit, DOD is responsible for the installation of monitoring wells.

Since 1995, ADEC has repeatedly requested that USACE complete investigation and remediation of the Pribilof FUDS Program sites, with specific mention of the Oil Drum Dump. Citing language from its Defense Environmental Restoration Program guidelines, USACE claims that beneficial use of the islands subsequent to the 1986 USACE action precludes USACE from further action.

The DOD document *Pribilof Islands Villages of St. George and St. Paul Site Assessments Report* (U.S. DOD 1998) stated, "The 1986 BD/DR action performed by the ACOE [USACE] successfully remediated the environmental impacts due to U.S. Army occupation of the Pribilof Islands. The DOD is reported to have no current interests on the Pribilof Islands and no further actions are planned." This report did not, however, present sampling data to support DOD assertions, and the company who wrote the report, Portage Environmental, had not actually been to the islands.

DOD reasserted its position in an October 23, 1998 letter stating that "impacts to St. Paul have been mitigated to acceptable risk levels and satisfy community concern… Therefore, we will not reopen our remediation." In 1999, ADEC responded to DOD's letter, essentially reiterating its concerns that a number of sites on St. Paul had not been satisfactorily closed (Appendix K, item 182).

Congressman Don Young became involved in November 1998, writing a letter to the Assistant Secretary of the Department of the Army (Appendix K, item 33). In his letter, Young stated that DOD through the USACE appears to be responsible for the environmental cleanup of FUDS on the Pribilof Islands, and that the USACE has acknowledged responsibility for the site known as Telegraph Hill, and attention to this and other FUDS is needed. The USACE responded to Congressman Young's letter (Appendix K, item 26) in January 1999 saying, "the Corps has evaluated all known areas of former DOD usage within the Pribilofs, and concluded there is no further DOD responsibility." The response goes on to say, "In 1986 the Corps successfully removed all DOD contamination from … sites on the island to the satisfaction of the community (tribal government and native villages). Any pollution remaining was non-DOD."

When the TPA was negotiated between ADEC and NOAA, the Oil Drum Dump site was included as Site 1 on the TPA's Table A with a footnote indicating that NOAA was reserving its position on whether or not it had responsibility for cleaning up the site. Further investigation has shown that any on-site contamination is most likely the result of spills and leakage during the USACE's staging of barrels on the site in 1986 or deterioration or damaging of barrels brought to and abandoned on the site by the USACE. In light of this information, and given statutory language prohibiting NOAA from cleaning up contaminants including petroleum products left by the Department of Defense on lands on the Pribilof Islands, NOAA is precluded from taking further action at this site.

9 FINDINGS AND RECOMMENDATIONS

Based on data and other information presented in this site characterization, NOAA finds and recommends the following regarding the Oil Drum Dump Site:

- Approximately 5761 cubic yards of contaminated soil should be considered for removal.
- The extent of groundwater contamination is limited. Future groundwater monitoring may be warranted.
- Soil contamination on site is most likely the result of spills and leakage during the USACE's staging of barrels on the site in 1986 or deterioration or damaging of barrels brought to and abandoned on the site by the USACE.
- As a result of statutory restraints on NOAA's expending appropriated funds to clean up contamination including petroleum products left by the Department of Defense on lands on the Pribilof Islands, no further remedial action should be required of NOAA for this site.

10 REFERENCES

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FIGURES

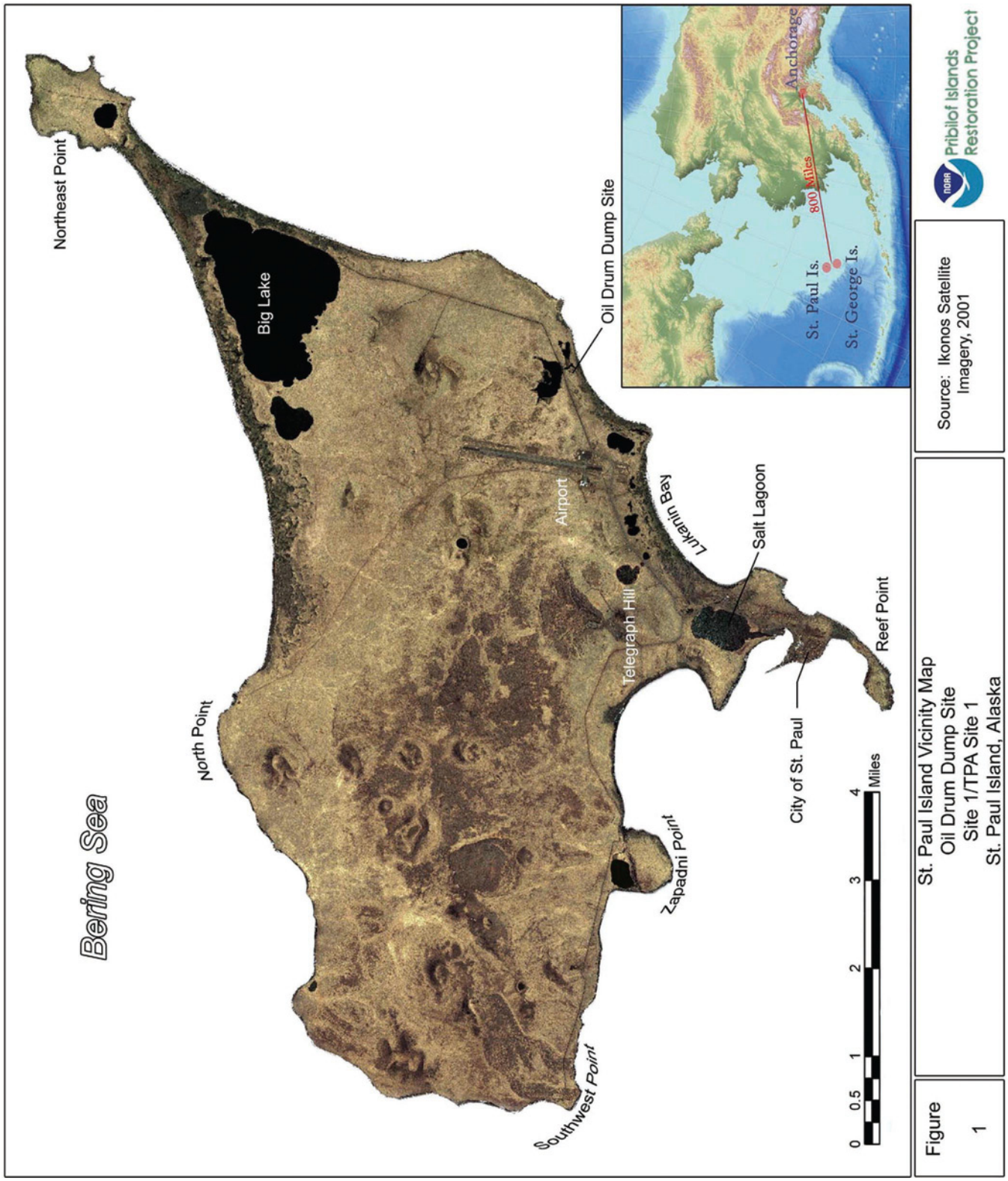

Bering Sea
Northeast Point
Big Lake
North Point
Oil Drum Dump Site
Airport
Telegraph Hill
Lukanin Bay
Salt Lagoon
Reef Point
City of St. Paul
Zapadni Point
Southwest Point
0 0.5 1 2 3 4 Miles
Anchorage
800 Miles
St. Paul Is.
St. George Is.
Pribilof Islands Restoration Project
Source: Ikonos Satellite Imagery, 2001
Figure 1
St. Paul Island Vicinity Map
Oil Drum Dump Site
Site 1/TPA Site 1
St. Paul Island, Alaska

Figure 2	Drums Present Prior to Site Cleanup Circa 1950s Oil Drum Dump Site (View is to south) St. Paul Island, Alaska	Source: NOAA Historical Photo Archive

Pribilof Islands Restoration Project

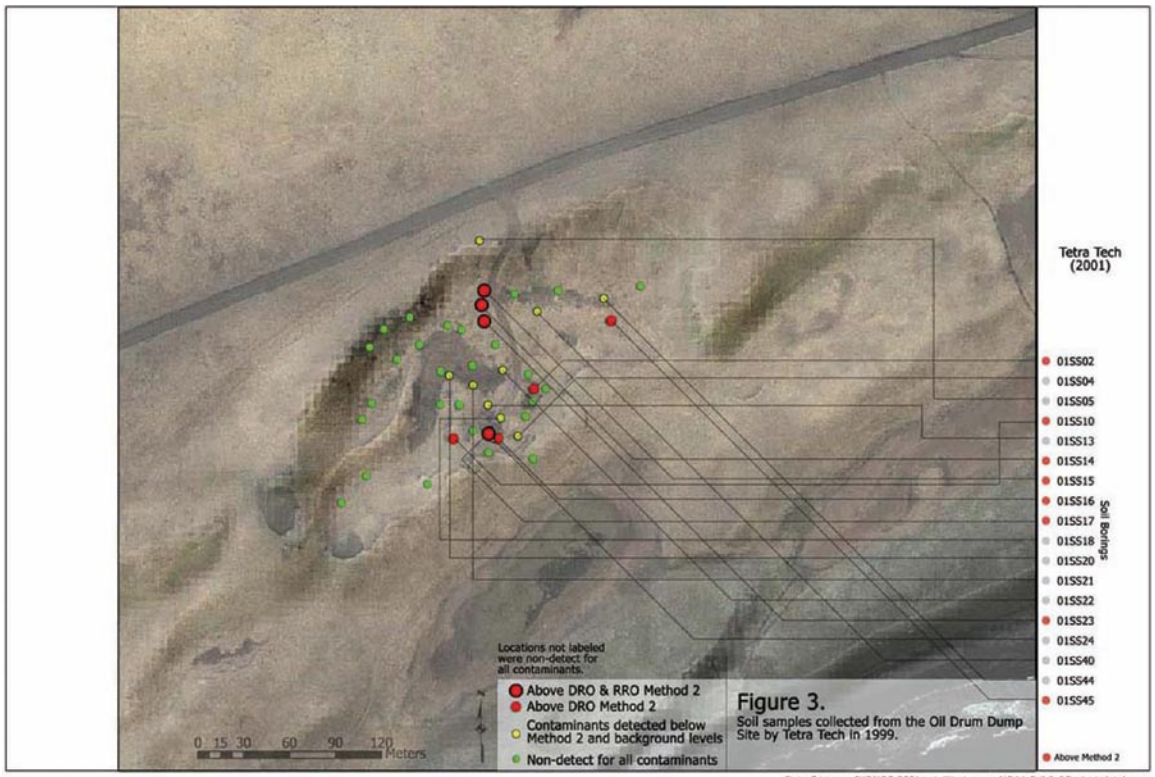


Figure 3.
Soil samples collected from the Oil Drum Dump Site by Tetra Tech in 1999.

Data Sources: IKONOS 2001 satellite image, NOAA Pribilof Project database.

Figure 4.
Ground and surface water sampling locations & detections of contaminants above ADEC Table C cleanup levels at the Oil Drum Dump Site. (SWODDS-3 not shown)

Data Sources: IKONOS 2001 satellite image, NOAA Pribilof Project database.

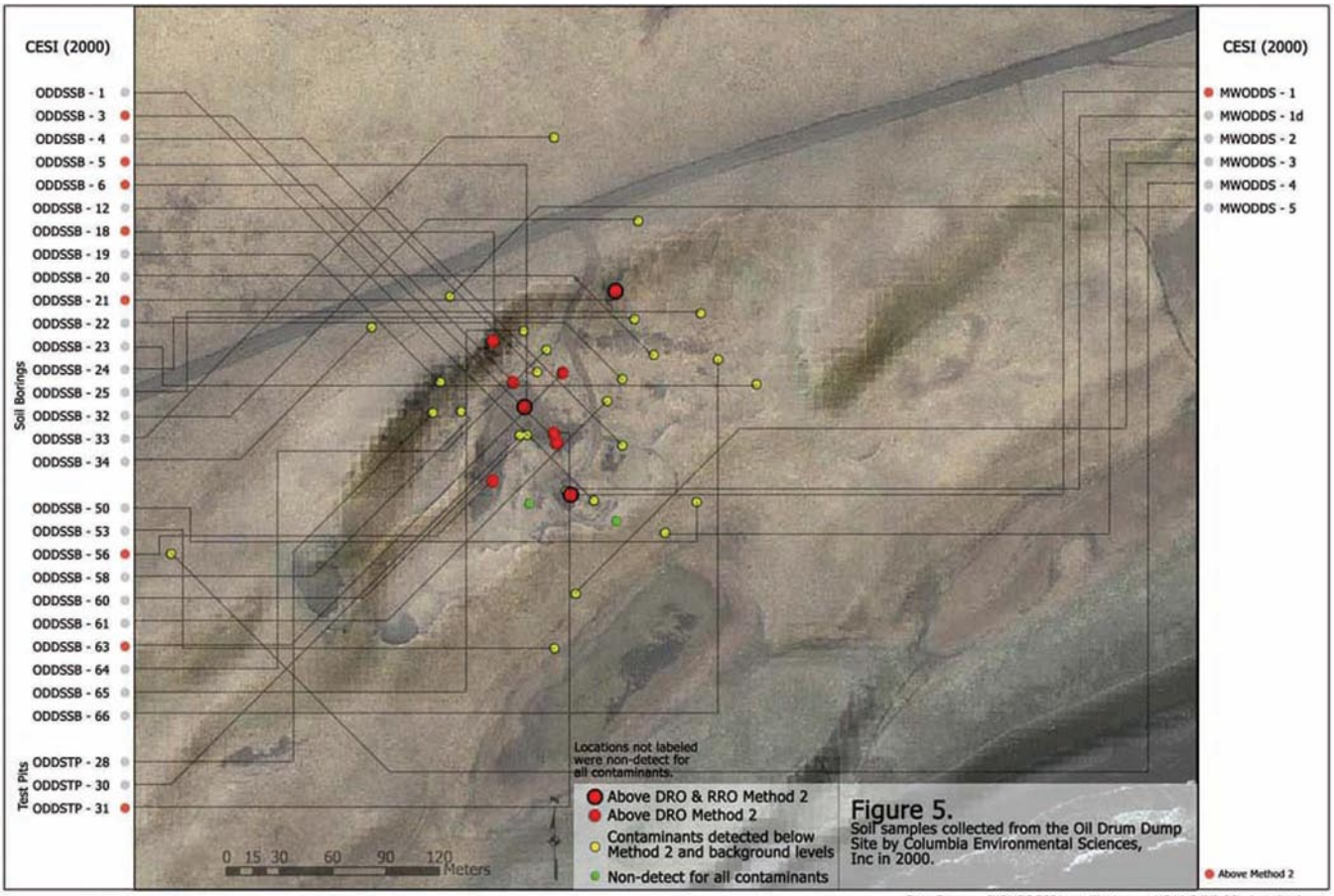


Figure 5.
Soil samples collected from the Oil Drum Dump Site by Columbia Environmental Sciences, Inc in 2000.

Data Sources: IKONOS 2001 satellite image, NOAA Pribilof Project database.

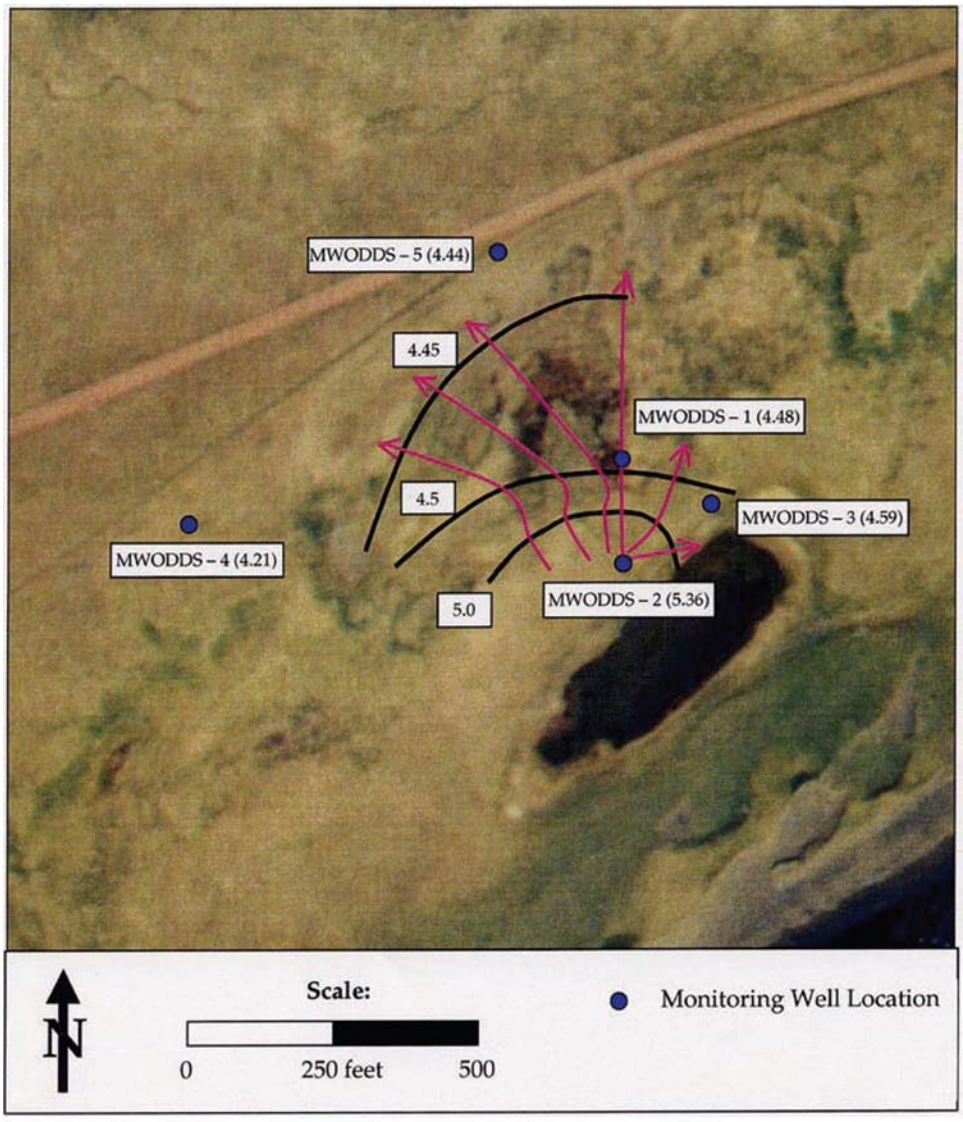


Figure 6	Mean water level elevations and flow lines at the Oil Drum Dump Site. St. Paul Island, Alaska.	Source: CESI, 2002.	Pribilof Islands Restoration Project

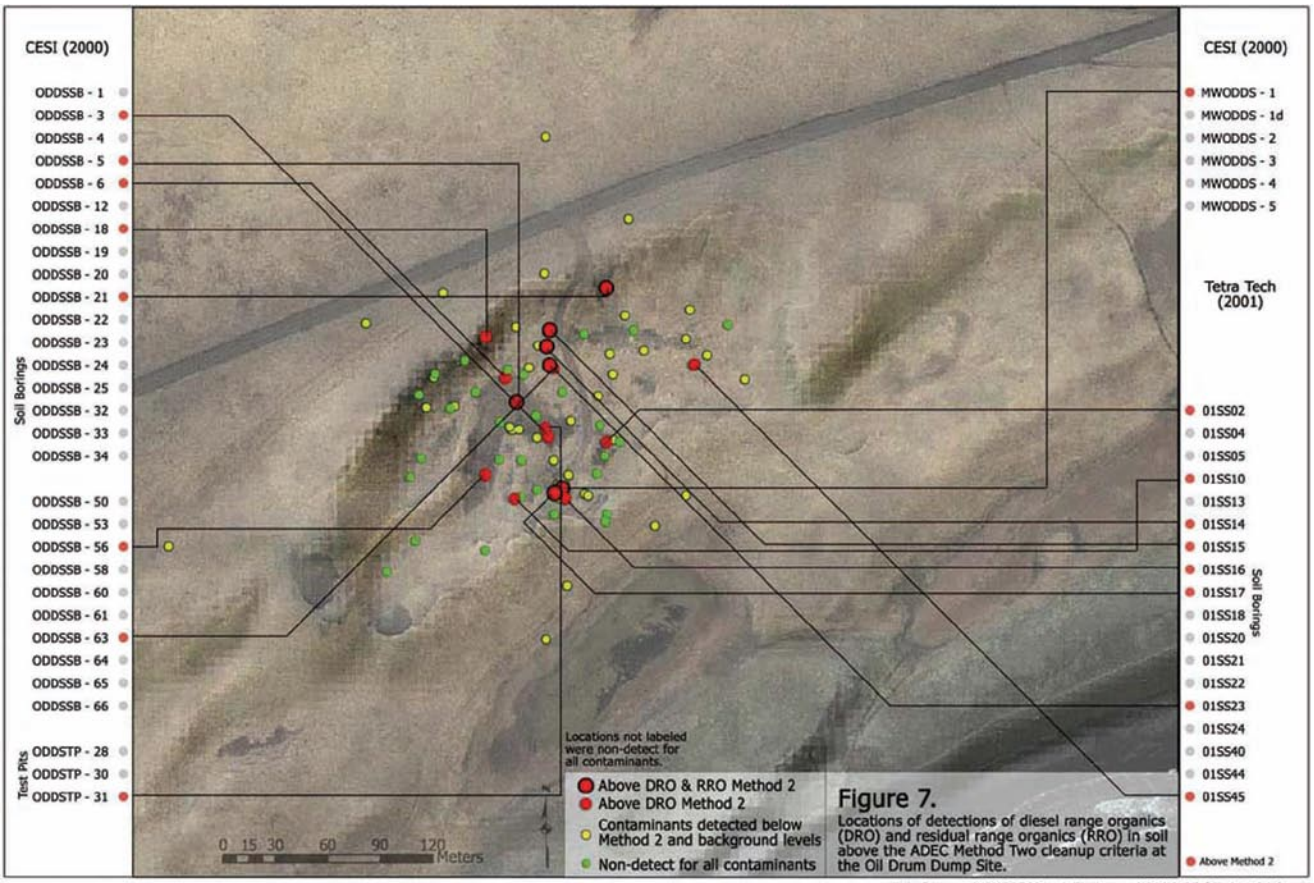


Figure 7.
Locations of detections of diesel range organics (DRO) and residual range organics (RRO) in soil above the ADEC Method Two cleanup criteria at the Oil Drum Dump Site.

Data Sources: IKONOS 2001 satellite image, NOAA Pribilof Project database.

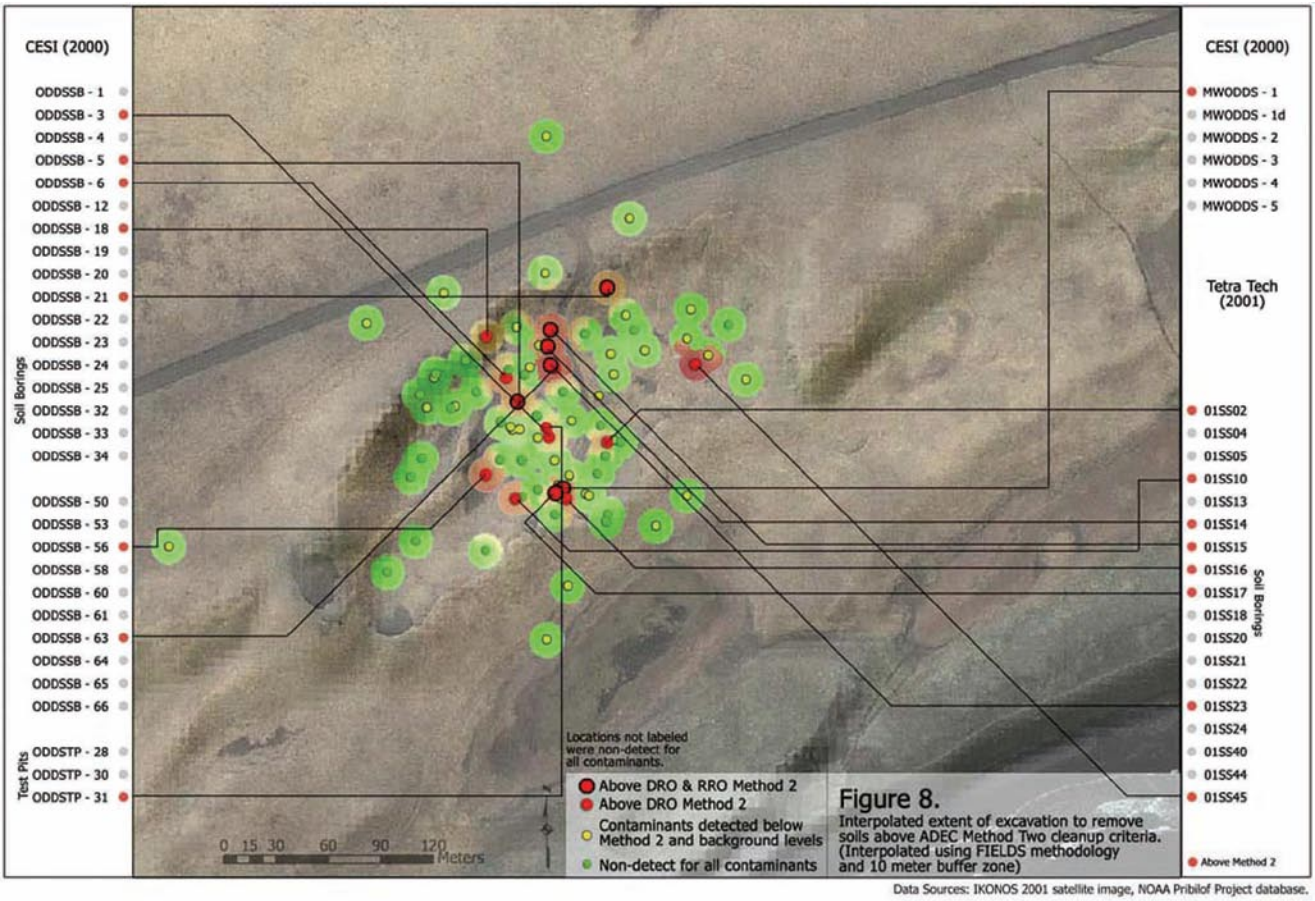


Figure 8.
Interpolated extent of excavation to remove soils above ADEC Method Two cleanup criteria. (Interpolated using FIELDS methodology and 10 meter buffer zone)

Data Sources: IKONOS 2001 satellite image, NOAA Pribilof Project database.

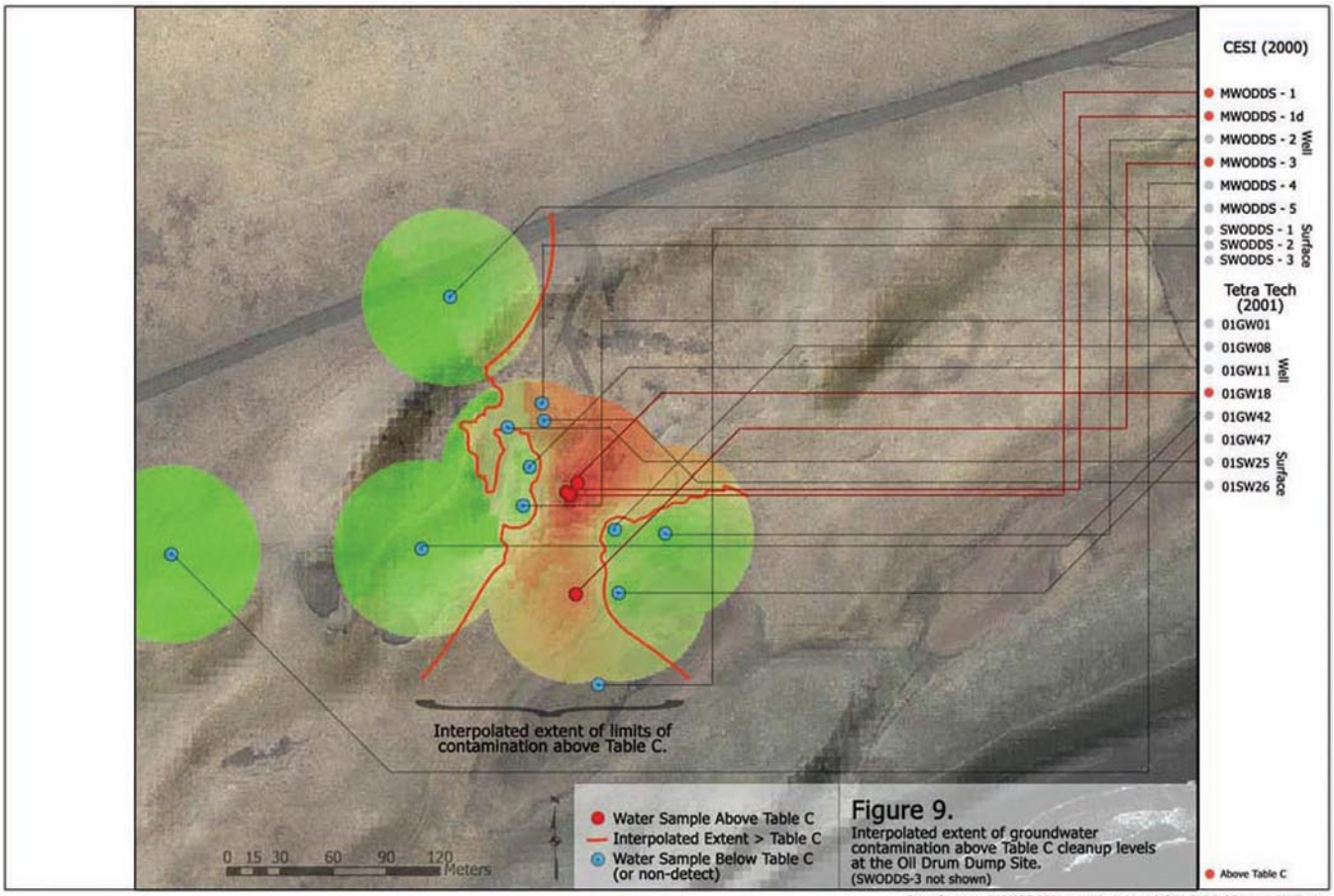


Figure 9.
Interpolated extent of groundwater contamination above Table C cleanup levels at the Oil Drum Dump Site.
(SWODDS-3 not shown)

Data Sources: IKONOS 2001 satellite image, NOAA Pribilof Project database.

APPENDICES

Appendix A

Historical Sources and Annotations

A1. Oil Drum Dump Site, ca. 1950s (NARA, 2000). View is to the south. The main road leads to the NOAA Central Pad.

Appendix B
Project Photography

B1. Overview of ODDS (TPA Site 1) looking southwest. Black arrow points to main access road. Note sand dunes and surface water bodies. Polovina Turnpike in foreground.

Photo ID:	CESI3373
File ID:	PA120001
Date:	10/12/00
Photo By:	Hostetler (CESI)
Island:	Saint Paul
TPA ID:	1-Oil Drum Dump Site
Site:	Overview
View:	Southwest

B2. Overview of ODDS (TPA Site 1) looking west. Black arrow points to main access road. Note sand dunes and surface water bodies. Polovina Turnpike in foreground.

Photo ID:	CESI2314
File ID:	PA010020
Date:	10/01/00
Photo By:	Hostetler (CESI)
Island:	Saint Paul
TPA ID:	1-Oil Drum Dump Site
Site:	Overview
View:	West

B3. Overview of ODDS (TPA Site 1) looking east. Drill rig (black arrow) is set up at MWODDS - 5 on the north side of the site. Note sand dunes and surface water bodies. Polovina Turnpike in foreground.

Photo ID:	CESI2316
File ID:	PA010022
Date:	10/01/00
Photo By:	Hostetler (CESI)
Island:	Saint Paul
TPA ID:	1-Oil Drum Dump Site
Site:	Overview
View:	East

B4. Overview of ODDS (TPA Site 1) looking north. Black arrow shows location of NOAA Central Pad. Note the site is in a bowl-shaped depression. South lake in foreground.

Photo ID:	CESI2832
File ID:	PA040194
Date:	10/04/00
Photo By:	Hostetler (CESI)
Island:	Saint Paul
TPA ID:	1-Oil Drum Dump Site
Site:	Overview
View:	North

B5. Central portion of site. Bulldozer is just to the left (east) of the NOAA Central Pad. Center bog is at the right of the photograph. Compare with Exhibit A1.

Photo ID:	CESI3437
File ID:	PA130005
Date:	10/13/00
Photo By:	Hostetler (CESI)
Island:	Saint Paul
TPA ID:	1-Oil Drum Dump Site
Site:	Overview
View:	South

B6. Buried drum fragments were located with inductive electromagnetic tracing and hand probes in central bog area. Metal was highly corroded with no identifying markings or stampings.

Photo ID:	CESI2155
File ID:	P9260014
Date:	9/26/00
Photo By:	Hostetler (CESI)
Island:	Saint Paul
TPA ID:	1-Oil Drum Dump Site
Site:	Central Area
View:	North

B7. Buried drum was located with inductive electromagnetic tracing and hand probes in central bog area. No identifying markings or stampings.

Photo ID:	CESI2151
File ID:	P9260010
Date:	9/26/00
Photo By:	Hostetler (CESI)
Island:	Saint Paul
TPA ID:	1-Oil Drum Dump Site
Site:	Central Area
View:	Straight Down

B8. Buried drum fragment was located with inductive electromagnetic tracing and hand probes in northern dune area. Metal was highly corroded with no identifying markings or stampings.

Photo ID:	CESI2153
File ID:	P9260012
Date	9/26/00
Photo By:	Hostetler (CESI)
Island	Saint Paul
TPA ID	1-Oil Drum Dump Site
Site:	North Dune Ridge
View:	Northeast

B9. Buried drum fragments were located with inductive electromagnetic tracing and excavation in western dune area. Metal was highly corroded with no identifying markings or stampings.

Photo ID:	CESI2215
File ID:	P9290010
Date:	9/29/00
Photo By:	Hostetler (CESI)
Island:	Saint Paul
TPA ID:	1-Oil Drum Dump Site
Site:	Central Area
View:	East

B10. Buried drum fragments were located with inductive electromagnetic tracing and excavation in western dune area. Metal was highly corroded with no identifying markings or stampings.

Photo ID:	CESI2216
File ID:	P9290011
Date:	9/29/00
Photo By:	Hostetler (CESI)
Island:	Saint Paul
TPA ID:	1-Oil Drum Dump Site
Site:	Central Area
View:	West

B11. Yellow/orange product material found at a soil pedestal along the northern dune ridge.

Photo ID:	CESI2141
File ID:	P9250046
Date:	09/25/00
Photo By:	Airhart(CESI)
Island:	Saint Paul
TPA ID:	1-Oil Drum Dump Site
Site:	Central Area
View:	Straight Down

B12. Yellow/orange product material found in test trench.

Photo ID:	CESI2213
File ID:	P9290008
Date:	9/29/00
Photo By:	Hostetler (CESI)
Island:	Saint Paul
TPA ID:	1-Oil Drum Dump Site
Site:	Central Area
View:	North

B13. Green product material (probably paint) uncovered in shallow excavation in central bog.

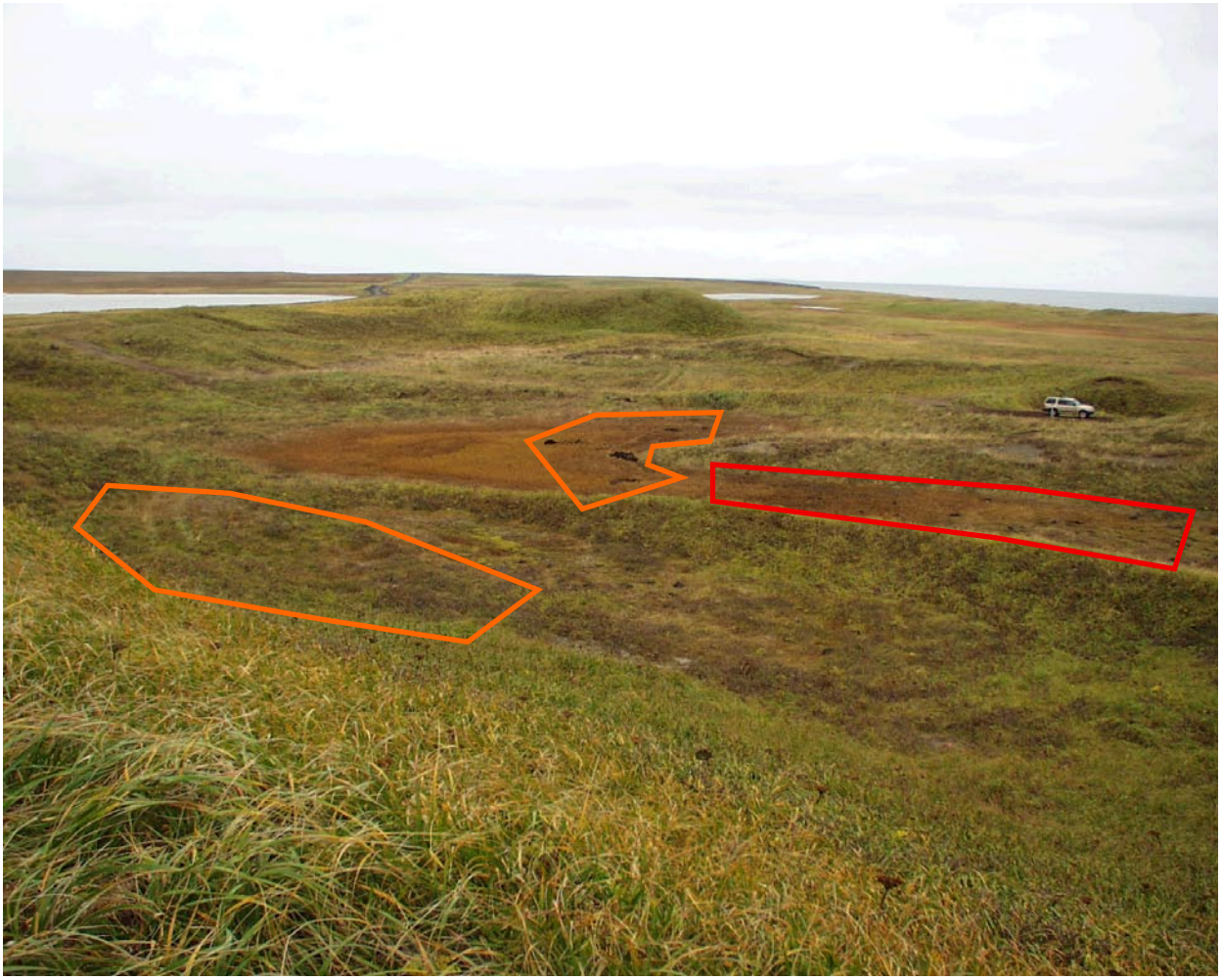
Photo ID:	CESI2218
File ID:	P9290013
Date:	9/29/00
Photo By:	Hostetler (CESI)
Island:	Saint Paul
TPA ID:	1-Oil Drum Dump Site
Site:	Central Area
View:	Straight Down

B14. Detail of green product material (probably paint).

Photo ID:	CESI2220
File ID:	P9290015
Date:	9/29/00
Photo By:	Hostetler (CESI)
Island:	Saint Paul
TPA ID:	1-Oil Drum Dump Site
Site:	Central Area
View:	Straight Down

B15. Product on water table in hand-held auger boring in the western part of the central bog.

Photo ID:	CESI2258
File ID:	P9290053
Date:	9/29/00
Photo By:	Hostetler (CESI)
Island:	Saint Paul
TPA ID:	1-Oil Drum Dump Site
Site:	Central Area
View:	Straight Down



B16. Western part of the central bog. The vehicle to the right of the photograph is parked on the NOAA Central Pad. The area of free product on the water table is outlined in red. Areas where buried drums were examined are outlined in orange.

Photo ID:	CESI2251
File ID:	P9290046
Date:	9/29/00
Photo By:	Hostetler (CESI)
Island:	Saint Paul
TPA ID:	1-Oil Drum Dump Site
Site:	Central Area
View:	East

B17. Typical contaminated soil pedestal on northern dune face. The soil pedestals are highly eroded.

Photo ID:	CESI2243
File ID:	P9290038
Date:	9/29/00
Photo By:	Hostetler (CESI)
Island:	Saint Paul
TPA ID:	1-Oil Drum Dump Site
Site:	Central Area
View:	Straight Down

B18. Soil sampling by hand-held Geoprobe near the north dune ridge.

Photo ID:	CESI2068
File ID:	P9220014
Date:	9/22/00
Photo By:	Hostetler(CESI)
Island:	Saint Paul
TPA ID:	1-Oil Drum Dump Site
Site:	Central Area
View:	North

B19. Installation of MWODDS - 4 by air rotary.

Photo ID:	CESI0997
File ID:	P7040015
Date:	7/04/00
Photo By:	Hostetler (CESI)
Island:	Saint Paul
TPA ID:	1-Oil Drum Dump Site
Site:	MWODDS-4
View:	North

Appendix E

Summary of ODDS water level data

9/16/2000

The latest data set from the ODDS wells extends the water level history from its previous span of 10 days, to 31 days. Fig. 1 compares the wells by offsetting the raw water level data so that all four well histories start at a value near zero. No attempt was made in Fig. 1 to remove a secular trend. It is apparent from Fig. 1 that the secular trend noted in previous analyses only applies for restricted time intervals.

From day 94 up to about day 104, all four wells show about the same linear decrease of mean water level with time. Following day 104, a general increase is observed in all four wells until about day 115, at which point the water level begins to decrease slightly. It is interesting to note that the general shape of the histories is similar and that the wells that exhibited the largest oscillations due to tides (wells 1 and 4) also show the largest increase in the mean water level.

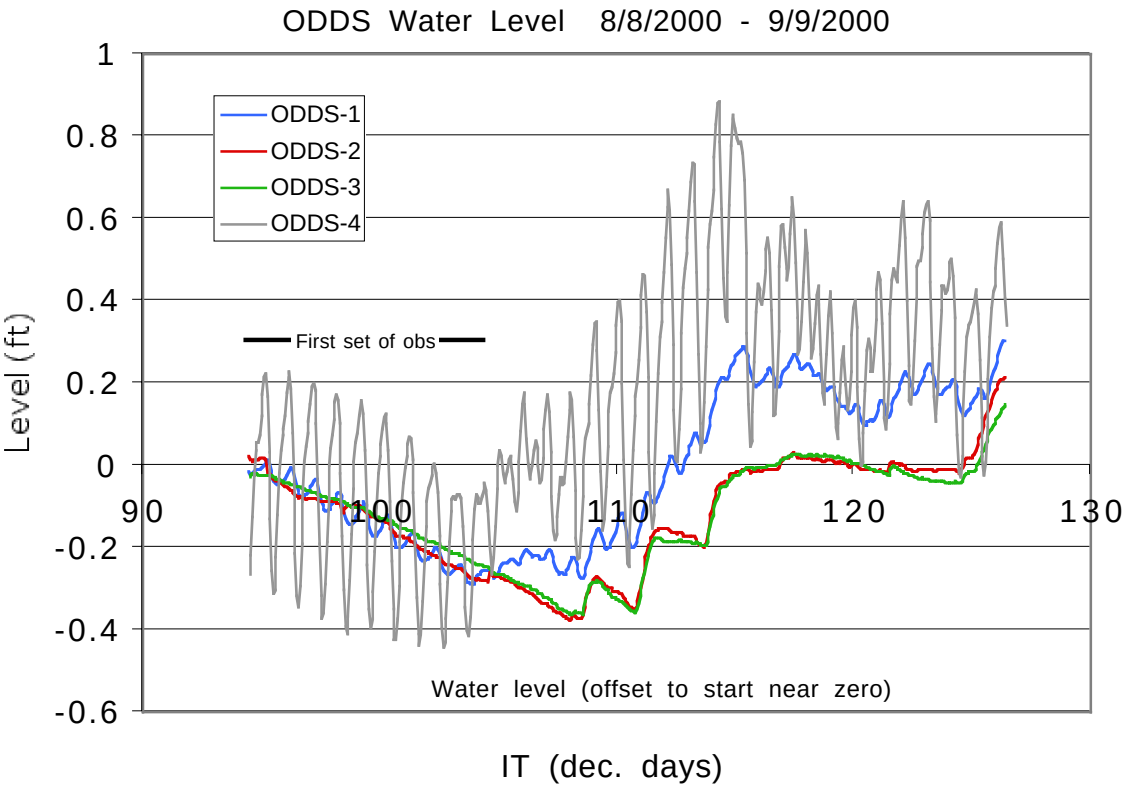


Fig 1. Water level histories for ODDS-1, -2, -3 and –4.

Figure 2 shows the FFTs of the 31-day water level histories. These data show the same general trend that the earlier (10-day) data set showed, and are consistent with the qualitative appearance of the data in Fig. 1. That is, ODDS-4 has the strongest tidal influence, followed by ODDS-1, with ODDS-3 and –4 showing small, but noticeable peaks at the expected periods of 12 and 24 hr. In contrast to the earlier data set, Fig. 2 shows that the peak at 24 hr has now split off a second peak near 25 hr. This is illustrated more clearly in Fig 3, which shows the FFT values on a linear scale. The longer sampling interval allows solar (24 hr) and lunar (24.9 hr) components to be separately resolved. As a check, an FFT was performed on tidal data collected for Galveston TX over a 170-day period (red curve in Fig. 3). The peaks of the ODDS data align well with those of the Galveston data, suggesting that we have in fact resolved the lunar and solar components, and that the double peak in the ODDS data is not a sampling artifact.

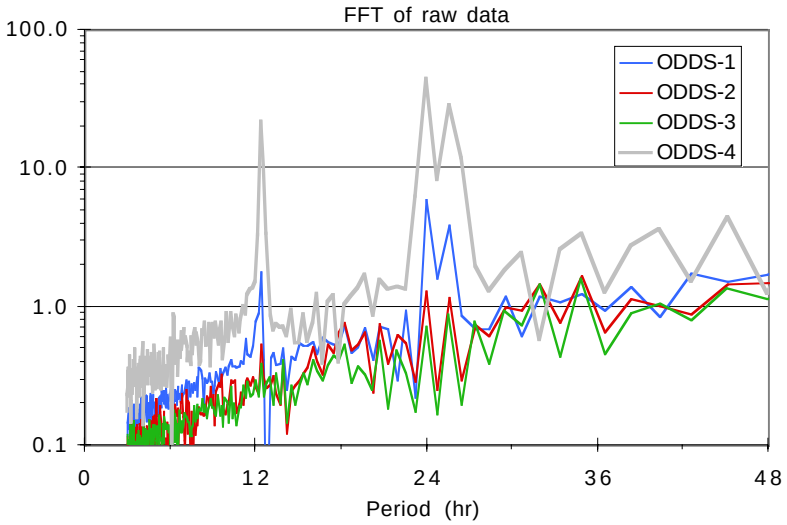


Fig 2. Fourier transforms of the ODDS water level histories.

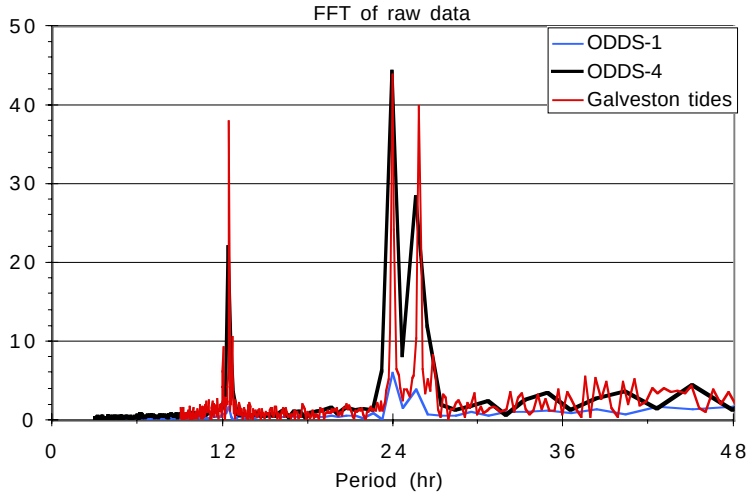


Fig 3. Fourier transforms of the ODDS1 and ODDS-4 water level histories (linear scale) compared to tidal data from Galveston TX.

Figure 4 shows the FFTs of depth histories after removal of a secular term.

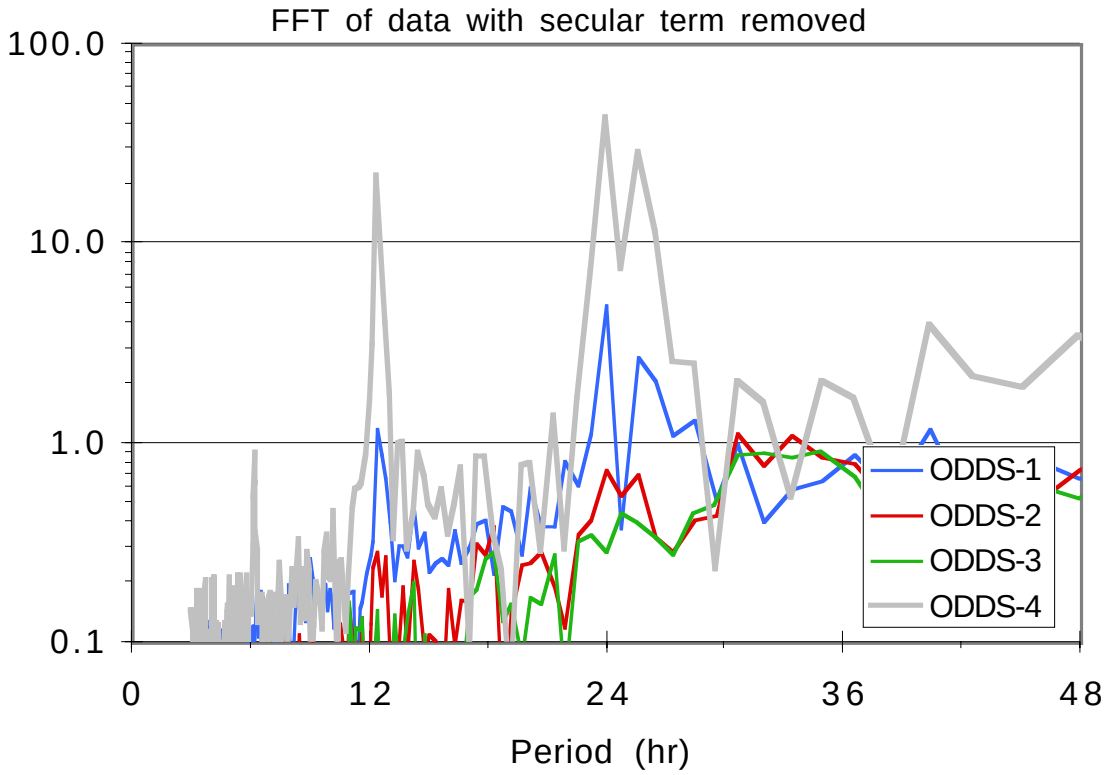


Fig 4. Fourier transforms of the ODDS water level histories, after removal of a secular trend.

Appendix I

Appendix I: Data Quality Evaluation Report

Data Quality Evaluation Report
Oil Drum Dump Site
St. Paul TPA Site No. 1 and FUDS B-1
Site Characterization Data from 2000

1.0 Introduction

During the 2000 field season, the National Oceanic and Atmospheric Administration (NOAA) contractor Columbia Environmental Sciences, Inc. (CESI) conducted site characterization activities at the Oil Drum Dump Site. These activities included a potential source survey, soil sampling, and groundwater well installation and sampling. CESI provided a Site Characterization Report (SCR) to NOAA. Subsequently, NOAA determined that the report did not meet its requirements relative to document readability and scientific defensibility. As a result, NOAA will prepare a SCR for this site using the data provided by CESI and incorporating data from previous investigations.

A component of SCR preparation is evaluation of the chemical data against the project's data quality indicators (DQIs), specific criteria developed by the data quality objective (DQO) process to evaluate whether the data meet the data quality needs of the project. This evaluation allows the investigator to make a statement of the data usability relative to project decision-making. Samples for this site were shipped to the laboratory in 11 sample delivery groups (SDGs). CESI indicated in its draft SCR that it performed data evaluation and that the data, with the exception of a small number of rejected results, met the project DQIs. To confirm the usability of the data, NOAA performed its own data evaluation by spot-checking the analytical data results relative to the DQIs for two of the 11 SDGs. The results of this data evaluation are presented in this report.

2.0 Summary of DQIs

The DQIs for the site characterization activities were established during a project DQO process and were based on the Alaska Department of Environmental Conservation (ADEC) underground storage tank procedures manual (ADEC 1999). A summary of the site characterization's DQIs is presented in Tables 2-1 and 2-2.

Table 2-1: Summary of Site Characterization Field and Laboratory Requirements for Soil

Parameter	Preparation/ Analytical Method	Practical Quantitation Limit (mg/kg)	Precision (%)	Accuracy (%)	Completeness (%)	Container Description	Preservation Holding Time
Gasoline Range Organics	AK101	20	±35	±50	≥85	4-oz amber glass, TLS[1]	Methanol preservative, <25°C/28 days
Diesel Range Organics	AK102	20	±50	±40	≥85	4-oz amber glass, TLC[2]	Cool 4±2°C/14 days to extraction, less than 40 days to analysis of extract
Residual Range Organics	AK103	100	±50	±40	≥85	4-oz amber glass, TLC	Cool 4±2°C/14 days to extraction, less than 40 days to analysis of extract
BTEX	EPA Method 8260B	0.07	±35	±35	≥85	4-oz amber glass, TLS	Methanol preservative, <25°C/28 days
Volatile Organic Compounds	EPA Method 8260B	0.07	±35	±25	≥85	4-oz amber glass, TLS	Methanol preservative, <25°C/28 days
Polynuclear Aromatic Hydrocarbons	EPA Method 8270C	1.0	±40	±35	≥85	4-oz amber glass, TLS	Cool 4±2°C/14 days to extraction, less than 40 days to analysis of extract
Semivolatile Organic Compounds	EPA Method 8270C	0.08	±35	±30	≥85	4-oz amber glass, TLS	Cool 4±2°C/14 days to extraction, less than 40 days to analysis of extract
RCRA Metals (As, Ba, Cd, Cr, Pb, Hg, Se, Ag)	EPA Method 6020 & 7470A	10	±35	±30	≥85	4-oz amber glass, TLC	Cool 4°±2°C/6 months

[1]TLS = Teflon-lined septa screw cap

[2]TLC = Teflon-lined screw cap

Table 2-2: Summary of Site Characterization Field and Laboratory Requirements for Groundwater

Parameter	Preparation/ Analytical Method	Practical Quantitation Limit (µg/L)	Precision (%)	Accuracy (%)	Completeness (%)	Container Description	Preservation Holding Time
Gasoline Range Organics	AK101	100	±35	±50	≥85	40-ml VOA[1], TLS[2]	HCl to pH less than 2, 4±2°C/14 days from sampling
Diesel Range Organics	AK102	800	±30	±25	≥85	1-L amber glass, TLC[3]	4±2°C/7 days to extraction, 40 days to analysis of extract
BTEX	EPA Method 8260B	5	±35	±30	≥85	Duplicate 40-ml VOA, TLS	HCl to pH less than 2, 4±2°C/14 days
Volatile Organic Compounds	EPA Method 8260B	10	±35	±30	≥85	1-L amber glass, TLS	HCl to pH less than 2, 4±2°C/14 days
Polynuclear Aromatic Hydrocarbons	EPA Method 8270C	8	±30	±30	≥85	4-oz amber glass, TLS	4±2°C/7 days to extraction, 40 days to analysis of extract
Semivolatile Organic Compounds	EPA Method 8270C	1000	±35	±30	≥85	Minimum 100-mL HDPE[4]	4±2°C/7 days to extraction, 40 days to analysis of extract
RCRA Metals (As, Ba, Cd, Cr, Pb, Hg, Se, Ag)	EPA Method 6020 & 7470A	100	±30	±30	≥85	40-ml VOA1, TLS[2]	HNO_3 to pH less than 2/6 months maximum total holding time

[1] VOA = volatile organics analysis
[2] TLS= Teflon-lined septa screw cap
[3] TLC = Teflon-lined screw cap
[4] HDPE = high-density polyethylene

3.0 Summary of Collected Analytical Data

CESI collected 15 soil samples and 10 groundwater samples for fixed laboratory analysis during 2000 and analyzed these samples in a total of 11 SDGs. An additional 11 groundwater samples were collected and analyzed by IT Alaska Corporation during 2001, however, the quality of those data was addressed in a separate evaluation (IT 2002).

The CESI samples were analyzed for the parameters and by the methods listed in Table 2-1 and 2-2.

4.0 Data Evaluation

The data found in the following SDGs were evaluated against the project-specific indicators of data quality (*i.e.*, precision, accuracy, completeness, cooler temperature, and holding times):

- SDG 40 (Soil)
- SDG 49 (Groundwater)

Data from these SDGs is evaluated in the following subsections.

4.1 Sample Delivery Group 40 Evaluation

SDG 40 consisted of soil samples collected in September and October 2000 from the following drill rig explorations:

- ABSB-1
- ABSB-2
- ABSB-3
- ABTP-3
- AKDSB-1
- CBSB-2
- DPASB-1
- FBSB-2
- MSSB-2
- MSSB-4
- MW46-21
- MW46-22
- MW46-24
- MWTH-5
- ODDSSB-19
- PSDO-1
- PSSB-2
- RBSB-22

The following DQI evaluation was performed for this SDG.

4.1.1 Holding Time

The first sample was collected for this batch on September 13, 2000 at 1340 hrs Alaska Daylight Time (ADT), though only samples to be analyzed for Total Organic Carbon (TOC) were collected between September 13, 2000 and October 4, 2000. The laboratory received the samples on October 12, 2000 at 0900 hrs. The last sample from this batch was extracted some time on October 13, 2000. The maximum holding time for the non-TOC samples was no greater than 9 days. The shortest maximum holding time for non-TOC soil samples prior to extraction, according to Table 2-1, is 14 days. Therefore, this SDG met the holding time requirements for the project.

4.1.2 Cooler Temperature

Friedman & Bruya, Inc. (FB&I), the project laboratory, indicated that the cooler temperatures for the cooler associated with this SDG was 11 °C, which is outside the project requirements of 4±2 °C for DRO, RRO, VOCs, PAHs, SVOCs, and heavy metals. Elevated temperature may have caused organic compounds to degrade and/or volatilize into the headspace, causing the analytical results for the organics to be biased low.

4.1.3 Practical Quantitation Limits

All PQL requirements were met for this SDG, with the following exceptions:

- VOCs by EPA Method 8260B: acetone, methylene chloride, 2-butanone (methylethyl ketone), 4-methyl-2-pentanone, and 2-hexanone, all at 0.5 mg/kg.

Of the listed that had PQLs exceeding the project requirements, only methylene chloride also exceeded its ADEC Method 2 soil cleanup level (PQL = 5 mg/kg vs. Method 2 Cleanup Level for groundwater protectiveness, Under 40 inch zone = 0.015 mg/kg). One should note that methylene chloride is a common laboratory contaminant and is not a suspected contaminant of concern for this investigation due to lack of historical information pointing to the use of methylene chloride on St. Paul Island. Based on this evaluation, the PQLs were acceptable.

4.1.4 Precision

Precision is the measure of the repeatability of a measurement. The samples in this SDG were evaluated for precision by comparing the laboratory control sample (LCS) results with the LCS duplicate (LCSD) results, by comparing laboratory duplicates to the project sample duplicated, as well as by matrix spike (MS)/MS duplicate (MSD) comparisons. Also note that field duplicates are normally used to evaluate precision but these results were not found with the laboratory deliverable.

Based on review of the laboratory data for SDG 40, the least precise measurement was for 4-chloro-3-methylphenol, with a relative percent difference (RPD) of 11%. This is well under the most stringent RPD (±25%) for project data. As a result, the data from SDG 40 were found to meet project requirements.

4.1.5 Accuracy

Accuracy is the measure of the correctness of a measurement. The samples in this SDG were evaluated for accuracy by comparing the spike level in the LCSs and LCSDs with the measured amounts, by evaluating surrogate recoveries, laboratory spike sample recoveries, and comparing MSs vs. MSDs.

The laboratory indicated that all surrogates were recovered to within the tolerances required by the analytical methods and their own standard operating procedures.

Based on review of the laboratory data for SDG 40, all samples met the project's accuracy requirements, except for one instance where the SVOC N-nitroso-di-n-propylamine had a matrix spike recovery of –32%, compared with the project requirement of ±30%. However, this recovery did fall within the laboratory's own acceptance criteria for that compound, based upon the EPA method requirements and the laboratory SOP. In addition, this compound is not a contaminant of concern for the project. As a result, the accuracy for SDG 2 is considered acceptable.

4.1.6 Completeness

Completeness is the measure of how much of the collected data meet the usability standards for the project. Since no data from SDG 40 were rejected, the completeness for this SDG is 100%, which is greater than the project completeness requirement of ≥85%.

4.2 Sample Delivery Group 49 Evaluation

SDG 49 consisted of soil samples collected in November 2000 from the following drill rig explorations:

- MWODDS-4
- MWTH-1
- MWTH-4
- MWTH-3
- MWTH-5

The following DQI evaluation was performed for this SDG.

4.2.1 Holding Time

All samples for this batch were collected on November 17, 2000 at 1115 hrs Alaska Daylight Time (ADT). Friedman & Bruya, Inc., the project laboratory, received the samples on November 20, 2000 at 1000 hrs. All extraction and analyses were performed within holding time requirements. The longest holding time for samples being analyzed for organic contaminants was 11 days, which is within the times specified in Table 2-2. For samples being analyzed for heavy metals, analyses were conducted on day 21, well within the two to six month maximum holding time (Table 2-2). Therefore, this SDG met the holding time requirements for the project.

4.2.2 Cooler Temperature

Friedman & Bruya, Inc. indicated that the cooler temperature for the cooler associated with this SDG was 11 °C, which is outside the project requirements of 4±2 °C for DRO, RRO, VOCs, PAHs, SVOCs, and heavy metals. Elevated temperature may cause organic compounds to degrade and/or volatilize into the headspace, potentially leading to analytical results for organics that are biased low.

4.2.3 Practical Quantitation Limits

All project PQL requirements were met for this SDG, though laboratory PQLs were not met for methyl ethyl ketone (MEK) and barium. MEK does not have a regulatory limit in Alaska and is not a contaminant of potential concern. Barium, also, is not a contaminant of potential concern Based on this evaluation, the PQLs were acceptable.

4.2.4 Precision

The samples in this SDG were evaluated for precision by comparing the laboratory control sample (LCS) results with the LCS duplicate (LCSD) results. Note that the results of matrix spike (MS)/MS duplicate (MSD) comparisons are normally used in addition to the LCS/LCSD comparisons to evaluate precision. CESI indicated that the project laboratory performed MS/MSD analyses, however, these results were not included in the laboratory deliverable. NOAA was unable to verify the MS/MSD evaluation performed. Also note that field duplicates and laboratory duplicates are normally used to evaluate precision, but these results were not found with the laboratory deliverable.

Based on review of the LCS and LCSD data for SDG 49, the least precise measurement was for silver, with a relative percent difference of 23%. This is within the most stringent RPD (±35%) for project data. As a result, the data from SDG 49 were found to meet project requirements.

4.2.5 Accuracy

The data for organic contaminants were evaluated for accuracy by comparing the spike level in the LCSs and LCSDs with the measured amounts and by surrogate recovery percentages. Data for heavy metals were evaluated for accuracy by comparing the spike level in the LCSs with the measured amounts and by comparing the spike level in the MSs and MSDs with the measured amounts.

With the exception of one sample analyzed for DRO and all samples analyzed for SVOCs, surrogate recovery percentages for organics were within tolerances required by the analytical methods and laboratory standard operating procedures.

Based on review LCS/LCSD data for SDG 49, data for two of 11 SVOCs analytes (phenol and 4-nitrophenol) did not meet the project's accuracy requirements. However, recoveries for these contaminants were within control limits for the analytical method. Neither of these contaminants is a suspected contaminant of concern.

Review of heavy metal MS/MSD data for SDG 49 indicated that all metals except silver met the project's accuracy requirements. Data for silver was also outside the control limits for the analytical method. The laboratory noted that this was due to matrix effects. Silver is not a contaminant of potential concern.

Based on this review of the data, accuracy for SDG 49 is considered acceptable.

4.2.6 Completeness

Since no data from SDG 49 were rejected, the completeness for this SDG is 100%, which is greater than the project completeness requirement of ≥85%.

5.0 Conclusions and Recommendations

Two of the 11 SDGs for this characterization were evaluated for data quality by NOAA. All 11 SDGs were previously evaluated by NOAA's contractor, CESI. NOAA found that the data quality for the two SDGs meets the project's data quality requirements, though an issue with cooler temperature may bias samples in SDG 40 and 49 to be low. NOAA's findings are consistent with CESI's findings for these SDGs.

Due to the acceptable quality of the two SDGs, and the agreement between NOAA's and CESI's data quality reviews, full use of the characterization data in a manner consistent with NOAA's and CESI's evaluations is recommended.

6.0 References

ADEC. 1999. Underground Storage Tank Procedures Manual, Guidance for Treatment of Petroleum-Contaminated Soil and Groundwater and Standard Sampling Procedures. December 1, 1999. State of Alaska.

IT. 2002. Draft Annual Groundwater Monitoring Report–2001 St. Paul Island, Alaska. IT Alaska Corporation. March 2002.

Appendix J
Chase Construction Daily Quality Control Inspection Reports

CHASE, INC.
201 E. 3rd Avenue
Anchorage, Alaska 99501

DAILY QUALITY CONTROL INSPECTION REPORT

Report #: 2. Date: 5-13-96 Contract #: DACA 85-86-C-0003

Project: DEBRIS CLEANUP & SITE RESTORATION, ST. PAUL & ST. GEORGE ISLAND, ALASKA

Site Inspected: A, B-1, C, D, E-1, E-2, & F

1. Work performed today: Pete Cornwell initial inspections w/ John Jorgenson. Held meeting w/ TLX Supt + workers (safety + job procedures discussed)

2. Inspection performed: Initial inspections A, B-1, C, D, E-1, E-2, and F

3. Deficiencies noted or corrected: -1, containers at site F possibly containing PCB's were collected from Weather Station & are isolated from main site

4. Instructions received or given: Talked to Al Poole in Anch. - He said OK to go ahead w/ more dangerous areas. Bob Boyer of COE to be out there on Tue.

5. Remarks: C.O.C random sampling report cannot be verified by numbers on containers. Site C - containers numbered 7-10 is not as found. Site E-1 - containers 1 yellow 6'x7 and Found - Site D - 6 containers supposedly removed not found) Site E-1 drums & barrels not present)

Contractor's Verification: The above report is completed and correct and all material and equipment used and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

ACKNOWLEDGEMENT:

Earl Brown
Quality Control Representative

Project Manager

Form CHASE 101

1 E. 3rd Avenue
Anchorage, Alaska 99501

DAILY QUALITY CONTROL INSPECTION REPORT

Report #: 8 Date: 5-20-86 Contract #: DACA 85-86-C-0003

Project: DEBRIS CLEANUP & SITE RESTORATION, ST. PAUL & ST. GEORGE ISLAND, ALASKA

Site Inspected: A, C, B-1, B-2, B-3, E-1

1. Work performed today: Continued hauling debris from A & E-1 to disposed site. Continued crushing barrels at B-1. Located newer barrels (not DOD) at sire C containing POL products- will stock pile at site B-1 w/others.

2. Inspection performed: None - Held safety meeting - Minutes attached.

3. Deficiencies noted or corrected:

4. Instructions received or given:

5. Remarks: At site B-3 - Mr. Rozier & Mr. Benson locate alot more old wood bldgs that appeared to be DOD. Mr. Rozier is looking into this. Also some old barrels.

Contractor's Verification: The above report is completed and correct and all material and equipment used and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

ACKNOWLEDGEMENT:

Quality Control Representative

Project Manager

Form CHASE 101

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NRC 5

CHASE, INC.
201 E. 3rd Avenue
Anchorage, Alaska 99501

DAILY QUALITY CONTROL INSPECTION REPORT

Report #: 11 Date: 5/22/96 Contract #: DACA 85-00-C-0003

Project: DEBRIS CLEANUP & SITE RESTORATION, ST. PAUL & ST. GEORGE ISLAND, ALASKA

Site Inspected: B-1, N-3

1. Work performed today: Continued crushing, cutting & hauling barrels & debris from B-1 to disposal site. Repairing road to disposal site.

2. Inspection performed:

3. Deficiencies noted and corrective action: Remarks- Investigated surrounding area of site N-3 (Lake Hill) w/Mr. Bezier COE. There are approx. 35-40 bunkers, most of which contain debris plus barrels & other DOD debris in area.

4. Instructions received or given:

5. Remarks: Barrels containing used oil (Not DOD) are being segregated. There are approx 650 by COE rep. & my count. About 160 contain oil, most of which are full. We are crushing & hauling empties and stockpiling those w/oil, most of which seem to have been put there recently.

Contractor's Verification: The above report is completed and correct and all material and equipment used and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

ACKNOWLEDGEMENT:

Quality Control Representative

Project Manager

Form CHASE 101

#6

CHASE, INC.
201 E. 3rd Avenue
Anchorage, Alaska 99501

DAILY QUALITY CONTROL INSPECTION REPORT

Report #: 12 Date: 05/24/86 Contract #: DACA 85-86-C-0003

Project: DEBRIS CLEANUP & SITE RESTORATION, ST. PAUL & ST. GEORGE ISLAND, ALASKA

Site Inspected: B-1

1. Work performed today: Continued crushing, cutting & hauling, barrels & debris from B-1 to disposal site.

2. Inspection performed:

3. Deficiencies noted or corrected:

4. Instructions received or given: Asked Glen Mullin of TNX for price on new barrel dump.

5. Remarks: Placed PTL samples on Northern Air Cargo. B-1 barrel dump elevation is very close to water table. Water table has been penetrated in a few places.

Contractor's Verification: The above report is completed and correct and all material and equipment used and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

ACKNOWLEDGEMENT:

Quality Control Representative

Project Manager

Form CHASE 101

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ATTACH 3

201 E. 3rd Avenue
Anchorage, Alaska 99501

DAILY QUALITY CONTROL INSPECTION REPORT

Report #: 20 Date: 6/1/90 Contract #: DACA 85-86-C-0003

Project: DEBRIS CLEANUP & SITE RESTORATION, ST. PAUL & ST. GEORGE ISLAND, ALASKA

Site Inspected: C, B-1, E-1, E-2

1. Work performed today: Continued crushing barrels at site "C"
-Hauling contaminated ~~dirt &~~ debris from B-1 to disposal site
-Hauling debris from site E-1 to disposal site

2. Inspection performed:

3. Deficiencies noted or corrected:

4. Instructions received or given: Mr. Rozier COE informed me that as part of change order certain concrete, metal & barrels in & around bunkers in Lake Hill Area (D-3) would be cleaned up & wood structures would be laid flat to rot. Mr. Fratis of TDX the landowner, agreed to this saving the wood left at the sites posed no safety or health problem.

5. Remarks:

Contractor's Verification: The above report is completed and correct and all material and equipment used and work performed during this reporting period is in compliance with the contract plans and specifications except as noted above.

ACKNOWLEDGEMENT:

Earl B — Quality Control Representative

Gregory Fratis Sr. — Project Manager

Form CHASE 101

Appendix K
Correspondence Regarding the Oil Drum Dump Site

TONY KNOWLES, GOVERNOR

555 Cordova Street
Anchorage, AK 99501
Phone: (907) 269-7545
Fax: (907) 269-7649
http://www.state.ak.us/dec/

DEPT. OF ENVIRONMENTAL CONSERVATION
DIVISION OF SPILL PREVENTION & RESPONSE
CONTAMINATED SITES REMEDIATION PROGRAM

August 27, 1999

U. S. Army Engineer District, Alaska
Attn: CEPOA-PM-E-F (Chivvis)
P.O. Box 898
Anchorage, Alaska 99506

Subject: PRP Notification/Request for site characterization and possible remedial action – St. Paul Island Formerly Used Defense Sites (FUDS)

Dear Mr. Chivvis:

We received the Alaska District's October 23, 1998 letter responding to the potentially responsible party (PRP) letters ADEC sent to on August 5 and September 11, 1998. The latest letter provided additional information on the cleanup work done on St. Paul Island in 1985-86 under the FUDS program. It described the Alaska District's conclusion that all Department of Defense (DOD) impacts to the Island have been "mitigated to acceptable risk based levels and satisfy community concerns" and a decision to "not reopen our remediation". Our Department (DEC) does not agree with the AK District's position that no further work should be done under the FUDS program. Insufficient information has been provided to document that the FUDS were adequately cleaned up. Therefore, the Department of Defenses has out-standing responsibilities for investigation and possibly cleanup on the Island. DEC is requesting that the Corps, as DOD's agent for cleanup at FUDS, conduct additional work under the FUDS Program to complete site characterization and any necessary cleanup.

The National Oceanic and Atmospheric Administration (NOAA), as the federal land manager for the island, is currently investigating and cleaning up areas that have impacts from past federal government activities. NOAA contends that areas in which cleanup work was done under the FUDS program, but which have not resulted in site closure under State regulations, should be brought to closure under the FUDS program. DEC requests that the Corps of Engineers work with NOAA to conduct site characterization and any necessary cleanup in these areas. Working together cooperatively will help ensure a timely and cost effective response.

The 1986 FUDS cleanup project included work on nine separate sites on the island. Based on all the information provided to date, the Corps has not demonstrated that the following areas were adequately characterized, cleaned up or closed: the LORAN Station at Southwest Point - FUDS site A in the '85-86 cleanup, the Oil Drum Dump Site #1 - site B-1 in the FUDS cleanup, the Barrel Dumps north and east of Big Lake - sites B-2 and B-4 in the FUDS cleanup, and the FUDS Landfill created near the Big Polovina Hill Vehicle boneyard.

Telegraph Hill is located in the recharge area for what appears to be a surface influenced sole-source aquifer for the community of St. Paul. The site is directly upgradient from the water supply wells. Periodic petroleum contamination has been documented in the water wells.

FUDS cleanup work at Telegraph Hill included removing what the Corps estimated to be 4000 abandoned drums from approximately two acres of land. At the Oil Drum Dump Site (site B-1) an estimated 4000 drums, 60 tanks and 300 cubic yards of other debris were to be removed. At Drum Dump sites B-2 and B-4 an estimated 650+ drums were reportedly removed. The contracting documents state that most of the drums had rusted through and spilled their contents. The documents called for cleaning up hazardous spills and sampling to verify the level of cleanup. Site logs produced by the contractor show that some contaminated soil was excavated and transported to the FUDS landfill for disposal. It is unclear what types and concentrations of contaminants were present in the soil that was placed in the landfill. It is unclear whether any site characterization work was done at the former LORAN Station. To date, no documentation has been provided to ADEC to demonstrate that these FUDS were adequately characterized or cleaned up. The October 23 letter from the AK District states, "I canvassed District personnel who may have some knowledge or records on this matter. Unfortunately, we were not able to locate soil or groundwater results."

A December 1991 Preliminary Assessment Report, prepared by DEC, described the 60-70 drums that were documented as being left behind at Telegraph Hill during the FUDS cleanup because they were from a non-military source. However, it also described "drums, crushed drums, and drum debris scattered over the area" along with old pipes remaining at the site. An AK District trip report, Saint Paul (Sanders, May 1996) documents that residual soil contamination and old crushed drums remain at Telegraph Hill. It states that the drums were rusted and that it was not possible to define the origin of the drums, with the exception that one may have been a Shell Oil drum. DEC staff inspected the site again on November 3 and 4, 1998 and again observed drum remnants and other metal debris protruding from the ground at Telegraph Hill.

The October 23 letter refers to a December 10, 1986 memorandum from Delwyn Thomas and concludes that an acceptable level of cleanup was achieved. However, that memorandum states, "... the results indicate that an acceptable level of cleanup has been achieved for those chemicals tested." It also recommended additional testing for polynuclear aromatic hydrocarbons and PCBs. Furthermore, no information has been provided to DEC on the number of samples collected, the sampling locations and the analytical test methods that were or the results of such tests. Therefore, we are unable to concur with the Corps conclusions.

The October 23 letter asserts the AK District's position through twelve *"facts"* based on the information attached to the letter. DEC's further detailed responses are enclosed as attachment 1.

Conclusion

DEC does not agree that FUDS on St. Paul Island have been adequately characterized and cleaned up. DEC requests that the AK District work with NOAA to ensure that all necessary site characterization and cleanup work is completed. This work needs to be done following plans reviewed and approved by DEC, to ensure federal government's (including DOD's) responsibilities are addressed and that the sites are cleaned up to acceptable levels. We request a written response on this matter by September 30, 1999.

Sincerely,

John Halverson
Project Manager

Attachment: DEC response to 12 points raised in Corps Oct. 23, '98 letter

cc: Scott Marchand, AK District Corps of Engineers
Jennifer Roberts, ADEC
Louis Howard, ADEC
John Lindsey, NOAA
Breck Tostevin, AGO

Stpaul7.doc File: FUDS - St. Paul 1999 Correspondence

ATTACHMENT 1
DEC's Responses to *"relevant facts"* the AK District raised its October 23, 1998 letter

1) The Corps letter refers to a recent DOD Site Assessment report as support of its position that no further assessment or cleanup is necessary and that the landowner concurs. The Pribilof Islands Site Assessment Report, prepared for the Office of the Deputy Under Secretary of Defense, March 31, 1998, is a draft report. DEC and the Aleutian Pribilof Island Association both provided comments on the draft stating that concerns over DOD impacts to the Islands have not been adequately addressed. The assessment did not include any sampling or even a trip to the site, but was done through phone calls, letters, and review of historical records (which are incomplete and do not document adequate cleanup). NOAA, as a landowner/manager has clearly stated its position that DOD has further obligations to investigate and cleanup these FUDS.

2) Item number five on page two of the Corps letter states, "Chase Construction was responsible for and did, in fact, arrange for disposal, not the Corps of Engineers. Therefore ADEC has failed to show that the Corps is subject to AS 46.03.822." However, on the contrary, it is very clear that the Corps contracted with Chase Construction to dispose of the DOD waste. Therefore, the Corps is liable under AS 46.03.822(a)(4) which provides that "any person who by contract, agreement or otherwise arranged for disposal . . . of hazardous substances . . ." is strictly liable. The Corps is also liable as a person who arranged for disposal under 42 U.S.C. 9607(a)(3) and 42 U.S.C. 6973.

3) Item number 10 refers to an 1987 letter from DEC which indicated that submittal of photographs or as-built drawings showing the location of the landfill would allow for closing the file on the landfill. However, the photographs or as-built drawings are required under permit condition "H" (Reporting). Groundwater monitoring is required under permit condition "G" (Monitoring). They are separate and distinct requirements that cannot be modified without a written permit amendment (see permit appendix A at A).

4) The letter states that a St. Paul Landfill Closure Report, dated February 1996, and photographs were submitted to DEC to meet closure requirements. However, DEC has received a draft report, dated December 1, 1995, but has no record of receiving a final closure report or the photographs that are referenced. Nor has DEC received groundwater-monitoring data that was required under the permit. Therefore, the landfill is not in compliance with permit requirements and has not been properly closed.

5) Item number 11 states that DEC has not provided any documentation of releases by DOD subsequent to 1986. However, the Corps has failed to demonstrate that it adequately cleaned up releases that were documented before 1986. In fact several people have documented that crushed, rusted drums and soil contamination remain at Telegraph Hill. No documentation has been provided on the types or concentrations of contaminants that were in soil buried in the landfill. The required groundwater monitoring has not been conducted, thus it is unclear whether contaminants are leaching from the waste, impacting groundwater and posing a risk to human health, safety, or welfare or to the environment.

6) Item number 12 states, "Any contamination left at the disposal site was permitted by ADEC and cannot be grounds for further action." Again, to the contrary, the solid waste disposal permit specifically stipulates, in condition "I", "Pollution, as defined in AS 46.03.900, resulting from the operation of this permitted facility, constitutes a violation of this permit . . . Violation of the conditions of this permit may result in the imposition of civil penalties and/or criminal penalties. Additionally, the Permittee may be required to monitor, evaluate impacts, and provide restoration . . .". Since the permit was obtained for, and work was performed under contract to, the AK District for waste under the jurisdiction of the FUDS program and generated during a FUDS cleanup, responsibility for resolving these issues extends to the Corps and ultimately the federal government.

OPTIONAL FORM 99 (7-90)

FAX TRANSMITTAL # of pages ▶)

11/20/98 11:58 202 226 0200 002/002

To KELLY SANDY From C. LEGATSKI

Dept./Agency Phone # 202/482-4638

Fax # 206/526-6660 Fax # 202/482-4960

NSN 7540-01-317-7368 5099-101 GENERAL SERVICES ADMINISTRATION

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U.S. House of Representatives
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LLOYD A. JONES
CHIEF OF STAFF
ELIZABETH MEGGINSON
CHIEF COUNSEL
JOHN LAWRENCE
DEMOCRATIC STAFF DIRECTOR

November 18, 1998

Honorable Joseph W Westphal
Assistant Secretary (Civil Works)
Department of the Army
Room 2E570, **The Pentagon**
Washington, D C. 203 IO-0 **108**

Dear Secretary Westphal :

I **am** writing to advise you that the Department of **Defense** (DOD), **through the Corps of** Engineers, appears to be **responsible** for environmental cleanup **at one or more formerly-used** defense sites on the Pribilof Islands (Sc Paul and St. George), **Alaska. and to ask** for your personal **attention to these sites** to ensure their prompt and complete cleanup and remediation.

The Natioanl Oceanic **and Atmospheric Administration (NOAA) is in** the **midst of a multi-year, $25+** million environmental restoration and cleanup project on the **lands that are or were under its jurisdiction, This is part** of a **larger effort to transfer control on** the Islands from Federal to local control. **That effort results** from the **demise of the Federal fur seal** harvest on the **Islands**. The Coast Guard is also **undertaking a cleanup of** property that it controlled.

The Corps of Engineers has previously acknowledgedresponsibility for **a site known as** Telegraph Hill *on St* Paul Island Unfortunately, the Corps has not scheduled the cleanup of **this site. The use of St. Paul and St. George** by DOD for defense purposes over **a** number of years suggests **that there may be** other sites on the Islands for which DOD should accept responsibility and **undertake cleanup and remediation** actions.

The **State of Alaska and the residents** of **the** Pribilof **Islands are anxious to complete the cleanup of** Federal sites. To enhance **the Islands'** private sector economy, cleanup of all Federal sites is needed. **Please** advise me at your earliest opportunity of the cleanup and remediation schedule for Telegraph Hill; rhe evaluation of DOD's potential responsibility **for other sites on the Pribilofs;** and the plan for resolving environmental problems at those sites

Thank you **for** your consideration I look forward to hearing from you,

Sincerely,

DON YOUNG
Chairman
Committee on Resources

33

http://www.house.gov/resources/

DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers
WASHINGTON, D.C. 20314-1000

15 JAN 1999

REPLY TO ATTENTION OF:

Military Programs

Honorable Don Young
House of Representatives
Washington, D.C. 20515

Dear Mr. Young:

This is in response to your November 18, 1998, letter regarding the Department of Defense's (DoD) responsibility for environmental clean up at the Pribilof Islands, Alaska, and specifically Telegraph Hill on St. Paul Island.

As you know, the U.S. Army Corps of Engineers manages the Formerly Used Defense Site program for DoD. In this regard, the Corps has evaluated all known areas of former DoD usage within the pribilofs, and concluded there is no further DoD responsibility.

In 1986 the Corps successfully removed all DoD contamination from Telegraph Hill and ten other sites on the islands to the satisfaction of the community (tribal government and native villages). Any pollution remaining, was determined as non-DoD. In a 1998 letter from the Alaska Department of Environmental Conservation (ADEC) to the National Oceanic and Atmospheric Administration, the ADEC corroborated our evaluation regarding Telegraph Hill, stating that the site was not the responsibility of DoD.

If you have further questions, or desire further details regarding our actions in the Pribilofs please contact our project manager, Mr. Ronald Pflum, at (907) 753-5785.

Sincerely,

William A. Brown, Sr., P.E.
Deputy Director
Directorate of Military Programs

Subject: RE: St. Paul Oil Drum Dump Site SCR
Date: Tue, 16 Nov 2004 11:05:39 -0900
From: "Howard, Louis" <Louis_Howard@dec.state.ak.us>
To: 'Paula Souik' <Paula.Souik@noaa.gov>

No comments (I guess that is my comment.) since none were requested (see attached email msg file from J Lindsay). We forwarded the information to the CORPS of Engineers (Suzanne Beauchamp, PE Chief, FUDS Program CEPOA-PM-C (FUDS) US Army Engineer District, Alaska PO Box 6898 Elmendorf AFB 99506-6898).

Louis Howard
AK Dept. of Environmental Conservation
SPAR Contaminated Sites Program
Federal Facilities Section
555 Cordova St. 2nd fl.
Anchorage AK 99501-2617
Phn. 907.269.7552
Fax 907.269.7649
mailto:louis_howard@dec.state.ak.us

Alaska 99506-6898).

-----Original Message-----
From: Paula Souik [mailto:Paula.Souik@noaa.gov]
Sent: November 16, 2004 10:18 AM
To: Louis Howard
Subject: St. Paul Oil Drum Dump Site SCR

Louis-
I'm working on finalizing some documents. Did you receive and review the draft site characterization report dated May 2004 for the Oil Drum Dump Site/TPA 1 on St. Paul? NOAA sent this document to ADEC on May 25, 2004. If you have reviewed it and have no comments, could you please let me know. If you did not receive it, I can send it to you again.

Thanks,
Paula

Subject: Re: Oil drum site TPA 1 FUDS B1
Date: Tue, 22 Jun 2004 14:23:27 -0900
From: John Lindsay <John.Lindsay@noaa.gov>
To: "Howard, Louis" <Louis_Howard@dec.state.ak.us>

Louis, you don't have to comment on it, but we are submitting it along with Telegraph Hill as the NOAA report on NOAA's investigations at the site and with the understanding that the DEC may wish to use this information to pursue its case against DOD/Corps. of Eng. John

1200-01-P0001-I.007-0014

"Howard, Louis" wrote:

> You sent me two copies of the oil drum dump site for my review. However,
> NOAA is precluded by P.L. 106-562 from working further on any DOD (FUDS) sites for cleanup or remediation so I have no reason to comment on it for
> NOAA's benefit since it would be an exercise in futility.
>
> Louis Howard
> AK Dept. of Environmental Conservation
> SPAR Contaminated Sites Program
> Federal Facilities Section
> 555 Cordova St. 2nd fl.
> Anchorage AK 99501-2617
> Phn. 907.269.7552
> Fax 907.269.7649
> mailto:louis_howard@dec.state.ak.us <mailto:louis_howard@dec.state.ak.us>

NOAA Site 2
TPA Site 2: Vehicle Boneyard

Request for Conditional Closure, Vehicle Boneyard,
NOAA Site 2/TPA Site 2, St. Paul Island, Alaska.....109

Notice to Deed for a Closed Inert Solid Waste Monofill Formerly Known as
Vehicle Boneyard, TPA 2, Reckey #1994250135404, St. Paul Island, Alaska,
The National Oceanic and Atmospheric Administration, March 12, 2008.....123

Request for Conditional Closure
Vehicle Boneyard, NOAA Site 2/TPA Site 2
St. Paul Island, Alaska

Request for Conditional Closure

Site: Vehicle Boneyard, also known as National Oceanic and Atmospheric Administration (NOAA) Site 2 and Two Party Agreement (TPA) Site 2. The site will be referred to as the Vehicle Boneyard herein.

Location: St. Paul Island, Alaska is approximately 800 miles southwest of Anchorage in the Bering Sea. On the island, the Vehicle Boneyard is located on the eastern portion of St. Paul Island north of Polovina Hill and south of Big Lake (Figures 1 and 2) (57°11'25.50" North Latitude, 170°10'44.36" West Longitude).

Legal Property Description: The area of excavation is located in Township 34 South, Range 131 West, Section 34, of the Seward Meridian, Alaska as shown on the plat of rectangular survey officially filed May 14, 1986 (Figure 2). Tanadgusix Corporation (TDX) owns the surface property and The Aleut Corporation owns the subsurface property at the Vehicle Boneyard.

Type of Release: Potential release mechanisms include: 1) petroleum, oil and lubricant (POL) leaks associated with drums and vehicles disposed at this former "boneyard" and 2) asbestos-containing material (ACM) buried at the site.

History and Background:
The major portion of the site, the Vehicle Boneyard proper, was used for disposal of old vehicles, drums, and debris. The northwestern portion of the site is a Formerly Used Defense Site (FUDS). The FUDS area was also used as a disposal site for drums and debris. The Vehicle Boneyard and FUDS area border (to the south and east) the proposed location for a new solid waste landfill for Saint Paul Island (Figure 2). The Vehicle Boneyard is currently not in use.

Summary of Site Investigations and Removals:
October 1992, Harding Lawson Associates Phase I Environmental Assessment: In September and October 1992, Harding Lawson Associates (HLA) inventoried and drained fluid from 240 vehicles at the Vehicle Boneyard as part of a Phase I Environmental Assessment. These fluids included diesel fuel, oil, oil and water mixtures, hydraulic fluid, transmission fluid, brake fluid, and antifreeze. The fluids were bulked into four drums and subsequently removed from the site (HLA 1993).

October 1992, Ecology & Environment Preliminary Assessment: In October 1992, Ecology & Environment, Inc. (E&E) performed a preliminary assessment at the Vehicle Boneyard. Site inspectors noted that the site contained construction debris, tanks, cement trucks, cranes, engine blocks, pipes, assorted heavy equipment, automobiles, and household waste (E&E 1993).

Summer of 1994, Oil Spill Consultants Inspection: In the summer of 1994, Oil Spill Consultants (OSC) conducted an inspection of the Vehicle Boneyard and identified 213 drums at the site, 211 of which were mostly empty. The other two drums were filled with petroleum product. Field screening of the petroleum product revealed that it was noncombustible and nonreactive and did not contain polychlorinated biphenyls (PCBs) or chlorinated hydrocarbons. OSC removed all drums at the Vehicle Boneyard and shipped them to Basin Oil Company in Seattle, Washington, for disposal (OSC 1995).

1997, Bering Sea Eccotech, Inc. Phase 1: In 1997, Bering Sea Eccotech, Inc. (BSE) removed bulk surface debris from the Vehicle Boneyard and smaller amounts from several other sites as part of a Phase I cooperative agreement with NOAA (Aleutian Enterprises 1998). During the debris removal, NOAA removed 2,359.3 tons of steel, 88.2 tons of tires, and 8.75 tons of batteries for off island recycling and disposal (BSE 1997). Soil samples were not collected during the debris removal. No visually stained soils were identified during the debris removal project. After the surface debris was removed, BSE attempted to revegetate the area using native flora.

1999, Tetra Tech EM, Inc. Closure Confirmation Study: In 1999, Tetra Tech EM, Inc. (TTEMI), conducted closure confirmation activities at the Vehicle Boneyard site (TTEMI 2000). TTEMI initially performed a visual site reconnaissance. After the visual site reconnaissance, TTEMI personnel completed a site walk through the southwestern half of the site. During the site walk, TTEMI consolidated metal, wood, plastic, and rubber debris (mostly former car parts and heavy machinery). In total, TTEMI consolidated about 18,500 pounds (lbs.) of debris. Any debris requiring the use of heavy equipment to conduct a removal action was left in place. Tetra Tech transported all removed debris to the designated debris staging area at Tract 38, along the northern side of Polovina Hill. Tetra Tech then used a direct-push sampler to collect 20 soil samples from ten locations (02SS01-02SS10, Figure 3). (Note that there is a discrepancy with the location of one Geoprobe™ sample, 02SS02 as explained on Figure 3). Soil samples were collected from depths of 2 to 25 feet (ft) below ground surface (bgs). Groundwater was not encountered during this investigation. All of the samples submitted to the laboratory were analyzed for gasoline range organics (GRO); diesel range organics (DRO); residual range organics (RRO); and benzene, toluene, ethylbenzene, and xylenes (BTEX). In addition, 12 soil samples were analyzed for polynuclear aromatic hydrocarbons (PAHs), chlorinated solvents, and heavy metals.

The results of the Geoprobe™ samples indicated that elevated levels of DRO and RRO were present at one of the sampling locations in shallow soil (02SS09), with DRO at 4,460 milligrams per kilogram (mg/kg) and RRO at 15,000 mg/kg (Figure 3). These levels exceed the ADEC Method Two cleanup levels of 250 mg/kg and 10,000 mg/kg for DRO and RRO respectively (ADEC 2003). GRO, BTEX, PAHs, and chlorinated solvents were either not detected or were detected below their applicable ADEC Method One or Method Two cleanup levels. Metals were detected at levels within the range of island-specific background concentrations.

Summer of 2000, Columbia Environmental Sciences Inc. Site Characterization: During the summer of 2000, Columbia Environmental Sciences Inc. (CESI) performed site characterization work at the Vehicle Boneyard site (CESI 2002), including a geophysical investigation to locate subsurface magnetic anomalies indicative of buried debris; groundwater monitoring well installation, and soil sampling and analysis. Thirteen monitoring wells were installed (MWVB-1- MWVB-13, Figure 3), from which 35 soil samples were collected during well boring operations. CESI also drilled 3 other soil borings (SVB 1-SVB 3, Figure 3) from which 3 soil samples were collected. The soil samples were analyzed for GRO, DRO, RRO, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and heavy metals. None of the soil samples exceeded any of the ADEC Method Two cleanup levels. The groundwater wells were used for hydrogeologic testing, groundwater sampling, and groundwater analyses for GRO, DRO, RRO, VOCs, SVOCs, and heavy metals (Figures 3 and 4). None of the groundwater samples exceeded any of the ADEC Table C cleanup levels (ADEC 2003). Monitoring well MWVB-5 was installed but damaged due to driller mistakenly pumping grout into the well casing, clogging up the screened interval. This well could not be repaired to allow representative sampling, so it was not included in groundwater monitoring.

CESI concluded that:

- Buried and surface debris remains at the site.
- No site-related contaminants of concern that exceeded ADEC Method One or Method Two cleanup levels were present in soil at CESI's sampling locations (Figure 3).
- No contaminants exceeded ADEC Table C cleanup levels in groundwater (Figure 4).
- Hydraulic conductivities range from 10-4 to 10-6 meters per year.
- The aquifer is tidally influenced, but the influence is damped.
- A groundwater divide is present at the site; groundwater flow west of the site is to the west; groundwater flow beneath the Vehicle Boneyard proper is to the east.

2000-2001 Groundwater Monitoring by IT Corporation and Others: Five rounds of groundwater monitoring were conducted at the Vehicle Boneyard as reported by IT Alaska Inc. (IT 2002). Figure 2-1 shows the location of the monitoring wells relative to the Vehicle Boneyard site and soil sample locations there. Figure 4 shows the highest DRO results of groundwater samples collected at each well in 2000 and 2001 (IT 2002). Neither DRO nor any

other contaminant was found to be present above its ADEC Table C groundwater cleanup level during any of the sampling events.

2001 NOAA Test Pit Investigation: In 2001, NOAA excavated approximately 75 test pits to an average depth of six feet bgs, to determine the locations of buried debris. NOAA surveyed the locations of all the test pits, and recorded which pits contained and did not contain buried debris (Figure 5). The area of buried debris was estimated at 0.9 acres. NOAA also recognized a larger area of small-sized surface debris (less than 6 inches), estimated at 3.4 acres.

October 2004 NOAA Geoprobe™ Sampling: NOAA conducted an additional round of soil sampling on October 9, 2004 at the sample location where Tetra Tech (discussed above) had collected 1999 a soil sample (02SS09) exceeding the ADEC Method Two soil cleanup standards for DRO and RRO, as shown on Figure 3 (NOAA 2005). NOAA returned to the location of this sample using the NOAA GPS unit, resampling the exact same location and depth as the Tetra Tech sample (02SS09 at 2 feet bgs) as well as 4 other locations describing a square with approximately 10 foot sides around the original sample location (Figure 6). NOAA chose not to use its larger, track mounted Geoprobe™ because the area of concern is densely vegetated and the use of tracked vehicles in this area would cause extensive vegetative injury. NOAA instead used a hand-operated Geoprobe™ to collect 2 samples at each location, one from the 6-inch to 2-foot, and one from the 2- to 4-foot intervals. NOAA analyzed all of these samples using thin layer chromatography (TLC). The TLC analysis indicated DRO in 4 of these samples at levels potentially above the ADEC Method Two cleanup level. NOAA sent aliquots of these 4 samples (with one duplicate) to an offsite laboratory for DRO and RRO analyses. In order to eliminate potential high bias of the analytical results due to the presence of other organic compounds in the samples, NOAA had the laboratory perform a "silica gel cleanup" on the samples prior to analysis. This step had not been performed during the previous lab analysis by Tetra Tech (TTEMI 2000). The NOAA off site lab results indicated that DRO exceeded the ADEC Method Two cleanup level only at the location and depth of the original Tetra Tech 1999 sample. NOAA's results were significantly lower than the TTEMI 2000 results, with DRO at 1,700 mg/kg and RRO at 10,000 mg/kg (Table 1), and these levels did not exceed the site specific ADEC Method Three cleanup levels described below.

Summary of Applied Cleanup Levels:
NOAA first employed ADEC Method One cleanup criteria, discussed at 18 AAC 75.341(a) (ADEC 2003) to screen the severity of the contamination at the site. For benzene, under the TPA, NOAA had the option to cleanup to the less stringent State of Alaska cleanup level in effect in 1991 (ADEC 1991).

Once NOAA determined that the area of contamination around sample 02SS09 was limited to a depth of 2 feet bgs, within a 100 square foot area, NOAA decided to use site specific data to calculate a cleanup level using the ADEC on line Method Three calculator (ADEC 2003). Based on ADEC Method Three, NOAA determined that the highest soil concentration of DRO and RRO allowable at the Vehicle Boneyard site is 2,920 mg/kg and 22,000 mg/kg (NOAA 2005). Cleanup criteria were applied to the maximum extent practicable (18 AAC 75.325 (f), 18 AAC 75.990).

Summary of Cleanup Actions:
NOAA is required to satisfy two different sets of requirements to obtain complete closure of the Vehicle Boneyard. The first set of requirements is that of the ADEC Contaminated Sites Program in 18 AAC 75, as specified in the TPA, to which this Conditional Closure Request is dedicated.

The second set of requirements is that of the Solid Waste Program under 18 AAC 60.460 for closure of inert waste landfills, and 18 AAC 60.490 for closure of such landfills. This set of requirements includes closure and post closure care requirements, and will be addressed by NOAA under separate cover.

In October 2003 NOAA contractor TTEMI, with subcontractor Kelly-Ryan Incorporated (KRI), performed site capping preparatory work by bulldozing surface debris in areas of potential dump truck operation to reduce the likelihood of dump trucks containing surface debris or capping material puncturing their tires. An estimated 2,750 cubic yards (yd^3) of small surface debris and soil were relocated to the area of subsurface debris. The bulldozer also graded the surface debris areas to roughly match the grade of the adjacent undisturbed areas. This component of the corrective action was completed on November 3, 2003. During bulldozing operations, KRI encountered

a discrete area containing apparent cement-asbestos pipes approximately six inches bgs (Figure 5). NOAA and TTEMI staff investigated this location and found that it contained both cement-asbestos pipes and broken Transite shingles. NOAA staff, certified in handling this type of ACM, removed the loose ACM and containerized it. The loose ACM was subsequently disposed off-island. NOAA staff noted that the remaining ACM extends to an approximate depth of three ft bgs and is somewhat intermingled with inert demolition debris, like plywood. NOAA video-documented and surveyed the remaining ACM area and temporarily covered over the ACM with plywood and soil until a two feet thick soil cover could be placed atop the combined debris area. NOAA determined that the ACM is non-friable, and does not meet the definition of a regulated asbestos containing material (RACM) found in 18 AAC 60.990. NOAA also determined that a non-RACM can be disposed in a municipal solid waste landfill under 18 AAC 60.450, and obtained clarification that non-RACM waste may also be disposed in a inert solid waste monofill (ADEC 2005).

On November 9, 2003 TTEMI, BSE and KRI began capping subsurface debris area as shown in Figure 5. An estimated 1,350 yd^3 of clean scoria was placed atop the subsurface debris area, including the area of asbestos debris. TTEMI, BSE and KRI also hauled an estimated 2,750 yd^3 of clean sand from Vic's Sand Pit and placed it atop the subsurface debris area, bringing the thickness of the cap to at least 2 feet. Subsurface debris soil cover activities were completed on November 15, 2003.

NOAA initiated revegetation activities for the subsurface debris cover area from May 24, to June 1, 2004. NOAA spread a mixture of boreal red fescue, Bering hairgrass, and beach wild rye seeds and fertilizer. Erosion control mat was then installed over the seed and fertilizer atop the soil cover. Figure 7 shows how the grass seeds had taken root and begun to grow by September of 2004.

During the summer of 2004, NOAA determined that the 2-foot thick soil cover applied in 2003 had inadvertently missed a small area at the south end of the area of sub-surface debris. Therefore, NOAA mobilized again to the site on October 11, 2004, to haul an additional 330 yd^3 of sand and 100 yd^3 of topsoil to the Vehicle Boneyard and extend the cover. This cover extension was completed on October 12, 2004. On October 27, 2004, NOAA completed revegetating the cover extension, using the same mixture of native grasses and fertilizer, covered with erosion control mat as before. The full extent of the cover is shown in Figure 5.

No removal of contaminated soil occurred at this site. Soil contamination above ADEC Method Method Two levels for DRO and RRO exists at one sampling location northwest of the cover area. Site groundwater does not contain contamination above ADEC Table C cleanup levels, demonstrating that the one soil sampling location with elevated DRO and RRO does not represent a risk to groundwater. No further groundwater monitoring is necessary for the Vehicle Boneyard. NOAA used the ADEC Method Three calculator to calculate a site specific cleanup level for the Vehicle Boneyard site. NOAA believes that contaminant levels at the site are most accurately depicted by the soil samples collected by NOAA in 2004. These samples do not exceed the ADEC Method Three cleanup levels.

Recommended Action:
In accordance with paragraph 59 of the Two Party Agreement (NOAA 1996), NOAA requests written confirmation that NOAA completed all appropriate corrective action under 18 AAC 75, to the maximum extent practicable, at the Vehicle Boneyard, NOAA Site 2/TPA Site 2 in accordance with the Agreement and that ADEC grant a conditional closure that soil and groundwater will not require further remedial action from NOAA. ADEC will require additional containment, investigation, or cleanup if subsequent information indicates that the level of contamination that remains does not protect human health, safety, or welfare, or the environment.

NOAA will also request a confirmation of closure of the Vehicle Boneyard from ADEC under separate cover, according to 18 AAC 60.460, and 18 AAC 60.490. Under these requirements, NOAA will do the following:

- Submit a post closure monitoring plan, proposing a program of visual monitoring of the integrity of the cap, to begin at a date to be suggested at that time.
- Record a notation to the deed to the property, or other such instrument that is routinely examined during a title search, making notice of the location of the landfill. ADEC will be notified by NOAA in writing when the notation has been recorded.
- Submit a report to ADEC at end of 60 month post closure monitoring period describing the site conditions and summarizing information collected during the monitoring period.

References:

Alaska Department of Environmental Conservation (ADEC). 1991. *Interim Guidance for Non-UST Contaminated Soil Cleanup Levels. Contaminated Sites Program.* July 17, 1991.

ADEC. 2003. 18 AAC 75, Articles 3 and 9. *Oil and Hazardous Substances Pollution Control Regulations*. State of Alaska. Effective date January 30, 2003.

ADEC. 2005. *Telephone conversation between James P. Wright, P.E. of NOAA and Bob Blankenburg of ADEC, Solid Waste Program*. June 3.

Aleutian Enterprises. 1997. *NOAA Debris Cleanup, St. Paul Island, Alaska, Project Closeout Report*.

Columbia Environmental Sciences, Inc. (CESI). 2002. *Final Site Characterization Report, St. Paul Island, AK Saint Paul Vehicle Boneyard (TPA Site 2)*. February.

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

Harding Lawson Associates (HLA). 1993. *Final Report, Phase I Environmental Assessment, Pribilof Islands, Alaska*. March 5.

IT Alaska Corporation. 2002. *Draft Annual Groundwater Monitoring Report 2001, St. Paul Island, Alaska*. March.

National Oceanic and Atmospheric Administration (NOAA). 1996. *Pribilof Islands Environmental Restoration Two Party Agreement*, Attorney General's Office File No. 66 1-95-0126. January 26.

NOAA. 2005. Initial Draft Corrective Action Report Site 2/TPA Site 2 – Vehicle Boneyard St. Paul Island, Alaska. January.

Oil Spill Consultants (OSC). 1995. *Final Report for St. Paul Island Drum Removal Project, St. Paul Island*. January 31.

Tetra Tech EM Inc. (TTEMI). 2000. *Closure Confirmation Report, Vehicle Boneyard*, Tetra Tech EM Inc. December.

For the National Oceanic and Atmospheric Administration

6/15/05

John Lindsay — Date
NOAA, Pribilof Project Office

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 Vehicle Boneyard, NOAA Site 2/TPA Site 2, in accordance with the Agreement and that no further remedial action is required as a part of this conditional closure granted by ADEC

For the Alaska Department of Environmental Conservation

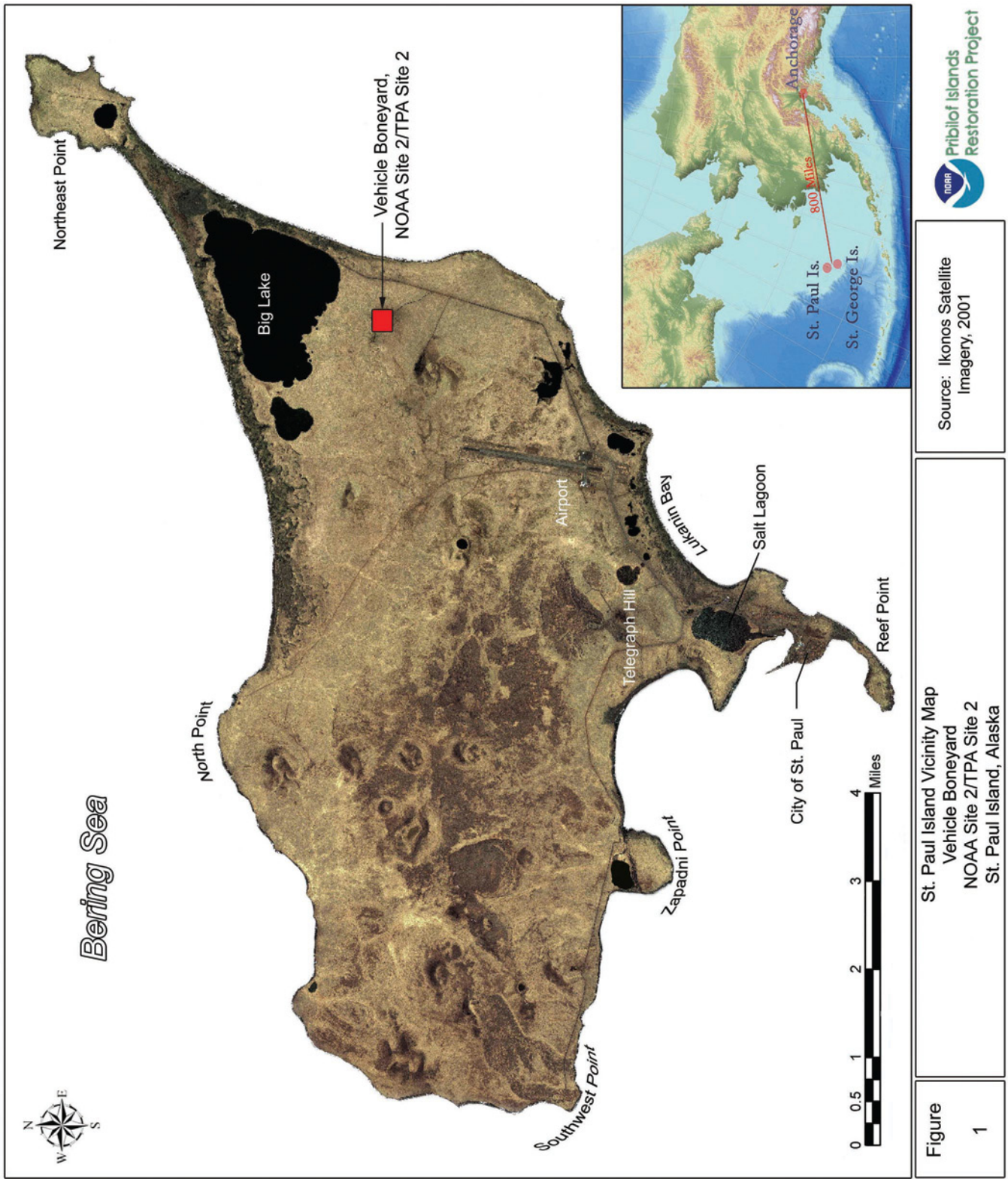
6/20/05

Louis Howard — Date
Alaska Department of Environmental Conservation
Remedial Project Manager

Table 1. Vehicle Boneyard Sampling Results, October 2004.

Sample ID	Date Sampled	Date Analyzed	DRO (ppm)	RRO (ppm)
VB4-040	10/9/2004	10/14/2004	200	1,200
VB1-020	10/9/2004	10/14/2004	1,700	10,000
VB3-020	10/9/2004	10/14/2004	<10	<50
VB6-020	10/9/2004	10/14/2004	<10	<50
VB1-040	10/9/2004	10/14/2004	220	1,100

Figures


Bering Sea
Northeast Point
Big Lake
Vehicle Boneyard,
NOAA Site 2/TPA Site 2
North Point
Airport
Telegraph Hill
Lukanin Bay
Salt Lagoon
Reef Point
City of St. Paul
Zapadni Point
Southwest Point
0 0.5 1 2 3 4 Miles
Anchorage
800 Miles
St. Paul Is.
St. George Is.
Pribilof Islands Restoration Project
Source: Ikonos Satellite Imagery, 2001
St. Paul Island Vicinity Map
Vehicle Boneyard
NOAA Site 2/TPA Site 2
St. Paul Island, Alaska
Figure
1

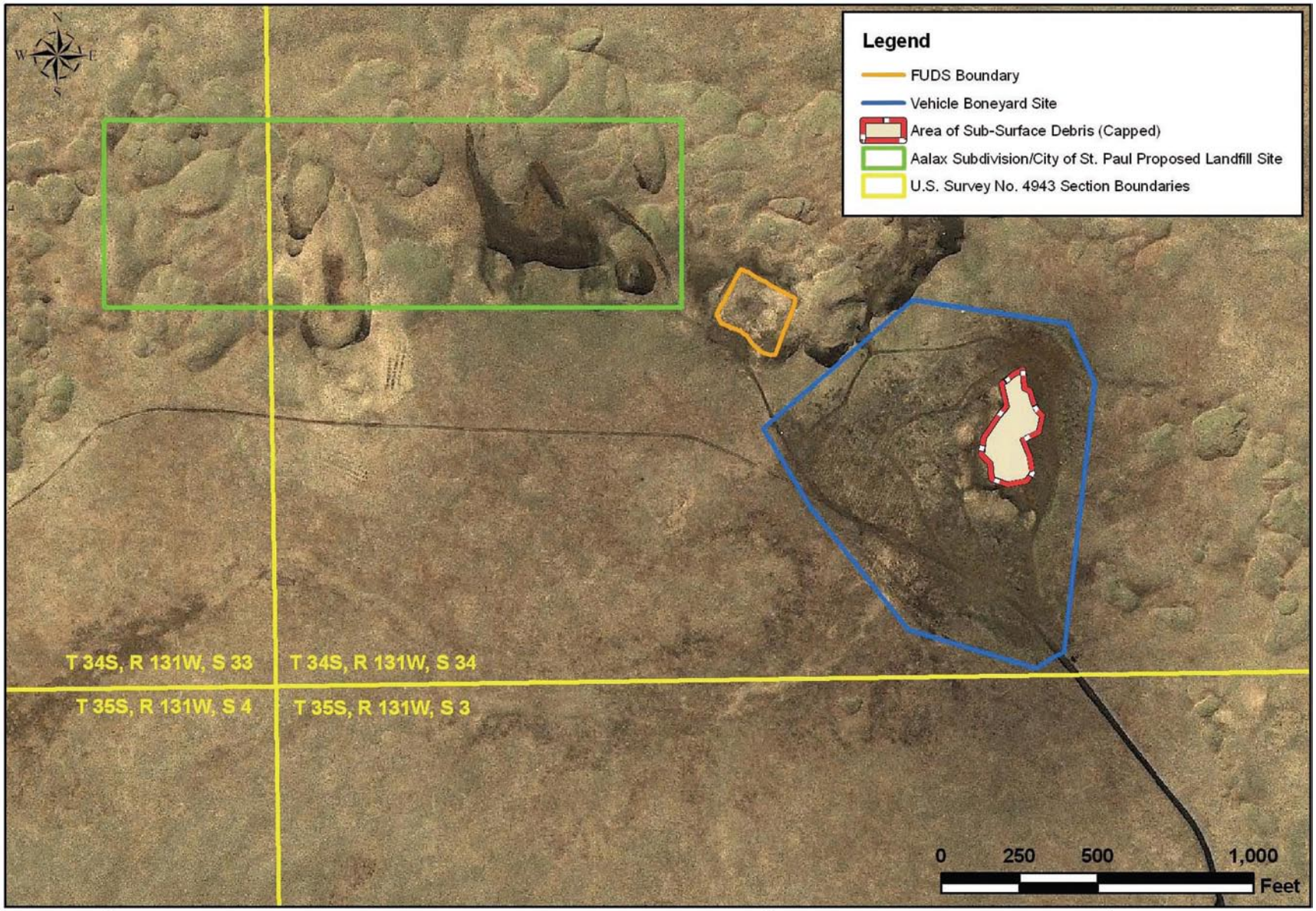


Figure 2	Legal Property Description Map Vehicle Boneyard Site 2/TPA Site 2 St. Paul Island, Alaska	Sources: Public Land Survey Sections (BLM MTPs 1983), Vehicle Boneyard Site and FUDS Site (NOAA GPS 2000), Aalax Subdivision (NOAA GIS 2003), Satellite Imagery (Ikonos 2001).

Pribilof Islands Restoration Project

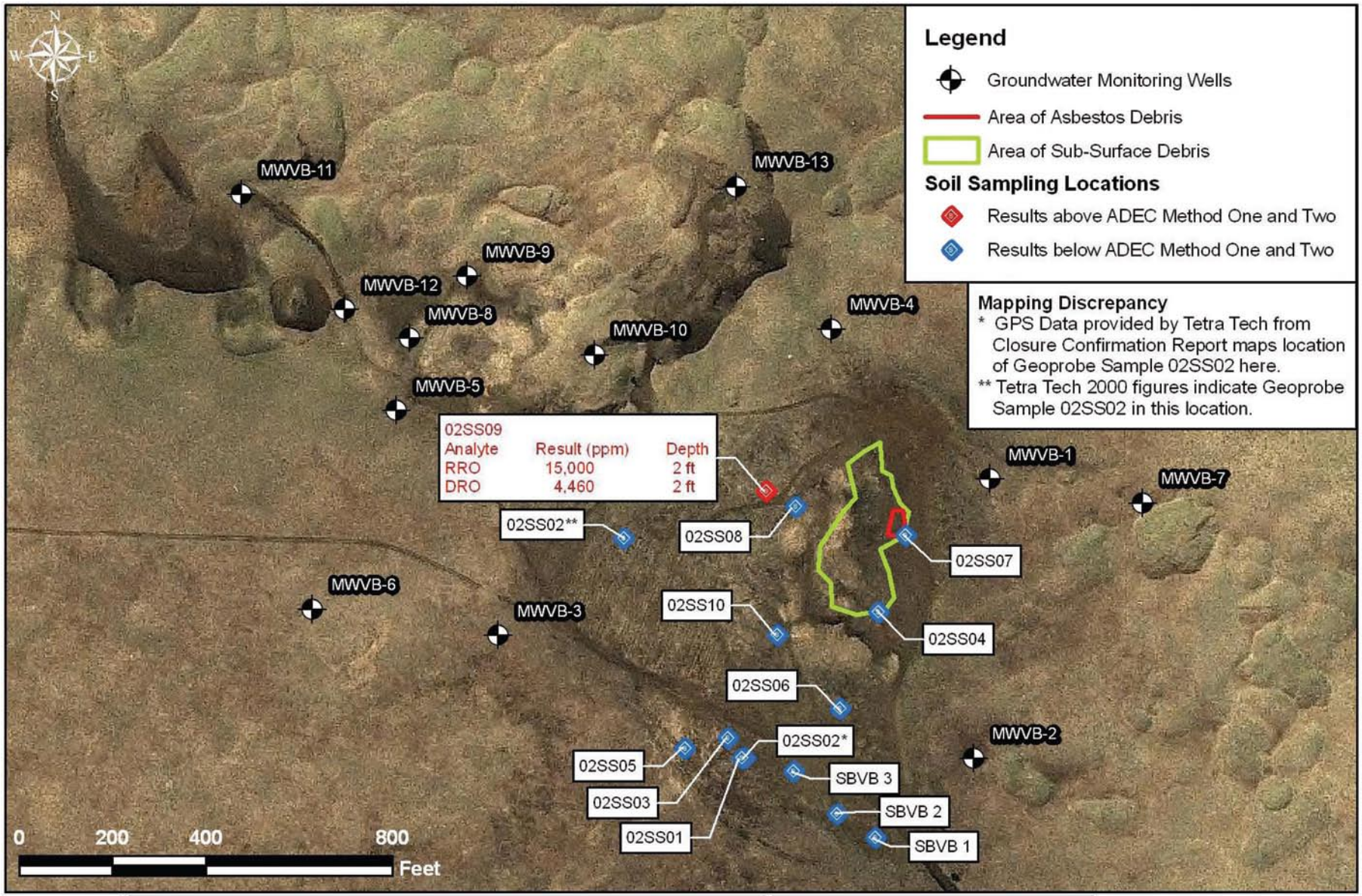


Figure 3	Sampling and Well Installation Events CESI 2000 and TTEMI 1999 Vehicle Boneyard, NOAA Site 2/TPA Site 2 St. Paul Island, Alaska	Sources: Ikonos 2001 Satellite Image & Pribilof Project Database	Pribilof Islands Restoration Project

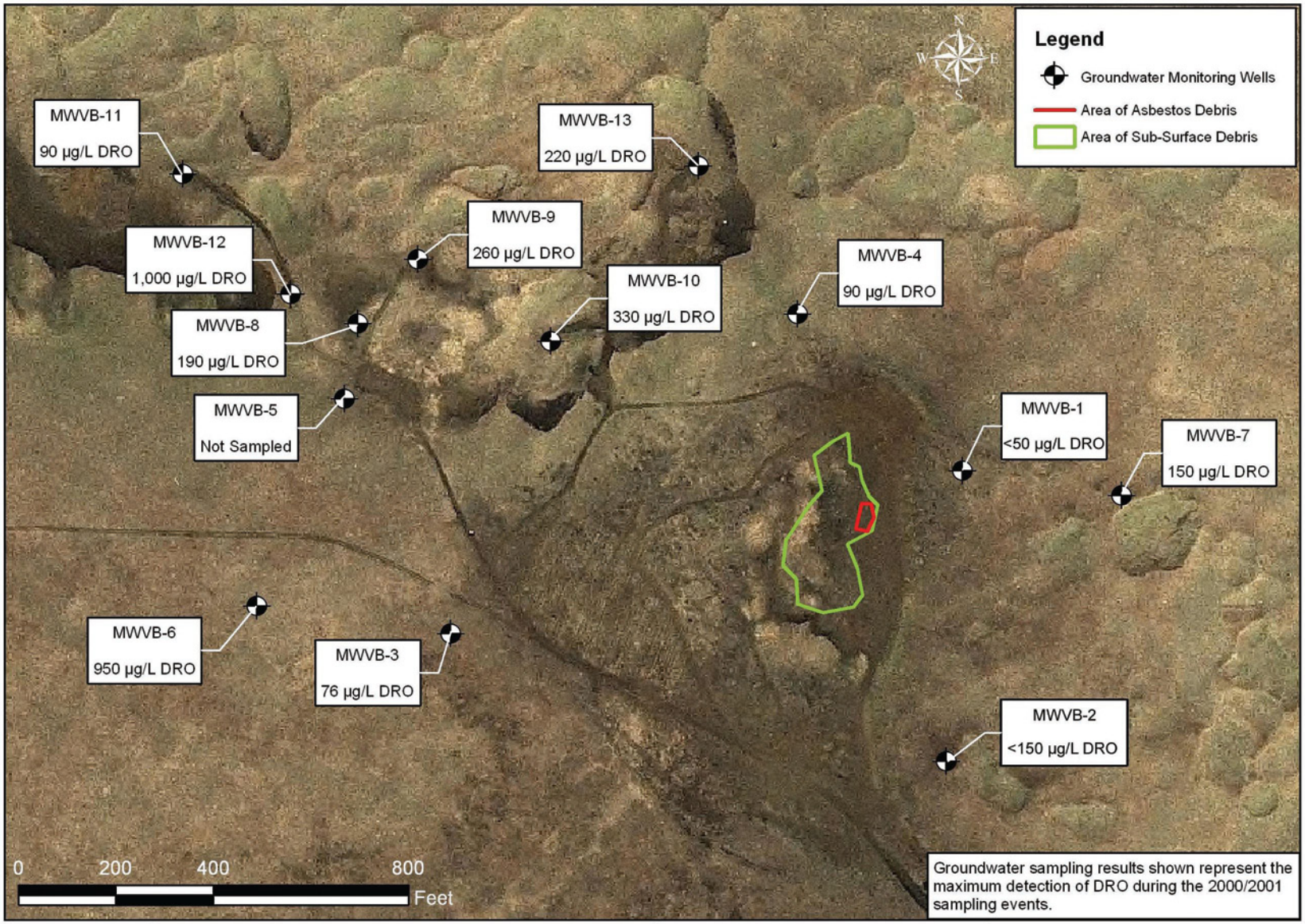


Figure 4	**Maximum DRO Detection in Groundwater Vehicle Boneyard NOAA Site 2/TPA Site 2 St. Paul Island, Alaska**	Source: Ikonos 2001 Satellite Image & Pribilof Project Database

Pribilof Islands Restoration Project

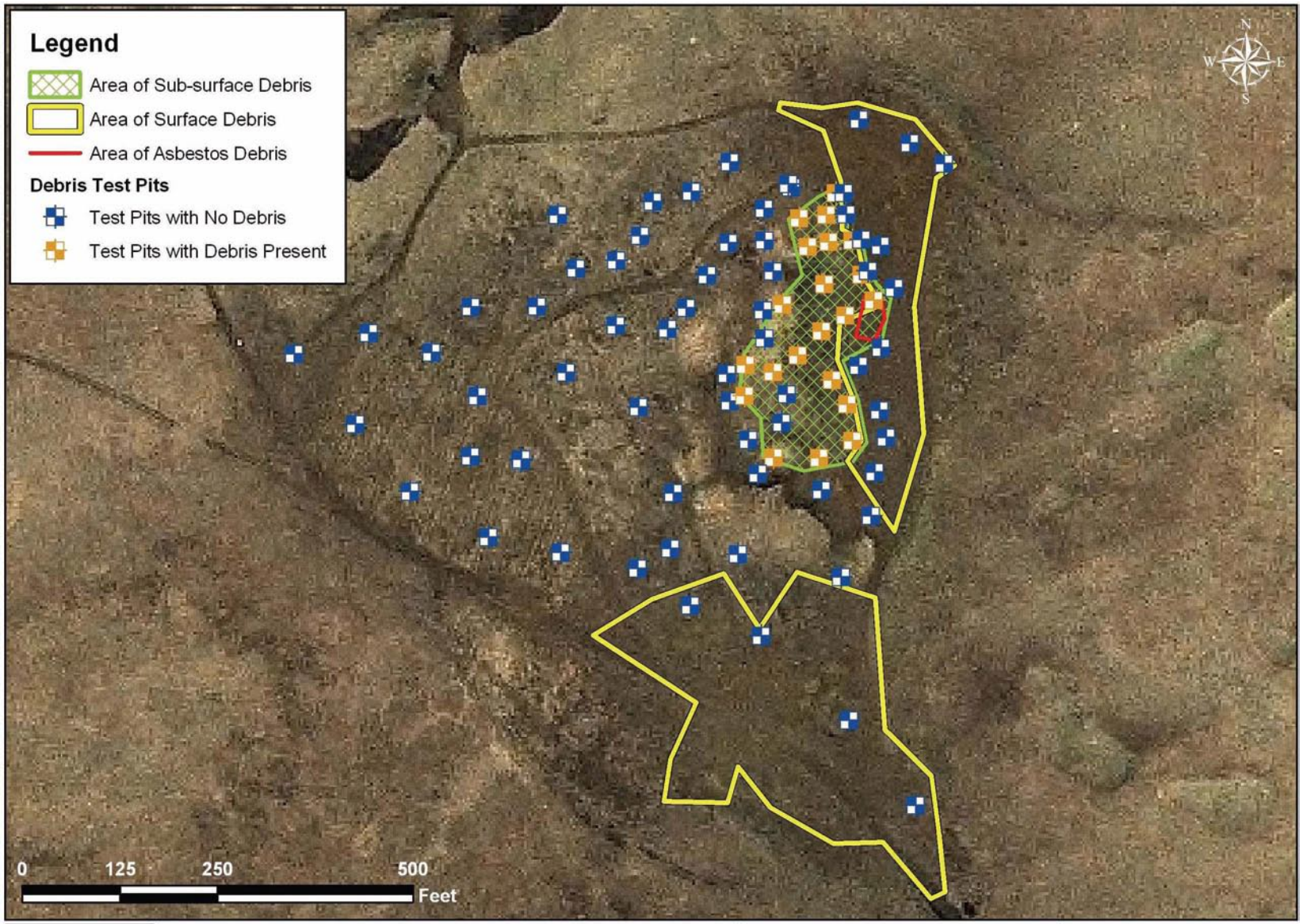


Figure 5	2001 Test Pits for Buried Debris and 2003 Survey of Surface Debris and Asbestos Debris Vehicle Boneyard NOAA Site 2/TPA Site 2 St. Paul Island, Alaska	Source: Ikonos 2001 Satellite Image & Pribilof Project Database

Pribilof Islands Restoration Project

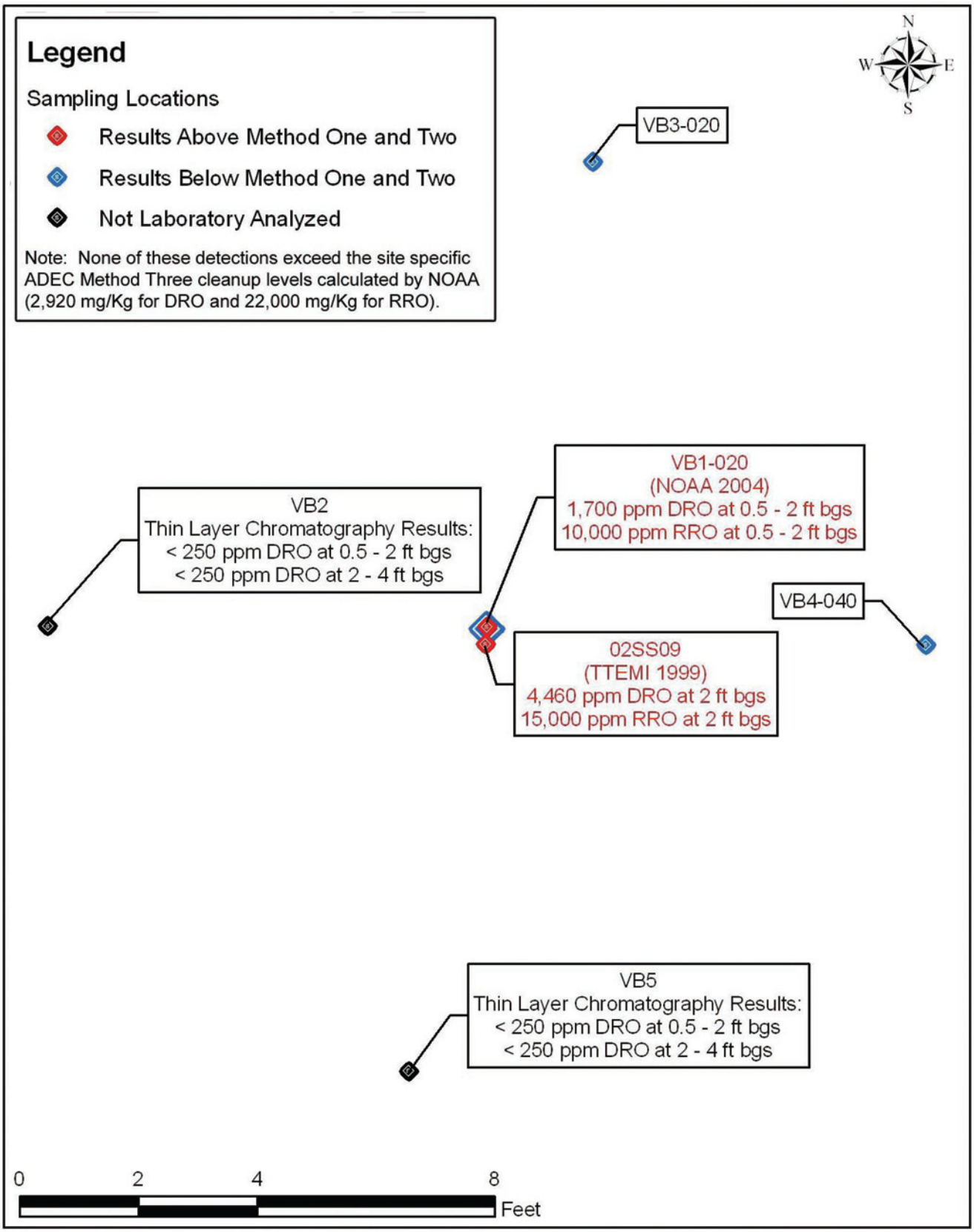


Figure 6	NOAA 2004 Soil Sampling Locations Vehicle Boneyard NOAA Site 2/TPA Site 2 St. Paul Island, Alaska	Sources: NOAA Pribilof Project GIS (2004).

Pribilof Islands Restoration Project

Figure 7

Erosion Control Matting and Revegetation
(September 2004)
Vehicle Boneyard
NOAA Site 2/TPA Site 2
St. Paul Island, Alaska

Source: NOAA 2004.

Pribilof Islands Restoration Project

ALASKA

2008-000113-0
Recording Dist: 305 - Aleutian Islands
3/12/2008 2:13 PM Pages: 1 of 8

CC

Notice to Deed for a Closed Inert Solid Waste Monofill
Formerly Known as Vehicle Boneyard, TPA 2, Reckey #1994250135404
St. Paul Island, Alaska
The National Oceanic and Atmospheric Administration, March 12, 2008

This Notice to Deed informs potential purchasers or leaseholders of the property known as the Vehicle Boneyard contains an inert solid waste monofill; that this property may not be suitable for some uses; that maintenance and repairs to this property might become necessary to prevent pollution problems at the site; and that any activity that results in damage to the final cover of the property must be corrected to control potential pollution problems. This Notice to Deed was prepared by the US Department of Commerce, Nation Oceanic and Atmospheric Administration (NOAA), National Ocean Service, Office of Response and Restoration, Pribilof Project Office, Seattle, Washington 98115. This Notice to Deed complies with 18 AAC 60.490 as amended through August 8, 2003, and other applicable laws.

Legal Description of the Property

This Notice to Deed addresses a site known as the Vehicle Boneyard, in the State of Alaska, Aleutian Islands Recording District, located at the eastern portion of Saint Paul Island, northeasterly of Polovina Hill, and southwesterly of Big Lake.

Coordinates: 57°11'25.50" North Latitude; 170°10'44.36" West Longitude (Figure 1),
Township 34 South, Range 131 West, Section 34, of the Seward Meridian, Alaska as shown on the plat of rectangular survey officially filed May 14, 1986 (Figure 2).

Grantor, the US Bureau of Land Management.

Grantees:

- the Tanadgusix Corporation (grantee of the surface estate),
  4300 B Street, Suite 402
  Anchorage, AK 99503-5946

- The Aleut Corporation (grantee of the subsurface estate)
  4000 Old Seward Highway, Suite 300
  Anchorage, AK 99503

Recording District
Aleutian Islands

Remedial Actions and Residual Pollution

The Vehicle Boneyard site was used by the federal government and the St. Paul Island community prior to the mid-1990s for disposal of old vehicles, drums, scrap metal, and construction and demolition debris, including asbestos-containing material (ACM). The U.S. Department of Commerce, National Oceanic

and Atmospheric Administration (NOAA), removed much of the surface debris, exceeding 5,000 tons, at the Vehicle Boneyard in the mid to late-1990s, and smaller items through 2005. After removal of debris, soil testing, and groundwater analysis, NOAA submitted a corrective action report to ADEC (NOAA, 2005a).

However, inert solid wastes remained buried under a thin layer of soil within an approximate 1-acre area at the Vehicle Boneyard site. NOAA surveyed several points around the perimeter of the area containing buried debris as shown in Figure 3, using survey-grade global positioning system equipment. The coordinates of these points are given in Table 1. Horizontal positions of the points are precise to within approximately plus or minus 1 centimeter.

NOAA's Asbestos Hazard Emergency Response Act building inspector, Mr. Gregory Gervais P.E. (inspector certificate number 05-0261), inspected the ACM at the site during 2004 and determined that the ACM is non-friable. Under 18 AAC 60.990 (ADEC 2003) the Vehicle Boneyard site ACM did not meet the definition of a regulated asbestos containing material (RACM). The Alaska Department of Environmental Conservation (ADEC) confirmed that a non-RACM can be disposed in a municipal solid waste landfill under 18 AAC 60.450 (ADEC 2003). NOAA obtained clarification that non-RACM waste may also be disposed in an inert solid waste monofill (ADEC 2003 and ADEC 2005). During 2003 and 2004, NOAA covered and closed the area containing buried debris, (including the ACM) as shown in Figure 3 as an inert solid waste monofill (NOAA 2005a). The following actions taken to close the monofill met the requirements of 18 AAC 60.460 (ADEC 2003):

- Removal and/or consolidation of surface debris;
- Grading the area to approximate the surrounding area grade;
- Application of a minimum two-feet thick soil cover consisting of scoria and sand; and,
- Implement soil erosion control on the cover with vegetation by applying an erosion control mat followed by a mixture of native grass species and fertilizer.

Pursuant to the *Pribilof Islands Environmental Restoration Two Party Agreement* (NOAA 1996), NOAA submitted a request for conditional closure to the ADEC Division of Spill Prevention and Response, Contaminated Sites Program (NOAA 2005b). ADEC granted the conditional closure and confirmed that no further remedial action was required at the site unless new information becomes available that indicates to ADEC that the site may pose an unacceptable risk to human health, safety, welfare to the environment (NOAA 2004a). NOAA also notified the ADEC Division of Environmental Health, Solid Waste Program of the proper closure of the site as an inert solid waste monofill, and NOAA's intent to begin the regulatory post-closure monitoring period (NOAA 2005b) under 18 AAC 60.460 and 18 AAC 60.490, respectively (ADEC 2003). NOAA will request a confirmation of the Vehicle Boneyard closure from ADEC under separate cover at the satisfactory end of NOAA's 60 month post-closure monitoring period (18 AAC 60.460, and 18 AAC 60.490). Toward this end, NOAA completed the following:

- Submitted a post-closure monitoring plan, proposing a program of visual monitoring of the integrity of the cap that began on October 7, 2004, the day NOAA completed the revegetation of the site (NOAA 2005c). Post closure monitoring annually for sixty (60) months, according to the plan.
- Recorded a Notation to Deed to the property, making notice of the location of the monofill (this document).

At the time of recording this Notice to Deed, NOAA continues to comply with ADEC's long-term (60 month) monitoring requirement of the site as described in NOAA 2005b. Upon completion of the post-closure monitoring period (October 2009), NOAA will submit a report to ADEC describing the site conditions and summarizing information collected during the monitoring period. At that time, NOAA will request a confirmation of closure of the Vehicle Boneyard from ADEC under 18 AAC 60.490.

Site Use, Maintenance and Repair

Potential purchasers or leaseholders are hereby advised that portions of the site may not be suitable for some uses, in particular uses that may disturb, damage or threaten the integrity or effectiveness of the soil cover placed over the subsurface debris. Maintenance and repairs to this property might become necessary in the future to prevent pollution problems at the site. In addition potential purchasers or leaseholders are advised that any activity that results in damage to the final cover of the property must be corrected to control potential pollution problems according to regulations in effect at the time of the disturbance. Potential purchasers or leaseholders are advised to contact ADEC for further information on site use and maintenance.

References:

Alaska Department of Environmental Conversation (ADEC). 2003. 18 AAC 60, Article 4. *Solid Waste Management.* Effective date August 8, 2003.

ADEC. 2005. *RE: Draft Corrective Action Report TPA 2-Vehicle Boneyard St. Paul Island January7 6, 2004.* Letter from Louis Howard to John Lindsay. January 14.

ADEC. 2005. Telephone conversation between James P. Wright, P.E. of NOAA and Bob Blankenburg of ADEC, Solid Waste Program. June 3.

National Oceanic and Atmospheric Administration (NOAA). 1996. *Pribilof Islands Environmental Restoration Two Party Agreement*, Attorney General's Office File No. 66 1-95-0126. National Oceanic and Atmospheric Administration. January 26.

NOAA. 2005a. Final Corrective Action Report Site 2/TPA Site 2 – Vehicle Boneyard St. Paul Island, Alaska. February 24.

NOAA. 2005b. Conditional Closure Request Vehicle Boneyard NOAA Site 2/TPA Site 2, St. Paul Island, Alaska. February 24. Signed by Louis Howard of ADEC, June 20, 2005.

NOAA. 2005c. Post Closure Monitoring Plan, Vehicle Boneyard NOAA Site 2/TPA Site 2, St. Paul Island, Alaska. June 15.

Please return original copy of this notice to the address below:

Signature: _____

Printed Name: ___John A. Lindsay_____
Mailing Address:

Attn: John Lindsay

US DOC, NOAA, NOS, OR&R, PPO
7600 Sand Point Way NE
Bldg 3, RM 1303
Seattle, WA 98115

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2008-000113-0

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2008-000113-0

Figure 2

Legal Property Description Map
Vehicle Boneyard
Deed Notice
St. Paul Island, Alaska

Sources: Public Land Survey Sections (BLM MTPs 1983), Vehicle Boneyard Site and FUDS Site (NOAA GPS 2000), Aalax Subdivision (NOAA GIS 2003), Satellite Imagery (Ikonos 2001).

Pribilof Islands Restoration Project

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2008-000113-0

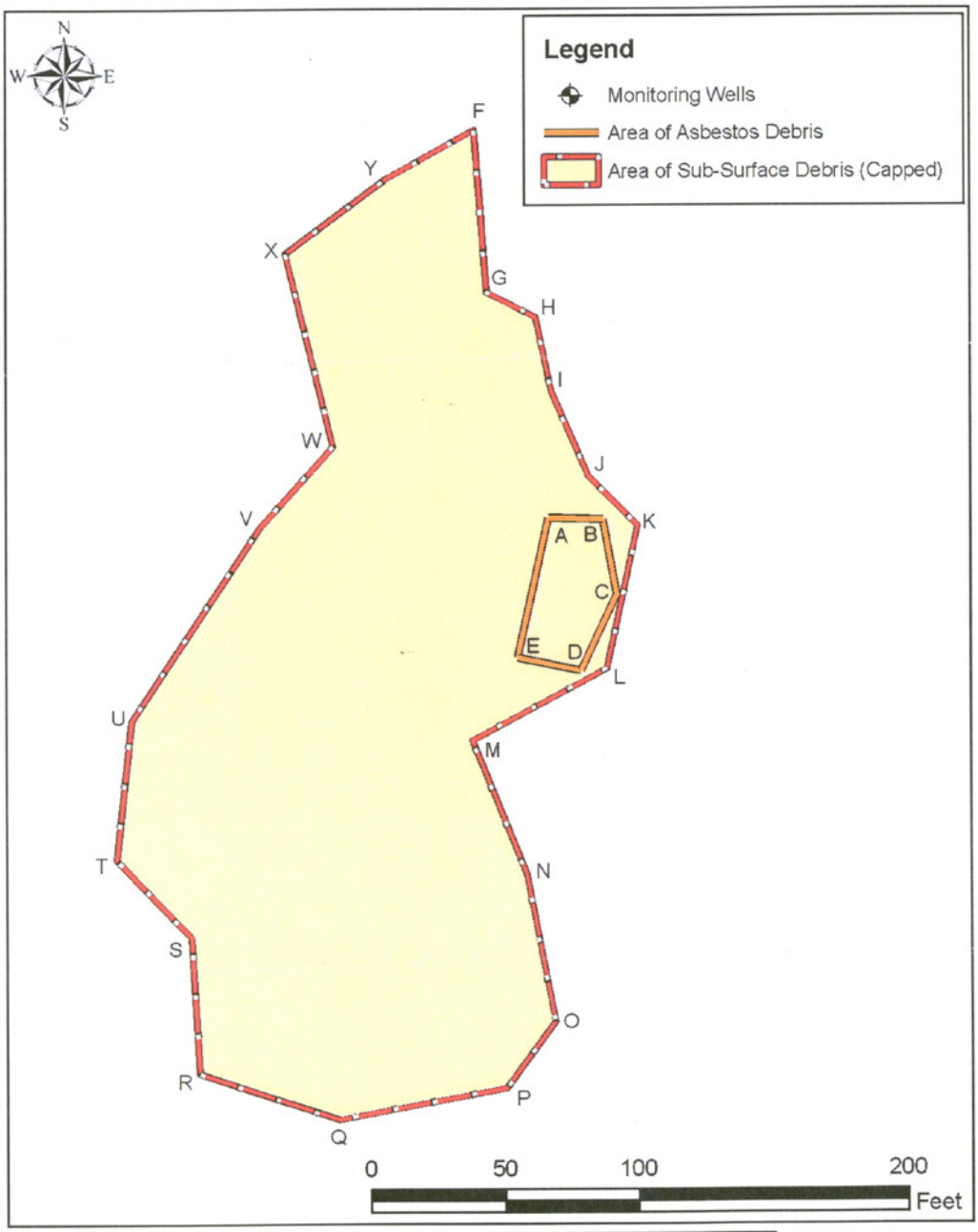

Figure 3	Plan View Vehicle Boneyard Deed Notice St. Paul Island, Alaska	Source: NOAA PPO GPS/GIS, 2005.

Pribilof Islands Restoration Project

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2008-000113-0

TABLE 1
COORDINATES OF SURVEY POINTS AROUND BURIED INERT SOLID WASTE MONOFILL AS DEPICTED IN FIGURE 3,
VEHICLE BONEYARD, ST. PAUL ISLAND, ALASKA (NOAA)

Point ID	Latitude (DD MM SS.SSSSS)	Longitude (DD MM SS.SSSSS)
A	57 11 26.99233	170 10 39.59180
B	57 11 26.98366	170 10 39.22001
C	57 11 26.70576	170 10 39.12922
D	57 11 26.42967	170 10 39.38096
E	57 11 26.47927	170 10 39.80945
F	57 11 28.42440	170 10 40.14938
G	57 11 27.82716	170 10 40.07541
H	57 11 27.72690	170 10 39.65652
I	57 11 27.45100	170 10 39.55937
J	57 11 27.14096	170 10 39.30806
K	57 11 26.95743	170 10 38.98736
L	57 11 26.43429	170 10 39.20640
M	57 11 26.18198	170 10 40.12743
N	57 11 25.68501	170 10 39.86129
O	57 11 25.14391	170 10 39.68140
P	57 11 24.89984	170 10 40.01831
Q	57 11 24.79361	170 10 41.15472
R	57 11 24.97026	170 10 42.09293
S	57 11 25.47256	170 10 42.13412
T	57 11 25.76000	170 10 42.63370
U	57 11 26.27074	170 10 42.51768
V	57 11 26.97535	170 10 41.62968
W	57 11 27.26576	170 10 41.13471
X	57 11 27.97813	170 10 41.43294
Y	57 11 28.24833	170 10 40.74650

NOAA Site 3
TPA Site 3: Little Polovina Boneyard
(Little Polovina Hill Buried Vehicle Boneyard, TPA 3; TPA Attachment A)

Final Closure Confirmation Report, Little Polovina Hill Vehicle Boneyard (Two-Party Agreement Site No. 3), Pribilof Islands Site Restoration, St. Paul Island, Alaska 133

Letter from Louis Howard to John Lindsay RE: Draft Confirmation Report-TPA Site No. 3 Little Polovina Hill Vehicle Boneyard January 13, 2000. Dated March 3, 2000.....149

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

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

Prepared by

TETRA TECH EM INC.
600 University Street, Suite 800
Seattle, Washington 98101

NOAA Region	:	Western Administrative Support Center
Date Prepared	:	December 18, 2000
Contract No.	:	50WCNA906018
Modification No.	:	56WCNA901077
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2 SITE LAYOUT AND SAMPLING LOCATION

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 aboveg-

round 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 identified 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.

8.0 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.

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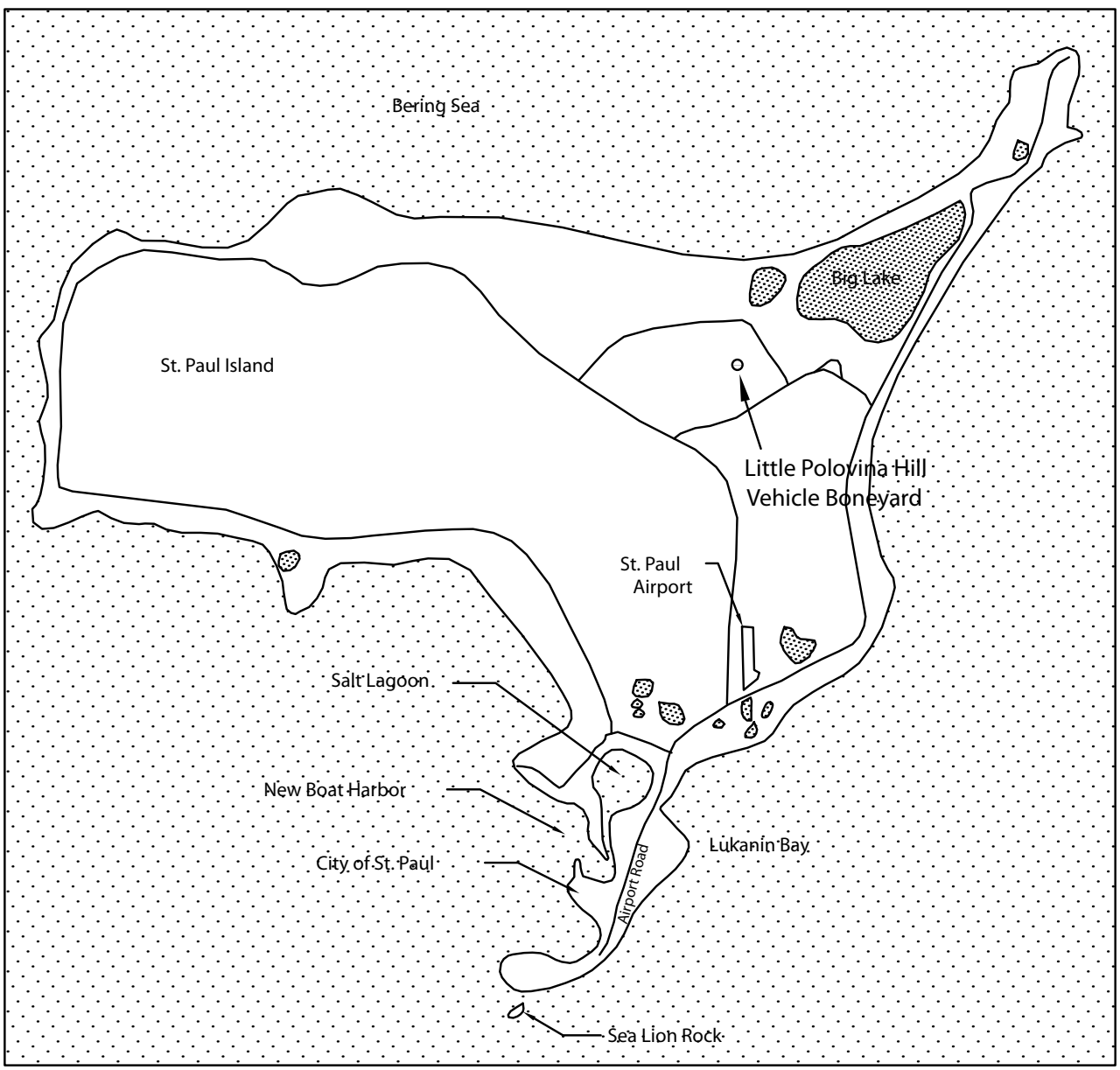
FIGURES



NOT TO SCALE

LITTLE POLOVINA HILL VEHICLE BONEYARD
ST. PAUL ISLAND, ALASKA

FIGURE 1
SITE LOCATION

Tetra Tech EM Inc.

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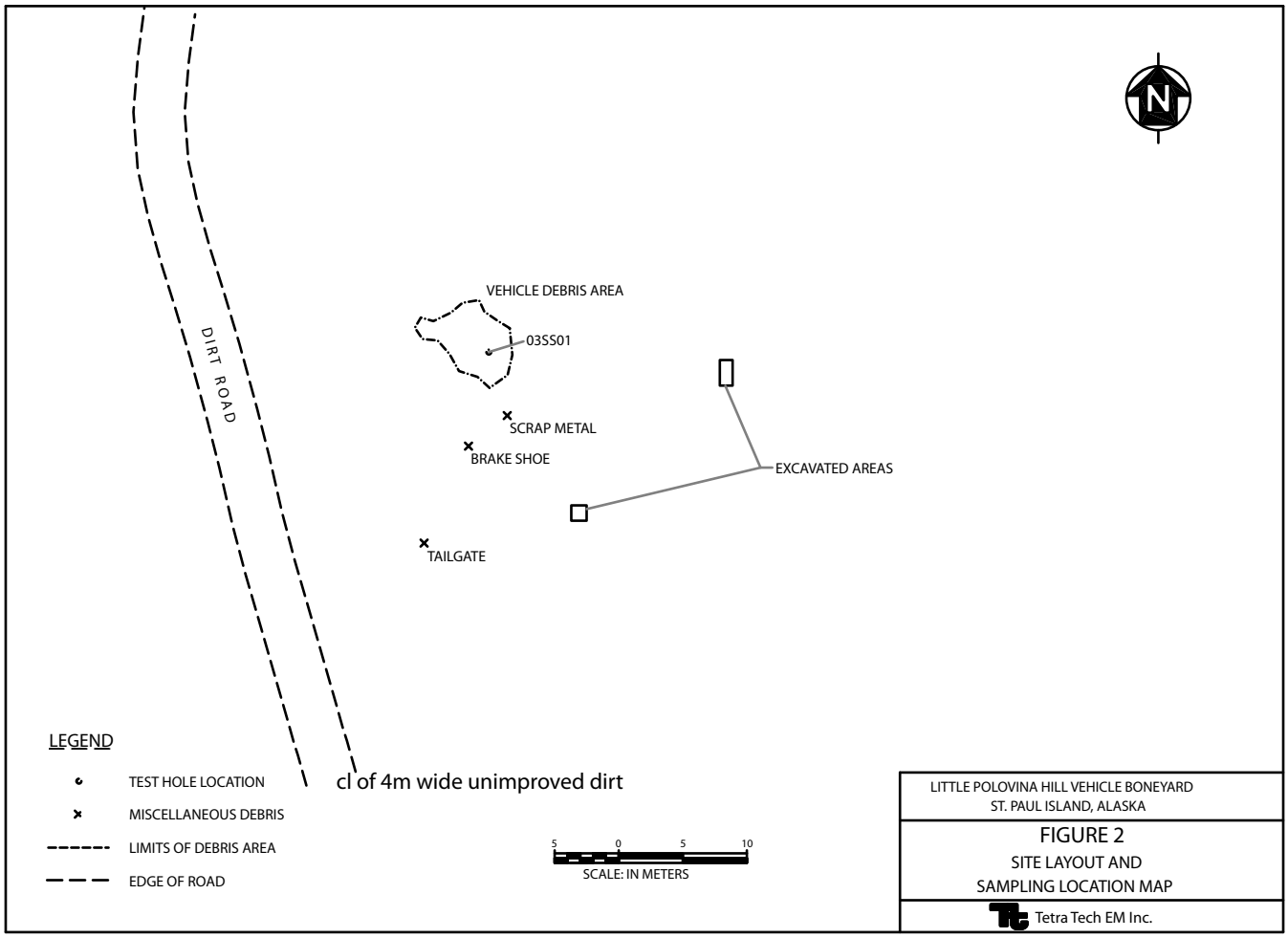

LITTLE POLOVINA HILL VEHICLE BONEYARD
ST. PAUL ISLAND, ALASKA

FIGURE 2
SITE LAYOUT AND
SAMPLING LOCATION MAP

Tetra Tech EM Inc.

APPENDIX A: PHOTOGRAPHS

Photograph No. 1 Date: September 7, 1999
This photograph shows the engine block, a portion of the steering column assembly, and miscellaneous vehicle debris associated with the primary vehicle debris field at the Little Polovina Hill Vehicle Boneyard.

Photograph No. 2 Date: September 7, 1999
This photograph shows field personnel removing soil to access and assess the rear differential associated with the sole vehicle at the site. The primary debris field contains the vehicle chassis (center) and its associated steering column assembly (right). Miscellaneous vehicle debris is scattered around the vehicle chassis. The secondary debris field visible on the left side of the photograph contains an isolated engine block.

Photograph No. 3 Date: September 7, 1999
This photograph shows the partially unearthed rear differential. The differential housing was intact, and no staining was observed.

Photograph No. 4 Date: September 7, 1999
This photograph depicts an oil filter cylinder that was removed from the chassis engine block. A small amount of residual oil was present on the cylinder's interior.

Photograph No. 5 Date: September 7, 1999
This photograph depicts the secondary debris field, including an isolated engine block and other metal debris. An oil filter canister was removed 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 Date: September 7, 1999
This photograph shows the oil filter canister that was removed from the engine block. The oil filter canister was removed intact and exhibited only remnants of residual oil. Field personnel observed no evidence of staining.

STATE OF ALASKA

DEPT. OF ENVIRONMENTAL CONSERVATION
DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITES REMEDIATION PROGRAM

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March 3, 2000

Mr. John Lindsay
Pribilof Project Manager
U.S. Department of Commerce, NOAA
National Ocean Service
Office of Restoration and Response
7600 Sand Point Way, N.E. Bldg. 4 BIN C 15700
Seattle, WA 98 1150070

RECEIVED
MAR 8 2000

RE: Draft Closure Confirmation Report-TPA Site No. 3 Little Polovina Hill Vehicle Boneyard January 13, 2000.

Dear Mr. Lindsay:

The Department of Environmental Conservation (DEC) has received the above document on February 2, 2000. Below are our comments.

8.0 **Recommendations Page 8**
Based on a review of the data presented in the document, DEC concurs that no further action is warranted at the site. The following project objectives appeared to have been met:

1. no releases of petroleum hydrocarbons or other hazardous substances have occurred;
2. the boundaries of the site have been adequately mapped;
3. surface debris appears to have been removed from the site;
4. no erosion, seepage or other settlement is occurring; and
5. no buried debris is located at the site based on the geophysical survey.

DEC will not require NOAA to conduct further investigation or remedial action at this site. However, please note that DEC reserves all of its rights under 18 AAC 75, 18 AAC 60, and AS 46 to require NOAA to conduct further investigation and/or remedial action if information indicates the site conditions pose a risk to human health, safety, and welfare, and of the environment.

If you have any questions regarding this letter, please don't hesitate to call me at (907) 269-7552.

Sincerely,

Louis Howard
Project Manager

cc: Laura Ogar, DEC Anchorage
Jennifer Roberts, DEC Anchorage
Breck Tostevin, AGO
Pribilof Islands RAB Members

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NOAA Site 4
TPA Site 4: Dune Vehicle Boneyard

Site Closure Report - Final, Dune Vehicle Boneyard,
(Two-Party Agreement Site 4) 153

Letter from Louis Howard to John Lindsay RE: Site Closure Report Draft Dune Vehicle Boneyard TPA 4 Pribilof Islands Site Restoration Project St. Paul Island, AK January 24, 2001. Dated February 20, 2001 169

SITE CLOSURE REPORT - FINAL

Dune Vehicle Boneyard
(Two-Party Agreement Site 4)

Pribilof Islands Site Restoration
St. Paul Island, Alaska

June 6, 2001

Prepared For:
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Pribilof Project Office

Prepared By:

NORTECH
ENVIRONMENTAL & ENGINEERING CONSULTANTS
Fairbanks, Alaska

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APPENDICES

Appendix 1: Figures & GPS Information
Appendix 2: Site Photographs
Appendix 3: Daily Reports (and Scrap Recycle Receipt)
Appendix 4: Laboratory Analytical Reports – not prepared for this debris site
Appendix 5: Site Video Documentation

1.0 EXECUTIVE SUMMARY

The Dune Vehicle Boneyard, which is Two Party Agreement (TPA) Site 4, is located within the bowl of a large dune directly north of Little Polovina Hill, near the northern shore of St. Paul Island, Alaska. This site held the rusted remains of large trucks, abandoned several decades ago in the 1960's.

NORTECH Environmental and Engineering Consultants and Bering Sea Eccotech mobilized personnel and equipment to the Dune Vehicle Boneyard, and administered a program of debris removal from June 14 to June 17, 2000. Sixteen trucks, and an array of associated metal and other debris were excavated, loaded, and hauled away for disposal and recycling off-island. Based on a review and analysis of available project photographs, Daily Reports, and limited field screening data, ***NORTECH*** arrived at the following environmental conclusions:

- The only soils at the Dune Vehicle Boneyard site which were suspected of being contaminated, though at a level much less than the applicable ADEC soil cleanup standard of 1000 ppm DRO, were removed from the site during the site cleanup process. Less than 0.1 cubic yards of sandy material was segregated and transported to the Blubber Dump PCS stockpile, for thermo-volatilization treatment along with other stockpiled PCS soils.
- Groundwater contamination is considered unlikely at this debris removal site, given the lack of any evidence of significant spills, leaks, or other petroleum hydrocarbon releases.

Based on these conclusions, ***NORTECH*** recommends the following:

- No Further Action at this debris removal site.

2.0 INTRODUCTION

The National Oceanic and Atmospheric Administration (NOAA), Office of Response and Restoration, is responsible for environmental restoration activities on St. Paul and St. George Islands, Alaska. Collectively, these islands are part of a five island archipelago known as the Pribilof Islands. Under Public Law 104-91, NOAA is responsible for the cleanup of debris, landfills, wastes, storage tanks, hazardous and unsafe conditions, as well as contaminants including petroleum products and their derivatives left by NOAA on lands transferred or obligated for transfer on the Pribilof Islands. 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 environmental regulations and in accordance with the TPA, NOAA has undertaken an array of site characterization and restoration activities on St. Paul and St. George Islands. Additional work must be conducted to satisfy the TPA, including limited site characterization, remediation, confirmation sampling, and site restoration (NOAA 1996).

Under Contract No. 52ABNA500049, Task Order 56ABNA703706, ***NORTECH*** Environmental and Engineering Consultants (***NORTECH***) has prepared this Site Closure Report for the Dune Vehicle Boneyard, TPA Site 4, to report on the debris removal and environmental assessment activities which occurred during the 2000 fieldwork season.

2.1 Objectives

The overall objective for the St. Paul Debris Removal project undertaken by ***NORTECH*** was to develop a written plan of action, have it approved by NOAA and ADEC, and execute it for each TPA and non-TPA site. At each removal area ***NORTECH*** was to accomplish the acts necessary to gain a no-further-action designation from ADEC, or else gain an understanding of the corrective action efforts that could eventually lead to proper site closure.

2.2 Methodology and Applicable Regulations

In order to meet the project objective, ***NORTECH*** developed a draft Corrective Action Plan and an array of Sampling & Analysis Plans (SAPs) in March 2000 for eleven designated St. Paul debris sites. They were reviewed and approved by NOAA and ADEC, fieldwork was begun in mid-April, and essentially completed in

late November 2000. The fieldwork was performed in accordance with the Corrective Action Plan, the site's SAP, and the 1996 Two Party Agreement (TPA) between ADEC and NOAA including the following 1991 versions of ADEC's regulations and associated guidance documents, as referenced in the TPA, particularly sections 21 to 28, 59, and 103 which call for the application of:

- 18 Alaska Administrative Code (AAC) 70 Water Quality Standards
- 18 AAC 75 Oil and Hazardous Substances Pollution Control
- Underground Storage Tank Procedures Manual, Guidance for Treatment of Petroleum Contaminated Soil and Water and Standard Sampling Procedures

3.0 SITE BACKGROUND

This section provides a brief discussion of the location and history of the Pribilof Islands, weather and environmental conditions on St. Paul Island, a site description, and a summary of previous investigations ***NORTECH*** was aware of at this specific St. Paul debris removal site.

3.1 Island Historical Information

Russia first discovered St. Paul Island and its seal rookeries 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. In 1869, the United States made the Pribilof Islands a federal reservation. From 1869 to 1909, the United States contracted fur seal harvesting and pelt processing to private companies. 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 passed, which provided for the transfer of property and management of the islands to Alaskan Native regional and village corporations.

The only major landowners on St. Paul Island are the Tanadgusix Corporation (TDX) and the federal government. Minor landowners include the City of St. Paul, the St. Paul Tribal Council, and the State of Alaska. The federal government currently retains title to about 1,515 acres on St. Paul Island, which consisted of seal rookeries and administrative offices managed by the National Marine Fisheries Service, bird rookeries managed by the U.S. Fish & Wildlife Service, a U.S. Coast Guard (USCG) LORAN station, two scoria pits, the current landfill, and a National Weather Service station. The island's airport, which consists of about 67 acres of land, 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. It is surrounded by the Bering Sea, and is 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 (Figure 1). About 27 centerline miles of road bisect the island north south and east west. The City of St. Paul is located on the southern peninsula of the island; its 1998 population included 761 people (ADL 1999). St. Paul Island has many sand dunes and is vegetated with grasses and small forbes over the majority of its area. The vegetation is broadly classified as moist tundra. Some common plant species present on the island include blue lupine, arctic poppy, beach wild rye, and sea beach sandwort.

St. Paul Island serves as a nesting area for a great number of seabirds and a rookery area for northern fur seals. Commercial crab harvesting areas are located within 15 miles of the island. Major harvest species are the Tanner crab and Korean Hair crab.

3.2.1 Climate

The climate of the island is classified as subpolar. Maritime weather conditions prevail on the island, with predominantly cloudy, foggy, and windy conditions. Total annual precipitation averages 23.3 inches, with most occurring between the months of April and October. The mean monthly temperature ranges from 22.4°F in winter to

47.8°F in summer, with a mean annual temperature of 34.8°F. Wind speeds range from nil to over 100 miles per hour, with an average of 17.2 miles per hour (NCDC 1999).

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 eastern portion 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. The lakes with direct estuarine connection to the Bering Sea (for example, the Salt Lagoon) tend to be brackish; the remaining lakes are freshwater. Much of the surface of the island is composed of sandy or scoriaceous material that allows for rapid infiltration of water. Presently, little else is known about the island's groundwater.

The City of St. Paul obtains its municipal water supply from four wells located about 1.5 miles north-northeast of the city and immediately east of Telegraph Hill (Fredreka I, Fredreka II, south well, and north well). A fifth well serves the USCG station. These wells are reportedly completed within the basalt aquifer. The four municipal wells are connected by pipelines that supply three 200,000 gallon water storage tanks located on a hill above the city.

3.3 Site Description

The Dune Vehicle Boneyard, TPA Site 4, is characterized as a debris site under the Two Party Agreement. It is located within the large dunes directly north of Little Polovina Hill in the north-central area of the island, about 0.25 miles south of the Bering Sea shoreline (Figure 1, Appendix 1).

The TPA described the debris site as having two sites containing abandoned vehicles, separated by a ridge. The "east" site was directly east of a road leading into the dunes and contained three stripped-down truck bodies. These trucks were badly rusted, and only the frames and tires remained. No stressed vegetation or visibly stained soil had been observed located near these trucks. A gas canister (later confirmed to be a fire extinguisher) of unknown contents was observed adjacent to one of the vehicles during a 1992 preliminary assessment conducted by Ecology & Environment, Inc. (E&E 1993). The second, "north" site was located about a hundred yards away on the northern side of the dune ridge, adjacent to the first site but much less easily accessible. This older federal "vehicle boneyard" contained "at least ten dump trucks" that were very rusted and either partially or totally buried in the sandy bowl of the dune.

3.3.1 Geology and Soil

The site is located in a sand dune environment, heavily scoured by winds. The thickness of the sand and the depth to bedrock are not known.

3.3.2 Surface Water and Groundwater

The nearest surface water body is the Bering Sea, which is about 0.25 mile north of the site, TPA Site 4. No freshwater bodies are located at or near the site. Depth to groundwater at the site is not known, but is presumed to be close to sea level.

3.4 Previous Investigations And Other Activities

E&E conducted a 1992 preliminary assessment at the Dune Vehicle Boneyard (E&E 1993). During the preliminary assessment, E&E performed a visual inspection of the site, noting the conditions described in Section 3.3 above. In addition, field observations made at the site where the dump trucks were located noted that one dump truck piston was covered with a tar like substance. Photoionization detector (PID) readings from the piston area ranged from 0.6 parts per million (ppm) to 2 ppm (E&E 1993).

In November 2000, Tetra Tech EM Inc. (TTEMI) submitted a Closure Confirmation Report to NOAA for the Dune Vehicle Boneyard, which described the results of their fieldwork efforts during 1999; including: a limited geophysical survey, small and road-accessible vehicle debris removal and limited stained soils removal, draining of accessible vehicle fluids, soil sampling and analytical results, and their conclusions and recommendations. The three vehicle frames and miscellaneous automobile parts were removed from the first, accessible site and were staged nearby at the Big Polovina scoria pit for the planned 2000 St. Paul Island debris removal program. During this event, two soil samples were collected at the most heavily stained locations observed by TTEMI, and the results fell below the applicable ADEC soil cleanup levels. The highest DRO reading reported by the laboratory for soils sampled at the site was 26 mg/kg, compared with a predicted soil cleanup level of 1000 mg/kg. (18 AAC 75.341 (Table A1))

4.0 FIELDWORK ACTIVITIES

4.1 Debris Removal

After visiting the site and assessing the fieldwork circumstances on June 14, 2000 (Photo 1, Appendix 2: Site Photographs), ***NORTECH*** mobilized BSE workmen and suitable heavy equipment to the sand dune bowl of the Dune Vehicle Boneyard. On the afternoon of June 14th the crew began loading and hauling truck parts away. (Photo 2 and Appendix 3: Daily Reports) Debris removal work proceeded on each of the next three days, until June 17th, when the site cleanup was completed and all field activities ended.

A Hitachi 150 excavator on tracks was used to break up, lift and remove pieces of the sixteen abandoned trucks exposed or uncovered, carrying them over the dune edge to the adjacent road. (Photos 3 and 5, and Figure 2) When necessary, a cutting torch was used to cut the larger, heavier items into pieces that could be handled by the excavator. (Photo 6) A flatbed truck and end-dump truck were used to haul the debris from the site overland to the solid waste/debris staging area at NOAA's administrative "compound", south of the Polovina Turnpike, near the Post Office. (Photo 7)

During the debris removal operations, a constant watch was kept to capture any remaining trapped automotive fluids or contaminants in these vehicles. Some trapped water was noted in the bed of one truck (Photo 4), some oil was removed from an oil pan, containerized, and disposed of, and while turning a truck over some hydraulic fluid was observed to squirt from its truck-bed cylinder onto the adjacent sand.

In response to this minor spill event, the potentially impacted soils were promptly collected and added to the PCS stockpile located at the Blubber Dump to await thermal remediation treatment. As noted in the Daily Reports, no other soil stains, odors or evidences of any additional contamination were observed at this site which would cause us to believe that the soils at the site had been contaminated with petroleum hydrocarbons or other contaminants due to the presence of the abandoned trucks.

Once the last solid waste was hauled away and the site was field-screened with a PID, the debris removal action was terminated and all personnel demobilized. (Photo 8)

4.2 Soil and Groundwater Sampling

The only analytical sampling performed at this site was a single field-screening level Hanby Extraction Leaching Process Kit (Hanby Kit) sample. ***NORTECH*** personnel processed a suspect soil sample collected from below a truck body. The sample was field analyzed on June 16, 2000. The Hanby test yielded a light tan-colored result,

at about the color and intensity of 100+ ppm of Diesel Range Organics. No soil was retained to send as a sample to a laboratory for further analytical evaluation. No other Hanby Kit samples were processed at the Dune Vehicle Boneyard, nor were any viewed as necessary since no staining, stressed vegetation, PID deflections, or evidences of spills or past fluid releases from the truck bodies were observed.

After all of the truck bodies, truck beds, metal and miscellaneous debris (tires, wood, bits of auto parts, etc.) were removed from the site, ***NORTECH*** staff toured the disturbed dune area on the afternoon of June 17 with a Photo-Vac MicroTip HL-2000 Photo-Ionization Detector (PID) with a 10.6 EV lamp, in a random search for indications of soil contamination.

Approximately 20 distinct, random fieldscreening locations at the Dune Vehicle Boneyard site were selected and tested, and ***NORTECH*** observed no readings above the 0.0 ppm background level.

5.0 DEBRIS AND SUSPECT SOILS DISPOSAL

5.1 Debris Disposal and Recycling

The metal debris removed from the Dune Vehicle Boneyard site was temporarily staged on Tract 50 (the NOAA "compound"), as part of a large metal debris pile behind the Garco warehouse and Combine Building. In mid-September 2000, this metal debris was transported to a large walled barge at the St. Paul dock. The barge was towed to Seattle and was unloaded at the Seattle Iron & Metals yard on the Duwamish River at the end of September 2000. All tires and rubber had been stripped from the truck chassis and recycled separately, while the steel, copper, and aluminum were processed and recycled by the salvage yard. (See receipt for recycled metals from Seattle Iron & Metals in Appendix 3: Daily Reports)

The small amount of wood retrieved from the Dune Vehicle Boneyard was burned with other wooden debris at the St. Paul Landfill in August 2000.

5.2 Soil Disposal and Remediation Treatment

Although no PID readings were observed above background level at the Dune Vehicle Boneyard, which would indicate the presence of contamination, a small zone of suspect soils (less than one-tenth cubic yard of sand) was removed from the exposed location where the Hanby Kit sample had been collected. This sand was taken to NOAA's PCS stockpile at the Blubber Dump for thermo-volatilization remediation treatment.

6.0 DISCUSSION

NORTECH completed the removal of all visible solid wastes, abandoned trucks, and general debris found above the ground surface at the Dune Vehicle Boneyard. The cleanup objectives outlined in the Corrective Action Plan prepared by ***NORTECH*** for the Pribilof Islands Site Restoration Project and stated in Section 2.1 above were generally met, although no soil samples were collected and analyzed by an off-site laboratory.

The single Hanby Kit soil sample collected and analyzed during the prosecution of the debris removal effort revealed very little evidence of soil contamination since its colorimetric reading matched the chart code for a contaminate concentration of approximately 100 ppm DRO. The limited quantity of soils – less than 0.1 cubic yard of sand – represented by that field screening sample were removed from the site for remediation at the Blubber Dump even though they were not suspected of being impacted at a level that exceeded the applicable Category C soil cleanup level, 1000 ppm DRO. (18 AAC 75.341 (Table A1))

Intensive, random PID screening of the site failed to detect the presence of any volatile hydrocarbon contaminants above 0.0 ppm in any of the site's soils, and therefore soil sampling for laboratory analysis was deemed to be unnecessary by ***NORTECH***.

This decision was determined in accordance with the Corrective Action Plan and the ADEC's corrective guidance that suspect soils should be sampled and analyzed whenever contamination is evidenced by PID field screening deflections, i.e. readings above background levels. No PID readings were observed at any time, on this site, above 0.0 ppm. ***NORTECH*** acknowledges that the collection and processing of a soil sample to prove clearance for the soils located below the small zone of impacted soils would have provided further and more credible proof of the site's clean condition, but no such sample was collected or analyzed.

Care was taken to avoid spills and/or releases of automotive fluids during removal activities at the Dune Vehicle Boneyard site. Visual evidence confirmed by PID readings demonstrated that the site's low-level soil contamination was limited to a small quantity of soil that was containerized and removed from the site. Given the apparent absence of any remaining soil contamination, it is ***NORTECH***'s professional opinion that no further excavation or cleanup activities are considered necessary at this site.

7.0 CONCLUSIONS AND RECOMMENDATIONS

NORTECH Environmental and Engineering Consultants and Bering Sea Eccotech mobilized personnel and equipment to TPA Site 4, the Dune Vehicle Boneyard at St. Paul Island, Alaska, and administered a program of debris removal from June 14 to June 17, 2000. Sixteen trucks, and an array of associated metal and other debris were excavated, loaded, and hauled away for disposal and recycling off-island. Based on a review and analysis of available project photographs, Daily Reports, and limited field screening data, ***NORTECH*** arrived at the following environmental conclusions:

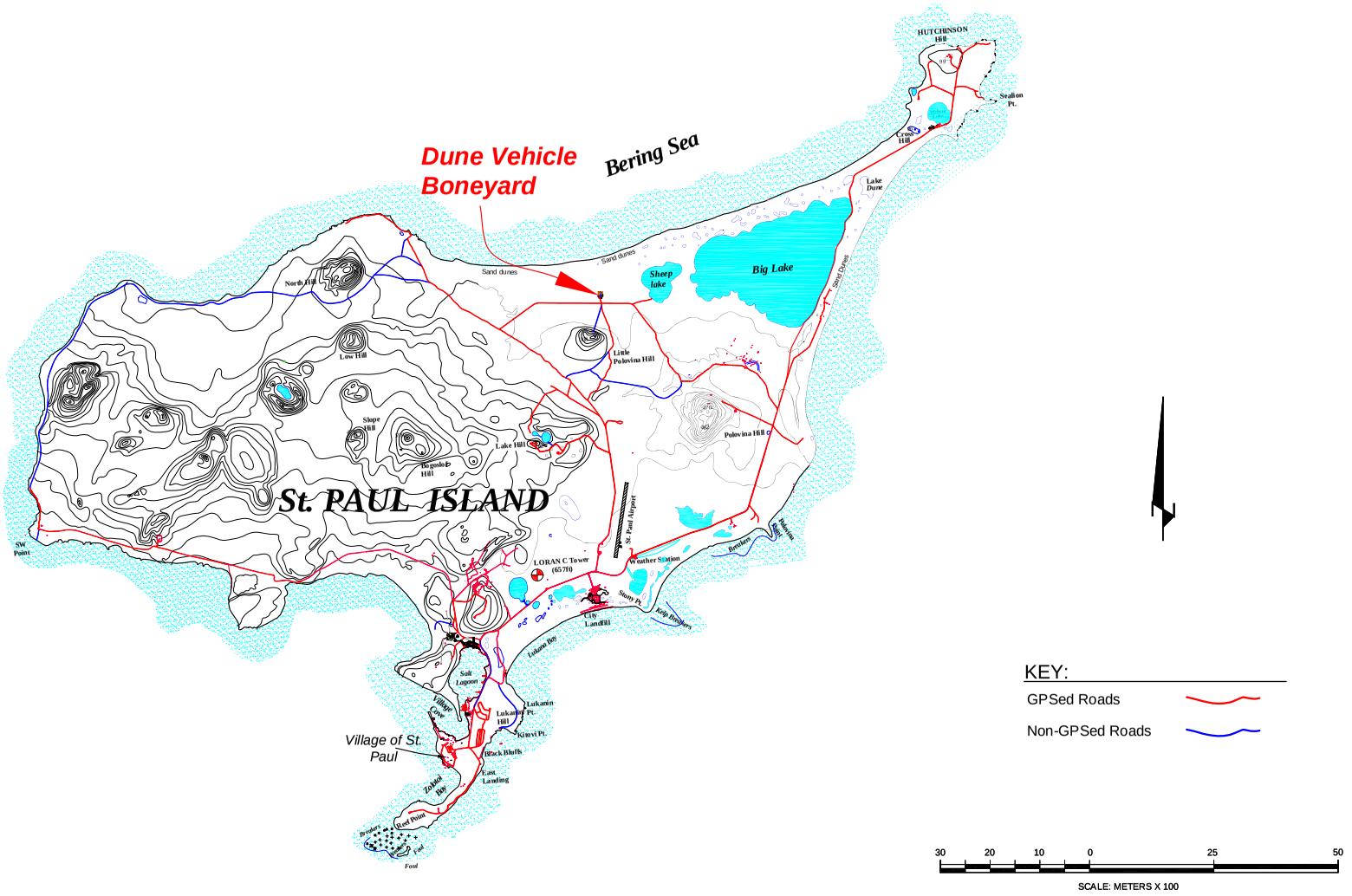
- The only soils at the Dune Vehicle Boneyard site which were suspected of being contaminated, though at a level much less than the applicable ADEC soil cleanup standard of 1000 ppm DRO, were removed from the site during the site cleanup process. Less than 0.1 cubic yards of sandy material was segregated and transported to the Blubber Dump PCS stockpile, for thermo-volatilization treatment along with other stockpiled PCS soils.
- Groundwater contamination is considered unlikely at this debris removal site, given the lack of any evidence of significant spills, leaks, or other petroleum hydrocarbon releases.

Based on these conclusions, ***NORTECH*** recommends the following:

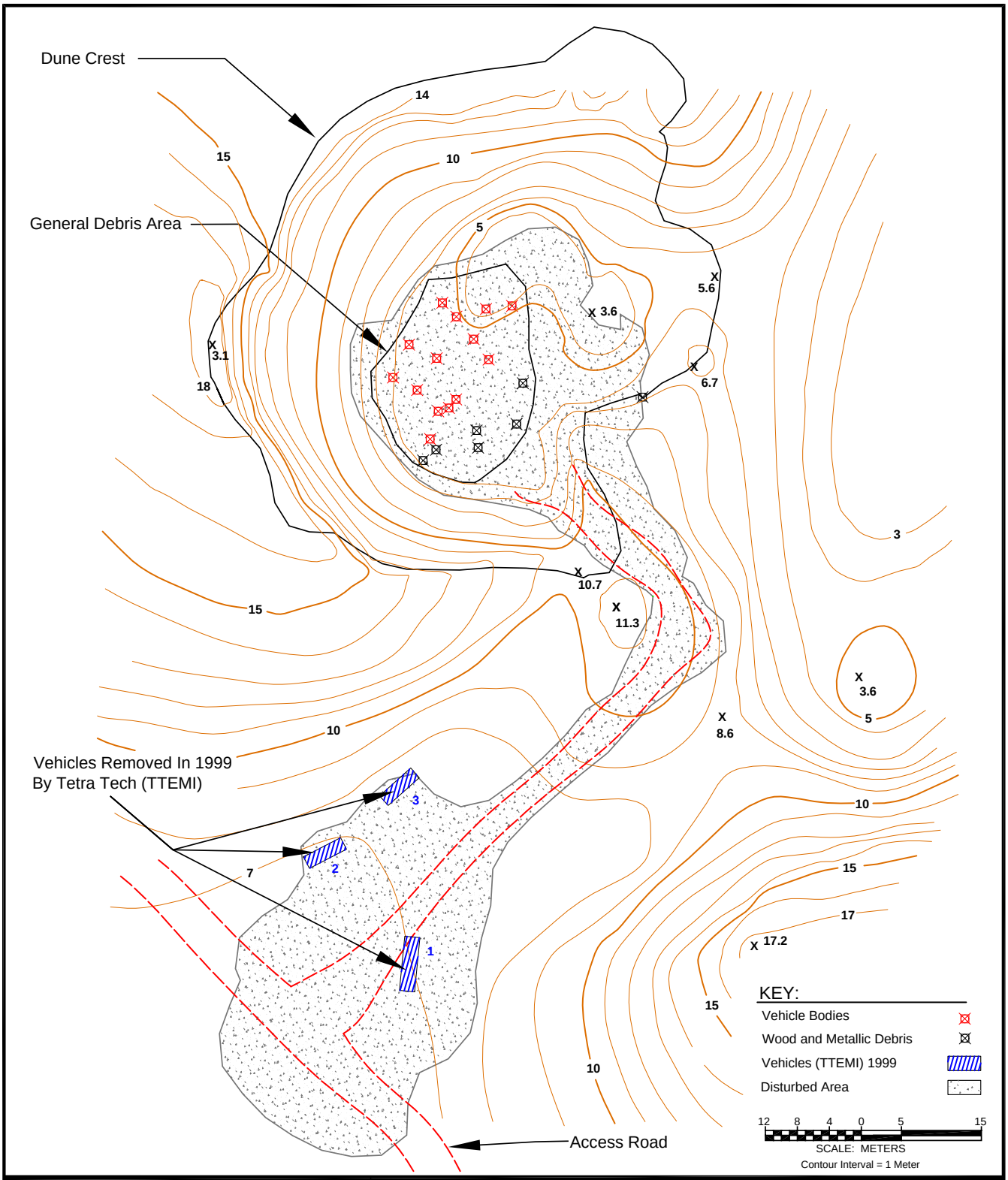
- No Further Action at this debris removal site.

APPENDIX 1

Figures & GPS Information



NORTECH	ENVIRONMENTAL & ENGINEERING CONSULTANTS 2400 College Road, Fairbanks, Alaska 99709 (907) 452-5688 FAX: (907) 452-5694	DUNE VEHICLE BONEYARD DEBRIS REMOVAL SITE PRIBILOF ISLAND SITE RESTORATION PROJECT ST. PAUL ISLAND, ALASKA	DATE: 1/23/01 PROJ MGR: CRM DRAWN: DRB	SCALE: 1:2000 PROJECT: 20108 DWG. NO.: 20108 DV-1	FIGURE 1



NORTECH

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DUNE VEHICLE BONEYARD DEBRIS REMOVAL ST. PAUL ISLAND, ALASKA

N

FIGURE ???

DATE:	1/10/00
DESIGN:	CRM
DRAWN:	DRB
PROJECT NO:	20108
DWG:	?????
SCALE:	1 TO 16

APPENDIX 2

Site Photographs

Photo 1:*A040500F0.JPG:* **Dune Vehicle Boneyard inspection prior to initiation of debris removal and cleanup**

Photo 2: *A040512F0.JP* **Beginning of general debris removal by BSE &** ***NORTECH*****. (6/14/00)**

Photo 3: *A040520F0.JPG* **Excavator extracting buried debris in order to remove it from the site.**

Photo 4: *A040537F0.JPG* **Water found and exposed at corner of truck bed. (6/14/00)**

Photo 5: *A040552F0.JPG* **Excavator walks out of dune bowl to carry debris to road and haul trucks.**

Photo 6: *A040555F0.JPG* **BSE laborer uses cutting torch to provide smaller pieces to haul.**

Photo 7: *A040560F0.JPG* **End dump truck, at road, hauls debris to NMFS staging area near harbor.**

Photo 8: *A040573F0.JPG* **Debris removal completion, excavator leaves, raking up small pieces. (6/17/00)**

STATE OF ALASKA

DEPT. OF ENVIRONMENTAL CONSERVATION

DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITES REMEDIATION PROGRAM

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February 20, 2001

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Mr. John Lindsay
Pribilof Project Manager
U.S. Department of Commerce, NOAA
National Ocean Service
Office of Response and Restoration
7600 Sand Point Way, NE BIN C15700
Seattle, Washington 98115-0070

RE: Site Closure Report Draft Dune Vehicle Boneyard TPA 4 Pribilof Islands Site Restoration Project St. Paul Island, AK January 24, 2001

Dear Mr. Lindsay:

The Alaska Department of Environmental Conservation (ADEC) has received the above document on January 29, 2001. Below are DEC's comments on the document.

7.0 Conclusions and Recommendations Page 8
Based on a review of the data presented in the report, ADEC concurs with the conclusion that no further action is required at TPA 4 Dune Vehicle Boneyard. However, if in the future, additional contamination is discovered at this site, further investigation and/or remedial actions will be requested of NOAA by ADEC. ADEC reserves its rights, under 18 AAC 75 Oil and Hazardous Substances Pollution Control and AS 46.03 to require NOAA to conduct additional assessment and/or corrective actions in the future, if information indicates the site conditions pose an unacceptable risk to human health, safety, or welfare, or to the environment.

If you have any questions regarding this letter, please call me at (907) 269-7552.

Sincerely,

Louis Howard

Louis Howard
Project Manager

cc: Jennifer Roberts, ADEC Anchorage
Robert A. Taylor, NOAA GC Seattle, WA
Breck Tostevin, AGO
Pribilof RAB Members

lhoward\ TPA 4 Dune Vehicle Boneyard 2001.doc

NOAA-St. Paul TPA 4 Dune Vehicle Boneyard

NOAA Site 5
TPA Site 5a: St. Paul Landfill (Active Cell C)
(St. Paul Landfill, TPA 5; TPA Attachment A)

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Letter from John Lindsay to Louis Howard, RE: Review and Approval of *Closure Report, Site 5a/TPA Site 5 – St. Paul Landfill Cell C (Tract 42)*, dated September 19, 2005. Dated September 19, 2005 205

Letter from John Lindsay to Leslie Simmons, RE: Review and Approval of *Closure Report, Site 5a/TPA Site 5 – St. Paul Landfill Cell C (Tract 42)*, dated September 19, 2005. Dated September 19, 2005 209

Letter from Leslie Simmons to John Lindsay, RE: Closure Report for Site 5a, St. Paul Landfill Cell C, Tract 42. Dated November 7, 2005 213

Letter from John Lindsay to Robert J. Blankenburg RE: Technical Memorandum, Request for Re-Closure of Site 5a/TPA Site 5 – St. Paul Landfill Cell C (Tract 42) St. Paul Island, Alaska. Dated December 14, 2007 215

Letter from Robert J. Blankenburg to John Lindsay RE: Approval of Re-Closure of Site 5a/TPA Site 5–St. Paul Landfill Cell C (Tract 42) St. Paul, Alaska. Dated January 24, 2008 225

Closure Report

Site 5/TPA Site 5a – St. Paul Landfill Cell C (Tract 42)
St. Paul Island, Alaska

September 19, 2005

Prepared By:

National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
7600 Sand Point Way NE
Seattle, Washington 98115

And:

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6100 219th St. SW, Suite 550
Mountlake Terrace, Washington 98043

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1-2 Site Location Map
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4-3 St. Paul Landfill Cell C Pre-Closure Topography (July 2003)
4-4 St. Paul Landfill Cell C Mid-Closure Topography (November 2003)
4-5 St. Paul Landfill Cell C Closure Final Topography (October 2004)

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A Photographic Documentation
B Daily Reports and Logbook Notes
C Slope Calculations
D PCS Volumes and Contaminant Concentration Assessment for Landfill Cell C Cap and NWS Landspreading Area
E Proposed Revision to St. Paul Landfill Cell C Post-Closure Monitoring Plan
F ADEC Approval of Closure Report

ACRONYMS AND ABBREVIATIONS

18 AAC	Title 18 Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
bgs	Below ground surface
BSE	Bering Sea Eccotech
BTEX	Benzene, toluene, ethylbenzene, and total xylenes
CAP	Corrective action plan
CESI	Columbia Environmental Sciences, Inc.
cm	Centimeter
COC	Chain of custody
CSM	Conceptual site model
CY	Cubic yard
DRO	Diesel-range organic compounds
EPA	U.S. Environmental Protection Agency
ft	Foot
GIS	Geographic information system
GPS	Global positioning system
GRO	Gasoline-range organic compounds
KRI	Kelly Ryan, Inc.
MSL	Mean sea level
MSW	Municipal solid waste
NOAA	National Oceanic and Atmospheric Administration
NWS	National Weather Service
PAH	Polynuclear aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PCS	Petroleum-contaminated soil
Polarconsult	Polarconsult Alaska, Inc.
QAP	Quality assurance plan
RRO	Residual-range organic compounds
Tetra Tech	Tetra Tech EM Inc.
TPA	Two-Party Agreement
TOPA	Transfer of Property Agreement
UST	Underground storage tank

EXECUTIVE SUMMARY

The U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA) and its contractor, Tetra Tech EM Inc. (Tetra Tech), prepared this closure report. The report details closure activities conducted at Tract 42 Cell C (Site 5/Two-Party Agreement [TPA] Site 5a) of the St. Paul Landfill on St. Paul Island, Alaska. Activities associated with this site were conducted during the 2003 and 2004 field seasons.

The former St. Paul municipal solid waste (MSW) landfill lies in Tract 42 of Section 17, Township 35 South, Range 131 West of the Seward Meridian, Alaska as shown on the plat of rectangular survey officially filed May 14, 1986. The U.S. Government owns the surface and subsurface estate of Tract 42. Tract 42 is scheduled for transfer to the City of St. Paul under the Transfer of Property Agreement (TOPA; NOAA 1984). NOAA, its predecessor agencies, and the St. Paul municipality used the former landfill as the primary landfill for St. Paul Island from the 1940s until 2004. Although the former landfill never received an operating permit from the State of Alaska, disposal activities occurred on lands in and adjacent to Tract 42, and included the disposal of MSW, construction and demolition debris, and drums containing petroleum products. In 2002, the village native corporation, the Tanadgusix Corporation, deeded approximately nineteen acres of land adjacent to and contiguous with Tract 42 to the City of St. Paul for use as a community MSW facility. The regional native corporation, The Aleut Corporation, retained ownership of the subsurface estate. The City of St. Paul identifies this property as the *Ataqan* Subdivision.

Tract 42 is a 5.78-acre tract owned by the U.S. government and managed by NOAA. It is situated approximately 1.5 miles northeast of the City of St. Paul and 0.25 miles south of the St. Paul Airport (57°08’54.10” North Latitude, 170°13’57.76” West Longitude). For purposes associated with the environmental restoration project, NOAA arbitrarily distinguished three areas within the Tract 42 landfill and the *Ataqan* Subdivision: (1) Cell A (Site 6/TPA Site 5b); (2) Cell B (Site 7/TPA Site 5c [Drum Dump] and Site 8/TPA Site 5d [Solid Waste]); and (3) Cell C. Cell A, located north of Tract 42, contained construction debris and barrels, some with waste oil. Cell A was capped with sand and scoria during the 2000 and 2003 field seasons. Cell B, located north and west of Tract 42, was associated with historical disposal activities on St. Paul Island and contained primarily MSW and drums, some with waste oil. Cell B was closed during the 2003 field season when the MSW was relocated to within Cell C; the drums were removed and disposed off-island. Cell C, located within the boundaries of Tract 42, primarily contained MSW. All the MSW in Cell C that was near the property boundary was relocated to the central portion of Tract 42, inside a line set back 50 feet (ft) from the property boundary (“50 ft setback line”). Prior to the closure of Cell C, NOAA operated a permitted, short-term stockpile of petroleum-contaminated soil (PCS) atop Cell C during 2003 and 2004. This closure report summarizes the closure activities conducted at Cell C during the 2003 and 2004 field seasons. A closure report submitted under separate cover summarized closure activities conducted at Cell A and Cell B (Tetra Tech 2004b).

NOAA selected Tetra Tech to implement the corrective action plan for the closure of Cell C consistent with the requirements of Title 18 of the Alaska Administrative Code (AAC) Chapter 75 respecting hazardous materials, with 18 AAC 70 respecting water quality standards, and as a Class III solid waste disposal facility in accordance with 18 AAC 60, even though Cell C is not a permitted landfill.

Closure activities conducted at Cell C included:

- removal and relocation of MSW from Cells A and B to tract 42, inside the 50 ft setback line;
- recontouring the MSW consolidated within Tract 42 to a mound with side slopes no steeper than 3 to 1 (horizontal to vertical);
- relocation of some of the short-term stockpiled PCS from Tract 42 to the National Weather Service (NWS) landspreading area; and
- placement and grading of 2 ft of final cover material over the MSW in Tract 42.

During the 2003 field season, NOAA relocated an estimated 14,736 cubic yards (CY) of MSW from Cell A, Cell B, and from portions of Cell C where MSW existed inside Tract 42 within 50-ft of the Tract 42 boundary. The MSW was incorporated within the southern and western portions of Tract 42, inside the 50 ft setback line, where it was leveled and compacted. In 2003, NOAA also received permission from the Alaska Department of Environ-

mental Conservation (ADEC) for a short-term PCS stockpile atop of MSW in Tract 42. That year, NOAA placed on Tract 42 approximately 23,397 CY of PCS that had been excavated from St. Paul Island corrective action sites. During 2004, NOAA added to Tract 42 a net additional 1,870 CY of PCS, as well as, an estimated 395 CY of debris from corrective action sites.

NOAA estimated 25,267 CY as the final volume of PCS at the short-term stockpile after PCS relocation activities.

ADEC approved a NOAA request to utilize stockpiled PCS as final cover material for the MSW consolidated within Tract 42. Subsequently, PCS remaining at Tract 42 was contoured, leveled, and graded over the area ensuring a minimum 2 ft of cover material in areas containing MSW. In addition, the top of the cell was graded to a slope of no less than 100 to 1 (horizontal to vertical) to allow for drainage while the side slopes were graded to no steeper than 3 to 1 for both slope stability and erosion control. Following completion of grading activities, large boulders were placed along the perimeter of the area to restrict vehicle access. Cap vegetation was initiated in June 2005 by planting native grass seeds, applying fertilizer, and installing erosion control matting along the side slopes of the cap.

Because closure of Cell C has been completed in accordance with regulatory requirements, NOAA requests acceptance of the Cell C closure by ADEC's Division of Environmental Health, Solid Waste Program and the initiation of post-closure monitoring consistent with 18 AAC 60. NOAA requests a conditional closure determination from ADEC's Division of Spill Prevention & Response, Contaminated Sites Program consistent with the 1996 Two-Party Agreement signed by NOAA and the State of Alaska.

NOAA proposes post-closure monitoring to include groundwater sampling in the vicinity of the St. Paul Landfill and periodic inspections of the landfill cap over a five-year period. NOAA also proposes recording a deed notice regarding the closed MSW landfill and the use of PCS for its cap.

1.0 INTRODUCTION

The U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA) is responsible for characterization and restoration of specific sites on St. Paul Island, Alaska under Public Law (PL) 104-91 of 1996 and PL 106-562 of 2000. A Two-Party Agreement (TPA), signed in 1996 by NOAA and the State of Alaska, provides the framework for corrective action on St. Paul Island (NOAA 1996). The State of Alaska provides TPA oversight through the Alaska Department of Environmental Conservation (ADEC). Under the TPA, NOAA is required to comply with State of Alaska regulations that were in effect in 1991 (ADEC 1991); however, with ADEC agreement, NOAA has chosen to follow more current regulations whenever possible.

St. Paul Island is located north of the Aleutian Island chain in the Bering Sea, approximately 800 miles west-southwest of Anchorage, Alaska (Figure 1-1). The former St. Paul municipal solid waste (MSW) landfill (landfill) lies in Tract 42 of Section 17, Township 35 South, Range 131 West of the Seward Meridian, Alaska as shown on the plat of rectangular survey officially filed May 14, 1986. The U.S. Government owns the surface and subsurface estate of Tract 42 (Figure 1-2). Tract 42 is scheduled for transfer to the City of St. Paul under the Transfer of Property Agreement (TOPA; NOAA 1984). Although the landfill never received an operating permit from the State of Alaska, solid waste disposal activities by NOAA, its predecessor agency (*i.e.* Department of the Interior, Bureau of Commercial Fisheries), and the City of St. Paul occurred on lands in and adjacent to Tract 42; solid waste included MSW, construction and demolition debris, and used oil drums. In accordance with PL 104-91, NOAA is required to cleanup and close the landfill. In 2002, the village native corporation, Tanadgusix Corporation, deeded approximately 19 acres of land adjacent to and contiguous with Tract 42 to the City of St. Paul for use as a community MSW facility. The regional native corporation, The Aleut Corporation, retained ownership of the subsurface estate. The City of St. Paul identifies this property as the *Ataqan* Subdivision (Figure 1-2).

NOAA selected Tetra Tech EM Inc. (Tetra Tech) to implement a corrective action plan (CAP) for closure of Cell C (NOAA 2003a). Tetra Tech subcontracted Kelly Ryan, Inc. (KRI) and Bering Sea Eccotech (BSE) to provide the personnel and equipment necessary to implement the requirements of the CAP. Tetra Tech provided oversight and completed closure activities in accordance with the TPA, the CAP, the landfill closure plan (Polarconsult Alaska, Inc. [Polarconsult] 2002, NOAA 2003a), State of Alaska regulations and guidance for solid waste under Title

18 of the Alaska Administrative Code (AAC) Chapter 60 (ADEC 2003a), State of Alaska regulations respecting water quality under 18 AAC Chapter 70 (ADEC 2003b), State of Alaska regulations respecting hazardous materials under 18 AAC Chapter 75 (ADEC 2003c), and State of Alaska regulations respecting underground storage tanks under 18 AAC Chapter 78 (ADEC 2003d). For the purposes of this closure report, Cell C is now defined as that portion of Tract 42 containing MSW. Closure activities included confining all MSW within an area set back 50 feet (ft) from the Tract 42 property boundary.

The objectives of Cell C closure activities, as outlined in the CAP (NOAA 2003a, 2004a), were as follows:

- Removal and relocation of MSW from between the Tract 42 boundary and the 50 ft setback line.
- Contouring the side slopes of Cell C to meet regulatory requirements for side slopes no steeper than 3 to 1 (horizontal to vertical).
- Construction of a cap over Cell C as shown in the landfill closure plan (Polarconsult 2002).
- Installation of a boulder barrier along the perimeter of Cell C.
- Incorporation of site features and sampling locations into a geographic information system (GIS) database.
- Reporting of closure activities and results to ADEC for acknowledgement of a no further remedial action planned status as well as completion of the closure and initiation of the post-closure monitoring period.

Except as noted in this closure report, field activities were carried out in accordance with the following documents:

- Landfill Closure Plan for the St. Paul Landfill (Polarconsult 2002)
- Draft CAP for the St. Paul Landfill Closure, including Appendix B - Addendum 1 to the Landfill Closure Plan (NOAA 2003a)
- Master Quality Assurance Plan (QAP) (NOAA 2003b)
- Master Health and Safety Plan (NOAA 2003c)
- Master Investigation-Derived Waste Plan (NOAA 2003d)
- Addendum 2 to the Landfill Closure Plan (NOAA 2004a)

2.0 SITE DESCRIPTION

The following subsections describe site background, site geology, site hydrogeology, and previous investigations for Cell C.

2.1 SITE BACKGROUND

Tract 42 is a 5.78-acre tract owned by the U.S. government and situated at 57°08’54.10” North Latitude, 170°13’57.76” West Longitude, approximately 1.5 miles northeast of the City of St. Paul and 0.25 miles south of the St. Paul Airport (Figures 1-1 and 1-2). For purposes related to the environmental restoration project, NOAA arbitrarily divided the Tract 42 MSW landfill and portions of the surrounding *Ataqan* Subdivision into three geographic areas identified as Cell A, Cell B, and Cell C (Figure 2-1). NOAA and its predecessor agency (Bureau of Commercial Fisheries), along with the City of St. Paul, managed landfill operations at and near Tract 42 from the 1940s to present (Columbia Environmental Sciences, Inc. [CESI] 2001a).

Cell A, located north of Tract 42, contained MSW, demolition and construction debris, and drums, many of which contained used motor oil. NOAA removed the drums and closed Cell A (NOAA 2003a; Tetra Tech 2004b). Prior to closure activities, Cell B contained primarily drums and fuel storage tanks with some drums containing waste oil. In addition, Cell B was used to burn wood debris, and to accept some MSW that was covered over (Merculief 2005). NOAA removed petroleum-contaminated soil (PCS) and drums from Cell B in 2003, burned residual

wood, and relocated the MSW to Cell C (Tetra Tech 2004b). NOAA is submitting separate conditional closure requests for Cells A and B, and they will not be further discussed here.

Tract 42 served as an intermittent MSW landfill possibly dating back to the 1940s. The area of usage was relatively small and MSW was kept covered over with soil. The exclusive use of Tract 42 for MSW didn't occur until the early/mid 1990s following an order to the City of St. Paul by the State of Alaska to cease and desist regarding the use of Cell A as the City's landfill for encroaching on the adjacent wetlands (Merculief 2005). Cell C lies within the boundaries of Tract 42 and primarily contains MSW.

During 2003 and 2004, NOAA operated an ADEC-permitted, short-term PCS stockpile atop Tract 42. The City of St. Paul conducted daily waste management operations at Cell C until mid-2004. Waste management operations included the use of a "burn box" to incinerate MSW. The City disposed burn box ash into the active portion of Cell C. Prior to the implementation of burn box operations, MSW was either deposited in Cell C and covered with soil or openly burned atop Cell C. During June 2004, the City of St. Paul moved its MSW incineration and disposal operations from Cell C to its own property on the Ataqan Subdivision, adjacent to Tract 42. NOAA continued to landfill inert debris in Cell C up until the completion of its closure in the fall of 2004.

2.2 SITE GEOLOGY

St. Paul Island was formed as a result of volcanic eruptions of basaltic lavas onto the southern edge of the Bering Sea Shelf. The island has never been glaciated, and many cinder cones with steep slopes and sharp crater rims are present on the island. The island soil is characterized as primarily volcanic deposits consisting of scoria of varying sizes (pebbles to cobbles) and colors (lenses of gray, red, and black) with fractured basalt occurring at depth (Barth 1956).

The landfill is situated amid a series of coastal sand dunes that begin at the south shore of the island along the Bering Sea and extend inland to the northern perimeter of the landfill (Figure 1-2). As such, topography in this area is variable with surface elevations that vary from 5 ft above mean sea level (MSL) in low-lying depressions to 40 ft above MSL atop the largest sand dunes. Surface soil in this area consists primarily of fine sand with gravels present in some locations, most likely imported to the site during past development or disposal activities. Beneath the sand lies a layer of sandy silt and clay that is classified as undifferentiated mud. Fractured basalt is present beneath this layer throughout the area (Polarconsult 2002, NOAA 2003a). A shallow lake and contiguous wetland are present in the northeast portion of the landfill and cover approximately 100,000 square ft (Figure 2-1). The elevation of the lake surface is approximately 5 ft above MSL (Polarconsult 2002).

2.3 SITE HYDROGEOLOGY

Groundwater beneath the landfill reportedly exists in two aquifers: the upper aquifer and the lower aquifer. A layer of sandy silt and clay, which is classified as undifferentiated mud, and appears to act as a semi-confining layer, separates these two units. An undetermined vertical gradient exists between the upper and lower aquifers (CESI 2001b).

The upper aquifer occurs in the fine sand layers, and is present at depths that vary from 1 ft below ground surface (bgs) in low-lying areas to 25 ft bgs in the area of larger sand dunes. Groundwater flow in the upper aquifer is defined by a groundwater divide that runs generally from east to west between Cell A and Cell C; to the north of this divide, groundwater flows to the north-northeast, while to the south of this divide, groundwater flows to the south-southwest. Based on available data, groundwater within the upper aquifer is not tidally influenced (CESI 2001b).

The lower aquifer occurs within the fractured basalt layer. Groundwater flow in this unit appears to be to the south toward the Bering Sea. Based on available data, groundwater within the lower aquifer is tidally influenced (Dames and Moore 1997; CESI 2001b).

2.4 PREVIOUS INVESTIGATIONS

Since Cell C has been active until recently, most previous investigations have focused on Cells A and B. However, in May 2000, CESI conducted a routine inspection of the landfill and identified a tar spill in the active portion of Cell C. Further investigation revealed that the spill originated from a drum located in the area. CESI subsequently uncovered, removed, and disposed off-island two buried drums, spilled tar, and a small quantity of visually stained or tar-coated soil (CESI 2001c). CESI collected one soil sample from the small excavation created after tar and soil removal. The sample was field screened for petroleum hydrocarbons using PetroFlag®, a colorimetric test kit, with the result below the kit detection limit (CESI 2001a). No confirmation samples were analyzed for the excavation.

NOAA and its contractors installed 17 groundwater monitoring wells within and near Tract 42 from approximately 1995 to 2004, and decommissioned 9 of these wells during 2003 and 2004 landfill closure activities (Figure 2-1). Recent groundwater sampling results indicate no contaminants exceeded their ADEC Table C cleanup levels excepting lead, which was detected in MWSNPLF-1 above its Table C cleanup level of 15 micrograms per liter during the October 2003 quarterly sampling event (Tetra Tech 2004d).

3.0 CLOSURE STANDARDS

Closure activities at the landfill were conducted in accordance with State of Alaska regulations (ADEC 2003a, 2003b, 2003c, 2003d) and the TPA signed between NOAA and the State of Alaska (NOAA 1996).

In accordance with 18 AAC 60 (ADEC 2003a), NOAA was required to conduct the following closure activities:

- Remove and relocate MSW from between the Tract 42 boundary and the 50 ft setback line.
- Contour the side slopes of Cell C to meet regulatory requirements for side slopes no steeper than 3 to 1 (horizontal to vertical).
- Construct a cap over Cell C as shown in the landfill closure plan (Polarconsult 2002; NOAA 2003a, 2004a).

In 2004, NOAA and its contractor conducted a feasibility study-level screening of remedial alternatives for the treatment of PCS staged in the short-term stockpile at Cell C and scheduled for removal from NOAA's sites under the TPA. As a result of the screening, NOAA narrowed the plausible alternatives to industrial landfilling on island, landspreading on island, and landfarming on island (Mitretek Systems, Inc. 2004, NOAA 2004b). NOAA subsequently proposed, and ADEC approved, using PCS as Landfill Cell C cover material and landspreading PCS at the NOAA National Weather Service (NWS) property located on Tract 41 approximately 0.5-mile northeast of the landfill (ADEC 2004a, 2004b, 2004c, 2004d; NOAA 2004a, 2004b, 2004c).

4.0 FIELD ACTIVITIES

The following subsections summarize the equipment used and the activities performed during closure activities at Cell C. Appendix A provides photographic documentation of closure activities. Appendix B provides copies of the daily reports as well as logbook notes generated during closure activities.

4.1 CONTRACTORS AND EQUIPMENT

Tetra Tech provided overall site management and engineering oversight, including the direction of closure activities during implementation of the CAP, excepting cap vegetation activities that were performed by NOAA. Tetra Tech subcontracted KRI and BSE to provide the personnel and equipment, including excavators and dump trucks, necessary to implement the closure requirements. NOAA also furnished several pieces of government-owned equipment for use during the corrective action. Health and safety meetings were conducted before the commencement of each day's activities. NOAA representatives provided survey support using real-time kinematic global positioning system (GPS) techniques and equipment.

Equipment used on site during field activities included the following:

- Caterpillar D3 Bulldozer (NOAA)
- Caterpillar D4 Bulldozer (KRI)
- Caterpillar D8 Bulldozer (KRI)
- Hitachi EX300 Excavator (KRI)
- Hitachi EX350 Excavator (KRI)
- Komatsu PC200 Excavator (KRI)
- Caterpillar 320BL Excavator (NOAA)
- Caterpillar 988 Loader (KRI)
- Michigan L70 Loader (BSE)
- Ingersoll Rand SP56D Compactor (KRI)
- Bell 25B 20-CY Dump Trucks (3) (KRI)
- Caterpillar 773 40-CY Dump Trucks (3) (KRI)
- Kenworth T800 12-CY Dump Trucks (2) (NOAA)
- International 12-CY Dump Truck (BSE)
- Kenworth 10-CY Dump Truck (BSE)
- New Holland LB115.B Backhoe (City of St. Paul)
- Thompson Seeder (NOAA)
- Trimble Total Station® 5700 GPS (NOAA)
- Trimble Total Station® 5700 GPS (NOAA)
- Laser Leveling System (KRI)
- Survey Transit (KRI)

4.2 MSW AND INERT DEBRIS ACTIVITIES

4.2.1 2003 Field Season

Between August and November 2003, landfill closure activities included the incorporation of approximately 13,560 CY of MSW from Cell B to inside the 50 ft setback line in Tract 42 (Figure 4-1). [Note: A summary of closure activities conducted at Cell A and Cell B has been provided in a closure report submitted under separate cover (Tetra Tech 2004b).] In addition, approximately 1,176 CY of MSW were removed from the area between the Tract 42 boundary and the 50 ft setback at the southeast corner of Tract 42, and incorporated inside the 50 ft setback line.

Upon placement, MSW was shaped and compacted in approximately 18-inch lifts using a bulldozer and vibratory compactor. MSW was initially placed in the southeast corner of Tract 42, inside the 50 ft setback line, and placement continued along the southern boundary of this area to the southwest corner as lifts were completed (Figure 4-1). When large objects, including concrete and boulders were encountered and could not be incorporated with MSW, they were segregated and staged to avoid interference with the removal and placement of MSW.

4.2.2 2004 Field Season

NOAA excavated two debris pits within Cell C in 2004 to accommodate solid wastes acquired during island cleanup operations. Debris Pit 1 was excavated in June 2004 within a sand dune area in the southwest corner of Cell C, and inside the 50 ft setback line (Figure 4-1). The excavated soil was sand without MSW that was set aside for use as cover material. Debris Pit 1 was initially filled with discarded fish net, used PCS stockpile plastic liner material from Tract 42, and other solid waste. The pit's upper half and another pit (Debris Pit 2; Figure 4-2)

were filled with an estimated 395 CY of debris excavated from the Lukanin Bay PCS site (TPA 12c; Tetra Tech 2005a). The City of St. Paul placed its Cell C burn box ash in the western portion of Tract 42, covering it with soil. This location is marked as "2004 MSW Disposal Area" on Figure 4-1.

The debris placed in the pits was covered with fill material, thereby incorporating the debris with existing Cell C MSW (Figures 4-1 and 4-2).

4.3 PCS STOCKPILING

Between June and November 2003, NOAA conducted corrective action activities at 13 sites and NOAA's previous short-term PCS stockpile at the Blubber Dump, which included the removal and relocation of approximately 23,397 CY of PCS. With ADEC approval, NOAA designated a portion of Cell C for the placement of a short-term, lined stockpile to contain PCS removed during these corrective actions (Figure 2-1). The designated area was graded, cleared of debris, and a liner was installed in July 2003. The liner footprint was approximately 60,000 square ft. Subsequently, NOAA transported PCS from each site to the Tract 42 stockpile. Figure 4-3 illustrates the topography of Tract 42 prior to and following MSW relocation and PCS stockpile activities. Figure 4-4 illustrates the topography of the Cell C after MSW removed from TPA sites in 2003 had been relocated into Tract 42 and the PCS stockpile had reached nearly its maximum size. Figure 4-5 illustrates the topography of Tract 42 in October 2004 after the remaining PCS had been used as the final cover material. These activities are discussed in greater detail below. A summary of stockpile activities conducted during the 2003 field season has been provided under separate cover (Tetra Tech 2004a).

Between June and October 2004, NOAA transported an additional 4,471 CY of PCS to Tract 42 for stockpiling following corrective actions at four sites, and additional cleanup at the Blubber Dump PCS stockpile.

In 2004, NOAA relocated an estimated total of 2,601 CY of PCS from the Tract 42 stockpile to NOAA's National Weather Service (NWS) landspreading site (Figure 1-2). The change in PCS at Tract 42 during 2004 was a net increase of 1,870 CY (+4,471 CY – 2,601 CY = 1,870 CY). At the end of stockpile activities, there were an estimated 25,267 CY of PCS at Tract 42 (Appendix D).

4.4 LANDFILL CAPPING

During the 2004 field season NOAA used the Cell C short-term stockpile material to cap the Tract 42 Cell C landfill, as approved by ADEC (ADEC 2004b, 2004d). The capping soil was contoured, leveled, and graded over the landfill ensuring a minimum 2 ft cover over the MSW. In accordance with regulatory requirements, the side slopes were graded to no steeper than 3 to 1 (horizontal to vertical) and the top of Cell C was graded to a slope of no less than 100 to 1 to ensure proper drainage of potential surface water runoff. Along the eastern edge of Cell C, final cover material abutted the existing sand dunes. Figure 4-5 illustrates the topography of Cell C following completion of closure activities. Appendix C provides examples of the slope measurements and calculations. Following final cover placement activities, Tetra Tech placed large boulders along the perimeter of Cell C to restrict vehicle access.

In June 2005 NOAA completed landfill closure activities. NOAA repaired several cap locations impacted by winter erosion and the lack of vegetative cover during the 2004/2005 winter. NOAA punctured the former short-term PCS stockpile liner in several locations to mitigate future erosion risk posed by surface water pooling and runoff. Finally, NOAA broadcast seed and fertilizer to initiate a vegetative cover throughout the closure area consistent with the landfill closure plan (Polarconsult 2002; NOAA 2003a, 2004a), and placed erosion control matting along the side slopes of the cap to aid with erosion protection until the vegetative cover matures. The seed consisted of beach wild rye at a rate of 12 pounds (lbs) per acre, and a mixture of boreal red fescue and Bering hair grass applied at a rate of 28 lbs per acre. Fertilizer was applied at the rate of 400 lbs per acre. After application of all seed and fertilizer, a 10-ft long by 8-ft wide piece of chain link fence attached to an 8-foot length of pipe was dragged over the surface to bury the seed.

4.5 INVESTIGATION-DERIVED WASTE MANAGEMENT

No investigation-derived waste was generated during the 2003 and 2004 closure activities at Cell C.

4.6 SITE SURVEYING

Elevations, benchmarks, excavation extents, boundaries, and side slopes were surveyed by NOAA representatives using a survey-grade Trimble Total Station® 5700 differential GPS. The Trimble Total Station® 5700 is a GPS and GIS data collection and mapping system that combines a high-performance, dual-channel GPS receiver and antenna with a local base station and real-time differential correction system to provide survey-grade accuracy in real time. Horizontal positions of locations and excavation boundaries were determined to within approximately plus or minus 1 centimeter (cm), and elevations were determined to within approximately plus or minus 2 cm. A repeater radio was placed atop Diamond Hill, approximately 1 mile west of the landfill, to provide radio transmission from the base station to the site location. Data were collected in latitude and longitude referenced to the World Geodetic System 84 Datum, Universal Transverse Mercator Zone 2 coordinate system in meters.

5.0 ANALYTICAL SAMPLING AND ANALYSIS

During the 2003 and 2004 field seasons, Tetra Tech collected representative analytical samples from the PCS stockpiled on Tract 42. The PCS came from excavations at NOAA corrective action sites in accordance with the CAPs for each site. Stockpile samples were collected according to 18 AAC 78 (ADEC 2003d), and the ADEC underground storage tank (UST) procedures manual (ADEC 2002a).

Details regarding the numbers of samples collected and their results are included in Appendix D of this closure report in the context of determining the average contaminant concentrations for PCS used for landfill closure cover material. Details regarding the sample collection and analytical methods, as well as, evaluations of data usability associated with each corrective action have been provided in the corrective action reports submitted under separate cover for each respective site (Tetra Tech 2004c, 2005a, 2005c, 2005d).

6.0 CONCEPTUAL SITE MODEL

A conceptual site model (CSM) is used to evaluate exposure pathways for human health and ecological receptors (ADEC 2000). The following subsections provide an evaluation for each of the elements of the CSM for Cell C, including historical contamination sources, release mechanisms, impacted media, migration pathways, exposure routes, potential receptors, and a cumulative risk assessment.

6.1 HISTORICAL SOURCES OF CONTAMINATION

The site served as an intermittent MSW landfill for approximately sixty years, with the City of St. Paul beginning exclusive use of Tract 42 for MSW disposal in the early/mid 1990s. The landfill cell operated without a State of Alaska permit, and neither the federal government nor the City of St. Paul kept records of disposal practices. The landfill potentially contains numerous items that could contribute to soil, air, and groundwater contamination. The only recorded removal of potential contaminant sources are for two drums containing petroleum products, as detailed in Section 2.4. By the end of the 2004 field season an estimated 25,267 CY of PCS was stockpiled at Tract 42 and subsequently used to construct the soil closure cap atop Cell C MSW. Groundwater monitoring results downgradient of Cell C indicated the presence of lead above its ADEC Table C cleanup level in one well during one monitoring round (Tetra Tech 2005b).

6.2 RELEASE MECHANISMS

Potential release mechanisms from the MSW and PCS cap include dissolution by precipitation percolating through the soils, volatilization, and dispersal of particulates by winds. Lead in a single groundwater sample from monitoring well MWSNPLF-1 suggests a potential release from the MSW through percolation of precipitation through the MSW and leachate entering site groundwater.

6.3 IMPACTED MEDIA

Cell C surface soil consists of an estimated 25,267 CY of PCS. No soil sampling took place below the MSW, but presumably the soils are impacted by MSW. The presence of lead above its ADEC Table C cleanup level in groundwater downgradient from Cell C during one sampling round suggests that groundwater at the site could potentially become an impacted medium (Tetra Tech 2005b).

6.4 MIGRATION PATHWAYS

Migration pathways include vertical migration of contamination through the soil vadose zone and lateral migration in groundwater. Climatic conditions on St. Paul Island including moderate rainfall and a high infiltration to precipitation ratio could allow vertical migration of contaminants through the vadose zone to the upper aquifer. The presence of a layer of sandy silt and clay that is classified as undifferentiated mud may act as a confining layer limiting vertical migration of contaminants to the lower aquifer.

Overland transport is not a likely migration pathway because of the high permeability of soil and the low intensity of rainfall typical for St. Paul Island. Although PCS is present at Cell C, the permeable soil is more conducive to vertical migration than overland transport. However, any vertical migration would be expected to occur slowly because of the low solubility of contaminants of concern, primarily petroleum related compounds.

6.5 EXPOSURE ROUTES

Direct exposure routes include dermal contact with or ingestion of MSW or contaminated soils. Direct exposure to MSW is unlikely because it is covered by at least two feet of soil. Direct exposure to PCS is limited because Cell C is located on Tract 42, which is owned by the federal government and closed to the public. In addition, access to Cell C has been restricted by the placement of large boulders along the perimeter.

Indirect exposure routes include inhalation of contaminated soil particles or vapors and ingestion of potentially contaminated groundwater. Inhalation of contaminated soil particles or vapors is unlikely because Cell C is located on Tract 42, which is owned by the federal government and closed to the public. Volatilization of the petroleum will occur over time, which is an intended consequence of spreading the PCS out as cover material at Cell C, although the low volatility of contaminants present at Cell C limits inhalation of contaminant vapors. Through volatilization, the cover soil will become less contaminated over time. Ingestion of potentially contaminated groundwater is unlikely because no potable water wells are located in the vicinity of Cell C. In addition, groundwater beneath Cell C generally flows to the south-southeast toward the Bering Sea and away from the City of St. Paul's water supply wells.

6.6 POTENTIAL RECEPTORS

Because Cell C is located on Tract 42, which is owned by the federal government and closed to the public, humans are unlikely receptors. Potential ecological receptors include plants, shrews, foxes, and birds.

6.7 RISK ASSESSMENT

ADEC performed a risk assessment to determine whether placement of PCS in a landspreading operation would be protective of human health and the environment. ADEC concluded the PCS would not pose unacceptable risk to human health or the environment (ADEC 2004a). Key assumptions made in the landspreading risk evaluation

are shared with the use of PCS as cover material for Cell C. ADEC approved both landspreading of PCS at the NWS landspreading area and using PCS as Cell C cover material (ADEC 2004b, 2004c, 2004d).

7.0 CONCLUSIONS AND RECOMMENDATIONS

The following subsections present conclusions and recommendations for Cell C based on field activities performed and analytical findings obtained from corrective action activities conducted during the 2003, 2004, and 2005 field seasons.

7.1 CONCLUSIONS

Closure activities at Cell C during 2003 and 2004 included the removal and relocation of approximately 14,736 CY of MSW from Cell A, Cell B, and Tract 42 outside the 50 ft setback line to within the 50 ft setback line of Tract 42 (Figure 4-2). This MSW was leveled and compacted in the southern portion of Cell C. NOAA stockpiled an estimated 25,267 CY of PCS in an ADEC-permitted short-term stockpile within Tract 42, including Cell C during 2003 and 2004. Subsequently, ADEC approved NOAA's request to utilize the stockpiled PCS as final cover material for landfill closure. The landfill cap utilized an estimated 25,267 CY of PCS. Tetra Tech leveled and graded the PCS over the entire landfill to ensure a minimum thickness of 2 ft of cover. In accordance with regulatory requirements, the landfill top was graded to a slope of no less than 100 to 1 while the sides were graded to a slope of 3 to 1 or less. NOAA initiated a vegetative cover for the soil cap in 2005 using native grass seeds and fertilizer, with erosion-control matting along the side slopes.

7.2 RECOMMENDATIONS

Because closure of Cell C has been completed in accordance with regulatory requirements, NOAA requests acceptance of the Cell C closure by the ADEC's Division of Environmental Health, Solid Waste Program and the initiation of post-closure monitoring consistent with 18 AAC 60. NOAA also requests a conditional closure determination for no further remedial action planned from the ADEC's Division of Spill Prevention & Response, Contaminated Sites Program consistent with the TPA.

Consistent with Appendix E, NOAA proposes post-closure monitoring to include groundwater sampling in the vicinity of the St. Paul Landfill and periodic inspections of the Cell C cover over a five-year period. Monitoring wells remaining in the vicinity of the St. Paul Landfill include MWSNPLF-1, MWSNPLF-9, MWSNPLF-10, MWSNPLF-11, MWSNPLF-12, MWSNPLF-13, HC-4, and HC-5 (Figure 2-1). NOAA also proposes recording a deed notice regarding the closed MSW landfill and the use of PCS for its cap.

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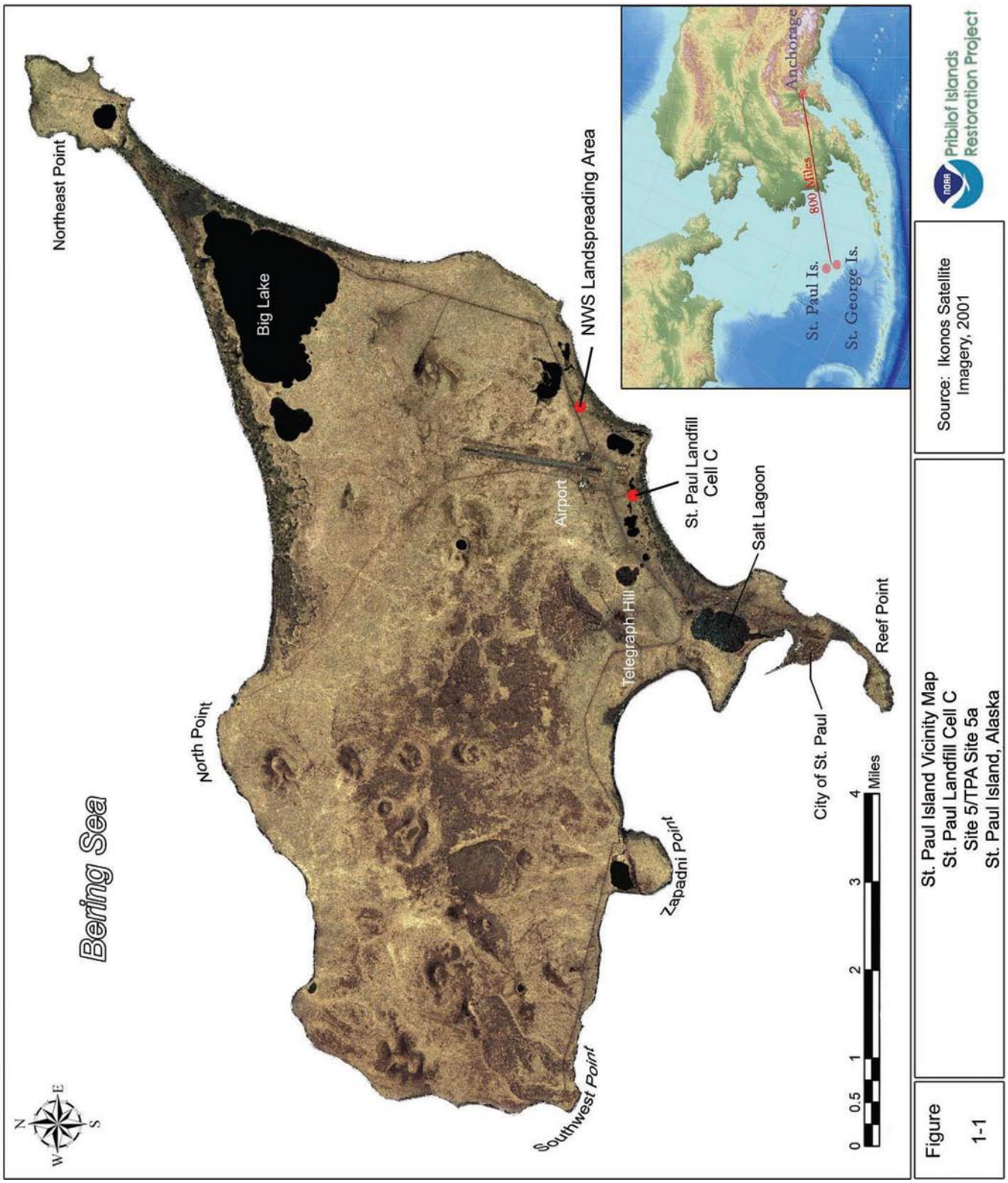
FIGURES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Bering Sea
North Point
Airport
St. Paul Landfill
Cell C
Salt Lagoon
Telegraph Hill
Reef Point
City of St. Paul
Zapadni Point
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Restoration Project
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St. Paul Landfill Cell C
Site 5/TPA Site 5a
St. Paul Island, Alaska

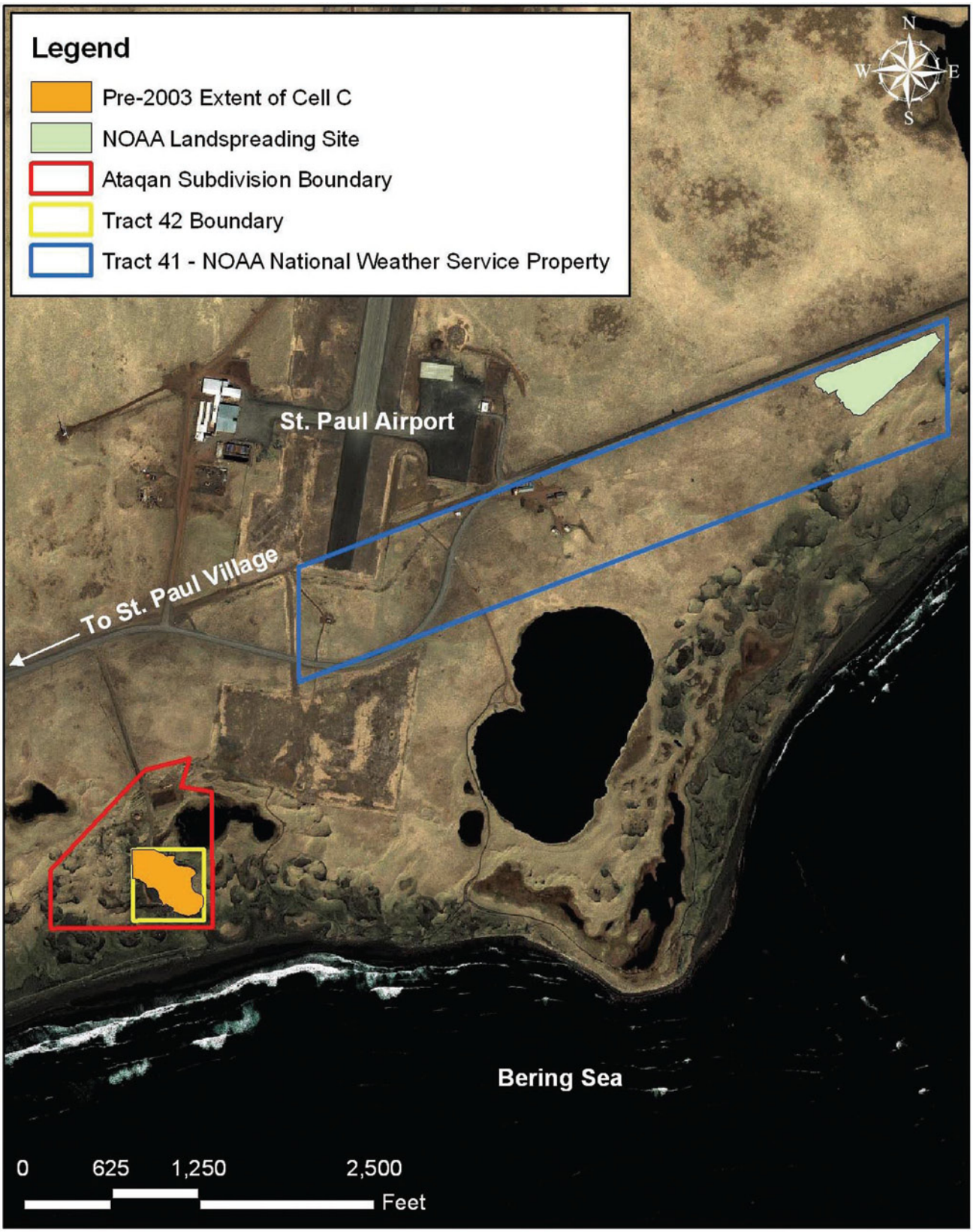

Figure 1-2	Site Location Map St. Paul Landfill Cell C Site 5/TPA Site 5a St. Paul Island, Alaska	Sources: GIS Data (NOAA Pribilof Project Office 2004), Satellite Imagery (Ikonos 2001).

Pribilof Islands Restoration Project

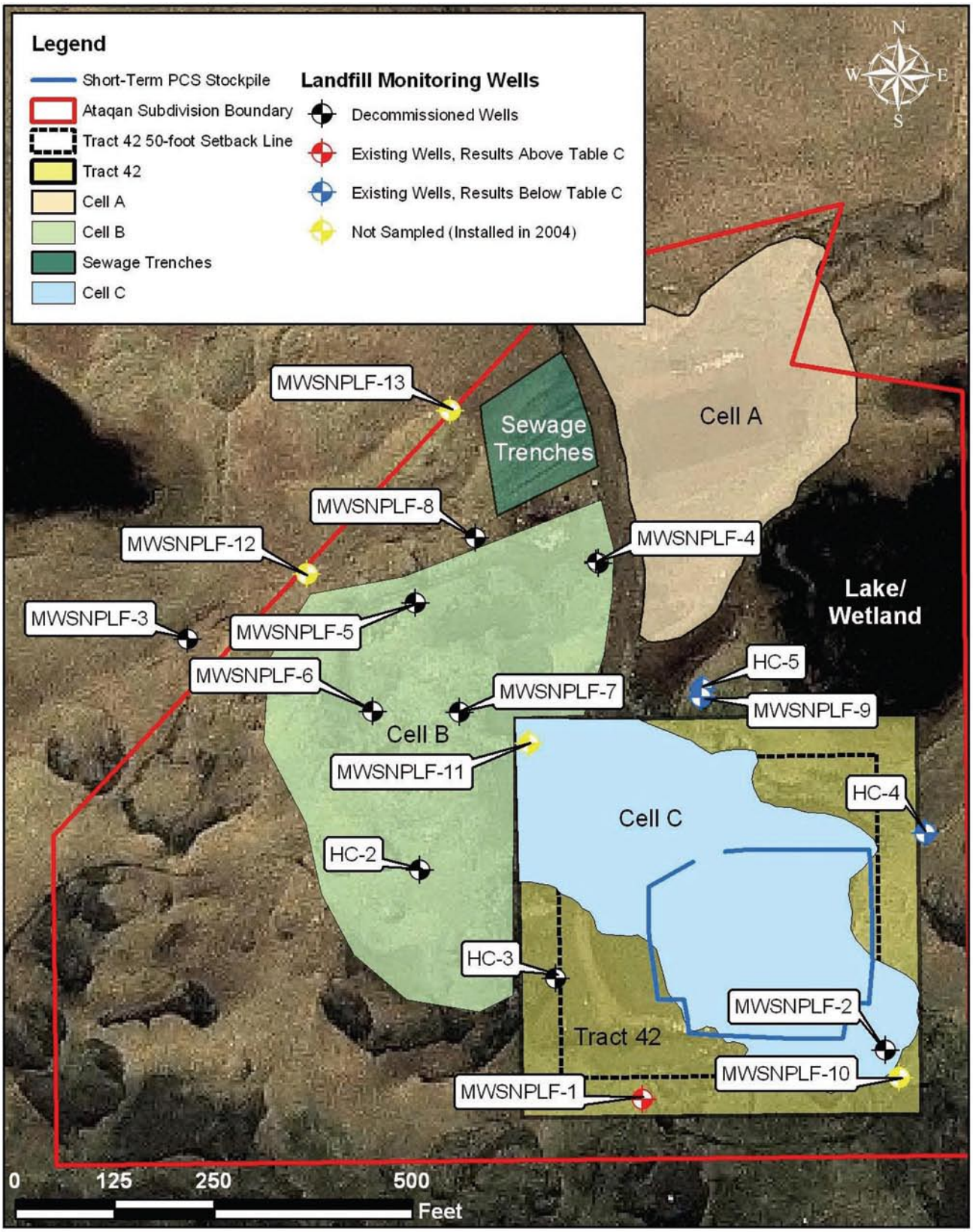

Figure 2-1	Pre-Closure Site Layout St. Paul Landfill Cell C Sites 5/TPA Site 5a St. Paul Island, Alaska	Sources: PCS Stockpile Location, Tract 42 Setback, and Tract 42 Boundary (NOAA GPS 2003), Ataqan Subdivision and Cell Boundaries, MSW Location (NOAA GIS 2005), Satellite Imagery (Ikonos 2001).

Pribilof Islands Restoration Project

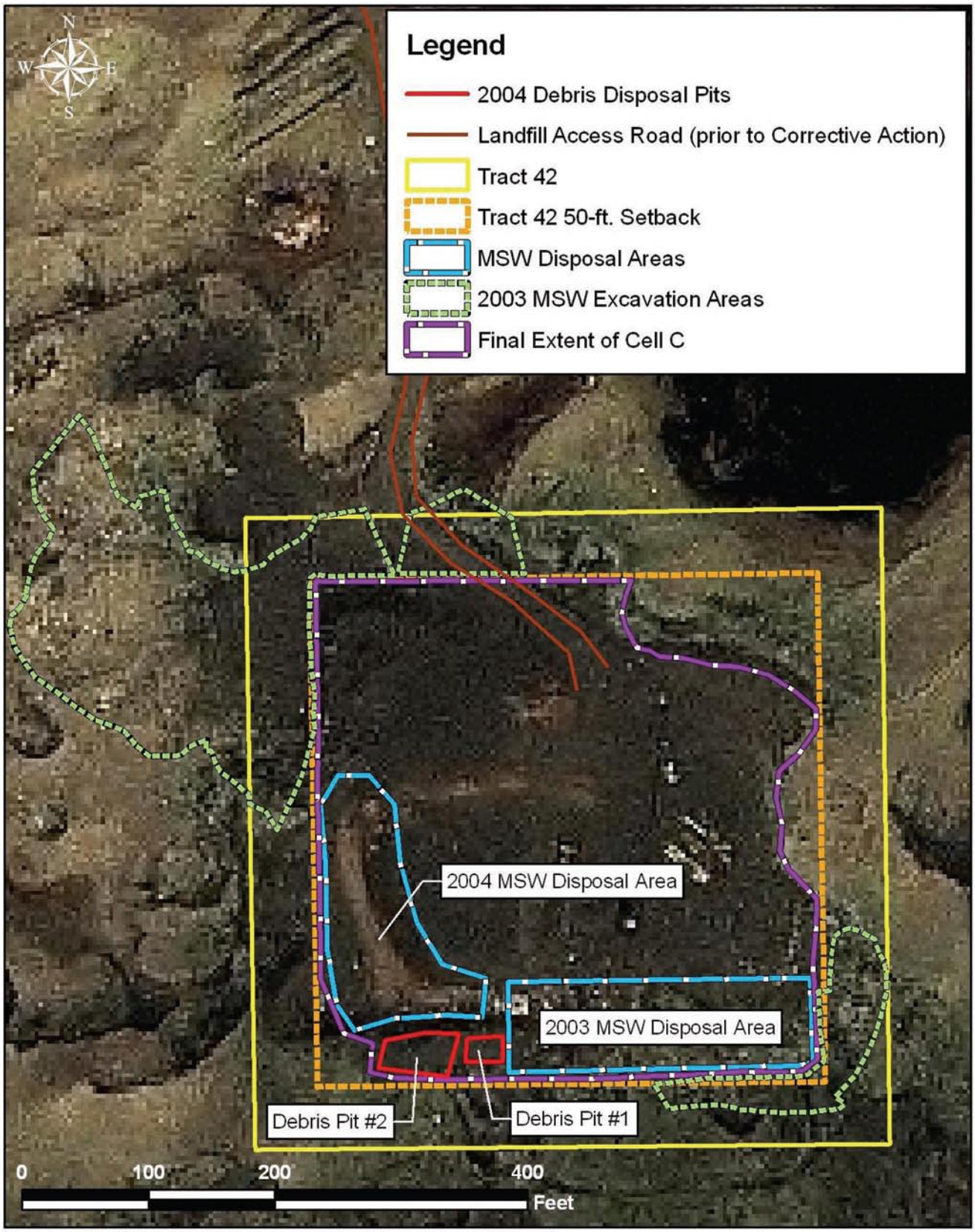

Figure 4-1	St. Paul Landfill Cell C Final Locations of Municipal Solid Waste (October 2004) St. Paul Landfill Cell C Site 5/TPA Site 5a St. Paul Island, Alaska	Sources: NOAA Pribilof Project GIS/GPS (2005), Satellite Imagery (Ikonos 2001).

Pribilof Islands Restoration Project

Figure 4-2	St. Paul Landfill Cell C Final Closure (October 2004) St. Paul Landfill Cell C Site 5/TPA Site 5a St. Paul Island, Alaska	Sources: NOAA Pribilof Project GIS/GPS (2005), Satellite Imagery (Ikonos 2001).

Pribilof Islands Restoration Project

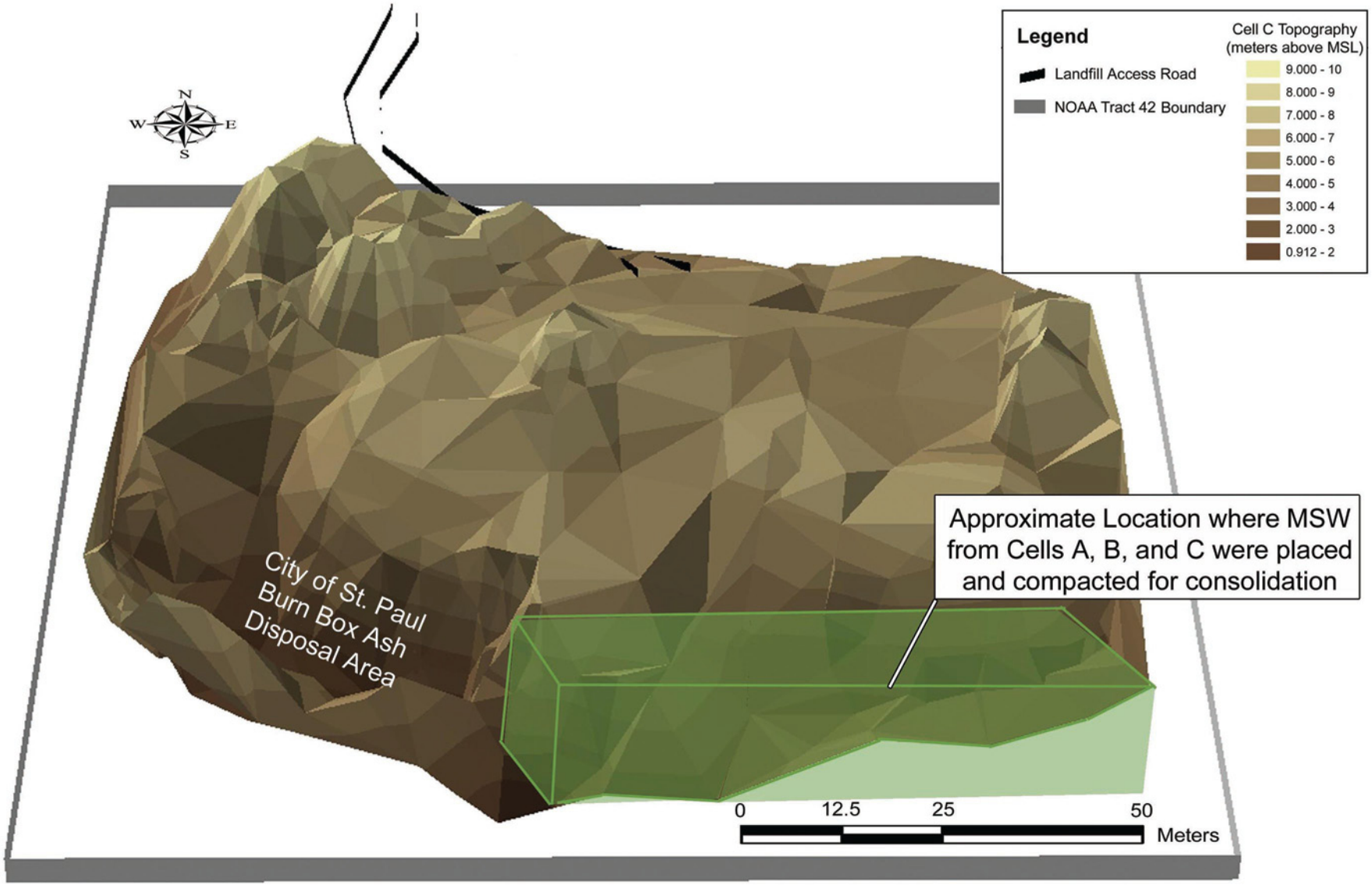

Figure 4-3	St. Paul Landfill Cell C Pre-Closure Topography (July 2003) Site 5/TPA Site 5a St. Paul Island, Alaska	Source: NOAA Pribilof Project GPS.

Pribilof Islands Restoration Project

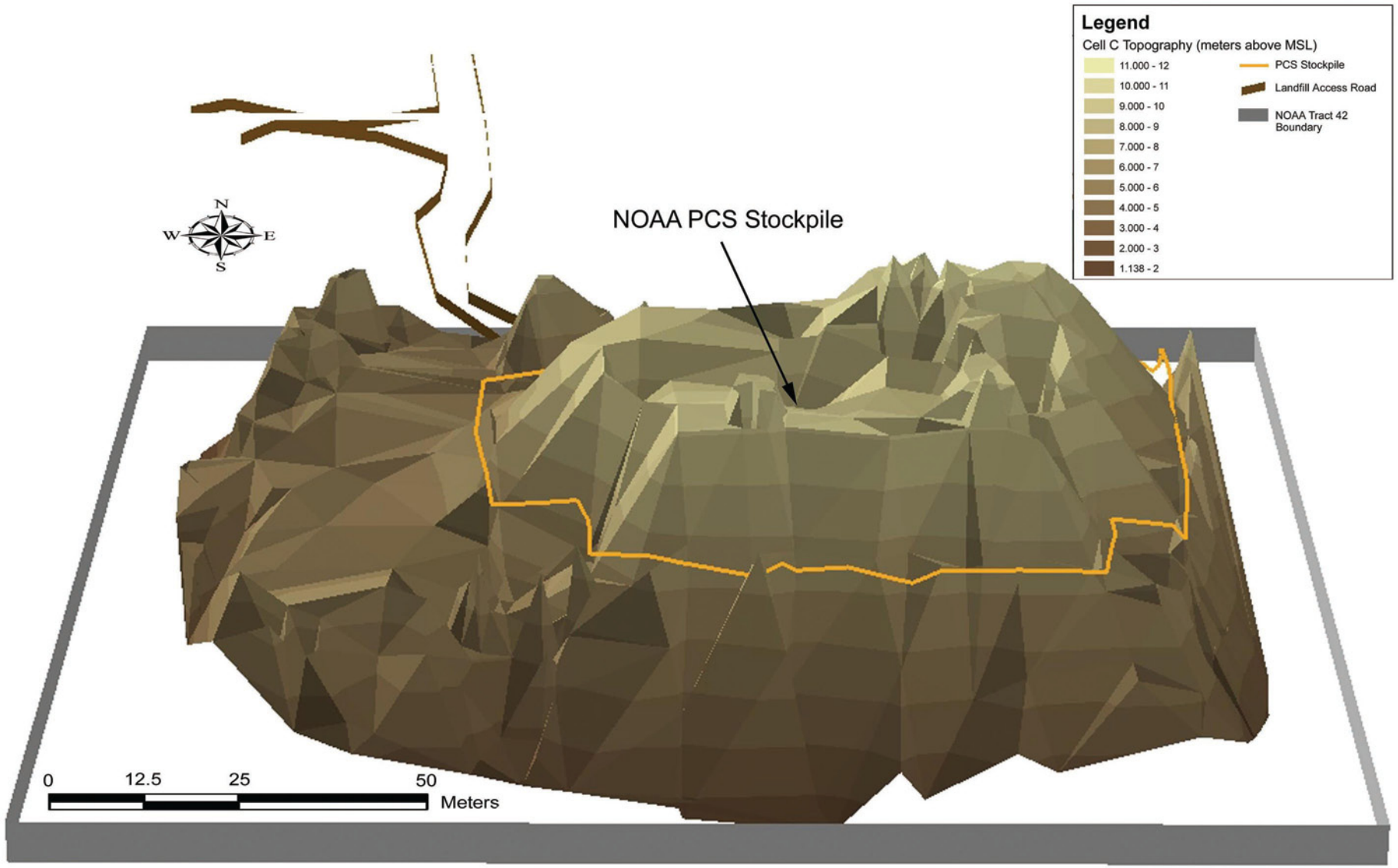

Figure 4-4	St. Paul Landfill Cell C Mid-Closure Topography (November 2003) Site 5/TPA Site 5a St. Paul Island, Alaska	Source: NOAA Pribilof Project GPS.

Pribilof Islands Restoration Project

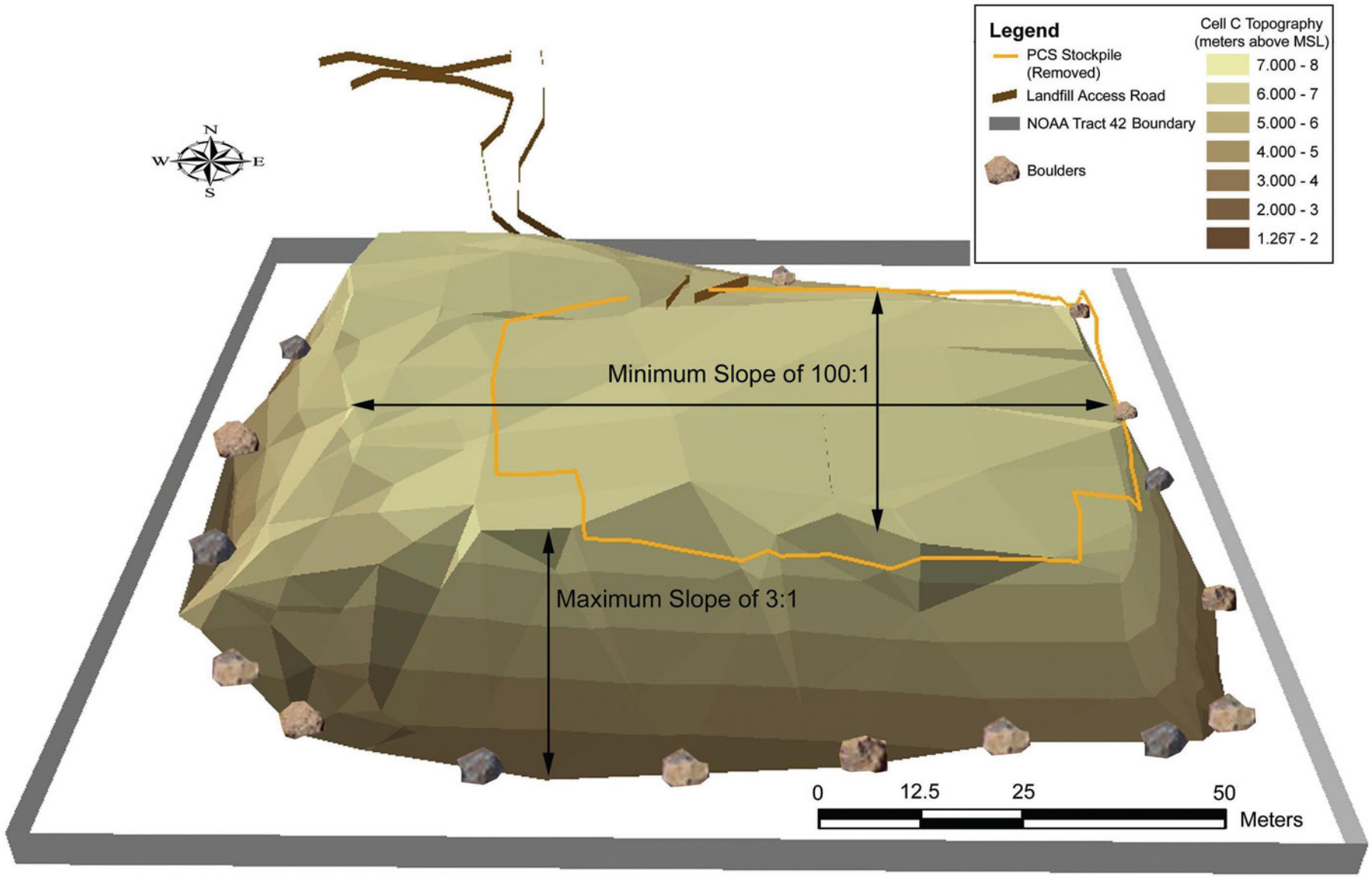

Figure 4-5	St. Paul Landfill Cell C Closure Final Topography (October 2004) Site 5/TPA Site 5a St. Paul Island, Alaska	Source: NOAA Pribilof Project GPS.

Pribilof Islands Restoration Project

APPENDIX C: SLOPE CALCULATIONS

SLOPE CALCULATIONS
ST. PAUL LANDFILL
ST. PAUL ISLAND, ALASKA

ST. PAUL LANDFILL CELL C (Site 5/TPA Site 5a)			
Measurement Location [a]	**Horizontal Change** [b] **(feet)**	**Vertical Change** [b] **(feet)**	**Calculated Slope** [c]
North Side	58.01	12.64	4.6 to 1
East Side	48.25	14.61	3.3 to 1
South Side	63.35	15.62	4.1 to 1
West Side	59.42	10.43	5.7 to 1
Top	181.04	1.92	94.3 to 1

a Measurements shown in this table are a representative sampling of the steepest cross section from each side of Cell C.
b Measurements of the horizontal and vertical change was obtained from Trimble Total Station 5700 GPS®.
c Slope was calculated by dividing the vertical change into the horizontal change.

APPENDIX D: PCS VOLUMES AND CONTAMINANT CONCENTRATION ASSESSMENT FOR LANDFILL CELL C CLOSURE CAP AND NWS LANDSPREADING AREA ST. PAUL ISLAND, ALASKA

D1.0 Background

The total amount of PCS within the Landfill Cell C cap and at the NWS landspreading area is 35,965 CY. NOAA used an estimated 25,267 cubic yards (CY) of this petroleum-contaminated soil (PCS) as cap material for closing St. Paul Landfill Cell C. NOAA also placed an estimated 10,698 CY of this PCS at its National Weather Service (NWS) landspreading area, with 9,801 CY originating from the same PCS sources as those supplying PCS for the Cell C closure cap and an estimated 897 CY of this PCS originating from different sources than the Cell C closure cap.

NOAA collected representative characterization samples for the PCS to determine the contaminant levels for disposal method selection. This appendix summarizes the volumetric movement of excavated PCS from their contaminated sites and stockpiles to the final locations of PCS and describes the approach used to calculate the average contaminant concentrations for PCS used in the Cell C closure cap as well as PCS placed at the NWS landspreading area.

D2.0 PCS Volumes

This section provides data for PCS excavated in 2003 and 2004, and the movement of the PCS to its final disposal sites in 2004.

D2.1 2003 CORRECTIVE ACTION ACTIVITIES

Tetra Tech EM Inc. (Tetra Tech) performed corrective action implementation and reporting for NOAA in 2003. Table D2-1 summarizes the quantity of PCS removed from each 2003 site and its location at the end of the 2003 field season.

D2.2 2004 CORRECTIVE ACTION ACTIVITIES

Tetra Tech performed corrective action implementation and reporting for NOAA in 2004. Table D2-2 summarizes the quantity of PCS removed from each 2004 corrective action site.

D2.3 2004 PCS DISPOSAL ACTIVITIES

Tetra Tech disposed of all NOAA PCS described in D2.1 and D2.2 above at either the NOAA NWS landspreading area or as Landfill Cell C closure cap material. At the beginning of the 2004 field season, there was an estimated 23,397 CY of PCS stored in NOAA's short-term stockpile atop Landfill Cell C during 2003. Tetra Tech removed an estimated 575 CY of PCS from the Tract 50 Foundation PCS site in June 2004, placing the material directly on top of the landfill surface, adjacent to the western edge of the short-term PCS stockpile at Landfill Cell C as approved by the Alaska Department of Environmental Conservation ([ADEC] 2004a). PCS removed from the Diesel Seep, Lukanin Bay, Icehouse Lake, and the Blubber Dump sites in June and July 2004 was placed in the Landfill Cell C short-term stockpile.

NOAA completed site preparation work for the ADEC-approved landspreading area at the NWS station in mid-August 2004 (ADEC 2004b; NOAA 2004c). During June and July 2004, PCS removed from the Diesel Seep in August, September, and October 2004 was placed at both the landspreading area and Landfill Cell C as this PCS consisted of poorly-graded sands and was excellent landfill closure cap material. All PCS excavated from the Cascade Building in 2004 was placed at the NWS station landspreading area. In August and September 2004, Tetra Tech sorted large rocks from the PCS atop Landfill Cell C, as these rocks were not suitable for placement at the landspreading area should NOAA subsequently choose to plow this soil to enhance contaminant remediation. Some of the sorted PCS was transported from Landfill Cell C to the landspreading area after rock sorting. Later, some PCS was transported to Landfill Cell C from the landspreading area in order to ensure cap thickness and slope requirements per the landfill closure design. Table D2-3 summarizes the hauling of PCS in 2004.

D3.0 Previous PCS Concentration Reporting

This section summarizes NOAA's estimations of contaminant concentrations in the PCS as the corrective actions were completed.

D3.1 2004 TETRA TECH REPORTING

Tetra Tech performed corrective action implementation and reporting for NOAA in 2003 and 2004. Tetra Tech prepared a PCS stockpile characterization technical memorandum to document the characterization of PCS in NOAA's short-term PCS stockpile atop Landfill Cell C at the end of the 2003 field season (Tetra Tech 2004). Tetra Tech calculated the contaminant concentrations for the stockpile using a weighted average based on the concentration from each PCS source (in other words, each PCS corrective action or an existing PCS stockpile such as the former Blubber Dump PCS stockpile). Tetra Tech's results are summarized in Table D3-1.

An evaluation of Tetra Tech's weighted average approach is worthy of scrutiny for the following reasons:

PCS stockpile characterization samples were inadvertently not collected from several sites during 2003 corrective actions, with an estimated 1,760 CY of PCS or 8 percent of the total 2003 PCS volume. NOAA assumed that the weighted concentration of the other 92 percent of PCS represents the 8 percent that was not sampled.

The stockpile sampling results presented for the Blubber Dump's 5,571 CY of PCS were for samples collected in 1999. As described in NOAA's 2002 Enhanced Thermal Conduction operations report for treating soil on St. Paul Island (NOAA 2005), the soil represented by the 1999 samples had largely been treated by the end of 2002. Therefore, much of the 5,571 CY of PCS moved from the Blubber Dump to Tract 42 in 2003 had been added to the Blubber Dump stockpile after 2002 and my not be represented by the 1999 samples. Additionally, the 5,571 CY of PCS removed from the Blubber Dump in 2003 includes an estimated 700 CY of PCS removed from beneath the Blubber Dump PCS stockpile liner with no collection of stockpile samples.

The average concentration of all the PCS excavated may be statistically biased because NOAA used different approaches for determining the number of stockpile samples collected for each site's PCS. Sites excavated prior to mid-2003 normally used a removed-PCS sampling frequency of two samples for the first 50 CY removed, then one sample for each additional 50 CY removed. Samples were normally collected at random from the PCS stockpile generated after removal activities ceased for the specific site. After mid-2003 NOAA switched, with regulator approval, to a sliding scale that generally decreased the frequency of sample collection to once every 500 CY after a total of 500 CY was removed from a site. Additionally, NOAA switched from collecting the total calculated number of samples for a site from its final stockpile location to collecting samples directly from the excavator bucket during dump truck loading.

Nevertheless, all the PCS stockpile samples were collected in compliance with ADEC regulations. Although combining all these stockpile samples to calculate the average PCS concentration may introduce some bias toward sites excavated in 2003, it is unlikely that this significantly affects the overall average contaminant concentrations calculated because the nature of all the sites that have been excavated to date and the methods used to determine how much soil to excavate at each site has been consistent.

D3.2 2004 NOAA SESOIL MODELING

NOAA prepared a chemical fate and transport model in support of decision-making for selecting a PCS disposal alternative for St. Paul Island PCS. NOAA input unweighted, average contaminant concentrations for PCS in its short-term PCS stockpile at the end of the 2003 field season (NOAA 2004b). NOAA considered the average of all the characterization sample results collected from the soil in the stockpile more representative than the weighting approach (see D3.1 above), assuming the PCS sites were similar in nature such that approximately 80 samples collected at random "locations" from a PCS stockpile would adequately represent the heterogeneity of the PCS. NOAA calculated the average concentrations for PCS contaminants of concern for soil stockpiled at the end of the 2003 field season as shown in Table D3-2. Note that the unweighted average DRO concentration calculated by NOAA (1,665 mg/kg) is significantly lower than the weighted average DRO concentration calculated by Tetra Tech (2,869 mg/kg).

NOAA erroneously included seven field duplicate sample results and two characterization results for material eventually disposed off-island in the 2004 calculations, causing additional error in the average calculations. NOAA's 2004 SESOIL modeling effort had shown that DRO was the one constituent with a potential to cause contamination in groundwater near the ADEC groundwater cleanup level (under 18 AAC 75.345 Table C) if the PCS DRO level was assumed to be near that estimated as described above using a non-weighted approach. The SESOIL model run assuming the DRO concentration was 1,665 mg/kg resulted in a predicted a maximum groundwater DRO concentration of 0.50 milligrams per liter (mg/l). The model predicted that this level would be reached in approximately 26 years. The Tetra Tech weighted average concentration of 2,869 mg/kg DRO is significantly higher than the original NOAA DRO soil concentration estimate.

Because of this, NOAA re-ran the SESOIL model to determine whether the increase in DRO might cause the SESOIL model to predict that groundwater at the site may exceed the ADEC groundwater cleanup level of 1.5 mg/kg. However, NOAA had also collected soil samples from the NWS landspreading site in 2004 to measure the actual total organic carbon (TOC) concentration, after the completion of the initial Sesoil modeling effort. These soil samples showed that the TOC concentration of the soil at the site (1.4%) as shown in Table D3-3 was much higher than the TOC concentration assumed in the first Sesoil modeling effort (.1 %). TOC is an important parameter governing transport of organic contaminants in soil because higher organic carbon in soil tends to absorb the organic contaminants and retard their migration. The result of the SESOIL modeling re-run using both the higher DRO concentration of 2,869 mg/kg and the higher TOC concentration of 1.4% was that the highest expected DRO concentration in groundwater would only be 3.7×10^{-5} mg/l. The model predicted that this level would be reached in approximately 195 years. Therefore, according to the SESOIL model, the migration of DRO is so sensitive to TOC that an increase of about one order of magnitude in TOC concentration from 0.1% to 1.4% causes a four order of magnitude decrease in predicted DRO concentration at this site.

D4.0 PCS Concentration Evaluation and Calculation Approaches

The average concentration for the 25,267 CY of PCS used in the St. Paul Landfill Cell C closure cap was calculated with the initial 9,801 CY of PCS placed at the NWS Landspreading Area since the PCS came from the same sources. The calculation approach used for this Landfill/Initial Landspreading PCS was the same as that used in 2004 by NOAA, as described in D3.2 above, except field duplicate results and results for waste disposed off-island were excluded. These average concentrations are shown in Table D4-1.

NOAA subsequently calculated the average concentration of the additional 897 CY of PCS placed at the NWS Landspreading Area, as shown in Table D4-2.

D5.0 Results

The average contaminant concentrations for PCS used for the Landfill Cell C closure cap are summarized in Table D5-1. The average contaminant concentrations for PCS placed at the NWS landspreading area can be approximated by a weighted average of the Landfill/Initial Landspreading PCS and the additional Landspreading PCS concentrations, with the Landspreading Area containing an estimated 9,801 CY and an estimated 897 CY, respectively.

D6.0 References

Alaska Department of Environmental Conservation (ADEC). 2004a. Verbal communication between Louis Howard of ADEC and John Lindsay of the National Oceanic and Atmospheric Administration (NOAA) regarding ADEC approval for stockpiling petroleum-contaminated soil from the Tract 50 Foundation PCS site on bare ground along the western side of Landfill Cell C. June 20.

ADEC. 2004b. *St. Paul Island Risk Evaluation, Petroleum-Contaminated Soils*. June.

National Oceanic and Atmospheric Administration (NOAA). 2004a. *Operations Work Plan, Petroleum Contaminated Soil Remediation by Landspreading*. St. Paul Island, Alaska. June 23.

NOAA. 2004b. *Addendum 2, Landfill Closure Plan, St. Paul Landfill*. St. Paul Island, Alaska. August 25.

NOAA. 2005. *Draft Project Report for 2002 Petroleum-Contaminated Soil Remediation*. St. Paul Island, Alaska. February 8.

Tetra Tech EM Inc. 2004. *Letter Report, Summary of 2003 Field Season Stockpile Activities, St. Paul Island, Alaska*. July 23.

Table D2-1: Summary of 2003 Corrective Action PCS Volumes

Corrective Action Site	**PCS Removed (cubic yards)**	**Location at End of 2003 Field Season**
Sites 6, 7/TPA Sites 5b, 5c - St. Paul Landfill	1,426	Lanfill Cell C Short-Term PCS Stock
Site 19/TPA Site 9d - West Dock Fuel Transfer Facility	250	Lanfill Cell C Short-Term PCS Stock
Site 20/TPA Site 9e - Municipal Garage/Machine Shop	2,805	Lanfill Cell C Short-Term PCS Stock
Site 21/TPA Site 9f - Cascade Building (2003)	3,510	Lanfill Cell C Short-Term PCS Stock
Site 22/TPA Site 9g - Former Fouke Bunkhouse	155	Lanfill Cell C Short-Term PCS Stock
Site 24/TPA Site 9i - Duplex Building and Former E-Shop	160	Lanfill Cell C Short-Term PCS Stock
Site 25/TPA Site 9j - Five Car Garage and Anderson Building	80	Lanfill Cell C Short-Term PCS Stock
Site 26/TPA Site 9k - AST Saddles Complex	1,370	Lanfill Cell C Short-Term PCS Stock
Site 27/TPA Site 9l - Old Sealing Plant	10	Lanfill Cell C Short-Term PCS Stock
Site 54 /TPA Site 9r - Tract A House 102	50	Lanfill Cell C Short-Term PCS Stock
Site 30/TPA Site 11 - Former Diesel Tank Farm	6,550	Lanfill Cell C Short-Term PCS Stock
Site 47 - Blubber Dump	5,571	Lanfill Cell C Short-Term PCS Stock
Site 50/TPA Site 9o - Former Gasoline/Diesel Drum Storage Area	1,160	Lanfill Cell C Short-Term PCS Stock
Site 51/TPA Site 9p - Decomissioned Power Plant Annex	300	Lanfill Cell C Short-Term PCS Stock
TOTAL	23,397	

Table D2-2: Summary of 2004 Corrective Action PCS Volumes

Corrective Action Site	**PCS Removed (cubic yards)**
Site 33/TPA Site 12c - Lukanin Bay PCS Site	1,778
Sites 34 &35/TPA Site 13a & 13b - Diesel Seep	9,234
Site 58/NTPA - Tract 50 Foundation PCS (June 2004)	575
Site 36/TPA Site 14 - Icehouse Lake	72
Site 47 - Blubber Dump (2004)	12
Site 21/TPA Site 9f - Cascade Building Interior (2004)	145
Site 58/NTPA - Tract 50 Foundation PCS (October 2004)	752
TOTAL	12,568

Table D2-3: Summary of 2004 Final Relocation of PCS

From Site	To Landfill Cell C Closure (cubic yards)	To NWS Landspreading Area (cubic yards)	Total PCS Cubic yards
Existing PCS Volume at End of 2003 in Tract 42 PCS Stockpile	23,397	0	23,397
Sites 34 & 35/TPA Site 13a & 13b - Diesel Seep	2,034	7,200	9,234
Site 47 - Blubber Dump (2004)	12	0	12
Site 36/TPA Site 14 - Icehouse Lake	72	0	72
Site 33/TPA Site 12c - Lukanin Bay PCS Site	1,778	0	1,778
Site 21/TPA Site 9f - Cascade Building Interior (2004)	0	145	145
Site 58/NTPA - Tract 50 Foundation Pad	575	752	1,327
Landfill to NWS Landspreading Area	-4,876	4,876	0
NWS Landspreading Area to Landfill	2,275	-2,275	0
TOTAL	25,267	10,698	35,965

Note: Negative values in the table signify soil that was removed from Landfill Cell C or the NWS Landspreading Area.

Table D3-1: Tetra Tech PCS Average Concentration Findings for End of 2003 Field Season

Sample Number	Benzene (mg/kg)	Toluene (mg/kg)	Ethybenzene (mg/kg)	Total Xylenes (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	RRO (mg/kg)	Lead (mg/kg)
SUMMARY OF CONTAMINANT CONCENTRATIONS IN STOCKPILED SOIL Soil Removed: 23,397 CY								
Weighted Average	1.5	3.1	1.8	8.0	124	2,869	1,112	81.5
Minimum	0.02 U	0.02 U	0.02 U	0.02 U	1.00 U	10.00 U	50.00 U	2.30
Maximum	140	130	73	360	3,900	27,400	23,000	995
Detection Frequency	19/129	24/129	24/129	70/129	64/107	123/129	65/69	20/20

Table D3-2: NOAA PCS Average Concentration Findings for End of 2003 Field Season

Bezene	Toluene	Ethylbenzene	Total Xylenes	GRO	DRO
2003 St. Paul Short-Term PCS Stockpile Average Concentrations - NOAA					
0.26* mg/kg	4.21 mg/kg	2.40 mg/kg	10.9 mg/kg	214 mg/kg	1,656 mg/kg

Notes: *Benzene result based on excluding one result of 140 mg/kg, which is two orders of magnitude higher than the median concentration of 0.045 mg/kg and more than nine standard deviations (15.64 mg/kg). NOAA considers the 140 mg/kg result as valid, but that it only represents a small volume of PCS removed from the Old Coal Shed (Cascade Building) Site.

Table D3-3: Total Organic Carbon in Soil Samples, National Weather Service Landspreading Area, St. Paul Island, Alaska

Sample Name	Jar	Depth Below Ground Surface, Feet	Total Organic Carbon (TOC)1 mg/kg	percent TOC
Hole 1, 0-0.5’	1	Hole 1, 0-0.5’	22,300	2.20%
Hole 1, .5-3.75’	2	Hole 1, .5-3.75’	2,950	0.30%
Hole 1, 4-7’	3	Hole 1, 4-7’	4,790	0.50%
Hole 1, 12-13.3’	4	Hole 1, 12-13.3’	28,400	2.80%
Hole 2, 5.5-8’	5	Hole 2,5.5-8’	3,540	0.40%
Hole 2, 8-9.25’	6	Hole 2, 8-9.25’	18,500	1.90%
Hole 4, 2-4’	7	Hole 4, 2-4’	3,290	0.30%
Hole 5, .75-2’	8	Hole 5, .75-2’	31,600	3.20%
Average TOC			14,421	1.40%

Note: [1]Data from TOC samples collected by NOAA personnel in May 2004, and analyzed by Friedman & Bruya/North Creek Analytical using EPA Method SW-8469060.

APPENDIX E

PROPOSED REVISION TO ST. PAUL LANDFILL POST-CLOSURE MONITORING PLAN

This appendix, dated September 19, 2005, serves as the proposed revision to the post-closure monitoring plan for the St. Paul Landfill Cell C (Polarconsult 2002). The existing monitoring plan is summarized below.

Existing Post-Closure Monitoring Plan:

1. Visual Inspection: A five-year visual inspection program (monthly for the first two years and semiannually the final three years) will be established to evaluate the following aspects of the landfill cover, in accordance with 18 AAC 60:
    a. Signs of damage or potential damage from settlement, ponding, leakage, frost action, erosion, or cracking of the soil cover, including adequacy of the cap vegetation.
    b. Generation or escape of leachate or any improper waste disposal.
    c. Damage to the erosion control devices (vegetation layer).
2. Maintenance: Repairs and maintenance of the vegetation will occur as necessary, to include applying fertilizer (once per season) and revegetating barren areas.

NOAA proposes to replace the existing monitoring plan with the revised plan detailed below. NOAA's revised plan will address monitoring needs perpetuated by NOAA's use of petroleum-contaminated soil (PCS) for Landfill Cell C cover soil, NOAA leaving PCS in-situ within Landfill Cell B (Tetra Tech 2004), NOAA detecting total lead in groundwater during sampling of monitoring well MWSNPLF-1, and NOAA's desire to identify and quantify contaminants in groundwater up gradient Landfill Cells B and C and the new landfill operation of the City of St. Paul within the *Ataqan* subdivision.

Revised Post-Closure Monitoring Plan:

1. Visual Inspection: A five-year visual inspection program (once per year for five years, likely during the summer vegetation growing season months of June through September), using the example inspection form shown in Table E-1, will be established to evaluate the following aspects of the landfill cover, in accordance with 18 AAC 60:
    a. Signs of damage or potential damage from settlement, ponding, leakage, frost action, erosion, or cracking of the soil cover, including adequacy of the cap vegetation.
    b. Generation or escape of leachate or any improper waste disposal.
    c. Signs of trespassers and/or determining the effectiveness of the perimeter boulder barrier.
    d. Damage to the erosion control devices (vegetation layer).
2. Maintenance: Perform as necessary to protect the closure cap during the five year post-closure monitoring period.
    a. Soil Cap: Repair areas of erosion using clean borrow sand from within Tract 42, or a suitable off-site source such as the NOAA NWS Landspreading Area. Cap areas prone to chronic erosion (***e.g.,*** side slopes) may require the installation of erosion control matting.
    b. Vegetation: <u>As needed</u>, apply fertilizer once at the beginning of each growing season and revegetate barren areas using the seed mixture and fertilizer type recommended for St. Paul Island.

3. Groundwater Monitoring:
    a. Sampling Frequency and Duration: Annually for five years.
    b. Wells to Sample: MWSNPLF-1, MWSNPLF-9, MWSNPLF-10, MWSNPLF-11, MWSNPLF-12, MWSNPLF-13, HC-4, and HC-5,
    c. Contaminants of Concern: Gasoline-range organics, diesel-range organics, benzene, toluene, ethyl-benzene, total xylenes, total lead, and dissolved lead (filtered in the field using a 0.45 micron filter, then preserved to < 2 pH units with reagent-grade nitric acid).
    d. Sampling Reporting: Landfill groundwater monitoring results will be provided to ADEC as part of NOAA's periodic groundwater monitoring for St. Paul and St. George Islands.

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Pribilof Project Office
7600 Sand Point Way N.E
Seattle, Washington 98115
Ph 206-526-6965, fax 206-526-4819

September 19, 2005

Mr. Louis Howard
Project Manager
Alaska Department of Environmental Conservation
Division of Spill Prevention and Response
Contaminated Sites Program
555 Cordova Street
Anchorage, AK 99501-2617

Subject: Review and Approval of *Closure Report, Site 5/TPA Site 5a – St. Paul Landfill Cell C (Tract 42), St. Paul Island, Alaska*, dated September 19, 2005

Dear Mr. Howard:

Attached please find two hard copies and one electronic copy on CD of the subject Closure Report. NOAA requests your review at the earliest possible time. NOAA will consider this the final version only pending the receipt of any substantive comments that would otherwise alter the conclusions and recommendations reached in the document.

Additionally, NOAA requests that ADEC consider this closure report NOAA's documentation for consideration of conditional closure status for this site. NOAA has attached two copies of a signature page for ADEC's use. If ADEC considers this site conditionally closed, consistent with the Two-Party Agreement and applicable laws and regulations, please sign the attached pages and return one of them to NOAA. NOAA has sent a similar letter and request to the ADEC Solid Waste Program, requesting acceptance of Cell C's closure consistent with 18 Alaska Administrative Code Chapter 60 (Solid Waste Management) and approval for NOAA to initiate a five year post-closure monitoring period.

If you have any questions, please do not hesitate to contact me either in writing, or at (206) 526-4560.

Sincerely,

John A. Lindsay, Manager
Pribilof Project Office

cc: Leslie Simmons, ADEC EH Solid Waste (letter only)
St. Paul RAB Members (CD only)

Attachments

Request for Conditional Closure
St Paul Landfill Cell C, TPA Site 5a, NOAA Site 5
St. Paul Island, Alaska

For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

9-19-05
Date

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 St Paul Landfill Cell C, TPA Site 5a, NOAA Site 5, in accordance with the Agreement and that no further remedial action is required 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

Oct 4, 2005
Date

RECEIVED
OCT 07 2005

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Pribilof Project Office
7600 Sand Point Way N.E
Seattle, Washington 98115
Ph 206-526-6965, fax 206-526-4819

September 19, 2005

Ms. Leslie Simmons
Alaska Department of Environmental Conservation
Division of Environmental Health
Solid Waste Program
555 Cordova Street
Anchorage, AK 99501-2617

Subject: Review and Approval of *Closure Report, Site 5/TPA Site 5a – St. Paul Landfill Cell C (Tract 42), St. Paul Island, Alaska*, dated September 19, 2005

Dear Ms. Simmons:

Attached please find two hard copies and one electronic copy on CD of the subject Closure Report. NOAA requests your review at the earliest possible time. NOAA will consider this the final version only pending the receipt of any substantive comments that would otherwise alter the conclusions and recommendations reached in the document.

Additionally, NOAA requests that Solid Waste Program accept Cell C's closure consistent with 18 Alaska Administrative Code Chapter 60 (Solid Waste Management) and approve NOAA's revised Post-Closure Monitoring Plan. The Plan is included as Appendix E of the Closure Report. NOAA has attached two copies of a signature page for ADEC's use. If ADEC considers this landfill closed, consistent with the applicable laws and regulations, please sign the attached pages and return one of them to NOAA. NOAA has sent a similar letter and request to the ADEC Contaminated Sites Program, requesting conditional closure of Cell C consistent with the Two Party Agreement between ADEC and NOAA.

If you have any questions, please do not hesitate to contact me either in writing, or at (206) 526-4560.

Sincerely,

John A. Lindsay, Manager
Pribilof Project Office

cc: Louis Howard, ADEC SPAR Contaminated Sites (letter only)
St. Paul RAB Members (letter only)

Attachments

Request for Landfill Closure Acceptance, Start Post-Closure Monitoring
St Paul Landfill Cell C, TPA Site 5a, NOAA Site 5
St. Paul Island, Alaska

For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

9-19-05
Date

Approvals: In accordance with Paragraph 59 of the Two Party Agreement, this is to confirm that all landfill closure activities have been completed at the St Paul Landfill Cell C, TPA Site 5a, NOAA Site 5, in accordance with 18 Alaska Administrative Code Chapter 60 and that ADEC approves NOAA's proposed revised post-closure monitoring plan dated September 19, 2005.

For the Alaska Department of Environmental Conservation

Leslie Simmons
Alaska Department of Environmental Conservation
Solid Waste Program Coordinator

10-27-05
Date

RECEIVED
NOV 17 2005

STATE OF ALASKA

FRANK H. MURKOWSKI, GOVERNOR

DEPT. OF ENVIRONMENTAL CONSERVATION
DIVISION OF ENVIRONMENTAL HEALTH
SOLID WASTE PROGRAM

555 Cordova Street
Anchorage, Alaska 99501
PHONE: (907) 269-7590
FAX: (907) 269-7600
http://www.dec.state.ak.us/

November 7, 2005

Mr. John Lindsay
U.S. Department of Commerce
National Oceanic and Atmospheric Administration
7600 Sand Point Way NE
Seattle, Washington 98115

Certified Mail
 # 7002 0510 0003 4244 9832
Return Receipt Requested

Subject: Closure Report for Site 5a, St. Paul Landfill Cell C, Tract 42

Dear Mr. Lindsay:

The Alaska Department of Environmental Conservation has completed review of the Closure Report for Site 5a, St. Paul Landfill Cell C, Tract 42, dated September 19, 2005, and approves closure of the landfill.

If you have any questions about closure and post-closure requirements, please contact me at (907) 269-7650. My email is *leslie_simmons@state.dec.state.ak.us*. I look forward to continuing our close relationship with your agency through the post-closure monitoring period.

Sincerely,

Leslie F. Simmons
Solid Waste Program Coordinator

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NOV 1 0 2005

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Pribilof Project Office
7600 Sand Point Way N.E
Seattle, Washington 98115
Ph: 206-526-6965, fax: 206-526-4819

December 14, 2007

Bob Blankenburg
Program Coordinator
Alaska Department of Environmental Conservation
Division of Environmental Health
Solid Waste Program
555 Cordova Street
Anchorage, AK 99501-2617

Subject: Technical Memorandum, Request for Re-Closure of Site 5a, / TPA Site 5 – St. Paul Landfill Cell C (Tract 42) St. Paul Island, Alaska

This letter and the attached technical memorandum requests the Alaska Department of Environmental Conservation (ADEC) approve the re-closure of Site 5a, / TPA Site 5 – St. Paul Landfill Tract 42 Cell C, St. Paul Island, Alaska (landfill). The landfill is a former municipal solid waste disposal site owned by the National Oceanic and Atmospheric Administration (NOAA). NOAA closed the landfill with concurrence in 2005 by the ADEC Contaminated Sites Program, and the ADEC Solid Waste Program. NOAA then re-opened it in 2006, with ADEC Solid Waste Program concurrence, for additional disposal of inert waste (i.e., non-hazardous waste as defined by the Resource Conservation and Recovery Act and non-Regulated Asbestos Containing Materials). The inert waste included materials from lead-based paint and asbestos abatement, building renovation, building and well head demolition debris, and lead contaminated soil above ADEC Contaminated Sites Program's cleanup standards of 400 milligrams per kilogram (mg/kg) for residential areas and 1,000 mg/kg for commercial and industrial areas. NOAA re-capped the area used for inert waste disposal in 2006 and 2007, consistent with the ADEC Solid Waste Program -approved landfill re-open request.

The accompanying technical memorandum describes how NOAA re-opened the landfill, what was placed in it, and how NOAA re-capped the area. The technical memorandum also requests that ADEC approve NOAA's re-closure of the landfill consistent with the requirements of Title 18 of the Alaska Administrative Code (AAC) Chapter 75 respecting hazardous materials, 18 AAC 70 respecting water quality standards, and as a Class III solid waste disposal facility in accordance with 18 AAC 60, even though Cell C is not a permitted landfill.

If the ADEC Solid Waste Program agrees to approve the landfill re-closure, please sign two copies of the Written Confirmation Page attached to the technical memorandum approving the final closure of the landfill and return one signed copy to NOAA for our records. If you have any questions, please contact me either in writing or at 206/526-4560.

Sincerely,

John Lindsay
Pribilof Project Office Manager
cc St. Paul Island RAB Members
Louis Howard, ADEC Contaminated Sites Program

TECHNICAL MEMORANDUM
RE-CLOSURE OF SITE 5a, / TPA SITE 5 – ST. PAUL LANDFILL CELL C (TRACT 42), ST. PAUL ISLAND, ALASKA

December 14, 2007

Introduction

St. Paul Island, Alaska is in the Bering Sea approximately 750 miles west of Anchorage, Alaska (Figure 1). The U.S. Government owns the surface and subsurface estate of a former landfill on the parcel known as Tract 42, which contains Cell C, also known as the St. Paul Landfill Cell C, Site 5a, and as Two-Party Agreement (TPA) Site 5. The TPA is an agreement between NOAA and the State of Alaska specifying the requirements for environmental cleanup of several properties on St. Paul Island, including Tract 42. Following completion of landfill closure Tract 42 is scheduled for transfer to the City of St. Paul under the Transfer of Property Agreement (TOPA; NOAA 1984).

NOAA, its predecessor agencies, and the St. Paul municipality used the former landfill including Cell C as the primary landfill for St. Paul Island from the 1940s until 2004. Although the former landfill never received an operating permit from the State of Alaska, disposal activities occurred there, including the disposal of municipal solid waste (MSW), construction and demolition debris, and drums containing petroleum products. NOAA capped and closed the landfill in 2004 and 2005 in compliance with the TPA (NOAA 1996). The closure of the landfill was acknowledged by the ADEC Contaminated Sites Program, and the ADEC Solid Waste Program (NOAA 2005a).

Tract 42 (Figure 2) lies in Section 17, Township 35 South, Range 131 West of the Seward Meridian, Alaska as shown on the plat of rectangular survey officially filed May 14, 1986 (57°08’54.10” North Latitude, 170°13’57.76” West Longitude). Tract 42 is a 5.78-acre tract owned and managed by NOAA, and is surrounded by the City of St. Paul owned property known as the Ataqan Subdivision. It is situated approximately 1.5 miles northeast of the City of St. Paul and 0.25 miles south of the St. Paul Airport (Figure 2). Cell C, located within the boundaries of Tract 42, primarily contains capped MSW within a 50 foot set back line from the property boundary as shown in Figure 3.

Discussion

In 2005 the ADEC Contaminated Sites Program and the ADEC Solid Waste Program approved NOAA’s request for closure of the Tract 42 Cell C landfill (NOAA 2005a). At that time NOAA had completed a landfill cap constructed of petroleum contaminated soil excavated at several other NOAA sites on the island. The cap is at least 2 feet thick over all areas containing MSW and has a slope of no more than 3 feet horizontal to 1 foot vertical around the side slopes of Cell C (Figure 4). The top of the landfill is mostly flat with a gentle slope of no less than 100 feet to 1 foot. The entire surface of the landfill was planted with native grasses during the spring of 2005. The grasses had become well established during the spring and summer of 2005 and 2006.

In 2006 NOAA determined it would abate lead-based paint (LBP) and asbestos hazards, repair buildings, demolish buildings and well heads, and remediate lead-contaminated soil at several locations on St. Paul Island. These properties included teacher houses 101, 102, and 103; the E-Shop/Radio Building/Headstart Building; duplex 108/109; the Five-Car Garage; the Machine Shop, the Municipal Garage, the Decommissioned Power Plant (DPP), a salt water well pump house adjacent the DPP, and 13 monitoring wells located in St. Paul Village and at Site 2/TPA Site 2 – Oil Drum Dump Site. The City of St. Paul operated the only landfill on the island in 2006, and the City was unwilling to allow NOAA to dispose of some of the waste expected from these projects in its landfill. (Note: The abatement activities generated a small volume of friable asbestos and hazardous waste, but these were shipped or stored for eventual disposal in a permitted facility off the island and are not discussed in this technical memorandum.)

NOAA made a formal request to the ADEC Solid Waste Program in May 2006 to re-open the Tract 42 Cell C landfill and use it for the disposal of the non-hazardous lead and other inert wastes to be generated by NOAA

during the planned abatement, renovation, demolition and remediation activities (NOAA 2006). This request was approved by ADEC Department of Solid Waste (ADEC 2006).

Because several of the buildings to be abated for LBP were used for housing (teacher houses 101, 102, and 103 and the duplex 108/109), their LBP painted building parts are considered "household waste" as defined in 40 CFR 258.2 and could be disposed as a non-hazardous municipal solid waste without additional testing. That such household wastes are not hazardous wastes is also clarified in 40 CFR 261.4(b)(1).

NOAA identified lead contaminated soil in 2005 and 2006 around teacher houses 101 and 103 and duplex 108/109 above ADEC Contaminated Sites Program's cleanup standard of 400 milligrams per kilogram (mg/kg) for residential areas, and in 2007 around the Municipal Garage above the cleanup standard of 1,000 mg/kg for commercial and industrial areas (18 AAC 75.340 Table B1). Lead contaminated soil around the buildings is excluded from the definition of a household waste. Therefore prior to disposal it must be tested using the Environmental Protection Agency (EPA) Toxicity Characteristics Leaching Procedure (TCLP, 40 CFR 261.23) for leachable lead. The TCLP determines whether soil, if excavated, would be considered a Resource Conservation and Recovery Act (RCRA) characteristic hazardous waste. NOAA performed TCLP testing on representative soil samples collected from locations surrounding these buildings. NOAA found that some of the soil around teacher houses 101 and 103, and duplex 108/109 did exceed the 5.0 milligram per liter (mg/L) RCRA limit for leachable lead, and therefore excavated soil would have to be disposed as RCRA hazardous waste. NOAA subsequently designated the lead contaminated soil around these three buildings as "Site 60/Non-TPA – Lead Contaminated Soils". NOAA conducted informal discussions with EPA and determined that federal hazardous waste regulations under RCRA would allow amending the soil to eliminate its leachability characteristic and render it non-hazardous with no federal or state permitting required, as long as the soil was amended in-situ prior to excavation. The state of Alaska does not have authority to implement its own hazardous waste regulations, so the federal government is responsible for regulation of hazardous wastes under RCRA, and there are no separate State requirements. Prior to its excavation, contaminated soil does not meet the definition of a solid waste described in RCRA regulations at 40 CFR 261.2. Mixing and amending contaminated soil in-situ is not regulated by RCRA because the soil does not become a waste until excavation. A material that is not a waste is not subject to RCRA. Therefore, amending the contaminated soil in-situ with chemicals that reduce the leachability of lead is not subject to RCRA. NOAA conducted in-situ amendment of lead contaminated soil at the Lead Contaminated Soil site in October 2006 using a phosphate-based additive, testing the amended soil via the TCLP, and verifying prior to excavation that it did not exceed the leachability characteristic for lead. Once this was verified, the soil was excavated, becoming a solid waste that was non-hazardous in nature at that time. The amended non-hazardous waste soil was then disposed in the Tract 42 Cell C landfill. A more complete discussion of the soil treatment conducted at the site can be found in the Corrective Action Report/Conditional Closure Request (NOAA 2007) as approved by the ADEC Contaminated Sites Program and the ADEC Solid Waste Program.

In September of 2006 NOAA re-opened a portion of the Tract 42 Cell C landfill. The area re-opened was inside from the 50 foot setback line, on top of previously landfilled and capped solid waste. The pre-2006 PCS cap was thicker in this area than the required 2 feet, varying from approximately 6 to 8 feet deep. Several disposal trenches were excavated into the PCS without disturbing the underlying MSW (Figure 3). NOAA filled the trenches with inert debris from the construction, abatement, demolition, repair projects and soil from the soil remediation areas. NOAA re-capped the area in December 2006 using PCS unearthed from the trench excavations (Figure 3). The PCS covered all wastes in the trenches to a thickness of at least 2 feet. NOAA seeded and fertilized the 2006 disposal trench area during the summer and fall of 2007.

The Municipal Garage, DPP, and pump house demolition work did not proceed until 2007. NOAA and the City of St. Paul reached an agreement in 2007 to allow inert demolition wastes to be disposed in the City's landfill. While lead contaminated soil around the Municipal Garage exceeded the commercial and industrial cleanup level of 1,000 mg/kg, it did not fail TCLP. This soil was disposed in a trench excavated in the Tract 42 Cell C landfill in August 2007, along with teacher house 102 radiators coated with LBP. This last remaining disposal trench in Tract 42 Cell C was backfilled on October 15, 2007 with the PCS that had been excavated during trench excavation. The PCS covered all wastes in the trench to a thickness of at least 2 feet. No more waste has been added to

Tract 42 since then. The cap soil disturbed by the 2007 disposal activities will be seeded with native grasses and fertilized in the spring of 2008. The final contours of the disposal trench area can be seen in Figure 4.

TABLE 1. Approximate Volumes of Wastes Disposed in the Re-Opened Portion of Tract 42

WASTE DESCRIPTION	Volume Disposed, Cubic Yards[1,2]
Disposed in 2006	
Lead Contaminated Soil Treated With Phosphate Additive: NOAA determined that lead contaminated soil that required removal from several areas around the lead abatement project houses because it exceeded State of Alaska standards (18 AAC 75.340 Table B1) also failed the TC|LP (40 CFR 261.23) for lead. NOAA amended this soil in-situ at each of the sites prior to excavation using a commercial phosphate additive and documented that it no longer failed the TCLP, thus it could be excavated and disposed as a non-hazardous solid waste in the Tract 42 Cell C landfill (NOAA 2007).	73
Clean Soil: NOAA removed clean soil from the lead abatement project sites to improve the grade surrounding the structures. This soil was also disposed in the Tract 42 landfill.	50
Lead Painted Wastes From Residential Building Abatement: Four of the buildings from which lead painted materials (wood siding, drywall, etc.) were removed were residential structures. Their renovation wastes are defined as household waste (40 CFR 258.2) and could be disposed without further testing.	28
Lead Painted Concrete Waste: Pieces of concrete painted with lead based paint were removed from the Headstart Building, one of the non-residential structures abated for lead. Knowing the concentration of lead in the paint, and the mass of the concrete and paint, NOAA determined that it was not a hazardous waste.	1
Miscellaneous Items Stored in Headstart Building Attic: Miscellaneous spare electrical parts and other non-liquid items stored in the attic of the Headstart Building were removed and disposed as non-hazardous solid waste.	35
Fiberglass Insulation: NOAA removed wet fiberglass insulation from the attic of the Machine Shop and disposed it as a non-hazardous waste.	30
Roofing Waste: Old roofing material removed from the machine shop during a re-roofing project was disposed in the Tract 42 Cell C landfill. This roofing material contained small amounts of asbestos containing material (ACM). NOAA determined that the ACM is non-friable, and does not meet the definition of a regulated asbestos containing material (RACM) found in 18 AAC 60.990. A non-RACM can be disposed in a municipal solid waste landfill under 18 AAC 60.450.	20
Steel Well Head Stickup Covers: NOAA disposed of thirteen steel well head stickup covers removed from decommissioned monitoring wells as non-hazardous wastes in Tract 42 Cell C.	2
Disposed in 2007	
Lead Contaminated Soil from the Municipal Garage: Soil sampling along the exterior walls of the Municipal Garage identified soil that exceeded the industrial cleanup level of 1,000 mg/kg for lead. This soil did not fail the TCLP and therefore was handled as a non hazardous waste. This soil was removed during the Municipal Garage demolition project in the fall of 2007 and was deposited in a small trench on top of Tract 42 Cell C adjacent to those trenches used in 2006. Also, during the demolition of the wooden part of the municipal garage, lead paint chips coated with a phosphate based paint designed to reduce lead leachability were released onto the soil along the east wall of the building. The soil with the chips was removed in one truckload (estimated at 8 cubic yards) to the disposal trench in Tract 42 Cell C.	30
Lead Painted Cast Iron Radiators from Teacher House 102: Eight cast iron radiators from teacher house 102, two of which were painted with lead based paint, were considered household wastes and were placed in the disposal cell in Tract 42 without further testing, pursuant to 40 CFR 258.2 and for CFR 261.4(b)(1).	2
Total	**271**

1 Waste volume data for 2006 compiled from NOAA internal daily reports from September 10 through December 6, 2006.
2 Waste volume data for 2007 compiled from NOAA internal daily reports from August 17 through October 15, 2007.

Conclusions

The Tract 42 Cell C, TPA Site 5, landfill was reopened by NOAA in 2006 with the approval of ADEC's Solid Waste Program (ADEC 2006). Subsequently, NOAA disposed a total of 271 cubic yards of lead contaminated soil, demolition debris, and other miscellaneous items removed from several NOAA excavation, renovation, and demolition projects in several small trenches on the top of the existing Tract 42 Cell C cap during 2006 and 2007. These trenches were then capped in compliance with State of Alaska regulations in the fall of 2006 and 2007.

NOAA will continue to conduct groundwater monitoring at the landfill under the ADEC approved Long Term Groundwater Monitoring Plan (NOAA 2005b), and will perform annual visual inspections of the landfill cap as specified in the Closure Report (NOAA 2005a), with repairs as needed, for at least 5 years from the ADEC approved closure date. NOAA performed its first visual inspection in 2005, but the 5 year period will be restarted at the date when ADEC signs the attached closure approval form. After 5 years, NOAA understands that ADEC may grant a reduced frequency or cessation of inspections and groundwater monitoring if requested by NOAA and supported by data.

Recommended Action:

NOAA recommends that the ADEC Solid Waste Program approve NOAA's request for the final closure of the Tract 42 Cell C landfill, TPA Site 5.

REFERENCES

Alaska Department of Environmental Conservation (ADEC). 2006. *Approval to Re-open, Dispose of Inert Waste, and Re-Close NOAA Site 5/TPA Site 5a – St. Paul Landfill Cell C (Tract 42), St. St. Paul Island*, AK. August 24.

National Oceanic and Atmospheric Administration (NOAA). National Oceanic and Atmospheric Administration (NOAA). 1984. *Transfer of Property on the Pribilof Islands ("Transfer of Property Agreement (TOPA)")*. February 10.

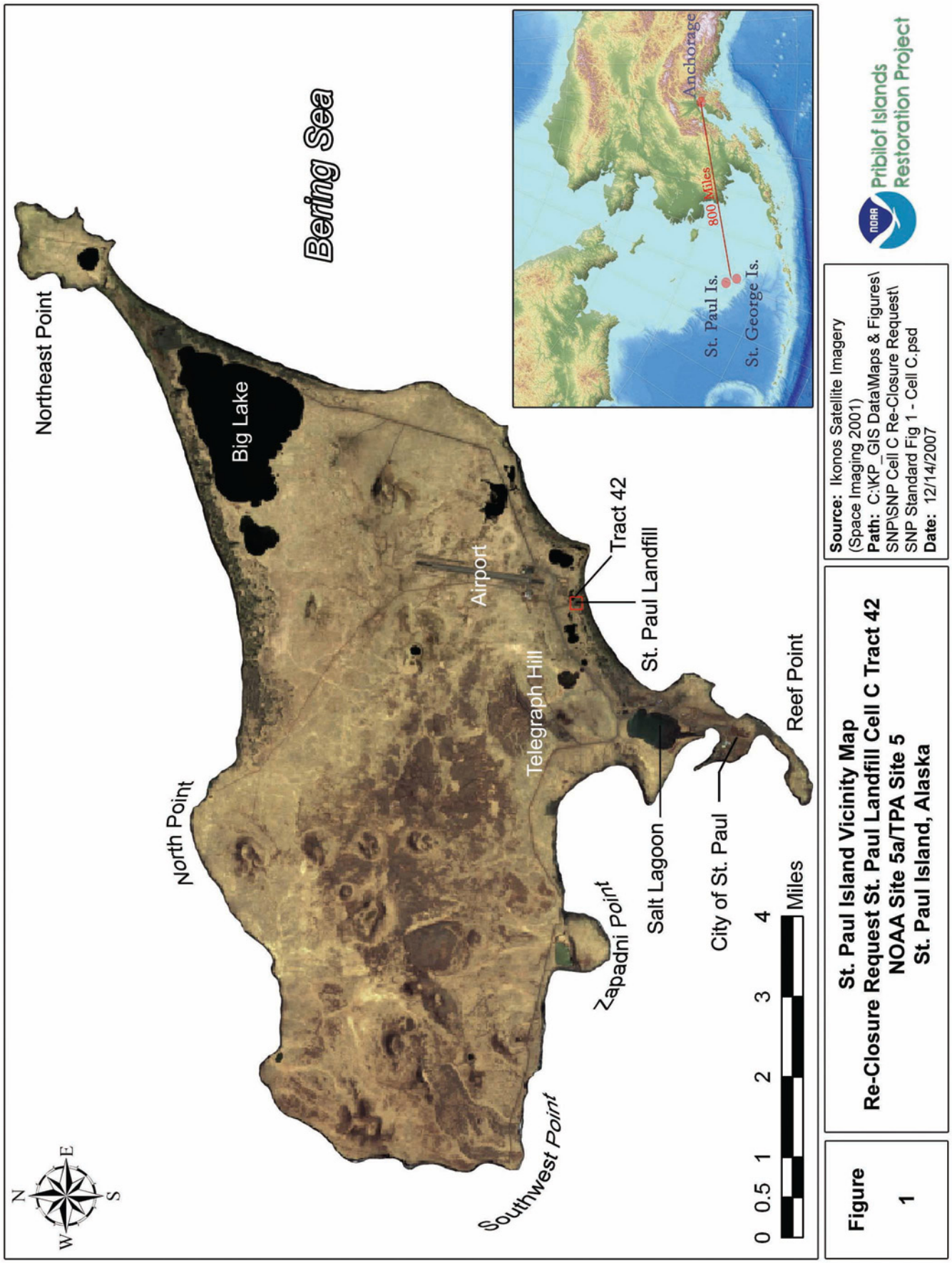
NOAA. 1996. *Pribilof Islands Environmental Restoration Two Party Agreement*. Attorney General's Office File No. 66 1-95-0126. January 26.

NOAA. 2005a. *Closure Report Site 5/TPA Site 5a – St. Paul Landfill Cell C (Tract 42) St. Paul Island, Alaska*. September 19.

NOAA. 2005b. *Long Term Groundwater Monitoring Plan, St. Paul Island, Alaska*. August 29.

NOAA. 2006. *Approval to Re-open, Dispose of Inert Waste, and Re-Close NOAA Site 5/TPA Site 5a – St. Paul Landfill Cell C (Tract 42), St. Paul Island, Alaska.* May 30

NOAA. 2007. *Corrective Action Report/Conditional Closure Request, NOAA Site 60/Non-TPA-Lead contaminated Soil, St. Paul Island, Alaska*. February 7.


Bering Sea
Northeast Point
Big Lake
North Point
Airport
Telegraph Hill
Tract 42
St. Paul Landfill
Reef Point
Zapadni Point
Salt Lagoon
City of St. Paul
Southwest Point
0 0.5 1 2 3 4
Miles
N
E
S
W
Anchorage
800 Miles
St. Paul Is.
St. George Is.
Pribilof Islands Restoration Project
Source: Ikonos Satellite Imagery (Space Imaging 2001)
Path: C:\KP_GIS Data\Maps & Figures\SNP\SNP Cell C Re-Closure Request\SNP Standard Fig 1 - Cell C.psd
Date: 12/14/2007
St. Paul Island Vicinity Map
Re-Closure Request St. Paul Landfill Cell C Tract 42
NOAA Site 5a/TPA Site 5
St. Paul Island, Alaska
Figure
1

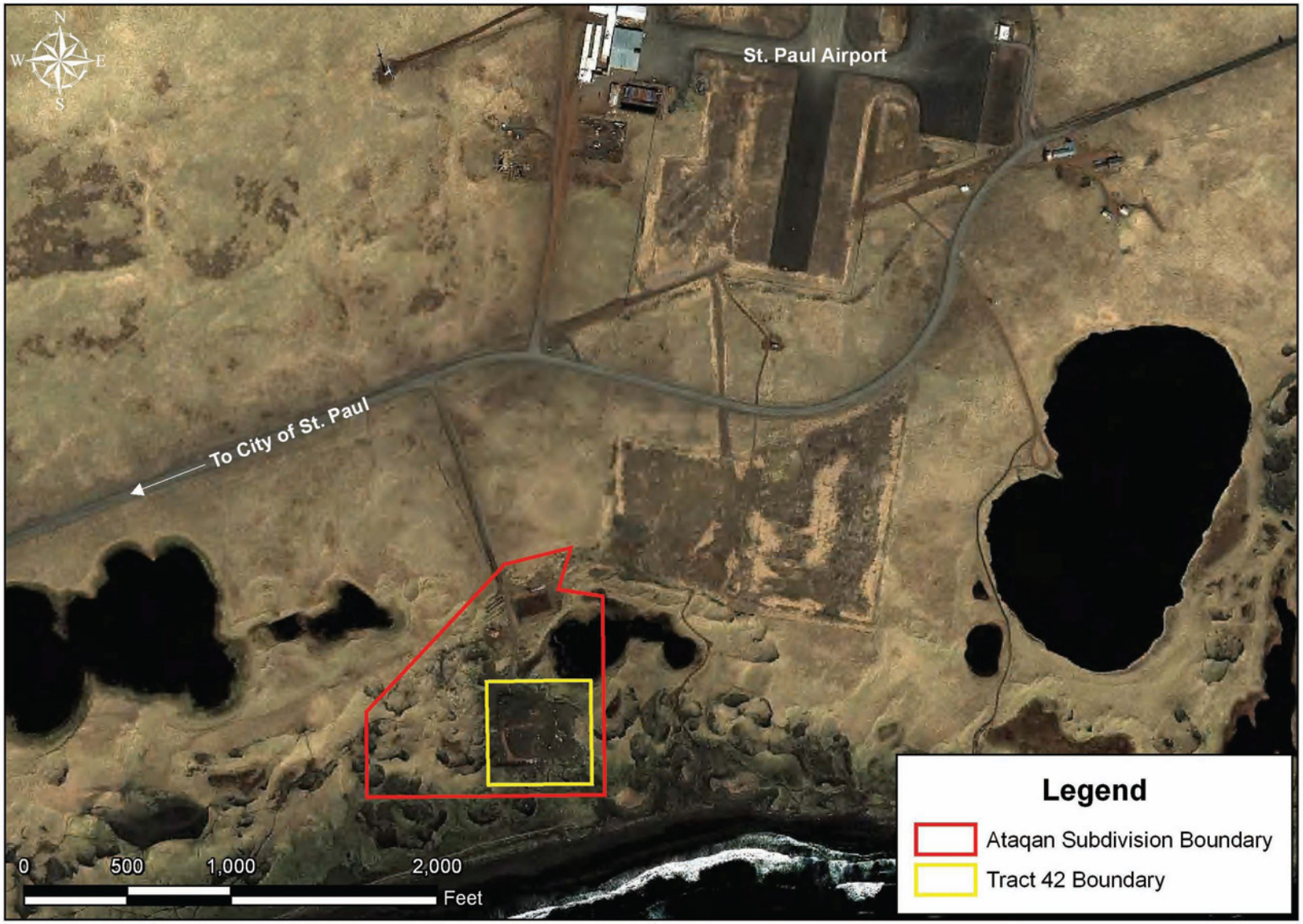


Figure 2	Site Location Map Re-Closure Request St. Paul Landfill Cell C Tract 42 NOAA Site 5a/TPA Site 5 St. Paul Island, Alaska	Sources: Ikonos Satellite Imagery (Space Imaging 2001), GIS Layers (NOAA Pribilof Project Database 2007) Path: C:\KP_GIS Data\Maps & Figures\SNP\SNP Cell C Re-Closure Request\Figure 2.mxd Date: 12/14/2007 @ 10:54:04 AM	Pribilof Islands Restoration Project

Figure 3	Re-Opened Area Re-Closure Request St. Paul Landfill Cell C Tract 42 NOAA Site 5a/TPA Site 5 St. Paul Island, Alaska	Sources: Ikonos Satellite Imagery (Space Imaging 2001), GIS Layers (NOAA Pribilof Project Database 2007) Path: C:\KP_GIS Data\Maps & Figures\SNP\SNP Cell C Re-Closure Request\Figure 3.mxd Date: 12/14/2007 @ 10:56:09 AM

Pribilof Islands Restoration Project

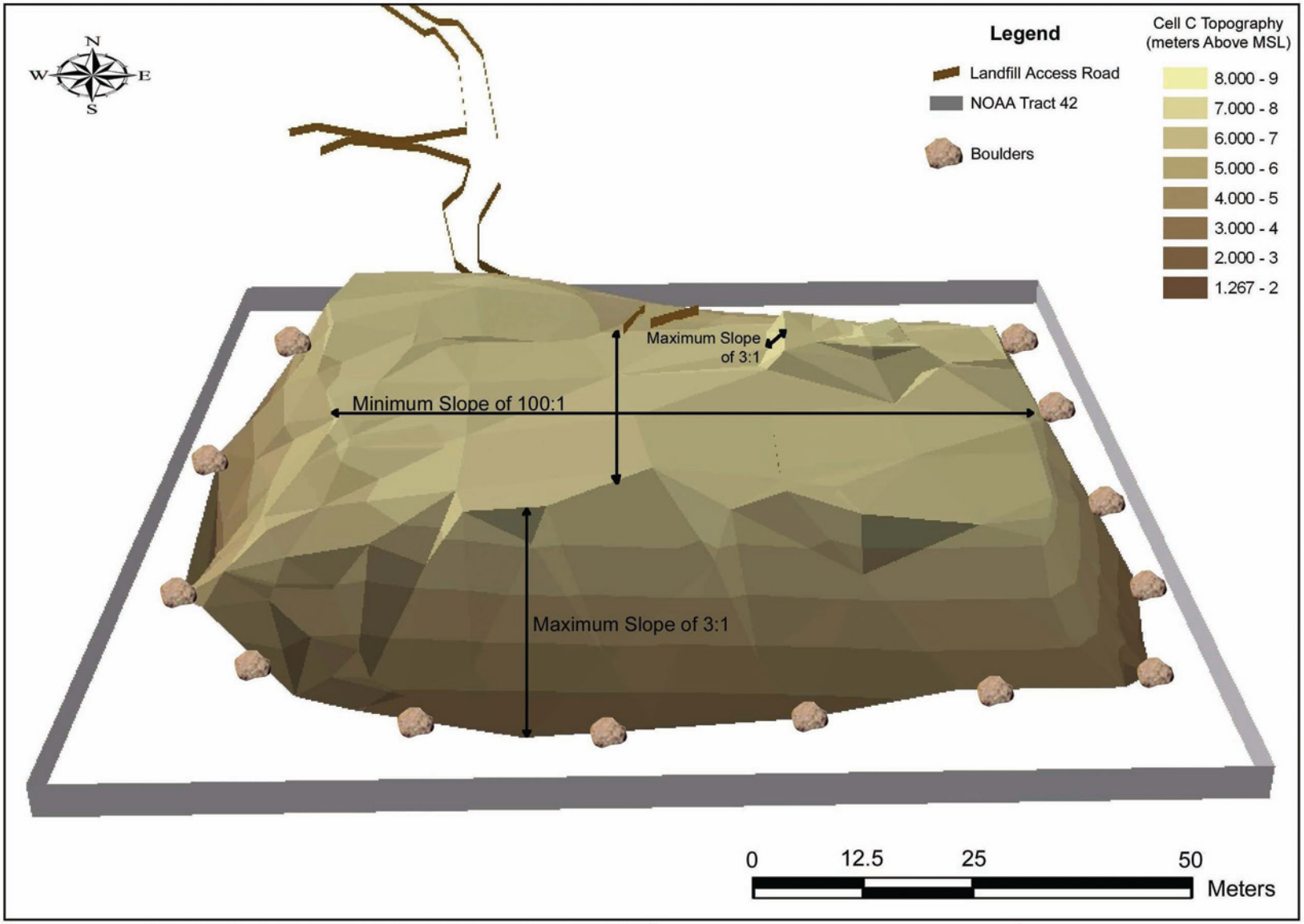


Figure 4	Final Topography St. Paul Lanfill Cell C Re-Closure Request Tract 42 (December 2006) NOAA Site 5a/TPA Site 5 St. Paul Island, Alaska	**Source:** NOAA Pribilof Project GPS Data **Path:** C:\KP_GIS Data\Maps & Figures\SNP\ SNP Cell C Re-Closure Request\Figure 4.psd **Date:** 12/14/2007

Pribilof Islands Restoration Project

For the National Oceanic and Atmospheric Administration:

John Lindsay
NOAA, Pribilof Project Office

15 MAY 2008
Date

Approvals: This is to confirm that all closure actions have been completed to the maximum extent required at the St. Paul Landfill Cell C, also known as NOAA Site 5a, and as Two-Party Agreement (TPA) Site 5, or Tract 42, on St. Paul Island, Alaska, and that post closure monitoring consistent with Paragraph 59 of the Two Party Agreement and 18 AAC 60 will be conducted for at least 5 years, beginning on the date that ADEC signs this approval form. No further investigation or remedial action is required at this site, unless new information regarding conditions at the site indicate that further action is required to protect human health or the environment.

For the Alaska Department of Environmental Conservation:

Robert Blankenburg
Program Coordinator
Alaska Department of Environmental Conservation
Division of Environmental Health
Solid Waste Program

5/16/08
Date

C.2.a

STATE OF ALASKA

SARAH PALIN, GOVERNOR

DEPT. OF ENVIRONMENTAL CONSERVATION
DIVISION OF ENVIRONMENTAL HEALTH
SOLID WASTE PROGRAM

555 Cordova Street
Anchorage, Alaska 99501
PHONE: (907) 269-7690
FAX: (907) 269-7600
http://www.dec.state.ak.us/

Certified Mail #7003 2260 0004 1151 1935
Return Receipt Requested

January 24, 2008

Mr. John Lindsay
Pribilof Project Office Manager
NOAA Pribilof Project Office
7600 Sand Point Way, N.E.
Seattle, WA 98115

Subject: Approval of Re-Closure of Site 5a, / TPA Site 5 – St. Paul Landfill Cell C (Tract 42)
St. Paul Island, Alaska

Dear Mr. Lindsay,

The Alaska Department of Environmental Conservation Solid Waste Program (ADEC) received a letter, dated December 14, 2007, with an attached technical memorandum, requesting ADEC approval of the re-closure of the Site 5a, / TPA Site 5 – St. Paul Landfill Tract 42 Cell C (landfill) in St. Paul, Alaska. ADEC originally approved closure of this landfill in 2005. The National Oceanic and Atmospheric Administration (NOAA) reopened the landfill in 2006, with ADEC concurrence, to dispose of inert wastes (described in detail in the December 14, 2007 technical memorandum). NOAA capped the area used for disposal of the inert waste in 2006 and 2007, as described in the technical memorandum.

The ADEC Solid Waste Program hereby approves the re-closure of this landfill. Post-closure monitoring is required for at least 5 years from the date of this approval letter. No further investigation or remedial action is required at this site, unless new information regarding conditions at the site indicate that further action is required to protect human health or the environment.

Please contact me at (907) 269-7690, or by e-mail at *bob.blankenburg@alaska.gov*, with any questions or comments.

Sincerely,

Robert J. Blankenburg
Solid Waste Program Coordinator

cc: Louis Howard, ADEC CS

1200-01-C.2.a-1044

NOAA Site 6
TPA Site 5b: Cell A
(St. Paul Landfill, TPA 5; TPA Attachment A)

Request for Conditional Closure, St Paul Landfill Cell A, TPA Site 5b, NOAA Site 6, St. Paul Island, Alaska.....229

Notice of Environmental Cleanup and Residual Soil and Debris at TPA05 (b), NOAA Cell A Landfill, St. Paul Island, Alaska 245

Request for Conditional Closure
St Paul Landfill Cell A, TPA Site 5b, NOAA Site 6
St. Paul Island, Alaska

Request for Conditional Closure

Site: The site is known as St. Paul Landfill Cell A, Two-Party Agreement (TPA; NOAA 1996) Site 5b, and as National Oceanic and Atmospheric Administration (NOAA) Site 6.

Location: St. Paul Island, Alaska is approximately 800 miles southwest of Anchorage in the Bering Sea. The St. Paul Landfill is approximately 1.5 miles northeast of the City of St. Paul (Figure 1). The St. Paul municipal solid waste (MSW) landfill currently is comprised of three disposal cells, A, B, and C, found within two properties owned by different entities. Cells A (2.374 acres) is within the property called the Ataqan Subdivision (Figure 2).

Legal Property Description: The legal description for Cell A is: Township 35 South, Range 131 West, Section 17, of the Seward Meridian, Alaska as shown on the plat of rectangular survey officially filed May 14, 1986 (Figure 2). The City of St. Paul is the surface estate owner of Cell A and the greater Ataqan Subdivision. The Aleut Corporation is the subsurface estate owner.

Type of Release: Cell A was used primarily to dispose of construction debris. Petroleum-contaminated soil (PCS) has been found at the site, and drums containing petroleum wastes have been excavated from within the site. No other release of contaminants has been documented at the site.

History and Background:

The landfill area is believed to have been used as the primary landfill for the Island of St. Paul since the 1940s. Cell A was purportedly used for the disposal of construction and demolition debris, municipal solid waste, and an unknown quantity of drummed petroleum wastes. Drums and petroleum contaminated soil were removed by both Colombia Environmental Sciences, Inc. (CESI) and Nortech Environmental & Engineering Consultants (Nortech) in the summer of 2000, at which time Cell A was described as no longer active (CESI 2001a). In October 2000, Foster Wheeler Environmental Corporation (Foster Wheeler) constructed a sand and scoria cap measuring 120 by 155 feet in the central portion of Cell A (Figure 2) to provide the City of St. Paul a location to store large scrap items. The cap was constructed with an 18-inch layer of sand covered by a 12-inch layer of scoria (Foster Wheeler 2000). ADEC (2001) provided NOAA with a No Further Action designation for only the area covered by the pad on Cell A.

In a closure plan dated April 2, 2002, NOAA proposed to close Cell A in its entirety (Polarconsult 2002). The closure plan was approved by ADEC on August 7, 2002 (ADEC 2002). On June 30, 2003, NOAA submitted a Draft Corrective Action Plan for closure of the landfill (NOAA 2003a), which contained Addendum 1, proposing certain changes to the original closure plan, including the substitution of a boulder barrier around the perimeter of Cell A instead of a chain link fence.

During the summer of 2003, NOAA and ADEC agreed to modify the required removal of PCS at the site (NOAA 2003b), after NOAA proposed to remove PCS only to a depth of 2 feet below ground surface, due to the following reasons:

- The long term use of the site as a landfill resulted in a potentially random distribution of petroleum waste disposal locations throughout the landfills active life, resulting in a great difficulty of characterizing the landfill and finding all petroleum wastes potentially disposed within.
- The Ataqan Subdivision will continue to be used by the City of St. Paul as a permitted MSW disposal facility, including the operation of a burn box and the disposal of the ashes it generates.
- The facility is unlikely to ever be used for residential purposes, and therefore, it is unlikely that residential exposure will occur at the site.

- Given that residential exposure is not likely to occur, site cleanup levels should reflect exposure of site workers via the ingestion and inhalation pathways, rather than the much lower cleanup levels of the migration to groundwater pathway.
- The disposal of MSW excavated from the side slopes to the top of Cell A, and the application of a sand and scoria cap covered the one known area of PCS in Cell A with several feet of soil.

ADEC suggested that NOAA remove PCS to a depth of 5 feet (ft) below ground surface (bgs), but agreed to allow the excavation of PCS only to a depth of 2 ft bgs subject to the potential installation of additional groundwater monitoring wells in the area of PCS contamination.

Summary of Site Investigations:

ADEC investigated waste disposal practices on St. Paul Island including the St. Paul Landfill, and reported in 1983 that there were many drums of petroleum and other wastes disposed at the landfill area (Harmon 1983).

NOAA reported in 1990 that they had conducted an environmental compliance survey, and noted 27 apparently empty drums disposed in Cell A (Buckel 1990).

Between August and October 1999, Tetra Tech conducted site characterization activities at Cell A, which included the collection of soil, sediment, and groundwater samples (Figure 3). Analytical data for soil samples indicated the presence of PCS with diesel-range organic compounds (DRO) and residual-range organic compounds (RRO) at concentrations above cleanup levels at two locations (05SS10 and 05SS17) within Cell A (Figure 3) that corresponded with an area of drums identified during the Tetra Tech 1999 investigation (Tetra Tech 2000). Analytes in neither groundwater nor sediment samples exceeded cleanup levels.

During the summer of 2000, Nortech conducted an interim removal action by removing more than 50 buried drums from various areas in the landfill area, and 45 cubic yards (CY) of soil from the south end of Cell A where Tetra Tech (2000) previously identified drums (Nortech 2001); the removal included the soil associated with sample 05SS10 taken by Tetra Tech in 1999. The excavation extent is shown in Figure 4.

In a separate interim removal action conducted by CESI in 2000, CESI removed several buried drums and an additional 45 CY of PCS from the south end of Cell A in an area that overlapped the Nortech removal action (see inset in Figure 4). Soil samples collected by CESI following PCS removal from Cell A (shown on Figure 4 as SNPLFIR-1 through SNPLFIR-9) confirmed that no contaminants remained above cleanup levels (CESI 2001a).

NOAA did not conduct a removal action at the second landfill location (05SS17) where soil contamination of DRO (771 mg/kg) and RRO (11,000 mg/kg) exceeded action levels because of the presence of concrete construction debris (Figures 3 and 4).

[Note: Figures 2 and 3 in NOAA's corrective action plan (NOAA 2003a) incorrectly show a CESI confirmation sample (SNPLFIR-7) as exceeding the DRO and RRO cleanup levels after the two removal actions discussed above. NOAA subsequently examined the hard copies of the laboratory reports and found that the sample results were non detect for these constituents at detection limits of 10 and 50 mg/kg, respectively (CESI 2001a).]

NOAA contractors conducted quarterly groundwater monitoring from June 2000 to September 2001 and from October 2003 to July 2004, including sampling 16 monitoring wells in the landfill area, 2 of which (MWSNPLF-9 and HC-5) are directly down gradient of Cell A (Figure 5). The results are summarized below.

During 2000-2001 quarterly sampling events, DRO was not detected above the ADEC Table C cleanup level of 1,500 µg/l in the 12 wells sampled (MWSNPLF 1, MWSNPLF 2, MWSNPLF 4 through MWSNPLF 9, and HC-2 through HC-5) with one exception. During the last quarter, the sample from well MWSNPLF-1 indicated the presence of DRO at 4,200 µg/l, (Figure 5), along with GRO, benzene, and 13 other VOCs. According to NOAA's contractor, IT Alaska Inc., this sample was part of a "highly suspect analytical data package and should be viewed with caution" (IT Alaska Inc. 2002). The groundwater samples from the same well during earlier quarters did not exceed the cleanup levels. NOAA observed the City of St. Paul MSW burn crew staged their igniter materials (gasoline and fuel oil) in close proximity to this well prior to and during the sampling event.

During the 2003-2004 sampling, NOAA contractors sampled only five wells because seven of the original twelve wells had been decommissioned to allow construction of the City of St. Paul's municipal solid waste burn box pad and ash disposal cell. None of the samples from these wells exceeded the Table C cleanup levels, including those from MWSNPLF-1, the only well at the landfill ever to yield a sample that exceeded these cleanup levels. This data supports the contention that the contamination found in MWSNPLF-1 was due to lab error or cross contamination, and not to the presence of contamination in the well. Later in 2004, an eighth well in the vicinity of the landfill was decommissioned (MWSNPLF-8), and four new monitoring wells were installed (MWSNPLF 10 through MWSNPLF 13). These new wells have not yet been sampled.

In summary, groundwater monitoring results for the St. Paul landfill have consistently shown that the groundwater does not contain constituents exceeding the Table C cleanup levels.

Summary of Applied Cleanup Levels:

The State of Alaska provides TPA oversight through the Alaska Department of Environmental Conservation (ADEC). Under the TPA, NOAA is required to comply with State of Alaska regulations that were in effect in 1991 (NOAA 1996, ADEC 1991); however, with ADEC agreement, NOAA has chosen to follow more current regulations whenever possible. Generally, NOAA employed ADEC Method Two soil cleanup criteria, discussed at 18 AAC 75.341(c) (ADEC 2000). For benzene, the less stringent State of Alaska cleanup level (0.5 mg/kg) in effect in 1991 was applied to the site (ADEC 1991).

ADEC uses 15 ft bgs to define subsurface soil to which residents will have a reasonable potential for exposure through the inhalation or ingestion pathways (ADEC 2000). Therefore, NOAA is not obligated to excavate contaminated soil occurring at depths deeper than 15 ft to address the inhalation and ingestion pathways. Due to unique circumstance of the site discussed above, ADEC approved a waiver to this requirement, allowing NOAA to halt excavation at 2 ft bgs provided additional area groundwater monitoring wells were installed and monitored at the site.

Summary of Corrective and Closure Actions:

Corrective action and closure activities at Cell A included the re-contouring of side slopes to meet ADEC slope requirements (maximum 3 to 1, horizontal to vertical) and to facilitate the placement of additional cover material without encroaching on an adjacent wetland area (Figure 6). During side slope contouring operations, NOAA uncovered a total of 56 fifty-five gallon drums containing variable amounts of tar and petroleum products in the northeast portion of Cell A; an area where NOAA previously removed drums (Nortech 2001;Figure 6). The drums were removed, placed in salvage drums, or secured in tarp-covered, open-top conex containers, and ultimately shipped for off-island disposal to Onyx Environmental Services LLC, Vancouver, Washington. In addition, NOAA transported approximately 18 CY of PCS from this area to the short-term PCS stockpile at Tract 42.

NOAA's contractor collected two confirmation samples during 2003 corrective action activities at Cell A (Tables 1 and 2, Figure 6). The samples were analyzed for the following constituents:

- BTEX by U.S. Environmental Protection Agency (EPA) SW-846 (EPA 1996) Method 8021B
- DRO by Method AK102
- GRO by Method AK101
- RRO by Method AK103
- PAHs by EPA SW-846 (EPA 1996) Method 8270C Selected Ion Monitoring

The two confirmation samples collected from the bottom of the buried drum excavation in the northeast portion of Cell A found concentrations of all contaminants below the ADEC Method Two cleanup levels (Figure 6). Laboratory reporting limits were below ADEC Method Two cleanup levels for all contaminants except benzene. For benzene, reporting limits of 0.03 mg/kg or lower were achieved, which is above the current ADEC Method Two cleanup level of 0.02 mg/kg, but below the 1991 cleanup level of 0.5 mg/kg.

One waste sample was collected from the tar contents of drums removed from Cell A and Cell B. The drums had been consolidated in an open topped conex container when sampled, so it is unclear from which Cell (A or B) the drum sample originated, but the materials appeared identical. This sample was analyzed for the same constituents listed above, as well as for PCBs using EPA SW-846 (EPA 1996) Method 8082. The waste sample contained the following contaminants at concentrations above ADEC Method Two cleanup levels: benzene at 1.7 mg/kg, ethylbenzene at 6 mg/kg, GRO at 510 mg/kg, and DRO at 1,600 mg/kg. All other contaminants, including PCBs, were below ADEC Method Two cleanup levels (Tables 1, 2, and 3). Laboratory reporting limits were below ADEC Method Two cleanup levels for all contaminants except benzo(a)pyrene and dibenzo(a,h)anthracene. For both of these contaminants, reporting limits of 2.5 mg/kg exceeded the ADEC Method Two cleanup level of 1.0 mg/kg.

During site contouring, NOAA removed sand material previously placed on the Cell A side slopes as necessary to meet regulatory slope requirements. This excess sand (2,304 CY) was either relocated to low-lying depressions on Cell A or was transported (750 CY) to the Tract 42 short-term PCS stockpile. NOAA placed some of this material over the location of Sample 05SS17, the only area still exceeding the cleanup level for DRO and RRO as discussed above. This cover material placement resulted in the area about Sample 05SS17 being buried with several feet of soil, in addition to the 2-ft thick cap subsequently applied to the site.

Following completion of contouring operations, NOAA placed sufficient sand and scoria cover material over the portions of Cell A not previously capped by Foster Wheeler (Foster Wheeler 2000) to provide a 24 inch site closure cap. NOAA confirmed final side slope measurements using the Trimble Total Station® 5700 GPS. Side slopes varied from a maximum of 3.7:1 to a minimum of 4.2:1 (Tetra Tech 2004). NOAA used large boulders to construct a barrier around the perimeter of Cell A. NOAA seeded and applied fertilizer to the Cell A side slopes in the spring of 2004. By the end of the 2004 summer, native grasses nearly covered the slopes.

Other Closure Activities:

NOAA previously submitted a closure report for Cells A, B, and C to ADEC (Tetra Tech 2004). NOAA will address groundwater monitoring at the landfill as a part of an island groundwater monitoring plan scheduled for submittal to ADEC during the winter of 2004/2005.

Recommended Action:

In accordance with paragraph 59 of the Two Party Agreement (NOAA 1996), NOAA requests written confirmation that NOAA completed all appropriate corrective and closure actions, to the maximum extent practicable, at the St. Paul Landfill Cell A, TPA Site 5b, NOAA Site 6, in accordance with the Agreement and that 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 contamination that remains does not protect human health, safety, or welfare, or the environment.

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Tetra Tech EM Inc. 2004. Draft Closure Report Site 6/TPA Site 5b – St. Paul Landfill Cell A Site 7/TPA Site 5c – St. Paul Landfill Cell B (Drum Dump) Site 8/TPA Site 5d – St. Paul Landfill Cell B (Solid Waste) St. Paul Island, Alaska. October 28.

For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

11/10/04
Date

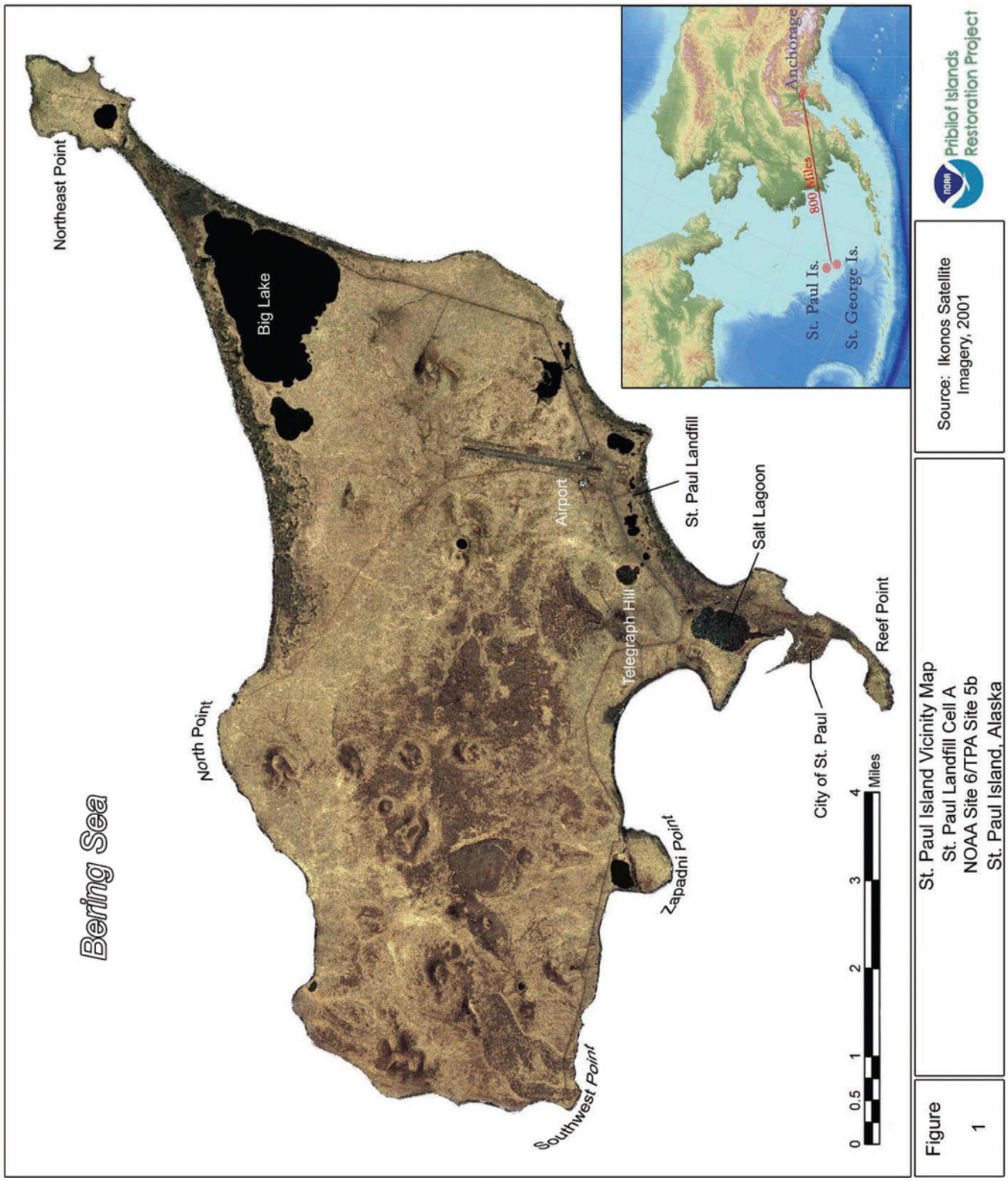
Approvals: In accordance with Paragraph 59 of the Two Party Agreement, this is to confirm that all corrective action has been completed to the maximum extent practicable at the St Paul Landfill Cell A, TPA Site 5b, NOAA Site 6, in accordance with the Agreement and that no further remedial action is required 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

Nov 15, 2004
Date

FIGURES


Northeast Point
Big Lake
Bering Sea
North Point
Airport
St. Paul Landfill
Salt Lagoon
Telegraph Hill
Reef Point
City of St. Paul
Zapadni Point
Southwest Point
0 0.5 1 2 3 4 Miles
Anchorage
800 Miles
St. Paul Is.
St. George Is.
Pribilof Islands Restoration Project
Source: Ikonos Satellite Imagery, 2001
St. Paul Island Vicinity Map
St. Paul Landfill Cell A
NOAA Site 6/TPA Site 5b
St. Paul Island, Alaska
Figure 1

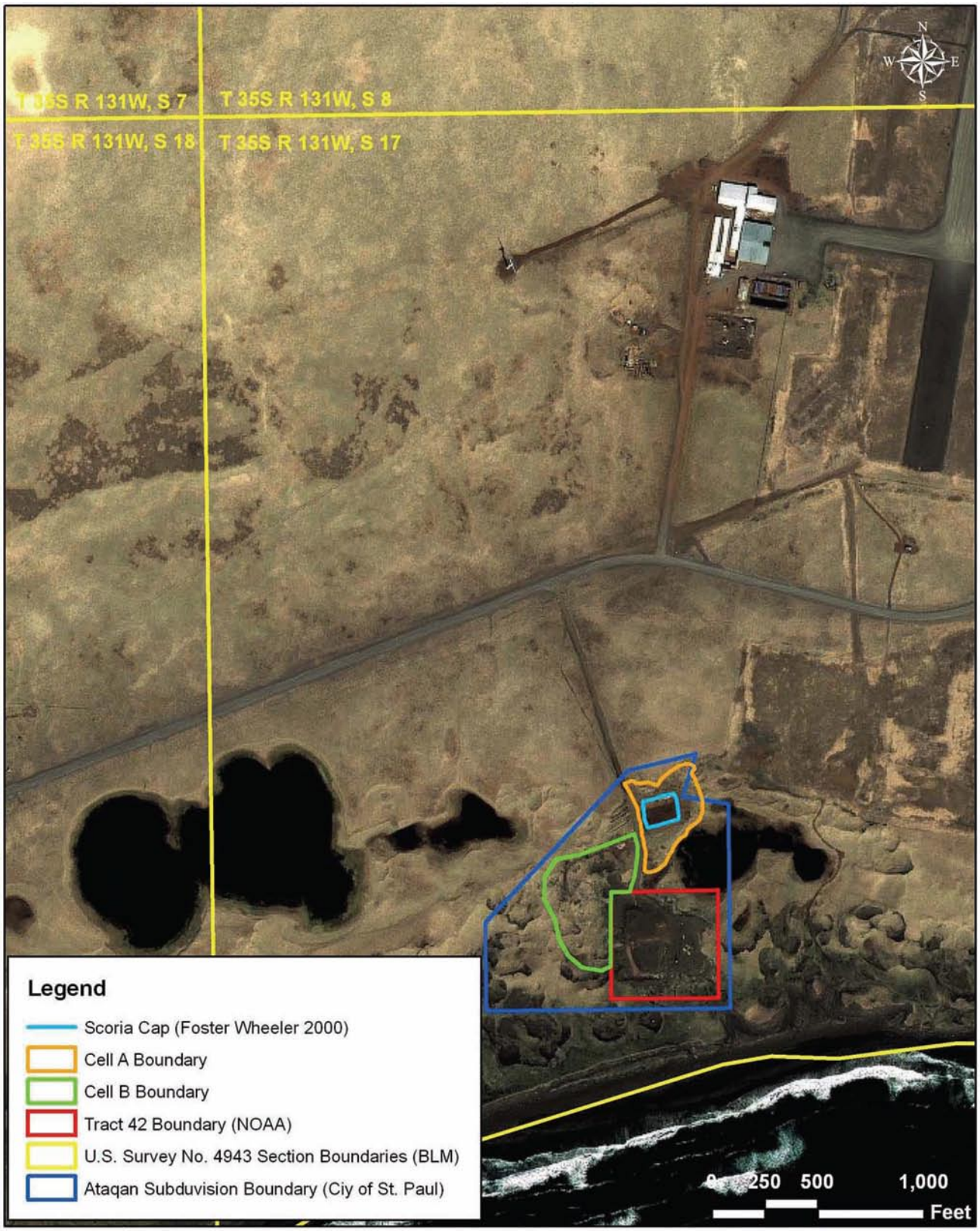


Figure 2	Legal Property Description Map St. Paul Landfill Cell A NOAA Site 6/TPA Site 5b St. Paul Island, Alaska	Sources: Tract 42 Boundary and Land Survey Sections (BLM MTPs 1983), Ataqan Subdivision Boundary (Polarconsult 1997), Cell A Boundary (NOAA GIS 2004), Satellite Imagery (Ikonos 2001).

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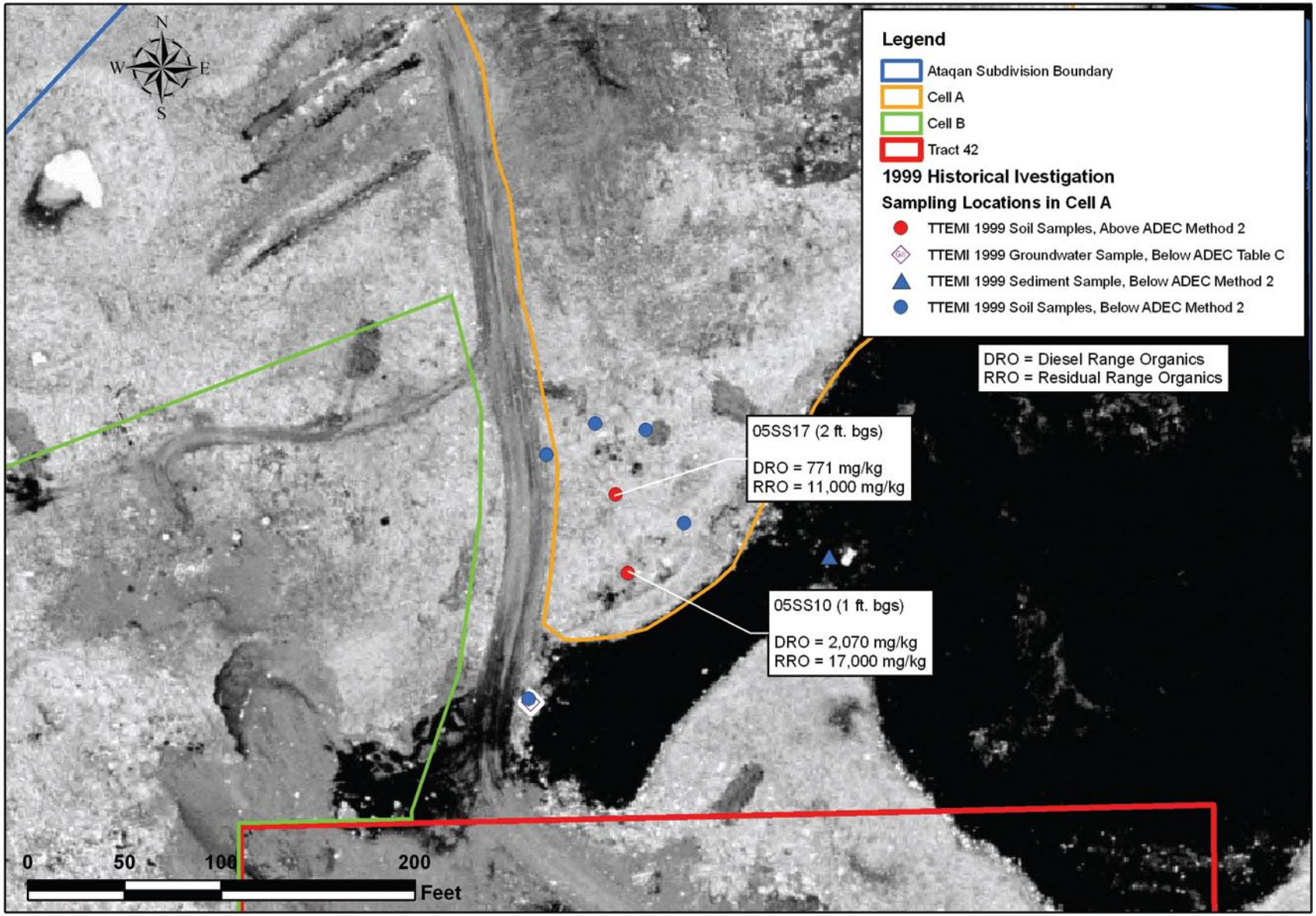

Figure 3	Historical Sampling Results St. Paul Landfill Cell A NOAA Site 6/TPA Site 5b St. Paul Island, Alaska	Sources: Ataqan Subdivision Boundary (Polarconsult 1997), Cell Boundaries (NOAA GIS 2004), Tract 42 Boundary (BLM MTPs 1983), Historical Sampling Locations and results (Pribilof Database 2004), Aerial Photo (Davis 2000).

Pribilof Islands Restoration Project

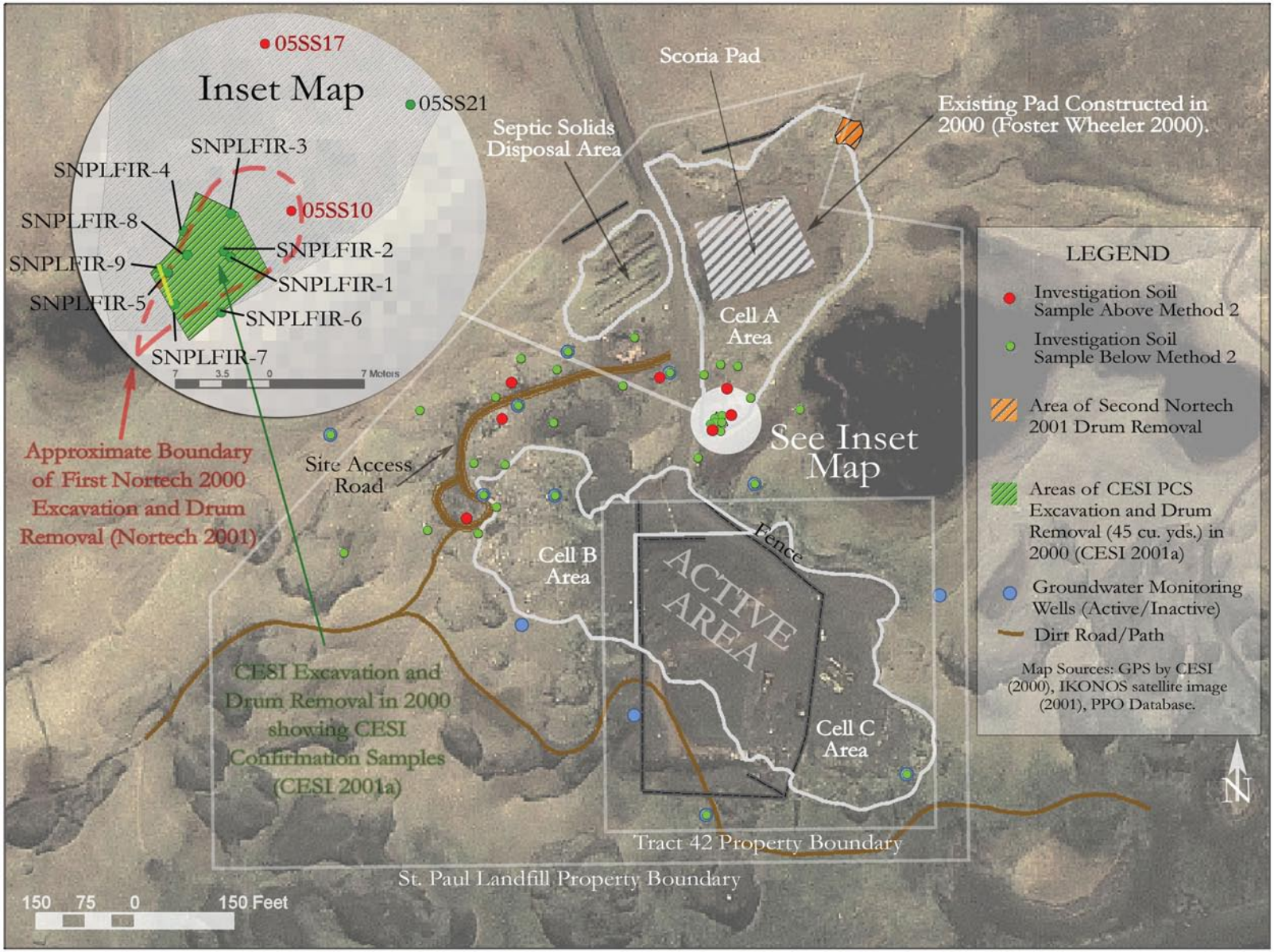

Figure 4	Previous Remedial Actions St. Paul Landfill Cell A NOAA Site 6/TPA Site 5b St. Paul Island, Alaska	Sources: NOAA PPO Database, Satellite Imagery (Ikonos 2001).

Pribilof Islands Restoration Project

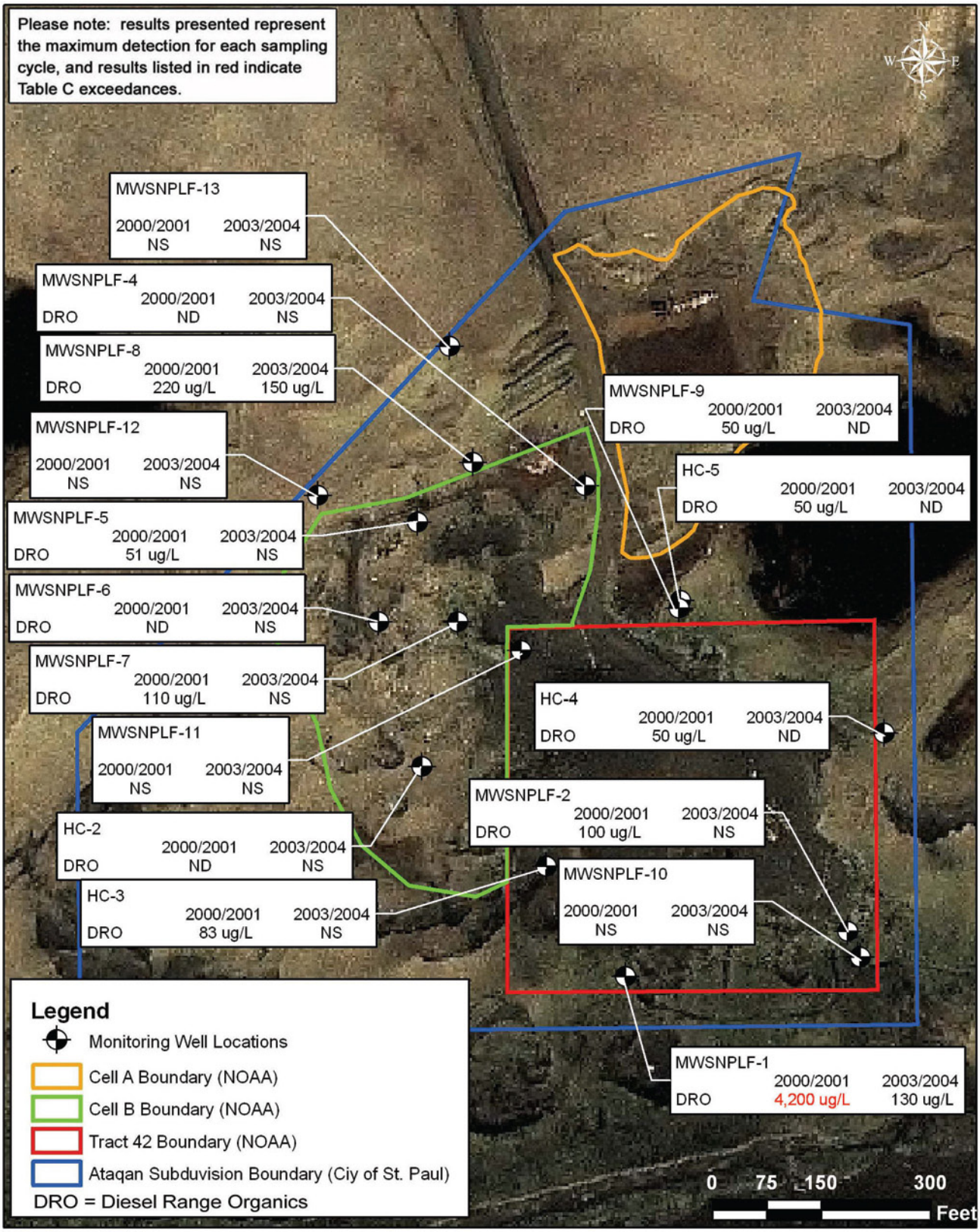

Figure 5	Groundwater Sampling Results St. Paul Landfill Cell A NOAA Site 6/TPA Site 5b St. Paul Island, Alaska	Sources: Tract 42 Boundary (BLM MTPs 1983), Ataqan Subdivision Boundary (Polarconsult 1997), Cell B Boundary (NOAA GIS 2004), Well Locations (NOAA GPS 2004), Satellite Imagery (Ikonos 2001).

Pribilof Islands Restoration Project

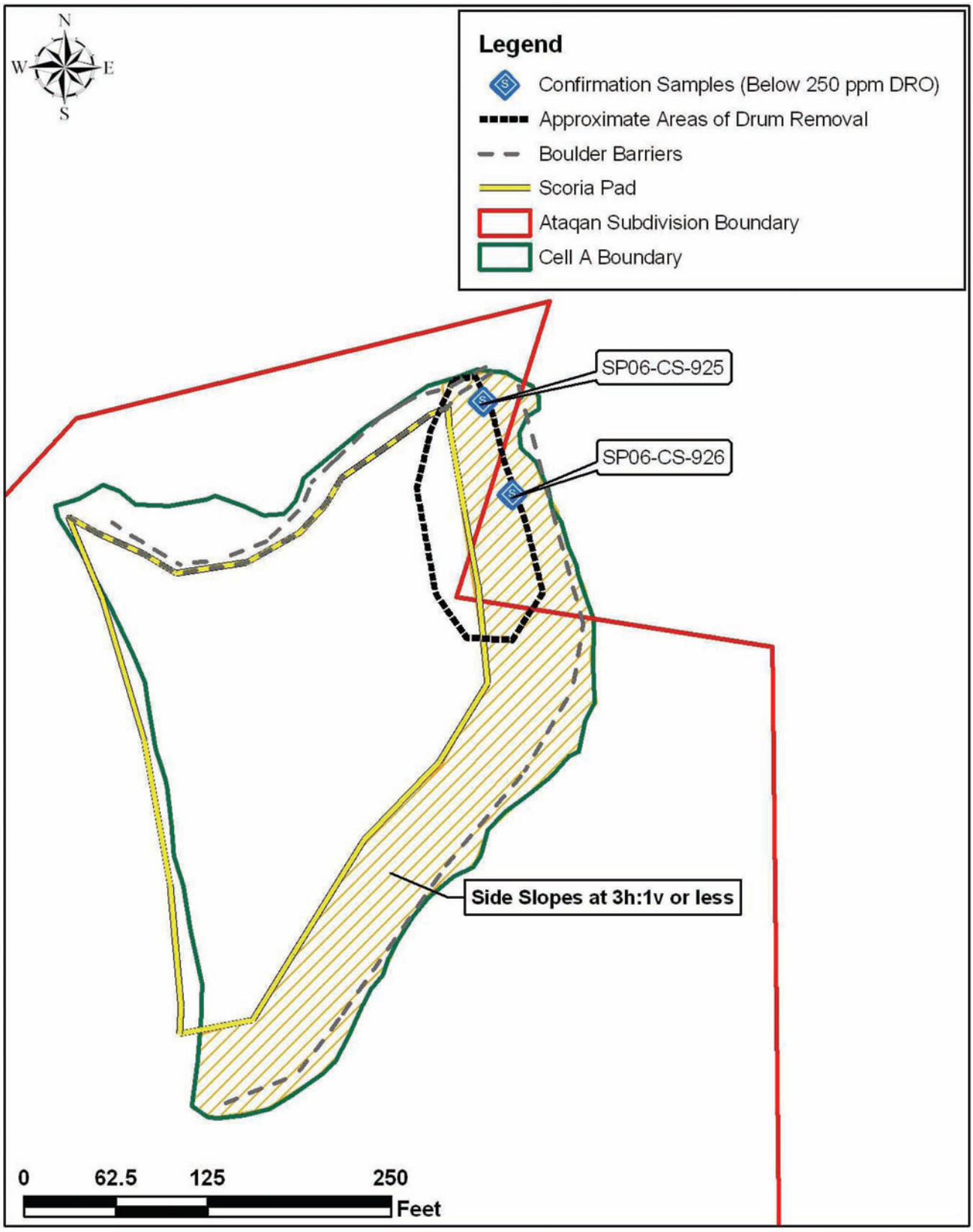

Figure 6	Sampling Location Map St. Paul Landfill Cell A Site 6/TPA Site 5b St. Paul Island, Alaska	Sources: Excavation Areas, Scoria Pad, and Confirmation Sample Locations (NOAA GPS 2003), Ataqan Subdivision Boundary and Cell A Boundary (NOAA GIS 2004).

Pribilof Islands Restoration Project

TABLES

Table 1. Analytical Data Summary - BTEX, GRO, DRO, and RRO, St. Paul Landfill Cell A, St. Paul Island, Alaska

Sample Number	Sample Date	Sample Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Gasoline-range Organics (mg/kg)	Diesel-range Organics (mg/kg)	Residual-range Organics (mg/kg)
Cell A Confirmation Samples									
SP06-CS-925[a]	10/09/03	--	0.02	0.03	0.09	0.13	22	200 J	2,100 J
SP06-CS-926[a]	10/09/03	--	0.03 U	0.03 U	0.03 U	0.09 U	2 U	59 J	300 J
Waste Sample									
SP07-CS-927[b]	10/24/03	--	**1.7** J	3.7 J	**6.0** J	11 J	**510** J	**1,600**	7,500
Trip Blank Samples									
Trip blank	09/04/04	--	0.02 U	0.02 U	0.02 U	0.02 U	1 U	--	--
Trip blank	09/17/03	--	0.02 U	0.02 U	0.02 U	0.02 U	1 U	--	--
ADEC Method Two Cleanup Level[c]			*0.02*[d]	*5.4*	*5.5*	*78*	*300*	*250*	*10,000*

Notes:

bold Indicates a concentration exceeding soil cleanup level. Although reporting limits for benzen sometimes exeeded the ADEC Method Two cleanup level, no reporting limits exceeded the 1991 cleanup level of 0.5 mg/kg identified under the TPA.

ADEC Alaska Department of Environmental Conservation

bgs Below ground surface

BTEX Benzene, toluene, ethylbenzene, and total xylenes

DRO Diesel-range organic compounds

GRO Gasoline-range organic compounds

J The analyte was positively identified, but the numerical value is an estimated concentration.

mg/kg Milligram per kilogram

-- Not analyzed

NA Not available

PCS Petroleum-contaminated soil

RRO Residual-range organic compounds

TPA Two-Party Agreement

U The analyte was analyzed for, but not detected above the sample reporting limt.

a Sample collected from the buried drum excavation in the northeast portion of Cell A.

b Sample collected from tar material identified in drums removed from Cell A and Cell B.

c Cleanup level is obtained from Title 18 of the *Alaska Administrative Code* 75 "Oil and Hazardous Substances Pollution Control Regulations," published by the State of Alaska and amended through October 28, 2000. Contaminants of concern for this site are limited to BTEX, GRO, DRO, RRO, and select PAHs.

d Under the TPA, NOAA is required to comply with the 1991 ADEC cleanup level for benzene (0.5 mg/kg); however, whenever possible, NOAA has attempted to remove all contamination above the current ADEC Method Two cleanup level (0.02 mg/kg).

Table 2. Analytical Data Summary - Polynuclear Aromatic Hydrocarbons, St. Paul Landfill Cell A, St. Paul Island, Alaska

Sample Number	Sample Date	Sample Depth (feet bgs)	Naphthalene (mg/kg)	Acenaph-thylene (mg/kg)	Acenaph-thene (mg/kg)	Fluorene (mg/kg)	Phenan-threne (mg/kg)	Anthracene (mg/kg)	Fluoranthene (mg/kg)
Cell A Confirmation Samples									
SP06-CS-925[a]	10/09/03	--	0.056	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
SP06-CS-926[a]	10/09/03	--	0.007	0.005 U	0.005 U	0.005 U	0.009	0.005 U	0.007
Waste Sample									
SP07-CS-927[b]	10/24/03	--	38	2.5 U	2.5 U	2.5 U	4.2	2.5 U	2.5 U
ADEC Method Two Cleanup Level[d]			*43*	*NA*	*210*	*270*	*NA*	*4,300*	*NA*

Sample Number	Pyrene (mg/kg)	Benzo(a) anthracene (mg/kg)	Chrysene (mg/kg)	Benzo(b) fluoran-thene (mg/kg)	Benzo(k) fluoran-thene (mg/kg)	Benzo(a) pyrene (mg/kg)	Indeno (1,2,3-cd) pyrene (mg/kg)	Dibenzo(a,h) anthracene (mg/kg)	Benzo(g,h,i) perylene (mg/kg)
Cell A Confirmation Samples									
SP06-CS-925[a]	0.050 U	0.050 U	0.073	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
SP06-CS-926[a]	0.009	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Waste Sample									
SP07-CS-927[b]	3.5	2.5 U	8	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
ADEC Method Two Cleanup Level[d]	*1,500*	*6*	*620*	*11*	*110*	*1*	*11*	*1*	*NA*

Notes:

bgs Below ground surface
mg/kg Milligram per kilogram
-- Not analyzed
NA Not available
PCS Petroleum-contaminated soil
U The analyte was analyzed for, but not detected above the sample reporting limt.
a Sample collected from the buried drum excavation in the northeast portion of Cell A.
b Sample collected from tar material identified in drums removed from Cell A and Cell B.
c Duplicate of sample number SP07-SS-910.
d Cleanup level is obtained from Title 18 of the *Alaska Administrative Code* 75 "Oil and Hazardous Substances Pollution Control Regulations," published by the State of Alaska and amended through October 28, 2000.

Table 3. Analytical Data Summary - Polychlorinated Biphenyls, St. Paul Landfill Cell A, St. Paul Island, Alaska

Sample Number	Sample Depth (feet bgs)	Aroclor 1221 (mg/kg)	Aroclor 1232 (mg/kg)	Aroclor 1016 (mg/kg)	Aroclor 1242 (mg/kg)	Aroclor 1248 (mg/kg)	Aroclor 1254 (mg/kg)	Aroclor 1260 (mg/kg)	Aroclor 1262 (mg/kg)
Drum Contents Confirmation Samples									
SP07-CS-927[a]	--	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
ADEC Method Two Cleanup Level[b]		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*

Notes

bgs Below ground surface
mg/kg Milligram per kilogram
-- Not analyzed
NA Not available
U The analyte was analyzed for, but not detected above the sample reporting limit.
a Sample collected from tar material identified in drums removed from Cell A and Cell B.
b Cleanup level is obtained from Title 18 of the *Alaska Administrative Code* 75 "Oil and Hazardous Substances Pollution Control Regulations," published by the State of Alaska and amended through October 28, 2000.

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NOTICE OF ENVIRONMENTAL CLEANUP AND RESIDUAL SOIL AND DEBRIS AT TPA05 (b),
NOAA CELL A LANDFILL,
ST. PAUL ISLAND, ALASKA

Pursuant to 18 AAC 75.375, the City of St. Paul and The Aleut Corporation as the owners, and the U.S. Department of Commerce/National Oceanic and Atmospheric Administration (NOAA), as the operator of the subject property hereby provide public notice that the property located on the southerly side of Polovina Turnpike and south of the St. Paul Island Airport, St Paul Island, Alaska 99660 is contaminated. More specifically, the site described as follows,

Lot 6 (Ataqan subdivision) of the Seward Meridian, Alaska,
Section 17, Township 35 South, Range 131 West,
57° 9' 1.56" North Latitude; 170°13' 56.30" West Longitude,

Cell A (Figures 1 and 2) has been subject to solid waste and petroleum contaminated soil, and potential groundwater contamination from a discharge, or release and subsequent cleanup of oil or other hazardous substances, regulated under 18 AAC 75, Article 3 as amended December 2006, and solid waste disposal regulated under 18 AAC 60, as amended August 2003. Buried solid waste remains on the property. Adequate soil cover must be maintained over the waste to prevent exposure, and excavation into the buried waste should be avoided. If contaminated soil or solid wastes are exposed in the future they must be managed in accordance with laws applicable at that time. These releases and cleanup are documented in the Alaska Department of Environmental Conservation (ADEC) contaminated sites database under site number *CS Reckey* #1994250135407; File No. 2644.38.017.02.

The St. Paul Landfill Site was identified as *Site 5 St. Paul Landfill* pursuant to the *Pribilof Islands Environmental Restoration Two Party Agreement* (TPA) between the State of Alaska and NOAA (NOAA 1996). NOAA addressed the Landfill Site as TPA Site 05, Cells A, B, and C, and NOAA Sites 6 (5b), 7 (5c) and 8 (5d), and 5 (5a), respectively. Landfill Site TPA05, Cell C, NOAA Site 5a in Township 35 South, Range 131 West, Section 17, Tract 42, is currently (2008) owned by the federal government. Following corrective action, NOAA submitted a request for conditional closure of Cell A, Site 05b, as an inert waste monofill under 18 AAC 60.460(e) pending additional application for a site wide cap to the ADEC Solid Waste Program and to the ADEC Division of Spill Prevention and Response, Contaminated Sites Program (NOAA 2001). The ADEC Solid Waste Program approved the inert waste monofill (ADEC 2001a). ADEC Contaminated Sites Program determined, in accordance with 18 AAC 75.325(f)(1) that site cleanup has been performed to the maximum extent practicable even though residual petroleum contaminated soils, primarily diesel range and residual range organics exist on the site property (ADEC 2001b). NOAA applied a soil cap with vegetated slopes over the entire site (Cells A, B, and C) in accordance with 18 AAC 60.460 and following ADEC Solid Waste Program approval of the closure plan for an inert waste monofill (ADEC 2002). ADEC granted a conditional closure of Cell A, TPA05b, in part subject to this institutional control (deed notice), and confirmed that no further remedial action was required at the site unless new information becomes available that indicates to ADEC that the site may pose an unacceptable risk to human health, safety, welfare or the environment (NOAA 2004).

8

Grantor (subsurface estate): U.S. Bureau of Land Management
Grantee (subsurface estate): The Aleut Corporation
4000 Old Seward Highway, Suite 300
Anchorage, AK 99503
Grantor (surface estate): Tanadgusix Corporation
4300 B Street, Suite 402
Anchorage, AK 99503-5946
Grantee (surface estate): City of St. Paul, St. Paul Island, Alaska

Recording District: Aleutian Islands

Remedial Actions and Residual Contamination

The Landfill Site Cell A, TPA05b, was used by the federal government and the St. Paul Island community to primarily dispose construction and demolition debris, although some household wastes and steel drums of used oil were deposited at the site. During 2000 and 2001, NOAA removed drums, but not necessarily all drums, containing petroleum products, and approximately fifty-cubic yards of petroleum contaminated soils from the site. Small areas of contamination by diesel range and residual range organics remain mixed among concrete demolition debris. During 2004, NOAA applied a soil cap consisting at a minimum of eighteen inches of sand and twelve inches of scoria over the inert waste monofill (Figure 3), Tetra Tech 2004. The monofill's exposed slopes along the east and southerly sides contain capping materials much thicker than minimum requirements. These 3:1 slopes have been vegetated with native Alaskan grasses. The site covered a surface area of approximately 2.4 acres of which circa 0.78 acres are vegetated slopes. Attached is a site survey or diagram (Figure 2) drawn to scale that shows the property boundaries, locations of buried solid waste, the area that had been cleaned up, the approximate location and extent of remaining soil contamination, and the locations where confirmation soil samples were collected applicable to the Cell A TPA Site 05b.

NOAA installed several groundwater monitoring wells at the site, which are maintained under its long-term groundwater monitoring plan (NOAA 2005b). GW beneath the site may become contaminated with diesel range and residual range organic compounds because of potentially undiscovered buried drums. Figure 4 depicts the location of GW wells. Groundwater sampling since closure has not found groundwater near Cell A with contaminants above ADEC Table C levels (Tutka 2007). ADEC requires GW monitoring for at least five years following an approved closure or at least through 2009.

Site Use

In the event that information becomes available which indicates that the site may pose an unacceptable risk to human health, safety, welfare or the environment, the land owner and/or operator is required under 18 AAC 75.300 to notify ADEC and evaluate the environmental status of the contamination in accordance with applicable laws and regulations. Further site characterization and cleanup may be necessary under 18 AAC 75.325-.390 and 18 AAC 78.600. Any transport, treatment, or disposal of any potentially contaminated soil or water from the site or use of the groundwater at or near the contaminated area requires notification to and approval from the Department in accordance with 18 AAC 75.370(b) and 18 AAC 78.600(h).

In the future, ADEC approval is required prior to moving the soil cover over the solid waste pursuant to 18 AAC 60. If contaminated soil and solid wastes are removed from the site, the site must be characterized and managed following regulations applicable at that time including 18 AAC 75.325(i)(1), (2) 18 AAC 75.370, and (3) 18 AAC 60 as amended. ADEC approval is required prior to moving soil or solid wastes that is, or has been, subject to the cleanup rules found at 18 AAC 75.325-.390, and 18 AAC

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2008-000252-0

60 as amended.

This notice remains in effect until a written determination from ADEC is recorded that states that soil at the site has been shown to meet the most stringent soil cleanup levels in Method Two of 18 AAC 75.341 (c) and that off-site transportation of soil is not a concern, and until all wastes are removed from the property.

References:

ADEC. 2001a. Letter from Heather Stockard (ADEC, Solid Waste Program), "Closure Approval, Portion of Cell A, St. Paul Island TPA Site 5" to John Lindsay (NOAA). February 8, 2001.

ADEC. 2001b. Letter from Louis Howard (Federal Facilities Section), "Closure Approval, Portion of Cell A, St. Paul Island TPA Site 5" to John Lindsay (NOAA). February 8, 2001.

ADEC. 2002. Certified Mail #7001 2510 002 7773 2912 Re: Approval for Saint Paul Landfill Closure Plan, #0225-PR001. Letter from Leslie Simmons, ADEC Solid Waste Program Coordinator, Southcentral and Western Alaska to John Lindsay, U.S. Department of Commerce, National Oceanic and Atmospheric Administration." August 7.

National Oceanic and Atmospheric Administration (NOAA). 1996. *Pribilof Islands Environmental Restoration Two Party Agreement*, Attorney General's Office File No. 66 1-95-0126. National Oceanic and Atmospheric Administration. January 26.

NOAA. 2000. Letter from John Lindsay, "Partial Cell A Closure Request: St. Paul Island TPA Site 5" to Louis Howard (ADEC). December 19.

NOAA. 2004. *Request for Conditional Closure, St. Paul Landfill Cell A, TPA Site 5b, NOAA Site 6, St. Paul Island, Alaska.* Signed by John Lindsay (NOAA) and submitted November 10. Signed by Louis Howard of ADEC Contaminated Sites Program, November 15, 2004

Tetra Tech. 2004. *Final Closure Report: Site 6/TPA Site 5b –St. Paul Landfill Cell A; Site 7/TPA Site 5c – St. Paul Landfill Cell B (Drum Dump); Site 7/TPA Site 5d – St. Paul Landfill Cell B (Solid Waste).* Prepared for National Oceanic and Atmospheric Administration, National Ocean Service, Office of Response and Restoration, 7600 Sand Point Way NE, Seattle, WA. 98115. November 30.

Tutka. 2007. *Annual Groundwater Monitoring Report 2007, St. Paul Island, Alaska.* December 21. Prepared for NOAA, Office of Response and Restoration, 7600 Sand Point Way NE, Seattle, WA. 98115.Please return original copy of this notice to the (operator) address below:

Signature: _____

Printed Name: John A. Lindsay

Mailing Address:
Attn: John Lindsay

US DOC, NOAA, NOS, OR&R, PPO
7600 Sand Point Way NE
Bldg 3, RM 1301
Seattle, WA 98115

(seal) Subscribed and sworn to before me this ___ day of _____, 19___.
Notary Public in and for the State of _____
My commission expires:_____

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Figure 1

St. Paul Island Vicinity Map
St. Paul Landfill Cell A
NOAA Site 6/TPA Site 5b
St. Paul Island, Alaska

Source: Ikonos Satellite Imagery (Space Imaging 2001)
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Date: 4/29/2008

Pribilof Islands Restoration Project

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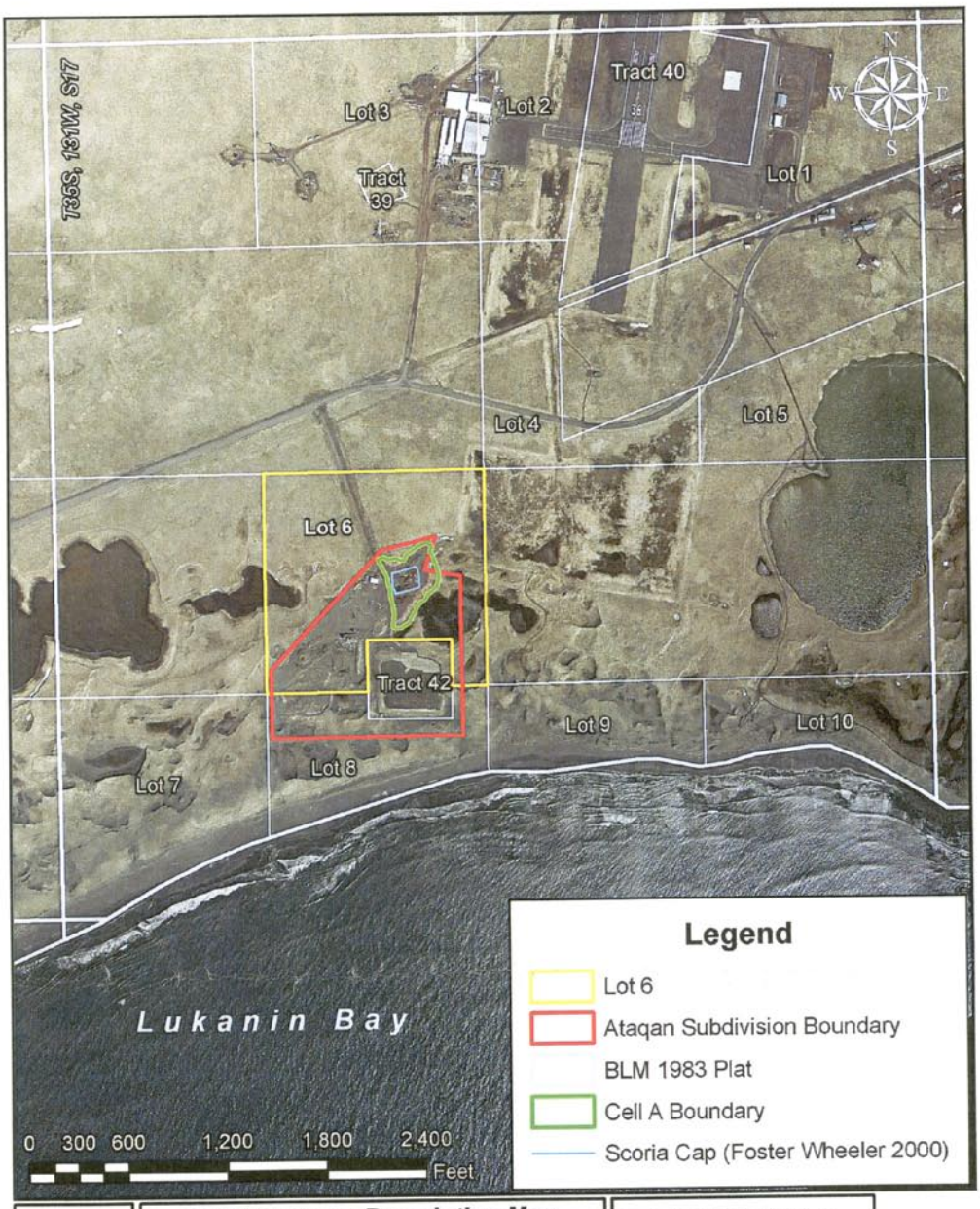

Figure 2	Legal Property Description Map Lot 6 & Ataqan Subdivision St. Paul Landfill Cell A NOAA Site 6/TPA Site 5b St. Paul Island, Alaska	Sources: Landfill Cell A Layers (NOAA PPO GIS, 2003), Aero-Metric 2006 2 ft Aerial, 1983 Bureau of Land Management Land Survey Plat Officially filed February 15, 1985. Path: C:\KP_GIS Data\Maps & Figures\SNP\Deed Notices\Site 6, TPA 5b\CellA_PropDescription_Fig2.mxd Date: 4/30/2008 @ 9:03:38 AM

Pribilof Islands Restoration Project

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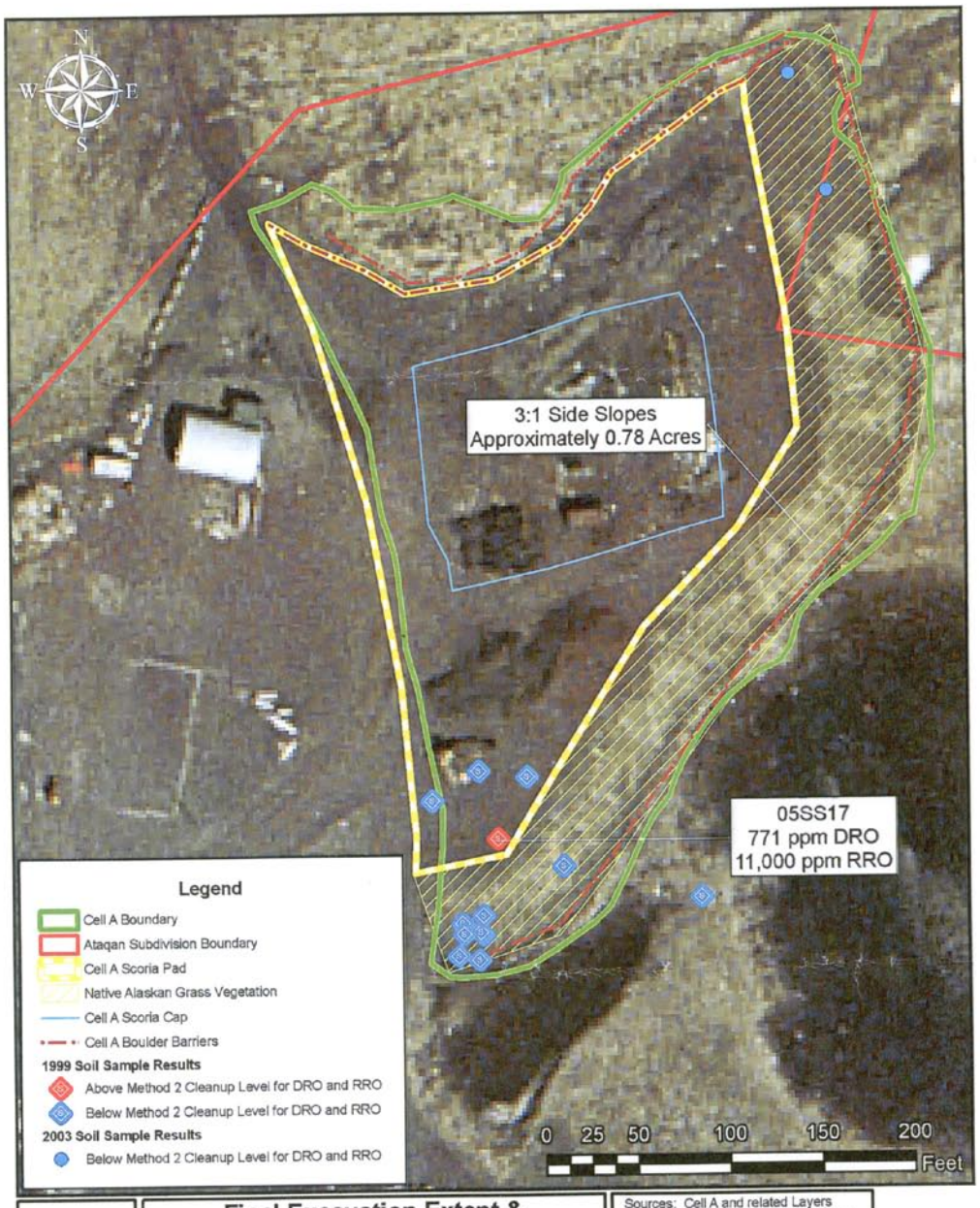

Figure 3	Final Excavation Extent & Confirmation Sampling Results St. Paul Landfill Cell A NOAA Site 6/TPA Site 5b St. Paul Island, Alaska	Sources: Cell A and related Layers (NOAA GIS 2003), Ataqan Boundaries (Polarconsult 1997), Samples '99 & '03 (PPO Chemical Database 2003), Aero-Metric 2006 2 ft Aerial Photo Path: C:\KP_GIS Data\Maps & Figures\SNP\Deed Notices\Site 6, TPA 5b\CellA_Samples&Excavate_Fig3.mxd Date: 4/29/2006 @ 2:57:09 PM

Pribilof Islands Restoration Project

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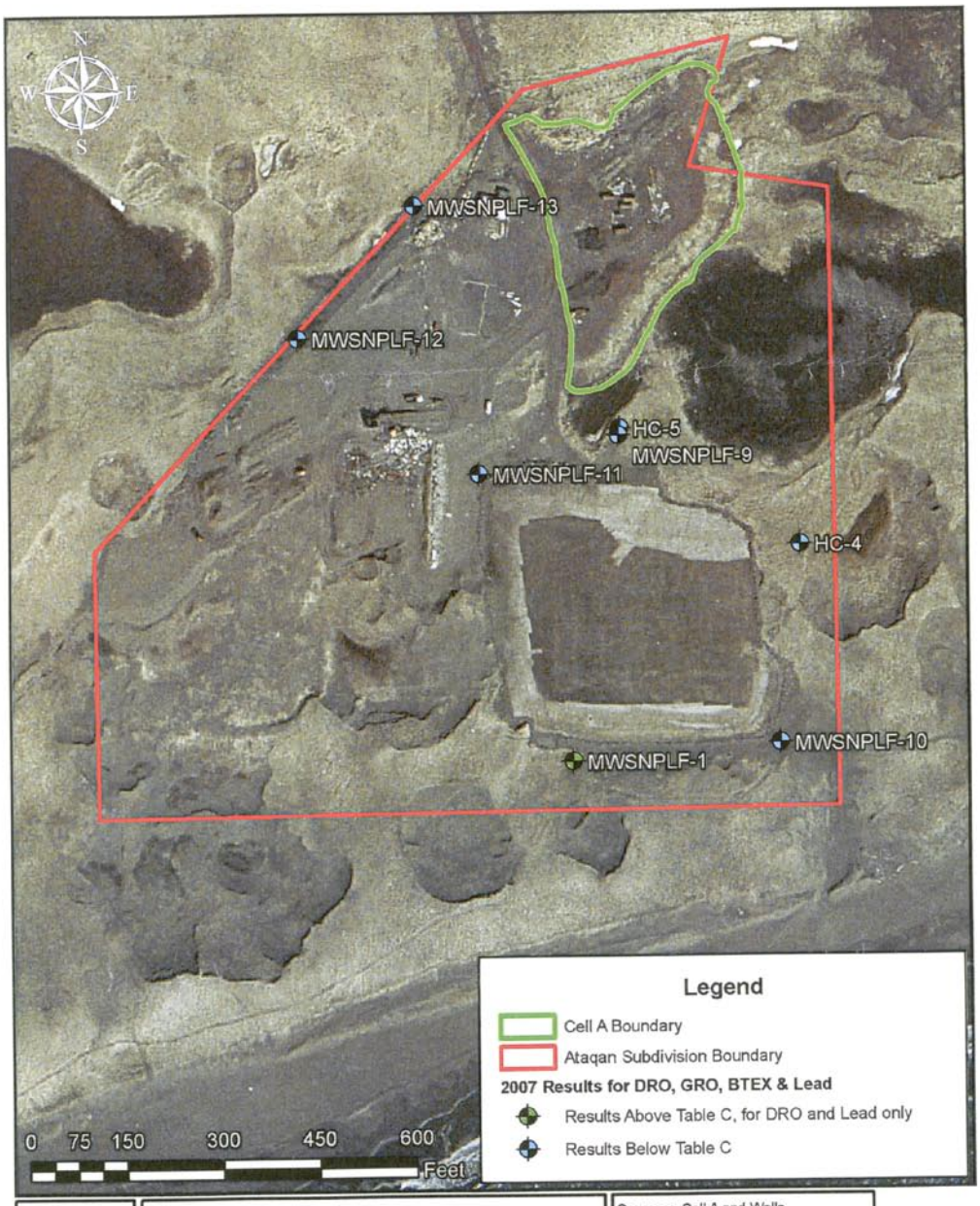

Figure 4	Location of Groundwater Wells St. Paul Landfill Cell A NOAA Site 6/TPA Site 5b St. Paul Island, Alaska	Sources: Cell A and Wells (NOAA GIS/Chemical Database '04-'07) Ataqan Boundaries (Polarconsult 1997) Aero-Metric 2006 2 ft Aerial Photo Path: C:\KP_GIS Data\Maps & Figures\SNP\Deed Notices\Site 6, TPA 5b\CellA_Wells&Gradient_Fig4.mxd Date: 4/29/2008 @ 3:06:14 PM

Pribilof Islands Restoration Project

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2008-000252-0

NOAA Site 7
TPA Site 5c: Cell B drum dump
(St. Paul Landfill, TPA 5; TPA Attachment A)

Request for Conditional Closure Site 7/TPA Site 5c –
St. Paul Landfill Cell B (Drum Dump) St. Paul Island, Alaska 255

Notice of Environmental Cleanup and Residual Soil and Debris at
TPA05 (c and d), NOAA Cell B Landfill, St. Paul Island, Alaska.....275

Request for Conditional Closure
Site 7/TPA Site 5c – St. Paul Landfill Cell B (Drum Dump)
St. Paul Island, Alaska

REQUEST FOR CONDITIONAL CLOSURE

Site: The site is known as St Paul Landfill Cell B, Two-Party Agreement (TPA, NOAA 1996) Site 5c, and as National Oceanic and Atmospheric Administration (NOAA) Site 7.

Location: St. Paul Island, Alaska is approximately 800 miles southwest of Anchorage in the Bering Sea. The St Paul Landfill is approximately 1.5 miles northeast of the City of St. Paul (Figure 1). NOAA arbitrarily divided the St. Paul municipal solid waste (MSW) landfill into three areas or cells in 2000 for discussion and closure planning purposes. Cells A and B are currently located on property owned by the City of St. Paul. Cell B (3.949 acres) is within the property called the Ataqan Subdivision (Figure 2). Cell C is located within Tract 42, a 5.78 acre parcel owned by NOAA. In 2003, NOAA sited a short-term, petroleum contaminated soil (PCS) stockpile upon Tract 42.

Legal Property Description: The legal description for Cell B is: Township 35 South, Range 131 West, Section 17, of the Seward Meridian, Alaska as shown on the plat of rectangular survey officially filed May 14, 1986 (Figure 2). The City of St. Paul is the surface estate owner of Cell B and the greater Ataqan Subdivision. The Aleut Corporation is the subsurface estate owner.

Type of Release: Cell B, located north and west of Tract 42, contained primarily MSW associated with historical disposal activities on St. Paul Island. In 1994, NOAA counted 774 drums or barrels at the landfill site. NOAA found many of these drums empty, although it is unknown how many leaked their contents through holes NOAA observed in the drums during the removal action (Oil Spill Consultants 1995). During later excavation work at the site, NOAA encountered and removed several more buried drums in Cell B that were either empty or contained varying amounts of petroleum.

History and Background:

The landfill area has been used as the primary landfill for the Island of St. Paul since the 1940s (CESI 2001a). Cell B was described as inactive in the Site Characterization Report (Tetra Tech 2000), with much of the area apparently used for the disposal of all types of "residential, commercial, and industrial wastes…" as well as exposed and partially buried drums containing petroleum wastes, and lead acid batteries. NOAA surveyed the site in 1990 and several times thereafter to assess the magnitude of contamination at the site as described below in the Summary of Site Investigations. NOAA removed the drums scattered about the landfill surface in 1994. They shipped 774 off island disposal (Oil Spill Consultants 1995). In 1996, NOAA agreed in the TPA to close the landfill.

In a closure plan dated April 2, 2002, NOAA proposed to close Cell B by relocating all the solid waste to the Tract 42 Cell C, owned by NOAA (Polarconsult 2002). The closure plan was approved by the Alaska Department of Environmental Conservation (ADEC) on August 7, 2002 (ADEC 2002). On June 30, 2003, NOAA submitted a Draft Corrective Action Plan (CAP) for closure of the landfill (NOAA 2003a), which contained Addendum 1, proposing certain changes to the original closure plan. The CAP proposed to remove PCS identified by Tetra Tech (2000) in 3 areas within Cell B to the depth of groundwater, or to refusal.

During the summer of 2003, NOAA and ADEC agreed to modify the CAP's proposed removal of PCS at the site (NOAA 2003b), after NOAA proposed to remove PCS only to a depth of 2 feet below ground surface (bgs), due to the following reasons:

- The long term use of the site as a landfill created a potentially random distribution of petroleum waste disposed throughout the landfill during its active life, resulting in a great difficulty of characterizing the landfill and finding all potential minor deposits of petroleum wastes.
- The City of St. Paul will continue to use the Ataqan Subdivision as a permitted MSW disposal facility.

- The facility is unlikely to ever be used for residential purposes, and therefore, it is unlikely that residential exposure will occur at the site.
- Given that residential exposure is not likely to occur, site cleanup levels should reflect exposure of site workers via the ingestion and inhalation pathways, rather than the much lower cleanup levels associated with the migration to groundwater pathway.
- Groundwater in the vicinity of the site did not exhibit petroleum contamination and the threat to the drinking water supply is minimal.
- The City of St. Paul constructed an approximate 21 feet (ft) above ground surface sand and scoria pad for its MSW operations; this pad would further bury much of the Cell B area of concern.

ADEC suggested that NOAA remove PCS to a depth of 5 ft bgs, but agreed to allow the excavation of PCS only to a depth of 2 ft bgs subject to the potential installation of additional groundwater monitoring wells in the area of PCS contamination.

Summary of Site Investigations:

In 1983, ADEC investigated waste disposal practices on St. Paul Island including the St. Paul Landfill. They reported the disposal of many drums of petroleum and other wastes at the landfill area (Harmon 1983).

In 1990, NOAA conducted an environmental compliance survey (Buckel 1990), and reported 5 groups of drums along the unmaintained access road into the north end of the landfill (Cell B).

In September and October 1992, NOAA contractor Harding Lawson Associates (HLA) conducted a Phase I environmental assessment that included an inventory and characterization of approximately 650 drums located at the landfill, mostly in or near Cell B. The assessment identified the presence 191 drums of concern, which were assigned to the following groups: solid grease (1 drum); nonflammable oil and water mixtures (174 drums); flammable oil and water mixtures (8 drums); water (4 drums); non-flammable mixtures of antifreeze, oil, and water (1 drum); and polychlorinated biphenyls (PCB) at concentrations greater than 50 parts per million (3 drums) (HLA 1993). Following this assessment, NOAA staged all drums on site pending future decisions.

In 1992, Ecology and Environment, Inc. (E&E) conducted a preliminary assessment and reported six to seven drum groups spread over 1.5 acres at the sanitary landfill site (E&E 1993). They reported, "NOAA reportedly disposed of drums along an east-west-oriented road at the north end of the landfill. The City of St. Paul reportedly collected NOAA drums from the Power Plant and Machine Shop and transported them to the landfill". The report went on to state, "Once the drums are removed, petroleum-contaminated soils will be the remaining source."

In 1993 and 1994, NOAA contractor Woodward-Clyde Consultants, Inc. (Woodward-Clyde) conducted a site inspection at the landfill that included the segregation of drums located at Cell B. Observations made during the inspection noted leaking and deteriorated drums, soil staining, and a strong petroleum odor. They classified many of the drums as empty. Soil samples collected by Woodward-Clyde from depths up to 5 feet bgs indicated the presence of volatile organic compounds, semi-volatile organic compounds, polynuclear aromatic hydrocarbons (PAH), and metals; however, these analytes were present at concentrations below ADEC Method Two cleanup levels. In addition, analytical data for sediment and surface water samples collected from the pond in the eastern portion of the landfill did not recognize any contaminants of concern (Woodward-Clyde 1994).

During the fall of 1994, NOAA contractor Oil Spill Consultants (1995) collected 774 drums from the landfill and disposed them off island. The project report did not specify the location of these drums within the landfill area.

In 1996, NOAA contractor Hart Crowser, Inc. (Hart Crowser) installed five monitoring wells at the landfill, including two in the vicinity of Cell B (MW1 and MW2, Figure 3). Although analytical data for groundwater samples collected from these wells indicated the presence of toluene and lead, they did not find these compounds at concentrations above cleanup levels (Figure 3). Hart Crowser concluded that landfill operations did not significantly impact groundwater quality (Hart Crowser 1996).

Between August and October 1999, NOAA contractor Tetra Tech conducted site characterization activities at Cell B, including the collection of soil and groundwater samples (Figure 3). Analytical soil data indicated the presence

of PCS with diesel-range organic compounds (DRO) and residual-range organic compounds (RRO) at concentrations above cleanup levels at 4 locations in and near the north end of Cell B (Figure 3). The areas corresponded with areas of drums identified during previous investigations (Tetra Tech 2000). NOAA also collected groundwater samples from 4 boreholes in and around Cell B (05GW1 through 05GW04, Figure 3), and from two monitoring wells (MW1 and MW2, Figure 3) that had been sampled by Hart Crowser in 1996. Analytical data for the groundwater samples showed no analytes above the ADEC Table C levels.

During the spring and summer of 2000, NOAA contractor Nortech Environmental and Engineering Consultants (Nortech) conducted excavations and removals of buried drums during three different field visits (Nortech 2001). Nortech removed approximately 50 buried barrels from Cells A and B during the initial visit, then removed an unspecified number of buried drums in two following visits. During this fieldwork, Nortech also dug 25 test trenches around Cell B to delineate the extent of solid waste disposal.

During the summer of 2000, NOAA contractor CESI installed nine groundwater monitoring wells in the vicinity of Cell B; they screened the wells in both the upper and lower aquifers. Although analytical data for groundwater samples collected from the landfill revealed the presence of DRO (Figure 4), the data did not identify any analytes at concentrations above cleanup levels (CESI 2001b).

NOAA contractors conducted quarterly groundwater monitoring from June 2000 to September 2001 (IT 2002) and from October 2003 to July 2004 (report scheduled to be submitted in May 2005) including as many as 12 monitoring wells in the landfill area, most of which are upgradient, within, or downgradient of Cell B (Figure 4). The results are summarized below.

> During 2000-2001 quarterly sampling events, NOAA did not detect DRO above the ADEC Table C cleanup level of 1,500 µg/l in the 12 wells sampled (MWSNPLF 1, MWSNPLF 2, MWSNPLF 4 through MWSNPLF 9, and HC-2 through HC-5) with one exception. During the last quarter, the sample from well MWSNPLF-1 indicated the presence of DRO at 4,200 µg/l, (Figure 4), along with GRO, benzene, and 13 other VOCs. According to NOAA's contractor, IT Alaska Inc., this sample was part of a "highly suspect analytical data package and should be viewed with caution" (IT Alaska Inc. 2002). The groundwater samples from the same well during earlier quarters did not exceed the cleanup levels. The City of St. Paul MSW burn crew staged their igniter materials in close proximity to this well prior to and during the sampling event.
>
> During the 2003-2004 sampling, only five wells were sampled by NOAA because seven of the original twelve wells had been decommissioned to allow construction of the City of St. Paul's MSW facility. None of the samples exceeded the Table C cleanup levels, including those from MWSNPLF-1, the only landfill well ever to yield a sample with analytes exceeding cleanup levels. This data supports the contention that the contamination found in MWSNPLF-1 was due to lab error or cross contamination, and not to the presence of contamination in the well. Later in 2004, NOAA decommissioned an eighth well in the vicinity of the landfill (MWSNPLF-8), and installed four new monitoring wells (MWSNPLF 10 through MWSNPLF 13). Results from sampling of these wells are not yet published, but preliminary data did not reveal any analytes above cleanup levels.

In summary, groundwater monitoring results for the St. Paul landfill have consistently shown that the groundwater does not contain analytes exceeding the Table C cleanup levels.

Summary of Applied Cleanup Levels:

The State of Alaska provides TPA oversight through the ADEC. Under the TPA, NOAA is required to comply with State of Alaska regulations in effect in 1991 (NOAA 1996, ADEC 1991); however, with ADEC agreement, NOAA chose to follow more current regulations whenever possible.

ADEC uses 15 ft bgs to define subsurface soil to which residents will have a reasonable potential for exposure through the inhalation or ingestion pathways (ADEC 2000). Therefore, NOAA is not obligated to excavate contaminated soil occurring at depths deeper than 15 ft. Due to unique site circumstances as discussed above, ADEC

approved a waiver to this requirement, allowing NOAA to halt excavation at 2 ft bgs provided additional area groundwater monitoring wells were installed and monitored at the site.

Summary of Corrective and Closure Actions:

Drum Removal Area

During closure activities (Tetra Tech 2004), NOAA identified numerous buried drums in the hillside of a sand dune located in the northern portion of Cell B (Figures 5 and 7). NOAA recovered a total of 76 drums from the dune, including 33 drums containing a suspected petroleum based tar. NOAA found forty-three (43) drums either empty or containing only residual tar or waste oil. NOAA recovered a total of approximately 190 gallons of liquid oil into secure salvage drums. NOAA placed several drums containing solid material or material that could not be pumped directly into salvage drums. Subsequent characterization analysis confirmed the tar material as a petroleum substance. NOAA arranged for the off-island shipment and disposal of the tar and oily wastes. According to manifest documentation, the shipper (Northland) received the conex boxes containing the tar and oily waste containers on January 9, 2004, and the disposal facility (Onyx Environmental Services, LLC) confirmed receipt on February 18, 2004.

In addition, NOAA excavated approximately 300 cubic yards (CY) of tar-contaminated soil from the vicinity of the buried drums (Figures 5, 6 and 7). NOAA incorporated these soils into its short-term PCS stockpile at Tract 42, based on characterization sample results taken from a drum waste sample (SP07-CS-927). NOAA did not take soil confirmation samples at this location. Figure 7 shows the Drum Removal Area in relation to a subsequently constructed earthen pad of sand and scoria. The earthen pad main serves the City of St. Paul's municipal solid waste (MSW) burn box. Figure 5 shows that the original elevation of the area of drum removal ranged from 3 to 6 meters (9.7 to 19.4 feet) above mean sea level (MSL). Figure 6 shows the drum removal area with the addition of the earthen pad that increased the ground elevation up to 6.4 meters above MSL (20.7 feet).

PCS Areas

NOAA removed approximately 1,108 CY of PCS from two locations, north and northwest areas, along a small access road [since covered by the City of St. Paul's earthen pad] passing into Cell B. NOAA transported the PCS directly to its short-term stockpile at Tract 42. PCS excavations focused at the north and northwest area sites (Figures 5 and 6). PCS remained around 6 sample locations within the north area at depths ranging from 4 ft bgs to 11 ft bgs; these depths are greater than the minimum 2 ft bgs agreed to with ADEC. No PCS remained at the northwest area site.

NOAA collected twenty-one confirmation samples, one field duplicate sample, and one waste sample during corrective action activities at the Cell B drum dump. Tables 1, 2, and 3 provide a summary of the confirmation samples collected during this corrective action. Figure 6 illustrates the sampling locations. NOAA analyzed all samples for the following constituents (Table 1):

- BTEX by U.S. Environmental Protection Agency (EPA) SW-846 (EPA 1996) Method 8021B
- DRO by Method AK102
- GRO by Method AK101
- RRO by Method AK103

In accordance with the CAP (NOAA 2003a), NOAA conducted the following analysis on approximately 20% of the confirmation samples collected at Cell B, and the tar like waste material (see Table 2):

- PAHs by EPA SW-846 (EPA 1996) Method 8270C Selected Ion Monitoring

In addition, NOAA conducted the following analysis on the tar like waste material (see Table 3):

- PCBs by EPA SW-8082 (EPA 1996)

Confirmation samples from the excavations at Cell B indicated DRO concentrations varied from not detected to 6,100 mg/kg. Six of the 21 confirmation samples contained concentrations of DRO above the ADEC Method Two

cleanup level threat to groundwater pathway of 250 mg/kg; concentrations did not exceed the threat to inhalation or ingestion pathways. Four of these six samples revealed RRO concentrations above the ADEC Method Two threat to groundwater pathway cleanup level of 10,000 mg/kg. Figure 6 illustrates the distribution of DRO and RRO concentrations.

GRO concentrations varied from not detected to 61 mg/kg in confirmation samples, which is below the ADEC Method Two cleanup level of 300 mg/kg.

None of the 21confirmation samples collected by NOAA from this area contained concentrations of BTEX above the ADEC Method Two cleanup levels, although analysis detected toluene up to 0.4 mg/kg.

Confirmation samples did not detect PAHs in any of the soil samples. Two PAH analytes were detected in the tar-like waste sample, but neither of these exceeded their respective PAH cleanup levels.

No PCBs were detected in the tar-like waste sample.

The north and northwest excavation areas were backfilled to original grade as shown in Figure 5. The major portion of the two excavation areas was subsequently covered by the sideslope of the earthen pad, thereby resulting in deeper burial of residual PCS. Figure 5 shows that the original elevation of the PCS excavation area ranged from approximately 2.8 to 4.8 meters (9 to 15.5 ft) above mean sea level (MSL). With the addition of the earthen pad, Figure 6 shows that much of the PCS excavation area was backfilled to greater than the original grade. The earthen pad now covers the area where the original elevation was lowest thereby raising ground elevation to 4 to 6.4 meters (12.9 to 20.7 ft). The west end of the north PCS excavation was backfilled up to the original grade and was not covered with additional soil. Four of the confirmation samples taken in this area show RRO exceeding the threat to groundwater pathway. This area was backfilled to it original elevation, such that the shallowest confirmation sample location (SP07-CS-908-040) is covered with at least 4 ft of backfill. The presence of some contamination at depths less than 15 ft bgs and above groundwater represents a deviation from the CAP. NOAA and ADEC discussed the practicality of leaving some contamination in place because of the relative high cost of removal to the low potential risk. NOAA and ADEC agreed that long-term groundwater monitoring at up to eight wells [MWSNPLF-1, MWSNPLF-9, MWSNPLF-10, MWSNPLF-11, MWSNPLF-12, MWSNPLF-13, HC-4 and HC-5] for petroleum analytes would serve to evaluate leaving in place PCS exceeding the risk to groundwater pathway. The long-term groundwater sampling schedule will be subsequently negotiated between NOAA and ADEC as part of NOAA's long-term operations and maintenance responsibility.

Recommended Action:

In accordance with paragraph 59 of the Two Party Agreement (NOAA 1996), NOAA requests written confirmation that NOAA completed all appropriate corrective and closure action, to the maximum extent practicable, at the St Paul Landfill Cell B (Drum Dump), TPA Site 5c, NOAA Site 7 in accordance with the TPA, and that ADEC grant a conditional closure that will not require further remedial action from NOAA. NOAA should conduct groundwater monitoring at eight established wells around the landfill; NOAA should negotiate the periodicity of this sampling with ADEC during 2005. NOAA understands ADEC will/may require additional containment, investigation, or cleanup if subsequent information indicates that the level of contamination that remains does not protect human health, safety, or welfare, or the environment.

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ADEC. 2000. Title 18 of the *Alaska Administrative Code* 75, 18 AAC 75, Articles 3 and 9. Oil and Hazardous Substances Pollution Control Regulations. State of Alaska. Effective date January 30, 2003.

ADEC 2002. Certified Mail # 7001 2510 0002 7773 2912 Re: Approval for Saint Paul Landfill Closure Plan, #0225-PR001. Letter from Leslie F. Simmons, ADEC Solid Waste Program Coordinator, Southcentral and Western Alaska to John Lindsay, U.S. Department of Commerce, National Oceanic and Atmospheric Administration. August 7.

Buckel, S. 1990. Environmental Compliance Survey Report, Pribilof Islands, Alaska. Facilities and Logistics Division, Western Administrative Support Center.

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Tetra Tech EM Inc. (Tetra Tech). 2000. *Site Characterization Report St. Paul Landfill Cell B (Two-Party Agreement Site No. 5) Pribilof Islands Site Restoration St. Paul Island, Alaska*. December.

Tetra Tech 2004. *Draft Closure Report Site 6/TPA Site 5b – St. Paul Landfill Cell A Site 7/TPA Site 5c – St. Paul Landfill Cell B (Drum Dump) Site 8/TPA Site 5d – St. Paul Landfill Cell B (Solid Waste) St. Paul Island, Alaska*. October 28.

Woodward-Clyde Consultants, Inc. (Woodward-Clyde). 1994. *Site Inspection Report, St. Paul Island, Alaska*. November.

For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

3/30/05
Date

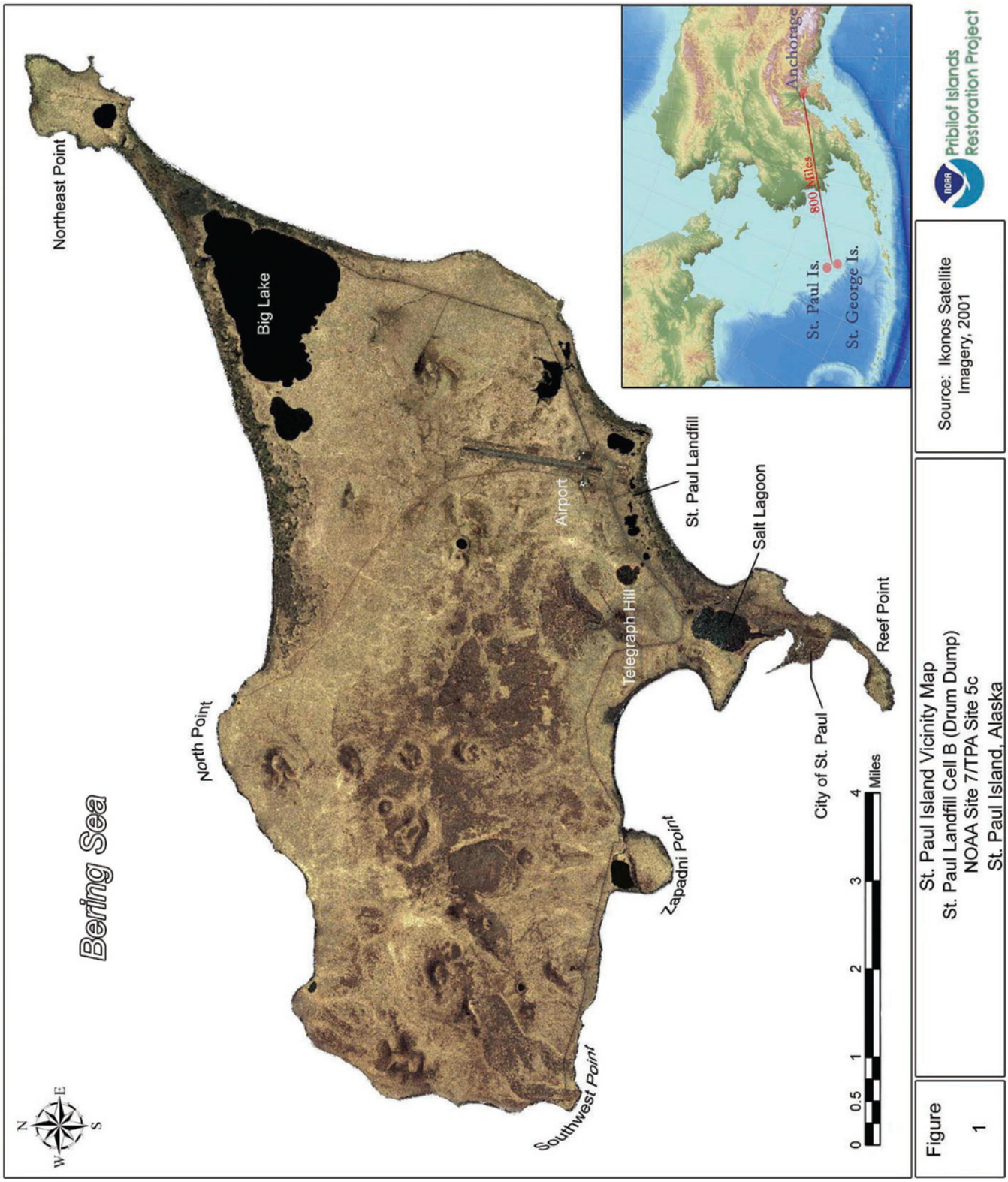
Approvals: In accordance with Paragraph 59 of the Two Party Agreement, this is to confirm that all corrective action has been completed to the maximum extent practicable at the Site 7/TPA Site 5c – St. Paul Landfill Cell B (Drum Dump) in accordance with the Agreement and that no further remedial action is required 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

4-1-05
Date

FIGURES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Big Lake
Bering Sea
North Point
Airport
St. Paul Landfill
Salt Lagoon
Telegraph Hill
Reef Point
Zapadni Point
City of St. Paul
Southwest Point
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800 Miles
St. Paul Is.
St. George Is.
Pribilof Islands Restoration Project
Source: Ikonos Satellite Imagery, 2001
Figure 1
St. Paul Island Vicinity Map
St. Paul Landfill Cell B (Drum Dump)
NOAA Site 7/TPA Site 5c
St. Paul Island, Alaska

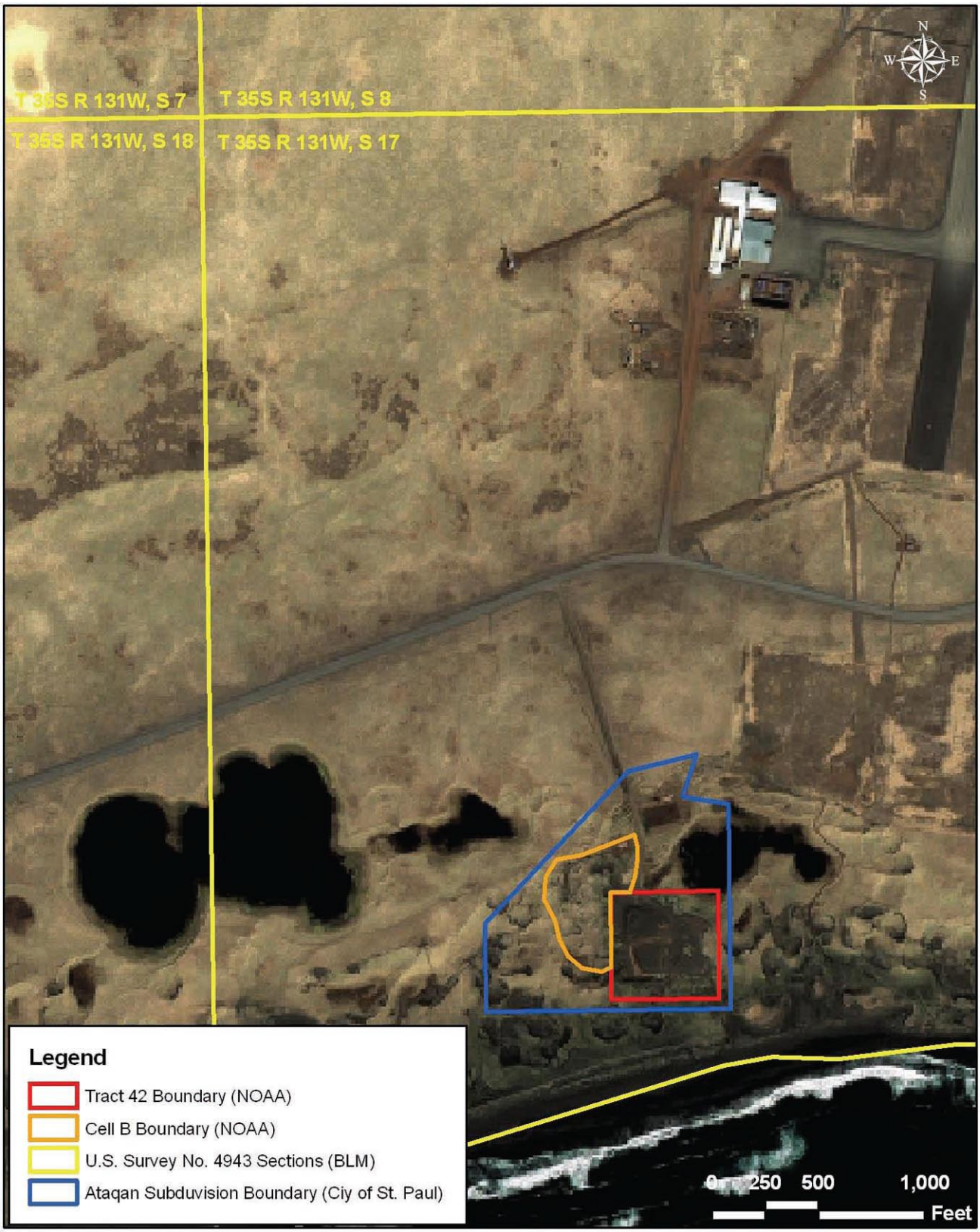

Figure 2	Legal Property Description Map St. Paul Landfill Cell B(Drum Dump) NOAA Site 7/TPA Site 5c St. Paul Island, Alaska	Sources: Tract 42 Boundary and Land Survey Sections (BLM MTPs 1983), Ataqan Subdivision Boundary (Polarconsult 1997), Cell B Boundary (NOAA GIS 2004), Satellite Imagery (Ikonos 2001).

Pribilof Islands Restoration Project

Analytical Results

Sample Name	Depth (ft)	DRO (mg/kg)	RRO (mg/kg)
05SS02	2	2,990	<10,000
	10	256	<10,000
05SS05	2	1,820	22,000
	5	1,640	19,000
05SS09	0	3,300	36,000
05SS15	2	3,600	38,000
	5	5,000	<10,000
	10	312	<10,000
	15	1,880	11,000
	24	582	<10,000

Legend

- Groundwater Sampling Locations (all results below Table C)
- Ataqan Subdivision Boundary
- Cell B
- Tract 42 Boundary

Historical Soil Sampling Locations

- Results above Method 2
- Results below Method 2

DRO = Diesel Range Organics
RRO = Residual Range Organics

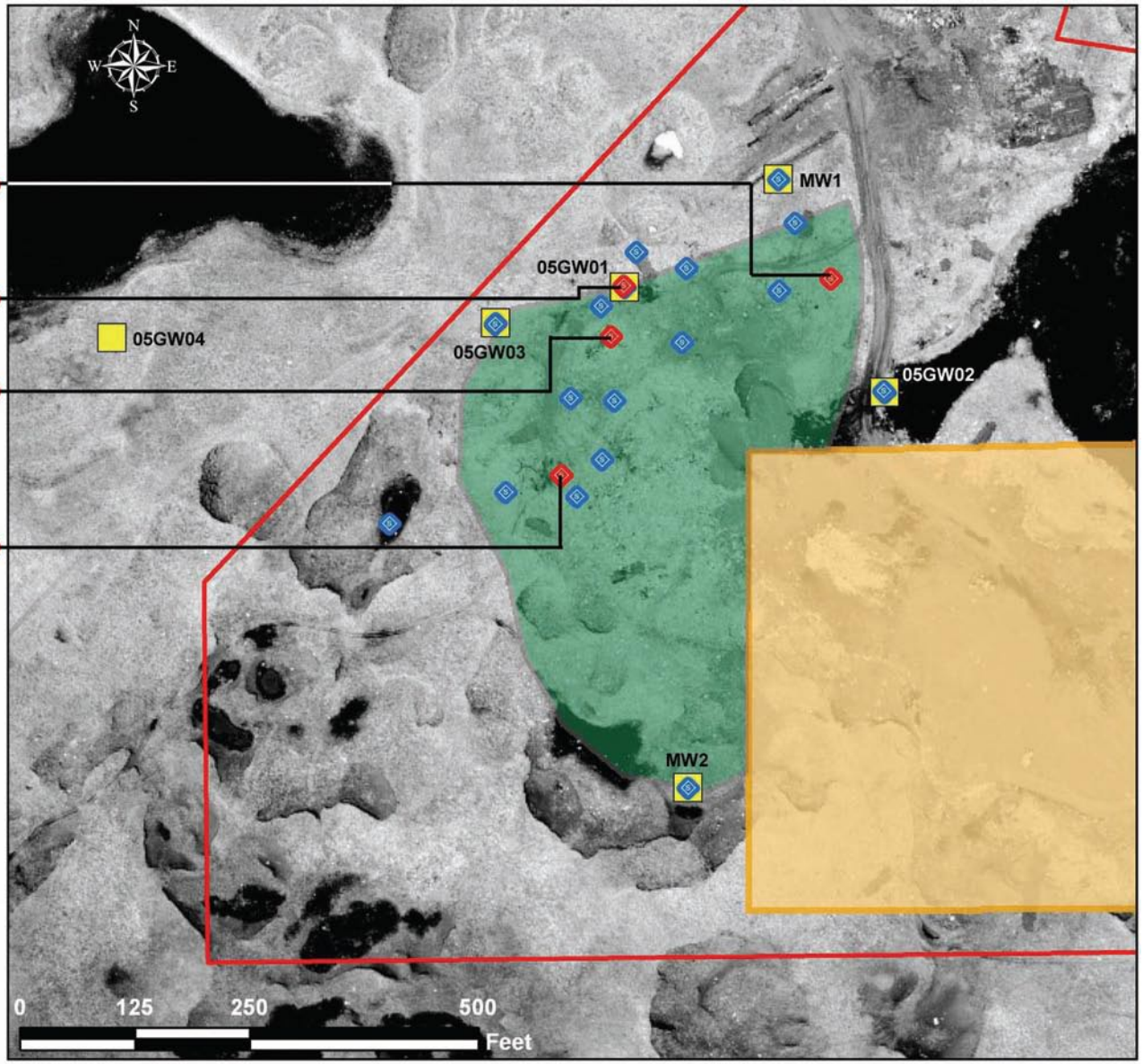

Figure 3

Historical Soil Sampling Results
St. Paul Landfill Cell B (Drum Dump)
NOAA Site 7/TPA Site 5c
St. Paul Island, Alaska

Sources: Ataqan Subdivision Boundary (Polarconsult 1997), Cell B Boundary (NOAA GIS 2004), Tract 42 Boundary (BLM MTPs 1983), Historical Sampling Locations and results (Pribilof Project Database 2004), Aerial Photo (Davis 2000).

Pribilof Islands Restoration Project

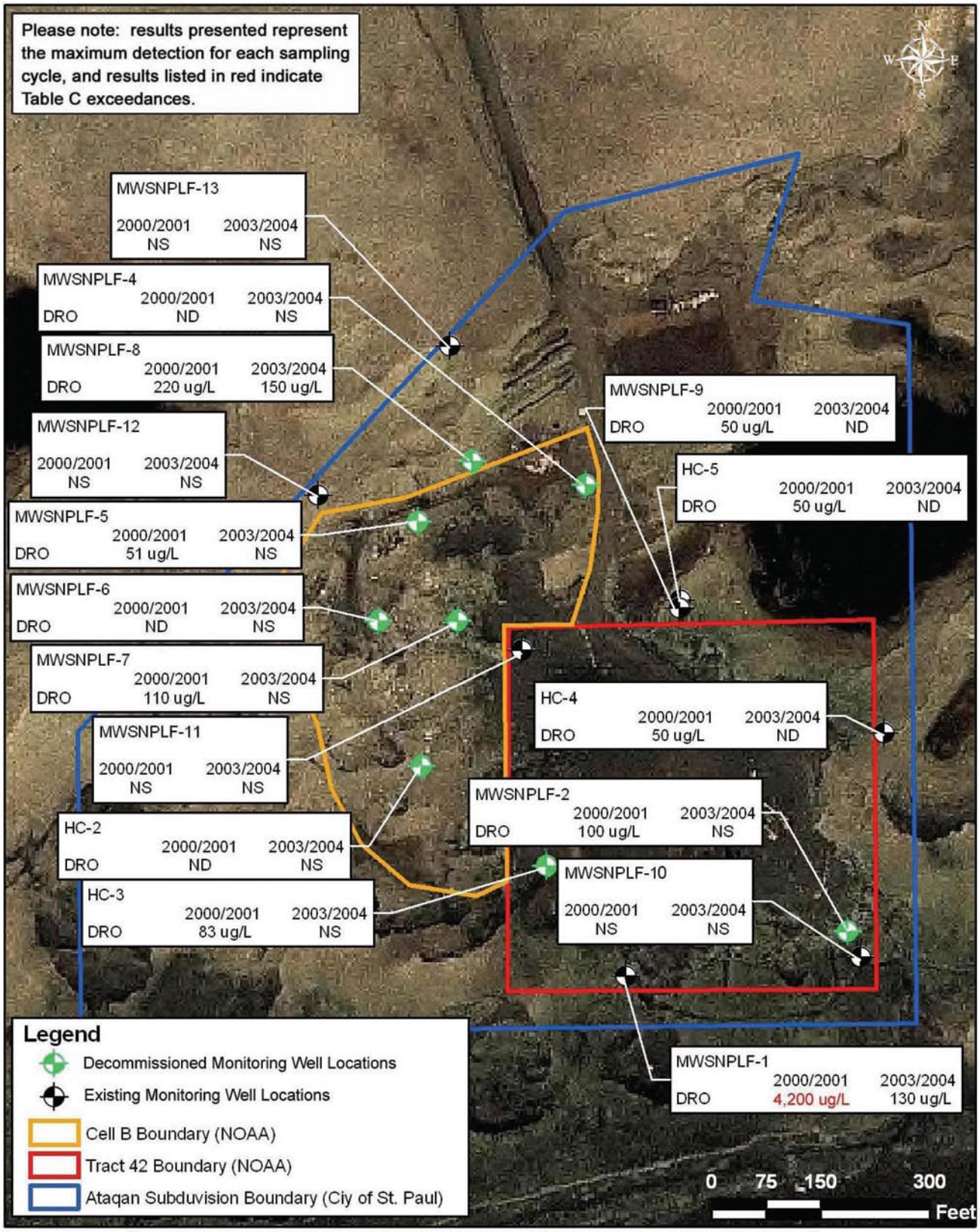

Figure 4	Groundwater Sampling Results St. Paul Landfill Cell B (Drum Dump) NOAA Site 7/TPA Site 5c St. Paul Island, Alaska	Sources: Tract 42 Boundary (BLM MTPs 1983), Ataqan Subdivision Boundary (Polarconsult 1997), Cell B Boundary (NOAA GIS 2004), Well Locations (NOAA GPS 2004), Satellite Imagery (Ikonos 2001).

Pribilof Islands Restoration Project

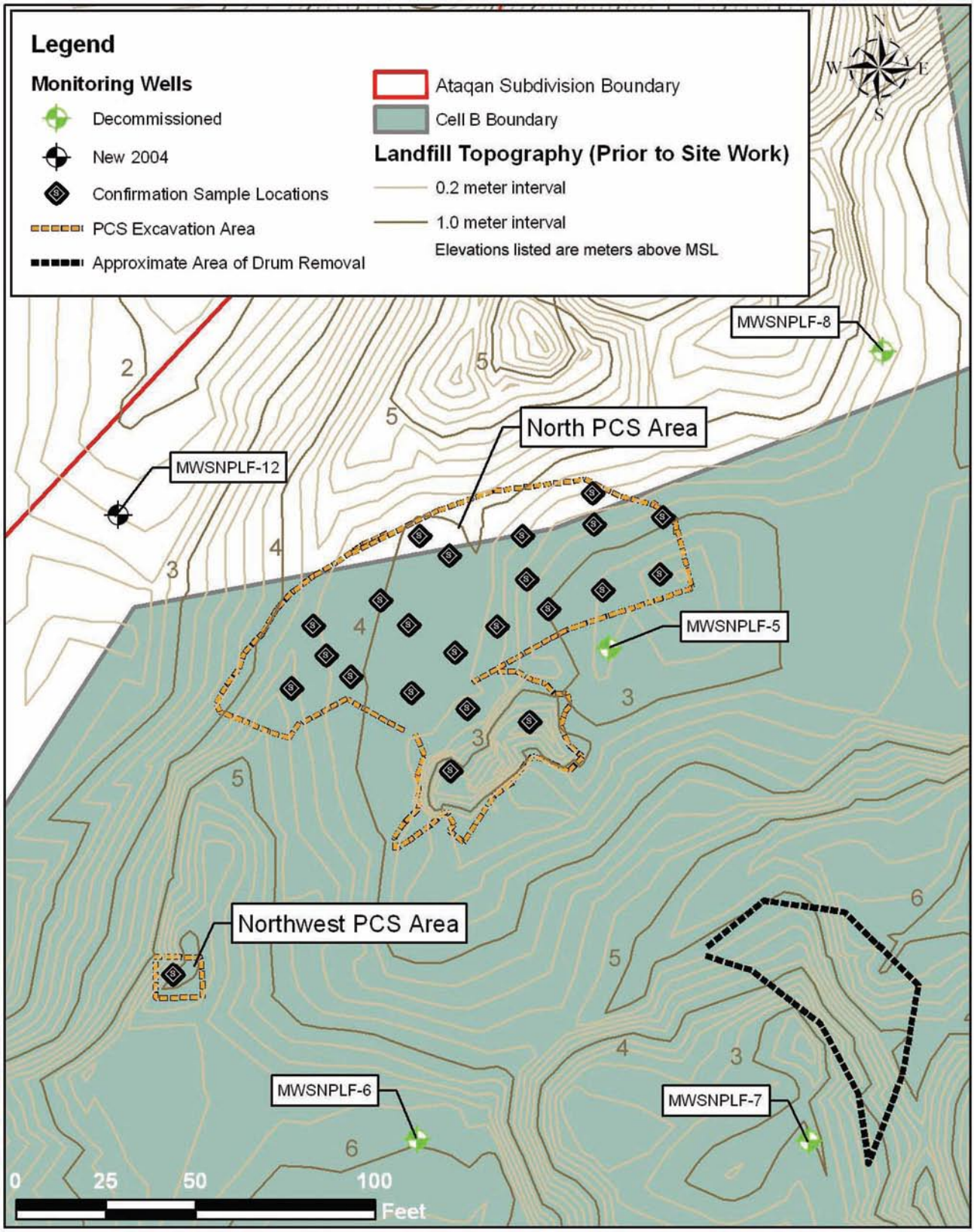

Figure 5	PCS/Drum Removal Areas St. Paul Landfill Cell B (Drum Dump) Site 7/TPA Site 5c St. Paul Island, Alaska	Sources: Excavation Areas, and Confirmation Sample Locations (NOAA GPS 2003), Ataqan Subdivision Boundary and Cell B Boundary (NOAA GIS 2004).

Pribilof Islands Restoration Project

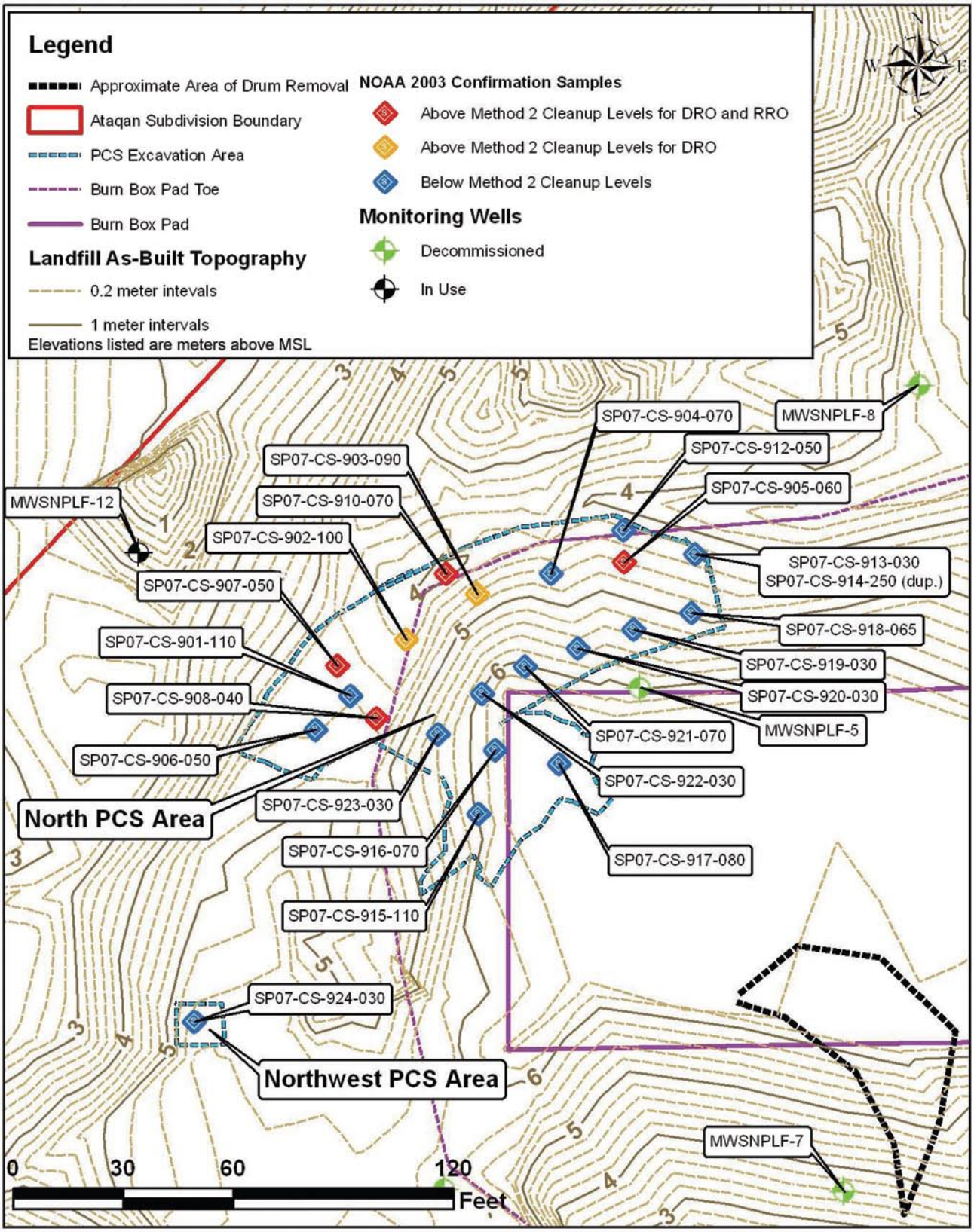

Figure 6	Sampling Locations and Final Elevations St. Paul Landfill Cell B (Drum Dump) Site 7/TPA Site 5c St. Paul Island, Alaska	Sources: Excavation Areas, and Confirmation Sample Locations (NOAA GPS 2003), Ataqan Subdivision Boundary and Cell B Boundary (NOAA GIS 2004), Satellite Imagery (Ikonos 2001).

Pribilof Islands Restoration Project

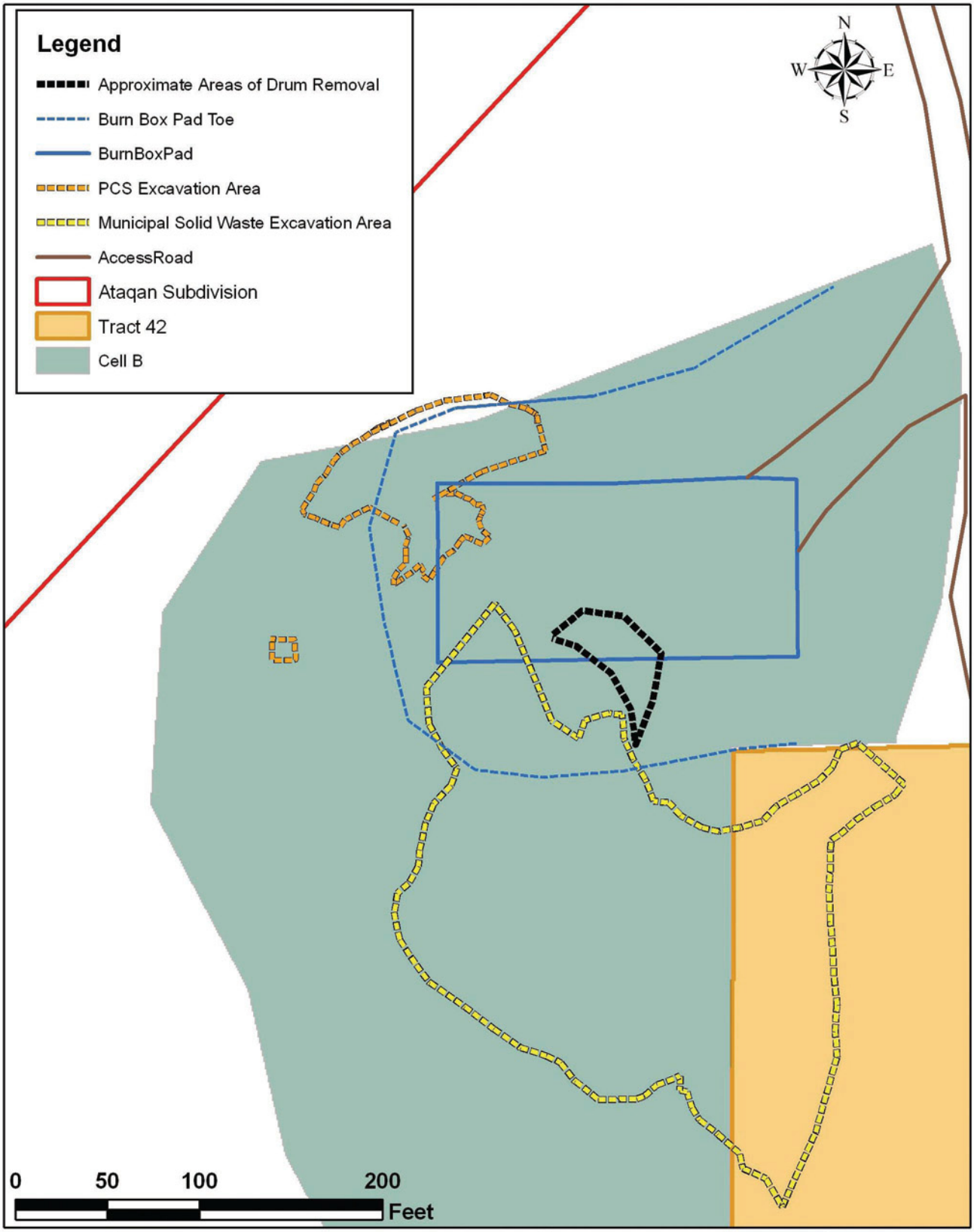

Figure 7	Drum Removal and PCS Excavation Area St. Paul Landfill Cell B (Drum Dump) Site 7/TPA Site 5c St. Paul Island, Alaska	Source: Pribilof Project GIS (2004)

Pribilof Islands Restoration Project

TABLES

Table 1. Analytical Data Summary - BTEX, GRO, DRO, and RRO, St. Paul Landfill Cell B, Drum Dump, St. Paul Island, Alaska

Sample Number	Sample Date	Sample Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Total Xylenes (mg/kg)	Gasoline-range Organics (mg/kg)	Diesel-range Organics (mg/kg)	Residual-range Organics (mg/kg)
Cell B Confirmation Samples									
SP07-CS-901-110[a]	09/03/03	11	0.03 U	0.04	0.03 U	0.06	2 U	15	200
SP07-CS-902-100[a]	09/03/03	10	0.03 U	0.03 U	0.03 U	0.03 U	2 U	**280**	3,500
SP07-CS-903-090[a]	09/03/03	9	0.02 U	0.02	0.02 U	0.03	2	**820**	130
SP07-CS-904-070[a]	09/03/03	7	0.02 U	0.02 U	0.02 U	0.02 U	1 U	50	480
SP07-CS-905-060[a]	09/03/03	6	0.05 U	0.05 U	0.05 U	0.05 U	61	**6,100**	**14,000**
SP07-CS-906-050[a]	09/03/03	5	0.02 U	0.02 U	0.02 U	0.02 U	1 U	10 U	50 U
SP07-CS-907-050[a]	09/03/03	5	0.10 U	0.10 U	0.10 U	0.10 U	5 U	**3,000**	**15,000**
SP07-CS-908-040[a]	09/03/03	4	0.06 U	0.06 U	0.06 U	0.06 U	3 U	**1,600**	**15,000**
SP07-CS-910-070[a]	09/03/03	7	0.03 U	0.03 U	0.03 U	0.03 U	2 U	**1,900**	**16,000**
SP07-CS-912-050[a]	09/03/03	5	0.03 U	0.03 U	0.03 U	0.03 U	2 U	10 U	50 U
SP07-CS-913-030[a]	09/03/03	3	0.03 U	0.03 U	0.03 U	0.03 U	2 U	10 U	50 U
SP07-CS-914-250[b]	09/03/03	3	0.03 U	0.03 U	0.03 U	0.03 U	2 U	10 U	50 U
SP07-CS-915-110[c]	09/08/03	11	0.03 U	0.03 U	0.03 U	0.03 U	2 U	56	380
SP07-CS-916-070[c]	09/15/03	7	0.05 U	0.05 U	0.05 U	0.05 U	3 U	10 U	50 U
SP07-CS-917-080[c]	09/15/03	8	0.10 U	0.10 U	0.10 U	0.10 U	5 U	120	930
SP07-CS-918-065[a,d]	09/25/03	6.5	0.06 U	0.06 U	0.06 U	0.06 U	3 U	10 U	75
SP07-CS-919-030[a]	09/16/03	3	0.03 U	0.03 U	0.03 U	0.03 U	2 U	14	190
SP07-CS-920-030[a]	09/16/03	3	0.05 U	0.05 U	0.05 U	0.05 U	3 U	10 U	50 U
SP07-CS-921-070[a]	09/25/03	7	0.04 U	0.04 U	0.04 U	0.04 U	2 U	10 U	50 U
SP07-CS-922-030[a]	09/16/03	3	0.03 U	0.03 U	0.03 U	0.03 U	2 U	10 U	50 U
SP07-CS-923-030[a]	09/16/03	3	0.04 U	0.04 U	0.04 U	0.04 U	2 U	10 U	50 U
SP07-CS-924-030[d,g]	09/25/03	3	0.06 U	0.06 U	0.06 U	0.06 U	3 U	10 U	110
Waste Sample									
SP07-CS-927[e]	10/24/03	--	**1.7** J	3.7 J	**6.0** J	11 J	**510** J	**1,600**	7,500
Trip Blank Samples									
Trip blank	09/04/04	--	0.02 U	0.02 U	0.02 U	0.02 U	1 U	--	--
Trip blank	09/17/03	--	0.02 U	0.02 U	0.02 U	0.02 U	1 U	--	--
ADEC Method Two Cleanup Level[f]			*0.02*[g]	*5.4*	*5.5*	*78*	*300*	*250*	*10,000*

Notes

bold Indicates a concentration exceeding soil cleanup level. Although reporting limits for benzen sometimes exeeded the ADEC Method Two cleanup level, no reporting limits exceeded the 1991 cleanup level of 0.5 mg/kg identified under the TPA.

ADEC Alaska Department of Environmental Conservation

bgs Below ground surface

BTEX Benzene, toluene, ethylbenzene, and total xylenes

DRO Diesel-range organic compounds

GRO Gasoline-range organic compounds

J The analyte was positively identified, but the numerical value is an estimated concentration.

mg/kg	Milligram per kilogram
--	Not analyzed
NA	Not available
PAH	Polynuclear aromatic hydrocarbon
PCS	Petroleum-contaminated soil
RRO	Residual-range organic compounds
TPA	Two-Party Agreement
U	The analyte was analyzed for, but not detected above the sample reporting limt.
a	Sample collected from the PCS excavation in the north portion of Cell B.
b	Duplicate of sample number SP07-CS-913-030.
c	Sample collected from the buried drum excavation in the north portion of Cell B.
d	Sample collected from PCS excavation in the northwest portion of Cell B.
e	Sample collected from tar material identified in drums removed from Cell A and Cell B.
f	Cleanup level is obtained from Title 18 of the *Alaska Administrative Code* 75 "Oil and Hazardous Substances Pollution Control Regulations," published by the State of Alaska and amended through October 28, 2000. Contaminants of concern for this site are limited to BTEX, GRO, DRO, RRO, and select PAHs.
g	Under the TPA, NOAA is required to comply with the 1991 ADEC cleanup level for benzene (0.5 mg/kg); however, whenever possible, NOAA has attempted to remove all contamination above the current ADEC Method Two cleanup level (0.02 mg/kg).

Table 2. Analytical Data Summary - Polynuclear Aromatic Hydrocarbons, St. Paul Landfill Cell B, Drum Dump, St. Paul Island, Alaska

Sample Number	Sample Date	Sample Depth (feet bgs)	Naphthalene (mg/kg)	Acenaphthylene (mg/kg)	Acenaphthene (mg/kg)	Fluorene (mg/kg)	Phenanthrene (mg/kg)	Anthracene (mg/kg)
Cell B Confirmation Samples								
SP07-CS-901-110[a]	09/03/03	11	--	--	--	--	--	--
SP07-CS-902-100[a]	09/03/03	10	--	--	--	--	--	--
SP07-CS-903-090[a]	09/03/03	9	--	--	--	--	--	--
SP07-CS-904-070[a]	09/03/03	7	--	--	--	--	--	--
SP07-CS-905-060[a]	09/03/03	6	--	--	--	--	--	--
SP07-CS-906-050[a]	09/03/03	5	--	--	--	--	--	--
SP07-CS-907-050[a]	09/03/03	5	--	--	--	--	--	--
SP07-CS-908-040[a]	09/03/03	4	--	--	--	--	--	--
SP07-CS-910-070[a]	09/03/03	7	--	--	--	--	--	--
SP07-CS-912-050[a]	09/03/03	5	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U
SP07-CS-913-030[a]	09/03/03	3	--	--	--	--	--	--
SP07-CS-914-250[b]	09/03/03	3	--	--	--	--	--	--
SP07-CS-915-110[c]	09/08/03	11	--	--	--	--	--	--
SP07-CS-916-070[c]	09/15/03	7	--	--	--	--	--	--
SP07-CS-917-080[c]	09/15/03	8	--	--	--	--	--	--
SP07-CS-918-065[a,d]	09/25/03	6.5	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP07-CS-919-030[a]	09/16/03	3	--	--	--	--	--	--
SP07-CS-920-030[a]	09/16/03	3	--	--	--	--	--	--
SP07-CS-921-070[a,e]	09/25/03	7	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP07-CS-922-030[a]	09/16/03	3	--	--	--	--	--	--
SP07-CS-923-030[a]	09/16/03	3	--	--	--	--	--	--
SP07-CS-924-030[d]	09/25/03	3	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Waste Sample								
SP07-CS-927[e]	10/24/03	--	38	2.5 U	2.5 U	2.5 U	4.2	2.5 U
ADEC Method Two Cleanup Level[i]			*43*	*NA*	*210*	*270*	*NA*	*4,300*

Sample Number	Fluoranthene (mg/kg)	Pyrene (mg/kg)	Benzo(a) anthracene (mg/kg)	Chrysene (mg/kg)	Benzo(b) fluoranthene (mg/kg)	Benzo(k) fluoranthene (mg/kg)	Benzo(a) pyrene (mg/kg)	Indeno (1,2,3-cd) pyrene (mg/kg)	Dibenz(a,h) anthracene (mg/kg)	Benzo(g,h,i) perylene (mg/kg)
Cell B Confirmation Samples										
SP07-CS-901-110[a]	--	--	--	--	--	--	--	--	--	--
SP07-CS-902-100[a]	--	--	--	--	--	--	--	--	--	--
SP07-CS-903-090[a]	--	--	--	--	--	--	--	--	--	--
SP07-CS-904-070[a]	--	--	--	--	--	--	--	--	--	--
SP07-CS-905-060[a]	--	--	--	--	--	--	--	--	--	--
SP07-CS-906-050[a]	--	--	--	--	--	--	--	--	--	--
SP07-CS-907-050[a]	--	--	--	--	--	--	--	--	--	--
SP07-CS-908-040[a]	--	--	--	--	--	--	--	--	--	--
SP07-CS-910-070[a]	--	--	--	--	--	--	--	--	--	--
SP07-CS-912-050[a]	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U
SP07-CS-913-030[a]	--	--	--	--	--	--	--	--	--	--
SP07-CS-914-250[b]	--	--	--	--	--	--	--	--	--	--
SP07-CS-915-110[c]	--	--	--	--	--	--	--	--	--	--
SP07-CS-916-070[c]	--	--	--	--	--	--	--	--	--	--
SP07-CS-917-080[c]	--	--	--	--	--	--	--	--	--	--
SP07-CS-918-065[a,d]	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP07-CS-919-030[a]	--	--	--	--	--	--	--	--	--	--
SP07-CS-920-030[a]	--	--	--	--	--	--	--	--	--	--
SP07-CS-921-070[a,e]	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP07-CS-922-030[a]	--	--	--	--	--	--	--	--	--	--
SP07-CS-923-030[a]	--	--	--	--	--	--	--	--	--	--
SP07-CS-924-030[d]	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Waste Sample										
SP07-CS-927[e]	2.5 U	3.5	2.5 U	8	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
ADEC Method Two Cleanup Leveli	*NA*	*1,500*	*6*	*620*	*11*	*110*	*1*	*11*	*1*	*NA*

Notes

bgs Below ground surface
mg/kg Milligram per kilogram
-- Not analyzed

NA Not available
PCS Petroleum-contaminated soil
U The analyte was analyzed for, but not detected above the sample reporting limt.
a Sample collected from the PCS excavation in the north portion of Cell B.
b Duplicate of sample number SP07-CS-913-030.
c Sample collected from the buried drum excavation in the north portion of Cell B.
d Sample collected from PCS excavation in the northwest portion of Cell B.
e Sample collected from tar material identified in drums removed from Cell A and Cell B.
j Duplicate of sample number SP07-SS-910.
I Cleanup level is obtained from Title 18 of the *Alaska Administrative Code* 75 "Oil and Hazardous Substances Pollution Control Regulations," published by the State of Alaska and amended through October 28, 2000.

Table 3. Analytical Data Summary - Polychlorinated Biphenyls, St. Paul Landfill Cell B, Drum Dump, St. Paul Island, Alaska

Sample Number	**Sample Depth (feet bgs)**	**Aroclor 1221 (mg/kg)**	**Aroclor 1232 (mg/kg)**	**Aroclor 1016 (mg/kg)**	**Aroclor 1242 (mg/kg)**	**Aroclor 1248 (mg/kg)**	**Aroclor 1254 (mg/kg)**	**Aroclor 1260 (mg/kg)**	**Aroclor 1262 (mg/kg)**
Drum Contents Confirmation Samples									
SP07-CS-927[a]	--	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U	0.8 U
ADEC Method Two Cleanup Level[b]		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*

Notes
bgs Below ground surface
mg/kg Milligram per kilogram
-- Not analyzed
NA Not available
U The analyte was analyzed for, but not detected above the sample reporting limt.
a Sample collected from tar material identified in drums removed from Cell A and Cell B.
b Cleanup level is obtained from Title 18 of the *Alaska Administrative Code* 75 "Oil and Hazardous Substances Pollution Control Regulations," published by the State of Alaska and amended through October 28, 2000.

ALASKA

2008-000251-0
Recording Dist: 305 - Aleutian Islands
5/20/2008 12:46 PM Pages: 1 of 7

NOTICE OF ENVIRONMENTAL CLEANUP AND RESIDUAL SOIL AND DEBRIS AT TPA05 (c and d), ST. PAUL LANDFILL CELL B,
ST. PAUL ISLAND, ALASKA

Pursuant to 18 AAC 75.375, the City of St. Paul and The Aleut Corporation as the owners, and the U.S. Department of Commerce/National Oceanic and Atmospheric Administration (NOAA), as the operator of the subject property hereby provide public notice that the property located south of the St. Paul Island Airport and on the southerly side of Polovina Turnpike, St Paul Island, Alaska 99660 is contaminated with petroleum products. More specifically, the site described as follows:

Lot 6 (Ataqan subdivision) of the Seward Meridian, Alaska,
Section 17, Township 35 South, Range 131 West,
57° 8' 57.58" North Latitude;
170°14' 2.93" West Longitude

Cell B (Figures 1 and 2) has been subject to debris and petroleum contaminated soil, and potential groundwater contamination from a discharge, or release and subsequent cleanup of oil or other hazardous substances, regulated under 18 AAC 75, Article 3 as amended December 2006, and solid waste disposal, which is regulated under 18 AAC 60 as amended August 2003. Adequate soil cover needs to be maintained over the residual petroleum contaminated soil. If contaminated soil or solid wastes are exposed in the future they must be managed in accordance with laws applicable at that time. These releases and cleanup are documented in the Alaska Department of Environmental Conservation (ADEC) contaminated sites database under site number *CS Reckey* #1994250135407; File No. 2644.38.017.01.

The St. Paul Landfill Site was identified as *Site 5 St. Paul Landfill* pursuant to the *Pribilof Islands Environmental Restoration Two Party Agreement* (TPA) between the State of Alaska and NOAA (NOAA 1996). NOAA addressed the Landfill Site as TPA Site 05, Cells A, B, and C, and NOAA Sites 6 (5b), 7 (5c) and 8 (5d), and 5 (5a), respectively. Landfill Site TPA05 [5a], Cell C, NOAA Site 5a in Township 35 South, Range 131 West, Section 17, Tract 42, is currently (2008) owned by the federal government. Following corrective action, NOAA submitted a request for conditional closure for Cell B, Sites 5c and 5d, to the ADEC Division of Spill Prevention and Response, Contaminated Sites Program (NOAA 2005a and NOAA 2005b, respectively). ADEC determined, in accordance with 18 AAC 75.325(f)(1) that site cleanup has been performed to the maximum extent practicable even though residual petroleum contaminated soils, primarily diesel range and residual range organics exist on the site property (NOAA 2005). ADEC granted a conditional closure, in part subject to this institutional control (deed notice), and confirmed that no further remedial action was required at the site unless new information becomes available that indicates to ADEC that the site may pose an unacceptable risk to human health, safety, welfare or the environment (NOAA 2005a and NOAA 2005b, respectively).

Grantor (subsurface estate): U.S. Bureau of Land Management
Grantee (subsurface estate): The Aleut Corporation
4000 Old Seward Highway, Suite 300
Anchorage, AK 99503

Grantor (surface estate): Tanadgusix Corporation
4300 B Street, Suite 402
Anchorage, AK 99503-5946
Grantee (surface estate): City of St. Paul, St. Paul Island, Alaska

Recording District: Aleutian Islands

Remedial Actions and Residual Contamination

The Landfill Site TPA05c and 5d was used by the federal government and the St. Paul Island community to dispose steel drums containing used oil, and to a lesser extent municipal solid waste. During 2000 and 2001, NOAA removed drums containing petroleum products and approximately 1,500 cubic yards of petroleum contaminated soils from the site. During 2004, NOAA pushed surface debris (0-2 feet below ground surface) from Cell B site 5d onto NOAA Landfill Cell C for proper closure. During 2004, the City of St. Paul capped the residual diesel range and residual range organic contaminated soils at Cell B to depths exceeding twenty feet as part of the City's ADEC approved interim landfill development (Figure 3). Following additional site improvements, the City uses the site as the community's interim municipal solid waste landfill. Attached is a site survey or diagram (Figure 2) drawn to scale that shows the property boundaries, the area that has been cleaned up, the approximate location and extent of remaining soil contamination, and the locations where confirmation soil samples were collected applicable to the Cell B..

NOAA installed several groundwater monitoring wells at the site, which are maintained under its long-term groundwater monitoring plan (NOAA 2005b). GW beneath the site may become contaminated with diesel range and residual range organic compounds because of potentially undiscovered buried drums or residual soil contamination acting as a source. Figure 4 depicts the location of GW wells and the groundwater gradient. During 2007, one groundwater well in the vicinity of Cell B found diesel range organics above ADEC Table C levels (Tutka 2007). ADEC requires GW monitoring for at least five years following an approved closure or at least through 2009.

Site Use

In the event that information becomes available which indicates that the site may pose an unacceptable risk to human health, safety, welfare or the environment, the land owner and/or operator is required under 18 AAC 75.300 to notify ADEC and evaluate the environmental status of the contamination in accordance with applicable laws and regulations. Further site characterization and cleanup may be necessary under 18 AAC 75.325-.390 and 18 AAC 78.600. Also, any transport, treatment, or disposal of any potentially contaminated soil or water from the site or use of the groundwater at or near the contaminated area requires notification to and approval from the Department in accordance with AAC 75.370(b) and 18 AAC 78.600(h).

In the future, ADEC approval is required prior to moving the soil cover over the solid waste pursuant to 18 AAC 60. If contaminated soil and solid wastes are removed from the site, the site must be characterized and managed following regulations applicable at that time including 18 AAC 75.325(i)(1), (2) 18 AAC 75.370, and (3) 18 AAC 60 as amended. ADEC approval is required prior to moving soil or solid wastes that is, or has been, subject to the cleanup rules found at 18 AAC 75.325-.390, and 18 AAC 60 as amended.

This notice remains in effect until a written determination from ADEC is recorded that states that soil at the site has been shown to meet the most stringent soil cleanup levels in Method Two of 18 AAC 75.341 (c) and that off-site transportation of soil is not a concern, and until all wastes are removed from the property.

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2008-000251-0

References:

National Oceanic and Atmospheric Administration (NOAA). 1996. *Pribilof Islands Environmental Restoration Two Party Agreement*, Attorney General's Office File No. 66 1-95-0126. National Oceanic and Atmospheric Administration. January 26.

NOAA. 2005a. *Request for Conditional Closure St. Paul Landfill Cell B, NOAA Site 7/TPA Site 5d –St. Paul Island, Alaska*. Signed by John Lindsay (NOAA) and submitted February 2 (cover letter dated January 28, 2005). Signed by Louis Howard of ADEC Contaminated Sites Program, February 11, 2005.

NOAA. 2005b. *Request for Conditional Closure St. Paul Landfill Cell B, NOAA Site 7/TPA Site 5c –St. Paul Island, Alaska*. Signed by John Lindsay (NOAA) and submitted March 30. Signed by Louis Howard of ADEC Contaminated Sites Program, April 11, 2005.

Tetra Tech. 2004. *Final Closure Report: Site 6/TPA Site 5b –St. Paul Landfill Cell A; Site 7/TPA Site 5c – St. Paul Landfill Cell B (Drum Dump); Site 7/TPA Site 5d – St. Paul Landfill Cell B (Solid Waste)*. Prepared for National Oceanic and Atmospheric Administration, National Ocean Service, Office of Response and Restoration, 7600 Sand Point Way NE, Seattle, WA. 98115. November 30.

Tutka. 2007. *Annual Groundwater Monitoring Report 2007, St. Paul Island, Alaska.* December 21. Prepared for NOAA, Office of Response and Restoration, 7600 Sand Point Way NE, Seattle, WA. 98115.

Please return original copy of this notice to the (operator) address below:

Signature: _____

Printed Name: _____John A. Lindsay_____

Mailing Address:
Attn: John Lindsay

US DOC, NOAA, NOS, OR&R, PPO
7600 Sand Point Way NE
Bldg 3, RM 1301
Seattle, WA 98115

(seal) Subscribed and sworn to before me this ___ day of _____, 19___.
Notary Public in and for the State of _____
My commission expires:_____

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2008-000251-0

Figure
1

St. Paul Island Vicinity Map
St. Paul Landfill Cell B
NOAA Sites 7 & 8/TPA Sites 5c & 5d
St. Paul Island, Alaska

Source: Ikonos Satellite Imagery (Space Imaging 2001)
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Date: 4/29/2008

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Figure 2	Legal Property Description Map Lot 6 & Ataqan Subdivision St. Paul Landfill Cell B NOAA Sites 7 & 8/TPA Sites 5c & 5d St. Paul Island, Alaska	Sources: Landfill Cell B Layers (NOAA PPO GIS, 2003), Aero-Metric 2006 2 ft Aerial, 1983 Bureau of Land Management Land Survey Plat Officially filed February 15, 1985. Path: C:\KP_GIS Data\Maps & Figures\SNPI\ Deed Notices\Site 7 & 8, TPA 5c & 5d\ CellB_PropDescription_Fig2.mxd Date: 4/30/2008 @ 9:11:17 AM

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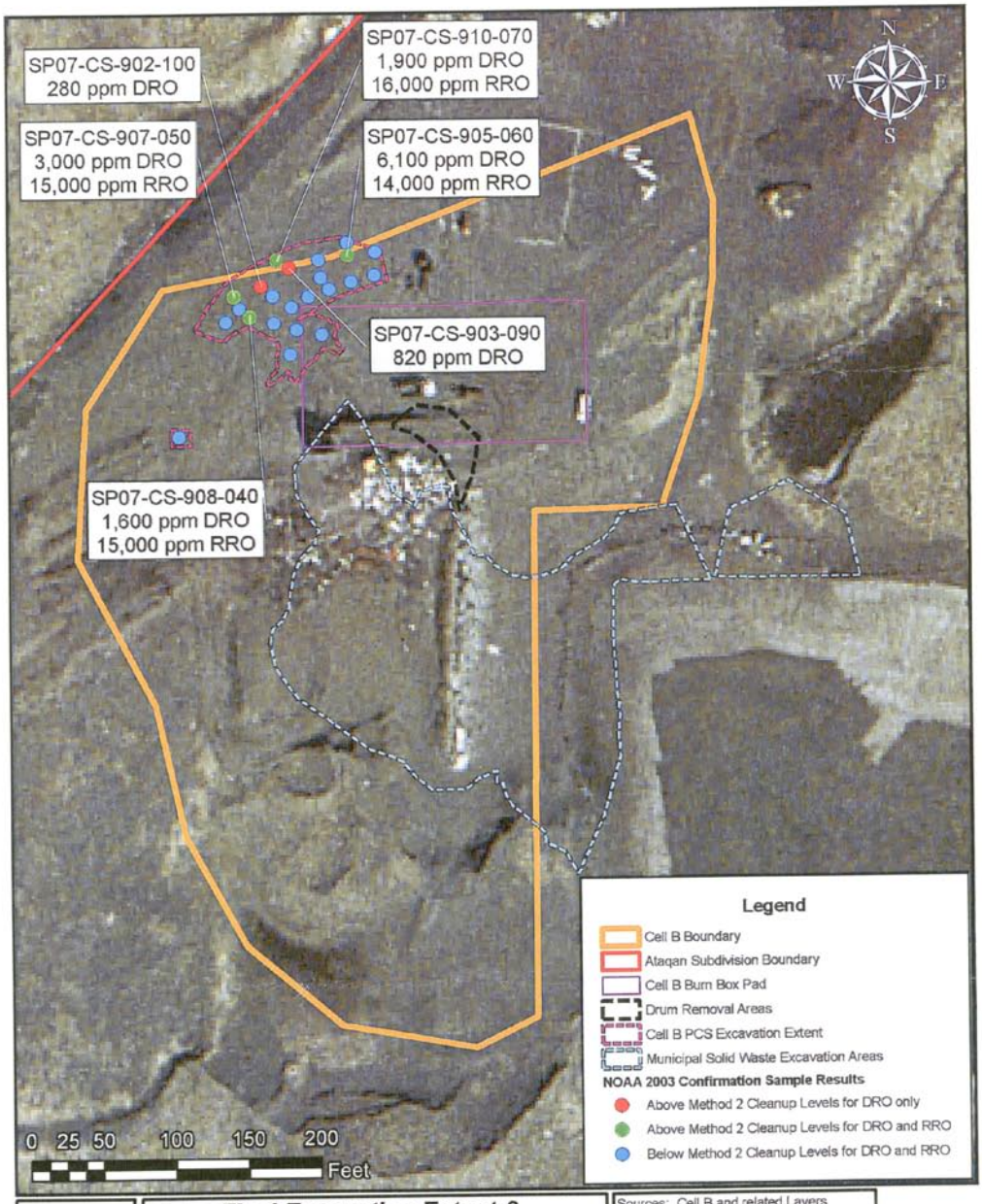

Figure 3	Final Excavation Extent & Confirmation Sampling Results St. Paul Landfill Cell B NOAA Sites 7 & 8/TPA Sites 5c & 5d St. Paul Island, Alaska	Sources: Cell B and related Layers (NOAA GIS 2003), Ataqan Boundaries (Polarconsult 1997), Samples (PPO Chemical Database 2003), Aero-Metric 2006 2 ft Aerial Photo Path: C:\KP_GIS Data\Maps & Figures\SNP\Deed Notices\Site 7 & 8, TPA 5c & 5d\CellB_Samples&Excavate_Fig3.mxd Date: 4/30/2008 @ 9:22:26 AM

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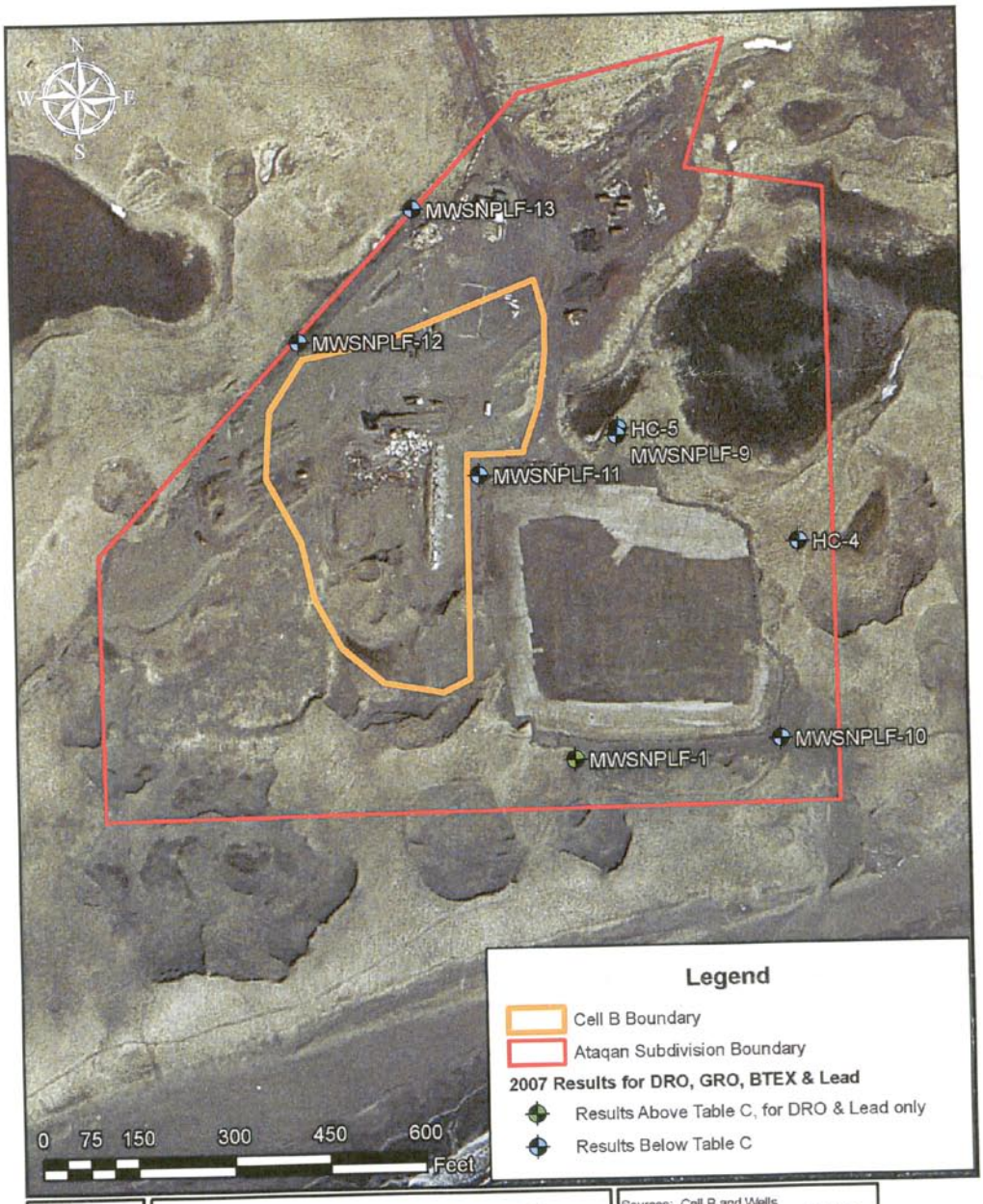

Figure 4	Location of Groundwater Wells St. Paul Landfill Cell B NOAA Sites 7 & 8/TPA Sites 5c & 5d St. Paul Island, Alaska	Sources: Cell B and Wells (NOAA GIS/Chemical Database '04-'07) Ataqan Boundaries (Polarconsult 1997), Aero-Metric 2006 2 ft Aerial Photo Path: C:\KP_GIS Data\Maps & Figures\SNP\Deed Notices\Site 7 & 8, TPA 5c & 5d\CellB_Wells&Gradient_Fig4.mxd Date: 4/30/2008 @ 9:40:55 AM

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NOAA Site 8
TPA Site 5d: Cell B solid waste
(St. Paul Landfill, TPA 5; TPA Attachment A)

Request for Conditional Closure, St Paul Landfill Cell B (Solid Waste), TPA Site 5d, NOAA Site 8.....285

Notice of Environmental Cleanup and Residual Soil and Debris at TPA05 (c and d), NOAA Cell B Landfill, St. Paul Island, Alaska.....295

Request for Conditional Closure
St Paul Landfill Cell B (Solid Waste), TPA Site 5d, NOAA Site 8

Request for Conditional Closure

Site:
The site is known as St Paul Landfill Cell B, Two-Party Agreement (TPA, NOAA 1996) Site 5d, and as National Oceanic and Atmospheric Administration (NOAA) Site 8.

Location:
St. Paul Island, Alaska is approximately 800 miles southwest of Anchorage in the Bering Sea. The St Paul Landfill is approximately 1.5 miles northeast of the City of St. Paul (Figure 1). The St. Paul municipal solid waste (MSW) landfill was arbitrarily divided into three areas or cells by NOAA in 2000, for discussion and closure planning purposes. Cells A and B are currently located on property known as the Ataqan Subdivision, owned by the City of St. Paul. Cell B occupies approximately 3.949 acres (Figure 2). Cell C is located within Tract 42, a 5.78 acre parcel owned by NOAA.

Legal Property Description:
The legal description for Cell B is: Township 35 South, Range 131 West, Section 17, of the Seward Meridian, Alaska as shown on the plat of rectangular survey officially filed May 14, 1986. (Figure 2). The City of St. Paul is the surface estate owner of Cell B and the greater Ataqan Subdivision. The Aleut Corporation is the subsurface estate owner.

Type of Release:
Cell B, located north and west of Tract 42, contained primarily MSW associated with historical disposal activities on St. Paul Island. Several drums containing petroleum wastes have been excavated from within Cell B, but these are considered as part of Site 7/TPA Site 5c, St. Paul Landfill Cell B (Drum Dump). Site 7/TPA Site 5c will be addressed in a separate document. No other release of contaminants has been documented.

History and Background:
The landfill area has been used as the primary landfill for the Island of St. Paul since the 1940s (CESI 2001a). Cell B was described as inactive in the Site Characterization Report (Tetra Tech 2000), with much of the area used for the disposal of all types of "residential, commercial, and industrial wastes…" as well as exposed and partially buried drums containing petroleum wastes, and lead acid batteries. Beginning in 1990, NOAA assessed the nature and extent of contamination at the site as described below in the Summary of Site Investigations. NOAA removed the majority of drums in 1994 when 774 of them were taken from the area and shipped off site for disposal (Oil Spill Consultants 1995). Following this, NOAA agreed in the TPA to close the landfill. (NOAA 1996).

In a closure plan dated April 2, 2002, NOAA proposed to close Cell B by relocating all the solid waste into Cell C, a parcel owned by NOAA (Polarconsult 2002). The closure plan was approved by ADEC on August 7, 2002 (ADEC 2002). On June 30, NOAA submitted a Draft Corrective Action Plan for closure of the landfill (NOAA 2003).

Summary of Site Investigations:
ADEC investigated waste disposal practices on St. Paul Island including the St. Paul Landfill, and reported in 1983 that there were many drums of petroleum and other wastes disposed at the landfill area (Harmon 1983).

NOAA reported in 1990 that they had conducted an environmental compliance survey, and noted 5 groups of drums along the unmaintained access road into the north end of the landfill (Cell B) (CESI 2001a, Buckel 1990).

In September and October 1992, NOAA contractor Harding Lawson Associates (HLA) conducted a Phase I environmental assessment that included an inventory and characterization of approximately 650 drums located

at the landfill, mostly in or near Cell B. The assessment identified the presence 191 drums of concern, which were assigned to the following groups: solid grease (1 drum); nonflammable oil and water mixtures (174 drums); flammable oil and water mixtures (8 drums); water (4 drums); non-flammable mixtures of antifreeze, oil, and water (1 drum); and polychlorinated biphenyls (PCB) at concentrations greater than 50 parts per million (3 drums) (HLA 1993). Following this assessment, NOAA staged all drums on site pending future decisions. Subsequently, NOAA directed Ecology and Environment, Inc. (E&E) to prepare a preliminary assessment report that included the data generated by HLA (E&E 1992).

In 1993 and 1994, NOAA contractor Woodward-Clyde Consultants, Inc. (Woodward-Clyde) conducted a site inspection at the landfill that included the segregation of drums located at Cell B. Observations made during the inspection noted leaking and deteriorated drums, soil staining, and a strong petroleum odor. Many of the drums were determined empty. Soil samples collected by Woodward-Clyde from depths up to 5 feet below ground surface (bgs) indicated the presence of volatile organic compounds, semi-volatile organic compounds, polynuclear aromatic hydrocarbons (PAH), and metals; however, these contaminants were present at concentrations below ADEC Method Two cleanup levels. In addition, analytical data for sediment and surface water samples collected from the pond in the eastern portion of the landfill did not identify any contaminants of concern (Woodward-Clyde 1994).

During the fall of 1994, NOAA contractor Oil Spill Consultants collected 774 drums from the St. Paul Landfill area and disposed them off island (Oil Spill Consultants 1995). The project report does not specify the locations of these drums within the greater landfill area.

Between August and October 1999, NOAA contractor Tetra Tech conducted site characterization activities at Cell A and Cell B, which included the collection of soil, sediment, and groundwater samples. Analytical data for soil samples indicated the presence of petroleum contaminated soil (PCS) with diesel-range organic compounds (DRO) and residual-range organic compounds (RRO) at concentrations above cleanup levels at 3 locations in and near the north end of Cell B corresponding with areas of drums identified during previous investigations (Tetra Tech 2000).

During the spring and summer of 2000, NOAA contractor Nortech conducted excavations and removals of buried drums during three different field visits (Nortech 2001). Nortech removed approximately 50 buried drums from Cells A and B during the initial visit, then removed an unspecified number of buried drums in the following two visits. During this fieldwork, Nortech also dug 25 test trenches to delineate the extent of the areas of solid waste disposal.

In 1996, NOAA contractor Hart Crowser, Inc. (Hart Crowser) installed five monitoring wells at the landfill, including two in the vicinity of Cell B. Although analytical data for groundwater samples collected from these wells indicated the presence of toluene and lead, these compounds were not present at concentrations above cleanup levels. Hart Crowser concluded that landfill operations were not significantly impacting groundwater quality (Hart Crowser 1996).

During the summer of 2000, NOAA contractor CESI installed nine groundwater monitoring wells in the vicinity of Cell B; the wells were screened in both the upper and lower aquifers. Although analytical data for groundwater samples collected from the landfill revealed the presence of DRO, the data did not identify any contaminants at concentrations above cleanup levels (CESI 2001b).

NOAA contractors conducted quarterly groundwater monitoring from June 2000 to September 2001 (IT 2002) and from October 2003 to July 2004 (report scheduled to be submitted in November or December 2004) including as many as 12 monitoring wells in the landfill area, most of which are upgradient, within, or downgradient of, Cell B (Figure 3). The results are summarized below.

During 2000-2001 quarterly sampling events, DRO was not detected above the ADEC Table C cleanup level of 1,500 µg/l in the 12 wells sampled (MWSNPLF 1, MWSNPLF 2, MWSNPLF 4 through MWSNPLF 9, and HC-2 through HC-5) with one exception. During the last quarter, the sample from well MWSNPLF-1 indicated the presence of DRO at 4,200 µg/l, (Figure 3), along with GRO, benzene, and 13 other VOCs. According to NOAA's contractor, IT Alaska Inc., this sample was part of a "highly suspect analytical data package and should be viewed with caution" (IT Alaska Inc. 2002). The groundwater samples from the same well during earlier quarters did not

exceed the cleanup levels. The City of St. Paul MSW burn crew staged their igniter materials in close proximity to this well prior to and during the sampling event.

During the 2003-2004 sampling, only five wells were sampled by NOAA because seven of the original twelve wells had been decommissioned to allow construction of the City of St. Paul's municipal solid waste burn box pad and ash disposal cell. None of the samples from these wells exceeded the Table C cleanup levels, including those from MWSNPLF-1, the only well at the landfill ever to yield a sample that exceeded these cleanup levels. This data supports the contention that the contamination found in MWSNPLF-1 was due to lab error or cross contamination, and not to the presence of contamination in the well. Later in 2004, NOAA decommissioned an eighth well in the vicinity of the landfill (MWSNPLF-8), and installed four new monitoring wells (MWSNPLF 10 through MWSNPLF 13). Results from sampling of these wells is not yet published.

In summary, groundwater monitoring results for the St. Paul landfill have consistently shown that the groundwater does not contain constituents exceeding the Table C cleanup levels.

Summary of Applied Cleanup Levels:
The State of Alaska provides TPA oversight through the Alaska Department of Environmental Conservation (ADEC). Under the TPA, NOAA is required to comply with State of Alaska regulations that were in effect in 1991 (NOAA 1996, ADEC 1991); however, with ADEC agreement, NOAA has chosen to follow more current regulations whenever possible. The waste in Cell B was known to cover an irregular area at varying depths. NOAA agreed to consolidate the wastes to the active landfill area within the NOAA owned Tract 42 to minimize the impact on the area, and to then cap the Tract 42 landfill in compliance with ADEC solid waste management regulations in 18 AAC 60 (ADEC 2003).

The objective for Cell B (Solid Waste) TPA Site 5d, NOAA Site 8 was simply to remove deposits of MSW, relocating it to Tract 42 for proper landfilling. Cleanup of contaminated soil was not an objective for Site 8, so there are no applicable soil cleanup levels.

Summary of Corrective and Closure Actions:
NOAA initiated closure activities in Cell B by excavating and relocating MSW to Tract 42 (Figure 4). NOAA excavated all MSW from Cell B and relocated it to within an area set back 50-feet inside the boundary of Tract 42 (Figure 5). NOAA excavated test pits throughout Cell B in order to determine the extent of MSW, which was identified at depths up to 8 feet bgs in various areas. NOAA used excavators and dump trucks to load and transport MSW to Tract 42. Upon placement, NOAA shaped and compacted the MSW in approximately 18-inch lifts using a bulldozer and vibratory compactor. NOAA initially placed the MSW in the southeast corner of Tract 42, and placement continued along the southern boundary of this area to the southwest corner as lifts were completed. When NOAA encountered large objects including concrete and boulders that could not be incorporated into Tract 42, they were segregated and staged separately to avoid interference with the removal and placement of MSW.

Cell B closure activities also included the removal and relocation of MSW from between the Tract 42 boundary and the 50 foot setback line and a small area outside the northern boundary of Tract 42, beneath the access road (Figure 5). Activities in this area required that NOAA remove and reconstruct the existing access road using approximately 1,298 CY of sand obtained from sand dunes located primarily in the southwest portion of the Ataqan Subdivision with approval from the City of St. Paul, and approximately 114 CY of scoria obtained from the portion of the Telegraph Hill quarry owned by NOAA.

During closure activities, NOAA removed a total of approximately 13,560 CY of MSW from Cell B and relocated it to within the 50-foot setback area at Tract 42.

Recommended Action:
In accordance with paragraph 59 of the Two Party Agreement (NOAA 1996), NOAA requests written confirmation that NOAA completed all appropriate corrective and closure action, to the maximum extent practicable, at the St Paul Landfill Cell B (Solid Waste), TPA Site 5d, NOAA Site 8, in accordance with the Agreement and that ADEC grant a conditional closure that will not require further remedial action from NOAA.

References:

Alaska Department of Environmental Conservation (ADEC). 1991. Interim Guidance for Non-UST Contaminated Soil Cleanup Levels. Contaminated Sites Program. July 17.

ADEC 2002. Certified Mail # 7001 2510 0002 7773 2912 Re: Approval for Saint Paul Landfill Closure Plan, #0225-PR001. Letter from Leslie F. Simmons, ADEC Solid Waste Program Coordinator, Southcentral and Western Alaska to John Lindsay, U.S. Department of Commerce, National Oceanic and Atmospheric Administration. August 7.

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Tetra Tech EM Inc. 2004. *Draft Closure Report Site 6/TPA Site 5b – St. Paul Landfill Cell A Site 7/TPA Site 5c – St. Paul Landfill Cell B (Drum Dump) Site 8/TPA Site 5d – St. Paul Landfill Cell B (Solid Waste) St. Paul Island, Alaska*. October 28.

Woodward-Clyde Consultants, Inc. (Woodward-Clyde). 1994. *Site Inspection Report, St. Paul Island, Alaska.* November.

For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

2/2/05
Date

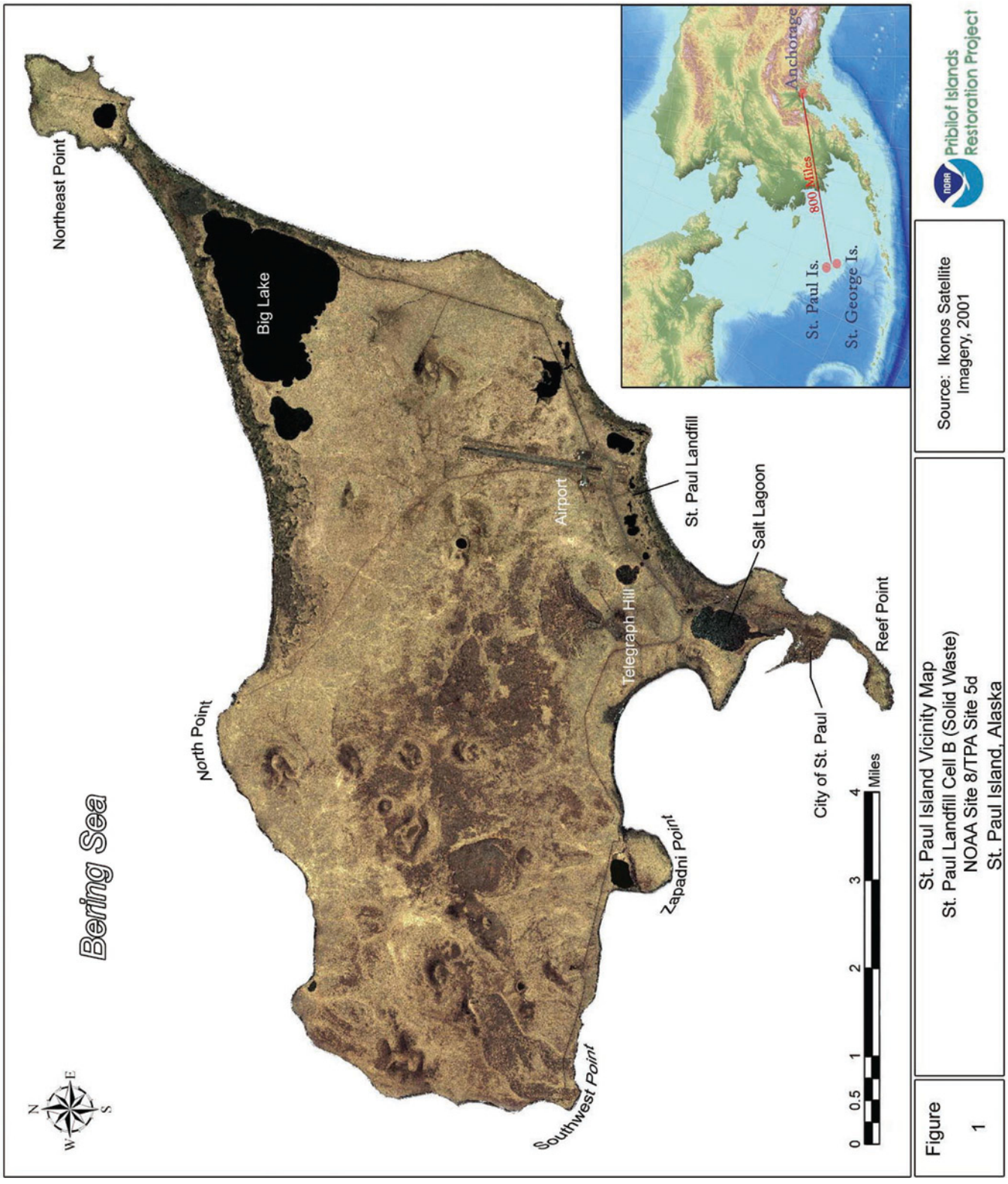
Approvals: In accordance with Paragraph 59 of the Two Party Agreement, this is to confirm that all corrective action has been completed to the maximum extent practicable at the St Paul Landfill Cell B (Solid Waste), TPA Site 5d, NOAA Site 8, in accordance with the Agreement and that no further remedial action is required 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

2/11/05
Date

FIGURES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Pribilof Islands Restoration Project
Source: Ikonos Satellite Imagery, 2001
Figure 1
St. Paul Island Vicinity Map
St. Paul Landfill Cell B (Solid Waste)
NOAA Site 8/TPA Site 5d
St. Paul Island, Alaska

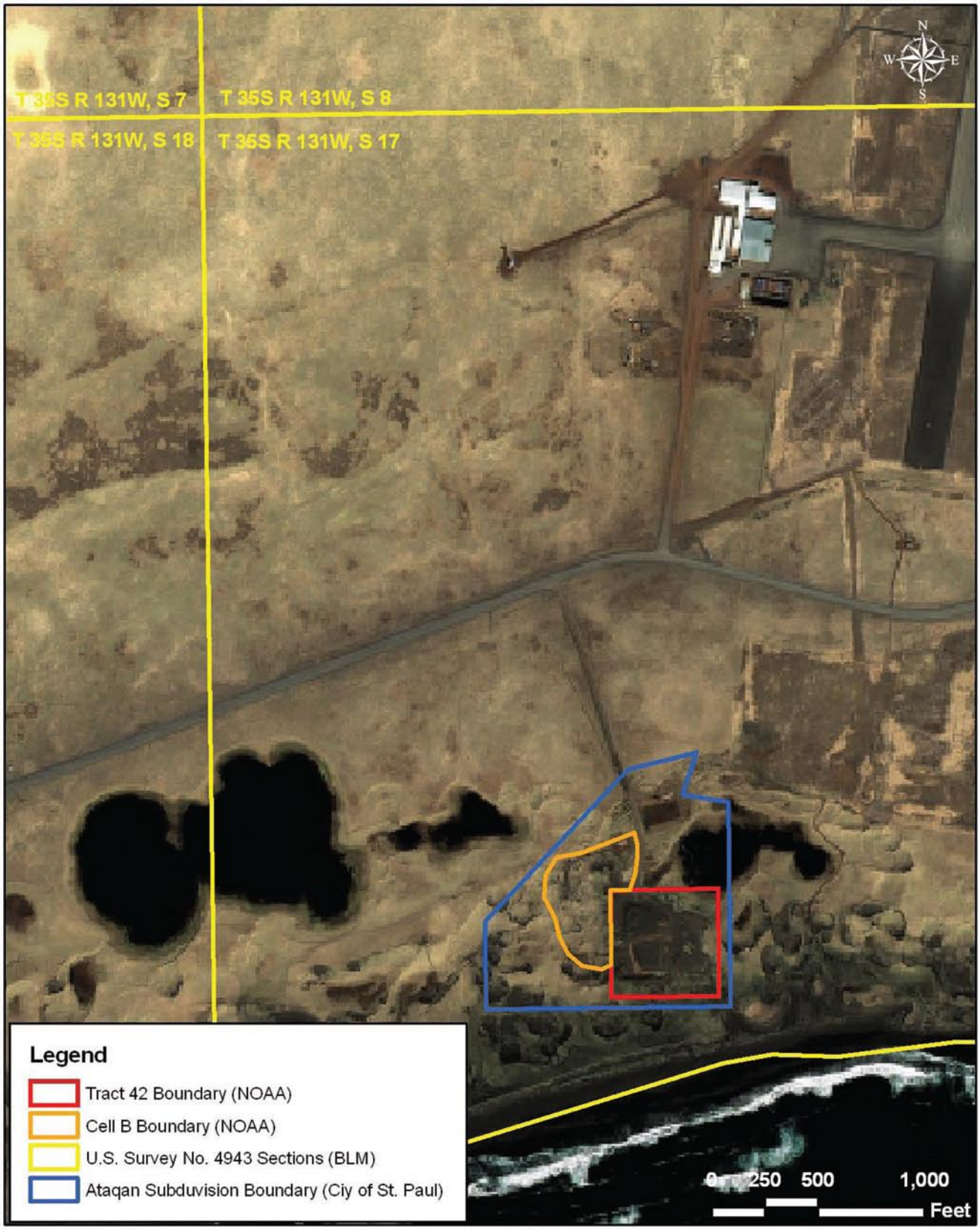

Figure 2	Legal Property Description Map St. Paul Landfill Cell B(Solid Waste) NOAA Site 8/TPA Site 5d St. Paul Island, Alaska	Sources: Tract 42 Boundary and Land Survey Sections (BLM MTPs 1983), Ataqan Subdivision Boundary (Polarconsult 1997), Cell B Boundary (NOAA GIS 2004), Satellite Imagery (Ikonos 2001).

Pribilof Islands Restoration Project

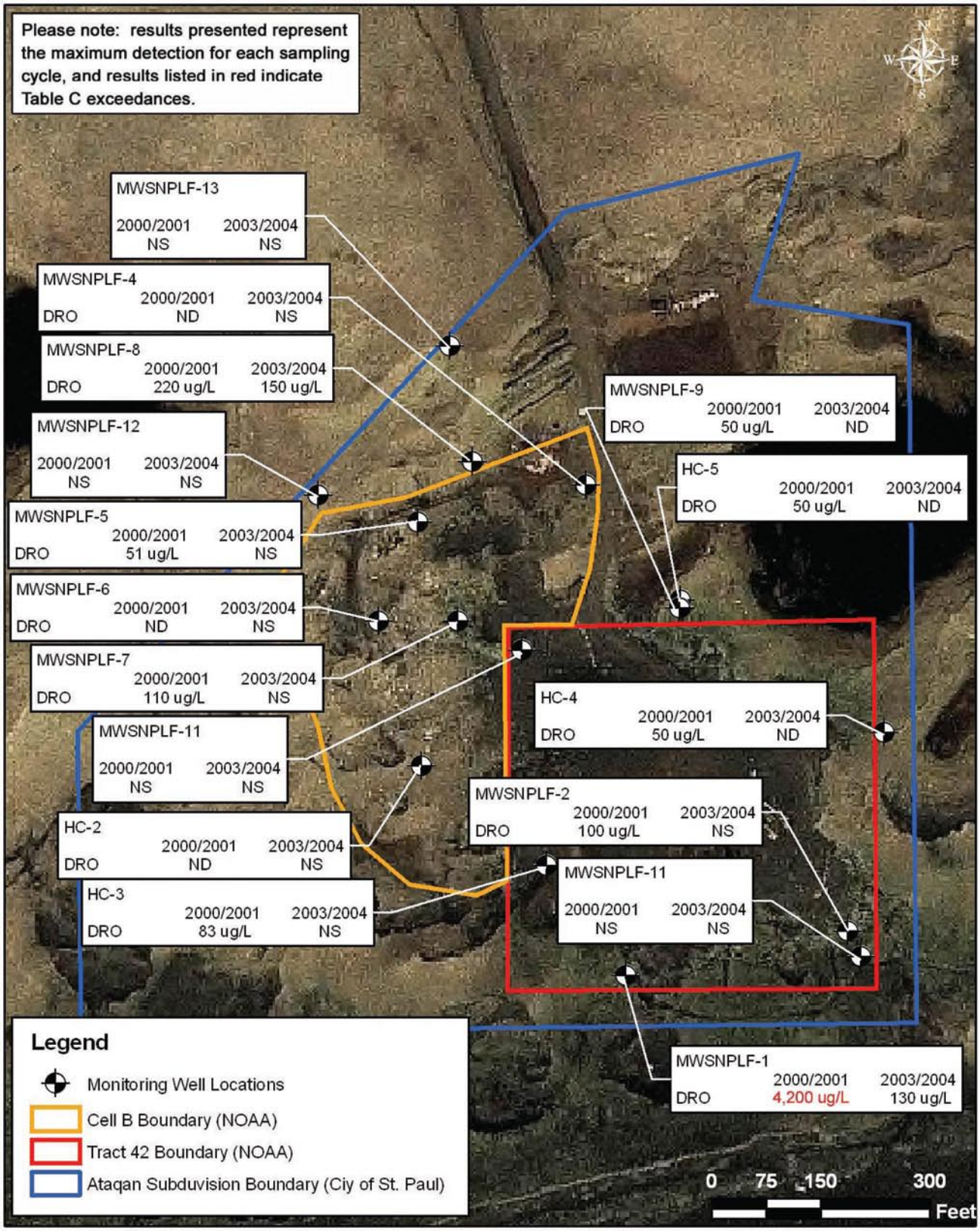

Figure 3	Groundwater Sampling Results St. Paul Landfill Cell B (Solid Waste) NOAA Site 8/TPA Site 5d St. Paul Island, Alaska	Sources: Tract 42 Boundary (BLM MTPs 1983), Ataqan Subdivision Boundary (Polarconsult 1997), Cell B Boundary (NOAA GIS 2004), Well Locations (NOAA GPS 2004), Satellite Imagery (Ikonos 2001).

Pribilof Islands Restoration Project

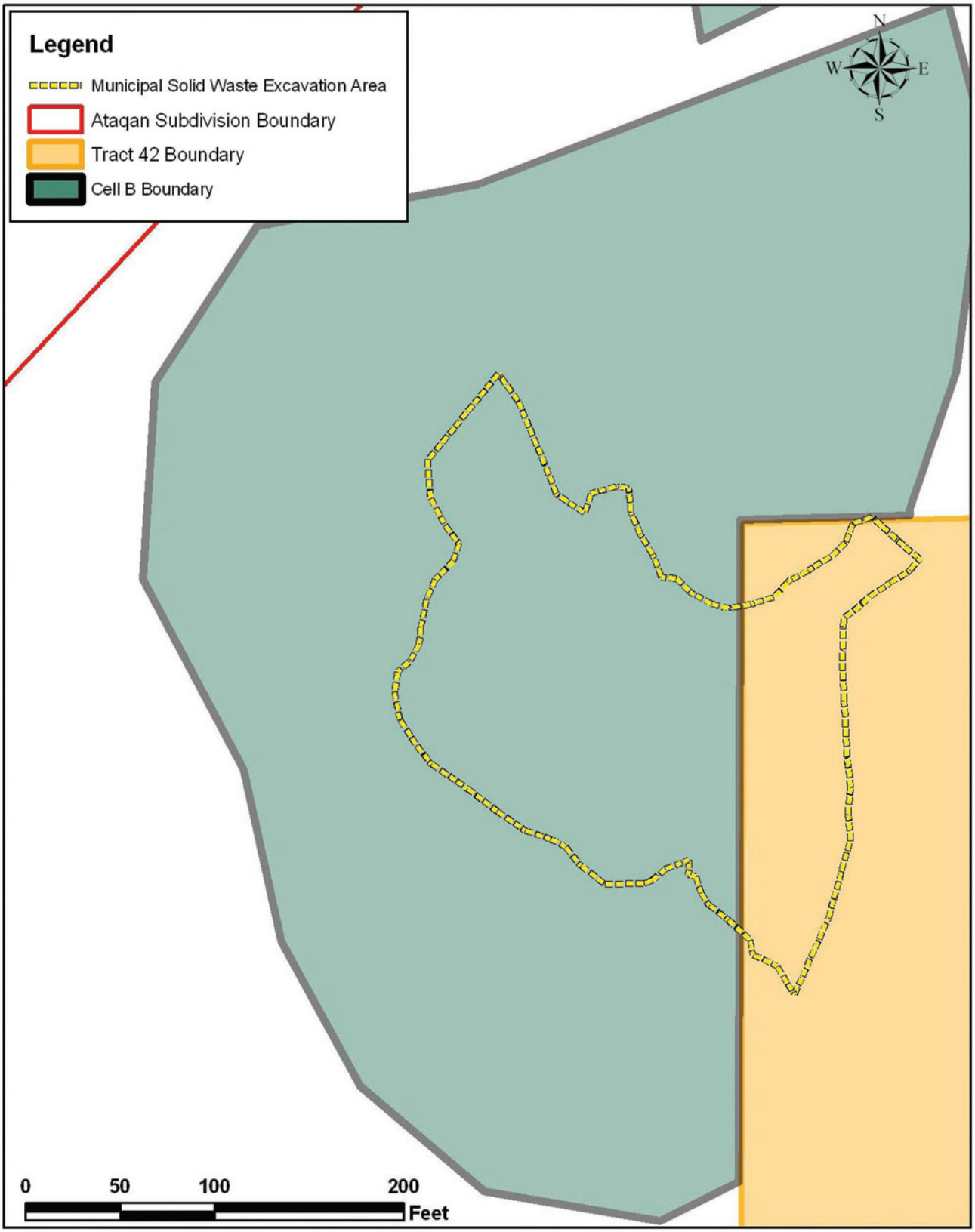

Figure 4	MSW Excavation Area in Cell B St. Paul Landfill Cell B (Solid Waste) Site 8/TPA Site 5c St. Paul Island, Alaska	Sources: Excavation Areas, (NOAA GPS 2003), Ataqan Subdivision Boundary and Cell B Boundary (NOAA GIS 2004), Tract 42 Boundary (BLM MTPs 1983).

Pribilof Islands Restoration Project

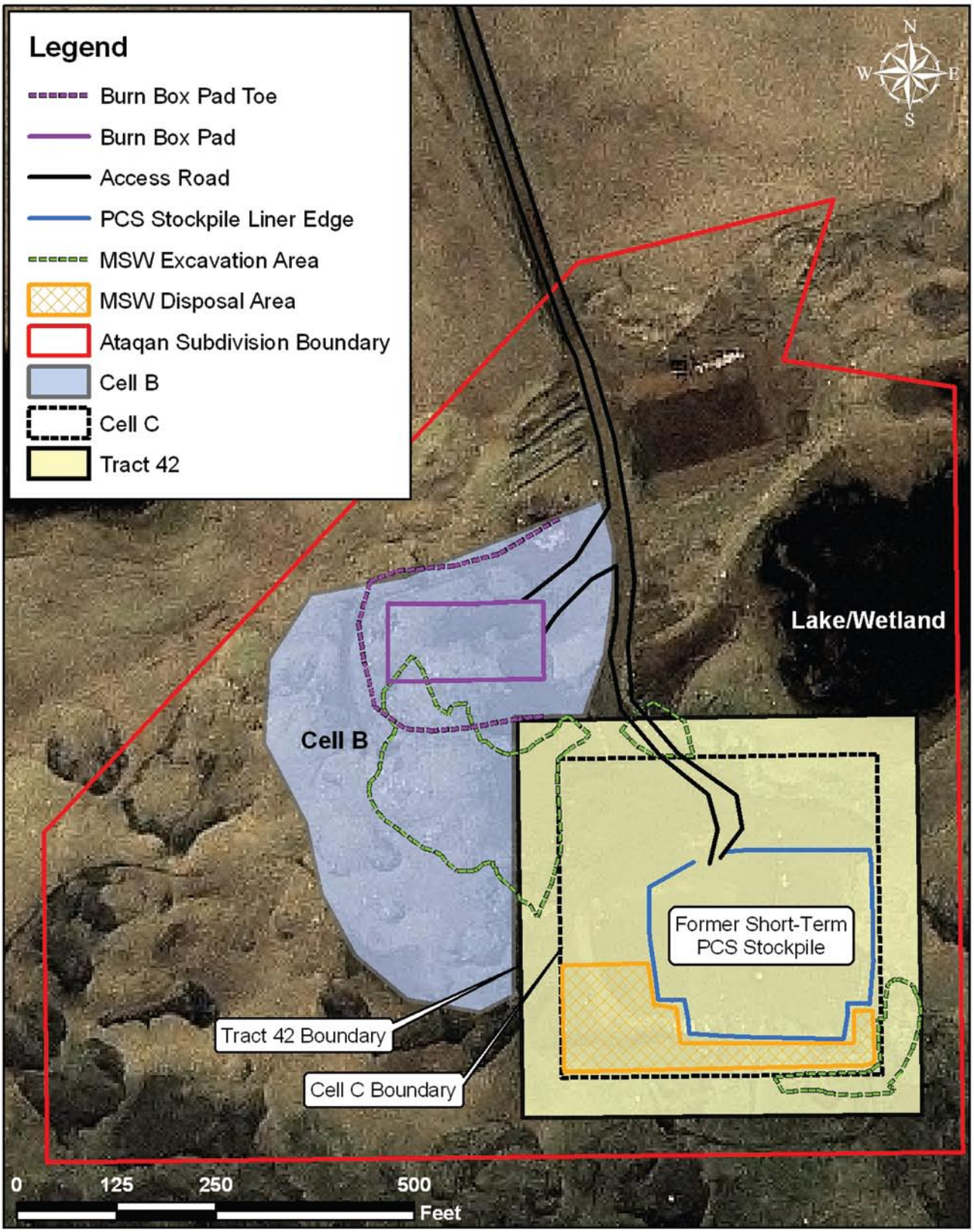

Figure 5	MSW Relocation Area in Cell C St. Paul Landfill Cell B (Solid Waste) NOAA Site 8/TPA Site 5d St. Paul Island, Alaska	Sources: Excavation Areas, Burn Box Pad, Access Road, Stockpile Locations, Cell C, and Tract 42 (NOAA GPS 2003) Ataqan Subdivision Boundary (NOAA GIS 2004), Satellite Imagery (Ikonos 2001).

Pribilof Islands Restoration Project

ALASKA

2008-000251-0
Recording Dist: 305 - Aleutian Islands
5/20/2008 12:46 PM Pages: 1 of 7

NOTICE OF ENVIRONMENTAL CLEANUP AND RESIDUAL SOIL AND DEBRIS AT TPA05 (c and d), ST. PAUL LANDFILL CELL B,
ST. PAUL ISLAND, ALASKA

Pursuant to 18 AAC 75.375, the City of St. Paul and The Aleut Corporation as the owners, and the U.S. Department of Commerce/National Oceanic and Atmospheric Administration (NOAA), as the operator of the subject property hereby provide public notice that the property located south of the St. Paul Island Airport and on the southerly side of Polovina Turnpike, St Paul Island, Alaska 99660 is contaminated with petroleum products. More specifically, the site described as follows:

Lot 6 (Ataqan subdivision) of the Seward Meridian, Alaska,
Section 17, Township 35 South, Range 131 West,
57° 8' 57.58" North Latitude;
170°14' 2.93" West Longitude

Cell B (Figures 1 and 2) has been subject to debris and petroleum contaminated soil, and potential groundwater contamination from a discharge, or release and subsequent cleanup of oil or other hazardous substances, regulated under 18 AAC 75, Article 3 as amended December 2006, and solid waste disposal, which is regulated under 18 AAC 60 as amended August 2003. Adequate soil cover needs to be maintained over the residual petroleum contaminated soil. If contaminated soil or solid wastes are exposed in the future they must be managed in accordance with laws applicable at that time. These releases and cleanup are documented in the Alaska Department of Environmental Conservation (ADEC) contaminated sites database under site number *CS Reckey* #1994250135407; File No. 2644.38.017.01.

The St. Paul Landfill Site was identified as *Site 5 St. Paul Landfill* pursuant to the *Pribilof Islands Environmental Restoration Two Party Agreement* (TPA) between the State of Alaska and NOAA (NOAA 1996). NOAA addressed the Landfill Site as TPA Site 05, Cells A, B, and C, and NOAA Sites 6 (5b), 7 (5c) and 8 (5d), and 5 (5a), respectively. Landfill Site TPA05 [5a], Cell C, NOAA Site 5a in Township 35 South, Range 131 West, Section 17, Tract 42, is currently (2008) owned by the federal government. Following corrective action, NOAA submitted a request for conditional closure for Cell B, Sites 5c and 5d, to the ADEC Division of Spill Prevention and Response, Contaminated Sites Program (NOAA 2005a and NOAA 2005b, respectively). ADEC determined, in accordance with 18 AAC 75.325(f)(1) that site cleanup has been performed to the maximum extent practicable even though residual petroleum contaminated soils, primarily diesel range and residual range organics exist on the site property (NOAA 2005). ADEC granted a conditional closure, in part subject to this institutional control (deed notice), and confirmed that no further remedial action was required at the site unless new information becomes available that indicates to ADEC that the site may pose an unacceptable risk to human health, safety, welfare or the environment (NOAA 2005a and NOAA 2005b, respectively).

Grantor (subsurface estate): U.S. Bureau of Land Management
Grantee (subsurface estate): The Aleut Corporation
4000 Old Seward Highway, Suite 300
Anchorage, AK 99503

Grantor (surface estate): Tanadgusix Corporation
4300 B Street, Suite 402
Anchorage, AK 99503-5946
Grantee (surface estate): City of St. Paul, St. Paul Island, Alaska

Recording District: Aleutian Islands

Remedial Actions and Residual Contamination

The Landfill Site TPA05c and 5d was used by the federal government and the St. Paul Island community to dispose steel drums containing used oil, and to a lesser extent municipal solid waste. During 2000 and 2001, NOAA removed drums containing petroleum products and approximately 1,500 cubic yards of petroleum contaminated soils from the site. During 2004, NOAA pushed surface debris (0-2 feet below ground surface) from Cell B site 5d onto NOAA Landfill Cell C for proper closure. During 2004, the City of St. Paul capped the residual diesel range and residual range organic contaminated soils at Cell B to depths exceeding twenty feet as part of the City's ADEC approved interim landfill development (Figure 3). Following additional site improvements, the City uses the site as the community's interim municipal solid waste landfill. Attached is a site survey or diagram (Figure 2) drawn to scale that shows the property boundaries, the area that has been cleaned up, the approximate location and extent of remaining soil contamination, and the locations where confirmation soil samples were collected applicable to the Cell B..

NOAA installed several groundwater monitoring wells at the site, which are maintained under its long-term groundwater monitoring plan (NOAA 2005b). GW beneath the site may become contaminated with diesel range and residual range organic compounds because of potentially undiscovered buried drums or residual soil contamination acting as a source. Figure 4 depicts the location of GW wells and the groundwater gradient. During 2007, one groundwater well in the vicinity of Cell B found diesel range organics above ADEC Table C levels (Tutka 2007). ADEC requires GW monitoring for at least five years following an approved closure or at least through 2009.

Site Use

In the event that information becomes available which indicates that the site may pose an unacceptable risk to human health, safety, welfare or the environment, the land owner and/or operator is required under 18 AAC 75.300 to notify ADEC and evaluate the environmental status of the contamination in accordance with applicable laws and regulations. Further site characterization and cleanup may be necessary under 18 AAC 75.325-.390 and 18 AAC 78.600. Also, any transport, treatment, or disposal of any potentially contaminated soil or water from the site or use of the groundwater at or near the contaminated area requires notification to and approval from the Department in accordance with AAC 75.370(b) and 18 AAC 78.600(h).

In the future, ADEC approval is required prior to moving the soil cover over the solid waste pursuant to 18 AAC 60. If contaminated soil and solid wastes are removed from the site, the site must be characterized and managed following regulations applicable at that time including 18 AAC 75.325(i)(1), (2) 18 AAC 75.370, and (3) 18 AAC 60 as amended. ADEC approval is required prior to moving soil or solid wastes that is, or has been, subject to the cleanup rules found at 18 AAC 75.325-.390, and 18 AAC 60 as amended.

This notice remains in effect until a written determination from ADEC is recorded that states that soil at the site has been shown to meet the most stringent soil cleanup levels in Method Two of 18 AAC 75.341 (c) and that off-site transportation of soil is not a concern, and until all wastes are removed from the property.

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2008-000251-0

References:

National Oceanic and Atmospheric Administration (NOAA). 1996. *Pribilof Islands Environmental Restoration Two Party Agreement*, Attorney General's Office File No. 66 1-95-0126. National Oceanic and Atmospheric Administration. January 26.

NOAA. 2005a. *Request for Conditional Closure St. Paul Landfill Cell B, NOAA Site 7/TPA Site 5d –St. Paul Island, Alaska*. Signed by John Lindsay (NOAA) and submitted February 2 (cover letter dated January 28, 2005). Signed by Louis Howard of ADEC Contaminated Sites Program, February 11, 2005.

NOAA. 2005b. *Request for Conditional Closure St. Paul Landfill Cell B, NOAA Site 7/TPA Site 5c –St. Paul Island, Alaska*. Signed by John Lindsay (NOAA) and submitted March 30. Signed by Louis Howard of ADEC Contaminated Sites Program, April 11, 2005.

Tetra Tech. 2004. *Final Closure Report: Site 6/TPA Site 5b –St. Paul Landfill Cell A; Site 7/TPA Site 5c – St. Paul Landfill Cell B (Drum Dump); Site 7/TPA Site 5d – St. Paul Landfill Cell B (Solid Waste)*. Prepared for National Oceanic and Atmospheric Administration, National Ocean Service, Office of Response and Restoration, 7600 Sand Point Way NE, Seattle, WA. 98115. November 30.

Tutka. 2007. *Annual Groundwater Monitoring Report 2007, St. Paul Island, Alaska.* December 21. Prepared for NOAA, Office of Response and Restoration, 7600 Sand Point Way NE, Seattle, WA. 98115.

Please return original copy of this notice to the (operator) address below:

Signature: _____

Printed Name: _____John A. Lindsay_____

Mailing Address:
Attn: John Lindsay

US DOC, NOAA, NOS, OR&R, PPO
7600 Sand Point Way NE
Bldg 3, RM 1301
Seattle, WA 98115

(seal) Subscribed and sworn to before me this ___ day of _____, 19___.
Notary Public in and for the State of _____
My commission expires:_____

3 of 7
2008-000251-0

Figure
1

St. Paul Island Vicinity Map
St. Paul Landfill Cell B
NOAA Sites 7 & 8/TPA Sites 5c & 5d
St. Paul Island, Alaska

Source: Ikonos Satellite Imagery (Space Imaging 2001)
Path: C:\KP_GIS Data\Maps & Figures\SNP\Deed Notices\Site 7 & 8, TPA 5c & 5d\SNP Standard Fig 1 - Cell B.psd
Date: 4/29/2008

Pribilof Islands Restoration Project

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2008-000251-0

Figure 2	Legal Property Description Map Lot 6 & Ataqan Subdivision St. Paul Landfill Cell B NOAA Sites 7 & 8/TPA Sites 5c & 5d St. Paul Island, Alaska	Sources: Landfill Cell B Layers (NOAA PPO GIS, 2003), Aero-Metric 2006 2 ft Aerial, 1983 Bureau of Land Management Land Survey Plat Officially filed February 15, 1985. Path: C:\KP_GIS Data\Maps & Figures\SNPI\ Deed Notices\Site 7 & 8, TPA 5c & 5d\ CellB_PropDescription_Fig2.mxd Date: 4/30/2008 @ 9:11:17 AM

Pribilof Islands Restoration Project

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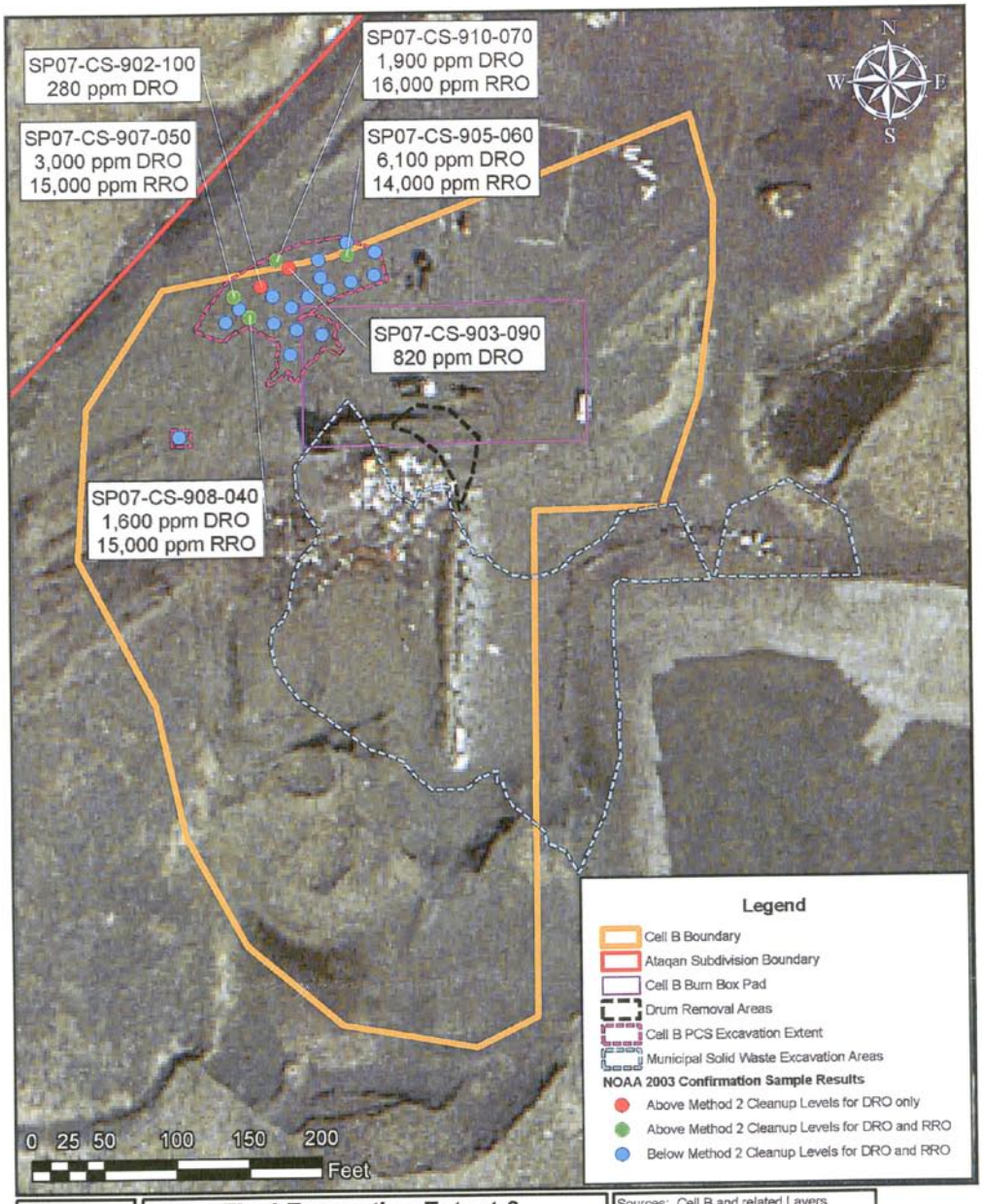

Figure 3	Final Excavation Extent & Confirmation Sampling Results St. Paul Landfill Cell B NOAA Sites 7 & 8/TPA Sites 5c & 5d St. Paul Island, Alaska	Sources: Cell B and related Layers (NOAA GIS 2003), Ataqan Boundaries (Polarconsult 1997), Samples (PPO Chemical Database 2003), Aero-Metric 2006 2 ft Aerial Photo Path: C:\KP_GIS Data\Maps & Figures\SNP\Deed Notices\Site 7 & 8, TPA 5c & 5d\CellB_Samples&Excavate_Fig3.mxd Date: 4/30/2008 @ 9:22:26 AM

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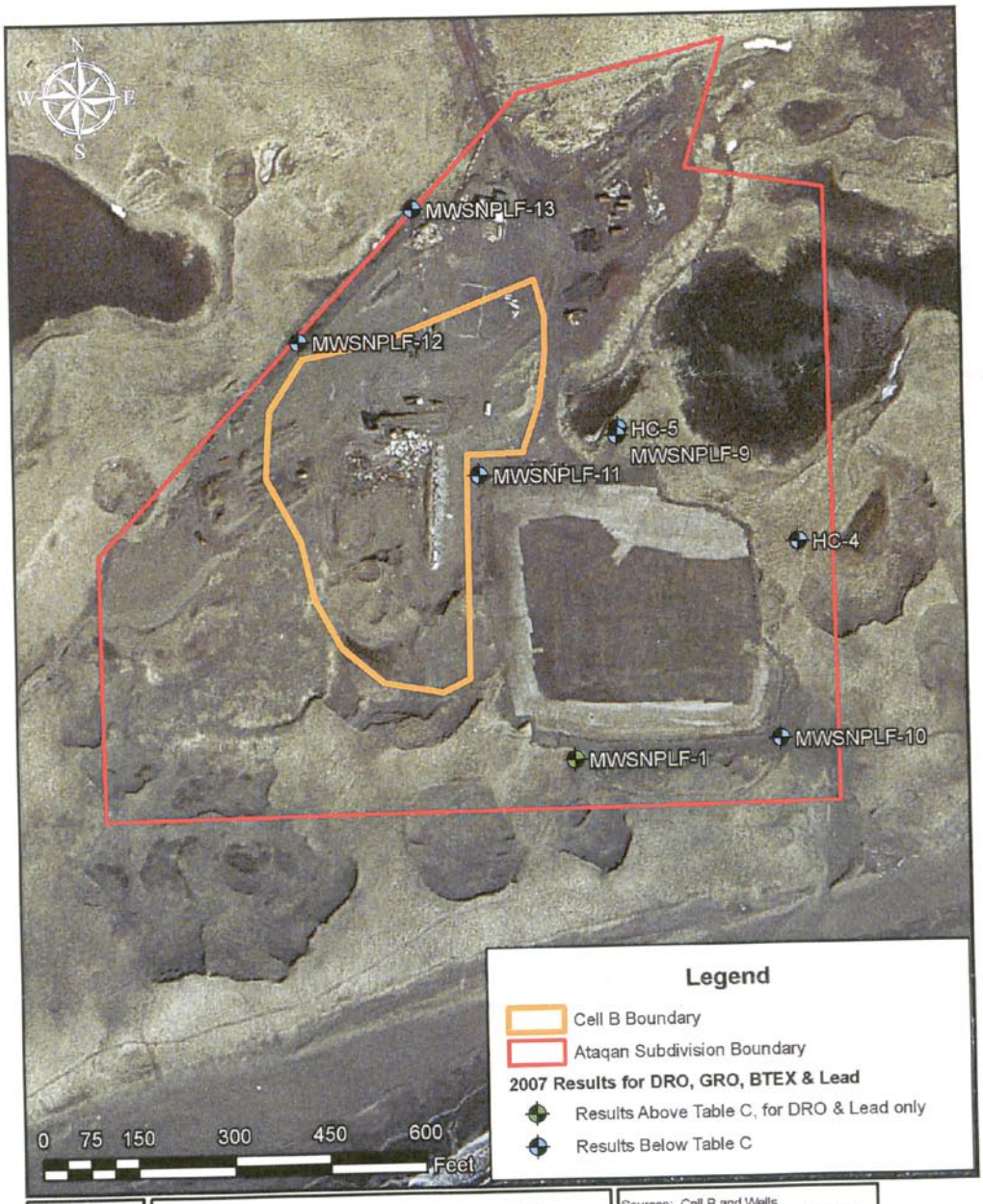

Figure 4	Location of Groundwater Wells St. Paul Landfill Cell B NOAA Sites 7 & 8/TPA Sites 5c & 5d St. Paul Island, Alaska	Sources: Cell B and Wells (NOAA GIS/Chemical Database '04-'07) Ataqan Boundaries (Polarconsult 1997), Aero-Metric 2006 2 ft Aerial Photo Path: C:\KP_GIS Data\Maps & Figures\SNP\Deed Notices\Site 7 & 8, TPA 5c & 5d\CellB_Wells&Gradient_Fig4.mxd Date: 4/30/2008 @ 9:40:55 AM

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NOAA Site 9
TPA Site 6: Pumphouse Lake

Site Closure Report – Final, Pumphouse Lake (Two-Party Agreement Site 6), Pribilof Islands Site Restoration, St. Paul Island, Alaska 305

Letter from Louis Howard to John Lindsay RE: Draft Site Closure Report Pumphouse Lake Two Party Agreement Site No. 6 Pribilof Islands Site Restoration Project, St. Paul Island, AK, February 23, 2001. Dated April 11, 2001.....315

SITE CLOSURE REPORT - FINAL

Pumphouse Lake
(Two-Party Agreement Site 6)

Pribilof Islands Site Restoration
St. Paul Island, Alaska

June 6, 2001

Prepared For:
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Pribilof Project Office

Prepared By:

NORTECH
ENVIRONMENTAL & ENGINEERING CONSULTANTS
Fairbanks, Alaska

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Appendix 3: Daily Reports (and Scrap Recycle Receipt)

Appendix 4: Laboratory Analytical Reports – not prepared for this debris site

Appendix 5: Site Video Documentation

1.0 EXECUTIVE SUMMARY

NORTECH Environmental and Engineering Consultants and Bering Sea Eccotech mobilized personnel and equipment to TPA Site 6, the Pumphouse Lake site at St. Paul Island, Alaska, and administered a brief program of debris removal from June 20 to June 21, 2000. Approximately two truckloads of rotted wood and other household debris were excavated, loaded, and hauled away for disposal at the St. Paul Landfill. Based on a review and analysis of available project photographs, Daily Reports, and the data cited in TTEMI's Closure Confirmation Report, ***NORTECH*** arrived at the following environmental conclusions:

- The site's water supply pumping sump and flume trenches were backfilled with clean soils, and no signs or evidence of any petroleum hydrocarbon contamination has been observed at any time since 1992.
- Groundwater contamination is considered unlikely at this debris removal site, given the lack of any evidence of significant spills, leaks, or other petroleum hydrocarbon releases.

Based on these conclusions, ***NORTECH*** recommends the following:

- No Further Action at this debris removal site.

2.0 INTRODUCTION

The National Oceanic and Atmospheric Administration (NOAA), Office of Response and Restoration, is responsible for environmental restoration activities on St. Paul and St. George Islands, Alaska. Collectively, these islands are part of a five island archipelago known as the Pribilof Islands. Under Public Law 104-91, NOAA is responsible for the cleanup of debris, landfills, wastes, storage tanks, hazardous and unsafe conditions, as well as contaminants including petroleum products and their derivatives left by NOAA on lands transferred or obligated for transfer on the Pribilof Islands. 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 environmental regulations and in accordance with the TPA, NOAA has undertaken an array of site characterization and restoration activities on St. Paul and St. George Islands. Additional work must be conducted to satisfy the TPA, including limited site characterization, remediation, confirmation sampling, and site restoration (NOAA 1996).

Under Contract No. 52ABNA500049, Task Order 56ABNA703706, ***NORTECH*** Environmental and Engineering Consultants (***NORTECH***) has prepared this Site Closure Report for the Pumphouse Lake site, TPA Site 6, to report on the debris removal and environmental assessment activities which occurred during the 2000 fieldwork season.

2.1 Objectives

The overall objective for the St. Paul Debris Removal project undertaken by ***NORTECH*** was to develop a written plan of action, have it approved by NOAA and ADEC, and execute it for each TPA and non-TPA site. At each removal area ***NORTECH*** was to accomplish the acts necessary to gain a no-further-action designation from ADEC, or else gain an understanding of the corrective action efforts that could eventually lead to proper site closure.

2.2 Methodology and Applicable Regulations

In order to meet the project objective, ***NORTECH*** developed a draft Corrective Action Plan and an array of Sampling & Analysis Plans (SAPs) in March 2000 for eleven designated St. Paul debris sites. They were reviewed and approved by NOAA and ADEC, fieldwork was begun in mid-April, and completed by late November 2000. The fieldwork was performed in accordance with the Corrective Action Plan, the site's SAP, and the 1996 Two Party Agreement (TPA) between ADEC and NOAA including the following 1991 versions of ADEC's regulations

and associated guidance documents, as referenced in the TPA, particularly sections 21 to 28, 59, and 103 which call for the application of:

- 18 Alaska Administrative Code (AAC) 70 Water Quality Standards
- 18 AAC 75 Oil and Hazardous Substances Pollution Control
- Underground Storage Tank Procedures Manual, Guidance for Treatment of Petroleum Contaminated Soil and Water and Standard Sampling Procedures

3.0 SITE BACKGROUND

This section provides a brief discussion of the location and history of the Pribilof Islands, weather and environmental conditions on St. Paul Island, a site description, and a summary of previous investigations ***NORTECH*** was aware of at this specific St. Paul debris removal site.

3.1 Island Historical Information

Russia first discovered St. Paul Island and its seal rookeries 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. In 1869, the United States made the Pribilof Islands a federal reservation. From 1869 to 1909, the United States contracted fur seal harvesting and pelt processing to private companies. 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 passed, which provided for the transfer of property and management of the islands to Alaskan Native regional and village corporations.

The only major landowners on St. Paul Island are the Tanadgusix Corporation (TDX) and the federal government. Minor landowners include the City of St. Paul, the St. Paul Tribal Council, and the State of Alaska. The federal government currently retains title to about 1,515 acres on St. Paul Island, which consists of seal rookeries and administrative offices managed by the National Marine Fisheries Service, bird rookeries managed by the U.S. Fish & Wildlife Service, a U.S. Coast Guard (USCG) LORAN station, two scoria pits, the current landfill, and a National Weather Service station. The island's airport, which consists of about 67 acres of land, 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. It is surrounded by the Bering Sea, and is 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 (Figure 1). About 27 centerline miles of road bisect the island north south and east west. The City of St. Paul is located on the southern peninsula of the island; its 1998 population included 761 people (ADL 1999). St. Paul Island has many sand dunes and is vegetated with grasses and small forbes over the majority of its area. The vegetation is broadly classified as moist tundra. Some common plant species present on the island include blue lupine, arctic poppy, beach wild rye, and sea beach sandwort.

St. Paul Island serves as a nesting area for a great number of seabirds and a rookery area for northern fur seals. Commercial crab harvesting areas are located within 15 miles of the island. Major harvest species are the Tanner crab and Korean Hair crab.

3.2.1 Climate

The climate of the island is classified as subpolar. Maritime weather conditions prevail on the island, with predominantly cloudy, foggy, and windy conditions. Total annual precipitation averages 23.3 inches, with most occurring between the months of April and October. The mean monthly temperature ranges from 22.4°F in winter to 47.8°F in summer, with a mean annual temperature of 34.8°F. Wind speeds range from nil to over 100 miles per hour, with an average of 17.2 miles per hour (NCDC 1999).

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 eastern portion 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. The lakes with direct estuarine connection to the Bering Sea (for example, the Salt Lagoon) tend to be brackish; the remaining lakes are freshwater. Much of the surface of the island is composed of sandy or scoriaceous material that allows for rapid infiltration of water. Presently, little else is known about the island's groundwater.

The City of St. Paul obtains its municipal water supply from four wells located about 1.5+ miles northeast of the city and immediately east of Telegraph Hill (Fredreka I, Fredreka II, south well, and north well). A fifth well serves the USCG LORAN station. These wells are reportedly completed within the basalt aquifer. The four municipal wells are connected by pipelines that supply three 200,000 gallon water storage tanks located on a hill above the city.

3.3 Site Description

The Pumphouse Lake site, TPA Site 6, is referenced as a debris site under the Two Party Agreement. It is located just south of the St. Paul airport and approximately 3 miles northeast of the city center. (Figure 1, Appendix 1) The nearest ocean shoreline is Lukanin Bay, about 0.3 miles to the south.

The TPA describes the debris site as having two abandoned water supply pumps, with no identified ownership. "No stressed vegetation or stained soils were evident", but local residents "reported possible diesel contamination based on MNFS operating practices", thus the "potential for diesel contamination exists". As reported in the November 2000 Closure Confirmation Report by Tetra Tech EM Inc., this site consists of "several abandoned and dilapidated permanent structure remnants, as well as small miscellaneous debris scattered near the shore of, and in, Pumphouse Lake".

3.3.1 Geology and Soil

The site is located in a tundra environment, with sand dunes to the east and beyond the lake to the south. The thickness of the sand and the depth to bedrock are not known, although tank excavations at the U.S. National Weather Service (NWS) facility less than ¼ mile east of the site reportedly found bedrock at about 12 feet below ground surface.

3.3.2 Surface Water and Groundwater

The nearest surface water body is Pumphouse Lake, which is directly adjacent to and east of the debris site, TPA Site 6. This lake is freshwater, and was used during previous decades to extract drinking water for the use of residents of St. Paul. Depth to groundwater at the site was observable, since the flume trench which once fed the framed sump where water pumps were previously installed was still awash, and the water surface was noted to be at approximately 6 feet below the ground surface (bgs).

3.4 Previous Investigations And Other Activities

In 1986, Chase Construction, Inc. reportedly conducted debris removal activities at the Formerly Used Defense Site (FUDS) F, also referred to as "Quonset Ruins Near Airport". According to Department of Defense contracting documents, FUDS F was located between Pumphouse Lake, the St. Paul Landfill, the southern airport airfield, and the NWS compound (U.S. Army, 1991) It appears that the area shown in the photographs in Appendix 2 - Site Photographs are the remains of this FUDS F site. During their debris removal work, Chase reportedly removed about 100 cubic yards of debris, most of which was the remains of a collapsed building including a concrete foundation, piping, a Quonset hut, and metal and wooden debris.

In 1992, Ecology & Environment, Inc. (E&E) conducted a preliminary assessment at the Pumphouse Lake site, and reported on it in 1993. E&E inspected the site and noted the presence of two abandoned water supply pumps on the western side of the lake. No soil staining or other evidence of contamination was noted. (E&E 1993)

The two water pumps were removed by Aleutian Enterprises in 1997, and again no staining or other evidence of contamination was noted. (Aleutian Enterprises 1997)

In November 2000, Tetra Tech EM Inc. (TTEMI) submitted a Closure Confirmation Report to NOAA for the Pumphouse Lake site, which described the results of their fieldwork efforts during 1999; including: a limited geophysical survey, thorough field reconnaissance, and their conclusions and recommendations. TTEMI closely observed the entire site, mapped it, and used a hand-held Schonstedt magnetometer to search for metallic anomalies and debris. No significant magnetic anomalies were detected. TTEMI personnel waded into the lake and removed various items, as well as all other nonstructural debris seen above-ground at the site. Their report states that "no stained soil, depressed vegetation, or other structures that likely contained petroleum hydrocarbons or other potentially hazardous substances" were noted. Apparently, no PID fieldscreening or soil sampling was performed. Other than the large surface structures, all remaining debris was removed from the site.

4.0 FIELDWORK ACTIVITIES

4.1 Debris Removal

NORTECH mobilized BSE workmen and several pieces of heavy equipment to the Pumphouse Lake site on the evening of June 20, 2000. (Photo 1, Appendix 2: Site Photographs) After unloading an Hitachi 150 excavator, the crew began demolishing and removing the wooden flume leading from the abandoned foundation to the lake, and hauling the wastes away to the St. Paul landfill in end-dump trucks. (Photo 2 and Appendix 3: Daily Reports) The sump and flume were totally removed, and the excavation backfilled with scoria and topped with sand. In addition, a depressed area within the concrete foundation was filled with scoria, to eliminate a potential tripping hazard. Cleanup and closure work was completed, so the crew was demobilized on June 21, 2000. (Photo 3)

Later, on July 18th, the BSE crew returned to the site to fully expose and backfill another flume trench discovered approximately 100 yards east of the concrete foundation. (Photo 4) Clean, pit-run sand was brought to this trench and tamped into place. Approximately two hours later all field activities were terminated.

4.2 Soil and Groundwater Sampling

No analytical, or photoionization detector field-screening, sampling was performed at this debris site. During the debris removal operations, no soil staining, stressed vegetation, sheens or rainbows on water surfaces, or any other evidences of spills or past fluid releases from any sources were observed.

5.0 DEBRIS AND SUSPECT SOILS DISPOSAL

5.1 Debris Disposal and Recycling

The wood debris removed from the Pumphouse Lake site was hauled to a stockpile and burned with other wooden debris at the St. Paul Landfill in August 2000.

5.2 Soil Disposal and Remediation Treatment

No soils removed from this site for disposal or treatment.

6.0 DISCUSSION

NORTECH completed the removal of all visible solid wastes and general debris found above the ground surface and on the lake bottom at the Pumphouse Lake site. The cleanup objectives outlined in the Corrective Action Plan prepared by ***NORTECH*** for the Pribilof Islands Site Restoration Project and stated in Section 2.1 above were generally met, although no PID fieldscreening was performed, nor were any soil or water samples collected or analyzed by an off-site laboratory. Given the total absence of any evidences of contamination at this site, soil sampling was deemed to be unnecessary.

7.0 CONCLUSIONS AND RECOMMENDATIONS

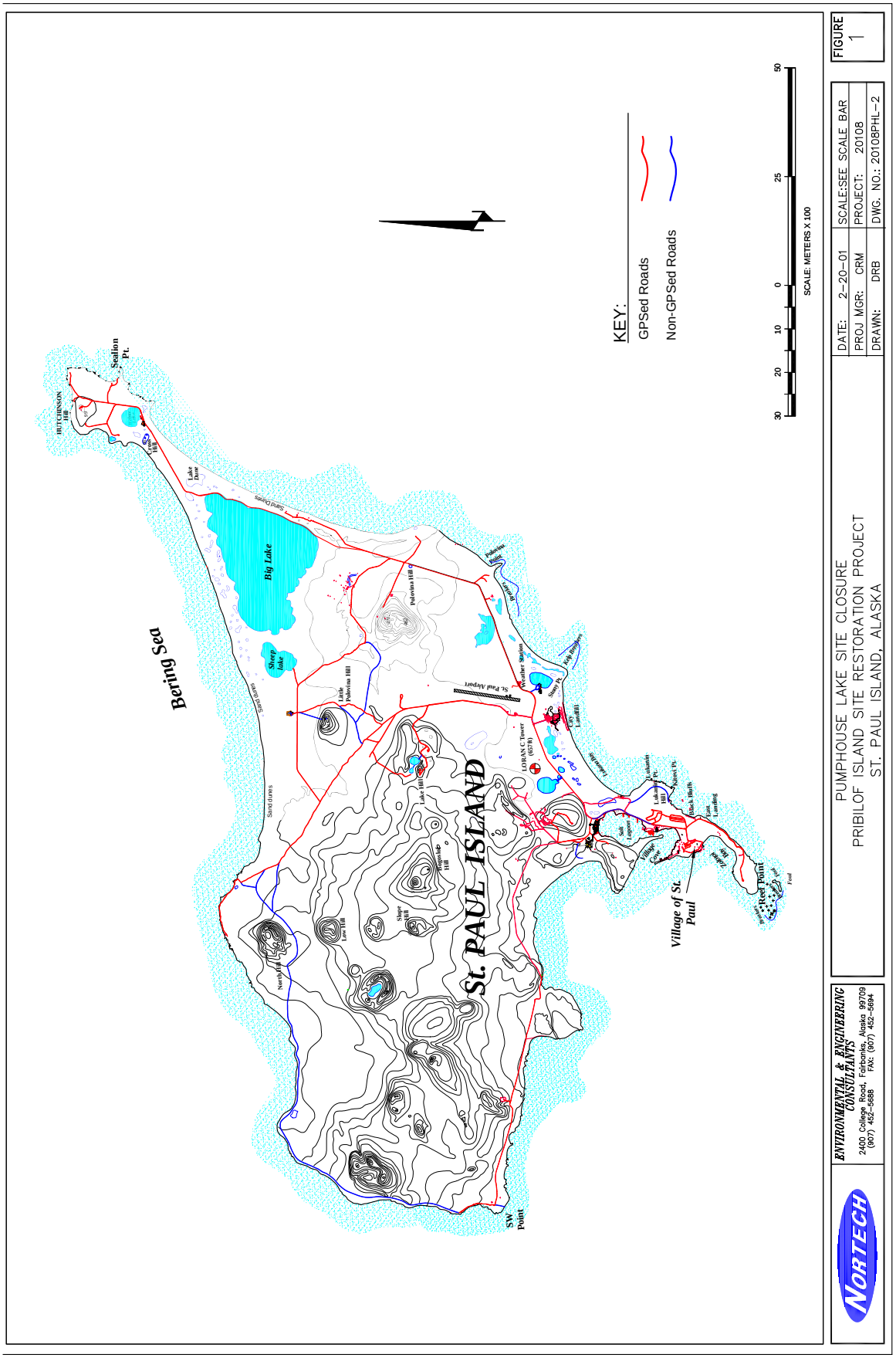
NORTECH Environmental and Engineering Consultants and Bering Sea Eccotech mobilized personnel and equipment to TPA Site 6, the Pumphouse Lake site at St. Paul Island, Alaska, and administered a brief program of debris removal from June 20 to June 21, 2000. Approximately two truckloads of rotted wood and other household debris were excavated, loaded, and hauled away for disposal at the St. Paul Landfill. Based on a review and analysis of available project photographs, Daily Reports, and the data cited in TTEMI's Closure Confirmation Report, ***NORTECH*** arrived at the following environmental conclusions:

- The site's water supply pumping sump and flume trenches were backfilled with clean soils, and no signs or evidence of any petroleum hydrocarbon contamination has been observed at any time since 1992.
- Groundwater contamination is considered unlikely at this debris removal site, given the lack of any evidence of significant spills, leaks, or other petroleum hydrocarbon releases.

Based on these conclusions, ***NORTECH*** recommends the following:

- No Further Action at this debris removal site.

APPENDIX 1: Figures & GPS Information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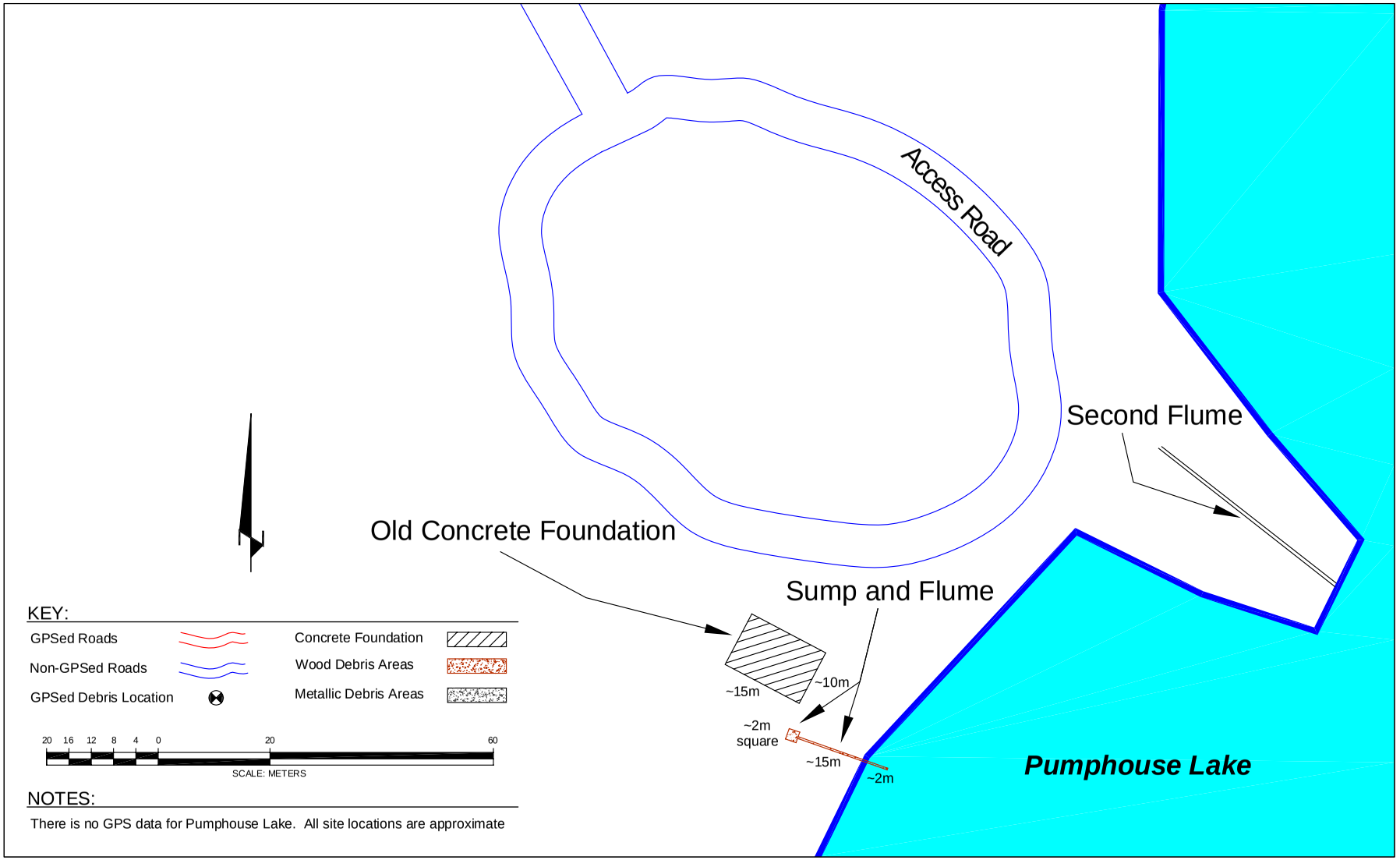
GPSed Roads
Non-GPSed Roads
SCALE: METERS X 100
0
10
20
30
25
50
Bering Sea
St. PAUL ISLAND
Village of St. Paul
Reef Point
SW Point
Sealion Pt.
Big Lake
Sheep lake
Lake Dune
Lake Paleovina
Paleovina Hill
Lake Hill
Sharp Hill
Lakeside Hill
Lakeside Pt.
Alaska Hill
Village Cove
Salt Lagoon
Weather Station
St. Paul Airport
LORAN C Tower (657ft)
Old Landfill
New Landfill
Sand Dunes
Sand Dunes
Lagoon
Lagoon
Lagoon



NORTECH

ENVIRONMENTAL & ENGINEERING CONSULTANTS
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(907) 452-5688 FAX: (907) 452-5694

PUMPHOUSE LAKE SITE CLOSURE
PRIBILOF ISLAND SITE RESTORATION PROJECT
ST. PAUL ISLAND, ALASKA

DATE:	2-20-01	SCALE:	SEE SCALE BAR
PROJ MGR:	CRM	PROJECT:	20108
DRAWN:	DRB	DWG. NO.:	20108PHL-2

FIGURE 2

APPENDIX 2: Site Photographs

Photo 1: A06501F0.jpg: Worksite, before initiating closure. Intake “sump” is near pond shoreline.

Photo 2: A06516Fo.jpg: Excavator removes wooden flume, sump, and backfills holes with scoria.

Photo 3: A06511F0.jpg: Pumphouse trench and foundation slab backfilled. Crew demobilized.

Photo 4: A06500G0.jpg: BSE crew cleans out and backfills “secondary” flume and trench.

C.2.a
(rrP9 C16)

STATE OF ALASKA

DEPT. OF ENVIRONMENTAL CONSERVATION

DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITES REMEDIATION PROGRAM

TONY KNOWLES, GOVERNOR

555 Cordova Street
Anchorage, AK 99501-2617
Phone: (907) 269-7552
Fax: (907) 269-7649
http://www.state.ak.us/dec/

April 11, 2001

Mr. John Lindsay
Pribilof Project Manager
U.S. Department of Commerce, NOAA
National Ocean Service
Office of Response and Restoration
7600 Sand Point Way, NE BIN C15700
Seattle, Washington 98115-0070

RE: Draft Site Closure Report Pumphouse Lake Two Party Agreement Site No. 6
Pribilof Islands Site Restoration Project St. Paul Island, AK, February 23, 2001

Dear Mr. Lindsay:

The Alaska Department of Environmental Conservation (ADEC) has received the above document on March 20, 2001. Based on a review of the data presented in the report, ADEC concurs with the conclusion in section 7.0 that no further action is required at the site known as the Pumphouse Lake. However, if in the future, additional contamination is discovered at this site, further investigation and/or remedial actions will be requested of NOAA by ADEC. ADEC reserves its rights, under 18 AAC 75 Oil and Other Hazardous Substances Pollution Control regulations and AS 46.03 to require NOAA to conduct additional assessment and/or corrective actions, if information indicates the site conditions pose an unacceptable risk to human health, safety, or welfare, or to the environment.

If you have any questions regarding this letter, please call me at (907) 269-7552.

Sincerely,

Louis Howard
Project Manager

cc: Jennifer Roberts, ADEC Anchorage
Robert A. Taylor, NOAA GC Seattle, WA
Breck Tostevin, AGO
Pribilof RAB Members

PDF 15,12

NOAA Sites 10–13
(NMFS Fuel Barges, TPA 7; TPA Attachment A)

NOAA Site 10 – TPA Site 7a: NMFS Fuel Barge: North End Lagoon
NOAA Site 11 – TPA Site 7b: NMFS Fuel Barge: Lagoon Channel
NOAA Site 12 – TPA Site 7c: NMFS Fuel Barge: Black Bluff
NOAA Site 13 – TPA Site 7d: NMFS Fuel Barge: East Landing

Site Closure Report - Draft, NMFS Fuel Barges: "A," "B," "C" and "D" (Two-Party Agreement Site 7), Pribilof Islands Site Restoration, St. Paul Island, Alaska 319

Letter from Louis Howard to John Lindsay RE: Draft Site Closure Report TPA Site 7-NMFS Fuel Barges A, B, C, D St. Paul Island, Alaska November 19, 2001. Dated January 2, 2002.....349

SITE CLOSURE REPORT - DRAFT

NMFS Fuel Barges: “A”, “B”, “C” and “D”
(Two-Party Agreement Site 7)

Pribilof Islands Site Restoration
St. Paul Island, Alaska

November 19, 2001

Prepared For:
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Pribilof Project Office

Prepared By:

ENVIRONMENTAL & ENGINEERING CONSULTANTS
Fairbanks, Alaska

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5.0 DEBRIS DISPOSAL & RECYCLING 332
6.0 ANALYSIS 333
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APPENDICES

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Appendix 2: Site Photographs: Fuel Barges “A”, “B”, “C”, and “D”
Appendix 3: Daily Reports: Fuel Barges “A”, “B”, “C”, & “D” (+ Scrap Recycle Receipt)
Appendix 4: Laboratory Analytical Reports
Appendix 5: Site Video Documentation
Appendix 6: Barge “B” Salvage/Removal Plan & Acceptance Documentation

1.0 EXECUTIVE SUMMARY

NORTECH Environmental and Engineering Consultants and Bering Sea Eccotech mobilized personnel and equipment to the four NOAA Fuel Barge sites at St. Paul Island, Alaska, and administered a program of metal barge and debris removal beginning on April 22, 2000. These long-wrecked Bureau of Commercial Fisheries fuel barges and miscellaneous nearby wooden/plastic/metal debris were removed from the four sites and hauled away for disposal and recycling off-island. A small quantity (<2 CY overall) of suspected-contaminated soil from a limited soil removal program within and under the "footprint" of Barge "A" was transported and deposited at the Blubber Dump PCS stockpile for thermal remediation. Based on a review and analysis of available project photographs, Daily Reports, personnel memories and documented field observations, ***NORTECH*** has arrived at the following environmental conclusions:

- The soils at each of these fuel barge and debris removal sites are unlikely to be contaminated by petroleum hydrocarbons at a level greater than the applicable ADEC soil cleanup standards.
- Groundwater contamination is considered unlikely at these debris removal sites, given the lack of any evidence of the presence of any significant spills, leaks, or other petroleum hydrocarbon releases at the sites.

Based on these conclusions, ***NORTECH*** recommends the following:

- No-Further-Action for any of these TPA 7 barge and debris removal sites.

2.0 INTRODUCTION

The National Oceanic and Atmospheric Administration (NOAA), Office of Response and Restoration, is responsible for site restoration activities at the St. Paul and St. George Islands, Alaska. Collectively, these islands are part of a five island archipelago known as the Pribilof Islands. Petroleum contamination has 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 environmental regulations and in accordance with the TPA, NOAA has undertaken an array of site characterization and restoration activities on St. Paul and St. George Islands. Additional work must be conducted to satisfy the TPA, including limited site characterization, remediation, confirmation sampling, and site restoration (NOAA 1996).

Under Contract No. 52ABNA500049, Task Order 56ABNA703706, ***NORTECH*** Environmental and Engineering Consultants (***NORTECH***) has prepared this Site Closure Report for the NMFS (National Marine Fisheries Service), formerly the Bureau of Commercial Fisheries Fuel Barges, TPA Site 7, to report on the barge retrieval, debris removal and environmental screening/sampling activities which occurred at the four separate barge locations accomplished during the 2000 fieldwork season.

2.1 Objectives

The overall objective for the St. Paul Debris Removal project undertaken by ***NORTECH*** was to develop a written plan of action, have it approved by NOAA and ADEC, and execute it for each TPA and non-TPA site. At each removal area ***NORTECH*** was to accomplish the acts necessary to gain a no-further-action decision from ADEC, or else gain an understanding of the corrective action efforts that could eventually lead to proper site closure.

2.2 Methodology and Applicable Regulations

In order to meet the project objective, ***NORTECH*** developed a draft Corrective Action Plan and an array of Sampling & Analysis Plans (SAPs) in March 2000 for eleven designated St. Paul debris sites. They were reviewed and approved by NOAA and ADEC, fieldwork was begun in mid-April, and essentially completed in late November 2000. The fieldwork was performed in accordance with the Corrective Action Plan, the site's SAP, and the 1996 Two Party Agreement (TPA) between ADEC and NOAA including the following 1991 versions of ADEC's

regulations and associated guidance documents, as referenced in the TPA, particularly sections 21 to 28, 59, and 103 which call for the application of:

- 18 Alaska Administrative Code (AAC) 70 Water Quality Standards
- 18 AAC 75 Oil and Hazardous Substances Pollution Control
- Underground Storage Tank Procedures Manual, Guidance for Treatment of Petroleum Contaminated Soil and Water and Standard Sampling Procedures

3.0 SITE BACKGROUND

This section provides a brief discussion of the location and history of the Pribilof Islands, weather and environmental conditions on St. Paul Island, a site description, and a statement regarding the fact that we are not aware of any previous investigations at this specific St. Paul debris removal site.

3.1 Island Historical Information

Russia first discovered the Pribilof Islands and their seal rookeries 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. In 1869, the United States made the Pribilof Islands a federal reservation. From 1869 to 1909, the United States contracted fur seal harvesting and pelt processing to private companies. 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 passed, which provided for the transfer of property and management of the islands to Alaskan Native regional and village corporations.

The only major landowners on St. Paul Island are the Tanadgusix Corporation (TDX) and the federal government. The federal government currently retains title to about 1,515 acres on St. Paul Island, which consist of seal rookeries managed by the National Marine Fisheries Service, a U.S. Coast Guard (USCG) LORAN station, two scoria pits, a portion of the current Landfill, and a National Weather Service station. The island's airport, which consists of about 67 acres of land, 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. It is surrounded by the Bering Sea, and is 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 (Figure 1). About 27 centerline miles of road bisect the island north south and east west. The City of St. Paul is located on the southern peninsula of the island; its 1998 population included 761 people (ADL 1999). St. Paul Island has many sand dunes and is vegetated with grasses and small forbes over the majority of its area. The vegetation is broadly classified as moist tundra. Some common plant species present on the island include blue lupine, arctic poppy, beach wild rye, and sea beach sandwort.

St. Paul Island serves as a nesting area for a great number of seabirds and a rookery area for fur seals. Commercial crab harvesting areas are located within 15 miles of the island. Major harvest species are the Tanner crab and Korean Hair crab.

3.2.1 Climate

The climate of the island is classified as subpolar. Maritime weather conditions prevail on the island, with predominantly cloudy, foggy, and windy conditions. Total annual precipitation averages 23.3 inches, with most occurring between the months of April and October. The mean monthly temperature ranges from 22.4°F in winter to 47.8°F in summer, with a mean annual temperature of 34.8°F. Wind speeds range from 12.2 to 20.6 miles per hour, with an average of 17.2 miles per hour (NCDC 1999).

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 eastern portion 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. The lakes with direct estuarine connection to the Bering Sea (for example, the Salt Lagoon) tend to be brackish; the remaining lakes are freshwater. Much of the surface of the island is composed of sandy or scoriaceous material that allows for rapid infiltration of water.

The City of St. Paul obtains its municipal water supply from four wells located about 2.2 miles north-northeast of the city and immediately east of Telegraph Hill (Fredreka I, Fredreka II, south well, and north well). A fifth well serves the USCG station. These wells are reportedly completed within the basalt aquifer. The four municipal wells are connected by pipelines that supply three 200,000 gallon water storage tanks located on a hill above the city.

3.3 Site Descriptions

The NMFS Fuel Barges debris "site", TPA Site 7, involves four separate steel fuel transport barges at four different locations. (Figure 1, Appendix 1: Figures & Geographic Positioning System (GPS) Data) Barges "A", "B", and "C" were each reportedly placed at their final demolition sites when they broke free from a collection of vessels during severe storms from 30 to 34 years ago. The barges have remained stranded where they grounded until the cleanup program during the summer of 2000. Barge "D" is somewhat different in that it was small enough to have been retrieved and lifted ashore after it's grounding, and appeared to have been partially repaired. Due to its earlier ownership by the federal U. S. government, it was included by ADEC and NOAA as part of the broad debris removal and disposal program defined as TPA Site 7.

Barge "A" was located at the northern end of the Salt Lagoon, having been thrown onto shore and almost totally out of the water by storm action in 1967. (Photo 1, Appendix 2: Site Photographs) This shoreline location is approximately 0.3 miles southeast of the Blubber Dump, and 1.3 miles north of the City center.

Barge "B" was buried in the eastern bank of the narrow channel feeding the Salt Lagoon from the St. Paul Harbor and Village Cove. (Photo 11) It is approximately 0.75 miles south of the Blubber Dump, and 0.6 miles north of the City center.

Barge "C" was stranded just offshore of Black Bluffs, and then (reportedly) totally smashed to pieces in a heavy storm and strewn up and down the rocky beach just below Cemetery Hill, north of East Landing, and directly north of the City's sewer outfall. (Photo 21) It is approximately 0.4 miles east of the City center.

Barge "D" was stored on a flat area fully exposed to the weather, just a few hundred yards north of East Landing and approximately 0.4 miles east of the City center. (Photo 31)

3.3.1 Geology and Soil

The four fuel barge sites were all located on wave and storm-lashed shorelines, in sandy or boulder strewn, and tide-affected beach environments. Inland of the sandy beachline and washed sediment channel bank, the areas near Barges "A" and "B" are thickly vegetated with salt-resistant grasses and small forbes typical of the Island. The thickness of the sand and the depth to bedrock are not known. At Barges "C" and "D" the shorelines are

primarily comprised of large boulders, and behind Barge "C" the adjacent near-shore area is a tall, undercut slope composed of scoria, gravel and sands. (Photos 22 and 29)

3.3.2 Surface Water and Groundwater

The nearest surface water bodies to these four distinct cleanup sites were:

Barge "A" is adjacent to the Salt Lagoon, a brackish shallow tidal lake which is fed by a narrow channel leading to the St. Paul Harbor and Village Cove, near the southern end of St. Paul Island. In addition, the Bering Sea is approximately 0.5 miles west of the site. No freshwater bodies are located at or near this debris removal site. The depth to groundwater at the site was observed during the Barge "A" extraction to be at the same level as the water surface of the adjacent Salt Lagoon.

Barge "B", at the southern end of the Salt Lagoon and the northern end of the connecting channel to the harbor, was only partially above normal high tide. It was almost completely inundated each day at high tide, and above the water surface at low tide. No freshwater bodies are located at or near this debris removal site.

Barge "C" was partially pulled from the near-shore waters of the Bering Sea and partially retrieved from where pieces were thrown up on the narrow strip of rocky beach below the steep, sloughing slopes called the Black Bluffs. No freshwater bodies are located at or near this debris removal site, nor near Barge "D" which was also sited about 8' to 10' vertically above, and 150' away from, the rocky, bouldered Bering Sea shoreline just north of East Landing.

3.4 Previous Investigations And Other Activities

A limited drum and debris removal program at and adjacent to Barge "A" was accomplished in October 1999 and reported on by Tetra Tech EM, Inc. in their Technical Memorandum dated December 26, 2000, and entitled Debris Removal, Salt Lagoon Debris Site, St. Paul Island, Alaska. Tetra Tech was responding to the earlier discovery and GPS-location by NOAA in June 1998 of (27) highly corroded steel 55-gallon drums, as well as (20) large steel fishing floats (2' diameter), and several large assemblages of miscellaneous wooden debris cast up on the Salt Lagoon shore. ***NORTECH*** completed the debris removal program begun by Tetra Tech, and reported in detail regarding that cleanup in an April 2001 draft report entitled, Site Closure Report: Salt Lagoon Drum Removal Site.

Tetra Tech also prepared a report for NOAA in November 2000 entitled Closure Confirmation Report, NMFS Fuel Barges, TPA Site 7. This report describes a 1992 preliminary assessment of the four fuel barges by Ecology and Environment, Inc. involving visual inspections of each barge, and then goes on to briefly detail the field screening and inspection activities conducted by Tetra Tech during the 1999 work season. In short, both reports indicated that the barges showed no signs of any remaining petroleum hydrocarbons, and had been in place for decades. Barge "C" was reportedly still largely intact when inspected for the 1992 E&E report, but had been "destroyed by wave action" and strewn about the beach below Black Bluffs by 1999.

NORTECH does not know of any other previous environmental reports involving either Barge "A" or the other barges, "B", "C", and "D".

4.0 FIELDWORK ACTIVITIES

4.1 BARGE "A" FIELDWORK

4.1.1 Barge Demolition and Debris Removal

On April 20, 2000, ***NORTECH*** inspected site conditions at several of the barge locations, and prepared to do the winter work necessary to extract Barge "A" and "C" without causing any long-term damage to the vegetated access path(s). (Photo 1, Appendix 2: Site Photographs) Then on April 21st ***NORTECH*** GPSed the Barge "A" location, and on April 22nd mobilized several BSE workmen and suitable heavy equipment to the northern shoreline of the Salt Lagoon to begin the winter-season barge/debris removal. A key aspect of the winter-shielded

access plan was the decision to use a deeply snow-covered swale to approach the barge across the still-frozen, grassy terrain. (Photo 2)

The work crew quickly confirmed with an LEL/O2 meter that the various sections of Barge "A" did not have explosive levels of hydrocarbon gases, and proceeded to use both a cutting torch and hand-held Whacker "chop saw" to cut the barge into three excavator lift-able sections. (Photo 3) BSE's Hitachi 150 excavator (with "thumb" bucket) removed the remnants of Barge "A" from its grounded site, as well as an array of associated/ nearby driftwood and flotsam debris scattered along the shore, including (2) 55-gallon rusted steel drums and various large steel floats (Photos 3 to 6, and Appendix 3: Daily Reports).

During the Barge "A" debris operation, a limited quantity of suspected-contaminated soil was found inside the "lower" (southern) portion of the barge, and most of these soils were shoveled into containment drums for transport to the remediation site at the Blubber Dump petroleum contaminated soils (PCS) stockpile. (Photo 5) Soil samples from within the barge were collected on April 27th and April 29th, including soil samples SPN 20427-003-S, SPN 20427-004-S (dup), and SPN 20429-008-S. The analytical results for these samples are presented below in Tables 1 and 2. Sufficient contamination was confirmed to cause ***NORTECH*** to transport all of the stained or suspect soils collected at Barge "A" to lined storage and eventual thermal remediation at the Blubber Dump PCS stockpile. Some of the soil was removed from the last barge section after it was transported to the NOAA Staging Area, within the NMFS Compound; the soil was shoveled into drums, sampled, and disposed at the PCS stockpile.

After Barge "A" was cut up and wholly removed, several additional front-end loader bucket-loads of miscellaneous driftwood and large wooden debris, plywood, steel fishing floats, and general rubbish was also removed from the beachline of the Salt Lagoon on April 24, 2000. (For details, see ***NORTECH*** 's Site Closure Report: Salt Lagoon Drum Removal Site)

Careful examination of the terrain and vegetation at and near Barge "A" did not uncover any soil staining during the barge removal efforts at this site, and there was no other evidence leading us to believe that the soils at the site had been contaminated with petroleum hydrocarbons or other contaminants. The Barge "A" debris removal program was completed and crew efforts shifted to other sites, on April 25, 2000. (Photos 8 and 10)

4.1.2 Soil and Groundwater Sampling

The sandy soils lying directly beneath the former Barge "A" footprint were field-screened with a PhotoVac MicroTip HL-2000 Photo-Ionization Detector (PID) with a 10.6 EV lamp calibrated to 101-ppm isobutylene, and sampled on April 27, 2000. (Photo 9) The field screening failed to identify any soils with any significant volatile constituents, the highest PID reading observed was 2.8 units, and the soil sample results are detailed below in Tables 1 and 2. The soil "clearance" sample collected from under the Barge, SPN 20427-005-S, was found to be free of any indication that petroleum hydrocarbon contamination had leaked from the Barge into the adjacent or underlying soils. (Photo 7) Chromium exceeded the ADEC's Method 2 (Table B1) soil cleanup standard of 26 mg/kg in all three samples collected from within and under Barge A. Similarly, arsenic values exceeding the ADEC's Method 2 soil cleanup standard of 2 mg/kg were detected in two of the three samples collected. Elevated concentrations of these metals are relatively common for samples of St. Paul's scoria and sandy soils. These contaminated soils, a quantity of less than 2 cubic yards (CY), from within the lower end of the barge, were deposited at the PCS stockpile for remediation.

No groundwater sampling was performed at this site, since the only groundwater exposed by the barge removal work being performed was clearly water percolating from the adjacent Salt Lagoon through the sandy shore materials. (Photo 10) This exposed water, essentially at the same water surface level as the Salt Lagoon, is not suspected to have been contaminated given the analytical results reported below and lack of any visible sheen.

None of the barge removal, fieldscreening, or soil sampling efforts, either PID screening or laboratory analytical work, yielded data which caused ***NORTECH*** to believe that the soils or groundwater at the Salt Lagoon and Barge "A" debris site was contaminated at levels above the allowable ADEC soil cleanup standards.

Table 1: Soil Samples taken from within Barge “A”

Analyses	**ADEC Regulatory Cleanup Level (18 AAC 75.341)**	**Soil from south end of Barge “A”**		**Soil from south end of Barge “A”**	
		SPN20427-003-S	**PQL (mg/Kg)**	**SPN20427-004-S (dup)**	**PQL (mg/Kg)**
PID	NA	49.6	NA	49.6	NA
GRO (mg/Kg)	500	1.35 U	1.35	1.31 U	1.31
DRO (mg/Kg)	1,000	461	17.2	301	15.8
RRO (mg/Kg)	2,000	36	28.3	26.1 U	26.1
BTEX (mg/Kg)					
Benzene	0.02	0.00676 U	0.00676	0.00655 U	0.0066
Toluene	5.4	0.0270 U	0.0270	0.0262 U	0.0262
Ethylbenzene	5.5	0.0270 U	0.0270	0.0262 U	0.0262
Xylenes	78	0.0540 U	0.0540	0.0524 U	0.0524
VOCs (mg/Kg)					
-All Analytes-	Varies	~PQL**	Varies	~PQL**	Varies
PAHs (mg/Kg)					
Benzo(a)Anthracene	6	5.55	3.7	3.3 U	3.3
Benzo[b]floranthene	20	4.81	3.7	3.3 U	3.3
Chrysene	620	15.1	3.7	5.73	3.3
Pyrene	1,500	29.0	3.7	14.0	3.3
Phenanthrene	No SCL	80.4	3.7	34.4	3.3
All Other Analytes	Varies	~PQL**	Varies	~PQL**	Varies
Metals: (mg/Kg)					
Arsenic	2	**34.2**	2.62	**2.29**	0.231
Barium	1,100	26.6	0.556	25.4	0.647
Cadmium	5	0.0971	0.0262	0.0486	0.0231
Chromium	26	**124**	10.5	**82.0**	9.25
Lead	1,000	354	26.2	86.0	9.25
Selenium	3.5	0.262 U	0.262	0.231 U	0.231
Silver	21	0.0525 U	0.0525	0.0463 U	0.0463
Mercury	1.4	0.420	0.0287	0.0256 U	0.0256

Note:
U Indicates the analyte was not detected above the practical quantitation limit cited.
NA Indicates the parameter is not applicable.
No SCL No Allowable Site Cleanup Level has been set by ADEC at this time.
~PQL** There were no significant variations from PQL; see Appendix 4 for copies of samples' full analytical results.
Bolded numbers indicate the contaminant concentration is above the established regulatory cleanup limit.

ADEC’s Regulatory limits were taken from Tables A1 & B1, Under 40-inches Category, “Migration to Groundwater Pathway” in ADEC’s regulations, 18 AAC 75, dated October 1999.

Table 2: Soils from under, or within, Barge "A"

Analyses	**ADEC Regulatory Cleanup Level (18 AAC 75.341)**	***Clearance sample*, taken from under Barge "A"**		**Drummed soil, taken from inside Barge "A"**	
		SNP20427-005-S	**PQL (mg/Kg)**	**SNP20429-008-S**	**PQL (mg/Kg)**
PID	NA	2.8	NA	853	NA
GRO (mg/Kg)	500	1.10 U	1.10	1.44 U	1.44
DRO (mg/Kg)	1,000	13.0 U	13.0	**9,700**	404
RRO (mg/Kg)	2,000	21.4 U	21.4	667 U	667
BTEX (mg/Kg)					
Benzene	0.02	0.0050 U	0.0050	0.00718 U	0.00718
Toluene	5.4	0.0020 U	0.0020	0.0287 U	0.0287
Ethylbenzene	5.5	0.0020 U	0.0020	0.0287 U	0.0287
Xylenes	78	0.0040 U	0.0040	0.0574 U	0.0574
VOCs (mg/Kg)					
trichlorobenzenes	2	0.0114 U	0.0114	0.01598	0.015
trimethylbenzenes	No SCL	0.0114 U	0.0114	0.04084	0.015
-All Other Analytes-	Varies	~PQL**	Varies	~PQL**	Varies
PAHs (mg/Kg)					
Chrysene	4.3	3.2 U	3.2	**65.1**	39
Fluorene	270	3.2 U	3.2	**3890**	390
Napthalene	43	3.2 U	3.2	**2050**	390
Phenanthrene	No SCL	3.2 U	3.2	9070	390
All Other Analytes	Varies	~PQL**	Varies	~PQL**	Varies
Metals: (mg/Kg)					
Arsenic	2	1.61	0.288	**42.7**	4.68
Barium	1,100	31.2	0.653	5.70	0.642
Cadmium	5	0.288 U	0.288	0.0481	0.0243
Chromium	26	**63.5**	23.0	**112**	9.72
Lead	1,000	0.288 U	0.288	27.0	2.43
Selenium	3.5	14.4 U	14.4	0.243 U	0.243
Silver	21	0.0575 U	0.0575	0.0486 U	0.0486
Mercury	1.4	0.0251 U	0.0251	0.0301 U	0.0301

Note:
U Indicates the analyte was not detected above the practical quantitation limit cited.
NA Indicates the parameter is not applicable.
No SCL No Allowable Site Cleanup Level has been set by ADEC at this time.
~PQL** There were no significant variations from PQL; see Appendix 4 for copies of samples' full analytical results.
Bolded numbers indicate the contaminant concentration is above the established regulatory cleanup limit.

4.2 BA41RGE "B" FIELDWORK

4.2.1 Barge Demolition and Debris Removal

On April 21, 2000, ***NORTECH*** inspected site conditions at the Barge "B" location, and over the next few weeks identified the planning, technical and environmental permitting work necessary to successfully extract Barge "B" from the Salt Lagoon channel without causing any sedimentation or damage to the marine environment. (Photo 11) A detailed plan was prepared, submitted and finally approved by the U. S. Army Corps of Engineers in early July 2000. Then on July 13, 2000, ***NORTECH*** mobilized several BSE workmen, silt fencing material, and some sand-slurry pumping equipment to the channel sediment shoreline of the Salt Lagoon to begin the U.S. Army Corps of Engineers-authorized barge/debris removal program (see Barge "B" Removal/Salvage Plan, and associated Corps of Engineers approval paperwork at Appendix 6).

A key aspect of the approved barge extraction plan was the segregation of the barge-load of sand from the tidally-affected waters of the Salt Lagoon channel. Per the removal plan, ***NORTECH*** started the barge work by first installing the vertical "curtain" of geo-fabric which would pass water, but not silt or sand, if any sands from the Barge cleanup fell into the waters beside the barge during pumping or barge extraction activities. (Photo 12)

Once the silt fence was in place, BSE workmen began cutting access panels into the barge's top surface and pumped approximately 45 CY of sand (as a sand slurry) from the barge with a small gas-powered diaphragm pump, located on the barge deck. (Photos 13 and 15) The sand slurry was pumped overland approximately 450 feet to a lined containment "pool" atop the firm scoria soils of the Crab Pots Storage yard, also known as the Diesel Seep Site, TPA-13. (Photo 14 and Figure 4, Appendix 1: Figures & GPS Data) The water entrained with the sand passed through the geo-fabric containment pond, or else poured over the weir-like low point built into the pond at the north end, farthest from where the hose was delivering the sand slurry. The sands settled out at the more southern portion of the containment pond. Samples were taken to confirm the non-contaminated status of the sand removed from the Barge "B" carcass. (Photo 16)

After a week of pumping sand, the barge was finally emptied and the BSE crew and excavator walked along the tidal flats to the barge each day during July 20, 21 and 22, 2000 in order to extract it from its long-buried location. (Photos 17, 18 & 19) The excavator and a pair of front-end loaders were used to lift and pull the barge from the sand and haul it to the staged debris pile at the NMFS Compound. Extraction was primarily done during low tide, to minimize the possibility of discharging sands or sediments into the waters of the channel to the Salt Lagoon.

A photographic view of the former location of the Barge "B" was taken a month later on August 21, to indicate the minimal disturbance caused by the removal of the barge from the channel to the Salt Lagoon. (Photo 20)

4.2.2 Soil and Groundwater Sampling

No groundwater occurs in this intertidal environment, hence no ground water sampling was deemed to be required. No sheens were observed on the waters adjacent to Barge "B".

On April 27, 2000, a PhotoVac MicroTip HL-2000 Photo-Ionization Detector (PID) with a 10.6 EV lamp calibrated to 101-ppm isobutylene, was used to examine the channel sands which had washed into Barge "B". A PID reading of 33 was observed, from a "worst-case" soil sample collected from near the bottom of a section of the southern, lowest end of the barge, and that soil was analyzed for the potential presence of hydrocarbon residues. (Table 3) The results derived were relatively nominal and below regulatory cleanup standards, and the sand pumping/transport plans made for the disposal of the sands/sediments collected in the barge were to use it as granular landfill cover materials.

During the sand slurry pumping process another sample was taken, SPN 20719-001-S, to evaluate and confirm the suspected "clean" condition of the Barge "B" sediments, and then another sample was collected from the Barge "B" sediments once these materials had been taken to the St. Paul Landfill. (Sample "SNP Landfill) Both of these samples were found to be satisfactorily within the allowable soil cleanup standards established by ADEC. After the barge had been emptied of sediments and removed from the site, a soil sample labeled as SNP 2087-001-S was collected from under the footprint of the barge, on August 7, 2000. Again this sample was determined to meet all of the ADEC's soil cleanup standards.

The final soil clearance sample, SNP 2087-002-S, also collected on August 7, was drawn from below the footprint of the lined containment pond, at the northeastern portion of the Crab Pots Storage area. This sample had a low PID value (1.9) and did not evidence any significant hydrocarbon contamination, but did display an unusual array of results within the PAH analyses. (Table 3) Ten PAH compounds were detected within the surface soil sample collected from beneath the containment pond at levels above the applicable sample PQLs, and five of these compounds were shown to be present at levels exceeding the applicable ADEC soil cleanup levels. These contaminants appear to have nothing to do with the temporary presence of Barge "B"'s pond-contained sediments and slurry water, since none of the Barge "B" samples showed the presence of any of these compounds, but they are of environmental concern. Columbia Environmental Sciences, Inc. has identified some contaminants within soils collected and analyzed from elsewhere within the Crab Pots area, so ***NORTECH*** will leave the evaluation of Crab Pots area soils to a separate report and sampling scheme.

None of the barge removal, fieldscreening, or soils analytical work yielded data which caused ***NORTECH*** to believe that the soils or groundwater at the Barge "B" debris removal site was contaminated at levels above the allowable ADEC soil cleanup standards. It appears likely that the Crab Pots Storage area has been contaminated in some manner with some PAH compounds (per Sample SNP 2087-002-S), but the origin and extent of such contamination is unknown, and given the precautions taken to prevent contamination of surface soils, it is probably not associated with the temporary installation of the sediment containment pond on a small portion of the Crab Pots Storage area.

Table 3: Soil Samples for Barge "B" Removal and Clearance

		Soil from within Barge "B", used to plan extraction		Soil from within Barge "B", taken to Landfill disposal		Soil from within Barge "B", taken to Landfill disposal		Soil from beneath Barge "B" footprint = "clearance"		Soil collected from under "containment" pond	
Analyses	**ADEC Regulatory Cleanup Level (18 AAC 75.341)**	**SPN20427-006-S**	**PQL (mg/Kg)**	**SPN20719-001-S**	**PQL (mg/Kg)**	**SNP Landfill**	**PQL (mg/Kg)**	**SNP2087-001-S**	**PQL (mg/Kg)**	**SNP2087-002-S**	**PQL (mg/Kg)**
PID	NA	33	NA	not done	NA	6.7	NA	1.7	NA	1.9	NA
Hanby	NA	not done	NA	not done	NA	50	NA	not done	NA	not done	NA
GRO (mg/Kg)	500	1.40 U	1.40	2.25 U	2.25	2.25 U	2.25	3.04 U	3.04	3.61 U	3.61
DRO (mg/Kg)	1,000	14.5 U	14.5	17.4 U	17.4	17.4 U	17.4	21.3	12.3	11.4	10.3
RRO (mg/Kg)	2,000	24.0 U	24.0	28.7 U	28.7	28.7 U	28.7	116	20..2	22.0	17.0
PAHs (mg/Kg)											
Benzo(a)anthracene	6	<PQL	-	<PQL	-	<PQL	-	<PQL	-	**64**	9.2
Benzo[a]pyrene	3	<PQL	-	<PQL	-	<PQL	-	<PQL	-	**76**	9.2
Benzo[b]fluoranthene	20	<PQL	-	<PQL	-	<PQL	-	<PQL	-	**27**	9.2
Benxo[g,h,I]perylene	No SCL	<PQL	-	<PQL	-	<PQL	-	<PQL	-	130	9.2
Benzo[k]fluoranthene	200	<PQL	-	<PQL	-	<PQL	-	<PQL	-	30	9.2
Chrysene	620	<PQL	-	<PQL	-	<PQL	-	<PQL	-	120	9.2
Dibenzo[a,h]anthracene	6	<PQL	-	<PQL	-	<PQL	-	<PQL	-	**24**	9.2
Fluoranthene	2,100	<PQL	-	<PQL	-	<PQL	-	<PQL	-	160	9.2
Ideno[1,2,3-c,d]pyrene	54	<PQL	-	<PQL	-	<PQL	-	<PQL	-	**56**	9.2
Phenanthrene	No SCL	<PQL	-	<PQL	-	<PQL	-	<PQL	-	180	9.2
-All Other Analytes-	Varies	~PQL**	NA	~PQL**	NA	~PQL**	Varies	~PQL**	Varies	~PQL**	Varies
BTEX (mg/Kg)											
-All Analytes-	Varies	~PQL**	Varies	~PQL**	Varies	NA	NA	~PQL**	Varies		
Metals: (mg/Kg)											
Arsenic	2	1.52	0.256	NA	NA	NA	NA	NA	NA	NA	NA
Barium	1,100	58.9	0.670	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	5	0.256 U	0.256	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	26	**43.5**	25.6	NA	NA	NA	NA	NA	NA	NA	NA
Lead	1,000	25.6 U	25.6	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	3.5	5.11 U	5.11	NA	NA	NA	NA	NA	NA	NA	NA
Silver	21	0.0511 U	0.0511	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	1.4	0.0286 U	0.0286	NA	NA	NA	NA	NA	NA	NA	NA

Note:
U Indicates the analyte was not detected above the practical quantitation limit cited.
NA Indicates the parameter is not applicable.
No SCL No Allowable Site Cleanup Level has been set by ADEC at this time.
~PQL** There were no significant variations from PQL; see Appendix 4 for copies of samples' full analytical results.
Bolded numbers indicate the contaminant concentration is above the established regulatory cleanup limit.

ADEC's Regulatory limits were taken from Tables A1 & B1, Under 40-inches Category, "Migration to Groundwater Pathway" in ADEC's regulataions, 18 AAC 75, dated October 1999.

4.3 BARGE "C" FIELDWORK

4.3.1 Barge Demolition and Debris Removal

On several occasions, beginning on April 25, 2000, ***NORTECH*** mobilized BSE workmen and suitable heavy equipment to the shoreline below Black Bluffs to remove the remnants of a wrecked fuel barge known by NOAA and ADEC as Barge "C" (Photos 21 and 22). Pieces of Barge "C" were scattered over more than 2,000 feet of shoreline and were heavily weathered. The exact positions of the larger sections of Barge "C" were GPSed and are shown on Figure 4, Appendix 1: Figures & GPS Data. The Hitachi excavator was used to pick the more massive pieces and a loader transported both this large debris as well as the hand-retrieved metallic debris to a flatbed truck and end-dump truck (Photos 23, 25, and 26). The debris was hauled from the site overland to the solid waste/debris staging area at the NMFS Compound, Tract 50. The initial Barge "C" metallic debris removal program was completed by the BSE work crew on April 27th.

NORTECH personnel returned to the northern-most reaches of the Black Bluff beach area on April 30, 2000 in order to remove some additional metallic debris by hand from the basaltic boulders that made the area practically inaccessible to heavy equipment. In this instance, the debris was hauled from the area with four-wheelers and deposited in the solid waste/debris staging area. (Daily Reports)

The larger, more obvious, or most readily accessible pieces of the barge were removed during the April cleanup session. As shoreline snow melted and storm activity moved around some of the large beach rocks, more pieces of metallic debris became apparent, especially during low tides. ***NORTECH*** remobilized BSE workmen and equipment to the Black Bluffs area during low tide (10:36 AM) on June 12, 2000 and removed an additional dump-truck load of metallic debris (Photos 27 and 28) for deposit at the NMFS Compound solid waste/debris staging area.

NORTECH and BSE workmen and equipment again returned to Black Bluffs on September 13, 2000 for a final debris removal effort during a low tide event. Offshore debris was discovered by wading and probing for metals with a 4' wrecking bar. The Hitachi excavator removed boulders or waded into shallow water to access the pieces discovered. The far eastern reaches of the Black Bluffs beach were inaccessible by equipment, so the hand collected debris depicted on Figure 4 was bagged in a supersack and hoisted up the steep slope with a rope attached to a loader (Photo 29).

Following the September removal session, a thorough search of the entire Black Bluff's beach area was accomplished both from "on-the ground" inspection, from the top of Black Bluff (Photo 30), and by wading as far as possible into the rocky subtidal areas. This inspection effort failed to locate any additional residues of the wreck of Barge "C". It is possible that remnants of Barge "C" remain offshore in water too deep for our inspection or access. Storm activity could deposit these residues on the beach below Black Bluffs sometime in the future.

Cleanup and debris removal workers were constantly on the alert for falling rock from the poorly consolidated scoria slopes of Black Bluffs. The slippery nature of algae covered rocks presented hazards unique to the St. Paul Island debris removal program. Specialized maintenance was required on all equipment following each removal session at Black Bluffs.

4.3.2 Soil and Groundwater Sampling

No groundwater occurs in this intertidal environment; hence no ground water sampling was contemplated or deemed required.

One of the largest of the Barge "C" sections was partially filled with beach sand, which was considered as potentially suspect since the carcass of the barge could have had fuel in it when it was finally ripped apart by wave action between 1992 and 1999. On April 25, 2000, a PhotoVac MicroTip HL-2000 Photo-Ionization Detector (PID) with a 10.6 EV lamp calibrated to 101-ppm isobutylene was used to examine both the sands deep within the Barge "C" section, and the nearby beach sands for hydrocarbon residues (Photo 24). Excavations in the beach sand below Black Bluffs indicated no subsurface layers of suspect petroleum hydrocarbons, though there were clearly background levels of volatile compounds present in the beach sands. Readings of 3 to 25 were observed in the beach sands at significant distances from the barge section. Given the nearby (200 feet away) sewage system outfall from the seafood processing facility, it was apparent that the area did have some biogenically-based volatiles present. Since the PID results were uniform and comparable at both locations, within the barge section and up and down the beach, no soil samples were collected or analyzed.

No staining or any oil sheen was observed during any tidal cycle or on the near shore waters. Hence, no soil sampling was deemed necessary at this site.

4.4 BARGE "D" FIELDWORK

4.4.1 Barge Demolition and Debris Removal

On April 28, 2000, ***NORTECH*** mobilized several BSE workmen and suitable heavy equipment to the East Landing where a fuel barge known as Barge "D" had lain for a number of years (Photo 31 and Figure 4). A 6" hole in the hull was used to access the interior with a Gastech Environmental Monitor to determine the lower explosive limit (LEL) and to confirm the presence or absence of explosive gases prior to beginning demolition or disposal work. The barge was loaded onto a flat bed truck (Photos 33 and 34) and transported intact to the staging area where it was sawn into three pieces with a metal cutting "chop saw" (Photo 32).

The Barge "D" pieces were deposited in the large pile of metallic debris in the solid waste/debris staging area at the NMFS Compound, Tract 50, preparatory to eventual transport off-island for recycling.

4.4.2 Soil and Groundwater Sampling

No groundwater sampling was performed at this site, since no groundwater in this near shore environment was exposed by the barge removal work performed. No evidence of any spills, leaks or stained soils was evident in the vicinity of the barge, and soils contamination was not suspected as the barge had been moved empty to this location for storage. No PID screening was performed on soils surrounding or under the barge, nor were any soil samples taken.

5.0 BARGE AND MISCELLANEOUS DEBRIS DISPOSAL & RECYCLING

The steel barge sections and debris removed from the four barge sites, the TPA 7 "site", were all temporarily placed (staged) at the NMFS Staff compound, as part of a large pile of metal debris at the NMFS Compound, Tract 50. This metal debris was later reloaded and hauled in mid-September 2000 to a large walled barge at the St. Paul dock, which sailed to Seattle and was unloaded at the Seattle Iron & Metals yard on the Duwamish River at the end of September 2000. The miscellaneous steel, copper, and aluminum items were unloaded, processed and recycled by the salvage yard. A receipt from the salvage yard provides documentation of off-island salvage disposal. This receipt has been attached at the end of Appendix 3.

The miscellaneous wood and burnable trash removed from the Barge "A" site was all disposed of on-island. The wood items were temporarily stored at the NMFS Compound, and then transported and burned at the Landfill, as part of a series of large wooden debris burns coordinated with the City of St. Paul.

6.0 ANALYSIS

NORTECH has completed the removal of all visible solid wastes in the vicinity of the wrecked Barges "A", "B", "C", and "D". A wide array of metallic debris was cleared from the Barge "C" area, and each of the Barges "A", "B", and "D" were cut up and extracted without releasing sediments into the adjacent waters. All of the metal wastes were later transported off-island and recycled for their steel content.

PID field-screening of the suspect soils beneath (and in two instances also from within) the former barge "foot-prints" for Barges "A", "B", and "C" suggested that none of the potentially contaminated soils left in place, and unexcavated, at these sites had the likelihood of being contaminated with petroleum hydrocarbons. Clearance soil samples of the soils under or within Barge "A" and Barge "B" were collected and analyzed, proving that no petroleum contamination remained. Only a limited quantity (< 2 CY) of suspect soils were drummed up and removed from within Barge "A", and these soils were transported for eventual remediation by the Blubber Dump soils treatment system. No analytical soil sampling was found to be necessary or performed at either Barge "C" or Barge "D".

The cleanup objectives outlined in the Corrective Action Plan for the Pribilof Islands Site Restoration Project and in Section 2.1 above were met. Care was taken to avoid spills from the barge sections, occasional drums and miscellaneous extracted debris, and no other evidence was discovered indicating the presence or a suspicion of contaminated soils at these barge sites.

It may be considered to be of minor concern that the chromium and arsenic concentrations determined to be present in the soils beneath the Barge "A" and Barge "B" footprints are greater than the ADEC's published soil cleanup levels, but consistency of these values as well as others collected during 2000 on St. Paul Island make it apparent that these values appear to be within the range of "background" As and Cd levels for St. Paul's volcanic scoria and sandy soils.

7.0 CONCLUSIONS AND RECOMMENDATIONS

NORTECH Environmental and Engineering Consultants and Bering Sea Eccotech mobilized personnel and equipment to the four NOAA Fuel Barge sites at St. Paul Island, Alaska, and administered a program of metal barge and debris removal beginning on April 22, 2000. These long-wrecked Bureau of Commercial Fisheries fuel barges and some miscellaneous nearby wooden/plastic/metal debris were removed from the four sites and hauled away for disposal and recycling off-island. A small quantity (<2 CY overall) of suspected-contaminated soils from limited soil removal programs from within Barge "A" were transported and deposited at the Blubber Dump PCS stockpile for thermal remediation. Based on a review and analysis of available project photographs, Daily Reports, personnel memories and documented field observations, ***NORTECH*** has arrived at the following environmental conclusions:

- The soils at each of these fuel barge and debris removal sites are unlikely to be contaminated by petroleum hydrocarbons at a level greater than the applicable ADEC soil cleanup standards.
- Groundwater contamination is considered unlikely at these debris removal sites, given the lack of any evidence of the presence any significant spills, leaks, or other petroleum hydrocarbon releases at the sites.

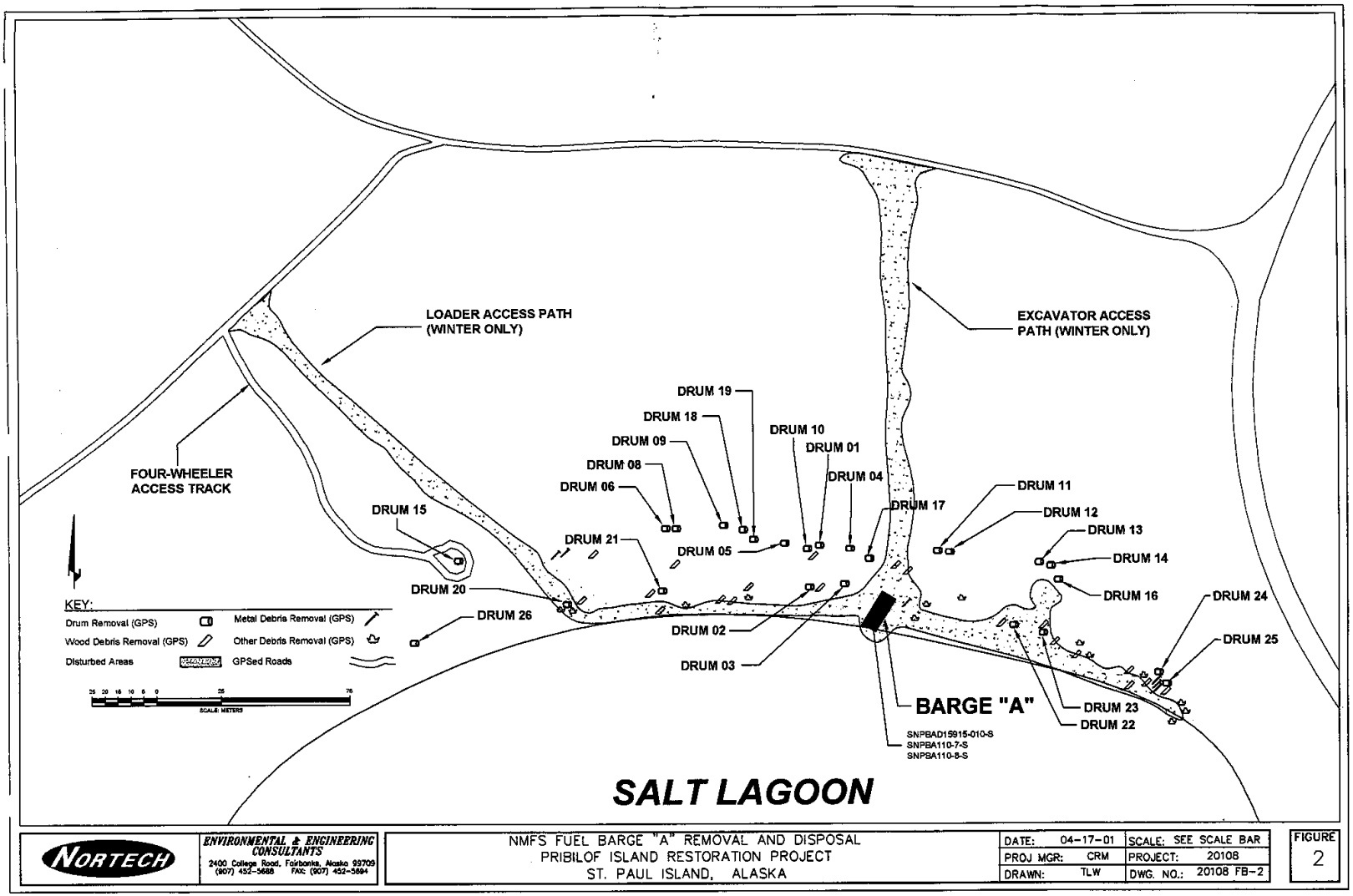
Based on these conclusions, ***NORTECH*** recommends the following:

- No-Further-Action for any of these TPA 7 barge and debris removal sites.

APPENDIX 1

Figures & GPS Information

NORTECH
ENVIRONMENTAL & ENGINEERING CONSULTANTS
2400 College Road, Fairbanks, Alaska 99709
(907) 452-5688 FAX: (907) 452-5694
NMFS FUEL BARGES "A", "B", "C", "D" REMOVAL & DISPOSAL
PRIBILOF ISLAND RESTORATION PROJECT
ST. PAUL ISLAND, ALASKA
DATE: 4-17-01
PROJ MGR: CRM
DRAWN: TLW
SCALE: SEE SCALE BAR
PROJECT: 20108
DWG. NO.: 20108 FB-1
FIGURE 1
ST. PAUL ISLAND
Bering Sea
"A"
"B"
"C"
"D"
Village of St. Paul
NMFS Fuel Barges
KEY:
GPSed Roads
Non-GPSed Roads
SCALE: METERS X 100
30 20 10 0 25 50



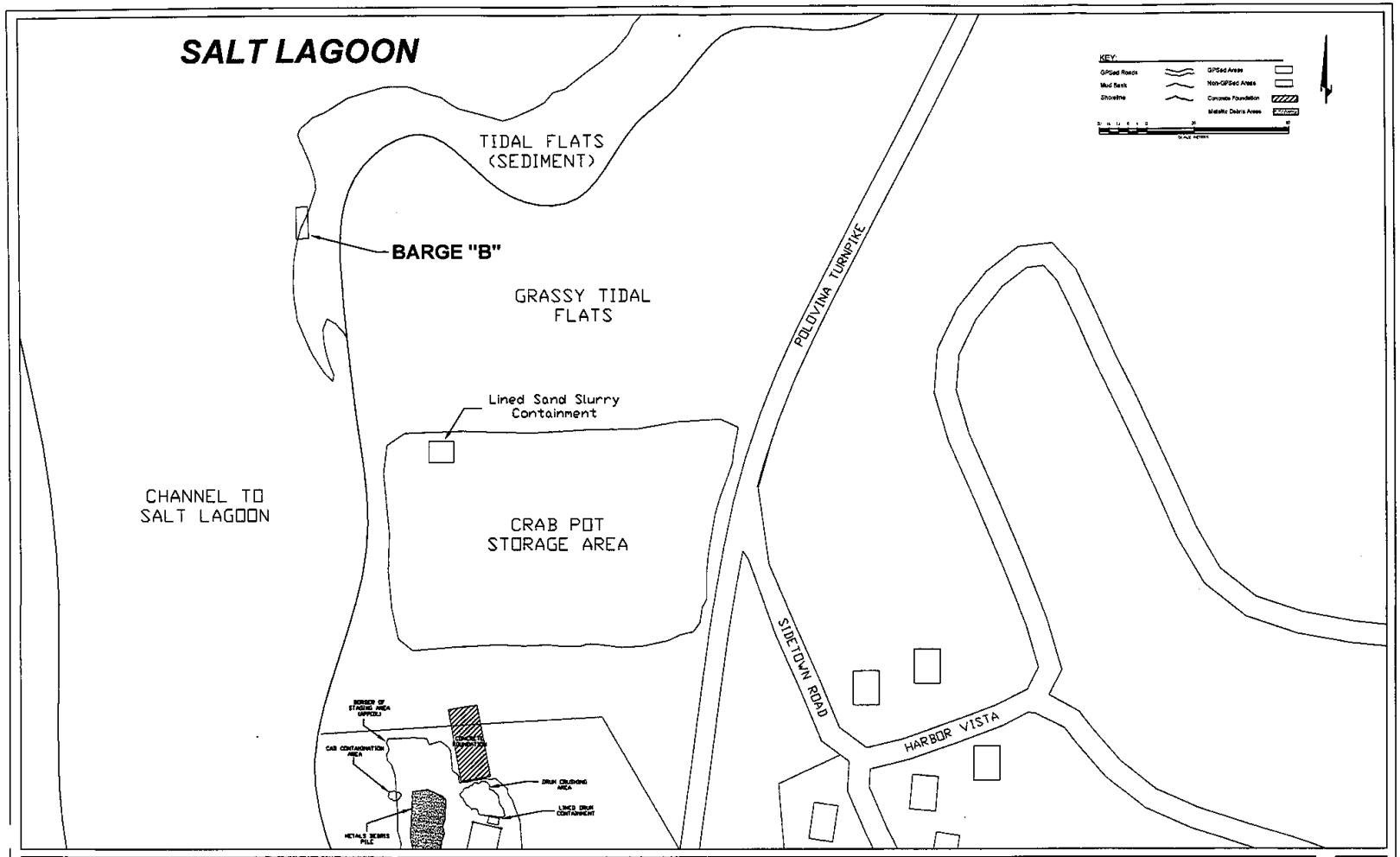
NORTECH

ENVIRONMENTAL & ENGINEERING CONSULTANTS
2400 College Road, Fairbanks, Alaska 99709
(907) 452-5688 FAX: (907) 452-5694

NMFS FUEL BARGE "A" REMOVAL AND DISPOSAL
PRIBILOF ISLAND RESTORATION PROJECT
ST. PAUL ISLAND, ALASKA

DATE:	04-17-01	SCALE:	SEE SCALE BAR
PROJ MGR:	CRM	PROJECT:	20108
DRAWN:	TLW	DWG. NO.:	20108 FB-2

FIGURE 2



NORTECH	ENVIRONMENTAL & ENGINEERING CONSULTANTS 2400 College Road, Fairbanks, Alaska 99709 (907) 452-5688 FAX: (907) 452-5694	NMFS FUEL BARGE "B" REMOVAL AND DISPOSAL PRIBILOF ISLAND RESTORATION PROJECT ST. PAUL ISLAND, ALASKA	DATE: 04-17-01 PROJ MGR: CRM DRAWN: TLW	SCALE: SEE SCALE BAR PROJECT: 20108 DWG. NO.: 20108 FB-3	FIGURE 3

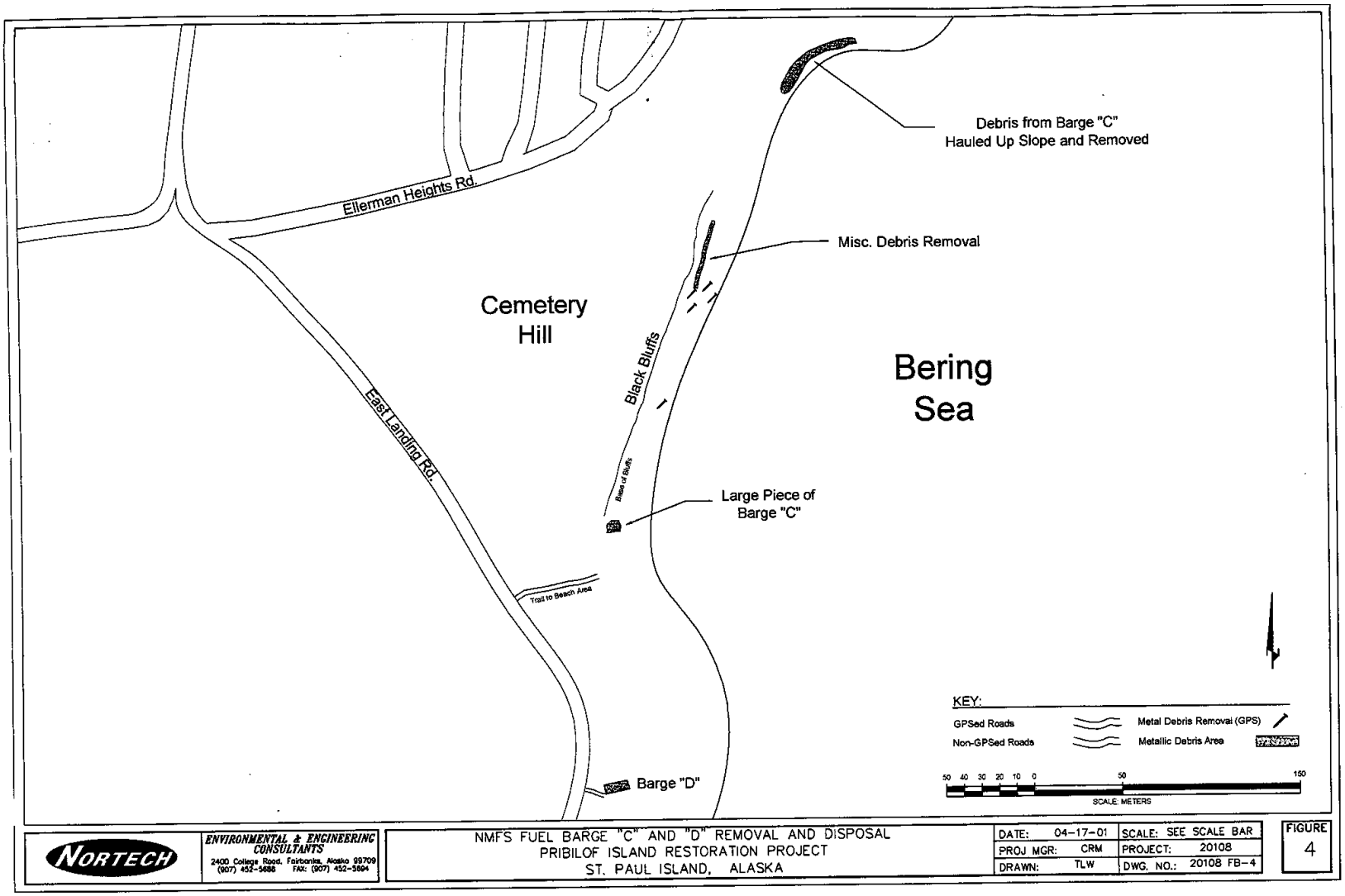

Ellerman Heights Rd.
Cemetery Hill
East Landing Rd.
Black Bluffs
Base of Bluffs
Trail to Beach Area
Debris from Barge "C" Hauled Up Slope and Removed
Misc. Debris Removal
Large Piece of Barge "C"
Barge "D"
Bering Sea
KEY:
GPSed Roads
Non-GPSed Roads
Metal Debris Removal (GPS)
Metallic Debris Area
50 40 30 20 10 0 50 150
SCALE: METERS
NORTECH
ENVIRONMENTAL & ENGINEERING CONSULTANTS
2400 College Road, Fairbanks, Alaska 99709
(907) 452-5688 FAX: (907) 452-5694
NMFS FUEL BARGE "C" AND "D" REMOVAL AND DISPOSAL
PRIBILOF ISLAND RESTORATION PROJECT
ST. PAUL ISLAND, ALASKA
DATE: 04-17-01
PROJ MGR: CRM
DRAWN: TLW
SCALE: SEE SCALE BAR
PROJECT: 20108
DWG. NO.: 20108 FB-4
FIGURE 4

Photo 1: A07505D0.jpg Barge "A": View of long-stranded barge from out on ice covering the Salt Lagoon, as site was inspected and overland access with least impacts evaluated. (April 21, 2000)

Photo 2: A07544D0.jpg Barge "A": Work on Barge A begins, ***NORTECH*** GPSed the exact path of excavator access, and crew began cutting up barge into pieces to be pulled out. (April 23, 2000)

Photo 3: A07554D0.jpg Barge "A": Hitachi 150 excavator picking up ¼ section of cut-up Barge A to carry it out to road and then transport it by truck or front-end loader to NMFS staging area.

Photo 4: A7571D0.jpg Barge "A": Front-end loader removing last pieces of the barge, in addition to some drummed soils, miscellaneous debris and driftwood from shore of Salt Lagoon. (4/24/00)

Photo 5: A07579D0.jpg Barge "A": BSE crew drumming up small quantity of stained soils from directly below barge, and removal of last section of barge by front-end loader.

Photo 6: A07585D0.jpg Barge "A": Loader delivering last section of Barge "A" to flatbed to be hauled to NMFS staging area and later barge transport to Seattle for recycling. (4/24/00)

Photo 7: A07604D0.jpg Barge "A": View of site where barge has been removed, impacted dirt picked up, and miscellaneous additional debris retrieved. Access track is melting, but snow cushioned traffic nicely.

Photo 8: A07602D0.jpg Barge "A": Project "wrapup view", looking southward from road toward Barge "A" 's removal site and the path consistently taken by tracked excavator. (4/25/00)

Photo 9: A07609D0.jpg Barge "A": Mike Cheek, ***NORTECH***, collecting clearance samples of soil from under south end of barge, SPN20427-003-S and –004-S (dup) and -005-S. (4/27/00)

Photo 10: A07503G0.jpg Barge "A": Former location of Barge "A", photo indicating minimal damage caused by winter access across grassy slopes, and removal of all sizeable debris from this site. (7/31/00)

Photo 11: A07510D0.jpg Barge "B": View of fuel barge grounded in the midst of Salt Lagoon channel, photo taken looking southward toward "old" St. Paul. (4/21/00)

Photo 12: A07514G0.jpg Barge "B": ***NORTECH*** and BSE workers installing silt fence as staked vertical "curtain" around barge to minimize chance of streambed siltation during sand removal activities. (7/14/00)

Photo 13: A07570G0.jpg Barge "B": Pumping sand as slurry, using diaphram pump, from barge to containment basin on shore. (7/17/00)

Photo 14: A07572G0.jpg Barge "B": Sand slurry from Barge "B" spewing from hose into filter fabric-lined containment basin. Total quantity moved was approximately 40 CY in 8 days' work. (7/17/00)

Photo 15: A07588G0.jpg Barge "B": Another view of sand slurry pumping efforts, with panels cut out of each section of fuel barge to enable access to pockets within structure of barge. (7/18/00)

Photo 16: A07592G0.jpg Barge B: Collecting sample of sand at containment basin for PID and analytical confirmation that sand could be disposed of as "clean" landfill cover material. (7/19/00)

Photo 17: A07597G0.jpg Barge "B": BSE crew and excavator wresting Barge "B" from channel and starting metal debris haul to NMFS staging area. (7/20/00)

Photo 18: A07609G0.jpg Barge "B": BSE workman and heavy equipment cutting up and pulling parts of barge from its long-buried location. Silt fence still present to intercept any spilled soil during removal.

Photo 19: A07610G0.jpg Barge "B": One of the last portions of barge being pulled from edge of channel with heavy equipment. (7/21/00)

Photo 20: A07505H0.jpg Barge "B": View of former location of Barge "B" once tidal water movement in Salt Lagoon channel had smoothed and settled out visible aspects of disturbance. (8/21/00)

Photo 21: A07534D0.jpg Barge "C": View of shoreline requiring thorough cleanup of many demolished and scattered pieces of Barge "C", below Black Bluffs and north of concrete ramp @ East Landing. (4/25/00)

Photo22: A07524D0.jpg Barge "C": GPS targeting and location was attempted (often shielded by steep cliff behind workman) of miscellaneous pieces of barge, as thrown up on shore by series of heavy storms.

Photo 23: A07523D0.jpg Barge "C": Hitachi 150 excavator pulling wide array of metal pieces from coastline and shallow water, before loading into front end loader bucket and hauling to staging area. (4/25/00)

Photo 24: A07524D0.jpg Barge "C": ***NORTECH*** checking on background level of volatile compounds in shoreline sands below Black Bluffs, where barge chunks were strewn about, some filled with sand. (4/25/00)

Photo 25: A07638D0.jpg Barge "C": View of loader with forks loading large portion of Barge "C" to flatbed truck, for transport to NMFS staging area and eventual disposal off-island. (4/26/00)

Photo 26: A07624D0.jpg Barge "C": Hitachi excavator and BSE workmen loading pieces of metal to loader bucket, for transport off beach to end-dump truck, which hauled debris to staging area.

Photo 27: A07505F0.jpg Barge "C": BSE crew & front-end loader returned to shoreline at Black Bluffs to remove additional pieces of metal debris now that snow is all melted, and more has washed ashore (6/12/00)

Photo 28: A07513F0.jpg Barge "C": View of shoreline below Black Bluffs once Barge "C" debris removal was completed. (6/26/00)

Photo 29: A076XXH0.jpg Barge "C": BSE crew hoisting out super-sacks of minor metal debris from beach to top of bluff, from Lukanin Bay shoreline beyond the zone practically accessible by loader. (9/10/00)

Photo 30: A07500I0.jpg Barge "C": View from atop bluff beyond Barge "C", debris found at area past barge breakup zone. "New" minor metal debris was discovered and removed by hoisting up slope. (9/10/00)

Photo 31: A07538D0.jpg Barge "D": View of abandoned barge "stored" at level area just off of road to Reef Point (just north of East Landing) as seen when first assessed. (4/21/00)

Photo 32: A07653D0.jpg Barge "D": BSE workman sawing barge into hoist-able pieces for loading and transport on flatbed truck to NMFS staging area. (4/28/00)

Photo 33: A07644D0.jpg Barge "D": Front-end loader picking up section of barge to remove from debris cleanup site. (4/28/00)

Photo 34: A07645D0.jpg Barge "D": Portion of Barge "D" loaded onto flatbed truck for haul to staging area and eventual barging to Seattle for recycling. (4/28/00)

STATE OF ALASKA

DEPT. OF ENVIRONMENTAL CONSERVATION

DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITES REMEDIATION PROGRAM

TONY KNOWLES, GOVERNOR

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Anchorage, AK 99501-2617
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http://www.state.ak.us/dec/

January 2, 2002

Mr. John Lindsay
Pribilof Project Manager
U.S. Department of Commerce, NOAA
National Ocean Service
Office of Response and Restoration
7600 Sand Point Way, NE BIN C15700
Seattle, Washington 98115-0070

RE: Draft Site Closure Report TPA Site 7-NMFS Fuel Barges A, B, C, D St. Paul Island, Alaska November 19, 2001

Dear Mr. Lindsay:

The Alaska Department of Environmental Conservation (ADEC) had received the above document on December 3, 2001. Based on a review of the data presented in the report, ADEC concurs the site does not require any further remedial action and can be considered closed. This closure is only for the site known as *NOAA TPA Site 7 NMFS Fuel Barges A, B, C, and D.* ADEC is basing this determination on the most current and complete information provided by NOAA to the department. ADEC reserves its rights, under 18 AAC 75 Oil and Other Hazardous Substances Pollution Control regulations and AS 46.03 to require NOAA to perform additional containment or cleanup if subsequent information indicates that:

(1) the level of contamination that remains does not protect human health, safety, or welfare, or the environment (which includes, but is not limited to*: area of public concern, ecological receptors, environmentally sensitive areas* and *marine waters)*; or
(2) the information ADEC relied upon (to make its decision) was invalid, incomplete, or fraudulent.

Authority:	AS 46.03.020	AS 46.03.740	AS 46.04.070
	AS 46.03.050	AS 46.03.745	AS 46.09.020
	AS 46.03.710	AS 46.04.020	

Area of public concern means a geographic area that, in ADEC's judgment, deserves special protection, including:

(A) an area of unique cultural value, historical significance, or scenic importance;
(B) an area of substantial residential or public recreational value or opportunity;

(C) an area where fish hatcheries or other facilities primarily dependent upon the use of potentially affected water are located;
(D) an area significantly used for commercial, sport, or subsistence hunting, fishing, and gathering; and
(E) an area where concentrations of terrestrial or marine mammals or bird populations primarily dependent on the marine environment are located.

Ecological receptor means a
(A) member or local population of plant or animal species in the geographic area of the site; and
(B) habitat on or adjacent to the site.

Environmentally sensitive area means a geographic area that, in the department's determination, is especially sensitive to change or alteration, including:
(A) an area of unique, scarce, fragile, or vulnerable natural habitat;
(B) an area of high natural productivity or essential habitat for living organisms;
(C) an area of unique geologic or topographic significance that is susceptible to a discharge;
(D) an area needed to protect, maintain, or replenish land or resources, including floodplains, aquifer recharge areas, beaches, and offshore sand deposits;
(E) a state or federal critical habitat, refuge, park, wilderness area, or other designated park, refuge, or preserve; and
(F) an area that merits special attention as defined at 6 AAC 80.170.

Marine waters means all saltwater environments, including saltwater wetlands, estuaries, and the intertidal zone.

NOAA needs to be aware of 18 AAC 75.396 Local Control which also states: Subject to AS 29.35.020, AS 46.04.110, and AS 46.09.060, the requirements of 18 AAC 75.300 - 18 AAC 75.390 do not preempt *local control*[1] that is as stringent as, or more stringent than, those requirements, and that is consistent with a regional master plan prepared under AS 46.04.210.

If you have any questions regarding this letter, please call me at (907) 269-7552.

Sincerely,

Louis Howard

Louis Howard
Project Manager

cc: Jennifer Roberts, ADEC Anchorage
Pribilof RAB Members

lhoward\ TPA 7 barges.doc NOAA-St. Paul TPA Site 7 NMFS Fuel barges A, B, C, D

[1] local government (control) means any borough, city, town, village, or other political subdivision of the state or any Indian tribe or authorized tribal organization; "local government" includes any rural community or unincorporated town or village

NOAA Sites 14, 15
(NOAA Landfill, TPA 8; TPA Attachment A)

NOAA Site 14 – TPA Site 8a: NOAA (NMFS) Reef Point Landfill
NOAA Site 15 – TPA Site 8b: NOAA (Village) Landfill

Site Closure Report – DRAFT, NOAA Landfill: Cliffside Dump and Reef Point Shoreline Site (Two-Party Agreement Site 8), Pribilof Islands Site Restoration, St. Paul Island, Alaska 353

Letter from Louis Howard to John Lindsay RE: Draft Site Closure Report for NOAA Landfill Cliffside Dump and Reef Point: TPA 8 St. Paul Island November 2001. Dated December 19, 2001.....369

Notice of Environmental Cleanup and Residual Soil and Debris at TPA08, NOAA (Village) Landfill, St. Paul Island, Alaska 373

SITE CLOSURE REPORT - DRAFT

NOAA Landfill: Cliffside Dump and Reef Point Shoreline Site
(Two-Party Agreement Site 8)

Pribilof Islands Site Restoration
St. Paul Island, Alaska

November 21, 2001

Prepared For:
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Pribilof Project Office

Prepared By:

NORTECH
ENVIRONMENTAL & ENGINEERING CONSULTANTS
Fairbanks, Alaska

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Appendix 1: Figures & GPS Information
Appendix 2: Site Photographs
Appendix 3: Daily Reports (and Scrap Recycle Receipt)
Appendix 4: Laboratory Analytical Reports
Appendix 5: Site Video Documentation

1.0 EXECUTIVE SUMMARY

NORTECH Environmental & Engineering Consultants and Bering Sea Eccotech mobilized personnel and equipment to the Cliffside Landfill and Reef Point abandoned landfill at St. Paul Island, Alaska, and administered a program of metallic debris removal beginning on April 26, 2000. A small quantity (<1 CY) of suspected lead-contaminated soils from under the "footprint" of a broken lead-acid battery was removed on two separate occasions, and subsequently manifested and transported by freighter to Seattle for proper hazardous waste disposal. Based on a review and analysis of available project photographs, Daily Reports, and limited field observations, ***NORTECH*** has arrived at the following environmental conclusions:

- The very limited quantity of lead-contaminated soil that remains trapped in pockets of basaltic rock at this site (<2 CF) are not readily retrievable by conventional, mechanical methods. ***NORTECH*** believes that since only a "de minimus" quantity of lead-contaminated soil remains it will not cause appreciable harm to human health or the environment.
- Groundwater contamination is considered unlikely at this debris removal site, given the lack of nearby groundwater and the lack of evidence indicating the presence of any significant spills, leaks, or other petroleum hydrocarbon releases at this site.

Based on these conclusions, ***NORTECH*** recommends the following:

- No-Further-Action decision for this TPA debris removal site.

2.0 INTRODUCTION

The National Oceanic and Atmospheric Administration (NOAA), Office of Response and Restoration, is responsible for site restoration activities at the St. Paul and St. George Islands, Alaska. Collectively, these islands are part of a five island archipelago known as the Pribilof Islands. Petroleum contamination has 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 environmental regulations and in accordance with the TPA, NOAA has undertaken an array of site characterization and restoration activities on St. Paul and St. George Islands. Additional work must be conducted to satisfy the TPA, including limited site characterization, remediation, confirmation sampling, and site restoration (NOAA 1996).

Under Contract No. 52ABNA500049, Task Order 56ABNA703706, ***NORTECH*** Environmental and Engineering Consultants (***NORTECH***) has prepared this Debris Removal Report for the NOAA/ NMFS Cliffside Landfill and Reef Point shoreline, TPA Site 8 to report on the debris removal and environmental screening/sampling activities which occurred there during the 2000 fieldwork season.

2.1 Objectives

The overall objective for the St. Paul Debris Removal project undertaken by ***NORTECH*** was to develop a written plan of action, have it approved by NOAA and ADEC, and execute it for each TPA and non-TPA site. At each removal area ***NORTECH*** was to accomplish the acts necessary to gain a no-further-action decision from ADEC, or else gain an understanding of the corrective action efforts that could eventually lead to proper site closure.

2.2 Methodology and Applicable Regulations

In order to meet the project objective, ***NORTECH*** developed a draft Corrective Action Plan and an array of Sampling & Analysis Plans (SAPs) in March 2000 for eleven designated St. Paul debris sites. They were reviewed and approved by NOAA and ADEC, fieldwork was begun in mid-April, and essentially completed in late November 2000. The fieldwork was performed in accordance with the Corrective Action Plan, the site's SAP, and the 1996 Two Party Agreement (TPA) between ADEC and NOAA including the following 1991 versions of ADEC's

regulations and associated guidance documents, as referenced in the TPA, particularly sections 21 to 28, 59, and 103 which call for the application of:

- 18 Alaska Administrative Code (AAC) 70 Water Quality Standards
- 18 AAC 75 Oil and Hazardous Substances Pollution Control
- Underground Storage Tank Procedures Manual, Guidance for Treatment of Petroleum Contaminated Soil and Water and Standard Sampling Procedures

3.0 SITE BACKGROUND

This section provides a brief discussion of the location and history of the Pribilof Islands, weather and environmental conditions on St. Paul Island, a site description, and a statement regarding the fact that we are not aware of any previous investigations at this specific St. Paul debris removal site.

3.1 Island Historical Information

Russia first discovered the Pribilof Islands and their seal rookeries 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. In 1869, the United States made the Pribilof Islands a federal reservation. From 1869 to 1909, the United States contracted fur seal harvesting and pelt processing to private companies. 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 passed, which provided for the transfer of property and management of the islands to Alaskan Native regional and village corporations.

The only major landowners on St. Paul Island are the Tanadgusix Corporation (TDX) and the federal government. The federal government currently retains title to about 1,515 acres on St. Paul Island, which consist of seal rookeries managed by the National Marine Fisheries Service, a U.S. Coast Guard (USCG) LORAN station, two scoria pits, a portion of the current Landfill, and a National Weather Service station. The island's airport, which consists of about 67 acres of land, 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. It is surrounded by the Bering Sea, and is 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 (Figure 1). About 27 centerline miles of road bisect the island north south and east west. The City of St. Paul is located on the southern peninsula of the island; its 1998 population included 761 people (ADL 1999). St. Paul Island has many sand dunes and is vegetated with grasses and small forbes over the majority of its area. The vegetation is broadly classified as moist tundra. Some common plant species present on the island include blue lupine, arctic poppy, beach wild rye, and sea beach sandwort.

St. Paul Island serves as a nesting area for a great number of seabirds and a rookery area for fur seals. Commercial crab harvesting areas are located within 15 miles of the island. Major harvest species are the Tanner crab and Korean Hair crab.

3.2.1 Climate

The climate of the island is classified as subpolar. Maritime weather conditions prevail on the island, with predominantly cloudy, foggy, and windy conditions. Total annual precipitation averages 23.3 inches, with most occurring between the months of April and October. The mean monthly temperature ranges from 22.4°F in winter to 47.8°F in summer, with a mean annual temperature of 34.8°F. Wind speeds range from 12.2 to 20.6 miles per hour, with an average of 17.2 miles per hour (NCDC 1999).

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 eastern portion 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. The lakes with direct estuarine connection to the Bering Sea (for example, the Salt Lagoon) tend to be brackish; the remaining lakes are freshwater. Much of the surface of the island is composed of sandy or scoriaceous material that allows for rapid infiltration of water.

The City of St. Paul obtains its municipal water supply from four wells located about 2.2 miles north-northeast of the city and immediately east of Telegraph Hill (Fredreka I, Fredreka II, south well, and north well). A fifth well serves the USCG station. These wells are reportedly completed within the basalt aquifer. The four municipal wells are connected by pipelines that supply three 200,000 gallon water storage tanks located on a hill above the city.

3.3 Site Description

The NOAA/NMFS (National Marine Fisheries Service) "traditional" landfills, referenced as TPA Site 8, are formally classified as abandoned landfill sites under the Two Party Agreement. Two distinct landfills were identified in creating this debris removal site: the first, Cliffside Landfill (Photo 1, Appendix 2: Site Photographs), is located along the northern shore of Zolotoi Bay directly south of (and below) the City of St. Paul; and the other is located along the northern shore of the peninsula which stretches from East Landing to Reef Point (Photos 10 to 12). The Reef Point "landfill" is shown on the TPA documents to extend along the rocky and steep northern coastline that makes up the Reef Point Seal Rookery. Refuse discarded in the Cliffside Landfill included generations of household wastes that (reportedly) were burned prior to disposal. The Reef Point landfill was reportedly used for two or three seasons during the 1950s and 1960s to incinerate wood debris. The resulting ash was buried at the site. Residents interviewed during previous investigations (E&E, 1992) at the site could not recall whether metallic debris was also disposed at the site. Both sites are frequently washed with storm spray.

3.3.1 Geology and Soil

The Cliffside Landfill is located along a narrow beach slope/cliff thinly surfaced with granular scoria overlying dense basalt (Photos 1 and 4).

The geology of the Reef Point shoreline is similar to the Cliffside landfill with the addition of vegetated sand dunes overlying portions of the low-lying peninsula.

3.3.2 Surface Water and Groundwater

The Cliffside and Reef Point landfills are both located along beach cliffs immediately adjacent to the Bering Sea. No freshwater bodies are located at or near either site. A shallow brackish pond periodically charged with windblown storm surge is located inland between the two landfills, just east of the St. Paul School, approximately 1,500 feet NE of the Cliffside Landfill.

3.4 Previous Investigations And Other Activities

E&E conducted a 1992 preliminary assessment of the two "traditional" landfills (E&E 1993). Then in 1999, Tetra Tech EM, Inc. removed some rusted-out residues of drums and barbed wire from an area east of the Reef Point seal rookery viewing area. The heavily weathered debris removed was believed part of a fence which had once confined a dairy herd formerly kept on the island for federal employees. Field screening with a photoionization detector of the drum sites reportedly failed to discern or uncover any evidence of volatile hydrocarbons above similar background fieldscreening samples taken of nearby "clean" beach sand. No other indications of hydrocarbon contamination were observed during the limited 1999 Reef Point cleanup by Tetra Tech.

4.0 FIELDWORK ACTIVITIES

4.1 Shoreline Inspection along Reef Point Shoreline and Debris Removal Efforts

On April 25, 2000, ***NORTECH*** and NOAA's project management personnel contracted with a local fisherman to cruise the waters offshore from the Cliffside and Reef Point landfills to search for visible debris on shore (Photos 9, 10, 11, and 12). An on-shore inspection and scope-of-work assessment occurred that evening, which was accompanied by extensive video and digital photo documentation of the Reef Point to fur seal bachelor beach shoreline. (Appendix 5: Site Video Documentation)

On April 28, 2000, BSE workers and equipment were mobilized to the fur seal bachelor beach area to remove limited quantities of metallic and rubber debris from the north side of the peninsula within and around sand dunes and the sandy beach east of the seal rookery viewing area. A visual inspection of the general zone referenced as the Reef Point Landfill on April 29, 2000 confirmed the removal of all visible debris.

On April 28 and 29, 2000, ***NORTECH*** and BSE personnel assembled equipment and rigging in order to remove any array of discarded equipment parts, engine blocks, piping, and domestic refuse from the Cliffside Landfill (Photos 2 through 8). Because of the steepness of the slope adjacent to the toe of this "landfill", and its inaccessibility for heavy equipment, all debris was extracted and removed from the grassy, overgrown area by hand and hauled up the slope with a cargo net cabled through a forklift mounted boom and winched by a loader (Photos 3 and 7).

Metallic debris visible from the bottom of the steep fill slope was cut off one to two feet below the soil surface, but no other efforts were expended to excavate under or within the vegetated slope to search for buried refuse. Some metallic debris was wedged within cracks of the broken basaltic shelving and required extensive manpower efforts to remove (Photo 5). Because some of the debris was still covered with snow during April 2000, ***NORTECH*** and BSE returned to the Cliffside Landfill on July 26, 27 and 28, 2000 to complete the "exposed and visible" debris removal.

During the April 2000 Cliffside Landfill debris removal session, workers found and removed the remnants of a broken lead acid storage battery and excavated approximately 4 ft^3 of the nearby and/or underlying impacted soils. (Figure 2, Appendix 1: Figures & GPS Data) Soil sample SPN20428-007-S (lead content of 1440 mg/Kg) was obtained from the base of the excavation in order to gain site cleanup clearance. The excavated soils removed from this spill location were containerized, temporarily stored in doubled 6 mm. poly debris bags, moved off-site, and then later added to a tote containing other lead-acid contaminated soils that were shipped off-island on September 16, 2000. (See manifest at Appendix 3, and details at Section 5.0)

On November 8th, and again on November 10, 2000, ***NORTECH*** mobilized two BSE laborers to further excavate the thin layer of impacted soils that were present beneath the site of the broken lead-acid storage battery. The excavated materials included all loose, granular soils above the hard basaltic shelving underlying the former battery site. A total of (2) 55-gallon drums of lead contaminated soils were excavated and prepared for off-island treatment. These lead contaminated soils were included in a shipment of hazardous wastes that were shipped off island for disposal as of January 10, 2001. Following removal of the lead contaminated soils and visual clearance, another soil sample (SPNCSL11-11-001-S, lead contamination @ 3,380 mg/Kg) was obtained from the minimal quantity of loose soils yet remaining in small pockets and crevices in the underlying basalt.

During these debris removal operations, a constant watch was kept for the appearance of contaminated soils. Other than the above-mentioned frozen/broken storage battery, no other signs or sources of potential soils contamination were observed at either of the NOAA/NMFS landfill locations. Since no indications of soil staining or other possible petroleum contamination were observed, no PID screening of the soils was conducted. The steepness of the Cliffside slope and the unconsolidated nature of portions of the granular slope (Photo 7) required attention and vigilance to avoid injuries from falling rock or slips on wet surfaces.

4.2 Soil and Groundwater Sampling

No groundwater sampling was performed at this site, since groundwater was not exposed by the debris removal work performed, nor is groundwater suspected to be impacted at either near-shore site.

The soils lying directly beneath the lead-acid storage battery were sampled on April 27, 2000, and, following the removal of additional quantities of suspect contaminated soils, again on November 11, 2000. The analytical results reported in Table 1 indicate that the limited quantity of soil trapped in pockets and crevices within the basaltic bedrock remains contaminated with lead residue in excess of ADEC industrial cleanup levels (1000 mg/Kg). The water-soluble nature of lead sulfate undoubtedly contributes to the mobility of lead in these soils. No other battery parts were observed in the area. Chromium and arsenic exceeded the ADEC Method 2 soil cleanup standards of 26 mg/kg and 2 mg/kg, respectively, in single soil samples taken from beneath the battery at the Cliffside Landfill site. However, these levels are well within the range expected for background soils on St. Paul Island, which are 67 to 113 mg/kg for chromium and 2.9 to 5.6 mg/kg for arsenic in a sand/scoria matrix (Tetra Tech EM Inc., Soil Background Study, Pribilof Islands Site Restoration, St. Paul Island, AK. Dec. 29, 2000)

Table 1. Cliffside Landfill. Soils Collected from beneath frozen/broken Lead/Acid Battery

	ADEC Regulatory Cleanup Level (18 AAC 75.341)	SPN 20428-007-S (mg/Kg)	PQL (mg/Kg)	SNPCSL11-11-001-S (mg/Kg)	PQL (mg/Kg)
Metals: (mg/Kg) Pb	1,000	**1,140**	3.64	**3,380**	42.3
As	2	**2.1**	0.227	No Data	-
Ba	1,100	50.2	0.604	No Data	-
Ca	5	0.227	0.0227	No Data	-
Cr	26	**36.2**	2.27	No Data	-
Se	3.5	0.227 U	0.227	No Data	-
Ag	21	0.175	0.0454	No Data	-
Hg	1.4	0.075	0.0242	No Data	-

5.0 DEBRIS DISPOSAL & RECYCLING

The metallic and rubber debris collected resulting from the cleanup of the Cliffside and Reef Point Landfills was temporarily placed (staged) at the NMFS Staff Compound (Tract 50) as part of a large pile of metal debris and rubber tires. These staged wastes and debris, both metals and rubber, were later reloaded and hauled in mid-September 2000 to a large walled barge at the St. Paul dock, which sailed to Seattle and was unloaded at the Seattle Iron & Metals yard on the Duwamish River at the end of September 2000. The miscellaneous steel, copper, and aluminum items were unloaded, processed and recycled by the salvage yard. The limited quantities of rubber debris were disposed of in Seattle by Tire Recycling and Disposal.

The polyethylene bag of lead-contaminated soil collected during the initial soil removal effort on April 28, 2000, was stored in a separate area of the NMFS staging area reserved for drums and soils, and eventually added to a shipment of lead-contaminated soil that was transported off St. Paul Island on September 16, 2000 (see Line a.,

Page 2/2, Manifest 00003; Appendix 3: Daily Reports). The two 55-gallon drums of soils derived from the November 2000 soils removal event were shipped off-island in January 2001 (See Line c., Page 1/2 manifest 765). Both shipments of lead contaminated soils were treated and disposed of outside of Alaska, by Chemical Waste Management of the Northwest, Arlington, OR.

6.0 ANALYSIS

It is ***NORTECH***'s contention that the mobility of water soluble lead salts derived from the broken storage battery spill discovered at the Cliffside landfill, combined with the impenetrable barrier formed at the bedrock interface, contributes to the concentrations of lead found in the soils trapped in pockets and crevices of the basaltic rock underlying the release site. The very limited, de minimis, quantity of soil that remains at this release site is estimated at less than 2 cubic feet. This contaminated soil is largely inaccessible for the application of conventional excavation techniques and may have already been displaced by the scouring action of St. Paul's periodic and intensive shore-side storm activity. Furthermore, the soils trapped in this tiny area are not readily accessible to human receptors nor is the area a potential source for the groundwater replenishment.

The cleanup objectives outlined in the Corrective Action Plan for the Pribilof Islands Site Restoration Project and in Section 2.1 above were met although limited quantities of soils contaminated with lead in excess of ADEC's cleanup criteria may remain in the area of the broken lead-acid battery. It is considered to be of minor concern that the chromium and arsenic concentrations analyzed to be present in the soil beneath the broken storage battery are greater than the ADEC's published soil cleanup levels, given that the values observed appear to be within the range of "background" As and Cd levels for St. Paul's volcanic scoria soils. (see discussion in Section 4.2)

7.0 CONCLUSIONS AND RECOMMENDATIONS

NORTECH Environmental & Engineering Consultants and Bering Sea Eccotech mobilized personnel and equipment to the Cliffside Landfill and Reef Point abandoned landfill at St. Paul Island, Alaska, and administered a program of metallic debris removal beginning on April 26, 2000. A small quantity (<1 CY) of suspected lead-contaminated soils from under the "footprint" of a broken lead-acid battery was removed on two separate occasions, and subsequently manifested and transported by freighter to Seattle for proper hazardous waste disposal. Based on a review and analysis of available project photographs, Daily Reports, and limited field observations, ***NORTECH*** has arrived at the following environmental conclusions:

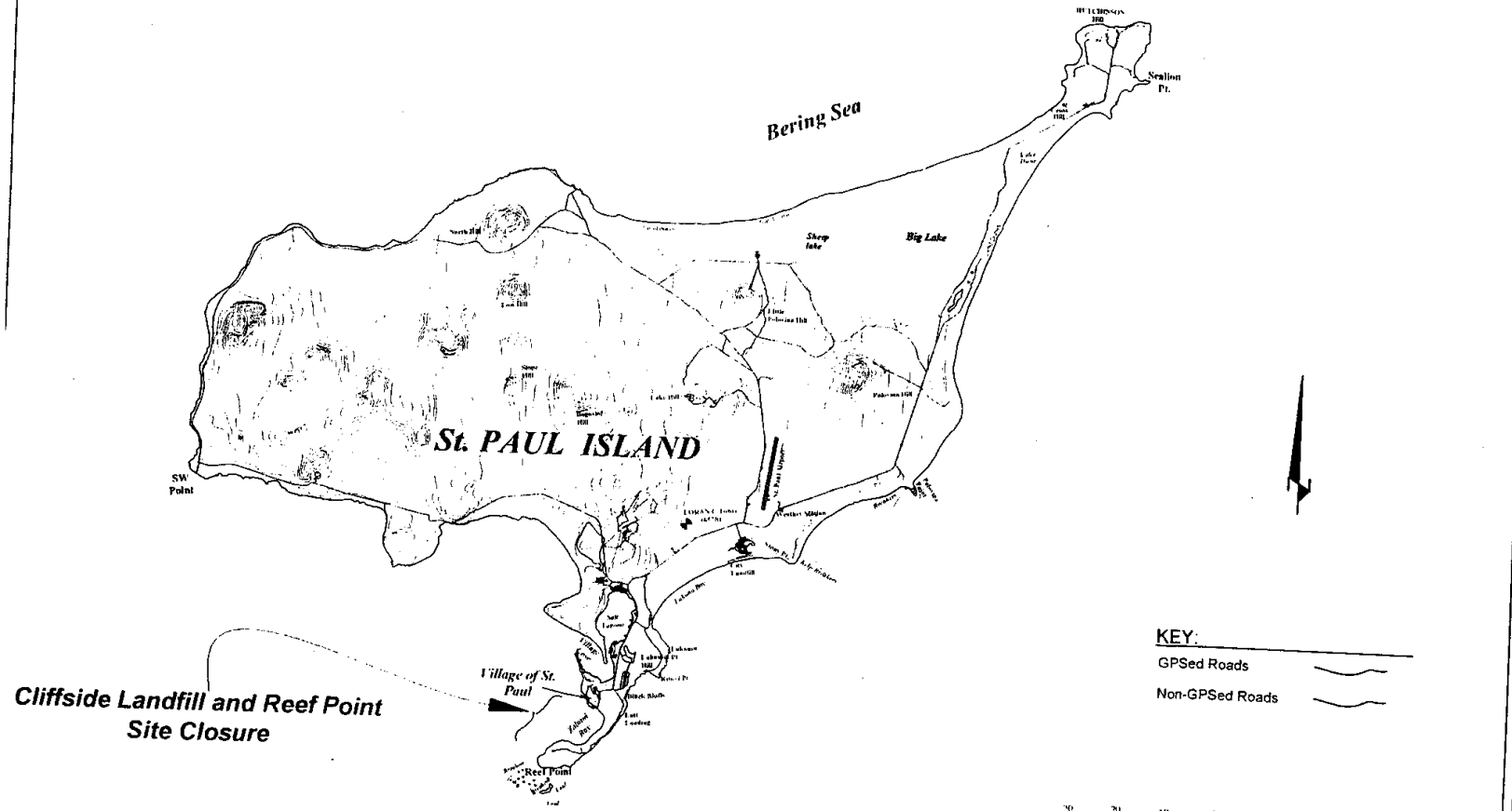
- The very limited quantity of lead-contaminated soil that remains trapped in pockets of basaltic rock at this site (<2 CF) are not readily retrievable by conventional, mechanical methods. ***NORTECH*** believes that since only a "de minimus" quantity of lead-contaminated soil remains it will not cause appreciable harm to human health or the environment.
- Groundwater contamination is considered unlikely at this debris removal site, given the lack of nearby groundwater and the lack of evidence indicating the presence of any significant spills, leaks, or other petroleum hydrocarbon releases at this site.

Based on these conclusions, ***NORTECH*** recommends the following:

- No-Further-Action decision for this TPA debris removal site.

APPENDIX 1

Figures & GPS Information



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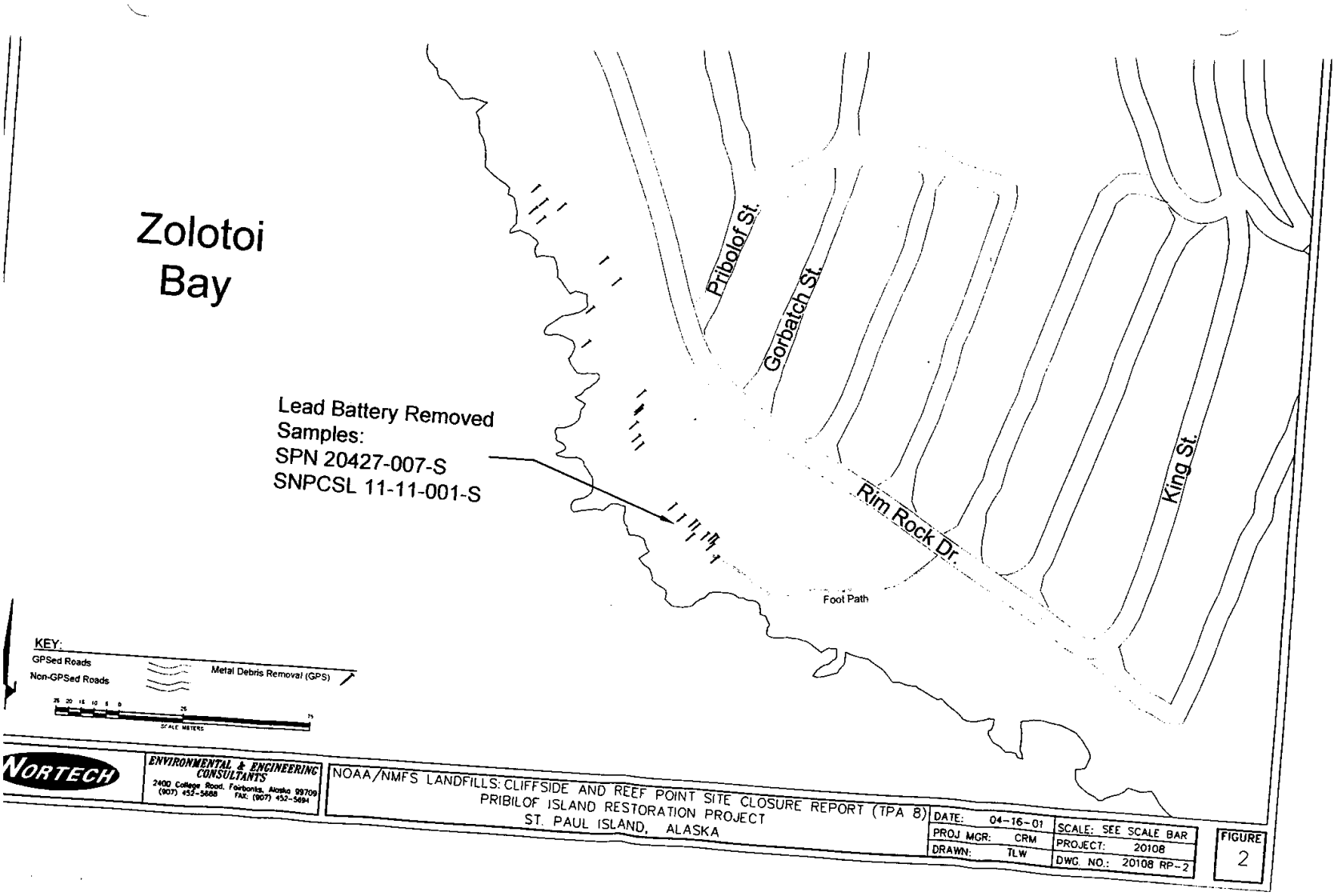
NOAA/NMFS LANDFILLS: CLIFFSIDE AND REEF POINT SITE CLOSURE REPORT (TPA 8)
PRIBILOF ISLAND SITE RESTORATION PROJECT
ST. PAUL ISLAND, ALASKA

DATE:	04-16-01	SCALE:	SEE SCALE BAR
PROJ MGR:	CRM	PROJECT:	20180
DRAWN:	TLW	DWG. NO.:	20180 RP-1

FIGURE 1


Zolotoi Bay
Pribilof St.
Gorbatch St.
King St.
Rim Rock Dr.
Foot Path
Lead Battery Removed
Samples:
SPN 20427-007-S
SNPCSL 11-11-001-S
KEY:
GPSed Roads
Non-GPSed Roads
Metal Debris Removal (GPS)
NORTECH
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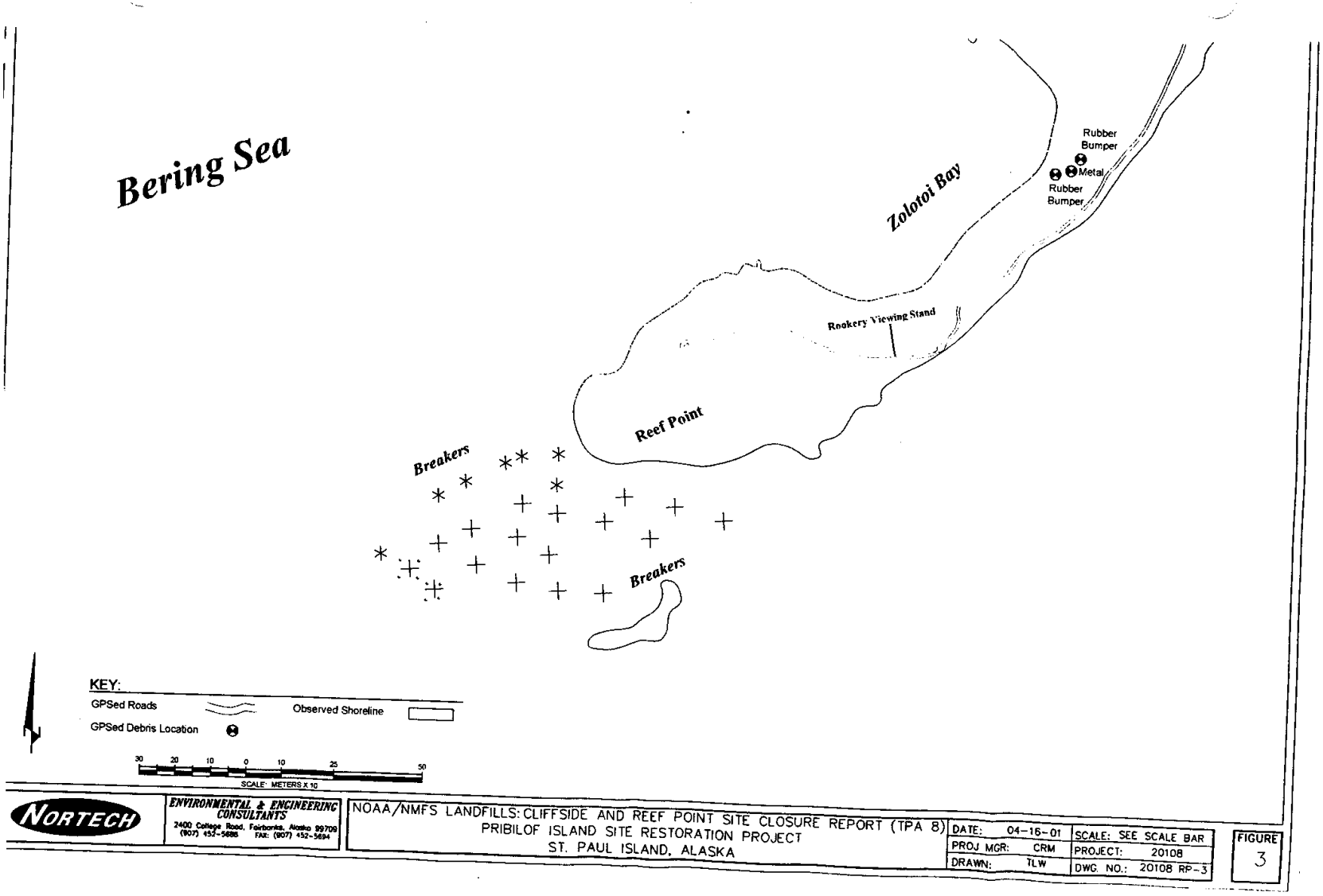
NOAA/NMFS LANDFILLS: CLIFFSIDE AND REEF POINT SITE CLOSURE REPORT (TPA 8)
PRIBILOF ISLAND RESTORATION PROJECT
ST. PAUL ISLAND, ALASKA
DATE: 04-16-01
PROJ MGR: CRM
DRAWN: TLW
SCALE: SEE SCALE BAR
PROJECT: 20108
DWG. NO.: 20108 RP-2
FIGURE 2


Bering Sea
Zolotoi Bay
Rubber Bumper
Metal
Rubber Bumper
Rookery Viewing Stand
Reef Point
Breakers
Breakers
KEY:
GPSed Roads
Observed Shoreline
GPSed Debris Location
30 20 10 0 10 25 50
SCALE: METERS X 10
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NOAA/NMFS LANDFILLS: CLIFFSIDE AND REEF POINT SITE CLOSURE REPORT (TPA 8)
PRIBILOF ISLAND SITE RESTORATION PROJECT
ST. PAUL ISLAND, ALASKA
DATE: 04-16-01
PROJ MGR: CRM
DRAWN: TLW
SCALE: SEE SCALE BAR
PROJECT: 20108
DWG. NO.: 20108 RP-3
FIGURE 3

Photo 1: A08503D0.jpg: View of the Cliffside landfill along the NW shore of the Zolotoi Bay. Note the basaltic shelf and scarred, grassy hillside covering cast off domestic rubbish and wastes. (4/25/00)

Photo 2: A08502D0.jpg: Typical NMFS Cliffside Landfill metallic debris collected on the edges of the basaltic shelf.

Photo 3: A08560D0.jpg: The forklift mounted boom was retained but the skid was eventually abandoned in favor of cargo netting to haul debris up the steep, grassy slopes of the Cliffside landfill. (4/29/00)

Photo 4: A08564D0.jpg BSE crew stockpiling smaller bits of debris preparatory to hauling the material up the grassy slope in the background.

Photo 5: A08571D0.jpg: BSE foreman Ben Leon Guerrero cutting lose a crane turntable wedged in a crack of the basaltic shelf. Some metal items were unable to be removed because of rocks trapping them.

Photo 6: A08575F0.jpg A typical view of the weathered metallic and miscellaneous debris found at the base of the Cliffside landfill.

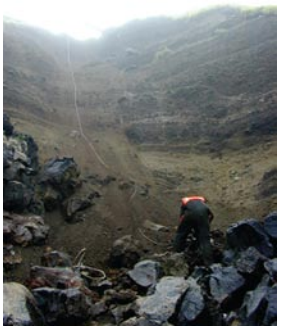

Photo 7: A08589F0.jpg: BSE workman cutting loose some exposed debris at the Cliffside landfill. A constant watch was maintained for falling rock and debris. (7/28/00)

Photo 8: A08584G0.jpg: A typical loader bucket of the approximately 4 tons of debris removed from the NMFS Cliffside Landfill. (7/26/00)

Photo 9: A08515D0 .jpg: The NOAA/NMFS Cliffside landfill and Reef Point shoreline were examined from offshore prior to beginning debris removal. (4/25/00)

Photo 10: A08523D0.jpg: Offshore view of the northern side of the Reef Point peninsula, showing basaltic cliffs and rocky shoreline – but no debris observed during coastline tour.

Photo 11: A08526D0.jpg: John Lindsay, NOAA project manager, glassing the shorline along Zolotoi Bay peninsula for washed up debris.

Photo 12: A08541D0.jpg The north side of the peninsula inspected for washed up debris. The wooden structure is used to view the fur seal rookery on the rocky beach below.

STATE OF ALASKA

TONY KNOWLES, GOVERNOR

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DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITES REMEDIATION PROGRAM

December 19, 2001

Mr. John Lindsay
Pribilof Project Manager
U.S. Department of Commerce, NOAA
National Ocean Service
Office of Response and Restoration
7600 Sand Point Way NE BIN C15700
Seattle, WA 98115-0070

RE: Draft Closure Report for NOAA Landfill Cliffside Dump and Reef Point
TPA 8 Saint Paul Island November 2001

Dear Mr. Lindsay:

The Alaska Department of Environmental Conservation (ADEC) has received the above document on November 2001. Below are ADEC's comments.

Section 4.3 Phase III Contaminated Soil Removal
18 AAC 75.315(d) states: If ADEC determines that the lowest *practicable*[1] level of contamination has been achieved under this section, a responsible person (NOAA) is not required to perform additional containment or cleanup. ADEC will base a determination under this section on the most current and complete information available to the department. ADEC will require a responsible person (NOAA) to perform additional containment or cleanup if subsequent information indicates that:

(1) the level of contamination that remains does not protect human health, safety, or welfare, or the environment; or
(2) the information ADEC relied upon (to make its decision) was invalid, incomplete, or fraudulent.

Based on a review of the data presented in the report, ADEC concurs no further remedial action (NFA) is required for the site known as *NOAA TPA - Cliffside Landfill (Dump) and Reef Point Landfill (Dump)* located adjacent to Zolotoi Bay and Reef Point Seal Rookery respectively.

This NFA determination is only for TPA 8. TPA 8 will **not** be assigned a closed status in ADEC's contaminated site database since the levels of lead contamination are above those

[1] *practicable* means capable of being designed, constructed, and implemented in a reliable and cost-effective manner, taking into consideration existing technology, site location, and logistics in light of overall project purposes; "practicable" does not include an alternative if the incremental cost of the alternative is substantial and disproportionate to the incremental degree of protection provided by the alternative as compared to another lower Read, Marcia (E-mail)cost alternative.

levels, which would allow for unrestricted use. The NFA decision is based on the following facts presented in the document:

- the steepness of the slope adjacent to the Cliffside landfill which requires special equipment and logistics to get to the site which is a limiting factor for access by people;
- all loose granular (contaminated) soils acting as a source of contamination were removed to a hard basaltic shelving underlying the former battery site;
- no indications of soil staining or other possible petroleum contamination was observed at the site;
- groundwater is not threatened by the residual contamination since groundwater is not present at the site nor is the site within an area which could be considered a groundwater recharge zone for drinking water source(s);
- the residual contaminated soil (less than 2 cubic feet), is largely inaccessible by conventional excavation techniques and may already be displaced by the scouring action of St. Paul's periodic and intensive shore-side storm activity.

However, further investigation and/or remedial actions will be requested of NOAA by ADEC at TPA 8 based on an ADEC determination that the cleanup is not protective of human health, safety, or welfare, or of the environment, which includes, but is not limited to: *area of public concern, ecological receptors, environmentally sensitive areas* and *marine waters.*

Area of public concern means a geographic area that, in ADEC's judgment, deserves special protection, including

(a) an area of unique cultural value, historical significance, or scenic importance;
(b) an area of substantial residential or public recreational value or opportunity;
(c) an area where fish hatcheries or other facilities primarily dependent upon the use of potentially affected water are located;
(d) an area significantly used for commercial, sport, or subsistence hunting, fishing, and gathering; and
(e) an area where concentrations of terrestrial or marine mammals or bird populations primarily dependent on the marine environment are located.

Ecological receptor means a

(a) member or local population of plant or animal species in the geographic area of the site; and
(b) habitat on or adjacent to the site.

Environmentally sensitive area means a geographic area that, in the department's determination, is especially sensitive to change or alteration, including

(a) an area of unique, scarce, fragile, or vulnerable natural habitat;
(b) an area of high natural productivity or essential habitat for living organisms;
(c) an area of unique geologic or topographic significance that is susceptible to a discharge;
(d) an area needed to protect, maintain, or replenish land or resources, including floodplains, aquifer recharge areas, beaches, and offshore sand deposits;
(e) a state or federal critical habitat, refuge, park, wilderness area, or other designated park, refuge, or preserve; and
(f) an area that merits special attention as defined at 6 AAC 80.170.

Marine waters means all saltwater environments, including saltwater wetlands, estuaries, and the intertidal zone

ADEC reserves its rights, under 18 AAC 75 Oil and Other Hazardous Substances Pollution Control regulations and AS 46.03 to require NOAA to conduct additional assessment and/or corrective actions, if information indicates the site conditions at TPA 8 pose an unacceptable risk to human health, safety, or welfare, or to the environment.

NOAA needs to be aware of 18 AAC 75.396 Local Control which also states: Subject to AS 29.35.020, AS 46.04.110, and AS 46.09.060, the requirements of 18 AAC 75.300 - 18 AAC 75.390 do not preempt *local control*[2] that is as stringent as, or more stringent than, those requirements, and that is consistent with a regional master plan prepared under AS 46.04.210.

If you have any questions regarding this letter, call me at (907) 269-7552.

Sincerely,

Louis Howard

Louis Howard
Project Manager

cc: Jennifer Roberts, DEC Anchorage
Pribilof Islands RAB Members

lhoward\TPA 8 NOAA Landfill cliffside 2001.doc

NOAA STP TPA 8 genl corr.

[2] local government (control) means any borough, city, town, village, or other political subdivision of the state or any Indian tribe or authorized tribal organization; "local government" includes any rural community or unincorporated town or village

ALASKA

2008-000215-0
Recording Dist: 305 - Aleutian Islands
5/1/2008 2:26 PM Pages: 1 of 6

NOTICE OF ENVIRONMENTAL CLEANUP AND RESIDUAL SOIL AND DEBRIS AT TPA08,
NOAA (VILLAGE) LANDFILL,
ST. PAUL ISLAND, ALASKA

Pursuant to 18 AAC 75.375, Tanadgusix Corporation as the owner, and the U.S. Department of Commerce/National Oceanic and Atmospheric Administration (NOAA), as the operator of the subject property hereby provide public notice that the property located southerly of Rim Rock Drive at the intersections of Pribilof Street and Gorbatch Street, St. Paul, St. Paul Island, Alaska 99660 is contaminated and has buried solid wastes. More specifically, the site described as follows, Township 35 South, Range 132 West, Section 25 Tract A of the Seward Meridian, Alaska and is located at 57° 7' 9.74" North Latitude; 170°16' 58.47" West Longitude (Figures 1 and 2), has been subjected to lead contamination and solid waste, as a result of a discharge, or release and subsequent cleanup of oil or other hazardous substances, regulated under 18 AAC 75, Article 3 as amended October 2005, and solid waste disposal, which is regulated under 18 AAC 60 as amended August 2003. Buried solid waste remains on the property. Adequate soil cover must be maintained over the solid waste to prevent exposure, and excavation into the buried solid waste should be avoided. If contaminated soil or solid wastes are exposed in the future they must be managed in accordance with laws applicable at that time. This release and cleanup are documented in the Alaska Department of Environmental Conservation (ADEC) contaminated sites database under site number *CS Reckey* # 1994250935410; 2644.38.022.

The NOAA Village Landfill Site was identified as the *NOAA Landfill Site 8* pursuant to the *Pribilof Islands Environmental Restoration Two Party Agreement* (TPA) between the State of Alaska and NOAA (NOAA 1996). Subsequently, NOAA addressed the abandoned landfill as NOAA Village Landfill Site 8b and NOAA Site 15. Following corrective action, NOAA submitted a request for conditional closure to the ADEC Division of Spill Prevention, Response Contaminated Sites Program. ADEC determined, in accordance with 18 AAC 75.325(f)(1) that site cleanup has been performed to the maximum extent practicable even though debris and residual, *de minimis* quantities of lead contaminated soils remain on the site property (ADEC 2001). ADEC granted the conditional closure, in part subject to this institutional control (deed notice), and confirmed that no further remedial action was required at the site unless new information becomes available that indicates to ADEC that the site may pose an unacceptable risk to human health, safety, welfare to the environment (NOAA 2004).

Grantor, the US Bureau of Land Management.

Grantees:

- the Tanadgusix Corporation (grantee of the surface estate),
  4300 B Street, Suite 402
  Anchorage, AK 99503-5946
- The Aleut Corporation (grantee of the subsurface estate)
  4000 Old Seward Highway, Suite 300
  Anchorage, AK 99503

Recording District
Aleutian Islands

Remedial Actions and Residual Contamination

The abandoned NOAA Village Landfill Site was used by the federal government and the community as a community solid waste disposal site. During 2000 and 2001, NOAA removed debris, such as automobile part, pots, glass, wood, springs that had fallen on the basalt shelf at the base of the cliff or was exposed on the soil overburden on the cliff face (Tetra Tech 2000 and Nortech 2001), and less than one cubic yard of lead contaminated soil recovered from beneath an automobile battery (Nortech 2001). The site covered a surface area of approximately one-quarter of an acre.

Site Use

In the event that information becomes available which indicates that the site may pose an unacceptable risk to human health, safety, welfare or the environment, the land owner and/or operator is required under 18 AAC 75.300 to notify ADEC and evaluate the environmental status of the contamination in accordance with applicable laws and regulations. Further site characterization and cleanup may be necessary under 18 AAC 75.325-.390 and 18 AAC 78.600. Also, any transport, treatment, or disposal of any potentially contaminated soil or water from the site or use of the groundwater at or near the contaminated area requires notification to and approval from the Department in accordance with 18 AAC 75.370(b) and 18 AAC 78.600(h).

In the future, DEC approval is required prior to moving the soil cover over the solid waste pursuant to 18 AAC 60. If contaminated soil and solid wastes are removed from the site, the site must be characterized and managed following regulations applicable at that time including 18 AAC 75.325(i)(1), 18 AAC 75.370, and (3) 18 AAC 60 as amended. ADEC approval is required prior to moving soil or solid wastes that is, or has been, subject to the cleanup rules found at 18 AAC 75.325-.390, and 18 AAC 60 as amended.

This notice remains in effect until a written determination from ADEC is recorded that states that soil at the site has been shown to meet the most stringent soil cleanup levels in Method Two of 18 AAC 75.341 (c) and that off-site transportation of soil is not a concern, and until all wastes are removed from the property.

References:

Alaska Department of Environmental Conservation (ADEC). 2001. Letter from Louis Howard to John Lindsay NOAA. Re: *Draft Closure Report for NOAA Landfill Cliffside Dump and Reef Pont TPA St. Paul Island November 2001.* May 30.

National Oceanic and Atmospheric Administration (NOAA). 1996. *Pribilof Islands Environmental Restoration Two Party Agreement*, Attorney General's Office File No. 66 1-95-0126. National Oceanic and Atmospheric Administration. January 26.

Nortech. 2001. *Site Closure Report – Draft. NOAA Landfill: Cliffside Dump and Reef Point Shoreline Site (Two-Party Agreement Site 8), Pribilof Islands Site Restoration, St. Paul Island, Alaska.* Prepared for National Oceanic and Atmospheric Administration, National Ocean Service, Office of Response and Restoration, Pribilof Project Office, 7600 Sand Point Way NE, Seattle, WA. 98115. November 21.

Tetra Tech. (Tetra Tech EM Inc.) 2000. *Closure Confirmation Report, Cliffside Landfills (Two-Party Agreement Site No. 8), Pribilof Islands Site Restoration, St. Paul Island, Alaska.*. . Prepared for National Oceanic and Atmospheric Administration, National Ocean Service, Office of Response and Restoration, 7600 Sand Point Way NE, Seattle, WA. 98115. December.

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2008-000215-0

Please return original copy of this notice to the (operator) address below:

Signature: _____

Printed Name: JOHN A. LINDSAY

Mailing Address:
Attn: John Lindsay

US DOC, NOAA, NOS, OR&R, PPO
7600 Sand Point Way NE
Bldg 3, RM 1301
Seattle, WA 98115

(seal) Subscribed and sworn to before me this ___ day of _____, 19___.
Notary Public in and for the State of _____
My commission expires:_____

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2008-000215-0

Pribilof Islands Restoration Project

Figure 1

St. Paul Island Vicinity Map
NOAA Village Hill Landfill
NOAA Site 15/TPA Site 8b
St. Paul Island, Alaska

Source: Ikonos Satellite Imagery (Space Imaging 2001)
Path: C:\KP_GIS Data\Maps & Figures\SNP\Deed Notices\Site 15, TPA 8b\SNP Standard Fig 1 - Cliffside Village Landfill.psd
Date: 4/30/2008

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2008-000215-0

Figure 2	Legal Property Description Map Tract A of T35S, R132W, S25 NOAA Village Hill Landfill NOAA Site 14/TPA 8b St. Paul Island, Alaska	Sources: Landfill Features (TTEMI, 1999), Aero-Metric 2006 2 ft Aerial Photo, 1983 Bureau of Land Management Land Survey Plat Officially filed February 15, 1985 Path: C:\KP_GIS Data\Maps & Figures\SNP\Deed Notices\Site 15, TPA 8b\Landfill_PropDescription_Fig2.mxd Date: 4/30/2008 @ 11:54:33 AM

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2008-000215-0

Figure 3	Landfill Debris Areas & Lead Sampling Result NOAA Village Hill Landfill NOAA Site 14/TPA 8b St. Paul Island, Alaska	Sources: Landfill Features (TTEMI, 1999/2000),Lead Sample (Nortech, 2000), Aero-Metric 2006 2 ft Aerial Photo. Path: C:\KP_GIS Data\Maps & Figures\SNP\Deed Notices\Site 15, TPA 8b\VillageLandfill_Fig3.mxd Date: 4/30/2008 @ 12:07:31 PM

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NOAA Site 16
TPA Site 9a: Old Movie Theater

Request for NFRAP, Old Movie Theater, TPA 9a/Site 16,
St. Paul Island, Alaska 381

Request for NFRAP
Old Movie Theater, TPA 9a/Site 16
St. Paul Island, Alaska

Request for No Further Remedial Action Planned

Site: Old Movie Theater (OMT), also known as Two Party Agreement (TPA) Site 9a and National Oceanic and Atmospheric (NOAA) Site 16

Location: St. Paul Island is approximately 800 miles southwest of Anchorage in the Bering Sea. On the island, the OMT site is located below the summit and on the southerly side of Village Hill (57º 07' 17.52" N latitude, 170º 16' 59.68" W longitude; Figure 1). It is approximately 300 feet northerly of the City Municipal Building and 125 feet southeasterly of the city's concrete water supply tanks. The OMT is bounded to the south by Bartlett Boulevard and to the west by Pribilof Street. Private residences are located to the east and northwest.

Legal Property Description: The OMT is located in Lot 8, Block 5, U.S. Survey No. 4943, Alaska Tract "A", St. Paul Townsite, accepted by the Bureau of Land Management August 2, 1968 (Figure 2). The property is owned by Tanadgusix Corporation (TDX). [Note: TPA site boundaries are not defined in the TPA. At its discretion, NOAA established a boundary for this TPA site based on site characterization data and historic information. Though this boundary extends in Lot 9, corrective actions were only conducted within Lot 8.]

Type of Release: Potential release sources and mechanisms include diesel fuel spillage occurring during the filling of 55-gallon barrels storing fuel to provide heat to the theater.

History and Background:
The OMT was constructed around 1962 and served as a theater for the local community. Prior to construction, the area about the theater was undeveloped. The theater went into disuse in the 1980s and is presently abandoned and in disrepair. Specific dates of operation and modification are uncertain.

While not identified in the TPA proper, NOAA elected to include the OMT within the broader definition of TPA Site 9 and designated the site as TPA Site 9a.

Summary of Site Investigations:
NOAA identified the OMT as a site of concern after the signing of the TPA and following a site investigation and site characterization (SC) of TPA Site 9a and the vicinity (i.e. Tracts 46 and A) by NOAA's contractor Columbia Environmental Sciences, Inc. (CESI; CESI 2001a and 2001b). The SC identified aboveground storage tanks (ASTs) in the form of 55-gallon barrels (Figure 3) used to provide fuel to heat the OMT. The ASTs and associated piping were removed by CESI during 2001 (CESI 2001a).

The SC confirmed contamination in the soils below the ASTs. CESI collected seven soil samples from this site (CESI 2001a). The samples were analyzed at a fixed laboratory for petroleum hydrocarbons, volatile organic carbons, semi-volatile organic carbons, and heavy metals. Two of the samples exceeded the Alaska Department of Environmental Conservation (ADEC) Method Two regulatory limit of 250 mg/kg for diesel-range organic compounds (DRO), with a maximum concentration of 1,300 mg/kg.

NOAA contractors conducted quarterly groundwater monitoring from September 2000 to September 2001 and from October 2003 to July 2004 in the vicinity of the OMT (Figure 4). Groundwater wells installed in the area reached the water table at approximately 90 feet bgs (CESI 2001a). No monitoring wells are located up gradient of the OMT, and none are located directly down gradient. MWA-4 and MW46-2 are the closest wells to the OMT and are located in areas with groundwater elevations lower than that beneath the OMT (Mitretek Systems 2002). During the 2000-2001 monitoring, DRO were detected at 73 µg/L and 730 µg/L in MWA-4 and MW46-2, respectively (IT Alaska Inc. 2002). This is below the Table C cleanup level of 1,500 µg/L DRO. During the first three quarters of the 2003-2004 monitoring, DRO were not detected in either well. Data from the fourth quarter is not currently available; a full report on 2003-2004 sampling events will be available late in 2004.

Summary of Applied Cleanup Levels:
ADEC Method One (18 Alaska Administrative Code (AAC) 75.341(a); ADEC 2000) was selected for determining site cleanup levels. Based on distance between contamination and potable groundwater, mean annual precipitation, soil type, distance to drinking water wells, and the volume of contaminated soil, a matrix score was generated placing this site in cleanup category C. The category C cleanup level for DRO is 1,000 mg/kg.

Summary of Cleanup Actions:
Corrective action began at the OMT on June 26, 2002 and ended a day later (NOAA 2002 and 2003; Figures 5, 6, and 7). After a utility locate was conducted, contaminated soils were excavated, loaded into 10- to 12-cubic yard (yd^3) dump trucks, and transported to the Blubber Dump petroleum contaminated soil (PCS) stockpile for subsequent treatment and disposal. Guided by field samples screened with a photo ionization detector, approximately 25 yd^3 were removed from the excavation site. Final excavation limits were approximately 6 x 12 x 8 feet. Precaution was taken to ensure the integrity of the OMT's foundation and structure. Backfill was hauled with dump trucks and placed in the excavation area. The site was restored to grade and compacted with a front-end loader and by walking the excavator across the excavation several times. No archeological findings were encountered during the excavation activities.

Soils transported to the Blubber Dump PCS stockpile were treated by an enhanced thermal conduction (ETC) system, verified to be clean via analytical data (BSE 2003), and transported to the City of St. Paul Landfill for final disposal.

Confirmation samples (Table 1; Figure 8), contaminated stockpile samples, and backfill samples were collected and sent to an off-site laboratory for analysis. The four confirmation samples and two backfill samples collected were all below the cleanup levels for the compounds analyzed. The highest DRO concentration in the four stockpile samples (*i.e.*, samples collected from the removed soil) was 1,220 mg/kg.

Recommend Action:
In accordance with paragraph 59 of the Two Party Agreement (NOAA 1996), NOAA requests written confirmation that NOAA completed all appropriate corrective action at the Old Movie Theater, TPA 9a/Site 16 in accordance with the Agreement and that ADEC requires no further remedial action plan from NOAA.

References:
Alaska Department of Environmental Conservation. 2000. Title 18 of the *Alaska Administrative Code* 75, Articles 3 and 9. *Oil and Hazardous Substances Pollution Control Regulations*. State of Alaska. Amended through October 28, 2000.

Bering Sea Eccotech, Inc. 2003. *Enhanced Thermal Conduction Yearly Report, St. Paul Island, Initial Draft.* Bering Sea Eccotech. February 2003.

Columbia Environmental Sciences, Inc. (CESI). 2001a. *Draft Site Characterization Report, Old Movie Theatre, St. Paul Island, Alaska*. Version 1.9. December 20, 2001. Columbia Environmental Sciences, Inc. Kennewick, WA.

CESI. 2000b. *Draft Site Characterization Report, Tract 46 and Vicinity (TPA Site 9), St. Paul Island, Alaska,* Version 2.1. December 16, 2001. Columbia Environmental Sciences, Inc. Kennewick, WA.

IT Alaska Corporation. 2002. *Draft Annual Groundwater Monitoring Report 2001, St. Paul Island, Alaska.* March.

Mitretek Systems. 2002. *Groundwater Use and Classification in the Vicinity of Tract 46, St. Paul Island, Pribilof Islands, Alaska*. Prepared by Mitretek Systems, for the National Oceanic and Atmospheric Administration. June 5.

National Oceanic and Atmospheric Administration (NOAA). 1996. *Pribilof Islands Environmental Restoration Two-Party Agreement*, Attorney General's Office File No. 66 1-95-0126. NOAA. January 26.

NOAA. 2002. *Draft Corrective Action Plan, St. Paul Island, Alaska, TPA Site 9 – Old Movie Theater*. May.

NOAA. 2004. *Corrective Action Report, St. Paul Island Alaska, TPA Site 9-A – Old Movie Theatre*. Prepared by NOAA Pribilof Project Office, Seattle, WA with Bering Sea Eccotech, Inc. February 5.

For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

9/30/04
Date

Approvals: In accordance with Paragraph 59 of the Two Party Agreement, this is to confirm that all corrective action has been completed at the Old Movie Theater, TPA Site Number 9a/Site 16 in accordance with the Agreement and that no plan for further remedial action is required.

For the Alaska Department of Environmental Conservation

Louis Howard
Alaska Department of Environmental Conservation
Remedial Project Manager

10/11/04
Date

Tables and Figures

Table 1: Analytical Data (mg/kg) Summary for Confirmation Samples from the Old Movie Theater, TPA9a/Site 16

Sample #	GRO	DRO	RRO	Benzene	Ethyl-benzene	Toluene	Total Xylenes	Location
SNP9ASS01-095	ND(5.82)	ND(28.8)	ND(28.8)	ND(.0291)	ND(.116)	ND(.116)	ND(.116)	Excavation bottom
SNP9ASS02-065	ND(6.67)	ND(25.7)	ND(25.7)	ND(.0334)	ND(.113)	ND(.113)	ND(.113)	East wall of excavation
SNP9ASS03-030	ND(3.44)	ND(22.0)	ND(22.0)	ND(.0172)	ND(.0688)	ND(.0688)	ND(.0688)	South wall of excavation
SNP9ASS04-028	ND(5.17)	ND(25.0)	ND(25.0)	ND(.0259)	ND(.103)	ND(.103)	ND(.103)	South wall of excavation
SNP99TB01	ND(2.36)	NA	NA	ND(.0118)	ND(.0472)	ND(.0472)	ND(.0472)	Soil trip blank

Notes:
NA: Not analyzed
ND: Analyte was analyzed for but not detected above method reporting limit (method reporting limit provided in parentheses)

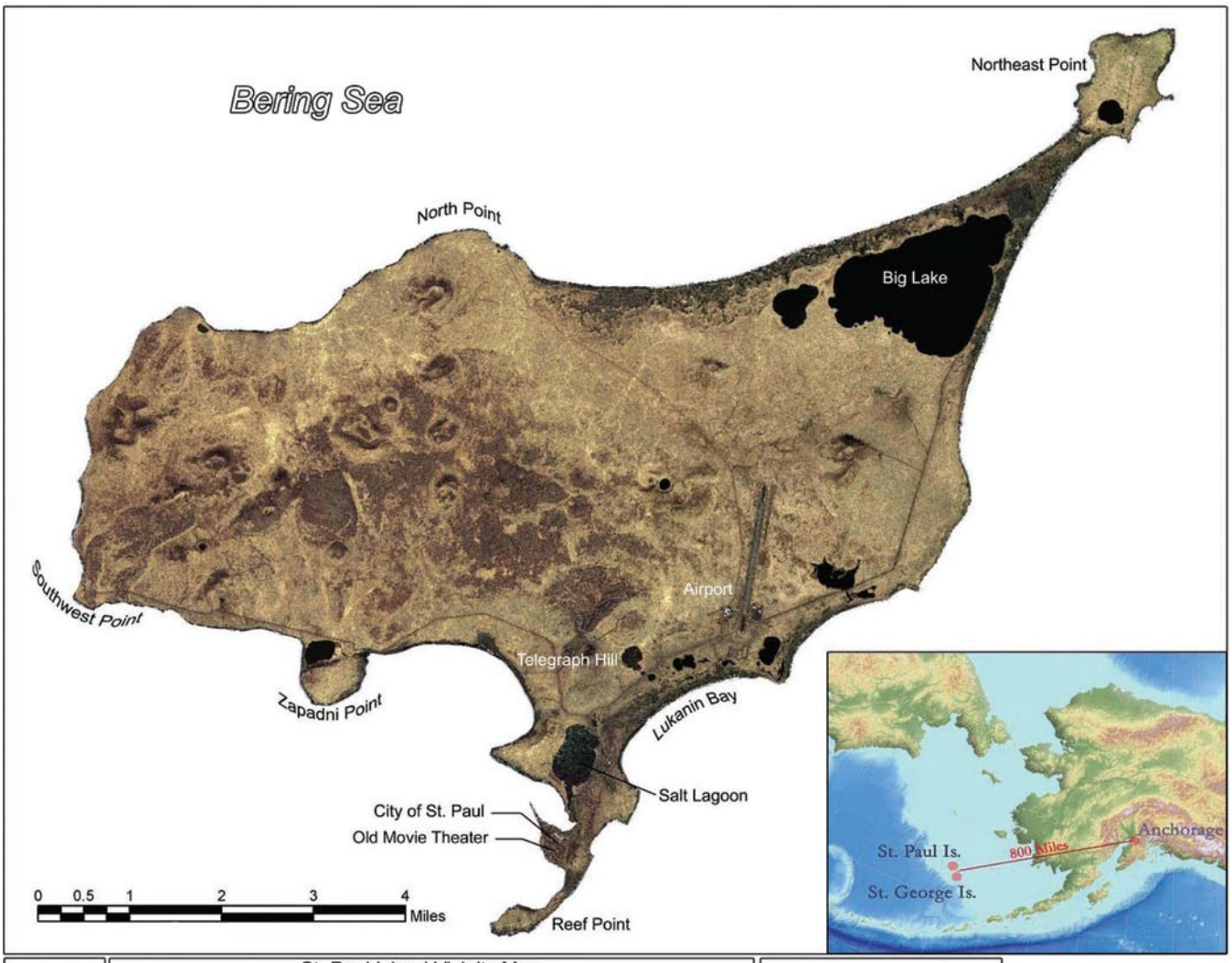

Figure 1	St. Paul Island Vicinity Map Location of the Old Movie Theater NOAA Site 16/TPA Site 9a St. Paul Island, Alaska	Source: Ikonos Satellite Imagery, 2001	Pribilof Islands Restoration Project

Figure 2	Legal Property Description Map Old Movie Theater NOAA Site 16/TPA Site 9a St. Paul Island, Alaska	Sources: BLM Tracts (BLM MTPs 1983), TPA 9a Boundary (NOAA GIS 2004), Aerial Photo (Aeromap US 1996).

Pribilof Islands Restoration Project

Figure	Historical Site Map, 1967 Old Movie Theater NOAA Site 16/TPA Site 9a St. Paul Island, Alaska	Source: NOAA Pribilof Project GIS, 2002.

Pribilof Islands Restoration Project

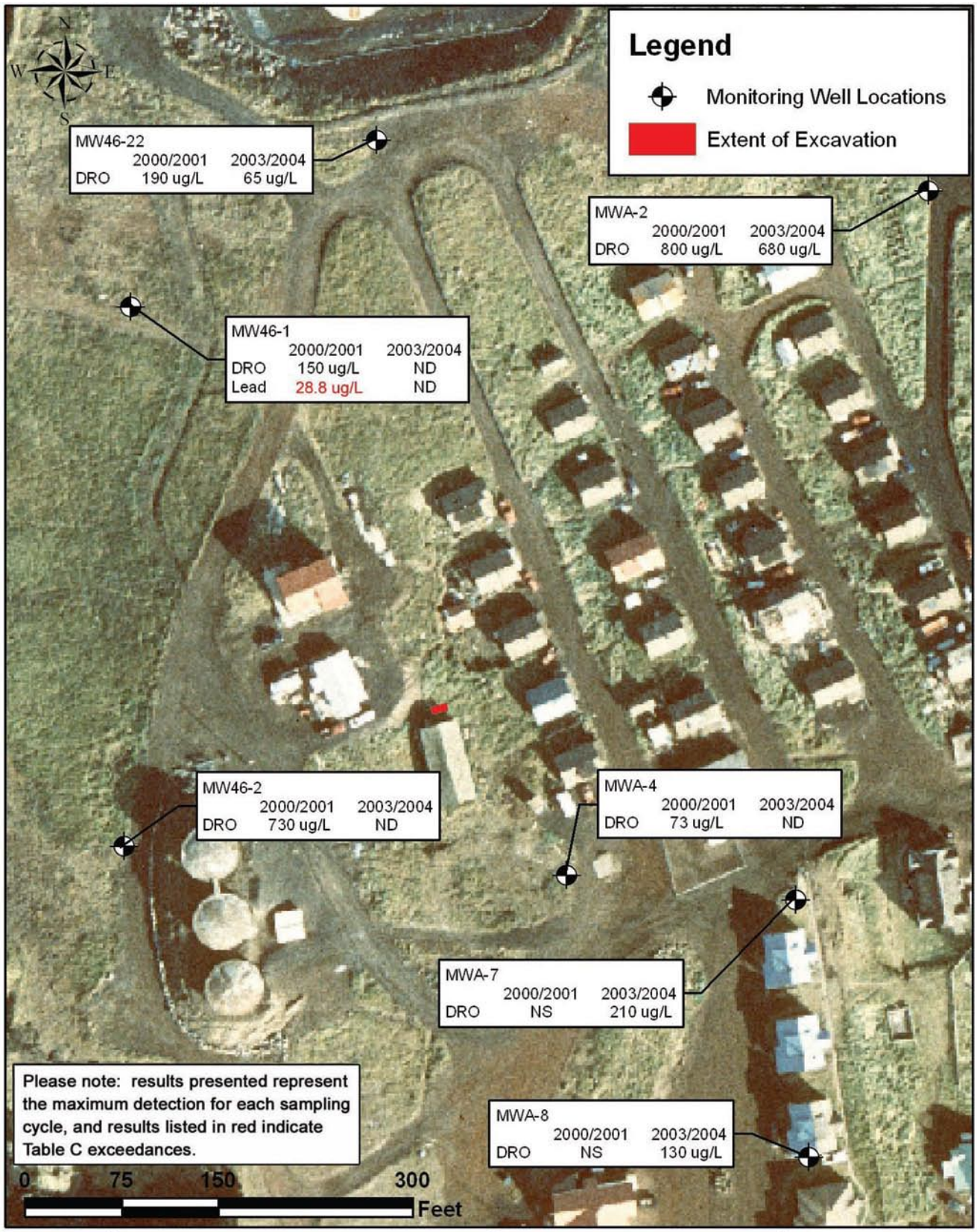

Figure 4	Groundwater Sampling Results Old Movie Theater NOAA Site 16/TPA Site 9a St. Paul Island, Alaska	Sources: Final excavation extent, (NOAA GPS 2002), Well locations (NOAA GPS 2004), Aerial photo (Aeromap US 1996).

Pribilof Islands Restoration Project

Figure 5. OMT excavation area prior to excavation activities

Figure 6. Extents of excavation

Figure 7. Final grading of clean backfill

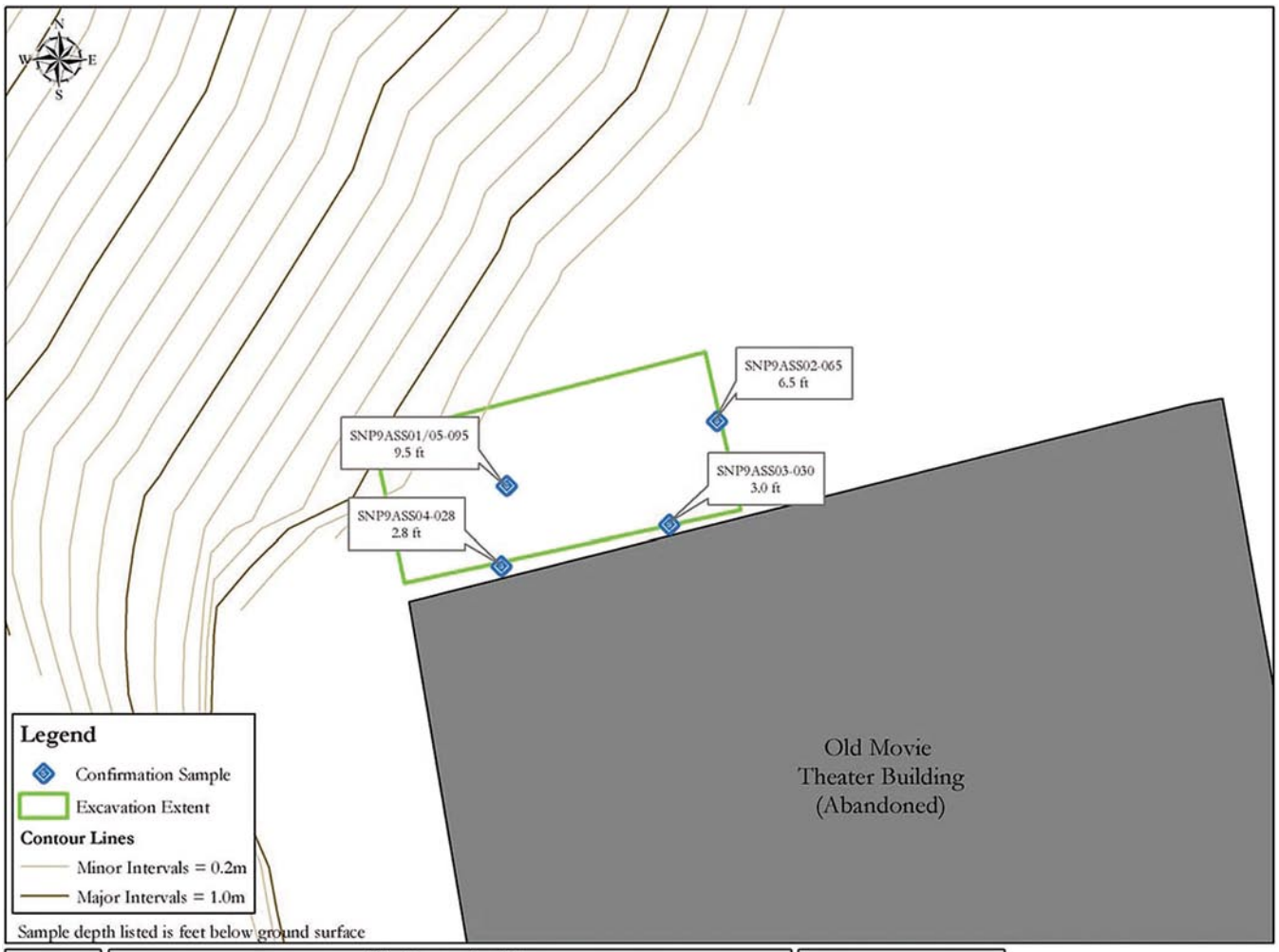

Figure 8	Site Excavation Map Old Movie Theater TPA Site 9a St. Paul Island, Alaska	Source: NOAA Pribilof Project GIS, 2002.

Pribilof Islands Restoration Project

NOAA Site 17
TPA Site 9b: Former Power Plant (Former Post Office)

Request for NFRAP, Former Power Plant, TPA 9b/Site 17,
St. Paul Island, Alaska 393

Notice of Environmental Cleanup and Residual Soil and Groundwater
Contamination at TPA9b, Former Power Plant, St. Paul Island, Alaska 405

Request for NFRAP
Former Power Plant, TPA 9b/Site 17
St. Paul Island, Alaska

Request for No Further Remedial Action Planned

Site: Former Power Plant (FPP), also known as Two Party Agreement (TPA) Site 9b and National Oceanic and Atmospheric Administration (NOAA) Site 17.

Location: The FPP site is situated on the northeastern slope of Village Hill on the southerly side of the intersection of Tolstoi Boulevard and Short Road. The site is approximately 50 feet north of the Pribilof Islands School Administrative Offices (Figure 1).

Legal Property Description: The Former Power Plant site is located on Lots 1& 2, Block 1, U.S. Survey No. 4943, Alaska Tract "A", St. Paul Townsite, accepted by the Bureau of Land Management August 2, 1968 (Figure 2). The property is currently owned by the St. Paul Tribal Government.

Type of Release: Diesel range organics (DRO), residual range organics (RRO), and oily sludge

History and Background:
The FPP served as an electrical power generating facility for the village of St. Paul between 1940 and 1960, after which time it was decommissioned. The structure burned subsequent to decommissioning.

A 1948 Department of the Interior aerial village photograph depicts nine 1,000-gallon and one approximately 2,500-gallon aboveground storage tanks (ASTs) at the site (Department of the Interior 1951). These tanks were located within 10 feet west of the FPP building (Figure 3). It is not known when these tanks were decommissioned; however, previous investigations verified that residual contamination from the tanks existed at the site.

The Tribal Government on St. Paul Island constructed a U.S. Post Office on the site in 1972. An underground storage tank (UST) was installed at the south end of the building to store heating fuel. In 1997, the post office was moved to a new location causing the building to remain unoccupied for four years until the Tribal Government converted the building into a café and delicatessen named Duna's Kitchen. Duna's moved to a new location in 2004, and the building is currently unoccupied.

Summary of Site Investigations:
Ecology & Environment, Inc. (E&E) performed a site reconnaissance at the FPP site in 1992. Site reconnaissance activities did not identify this site as one of concern (E&E 1993).

Hart Crowser Inc. conducted an expanded site investigation in 1996. DRO were detected in surface samples at concentrations up to 3,900 milligrams per kilogram (mg/kg). DRO were encountered in subsurface samples at concentrations up to 4,100 mg/kg, and RRO were detected at concentrations up to 3,100 mg/kg. Evidence of pooled petroleum product was encountered at the soil basalt interface, approximately 3 feet below ground surface (bgs). Gasoline-range organics (GRO), benzene, toluene, ethylbenzene and xylenes (BTEX), heavy metals, and polychlorinated biphenyls (PCBs) were analyzed for, but not detected at the site. Findings of this investigation resulted in a recommendation to excavate an estimated 260 cubic yards (yd^3) of contaminated soils beneath the former AST storage site (Hart Crowser Inc. 1997).

Columbia Environmental Sciences, Inc. (CESI) collected additional soil samples during site activities conducted in 2000 and 2001. These samples further verified the presence of DRO soil contamination beneath the former AST storage area. CESI recommended treating the contaminated soils in place (CESI 2001).

NOAA contractors conducted quarterly groundwater monitoring from September 2000 to September 2001 and from October 2003 to July 2004 in the vicinity of the FPP (Figure 4). During 2000-2001 sampling events, DRO was detected in MWA-3, an on-site well, at a concentration of 17,000 µg/L, exceeding the Alaska Department of Environmental Conservation (ADEC) Table C cleanup criterion of 1,500 µg/L (IT Alaska Corp. 2002). DRO was also detected below its cleanup criterion in two nearby wells, MW46-3 and MWA-2. During the first three

quarters of 2003-2004 sampling, DRO was again detected above its Table C cleanup level in MWA-3, with a maximum concentration of 13,000 µg/L. MW46-3 and MWA-2 contained DRO below its cleanup criterion. A full report on 2003-2004 sampling events will be available late in 2004.

Mitretek Systems (2002) evaluated the 2000-2001 groundwater data for the St. Paul Village area, which includes the FPP. The Mitretek report demonstrated that groundwater in the vicinity of St. Paul Village has high total dissolved solids and can be brackish. Consequently, the groundwater in the area is not suitable for drinking water. The evaluation, in part, provided a rationale for using alternative groundwater cleanup levels that are protective of human health and the environment where the groundwater is not potable. Mitretek concluded in accordance with 18 AAC 75.350 (ADEC 2003) that groundwater in the Village area is not currently used and does not afford any potential future use as a drinking water source. These findings provided the basis for the application of the Ten Times Rule discussed below.

Summary of Applied Cleanup Levels:
NOAA employed ADEC Method Two cleanup criteria, discussed at 18 AAC 75.341(c) (ADEC 2003). Alternative cleanup levels were also applied for some compounds. For benzene, under the TPA, NOAA had the option to cleanup to the less stringent State of Alaska cleanup level in effect in 1991 (ADEC 1991). Additionally, NOAA proposed and ADEC approved the use of alternative cleanup levels under 18 AAC 75.345 and 18 AAC 75.350, commonly referred to as the Ten Times Rule (ADEC 2002, Mitretek Systems 2002). According to these regulations, if groundwater beneath a site contains contaminant concentrations above the cleanup levels provided in ADEC Table C, then the soil may be remediated to levels ten times higher than those provided in Method Two Tables B1 and B2 for the migration to groundwater pathway for those contaminants found in groundwater at concentrations above the cleanup levels provided in ADEC Table C; however, if the inhalation or ingestion pathway values are more stringent than the migration to groundwater pathway, then the more stringent value is to be applied. ADEC uses 15 feet bgs to define subsurface soil to which residents will have a reasonable potential to be exposed through the inhalation or ingestion pathways (ADEC 2003; 18 AAC 75.340 (j)(2)). Therefore, NOAA is not obligated to excavate contaminated soil occurring at depths deeper than 15 feet to address the inhalation and ingestion pathways. Cleanup criteria were applied to the maximum extent practicable (18 AAC 75.325 (f), 18 AAC 75.990).

Summary of Clean up Actions:
Bering Sea Eccotech (BSE) initiated cleanup actions at the FPP on July 18, 2002 (NOAA 2003, Figure 5). Contaminated soils were excavated and removed from the site following the direction of a field engineer (Figures 6 and 7). The soils were loaded directly into trucks and transported to the petroleum-contaminated soil (PCS) stockpile at the St. Paul Blubber Dump Site pending treatment by NOAA's on-site enhanced thermal conduction (ETC) system (BSE 2003).

During the excavation, a concrete structure containing a chase and sump was uncovered (Figure 8). It contained a significant amount of sludge and oily debris. At the direction of the field engineer, sludge from the concrete chase and sump were removed and placed in 55-gallon drums for characterization and disposal.

A total of 420 yd^3 of soil was removed from the FPP site. After excavation activities were completed, confirmation soil samples were collected and analyzed for the petroleum-related compounds identified in the project corrective action plan (NOAA 2002; Figure 3). The site was backfilled with clean soil and restored to grade, and large boulders were placed against the slope to prevent erosion (Figure 9).

Confirmation sample results verified the removal of all soil contamination to alternative cleanup levels or better with the exception of one area (Table 1, Figure 3). Sample SNP9BSS24-010, collected below a concrete slab north of Duna's Kitchen, contained 2,690 mg/kg DRO, exceeding the alternative cleanup level of 2,500 mg/kg. DRO contamination above the more stringent Method Two criterion of 250 mg/kg remains in several locations including at refusal, below the steep slope supporting Short Street, and under portions of the former Post Office building. Therefore, soils were removed from this location to the maximum extent practical. All other target analytes were detected below cleanup levels established for this site.

Recommend Action:
In accordance with paragraph 59 of the Two Party Agreement (NOAA 1996), NOAA requests written confirmation that NOAA completed all corrective action at the Former Power Plant, TPA Site 9b/Site 17 in accordance with the Agreement and that ADEC requires no further remedial action plan from NOAA.

References:

Alaska Department of Environmental Conservation (ADEC). 1991. *Interim Guidance for Non-UST Contaminated Soil Cleanup Levels, Contaminated Sites Program*. July 17, 1991.

ADEC. 2003. Title 18 of the *Alaska Administrative Code 75*, Articles 3 and 9. *Oil and Hazardous Substances Pollution Control Regulations*. State of Alaska. Amended through October 28, 2000.

ADEC. 2002. Letter from Louis Howard, Project Manager, Alaska Department of Environmental Conservation, to John Lindsay, Project Manager, NOAA Pribilof Project Office regarding ADEC conditional approval for applying the Ten Times Rule. May 30.

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For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

9/30/04
Date

Approvals: In accordance with Paragraph 59 of the Two Party Agreement, this is to confirm that all corrective action has been completed at the Former Power Plant, TPA Site 9b/Site 17 in accordance with the Agreement and that no plan for further remedial action is required.

For the Alaska Department of Environmental Conservation

Louis Howard
Alaska Department of Environmental Conservation
Remedial Project Manager

10/11/04
Date

Tables and Figures

Table 1: Excavation Confirmation Sample Results (mg/kg) for the Former Power Plant, TPA 9b/Site 17

							BTEX						PAHs		
PSI Sample No.	**Sample Location**	**Sample Depth (ft bgs)**	**Sample Type (PR/QC)**	**DRO [2500]**	**GRO [300]**	**RRO [10,000]**	**Benzene [0.02]**	**Toluene [5.4]**	**Ethyl-benzene [5.5]**	**P&M-Xylene**	**o-Xy-lene**	**Total Xylenes [78]**	**Fluoran-thene**	**Pyrene**	**PCB Reported**
SNP9BSS01-120	Bottom NW Corner	12	PR	ND (126)	ND (3.44)	159	ND (0.0172)	ND (0.0689)	ND (0.0689)	ND (0.0689)	ND (0.0689)	ND	NA	NA	NA
SNP9BSS02-090	North Sidewall	9	PR	ND (24.6)	ND (4.57)	ND (24.6)	ND (0.0228)	ND (0.0914)	ND (0.0914)	ND (0.0914)	ND (0.0914)	ND	NA	NA	NA
SNP9BSS03-135	Bottom-North	13.5	PR	75.2	ND (4.63)	71	ND (0.0232)	ND (0.0927)	ND (0.0927)	ND (0.0927)	ND (0.0927)	ND	NA	NA	NA
SNP9BSS04-135	Duplicate of Sample -03	13.5	PR	38	ND (4.38)	38.1	ND (0.0241)	ND (0.0966)	ND (0.0966)	ND (0.0966)	ND (0.0966)	ND	NA	NA	NA
SNP9BSS05-085	Bottom -South (@ refusal due to large rocks)	8.5	PR	66.5	ND (5.25)	28.7	ND (0.0263)	ND (0.0105)	ND (0.0105)	ND (0.0105)	ND (0.0105)	ND	NA	NA	NA
SNP9BSS06-100	Bottom-Center (@refusal due to large rocks)	10	PR	2150	ND (4.12)	1680	ND (0.0206)	ND (0.0823)	ND (0.0823)	ND (0.0823)	ND (0.0823)	ND	NA	NA	NA
SNP9BSS07-090	W. Sidewall-South	9	PR	847	ND (3.88)	1290	ND (0.0194)	ND (0.0775)	ND (0.0755)	ND (0.0755)	ND (0.0775)	ND	NA	NA	NA
SNP9BSS08-050	W. Sidewall-North	5	PR	38.1	ND (4.94)	43.7	ND (0.0247)	ND (0.0988)	ND (0.0988)	ND (0.0988)	ND (0.0988)	ND	NA	NA	NA
SNP9BSS09-170	Bottom	16.5	PR	37.8	ND (5.69)	38.1	ND (0.0248)	ND (0.114)	ND (0.114)	ND (0.114)	ND (0.114)	ND	NA	NA	NA
SNP9BSS10-110	South wall	11	PR	103	ND (5.61)	36.4	ND (0.0281)	ND (0.112)	ND (0.112)	ND (0.112)	ND (0.112)	ND	NA	NA	NA
SNP9BSS11-130	East wall	13	PR	ND (25.5)	ND (4.63)	ND (25.5)	ND (0.232)	ND (0.0926)	ND (0.0926)	ND (0.0926)	ND (0.0926)	ND	NA	NA	NA
SNP9BSS12-020	W. Sidewall-South	2	PR	ND (24.9)	ND (5.33)	ND (24.9)	ND (0.0266)	ND (0.107)	ND (0.107)	ND (0.107)	ND (0.107)	ND	NA	NA	NA
SNP9BSS13-030	W. Sidewall-South	3	PR	ND (23.9)	ND (4.56)	ND (23.9)	ND (0.0228)	ND (0.0913)	ND (0.0913)	ND (0.0913)	ND (0.0913)	ND	NA	NA	NA
SNP9BSS14-035	W. Sidewall-South	3.5	PR	ND (24.0)	ND (6.03)	ND (24.0)	ND (0.0302)	ND (0.121)	ND (0.121)	ND (0.121)	ND (0.121)	ND	NA	NA	NA
SNP9BSS15-040	E. Sidewall-South	4	PR	ND (23.6)	ND (3.97)	ND (23.6)	ND (0.0199)	ND (0.0795)	ND (0.0795)	ND (0.0795)	ND (0.0795)	ND	NA	NA	NA

							BTEX						PAHs		
PSI Sample No.	**Sample Location**	**Sample Depth (ft bgs)**	**Sample Type (PR/QC)**	**DRO [2500]**	**GRO [300]**	**RRO [10,000]**	**Benzene [0.02]**	**Toluene [5.4]**	**Ethyl-benzene [5.5]**	**P&M-Xylene**	**o-Xy-lene**	**Total Xylenes [78]**	**Fluoran-thene**	**Pyrene**	**PCB Reported**
SNP9BSS16-060	E. Sidewall-South	6	PR	ND (22.9)	ND (5.30)	ND (22.9)	ND (0.0265)	ND (0.106)	ND (0.106)	ND (0.106)	ND (0.106)	ND	NA	NA	NA
SNP9BSS17-060	Center Side-wall	6	PR	582	ND (5.75)	1110	ND (0.0287)	ND (0.115)	ND (0.115)	ND (0.115)	ND (0.115)	ND	NA	NA	NA
SNP9BSS18-020	N. Sidewall-East	2	PR	954	ND (4.80)	1560	ND (0.0240)	ND (0.0960)	ND (0.0960)	ND (0.0960)	ND (0.0960)	ND	NA	NA	NA
SNP9BSS19-070	N.Sidewall-North	7	PR	1030	ND (5.61)	1720	ND (0.0281)	ND (0.112)	ND (0.112)	ND (0.112)	ND (0.112)	ND	NA	NA	NA
SNP9BSS20-070	Dup. of 19	7	PR	2440	ND (4.81)	2840	ND (0.0241)	ND (0.0962)	ND (0.0962)	ND (0.0962)	ND (0.0962)	ND	NA	NA	NA
SNP9BSS21-090	Below con-crete sump trough	-	PR	644	ND (4.84)	1090	ND (0.0242)	ND (0.0967)	ND (0.0967	ND (0.0967)	ND (0.0967)	ND	ND (61.2)	ND (61.2)	ND (.0380)
SNP9BSS22-075	Bottom - W of concrete slab	-	PR	42.2	ND (5.30)	58.1	ND (0.0265)	ND (0.106)	ND (0.106)	ND (0.106)	ND (0.106)	ND	NA	NA	NA
SNP9BSS23-060	Bottom - W of concrete slab	-	PR	120	ND (3.97)	232	ND (0.0199)	ND (0.0794)	ND (0.0794)	ND (0.0794)	ND (0.0794)	ND	NA	NA	NA
SNP9BSS24-010	1 foot below slab north of Dunas kitchen	3	PR	**2690**	ND (4.13)	2140	ND (0.0207)	ND (0.0827)	ND (0.0827)	ND (0.0827)	ND (0.0827)	ND	ND (59.8)	ND (59.8)	ND (.0364)
SNP9BSS25-020	2 foot below slab north of Dunas kitchen	4	PR	85.9	ND (5.19)	149	ND (0.0259)	ND (0.104)	ND (0.104)	ND (0.104)	ND (0.104)	ND	NA	NA	NA
SNP9BSS26-020	Bottom - Northern limit of exc. W of concrete slab	-	PR	99.7	ND (4.09)	159	ND (0.0204)	ND (0.0818)	ND (0.0818)	ND (0.0818)	ND (0.0818)	ND	NA	NA	NA
SNP9B99TB-03	-	-	QC	NA	ND (2.51)	NA	ND (0.0126)	ND (0.0503)	ND (0.0503)	ND (0.0503)	ND (0.0503)	ND	NA	NA	NA

[###] = Site Cleanup level per Corrective Action Plan (NOAA 2002)
PR = Project Sample
QC = Quality Control Sample
ND = Compound was analyzed but not detected within the limit shown in parenthesis
NA = Sample was not analyzed for that compound
Notes: Analytical results shown in **BOLD** exceed the site cleanup level stated in the Corrective Action Plan (NOAA 2002)
Various compounds analyzed but not detected have been omitted from this spreadsheet for clarity

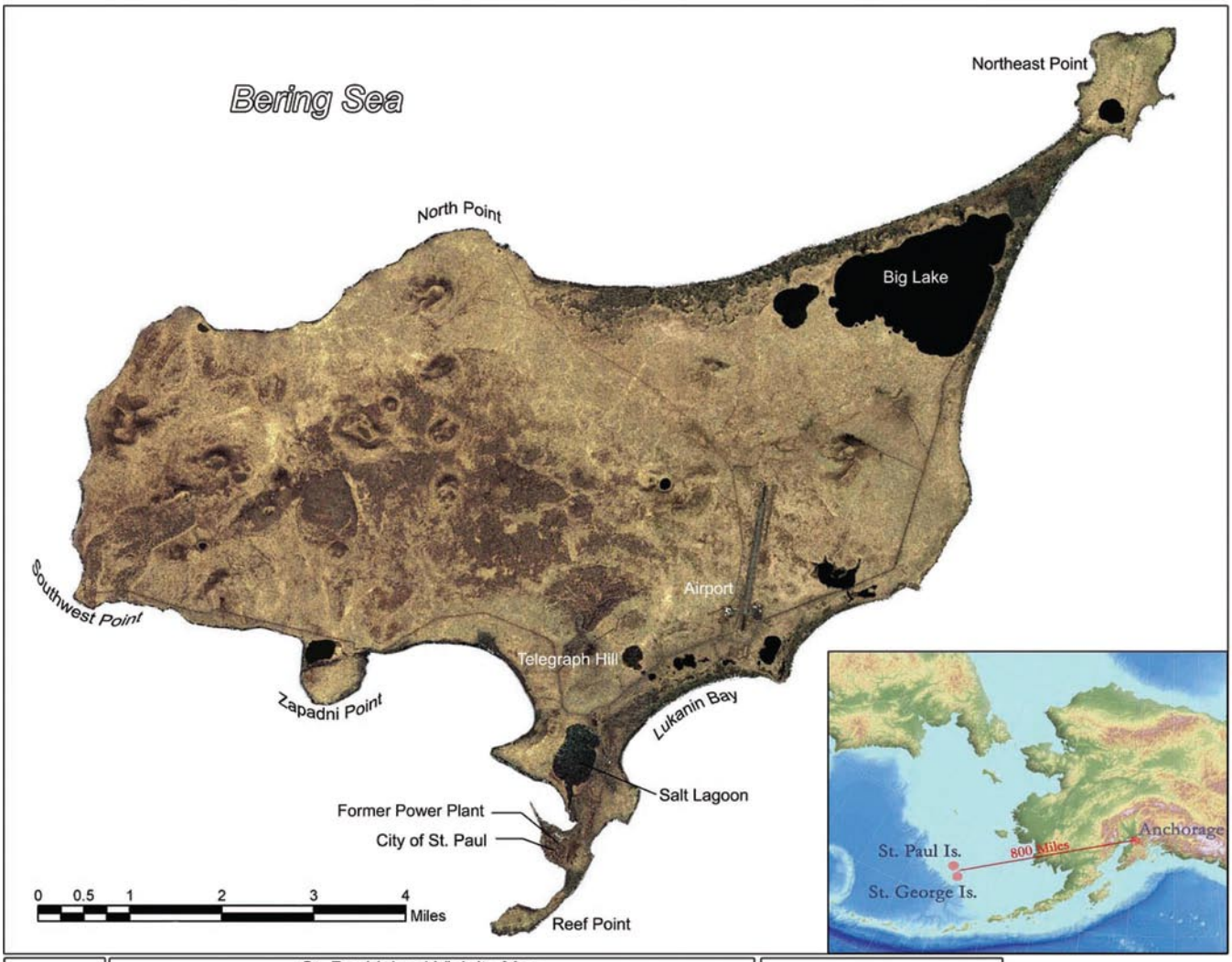

Figure 1	St. Paul Island Vicinity Map Location of the Former Power Plant NOAA Site 17/TPA Site 9b St. Paul Island, Alaska	Source: Ikonos Satellite Imagery, 2001	Pribilof Islands Restoration Project

Figure 2	Legal Property Description Map Former Fuel Drum Storage Site NOAA Site 17/TPA Site 9b St. Paul Island, Alaska	Sources: BLM Tracts (BLM MTPs 1983), TPA 9b Boundary (NOAA GIS 2004), Aerial Photo (Aeromap US 1996).

Pribilof Islands Restoration Project

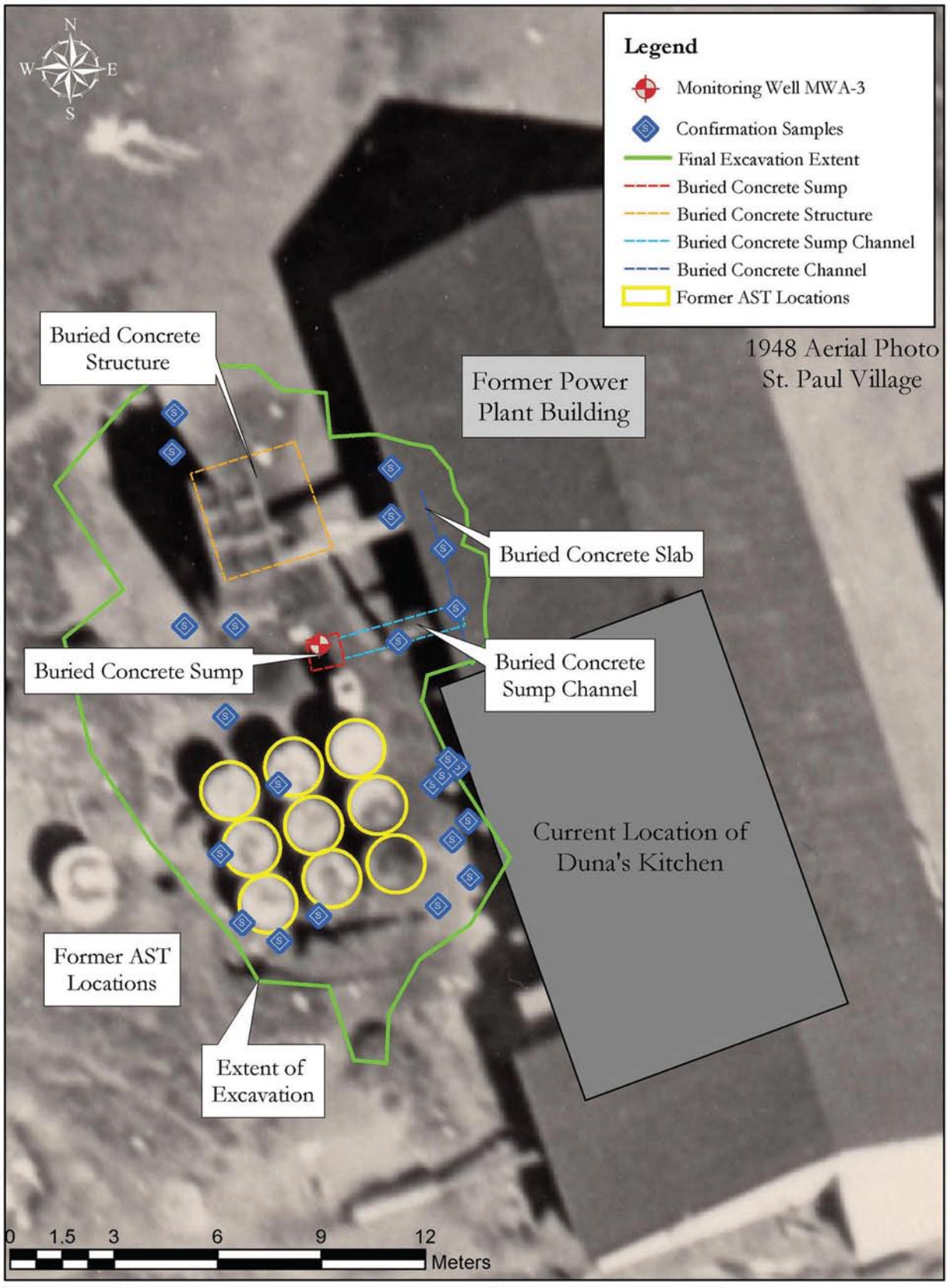

Figure 3	Site Excavation Map Former Power Plant NOAA Site 17/TPA Site 9b St. Paul Island, Alaska	Sources: Monitoring well and site excavation data (NOAA GPS 2002), Aerial Photo (Scheffer 1948).

Pribilof Islands Restoration Project

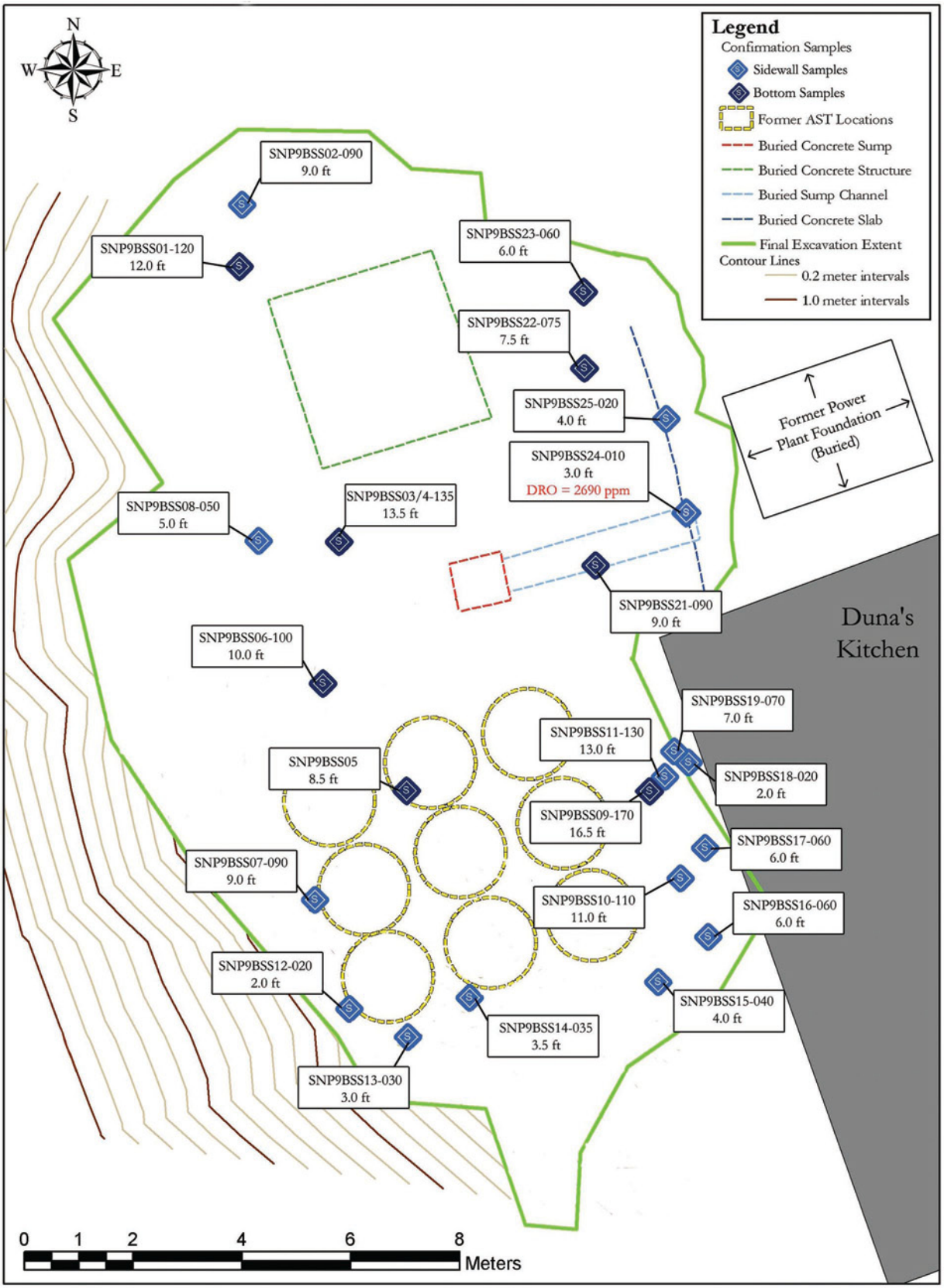

Figure 4	Sampling Location Map Former Power Plant NOAA Site 17/TPA Site 9b St. Paul Island, Alaska	Source: NOAA Pribilof Project Office GIS, 2002.

Pribilof Islands Restoration Project

Figure 5. Former Power plant site prior to excavation

Figure 6. Excavating petroleum contaminated soils northwest of Duna's Kitchen

Figure 7. Excavation of petroleum contaminated soils west and south of Duna's Kitchen

Figure 8. Waste oil trough west of FPP slab – north of Duna's Kitchen

Figure 9. Final grade and rock wall to prevent erosion.

ALASKA

2008-000210-0

Recording Dist: 305 - Aleutian Islands
5/1/2008 2:23 PM Pages: 1 of 7

NOTICE OF ENVIRONMENTAL CLEANUP AND RESIDUAL SOIL AND GROUNDWATER CONTAMINATION AT TPA9b, FORMER POWER PLANT, ST. PAUL ISLAND, ALASKA

Pursuant to 18 AAC 75.375, Tanadgusix Corporation and The Aleut Corporation, as the owners, and the U.S. Department of Commerce/National Oceanic and Atmospheric Administration (NOAA), as the operator of the subject property hereby provides public notice that the property located on Tolstoi Boulevard, St. Paul, St. Paul Island, Alaska 99660 is contaminated with petroleum products. More specifically, the site described as follows: Township 35 South, Range 132 West, Section 25 Tract A Block 1 and Lots 1 and 2 of the Seward Meridian, Alaska , and located at 57° 7' 19.78" North Latitude; 170°16' 51.96" West Longitude, (Figures 1 and 2) has been subjected to petroleum contaminated soil and groundwater contamination, as a result of a discharge, or release and subsequent cleanup of oil or other hazardous substances, regulated under 18 AAC 75, Article 3 as amended October 2005. If contaminated soil or solid wastes are exposed in the future they must be managed in accordance with laws applicable at that time. This release and cleanup are documented in the Alaska Department of Environmental Conservation (ADEC) contaminated sites database under site number *CS Reckey* # 1994250935427; File ID 2644.38.023.02.

The Former Power Plant Site was identified as a potential site of concern pursuant to the *Pribilof Islands Environmental Restoration Two Party Agreement* between the State of Alaska and NOAA (NOAA 1996). NOAA addressed the Former Power Plant Site as TPA Site 9b and NOAA Site 17. Following corrective action, NOAA submitted a request for conditional closure to the ADEC Division of Spill Prevention and Response, Contaminated Sites Program. NOAA's request stated further cleanup was impracticable because contaminated soils remained buried beneath portions of the existing building, below the steep slope at the base of Short Street, and at the soil horizon where consolidated material (rock) impeded excavation (NOAA 2004a). ADEC determined, in accordance with 18 AAC 75.325(f)(1) that site cleanup has been performed to the maximum extent practicable even though residual petroleum contaminated soils, primarily diesel range organics, including kerosene, exist on the site property. ADEC granted a conditional closure, in part subject to this institutional control (deed notice), and confirmed that no further remedial action was required at the site unless new information becomes available that indicates to ADEC that the site may pose an unacceptable risk to human health, safety, welfare to the environment (NOAA 2004a).

Grantor, the US Bureau of Land Management.

Grantees:

- the Tanadgusix Corporation (grantee of the surface estate),
  4300 B Street, Suite 402
  Anchorage, AK 99503-5946

- The Aleut Corporation (grantee of the subsurface estate)
  4000 Old Seward Highway, Suite 300
  Anchorage, AK 99503

Recording District: Aleutian Islands

Remedial Actions and Residual Contamination

The Former Power Plant Site was used by the federal government to generate electricity for the Village of St. Paul and the government's seal industry from circa 1940 to 1960. Up to nine 1,000 gallon above ground storage tanks (ASTs) and one 2,500 gallon AST were placed adjacent to the power plant. The power plant was razed and in 1972, and a U.S. Post Office was constructed on the site. Petroleum contaminated soil consisted of diesel range organics, including kerosene. NOAA removed approximately 420 cubic yards of petroleum contaminated soils from the site during 2002 (NOAA 2004b).The soil horizon at which consolidated material is found varies from approximately six to fourteen feet below ground surface (Figure 3) The site covered a surface area of approximately one-half acre.

NOAA has several groundwater monitoring wells in the vicinity of the site (Figure 4), which are maintained under its long-term groundwater monitoring plan (NOAA 2005). Figure 4 depicts the location of GW wells, groundwater flow direction (Mitretek 2002 and Mitretek 2005), and wells with contamination detected during the most recent sampling in the vicinity of the site (Tutka 2007). The Former Power Plant Site lies within a Critical Water Management Area (CWMA) determined by the Alaska Department of Natural Resources in accordance with 11 Alaska Administrative Code [AAC] 93.500 - 11 AAC 93.530 (ADNR 2006; Dept. Order 148). The CWMA acts as a management or institutional control necessary before a party can apply alternative cleanup levels to a site (18 AAC 75.345). ADEC acceptance of the CWMA determination by ADNR allowed groundwater cleanup criteria and soil cleanup criteria to increase to ten times the Table C and Method Two (18 AAC 75.341) cleanup levels, respectively, for those compounds listed above (ADEC 2002).

Site Use

In the event that information becomes available which indicates that the site may pose an unacceptable risk to human health, safety, welfare or the environment, the land owner and/or operator is required under 18 AAC 75.300 to notify ADEC and evaluate the environmental status of the contamination in accordance with applicable laws and regulations. Further site characterization and cleanup may be necessary under 18 AAC 75.325-.390 and 18 AAC 78.600. Also, any transport, treatment, or disposal of any potentially contaminated soil or water from the site or use of the groundwater at or near the contaminated area requires notification to and approval from the Department in accordance with 18 AAC 75.370(b) and 18 AAC 78.600(h).

In the future, if contaminated soil or wastes are removed from the site it must be characterized and managed following regulations applicable at that time. Pursuant to 18 AAC 75.325(i)(1) and (2) 18 AAC 75.370, ADEC approval is required prior to moving soil or groundwater that is, or has been, subject to the cleanup rules found at 18 AAC 75.325-.390.

This notice remains in effect until a written determination from ADEC is recorded that states that soil and/or groundwater at the site has been shown to meet the most stringent soil cleanup levels in method two of 18 AAC 75.341(c) and/or groundwater meets the cleanup levels in Table C in 18 AAC 75.345, and that off-site transportation of soil and/or groundwater is not a concern.

References:

Alaska Department of Environmental Conservation (ADEC). 2002. Letter from Jennifer Roberts to John Lindsay NOAA. Re: *Draft Final Groundwater Use and Classification in the Vicinity of Tract 46 TPA 9, April 30, 2002*. May 30.

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Alaska Department of Natural Resources (ADNR). 2006. *CWMA Commissioner's Order and Record of Decision, St. Paul Island, Alaska: Title Townsite of the City of St. Paul: Critical Water Management Area Department Order 148.* Includes cover memorandum by Commissioner Michael L. Mange. April 10.

Mitretek Systems. 2002. *Groundwater Use and Classification in the Vicinity of Tract 46, St. Paul Island, Pribilof Islands, Alaska.* May.

Mitretek Systems. 2005. *Tidal Corrections for Groundwater Flow in the Critical Water Management Area and the Diesel Seep, St. Paul Island, Pribilof Islands, Alaska.* August 10.

National Oceanic and Atmospheric Administration (NOAA). 1996. *Pribilof Islands Environmental Restoration Two Party Agreement*, Attorney General's Office File No. 66 1-95-0126. National Oceanic and Atmospheric Administration. January 26.

NOAA. 2004a. *Request for No Further Remedial Action Planned Determination, Former Power Plant TPA 9b Site 17, St. Paul Island, Alaska.* NOAA Site 17/TPA Site 9b, St. Paul Island, Alaska. Signed and submitted by John Lindsay (NOAA) October 6, 2004. Signed by Louis Howard of ADEC, October 11, 2004. ADEC File No. 2644.38.023.02.

NOAA. 2004b. *Corrective Action Report, St. Paul Island, Alaska, TPA Site 9-B –Former Power Plant.* NOAA Pribilof Project Office. July.

NOAA. 2005. *Final Long Term Groundwater Monitoring Plan, St. Paul Island, Alaska.* Prepared by National Oceanic and Atmospheric Administration, National Ocean Service, Office of Response and Restoration, 7600 Sand Point Way NE, Seattle, WA. 98115. August 29.

Tutka. 2007. *Annual Groundwater Monitoring Report 2007, St. Paul Island, Alaska.* December 21. Prepared for NOAA, Office of Response and Restoration, Seattle, WA. 98115.

Please return original copy of this notice to the (operator) address below:

Signature: _____

Printed Name: JOHN A LINDSAY

Mailing Address:
Attn: John Lindsay

US DOC, NOAA, NOS, OR&R, PPO
7600 Sand Point Way NE
Bldg 3, RM 1301
Seattle, WA 98115

(seal) Subscribed and sworn to before me this ___ day of _____, 19___.
Notary Public in and for the State of _____
My commission expires:_____

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2008-000210-0

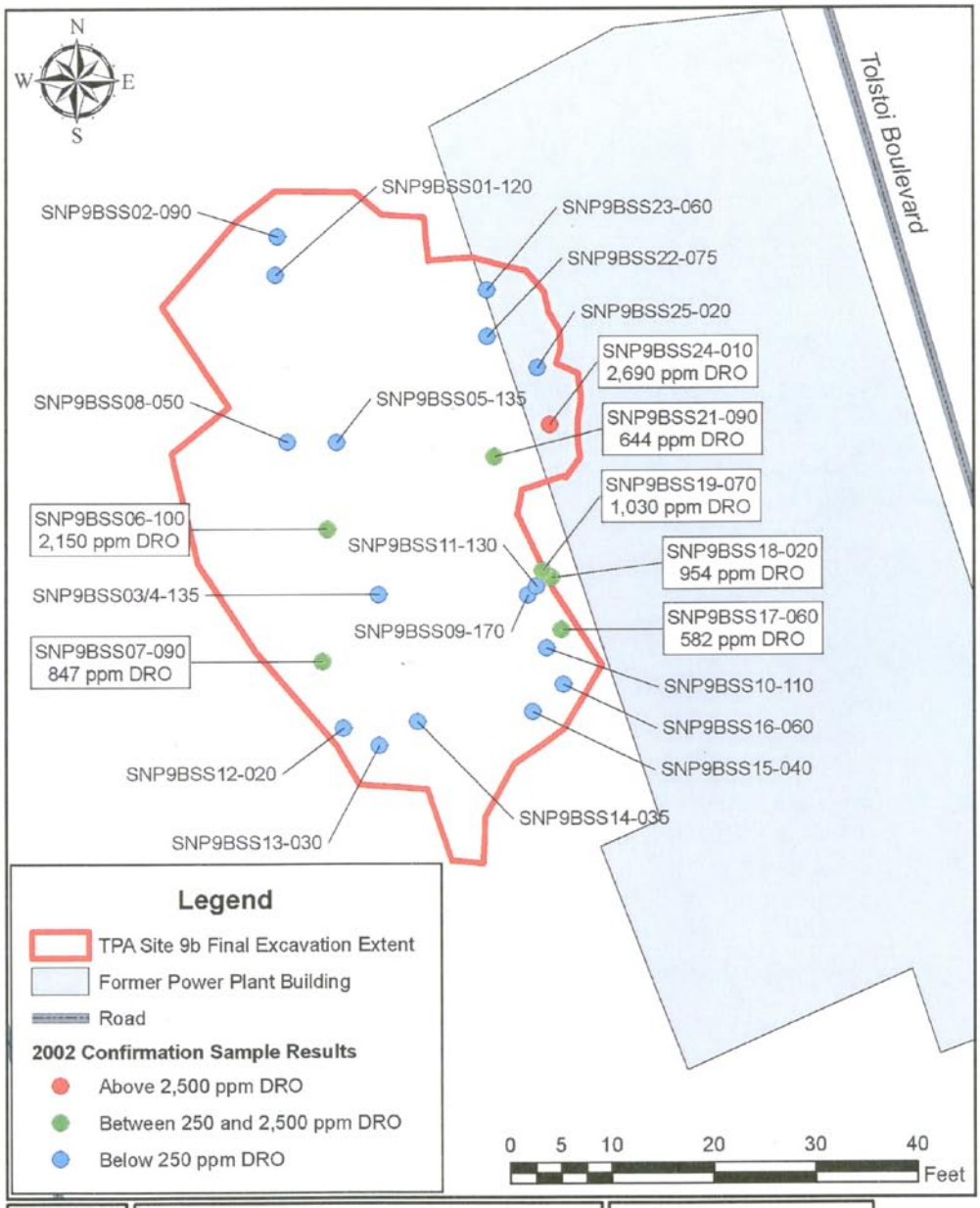

Figure 3	Final Excavation Extent & Confirmation Sampling Results Former Power Plant NOAA Site 17/TPA Site 9b St. Paul Island, Alaska	Sources: Excavation, Building, Road (NOAA Pribilof Project GIS, 2002). Confirmation Samples (2002v3 Chemical Database) Path: C:\KP_GIS Data\Maps & Figures\ SNP\Deed Notices\Site 17, TPA 9b\ FormerPP_Sample&Excavation_Fig3.mxd Date: 4/30/2008 @ 1:07:00 PM

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NOAA Site 18
TPA Site 9c: Decommissioned Power Plant
(USTs Site (Tract 41), TPA 9a; Power Plant (Tract 41) – Includes former Power Plant site, TPA 9b; TPA Attachment A)

Request for Conditional Closure: Decommissioned Power Plant, TPA Site 9c/Site 18, St. Paul Island, Alaska 415

Corrective Action Report, Decommissioned Power Plant Demolition and Contaminated Soil Removal — NOAA Site 18/TPA Site 9c, St. Paul Island, Alaska 431

Request for Conditional Closure
Decommissioned Power Plant, TPA Site 9c/Site 18
St. Paul Island, Alaska

Request for Conditional Closure

Site: Decommissioned Power Plant (DPP), also known as Two Party Agreement (TPA; NOAA 1996) Site 9c and National Oceanic and Atmospheric Administration (NOAA) Site 18

Location: St. Paul Island, Alaska is approximately 800 miles southwest of Anchorage in the Bering Sea. On the island, the Decommissioned Power Plant is located in the City of St. Paul on the northern plain below Village Hill, on the southerly side of Haul Road (57° 7' 25.72" N latitude, 170° 16' 57.30" W longitude; Figure 1).

Legal Property Description: The structure and area of excavation are located in the northern portion of Tract 46, Township 35 south, Range 132 west, Section 25 of the Seward Meridian, Alaska, as shown on the dependent resurvey of a portion of the U.S. Survey No. 4943, Alaska, Tract "A", St. Paul Townsite, officially filed June 3, 1997 (Figure 2). The federal government currently owns the surface and subsurface estate of Tract 46.

Type of Release: Sources of contamination included fuel leaks and spills associated with aboveground storage tanks (ASTs), underground storage tanks (USTs), and fuel transfer pipelines.

History and Background:
The electrical power plant at this site operated from 1960 until its decommissioning in November 1998. The building measured 90 feet (ft) along its east/west axis, and 40 ft along its north/south axis (Hart Crowser 1997). Three ASTs and two 10,000-gallon USTs originally serviced the facility. In 1997, NOAA arranged to remove one UST and closed the other in place (Bristol 1997). The ASTs were not present on site at the time of the 2002 corrective action, though it is not known when or by whom they were removed.

Summary of Site Investigations:
In 1990, NOAA identified two 10,000-gallon USTs at the now decommissioned power plant. One UST was determined to be empty, and the other serviced the then-active power plant (Buckel 1990).

Ecology and Environment, Inc. (E&E) identified two 10,000-gallon UST tanks, UST No. 3 and UST No. 4, in the area of the southeast corner of the DPP building in a 1992 preliminary assessment. This assessment noted that 13 gallons of diesel fuel/water mix had been removed from UST No. 3, while UST No. 4 was still in use, though scheduled to be abandoned in early 1993 (E&E 1993).

Woodward-Clyde Consultants, Inc. (Woodward-Clyde) performed a site inspection at the DPP in 1993. Woodward-Clyde dug a trench along the west side of the power plant up to the northeast corner of the power plant's annex building to locate a drain line but did not encounter a line nor any indication of petroleum contamination. Woodward-Clyde took hand auger borings near the large power plant doors and a valve box on the east side of the building. The suite of laboratory analyses on samples from these locations did not include diesel-range organics (DRO), but Woodward-Clyde reported detecting a diesel odor in a sample collected along the east side of the building. Woodward-Clyde determined that all analytes were well below human health risk-based concentrations (Woodward-Clyde 1994).

During a 1996 expanded site investigation, Hart Crowser, Inc. (Hart Crowser) collected samples from a test pit (TP-4) and hand auger borings (HA-2, HA-3, and HA-4) in the vicinity of the DPP (Hart Crowser 1997). With the exception of the location of HA-4, where refusal was encountered at 5.5 ft below ground surface (bgs), samples were collected to approximately 10 ft bgs. DRO was detected above its Alaska Department of Environmental Conservation (ADEC) Method Two soil cleanup level (18 AAC 75.341) in two samples collected from location HA-3; a sample collected from 0 to 0.5 ft bgs contained 2,600 miligrams/kilogram (mg/kg) DRO, and a sample collected from 10 to 10.5 ft bgs contained 900 mg/kg DRO.

CESI performed site investigation activities in the vicinity of the DPP January 25 through February 4, 1999 (CESI 1999). One emphasis of the investigation was obtaining water quality data from saltwater wells installed during the commercial fur-sealing days for process water. Free product was found in the west Decommissioned Power Plant well (WDPP), the east Decommissioned Power Plant well (EDPP), the west Old Sealing Plant well (WOSP), and the east Old Sealing Plant well (EOSP) (Figure 3). Of the wells, EDPP contained the most product, a viscous, paint-like, light non-aqueous phase liquid (LNAPL). A sample of the product contained 59,000 milligrams/liter (mg/L) DRO and 510,000 mg/L RRO. In groundwater samples collected from WDPP, WOSP, and EOSP (no groundwater sample was collected from EDPP), gasoline-range organics (GRO) exceeded the ADEC Table C cleanup level (1.3 mg/L) only in EOSP. DRO exceeded the cleanup level (1.5 mg/L) in all three groundwater samples. Data indicated that the RRO cleanup level was exceeded in samples from WDPP and WOSP; however, there is no ADEC approved method for analyzing RRO in groundwater. Groundwater salinity in the three wells varied from 4 to 14 parts per thousand.

In 2000 and continuing into 2001, Columbia Environmental Sciences, Inc. (CESI) conducted a site characterization (CESI 2001). Samples were collected at depth intervals at five locations about the DPP: DPP-WRC2, DPP-WRC4, SS46-2-2, DPPSB-2, and DPPSB-1. DRO was the only petroleum hydrocarbon detected above Method Two soil cleanup levels, with exceedances in two places. A sample collected from 2 to 3 ft bgs at location DPP-WRC4 contained 490 mg/kg DRO, and a sample collected from 11 to 12.5 ft bgs at DPPSB-1 contained 2,300 mg/kg DRO.

CESI (2001) again sampled the saltwater wells in October 2000, adding one additional well, pump house number 2 (PH2). CESI found DRO exceeding the ADEC Table C cleanup level in all five wells, with the highest concentration of 13 mg/L DRO detected in WOSP. GRO exceeded the Table C cleanup level in two wells, EOSP (3.5 mg/L) and WOSP (1.6 mg/L). Benzene was detected above its Table C cleanup level in every well except WDPP, with the highest concentration of 0.16 mg/L detected in WOSP.

CESI installed several groundwater monitoring wells (MW46-5, MW46-6, MW46-9, MW46-23, and MW46-28) at and around the DPP site (Figure 3). CESI sampled wells MW46-5 and MW46-6 once in 2000. CESI and IT Alaska Inc. (IT) sampled wells MW46-9, MW-23, and MW-28 five times, roughly quarterly, between September 2000 and September 2001 (CESI 2001, IT 2002). Groundwater analyses revealed DRO and benzene above ADEC Table C criteria in up gradient wells MW46-5, MW46-6, and MW46-28 (IT 2002). Additionally, GRO were detected above the Table C cleanup level in wells MW46-6 and MW46-28, and toluene was detected above the Table C cleanup level in MW46-28. In down gradient well MW46-9, DRO exceeded its Table C cleanup level. Tetrachloroethene, also known industrially as perchloroethylene (PCE), exceeded its Table C cleanup level during two sampling events at MW46-9, located adjacent to the Trident Seafoods facility and a former sewer line running from the DPP. The source of the PCE is unknown, and PCE was not considered part of this corrective action.

Tetra Tech EMI conducted groundwater monitoring in the vicinity of the DPP quarterly from October 2003 to July 2004. DRO were detected above the Table C cleanup level in four up gradient wells, MW46-30, MW46-5, MW46-6, and MW46-28. GRO, benzene, and toluene were also detected above Table C cleanup levels in some of these up gradient wells (Figure 3). In down gradient well MW46-9, the DRO concentration had decreased since 2000/2001 monitoring to a level below the Table C cleanup level.

Mitretek Systems (2002) evaluated the 2000-2001 groundwater data for the St. Paul Village area, which includes the DPP. The Mitretek report demonstrated that groundwater in the vicinity of St. Paul Village has high total dissolved solids and can be brackish. Consequently, the groundwater in the area is not suitable for drinking water. The evaluation, in part, provided a rationale for using alternative groundwater cleanup levels that are protective of human health and the environment where the groundwater is not potable. Mitretek concluded in accordance with 18 AAC 75.350 (ADEC 2000) that groundwater in the village area is not currently used and does not afford any potential future use as a drinking water source. These findings provided the basis for the application of the Ten Times Rule discussed below.

Summary of Applied Cleanup Levels:
NOAA employed ADEC Method Two cleanup criteria, discussed at 18 AAC 75.341(c) (ADEC 2000). Alternative cleanup levels were also applied for some compounds. For benzene, under the TPA (NOAA 1996), NOAA had the option to cleanup to the less stringent State of Alaska cleanup level (0.5 mg/kg) in effect in 1991 (ADEC 1991). Additionally, NOAA proposed and ADEC approved the use of alternative cleanup levels under 18 AAC 75.345 and 18 AAC 75.350, commonly referred to as the Ten Times Rule (ADEC 2002, Mitretek Systems 2002). According to these regulations, if groundwater beneath a site contains contaminant concentrations above the cleanup levels provided in ADEC Table C, then the soil may be remediated to levels ten times higher than those provided in Method Two Tables B1 and B2 for the migration to groundwater pathway for those contaminants found in groundwater at concentrations above the cleanup levels provided in ADEC Table C; however, if the inhalation or ingestion pathway values are more stringent than the migration to groundwater pathway, then the more stringent value is to be applied. ADEC uses 15 ft bgs to define subsurface soil to which residents will have a reasonable potential to be exposed through the inhalation or ingestion pathways (ADEC 2000; 18 AAC 75.340 (j)(2)). Therefore NOAA is not obligated to excavate contaminated soil occurring at depths deeper than 15 ft to address the inhalation and ingestion pathways. Cleanup criteria were applied to the maximum extent practicable (18 AAC 75.325 (f), 18 AAC 75.990).

Summary of Cleanup Actions:
In 1997, Bristol Environmental Services Corporation (Bristol) removed one of the 10,000-gallon USTs (UST No. 3; Facility Identification Number 3048), while closing the second UST (UST No. 4; Facility Identification Number 3048) in place. During UST No. 3 removal, Bristol removed 40 cubic yards (CY), of petroleum contaminated soil (PCS). The UST excavation measured 15 ft by 20 ft to a depth of 13 ft. DRO and benzene, toluene, ethylbenzene, and xylenes (BTEX) concentrations measured in three soil samples collected below the UST at approximately 14 ft bgs ranged from non-detect to 120 mg/kg, and non-detect to 0.10 mg/kg, respectively. At UST No. 4, a soil sample was taken at 6 ft bgs adjacent to the fill/vent pipe along side the UST. Bristol found this sample to contain 7,400 mg/kg DRO and 0.98 mg/kg BTEX (Bristol 1997).

Corrective action activities at the DPP were conducted during two phases in 2002 (NOAA 2002a, 2002b, and 2004). Figures 4-10 provide photographic documentation of these activities.

Phase I included the excavation of PCS from two areas of concern (Figure 11). Area 1 was associated with the previously decommissioned in-place 10,000-gallon UST (UST No.4). Area 2 was associated with previous soil sample HA-3/S-1 containing DRO at 2,600 mg/kg. NOAA's contractor initiated Phase I activities on July 30, 2002 and completed activities on August 5, 2002.

The contractor removed approximately 260 CY of PCS from Area 1. The maximum excavation depth approached 15 ft. Boulders and fractured rock prohibited excavation to greater depths. The UST was found to be oriented east-west, with the majority of the tank situated below the DPP's concrete floor slab (Figure 6). The field engineer collected 15 project confirmation samples from the excavation floor and sidewalls. After completion of confirmation sampling, the excavation area was lined with visqueen and backfilled with clean soil.

The contractor removed approximately 8 CY of soil from Area 2. The excavation measured approximately 10 ft by 10 ft to a depth of approximately 2 ft bgs. A visual inspection and field screen sample of in-place soils gave no indication that the area contained additional contamination. Following the collection of a single confirmation sample from the Area 2 excavation floor, the site was backfilled and graded with clean soil.

Confirmation soil samples collected during Phase I and analyzed for residual-range organics (RRO), DRO, GRO, BTEX, polynuclear aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs) revealed two exceedances of the DRO Ten Times Rule cleanup level of 2,500 mg/kg (Table 1, Figure 12). One of these samples, SNP9CSS02, containing 6,220 mg/kg DRO was collected from the bottom of the Area 1 excavation, at refusal. The other sample, SNP9CSS13, containing 7,110 mg/kg DRO was a duplicate of SNP9CSS08 in which DRO was not detected. Soil from this location was further excavated during Phase II activities. No other cleanup level exceedances were detected in Phase I confirmation samples. [Note: PAH analytes in samples SNP9CSS01 and 02 were reported as ND with PQLs above cleanup levels.]

Phase II of the DPP corrective action proceeded based upon the results and findings of Phase I activities. After reviewing the preliminary analytical data and the extent of contamination encountered during the Phase I, NOAA elected to remove the decommissioned 10,000-gallon UST (*i.e.*, UST No. 4) from the site along with any additional PCS encountered during removal (NOAA 2002b).

Phase II activities at the DPP began on November 6, 2002 with the demolition of the west portion of the DPP building overlying the concrete floor slab and UST. Demolition included the removal of approximately 15 ft by 90 ft of the southern portion of the building and approximately 15 ft by 60 ft of the building foundation and floor slab. The contractor transported wood building debris to the city landfill for incineration. Concrete debris removed from the site was staged on the concrete slab of the former DPP Annex located immediately west of the DPP building. Other debris was either salvaged by local community members, or staged at the NOAA Garco building on Tract 50 for final disposition or recycling. Sumps within the concrete building slab were cleaned of water, sludge, and debris before demolition of the pad.

The contractor removed and stockpiled the clean backfill material applied following Phase I activities. The contractor then removed PCS and loaded it into dump trucks for transport to the Blubber Dump PCS stockpile. Pipes and pipe appurtenances encountered during the first three to four vertical feet of excavation were removed when possible. Piping that terminated below the concrete building slab could not be removed, and was drained of fluids when necessary and crimped on the end. In addition, near the eastern limits of the excavation, a valve vault with abandoned piping was removed.

Soils were removed from both sides of the tank to approximately mid-tank (4 ft below the top of the tank) to provide a platform to stand on while facilitating the removal of the UST's contents. At this time, it was determined that the tank contained only several cubic yards of sand with water constituting the remaining volume. The tank appeared in good condition with no major deterioration or defects. A small hole (approximately 18 inches by 18 inches) had been cut into the top eastern end of the tank at the time of its in-place closure. This hole had not been previously sealed and therefore allowed water to enter the tank over time. The contractor pumped more than 9,000 gallons of water from the UST into a portable tank for transport to the Blubber Dump PCS stockpile for disposal. After removing the water from the UST, a series of cuts were made in the tank in order for the excavator to remove the remaining sands from inside. Sands removed from the tank were transported to the Blubber Dump PCS stockpile for future treatment and disposal.

NOAA coordinated the use of the Central Bering Sea Fisherman's Association (CBSFA) crane to remove the tank from the excavation on November 14, 2002. Following cleaning, the UST was cut into manageable pieces, and in July 2003, it was shipped off island for recycling in Seattle, Washington.

During Phase II activities, the contractor removed approximately 160 CY of PCS from the excavation along the south side of the DPP up to the concrete slab of the remaining structure. The field engineer collected eight confirmation samples from the excavation floor and walls. After confirmation samples were collected, the excavation was backfilled with clean soil and restored to the surrounding grade.

The eight confirmation samples collected at the end of Phase II activities and analyzed for DRO, RRO, GRO, BTEX, PAHs, and PCBs revealed three exceedances of the DRO Ten Times Rule cleanup level of 2,500 mg/kg (Table 1, Figure 12). Further excavation was not feasible at the location of each of these exceedances. Sample SNP9CSS39, containing 5,080 mg/kg DRO, was taken from the bottom of the excavation, at refusal. Sample SNP9CSS44, containing 8,280 mg/kg DRO, was collected at the east excavation sidewall near the valve vault where utility lines precluded excavation. Finally, sample SNP9CSS45, containing 4,120 mg/kg DRO, was taken at the north excavation sidewall, under the DPP footings. Total xylenes were detected above the cleanup level of 78 mg/kg in sample SNP9CSS40, with a concentration of 84.7 mg/kg. This sample was collected along the north excavation sidewall, under the DPP footings where soil could not be further excavated. No other cleanup level exceedances were detected.

Recommended Action:

In accordance with paragraph 59 of the Two Party Agreement (NOAA 1996), NOAA requests written confirmation that NOAA completed all appropriate corrective action, to the maximum extent practicable, at the Decommissioned Power Plant, TPA Site 9c/Site 18 in accordance with the Agreement and that ADEC grant a conditional

closure not requiring further remedial action from NOAA. NOAA understands ADEC will/may require additional containment, investigation, or cleanup if subsequent information indicates that the level of contamination that remains does not protect human health, safety, or welfare, or the environment.

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For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

1/31/05
Date

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 Decommissioned Power Plant, TPA Site 9c/Site 18 in accordance with the Agreement and that no further remedial action is required 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

2/11/05
Date

Tables and Figures

Table 1. Soil Analytical Data Summary for Petroleum Hydrocarbons, Benzene, Toluene, Ethylbenzene, and Xylenes (mg/kg) at the Decommissioned Power Plant, TPA Site 9c/Site 18.

		Diesel Range Organics	Residual Range Organics	Gasoline Range Organics	Benzene	Ethyl-benzene	o-Xylene	p & m -Xylene	Toluene
ADEC Method Two Cleanup Levels (mg/kg)		*250*	*10,000*	*300*	*0.02*	*5.5*	*78*[a]	*78*[a]	*5.4*
Alternative Cleanup Levels (mg/kg)[b]		*2,500*	*NA*	*1400*[c]	*0.5*[d]	*NA*	*NA*	*NA*	*54*
Sample ID	**Sample Type**								
SNP9CSS19	Borrow Source	ND (23.5)	26.3	ND (5.12)	ND (0.0256)	ND (0.102)	ND (0.102)	ND (0.102)	ND (0.102)
SNP9CSS20	Borrow Source	ND (24.8)	41.2	ND (4.09)	ND (0.0204)	ND (0.0818)	ND (0.0818)	ND (0.0818)	ND (0.0818)
SNP9CSS13	Duplicate of SNP9CSS8	7110	ND (1210)	12.7	0.0382	ND (0.0766)	0.228	0.348	0.179
SNP9CSS15	Duplicate of SNP9CSS14	214	60.7	ND (3.18)	ND (0.0159)	0.0872	0.0979	0.326	0.09
SNP9CSS01	Excavation Confirmation	1660	ND (136)	61.5	ND (0.0238)	0.305	0.156	0.399	ND (0.0951)
SNP9CSS02	Excavation Confirmation	6220	ND (251)	13	ND (0.0191)	ND (0.0764)	0.0767	ND (0.0764)	ND (0.0764)
SNP9CSS03	Excavation Confirmation	ND (24.9)	ND (24.9)	ND (4.72)	ND (0.0236)	ND (0.0944)	ND (0.0944)	ND (0.0944)	ND (0.0944)
SNP9CSS04	Excavation Confirmation	176	ND (22.9)	ND (4.22)	ND (0.0211)	ND (0.0844)	ND (0.0844)	ND (0.0844)	ND (0.0844)
SNP9CSS05	Excavation Confirmation	ND (22.7)	34.9	ND (3.59)	ND (0.0179)	ND (0.0718)	ND (0.0718)	ND (0.0718)	ND (0.0718)
SNP9CSS06	Excavation Confirmation	65.8	515	ND (2.34)	ND (0.0117)	ND (0.0468)	ND (0.0468)	ND (0.0468)	ND (0.0468)
SNP9CSS07	Excavation Confirmation	ND (23.8)	42.3	ND (4.14)	ND (0.0207)	ND (0.0828)	ND (0.0828)	ND (0.0828)	ND (0.0828)
SNP9CSS08	Excavation Confirmation	ND (22.6)	ND (22.6)	ND (4.36)	ND (0.0218)	ND (0.0873)	ND (0.0873)	ND (0.0873)	ND (0.0873)
SNP9CSS10	Excavation Confirmation	ND (21.7)	ND (21.7)	ND (3.81)	ND (0.0191)	ND (0.0763)	ND (0.0763)	ND (0.0763)	ND (0.0763)
SNP9CSS11	Excavation Confirmation	ND (23.4)	ND (23.4)	ND (3.57)	ND (0.0179)	ND (0.0714)	ND (0.0714)	ND (0.0714)	ND (0.0714)
SNP9CSS12	Excavation Confirmation	ND (22.8)	47.6	ND (3.8)	ND (0.019)	ND (0.0759)	ND (0.0759)	ND (0.0759)	ND (0.0759)
SNP9CSS14	Excavation Confirmation	182	51.9	5.46	ND (0.0217)	0.167	0.19	0.648	0.171
SNP9CSS16	Excavation Confirmation	ND (21.8)	ND (21.8)	ND (3.46)	ND (0.0173)	ND (0.0693)	ND (0.0693)	ND (0.0693)	ND (0.0693)
SNP9CSS39	Excavation Confirmation	5080	ND (253)	86.4	ND (0.0298)	0.162	1.99	0.451	ND (0.119)
SNP9CSS40	Excavation Confirmation	1670	843	332	0.0433	3.07	5.39	9.12	0.735

		Diesel Range Organics	Residual Range Organics	Gasoline Range Organics	Benzene	Ethyl-benzene	o-Xylene	p & m -Xylene	Toluene
SNP9CSS41	Excavation Confirmation	1740	ND (243)	132	ND (0.0174)	0.177	2.6	0.628	0.173
SNP9CSS42	Excavation Confirmation	1540	ND (239)	140	ND (0.0209)	0.161	2.48	0.578	0.128
SNP9CSS43	Excavation Confirmation	60.7	175	7.11	ND (0.0218)	ND (0.0871)	0.129	0.0933	0.0934
SNP9CSS44	Excavation Confirmation	8280	ND (1090)	107	ND (0.0367)	0.541	2.04	2.64	ND (0.147)
SNP9CSS45	Excavation Confirmation	4120	ND (1030)	226	ND (0.0534)	0.434	5.71	1.35	ND (0.214)
SNP9CSS46	Excavation Confirmation	ND (20.9)	ND (20.9)	ND (3.69)	ND (0.0185)	ND (0.0738)	ND (0.0738)	ND (0.0738)	ND (0.0738)
SNP9CSS17	In-Place Fill	ND (23.4)	26.7	ND (3.65)	ND (0.0183)	ND (0.0731)	ND (0.0731)	ND (0.0731)	ND (0.0731)
SNP9CSS18	In-Place Fill	ND (22.9)	24.6	ND (3.45)	ND (0.0173)	ND (0.069)	ND (0.069)	ND (0.069)	ND (0.069)
SNP9CSS28-015	In-Place Fill	ND (23.3)	ND (23.3)	ND (3.44)	ND (0.0172)	ND (0.0688)	ND (0.0688)	ND (0.0688)	ND (0.0688)
SNP9CSS29-015	In-Place Fill	ND (23.1)	ND (23.1)	ND (3.02)	ND (0.0151)	ND (0.0605)	ND (0.0605	ND (0.0605)	ND (0.0605)
SNP9CSS30-015	In-Place Fill	ND (23.1)	25.4	ND (2.85)	ND (0.0143)	ND (0.057)	ND (0.057)	ND (0.057)	ND (0.057)
SNP9CSS31-015	In-Place Fill	ND (22.3)	ND (22.3)	ND (3.01)	ND (0.0151)	ND (0.0603)	ND (0.0603)	ND (0.0603)	ND (0.0603)
SNP9CSS32-015	In-Place Fill	ND (23)	25.3	ND (3.17)	ND (0.0158)	ND (0.0633)	ND (0.0633)	ND (0.0633)	ND (0.0633)
SNP9CSS33-015	In-Place Fill	ND (23.2)	28.7	ND (3.37)	ND (0.0168)	ND (0.0673)	ND (0.0673)	ND (0.0673)	ND (0.0673)
SNP9CSS34	In-Place Fill	ND (23.5)	31.1	ND (4.24)	ND (0.0212)	ND (0.0847)	ND (0.0847)	ND (0.0847)	ND (0.0847)
SNP9CSS35	In-Place Fill	ND (24.7)	27.8	ND (4.83)	ND (0.0241)	ND (0.0965)	ND (0.0965)	ND (0.0965)	ND (0.0965)
SNP9CSS36	In-Place Fill	ND (25)	39.1	ND (3.2)	ND (0.016)	ND (0.064)	ND (0.064)	ND (0.064)	ND (0.064)
SNP9CSS37	In-Place Fill	ND (24.9)	40.3	ND (4.65)	ND (0.0232)	ND (0.0929)	ND (0.0929)	ND (0.0929)	ND (0.0929)
SNP9CSS38	In-Place Fill	ND (24.8)	39.2	ND (3.12)	ND (0.0156)	ND (0.0623)	ND (0.0623)	ND (0.0623)	ND (0.0623)
SNP9CSS21	Sand in UST	2870	ND (255)	11	ND (0.0134)	0.211	0.117	0.398	ND (0.0535)
SNP9CSS23-015	Stockpile Samples	860	641	ND (2.89)	ND (0.0145)	ND (0.0578)	ND (0.0578)	0.0658	ND (0.0578)
SNP9CSS24-015	Stockpile Samples	619	374	ND (3.67)	ND (0.0184)	ND (0.0734)	ND (0.0734)	ND (0.0734)	ND (0.0734)
SNP9CSS25-015	Stockpile Samples	391	251	ND (4.1)	ND (0.0205)	ND (0.0819)	ND (0.0819)	ND (0.0819)	ND (0.0819)
SNP9CSS26-015	Stockpile Samples	384	240	ND (3.19)	ND (0.0159)	ND (0.0638)	ND (0.0638)	ND (0.0638)	ND (0.0638)

		Diesel Range Organics	Residual Range Organics	Gasoline Range Organics	Benzene	Ethyl-benzene	o-Xylene	p & m -Xylene	Toluene
SNP9CSS27-015	Stockpile Samples	601	274	ND (3.31)	ND (0.0166)	ND (0.0662)	ND (0.0662)	ND (0.0662)	ND (0.0662)
SNP9CSS47	Sump Sludge Drum Char.	3330	6790	ND (6.39)					
SNP9CSS48	Sump Sludge Drum Char.	1160	2940	ND (4.24)					

Notes

a Cleanup level is for total xylenes; therefore, o-xylene and p&m-xylene combined must meet the cleanup level.

b Unless otherwise noted, the alternative cleanup level is based on the "Ten Times Rule" discussed in Title 18 of the *Alaska Administrative Code* 75, "Oil and Hazardous Substances Pollution Control Regulations," amended through October 28, 2000, sections 75.345 and 75.350.

c Cleanup level based on the most stringent value associated with ingestion and inhalation pathways.

d Under the Two Party Agreement, NOAA is required to comply with the 1991 ADEC cleanup level for benzene (0.5 mg/kg); however, NOAA has attempted to remove benzene to within the current ADEC Method Two cleanup level (0.02 mg/kg) when possible.

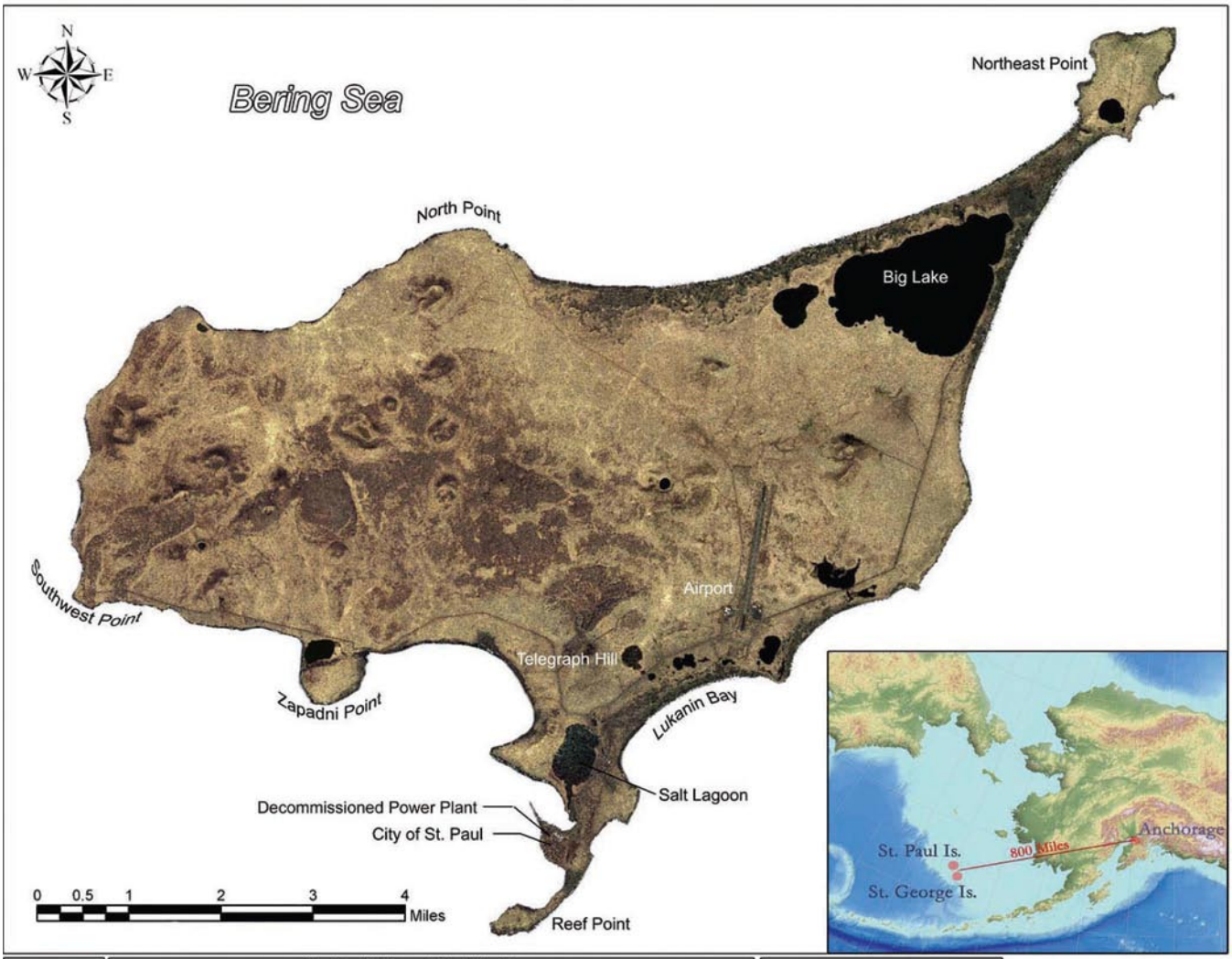

Figure 1

St. Paul Island Vicinity Map
Location of the Decommissioned Power Plant
NOAA Site 18/TPA Site 9c
St. Paul Island, Alaska

Source: Ikonos Satellite Imagery, 2001

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Figure 2	Legal Property Description Map Decommissioned Power Plant NOAA Site 18/TPA Site 9c St. Paul Island, Alaska	Sources: BLM Tracts (BLM MTPs 1983), TPA 9c Boundary (NOAA GIS 2004), Aerial Photo (Aeromap US 1996).

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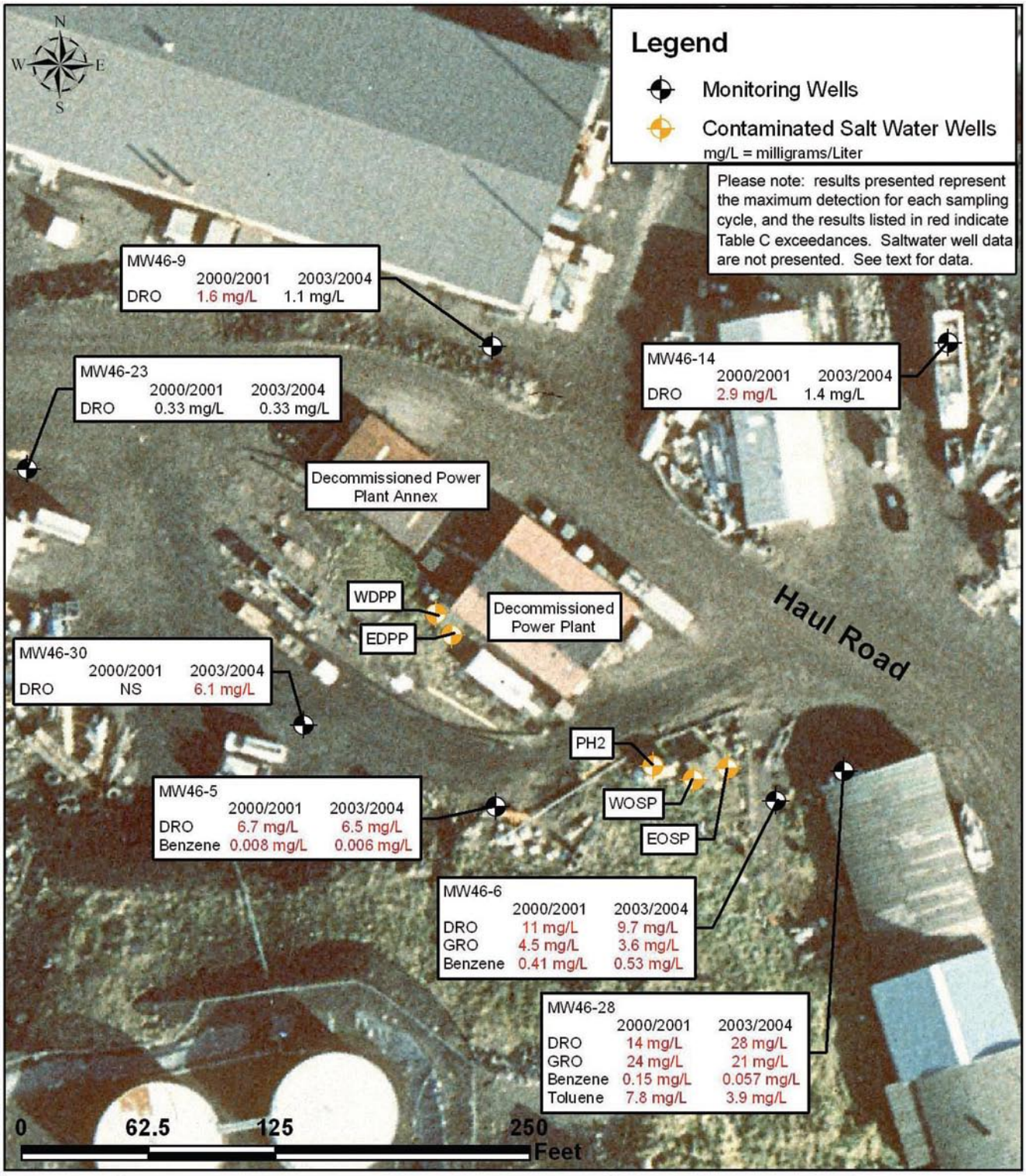

Figure 3	Groundwater Sampling Results Decommissioned Power Plant Site 18/TPA Site 9c St. Paul Island, Alaska	Sources: Monitoring Well Locations (NOAA GPS 2004), Aerial Photography (Aeromap US 1996).

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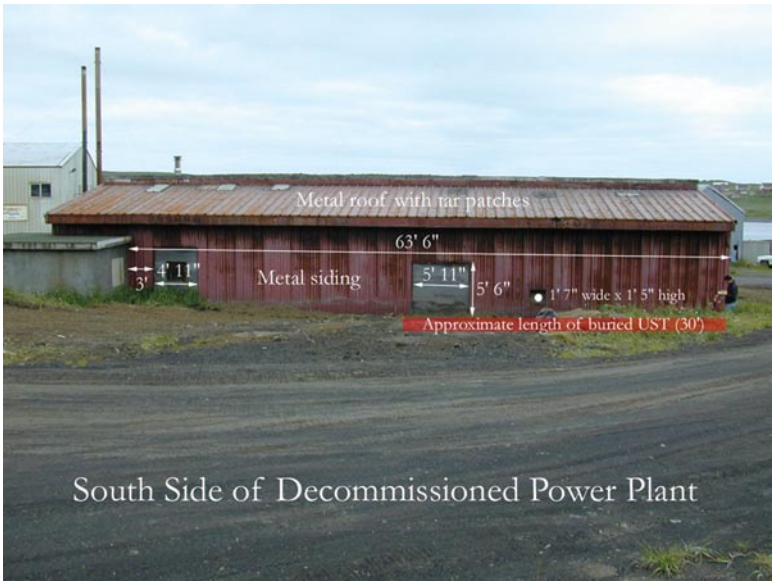

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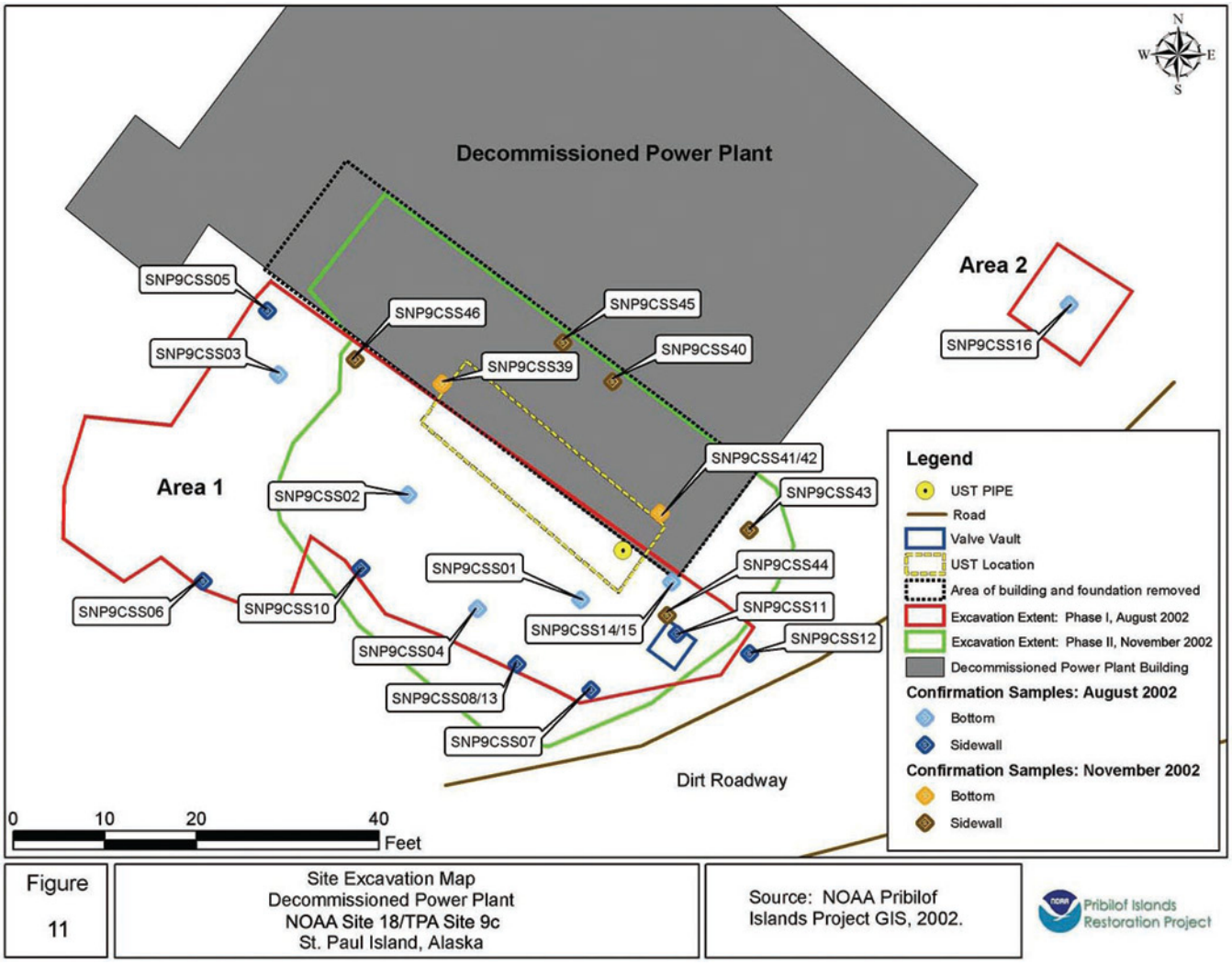

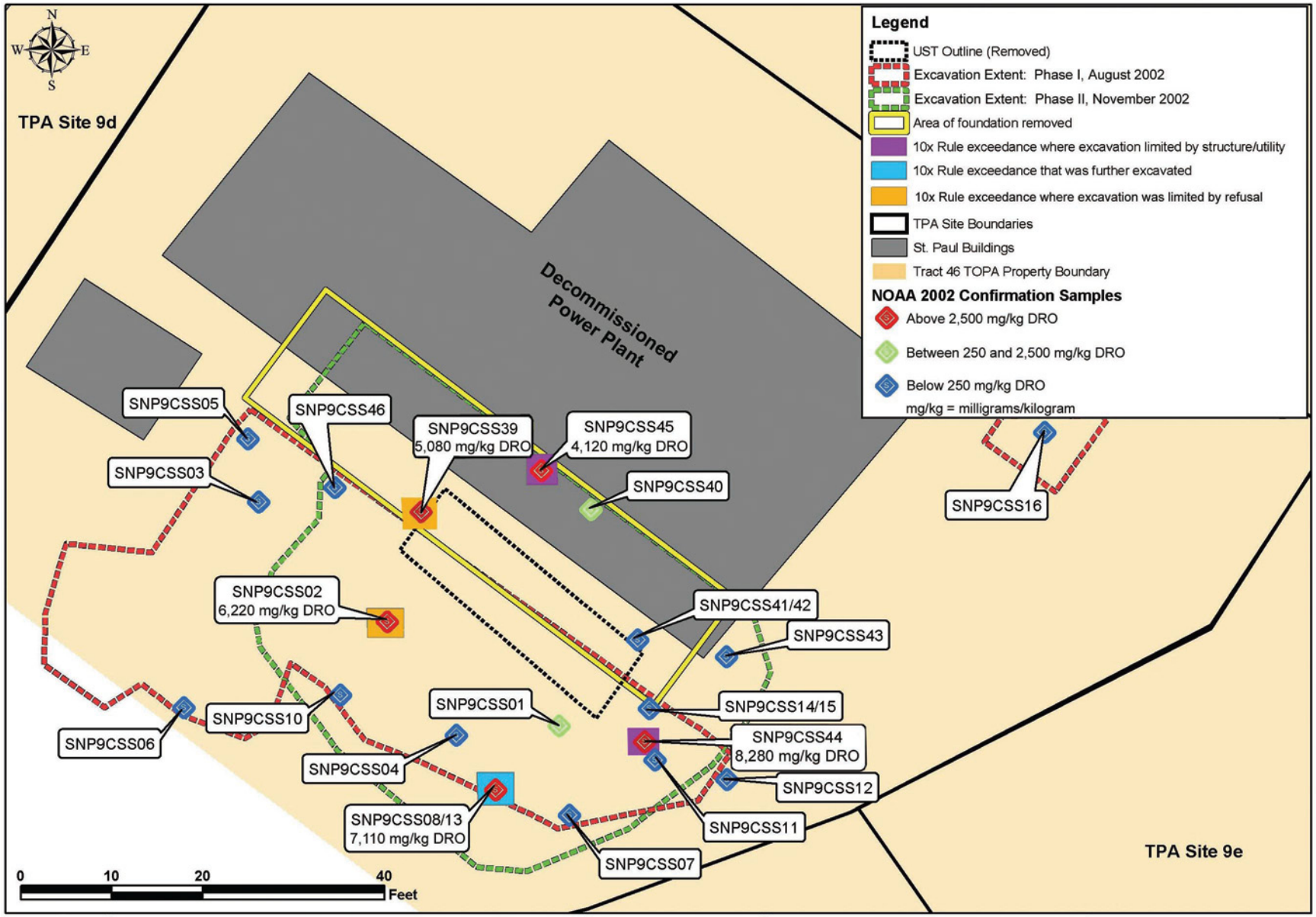

Figure 12

Confirmation Sample Results
Decommissioned Power Plant
NOAA Site 18/TPA Site 9c
St. Paul Island, Alaska

Sources: Excavation Extents, UST Location, Foundation Removed, and Confirmation Samples (NOAA GPS 2002), Building locations, TOPA Boundary, and TPA Site Boundary (NOAA GIS 2004).

Pribilof Islands Restoration Project

Corrective Action Report

Decommissioned Power Plant Demolition and Contaminated Soil Removal — NOAA Site 18/TPA Site 9c

St. Paul Island, Alaska

April 1, 2008

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ACRONYMS AND ABBREVIATIONS

AA	Alaska Abatement Corporation
AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
AST	above ground storage tank
bgs	below ground surface
BSE	Bering Sea Eccotech, Inc.
BTEX	benzene, toluene, ethylbenzene, and total xylenes
CAP	corrective action plan
CAR	corrective action report
CESI	Columbia Environmental Sciences, Inc.
CFR	Code of Federal Regulations
cm	centimeter
CSM	conceptual site model
CY	cubic yard
DPP	decommissioned power plant
DRO	diesel-range organics
e^2M	engineering-environmental Management, Inc.
E&E	Ecology & Environment
EPA	U.S. Environmental Protection Agency
ft	feet
GIS	geographic information system
GPS	global positioning system
GRO	gasoline-range organics
IDW	investigation-derived waste
LBP	lead-based paint
MDL	method detection limit
mg/kg	milligram per kilogram
mg/L	milligram per liter
MS/MSD	matrix spike/matrix spike duplicate
LCG	Larson Consulting Group
NOAA	National Oceanic and Atmospheric Administration
PAH	polynuclear aromatic hydrocarbon
PCS	petroleum contaminated soil
PID	photo ionization detector
PPO	Pribilof Project Office
QAP	quality assurance plan
RRO	residual-range organics
SGS	SGS Environmental Services, Inc. of Anchorage, Alaska
TCLP	Toxicity Characteristic Leaching Procedure
TLC	thin-layer chromatography
TPA	Two-Party Agreement
Tutka	Tutka Services LLC
UST	underground storage tank
VOCs	volatile organic compounds

EXECUTIVE SUMMARY

The U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), through its Office of Response and Restoration, Pribilof Project Office (PPO) is responsible for site characterization and restoration activities on St. Paul Island, Alaska (Figure 1). The PPO conducts these activities at several sites on the Pribilof Islands according to the Two Party Agreement (TPA) between NOAA and the State of Alaska. This corrective action report details corrective actions conducted at the Decommissioned Power Plant site (NOAA Site 18/TPA Site 9c), including the adjacent pump house, on St. Paul Island. This report was prepared by NOAA.

The Decommissioned Power Plant (DPP) was located at the base of Village Hill, just northwest of the former Municipal Garage building (Figure 2). The building was the location of the island's primary power generating facility from approximately 1960 to 1998. The DPP was most recently used by NOAA for storage of equipment, supplies, and miscellaneous items. The adjacent pump house was constructed in 1963 and water from its two wells was reportedly used for processing fur-seal pelts, in fish processing, and/or as coolant for electrical generators in the DPP.

Diesel underground storage tanks (USTs) were previously located on the south and southeast sides of the building. Pipelines transferred diesel fuel from a Diesel Tank Farm (NOAA Site 30/TPA Site 11) atop Village Hill to the diesel USTs, and conveyance pipes from the USTs fed electrical generators within the DPP building and an adjacent annex building (NOAA Site 19/TPA Site 9d). A raceway was constructed within the concrete floor, stem wall, and footing system for the building.

Accidental releases of diesel fuel previously stored and/or transferred by pipelines to the site led to environmental contamination. Also, wastes may have been spilled or dumped into the floor raceway. Investigations and past corrective action work at the site indicated the presence of diesel-range organic compounds (DRO) in soil at concentrations above site cleanup levels. Since the DPP had become structurally compromised due to a deteriorating roof, NOAA determined to demolish the structure. NOAA also determined to demolish the adjacent pump house structure, since it would potentially become damaged during DPP demolition activities. With the structure demolished, it was then necessary for NOAA to remove the petroleum contaminated soil (PCS) known to exist underneath.

NOAA selected Bering Sea Eccotech Inc. (BSE) to implement the corrective action for the demolition of the buildings and removal of PCS at the site. Based on past investigations and corrective actions for this site, the specific contaminants of concern are gasoline-range organic compounds (GRO), diesel-range organic compounds (DRO), residual-range organic compounds (RRO), benzene, toluene, toluene, ethylbenzene, total xylenes, and select polynuclear aromatic hydrocarbons (PAHs). NOAA's site cleanup levels for soil were based on applying Alaska Department of Environmental Conservation (ADEC) Ten Times Rule levels for GRO, DRO, and toluene; applying the 1991 ADEC cleanup level for benzene, consistent with a Two-Party Agreement between NOAA and ADEC; and applying ADEC's Method Two cleanup levels for all other contaminants.

The DPP and pump house were demolished, and the building demolition debris was placed in the City of St. Paul landfill. Minor amounts of asbestos in the DPP were removed, containerized, and either shipped off-island, and or disposed in a permitted asbestos monofill. During the corrective action, BSE removed approximately 800 cubic yards of PCS from the site and transported it to NOAA's ADEC-approved landspreading area at the National Weather Service property on the island. BSE backfilled the PCS excavation to its original grade, using approximately 970 cubic yards of clean fill material.

After completing the removal of PCS at the DPP site, confirmation samples collected from the excavation bottom and side walls indicated concentrations of DRO exceeded its site cleanup level within the southeastern half of the excavation, on the excavation bottom. No other contaminants exceeded their site cleanup levels in confirmation samples. More PCS could not be removed because it was located 18 feet below ground surface and beyond the reach limit of the excavator, or extended into areas with buried utilities and existing roadways where excavation is not required by ADEC.

As a result of this cleanup action, all specified contamination has been removed and no exposure routes remain for human receptors or the environment. NOAA is therefore requesting in this Corrective Action Report/Conditional Closure Request that ADEC agree further remedial action from NOAA is no longer required at the DPP site since the primary sources of contamination have been removed and analytical data indicate that PCS has been excavated to the maximum extent practicable.

1.0 INTRODUCTION

The U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), through its Office of Response and Restoration, Pribilof Project Office is responsible for site characterization and restoration on St. Paul Island, Alaska. St. Paul Island is located north of the Aleutian Islands chain in the Bering Sea, approximately 800 miles west-southwest of Anchorage, Alaska (Figure 1).

Public Law 104-91 of 1996 and Public Law 106-562 of 2000 provide the mandate for these activities. A Two-Party Agreement (TPA), signed in 1996 by NOAA and the State of Alaska, provides the framework for corrective action on St. Paul Island (NOAA 1996). The State of Alaska provides TPA oversight through the Alaska Department of Environmental Conservation (ADEC). Under the TPA, NOAA is required to comply with State of Alaska regulations in effect in 1991 (ADEC 1991); however, with ADEC agreement, NOAA has chosen to follow more current regulations whenever possible.

This corrective action report (CAR) documents the 2007 corrective action work performed at the St. Paul Island Decommissioned Power Plant (DPP), designated by NOAA as Site 18,, and also known as TPA Site 9c. The DPP site is located at the base of Village Hill, just northwest of the former Equipment Shed (Figure 2). During this corrective action, the DPP and a small adjacent pump house were demolished and petroleum contaminated soil (PCS) was removed from the site, followed by backfilling with clean soil. Except as noted in this CAR, field activities for this work were carried out in accordance with the following documents:

- Corrective Action Plan Addendum #2 For The Removal of Petroleum Contaminated Soil at the Decommissioned Power Plant (NOAA Site 18, TPA Site 9c) St. Paul Island, Alaska. (NOAA 2006a)
- Master Quality Assurance Plan (QAP) (NOAA 2006b)
- NOAA's Master Investigation Derived Waste Plan (NOAA 2003)
- Master Health and Safety Plan (NOAA 2004a)
- Operations Work Plan, Petroleum Contaminated Soil Remediation by Landspreading (NOAA 2004b)

NOAA performed this corrective action to address environmental impacts resulting from past operations conducted in and around the DPP. ADEC does not require that existing buildings be demolished to remediate environmental contamination underneath them. The DPP had not been properly maintained for several years and corrosion and leakage had damaged some of the roofing, possibly requiring major repairs. The building posed a potential liability had it remained on the property when transferred to the Tanadgusix Corporation under a Transfer of Property Agreement (NOAA 1984).

Because of these problems, NOAA determined to demolish the DPP structure. Due to its proximity to the DPP, NOAA also determined to demolish the adjacent pump house as it would potentially sustain damage during DPP demolition activities. An earlier survey that NOAA conducted of the building (e^2M 2006) had determined that several building parts were painted with lead-based paint (LBP), and some of the interior drywall joint compound contained asbestos. NOAA had discovered a band of Transite asbestos siding covered the roof fascia around the exterior of the roof. NOAA collected samples of representative parts of the DPP and pump house prior to demolition and analyzed them using the Toxicity Characteristic Leaching Procedure (TCLP), EPA Method 1311 (40 Code of Federal Regulations [CFR] 261.23). The results showed that these parts did not exceed allowable limits for lead leachability, thus would not be a Resource Conservation and Recovery Act (RCRA) hazardous waste if removed without treatment. Cleanup of the known PCS underneath the DPP building was required by State of Alaska Regulations if the building were to be removed. The pump house had no known PCS beneath it.

Therefore, the objectives of the corrective action were as follows:

- Remove and store or dispose of several items stored inside the building
- Remove asbestos fascia siding and interior drywall joint compound and dispose as a regulated asbestos waste
- Remove sediments in the utility trenches and dispose as PCS
- Demolish the DPP and pump house and dispose of the wood and concrete debris in the City of St. Paul Landfill
- Remove PCS from under the building and dispose it by land spreading on the island at the National Weather Service land spread area
- Conduct all soil excavation under the oversight of an archaeologist
- Collect field screening samples for analysis by photoionization detector (PID) and thin-layer chromatography (TLC)
- Collect confirmation samples for fixed laboratory analyses
- Restore the site to grade with clean fill
- Incorporate site features and sampling locations and results into a geographic information system (GIS) database
- Report corrective action activities and results to ADEC for acknowledgement of proper site closure.

2.0 BACKGROUND

The following subsections provide a description of the site background, site geology, site hydrogeology, and previous investigations for the DPP site.

2.1 SITE BACKGROUND

The DPP was located at the base of Village Hill, just northwest of the former Municipal Garage, on the southerly side of Haul Road (57° 7' 25.72" N latitude, 170° 16' 57.30" W longitude; Figure 2). The structure and area of excavation are located in the northern portion of Tract 46, Township 35 south, Range 132 west, Section 25 of the Seward Meridian, Alaska, as shown on the dependent resurvey of a portion of the U.S. Survey No. 4943, Alaska, Tract "A", St. Paul Townsite, officially filed June 3, 1997. The federal government currently owns the surface and subsurface estate of Tract 46.

The DPP foundation and primary load-bearing walls were constructed of reinforced concrete, covered with a corrugated metal roofing system. The north and south portions of the building were constructed of wood framing and corrugated metal siding. The building was the location of the electrical power generating plant for the island dating back to 1960 (Hart Crowser 1997), until 1998 when the power generation activity ended. The DPP was most recently used by NOAA for storage of an old fire engine, drying racks for seal pelts, and miscellaneous items. A small pump house was located near the southwest corner of the building (Figure 2). The pump house was constructed in 1963 and water from its two wells was reportedly used for processing fur-seal pelts, in fish processing, and/or as coolant for electrical generators in the DPP (CESI 1999, NOAA 1990). Three above ground storage tanks (ASTs) and two 10,000-gallon underground storage tanks (USTs) originally serviced the facility (Hart Crowser 1997).

2.2 SITE GEOLOGY

St. Paul Island was formed as a result of volcanic eruptions of basaltic lavas onto the southern edge of the Bering Sea Shelf. The island has never been glaciated, and many cinder cones with steep slopes and sharp crater rims are present on the island. The island soil is characterized primarily as volcanic deposits consisting of scoria of varying sizes (pebbles to cobbles) and colors (lenses of gray, red, and black) with fractured basalt occurring at depth (Barth 1956).

The site is approximately 20 feet (ft) above mean sea level. Soils in the vicinity of the DPP generally consist of sandy topsoil from the surface to a depth of 1.5 to 2 ft below ground surface (bgs). This is underlain by varying layers of red and black scoria to depths of approximately 16 to 20 ft, followed by fractured basalt. Bedrock in this area consists of basalt.

2.3 SITE HYDROGEOLOGY

Groundwater in the vicinity of the DPP is present at approximately 20 ft bgs and likely flows to the north-northwest toward Village Cove (Mitretek 2005).

2.4 CLEANUP LEVELS

NOAA performed a Groundwater Use and Classification Study of St. Paul Village in 2002 due to the brackish/non-potable water having been contaminated by petroleum releases for which NOAA is responsible (Mitretek 2002). Groundwater beneath the City of St. Paul is considered brackish and is therefore not potable (Mitretek 2002, ADEC 2002a). NOAA demonstrated the groundwater is not drinkable (potable) regardless of the past petroleum releases because of high total dissolved contents, primarily salt (Mitretek 2002). Using groundwater sampling data available in 2002, NOAA found groundwater in the village exceeded ADEC Table C cleanup levels for gasoline-range organic compounds (GRO), diesel-range organic compounds (DRO), benzene, toluene, tetrachloroethene, chromium, and lead.

NOAA requested ADEC to approve alternative groundwater and soil cleanup criteria allowed under (18 Alaska Administrative Code [AAC] 75.345). ADEC approval would allow groundwater cleanup criteria and soil cleanup criteria related to protection of groundwater to increase to ten times the Table C and Method Two (18 AAC 75.341) cleanup levels for those compounds listed above (ADEC 2002a). ADEC concurred with NOAA's request contingent upon NOAA providing for appropriate institutional controls as required under 18 AAC 75.350. NOAA applied to Alaska Department of Natural Resources (ADRN) for a Critical Water Management Area (CWMA) determination under 11 AAC 93.500 - 11 AAC 93.530 (ADNR 2006). Such a determination would enable application of the ADEC required institutional control. Following numerous regulatory procedures, ADNR determined a CWMA was appropriate for the areas with groundwater contamination in the old village. The CWMA determination allowed NOAA to apply the alternative cleanup levels under the Ten Times Rule (ADEC 2002a).

Subsequent to ADEC's 2002 conditional approval to use the Ten Times Rule, NOAA demonstrated that tetrachloroethene and lead did not persist above Table C limits and that the chromium was actually the less toxic trivalent form, with concentrations below the Table C cleanup level. NOAA also subsequently found that ethylbenzene exceeded its Table C cleanup level in village groundwater (Tetra Tech 2005, Tutka 2007).

Additionally, the 1996 TPA provided NOAA to clean up contaminated media on the Pribilof Islands consistent with ADEC regulations at that time. The benzene cleanup level for soil in 1996 was based on the 0.5 milligrams per kilogram (mg/kg) level established in ADEC 1991 promulgated regulations. As a result, NOAA applied the 0.5 mg/kg as its benzene cleanup level instead of 0.2 mg/kg under the Ten Times Rule or 0.02 mg/kg under ADEC Method Two.

Based on past investigations and corrective actions for this site (Section 2.5), the specific contaminants of concern are GRO; DRO; residual-range organic compounds (RRO); benzene, toluene, toluene, ethylbenzene, total xylenes (BTEX); and select polynuclear aromatic hydrocarbons (PAHs). NOAA's site cleanup levels for soil were based on applying Alaska Department of Environmental Conservation (ADEC) Ten Times Rule levels for GRO, DRO,

and toluene; applying the 1991 ADEC cleanup level for benzene, consistent with a Two-Party Agreement between NOAA and ADEC; and applying ADEC's Method Two cleanup levels for all other contaminants.

2.5 PREVIOUS INVESTIGATIONS

In 1990, NOAA identified two 10,000-gallon USTs at the DPP. One UST was determined to be empty, and the other serviced the then-active power plant (NOAA 1990).

Ecology and Environment, Inc. (E&E) identified two 10,000-gallon UST tanks ("UST No. 3" and "UST No. 4") in the area of the southeast corner of the DPP building in a 1992 preliminary assessment. This assessment noted that 13 gallons of diesel fuel/water mix had been removed from UST No. 3, while UST No. 4 was still in use, though scheduled to be abandoned in early 1993 (E&E 1993).

Woodward-Clyde Consultants, Inc. (Woodward-Clyde) performed a site inspection at the DPP in 1993. Woodward-Clyde dug a trench along the west side of the power plant up to the northeast corner of the power plant's annex building to locate a drain line but did not encounter a line nor any indication of petroleum contamination. Woodward-Clyde took hand auger borings near the large power plant doors and a valve box on the east side of the building. The suite of laboratory analyses on samples from these locations did not include DRO, but Woodward-Clyde reported detecting a diesel odor in a sample collected along the east side of the building. Woodward-Clyde determined that all analytes were well below human health risk-based concentrations (Woodward-Clyde 1994).

During a 1996 expanded site investigation, Hart Crowser, Inc. (Hart Crowser) collected samples from a test pit (TP-4) and hand auger borings (HA-2, HA-3, and HA-4) in the vicinity of the DPP (Hart Crowser 1997). With the exception of the location of HA-4, where refusal was encountered at 5.5 ft bgs, samples were collected to approximately 10 ft bgs. DRO was detected above its ADEC Method Two soil cleanup level in two samples collected from location HA-3; a sample collected from 0 to 0.5 ft bgs contained 2,600 mg/kg DRO, and a sample collected from 10 to 10.5 ft bgs contained 900 mg/kg DRO.

Columbia Environmental Sciences, Inc. (CESI) performed site investigation activities in the vicinity of the DPP January 25 through February 4, 1999 (CESI 1999). One emphasis of the investigation was obtaining water quality data from saltwater wells installed during the commercial fur-sealing days for process water. Non-aqueous phase liquid ("free product") was found in the west DPP well (WDPP), the east DPP well (EDPP), the west Old Sealing Plant well (WOSP), and the east Old Sealing Plant well (EOSP) (Figure 2). Of the wells, EDPP contained the most free product, a viscous, paint-like, floating free product. A sample of the product contained 59,000 milligrams per liter (mg/L) DRO and 510,000 mg/L residual-range organic compounds (RRO). In groundwater samples collected from WDPP, WOSP, and EOSP, gasoline-range organics (GRO) exceeded the ADEC Table C cleanup level (1.3 mg/L) only in EOSP. DRO exceeded the cleanup level (1.5 mg/L) in all three groundwater samples. Data indicated that the RRO cleanup level was exceeded in samples from WDPP and WOSP; however, there is no ADEC approved method for analyzing RRO in groundwater. Groundwater salinity in the three wells varied from 4 to 14 parts per thousand. No groundwater sample was collected from EDPP.

During 2000 and continuing into 2001, CESI conducted a site characterization (CESI 2001). Soil samples were collected at several depth intervals at five locations about the DPP: DPP-WRC2, DPP-WRC4, SS46-2-2, DPPSB-2, and DPPSB-1. DRO was the only petroleum hydrocarbon detected above Method Two soil cleanup levels, with exceedances in two places. A sample collected from 2 to 3 ft bgs at location DPP-WRC4 contained 490 mg/kg DRO, and a sample collected from 11 to 12.5 ft bgs at DPPSB-1 contained 2,300 mg/kg DRO.

During 2003, NOAA tasked Tetra Tech EM Inc. (Tetra Tech) to monitor groundwater wells in several locations on St. Paul Island, including near the DPP. Tetra Tech found groundwater cross-gradient from the DPP was contaminated with benzene, DRO and GRO above their Ten Times Rule groundwater cleanup levels, and toluene and ethylbenzene above their ADEC Table C cleanup levels. Tetra Tech also found groundwater upgradient from the DPP was contaminated with benzene and DRO above their ADEC Table C cleanup level, but below their Ten Times Rule groundwater cleanup level (Tetra Tech 2005). Tetra Tech did not observe any free product as had CESI.

During 2005, NOAA tasked engineering-environmental Management, Inc. (e^2M) with performing a Phase I Environmental Site Assessment, as well as asbestos and LBP building inspections, for the DPP, the adjacent pump house, and all other structures located on NOAA's Tract 46 parcel. e^2M identified LBP on a red gantry crane and its supports in the central "great room" of the DPP, on blue doors and door frames in the DPP interior, and on one window frame on the pump house. e^2M also found that drywall inside the room at the north corner of the DPP interior and siding used as roof fascia around the building contained asbestos; the pump house was not found to contain asbestos (e^2M 2006).

During 2006, NOAA tasked Bering Sea Eccotech (BSE) with implementing long-term groundwater monitoring on St. Paul Island, consistent with the ADEC-approved monitoring plan (NOAA 2005a). BSE subcontracted Tutka Services LLC (Tutka) to perform the monitoring work with BSE. Tutka found groundwater contamination similar to Tetra Tech's earlier findings (Tutka 2007).

2.6 PREVIOUS CORRECTIVE ACTIONS

During 1997, NOAA arranged to remove one UST and decommissioned the other in place by removing its liquid contents and then filling the tank with clean sand (Bristol 1997). ASTs were not present on site at the time of a 2002 corrective action, though it is not known when or by whom they were removed. During 2002 NOAA removed the 10,000 gallon UST that had been closed in place in 1997. The UST was found oriented partially beneath the southern end of the building along the east/west building axis and contained sand, oily residue, and diesel-contaminated water. To access the UST, NOAA demolished the wood framed southern portion of the DPP building and its concrete foundation. NOAA also removed an estimated 328 cubic yards (CY) of PCS from the site. Confirmation samples at two locations south of the DPP building exceeded the site cleanup levels for DRO, however the excavator encountered refusal at approximately 11 ft bgs (SNP9CSS02) and 13 ft bgs (SNP9CSS39), preventing further excavation. A confirmation sample at one location along the new southern extent of the building perimeter (SNP9CSS45) exceeded the site cleanup levels for DRO at approximately 8 ft bgs[1]; however the presence of the building prevented further excavation. A confirmation sample at one location along the east side of the excavation (SNP9CSS44) exceeded the site cleanup levels for DRO at approximately 8 ft bgs[2]; however the presence of a pipe valve box and the adjacent road prevented further excavation (NOAA 2004c). Subsequent the 2002 corrective action, NOAA received concurrence from ADEC that no further remedial actions were necessary based on the available data and the presence of the building (NOAA 2005b).

3.0 REMOVAL OBJECTIVES AND APPROACH

The PCS removal objective for this site involved the removal of all PCS beneath the footprint of the DPP building (including its concrete footings and floor), PCS cleanup levels for the site are detailed in the Corrective Action Plan (CAP) prepared for the 2002 PCS removal activities (NOAA 2002). The cleanup criteria are based upon NOAA's application of the Ten Times Rule and the 1991 ADEC benzene cleanup level as described in section 2.4 above. These levels are listed in Table 3-1. The site cleanup levels listed in the CAP Addendum (NOAA 2006a) included typographical errors for GRO and DRO. The errors are listed with site cleanup levels equal to their ADEC Method Two cleanup levels instead of levels based on applying the Ten Times Rule. One should also note that contaminated soil represented by two 2002 confirmation samples along the southern edge of the building footprint exceeded the site specific cleanup levels (Figure 3). This soil was not excavated in 2002 due to its proximity to the building. NOAA's objective was to remove and temporarily stockpile the clean backfill that had been placed over these 2002 confirmation sample locations, then resume excavation of this PCS even though a portion of it may extend outside the building footprint.

1 The listed sample depth is based on Photograph 17 from NOAA 2004c, since NOAA's contractor did not record this sample depth.
2 Id.

NOAA anticipated the removal of PCS contamination during 2007 at the DPP would be limited by sidewall sloping requirements to prevent damaging adjacent utilities or structures including the electrical transformers to the north and west, and the roads surrounding the site (Figures 4 and 5). Also, NOAA did not plan the excavation to extend deeper than 15 ft bgs due to impracticability associated with such deep excavating.

4.0 FIELD ACTIVITIES

The following subsections summarize the equipment used and the activities performed during this corrective action. Appendix A provides photographic documentation of the corrective action. Appendix B provides copies of the weekly reports as well as logbook notes generated during the corrective action.

4.1 CONTRACTORS AND EQUIPMENT

BSE provided overall site management via its subcontractor Larsen Consulting Group (LCG), including the direction of demolition, excavation and hauling activities, engineering services, and preparation of weekly reports. Alaska Abatement Corporation (AA) removed asbestos-containing building materials (ACBM) associated with the DPP, and coordinated its disposal at a permitted off-island facility. The collection of screening, characterization, and confirmation samples during implementation of the corrective action was performed by Tutka. BSE provided most of the equipment used during the corrective action, but NOAA furnished some government-owned equipment. BSE/LCG conducted health and safety meetings before the commencement of each day's activities. Tutka and NOAA performed PID and TLC analyses, respectively, of screening samples. In addition, NOAA staff provided survey support using real-time kinematic GPS techniques and equipment. BSE subcontracted laboratory analytical services to SGS Environmental Services Inc. of Anchorage, AK (SGS), an ADEC-approved laboratory.

Equipment used on site during field activities included the following:

- Hitachi EX150 excavator (BSE)
- Hitachi ZX200LC Excavator (BSE)
- 5-10 CY dump trucks (BSE and NOAA)
- Volvo L-70 Front End Loader (BSE)
- CAT 966 Front End Loader (BSE)
- Flat Bed Truck (BSE)
- Telescoping Rough Terrain Fork Lift (BSE)
- Trimble Total Station R8 GPS (NOAA)

4.2 ASBESTOS AND LBP REMOVAL

Photograph 1 shows a west-facing view of the eastern portion of the DPP in August 2007, prior to removing the Transite siding along the roofline fascia. Concrete flooring associated with the southern wooden portion of the DPP is visible in the foreground. AA mobilized to the site on September 17, 2007 and removed ACBM along with the removal of 400 square feet (SF) of drywall located along the west, inside wall of the DPP, and approximately 220 SF of Transite siding used as fascia along the exterior roof line. The ACBM was transported to the Anchorage area via air cargo and disposed in a permitted asbestos monofill. AA demobilized from the site on September 20, 2007. Photograph 2 shows a similar west-facing view in late September 2007, after removing the Transite siding along the roofline fascia.

During demolition preparation activities on October 5, 2007, BSE/LCG identified potential ACBM in the form of approximately 64 SF of 9-inch by 9-inch floor tiles inside a DPP room along the north portion of the building inte-

rior. This material was not identified during e²M's asbestos building inspection (e²M 2006), as the floor tiles were covered by approximately ten wooden racks built for drying Northern fur seal pelts. BSE/LCG found the tiles when relocating the racks. BSE/LCG designated the floor tile area "off limits" until the tiles could be sampled and analyzed for asbestos, and if necessary until AA could mobilize to remove the tiles. As described in LCG's Weekly Report #3 (Appendix B), most of the floor tiles were found missing from the DPP floor the morning of October 9, 2007. BSE determined the floor tiles were ACBM. AA mobilized to the site on October 11, 2007 and worked with BSE/LCG and NOAA to investigate the disappearance of approximately 60 SF of floor tiles; the missing tiles were not located, however BSE/LCG determined they had not been disposed with DPP building demolition debris at the City of St. Paul landfill. AA carefully removed the remaining tiles (Photograph 3), wetted and containerized the tiles consistent with federal and state regulations, and transported them to the Anchorage area with the ACBM removed in September 2007. The ACBM was disposed in a permitted asbestos monofill.

BSE removed the gantry crane and rails, blue doors and frames, and window and frame covered with LBP during demolition activities the week of October 7, 2007. BSE disposed of these items in the City of St. Paul Landfill.

4.3 BUILDING DEMOLITION

Photograph 4 shows a view of the DPP (in center) and pump house (left) taken from the base of Village Hill in 2002 during the partial building demolition, UST removal, and PCS removal (see Section 2.5). NOAA's contractor BSE began demolition work at the site on October 5, 2007. BSE drained liquids from the AST located inside the DPP building, containing them in a 55-gallon drum. BSE then decommissioned the AST by cutting it in pieces, and disposed of the pieces in the City of St. Paul landfill. BSE determined the liquid was primarily water with a small amount of oil, and the liquid did not contain chlorinated compounds exceeding 50 mg/kg. BSE disposed of the liquid atop the soil cap, at Landfill Cell C in NOAA's Tract 42 at the location of disposal trenches used in 2006 and 2007 to dispose of NOAA abatement, demolition, and lead contaminated soil waste (Figure 6). BSE removed an estimated 150 gallons of oily water and oily sludge from the DPP raceway and disposed of this water and sludge atop the soil cap. BSE then removed several remaining items owned by NOAA from the building's interior and stored or disposed of them at the permitted community landfill.

Next, BSE demolished the roof and walls of the DPP building. BSE removed soil around the exterior of the foundation stem walls and footings, providing access for workers to cut the stem walls and footings into approximately 8 foot long segments (Photograph 5). In some instances, the wall or footing was too thick to fully cut even from two sides. In these cases, the cuts served to deeply score the concrete and make it easier for BSE's excavator to break the concrete into the segments. BSE hauled concrete debris to the City of St. Paul's landfill, where it used the concrete to extend a concrete rubble-built berm to expand the capacity of the City's landfill disposal cell (Photograph 6). Three concrete vibration pads, each measuring approximately 5 ft by 12 ft by 2 ft, were too large to place in the City's berm. The City agreed to accept ownership of the pads for their eventual re-use as traffic barriers. BSE hauled the pads to the City's appliance and metal debris staging area atop Landfill Cell A (Photograph 7).

BSE demolished the above ground wooden structure of the pump house, hauling it to the City's landfill for disposal. The concrete stem walls for the pump house were removed so that the only remaining foundation elements were the footings, found approximately two ft bgs. BSE cut the steel well riser pipe at approximately two ft bgs. No further pump house removal was performed.

4.4 EXCAVATION ACTIVITIES

In 2006, NOAA contracted an archaeologist to evaluate the DPP site and its historical background in preparation for the PCS excavation work (Mobley 2006). The archaeologist identified a potential for significant archaeological deposits underneath or near the DPP where soil was not already disturbed by prior remedial actions. The archaeologist's report provided a monitoring plan that NOAA's excavation contractor used to plan and conduct archaeological monitoring during the PCS excavation.

All soil excavation activities at the DPP site proceeded under the supervision of an archaeologist to ensure proper conservation and management of any significant archaeological deposits unearthed during excavation. The archaeologist monitored all excavation at the site with the authority to halt excavation and consult with the Alaska State

Historical Preservation Office upon the discovery of significant archaeological deposits. With the exception of one mid 20th century bottle, the only cultural items that were observed during the course of the archaeological monitoring were wires, pipes and pieces of concrete associated with the power plant. The archaeologist did not deem any "significant archaeological deposits", and the excavation proceeded without interruption. The archaeologist's monitoring report (Pipken 2007) is included as Appendix C.

BSE began excavation of approximately 800 CY of PCS (Photograph 8) from under the DPP building footprint and along the exterior of the south wall on October 16 and terminated on October 19, 2007 (Photograph 8). No PCS excavation was needed at the pump house, consistent with the CAP Addendum (NOAA 2006b). Most of the 2007 footprint of the DPP building was contaminated; however, only the northwest ¼ of the footprint contained PCS exceeding the site cleanup levels to a depth of 3 to 5 ft bgs. The southwest ¼ of the footprint only contained PCS exceeding the site cleanup levels to a depth of 12 ft bgs. The eastern ½ of the footprint contained PCS exceeding the site cleanup levels to at least the vertical limit of excavation, approximately 18 ft bgs. Further vertical excavation of the eastern half of the footprint was not practicable due to the reach limit of the excavator (Photograph 9). Further horizontal excavation eastward and northward of the eastern half of the footprint was not practicable due to adjacent buried utilities and roads along the north and east sides of the building (Figures 4 and 5). The excavation was backfilled, compacted, and graded between October 19 and October 20, 2007, following collection of confirmation samples.

4.5 SOIL DISPOSAL

During the DPP corrective action, NOAA's contractors transported PCS directly to NOAA's National Weather Service landspreading area (Figure 7). The PCS was spread no more than 0.5 ft plus or minus (±) 3 inches deep, to promote volatilization and photodegradation. NOAA spread soils with the highest apparent levels of volatile organics separately at the landspreading area, with similar soils from the Municipal Garage PCS removal. NOAA's contractor will till the contaminated soil to promote evaporation of volatile organic compounds (VOCs) during the spring of 2008. The landspreading area with the DPP PCS will be fertilized and seeded with native grasses to promote revegetation after the tilling is complete.

4.6 BACKFILLING AND SITE RESTORATION

Backfilling the excavation began after soil screening with PID and TLC screening sample analyses indicated contaminant concentrations were below ADEC Method Two cleanup levels or further excavation was not practicable, and fixed laboratory confirmation samples had been collected. Backfill operations involved transporting clean fill from an on-island scoria pit to the site, dumping the material into the excavation, and compacting the fill material. Samples of the backfill material were collected and sent to a fixed laboratory for analysis, which showed no petroleum or PAHs present above State of Alaska Method Two cleanup standards for soil. Approximately 970 CY of scoria were used to backfill the DPP excavation and cover the remaining foundation and riser pipe of the pump house with a minimum of 2 ft of soil. The backfilled area was leveled to the surrounding grade (Photograph 10).

4.7 INVESTIGATION-DERIVED WASTE MANAGEMENT

Investigation-derived waste generated during this corrective action included:

- Used nitrile sampling gloves, which were placed in trash bags and disposed as municipal solid waste.
- Plastic bags and glassware, which were emptied of soil and disposed as municipal solid waste.
- Soil not extracted during TLC screening sample analyses, which was disposed at the landspreading site.
- Spent methylene chloride and small vials of soil extracted with methylene chloride from TLC analyses, which were containerized in glass jars, placed in lab pack containers and stored to be shipped off-island for disposal as hazardous waste in 2008.

- Silica gel plates spotted with methylene chloride during TLC analyses, which were containerized in glass jars and placed in lab pack containers, then prepared to be shipped off-island for disposal as hazardous waste in 2008.

All such wastes were or will be disposed according to NOAA's Master Investigation Derived Waste Plan (NOAA 2004)

4.8 SITE SURVEYING

NOAA representatives surveyed sampling locations, benchmarks, excavation extents, and buildings using a survey-grade Trimble Total Station® R8 differential GPS. The Trimble Total Station® R8 is a GPS and GIS data collection and mapping system that combines a high-performance, dual-channel GPS receiver and antenna with a local base station and real-time differential correction system to provide survey-grade accuracy in real time. NOAA's survey-grade GPS determines horizontal positions of soil sampling locations and excavation boundaries to within approximately ± 1 centimeter (cm), and elevations to within approximately ± 2 cm. NOAA collected survey data in latitude and longitude referenced to the World Geodetic System 84 Datum, Universal Transverse Mercator Zone 2 coordinate system in meters. However, many confirmation samples were collected near potentially unstable excavation sidewalls inside the excavation and it was unsafe to enter the excavation to survey the exact location. Consequently, NOAA surveyed some of these samples at a point on the upper rim of the excavation, as close to the actual sample location as deemed safe to approach. Several samples were collected from the excavation bottom and not near the excavation side wall. In those instances, NOAA and Tutka personnel estimated sample locations using swing ties from a nearby electrical transformer. Therefore, many survey point for these samples is displaced approximately 2 to 3 ft laterally, and up to 18 ft vertically higher than the actual sample location.

5.0 FIELD SCREENING AND ANALYTICAL SAMPLING

During this corrective action, BSE collected screening and analytical confirmation samples in accordance with the CAP Addendum (NOAA 2006b) and 18 AAC 78 (ADEC 2006). For petroleum contamination, NOAA performed TLC screening sample analyses, and provided the results to BSE to direct excavation activities and identify locations for analytical confirmation samples; BSE performed PID screening sample analyses for petroleum contamination. Based on evaluation of the TLC and PID screening sample results, BSE selected analytical sampling locations where the greatest potential for residual contamination existed.

The following subsections describe the instrumentation used and procedures followed during the collection of screening and analytical confirmation samples.

5.1 SCREENING SAMPLES

NOAA used three different technologies to screen soil samples in the field in order to facilitate rapid decision making, as described below.

5.1.1 PID SCREENING SAMPLES FOR PETROLEUM CONTAMINATION

As excavation of contaminated soil progressed and the remaining soil was no longer obviously contaminated with petroleum hydrocarbons as determined by visual and olfactory inspection, BSE collected field screening samples of soil from the bottom (or sidewalls) of the excavation, as directed by the on-site NOAA representative. BSE used a PID as a first screening method to determine whether remaining soil was still contaminated as specified by the CAP (NOAA 2003c). The soil sample was first warmed to approximately room temperature while sealed inside a plastic bag, and then the PID was inserted into the bag to sample any VOC vapors that may have been released. The PID was used because it can detect low levels of VOCs, and can detect moderate and high concentrations of DRO that had been detected in the soil at the DPP by previous NOAA laboratory analyzed samples. A PID cannot distinguish between the main VOC constituents that had previously been found to exceed ADEC cleanup standards (such as benzene) and other VOCs such as toluene, ethylbenzene, and xylenes. Nevertheless,

if VOCs were detected above background levels, the soil represented by the sample was assumed to be contaminated above site cleanup levels and was removed. If the soil sample did not show elevated VOC levels according to the PID reading, then a second aliquot of the sample was given to NOAA to perform TLC analysis as described below.

5.1.2 THIN-LAYER CHROMATOGRAPHY SCREENING SAMPLES FOR PETROLEUM CONTAMINATION

TLC is the use of solid-liquid chromatography for the semi-quantitative analysis of DRO in soil. A specific analytical method designed by NOAA, TLC, was originally used in support of field efforts during a crude oil spill in the State of Washington (NOAA 2006b).

The procedure involves the solvent extraction of soil screening samples in a field laboratory and subsequent comparison of the extracts to a range of standard diesel concentrations. By using standards that include diesel concentrations equal to, above, and below site-specific cleanup levels, the analyst determines whether the sample contains concentrations above or below the site cleanup level; in addition, the analyst is able to determine an approximate concentration of DRO in each sample.

TLC screening samples were collected throughout the corrective action by placing a small amount of soil (at least 20 grams) into a clean, re-sealable plastic bag. Each sample was homogenized and kept cool until it could be processed at the NOAA field laboratory.

5.2 CONFIRMATION SAMPLES

Once petroleum screening samples indicated that the remaining soil did not contain elevated VOCs or DRO from the PID and TLC testing, or further excavation was impracticable, Tutka collected a confirmation sample by placing a split of the screening sample into appropriate containers for fixed laboratory analyses by SGS to verify concentrations of contaminants remaining in soil in the excavation. Confirmation samples were packaged and shipped to SGS via Alaska Central Express air cargo company to Anchorage Airport, picked up by either a courier or a BSE employee for transport to SGS. SGS conducted the following analyses:

- BTEX by EPA Method 8260B
- GRO by ADEC Method AK101
- DRO by ADEC Method AK102
- RRO by ADEC Method AK103
- PAHs by EPA SW-846 (EPA 1996) Method 8270C, Selected Ion Monitoring [3]

BSE collected 16 petroleum contamination confirmation samples, plus two duplicate samples during corrective action activities at the DPP site. SGS analyzed all the samples for BTEX, GRO, DRO, RRO, and one of the samples for select PAHs per the methods listed above. Figure 4 illustrates the approximate sampling locations, with location uncertainty as described in Section 4.8.

5.3 WASTE CHARACTERIZATION SAMPLES

BSE collected 9 characterization samples, plus one duplicate sample from the 800 CY of PCS excavated from the site. SGS analyzed all the samples for BTEX, GRO, DRO, RRO, and one of the samples for select PAHs per the methods listed in Section 5.2.

3 The corrective action plan addendum (NOAA 2006), and by reference the original corrective action plan (NOAA 2002), indicate all samples would be analyzed for BTEX, GRO, DRO, RRO, and select PAHs. In 2003 NOAA began requesting that ADEC approve less frequent analyses for select PAHs (e.g., 20% of the samples), given their infrequent detection and St. Paul Island cleanup sites and the significant cost of PAHs analyses. NOAA did not request ADEC approval for a lesser PAHs frequency. NOAA erroneously directed its contractor to use a lesser frequency. Section 7.0 addresses data usability issues related to the PAHs analysis frequency.

5.4 BACKFILL CHARACTERIZATION SAMPLES

BSE collected three characterization samples from scoria available at the Lake Hill scoria pit and used as backfill for the excavation at both the Municipal Garage site (NOAA 2008a) and the DPP site. Backfill characterization samples were analyzed by SGS for BTEX, GRO, DRO, RRO, and select PAHs.

6.0 ANALYTICAL RESULTS

The following subsections summarize the analytical results for samples collected during corrective action activities at the Municipal Garage. Tables 6-1 and 6-2 provide an analytical data summary. Appendix D includes the analytical data for soil samples collected during the corrective action.

6.1 CONFIRMATION SAMPLES

Table 6-1, Table 6-2, Figure 4, and Figure 5 summarize the confirmation sample results. Soil within the northwestern half of the excavation did not exceed the site cleanup levels, or the ADEC Method Two cleanup levels for any contaminants for which NOAA is using an alternative cleanup level. Confirmation samples collected from the bottom and side walls of the excavation at the site indicated concentrations of DRO exceeded the site cleanup level of 2,500 mg/kg in three locations[4] on the bottom of the southeastern half of the excavation, at a maximum concentration of 14,400 mg/kg. Two additional confirmation samples taken on the southeastern excavation bottom contained DRO exceeding the ADEC Method Two cleanup level, but below the site cleanup level. Confirmation samples in four other locations indicated benzene contamination less than the 1991-based site cleanup level of 0.5 mg/kg but greater than the ADEC Method Two cleanup level of 0.02 mg/kg, with two of these four locations also exceeding the Ten Times Rule-based cleanup level of 0.2 mg/kg. Benzene was found at a maximum concentration of 0.359 mg/kg. The five DRO-containing and five benzene-containing samples described above were all found within the southeastern half of the excavation at depths greater than 15 ft bgs, with further excavation impracticable due to the reach limitation of the excavator. Contamination at these depths likely continues further northeast and southeast, however further excavation was not practicable due to buried utilities and adjacent roadways

All other contaminants were either not detected (i.e., below laboratory method detection limits [MDLs]), or were detected at concentrations below ADEC Method Two cleanup levels.

6.2 CHARACTERIZATION SAMPLES

Characterization samples collected from PCS removed from the site contained two constituents that exceeded the site cleanup levels: DRO with concentrations that varied from 144 mg/kg to 9,350 mg/kg, and RRO with concentrations that varied from 89 mg/kg to 41,800 mg/kg. All other contaminants were either not detected (i.e., below laboratory MDLs), or were detected at concentrations below ADEC Method Two cleanup levels (Tables 6-1 and 6-2).

6.3 BACKFILL CHARACTERIZATION SAMPLES

Backfill characterization samples collected from the Lake Hill scoria pit indicated concentrations of all clean backfill-specific analytes below the ADEC Method Two cleanup levels (Tables 6-1 and 6-2).

4 One of the three confirmation samples exceeding the DRO site cleanup level was SP18-CS-101-180, which is a field duplicate of project sample SP18-CS-017-180. This project sample had a DRO concentration of 1,690 mg/kg, which is above the ADEC Method Two cleanup level but below the Ten Times Rule-based site cleanup level for this site. The difference found between the project sample and its field duplicate is reasonable given these two duplicate samples were not homogenized in the field prior to placing in sample jars. NOAA used the higher result in the discussion above, as well as in Figure 4.

7.0 QUALITY ASSURANCE AND QUALITY CONTROL

To ensure that information obtained from field and laboratory procedures is an accurate and defensible representation of site conditions, quality assurance and quality control (QA/QC) procedures were implemented. NOAA followed the operational guidelines set forth in the ADEC Environmental Laboratory Data and Quality Assurance Requirements memorandum (ADEC 2006a) as well as those stipulated in the Pribilof Islands site restoration Master Quality Assurance Plan (NOAA 2006c). These documents provide detailed QA/QC information pertaining to each quality control item discussed in this section. Appendix D includes a completed copy of the ADEC-required Laboratory Data Review Checklist (ADEC 2006b).

Based on the data quality review detailed in Table 7-1, all project chemical data presented in Section 5 met project data quality requirements and are satisfactory for decision-making purposes. As indicated in the Section 6.1 footnote, NOAA did not analyze all project samples for select PAHs. The CAP Addendum (NOAA 2006a) indicated NOAA would analyze all samples for select PAHs. NOAA had previously received ADEC approval for a lesser frequency of select PAHs analyses at other sites near the DPP based on NOAA not having quantified any select PAHs above their ADEC Method Two cleanup levels at any site in St. Paul Village prior to 2006. NOAA erroneously failed to request a lesser frequency of select PAHs analyses in the CAP Addendum. NOAA directed its contractor to analyze samples for select PAHs at a lesser frequency, having assumed NOAA had requested and ADEC had approved a lesser frequency.

Accordingly, SGS analyzed five of the total 28 project samples for select PAHs, including one confirmation sample, one removed PCS characterization sample, and all three clean backfill characterization samples (Table 6-2). The confirmation sample and removed PCS characterization sample did not contain any select PAHs exceeding their site cleanup levels, with no PAH exceeding one-tenth of its ADEC Method Two cleanup level for ingestions or inhalation risk. These two samples contained DRO significantly above its Ten Times Rule-based site cleanup level, indicating the presence of high hydrocarbons concentrations and the representativeness of the samples relative to the potential presence of select PAHs at the site.

The sample results document residual site contamination that cannot be practicably removed due to its depth and proximity to existing roads and utilities, and the concentration of contaminants disposed at the landspreading area. The lack of additional select PAHs results does not affect data usability for decisionmaking purposes.

8.0 CONCEPTUAL SITE MODEL

A conceptual site model (CSM) is used to evaluate exposure pathways for human health and ecological receptors (ADEC 2002b). The following subsections provide an evaluation for each of the elements of the CSM for the Decommissioned Power Plant site, including historical contamination sources, release mechanisms, impacted media, migration pathways, exposure routes, potential receptors, and a cumulative risk assessment.

8.1 HISTORICAL SOURCES OF CONTAMINATION

Historical sources of contamination (e.g., raceway within building, ASTs, USTs, and fuel pipelines around the outside of the building) were removed from this site. The resulting contamination (i.e., PCS) was mostly removed from the site during the 2002 and 2007 field seasons.

8.2 RELEASE MECHANISMS

Potential release mechanisms include wastes released into the raceway, and leaks and spills from the ASTs, USTs, and pipelines.

8.3 IMPACTED MEDIA

As a result of past releases, NOAA identified PCS during site investigations. During the 2002 field seasons, NOAA removed PCS from areas on 2 sides of the site to depths up to 15 ft bgs. Contaminated soil was left behind in the 2002 excavation because the contamination continued beneath the DPP building, at refusal depths of 11 ft bgs and 13 ft bgs, toward an adjacent road, or close to buried utilities. In 2007, NOAA removed the DPP building, then removed PCS that had been underneath the building, reaching PCS excavation depths of 18 ft bgs. Analytical data for confirmation samples indicates that contamination remains in some areas at 18 ft bgs.

8.4 MIGRATION PATHWAYS

NOAA removed PCS to a maximum depth of 13 ft bgs in 2002 and 18 ft bgs in 2007. The majority of PCS, however, has been removed from this site, and the source volume has been significantly reduced.

Petroleum-contaminated surface soil has been removed by NOAA, and no overland transport pathway is available to PCS remaining at depths exceeding 15 ft bgs. Small amounts of DRO contamination remain shallower than 15 ft bgs due refusal and PCS proximity to utilities and roads as encountered during the 2002 corrective action. PCS that was not removed from the vadose zone continues to be a potential source of contamination to groundwater, which is found at approximately 20 ft bgs at the DPP site.

8.5 EXPOSURE ROUTES

NOAA assumes contamination found deeper than 15 ft bgs has no complete exposure pathway for inhalation and ingestion based on current and anticipated future land uses in this commercial and industrial area of St. Paul Village. NOAA has removed nearly all PCS down to a depth of 18 ft bgs. Minor amounts of DRO contamination remain shallower than 15 ft bgs, at levels exceeding the site cleanup level of 2,500 mg/kg. This cleanup level is based on applying the Ten Times Rule for protection of groundwater; the inhalation and ingestion cleanup levels for the site based on ADEC Method Two are 10,250 mg/kg and 12,500 mg/kg, respectively. Residual DRO contamination shallower than 15 ft bgs does not exceed the cleanup levels for ingestion and inhalation. While direct exposure pathways such as dermal contact with or incidental ingestion of PCS may for soil shallower than 15 ft bgs, there would be no unacceptable exposure since soil contamination does not exceed the risk-based cleanup levels for those pathways. Inhalation and ingestion of contaminated groundwater are not considered viable exposure routes because no potable or non-potable water production wells are located in the vicinity; therefore, exposure to contaminated groundwater is unlikely. Given the proximity of the site to the harbor and the direction of groundwater flow in the site's vicinity, it is possible that the contaminated groundwater could migrate to the surface water of the harbor; however, there is no indication this is occurring. NOAA is conducting long term groundwater monitoring of wells that are located between the site and the harbor and will be able to detect any such migration if it should occur (NOAA 2005a).

8.6 POTENTIAL RECEPTORS

Potential exposure pathways have been mitigated, and indirect exposure routes are not considered viable given existing site conditions, thus no potential receptors have been identified.

8.7 CUMULATIVE RISK ASSESSMENT

Cumulative risk is defined as the sum of risks resulting from multiple sources and pathways to which humans are exposed. When more than one hazardous substance is present at a site or multiple exposure pathways exist, the cleanup levels in Table B1 of 18 AAC 75.341 and Table C of 18 AAC 75.345 may need to be adjusted downward. In accordance with the requirements outlined in 18 AAC 78.600, NOAA must ensure that the cumulative cancer risk remaining after the completion of the corrective action does not exceed 1 in 100,000 (1×10^{-5}) and that the cumulative non-carcinogenic hazard index does not exceed 1.0. Each contaminant detected above one-tenth of the Table B1 inhalation or ingestion cleanup levels (excluding DRO, GRO, and RRO) must be included in cumulative risk calculations (ADEC 2002b).

No contaminants with complete exposure pathways exceed one-tenth of their Table B1 inhalation or ingestion cleanup levels (excluding DRO, GRO, and RRO), and no complete exposure pathways exist. Therefore cumulative risk calculations are not required.

8.8 MONITORING WELL NETWORK

Monitoring wells located in the vicinity of the site include MW46-5, MW46-6, MW46-9, MW46-28, MW46-14, MW46-28, and MW46-30 (Figure 8).

9.0 CONCLUSIONS AND RECOMMENDATIONS

The following subsections present conclusions and recommendations for the Decommissioned Power Plant site on field activities performed and analytical findings obtained from corrective action activities conducted during the 2007 field season.

9.1 CONCLUSIONS

NOAA and its contractors removed approximately 800 CY of PCS from the Decommissioned Power Plant site in 2007. Although confirmation sample data indicated that DRO concentrations remain above the site cleanup level in some portions of the bottom of the excavation, further excavation was not practicable due to the depth of excavation relative the reach limitation of the excavator. Also, PCS remains in areas proximate to buried utilities and roadways (18 AAC 75.325(f), 18 AAC 75.990(93)). Because of the great depth of the remaining contamination (18 ft bgs), there is no complete exposure pathway to humans or the environment, and therefore site contaminants do not pose unacceptable risks. Groundwater in the vicinity of the site is being monitored to ensure detection of unacceptable changes in contaminant conditions.

9.2 RECOMMENDATION

Because the primary sources of contamination have been removed and the objectives of the CAP addendum have been met for the Decommissioned Power Plant, NOAA is requesting with this report that ADEC grant a conditional closure not requiring further remedial action from NOAA for soil contamination at this site. NOAA requests that ADEC concur with this request by providing NOAA with a signed copy of the conditional closure approval letter attached at the end of this report as Appendix E.

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TABLES

TABLE 3-1. SITE CLEANUP LEVELS FOR SOIL AT THE DECOMMISSIONED POWER PLANT SITE UNDER THE TEN TIMES RULE OR 1991 ADEC PROMULGATED REGULATIONS

Analysis Type	Laboratory Method	Cleanup Level, mg/kg
Acenaphthene[a]	EPA 8270C	210
Anthracene[a]	EPA 8270C	4,300
Benzo(a)anthracene[a]	EPA 8270C	6
Benzo(b)fluoranthene[a]	EPA 8270C	11
Benzo(k)fluoranthene[a]	EPA 8270C	110
Benzo(a)pyrene[a]	EPA 8270C	1
Chrysene[a]	EPA 8270C	620
Dibenzo(a,h)anthracene[a]	EPA 8270C	1
Fluorene[a]	EPA 8270C	270
Indeno(1,2,3-c,d)pyrene[a]	EPA 8270C	11
Naphthalene[a]	EPA 8270C	43
Pyrene[a]	EPA 8270C	1,500
GRO [b]	AK-101	1,400
DRO [b]	AK-102	2,500
RRO [b]	AK-103	10,000
Benzene[b]	AK-101/EPA 8260B	0.5
Toluene[b]	AK-101/EPA 8260B	54
Ethylbenzene[a]	AK-101/EPA 8260B	5.5
Total Xylenes[a]	AK-101/EPA 8260B	78

a These contaminants are still subject to the cleanup levels under Method Two, the chemical-specific cleanup levels for the PAHs indicated must be met unless ADEC determines that those cleanup levels need not be met to protect human health, safety, and welfare, and the environment (Note 15 to Method Two Tables B1 and B2).

b ADEC has approved the use of the Ten Times Rule for these contaminants. NOAA will elect to cleanup benzene in soils at 0.5 mg/kg in accordance with the TPA (see Section 2.4), and NOAA may elect to cleanup GRO, DRO, and other contaminants as appropriate under the Ten Times Rule (see Section 2.4).

TABLE 6-1. ANALYTICAL DATA SUMMARY - BTEX, GRO, DRO, AND RRO, NOAA SITE 18/TPA SITE 9c - DECOMMISSIONED POWER PLANT, ST. PAUL ISLAND, ALASKA

Sample Number	Sample Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	RRO (mg/kg)
2007 Confirmation Samples								
SP18-CS-002-180	18	0.359	0.247 J	3.34	18.9	481 CL	**6,650**	296 J,CL
SP18-CS-004-180	18	0.223	0 ND	3.43	9.8	316 CL	**14,400** CL	360 J,CL
SP18-CS-007-170	17	0 ND	0 ND	0.0355	0.1591 J	37 CL	1,130	129 CL
SP18-CS-008-175	17.5	0 ND	0 ND	0 ND	0.0179 J	1 J	1,100	8,150 CL
SP18-CS-010-115	11.5	0 ND	0 ND	0 ND	0 ND	0 ND	3.17 J	13.6 J
SP18-CS-011-050	5	0 ND	0 ND	0 ND	0 ND	0.503 J	3.55 J	13 J
SP18-CS-013-030	3	0.0077 J	0 ND	0 ND	0 ND	0.759 J	43	234
SP18-CS-014-030	3	0 ND	0 ND	0 ND	0 ND	0 ND	5.34 J	49 CL,B
SP18-CS-015-030	3	0.0053 J	0.0158 J	0 ND	0 J	0.855 J	51	200
SP18-CS-017-180	18	0.176	0.112	1.48	4.12	192 CL	1,690	177 J,CL
SP18-CS-101-180[a]	18	0.0844	0.042	0.627	3.093	64.4 CL	**2,900**	104 J,CL
SP18-CS-018-060	6	0 ND	0 ND	0 ND	0 ND	1.16 J	88.1 J,CL	80.1 J,CL
SP18-CS-019-060	6	0 ND	0 ND	0 ND	0 ND	0.478 J	0 ND	38 J,CL
SP18-CS-021-120	12	0 ND	0 ND	0 ND	0 ND	0 ND	24.5 J,CL	154 CL
SP18-CS-022-080	8	0 ND	0 ND	0 ND	0 ND	0.821 J	3.39 J	8.06 J,CL
SP18-CS-023-180	18	0.0111 J	0 ND	0.0248 J	0.1066	5.38	20.1 J	15.7 J,CL
SP18-CS-102-180[b]	18	0.022	0.0199 J	0.153	0.6111	37.8 CL	18.1 J	17.5 J,CL
SP18-CS-024-075	7.5	0 ND	0 ND	0 ND	0 ND	0 ND	13.3 J	42.4 CL
2007 Excavated PCS Characterization Samples								
SP18-CH-001	--	0 ND	0 ND	0 ND	0 ND	20.9 CL	**9,350** CL	397 J,CL
SP18-CH-003	--	0.0627	0.0454 J	1.34	5.303	231 CL	**4,750** CL	867 CL
SP18-CH-005	--	0.0957	0.0421 J	0.892	3.985	63.8 CL	**2,500**	**11,800** CL
SP18-CH-006	--	0.13	0.229	0.542	3.33	24.2	**6,760** CL	**41,800** CL
SP18-CH-009	--	0 ND	0 ND	0.0363	0.1819	20.8 CL	210	117 CL
SP18-CH-012	--	0.0045 J	0.0131 J	0.0094 J	0.059	1.49 J	281 CL	1,520
SP18-CH-016	--	0.169	0.124	1.26	4.466	190 CL	1,490	197 J,CL
SP18-CH-020	--	0.0821	0.044 J	0.838	4.69	126 CL	**2,600**	613 CL
SP18-CH-100[c]	--	0.0041 J	0 ND	0.0454	0.2404	25.3 CL	144	89 J,CL
2007 Clean Backfill Samples								
SP20-CB-005[d]	--	0.017	0.0 ND	0 ND	0 ND	0.743 J	2.64 J	17.3 J
SP20-CB-006[d]	--	0 ND	0 ND	0 ND	0.0 ND	0 ND	0 ND	10.6 J
SP20-CB-007[d]	--	0 ND	0 ND	0 ND	0 ND	0 ND	2.68 J	13 J
2007 Trip Blank Samples								
Trip Blank VW 726-1	--	0 ND	0 ND	0 ND	0 ND	0.507 J	NA	NA
Method Two Cleanup Level [e]		*0.02*	*5.4*	*5.5*	*78*	*300*	*250*	*10,000*
Alternative Cleanup Level [f]		*0.5* [g]	*54*	*NA*	*NA*	*1,400* [h]	*2,500*	*NA*

a Duplicate of sample number SP18-CS-017-180
b Duplicate of sample number SP18-CS-023-180
c Duplicate of sample number SP18-CH-009

d	Sample collected during the 2007 corrective action for Site 20/TPA Site 9e - Municipal Garage, to characterize clean scoria from the Lake Hill scoria pit used for backfill. Scoria from the same source was used for backfill at the Decommissioned Power Plant in 2007. These samples are representative of backfill for both sites.
e	Cleanup level is obtained from Title 18 of the *Alaska Adminstrative Code* 75 "Oil and Hazardous Substances Pollution Control Regulations," published by the State of Alaska and amended through October 16, 2005, consistent with the Corrective Action Plan Addendum for this site (NOAA 2006a). Contaminants of concern for this site are limited to BTEX, GRO, DRO, and select PAHs; although not identified as contaminants of concern in the corrective action plan, RRO and lead are included because these analyses were conducted on some samples.
f	Cleanup level is obtained from ADEC Method Two based on the "Ten Times Rule" applied to the migration to groundwater pathway, as discussed in Section 5.0 of the corrective action plan (NOAA 2006a).
g	Under the TPA, NOAA is required to comply with the 1991 ADEC cleanup level for benzene (0.5 mg/kg).
h	Cleanup level selected based on the more stringent value associated with ingestion and inhalation pathways.
bold	Indicates concentration site cleanup level. Note that the ADEC Method Two cleanup levels are shown, as well as an alternative cleanup level if established for the site. The higher cleanup level shown for a contaminant is the site cleanup level.
B	EPA Flag - Analyte present in the blank and the sample
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and total xylenes
CL	Sample required dilution due to elevated concentrations of one or more contaminants, causing increase in MDL and PQL
DRO	Diesel-range organic compounds
GRO	Gasoline-range organic compounds
J	The analyte was positively identified, but the numerical value is an estimated concentration (i.e., above the MDL but below the PQL)
MDL	Method detection limit, which is the lowest concentration at which the laboratory can determine the presence or absence of a contaminant.
mg/kg	Milligram per kilogram
NA	Not analyzed
ND	The analyte was analyzed for but not detected above the MDL
NOAA	National Oceanic and Atmospheric Administration
PAH	Polynuclear aromatic hydrocarbon
PQL	Practical quantitation Limit, which is the concentration at or above which the laboratory can quantify a contaminant at the 95% upper confidence limit
RRO	Residual-range organic compounds
TPA	Two-Party Agreement

TABLE 6-2. ANALYTICAL DATA SUMMARY - POLYNUCLEAR AROMATIC HYDROCARBONS, NOAA SITE 18/TPA SITE 9c - DECOMMISSIONED POWER PLANT

Sample Number	Sample Depth (feet bgs)	Naphthalene (mg/kg)	Acenaph-thylene[c] (mg/kg)	Acenaph-thene (mg/kg)	Fluorene (mg/kg)	Phenan-threne[c] (mg/kg)	Anthracene (mg/kg)	Fluoran-thene[c] (mg/kg)	Pyrene (mg/kg)
Site 18/TPA Site 9d 2007 Confirmation Samples									
SP18-CS-002-180	18	4.05 CL	0 ND	0.482 CL	2.38 CL	3.67 CL	0.599 CL	0.119 CL	0.21 CL
2007 Clean Backfill Samples									
SP20-CB-005[a]	--	0 ND	0 ND	0 ND	0 ND	0 ND	0 ND	0 ND	0 ND
SP20-CB-006[a]	--	0 ND	0 ND	0 ND	0 ND	0 ND	0 ND	0 ND	0 ND
SP20-CB-007[a]	--	0.0042 J	0 ND	0 ND	0 ND	0 ND	0 ND	0 ND	0 ND
Site 18/TPA Site 9d 2007 Excavated PCS Characterization Samples									
SP18-CH-001	--	0.0218 J,CL	0 ND	0 ND	0.124 CL	0.125 CL	0 ND	0.116 CL	0.199 CL
Method Two Cleanup Level[b]		*43*	*NA*	*210*	*270*	*NA*	*4,300*	*2,100*	*1,500*

Sample Number	Benzo(a) anthracene (mg/kg)	Chrysene (mg/kg)	Benzo(b) fluoranthene (mg/kg)	Benzo(k) fluoranthene (mg/kg)	Benzo(a) pyrene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Dibenzo(a,h) anthracene (mg/kg)	Benzo(g,h,i) perylene[c] (mg/kg)
Site 18/TPA Site 9d 2007 Confirmation Samples								
SP18-CS-002-180	0 ND	0 ND	0 ND	0 ND	0 ND	0 ND	0 ND	0 ND
2007 Clean Backfill Samples								
SP20-CB-005[a]	0 ND	0 ND	0 ND	0 ND	0 ND	0 ND	0 ND	0 ND
SP20-CB-006[a]	0 ND	0 ND	0 ND	0 ND	0 ND	0 ND	0 ND	0 ND
SP20-CB-007[a]	0 ND	0 ND	0 ND	0 ND	0 ND	0 ND	0 ND	0 ND
Site 18/TPA Site 9d 2007 Excavated PCS Characterization Samples								
SP18-CH-001	0 ND	0 ND	0 ND	0 ND	0 ND	0 ND	0 ND	0.005 U
Method Two Cleanup Level[b]	*6*	*620*	*11*	*110*	*1*	*11*	*1*	*NA*

Notes

bgs below ground surface

mg/kg Milligram per kilogram

-- not applicable

TPA Two-Party Agreement

J The analyte was positively identified, but the numerical value is an estimated concentration (i.e., above the MDL but below the PQL)

ND The analyte was analyzed for but not detected above the MDL

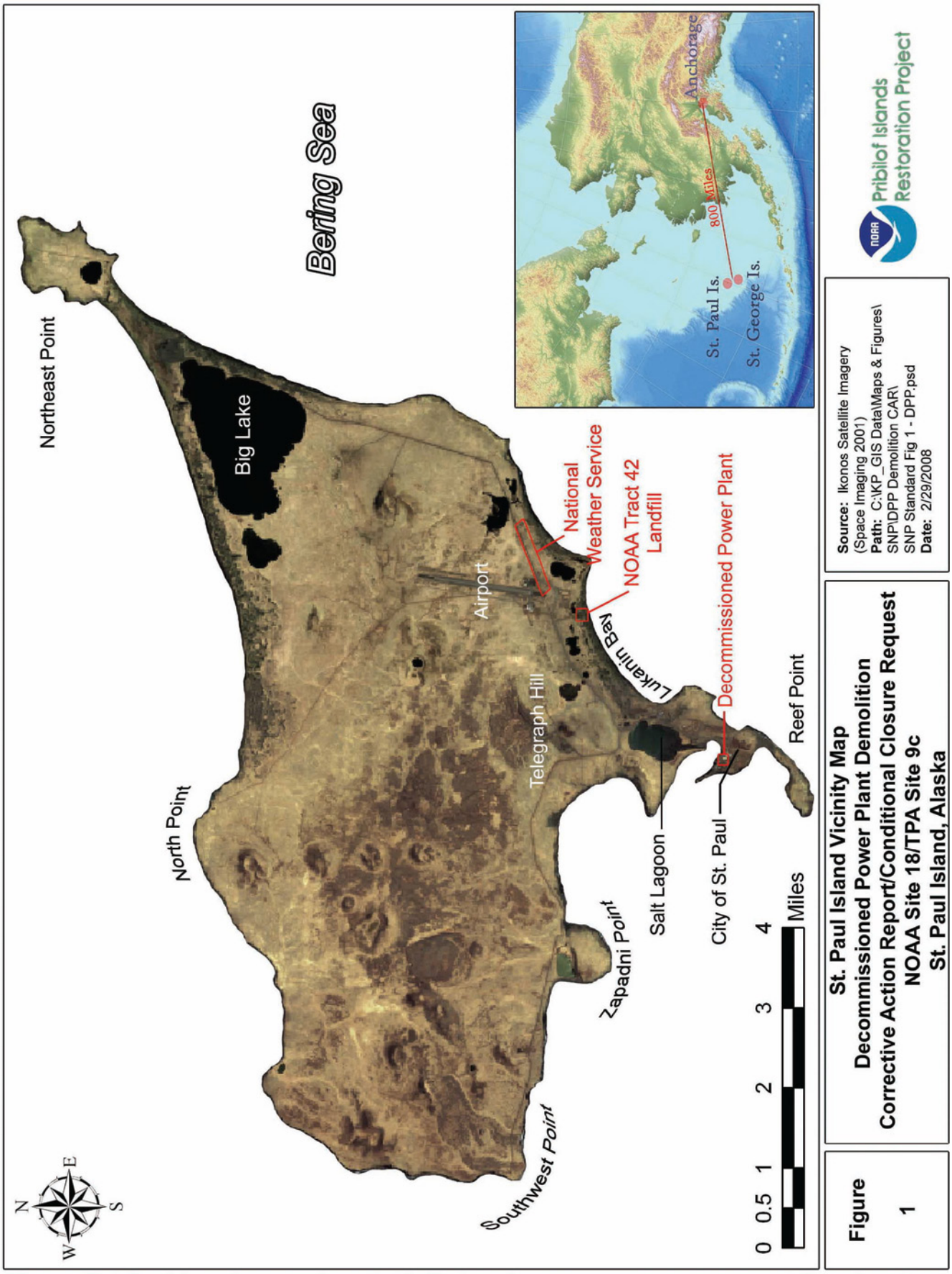
CL Sample required dilution due to elevated concentrations of one or more contaminants, causing increase in MDL and PQL

a Sample collected from overburden material used to backfill the excavation

b Cleanup level is obtained from Title 18 of the *Alaska Adminstrative Code* 75 "Oil and Hazardous Substances Pollution Control Regulations," published by the State of Alaska and amended through October 16, 2005.

c Not a select PAH required for analysis by ADEC under note 15 to Table B1 from 18 AAC 75. SGS quantified this contaminant as part of their own laboratory protocol for EPA Method 8270C. Results are reported, however it is not a site contaminant of concern and thus is not listed in Table 3-1 of this document.

FIGURES


Bering Sea
Northeast Point
Big Lake
North Point
Southwest Point
Zapadni Point
Salt Lagoon
City of St. Paul
Reef Point
Lukanin Bay
Airport
Telegraph Hill
National Weather Service
NOAA Tract 42 Landfill
Decommissioned Power Plant
Anchorage
800 Miles
St. Paul Is.
St. George Is.
N
E
S
W
0 0.5 1 2 3 4
Miles
Figure 1
St. Paul Island Vicinity Map
Decommissioned Power Plant Demolition
Corrective Action Report/Conditional Closure Request
NOAA Site 18/TPA Site 9c
St. Paul Island, Alaska
Source: Ikonos Satellite Imagery (Space Imaging 2001)
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Pribilof Islands Restoration Project

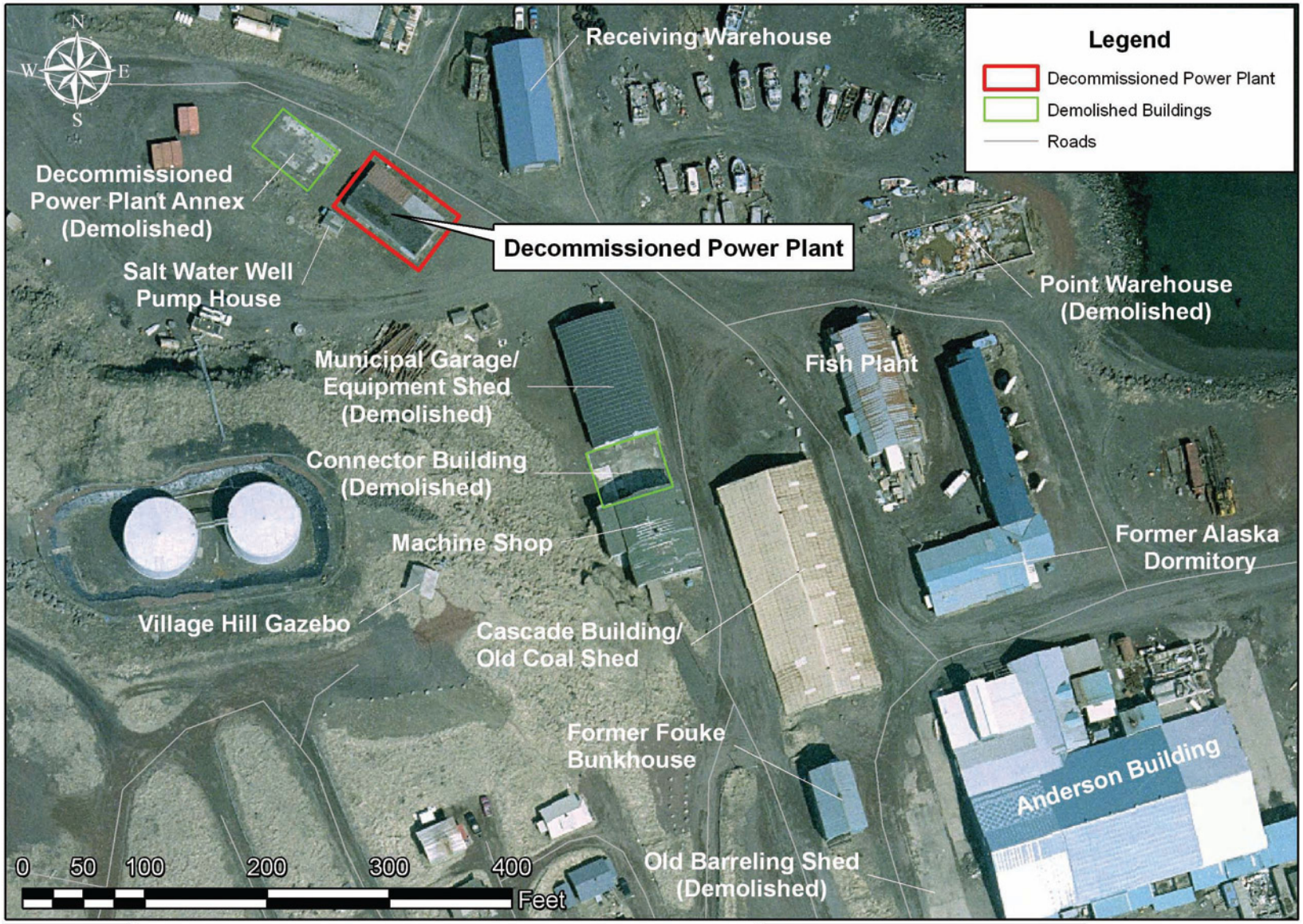

Figure 2	Decommissioned Power Plant and Vicinity Decommissioned Power Plant Demolition Corrective Action Report/Conditional Closure Request NOAA Site 18/TPA Site 9c St. Paul Island, Alaska	Source: Aero-Metric 2006 1 ft Aerial Photo, NOAA GIS Island wide layers Path: C:\KP_GIS Data\Maps & Figures\ SNP\DPP Demolition CAR\ DPP_Demolition_Fig2.mxd Date: 3/27/2008 @ 9:51:34 AM	Pribilof Islands Restoration Project

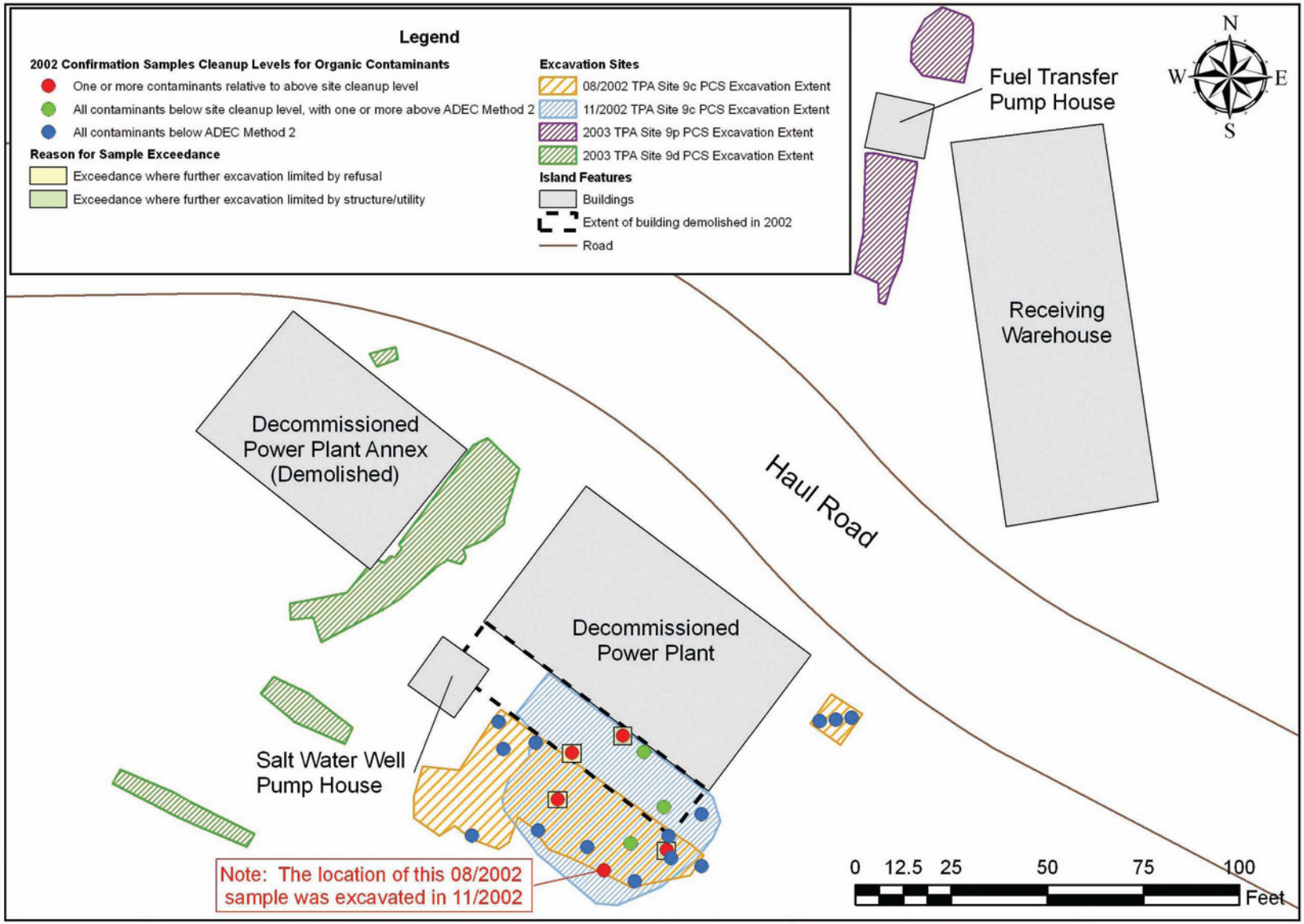

Figure 3	Areas of Previous Excavations Decommissioned Power Plant Demolition Corrective Action Report/Conditional Closure Request NOAA Site 18/TPA Site 9c St. Paul Island, Alaska	Sources: Building, Samples, Excavation Extents (NOAA GIS), Road (Hart Crowser CAD 2001). Path: C:\KP_GIS Data\Maps & Figures\SNP\DPP Demolition CAR\PreviousExcavated_DPP_Fig3.mxd Date: 4/10/2008 @ 9:08:54 AM	Pribilof Islands Restoration Project

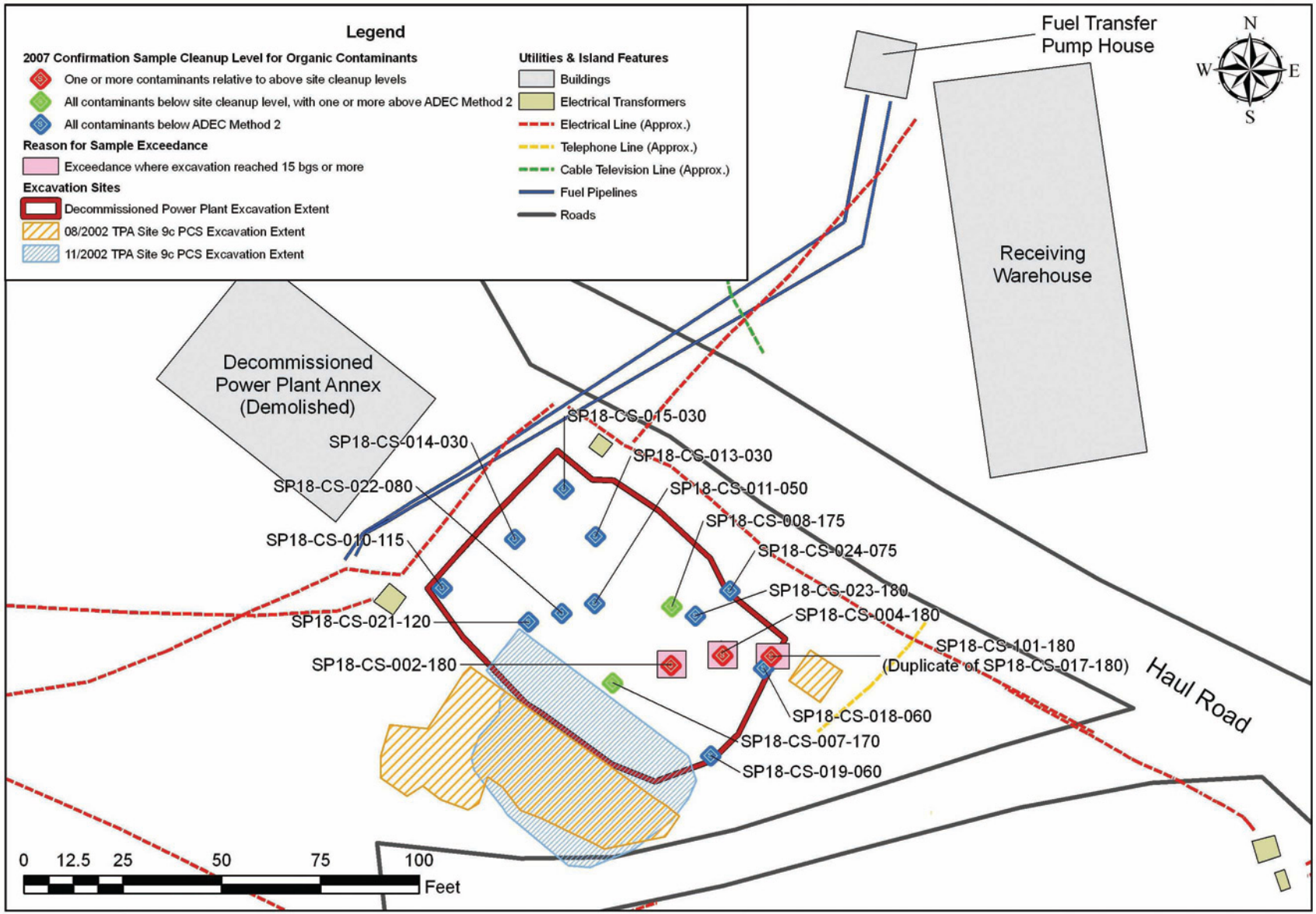

Figure 4	2007 Excavation Extent & Confirmation Results Decommissioned Power Plant Demolition Corrective Action Report/Conditional Closure Request NOAA Site 18/TPA Site 9c St. Paul Island, Alaska	Sources: Buildings, Samples, Utilities Roads, Excavation Extents (NOAA GIS 2007) Path: C:\KP_GIS Data\Maps & Figures\SNP\ DPP Demolition CAR\Utilities&07PCS_Fig4.mxd Date: 5/28/2008 @ 9:29:13 AM

Pribilof Islands Restoration Project

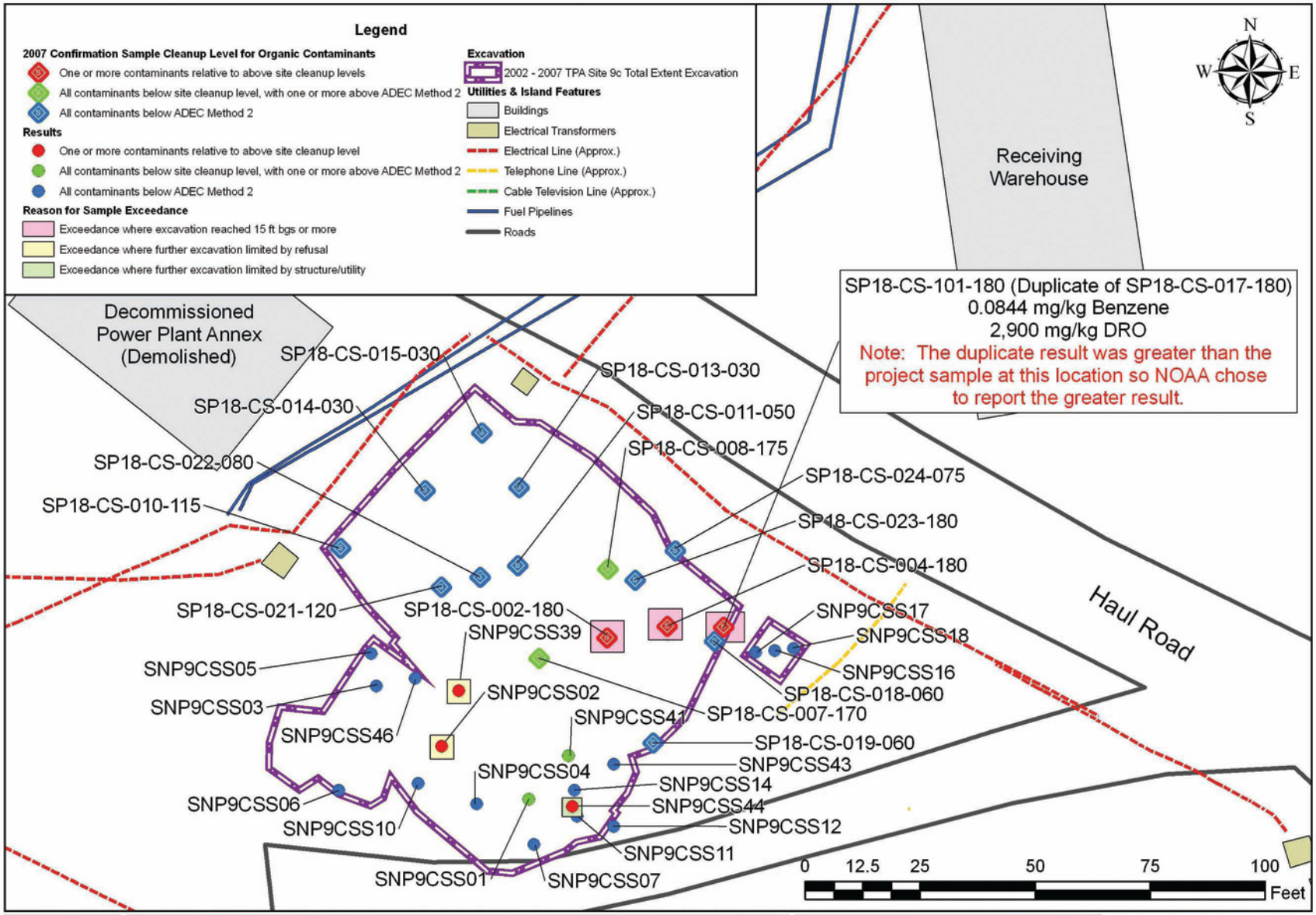

Figure 5

Residual Contamination & Total Extent of Excavation 2002 - 2007
Decommissioned Power Plant Demolition
Corrective Action Report/Conditional Closure Request
NOAA Site 18/TPA Site 9c
St. Paul Island, Alaska

Sources: Buildings, Samples, Utilities
Roads, Excavation Extents (NOAA GIS '02-'07)
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Pribilof Islands Restoration Project

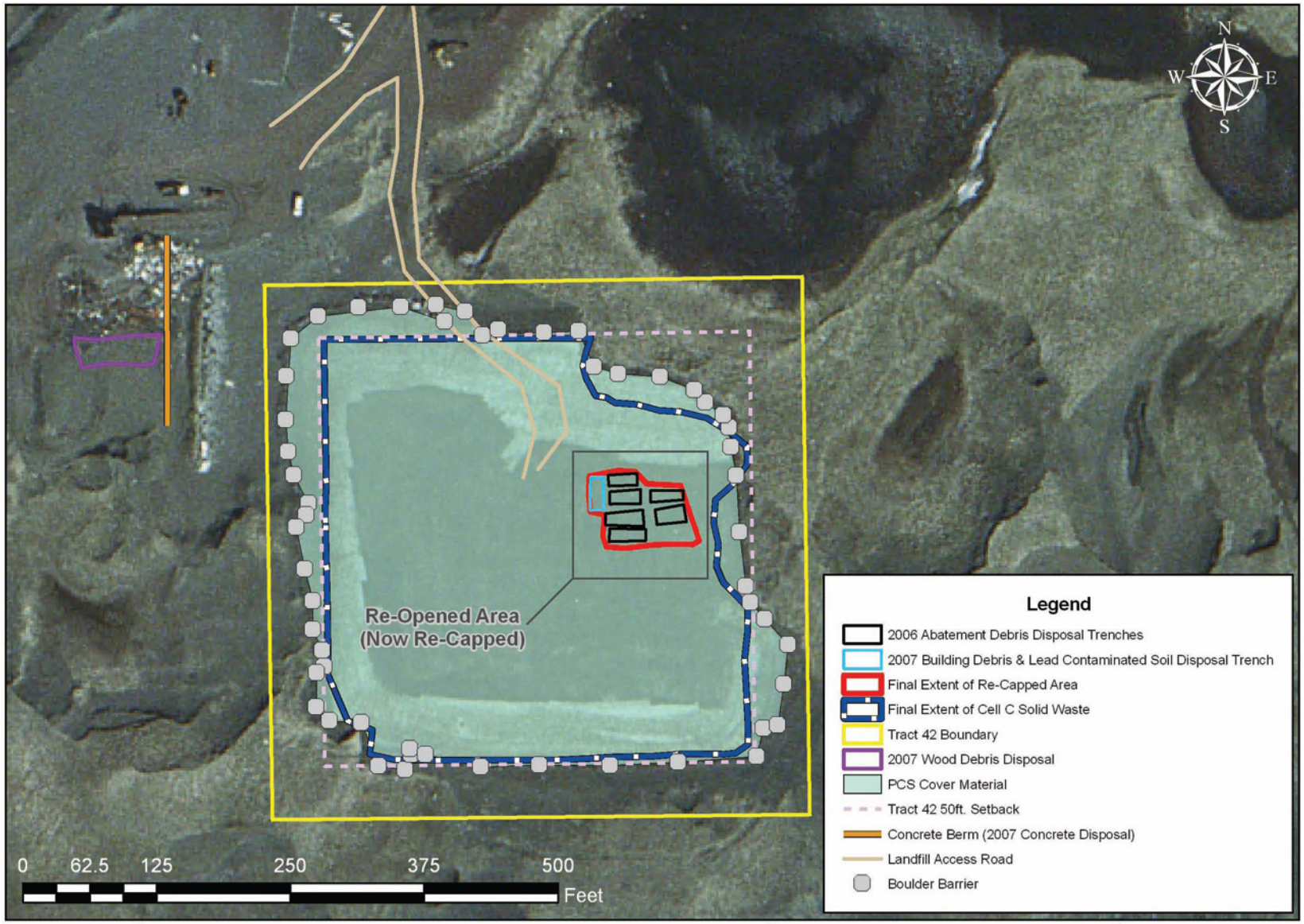

Figure 6	Select Waste Disposal Locations Decommissioned Power Plant Demolition Corrective Action Report/Conditional Closure Request NOAA Site 18/TPA Site 9c St. Paul Island, Alaska	Sources: Aero-Metric 2006 2ft Aerial Photo, GIS Layers (NOAA GIS & PPO Database 2007) Path: C:\KP_GIS Data\Maps & Figures\ SNP\DPP Demolition CAR\ DisposalCell_Fig6.mxd Date: 3/27/2008 @ 10:29:07 AM

Pribilof Islands Restoration Project

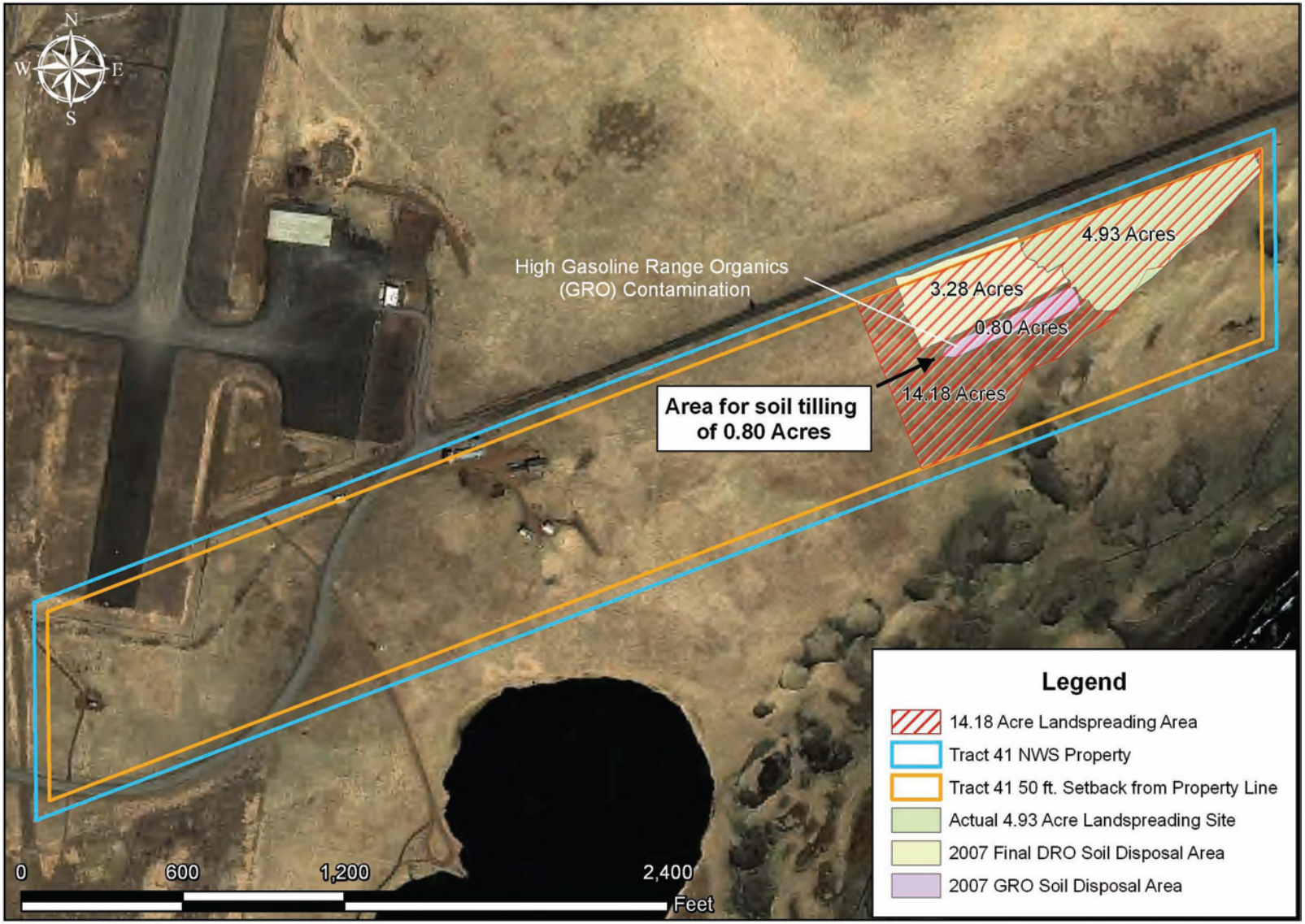

Figure 7	National Weather Service Landspreading Area Decommissioned Power Plant Demolition Corrective Action Report/Conditional Closure Request NOAA Site 18/TPA Site 9c St Paul Island, Alaska	Source: Ikonos 2001 Satellite Imagery GIS Layers (NOAA Pribilof Project Database); Path: C:\KP_GIS Data\Maps & Figures\ SNP\DPP Demolition CAR\ ContaminatedSoilTask11_Fig7.mxd Date: 3/26/2008 @ 11:00:19 AM Note: Calculations for landspreading and disposal areas are of estimated values.

Pribilof Islands Restoration Project

Figure 8	Current Monitoring Network Decommissioned Power Plant Demolition Corrective Action Report/Conditional Closure Request NOAA Site 18/TPA Site 9c St. Paul Island, Alaska	Sources: Well locations (GIS Layer), Aero-Metric 2006 2 ft Aerial Photo Path: C:\KP_GIS Data\Maps & Figures\SNP\DPP Demolition CAR\MonitoringWells_Fig8.mxd Date: 3/27/2008 @ 10:51:07 AM	Pribilof Islands Restoration Project

APPENDIX A
PHOTOGRAPHIC DOCUMENTATION

Photograph 1. Decommissioned Power Plant prior to site activities, facing the east side of the building. August 17, 2007.

Photograph 2. Decommissioned Power Plant after Transite fascia removal, Facing the east side of the building. September 26, 2007.

Photograph 3. Remaining floor tile (right-center) inside Decommissioned Power Plant, prior to removal by Alaska Abatement Corporation. October 12, 2007.

Photograph 4. Decommissioned Power Plant during 2002 corrective action activities. November 7, 2002.

Photograph 5. Bering Sea Eccotech workers cutting concrete stem wall at eastern end of Decommissioned Power Plant footprint. October 13, 2007

Photograph 6. Concrete from Decommissioned Power Plant disposed of by adding to City of St. Paul landfill berm. October 16, 2007.

Photograph 7. Large vibration pads from Decommissioned Power Plant foundation, placed on City of St. Paul Landfill Cell A for staging prior to City's re-use. October 23, 2007.

Photograph 8. Final excavation extent for 2007 PCS removal at the Decommissioned Power Plant. October 19, 2007.

Photograph 9. Bering Sea Eccotech completing excavation work in the northeast corner of the 2007 PCS excavation. October 19, 2007.

Photograph 10. Decommissioned Power Plant site after backfilling activities concluded. October 21, 2007.

APPENDIX E
ADEC APPROVAL LETTER FOR CONDITIONAL CLOSURE

For the National Oceanic and Atmospheric Administration

John Lindsay
National Oceanic and Atmospheric Administration
Pribilof Project Manager

April 1, 2008
Date

Approvals: In accordance with Paragraph 59 of the Two Party Agreement, this is to confirm that all corrective action has been completed at the St. Paul Island Alaska Decommissioned Power Plant, TPA Site 9c/TPA Site 18, in accordance with the Agreement and that no plan for further remedial action is required.

For the Alaska Department of Environmental Conservation

Louis Howard
Alaska Department of Environmental Conservation
Remedial Project Manager

April 8, 2008
Date

NOAA Site 19
TPA Site 9d: Decommissioned Power Plant Annex

Request for NFRAP, Decommissioned Power Plant Annex,
TPA Site 9d/Site 19, St. Paul Island, Alaska.....473

Request for NFRAP
Decommissioned Power Plant Annex, TPA Site 9d/Site 19
St. Paul Island, Alaska

Request for No Further Remedial Action Planned

Site: Decommissioned Power Plant Annex, also known as Two Party Agreement (TPA) Site 9d and National Oceanic and Atmospheric Administration (NOAA) Site 19

Location: St. Paul Island, Alaska is approximately 800 miles southwest of Anchorage in the Bering Sea (Figure 1). On the island, the Decommissioned Power Plant Annex is situated in the northern portion of the City of St. Paul, between the base of Village Hill and the Trident Seafood Processing plant on Village Cove (57°07'26" N latitude, 170°16'59" W longitude).

Legal Property Description: The location of the former Decommissioned Power Plant Annex and the area of excavation is in the northern portion of Tract 46, Township 35 South, Range 132 West, of the Seward Meridian, Alaska, as shown on the dependent resurvey of a portion of U.S. Survey No. 4943, Alaska, Tract "A", St. Paul Townsite, officially filed June 3, 1997 (Figure 2). [Note: TPA site boundaries are not defined in the TPA. At its discretion, NOAA established a boundary for this TPA site based on site characterization data and historic information. Though this boundary extends beyond the Tract 46 boundary, corrective actions were only conducted within Tract 46.]

Type of Release: Potential release mechanisms include: 1) spills or leaks that occurred from aboveground storage tanks and drums; and 2) leaks associated with the fuel transfer pipelines.

History and Background:
The Decommissioned Power Plant Annex consisted of a steel-framed and metal sided building constructed sometime between 1973 and 1982, based on historical aerial photographs. The building was constructed atop a concrete slab and was used by the City of St. Paul for power plant operations until sometime in the 1990s. The northeast corner of the building housed a 5,400 gallon vertical diesel fuel storage tank used to supply fuel to a power plant adjacent to its southeast side.

The Decommissioned Power Plant Annex was subsequently used by the City of St. Paul Public Works Department as an unheated storage warehouse. It housed a variety of items, including abandoned batteries, pails, miscellaneous debris, and 55-gallon drums containing various fluids such as diesel fuel, glycol, lubrication oil, and used oil. In June 2000, NOAA initiated a cleanout of the building in preparation for demolition activities (Nortech Environmental, Inc. 2001). The building was demolished in July 2000, leaving only the concrete pad and foundation.

Summary of Site Investigations:
In 1994, a soil sample collected by Woodward Clyde Consultants, Inc. (Woodward Clyde) from the south side of the Decommissioned Power Plant Annex revealed low concentrations of polynuclear aromatic hydrocarbons (PAH) (Woodward Clyde 1994). An expanded site investigation conducted by Hart Crowser, Inc. (Hart Crowser) in 1996 identified the presence of total petroleum hydrocarbons in soil at the Decommissioned Power Plant Annex (Hart Crowser 1997); however, no contaminants were detected above Alaska Department of Environmental Conservation (ADEC) cleanup levels.

NOAA contractors conducted quarterly groundwater monitoring from September 2000 to September 2001 and from October 2003 to July 2004 in the vicinity of the Decommissioned Power Plant Annex. During 2000-2001 sampling events, diesel range organic compounds (DRO) were detected above their Alaska Department of Environmental Conservation (ADEC) Table C cleanup level of 1,500 µg/l in upgradient well MW46-5 and downgradient well MW46-9, with maximum detected concentrations of 6,700 µg/l and 1,600 µg/l, respectively (IT Alaska Inc. 2002; Figure 3). Benzene was detected above its ADEC Table C cleanup level of 5 µg/l in well MW46-5, with a maximum detected concentration of 8 µg/l. During the first three quarters of 2003-2004 sampling, DRO

were detected above their ADEC Table C cleanup level in well MW46-5 and a second upgradient well, MW46-30, with maximum detected concentrations of 7,200 µg/l and 6,500 µg/l, respectively (Figure 3). [Note, MW46-30 was installed in 2003 and thus not included in 2000-2001 monitoring.] Benzene was detected above its ADEC Table C cleanup level in well MW46-5, with a maximum detected concentration of 10 µg/l. A full report on 2003-2004 sampling events will be available late in 2004.

Mitretek Systems (2002) evaluated the 2000-2001 groundwater data for the St. Paul Village area, which includes the Decommissioned Power Plant Annex. The Mitretek report demonstrated that groundwater in the vicinity of St. Paul Village has high total dissolved solids and can be brackish. Consequently, the groundwater in the area is not suitable for drinking water. The evaluation, in part, provided a rationale for using alternative groundwater cleanup levels that are protective of human health and the environment where the groundwater is not potable. Mitretek concluded in accordance with 18 AAC 75.350 (ADEC 2000) that groundwater in the Village area is not currently used and does not afford any potential future use as a drinking water source. These findings provided the basis for the application of the Ten Times Rule discussed below.

Summary of Applied Cleanup Levels:
NOAA employed ADEC Method Two cleanup criteria, discussed at 18 AAC 75.341(c) (ADEC 2000). Alternative cleanup levels were also applied for some compounds. For benzene, under the TPA, NOAA had the option to cleanup to the less stringent State of Alaska cleanup level in effect in 1991 (ADEC 1991). Additionally, NOAA proposed and ADEC approved the use of alternative cleanup levels under 18 AAC 75.345 and 18 AAC 75.350, commonly referred to as the Ten Times Rule (ADEC 2002, Mitretek Systems 2002). According to these regulations, if groundwater beneath a site contains contaminant concentrations above the cleanup levels provided in ADEC Table C, then the soil may be remediated to levels ten times higher than those provided in Method Two Tables B1 and B2 for the migration to groundwater pathway for those contaminants found in groundwater at concentrations above the cleanup levels provided in ADEC Table C; however, if the inhalation or ingestion pathway values are more stringent than the migration to groundwater pathway, then the more stringent value is to be applied. ADEC uses 15 feet below ground surface (bgs) to define subsurface soil to which residents will have a reasonable potential to be exposed through the inhalation or ingestion pathways (ADEC 2000; 18 Alaska Administrative Code 75.340 (j)(2)). Therefore NOAA is not obligated to excavate contaminated soil occurring at depths deeper than 15 feet to address the inhalation and ingestion pathways.

Summary of Cleanup Actions:
Corrective action activities for the Decommissioned Power Plant Annex were initiated in conjunction with corrective action activities at the West Dock Fuel Transfer Facility (TPA Site 9p/Site 51) on June 24, 2003 and were largely completed on July 7, 2003 (NOAA 2003, Tetra Tech 2004a). Final completion of the corrective action occurred on October 9, 2003, with the disposal of contaminated soil that had originally been placed into drums during excavation activities due to concerns regarding the potential presence of polychlorinated biphenyls (PCB). Analytical data subsequently documented that PCBs were not present. Initial areas of excavation were selected based on suspected contamination identified during previous investigations, while the extent of excavation was determined based upon thin-layer chromatography (TLC) screening sample analyses or visual and olfactory observations. Excavation of contaminated soil was conducted to the extent practicable to a maximum depth of 15 feet bgs. If contaminant concentrations remained above ADEC Method Two cleanup levels based on TLC screening sample analyses, additional excavation was conducted even if the concentrations were below alternative cleanup levels unless further excavation was prevented by the presence of obstructions. The excavated PCS was stockpiled at the Tract 42 landfill site, pending final disposal at the National Weather Service land spreading site, or other ADEC approved disposal alternative.

On June 25, 2003, personnel initiated excavation activities at the Decommissioned Power Plant Annex near the base of Village Hill by uncovering and removing sections of the former diesel fuel and gasoline pipelines located between the Decommissioned Power Plant and Decommissioned Power Plant Annex. During the corrective action, four areas were excavated to investigate and remove known or suspected petroleum-contaminated soil (PCS) (Figure 4). Area 1 (approximately 70 feet long and 10 to 20 feet wide) was excavated adjacent to the southeast side of the Decommissioned Power Plant Annex. Area 2 (approximately 25 feet long and 8 feet wide) was ex-

cavated to the south of the first pit and the Decommissioned Power Plant Annex. Area 3 (approximately 35 feet long and 5 feet wide) was excavated further south of the Decommissioned Power Plant Annex and Area 2, and generally trended in a northwest to southeast direction. Area 4 consisted of a small pit (approximately 4 square feet) excavated near the northeast side of the Decommissioned Power Plant Annex to investigate a "hot spot" identified during previous sampling events.

Area 1 (Figure 4) was selected based on contamination identified during the 1994 investigation performed by Woodward Clyde (1994) and the need to remove the former diesel fuel and gasoline pipelines from this area. As personnel uncovered the former diesel fuel and gasoline pipelines, the lines were cut, drained, and staged for disposal. Approximately 10 gallons of diesel fuel and 7 gallons of gasoline were recovered during the corrective action. In areas where it was not feasible to remove the pipelines because of other buried utilities, the road, and the Decommissioned Power Plant Annex concrete pad, the pipe ends were filled with cement after they had been drained. Based on TLC screening sample analyses and visual observations, Area 1 was expanded to the northeast and southwest; depths of excavation varied from 5 feet bgs in the southwest portion to 15 feet bgs in the northeast portion. In addition to the former diesel fuel and gasoline pipelines, numerous unknown utility lines were discovered throughout Area 1, including a 12-inch diameter pipe east of the Decommissioned Power Plant Annex that was leaking an unknown material. Personnel removed sections of the pipe, recovered as much of the unknown material as possible into drums, and excavated contaminated soil from the vicinity. The 12-inch pipe was later determined to be a broken drain line leading from the Decommissioned Power Plant Annex concrete pad and was likely once used as a saltwater discharge line. Laboratory analytical data for the unknown material indicated DRO concentrations up to 2,100,000 µg/L; PCBs were not detected. The unknown material was containerized in drums and subsequently deposited on the Tract 42 PCS stockpile. A 3-inch-diameter, polyvinyl chloride (PVC) pipe was also discovered at the northeast end of Area 1 near the access road. Upon verifying with local officials that the 3-inch PVC pipe was not an active utility, personnel cut and removed the pipe; approximately 15 gallons of machine oil were recovered.

Areas 2 and 3 (Figure 4) were selected in an effort to intercept the former diesel fuel and gasoline pipelines further to the south while avoiding existing utility lines that had been marked by local officials. Excavation in these areas was conducted to further investigate conflicting information obtained from local residents regarding the presence of the pipelines; it was uncertain whether the pipelines had been removed previously. These areas were chosen based on the most likely route of the pipelines identified by local residents. Each area was excavated to a maximum depth of approximately 8 feet bgs, and the pipelines were not unearthed, presumptively verifying that the pipelines had been removed previously during construction activities at the base of Village Hill. Upon investigation, no contamination was identified based on TLC analysis or visual and olfactory observations; therefore, no confirmation samples were deemed necessary. Both areas were backfilled using existing soil.

Hart Crowser identified a hot spot in 1996 (Hart Crowser 1997) that was investigated in Area 4 (Figure 4). This area was excavated to a depth of approximately 4 feet bgs. No contamination was identified based on TLC analysis or visual and olfactory observations. One confirmation sample was collected from Area 4 for laboratory analyses, and the excavation was backfilled.

Eleven confirmation samples were collected from Area 1 and one was collected from Area 4 for laboratory analyses including benzene, toluene, ethylbenzene, and total xylenes (BTEX), GRO, DRO, residual-range organic compounds (RRO), select PAHs, and lead. Confirmation samples collected from the bottom of Area 1 indicated DRO concentrations that varied from not detected to 10,000 mg/kg; six of the twelve samples collected from this area exceeded the ADEC Method Two cleanup level of 250 mg/kg, and three of the twelve samples were at or above the alternative cleanup level of 2,500 mg/kg (Table 1, Figure 5). The confirmation sample collected from the bottom of Area 4 had a DRO concentration of 470 mg/kg, exceeding the ADEC Method Two cleanup level, but below the alternative cleanup level (Table 1, Figure 5).

GRO concentrations in confirmation samples collected from the bottom of Area 1 varied from not detected to 310 mg/kg; one of the twelve samples collected from this area exceeded the ADEC Method Two cleanup level of 300 mg/kg, but none of the samples exceeded the alternative cleanup level of 1,400 mg/kg (Table 1, Figure 5).

Benzene concentrations in confirmation samples collected from the bottom of Area 1 varied from not detected to 0.11 mg/kg; two of the twelve samples collected from this area exceeded the ADEC Method Two cleanup level of 0.02 mg/kg, but none of the samples exceeded the alternative cleanup level of 0.5 mg/kg (Table 1).

Concentrations of all other contaminants in confirmation samples from Areas 1 and 4 were below the ADEC Method Two cleanup levels. Laboratory reporting limits were below ADEC Method Two cleanup levels for all analyses except benzene. For benzene, reporting limits varied from 0.02 mg/kg to 0.16 mg/kg, which is above the ADEC Method Two cleanup level of 0.02 mg/kg but below the alternative cleanup level of 0.5 mg/kg.

Additionally, one waste sample was collected for laboratory analyses from the liquid contents of the septic tank at the northeast corner of the Decommissioned Power Plant (Figure 4). Results indicated a DRO concentration of 1,000 µg/L. Concentrations of PCB congeners were below detection limits. The septic tank and its contents were left in place.

The two confirmation samples exceeding the alternative cleanup level for DRO (SP19-CS-028-150 and SP19-CS-034-150) were collected from the bottom (15 feet bgs) of Area 1. Although no further excavation could be conducted in this area because of equipment limitations (i.e., excavator reach from accessible areas), as discussed above, the excavation depth of 15 feet is sufficient to mitigate inhalation and ingestion pathways.

Each excavation was backfilled after TLC screening sample analyses indicated contaminant concentrations below ADEC Method Two cleanup levels and fixed laboratory confirmation samples had been collected. If remaining contamination was suspected but further excavation was prevented by the presence of obstructions such as structures, rock, boulders, and utility lines, backfill was also placed after fixed laboratory confirmation samples had been collected. Backfill operations involved transporting clean fill material from the portion of the Telegraph Hill quarry owned by Tanadgusix Corporation (TDX) to the site (Tetra Tech 2004b), dumping the material into the excavation, and compacting the fill material with the excavator bucket or by track-walking the excavator over the area. Each area of excavation was restored to its original grade. Backfilling and site restoration activities were completed on July 7, 2003.

During the corrective action, a total of approximately 300 cubic yards of PCS were removed from the four areas around the Decommissioned Power Plant Annex. No stockpile samples were collected from the removed PCS; however, stockpile samples collected from other corrective action sites during 2003 are believed to be generally representative of all corrective action sites (Tetra Tech 2004c). Metal pipelines removed from the excavations were cut into manageable sections and shipped on January 4, 2004 to Seattle Iron and Metal, Corp. for recycling.

Recommended Action:
In accordance with paragraph 59 of the Two Party Agreement (NOAA 1996), NOAA requests written confirmation that NOAA completed all appropriate corrective action at the Decommissioned Power Plant Annex, TPA Site 9d/Site 19 in accordance with the Agreement and that ADEC requires no further remedial action plan from NOAA.

References:
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Tetra Tech. 2004c. *Letter Report, Summary of 2003 Field Season Stockpile Activities, St. Paul Island, Alaska*. July 23.

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For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

9/10/04
Date

Approvals: In accordance with Paragraph 59 of the Two Party Agreement, this is to confirm that all corrective action has been completed at the Decommissioned Power Plant Annex, TPA Site 9d/Site 19 in accordance with the Agreement and that no plan for further remedial action is required.

For the Alaska Department of Environmental Conservation

Louis Howard
Alaska Department of Environmental Conservation
Remedial Project Manager

9-14-04
Date

Tables and Figures

Table 1. Analytical Data Summary for Confirmation Samples from the Decommissioned Power Plant Annex, TPA Site 9d/Site 19, St. Paul Island, Alaska

Sample Number	Sample Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Total Xylenes (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	RRO (mg/kg)	Lead (mg/kg)
Site 19/TPA Site 9d Confirmation Samples									
SP19-CS-003-050	5	0.02 U	0.02 U	0.02 U	0.02 U	1 U	10 U	50 U	2.60
SP19-CS-006-050	5	0.02 U	0.02 U	0.02 U	0.02 U	1 U	10 U	50 U	2.50
SP19-CS-008-050	5	0.02 U	0.02 U	0.02 U	0.03	1	110	930	1.60
SP19-CS-009-050	5	0.02 U	0.02 U	0.02 U	0.02 U	1 U	10 U	50 U	6.10
SP19-CS-925-040	4	0.02 U	0.02 U	0.02 U	0.03	5	**470**	450	3.85
SP19-CS-027-150	15	0.02 U	0.02 U	0.02 U	0.02 U	13	140	50 U	2.50
SP19-CS-028-150	15	0.02 U	0.02	0.02 U	0.65	88	**10,000**	4,400	2.46
SP19-CS-033-150	15	0.16 U	0.16 U	0.16 U	0.47	23	**2,500**	1,000	8.05
SP19-CS-034-150	15	0.02 U	0.05	0.02 U	0.82	97	**9,600**	2,400	2.49
SP19-CS-035-150	15	0.02 U	0.02 U	0.02 U	0.08	18	**690**	490	2.54
SP19-CS-036-150	15	**0.11**	0.30	0.89	5.00	**310**	**1,500**	650	2.76
SP19-CS-037-150	15	**0.03**	0.11	0.22	0.79	63	**1,800**	1,300	3.35
Trip Blank Samples									
Trip blank	- -	0.02 UJ	0.02 UJ	0.02 UJ	0.02 UJ	1 UJ	--	--	--
Trip blank	- -	0.02 U	0.02 U	0.02 U	0.02 U	1 U	--	--	--
Trip blank	- -	0.02 U	0.02 U	0.02 U	0.02 U	1 U	--	--	--
Trip blank	- -	0.02 U	0.02 U	0.02 U	0.02 U	1 U	--	--	--
Method Two Cleanup Level[a]		*0.02*	*5.4*	*5.5*	*78*	*300*	*250*	*10,000*	*400*[e]
Alternative Cleanup Level[b]		*0.5*[c]	*54*	*NA*	*NA*	*1,400*[d]	*2,500*	*NA*	*NA*

Notes:

bold Indicates concentration above one or both cleanup levels. Although reporting limits for benzene sometimes exceeded the ADEC Method Two cleanup level of 0.02 mg/kg, all reporting limits were below the alternative cleanup level of 0.5 mg/kg.

ADEC Alaska Department of Environmental Conservation

bgs Below ground surface

BTEX Benzene, toluene, ethylbenzene, and total xylenes

DPPA Decommissioned Power Plant Annex

DRO Diesel-range organic compounds

GRO Gasoline-range organic compounds

mg/kg Milligrams per kilogram

-- Not analyzed

NA Not available

PAH Polynuclear aromatic hydrocarbon

RRO Residual-range organic compounds

TPA Two-Party Agreement

U The analyte was analyzed for, but not detected above the sample reporting limit

UJ The analyte was analyzed for, but not detected. The associated numerical value is the estimated sample reporting limit

a Cleanup level is from Title 18 of the *Alaska Administrative Code* 75, "Oil and Hazardous Substances Pollution Control Regulations," published by the State of Alaska and amended through October 28, 2000. Contaminants of concern for this site are limited to BTEX, GRO, DRO, RRO, select PAHs, and lead.

b Cleanup level obtained from ADEC Method Two based on the "Ten Times Rule" applied to the migration to groundwater pathway, as discussed in Section 5.0 of the corrective action plan (National Oceanic and Atmospheric Administration [NOAA] 2003).

c Under the TPA, NOAA is required to comply with the 1991 ADEC cleanup level for benzene (0.5 mg/kg).

d Cleanup level selected is based on more stringent value associated with ingestion and inhalation pathways.

e Although these sites are in an industrial area, NOAA is using the residential cleanup level for lead (400/mg/kg).

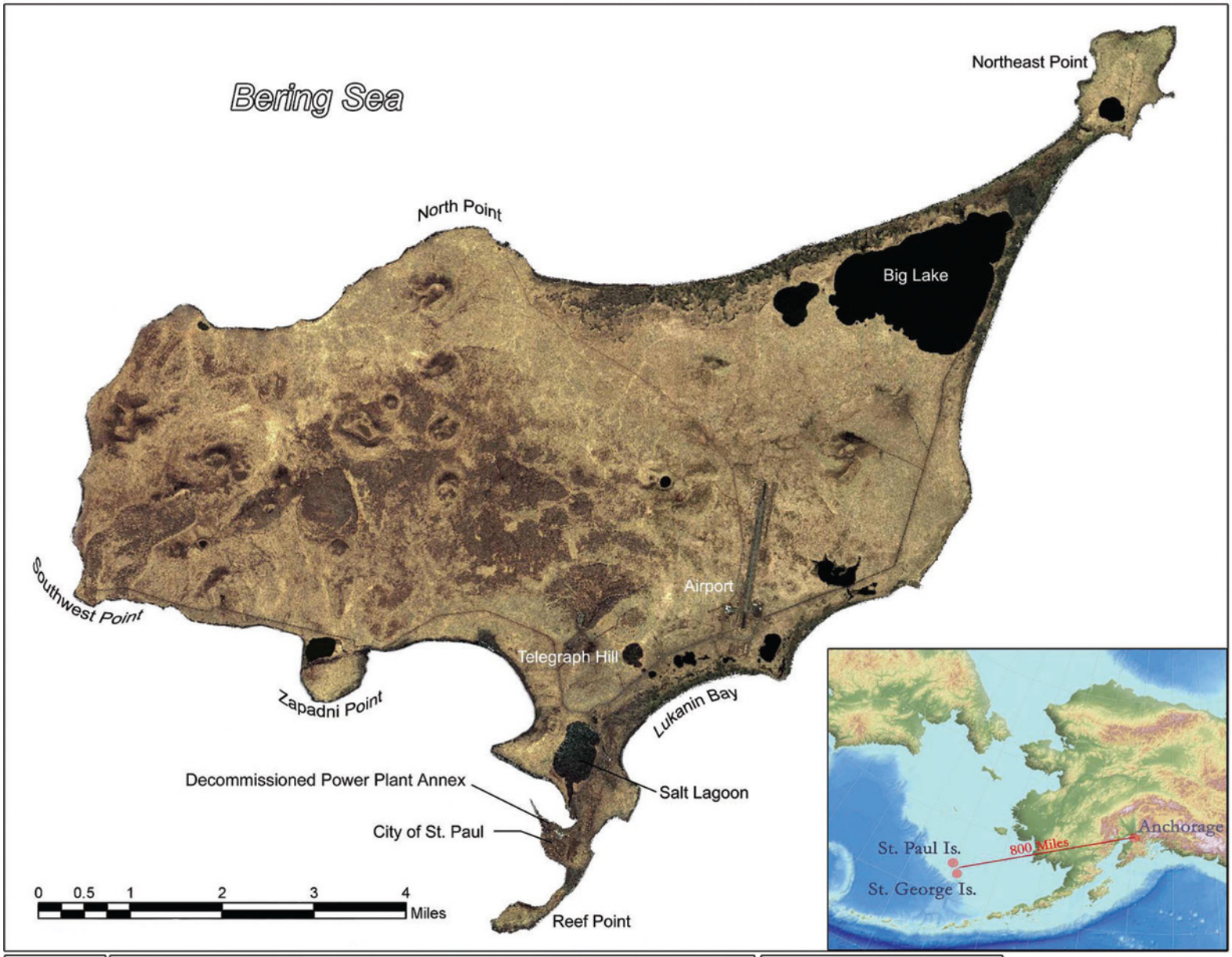

Figure 1	St. Paul Island Vicinity Map Site 19/Decommissioned Power Plant Annex (TPA Site 9d) St. Paul Island, Alaska	Source: Ikonos Satellite Imagery, 2001

Pribilof Islands Restoration Project

Figure 2	Legal Property Description Map Decommissioned Power Plant Annex Site 19/TPA Site 9d St. Paul Island, Alaska	Sources: BLM Tract (BLM MTPs 1983), TPA 9d Boundary (NOAA GIS 2004), Aerial Photo (Aeromap US 1996).

Pribilof Islands Restoration Project

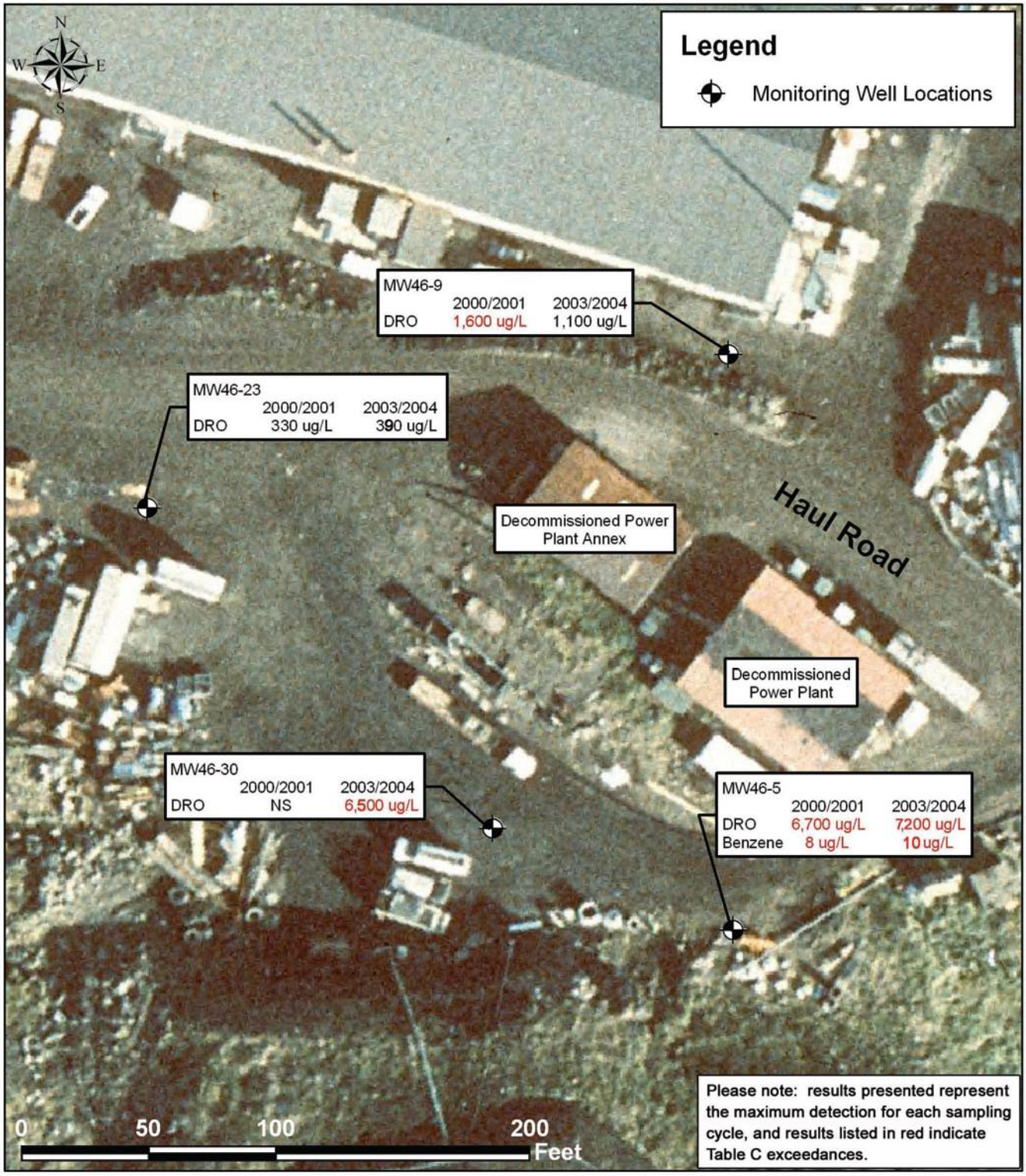

Figure 3	Groundwater Sampling Results Decommissioned Power Plant Annex Site 19/TPA Site 9d St. Paul Island, Alaska	Sources: Monitoring Well Locations (NOAA GPS 2004), Aerial Photography (Aeromap US 1996).

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Figure 4	Areas of Excavation Decommissioned Power Plant Annex Site 19/TPA Site 9d St. Paul Island, Alaska	Sources: Utility Locations and Excavation Extents (NOAA GPS, 2003), Aerial Photography (Aeromap US, 1996).

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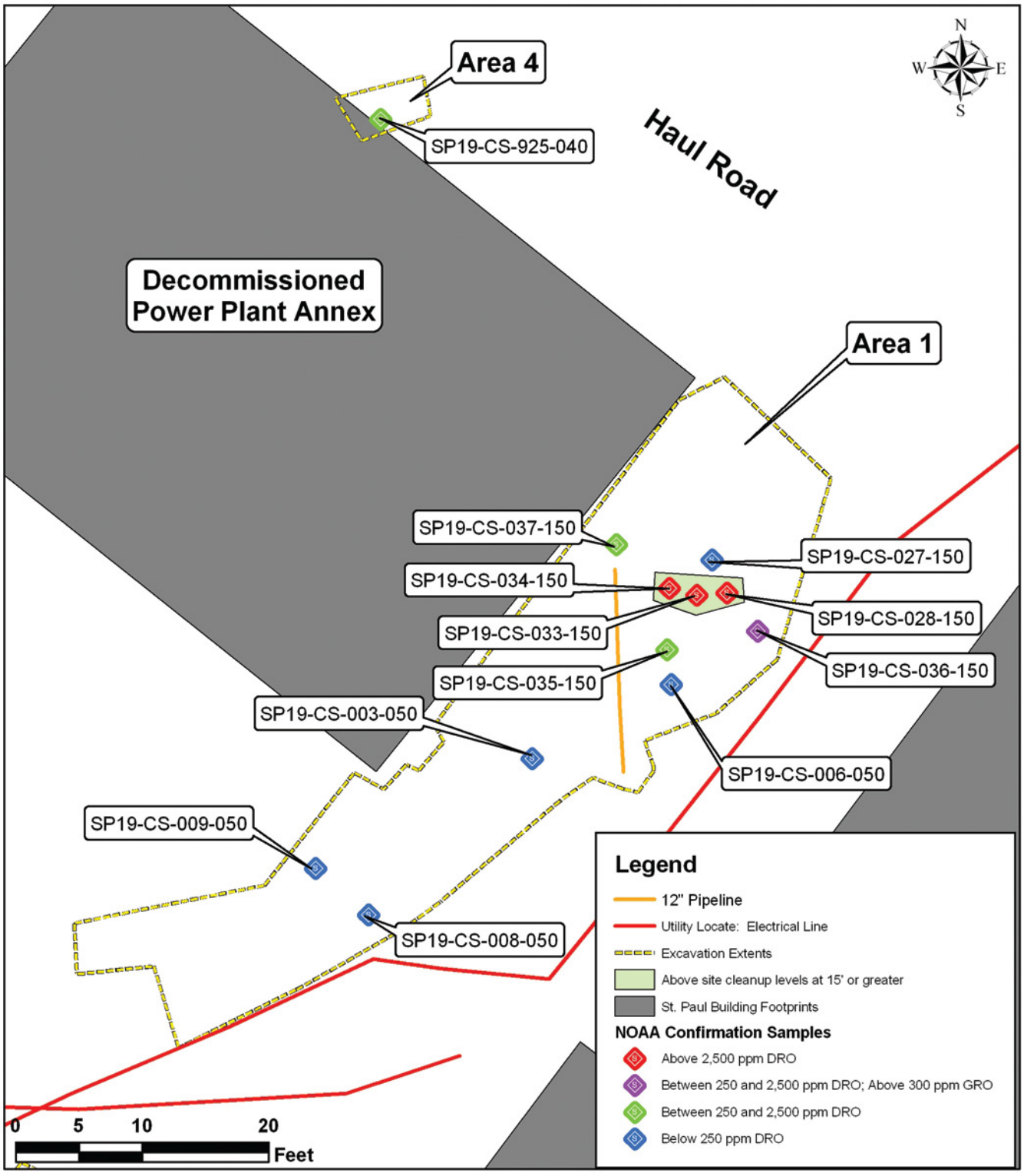

Figure 5	Sampling Location Map Decommissioned Power Plant Annex Site 19/TPA Site 9d St. Paul Island, Alaska	Sources: Confirmation Samples, Excavation Extents, Electrical Line and Pipeline Location (NOAA GPS, 2003), Cleanup level exceedance explanation (NOAA GIS2004), Building Footprints (Pribilof Project Database, 2003).

Pribilof Islands Restoration Project

NOAA Site 20
TPA Site 9e: Machine Shop/Municipal Garage
(USTs Site (Tract 41), TPA 9a; Municipal Garage – UST vent/fill pipe (Tract 41), TPA 9c; Municipal Garage Drum Staging Area (Tract 41), TPA 9d; TPA Attachment A)

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Corrective Action Report and Conditional Closure Request, Municipal Garage Demolition and Contaminated Soil Removal, NOAA Site 20/TPA Site 9e, St. Paul Island, Alaska.....511

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Request for NFRAP
Municipal Garage/Machine Shop, TPA Site 9e, NOAA Site 20
St. Paul Island, Alaska

Request for No Further Remedial Action Planned

Site:
The Municipal Garage/Machine Shop (Municipal Garage) site is known by several different names including the Equipment Shed, Community Garage, and Elephant Hut. It is formerly referred to as Two-Party Agreement [TPA] Site 9e, and as National Oceanographic and Atmospheric Administration (NOAA) site 20.

Location:
St. Paul Island, Alaska is approximately 800 miles southwest of Anchorage in the Bering Sea. The Municipal Garage is situated on St. Paul Island, close to the harbor to the northeast of Village Hill (57°07'21'' latitude, 170°16'50" longitude) Figures 1, 2, and 3.

Legal Description: Tract 46, Township 35 South, Range 132 West, of the Seward Meridian, Alaska, as shown on the dependent resurvey of a portion of U.S. Survey No. 4943, Alaska, Tract "A", St Paul Townsite, officially filed June 3, 1997. Some of the western portion of this site falls within Lot 3, Section 25, Township 35 South, Range 132 West, of the Seward Meridian, Alaska as shown on the plat of rectangular survey officially filed May 14, 1986 (Figure 2). NOAA currently owns the site.

Type of Release:
The site formerly included petroleum products contained in aboveground storage tanks (AST), underground storage tanks (UST), and associated piping mostly on the west side of the building near the north end (Figure 3). Anecdotal reports of above ground releases exist, but it also appears that these tanks and pipes may have leaked petroleum products into the soil.

History:
The Municipal Garage building complex consists of two wooden buildings constructed in the early 1930's. The complex is made up of the south building, a former machine shop with lathes and bays for vehicle maintenance and repair, and the north building, a large open storage area. These two wooden structures are connected by a metal structure constructed in the 1970's; this structure served for vehicle storage and access to the Machine Shop bays, and rooms for battery charging and welding (Figure 3). In 1987, the City of St. Paul leased the Machine Shop portion of the complex from TDX for $1.00 per year for five years. Eventually, the City sublet the Machine Shop to a private entity for the purpose of conducting an automotive repair business. Purportedly, the sublet did not include the other two buildings, however, the sublessee assumed use of the other two buildings. Currently, the Municipal Garage, or north building, is used for the storage of NOAA heavy equipment. The second story of the Machine Shop, or south building, is used to store the City of St. Paul ambulance. The connecting metal structure is not in use. Historically, aboveground storage tanks (AST) used to store gasoline and underground storage tanks (UST) used to store diesel fuel were located along the west side of the Municipal Garage near the north end. The ASTs and USTs were filled via pipelines connected to tank farms located on Village Hill (NOAA 2003a). Also, a pipeline extended from the tank area around the north end of the building to the former gasoline distribution station at the north end of the Cascade Building along the east side of the Municipal Garage.

Summary of Site Investigations:
In 1995, Hart Crowser, Inc. (Hart Crowser, 1997) conducted an expanded site inspection that included the collection of soil samples from the area east of the Municipal Garage (Figure 3). Analytical data for soil samples collected during this investigation indicated the presence of arctic diesel at concentrations up to 5,900 milligrams per kilogram (mg/kg) at a depth of 10 feet below ground surface (bgs). Arctic diesel consists of diesel fuel mixed with gasoline to prevent the mixture from freezing (Hart Crowser 1997, NOAA 2003a, NOAA 2003b).

In 1997, Aleutian Enterprises removed the ASTs and most of the USTs along the west side of the Municipal Garage (Aleutian Enterprises, 1998). In 2000, Columbia Environmental Sciences, Inc. (CESI, 2001) removed an UST at the southeast corner of the Municipal Garage during site characterization activities (Aleutian Enterprises 1998, NOAA 2003a, NOAA 2003b). In 2000, CESI also conducted additional sampling at the Municipal Garage (Figure 3). Analytical data for soil samples collected during this investigation indicated the presence of diesel-range organic compounds (DRO) up to 13,000 mg/kg, gasoline-range organic compounds (GRO) up to 470 mg/kg, toluene up to 20 mg/kg, and ethylbenzene up to 12 mg/kg (CESI 2001, NOAA 2003a, NOAA 2003b).

Summary of 2000/2001, and 2003/2004 GW Sampling:
NOAA contractors conducted quarterly groundwater monitoring from June 2000 to September 2001 and from October 2003 to July 2004 including 4 monitoring wells in the vicinity of the Municipal Garage (Figure 4). The results are summarized below.

During 2000-2001 sampling events, DRO were detected above their Alaska Department of Environmental Conservation (ADEC) Table C cleanup level of 1,500 micrograms per liter (µg/l) in all 4 wells, with maximum detected concentrations of 14,000 µg/l, (Figure 4). Gasoline range organics (GRO) were detected above their ADEC Table C cleanup level of 1,300 µg/l in two wells, with maximum detected concentrations of 24,000 µg/l, with this same well also exceeding the alternative Ten Times Rule (10x Rule) cleanup level for GRO of 13,000 µg/l, Figure 4. Benzene was detected above its ADEC Table C cleanup level of 5 µg/l in 3 of the 4 wells, with maximum detected concentrations of 410 µg/l, Figure 4. The two wells with the highest benzene concentrations also exceeded the 10x Rule cleanup level for benzene of 50 µg/l. Finally, analysis detected toluene above its ADEC Table C cleanup level of 1,000 µg/l in one well, at a concentration of 7,800 µg/l, (IT Alaska Inc. 2002), Figure 4.

During the first two quarters of 2003-2004 sampling, the same compounds that had exceeded the ADEC Table C cleanup levels were detected in all the same wells at levels exceeding the Table C cleanup levels. All the wells that had exceeded cleanup levels under the 10x Rule in 2000/2001 still did so, and one additional well exceeded the 10x Rule (for DRO) that had not in the previous sampling round. This well, MW46-28, went from 14,000 µg/l DRO in 2000/2001 to 28,000 µg/l DRO in 2003/2004, (Figure 4).

No clear pattern of increasing or decreasing groundwater concentrations evolved in the 4 monitoring wells. Concentrations of some constituents increased in some cases, and decreased in others.

Mitretek Systems (2002) evaluated the 2000-2001 groundwater data for the St. Paul Village area, which includes the FPP. The Mitretek report demonstrated that groundwater in the vicinity of St. Paul Village has high total dissolved solids and can be brackish. Consequently, the groundwater in the area is not suitable for drinking water. The evaluation, in part, provided a rationale for using alternative groundwater cleanup levels that are protective of human health and the environment where the groundwater is not potable. Mitretek concluded in accordance with 18 AAC 75.350 (ADEC 2003) that groundwater in the Village area is not currently used and does not afford any potential future use as a drinking water source. These findings provided the basis for the application of the 10x Rule discussed below.

Summary of Applied Cleanup Levels:
NOAA employed ADEC Method Two cleanup criteria, discussed at 18 AAC 75.341(c) (ADEC 2003). Alternative cleanup levels were also applied for some compounds. For benzene, under the TPA, NOAA had the option to cleanup to the less stringent State of Alaska cleanup level in effect in 1991 (ADEC 1991). Additionally, NOAA proposed and ADEC approved the use of alternative cleanup levels under 18 AAC 75.345 and 18 AAC 75.350, commonly referred to as the 10x Rule (ADEC 2002, Mitretek Systems 2002). According to these regulations, if groundwater beneath a site contains contaminant concentrations above the cleanup levels provided in ADEC Table C, then the soil may be remediated to levels ten times higher than those provided in Method Two Tables B1 and B2 for the migration to groundwater pathway for those contaminants found in groundwater at concentrations above the cleanup levels provided in ADEC Table C; however, if the inhalation or ingestion pathway values are more stringent than the migration to groundwater pathway, then the more stringent value is to be applied. ADEC uses 15 feet bgs to define subsurface soil to which residents will have a reasonable potential to be exposed through the inhalation or ingestion pathways (ADEC 2003; 18 AAC 75.340 (j)(2)). Therefore, NOAA is not obligated to

excavate contaminated soil occurring at depths deeper than 15 feet to address the inhalation and ingestion pathways. Cleanup criteria were applied to the maximum extent practicable (18 AAC 75.325 (f), 18 AAC 75.990).

Summary of Cleanup Actions:
Initial cleanup actions at this complex included removal of debris and more than fifty containers of diesel fuel, used oils, acids, solvents, paints, and other miscellaneous liquid substances (Nortech 2001).

Excavation activities for the Municipal Garage commenced on August 4, 2003, and were completed on September 4, 2003. Initial areas of excavation were selected based on contamination identified during previous investigations, while the extent of excavation was determined based on thin layer chromatography (TLC) screening sample analyses as well as visual and olfactory observations (Figure 5) NOAA 2004.

Initially, personnel removed the concrete valve box and sections of the abandoned aboveground fuel lines located along the northwest side of the Municipal Garage. The lines were cut, drained, and removed from the area in order to allow for heavy equipment access to the area. Excavation activities were initiated at the southwest corner of the building and progressed to the north and west based on TLC screening sample analyses as well as visual and olfactory observations. Signs of contamination, including petroleum staining and odors, were noted throughout the excavation, and extended to the east beneath the building. If contaminant concentrations remained above ADEC Method Two cleanup levels based on TLC screening analyses, additional excavation was conducted even if the concentrations were below alternative cleanup levels unless further excavation was prevented by the presence of obstructions. Maximum depths of excavation reached 15 feet bgs throughout the majority of the excavation. Forty-two confirmation samples were collected from the excavation for laboratory analyses including benzene, toluene, ethylbenzene, and total xylenes (BTEX), DRO, and GRO; in addition, approximately 20 percent of these samples were also analyzed for RRO, select polynuclear aromatic hydrocarbons (PAH) and lead (Figures 6 through 12).

During excavation activities, a buried tank containing debris and contaminated soil was discovered along the west side of the excavation near the base of Village Hill. Personnel removed the tank and containerized the debris and contaminated soil in drums for off site disposal.

Excavation activities encountered various underground pipelines along the west side of the Municipal Garage. These pipelines included three abandoned fuel pipelines, a 6-inch salt water line, and other unidentified lines, all of which were inactive. The cleanup crew cut, drained, removed and containerized pipelines in manageable sections for shipment and disposal off the island in January 2004. In addition, the open ends of two 2-inch pipes leading into the Municipal Garage building were sealed with cement.

Forty-two confirmation samples and three field duplicate samples were collected during corrective action activities at the Municipal Garage. Tables 1 and 2 provide a summary of the confirmation samples collected during this corrective action. Figure 6 illustrates the sampling locations. All samples were analyzed for the following constituents:

- BTEX by U.S. Environmental Protection Agency (EPA) SW-846 (EPA 1996) Method 8021B
- DRO by Method AK102

In addition, the following analyses were conducted on subsets of the confirmation samples collected at the FDTF:

- GRO by Method AK101
- RRO by Method AK103
- PAHs by EPA SW-846 (EPA 1996) Method 8270C Selected Ion Monitoring
- Total lead by EPA SW-846 (EPA 1996) Method 6020

In accordance with the CAP (NOAA 2003a), analyses for select PAHs were conducted on approximately 20 percent of the confirmation samples, with sampling locations biased toward the area near the southwest portion of the Municipal Garage where previous investigations identified elevated concentrations of benzo(a)pyrene.

Confirmation samples collected from the excavation at the Municipal Garage indicated DRO concentrations varying from not detected to 19,000 mg/kg. Twenty-two of the 42 samples collected from this area contained concen-

trations of DRO above the ADEC Method Two cleanup level of 250 mg/kg, and 17 of the 42 samples exceeded the alternative cleanup level of 2,500 mg/kg. Figure 7 illustrates the distribution of DRO concentrations.

Confirmation samples indicated GRO concentrations varying from not detected to 1,500 mg/kg. Fourteen of the 42 samples collected from this area contained concentrations of GRO above the ADEC Method Two cleanup level of 300 mg/kg, and 1 of the 42 samples exceeded the alternative cleanup level of 1,400 mg/kg. Figure 8 illustrates the distribution of GRO concentrations.

Confirmation samples indicated benzene concentrations varying from not detected to 1.2 mg/kg. Six of the 42 samples collected from this area contained concentrations of benzene above the ADEC Method Two cleanup level of 0.02 mg/kg, and 3 of the 42 samples exceeded the alternative cleanup level of 0.5 mg/kg. Figure 9 illustrates the distribution of benzene concentrations.

Confirmation samples indicated toluene concentrations varying from not detected to 25 mg/kg. Two of the 42 samples collected from this area contained concentrations of toluene above the ADEC Method Two cleanup level of 5.4 mg/kg, but none of the 42 samples exceeded the alternative cleanup level of 54 mg/kg. Figure 10 illustrates the distribution of toluene concentrations.

Confirmation samples indicated ethylbenzene concentrations varying from not detected to 23 mg/kg. Three of the 42 samples collected from this area contained concentrations of ethylbenzene above the ADEC Method Two cleanup level of 5.5 mg/kg. Since ethylbenzene was not detected in groundwater at this site, the 10x Rule does not apply to the ethylbenzene soil cleanup level. Figure 11 illustrates the distribution of ethylbenzene concentrations.

Confirmation samples indicated total xylenes concentrations varying from not detected to 105 mg/kg. One of the 42 samples collected from this area contained concentrations of total xylenes above the ADEC Method Two cleanup level of 78 mg/kg. Since xylenes were not detected in groundwater at this site, the 10x Rule does not apply to xylene soil cleanup levels. Figure 12 illustrates the distribution of total xylenes concentrations.

Concentrations of all other contaminants in confirmation samples were below ADEC Method Two cleanup levels. Laboratory reporting limits were below ADEC Method Two cleanup levels for all analyses except benzene. For benzene, reporting limits varied from 0.03 mg/kg to 0.5 mg/kg, which is above the ADEC Method Two cleanup level of 0.02 mg/kg, but equal to the alternative cleanup level of 0.5 mg/kg.

Throughout the corrective action, excavation was conducted at each location to the maximum extent practicable. However, due to the presence of obstructions, contamination was left in place at some locations. The following paragraphs summarize the rationale for leaving contamination in various sections of the excavation.

Although confirmation samples indicate that contamination remains in some areas of the excavation, no further excavation could be conducted in these areas because of concerns regarding worker safety and threats to the building's structural integrity. Obstructions encountered during excavation included the Municipal Garage building to the east, a steep slope to the west along the base of Village Hill, a live electric line, active fuel pipelines, a concrete pad, and monitoring well MW46-28 along the north side of the building, and monitoring well MW46-6 located near the northwest corner of the building (Figure 5). Near the northwest corner of the Municipal Garage, the integrity of the building foundation and wall was impacted because of efforts to remove as much PCS as possible, which resulted in the foundation being undercut and some settlement of the foundation.

In the southern portion of the excavation, including sampling locations SP20-CS-001-080 through SP20-CS-012-150, the building foundation prevented further excavation to the east and the steep slope of Village Hill to the west, as well as, refusal due to large boulders at the bottom of the excavation. Excavation in this area generally reached depths of 15 feet bgs. Contamination was left in place at 6 of the 12 sampling locations in this area, primarily along the edge of the building (Figures 7 through 12). Contaminants identified at concentrations above ADEC Method Two cleanup levels include DRO, GRO, benzene, toluene, ethylbenzene, and total xylenes; concentrations of DRO, GRO, benzene, ethylbenzene, and total xylenes also exceeded the alternative cleanup levels.

In the northwest portion of the excavation, including sampling locations SP20-CS-013-150 through SP20-CS-035-100, further excavation was prevented by the building foundation to the east and monitoring well MW46-6 as well as refusal due to large boulders and the presence of groundwater in the bottom of the excavation.

Excavation in this area generally reached depths of 10 to 15 feet bgs. Contamination was left in place at 16 of the 21 sampling locations in this area, primarily in the middle of the excavation where large boulders were encountered (Figures 7 through 12). Contaminants identified at concentrations above ADEC Method Two cleanup levels included DRO, GRO, benzene, and ethylbenzene; concentrations of DRO and ethylbenzene also exceeded the alternative cleanup levels.

In the northerly area of the excavation, including sampling locations SP20-CS-036-100 through SP20-CS-043-020, the concrete apron and building foundation, the presence of monitoring well MW46-28, and active utility lines prevented further excavation. Excavation in this area generally reached depths of 10 feet bgs. Contamination was left in place at 1 of the 7 sampling locations in this area (SP20-CS-043-020), where the top 2 feet of soil was removed, but further excavation could not be conducted due to the presence of an active fuel pipeline and an active underground electric line identified by a representative of the City of St. Paul. Contaminants identified at concentrations above ADEC Method Two cleanup levels include DRO and benzene; concentrations of DRO also exceeded the alternative cleanup level.

This corrective action excavated an approximate total of 2,805 CY of PCS at the Municipal Garage. In addition, numerous artifacts were discovered during excavation activities, including ceramic cups and plates, bottles, cast iron pots, shoes, and an old rifle. These artifacts were set aside for the Tribal Government.

After excavation activities were completed, NOAA and Tetra Tech advanced 7 soil borings through the concrete floor of the Municipal Garage during September 2003 to assess the nature and extent of contamination beneath the building to address potential concerns over risk and potential complications related to future land use raised by ADEC and future landowners. A total of 26 characterization samples were collected and shipped for fixed laboratory analyses. Figure 6 illustrates the sampling locations, and selected analytical results are shown in Figures 7 through 12.

Recommended Action:
In accordance with paragraph 59 of the Two Party Agreement (NOAA 1996), NOAA requests written confirmation that NOAA completed all appropriate corrective action at the Municipal Garage/Machine Shop, TPA Site 9e, NOAA Site 20, in accordance with the Agreement and that ADEC requires no further remedial action plan from NOAA.

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For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

9/30/04
Date

Approvals: In accordance with Paragraph 59 of the Two Party Agreement, this is to confirm that all corrective action has been completed at the Municipal Garage/Machine Shop, TPA Site 9e, NOAA Site 20, in accordance with the Agreement and that no plan for further remedial action is required.

For the Alaska Department of Environmental Conservation

Louis Howard
Alaska Department of Environmental Conservation
Remedial Project Manager

10/11/04
Date

FIGURES

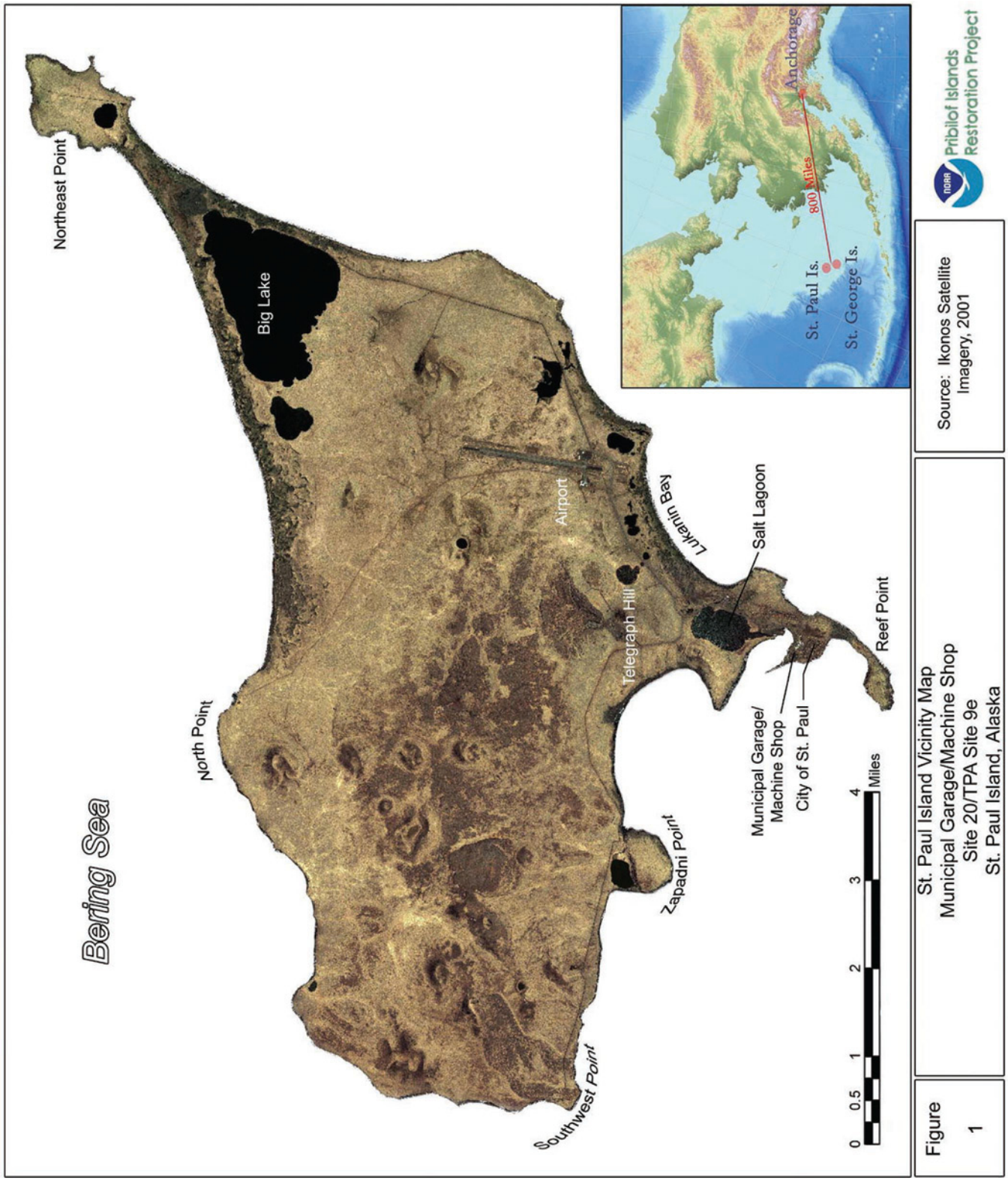
Bering Sea
Northeast Point
Big Lake
North Point
Airport
Lukanin Bay
Salt Lagoon
Telegraph Hill
Reef Point
Zapadni Point
Municipal Garage/
Machine Shop
City of St. Paul
Southwest Point
0 0.5 1 2 3 4 Miles
Anchorage
800 Miles
St. Paul Is.
St. George Is.
Pribilof Islands
Restoration Project
Source: Ikonos Satellite
Imagery, 2001
Figure
1
St. Paul Island Vicinity Map
Municipal Garage/Machine Shop
Site 20/TPA Site 9e
St. Paul Island, Alaska

Figure 2	Legal Property Description Map Municipal Garage/Machine Shop Site 20/TPA Site 9e St. Paul Island, Alaska	Sources: BLM Tracts (BLM MTPs 1983), TPA 9e Boundary (NOAA GIS 2004), Aerial Photo (Aeromap US 1996).

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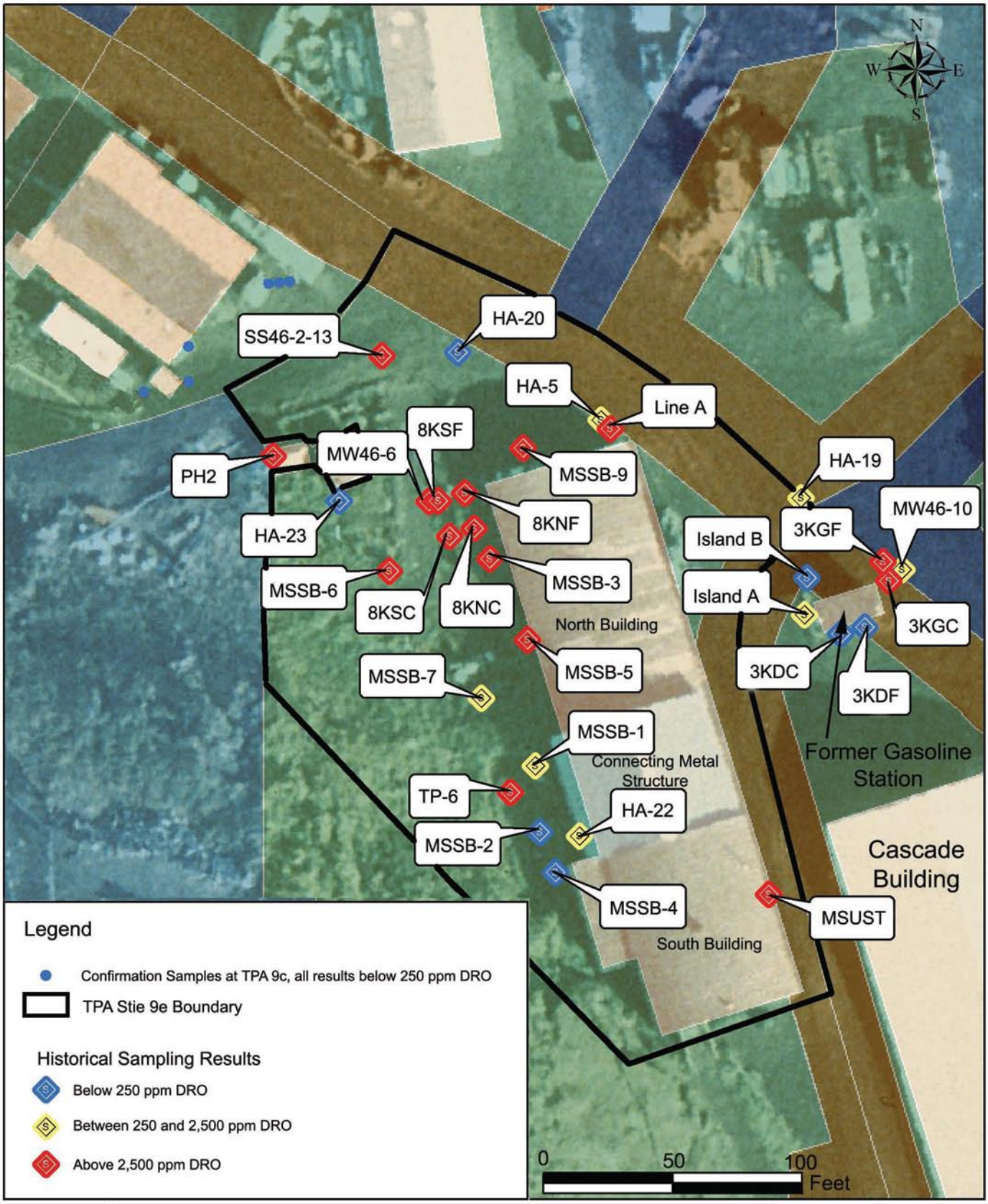

Figure 3	Historical Sampling Locations Municipal Garage/Machine Shop Site 20/TPA Site 9e St. Paul Island, Alaska	Sources: Site Boundaries (NOAA GIS 2004), Historical Sampling Locations (Bristol Environmental Services 1997, CESI 2000, and Hart Crower 1997), Aerial Photo (Aeromap US 1996).	Pribilof Islands Restoration Project

Figure 4	Groundwater Sampling Results Municipal Garage/Machine Shop Site 20/TPA Site 9e St. Paul Island, Alaska	Sources: Excavation Extent (NOAA GPS 2003), Well Locations (NOAA GPS 2004), Utility Locations (NOAA GPS 2003), Aerial Photo (Aeromap US 1996).

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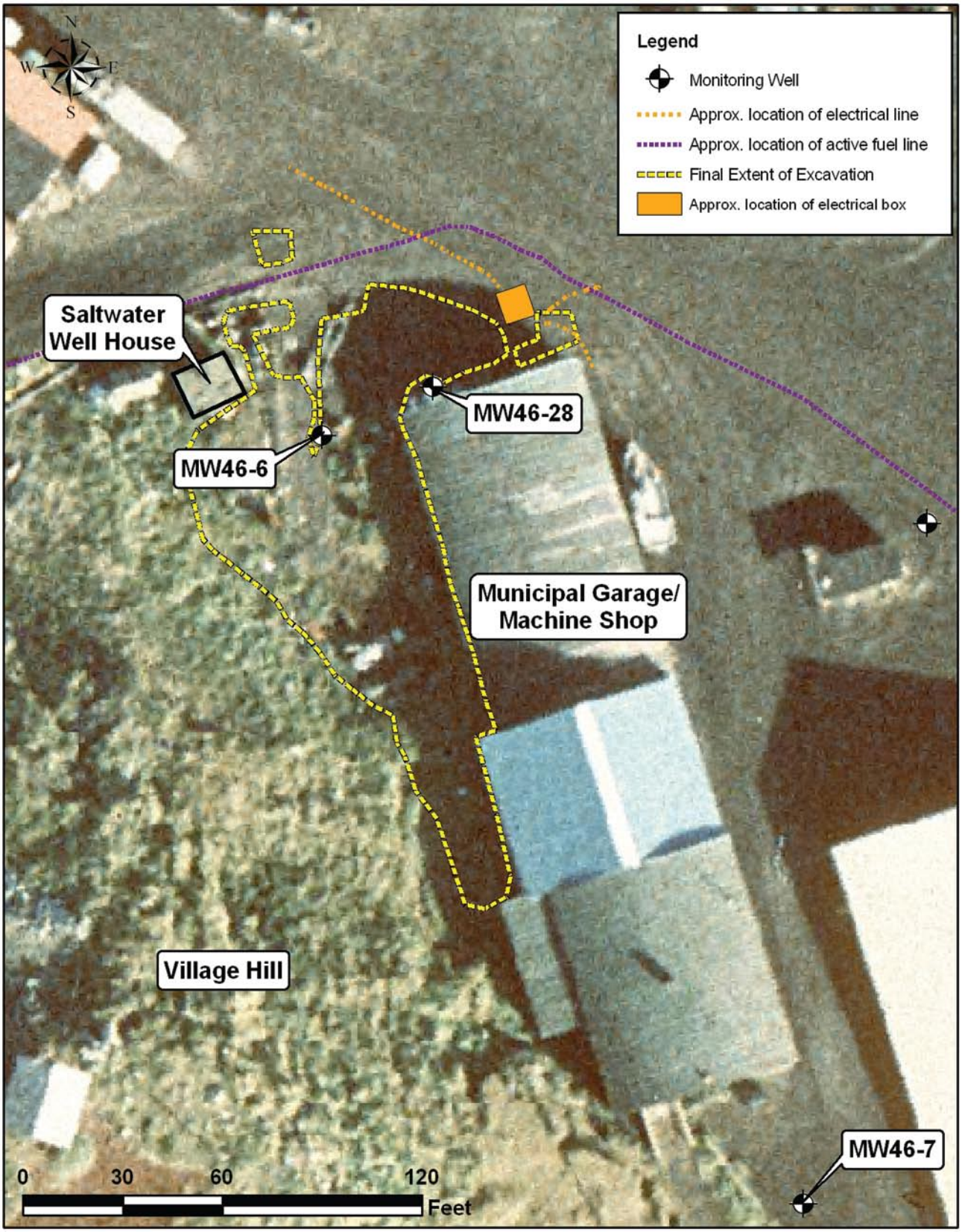

Figure 5	Areas of Excavation Municipal Garage/Machine Shop Site 20/TPA Site 9e St. Paul Island, Alaska	Sources: Excavation Extent (NOAA GPS 2003), Well Locations (NOAA GPS 2004), Utility Locations (NOAA GPS 2003), Aerial Photo (Aeromap US 1996).

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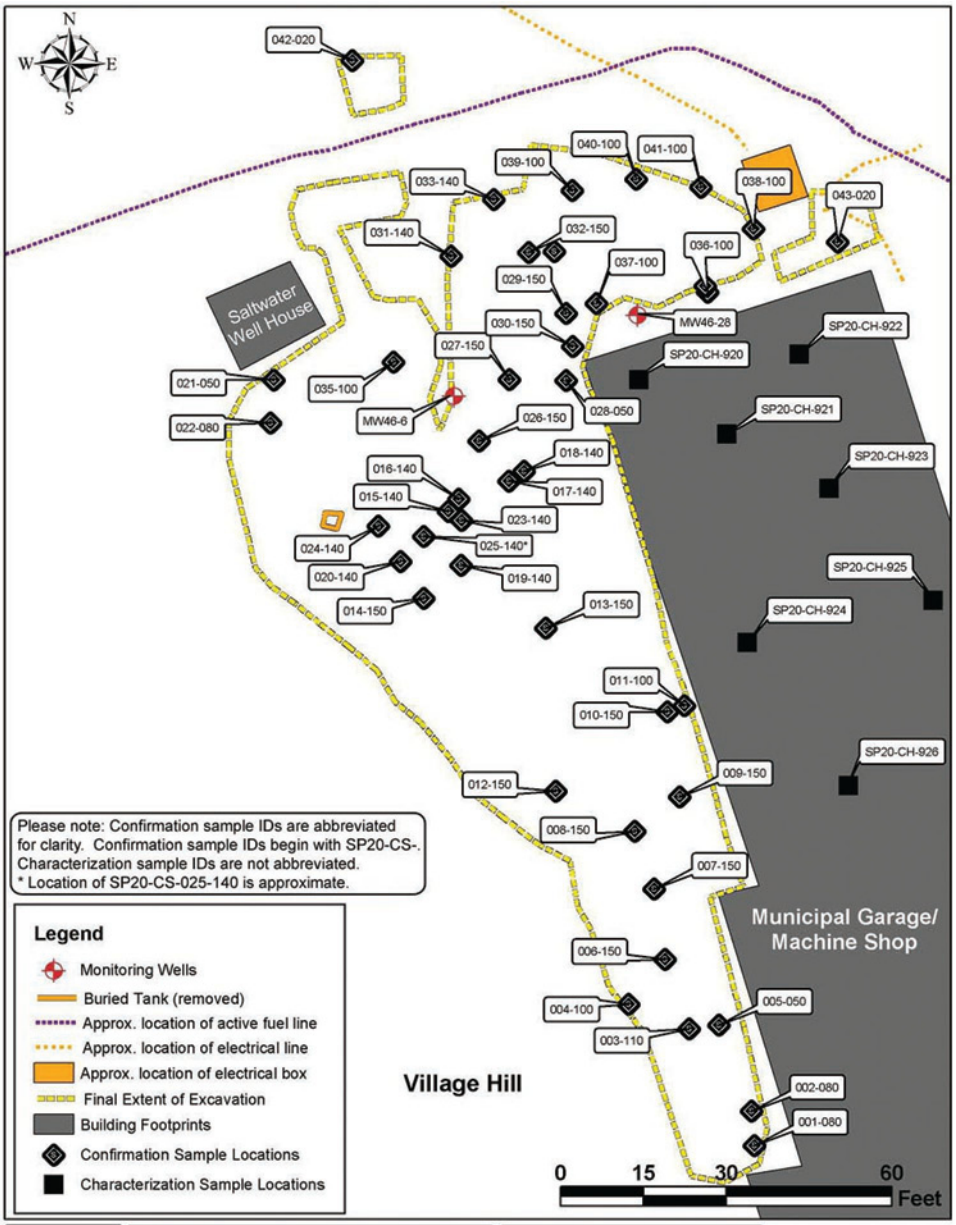

Figure 6

Confirmation Sampling Location Map
Municipal Garage/Machine Shop
Site 20/TPA Site 9e
St. Paul Island, Alaska

Sources: Excavation Extent, Confirmation Samples, Tank Location, and Building Outlines (NOAA GPS 2003) Well location (NOAA GPA 2002).

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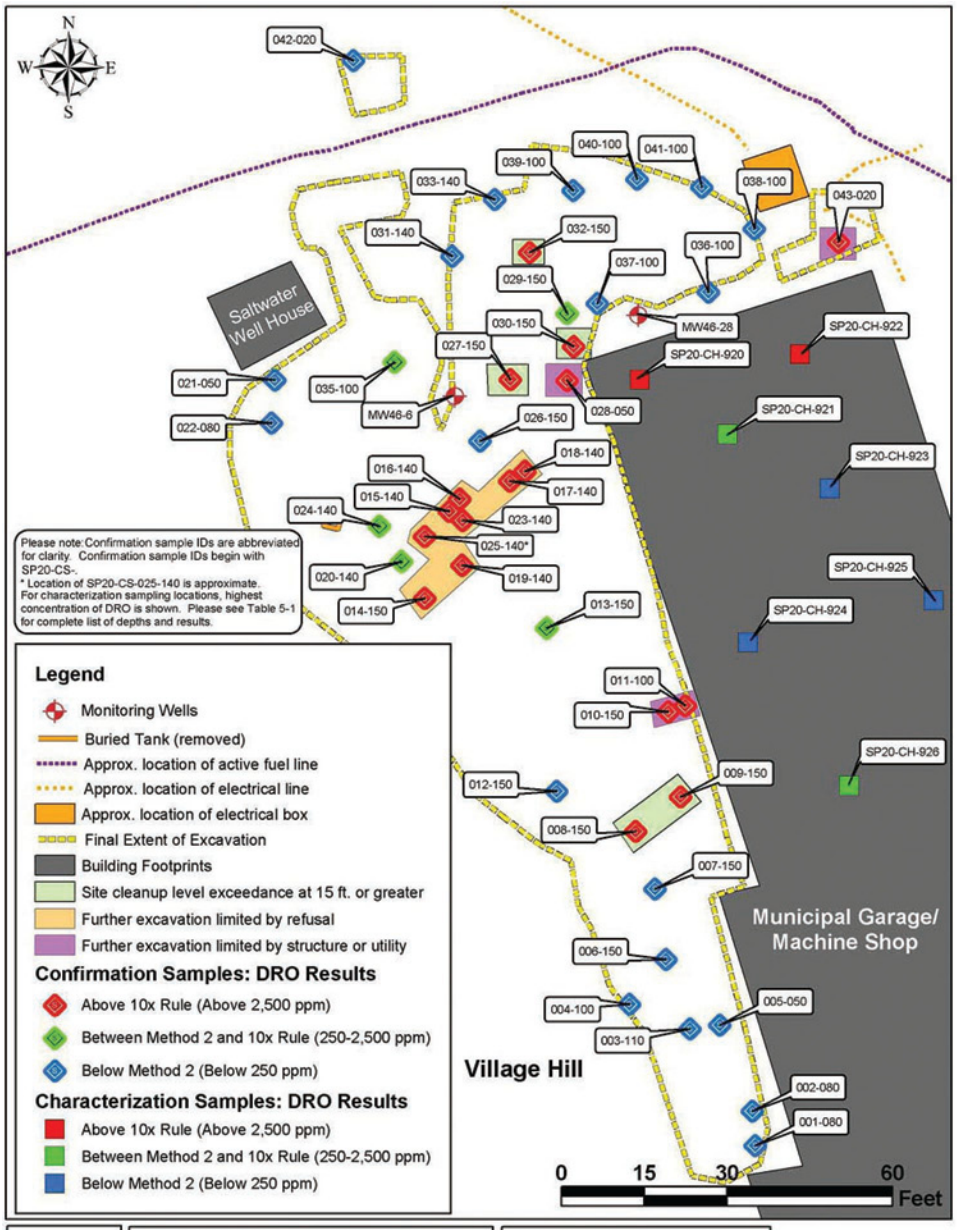

Figure 7	DRO Concentration Map Municipal Garage/Machine Shop Site 20/TPA Site 9e St. Paul Island, Alaska	Sources: Excavation Extent, Confirmation Samples, Tank Location, and Building Outlines (NOAA GPS 2003) Well locations (NOAA GPA 2004).

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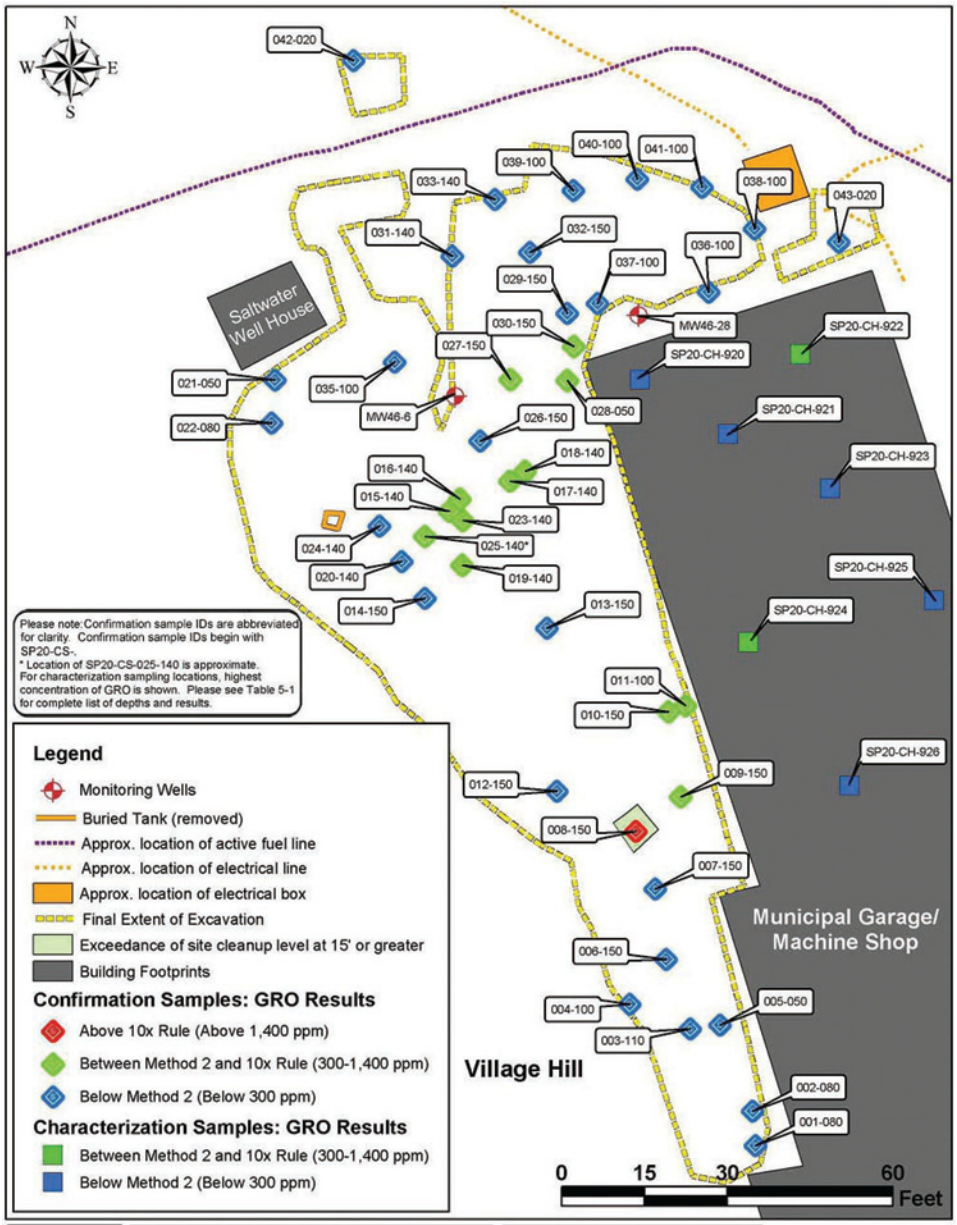

Figure 8

GRO Concentration Map
Municipal Garage/Machine Shop
Site 20/TPA Site 9e
St. Paul Island, Alaska

Sources: Excavation Extent, Confirmation Samples, Tank Location, and Building Outlines (NOAA GPS 2003) Well location (NOAA GPA 2002).

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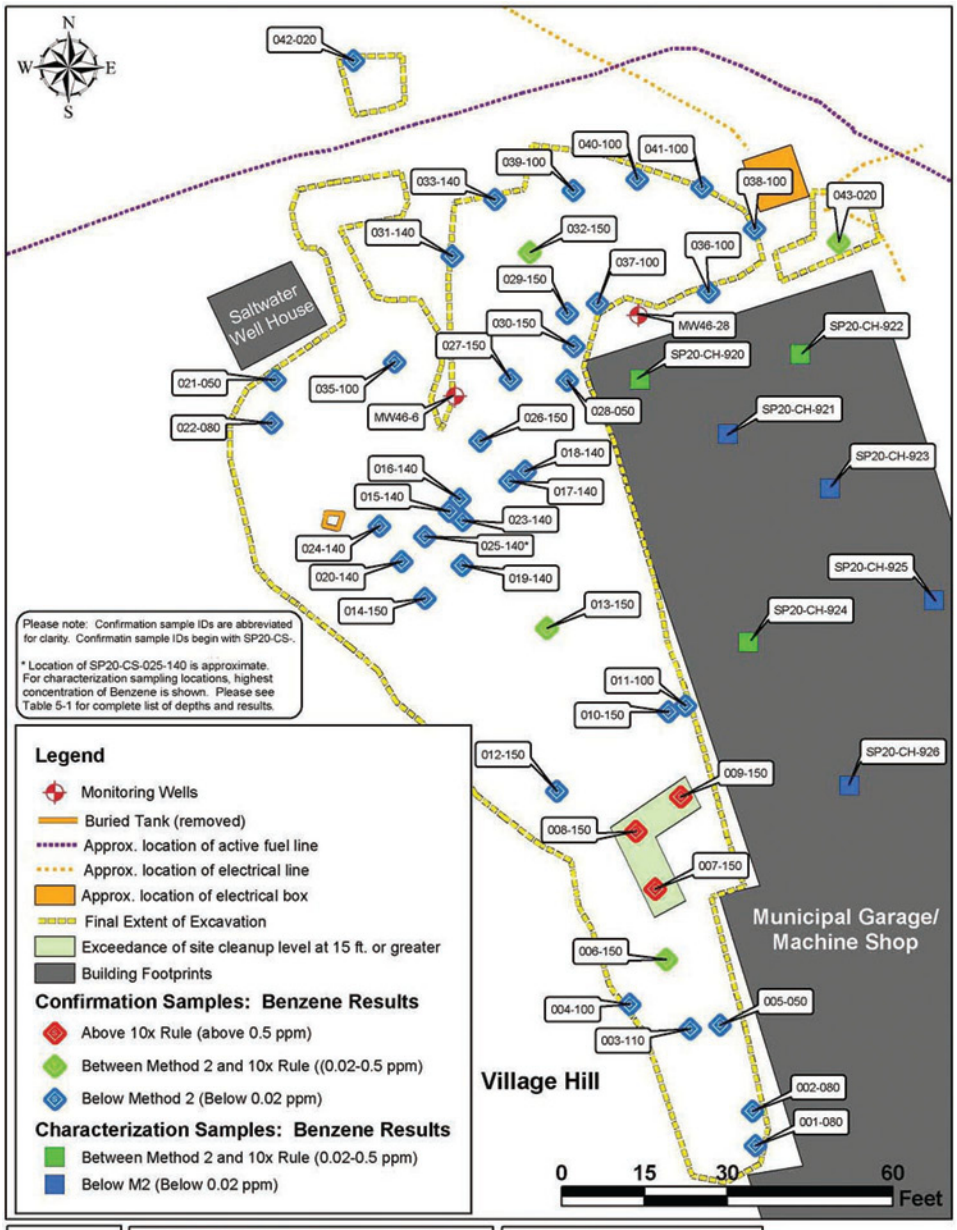

Figure 9	Benzene Concentration Map Municipal Garage/Machine Shop Site 20/TPA Site 9e St. Paul Island, Alaska	Sources: Excavation Extent, Confirmation Samples, Tank Location, and Building Outlines (NOAA GPS 2003) Well location (NOAA GPA 2002).

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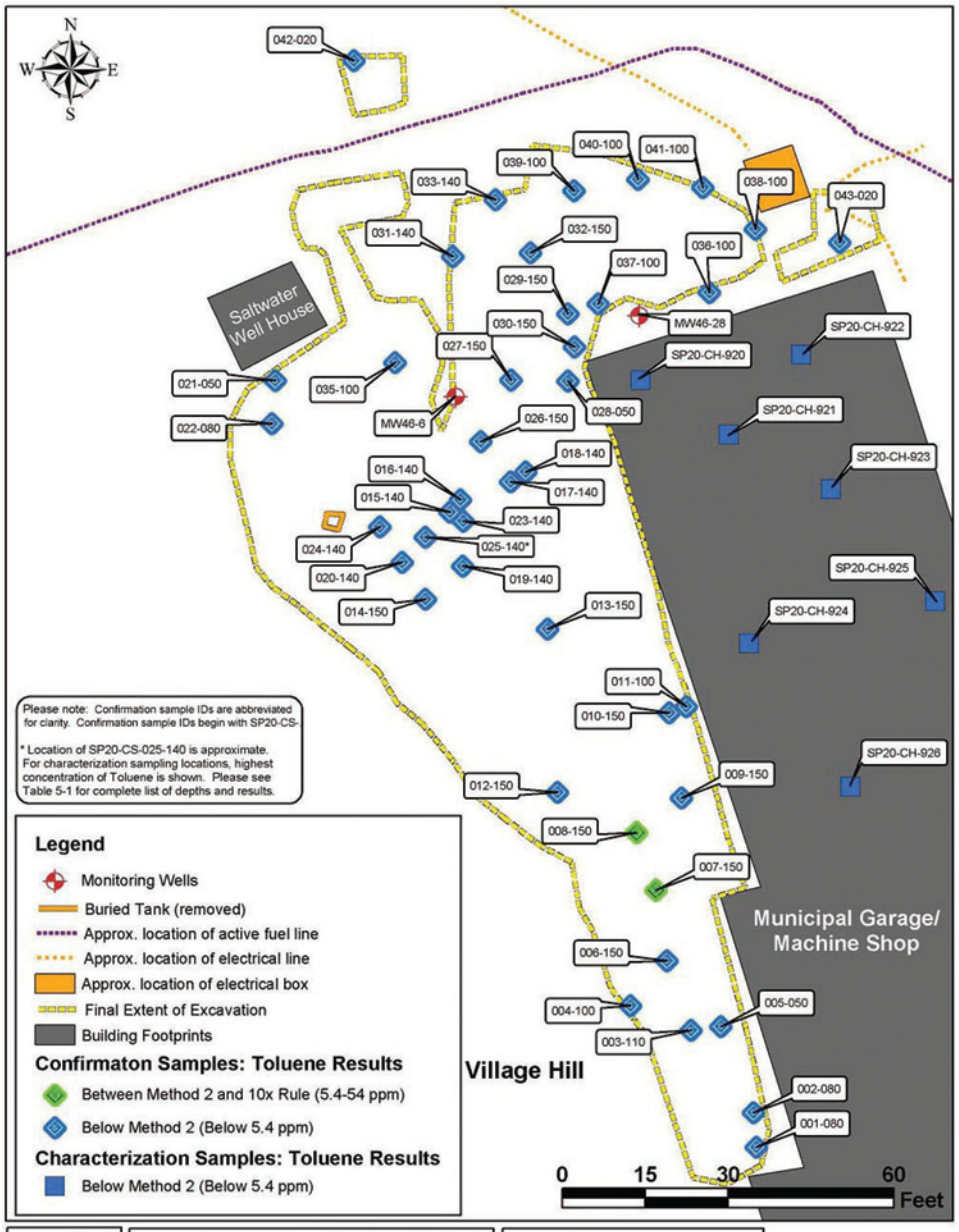

Figure 10

Toluene Concentration Map
Municipal Garage/Machine Shop
Site 20/TPA Site 9e
St. Paul Island, Alaska

Sources: Excavation Extent, Confirmation Samples, Tank Location, and Building Outlines (NOAA GPS 2003) Well location (NOAA GPA 2002).

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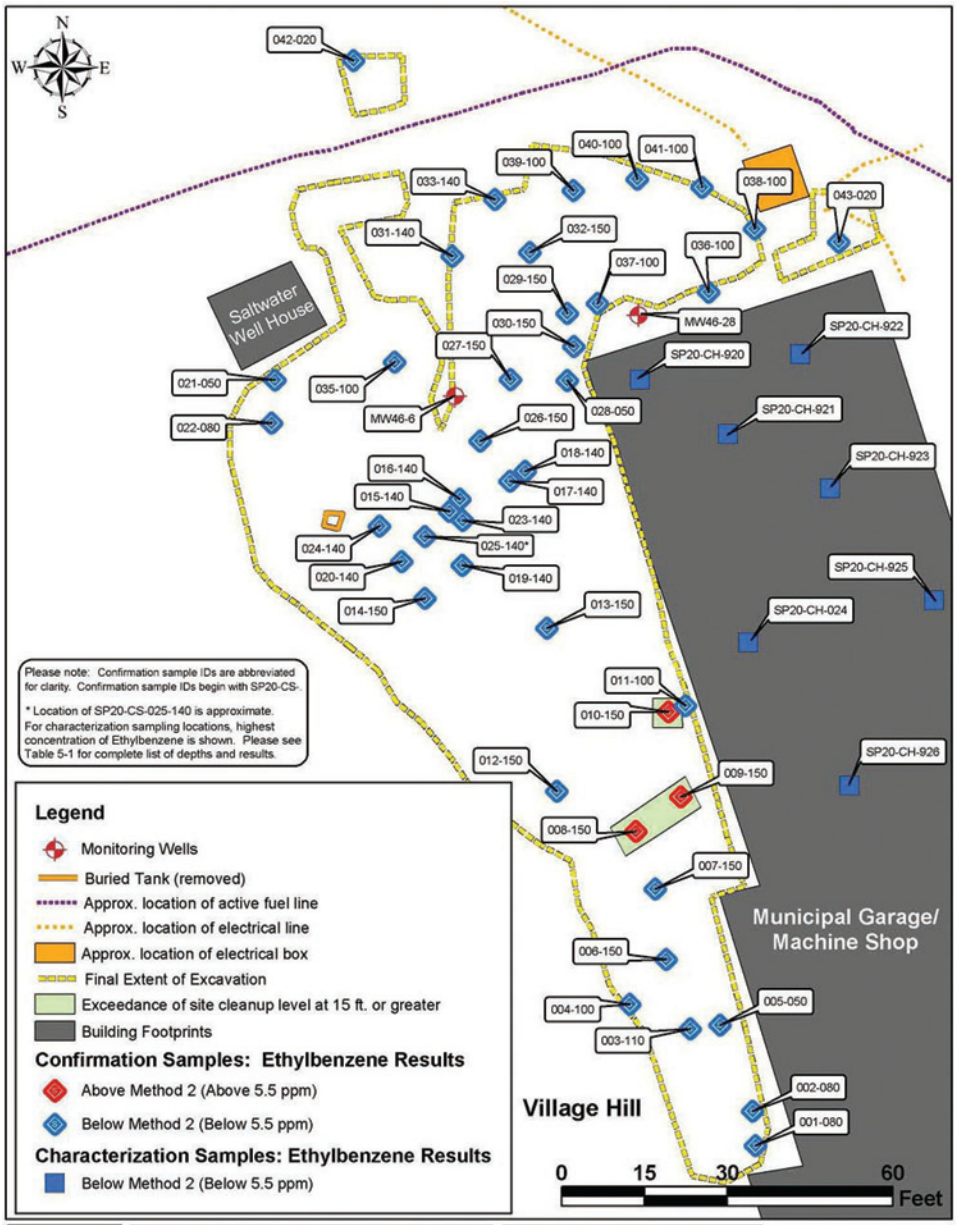

Figure 11	Ethylbenzene Concentration Map Municipal Garage/Machine Shop Site 20/TPA Site 9e St. Paul Island, Alaska	Sources: Excavation Extent, Confirmation Samples, Tank Location, and Building Outlines (NOAA GPS 2003) Well location (NOAA GPA 2002).

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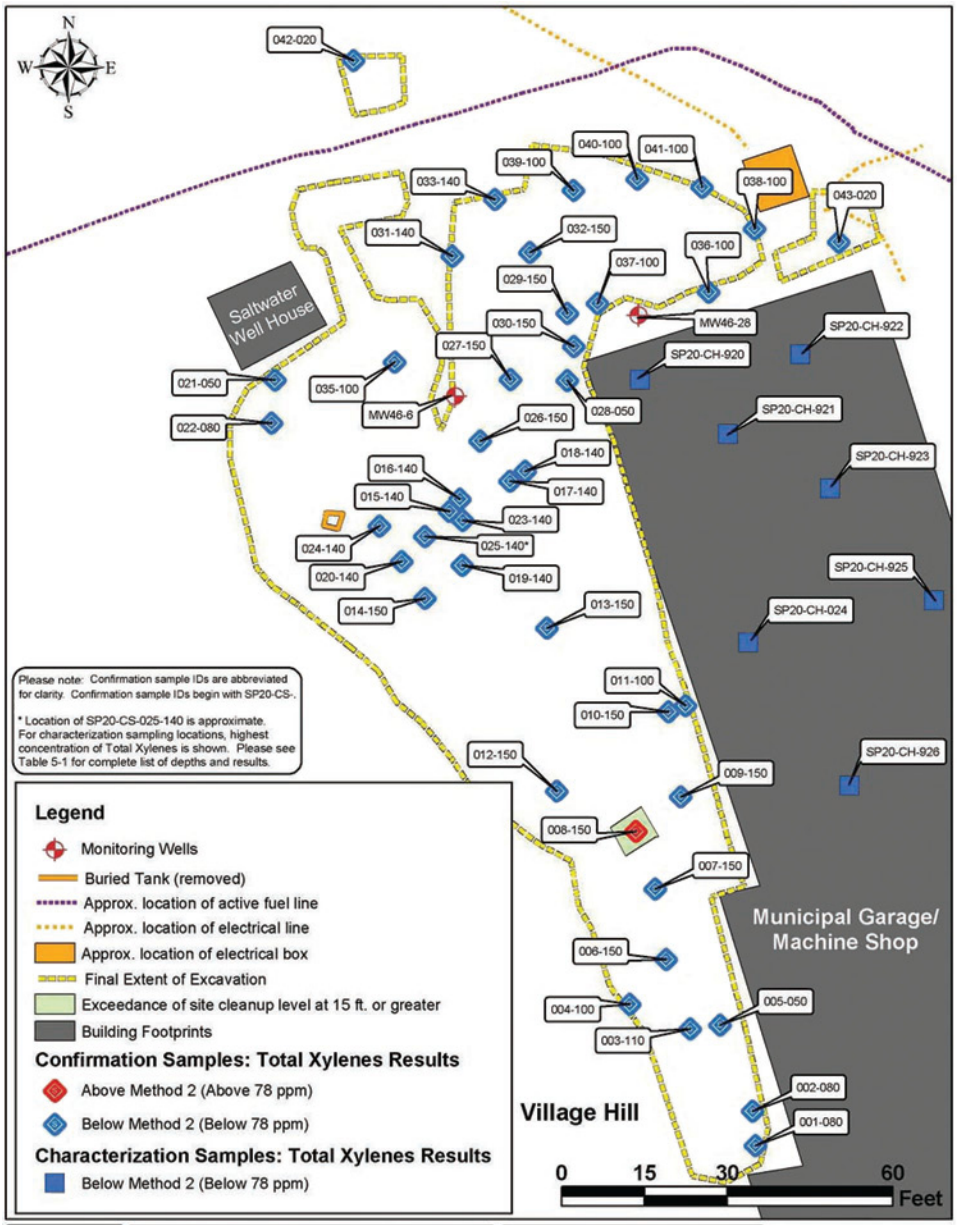

Figure 12

Total Xylenes Concentration Map
Municipal Garage/Machine Shop
Site 20/TPA Site 9e
St. Paul Island, Alaska

Sources: Excavation Extent, Confirmation Samples, Tank Location, and Building Outlines (NOAA GPS 2003) Well location (NOAA GPA 2002).

Pribilof Islands Restoration Project

TABLES

Table 1: Analytical Data Summary - BTEX, GRO, DRO, RRO, And Lead, Site 20/TPA Site 9e - Municipal Garage/Machine Shop, St. Paul Island, Alaska

Sample Number	Sample Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	RRO (mg/kg)	Lead (mg/kg)
TPA Site 9e Confirmation Samples									
SP20-CS-001-080	8	0.03 U	0.03 U	0.03 U	0.03 U	2 U	53	490	3.92
SP20-CS-002-080	8	0.03 U	0.03 U	0.03 U	0.03 U	2 U	46	340	3.60
SP20-CS-003-110	11	0.03 U	0.03 U	0.03 U	0.13	4	10 U	50 U	4.26
SP20-CS-004-100	10	0.03 U	0.03 U	0.03 U	0.03 U	2 U	10 U	50 U	4.90
SP20-CS-005-050	5	0.03 U	0.03 U	0.03 U	0.03 U	2 U	10 U	50 U	3.12
SP20-CS-006-150	15	**0.07**	1.80	0.73	3.3	18	10 U	50 U	8.95
SP20-CS-007-150	15	**0.65**	**5.80**	0.78	4.2	37	10 U	50 U	9.53
SP20-CS-008-150	15	**1.2** J	**25** J	**23** J	**105** J	**1,500** J	**3,300**	--	--
SP20-CS-009-150	15	**1.2** J	3.0 J	**7.5** J	35 J	**1,200** J	**5,500**	--	--
SP20-CS-010-150	15	0.5 U	0.5 U	**5.8** J	22 J	**1,100** J	**10,000**	--	--
SP20-CS-011-100	10	0.5 U	0.5 U	2.4 J	11 J	**440** J	**17,000**	--	--
SP20-CS-012-150	15	0.03 U	0.05	0.04	0.25	2 U	10 U	--	--
SP20-CS-013-150	15	0.03	0.04	0.19	0.85	19	**250**	--	--
SP20-CS-014-150	15	0.5 U	0.5 U	1.0	2.6	200	**3,900**	--	--
SP20-CS-015-140	14	0.06 U	0.17 J	3.7 J	8.2 J	**400** J	**18,000**	--	--
SP20-CS-016-140	14	0.08 U	0.08 U	4.1 J	15 J	**520** J	**11,000**	--	--
SP20-CS-017-140	14	0.07 U	0.07 U	0.27	5.4	**300**	**14,000**	--	--
SP20-CS-018-140	14	0.07 U	0.16 J	3.30 J	7.5 J	**480** J	**18,000**	--	--
SP20-CS-018-250 [a]	14	0.11 U	0.18 J	3.90 J	8.6 J	**480** J	**19,000**	--	--
SP20-CS-019-140	14	0.14 U	0.38 J	4.0 J	17 J	**980** J	**6,100**	--	--
SP20-CS-020-140	14	0.08 U	0.08 U	0.34	1.5	170	**2,400**	--	--
SP20-CS-021-050	0.5	0.04 U	0.04 U	0.04 U	0.04 U	2 U	220	--	--
SP20-CS-022-080	8	0.04 U	0.04 U	0.04 U	0.04 U	2 U	10 U	--	--
SP20-CS-023-140	14	0.14 U	0.14 U	1.4 J	11 J	**550** J	**9,600**	--	--
SP20-CS-024-140	14	0.03 U	0.03 U	0.04	0.34	22	**630**	--	--
SP20-CS-025-140	14	0.11 U	0.25 J	2.3 J	12 J	**680** J	**9,000**	--	--
SP20-CS-025-250 [b]	15	0.12 U	0.22 J	1.4 J	7.7 J	**630** J	**9,000**	--	--
SP20-CS-026-150	15	0.03 U	0.03 U	0.03 U	0.03 U	2 U	10 U	--	--
SP20-CS-027-150	15	0.08 U	0.14 J	1.8 J	12 J	**570** J	**8,400**	--	--
SP20-CS-027-250 [c]	15	0.10 U	0.10 U	1.8 J	12 J	**950** J	**8,900**	--	--
SP20-CS-028-050	5	0.04 U	0.04 J	0.40 J	4.4 J	**330** J	**2,800**	--	--
SP20-CS-029-150	15	0.04 U	0.04 U	0.35	1.70	97	**2,200**	--	--
SP20-CS-030-150	15	0.07 U	0.21 J	2.5 J	13 J	**570** J	**8,000**	--	--
SP20-CS-031-140	14	0.03 U	0.03 U	0.03 U	0.03 U	2 U	10 U	--	--
SP20-CS-032-150	15	**0.07**	0.34	1.2	3.9	170	**2,600**	--	--
SP20-CS-033-140	14	0.03 U	0.03 U	0.03 U	0.03 U	2 U	10 U	--	--
SP20-CS-035-100	10	0.10 U	0.10 U	0.10 U	0.18	20	**1,600**	--	--

Sample Number	Sample Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	RRO (mg/kg)	Lead (mg/kg)
SP20-CS-036-100	10	0.03 U	0.03 U	0.03 U	0.03 U	2 U	10 U	--	--
SP20-CS-037-100	10	0.04 U	0.04 U	0.04 U	0.04 U	2 U	10 U	--	--
SP20-CS-038-100	10	0.05 U	0.07	0.05 U	0.10	3 U	10 U	--	--
SP20-CS-039-100	10	0.03 U	0.03 U	0.03 U	0.03 U	2 U	10 U	--	--
SP20-CS-040-100	10	0.03 U	0.03 U	0.03 U	0.03 U	2 U	10 U	--	--
SP20-CS-041-100	10	0.03 U	0.03 U	0.03 U	0.03 U	2 U	10 U	--	--
SP20-CS-042-020	2	0.03 U	0.03 U	0.03 U	0.03 U	2 U	10 U	--	--
SP20-CS-043-020	2	**0.06** UJ	0.29 J	0.07 J	0.97 J	60 J	**6,400**	--	--
Trip Blank Samples									
SB-1	--	0.02 U	0.02 U	0.02 U	0.02 U	1 U	--	--	--
SB-2	--	0.02 U	0.02 U	0.02 U	0.02 U	1 U	--	--	--
Trip blank	--	0.02 U	0.02 U	0.02 U	0.02 U	1 U	--	--	--
Trip blank	--	0.02 U	0.02 U	0.02 U	0.02 U	1 U	--	--	--
ADEC Method Two Cleanup Level [f]		*0.02*	*5.4*	*5.5*	*78*	*300*	*250*	*10,000*	*400* [j]
Alternative Cleanup Level [g]		*0.5* [h]	*54*	*NA*	*NA*	*1400* [i]	*2,500*	*NA*	*NA*

Notes

bgs Below ground surface
BTEX Benzene, toluene, ethylbenzene, and total xylenes
DRO Diesel-range organic compounds
GRO Gasoline-range organic compounds
mg/kg Milligram per kilogram
-- Not analyzed
NA Not available
RRO Residual-range organic compounds
TPA Two-Party Agreement
U The analyte was analyzed for, but not detected above the sample reporting limit
J The analyte was positively identified, but the numerical value is the estimated concentration; the result is considered qualitatively acceptable, but quantitatively unreliable
a Duplicate of sample number SP20-CS-018-140
b Duplicate of sample number SP20-CS-025-140
c Duplicate of sample number SP20-CS-027-150
d Duplicate of sample number SP20-SS-014
e Duplicate of sample number SP20-SS-020
f Cleanup level obtained from Title 18 of the *Alaska Administrative Code 75*, "Oil and Hazardous Substances Pollution Control Regulations," published by the State of Alaska and amended through October 28, 2000.
g Cleanup level obtained from ADEC Method Two based on the "Ten Times Rule" applied to the migration to groundwater pathway, as discussed in Section 5.0 of the corrective action plan (National Oceanic and Atmospheric Administration [NOAA] 2003e).
h Under the TPA, NOAA is obligated to comply with the 1991 ADEC cleanup level for benzene (0.5 mg/kg).
i Cleanup level selected is based on more stringent value associated with ingestion and inhalation pathways.
j Although these sites are in an industrial area, NOAA is using the residential cleanup level for lead (400 mg/kg).

Table 2: Analytical Data Summary - Polynuclear Aromatic Hydrocarbons Site 20/TPA Site 9e - Municipal Garage/Machine Shop, St. Paul Island, Alaska

Sample Number	Sample Depth (feet bgs)	Naph-thalene (mg/kg)	Acenaph-thylene (mg/kg)	Acenaph-thene (mg/kg)	Fluorene (mg/kg)	Phenan-threne (mg/kg)	Anthra-cene (mg/kg)	Fluoran-thene (mg/kg)	Pyrene (mg/kg)	Benz(a) anthra-cene (mg/kg)	Chrysene (mg/kg)	Benzo(b) fluoran-thene (mg/kg)	Benzo(k) fluoran-thene (mg/kg)	Benzo(a) pyrene (mg/kg)	Indeno (1,2,3-cd) pyrene (mg/kg)	Dibenzo (a,h) an-thracene (mg/kg)	Benzo (g,h,i) perylene (mg/kg)
TPA Site 9e Confirmation Samples																	
SP20-CS-001-080	8	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP20-CS-002-080	8	0.005 U	0.005 U	0.005 U	0.005 U	0.008	0.005 U	0.005 U	0.009	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP20-CS-003-110	11	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP20-CS-004-100	10	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP20-CS-005-050	5	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP20-CS-006-150	15	0.590 D	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP20-CS-007-150	15	0.270	0.005 U	0.005 U	0.005 U	0.006	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP20-CS-008-150	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SP20-CS-009-150	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SP20-CS-010-150	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SP20-CS-011-100	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SP20-CS-012-150	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SP20-CS-013-150	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SP20-CS-014-150	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SP20-CS-015-140	14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SP20-CS-016-140	14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SP20-CS-017-140	14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Sample Number	Sample Depth (feet bgs)	Naph-thalene (mg/kg)	Acenaph-thylene (mg/kg)	Acenaph-thene (mg/kg)	Fluorene (mg/kg)	Phenan-threne (mg/kg)	Anthra-cene (mg/kg)	Fluoran-thene (mg/kg)	Pyrene (mg/kg)	Benz(a) anthra-cene (mg/kg)	Chrysene (mg/kg)	Benzo(b) fluoran-thene (mg/kg)	Benzo(k) fluoran-thene (mg/kg)	Benzo(a) pyrene (mg/kg)	Indeno (1,2,3-cd) pyrene (mg/kg)	Dibenzo (a,h) an-thracene (mg/kg)	Benzo (g,h,i) perylene (mg/kg)
SP20-CS-018-140	14	24	0.050 U	0.050 U	1.5	0.86	0.078	0.15	0.28	0.083	0.085	0.053	0.050 U	0.064	0.050 U	0.050 U	0.050 U
SP20-CS-018-250[a]	14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SP20-CS-019-140	14	3.3	0.050 U	0.49	0.55	0.24	0.050 U	0.050 U	0.059	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
SP20-CS-020-140	14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SP20-CS-021-005	0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SP20-CS-022-080	8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SP20-CS-023-140	14	0.050 U	0.050 U	0.48	0.53	0.45	0.073	0.14	0.28	0.094	0.091	0.073	0.050 U	0.086	0.050 U	0.050 U	0.050 U
SP20-CS-024-140	14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SP20-CS-025-140	14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SP20-CS-025-250[b]	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SP20-CS-026-150	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SP20-CS-027-150	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SP20-CS-027-250[c]	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SP20-CS-028-050	5	0.050 U	0.050 U	0.064	0.095	0.050 U	0.050 U	0.050 U	0.055	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
SP20-CS-029-150	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SP20-CS-030-150	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SP20-CS-031-140	14	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP20-CS-032-150	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SP20-CS-033-140	14	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Sample Number	Sample Depth (feet bgs)	Naph-thalene (mg/kg)	Acenaph-thylene (mg/kg)	Acenaph-thene (mg/kg)	Fluorene (mg/kg)	Phenan-threne (mg/kg)	Anthra-cene (mg/kg)	Fluoran-thene (mg/kg)	Pyrene (mg/kg)	Benz(a) anthra-cene (mg/kg)	Chrysene (mg/kg)	Benzo(b) fluoran-thene (mg/kg)	Benzo(k) fluoran-thene (mg/kg)	Benzo(a) pyrene (mg/kg)	Indeno (1,2,3-cd) pyrene (mg/kg)	Dibenzo (a,h) an-thracene (mg/kg)	Benzo (g,h,i) perylene (mg/kg)
SP20-CS-035-100	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SP20-CS-036-100	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SP20-CS-037-100	10	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP20-CS-038-100	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SP20-CS-039-100	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SP20-CS-040-100	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SP20-CS-041-100	10	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP20-CS-042-020	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SP20-CS-043-020	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Method Two Cleanup Level [f]		*43*	*NA*	*210*	*270*	*NA*	*4,300*	*NA*	*1,500*	*6*	*620*	*11*	*110*	*1*	*11*	*1*	*NA*

Notes

bgs Below ground surface
D Result reported from dilute analysis
mg/kg Milligram per kilogram
-- Not analyzed
NA Not available
TPA Two-Party Agreement
U The analyte was analyzed for, but not detected above the sample reporting limit
a Duplicate of sample number SP20-CS-018-140
b Duplicate of sample number SP20-CS-025-140
c Duplicate of sample number SP20-CS-027-150
d Duplicate of sample number SP20-SS-014
e Duplicate of sample number SP20-SS-020
f Cleanup level obtained from Title 18 of the *Alaska Administrative Code 75*, "Oil and Hazardous Substances Pollution Control Regulations," published by the State of Alaska and amended through October 28, 2000.

Corrective Action Report and Conditional Closure Request

Municipal Garage Demolition and Contaminated Soil Removal
NOAA Site 20/TPA Site 9e
St. Paul Island, Alaska

April 8, 2008

Prepared By:

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B Weekly Reports
C Chemical Data Quality Assessment Summary, Laboratory Data Review Checklists, and Laboratory Data Deliverables
D Archaeological Monitoring Report
E ADEC Approval Letter for Conditional Closure

ACRONYMS AND ABBREVIATIONS

AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
bgs	below ground surface
BSE	Bering Sea Eccotech, Inc.
BTEX	benzene, toluene, ethylbenzene, and total xylenes
CAP	corrective action plan
CAR	corrective action report
CESI	Columbia Environmental Sciences, Inc.
cm	centimeter
COC	chain-of-custody
CSM	conceptual site model
CY	cubic yard
DRO	diesel-range organics
EPA	U.S. Environmental Protection Agency
F&BI	Friedman and Bruya Inc.
FPXRF	field portable x-ray fluorescence instrument
ft	feet
GIS	geographic information system
GPS	global positioning system
GRO	gasoline-range organics
ICP/MS	inductively coupled plasma/ mass spectrometry
IDW	investigation-derived waste
LCS	laboratory control samples
mg/kg	milligrams per kilogram
MS/MSD	matrix spike/matrix spike duplicate
LCG	Larson Consulting Group
NOAA	National Oceanic and Atmospheric Administration
PAH	polynuclear aromatic hydrocarbon
PCS	petroleum contaminated soil
PID	photo ionization detector
PQL	practical quantitation limit
QA/QC	quality assurance and quality control
QAP	quality assurance plan
RPD	relative percent difference
RRO	residual-range organics
SGS	SGS Environmental Services, Inc. of Anchorage, Alaska
TLC	thin-layer chromatography
TPA	Two-Party Agreement
VOCs	volatile organic compounds

EXECUTIVE SUMMARY

The U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), through its Office of Response and Restoration, Pribilof Project Office (PPO) is responsible for site characterization and restoration activities on St. Paul Island, Alaska (Figure 1). The PPO conducts these activities at several sites on the Pribilof Islands according to the Two Party Agreement (TPA) between NOAA and the State of Alaska. This corrective action report details corrective actions conducted at the Municipal Garage Site (NOAA Site 20/TPA Site 9e), including the adjacent former Connector Building footprint, on St. Paul Island. This report was prepared by NOAA.

The Municipal Garage was located at the base of Village Hill, just north of the Machine Shop (Figure 2). The building has been the location of various storage and equipment maintenance operations dating back to the 1930s. The Municipal Garage (also referred to as the Equipment Shed and Elephant Hut) was most recently used by NOAA for storage of heavy equipment, construction supplies, and miscellaneous items. The concrete foundation of the former Connector Building abutted the Municipal Garage on the south end, connecting it to the Machine Shop building.

Gasoline above ground storage tanks (ASTs) were once located on the southwest side of the Municipal Garage, while diesel underground storage tanks (USTs) were previously located on the northwest side of the building. Pipelines transferred diesel fuel from a Diesel Tank Farm (NOAA Site 30/TPA Site 11) atop Village Hill to the diesel USTs. Gasoline was gravity fed to the ASTs from a former Gasoline Tank Farm (NOAA Site 29/TPA Site 10) located on the north slope of Village Hill. There were two floor drains inside the Municipal Garage and a small sump was located along the exterior of the south wall of the Municipal Garage, inside the former Connector Building. A former gasoline service station was located to the east of the Municipal Garage.

Accidental releases of diesel fuel and gasoline previously stored and/or transferred by pipelines to, or near to, the site led to environmental contamination. Also, wastes may have been spilled or dumped into the floor drains and sump. Investigations at the site indicated the presence of diesel-range and gasoline range organic compounds in soil at concentrations above site specific cleanup levels. Since the Municipal Garage had become structurally compromised due to partially rotted structural members, NOAA agreed to demolish the structure. With the structure demolished, it was then necessary for NOAA to remove the petroleum contaminated soil (PCS) known to exist underneath.

NOAA also discovered a six foot wide strip of soil along the north wall of the building where lead contamination in soil exceeded the State of Alaska industrial area cleanup level for soil of 1,000 mg/kg total lead. This contamination was thought to have resulted from lead paint peeling off the building's exterior siding.

NOAA selected Bering Sea Eccotech Inc. (BSE) to implement the corrective action for the demolition of the building and removal of PCS and lead contaminated soil at the site. NOAA's site cleanup levels for soil were based on ADEC Method Two, or alternative cleanup levels established under application of ADEC's 10x Rule where approved by ADEC. The Municipal Garage was demolished and the building demolition debris placed in the City of St. Paul municipal landfill. During the corrective action, BSE removed approximately 2,014 cubic yards (CY) of PCS from the site and transported it to NOAA's ADEC-approved landspreading area at the National Weather Service property on the island. BSE also removed approximately 18 CY of lead contaminated soil and transported it to a disposal trench in NOAA's Tract 42 Landfill Cell C, covering it with at least two feet of landfill cap soil. BSE backfilled the PCS and lead contaminated soil excavations to the original grade using clean fill material.

After completing removal of PCS at the Municipal Garage Site, confirmation samples collected from the excavation bottom indicated concentrations of GRO and DRO and some BTEX constituents that exceeded the site specific cleanup levels along the sides of the excavation. However, more PCS could not be removed because this remaining contaminated soil was at the depth of groundwater (14 feet below ground surface) or extended into areas with buried utilities that NOAA is not required to disturb. After completing removal of lead contaminated soil, a confirmation sample collected from the excavation bottom indicated no soil remained with lead contamination greater than the site cleanup level.

As a result of this cleanup action, all required contamination has been removed and no exposure routes remain for human receptors or the environment. NOAA is therefore requesting in this Corrective Action Report/Conditional Closure Request that ADEC agree further remedial action from NOAA is no longer required at the Municipal Garage Site since the primary sources of contamination have been removed and analytical data indicate that PCS and lead contaminated soil has been excavated to the maximum extent practicable.

1.0 INTRODUCTION

The U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), through its Office of Response and Restoration, Pribilof Project Office is responsible for site characterization and restoration on St. Paul Island, Alaska. St. Paul Island is located north of the Aleutian Islands chain in the Bering Sea, approximately 800 miles west-southwest of Anchorage, Alaska (Figure 1).

Public Law 104-91 of 1996 and Public Law 106-562 of 2000 provide the mandate for these activities. A Two Party Agreement (TPA), signed in 1996 by NOAA and the State of Alaska, provides the framework for corrective action on St. Paul Island (NOAA 1996). The State of Alaska provides TPA oversight through the Alaska Department of Environmental Conservation (ADEC). Under the TPA, NOAA is required to comply with State of Alaska regulations in effect in 1991 (ADEC 1991); however, with ADEC agreement, NOAA has chosen to follow more current regulations whenever possible.

This corrective action report/condition closure request (CAR/CCR) documents the 2007 corrective action work performed at the St. Paul Island Municipal Garage site ("site"), designated by NOAA as NOAA Site 20, and also known as TPA Site 9e. The Municipal Garage was located at the base of Village Hill, just north of the Machine Shop (Figure 2). During this corrective action, the Municipal Garage was demolished and petroleum or lead contaminated soil was removed from the site, followed by backfilling with clean soil. Except as noted in this CAR, field activities for this work were carried out in accordance with the following documents:

- Corrective Action Plan (CAP) Addendum for the Removal of Lead and Petroleum Contaminated Soil at the Municipal Garage (NOAA Site 20, TPA Site 9e) St. Paul Island, Alaska. (NOAA 2006b)
- Master quality assurance plan (QAP) (NOAA 2006a)
- NOAA's Master Investigation Derived Waste Plan (NOAA 2003b)
- Master health and safety plan (NOAA 2004a)

NOAA performed this corrective action to address environmental impacts resulting from past operations conducted in and around the Municipal Garage. The ADEC does not require that existing buildings be demolished to remediate environmental contamination underneath them. While the Municipal Garage building was still usable, some of its wooden roof trusses were structurally compromised by rot and NOAA determined that it should be demolished prior to a planned property transfer because it could be a potential safety hazard in the future. Demolition of the structure was complicated by the fact that the entire structure was painted with lead based paint, preventing reuse or burning of wood parts. NOAA collected representative samples of various parts of the building prior to demolition and analyzed them using the Toxicity Characteristic Leaching Procedure (TCLP), EPA Method 1311 (40 CFR 261.23). The results showed that the exterior siding exceeded allowable limits for lead leachability and would have to be considered a Resource Conservation and Recovery Act (RCRA) hazardous waste if removed without treatment. NOAA also found that a small area of soil along the north wall of the building exceeded the ADEC industrial cleanup standard for lead of 1,000 milligrams per kilogram (mg/kg), although this soil did not fail the TCLP and therefore did not require handling as a hazardous waste upon removal. Cleanup of the known petroleum contaminated soil (PCS) underneath the building was required by State of Alaska Regulations if the building were to be removed. Therefore, the objectives of the corrective action were as follows:

- Treat the exterior siding of the building prior to demolition with a commercial phosphate coating that would prevent leaching of the lead paint and render it non-RCRA hazardous and therefore able to be disposed by placing it in the City of St. Paul's municipal solid waste landfill.

- Demolish the Municipal Garage building and dispose of the wood and concrete debris in the City of St. Paul Landfill.
- Remove PCS from under the building and dispose it by land spreading it on the island at the National Weather Service land spread area.
- Remove the lead contaminated soil along the north side of the building and dispose it by burial in the NOAA Tract 42 Cell C landfill.
- Conduct all soil excavation under the oversight of an archaeologist to ensure documentation and preservation of any archaeologically significant artifacts that may be uncovered.
- Collect lead soil characterization and waste characterization and designation samples for analysis using a field-portable x-ray fluorescence meter (FPXRF), and verify FPXRF results by fixed laboratory analysis.
- Collect field petroleum hydrocarbon screening samples for analysis by thin-layer chromatography (TLC) and photoionization detector (PID).
- Collect confirmation samples from the excavation boundary for fixed laboratory analyses.
- Collect samples to characterize PCS removed from the excavation.
- Restore the site to grade with clean fill.
- Incorporate site features and sampling locations into a geographic information system (GIS) database and map project.
- Report CAP activities and results to ADEC for acknowledgement of clean closure.

2.0 SITE DESCRIPTION

The following subsections provide a description of the site background, site geology, site hydrogeology, and previous investigations for the Municipal Garage Site.

2.1 SITE BACKGROUND

The Municipal Garage was located at the base of Village Hill, just north of the Machine Shop (Figure 2). The building has been the location of various storage and maintenance operations dating back to the 1930s. The Municipal Garage (also referred to as the Equipment Shed and Elephant Hut) was most recently used by NOAA for storage of heavy equipment, construction supplies, and miscellaneous items. The concrete foundation of the former Connector Building lay between the Municipal Garage site and Machine Shop building (Figure 2).

Gasoline above ground storage tanks (ASTs) were once located on the southwest side of the Municipal Garage, while diesel underground storage tanks (USTs) were previously located on the northwest side of the building (Hart Crowser 1997). Pipelines transferred diesel fuel from a Diesel Tank Farm (NOAA Site 30/TPA Site 11) atop Village Hill to the diesel USTs. Gasoline was gravity fed to the ASTs from a former Gasoline Tank Farm (NOAA Site 29/TPA Site 10) located on the north slope of Village Hill. Petroleum contaminated soil (PCS) had been discovered and subsequently removed from the west, north, and east sides of the building (Figure 3) during earlier NOAA corrective actions as discussed below. NOAA sampling had revealed that some of the soil underneath the Municipal Garage building was also contaminated with petroleum, but since the building was still in use and had not been slated for demolition, this contamination was not removed at that time.

2.2 SITE GEOLOGY

St. Paul Island was formed as a result of volcanic eruptions of basaltic lavas onto the southern edge of the Bering Sea Shelf. The island has never been glaciated, and many cinder cones with steep slopes and sharp crater rims are present on the island. The island soil is characterized primarily as volcanic deposits consisting of scoria of vary-

ing sizes (pebbles to cobbles) and colors (lenses of gray, red, and black) with fractured basalt occurring at depth (Barth 1956).

Soils in the vicinity of the Municipal Garage generally consist of fill material including sand, scoria, and gravel from the surface to a depth of 2 to 12 feet below ground surface (bgs). This fill material is underlain by approximately 3 to 14 feet of sand. Bedrock in this area consists of basalt (NOAA 2003c).

2.3 SITE HYDROGEOLOGY

Groundwater in the vicinity of the Municipal Garage is present at approximately 4 feet above mean sea level, which is about 14 feet bgs. Groundwater likely flows to the north toward Village Cove (NOAA 2003c). Currently, groundwater in this area is not used for drinking water, and it is not expected that it will ever be used for drinking water. NOAA has elected to proceed with corrective actions at the Municipal Garage and other sites within Tract 46 under the guidelines afforded by 18 AAC 75.345(b)(2) and 18 AAC 75.350 (ADEC 2000a), commonly referred to as the Ten Times Rule (10x rule) as described below.

NOAA performed a Groundwater Use and Classification study of St. Paul Village in 2002 Based upon analyses of existing data, groundwater beneath the City of St. Paul is considered brackish and is therefore not potable (Mitretek 2002, ADEC 2002). NOAA demonstrated the water is not drinkable regardless of past petroleum releases that had resulted in groundwater exceeding ADEC Table C cleanup levels for GRO, DRO, benzene, and toluene found in the immediate vicinity of the Municipal Garage. NOAA requested of ADEC to utilize alternative groundwater and soil cleanup criteria allowed under (18 Alaska Administrative Code [AAC] 75.345). If ADEC concurred the alternative would allow groundwater and soil cleanup criteria to increase to ten times the Table C and Method Two (18 AAC 75.341) cleanup levels for those compounds listed above. ADEC conditionally approved NOAA's Groundwater Use and Classification Study's request to utilize alternative cleanup standards based on groundwater cleanup levels and soil (protection of groundwater) cleanup levels set at 10x the Method Two and Table C cleanup levels for those compounds listed above (ADEC 2002).ADEC's condition required NOAA to satisfy appropriate institutional controls as required under 18 AAC 75.350. NOAA applied to Alaska Department of Natural Resources (ADRN) for a Critical Water Management Area (CWMA) determination under 11 AAC 93.500 - 11 AAC 93.530 (ADNR 2006), which would satisfy ADEC's institutional control requirement. Following numerous regulatory procedures, ADNR determined a CWMA was appropriate for the areas with groundwater contamination in the old village. The CWMA determination allowed NOAA to apply the alternative cleanup levels under the Ten Times Rule (ADEC 2002).

ADEC conditionally approved NOAA's Groundwater Use and Classification Study's request to utilize alternative cleanup standards based on groundwater cleanup levels and soil (protection of groundwater) cleanup levels set at 10x the Method Two and Table C cleanup levels for those compounds listed above (ADEC 2002). Additionally, the 1996 TPA provided NOAA to clean up contaminated media on the Pribilof Islands consistent with ADEC regulations at that time. The benzene cleanup level for soil in 1996 was based on the 0.5 mg/kg level established in ADEC 1991 promulgated regulations. As a result, NOAA can use 0.5 mg/kg as its benzene cleanup level. As a result, NOAA applied the 0.5 mg/kg as its benzene cleanup level instead of 0.2 mg/kg under the Ten Times Rule or 0.02 mg/kg under ADEC Method Two.

NOAA also received approval from the State of Alaska to designate most of Tract 46 and some adjacent areas (including the Municipal Garage site) as a Critical Water Management Area (CWMA) under 11 AAC 93.500- 11 AAC 93.530 (ADNR 2006). This designation is required in order to implement the 10x rule.

2.4 PREVIOUS INVESTIGATIONS AND CORRECTIVE ACTIONS

During 1995, Hart Crowser, Inc. conducted an expanded site inspection that included the collection of soil samples from the area of the Municipal Garage. Analytical data for soil samples collected during this investigation indicated the presence of arctic diesel at concentrations up to 5,900 mg/kg at a depth of 10 feet bgs. Arctic diesel consists of diesel fuel mixed with gasoline-range hydrocarbons to prevent the mixture from freezing (NOAA 2003c, 2003d).

During 1997, the ASTs and most of the USTs along the west side of the Municipal Garage were removed by Aleutian Enterprises. In 2000, a UST at the southeast corner of the Municipal Garage was removed by Columbia Environmental Sciences, Inc. (CESI) during site characterization activities (NOAA 2003b, 2003d).

During 2000, CESI also conducted additional sampling at the Municipal Garage (CESI 2001). Analytical data for soil samples collected during this investigation indicated the presence of diesel-range organic compounds (DRO) up to 13,000 mg/kg, gasoline-range organic compounds (GRO) up to 470 mg/kg, toluene up to 20 mg/kg, and ethylbenzene up to 12 mg/kg (NOAA 2003b, 2003d).

Groundwater samples were collected from monitoring wells at and near the Municipal Garage in 2000 by CESI and in 2001 by IT Alaska Corporation. Analytical data for these samples indicated the presence of DRO, GRO, residual-range organic compounds (RRO), benzene, and toluene at concentrations exceeding regulatory limits established by ADEC (NOAA 2003b, 2003d).

A corrective action was conducted from August 4, 2003, through September 4, 2003 to remove PCS along the west and north sides of the Municipal Garage (Tetra Tech 2004). PCS site cleanup levels used were those developed by NOAA for soil under the 10x rule as described in Section 2.3 above, and as provided in section 3.0 below. A total of 2,805 cubic yards of PCS was excavated. PCS was excavated all along the length of the western wall, all the way to the bedrock, and as close to the building as possible (Figure 3). Confirmation samples at 10 to 15 feet bgs showed that DRO contaminated soil above the site cleanup level of 2,500 mg/kg continued underneath the building along the western wall. GRO contamination exceeded the 300 mg/kg ADEC Method Two cleanup level, but GRO did not exceed the site cleanup level of 1,400 mg/kg under the 10x rule. PCS was also excavated at the north end of the Municipal Garage, though the extent of the excavation was restricted by the presence of a monitoring well, electrical transformers, and the building itself. Confirmation samples inside the excavation at the north end of the building at a depth of 10 feet bgs indicated no contamination above the site cleanup levels or the ADEC Method Two cleanup levels, except at the north east and north west corners of the building where DRO contamination still exceeded the site cleanup level of 2,500 mg/kg, but could not be removed without damaging the building or adjacent utilities (NOAA 2004c).

NOAA also conducted a removal action at the Cascade Building (TPA Site 9f) in 2003, (NOAA 2005a), adjacent to the Municipal Garage on the south east side. A total of 3,510 cubic yards of PCS were excavated from the main part of the Cascade building site, which extended along the east foundation wall of the Municipal Garage (Figure 3). The soil removed exceeded site cleanup levels for both DRO and GRO. Except for two confirmation sample location near the northeast corner and center of the Municipal Garage (Figure 4), it did not appear that the petroleum contamination continued underneath the building, though it was not possible to excavate soil all the way to the water table along the foundation because of risk to compromising the structure and a buried electrical line and a water main (Figure 3). Confirmation samples at 8 to 11 feet bgs showed that the soil along the eastern wall of the Municipal garage did not exceed either the Method Two cleanup levels or the site cleanup levels under the 10x rule, except for GRO or DRO at two samples near the northeast corner and center of the Municipal Garage (NOAA 2005a).

NOAA collected additional characterization samples underneath the Municipal Garage by drilling through the concrete floor in the fall of 2003. These samples showed that there were areas under the building where the soil exceeded the site cleanup level for DRO, and the Method Two cleanup level for GRO (NOAA 2004c).

3.0 REMOVAL OBJECTIVES AND APPROACH

The corrective action's lead soil removal objective at this site involved the removal of all soil located between the building's perimeter and six (6) feet horizontally away from the perimeter, herein referred to as the "Potential Lead-Contaminated Soil Area" (Figure 3), that exceeded the commercial and industrial land use cleanup level of 1,000 mg/kg total lead listed in note 11 to Tables B1 and B2 of 18 AAC 75.341 (ADEC 2005). (NOTE: The CAP Addendum [NOAA 2006b] erroneously stated in Section 4.0 that the lead contaminated zone was that "between the building's perimeter and 10 feet horizontally away from the perimeter". This was a typographic error and should have said "6 feet horizontally away from the perimeter". Later in Section 5.1 the CAP Addendum made it clear that soil will only be characterized "6 feet horizontally from the building". Also, in past lead contaminated

soil corrective actions at the St. Paul Teacher Houses and Duplex, NOAA only removed lead contaminated soil within 6 feet of those structures [NOAA 2007]). The objective for the vertical extent of lead contaminated soil removal was from ground surface to a depth of 2 feet bgs. Lead-contaminated soil exceeding the commercial and industrial cleanup level is assumed to lack a complete risk pathway if covered by a minimum of two feet of clean soil, which would occur if lead soil at and deeper than two feet bgs is backfilled to grade with clean soil.

The PCS removal objective for this site involved the removal of all PCS beneath the footprint of the demolished building (including its concrete footings and floor), that exceeded the site-specific cleanup levels for GRO, DRO, benzene, toluene, ethylbenzene, and total xylenes (BTEX), and select polynuclear aromatic hydrocarbons (PAHs). PCS cleanup levels for the site are detailed in the corrective action report detailing the 2003 PCS removal activities (Tetra Tech 2004), and are based on applying the 10x (Ten Times) rule as described in section 2.3 above. These levels are listed in Table 3-1. One should note that contaminated soil represented by 2003 confirmation samples along the eastern edge of the building footprint, and one near the northeast corner of the building footprint, exceed the site specific cleanup levels (Figure 4). This soil was not excavated in 2003 due to its proximity to the building. NOAA's objective was to remove and temporarily stockpile the clean backfill that had been placed over these 2003 confirmation sample locations, then resume excavation of this PCS even though a portion of it may extend outside the building footprint.

NOAA expected that the extent of PCS contamination planned to be removed at this site would be limited by sidewall sloping requirements to prevent damaging adjacent utilities or structures including the electrical transformer and monitoring well to the north, the former Connector Building's concrete foundation to the south, and the electrical supply line along the east wall (Figure 3). Also, NOAA did not plan the excavation to extend deeper than 15 feet bgs or to groundwater due to impracticability associated with deep excavating and saturated soil excavation. Groundwater at this site was anticipated at approximately 14 feet bgs.

Under the 10x rule NOAA may elect to remove PCS to a cleanup level ten times higher than the Method Two cleanup levels for any chemical constituent found in the groundwater at levels that exceed the groundwater cleanup level for that constituent. However, NOAA attempted to clean up soils to the Method Two cleanup level where possible. For example, under the 10x rule the site-specific cleanup level for DRO is 2,500 mg/kg, while the Method Two cleanup level is only 250 mg/kg.

Site-specific cleanup levels are summarized in Table 3-1. A detailed discussion on the development of the site-specific cleanup levels for petroleum compounds can be found in the Final CAP for the 2003 corrective action along the west side of the building (NOAA 2003c).

4.0 FIELD ACTIVITIES

The following subsections summarize the equipment used and the activities performed during this corrective action. Appendix A provides photographic documentation of the corrective action. Appendix B provides copies of the daily reports as well as logbook notes generated during the corrective action.

4.1 CONTRACTORS AND EQUIPMENT

Bering Sea Eccotech (BSE) provided overall site management via its subcontractor Larsen Consulting Group (LCG), including the direction of excavation and hauling activities, engineering services, and preparation of weekly reports. The collection of screening, characterization, and confirmation samples during implementation of the corrective action was performed by Tutka Services LLC (Tutka). BSE provided most of the equipment used during the corrective action, but NOAA furnished some government-owned equipment. BSE/LCG conducted health and safety meetings before the commencement of each day's activities. Tutka performed PID analyses of screening samples. NOAA representatives performed TLC and FPXRF analyses of screening samples and provided survey support using real-time kinematic GPS techniques and equipment. BSE subcontracted laboratory analytical services to SGS Environmental Services Inc. of Anchorage, AK (SGS).

Heavy equipment used on site during field activities included the following:

- Hitachi EX150 excavator (BSE)
- Hitachi ZX200LC Excavator (BSE)
- 5-10 CY dump trucks (BSE and NOAA)
- Volvo L-70 Front End Loader (BSE)
- CAT 966 Front End Loader (BSE)
- Flat Bed Truck (BSE)
- Telescoping Rough Terrain Fork Lift (BSE)
- Trimble Total Station R8 GPS (NOAA)
- FPXRF instrument

4.2 LEAD CONTAMINATED SOIL INVESTIGATION

During the summer of 2007 NOAA conducted additional soil sampling for lead contamination around the perimeter of the building in a zone starting at the outer wall to 6 feet away from the wall. Samples were collected on June 24 and June 26 from ground surface to a depth of either 1 or 2 feet as shown in Figure 3. NOAA sampled this area because of the knowledge that the exterior of the building was painted with peeling LBP, and the peeling paint may have contaminated surface soil near the exterior wall of the building. NOAA collected soil samples at either two or four different depth intervals at each of the fourteen (1) locations shown on Figure 3 using a hand driven core sampler as follows:

- West side of building – 2 samples per boring at 0.0 to 0.5 foot, and at 0.5 foot to 1.0 foot. This soil was known to be clean fill placed along the wall after the 2003 Municipal Garage corrective action (NOAA 2004c). Lead contamination from recent peeling paint was expected to only have the potential to affect the surface soil.
- North and east sides of building – 4 samples per boring, at 0.0 to 0.5 foot, 0.5 foot to 1 foot, 1.0 foot to 1.5 feet, and 1.5 feet to 2.0 feet. All the soil along the north wall was believed undisturbed since construction of the building, noting that the building's approach apron was concrete and thus soil beneath it was assumed uncontaminated by peeling LBP since the apron was poured prior to the first application of LBP to the building during its construction. Only some of the surface soil along the east wall may have been removed and replaced with clean fill during the 2003 remedial action at the Cascade Building corrective action (NOAA 2005a). Lead contamination from historic paint peeling along these sides could potentially have contaminated soil to the two foot removal action depth.

NOAA collected FPXRF screening and fixed-laboratory definitive data samples in accordance with the CAP addendum (NOAA 2006b) and NOAA's Master Quality Assurance Plan (NOAA 2006a). NOAA collected the soil samples from a combination of hand excavated test pits and direct-push explorations, then screened them at its Seattle, Washington office using its FPXRF (Table 1). Consistent with the CAP addendum (NOAA 2006b), at least ten percent of the samples were then selected for off site laboratory analysis to confirm the results of the FPXRF readings (Table 1). NOAA selected 1 or 2 samples from each side of the building for laboratory analysis, based on which sample had the highest FPXRF reading for lead from that side of the building.

The following subsections describe the instrumentation used and procedures followed during the collection of FPXRF screening and fixed-laboratory site characterization samples. The FPXRF results are discussed in Section 5. Laboratory analytical results are discussed in Section 6.0. Data quality is discussed in Section 7.

4.2.1 FIELD-PORTABLE X-RAY FLUORESCENCE SCREENING SAMPLES

FPXRF involves the use of x-rays from a depleted radioactive source to cause a fluorescence response from metallic elements during the change of energy bands by electrons in the metal molecules as they react with the x-rays. The response is measured by a sensor, then compared against standard responses for materials with known levels

of lead contamination using an on-board computer. ADEC approved the use of the FPXRF for site characterization and excavation screening as part of NOAA's CAP addendum for the site (NOAA 2006b).

During site characterization, NOAA or PSI collected 50 samples into resealable plastic bags, with approximately 250 grams of soil collected per sample. These samples were then shipped to NOAA's Seattle facility. NOAA homogenized the soil in each bag, and analyzed each sample with the FPXRF. Table 1 provides a list of FPXRF ex-situ samples collected for the site investigation with lab analytical results for those samples sent to an off site lab.

4.2.2 FIXED-LABORATORY SAMPLES

Fixed-laboratory analytical samples for lead were selected from the 50 FPXRF samples collected as described above. Two samples were selected from the east and west sides of the building and one along the north side, based on which had the highest lead content on that side according to the FPXRF results. The homogenized bag was delivered to F&BI under chain-of-custody.

Fixed-laboratory total lead analyses were performed using inductively coupled plasma/ mass spectrometry (ICP/ MS), while leachable lead analyses were performed by first extracting the samples using EPA Method SW-846 1311 (TCLP) then analyzing the leachates using an ICP/MS.

Site Characterization

NOAA sent six (6) site characterization samples collected in June 2006 for fixed-laboratory total lead analysis to verify the accuracy of the 50 FPXRF site characterization analyses.

Confirmation Sampling

NOAA sent one confirmation sample for fixed-laboratory total lead analysis to confirm site excavation removed all soil exceeding the ADEC industrial cleanup level at the point of compliance.

4.3 BUILDING DEMOLITION

NOAA's contractor BSE began work at the site on August 2, 2007. Photograph 2 shows a view of the Municipal Garage (in center) taken in 2006 from the top of Village Hill. A portion of the Machine Shop is visible in the lower right corner, and the space between the two buildings is occupied by the concrete pad from the former Connector Building. BSE removed several remaining items owned by NOAA from the building's interior and stored or disposed of them. Next, BSE coated the lead painted exterior siding and a small area inside the south east corner of the building with a commercial phosphate based paint (Ecobond LBP) that was designed to bind with lead in the paint and render it less soluble (Photograph 3). Previous samples of the paint in these two areas had failed the TCLP limit of 5.0 mg/L for lead. The siding and the material from the interior painted walls would have required handling as a RCRA hazardous waste if they had been removed from the building in that condition. After coating the surfaces with Ecobond LBP, BSE then coated the same surfaces with a latex based primer, in order to better bind any peeling paint chips to the substrate. The Ecobond did not adhere well to the exterior siding on the south end of the building, so this was manually removed, brought inside the adjacent Machine Shop building, then after drying the siding was recoated with Ecobond LBP and primer. BSE collected samples from the exterior siding and the interior wall materials after coating them with the Ecobond LBP. These were analyzed by the TCLP and found to no longer exceed 5.0 mg/L (Table 3-1), and thus would be a non-hazardous solid waste if removed and disposed. At this point, demolition of the building proceeded (Photograph 4), with the wooden portions being buried in the City of St. Paul landfill. The City of St. Paul used the concrete portions (Photographs 5 and 6) being used at the landfill to extend their containment berm, enlarging the capacity of the landfill to accept more solid waste. The only portion of the building remaining was the concrete stem wall and footings along the north end of the building (Photographs 7, and 8). This was left in place because of the presence of lead contaminated soil as shown in Figure 3. NOAA was concerned that if the footings (installed 3 to 4 feet below the surface) were removed, some of the lead contaminated surface soil could fall into the remaining void and be mixed into the deeper soil.

4.4 EXCAVATION ACTIVITIES

In 2006, NOAA contracted an archaeologist to evaluate the Municipal Garage site and its historical background in preparation for the PCS excavation work (Mobley 2006). The archaeologist identified a potential for significant archaeological deposits underneath or near the Municipal Garage and Connector Building pad, and along the north wall where soil was not already disturbed by prior remedial actions. The archaeologist's report provided a monitoring plan that NOAA's excavation contractor used to plan and conduct archaeological monitoring during the PCS excavation.

All soil excavation activities at the Municipal Garage Site proceeded under the supervision of an archaeologist to ensure proper conservation and management of any significant archaeological deposits unearthed during excavation. The archaeologist monitored all excavation at the site with the authority to halt excavation and consult with the Alaska State Historical Preservation Office upon the discovery of significant archaeological deposits. Although the archaeologist observed many discarded artifacts from the early 1900s beneath the site, he did not deem any to be "significant archaeological deposits", and the excavation proceeded without interruption. The archaeologist's monitoring report (Pipken 2007) is included as Appendix D.

Approximately 18 CY of lead contaminated soil was removed from a 6 foot wide, 2 foot deep strip along the exterior of the north wall of the building (Photograph 9). Excavation of approximately 1,632 CY of PCS (Photograph 11) from under the building footprint and along the exterior of the north wall (Photograph 10) began on August 29 and terminated on September 7, 2007. BSE completed excavation of all petroleum contaminated soil under the original footprint of the building, extending into the clean backfill along the west side of the building from the 2003 excavation, and as far as could be excavated before threatening adjacent buried utilities along the north and east sides of the building (Figure 4). Approximately 1/3 of the area under the original footprint of the building in the southeast corner was not contaminated and left in place. Figure 4 and Photograph 11 show the final extent of the PCS excavation under the Municipal Garage. However, an area of heavily contaminated soil was discovered underneath an old sump located inside the former Connector Building, just outside the former south door of the Municipal Garage (Photograph 11). The petroleum contamination emanating from the sump extended from the sump down to the groundwater at 14 feet bgs. It occupied an area approximately15 feet in diameter along the exposed face (Photograph 12). NOAA proceeded with further excavation at the sump after backfilling the Municipal Garage Site (Photograph 13). NOAA's contractor excavated an additional 385 CY of PCS under the Connector Building Pad on October 21 and 22, 2007 (Figure 4, Photograph 14). This brought the total volume of PCS excavated to 2,017 CY. The excavation was backfilled following collection of confirmation samples on October 23, 2007 (Photograph 15).

4.5 SOIL DISPOSAL

During the Municipal Garage corrective action, NOAA's contractors transported PCS directly to NOAA's National Weather Service landspreading area (Figure 5). The PCS was spread no more than 0.5 ft ± 3 inches deep (Figure 5). NOAA spread soils with high levels of gasoline separately at the landspreading area. NOAA's contractor will till the contaminated soil to promote evaporation of volatile organic compounds (VOCs) during the spring of 2008. The landspreading area with the Municipal Garage and Connector Building Pad PCS will be fertilized and seeded with native grasses to promote revegetation after the tilling is complete.

BSE transported the lead contaminated soil to the NOAA Tract 42 landfill where it was placed in a disposal cell excavated into the capping material, atop approximately 2,000 pounds of a phosphate soil amendment (Ecobond) design to reduce the leachability of lead (Figure 6). NOAA was not required to use Ecobond with the lead contaminated soil, however it chose to place Ecobond in the bottom of the lead soil disposal trench as a precaution as well as a means to dispose of its otherwise unneeded supply of Ecobond. A small area of the Tract 42 landfill was reopened by NOAA in 2006 in order to dispose of demolition debris from lead and asbestos abatement projects at the Municipal Garage and other NOAA buildings on the island. These cells were recapped after materials from the Municipal Garage were disposed in them, using the same capping material spread at a thickness of 2 feet or greater. The areas at Tract 42 that were disturbed by the 2006 landfilling activity were revegetated in 2007, and the area disturbed in 2007 will be revegetated in 2008.

4.6 BACKFILLING AND SITE RESTORATION

Backfilling the excavation began after a point was reached where no more soil could be excavated, or when soil testing with FPXRF, PID and TLC screening sample analyses indicated contaminant concentrations were below ADEC Method Two cleanup levels, and fixed laboratory confirmation samples had been collected. Backfill operations involved transporting clean fill from an on-island scoria pit to the site, dumping the material into the excavation, and compacting the fill material. Samples of the backfill material were collected and sent to a fixed laboratory for analysis, which showed no petroleum, PAHs, or lead present above State of Alaska Method Two cleanup standards for soil. Approximately 1,627.5 CY of scoria were used to backfill the Municipal Garage excavation, and another 363 CY for the area under the former Connector Building Pad, bringing the total to 1,990.5 CY. Also, approximately 15 cubic yards of concrete from demolition of the former connector building pad was used as clean backfill. The backfilled area was leveled to the surrounding grade.

4.7 INVESTIGATION-DERIVED WASTE MANAGEMENT

Investigation-derived waste generated during this corrective action included:

- Used nitrile sampling gloves, which were placed in trash bags and disposed as municipal solid waste.
- Plastic bags and glassware, which were emptied of soil and disposed as municipal solid waste.
- Soil not extracted during TLC screening sample analyses, which was disposed at the landspreading site.
- Spent methylene chloride and small vials of soil extracted with methylene chloride from TLC analyses, which were containerized in glass jars, placed in lab pack containers and stored to be shipped off-island for disposal as hazardous waste in 2008.
- Silica gel plates spotted with methylene chloride during TLC analyses, which were containerized in glass jars and placed in lab pack containers, then prepared to be shipped off-island for disposal as hazardous waste in 2008.

All such wastes were disposed according to NOAA's Master Investigation Derived Waste Plan (NOAA 2003b)

4.8 SITE SURVEYING

NOAA representatives surveyed sampling locations, benchmarks, excavation extents, and buildings using a survey-grade Trimble Total Station® R8 differential GPS. The Trimble Total Station® R8 is a GPS and GIS data collection and mapping system that combines a high-performance, dual-channel GPS receiver and antenna with a local base station and real-time differential correction system to provide survey-grade accuracy in real time. NOAA's survey-grade GPS determines horizontal positions of soil sampling locations and excavation boundaries to within approximately plus or minus 1 centimeter (cm), and elevations to within approximately plus or minus 2 cm. NOAA collected survey data in latitude and longitude referenced to the World Geodetic System 84 Datum, Universal Transverse Mercator Zone 2 coordinate system in meters. However, most confirmation samples were collected at the toe of potentially unstable excavation sidewalls inside the excavation and it was unsafe to enter the excavation to survey the exact location. Consequently, NOAA surveyed these samples at a point on the upper rim of the excavation, as close to the actual sample location as deemed safe to approach. Therefore, each survey point for these samples is displaced approximately 2 to 3 feet laterally, and up to 14 feet vertically higher than the actual sample location.

5.0 FIELD SCREENING AND ANALYTICAL SAMPLING

During this corrective action, BSE collected screening and analytical confirmation samples in accordance with the CAP addendum (NOAA 2006b) and 18 AAC 78 (ADEC 2003). For petroleum contamination, NOAA performed TLC screening sample analyses, and provided the results to BSE to direct excavation activities and identify locations for analytical confirmation samples; BSE performed PID screening sample analyses for petroleum contamination. Based on evaluation of the TLC and PID screening sample results, BSE selected analytical sampling locations where the greatest potential for residual contamination existed. BSE also collected screening and laboratory

confirmation samples for lead contamination in soil; NOAA analyzed lead soil field screening samples using its FPXRF, and provided the results to BSE to direct excavation activities and identify locations for analytical confirmation samples.

The following subsections describe the instrumentation used and procedures followed during the collection of screening and analytical confirmation samples.

5.1 SCREENING SAMPLES

NOAA used three different technologies to screen soil samples in the field in order to facilitate rapid decision making, as described below.

5.1.1 PID SCREENING SAMPLES FOR PETROLEUM CONTAMINATION

As excavation of contaminated soil progressed and the remaining soil was no longer obviously contaminated with petroleum hydrocarbons as determined by visual and olfactory inspection, BSE collected field screening samples of soil from the bottom (or sidewalls) of the excavation, as directed by the on-site NOAA representative. BSE used a PID as a first screening method to determine whether remaining soil was still contaminated as specified by the CAP (NOAA 2003c). The soil sample was first warmed to approximately room temperature while sealed inside a plastic bag, and then the PID was inserted into the bag to sample any VOC vapors that may have been released. The PID was used because it can detect low levels of VOCs, which were expected because high levels of GRO and BTEX had been detected in the soil underneath the Municipal Garage by previous NOAA laboratory analyzed samples. A PID cannot distinguish between the main VOC constituents that had previously been found to exceed ADEC cleanup standards (such as benzene) and other VOCs such as toluene, ethylbenzene, and xylenes. Nevertheless, if VOCs were detected above background levels, the soil represented by the sample was assumed to be contaminated above site cleanup levels and was removed. If the soil sample did not show elevated VOC levels according to the PID reading, then a second aliquot of the sample was given to NOAA to perform TLC analysis as described below.

5.1.2 THIN-LAYER CHROMATOGRAPHY SCREENING SAMPLES FOR PETROLEUM CONTAMINATION

TLC is the use of solid-liquid chromatography for the semi-quantitative analysis of DRO in soil. A specific analytical method designed by NOAA, TLC, was originally used in support of field efforts during a crude oil spill in the State of Washington (NOAA 2006a).

The procedure involves the solvent extraction of soil screening samples in a field laboratory and subsequent comparison of the extracts to a range of standard diesel concentrations. By using standards that include diesel concentrations equal to, above, and below site-specific cleanup levels, the analyst determines whether the sample contains concentrations above or below the site cleanup level; in addition, the analyst is able to determine an approximate concentration of DRO in each sample.

TLC screening samples were collected throughout the corrective action by placing a small amount of soil (at least 20 grams) into a clean, re-sealable plastic bag. Each sample was homogenized and kept cool until it could be processed at the NOAA field laboratory.

5.1.3 X-RAY FLUORESCENCE SCREENING SAMPLES FOR LEAD CONTAMINATION

While none of the FPXRF readings exceeded the industrial lead cleanup level of 1,000 mg/kg total lead, the sample with the highest FPXRF reading, SP20-CH-108-015, was the only sample to exceed 1,000 mg/kg total lead in the laboratory analysis. These samples indicated that only the soil along the north end of the building exceeded the state of Alaska industrial cleanup level (18 AAC 75.340 Table B1) of 1,000 mg/kg lead. NOAA analyzed samples SP20-CH-108-005 and SP20-CH-108-015 (the sample with the highest FPXRF reading for lead) by the TCLP, finding that neither exceeded the TCLP limit of 5.0 mg/L (Table 1). Therefore, the soil along the north wall represented by these samples would not need to be handled as a hazardous waste during excavation and disposal. Based on the characterization data, NOAA estimated 20 CY of lead contaminated soil would require removal and disposal.

NOAA had determined that the soil 6 feet out from the concrete foundation along the north side of the building would be excavated to a predetermined depth of 2 feet to remove lead contamination from peeling exterior siding paint, based both on the ADEC-approved points of compliance (NOAA 2006b) and lead soil characterization results. NOAA's characterization results indicated lead soil contamination exceeded the State of Alaska industrial site lead cleanup level of 1,000 mg/kg total lead extends no greater than 1.5 ft bgs. Nonetheless, NOAA chose to remove lead soil to 2.0 ft bgs in this area to simplify the excavation work. Once two feet of soil was excavated, NOAA used an FPXRF instrument to determine whether soil remaining at that depth still exceeded the lead cleanup level in soil. The soil sample was then sent for laboratory confirmation analysis.

5.2 CONFIRMATION SAMPLES

Once petroleum screening samples indicated that the remaining soil did not contain elevated lead, VOCs or DRO from the FPXRF, PID, and TLC testing, Tutka collected a confirmation sample by placing a split of the screening sample into appropriate containers for fixed laboratory analyses by SGS to verify concentrations of contaminants remaining in soil in the excavation. Section 7.1.2 describes the confirmation sampling procedures. Confirmation samples were packaged and shipped to SGS via Air Cargo Express, to Anchorage Airport, picked up by either a courier or a BSE employee for transport to SGS. SGS conducted the following analyses:

- Total lead by U.S. Environmental Protection Agency (EPA) SW-846 (EPA 1996) Method 6020
- BTEX by EPA Method 8021B
- GRO by ADEC Method AK101
- DRO by ADEC Method AK102
- RRO by ADEC Method AK103
- PAHs by EPA SW-846 (EPA 1996) Method 8270C, Selected Ion Monitoring

One confirmation sample and one duplicate sample were collected to verify the lead concentration of soil that remained along the north end of the building where a strip of soil 2 feet deep by 6 feet wide was excavated. BSE initially collected fifteen (15) petroleum contamination confirmation samples, plus two duplicate samples during corrective action activities at the Municipal Garage Site. BSE then collected eleven (11) additional confirmation samples after the excavation was extended under the former connector building pad. Figure 4 illustrates the approximate sampling locations. Since most of the samples were collected from the toe of the nearly vertical excavation side wall, at a depth of approximately 14 feet, the surveyor could not enter the excavation to place the survey instrument directly on the sample location due to safety considerations. Instead, a point was surveyed just adjacent the actual sample location at the top edge of the side wall. This point was usually displaced only 2 to 3 feet horizontally from the actual sample point.

5.3 WASTE CHARACTERIZATION SAMPLES

BSE collected 18 characterization samples from the 2,017 CY of PCS excavated from the site. SGS analyzed all the samples for BTEX, GRO, DRO, RRO, and some of the samples for PAHs per the methods listed in Section 5.2. The total and TCLP sample analyses conducted during the June 2007 characterization sampling discussed in Section 4.2 above also served as waste characterization samples for the lead contaminated soil removed from the site for disposal at the Tract 42 landfill.

5.4 BACKFILL CHARACTERIZATION SAMPLES

BSE collected three characterization samples from 1,990.5 CY of scoria obtained from the Lake Hill scoria pit and used as backfill for the excavation at the Municipal Garage Site. Backfill characterization samples were analyzed by SGS for BTEX, GRO, DRO, RRO, and PAHs.

6.0 ANALYTICAL RESULTS

The following subsections summarize the analytical results for samples collected during corrective action activities at the Municipal Garage. Tables 6-1 through 6-3 provide an analytical data summary. Appendix C includes the analytical data for soil samples collected during the corrective action.

Laboratory reporting limits for non-detected compounds were mostly below ADEC Method Two cleanup levels except for several halogenated organic compounds in some samples (e.g., samples SP20-CS-021-140 and SP20-CS-029-130). In several samples the practical quantitation limit (PQL) for benzene was above the ADEC Method Two and the TPA-approved cleanup levels, coinciding with high detections of ethylbenzene in the same sample that could indicate contaminant interference. Section 7.0 of the report will address data usability issues associated with these issues.

6.1 CONFIRMATION SAMPLES

As shown in Table 4 and Figure 4, confirmation samples collected from the bottom of the excavation at the Municipal Garage Site indicated concentrations of DRO and GRO and some BTEX constituents exceeded the site cleanup levels along the four sides of the excavation. Soil with several constituents exceeding the site cleanup level was found at the depth of the water table (about 14 feet) along the west side.,. Petroleum constituents above the site cleanup levels remain in soils at the water table along the north and northeast sides of the site. Further excavation was precluded because of the risk to buried utilities. NOAA's initial extent of excavation along the southeast wall of the Municipal garage was extended to include soils below the concrete pad of the adjacent former Connector Building. The additional excavation effort became necessary when high levels of petroleum contamination were found in soils beneath a former used oil sump located along the south wall of the former Connector Building. After removing the concrete pad another 385 CY of soil was excavated from the site. Additional confirmation samples (Figure 4) showed that contamination had been removed down to the water table, which was still contaminated above the site cleanup level. For example, sample SP20-CS-306-140 at 14 feet bgs still exceeded the cleanup level, while sample SP20-CS-306-100 at the same location but at only 10 feet bgs did not exceed the cleanup level. This finding suggests that the source of contamination within the vadose zone had been removed, but petroleum products within the groundwater smear zone migrate along the water table.

Petroleum contaminant concentrations remaining at the site varied among the analytes. Several analytes exceeded the site cleanup levels allowed under the 10x rule determination: GRO reached a concentration as high as 3,430 mg/kg. DRO concentrations varied from not detected to 10,900 mg/kg. Total xylenes was detected above its Method Two cleanup level (78 mg/kg) as high as 735 mg/kg. Since total xylenes have never been detected above the cleanup level in groundwater at Tract 46, it is not subject to the 10X rule alternative cleanup level of 780 mg/kg. However, the detection of total xlyene above Method Two occurred only within the water table's smear zone, and is not subject to removal activity. Toluene exceeded the Method Two and the 10x rule alternative cleanup level with a reading of 123 mg/kg at a single location. As with total xylenes this level of toluene occurred within the water table's smear zone. All soil contaminant concentrations as measured in post excavation confirmation samples are presented in Table 4. Figure 4 depicts the sample locations.

In one confirmation sample (SP20-CS-401-130) benzene was detected at an estimated concentration of .639 mg/kg, which is above the site cleanup level of 0.5 mg/kg. The PQL for this sample was 1.38 mg/kg. However, this sample is a duplicate of sample SP20-CS-308-130, which did not detect benzene at a PQL of 1.04 mg/kg. Since the estimated benzene value was less than the PQL in both these cases, it cannot be determined whether the samples actually did contain benzene above the cleanup level. Since the confirmation sample and its duplicate were not homogenized prior to placing them in their sample jars, it is reasonable that their results would vary significantly. NOAA used the higher estimated result from the duplicate sample in mapping and discussion of contaminant levels at the site. As noted in the discussion of data quality, the PQL for benzene was above the site cleanup level in several of the samples coinciding with high detections of ethylbenzene. It is possible the benzene also exceeded its cleanup level in these samples but the data can neither prove nor disprove this.

All other contaminants were either not detected (with PQLs below ADEC Method Two cleanup levels), or were detected at concentrations below ADEC Method Two cleanup levels.

6.2 CHARACTERIZATION SAMPLES

Characterization samples collected from PCS removed from the Municipal Garage site contained several constituents that exceeded the site cleanup levels, including DRO with concentrations that varied from not detected to 6,860 mg/kg, GRO (as high as 1,600 mg/kg), ethylbenzene (as high as 20.6 mg/kg), and total xylenes (as high as 231.9 mg/kg). Toluene did not exceed the alternate cleanup level, but was detected as high as 11.4 mg/kg. Table 5 provides an analytical data summary of characterization sample results. The characterization samples collected during the June 2007 investigation detected lead as high as 1,160 mg/kg in the area where soil was eventually removed during this corrective action. Since only 18 CY of lead contaminated soil was removed during this corrective action, no additional characterization samples were collected from the soil removed.

6.3 BACKFILL CHARACTERIZATION SAMPLES

Backfill characterization samples collected from the Lake Hill scoria pit indicated concentrations of all clean backfill-specific analytes below the ADEC Method Two cleanup levels (Table 6).

7.0 QUALITY ASSURANCE AND QUALITY CONTROL

To ensure that information obtained from field and laboratory procedures is an accurate and defensible representation of site conditions, quality assurance and quality control (QA/QC) procedures were implemented. NOAA followed the operational guidelines set forth in the ADEC Environmental Laboratory Data and Quality Assurance Requirements memorandum (ADEC 2006) as well as those stipulated in the Pribilof Islands site restoration QAP (NOAA 2006a). These documents provide detailed QA/QC information pertaining to each quality control item discussed in this section. Appendix C contains a Chemical Data Quality Assessment Summary and 6 copies (one for each sample delivery group) of the ADEC-required (ADEC 2006) Laboratory Data Review Checklist completed by NOAA's contractor, BSE/Tutka, LLC.

Although the Chemical Data Quality Assessment Summary in Appendix C points out various instances with the data set in which data quality objectives defined by the QAP were not met, the data are satisfactory for decision making purposes.

8.0 CONCEPTUAL SITE MODEL

A conceptual site model (CSM) is used to evaluate exposure pathways for human health and ecological receptors (ADEC 2000b). The following subsections provide an evaluation for each of the elements of the CSM for the Municipal Garage, including historical contamination sources, release mechanisms, impacted media, migration pathways, exposure routes, potential receptors, and a cumulative risk assessment.

8.1 HISTORICAL SOURCES OF CONTAMINATION

Historical sources of contamination (*e.g.*, peeling LBP, a sump, two floor drains inside or adjacent to the building, ASTs, USTs, and fuel pipelines around the outside of the building) were removed from this site. The resulting contamination (*i.e.*, lead contaminated soil and PCS) was mostly removed from the site during the 2007 field season, except for petroleum contaminated soil at the depth of groundwater (14 feet bgs) and contaminated soil near underground utilities.

8.2 RELEASE MECHANISMS

Potential release mechanisms include LBP peeling from the Municipal Garage building, wastes dumped into the sump and the floor drains, and leaks and spills from the ASTs, USTs, and pipelines.

8.3 IMPACTED MEDIA

As a result of past releases, NOAA identified lead contaminated soil and PCS during site investigations. During the 2003 field seasons, NOAA removed PCS from areas on 3 sides of the site to depths up to 15 feet bgs. Groundwater was consistently encountered at approximately 14 to 15 ft bgs. Contaminated soil was left behind in these excavations because the water table was reached, or because the contamination continued beneath the Municipal Garage, the connector building next door, or close to buried utilities. In 2007, NOAA removed the Municipal Garage and part of the pad under the former connector building, then removed lead contaminated soil adjacent the northwest end of the building as well as PCS that had been underneath the buildings, again reaching PCS excavation depths of 14 feet deep. Analytical data for confirmation samples indicates that contamination remains in some areas at the interface of the groundwater table.

8.4 MIGRATION PATHWAYS

NOAA removed all lead contaminated soil that exceeds the site cleanup level, thus no migration pathway remains for this contaminant. NOAA removed PCS to the groundwater table (14 to 15 feet bgs). PCS that was not removed from the groundwater table continues to be a source of contamination to groundwater. The majority of PCS, however, has been removed from this site, and the source volume has been significantly reduced.

NOAA removed petroleum-contaminated surface soil, and no overland transport pathway is available to PCS remaining at 14 to 15 feet bgs.

8.5 EXPOSURE ROUTES

Because NOAA has removed all lead contaminated soil that exceeds site cleanup levels, all exposure routes have been eliminated for this contaminant. Because NOAA has removed nearly all PCS down to the groundwater table, direct exposure pathways such as dermal contact with or incidental ingestion of PCS no longer exist at this site. The depth of remaining contamination likely precludes inhalation of source material vapors or contaminated soil particles or direct contact with this soil. However, some contamination remains above cleanup criteria in soil at or near the water table at 13 to 14 feet bgs. The contaminant analytes are discussed below in section 8.7. Inhalation and ingestion of contaminated groundwater are not considered viable exposure routes because no water production wells are located in the vicinity; therefore, exposure to contaminated groundwater is unlikely. Given the proximity of the site to the harbor and the direction of groundwater flow, it is possible that the contaminated groundwater could migrate to the surface water of the harbor; however, there is no indication of this occurring. NOAA is conducting long term groundwater monitoring of wells located between the site and the harbor and will be able to detect in any such migration if it should occur (NOAA 2005b).

8.6 POTENTIAL RECEPTORS

Potential exposure pathways have been mitigated, and indirect exposure routes are not considered viable given existing site conditions, thus no potential receptors have been identified.

8.7 CUMULATIVE RISK ASSESSMENT

Cumulative risk is defined as the sum of risks resulting from multiple sources and pathways to which humans are exposed. When more than one hazardous substance is present at a site or multiple exposure pathways exist, the cleanup levels in Table B1 of 18 AAC 75.341 and Table C of 18 AAC 75.345 may need to be adjusted downward. In accordance with the requirements outlined in 18 AAC 78.600, NOAA must ensure that the cumulative cancer risk remaining after the completion of the corrective action does not exceed 1 in 100,000 ($1 \times 10\text{-}5$) and that the cumulative non-carcinogenic hazard index does not exceed 1.0. Each contaminant detected above one-tenth of the Table B1 inhalation or ingestion cleanup levels (excluding DRO, GRO, and RRO) must be included in cumulative risk calculations (ADEC 2007) if those contaminants are found in soil or groundwater to which there is a complete pathway. However, the only remaining soil with levels of contamination above one-tenth of the Table B1 inhalation or ingestion cleanup levels at the site are found within the groundwater smear zone at 13 to 14 feet

bgs. Since there is no complete exposure pathway to this soil or groundwater, there is no risk to human health, and no cumulative risk calculation is required with respect to this soil. No soil samples collected within soil shallower than the smear zone at the site exceeded one-tenth of the Table B1 inhalation or ingestion cleanup levels, so no cumulative risk calculation is required for the site.

8.8 MONITORING WELL NETWORK

Monitoring wells located in the vicinity of the site include MW46-6, MW46-28, MW46-5, MW46-9, MW46-14, MW46-10, and MW46-15 (Figure 7).

9.0 CONCLUSIONS AND RECOMMENDATIONS

The following subsections present conclusions and recommendations for the Municipal Garage on field activities performed and analytical findings obtained from corrective action activities conducted during the 2004 field season.

9.1 CONCLUSIONS

NOAA and its contractors removed approximately 2,017 CY of PCS and 18 CY of lead contaminated soil from the Municipal Garage and Connector Building sites. No lead contaminated soil remains above the site cleanup level of 1,000 mg/kg. Although confirmation sample data indicated that GRO, DRO, toluene, ethylbenzene, and total xylenes concentrations remain above the site cleanup level in some portions of the bottom of the excavation, further excavation was not practicable due to the presence of groundwater (18 AAC 75.325(f), 18 AAC 75.990). Because of the great depth of the remaining contamination (13 to 15 feet bgs), there is no complete exposure pathway to humans or the environment, and therefore no unacceptable risks are present. Groundwater in the vicinity of the site is being monitored to evaluate contaminant attenuation and to ensure that if contaminant levels increase they do not pose an unacceptable risk to the environment.

9.2 RECOMMENDATION

Because NOAA removed the primary sources of contamination and met the objectives of the CAP addendum, NOAA seeks a conditional closure for soil contamination at the Municipal Garage site. ADEC can concur with this request by providing NOAA with a signed copy of the conditional closure approval letter attached at the end of this report as Appendix E.

10.0 REFERENCES

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TABLES

TABLE 1. RESULTS OF 2007 NOAA BUILDING PERIMETER INVESTIGATION FOR LEAD IN SOIL
Municipal Garage Demolition St. Paul Island, Alaska

SAMPLE ID	Municipal Garage Building Side (soil condition)	XRF Lead Measurement		LAB ANALYTICAL RESULTS	TCLP RESULTS
		Reading	Error		
		mg/kg	+/- mg/kg	mg/kg	mg/L
SP20-CH-101-005	West (2003 clean fill)	8.22	19.07	823.00	
SP20-CH-101-010	West (2003 clean fill)	-8.92	21.73		
SP20-CH-102-005	West (2003 clean fill)	1.48	18.59		
SP20-CH-102-010	West (2003 clean fill)	-5.93	19.29		
SP20-CH-103-005	West (2003 clean fill)	13.1	25.7		
SP20-CH-103-010	West (2003 clean fill)	-3.89	21.89		
SP20-CH-104-005	West (2003 clean fill)	-3.31	20.3		
SP20-CH-104-010	West (2003 clean fill)	-8.82	18.72		
SP20-CH-105-005	West (2003 clean fill)	11.43	19.88	7.48	
SP20-CH-105-010	West (2003 clean fill)	4.06	19.24		
SP20-CH-106-005	West (2003 clean fill)	6.28	19.47		
SP20-CH-106-010	West (2003 clean fill)	8.91	20.86		
SP20-CH-107-005D	West (2003 clean fill)	3.27	24.01		
SP20-CH-108-005	North (undisturbed)	524.31	59.86	278.00	4.38
SP20-CH-108-005D	North (undisturbed)	197.68	40.49		
SP20-CH-108-010	North (undisturbed)	202.43	34.62		
SP20-CH-108-015	North (undisturbed)	673.27	66.19	1,160.00	2.99
SP20-CH-108-015D	North (undisturbed)	585.79	54.9		
SP20-CH-108-020	North (undisturbed)	168.93	38.37		
SP20-CH-109-005	North (undisturbed)	155.46	37.94		
SP20-CH-109-010	North (undisturbed)	271.41	50.15		
SP20-CH-109-015	North (undisturbed)	197.99	41.37		
SP20-CH-109-015D	North (undisturbed)	250.48	44.21		
SP20-CH-109-020	North (undisturbed)	147.89	36.35		
SP20-CH-110-010	East (road & 2003 fill)	108.8	34.76		
SP20-CH-110-015	East (road & 2003 fill)	116.57	33.77		
SP20-CH-110-015D	East (road & 2003 fill)	107.99	29.4		
SP20-CH-110-020	East (road & 2003 fill)	146.36	35.46		
SP20-CH-110-050	East (road & 2003 fill)	56.19	36.01		
SP20-CH-111-010	East (road & 2003 fill)	24.22	24.13		
SP20-CH-111-015	East (road & 2003 fill)	-13.04	21.7		
SP20-CH-111-020	East (road & 2003 fill)	25.99	27.02		
SP20-CH-111-050	East (road & 2003 fill)	61.01	30.27		
SP20-CH-112-005	East (road & 2003 fill)	9.69	25.79		
SP20-CH-112-010	East (road & 2003 fill)	314.04	69.5		
SP20-CH-112-015	East (road & 2003 fill)	333.48	54.87	398.00	
SP20-CH-112-015D	East (road & 2003 fill)	255.04	61.33		
SP20-CH-112-020	East (road & 2003 fill)	142.35	36.11		

SAMPLE ID	Municipal Garage Building Side (soil condition)	XRF Lead Measurement		LAB ANALYTICAL RESULTS	TCLP RESULTS
		Reading	Error		
		mg/kg	+/- mg/kg	mg/kg	mg/L
SP20-CH-113-005	East (road & 2003 fill)	24.59	28.45		
SP20-CH-113-010	East (road & 2003 fill)	163.72	39.19		
SP20-CH-113-015	East (road & 2003 fill)	36.71	24.69		
SP20-CH-113-020	East (road & 2003 fill)	-5.94	19.37		
SP20-CH-114-005	East (road & 2003 fill)	171.44	40.95	514.00	
SP20-CH-114-010	East (road & 2003 fill)	231.91	39.67		
SP20-CH-114-015	East (road & 2003 fill)	116.96	35.07		
SP20-CH-114-020	East (road & 2003 fill)	3.25	19.42		
SP20-CH-115-005	East (road & 2003 fill)	87.33	29.97		
SP20-CH-115-010	East (road & 2003 fill)	139.65	36.38		
SP20-CH-115-015	East (road & 2003 fill)	17.4	22.39		
SP20-CH-115-020	East (road & 2003 fill)	-1.58	19.79		

TABLE 2. SITE-SPECIFIC CLEANUP LEVELS FOR SOIL UNDER THE 10X RULE Municipal Garage Demolition St. Paul Island, Alaska

Analysis Type	Laboratory Method	Cleanup Level, mg/kg
Total Lead	EPA 6020	1,000
GRO [b]	AK-101	1,400
DRO [b]	AK-102	2,500
Acenaphthene[a]	EPA 8270C	210
Anthracene[a]	EPA 8270C	4,300
Benzo(a)anthracene[a]	EPA 8270C	6
Benzo(b)fluoranthene[a]	EPA 8270C	11
Benzo(k)fluoranthene[a]	EPA 8270C	110
Benzo(a)pyrene[a]	EPA 8270C	1
Chrysene[a]	EPA 8270C	620
Dibenzo(a,h)anthracene[a]	EPA 8270C	1
Fluorene[a]	EPA 8270C	270
Indeno(1,2,3-c,d)pyrene[a]	EPA 8270C	11
Naphthalene[a]	EPA 8270C	43
Pyrene[a]	EPA 8270C	1,500
Benzene[b]	AK-101	0.5
Toluene[b]	AK-101	54
Ethylbenzene[b]	AK-101	55
Total Xylenes[a]	AK-101	78

a These contaminants are still subject to the cleanup levels under Method Two, the chemical-specific cleanup levels for the PAHs indicated must be met unless ADEC determines that those cleanup levels need not be met to protect human health, safety, and welfare, and the environment (Note 15 to Method Two Tables B1 and B2).

b ADEC has approved the use of the 10X rule for these contaminants. NOAA will elect to cleanup benzene in soils at 0.5 mg/kg in accordance with the TPA (see Section 1.0), and NOAA may elect to cleanup GRO, DRO, and other contaminants as appropriate under the Ten Times Rule (see Section 5.1.1 of NOAA's Final CAP for this site (NOAA 2006b)).

TABLE 3. TCLP RESULTS FOR SIDING AND INTERIOR PLYWOOD TREATED WITH ECOBOND
Municipal Garage Demolition St. Paul Island, Alaska

Sample No./ sampling location	Parameter	Results	Units	PQL	Units	Analytical Method	Cleanup level	Units
Exterior 001	TCLP Lead	0.749	mg/L	0.500	mg/L	SW6010B TCLP	5	mg/L
Exterior 002	TCLP Lead	1.38	mg/L	0.500	mg/L	SW6010B TCLP	5	mg/L
Exterior 003	TCLP Lead	<0.500	mg/L	0.500	mg/L	SW6010B TCLP	5	mg/L
Exterior 004	TCLP Lead	3.74	mg/L	0.500	mg/L	SW6010B TCLP	5	mg/L
Exterior 005	TCLP Lead	0.968	mg/L	0.500	mg/L	SW6010B TCLP	5	mg/L
Exterior 006	TCLP Lead	1.13	mg/L	0.500	mg/L	SW6010B TCLP	5	mg/L
Exterior 007	TCLP Lead	0.986	mg/L	0.500	mg/L	SW6010B TCLP	5	mg/L
Interior 008	TCLP Lead	<0.500	mg/L	0.500	mg/L	SW6010B TCLP	5	mg/L
Interior 009	TCLP Lead	<0.500	mg/L	0.500	mg/L	SW6010B TCLP	5	mg/L
Interior 010	TCLP Lead	<0.500	mg/L	0.500	mg/L	SW6010B TCLP	5	mg/L
Interior 011	TCLP Lead	<0.500	mg/L	0.500	mg/L	SW6010B TCLP	5	mg/L

< = Less than the value listed
mg/L= Milligrams per Liter
PQL = Practical Quantitation Limit

TABLE 4. ANALYTICAL DATA SUMMARY -CONFIRMATION SAMPLE RESULTS
Municipal Garage Demolition St. Paul Island, Alaska

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CS-100-020	Lead	23	0.238	1,000	mg/kg
SP20-CS-001-020	Lead	18.7	0.215	1,000	mg/kg
Duplicate of SP20-CS-001-020					
SP20-CS-010-140	1-Methylnaphthalene	33.3	2.7	n/a	mg/kg
	2-Methylnaphthalene	43.9	2.7	n/a	mg/kg
	Acenaphthene	0.697	0.054	210	mg/kg
	Acenaphthylene	0	0.054	n/a	mg/kg
	Anthracene	0.0356J	0.054	4,300	mg/kg
	Benzene	0	0.155	0.5	mg/kg
	Benzo(a)anthracene	0.082	0.054	6	mg/kg
	Benzo(a)pyrene	0.07	0.054	3	mg/kg
	Benzo(b)fluoranthene	0.0516J	0.054	20	mg/kg
	Benzo(g,h,i)perylene	0.0301J	0.054	n/a	mg/kg
	Benzo(k)fluoranthene	0.0313J	0.054	200	mg/kg
	Chrysene	0.0794	0.054	620	mg/kg
	Dibenzo(a,h)anthracene	0	0.054	6	mg/kg
	Diesel Range Organics	**10,900**	1080	2,500	mg/kg
	Ethylbenzene	**8.87**	0.297	5.5	mg/kg
	Fluoranthene	0.143	0.054	2,100	mg/kg
	Fluorene	0.882	0.054	270	mg/kg
	Gasoline Range Organics	1,300	59.4	1,400	mg/kg
	Indeno(1,2,3-cd)pyrene	0.0262J	0.054	54	mg/kg
	Naphthalene	24.6	2.7	43	mg/kg
	o-Xylene	9.77	0.297	n/a	mg/kg
	Phenanthrene	0.492	0.054	n/a	mg/kg
	Pyrene	0.255	0.054	1,500	mg/kg
	Residual Range Organics	217	21.6	10,000	mg/kg
	Toluene	0.363J	0.594	54	mg/kg
	Total Xylene	42.87	0.891	78	mg/kg
	Xylene, Isomers m & p	33.1	0.594	n/a	mg/kg
SP20-CS-011-060	Benzene	0	0.0141	0.5	mg/kg
	Diesel Range Organics	3.58J	21.9	2,500	mg/kg
	Ethylbenzene	0.0349	0.0271	5.5	mg/kg
	Gasoline Range Organics	2.95	2.71	1,400	mg/kg
	o-Xylene	0.122	0.0271	n/a	mg/kg
	Residual Range Organics	9.31J	21.9	10,000	mg/kg
	Toluene	0.0414J	0.0541	54	mg/kg
	Total Xylene	0.34	0.0812	78	mg/kg
	Xylene, Isomers m & p	0.218	0.0541	n/a	mg/kg

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CS-023-130	Benzene	0	0.147	0.5	mg/kg
	Diesel Range Organics	**9,160**	436	2,500	mg/kg
	Ethylbenzene	5.26	0.283	5.5	mg/kg
	Gasoline Range Organics	654	28.3	1,400	mg/kg
	o-Xylene	1.25	0.283	n/a	mg/kg
	Residual Range Organics	1,180	218	10,000	mg/kg
	Toluene	0.441J	0.566	54	mg/kg
	Total Xylene	23.25	0.849	78	mg/kg
	Xylene, Isomers m & p	22	0.566	n/a	mg/kg
SP20-CS-024-130	Benzene	0	0.0124	0.5	mg/kg
	Diesel Range Organics	2,000	87.4	2,500	mg/kg
	Ethylbenzene	1.98	0.0239	5.5	mg/kg
	Gasoline Range Organics	206	11.9	1,400	mg/kg
	o-Xylene	2.32	0.239	n/a	mg/kg
	Residual Range Organics	71.6J	87.4	10,000	mg/kg
	Toluene	0.299	0.0477	54	mg/kg
	Total Xylene	13.02	0.716	78	mg/kg
	Xylene, Isomers m & p	10.7	0.477	n/a	mg/kg
SP20-CS-025-130	Benzene	0.0867J	0.105	0.5	mg/kg
	Diesel Range Organics	**2,710**	117	2,500	mg/kg
	Ethylbenzene	**13.2**	0.202	5.5	mg/kg
	Gasoline Range Organics	487	20.2	1,400	mg/kg
	o-Xylene	21.1	2.02	n/a	mg/kg
	Residual Range Organics	287	23.4	10,000	mg/kg
	Toluene	13.3	0.403	54	mg/kg
	Total Xylene	**79.4**	6.05	78	mg/kg
	Xylene, Isomers m & p	58.3	4.03	n/a	mg/kg
SP20-CS-027-130	Benzene	0	12.3	0.5	mg/kg
	Diesel Range Organics	**10,200**	445	2,500	mg/kg
	Ethylbenzene	**86.1**	23.6	5.5	mg/kg
	Gasoline Range Organics	**3,160**	236	1,400	mg/kg
	o-Xylene	134	23.6	n/a	mg/kg
	Residual Range Organics	288	88.9	10,000	mg/kg
	Toluene	35.4J	47.2	54	mg/kg
	Total Xylene	**552**	70.8	78	mg/kg
	Xylene, Isomers m & p	418	47.2	n/a	mg/kg
SP20-CS-028-130	Benzene	0	0.0732	0.5	mg/kg
GPS Point labeled as SP20-CH-028-130	Diesel Range Organics	**8,690**	434	2,500	mg/kg
	Ethylbenzene	**17.8**	1.41	5.5	mg/kg
	Gasoline Range Organics	529	14.1	1,400	mg/kg
	o-Xylene	19.1	1.41	n/a	mg/kg
	Residual Range Organics	209	86.8	10,000	mg/kg
	Toluene	3.52	0.281	54	mg/kg
	Total Xylene	**97.9**	4.22	78	mg/kg
	Xylene, Isomers m & p	78.8	2.81	n/a	mg/kg

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CS-029-130	1,1,1-Trichloroethane	0	2.43	1.0	mg/kg
	1,1,2,2-Tetrachloroethane	0	4.85	0.017	mg/kg
	1,1-Dichloroethane	0	2.43	12	mg/kg
	1,1-Dichloroethene	0	2.43	12	mg/kg
	1,2-Dichlorobenzene	0	2.43	7.0	mg/kg
	1,2-Dichloroethane	0	2.43	0.015	mg/kg
	1,2-Dichloropropane	0	2.43	0.017	mg/kg
	1,3-Dichlorobenzene	0	2.43	0.02	mg/kg
	1,4-Dichlorobenzene	0	2.43	0.8	mg/kg
	1-Methylnaphthalene	18	5.37	n/a	mg/kg
	2-Methylnaphthalene	34	5.37	n/a	mg/kg
	Acenaphthene	0.162	0.0537	210	mg/kg
	Acenaphthylene	0	0.0537	n/a	mg/kg
	Anthracene	0.0286J	0.0537	4,300	mg/kg
	Benzene	0	1.26	0.5	mg/kg
	Benzo(a)anthracene	0.0261J	0.0537	6	mg/kg
	Benzo(a)pyrene	0	0.0537	3	mg/kg
	Benzo(b)fluoranthene	0	0.0537	20	mg/kg
	Benzo(g,h,i)perylene	0	0.0537	n/a	mg/kg
	Benzo(k)fluoranthene	0.0274J	0.0537	200	mg/kg
	Bromodichloromethane	0	2.43	0.35	mg/kg
	Bromoform	0	2.43	0.38	mg/kg
	Carbon tetrachloride	0	2.43	0.03	mg/kg
	Chlorobenzene	0	2.43	0.6	mg/kg
	Chloroform	0	2.43	0.34	mg/kg
	Chrysene	0.0279J	0.0537	620	mg/kg
	cis-1,2-Dichloroethene	0	2.43	0.2	mg/kg
	Dibenzo(a,h)anthracene	0	0.0537	6	mg/kg
	Dibromochloromethane	0	2.43	n/a	mg/kg
	Diesel Range Organics	**3,060**	215	2,500	mg/kg
	Ethylbenzene	**86.1**	2.43	5.5	mg/kg
	Fluoranthene	0.0486J	0.0537	2,100	mg/kg
	Fluorene	0.19	0.0537	270	mg/kg
	Gasoline Range Organics	**3,290**	243	1,400	mg/kg
	Indeno(1,2,3-cd)pyrene	0	0.0537	54	mg/kg
	Methylene chloride	0	9.7	0.015	mg/kg
	Naphthalene	33.1	5.37	43	mg/kg
	o-Xylene	160	2.43	n/a	mg/kg
	Phenanthrene	0.253	0.0537	n/a	mg/kg
	Pyrene	0.0941	0.0537	1,500	mg/kg
	Residual Range Organics	3,220	215	10,000	mg/kg
	Tetrachloroethene	0	2.43	0.03	mg/kg
	Toluene	53.7	4.85	54	mg/kg
	Total Xylene	**645**	7.28	78	mg/kg
	trans-1,2-Dichloroethene	0	2.43	0.4	mg/kg
	Trichloroethene	0	2.43	0.027	mg/kg
	Xylene, Isomers m & p	485	4.85	n/a	mg/kg

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CS-110-130	1-Methylnaphthalene	20.5	5.38	n/a	mg/kg
Duplicate of	2-Methylnaphthalene	38	5.38	n/a	mg/kg
SP20-CS-029-130	Acenaphthene	0.172	0.0538	210	mg/kg
	Acenaphthylene	0	0.0538	n/a	mg/kg
	Anthracene	0.0298J	0.0538	4,300	mg/kg
	Benzene	0	11.1	0.5	mg/kg
	Benzo(a)anthracene	0.023J	0.0538	6	mg/kg
	Benzo(a)pyrene	0	0.0538	3	mg/kg
	Benzo(b)fluoranthene	0	0.0538	20	mg/kg
	Benzo(g,h,i)perylene	0	0.0538	n/a	mg/kg
	Benzo(k)fluoranthene	0.0305J	0.0538	200	mg/kg
	Chrysene	0.0258J	0.0538	620	mg/kg
	Dibenzo(a,h)anthracene	0	0.0538	6	mg/kg
	Diesel Range Organics	**3,770**	214	2,500	mg/kg
	Ethylbenzene	**97.5**	21.3	5.5	mg/kg
	Fluoranthene	0.0498J	0.0538	2,100	mg/kg
	Fluorene	0.204	0.0538	270	mg/kg
	Gasoline Range Organics	**3,430**	213	1,400	mg/kg
	Indeno(1,2,3-cd)pyrene	0	0.0538	54	mg/kg
	Naphthalene	37.1	5.38	43	mg/kg
	o-Xylene	167	21.3	n/a	mg/kg
	Phenanthrene	0.269	0.0538	n/a	mg/kg
	Pyrene	0	0.0538	1,500	mg/kg
	Residual Range Organics	4,000	214	10,000	mg/kg
	Toluene	**70.9**	42.6	54	mg/kg
	Total Xylene	**735**	63.9	78	mg/kg
	Xylene, Isomers m & p	568	42.6	n/a	mg/kg
SP20-CS-030-140	**1-Methylnaphthalene**	**0.0152**	**0.0066**	**n/a**	**mg/kg**
	2-Methylnaphthalene	0.009	0.0066	n/a	mg/kg
	Acenaphthene	0.0032J	0.0066	210	mg/kg
	Acenaphthylene	0	0.0066	n/a	mg/kg
	Anthracene	0	0.0066	4,300	mg/kg
	Benzene	0	0.0127	0.5	mg/kg
	Benzo(a)anthracene	0	0.0066	6	mg/kg
	Benzo(a)pyrene	0	0.0066	3	mg/kg
	Benzo(b)fluoranthene	0	0.0066	20	mg/kg
	Benzo(g,h,i)perylene	0.0021J	0.0066	n/a	mg/kg
	Benzo(k)fluoranthene	0	0.0066	200	mg/kg
	Chrysene	0	0.0066	620	mg/kg
	Dibenzo(a,h)anthracene	0	0.0066	6	mg/kg
	Diesel Range Organics	62.3	26	2,500	mg/kg
	Ethylbenzene	0.0102J	0.0244	5.5	mg/kg
	Fluoranthene	0.0023J	0.0066	2,100	mg/kg
	Fluorene	0.0041J	0.0066	270	mg/kg
	Gasoline Range Organics	2.01J	2.44	1,400	mg/kg
	Indeno(1,2,3-cd)pyrene	0	0.0066	54	mg/kg
	Naphthalene	0.0132	0.0066	43	mg/kg

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
	o-Xylene	0.0202J	0.0244	n/a	mg/kg
	Phenanthrene	0.0028J	0.0066	n/a	mg/kg
	Pyrene	0.0049J	0.0066	1,500	mg/kg
	Residual Range Organics	38.4	26	10,000	mg/kg
	Toluene	0	0.0487	54	mg/kg
	Total Xylene	0.0928J	0.0731	78	mg/kg
	Xylene, Isomers m & p	0.0726	0.0487	n/a	mg/kg
SP20-CS-031-140	Benzene	0	0.0132	0.5	mg/kg
	Diesel Range Organics	**3,280**	220	2,500	mg/kg
	Ethylbenzene	0.0132J	0.0254	5.5	mg/kg
	Gasoline Range Organics	31	2.54	1,400	mg/kg
	o-Xylene	0	0.0254	n/a	mg/kg
	Residual Range Organics	710	88.2	10,000	mg/kg
	Toluene	0	0.0508	54	mg/kg
	Total Xylene	0.0432J	0.0762	78	mg/kg
	Xylene, Isomers m & p	0.0432J	0.0508	n/a	mg/kg
SP20-CS-032-140	Benzene	0.0273	0.0165	0.5	mg/kg
	Diesel Range Organics	310	22.6	2,500	mg/kg
	Ethylbenzene	0.0876	0.0317	5.5	mg/kg
	Gasoline Range Organics	14.7	3.17	1,400	mg/kg
	o-Xylene	0.41	0.0317	n/a	mg/kg
	Residual Range Organics	1,570	90.4	10,000	mg/kg
	Toluene	0.145	0.0635	54	mg/kg
	Total Xylene	1.45	0.0952	78	mg/kg
	Xylene, Isomers m & p	1.04	0.0635	n/a	mg/kg
SP20-CS-033-140	Benzene	0	0.0131	0.5	mg/kg
	Diesel Range Organics	**3,310**	217	2,500	mg/kg
	Ethylbenzene	0	0.0251	5.5	mg/kg
	Gasoline Range Organics	58.5	2.51	1,400	mg/kg
	o-Xylene	0	0.0251	n/a	mg/kg
	Residual Range Organics	74.3J	86.7	10,000	mg/kg
	Toluene	0	0.0503	54	mg/kg
	Total Xylene	0	0.0754	78	mg/kg
	Xylene, Isomers m & p	0	0.0503	n/a	mg/kg
SP20-CS-034-140	Benzene	0	0.0106	0.5	mg/kg
	Diesel Range Organics	22.3	21.7	2,500	mg/kg
	Ethylbenzene	0	0.0204	5.5	mg/kg
	Gasoline Range Organics	1.84J	2.04	1,400	mg/kg
	o-Xylene	0.0072J	0.0204	n/a	mg/kg
	Residual Range Organics	50.4	21.7	10,000	mg/kg
	Toluene	0.0127J	0.0409	54	mg/kg
	Total Xylene	0.0276J	0.0613	78	mg/kg
	Xylene, Isomers m & p	0.0204J	0.0409	n/a	mg/kg

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CS-035-140	Benzene	0	0.0111	0.5	mg/kg
	Diesel Range Organics	21.1J	21.2	2,500	mg/kg
	Ethylbenzene	0.0486	0.0213	5.5	mg/kg
	Gasoline Range Organics	9.06	2.13	1,400	mg/kg
	o-Xylene	0.27	0.0213	n/a	mg/kg
	Residual Range Organics	34.8	21.2	10,000	mg/kg
	Toluene	0.0203J	0.0427	54	mg/kg
	Total Xylene	0.914	0.064	78	mg/kg
	Xylene, Isomers m & p	0.644	0.0427	n/a	mg/kg
SP20-CS-115-140 Duplicate of SP20-CS-035-140	Benzene	0	0.0119	0.5	mg/kg
	Diesel Range Organics	54J	85.2	2,500	mg/kg
	Ethylbenzene	0.187	0.0228	5.5	mg/kg
	Gasoline Range Organics	37.9	4.56	1,400	mg/kg
	o-Xylene	1.07	0.0228	n/a	mg/kg
	Residual Range Organics	85.6	85.2	10,000	mg/kg
	Toluene	0.0285J	0.0456	54	mg/kg
	Total Xylene	3.63	0.0684	78	mg/kg
	Xylene, Isomers m & p	2.56	0.0456	n/a	mg/kg
SP20-CS-303-140	1-Methylnaphthalene	16.2	2.87	n/a	mg/kg
	2-Methylnaphthalene	21.3	2.87	n/a	mg/kg
	Acenaphthene	0.0276J	0.0575	210	mg/kg
	Acenaphthylene	0	0.0575	n/a	mg/kg
	Anthracene	0	0.0575	4,300	mg/kg
	Benzene	0	0.142	0.5	mg/kg
	Benzo(a)anthracene	0	0.0575	6	mg/kg
	Benzo(a)pyrene	0	0.0575	3	mg/kg
	Benzo(b)fluoranthene	0	0.0575	20	mg/kg
	Benzo(g,h,i)perylene	0	0.0575	n/a	mg/kg
	Benzo(k)fluoranthene	0	0.0575	200	mg/kg
	Chrysene	0	0.0575	620	mg/kg
	Dibenzo(a,h)anthracene	0	0.0575	6	mg/kg
	Diesel Range Organics	309	23.1	2,500	mg/kg
	Ethylbenzene	2.46	0.273	5.5	mg/kg
	Fluoranthene	0	0.0575	2,100	mg/kg
	Fluorene	0.0375J	0.0575	270	mg/kg
	Gasoline Range Organics	330	136	1,400	mg/kg
	Indeno(1,2,3-cd)pyrene	0	0.0575	54	mg/kg
	Naphthalene	10.7	2.87	43	mg/kg
	o-Xylene	6.09	0.273	n/a	mg/kg
	Phenanthrene	0.0568J	0.0575	n/a	mg/kg
	Pyrene	0.0218J	0.0575	1,500	mg/kg
	Residual Range Organics	436	23.1	10,000	mg/kg
	Toluene	2.29	0.546	54	mg/kg
	Total Xylenes	23.6	0.819	78	mg/kg
	Xylene, Isomers m & p	17.5	0.546	n/a	mg/kg

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CS-304-120	Benzene	0	0.015	0.5	mg/kg
	Diesel Range Organics	569	23	2,500	mg/kg
	Ethylbenzene	0.0793	0.0289	5.5	mg/kg
	Gasoline Range Organics	38.1	2.89	1,400	mg/kg
	o-Xylene	0.245	0.0289	n/a	mg/kg
	Residual Range Organics	580	23	10,000	mg/kg
	Toluene	0.0915	0.0579	54	mg/kg
	Total Xylenes	0.727	0.0868	78	mg/kg
	Xylene, Isomers m & p	0.482	0.0579	n/a	mg/kg
SP20-CS-305-100	Benzene	0	0.0112	0.5	mg/kg
	Diesel Range Organics	2.75J	21.8	2,500	mg/kg
	Ethylbenzene	0	0.0215	5.5	mg/kg
	Gasoline Range Organics	0.854J	2.15	1,400	mg/kg
	o-Xylene	0.0071J	0.0215	n/a	mg/kg
	Residual Range Organics	13.4J	21.8	10,000	mg/kg
	Toluene	0	0.043	54	mg/kg
	Total Xylenes	0.0254J	0.0645	78	mg/kg
	Xylene, Isomers m & p	0.0183J	0.043	n/a	mg/kg
SP20-CS-306-140	Benzene	0	1.24	0.5	mg/kg
	Diesel Range Organics	565	24.1	2,500	mg/kg
	Ethylbenzene	**9.92**	2.39	5.5	mg/kg
	Gasoline Range Organics	739	239	1,400	mg/kg
	o-Xylene	18.6	2.39	n/a	mg/kg
	Residual Range Organics	130	24.1	10,000	mg/kg
	Toluene	11.1	4.78	54	mg/kg
	Total Xylenes	74.6	7.17	78	mg/kg
	Xylene, Isomers m & p	56	4.78	n/a	mg/kg
SP20-CS-308-130	Benzene	0	1.04	0.5	mg/kg
	Diesel Range Organics	30.9	23.2	2,500	mg/kg
	Ethylbenzene	**12.7**	1.99	5.5	mg/kg
	Gasoline Range Organics	686	99.7	1,400	mg/kg
	o-Xylene	19.3	1.99	n/a	mg/kg
	Residual Range Organics	28.2B	23.2	10,000	mg/kg
	Toluene	40.4	3.99	54	mg/kg
	Total Xylenes	76.3	5.98	78	mg/kg
	Xylene, Isomers m & p	57	3.99	n/a	mg/kg
SP20-CS-401-130	Benzene	0.639J	1.38	0.5	mg/kg
Duplicate of CS-308-130	Diesel Range Organics	55.6	23.5	2,500	mg/kg
	Ethylbenzene	**41.5**	2.66	5.5	mg/kg
	Gasoline Range Organics	**2,040**	133	1,400	mg/kg
	o-Xylene	57	2.66	n/a	mg/kg
	Residual Range Organics	36.7B	23.5	10,000	mg/kg
	Toluene	**123**	5.32	54	mg/kg
	Total Xylenes	**237**	7.98	78	mg/kg
	Xylene, Isomers m & p	180	5.32	n/a	mg/kg

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CS-309-140	Benzene	0	0.153	0.5	mg/kg
	Diesel Range Organics	4.81J	25.9	2,500	mg/kg
	Ethylbenzene	2.78	0.294	5.5	mg/kg
	Gasoline Range Organics	96.3	14.7	1,400	mg/kg
	o-Xylene	3.7	0.294	n/a	mg/kg
	Residual Range Organics	18.9J	25.9	10,000	mg/kg
	Toluene	3.63	0.588	54	mg/kg
	Total Xylenes	16	0.882	78	mg/kg
	Xylene, Isomers m & p	12.3	0.588	n/a	mg/kg
SP20-CS-311-100	Benzene	0	0.0193	0.5	mg/kg
	Diesel Range Organics	4.3J	22.5	2,500	mg/kg
	Ethylbenzene	0.0887	0.0371	5.5	mg/kg
	Gasoline Range Organics	0	3.71	1,400	mg/kg
	o-Xylene	0.13	0.0371	n/a	mg/kg
	Residual Range Organics	28.6B	22.5	10,000	mg/kg
	Toluene	0.135	0.0742	54	mg/kg
	Total Xylenes	0.567	0.1113	78	mg/kg
	Xylene, Isomers m & p	0.437	0.0742	n/a	mg/kg
SP20-CS-312-100	Benzene	0	0.0163	0.5	mg/kg
	Diesel Range Organics	3.53J	21.8	2,500	mg/kg
	Ethylbenzene	0	0.0314	5.5	mg/kg
	Gasoline Range Organics	0	3.14	1,400	mg/kg
	o-Xylene	0	0.0314	n/a	mg/kg
	Residual Range Organics	15.9J	21.8	10,000	mg/kg
	Toluene	0	0.0627	54	mg/kg
	Total Xylenes	0.0301J	0.0941	78	mg/kg
	Xylene, Isomers m & p	0.0301J	0.0627	n/a	mg/kg
SP20-CS-303-140	1-Methylnaphthalene	16.2	2.87	n/a	mg/kg
	2-Methylnaphthalene	21.3	2.87	n/a	mg/kg
	Acenaphthene	0.0276J	0.0575	210	mg/kg
	Acenaphthylene	0	0.0575	n/a	mg/kg
	Anthracene	0	0.0575	4,300	mg/kg
	Benzene	0	0.142	0.5	mg/kg
	Benzo(a)anthracene	0	0.0575	6	mg/kg
	Benzo(a)pyrene	0	0.0575	3	mg/kg
	Benzo(b)fluoranthene	0	0.0575	20	mg/kg
	Benzo(g,h,i)perylene	0	0.0575	n/a	mg/kg
	Benzo(k)fluoranthene	0	0.0575	200	mg/kg
	Chrysene	0	0.0575	620	mg/kg
	Dibenzo(a,h)anthracene	0	0.0575	6	mg/kg
	Diesel Range Organics	309	23.1	2,500	mg/kg
	Ethylbenzene	2.46	0.273	5.5	mg/kg
	Fluoranthene	0	0.0575	2,100	mg/kg
	Fluorene	0.0375J	0.0575	270	mg/kg
	Gasoline Range Organics	330	136	1,400	mg/kg
	Indeno(1,2,3-cd)pyrene	0	0.0575	54	mg/kg
	Naphthalene	10.7	2.87	43	mg/kg

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
	o-Xylene	6.09	0.273	n/a	mg/kg
	Phenanthrene	0.0568J	0.0575	n/a	mg/kg
	Pyrene	0.0218J	0.0575	1,500	mg/kg
	Residual Range Organics	436	23.1	10,000	mg/kg
	Toluene	2.29	0.546	54	mg/kg
	Total Xylenes	23.6	0.819	78	mg/kg
	Xylene, Isomers m & p	17.5	0.546	n/a	mg/kg
SP20-CS-304-120	Benzene	0	0.015	0.5	mg/kg
	Diesel Range Organics	569	23	2,500	mg/kg
	Ethylbenzene	0.0793	0.0289	5.5	mg/kg
	Gasoline Range Organics	38.1	2.89	1,400	mg/kg
	o-Xylene	0.245	0.0289	n/a	mg/kg
	Residual Range Organics	580	23	10,000	mg/kg
	Toluene	0.0915	0.0579	54	mg/kg
	Total Xylenes	0.727	0.0868	78	mg/kg
	Xylene, Isomers m & p	0.482	0.0579	n/a	mg/kg
SP20-CS-305-100	Benzene	0	0.0112	0.5	mg/kg
	Diesel Range Organics	2.75J	21.8	2,500	mg/kg
	Ethylbenzene	0	0.0215	5.5	mg/kg
	Gasoline Range Organics	0.854J	2.15	1,400	mg/kg
	o-Xylene	0.0071J	0.0215	n/a	mg/kg
	Residual Range Organics	13.4J	21.8	10,000	mg/kg
	Toluene	0	0.043	54	mg/kg
	Total Xylenes	0.0254J	0.0645	78	mg/kg
	Xylene, Isomers m & p	0.0183J	0.043	n/a	mg/kg
SP20-CS-306-140	Benzene	0	1.24	0.5	mg/kg
	Diesel Range Organics	565	24.1	2,500	mg/kg
	Ethylbenzene	**9.92**	2.39	5.5	mg/kg
	Gasoline Range Organics	739	239	1,400	mg/kg
	o-Xylene	18.6	2.39	n/a	mg/kg
	Residual Range Organics	130	24.1	10,000	mg/kg
	Toluene	11.1	4.78	54	mg/kg
	Total Xylenes	74.6	7.17	78	mg/kg
	Xylene, Isomers m & p	56	4.78	n/a	mg/kg
SP20-CS-308-130	Benzene	0	1.04	0.5	mg/kg
	Diesel Range Organics	30.9	23.2	2,500	mg/kg
	Ethylbenzene	**12.7**	1.99	5.5	mg/kg
	Gasoline Range Organics	686	99.7	1,400	mg/kg
	o-Xylene	19.3	1.99	n/a	mg/kg
	Residual Range Organics	28.2B	23.2	10,000	mg/kg
	Toluene	40.4	3.99	54	mg/kg
	Total Xylenes	76.3	5.98	78	mg/kg
	Xylene, Isomers m & p	57	3.99	n/a	mg/kg

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CS-309-140	Benzene	0	0.153	0.5	mg/kg
	Diesel Range Organics	4.81J	25.9	2,500	mg/kg
	Ethylbenzene	2.78	0.294	5.5	mg/kg
	Gasoline Range Organics	96.3	14.7	1,400	mg/kg
	o-Xylene	3.7	0.294	n/a	mg/kg
	Residual Range Organics	18.9J	25.9	10,000	mg/kg
	Toluene	3.63	0.588	54	mg/kg
	Total Xylenes	16	0.882	78	mg/kg
	Xylene, Isomers m & p	12.3	0.588	n/a	mg/kg
SP20-CS-311-100	Benzene	0	0.0193	0.5	mg/kg
	Diesel Range Organics	4.3J	22.5	2,500	mg/kg
	Ethylbenzene	0.0887	0.0371	5.5	mg/kg
	Gasoline Range Organics	0	3.71	1,400	mg/kg
	o-Xylene	0.13	0.0371	n/a	mg/kg
	Residual Range Organics	28.6B	22.5	10,000	mg/kg
	Toluene	0.135	0.0742	54	mg/kg
	Total Xylenes	0.567	0.1113	78	mg/kg
	Xylene, Isomers m & p	0.437	0.0742	n/a	mg/kg
SP20-CS-312-100	Benzene	0	0.0163	0.5	mg/kg
	Diesel Range Organics	3.53J	21.8	2,500	mg/kg
	Ethylbenzene	0	0.0314	5.5	mg/kg
	Gasoline Range Organics	0	3.14	1,400	mg/kg
	o-Xylene	0	0.0314	n/a	mg/kg
	Residual Range Organics	15.9J	21.8	10,000	mg/kg
	Toluene	0	0.0627	54	mg/kg
	Total Xylenes	0.0301J	0.0941	78	mg/kg
	Xylene, Isomers m & p	0.0301J	0.0627	n/a	mg/kg
SP20-CS-401-130	Benzene	0.639J	1.38	0.5	mg/kg
	Diesel Range Organics	55.6	23.5	2,500	mg/kg
	Ethylbenzene	**41.5**	2.66	5.5	mg/kg
	Gasoline Range Organics	**2040**	133	1,400	mg/kg
	o-Xylene	57	2.66	n/a	mg/kg
	Residual Range Organics	36.7B	23.5	10,000	mg/kg
	Toluene	**123**	5.32	54	mg/kg
	Total Xylenes	**237**	7.98	78	mg/kg
	Xylene, Isomers m & p	180	5.32	n/a	mg/kg

Bold numbers indicate greater than ADEC cleanup levels.
J = Estimated value due to value less than PQL
B = EPA Flag - Analyte present in the blank and the sample
CL = Initial analysis within holding time but required dilution
GRO = Gasoline Range Organics
DRO = Diesel Range Organics
RRO = Residual Range Organics
mg/Kg = Milligrams per Kilogram
PQL = Practical Quantitation Limit

TABLE 5. ANALYTICAL DATA SUMMARY -CHARACTERIZATION SAMPLE RESULTS
Municipal Garage Demolition St. Paul Island, Alaska

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CH-002	1-Methylnaphthalene	0.216	0.0591	n/a	mg/kg
	2-Methylnaphthalene	0.0791	0.0591	n/a	mg/kg
	Acenaphthene	0	0.0591	210	mg/kg
	Acenaphthylene	0	0.0591	n/a	mg/kg
	Anthracene	0	0.0591	4,300	mg/kg
	Benzene	0	0.0165	0.5	mg/kg
	Benzo(a)anthracene	0	0.0591	6	mg/kg
	Benzo(a)pyrene	0	0.0591	3	mg/kg
	Benzo(b)fluoranthene	0	0.0591	20	mg/kg
	Benzo(g,h,i)perylene	0	0.0591	n/a	mg/kg
	Benzo(k)fluoranthene	0	0.0591	200	mg/kg
	Chrysene	0	0.0591	620	mg/kg
	Dibenzo(a,h)anthracene	0	0.0591	6	mg/kg
	Diesel Range Organics	265	23.9	2,500	mg/kg
	Ethylbenzene	0.034	0.0318	5.5	mg/kg
	Fluoranthene	0.0219J	0.0591	2,100	mg/kg
	Fluorene	0.0251J	0.0591	270	mg/kg
	Gasoline Range Organics	55.6	3.18	1,400	mg/kg
	Indeno(1,2,3-cd)pyrene	0	0.0591	54	mg/kg
	Naphthalene	0.023J	0.0591	43	mg/kg
	o-Xylene	0.027J	0.0318	n/a	mg/kg
	Phenanthrene	0.0388J	0.0591	n/a	mg/kg
	Pyrene	0.046J	0.0591	1,500	mg/kg
	Residual Range Organics	52	23.9	10,000	mg/kg
	Toluene	0.0216J	0.0635	54	mg/kg
	Total Xylene	0.168J	0.0953	78	mg/kg
	Xylene, Isomers m & p	0.141	0.0635	n/a	mg/kg
SP20-CH-003	Benzene	0.0111J	0.0156	0.5	mg/kg
	Diesel Range Organics	261	21.6	2,500	mg/kg
	Ethylbenzene	0	0.0301	5.5	mg/kg
	Gasoline Range Organics	3.03	3.01	1,400	mg/kg
	o-Xylene	0.031	0.0301	n/a	mg/kg
	Residual Range Organics	157	21.6	10,000	mg/kg
	Toluene	0.0539J	0.0602	54	mg/kg
	Total Xylene	0.0849J	0.0903	78	mg/kg
	Xylene, Isomers m & p	0.0539J	0.0602	n/a	mg/kg

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CH-004	1-Methylnaphthalene	0.0455J	0.0557	n/a	mg/kg
	2-Methylnaphthalene	0.0395J	0.0557	n/a	mg/kg
	Acenaphthene	0	0.0557	210	mg/kg
	Acenaphthylene	0	0.0557	n/a	mg/kg
	Anthracene	0	0.0557	4,300	mg/kg
	Benzene	0.0475	0.0133	0.5	mg/kg
	Benzo(a)anthracene	0.0462J	0.0557	6	mg/kg
	Benzo(a)pyrene	0.0592	0.0557	3	mg/kg
	Benzo(b)fluoranthene	0.0483J	0.0557	20	mg/kg
	Benzo(g,h,i)perylene	0.0748	0.0557	n/a	mg/kg
	Benzo(k)fluoranthene	0.0265J	0.0557	200	mg/kg
	Chrysene	0.0375J	0.0557	620	mg/kg
	Dibenzo(a,h)anthracene	0	0.0557	6	mg/kg
	Diesel Range Organics	417	22.1	2,500	mg/kg
	Ethylbenzene	0.0107J	0.0255	5.5	mg/kg
	Fluoranthene	0.0435J	0.0557	2,100	mg/kg
	Fluorene	0	0.0557	270	mg/kg
	Gasoline Range Organics	4.51	2.55	1,400	mg/kg
	Indeno(1,2,3-cd)pyrene	0.0545J	0.0557	54	mg/kg
	Naphthalene	0.0345J	0.0557	43	mg/kg
	o-Xylene	0.0641	0.0255	n/a	mg/kg
	Phenanthrene	0.0514J	0.0557	n/a	mg/kg
	Pyrene	0.0791	0.0557	1,500	mg/kg
	Residual Range Organics	284	22.1	10,000	mg/kg
	Toluene	0.0996	0.0511	54	mg/kg
	Total Xylene	0.1961	0.0766	78	mg/kg
	Xylene, Isomers m & p	0.132	0.0511	n/a	mg/kg
SP20-CH-008-140 Confirmation Sample mis-labeled as Characterization Sample	Benzene	0	0.133	0.5	mg/kg
	Diesel Range Organics	**5,960**	245	2,500	mg/kg
	Ethylbenzene	3.74	0.257	5.5	mg/kg
	Gasoline Range Organics	205	12.8	1,400	mg/kg
	o-Xylene	6.22	0.257	n/a	mg/kg
	Residual Range Organics	44.5	24.5	10,000	mg/kg
	Toluene	0.19J	0.513	54	mg/kg
	Total Xylene	22.42	0.77	78	mg/kg
	Xylene, Isomers m & p	16.2	0.513	n/a	mg/kg

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CH-009	1-Methylnaphthalene	2.38	0.273	n/a	mg/kg
	2-Methylnaphthalene	3.12	0.273	n/a	mg/kg
	Acenaphthene	0.0625	0.0546	210	mg/kg
	Acenaphthylene	0	0.0546	n/a	mg/kg
	Anthracene	0	0.0546	4,300	mg/kg
	Benzene	0	0.124	0.5	mg/kg
	Benzo(a)anthracene	0	0.0546	6	mg/kg
	Benzo(a)pyrene	0	0.0546	3	mg/kg
	Benzo(b)fluoranthene	0	0.0546	20	mg/kg
	Benzo(g,h,i)perylene	0	0.0546	n/a	mg/kg
	Benzo(k)fluoranthene	0	0.0546	200	mg/kg
	Chrysene	0	0.0546	620	mg/kg
	Dibenzo(a,h)anthracene	0	0.0546	6	mg/kg
	Diesel Range Organics	1,950	86.9	2,500	mg/kg
	Ethylbenzene	1.68	0.238	5.5	mg/kg
	Fluoranthene	0.0197	0.0546	2,100	mg/kg
	Fluorene	0.0825J	0.0546	270	mg/kg
	Gasoline Range Organics	286	11.9	1,400	mg/kg
	Indeno(1,2,3-cd)pyrene	0	0.0546	54	mg/kg
	Naphthalene	1.43	0.273	43	mg/kg
	o-Xylene	0.845	0.238	n/a	mg/kg
	Phenanthrene	0.057	0.0546	n/a	mg/kg
	Pyrene	0.0399J	0.0546	1,500	mg/kg
	Residual Range Organics	149	21.7	10,000	mg/kg
	Toluene	0.466J	0.476	54	mg/kg
	Total Xylene	7.045	0.714	78	mg/kg
	Xylene, Isomers m & p	6.2	0.476	n/a	mg/kg
SP20-CH-012	Benzene	0	1.47	0.5	mg/kg
	Diesel Range Organics	**5,510**	219	2,500	mg/kg
	Ethylbenzene	**20.6**	2.83	5.5	mg/kg
	Gasoline Range Organics	938	28.3	1,400	mg/kg
	o-Xylene	37.8	2.83	n/a	mg/kg
	Residual Range Organics	523	21.9	10,000	mg/kg
	Toluene	11.4	5.66	54	mg/kg
	Total Xylene	**141.8**	8.49	78	mg/kg
	Xylene, Isomers m & p	104	5.66	n/a	mg/kg

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CH-013	1-Methylnaphthalene	15.3	1.21	n/a	mg/kg
	2-Methylnaphthalene	21.5	1.21	n/a	mg/kg
	Acenaphthene	0.206	0.0605	210	mg/kg
	Acenaphthylene	0	0.0605	n/a	mg/kg
	Anthracene	0	0.0605	4,300	mg/kg
	Benzene	0	0.139	0.5	mg/kg
	Benzo(a)anthracene	0.0208J	0.0605	6	mg/kg
	Benzo(a)pyrene	0	0.0605	3	mg/kg
	Benzo(b)fluoranthene	0	0.0605	20	mg/kg
	Benzo(g,h,i)perylene	0	0.0605	n/a	mg/kg
	Benzo(k)fluoranthene	0	0.0605	200	mg/kg
	Chrysene	0	0.0605	620	mg/kg
	Dibenzo(a,h)anthracene	0	0.0605	6	mg/kg
	Diesel Range Organics	2,120	95.9	2,500	mg/kg
	Ethylbenzene	4.55	0.268	5.5	mg/kg
	Fluoranthene	0.0385J	0.0605	2,100	mg/kg
	Fluorene	0.264	0.0605	270	mg/kg
	Gasoline Range Organics	185	5.36	1,400	mg/kg
	Indeno(1,2,3-cd)pyrene	0	0.0605	54	mg/kg
	Naphthalene	12.7	1.21	43	mg/kg
	o-Xylene	2.49	0.268	n/a	mg/kg
	Phenanthrene	0.161	0.0605	n/a	mg/kg
	Pyrene	0.0708	0.0605	1,500	mg/kg
	Residual Range Organics	45.7	24	10,000	mg/kg
	Toluene	0.172J	0.536	54	mg/kg
	Total Xylene	21.39	0.804	78	mg/kg
	Xylene, Isomers m & p	18.9	0.536	n/a	mg/kg

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CH-099 Duplicate of SP20-CH-013	1-Methylnaphthalene	7.42	0.605	n/a	mg/kg
	2-Methylnaphthalene	10.4	0.605	n/a	mg/kg
	Acenaphthene	0.214	0.0605	210	mg/kg
	Acenaphthylene	0	0.0605	n/a	mg/kg
	Anthracene	0	0.0605	4,300	mg/kg
	Benzene	0	0.116	0.5	mg/kg
	Benzo(a)anthracene	0.0203J	0.0605	6	mg/kg
	Benzo(a)pyrene	0	0.0605	3	mg/kg
	Benzo(b)fluoranthene	0	0.0605	20	mg/kg
	Benzo(g,h,i)perylene	0	0.0605	n/a	mg/kg
	Benzo(k)fluoranthene	0	0.0605	200	mg/kg
	Chrysene	0.0183J	0.0605	620	mg/kg
	Dibenzo(a,h)anthracene	0	0.0605	6	mg/kg
	Diesel Range Organics	1,310	96.6	2,500	mg/kg
	Ethylbenzene	2.75	0.223	5.5	mg/kg
	Fluoranthene	0.0422	0.0605	2,100	mg/kg
	Fluorene	0.27J	0.0605	270	mg/kg
	Gasoline Range Organics	118	4.45	1,400	mg/kg
	Indeno(1,2,3-cd)pyrene	0	0.0605	54	mg/kg
	Naphthalene	5.92	0.605	43	mg/kg
	o-Xylene	1.59	0.223	n/a	mg/kg
	Phenanthrene	0.175	0.0605	n/a	mg/kg
	Pyrene	0.0753	0.0605	1,500	mg/kg
	Residual Range Organics	54.5	24.1	10,000	mg/kg
	Toluene	0	0.445	54	mg/kg
	Total Xylene	12.99	0.668	78	mg/kg
	Xylene, Isomers m & p	11.4	0.445	n/a	mg/kg
SP20-CH-014-140 Confirmation Sample mis-labeled as Characterization Sample	Benzene	0	0.123	0.5	mg/kg
	Diesel Range Organics	**10,600**	437	2,500	mg/kg
	Ethylbenzene	**17.9**	2.36	5.5	mg/kg
	Gasoline Range Organics	**1,600**	236	1,400	mg/kg
	o-Xylene	61.9	2.36	n/a	mg/kg
	Residual Range Organics	2,410	437	10,000	mg/kg
	Toluene	9.2	4.72	54	mg/kg
	Total Xylene	**231.9**	7.08	78	mg/kg
	Xylene, Isomers m & p	170	4.72	n/a	mg/kg
SP20-CH-015	Benzene	0	0.0959	0.5	mg/kg
	Diesel Range Organics	6,050	232	2,500	mg/kg
	Ethylbenzene	1.92	0.184	5.5	mg/kg
	Gasoline Range Organics	139	18.4	1,400	mg/kg
	o-Xylene	1.58	0.184	n/a	mg/kg
	Residual Range Organics	60.5	23.2	10,000	mg/kg
	Toluene	0	0.369	54	mg/kg
	Total Xylene	8.64	0.553	78	mg/kg
	Xylene, Isomers m & p	7.06	0.369	n/a	mg/kg

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CH-016	Benzene	0	0.016	0.5	mg/kg
	Diesel Range Organics	3.04J	21.2	2,500	mg/kg
	Ethylbenzene	0	0.0308	5.5	mg/kg
	Gasoline Range Organics	2.01J	3.08	1,400	mg/kg
	o-Xylene	0	0.0308	n/a	mg/kg
	Residual Range Organics	11J	21.2	10,000	mg/kg
	Toluene	0	0.0616	54	mg/kg
	Total Xylene	0	0.0924	78	mg/kg
	Xylene, Isomers m & p	0	0.0616	n/a	mg/kg
SP20-CH-017	Benzene	0	0.0181	0.5	mg/kg
	Diesel Range Organics	55.4	23.8	2,500	mg/kg
	Ethylbenzene	0	0.0349	5.5	mg/kg
	Gasoline Range Organics	1.51J	3.49	1,400	mg/kg
	o-Xylene	0	0.0349	n/a	mg/kg
	Residual Range Organics	159	23.8	10,000	mg/kg
	Toluene	0	0.0698	54	mg/kg
	Total Xylene	0.000	0.1047	78	mg/kg
	Xylene, Isomers m & p	0	0.0698	n/a	mg/kg
SP20-CH-018	Benzene	0	0.0122	0.5	mg/kg
	Diesel Range Organics	**6,860**	214	2,500	mg/kg
	Ethylbenzene	1.32	0.234	5.5	mg/kg
	Gasoline Range Organics	0.831J	2.34	1,400	mg/kg
	o-Xylene	1.28	0.234	n/a	mg/kg
	Residual Range Organics	4,580	214	10,000	mg/kg
	Toluene	0	0.468	54	mg/kg
	Total Xylene	7.99	0.702	78	mg/kg
	Xylene, Isomers m & p	6.71	0.468	n/a	mg/kg
SP20-CH-019	Benzene	0	0.0139	0.5	mg/kg
	Diesel Range Organics	**4,290**	214	2,500	mg/kg
	Ethylbenzene	0	0.0266	5.5	mg/kg
	Gasoline Range Organics	159	13.3	1,400	mg/kg
	o-Xylene	0	0.0266	n/a	mg/kg
	Residual Range Organics	668	21.4	10,000	mg/kg
	Toluene	0	0.0533	54	mg/kg
	Total Xylene	0	0.0799	78	mg/kg
	Xylene, Isomers m & p	0	0.0533	n/a	mg/kg
SP20-CH-020	Benzene	0	0.0153	0.5	mg/kg
	Diesel Range Organics	3.01J	21.6	2,500	mg/kg
	Ethylbenzene	0	0.0295	5.5	mg/kg
	Gasoline Range Organics	1.83J	2.95	1,400	mg/kg
	o-Xylene	0	0.0295	n/a	mg/kg
	Residual Range Organics	13.4J	21.6	10,000	mg/kg
	Toluene	0	0.0589	54	mg/kg
	Total Xylene	0	0.0884	78	mg/kg
	Xylene, Isomers m & p	0	0.0589	n/a	mg/kg

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CH-022	Benzene	0	0.0106	0.5	mg/kg
	Diesel Range Organics	23.4	21.6	2,500	mg/kg
	Ethylbenzene	0	0.0205	5.5	mg/kg
	Gasoline Range Organics	0.697J	2.05	1,400	mg/kg
	o-Xylene	0.0076J	0.0205	n/a	mg/kg
	Residual Range Organics	24.2	21.6	10,000	mg/kg
	Toluene	0	0.041	54	mg/kg
	Total Xylene	0.0076J	0.0615	78	mg/kg
	Xylene, Isomers m & p	0	0.041	n/a	mg/kg
SP20-CH-301	1-Methylnaphthalene	0.15	0.0568	n/a	mg/kg
Connector Pad	2-Methylnaphthalene	0.172	0.0568	n/a	mg/kg
	Acenaphthene	0	0.0568	210	mg/kg
	Acenaphthylene	0	0.0568	n/a	mg/kg
	Anthracene	0	0.0568	4,300	mg/kg
	Benzene	0	0.0171	0.5	mg/kg
	Benzo(a)anthracene	0	0.0568	6	mg/kg
	Benzo(a)pyrene	0	0.0568	3	mg/kg
	Benzo(b)fluoranthene	0	0.0568	20	mg/kg
	Benzo(g,h,i)perylene	0	0.0568	n/a	mg/kg
	Benzo(k)fluoranthene	0	0.0568	200	mg/kg
	Chrysene	0	0.0568	620	mg/kg
	Dibenzo(a,h)anthracene	0	0.0568	6	mg/kg
	Diesel Range Organics	110	22.6	2,500	mg/kg
	Ethylbenzene	0	0.0329	5.5	mg/kg
	Fluoranthene	0	0.0568	2,100	mg/kg
	Fluorene	0	0.0568	270	mg/kg
	Gasoline Range Organics	0.76J	3.29	1,400	mg/kg
	Indeno(1,2,3-cd)pyrene	0	0.0568	54	mg/kg
	Naphthalene	0.0865	0.0568	43	mg/kg
	o-Xylene	0	0.0329	n/a	mg/kg
	Phenanthrene	0	0.0568	n/a	mg/kg
	Pyrene	0	0.0568	1,500	mg/kg
	Residual Range Organics	706	22.6	10,000	mg/kg
	Toluene	0.024J	0.0657	54	mg/kg
	Total Xylene	0.0207J	0.0986	78	mg/kg
	Xylene, Isomers m & p	0.0207J	0.0657	n/a	mg/kg
SP20-CH-302	Benzene	0.0338	0.0148	0.5	mg/kg
Connector Pad	Diesel Range Organics	438	22.9	2,500	mg/kg
	Ethylbenzene	0.525	0.0284	5.5	mg/kg
	Gasoline Range Organics	97.3	2.84	1,400	mg/kg
	o-Xylene	2.96	0.284	n/a	mg/kg
	Residual Range Organics	1,190	91.4	10,000	mg/kg
	Toluene	0.572	0.0568	54	mg/kg
	Total Xylene	11.68	0.852	78	mg/kg
	Xylene, Isomers m & p	8.72	0.568	n/a	mg/kg

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CH-307	Benzene	0	0.0121	0.5	mg/kg
Connector Pad	Diesel Range Organics	65.6	21.6	2,500	mg/kg
	Ethylbenzene	0	0.0233	5.5	mg/kg
	Gasoline Range Organics	9.36	2.33	1,400	mg/kg
	o-Xylene	0.275	0.0233	n/a	mg/kg
	Residual Range Organics	103B	21.6	10,000	mg/kg
	Toluene	0	0.0465	54	mg/kg
	Total Xylene	0.375	0.0698	78	mg/kg
	Xylene, Isomers m & p	0.0996	0.0465	n/a	mg/kg
SP20-CH-310	Benzene	0	0.0132	0.5	mg/kg
Connector Pad	Diesel Range Organics	4.77J	21.4	2,500	mg/kg
	Ethylbenzene	0	0.0253	5.5	mg/kg
	Gasoline Range Organics	1.08J	2.53	1,400	mg/kg
	o-Xylene	0.0403	0.0253	n/a	mg/kg
	Residual Range Organics	12.4J	21.4	10,000	mg/kg
	Toluene	0	0.0507	54	mg/kg
	Total Xylene	0.1011	0.076	78	mg/kg
	Xylene, Isomers m & p	0.0608	0.0507	n/a	mg/kg
SP20-CH-400	Benzene	0	0.0154	0.5	mg/kg
Connector Pad	Diesel Range Organics	85.7	21.9	2,500	mg/kg
	Ethylbenzene	0.011J	0.0296	5.5	mg/kg
	Gasoline Range Organics	2.6	2.01	1,400	mg/kg
	o-Xylene	0.111	0.0296	n/a	mg/kg
	Residual Range Organics	113	21.9	10,000	mg/kg
	Toluene	0.059J	0.0593	54	mg/kg
	Total Xylene	0.182	0.0889	78	mg/kg
	Xylene, Isomers m & p	0.0709	0.0593	n/a	mg/kg

Bold numbers indicate greater than ADEC cleanup levels.
J = Estimated value due to value less than PQL
B = EPA Flag - Analyte present in the blank and the sample
CL = Initial analysis within holding time but required dilution
GRO = Gasoline Range Organics
DRO = Diesel Range Organics
RRO = Residual Range Organics
mg/Kg = Milligrams per Kilogram
PQL = Practical Quantitation Limit

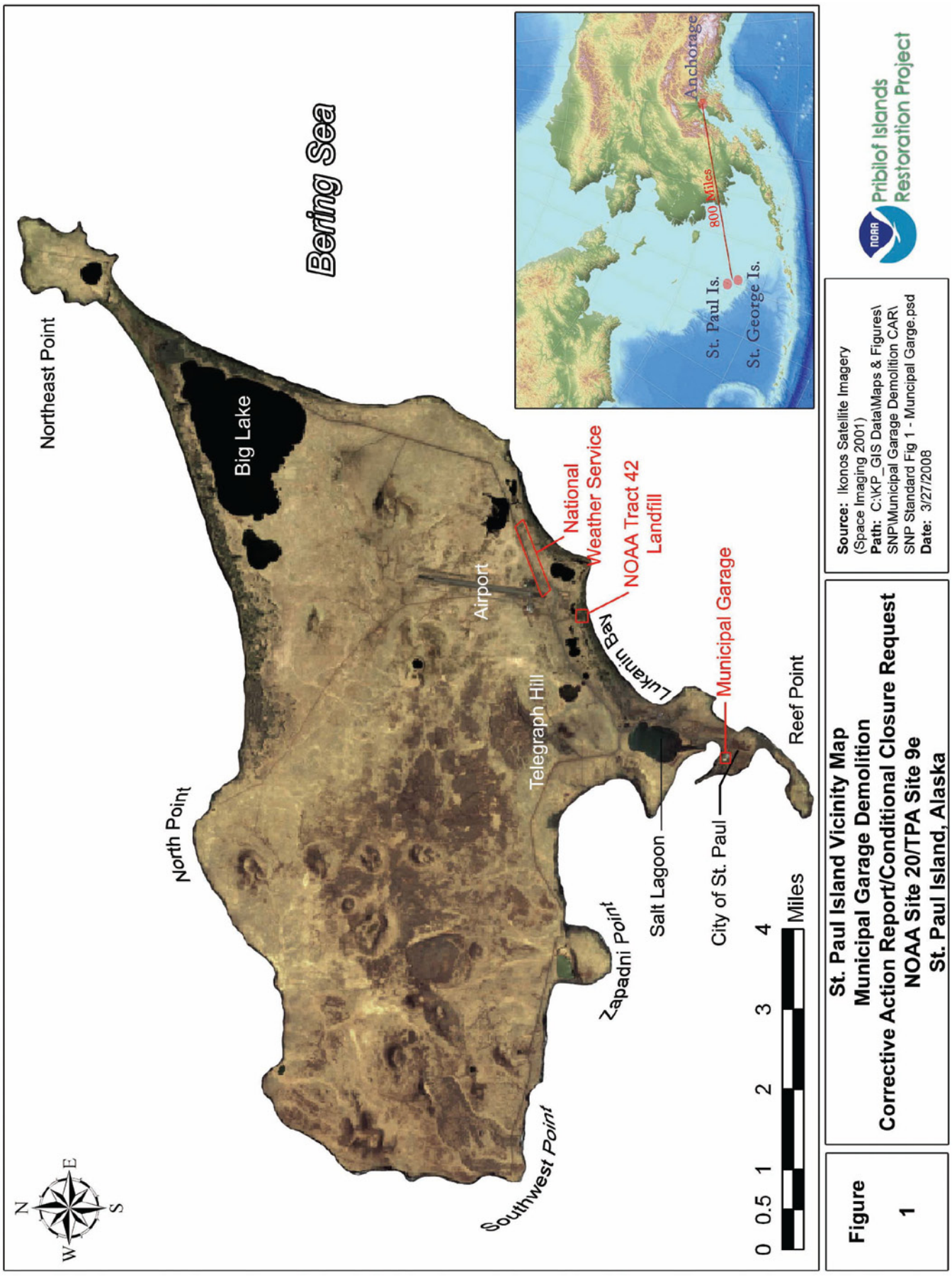
TABLE 6. BACKFILL CHARACTERIZATION SAMPLE RESULTS
Municipal Garage Demolition St. Paul Island, Alaska

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CB-005	1-Methylnaphthalene	0	0.0056	n/a	mg/kg
	2-Methylnaphthalene	0	0.0056	n/a	mg/kg
	Acenaphthene	0	0.0056	210	mg/kg
	Acenaphthylene	0	0.0056	n/a	mg/kg
	Anthracene	0	0.0056	4,300	mg/kg
	Benzene	0	0.017	0.5	mg/kg
	Benzo(a)anthracene	0	0.0056	6	mg/kg
	Benzo(a)pyrene	0	0.0056	3	mg/kg
	Benzo(b)fluoranthene	0	0.0056	20	mg/kg
	Benzo(g,h,i)perylene	0	0.0056	n/a	mg/kg
	Benzo(k)fluoranthene	0	0.0056	200	mg/kg
	Chrysene	0	0.0056	620	mg/kg
	Dibenzo(a,h)anthracene	0	0.0056	6	mg/kg
	Diesel Range Organics	2.64J	22.2	2,500	mg/kg
	Ethylbenzene	0	0.0326	5.5	mg/kg
	Fluoranthene	0	0.0056	2,100	mg/kg
	Fluorene	0	0.0056	270	mg/kg
	Gasoline Range Organics	0.743J	3.26	1,400	mg/kg
	Indeno(1,2,3-cd)pyrene	0	0.0056	54	mg/kg
	Lead	1.25	0.216	1,000	mg/kg
	Naphthalene	0	0.0056	43	mg/kg
	o-Xylene	0	0.0326	n/a	mg/kg
	Phenanthrene	0	0.0056	n/a	mg/kg
	Pyrene	0	0.0056	1,500	mg/kg
	Residual Range Organics	17.3J	22.2	10,000	mg/kg
	Toluene	0	0.0653	54	mg/kg
	Total Xylene	0	0.0979	78	mg/kg
	Xylene, Isomers m & p	0	0.0653	n/a	mg/kg

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CB-006	1-Methylnaphthalene	0	0.0055	n/a	mg/kg
	2-Methylnaphthalene	0	0.0055	n/a	mg/kg
	Acenaphthene	0	0.0055	210	mg/kg
	Acenaphthylene	0	0.0055	n/a	mg/kg
	Anthracene	0	0.0055	4,300	mg/kg
	Benzene	0	0.0113	0.5	mg/kg
	Benzo(a)anthracene	0	0.0055	6	mg/kg
	Benzo(a)pyrene	0	0.0055	3	mg/kg
	Benzo(b)fluoranthene	0	0.0055	20	mg/kg
	Benzo(g,h,i)perylene	0	0.0055	n/a	mg/kg
	Benzo(k)fluoranthene	0	0.0055	200	mg/kg
	Chrysene	0	0.0055	620	mg/kg
	Dibenzo(a,h)anthracene	0	0.0055	6	mg/kg
	Diesel Range Organics	0	22	2,500	mg/kg
	Ethylbenzene	0	0.0218	5.5	mg/kg
	Fluoranthene	0	0.0055	2,100	mg/kg
	Fluorene	0	0.0055	270	mg/kg
	Gasoline Range Organics	0	2.18	1,400	mg/kg
	Indeno(1,2,3-cd)pyrene	0	0.0055	54	mg/kg
	Lead	0.712	0.223	1,000	mg/kg
	Naphthalene	0	0.0055	43	mg/kg
	o-Xylene	0	0.0218	n/a	mg/kg
	Phenanthrene	0	0.0055	n/a	mg/kg
	Pyrene	0	0.0055	1,500	mg/kg
	Residual Range Organics	10.6J	22	10,000	mg/kg
	Toluene	0	0.0436	54	mg/kg
	Total Xylene	0	0.0654	78	mg/kg
	Xylene, Isomers m & p	0	0.0436	n/a	mg/kg

Sample No.	Parameter	Results	PQL	ADEC Cleanup level	Units
SP20-CB-007	1-Methylnaphthalene	0.0029J	0.0057	n/a	mg/kg
	2-Methylnaphthalene	0.0041J	0.0057	n/a	mg/kg
	Acenaphthene	0	0.0057	210	mg/kg
	Acenaphthylene	0	0.0057	n/a	mg/kg
	Anthracene	0	0.0057	4,300	mg/kg
	Benzene	0	0.0153	0.5	mg/kg
	Benzo(a)anthracene	0	0.0057	6	mg/kg
	Benzo(a)pyrene	0	0.0057	3	mg/kg
	Benzo(b)fluoranthene	0	0.0057	20	mg/kg
	Benzo(g,h,i)perylene	0	0.0057	n/a	mg/kg
	Benzo(k)fluoranthene	0	0.0057	200	mg/kg
	Chrysene	0	0.0057	620	mg/kg
	Dibenzo(a,h)anthracene	0	0.0057	6	mg/kg
	Diesel Range Organics	2.68J	22.4	2,500	mg/kg
	Ethylbenzene	0	0.0293	5.5	mg/kg
	Fluoranthene	0	0.0057	2,100	mg/kg
	Fluorene	0	0.0057	270	mg/kg
	Gasoline Range Organics	0	2.93	1,400	mg/kg
	Indeno(1,2,3-cd)pyrene	0	0.0057	54	mg/kg
	Lead	1.06	0.222	1,000	mg/kg
	Naphthalene	0.0042J	0.0057	43	mg/kg
	o-Xylene	0	0.0293	n/a	mg/kg
	Phenanthrene	0	0.0057	n/a	mg/kg
	Pyrene	0	0.0057	1,500	mg/kg
	Residual Range Organics	13J	22.4	10,000	mg/kg
	Toluene	0	0.0587	54	mg/kg
	Total Xylene	0	0.088	78	mg/kg
	Xylene, Isomers m & p	0	0.0587	n/a	mg/kg

Bold numbers indicate greater than ADEC cleanup levels.
J = Estimated value due to value less than PQL
B = EPA Flag - Analyte present in the blank and the sample
CL = Initial analysis within holding time but required dilution
GRO = Gasoline Range Organics
DRO = Diesel Range Organics
RRO = Residual Range Organics
mg/Kg = Milligrams per Kilogram
PQL = Practical Quantitation Limit


Bering Sea
Northeast Point
Big Lake
North Point
Southwest Point
Zapadni Point
Salt Lagoon
City of St. Paul
Reef Point
Lukanin Bay
Telegraph Hill
Airport
National Weather Service
NOAA Tract 42 Landfill
Municipal Garage
0 0.5 1 2 3 4 Miles
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E
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W
Anchorage
800 Miles
St. Paul Is.
St. George Is.
Figure 1
St. Paul Island Vicinity Map
Municipal Garage Demolition
Corrective Action Report/Conditional Closure Request
NOAA Site 20/TPA Site 9e
St. Paul Island, Alaska
Source: Ikonos Satellite Imagery (Space Imaging 2001)
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Date: 3/27/2008
Pribilof Islands Restoration Project

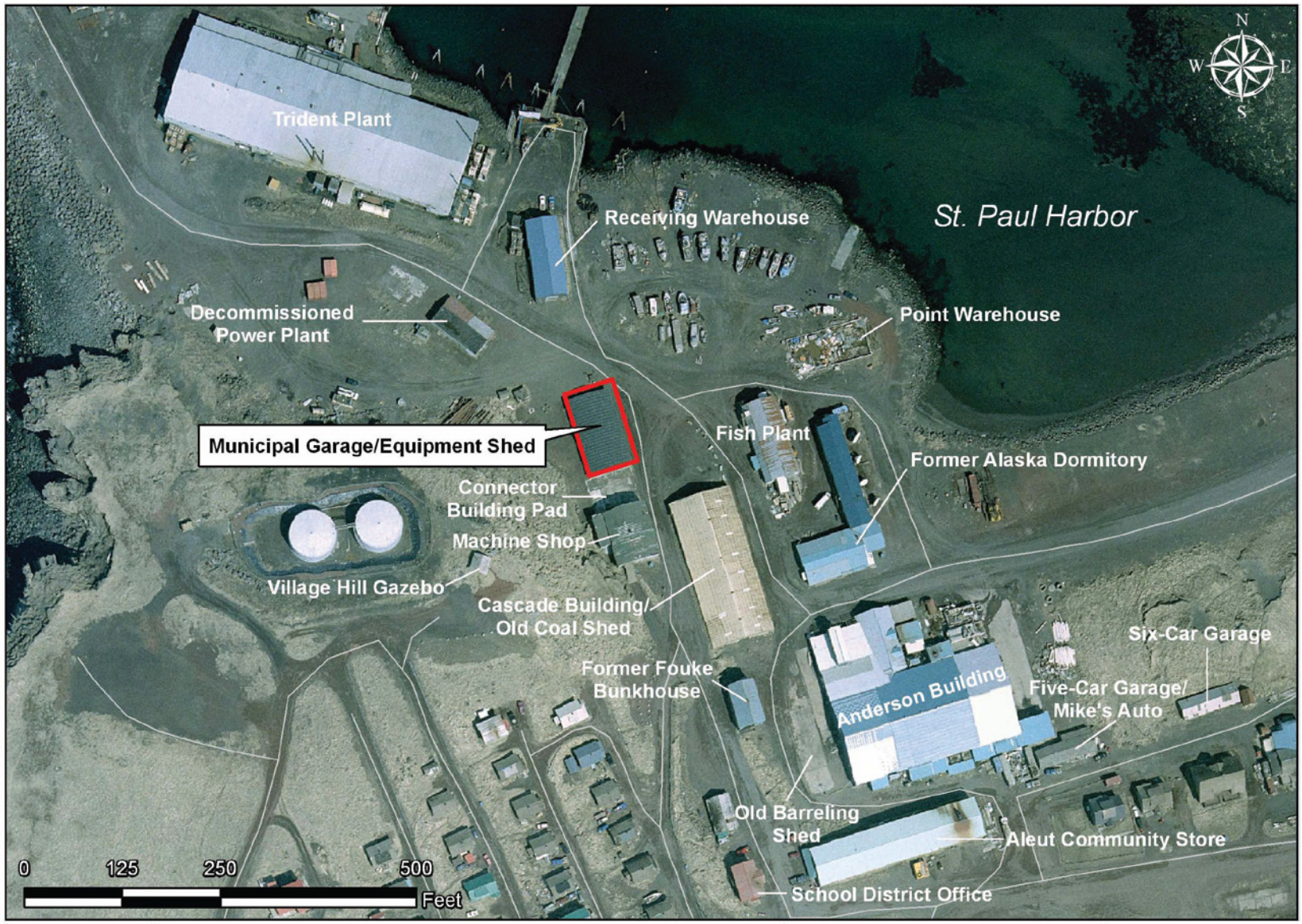

Figure 2	Municipal Garage and Vicinity Municipal Garage Demolition Corrective Action Report/Conditional Closure Request NOAA Site 20/TPA Site 9e St. Paul Island, Alaska	Source: Aero-Metric 2006 1 ft Aerial Photo Path: C:\KP_GIS Data\Maps & Figures\SNP\Municipal Garage Demolition CAR\Municipal_Garage_Demolition_Fig2.mxd Date: 3/27/2008 @ 1:37:14 PM	Pribilof Islands Restoration Project

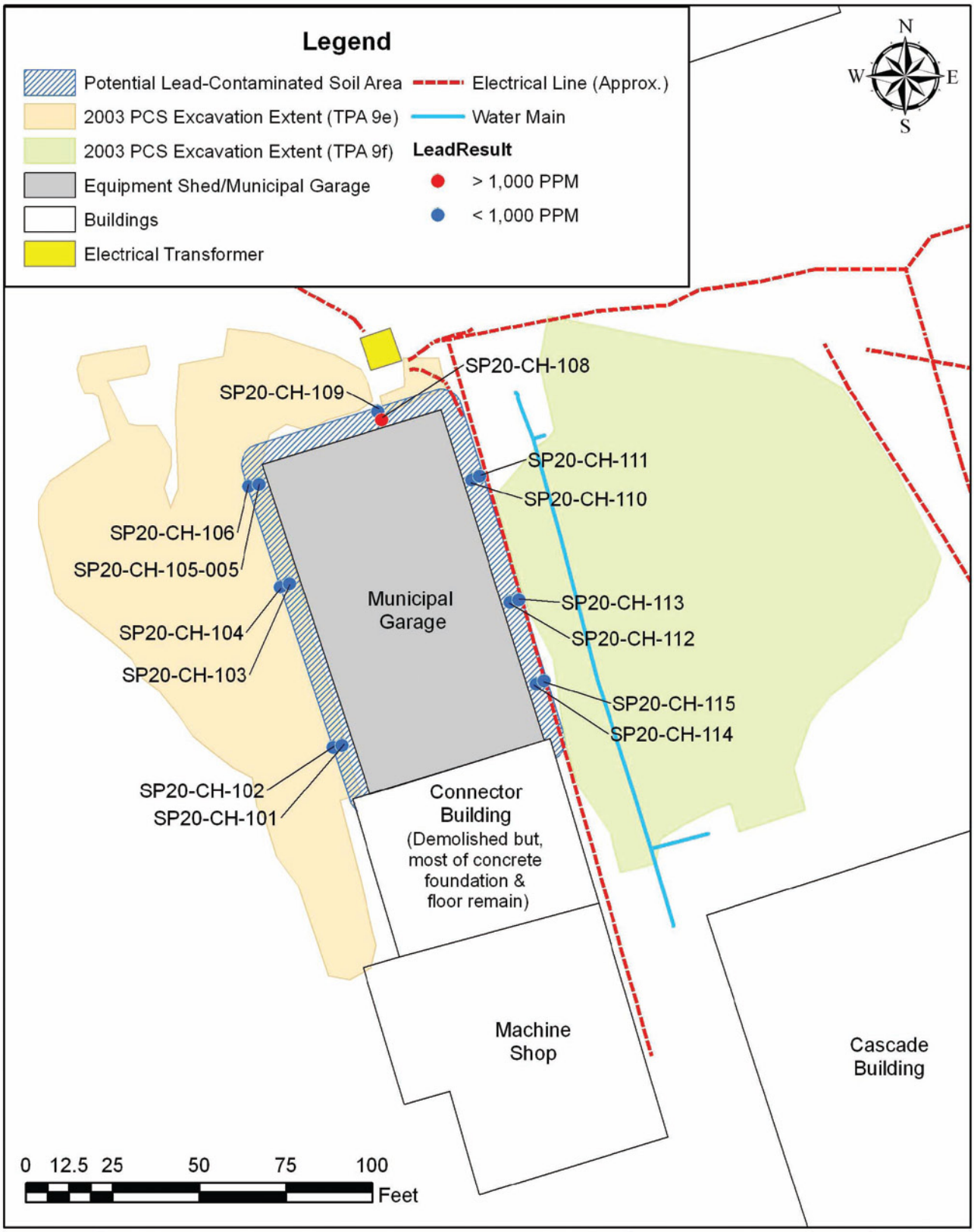

Figure 3	Areas of Previous Excavations and Potential Lead Contaminated Zone Municipal Garage Demolition Corrective Action Report/Conditional Closure Request NOAA Site 20/TPA Site 9e St. Paul Island, Alaska	Sources: NOAA GIS Layers (Pribilof Project GIS Database 2007) Path: C:\KP_GIS Data\ Maps & Figures\SNP\ Municipal Garage Demolition CAR\ Proposed_PCS_Removal_Fig3.mxd Date: 3/27/2008 @ 1:52:07 PM

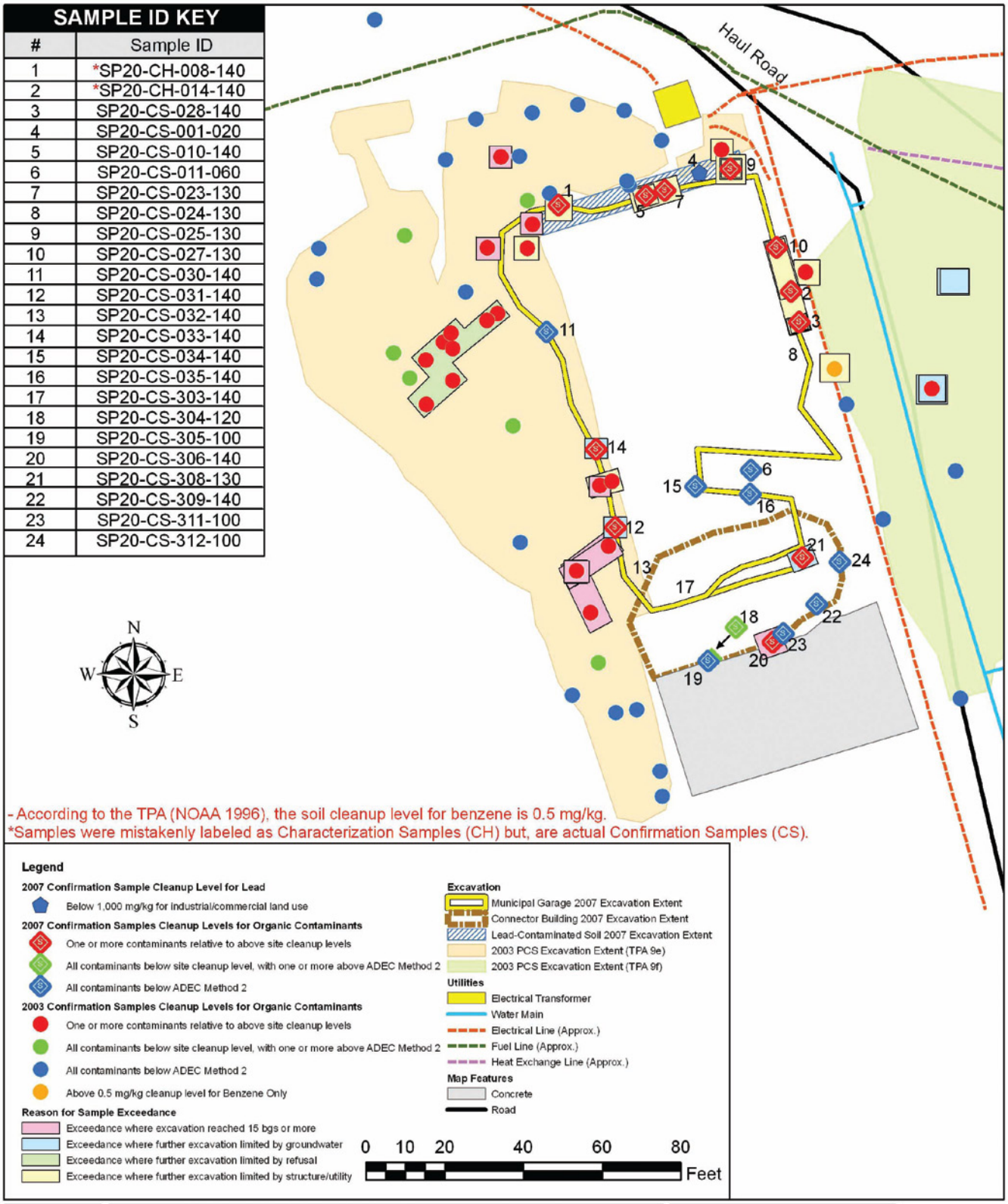

Figure 4

2003 & 2007 Soil Confirmation Samples
Municipal Garage Demolition
Corrective Action Report/Conditional Closure Request
NOAA Site 20/TPA Site 9e
St. Paul Island, Alaska

Sources: NOAA GIS Layers
(Pribilof Project Database 2006/2007)
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Pribilof Islands Restoration Project

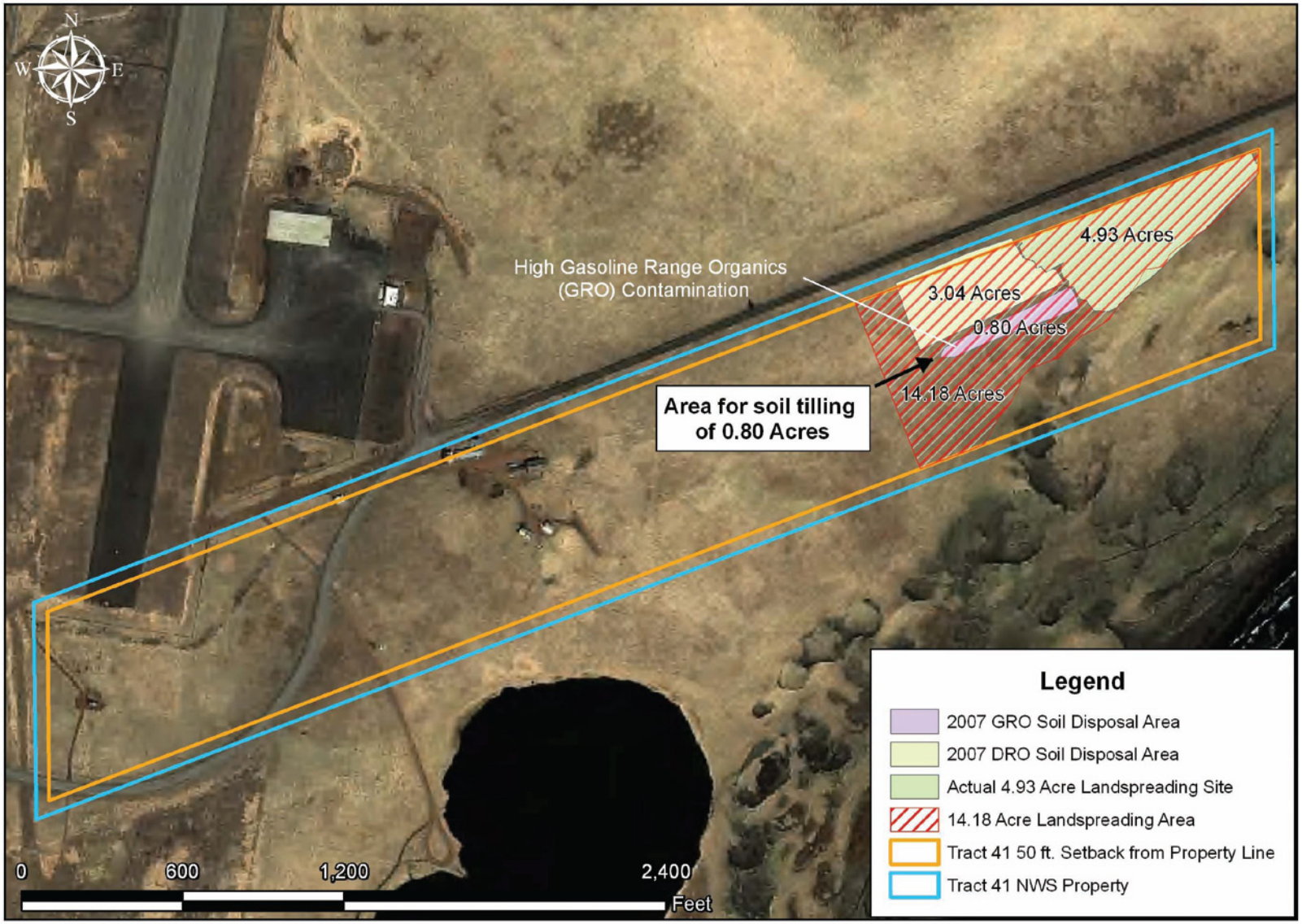

Figure 5	**National Weather Service Property Boundary and Landspreading Area Municipal Garage Demolition Corrective Action Report/Conditional Closure Request NOAA Site 20/TPA Site 9e St Paul Island, Alaska**	Source: Ikonos 2001 Satellite Imagery GIS Layers (NOAA Pribilof Project Database); Path Name: C:\KP_GIS Data\Maps & Figures\SNP\Municipal Garage Demolition CAR\ContaminatedSoilTask11_Fig5.mxd Date: 3/28/2008 @ 9:07:36 AM Note: Calculations for landspreading and disposal areas are of estimated values.

Pribilof Islands Restoration Project

Figure 6	Lead Contaminated Soil Disposal Cell in Tract 42 Municipal Garage Demolition Corrective Action Report/Conditional Closure Request NOAA Site 20/TPA Site 9e St. Paul Island, Alaska	Sources: Ikonos Satellite Imagery (Space Imaging 2001), GIS Layers (NOAA Pribilof Project Database 2007) Path: C:\KP_GIS Data\Maps & Figures\SNP\ Municipal Garage Demolition CAR\ DisposalCell_Fig6.mxd Date: 3/28/2008 @ 9:42:42 AM	Pribilof Islands Restoration Project

Figure 7	Current Monitoring Network Municipal Garage Demolition Corrective Action Report/Conditional Closure Request NOAA Site 20/TPA Site 9e St. Paul Island, Alaska	Sources: Well locations (NOAA GIS SNP_Wells), Aero-Metric 2006 2 ft Aerial Photo Path: C:\KP_GIS Data\ Maps & Figures\SNP\ Municipal Garage Demolition CAR\ MonitoringWells_Fig7.mxd Date: 3/28/2008 @ 9:58:02 AM	Pribilof Islands Restoration Project

APPENDIX A
PHOTOGRAPHIC DOCUMENTATION

Photograph 1. Municipal Garage during backfilling operations at Cascade Building Corrective Action, October 22, 2003.

Photograph 2. View of Municipal Garage from Village Hill, June 10 2006, showing concrete pad from former Connector Building.

Photograph 3. West side of Municipal Garage after siding was coated with phosphate paint and liner installed to contain paint chips during demolition, August 17, 2007.

Photograph 4. Municipal Garage during demolition, August 17, 2007.

Photograph 5. Municipal Garage's concrete stem wall, footings, and floor being removed, August 20, 2007.

Photograph 6. Excavator (in background) places concrete waste from Municipal Garage to form containment berm at City of St. Paul Landfill, August 21, 2007. Concrete in foreground is not from the Municipal Garage.

Photograph 7. Site of Municipal Garage after demolition, August 21, 2007. Remnants of north concrete stem wall visible at left, Connector Building Pad visible just behind excavator at right.

Photograph 8. Municipal Garage site after demolition. August 27, 2007.

Photograph 9. North end of Municipal Garage site after removal of lead contaminated soil and stem wall, August 29, 2007.

Photograph 10. Municipal Garage site at beginning of PCS excavation. September 1, 2007.

Photograph 11. Municipal Garage site at end of PCS excavation. Arrow shows location of former sump under Connector Building Pad. September 7, 2007.

Photograph 12. Municipal Garage site at end of PCS excavation. Petroleum contamination at south end of excavation under Connector Building pad. September 7, 2007.

Photograph 13. Municipal Garage site just before completion of backfilling. September 10, 2007.

Photograph 14. Municipal Garage site (at left) showing additional excavation under Connector Building Pad. October 21, 2007.

Photograph 15. Connector Building Pad after completion of excavation and backfilling. October 23, 2007 [Laboratory Data Deliverables Provided electronically. See report CD-ROM.]

APPENDIX E
ADEC APPROVAL LETTER FOR CONDITIONAL CLOSURE

For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

28 March 2008
Date

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 *Municipal Garage Demolition and Contaminated Soil Removal NOAA Site 20/TPA Site 9e, St. Paul Island, Alaska*, in accordance with the Agreement and that no further remedial action is required 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

Apr. 16 2008
Date

STATE OF ALASKA

SARAH PALIN, GOVERNOR

DEPT. OF ENVIRONMENTAL CONSERVATION

DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITES PROGRAM

555 Cordova Street
Anchorage, AK 99501
PHONE: (907) 269-7552
FAX: (907) 269-7649
www.dec.state.ak.us

File: 2644.38.023.05

April 9, 2008

Mr. John Lindsay
Pribilof Project Manager
U.S. Department of Commerce, NOAA
National Ocean Service
Office of Response and Restoration
7600 Sand Point Way NE BIN C15700
Seattle, WA 98115-0070

Re: Corrective Action Report and Conditional Closure Request-Municipal Garage Demolition Soil Removal NOAA Site 20/TPA Site 9e

Dear Mr. Lindsay:

The Alaska Department of Environmental Conservation Contaminated Sites Program (ADEC) received the above document on April 2, 2008, for review and comment. The Municipal Garage site is situated on St. Paul Island, close to the harbor to the northeast of Village Hill (57°07'21" latitude, 170°16'50" longitude). Its legal description is: Tract 46, Township 35 South, Range 132 West, of the Seward Meridian, Alaska, as shown on the dependent resurvey of a portion of U.S. Survey No. 4943, Alaska, Tract "A", St Paul Townsite, officially filed June 3, 1997. Some of the western portion of this site falls within Lot 3, Section 25, Township 35 South, Range 132 West, of the Seward Meridian, Alaska as shown on the plat of rectangular survey officially filed May 14, 1986. NOAA currently owns the site.

ADEC has previously made a no further remedial action decision in 2004 based on the condition that the Municipal Garage building and foundation remain intact. Since that time, NOAA has elected to demolish the building and remove the foundation. Therefore, further remedial investigation activities by NOAA was necessary. Two-thousand and seventeen (2,017) cubic yards of soil was excavated by NOAA in 2007. Further excavation of contaminated soil could not be conducted because of the risk to buried utilities that parallel the north and northeast sides of the site as well as groundwater occurring at a depth of 14 feet. Additionally, eighteen (18) cubic yards of lead-contaminated soil was removed and transported to a disposal trench in Landfill Cell C.

The excavated soil has been properly treated or disposed and ADEC has determined that a conditionally closed determination is still appropriate for Two-Party Agreement (TPA) Site No. 9e Municipal Garage site, NOAA Site 20, ADEC CS database reckey# 1994250119605.

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ADEC's determination is equivalent to certification by the Department that corrective action is complete under TPA section 59. Closure of Sites of Operable Units which states: "… NOAA may request from ADEC written confirmation that all corrective action has been completed at a site(s) or operable unit(s) in accordance with this Agreement. Within thirty (30) Days of its receipt of such request. ADEC shall: (1) provide written confirmation that no further corrective action is required at the subject site(s) or operable unit(s). ADEC shall not deny certification that corrective action is complete at any site(s) or operable unit(s) solely on the basis that post-remedial measures, such as monitoring, shall remain in place for a period of months or years."

In the event that the remaining contaminated soil becomes accessible by the removal of the soil located in the vicinity of the Municipal Garage TPA 9e Site 20, the land owner and/or operator will be required under 18 AAC 75.300 to notify ADEC. Also, any transport or disposal of contaminated soil excavated from the site outside of the "Village Area" requires approval from ADEC in accordance with 18 AAC 75.325(i).

ADEC reserves all of its rights, under A.S. 46.03, 18 AAC 75, and 18 AAC 78 to require NOAA to conduct additional site assessment, remediation, and/or other necessary actions deemed appropriate by ADEC at TPA 9e, if information becomes available that contamination is present which poses an unacceptable risk to human health or safety, welfare, or the environment.

Please contact me with any questions or concerns directly at (907) 269-7552.

Sincerely,

Louis Howard

Louis Howard
Environmental Program Specialist

NOAA Site 21
TPA Site 9f: Old Coal Shed (Cascade Bldg)
(USTs Site (Tract 41), TPA 9a; TPA Attachment A)

Request for Conditional Closure, Old Coal Shed (Cascade Building),
TPA Site 9f/NOAA Site 21, St. Paul Island, Alaska 577

Request for Conditional Closure
Old Coal Shed (Cascade Building), TPA Site 9f/NOAA Site 21
St. Paul Island, Alaska

Request for Conditional Closure

Site: Old Coal Shed (Cascade Building), also known as Two Party Agreement (TPA) Site 9f, National Oceanic and Atmospheric Administration (NOAA) Site 21, the Old Coal Shed, and Cascade Building. 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. On the island, the site is situated in St. Paul Village near St. Paul Harbor (Figures 1 and 2), approximately 25 feet (ft) east of the Machine Shop building (57°07'22.84" North Latitude, 170°16'51.34" West Longitude).

Legal Property Description: Tract 46, Township 35 South, Range 132 West, of the Seward Meridian, Alaska, as shown on the dependent resurvey of a portion of U.S. Survey No. 4943, Alaska, Tract "A", St. Paul Townsite, officially filed June 3, 1997. The federal government currently owns the surface and subsurface estate of this site. [Note: TPA site boundaries are not defined in the TPA. At its discretion, NOAA established a boundary for this TPA site based on site characterization data and historic information that includes the building footprint as well as some adjacent land and features like a former gasoline and diesel fueling station. This former fueling station is different than TPA Site 9n/NOAA Site 49 – Gas Station and Garage; TPA Site 9n is located north of the site and has been addressed separately from the site (Figure 2).]

Type of Release: Potential release mechanisms include: 1) leaks and spills associated with the transfer and storage of diesel and gasoline fuel in two underground storage tanks (USTs) at the site's former fueling station; 2) leaks associated with fuel dispensation at the fueling station; and 3) leaks associated with heavy equipment storage within the Cascade Building structure.

History and Background:
The Cascade Building is atop the former location of a coal storage facility and carpentry shop. The original coal storage shed was demolished in the early 1980s, and the Cascade Building structure was subsequently erected atop the former coal storage shed's footprint (Figure 2). The Cascade Building consists of a sheet metal building. The City of St. Paul used the building to store heavy equipment, boats, and trucks until 2004, when it vacated the structure (NOAA 2004). NOAA temporarily used the structure to store heavy equipment and waste in 2003 and 2004. NOAA ceased using the building in January 2005. The building is vacant and secured.

A gasoline and diesel fuel station was located in the area immediately north of the Cascade Building. The station stored gasoline in a 3,600-gallon UST and gasoline or diesel in a 3,000-gallon UST. Use of the fueling station ceased prior to 1997 (Aleutian Enterprises 1997).

Summary of Site Investigations:
In 1997, Aleutian Enterprises verified the presence and condition of the fuel station, including the two USTs (Bristol Environmental Services Corporation [BESC] 1997). Aleutian Enterprises performed a corrective action the same year, which is described in the *Summary of Cleanup Actions* section of this document.

During the summer of 2000, Columbia Environmental Sciences Inc. (CESI) conducted site characterization activities in the City of St. Paul including the installation of monitoring wells and the advancement of soil borings at various locations. Analytical results for soil samples collected in the vicinity of the Cascade Building indicated the presence of diesel-range organics (DRO) at concentrations up to 1,500 mg/kg, exceeding its ADEC Method Two cleanup level (CESI 2001).

During 2002 and 2003, NOAA and Louisiana State University performed a soil gas survey at the site. Findings indicated that contamination was present primarily in the area of the former fuel station 75-ft north of the Cascade Building (NOAA 2002).

In July 2003 and July 2004, NOAA conducted additional site characterization activities at the Cascade Building prior to initiating further corrective action activities. NOAA used soil analytical data from the site characterization to delineate the approximate extent of contamination within the Cascade Building as well as the area of the former fuel station (NOAA 2003, 2004).

In 2001, CESI installed two groundwater monitoring wells at the site and additional wells downgradient of the site to address potential impacts to groundwater caused by petroleum-contaminated soil (PCS; Figure 3). Monitoring well MW46-8 is at the upgradient end of the site. MW46-10 is at the northern end of the site, downgradient of MW46-8 but within a groundwater contamination source area. Monitoring wells MW46-28 and MW46-14 are downgradient of the site. MW 46-28 is also downgradient of the Machine Shop/Municipal Garage (TPA Site 9e/NOAA Site 20), another significant source of petroleum hydrocarbon contamination in the vicinity of the site. Groundwater at and near the site is interpreted to flow northwesterly away from the site, toward Village Cove (Figure 3; Mitretek 2002). Groundwater at the site begins approximately 11 ft below ground surface (bgs) (Tetra Tech EM Inc. [TTEMI] 2005a).

Between September 2000 and September 2001, CESI and IT Alaska Corporation (IT) performed six rounds of groundwater sampling and analysis in St. Paul Village, and sampled the monitoring wells associated with the site between one and six times. TTEMI performed four rounds of groundwater sampling and analysis between October 2003 and July 2004 for the wells associated with the site, excepting MW46-10 because it had been removed in October 2003 during corrective action activities. NOAA replaced MW46-10 in August 2004 using its direct-push exploration rig to install a 0.75-inch inner diameter microwell near the original location of MW46-10.

Analytical data revealed the presence of DRO in all four wells described above at concentrations exceeding ADEC Table C cleanup levels for groundwater (Table 1). These data also indicated the following contaminants were above the Table C cleanup levels: gasoline-range organics (GRO) in MW46-10 and MW46-28; benzene in MW46-10, MW46-14, and MW46-28; and toluene and ethylbenzene in MW46-28. NOAA compared these data with groundwater alternative cleanup levels (that is, the Ten Times Rule as described below in *Summary of Applied Cleanup Levels*). NOAA determined that GRO and DRO exceeded their alternative cleanup levels in MW46-28, and benzene exceeded its alternative cleanup level in MW46-10 and MW46-28 (TTEMI 2005a).

Mitretek Systems (Mitretek) evaluated the CESI and IT groundwater data for the St. Paul Village area, which includes the site. Mitretek demonstrated that groundwater in the vicinity of St. Paul Village has high total dissolved solids and can be brackish. Consequently, the groundwater in the area is not suitable for drinking water. The evaluation, in part, provided a rationale for using alternative groundwater cleanup levels that are protective of human health and the environment where the groundwater is not potable. Mitretek concluded in accordance with 18 AAC 75.350 (ADEC 2003) that groundwater in the Village area is not currently used and does not afford any potential future use as a drinking water source (Mitretek 2002). Mitretek's findings provided the basis for the application of the Ten Times Rule discussed below.

Summary of Applied Cleanup Levels:
NOAA employed ADEC Method Two cleanup criteria for soil, discussed at 18 AAC 75.341(c) (ADEC 2003a). Alternative cleanup levels were also applied for some contaminants in soil and all contaminants in groundwater, as described below. For benzene, under the TPA, NOAA had the option to cleanup to the less stringent State of Alaska soil cleanup level in effect in 1991 (ADEC 1991). Additionally, NOAA proposed and ADEC approved the use of alternative cleanup levels under 18 AAC 75.345 and 18 AAC 75.350, commonly referred to as the Ten Times Rule (ADEC 2002; Mitretek 2002). According to these regulations, if groundwater beneath a site contains contaminant concentrations above the cleanup levels provided in ADEC Table C, then the soil may be remediated to levels ten times higher than those provided in Method Two Tables B1 and B2 for the migration to groundwater pathway. Under the Ten Times Rule, groundwater cleanup levels are increased by ten times the ADEC Table C levels for all contaminants. Use of the Ten Times Rule for soil cleanup levels is limited to those contaminants found in groundwater at concentrations above the cleanup levels provided in ADEC Table C; however, if the inhalation or ingestion pathway values are more stringent than the migration to groundwater pathway, then the more stringent value is to be applied. ADEC uses 15 ft bgs to define subsurface soil to which residents will have a reasonable potential to be exposed through the inhalation or ingestion pathways (ADEC 2003a; 18 AAC 75.340

(j)(2)). Therefore, NOAA is not obligated to excavate contaminated soil occurring at depths deeper than 15 ft to address the inhalation and ingestion pathways. Cleanup criteria were applied to the maximum extent practicable (18 AAC 75.325 (f), 18 AAC 75.990).

Summary of Cleanup Actions:
Aleutian Enterprises removed the USTs and approximately 500 cubic yards (CY) of PCS associated with the site's former fuel station. Aleutian Enterprises ceased further excavation due to concerns regarding the main access road adjacent to the area and the presence of groundwater in the excavation (Figure 4). Confirmation samples collected from the excavation indicated the presence of DRO up to 15,000 milligrams per kilogram (mg/kg), GRO up to 5,600 mg/kg, and benzene up to 23 mg/kg, all at concentrations exceeding ADEC Method Two cleanup levels (Table 2; BESC 1997). Aleutian Enterprises stockpiled PCS removed from the site at one of NOAA's Polovina Hill PCS stockpiles. This PCS was subsequently relocated to NOAA's PCS stockpile at the Blubber Dump, and ultimately treated using NOAA's Enhanced Thermal Conduction (ETC) system. The treated soil was hauled to NOAA's Tract 42 and used by the City of St. Paul as clean day cover for its solid waste operation.

TTEMI and its subcontractor Bering Sea Eccotech (BSE) conducted additional excavation activities at the site during the 2003 and 2004 field seasons, with NOAA selecting initial areas of excavation based on suspected contamination identified during previous investigations. NOAA and Tanadgusix Corporation (TDX), the expected future property owner under the Transfer of Property Agreement (TOPA; NOAA 1984), agreed to have an observer representing TDX present during the 2003 excavation and sampling activities.

TTEMI initiated 2003 excavation activities in the area north of the Cascade Building near the site's former fuel station (Figure 4). TTEMI re-excavated and temporarily staged approximately 170 CY of clean backfill from the 1997 corrective action, exposing PCS left at the groundwater table in 1997. TTEMI excavated the exposed PCS, chasing contamination into the groundwater table. Analytical results for characterization samples collected from the staged backfill confirmed the material as clean, and BSE later used it to backfill portions of the excavation (Table 2).

Subsequently, TTEMI expanded the excavation to the west, north, and east based on field screening sample analyses as well as visual and olfactory observations. TTEMI and NOAA noted signs of contamination, including petroleum staining and odors, throughout the excavation. When thin-layer chromatography (TLC) screening sample analyses indicated DRO remained above ADEC Method Two cleanup levels, TTEMI conducted additional excavation even if the DRO concentrations were below the alternative cleanup level unless further excavation was prevented by the presence of groundwater or obstructions (Figure 4). TTEMI advanced the excavation vertically to a maximum depth of 11 ft bgs, where it encountered groundwater. PCS in the "smear zone" at the top of the groundwater table was removed to the extent practicable. Active utility lines, including fuel pipelines, electric lines, and telephone lines limited the excavation laterally in some areas. TTEMI collected 32 confirmation samples from the bottom and sidewalls of the excavation for laboratory analyses including GRO; DRO; benzene, toluene, ethylbenzene, and total xylenes (BTEX); and select polynuclear aromatic hydrocarbons (PAHs) (Figures 5 through 10). Table 2 summarizes the BTEX, GRO, and DRO results from this activity. PAH results are not presented because none exceeded the site cleanup levels and the number of results is voluminous; PAH results can be found in the Corrective Action Report for the site (TTEMI 2005b).

Confirmation results indicated that GRO, DRO, benzene, and toluene, ethylbenzene, and total xylenes remain onsite at concentrations exceeding their cleanup levels (Table 2, Figures 5 through 10). At such locations, however, further excavation was limited by structures, utilities, or groundwater. Laboratory reporting limits for the 2003 corrective action data were below ADEC Method Two cleanup levels for all contaminants, excepting benzene. For benzene, reporting limits of 0.37 mg/kg or lower were achieved, which is above the ADEC Method Two cleanup level of 0.02 mg/kg, but below the alternative cleanup level of 0.5 mg/kg.

During the 2003 field season, TTEMI removed approximately 3,510 CY of PCS from the excavation north of the Cascade Building and hauled it to NOAA's short-term PCS stockpile atop Landfill Cell C in Tract 42. TTEMI characterized the PCS for BTEX, GRO, DRO, and select PAHs, as summarized in Table 2. PAH results are not presented in Table 2 because none exceeded the site cleanup levels and the number of results is voluminous; PAH

results can be found in the Corrective Action Report for the site (TTEMI 2005b). NOAA used the 2003 PCS as soil capping material during 2004 Landfill Cell C closure activities (NOAA 2005).

In October 2004, TTEMI conducted additional excavation activities to remove PCS from seven hot spot locations inside the Cascade Building (Figure 4). Excavation activities involved the removal of PCS to depths up to 8.5 ft bgs. Refusal was encountered in some excavations because of obstructions including a concrete foundation. During excavation activities, TTEMI and NOAA noted solvent-type odors in PCS removed from one of the excavations inside the Cascade Building. As a result, TTEMI temporarily staged this PCS on a liner pending laboratory analyses for VOCs; subsequent analytical data indicated no VOCs were above laboratory reporting limits or ADEC Method Two cleanup levels.

TTEMI collected twelve confirmation samples from the bottoms of the excavations inside the Cascade Building (Table 2; Figure 11). TTEMI analyzed the samples for BTEX, GRO, DRO, and select PAHs. PAH results are not presented in Table 2 because none exceeded the site cleanup levels and the number of results is voluminous; PAH results can be found in the Corrective Action Report for the site (TTEMI 2005b). Analytical data for confirmation samples collected from the bottom of each excavation within the Cascade Building indicated no contaminants were present at concentrations above the soil cleanup levels (Table 2; Figure 11). Laboratory reporting limits for the 2004 corrective action data were below ADEC Method Two cleanup levels for all contaminants, excepting benzene. For benzene, reporting limits of 0.2 mg/kg or lower were achieved, which is above the ADEC Method Two cleanup level of 0.02 mg/kg, but below the alternative cleanup level of 0.5 mg/kg.

During the 2004 field season, TTEMI removed approximately 145 CY of PCS from excavations inside the Cascade Building and transported it to NOAA's National Weather Service (NWS) landspreading area, located southeast of the St. Paul Airport, for final disposition.

TTEMI performed a risk evaluation of site residual contamination, consistent with ADEC guidance (ADEC 2002). The cumulative cancer risk (1.6×10^{-5}) exceeds the limit (1.0×10^{-5}), primarily due to the presence of benzo(a)pyrene at a maximum concentration of 0.95 mg/kg in one sample analyzed for select PAHs. All remaining concentrations of benzo(a)pyrene were significantly lower, with an average concentration of 0.051 mg/kg. The isolated occurrence of benzo(a)pyrene, which is below the ADEC Method Two cleanup level of 1 mg/kg, is situated in the main access road that transects this area. Active utilities (telephone and electric) are located adjacent to the sampling location, thereby obstructing further excavation. TTEMI concluded that complete exposure pathways likely do not exist at this site (TTEMI 2005b).

Conclusions and Recommended Action:

NOAA and its contractors removed an estimated 4,155 CY of PCS from the site, backfilling the site with clean soil. NOAA permanently remediated approximately 500 CY of this PCS (1997 removal) with its ETC system, used approximately 3,510 CY of PCS (2003 removal) during the Landfill Cell C closure, and disposed of approximately 145 CY of PCS at its landspreading site. Soil GRO, DRO, benzene, toluene, ethylbenzene and total xylenes remain above site cleanup levels, particularly in the vicinity of the former fueling station. Removing this contamination, however, is impracticable due to groundwater, buildings, and the presence of active utility lines including fuel pipelines, electric lines, and telephone lines. Petroleum hydrocarbons contaminate groundwater at the site, as well as groundwater upgradient and downgradient. NOAA will separately address groundwater contamination in St. Paul Village.

In accordance with paragraph 59 of the Two Party Agreement (NOAA 1996), NOAA requests written confirmation that NOAA completed all appropriate corrective action, to the maximum extent practicable, at the Old Coal Shed (Cascade Building), TPA Site 9f/NOAA Site 21, in accordance with the Agreement and that ADEC grant a conditional closure not requiring further remedial action from NOAA. NOAA understands ADEC will/may require additional containment, investigation, or cleanup if subsequent information indicates that the level of contamination that remains does not protect human health, safety, or welfare, or the environment.

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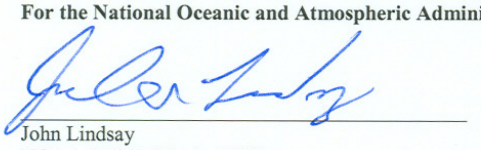
For the National Oceanic and Atmospheric Administration



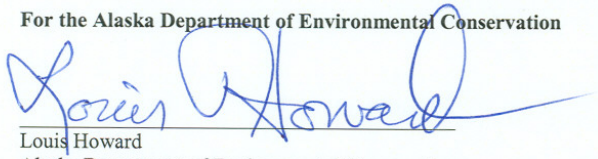
John Lindsay
NOAA, Pribilof Project Office

Date

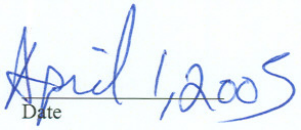
Approvals:

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 Old Coal Shed (Cascade Building), TPA Site 9f/NOAA Site 21 in accordance with the Agreement and that no further remedial action is required 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

Tables

Table 1 – Groundwater Monitoring Sample Results

Well	Sampling Event	GRO (mg/L)	DRO (mg/L)	Benzene (mg/L)	Toluene (mg/L)	Ethyl-benzene (mg/L)	Total Xylenes (mg/L)
Upgradient Well							
MW46-8	Sep-2000	0.05	1.3	0.001 U	0.001 U	0.001 U	0.001 U
MW46-8	Nov-2000	0.05	1.5	0.001 U	0.001 U	0.001 U	0.001 U
MW46-8	Feb-2001	0.067 U	1.2	0.002 U	0.002 U	0.002 U	0.002 U
MW46-8	May-2001	0.067 U	**2.4**	--	--	--	--
MW46-8	Jul-2001	0.250	1.4	0.001 U	0.001 U	0.001 U	0.001 U
MW46-8	Sep-2001	0.02 J	1.3	0.002 U	0.002 U	0.002 U	0.002 U
MW46-8	Oct-2003	0.05 U	0.63	0.001 U	0.001 U	0.001 U	0.001 U
MW46-8	Jan-2004	0.05 U	0.23	0.001 U	0.001 U	0.001 U	0.001 U
MW46-8	Apr-2004	0.05 U	0.48	0.001 U	0.001 U	0.001 U	0.001 U
MW46-8	Jul-2004	0.05 U	0.44	0.001 U	0.001 U	0.001 U	0.001 U
On-Site Well							
MW46-10	Sep-2000	**8.9**	**2.9**	**0.065**	0.46	0.27	2.4
Downgradient Wells							
MW46-14	Sep-2000	0.10 U	**2.9**	0.001 U	0.001 U	0.001 U	0.001 U
MW46-14	Nov-2000	0.05 U	**1.8**	0.001 U	0.001 U	0.001 U	0.001 U
MW46-14	Feb-2001	0.067 U	0.97	0.002 U	0.002 U	0.002 U	0.002 U
MW46-14	May-2001	0.071	1.4	**0.034**	0.002 U	0.002 U	0.004 U
MW46-14	Sep-2001	0.067 U	**2.5**	0.002 U	0.002 U	0.002 U	0.002 U
MW46-14	Oct-2003	0.25 U	1.4	0.001 U	0.001 U	0.001 U	0.002 U
MW46-14	Jan-2004	0.05 U	0.72	0.001 U	0.001 U	0.001 U	0.002 U
MW46-14	Apr-2004	0.05 U	0.87	0.001 U	0.001 U	0.001 U	0.003 U
MW46-14	Jul-2004	0.05 U	0.90	0.001 U	0.001 U	0.001 U	0.003 U
MW46-28	Oct-2000	**19.0**	**14.0**	**0.150**	**7.8**	0.53	2.20
MW46-28	Nov-2000	**19.0**	**12.0**	**0.140**	**5.4**	0.47	1.10
MW46-28	Feb-2001	**24.0**	**14.0**	**0.140**	**4.0**	0.41	1.40
MW46-28	May-2001	**2.0**	**18.0**	0.100 U	**5.2**	0.59	2.00
MW46-28	Sep-2001	**20.0**	**9.3**	**0.100**	**4.7**	0.69	2.20
MW46-28	Oct-2003	**15.0**	**28.0**	**0.055**	**3.9** J	0.53	2.83 J
MW46-28	Jan-2004	**15.0** J	**14.0**	**0.057**	**3.3**	0.59	2.46
MW46-28	Apr-2004	**21.0**	**19.0**	0.100 U	**7.7** J	**0.92** J	4.16 J
MW46-28	Jul-2004	**20.0** J	**20.0**	**0.051**	**3.6**	0.20	2.97
Cleanup Levels							
ADEC Table C Cleanup Level[a]		*1.3*	*1.5*	*0.005*	*1.0*	*0.7*	*10*
Alternative Cleanup Level[b]		*13.0*	*15.0*	*0.050*	*10*	*7.0*	*100*

Table 2: Corrective Action Sample Results

Sample Number	Sample Depth (feet bgs)	GRO (mg/kg)	DRO (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Total BTEX (mg/kg)
Site 21/TPA Site 9f 1997 Confirmation Samples								
3KDC	10	--	200	--	--	--	--	1.94
3KDF	10	--	99	--	--	--	--	0.94
3KGC	9	**3,600**	**15,000**	**14**	**150**	**110**	**500**	--
3KGF	9	**5,600**	**4,900**	**23**	**560**	**260**	**1300**	--
ISLAND A	2	260	**440**	**1.2**	2.7	0.60	11	--
ISLAND B	2	150	230	**4.0**	4.6	0.46	4.5	--
Site 21/TPA Site 9f 2003 Confirmation Samples								
SP21-CS-901-110	11	15	170	**0.06**	0.20	0.20	1.1	--
SP21-CS-902-110	11	21	150	**0.45**	1.10	0.24	2.5	--
SP21-CS-903-110	11	**530** J	**820**	**0.22** J	1.9 J	**7.9** J	56 J	--
SP21-CS-904-110	11	260	**10,000**	**0.16**	0.12	1.14	4.8	--
SP21-CS-905-110	11	200	**370**	**4.0**	**9.1**	4.1	26	--
SP21-CS-906-110	11	**1,100** J	**5,100**	**0.72** J	3.0 J	**7.8** J	51 J	--
SP21-CS-907-110	11	**560**	**350**	**0.33**	**11**	**8.4**	9.0	--
SP21-CS-908-110	11	**610** J	**720**	**2.7** J	**40** J	**17** J	76 J	--
SP21-CS-909-110	11	8	10 U	**0.13**	0.38	0.04	0.13	--
SP21-CS-910-110	11	140 J	**10,000**	0.37 U	0.37 U	0.99 J	1.9 J	--
SP21-CS-910-250 [c]	10	240 J	**8,800**	0.34 U	0.34 U	1.9 J	2.7 J	--
SP21-CS-911-100	10	6	70	**0.02**	0.03	0.02 U	0.25	--
SP21-CS-012-080	8	1	10 U	0.20 U	0.02	0.02 U	0.06 U	--
SP21-CS-013-110	11	**1,900** J	**1,600**	**0.67** J	**36** J	**50** J	**240** J	--
SP21-CS-014-080	8	2 U	10 U	0.03 U	0.03 U	0.03 U	0.09 U	--
SP21-CS-015-110	11	27	26	**0.68**	1.3	0.71	2.9	--
SP21-CS-016-100	10	**4,200** J	**7,800**	**3.2** J	**92** J	**79** J	**380** J	--
SP21-CS-017-100	10	2 U	10 U	0.04 U	0.04 U	0.04 U	0.12 U	--
SP21-CS-018-100	10	1 U	10 U	0.02 U	0.02 U	0.02 U	0.06 U	--
SP21-CS-019-100	10	3	65	**0.18**	0.04	0.04 U	0.12 U	--
SP21-CS-020-060	16	2 U	10 U	**0.25**	0.07	0.03 U	0.11	--
SP21-CS-021-020	2	1 U	60	**0.05**	0.06	0.02 U	0.07	--
SP21-CS-022-100	10	2 U	10 U	0.04 U	0.04 U	0.04 U	0.12 U	--
SP21-CS-023-060	6	2 U	12	**0.03**	0.02 U	0.02 U	0.06 U	--
SP21-CS-024-020	2	2	82	**0.11**	0.11	0.02 U	0.09	--
SP21-CS-025-100	10	3 U	10 U	0.05 U	0.05 U	0.05 U	0.15 U	--
SP21-CS-026-060	6	1 U	10 U	0.02 U	0.02 U	0.02 U	0.06 U	--
SP21-CS-027-020	2	9	160	**0.07**	0.20	0.08	0.54	--
SP21-CS-028-100	10	1 U	10 U	0.02 U	0.02 U	0.02 U	0.06 U	--
SP21-CS-029-060	6	1 U	10 U	0.02 U	0.02 U	0.02 U	0.06 U	--
SP21-CS-030-020	2	7 J	150	**0.07** J	0.33 J	0.09 J	0.81 J	--
SP21-CS-031-100	10	1 U	**720**	0.02 U	0.02 U	0.02 U	0.06 U	--
SP21-CS-032-060	6	2 U	10 U	0.03 U	0.03 U	0.03 U	0.09 U	--
SP21-CS-033-020	2	3 U	10 U	**0.09**	0.09	0.05 U	0.15 U	--

Sample Number	Sample Depth (feet bgs)	GRO (mg/kg)	DRO (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Total BTEX (mg/kg)
Site 21/TPA Site 9f 2003 Clean Overburden Stockpile Samples								
SP21-CSS-001 [d]	NA	1 U	150	0.02 U	0.04	0.02 U	0.09	--
SP21-CSS-002 [d]	NA	11	82	**0.41**	0.58	0.19	1.1	--
SP21-CSS-003 [d]	NA	3	24	0.03 U	0.03 U	0.05	0.29	--
SP21-CSS-004 [d]	NA	2 U	10 U	0.03 U	0.03 U	0.03 U	0.03	--
Site 21/TPA Site 9f 2004 Confirmation Samples								
SP21-CS-101-085	8.5	1 U	10 U	0.02 U	0.02 U	0.02 U	0.06 U	--
SP21-CS-102-070	7	2 U	28	0.02 U	0.04	0.02 U	0.06 U	--
SP21-CS-103-020	2	1 U	10 U	0.02 U	0.02 U	0.02 U	0.06 U	--
SP21-CS-104-300 [c]	2	1 U	10 U	0.02 U	0.02 U	0.02 U	0.06 U	--
SP21-CS-105-040	4	3	10 U	0.02	0.03	0.02 U	0.06	--
SP21-CS-106-040	4	5	10 U	**0.07**	0.24	0.04	0.49	--
SP21-CS-107-040	4	1 U	10 U	0.02 U	0.02 U	0.02 U	0.06 U	--
SP21-CS-108-060	6	1 U	10 U	0.02 U	0.02 U	0.02 U	0.06 U	--
SP21-CS-109-040	4	2	10 U	0.02 U	0.03	0.02 U	0.06 U	--
SP21-CS-110-060	6	1 U	100	0.02 U	0.02 U	0.02 U	0.06 U	--
SP21-CS-110-300 [c]	6	1 U	19	0.02 U	0.02	0.02 U	0.06 U	--
SP21-CS-111-060	6	30 U	10 U	0.2 U	0.2 U	0.3	1.7	--
SP21-CS-112-070	7	1 U	10 U	0.02 U	0.02 U	0.02 U	0.06 U	--
SP21-CS-112-080	8	1 U	10 U	0.02 U	0.02 U	0.02 U	0.06 U	--
Site 21/TPA Site 9f 2003 Stockpile Samples								
SP21-SS-001	NA	13	**400**	**0.67**	1.5	0.19	1.2	--
SP21-SS-002	NA	9	**510**	**0.08**	0.11	0.04 U	0.15	--
SP21-SS-003	NA	**1,700** J	76	**140** J	**79** J	**21** J	55 J	--
SP21-SS-004	NA	190	**540**	**0.14**	0.06	0.37	0.71	--
SP21-SS-005	NA	**2,400**	**6,200**	**4.40**	**130**	**73**	**350**	--
SP21-SS-006	NA	**460**	**580**	**0.29**	2.4	**6.7**	36	--
SP21-SS-007	NA	21	**3,500**	0.04 U	0.04 U	0.04 U	0.20	--
SP21-SS-008	NA	**560** J	**2,700**	**0.77** J	0.33 U	1.8 J	3.2 J	--
SP21-SS-009	NA	41	**650**	**0.15**	0.07	0.13	0.78	--
SP21-SS-010	NA	1	28	**0.072**	0.13	0.04	0.16	--
SP21-SS-011	NA	2	25	**0.11**	0.13	0.05	0.17	--
SP21-SS-012	NA	3	**510**	**0.03**	0.09	0.05	0.13	--
SP21-SS-013	NA	55	**1,100**	**1.1**	1.5	0.48	1.6	--
SP21-SS-014	NA	13	**2,600**	0.13 U	0.13 U	0.13 U	0.39 U	--
SP21-SS-015	NA	16	**1,900**	0.15 U	0.15 U	0.15 U	0.45 U	--
SP21-SS-016	NA	**3,900** J	**6,200**	**3.4** J	**110** J	**71** J	**360** J	--
SP21-SS-016A	NA	4	10 U	**0.56**	0.09	0.04	0.24	--
SP21-SS-017	NA	2 U	10 U	0.03 U	0.03 U	0.03 U	0.09 U	--

Sample Number	Sample Depth (feet bgs)	GRO (mg/kg)	DRO (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	Total BTEX (mg/kg)
Site 21/TPA Site 9f 2004 Stockpile Samples								
SP21-SS-001-020	2	1 U	28	0.02 U	0.02 U	0.02 U	0.06 U	--
SP21-SS-102-020	2	10 U	10 U	0.2 U	0.26	0.2 U	0.6 U	--
SP21-SS-103-020	2	3	130	0.02	0.11	0.02 U	0.13	--
SP21-SS-104-300[c]	2	2 U	180	0.02 U	0.03	0.02 U	0.06 U	--
SP21-SS-105-015	1.5	5	**590**	0.02 U	0.07	0.02	0.13	--
Method Two Cleanup Level [a]		*300*	*250*	*0.02*	*5.4*	*5.5*	*78*	*none*
Alternative Cleanup Level [b]		*1,400* [e]	*2,500*	*0.5* [f]	*54*	*NA*	*NA*	*none*

Notes for Tables 1 and 2:

bold Indicates detected concentration above Method Two (soil) or Table C (groundwater) cleanup levels. Although reporting limits for benzene in soil sometimes exceeded the current ADEC Method Two soil cleanup level of 0.02 mg/kg, reporting limits did not exceed the alternative soil cleanup level of 0.5 mg/kg.

shaded Highest detected concentration of the specific contaminant in this well

ADEC Alaska Department of Environmental Conservation

bgs Below ground surface

BTEX Benzene, toluene, ethylbenzene, and total xylenes

DRO Diesel-range organic compounds

GRO Gasoline-range organic compounds

J Analyte was positively identified, but concentration is estimated; result is considered qualitatively acceptable, but quantitatively unreliable.

mg/kg Milligram per kilogram

mg/L Milligram per liter

-- Not analyzed

NA Not applicable

none No cleanup standard established by State of Alaska law or regulation.

TPA Two-Party Agreement

U The analyte was analyzed for, but was not detected above the listed sample reporting limit.

a Cleanup level is from Title 18 of the Alaska Administrative Code 75 “Oil and Hazardous Substances Pollution Control Regulations,” published by the State of Alaska and amended through January 30, 2003. Contaminants of concern for this site are limited to GRO, DRO, RRO, BTEX and select PAHs.

b Cleanup level obtained from ADEC Method Two based on the 1991 cleanup level.

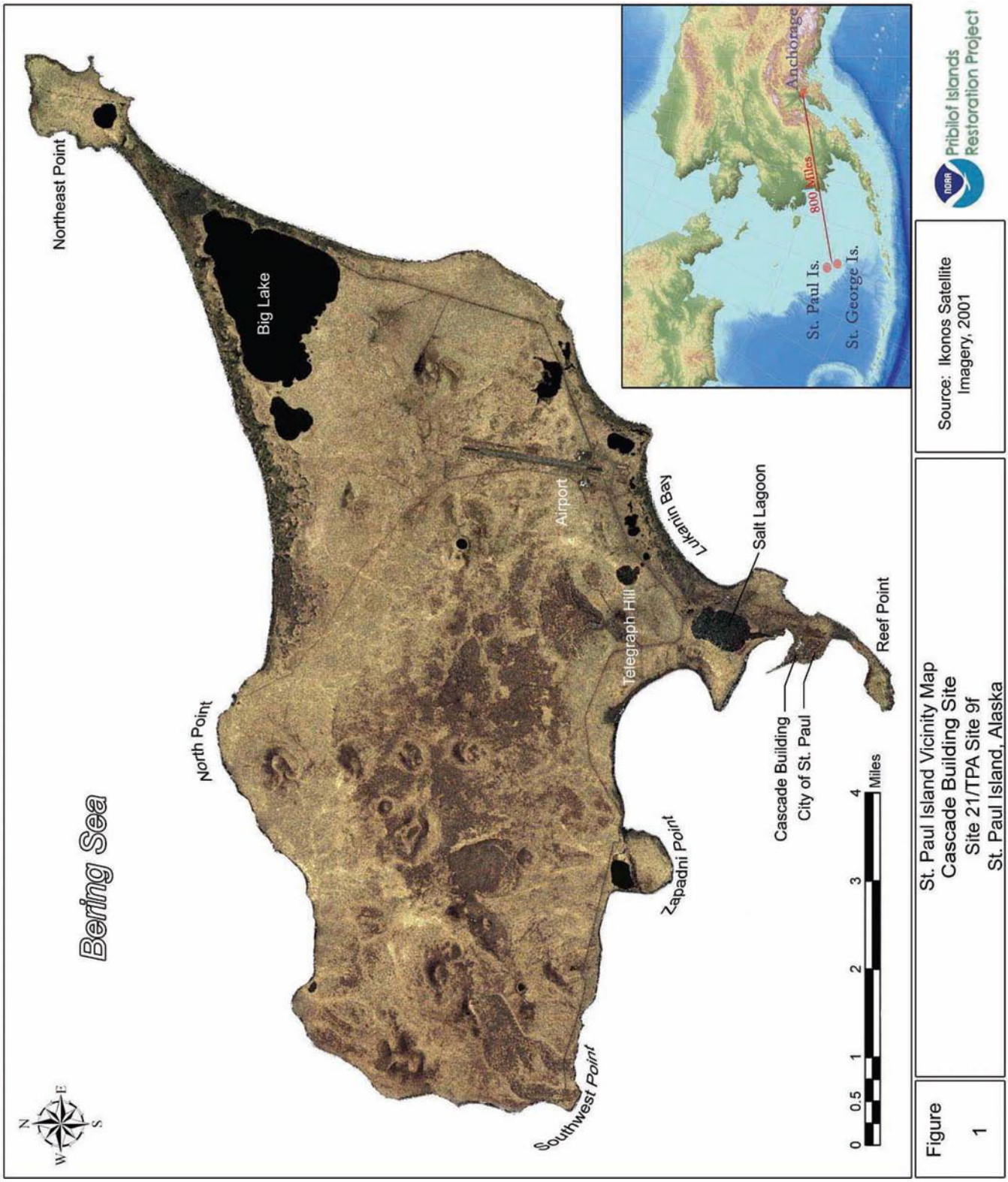
c Sample is a blind field duplicate for the sample listed in the previous row of the table.

d Sample results used to confirm this soil was clean enough to use as site backfill.

e The alternative cleanup standard for GRO in soil is the Method Two cleanup standard for the ingestion and inhalation pathways.

f Under the TPA, NOAA may utilize the 1991 ADEC cleanup level for benzene (0.5 mg/kg).

Figures


Northeast Point
Big Lake
Bering Sea
North Point
Airport
Telegraph Hill
Lukanin Bay
Salt Lagoon
Reef Point
Zapadni Point
Cascade Building
City of St. Paul
Southwest Point
N
E
W
S
0 0.5 1 2 3 4 Miles
Anchorage
800 Miles
St. Paul Is.
St. George Is.
Pribilof Islands Restoration Project
Source: Ikonos Satellite Imagery, 2001
Figure 1
St. Paul Island Vicinity Map
Cascade Building Site
Site 21/TPA Site 9f
St. Paul Island, Alaska

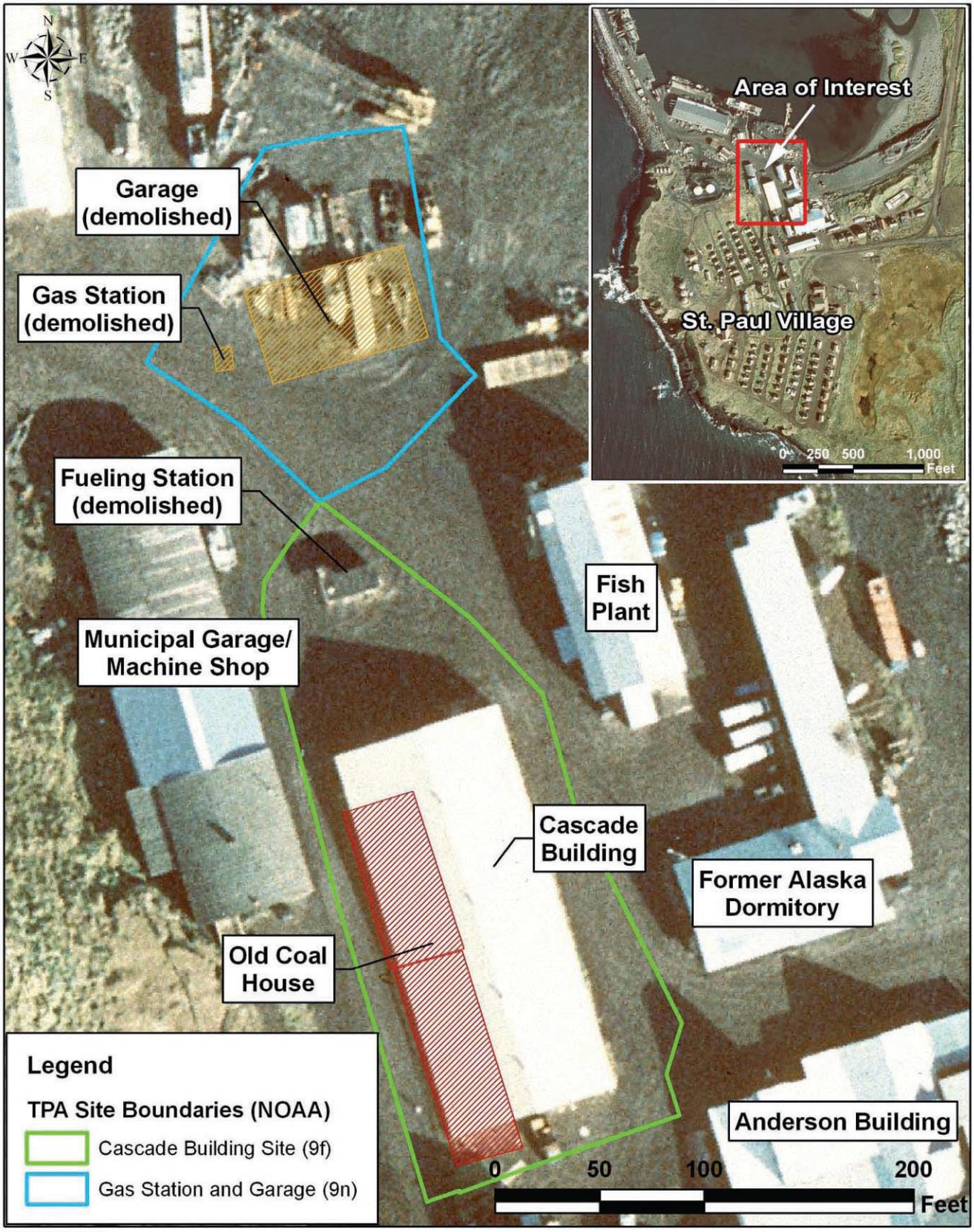


Figure 2	Site Location Cascade Building Site Site 21/TPA Site 9f St. Paul Island, Alaska	Sources: NOAA Pribilof Project GIS, 2005, Aerial Photo (Aeromap US, 1996).

Pribilof Islands Restoration Project

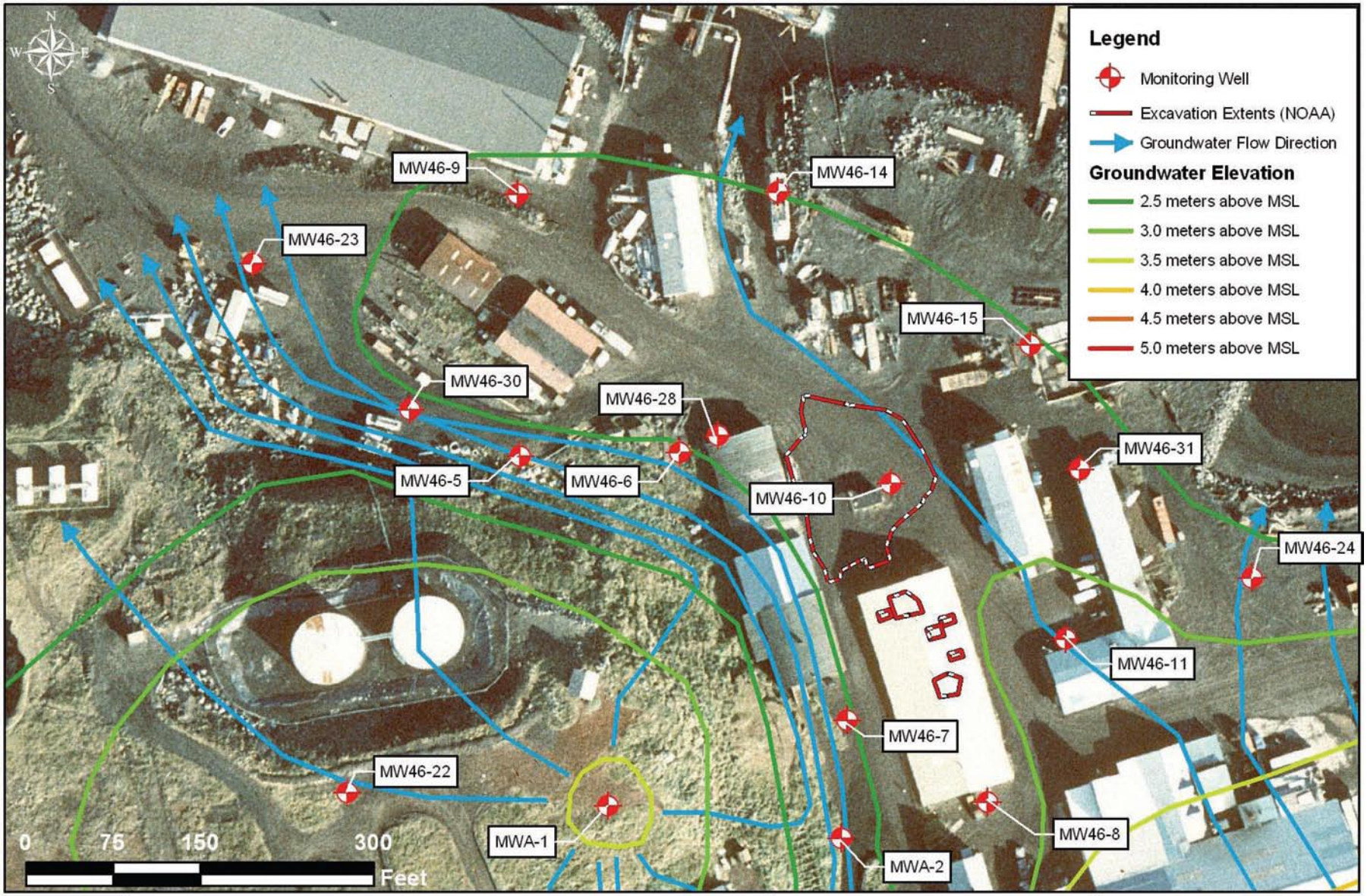


Figure 3	Monitoring Well Locations and Groundwater Gradient Cascade Building Site Site 21/TPA Site 9f St. Paul Island, Alaska	Sources: Well Locations and Excavation Extents (NOAA GIS 2005), Groundwater Data (CESI 2001), Aerial Imagery (Aeromap US 1996).

Pribilof Islands Restoration Project

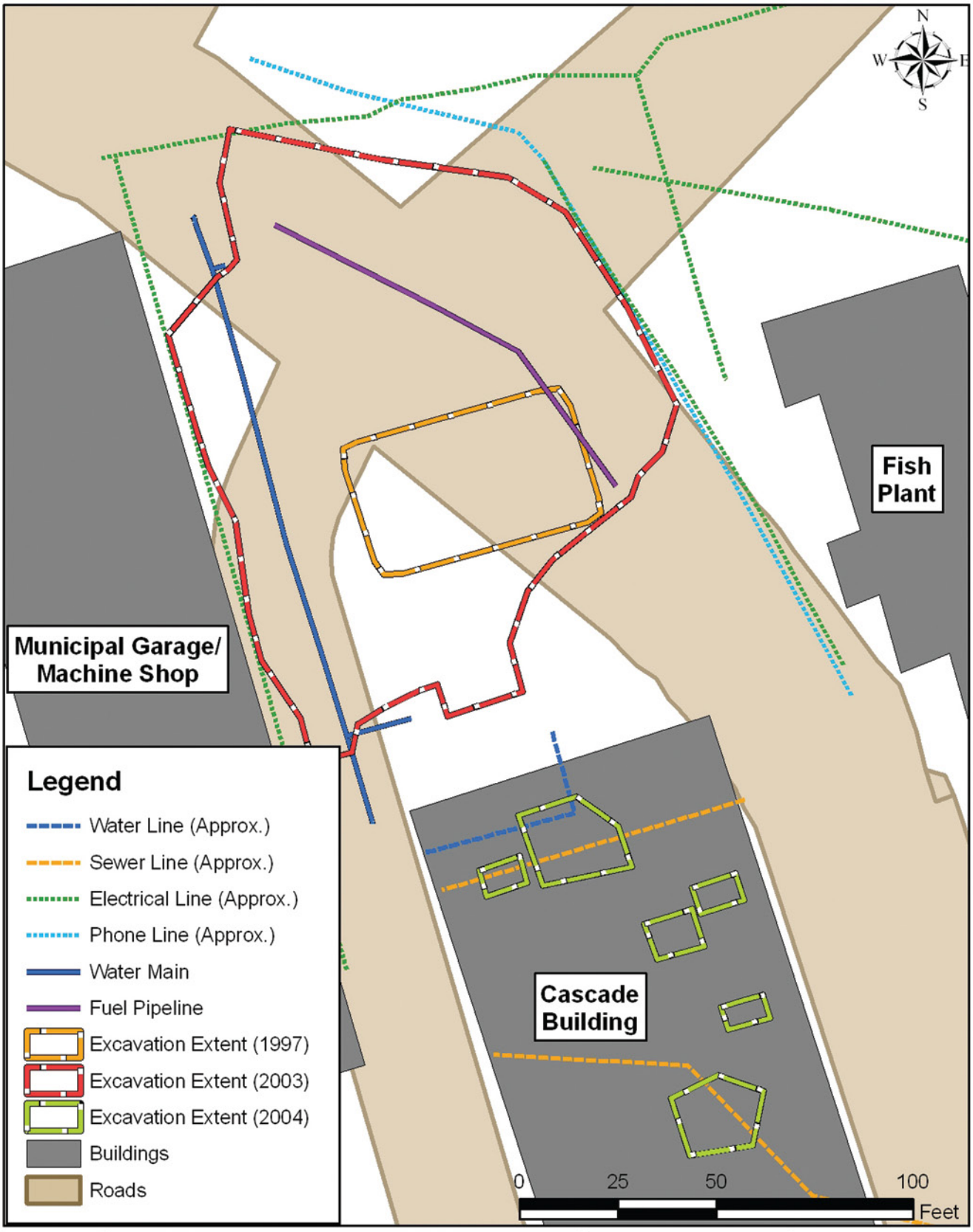


Figure 4	Areas of Excavation in 1997, 2003, and 2004 Cascade Building Site Site 21/TPA Site 9f St. Paul Island, Alaska	Source: NOAA Pribilof Project GIS, 2005

Pribilof Islands Restoration Project

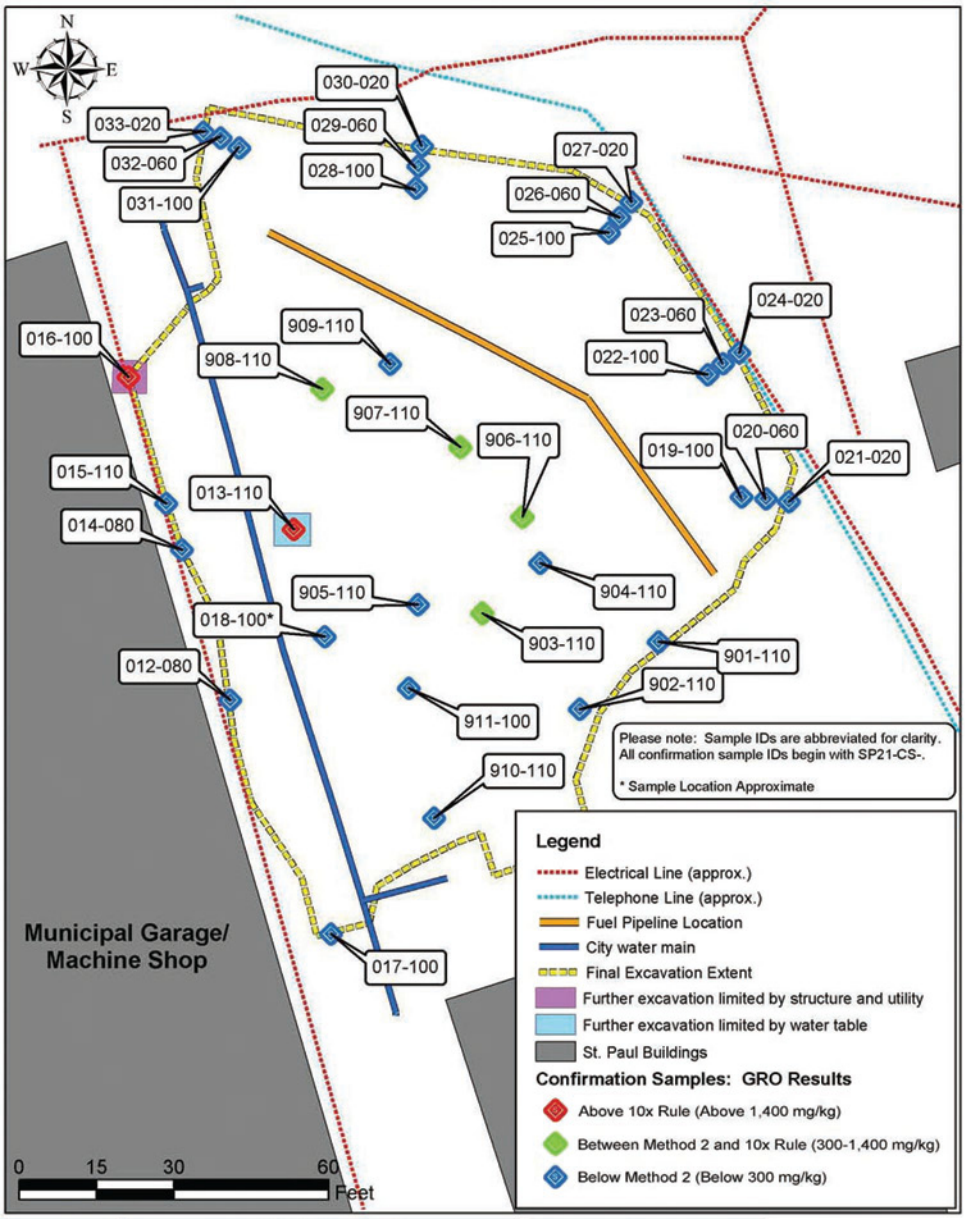


Figure 5

2003 Removal
GRO Confirmation Samples
Cascade Building Site
Site 21/TPA Site 9f
St. Paul Island, Alaska

Sources: Final excavation extent, utility locations, and sample locations, (NOAA GPS 2003), Well location (NOAA GPS 2002).

Pribilof Islands Restoration Project

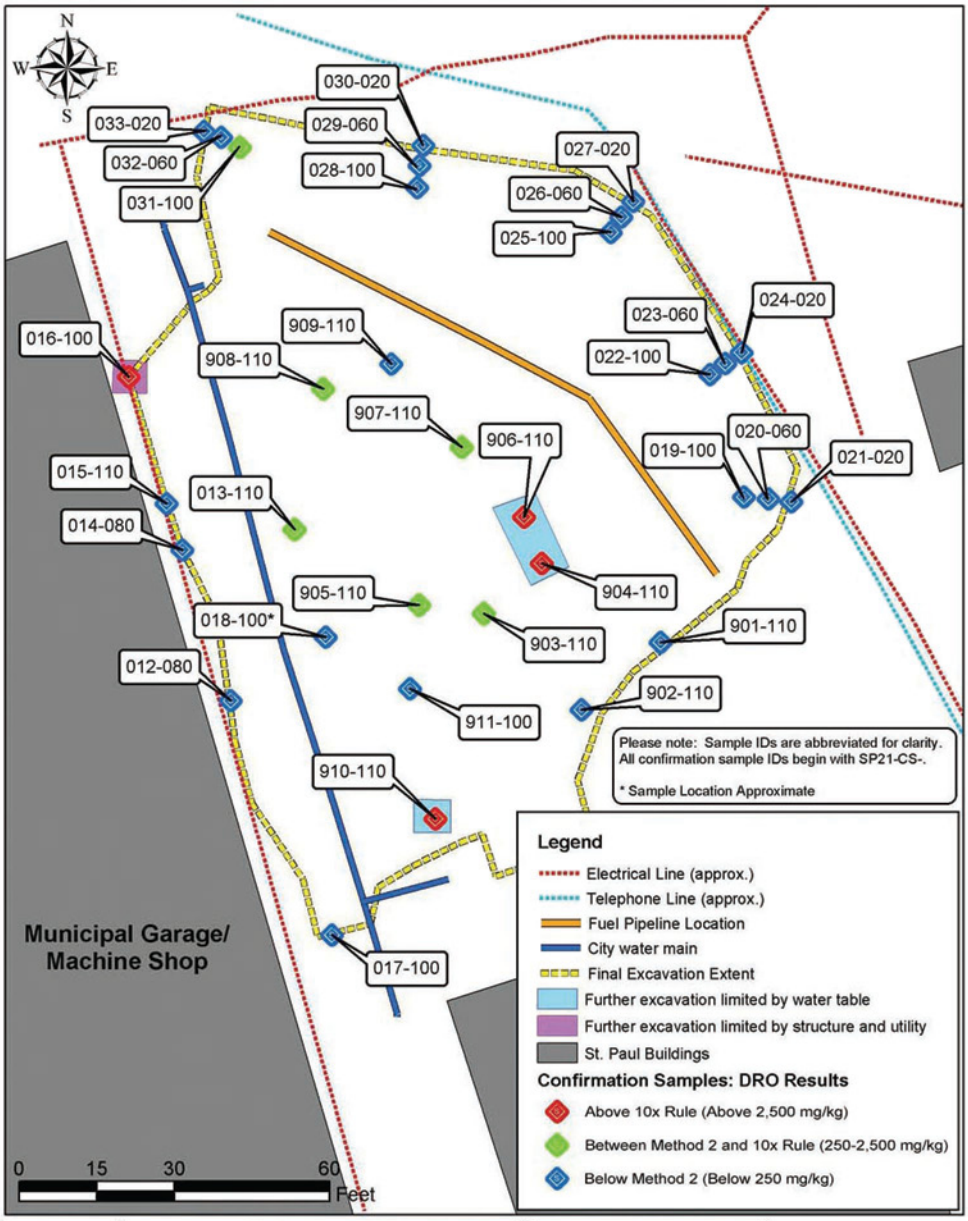


Figure 6	2003 Removal DRO Confirmation Samples Cascade Building Site Site 21/TPA Site 9f St. Paul Island, Alaska	Sources: Final excavation extent, utility locations, and sample locations, (NOAA GPS 2003), Well location (NOAA GPS 2002).	Pribilof Islands Restoration Project

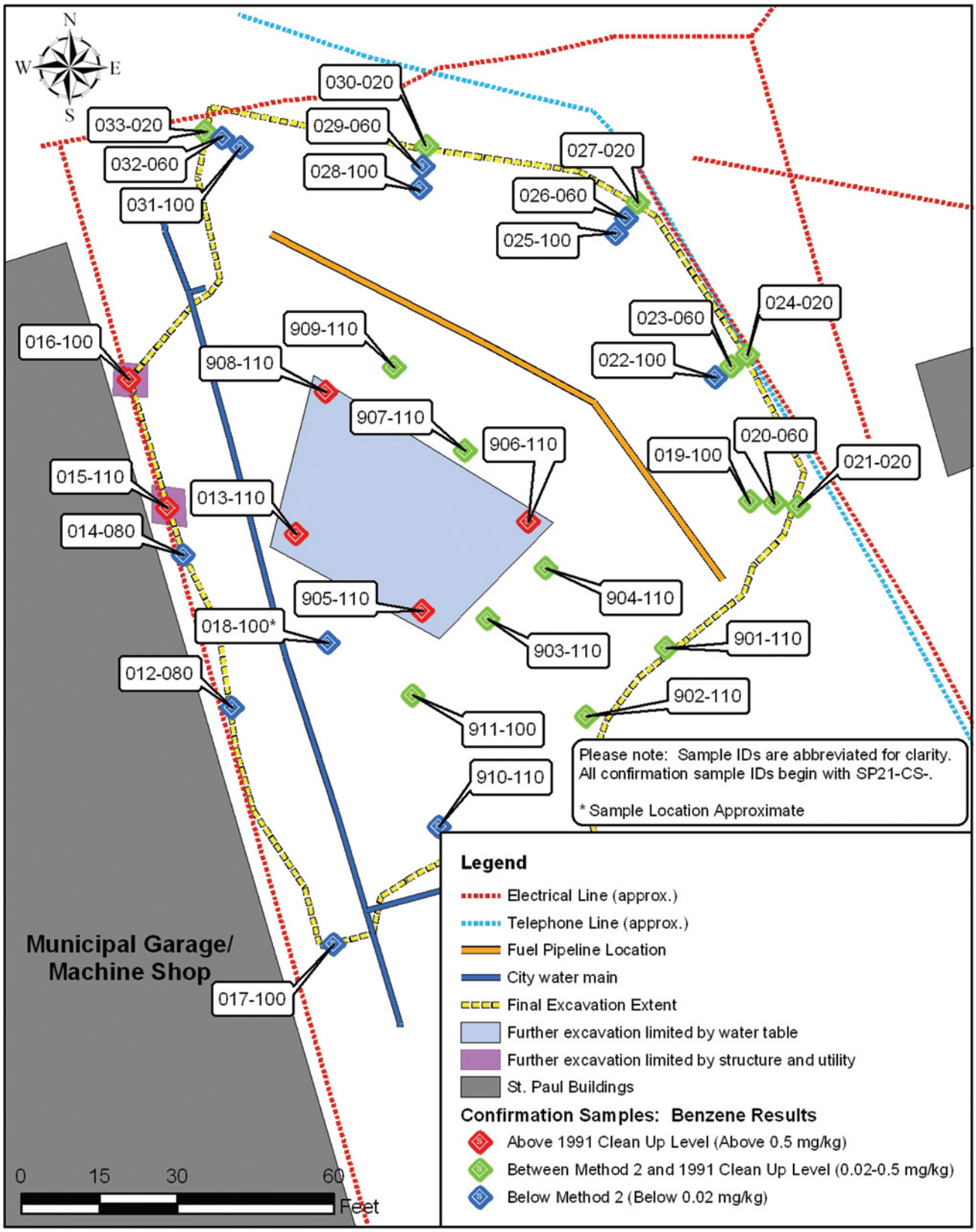


Figure 7	2003 Removal Benzene Confirmation Samples Cascade Building Site Site 21/TPA Site 9f St. Paul Island, Alaska	Sources: Final excavation extent, utility locations, and sample locations, (NOAA GPS 2003), Well location (NOAA GPS 2002).	Pribilof Islands Restoration Project

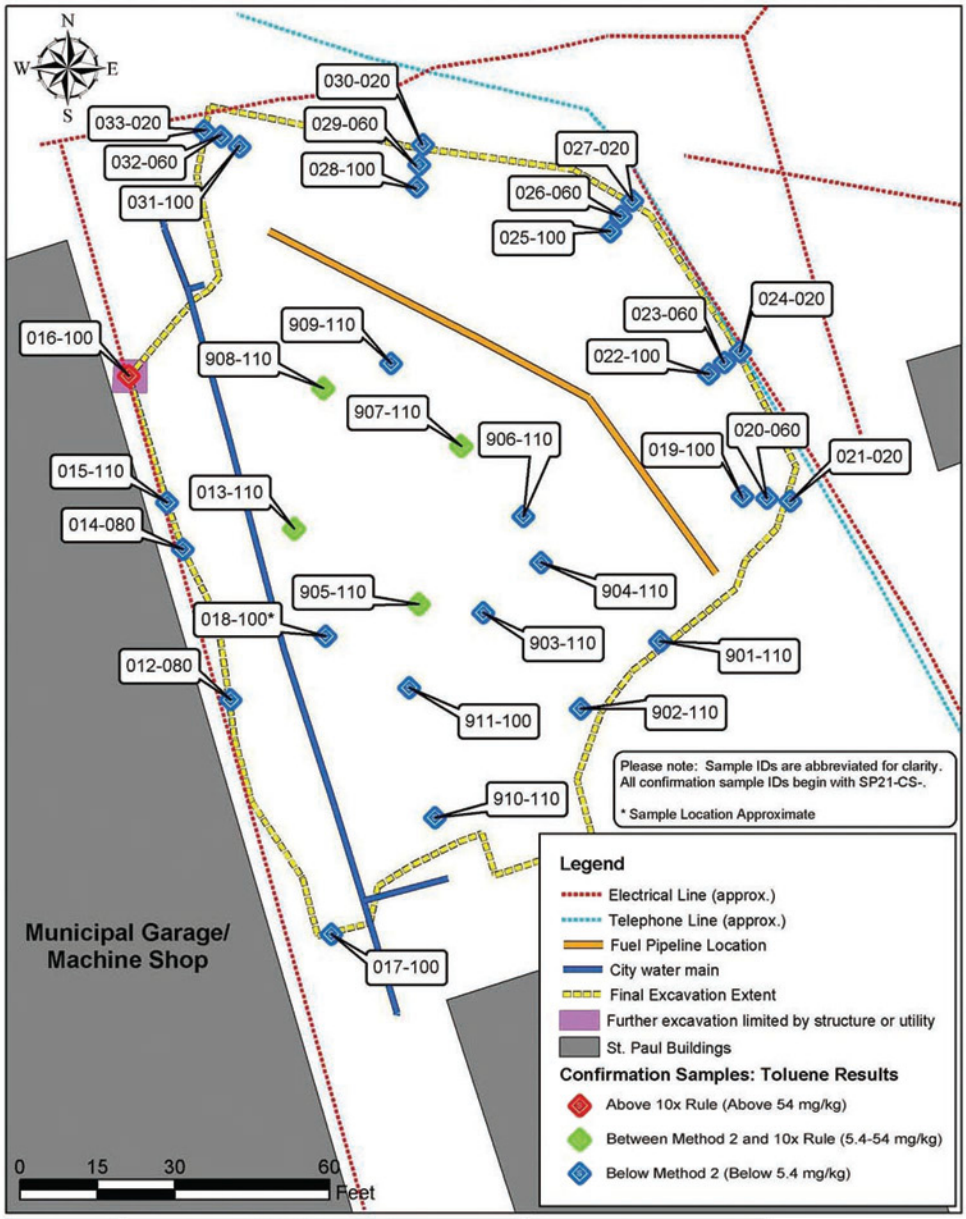


Figure 8	2003 Removal Toluene Confirmation Samples Cascade Building Site Site 21/TPA Site 9f St. Paul Island, Alaska	Sources: Final excavation extent, utility locations, and sample locations, (NOAA GPS 2003), Well location (NOAA GPS 2002).	Pribilof Islands Restoration Project

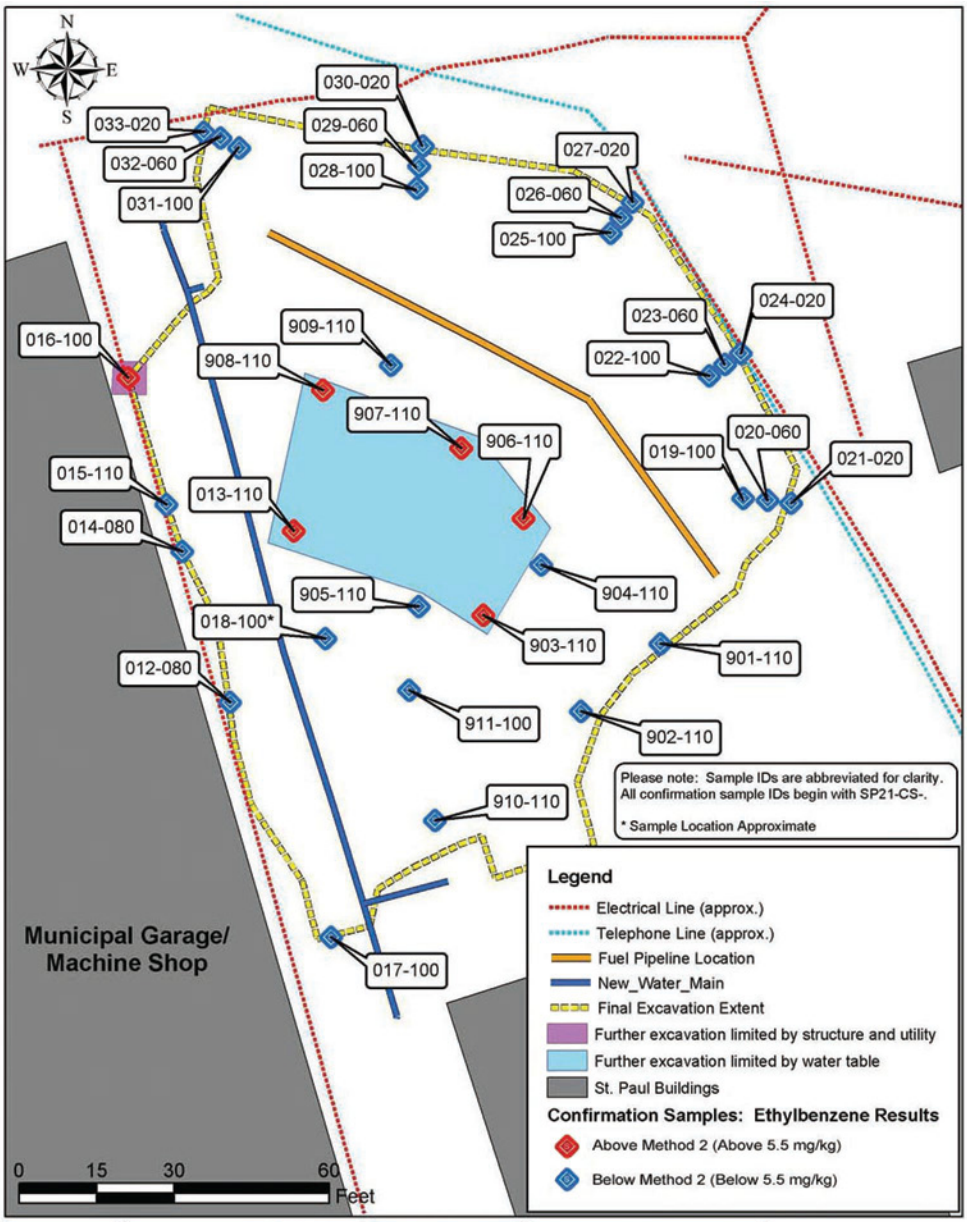


Figure 9	2003 Removal Ethylbenzene Confirmation Samples Cascade Building Site Site 21/TPA Site 9f St. Paul Island, Alaska	Sources: Final excavation extent, utility locations, and sample locations, (NOAA GPS 2003), Well location (NOAA GPS 2002).	Pribilof Islands Restoration Project

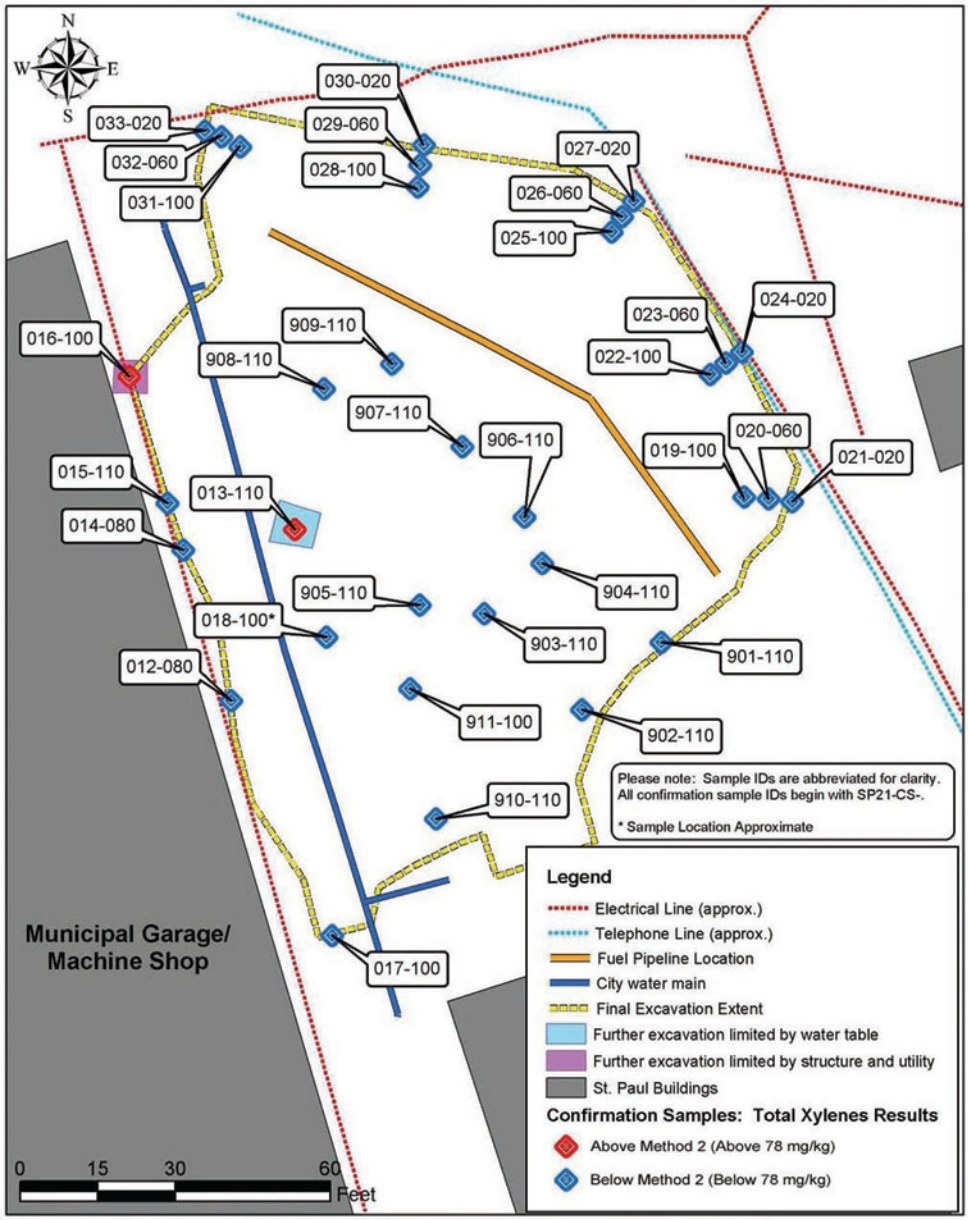


Figure 10	2003 Removal Total Xylenes Confirmation Samples Cascade Building Site Site 21/TPA Site 9f St. Paul Island, Alaska	Sources: Final excavation extent, utility locations, and sample locations, (NOAA GPS 2003), Well location (NOAA GPS 2002).	Pribilof Islands Restoration Project

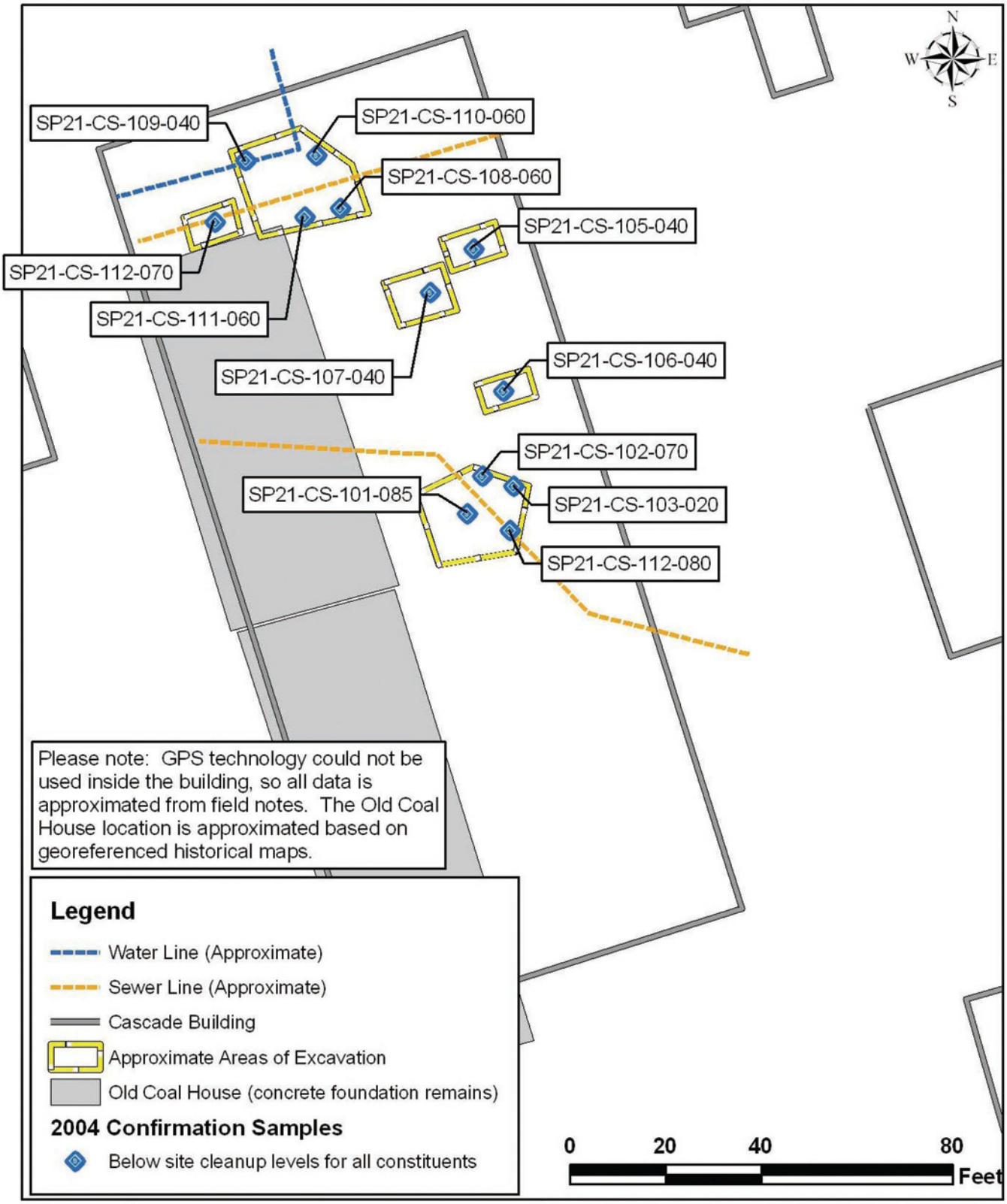


Figure 11	2004 Confirmation Sampling Results Cascade Building Site Site 21/TPA Site 9f St. Paul Island, Alaska	Sources: Building Footprints, Excavation Extents, Utilities, and Sampling Locations (NOAA Pribilof Project GIS 2005).

Pribilof Islands Restoration Project

NOAA Site 22
TPA Site 9g: Former Fouke Bunkhouse

Request for NFRAP, Former Fouke Bunkhouse TPA Site 9g/Site 22,
St. Paul Island, Alaska 599

Request for NFRAP
Former Fouke Bunkhouse
TPA Site 9g/Site22
St. Paul Island, Alaska

Request for No Further Remedial Action Planned

Site: Former Fouke Bunkhouse, also known as Two Party Agreement (TPA) Site 9g and National Oceanic and Atmospheric Administration (NOAA) Site 22

Location: St. Paul Island, Alaska is approximately 800 miles southwest of Anchorage in the Bering Sea. On St. Paul Island, the Former Fouke Bunkhouse is situated at the bottom of Village Hill in the central portion of the city of St. Paul near the community grocery store (57°07'21" N latitude, 170°16'50" W longitude; Figure 1).

Legal Property Description: The building and area of excavation are located in the southern portion of Tract 46, Township 35 South, Range 132 West, of the Seward Meridian, Alaska, as shown on the dependent resurvey of a portion of U.S. Survey No. 4943, Alaska, Tract "A", St. Paul Townsite, officially filed June 3, 1997 (Figure 2).

Type of Release:
An aboveground storage tank (AST) with an estimated volume of 300 gallons was located along the east side of the bunkhouse, and a 500-gallon underground storage tank (UST) was buried approximately 10 feet east of the building. Spillage during fueling operations and leakage from the tanks and their associated piping is presumed to have resulted in the petroleum-contaminated soil (PCS) previously present.

History and Background:
The building formerly provided housing for government personnel and workers with the Fouke Fur Company during the seal harvests. An AST, and before that a UST, on the east side of the building reportedly supplied diesel fuel for heating purposes (NOAA 2003).

Summary of Site Investigations:
During the summer of 2000, Columbia Environmental Sciences, Inc. (CESI) conducted site characterization activities in the city of St. Paul. These activities included the installation of monitoring wells and the advancement of soil borings at various locations. One soil sample (Figure 3) was collected just east of the Former Fouke Bunkhouse, revealing the presence of diesel range organics (DRO) at a concentration of 2,400 milligrams per kilogram (mg/kg) (CESI 2001).

NOAA contractors conducted quarterly groundwater monitoring from September 2000 to September 2001 and from October 2003 to July 2004 in the vicinity of the Former Fouke Bunkhouse (Figure 4). During 2000-2001 sampling events, DRO were detected above their Alaska Department of Environmental Conservation (ADEC) Table C cleanup level of 1,500 micrograms per liter (µg/L) in well MW46-8, located north of and down gradient from the site, with a maximum detection of 2,400 µg/L (IT Alaska Corp. 2002). Lead was also detected in this well above its Table C cleanup level of 15 µg/L, with a maximum detection of 106 µg/L. During the first three quarters of the 2003-2004 sampling, DRO were detected in well MW46-8, but at a much lower concentration and below the Table C clean up level. The maximum concentration detected was 630 µg/L. Lead was not detected. Further down gradient from the Former Fouke Bunkhouse, DRO exceedances were detected in MW46-7 during 2000-2001 and 2003-2004 sampling events. DRO have not been detected in well MWA-5, located up gradient from the site, but high concentrations of DRO (*i.e.*, 13,000 µg/L) have been detected in MWA-3, a well potentially located up gradient from the site (Mitretek Systems 2002; Figure 4). [Note that NOAA's contractor for the 2001 sampling analyzed for residual-range organic compounds (RRO) by adapting soil analytical method AK103. The adapted method was never approved by ADEC, and no ADEC approved method exists. Thus, although the contractor reported detecting RRO above its ADEC Table C cleanup level in MW46-8, ADEC has indicated it does not consider this data to be valid, and the results are not included herein.]

Mitretek Systems (2002) evaluated the 2000-2001 groundwater data for wells in the St. Paul Village area, which includes the Former Fouke Bunkhouse site. The Mitretek report demonstrated that groundwater in the vicinity of St. Paul Village has high total dissolved solids and can be brackish. Consequently, the groundwater in the area is not suitable for drinking water. The evaluation, in part, provided a rationale for using alternative groundwater cleanup levels that are protective of human health and the environment where the groundwater is not potable. Mitretek concluded in accordance with 18 AAC 75.350 (ADEC 2000) that groundwater in the Village area is not currently used and does not afford any potential future use as a drinking water source. These findings provided the basis for the application of the Ten Times Rule discussed below.

Summary of Applied Cleanup Levels:
NOAA employed ADEC Method Two cleanup criteria, discussed at 18 AAC 75.341(c) (ADEC 2000). Alternative cleanup levels were also applied for some compounds. For benzene, under the TPA, NOAA had the option to cleanup to the less stringent State of Alaska cleanup level in effect in 1991 (ADEC 1991). Additionally, NOAA proposed and ADEC approved the use of alternative cleanup levels under 18 AAC 75.345 and 18 AAC 75.350, commonly referred to as the Ten Times Rule (ADEC 2002, Mitretek Systems 2002). According to these regulations, if groundwater beneath a site contains contaminant concentrations above the cleanup levels provided in ADEC Table C, then the soil may be remediated to levels ten times higher than those provided in Method Two Tables B1 and B2 for the migration to groundwater pathway for those contaminants found in groundwater at concentrations above the cleanup levels provided in ADEC Table C; however, if the inhalation or ingestion pathway values are more stringent than the migration to groundwater pathway, then the more stringent value is to be applied. ADEC uses 15 feet below ground surface (bgs) to define subsurface soil to which residents will have a reasonable potential to be exposed through the inhalation or ingestion pathways (ADEC 2000; 18 Alaska Administrative Code 75.340 (j)(2)). Therefore NOAA is not obligated to excavate contaminated soil occurring at depths deeper than 15 feet to address the inhalation and ingestion pathways.

Summary of Cleanup Actions:
NOAA contractor Tetra Tech EM Inc. (Tetra Tech) and its subcontractor Bering Sea Eccotech (BSE) initiated corrective actions at the Former Fouke Bunkhouse on July 21, 2003 and completed work on July 30, 2003 (Tetra Tech 2004a). The liquid contents of the AST were determined to be a mixture of diesel fuel and water, and were subsequently pumped into four 55-gallon drums and recycled on-island (*i.e.*, provided to Trident Seafoods for use in its used oil space heater). Prior to excavation activities for the Former Fouke Bunkhouse, additional scoria was placed at the excavation as a road surface. Initial areas of excavation were selected based on the suspected contamination identified during previous investigations. The extent of excavation was determined based on thin-layer chromatography (TLC) screening sample analyses as well as visual and olfactory observations.

Excavation activities began in the area beneath and adjacent to the former AST (Figure 5). As the excavation progressed, a previously unidentified 500-gallon UST was discovered approximately 10 feet east of the building. The contents of the UST were determined to be a mixture of mostly water with highly weathered diesel fuel. As such, the contents were pumped into a plastic tank and hauled to the Blubber Dump, where they were emptied onto the lined stockpile area. Subsequently, the excavation was expanded in all directions based on TLC screening sample analyses as well as visual and olfactory observations. Signs of contamination, including petroleum staining and odors, were noted throughout the excavation. If contaminant concentrations remained above ADEC Method Two cleanup levels based on TLC screening results, additional excavation was conducted even if the concentrations were below alternative cleanup levels unless further excavation was prevented by the presence of groundwater or obstructions. The excavation was advanced to a maximum depth of 13 feet below ground surface (bgs), where groundwater was encountered. One unknown utility line, a 1.5-inch-diameter steel pipeline, was discovered during excavation (Figure 5). The line could not be further identified, so it was left intact throughout the corrective action.

Two test pits were also excavated near the southeast corner of the Former Fouke Bunkhouse to investigate local reports of a suspected UST in this area (Figure 5). Each test pit was advanced to a depth of approximately 7 feet bgs. Neither USTs nor signs of contamination were observed, and the pits were backfilled with the excavated soil.

Thirteen confirmation samples were collected from the bottom and sidewalls of the excavation at the Former Fouke Bunkhouse and analyzed at a fixed laboratory for benzene, toluene, ethylbenzene, and total xylenes (BTEX); DRO; gasoline-range organic compounds (GRO); RRO; select polynuclear aromatic hydrocarbons (PAHs), and lead. Results indicated DRO concentrations varied from not detected to 1,200 mg/kg; two of the thirteen samples collected from this area exceeded the ADEC Method Two cleanup level of 250 mg/kg, but no samples exceeded the alternative cleanup level of 2,500 mg/kg (Table 1, Figure 6). The elevated concentrations of DRO were detected in samples SP22-CS-001-130 and SP22-CS-005-130, which were collected from the bottom of the west side of the excavation at 13 feet bgs, adjacent to the building foundation and at the water table. Concentrations for all other contaminants were below the ADEC Method Two cleanup levels. Laboratory reporting limits were below ADEC Method Two cleanup levels for all analyses except benzene. For benzene, reporting limits of 0.03 mg/kg were achieved, which is above the ADEC Method Two cleanup level of 0.02 mg/kg, but below the alternative cleanup level of 0.5 mg/kg.

During the corrective action, a total of approximately 155 cubic yards of PCS were removed from the excavation at the Former Fouke Bunkhouse. Samples collected from PCS stockpiled from this site, the Old Sealing Plant/ Barreling Shed (Site 27/TPA Site 9ℓ), and Tract A House 102 (Site 54/TPA Site 9r) contained DRO concentrations that varied from not detected to 350 mg/kg (Tetra Tech 2004b). The excavated PCS was stockpiled at the Tract 42 landfill site, pending final disposal at the National Weather Service land spreading site, or other ADEC approved disposal alternative. Following excavation and sampling activities, the Former Fouke Bunkhouse site was restored to its original grade.

Recommended Action:
In accordance with paragraph 59 of the Two Party Agreement (NOAA 1996), NOAA requests written confirmation that NOAA completed all appropriate corrective action at the Former Fouke Bunkhouse, TPA Site 9g/NOAA Site 22 in accordance with the Agreement and that ADEC requires no further remedial action plan from NOAA

References:

Alaska Department of Environmental Conservation (ADEC). 1991. *Interim Guidance for Non-UST Contaminated Soil Cleanup Levels, Contaminated Sites Program*. July 17, 1991.

ADEC. 2000. Title 18 of the *Alaska Administrative Code* 75, Articles 3 and 9. *Oil and Hazardous Substances Pollution Control Regulations*. State of Alaska. Amended through October 28, 2000.

ADEC. 2002. Letter from Louis Howard, Project Manager, Alaska Department of Environmental Conservation, to John Lindsay, Project Manager, NOAA Pribilof Project Office regarding ADEC conditional approval for applying the Ten Times Rule. May 30.

Columbia Environmental Sciences, Inc. (CESI). 2001. *Draft Site Characterization Report, Tract 46 and Vicinity (TPA Site 9), St. Paul Island, Alaska*. Version 2.1 December 16, 2001. Columbia Environmental Sciences, Inc. Kennewick, WA.

IT Alaska Corp. 2002. *Draft, Annual Groundwater Monitoring Report–2001 St. Paul Island, Alaska*. March.

Mitretek Systems. 2002. *Groundwater Use and Classification in the Vicinity of Tract 46, St. Paul Island, Pribilof Islands, Alaska*. Prepared by Mitretek Systems, for the National Oceanic and Atmospheric Administration. June 5.

National Oceanic and Atmospheric Administration (NOAA). 1996. *Pribilof Islands Environmental Restoration Two Party Agreement*. Attorney General's Office File No. 66 1-95-0126, National Oceanic and Atmospheric Administration. January 26.

NOAA. 2003. *Draft Corrective Action Plan for Former Fouke Bunkhouse Petroleum Contaminated Soils (TPA Site 9g), St. Paul Island, Alaska*. Approved as submitted by ADEC on June 3, 2003.

Tetra Tech EM Inc. (Tetra Tech). 2004a. *Final Corrective Action Report, Site 22/TPA Site 9g- Former Fouke Bunkhouse, St. Paul Island, Alaska*.

Tetra Tech. 2004b. *Letter Report, Summary of 2003 Field Season Stockpile Activities, St. Paul Island, Alaska*. July 23.

For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

9/10/04
Date

Approvals: In accordance with Paragraph 59 of the Two Party Agreement, this is to confirm that all corrective action has been completed at the Former Fouke Bunkhouse, TPA Site 9g/NOAA Site 22, in accordance with the Agreement and that no plan for further remedial action is required.

For the Alaska Department of Environmental Conservation

Louis Howard
Alaska Department of Environmental Conservation
Remedial Project Manager

9-14-04
Date

Tables and Figures

Table 1. Analytical Data Summary for Confirmation Samples from the Former Fouke Bunkhouse- TPA 9g/Site 22, St. Paul Island, Alaska

Sample Number	Sample Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Total Xylenes (mg/kg)	Gasoline-range Organic Compounds (mg/kg)	Diesel-range Organic Compounds (mg/kg)	Residual-range Organic Compounds (mg/kg)	Lead (mg/kg)
TPA Site 9g Confirmation Samples									
SP22-CS-001-130	13	0.03 U	0.03 U	0.06	0.56	72	**340**	50 U	3.53
SP22-CS-002-130	13	0.03 U	0.03 U	0.03 U	0.13	18	78	50 U	3.89
SP22-CS-003-130	13	0.03 U	0.03 U	0.03 U	0.03 U	2 U	170	50 U	4.42
SP22-CS-004-130	13	0.03 U	0.03 U	0.03 U	0.03 U	2 U	10 U	150	3.44
SP22-CS-005-130	13	0.02 U	0.02 U	0.02 U	0.02 U	1 U	**1,200**	250	3.73
SP22-CS-006-100	10	0.02 U	0.02 U	0.02 U	0.02 U	1 U	10 U	50 U	2.79
SP22-CS-007-100	10	0.02 U	0.02 U	0.02 U	0.02 U	1 U	10 U	50 U	2.62
SP22-CS-008-130	13	0.02 U	0.02 U	0.02 U	0.03	1	110	50 U	4.24
SP22-CS-009-100	10	0.03 U	0.03 U	0.03 U	0.03 U	2 U	10 U	50 U	2.54
SP22-CS-010-130	13	0.03 U	0.03 U	0.03 U	0.03 U	2 U	22	50 U	4.43
SP22-CS-011-100	10	0.02 U	0.02 U	0.02 U	0.02 U	1 U	10 U	50 U	3.04
SP22-CS-012-100	10	0.03 U	0.03 U	0.03 U	0.03 U	2 U	10 U	50 U	2.74
SP22-CS-013-130	13	0.02 U	0.02 U	0.02 U	0.02 U	1 U	10 U	50 U	2.67
Trip Blank Sample									
Trip blank	- -	0.02 U	0.02 U	0.02 U	0.02 U	1 U	--	--	--
Method Two Cleanup Level[a]		*0.02*	*5.4*	*5.5*	*78*	*300*	*250*	*10,000*	*400*[e]
Method Two Alternative Cleanup Level[b]		*0.5*[c]	*54*	*NA*	*NA*	*1,400*[d]	*2,500*	*NA*	*400*[e]

Notes:

bgs Below ground surface
mg/kg Milligram per kilogram
-- Not analyzed
NA Not available
TPA Two-Party Agreement
U The analyte was analyzed for but not detected above the sample reporting limit.

a Cleanup level is from Title 18 of the *Alaska Administrative Code* 75 Oil and Hazardous Substances Pollution Control Regulations, published by the State of Alaska and amended through October 28, 2000.

b Cleanup level obtained from ADEC Method Two based on the "Ten Times Rule" applied to the migration to groundwater pathway, as discussed in Section 5.0 of the corrective action plan (National Oceanic and Atmospheric Administration [NOAA] 2003a).

c Under the TPA, NOAA is obligated to comply with the 1991 ADEC cleanup level for benzene (0.5 mg/kg).

d Cleanup level selected is based on more stringent value associated with ingestion and inhalation pathways.

e Although these sites are in an industrial area, NOAA is using the residential cleanup level for lead (400 mg/kg).

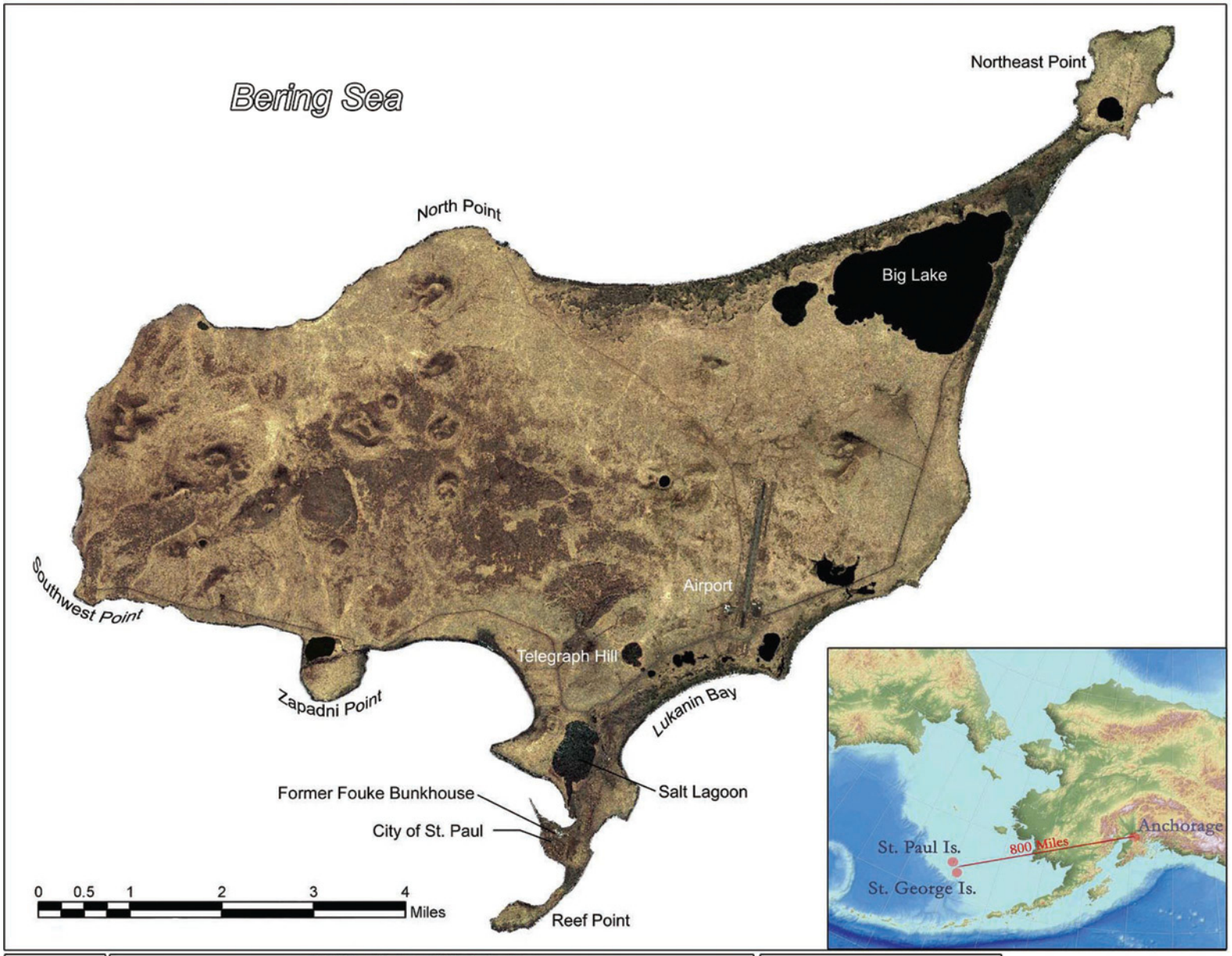


Figure 1	St. Paul Island Vicinity Map Former Fouke Bunkhouse TPA Site 9g/Site 22 St. Paul Island, Alaska	Source: Ikonos Satellite Imagery, 2001

Pribilof Islands Restoration Project

Figure 2	Legal Property Description Map Former Fouke Bunkhouse TPA Site 9g/Site 22 St. Paul Island, Alaska	Sources: BLM Tract (BLM MTPs 1983), TPA 9g Boundary (NOAA GIS 2004), Aerial Photo (Aeromap US 1996).

Pribilof Islands Restoration Project

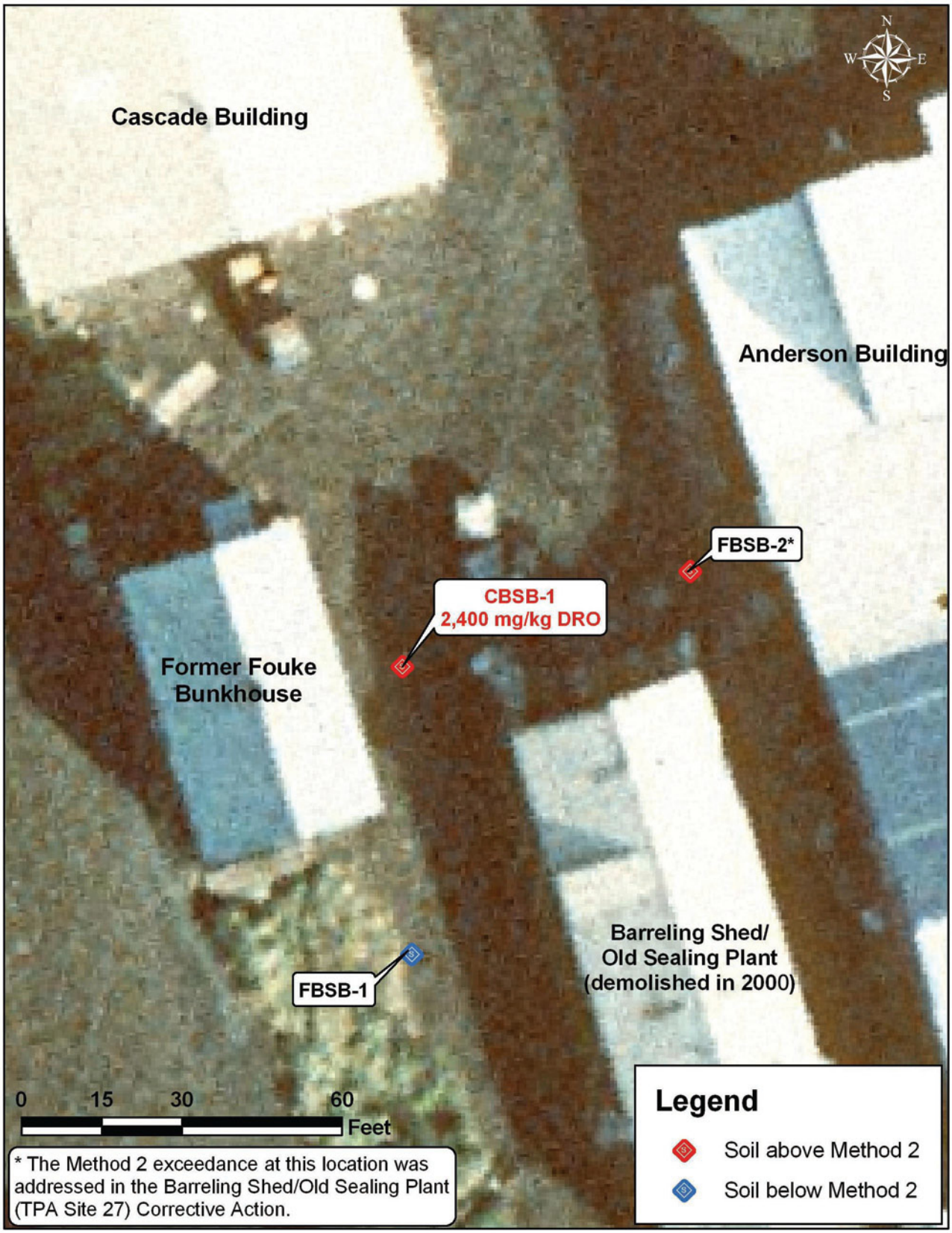


Figure 3	Historical Sampling Locations Former Fouke Bunkhouse TPA Site 9g/Site 22 St. Paul Island, Alaska	Sources: Historical Sampling Locations (Pribilof Islands GIS Project 2003), Aerial Photo (Aeromap US, 1996).

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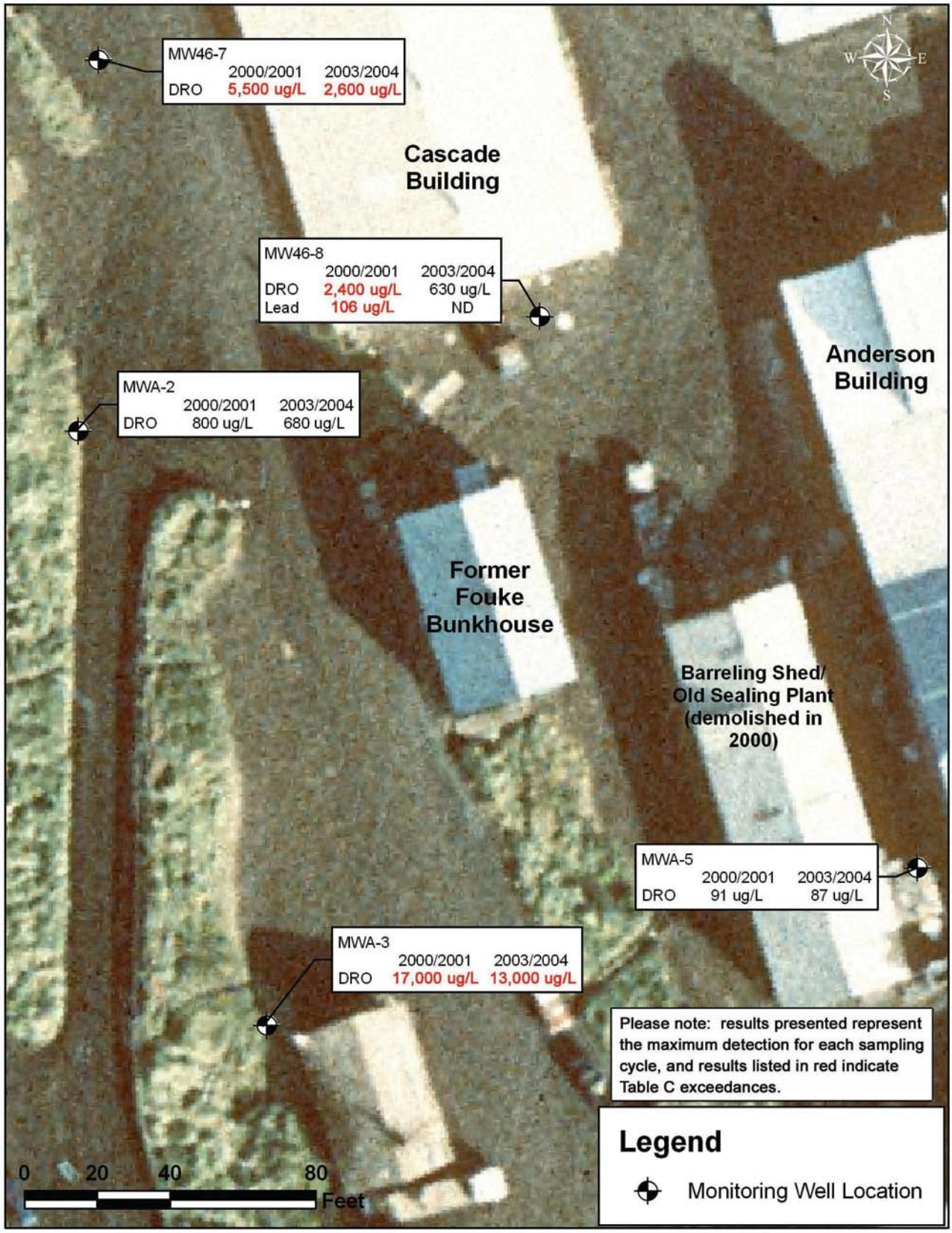

Figure 4	Groundwater Sampling Results Former Fouke Bunkhouse TPA Site 9g/Site 22 St. Paul Island, Alaska	Sources: Monitoring Well Locations (Pribilof Islands GIS Project 2003), Aerial Photo (Aeromap US, 1996).

Pribilof Islands Restoration Project

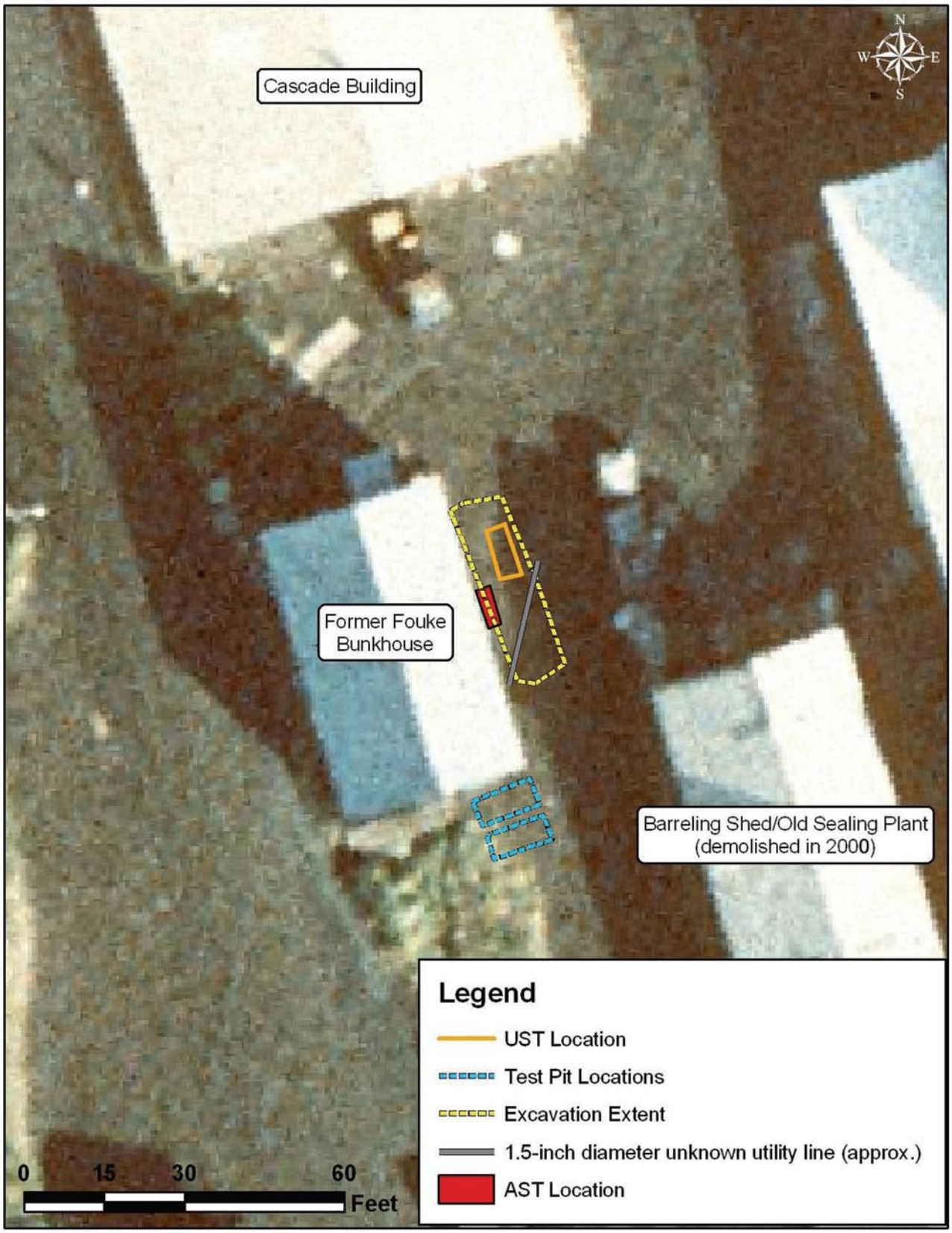

Figure 5	Areas of Excavation Former Fouke Bunkhouse TPA Site 9g/Site 22 St. Paul Island, Alaska	Sources: Monitoring Well Location (Pribilof Islands GIS Project 2003), UST Location, AST Location, and Excavation Extent (NOAA GPS 2003), Aerial Photo (Aeromap US, 1996).

Pribilof Islands Restoration Project

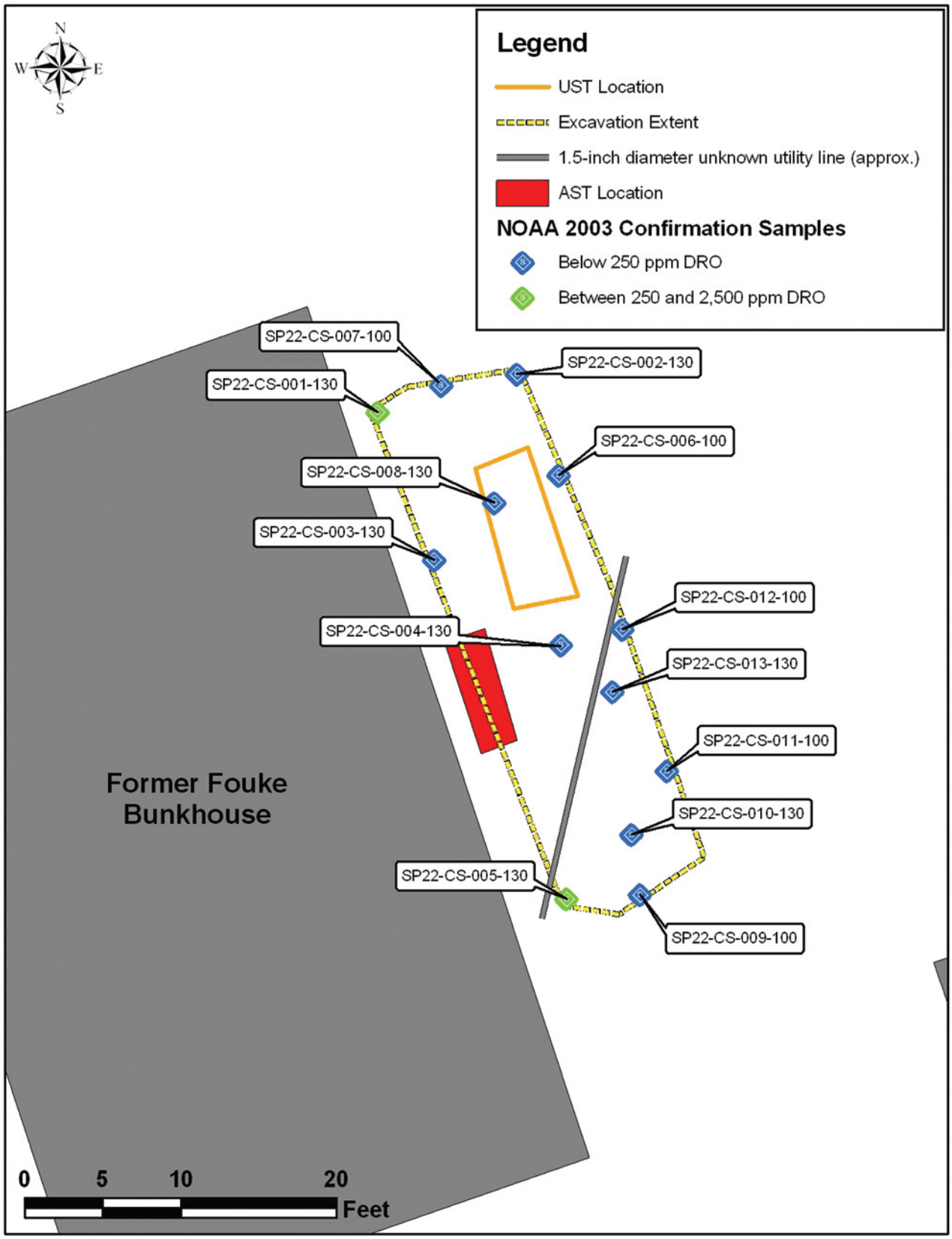

Figure 6	Confirmation Sampling Locations Former Fouke Bunkhouse TPA Site 9g/Site 22 St. Paul Island, Alaska	Sources: Confirmation Samples, UST Location and Excavation Extent (NOAA GPS 2003), AST Location (NOAA Pribilof Project GIS, 2003).

Pribilof Islands Restoration Project

NOAA Site 23
TPA Site 9h: Former Alaska Dormitory

Request for NFRAP, Former Alaska Dormitory,
TPA 9h/Site 23, St. Paul Island, Alaska 613

Request for NFRAP
Former Alaska Dormitory
TPA 9h/Site 23
St. Paul Island, Alaska

Request for No Further Remedial Action Planned

Site:
Former Alaska Dormitory, also known as Two Party Agreement (TPA) Site 9h and National Oceanic and Atmospheric (NOAA) Site 23

Location:
St. Paul Island, Alaska is approximately 800 miles southwest of Anchorage in the Bering Sea. On the island, the Former Alaska Dormitory (A-dorm) and the associated underground storage tank (UST) are located along the north side of Haul Road (57° 7' 22.93" N latitude, 170° 16' 48.50" W longitude; Figure 1).

Legal Property Description:
The structures and area of excavation are located in the central portion of Tract 46, Township 35 South, Range 132 West, of the Seward Meridian, Alaska, as shown on the dependent resurvey of a portion of U.S. Survey No. 4943, Alaska, Tract "A", St. Paul Townsite, officially filed June 3, 1997 (Figure 2). The federal government currently owns the surface and subsurface property of Tract 46.

Type of Release: Potential sources and release mechanisms include: 1) spills occurring during UST fueling; and 2) leaks occurring from the UST or its associated piping.

History and Background:
During the 1940s, an UST was installed on the site property to store heating oil for the Former Alaska Dormitory (also known locally as the Aleutian Bunkhouse), which served as government employee housing. NOAA proposed to remove the UST in anticipation of the transfer of the real property to Aleut Native American entities under the Transfer of Property Agreement (TOPA; NOAA 1984). NOAA prepared a Corrective Action Plan (CAP; NOAA 2002) for the removal of the UST at the Alaska Dormitory, implemented the CAP in October 2002, and provided a Corrective Action Report (CAR; NOAA 2003).

Summary of Site Investigations:
In the summer of 2000, monitoring wells were installed and soil borings taken in the City of St. Paul (Columbia Environmental Sciences, Inc. 2001). Surface staining adjacent to and/or near the UST indicated fuel contamination was present in the soil. Soil borings confirmed these observations. Borings indicated that levels of diesel-range organic compounds (DRO) varied from 6,800 mg/kg at the surface to 5,000 mg/kg at 4 to 10 feet below ground surface (bgs).

NOAA contractors conducted quarterly groundwater monitoring from September 2000 to September 2001 and from October 2003 to July 2004 in the vicinity of the Former Alaska Dormitory (Figure 3). During 2000-2001 sampling events, no ADEC Table C exceedances were detected in the well nearest to the area of excavation (MW46-11), although DRO were detected at a maximum concentration of 380 µg/l (IT Alaska Inc. 2002). DRO, gasoline-range organic compounds (GRO), and benzene were detected above their Table C cleanup levels in a down gradient well (MW46-10). During the first three quarters of 2003-2004 sampling, DRO were detected above their ADEC Table C cleanup level in well MW46-11, with a maximum concentration of 1,800 µg/l. MW46-10 was not sampled; however, DRO Table C cleanup levels were not exceeded in two other wells (MW46-31 and MW46-15) located down gradient from MW46-11. A full report on 2003-2004 sampling events will be available late in 2004. [Note that NOAA's contractor for the 2001 sampling analyzed for residual-range organic compounds (RRO) by adapting soil analytical method AK103. The adapted method was never approved

by ADEC, and no ADEC approved method exists. Thus, although the contractor reported detecting RRO in some wells, ADEC has indicated it does not consider this data to be valid, and the results are not included herein.]

Mitretek Systems (2002) evaluated the 2000-2001 groundwater data for the St. Paul Village area, which includes the Former Alaska Dormitory. The Mitretek report demonstrated that groundwater in the vicinity of St. Paul Village has high total dissolved solids and can be brackish. Consequently, the groundwater in the area is not suitable for drinking water. The evaluation, in part, provided a rationale for using alternative groundwater cleanup levels that are protective of human health and the environment where the groundwater is not potable. Mitretek concluded in accordance with 18 Alaska Administrative Code (AAC) 75.350 (ADEC 2000) that groundwater in the Village area is not currently used and does not afford any potential future use as a drinking water source. These findings provided the basis for the application of the Ten Times Rule discussed below.

Summary of Applied Cleanup Levels:
NOAA employed ADEC Method Two cleanup criteria, discussed at 18 AAC 75.341(c) (ADEC 2000). Alternative cleanup levels were also applied for some compounds. For benzene, under the TPA, NOAA had the option to cleanup to the less stringent State of Alaska cleanup level in effect in 1991 (ADEC 1991). Additionally, NOAA proposed and ADEC approved the use of alternative cleanup levels under 18 AAC 75.345 and 18 AAC 75.350, commonly referred to as the Ten Times Rule (ADEC 2002, Mitretek Systems 2002). According to these regulations, if groundwater beneath a site contains contaminant concentrations above the cleanup levels provided in ADEC Table C, then the soil may be remediated to levels ten times higher than those provided in Method Two Tables B1 and B2 for the migration to groundwater pathway for those contaminants found in groundwater at concentrations above the cleanup levels provided in ADEC Table C; however, if the inhalation or ingestion pathway values are more stringent than the migration to groundwater pathway, then the more stringent value is to be applied. ADEC uses 15 feet bgs to define subsurface soil to which residents will have a reasonable potential to be exposed through the inhalation or ingestion pathways (ADEC 2000; 18 AAC 75.340 (j)(2)). Therefore NOAA is not obligated to excavate contaminated soil occurring at depths deeper than 15 feet to address the inhalation and ingestion pathways. Cleanup criteria were applied to the maximum extent practicable (18 AAC 75.325 (f), 18 AAC 75.990).

Summary of Cleanup Actions:
Site cleanup actions started on October 30, 2002. Bering Sea Eccotech (BSE) personnel directed by a PSI Environmental and Instrumentation (PSI) engineer used an excavator to remove soils covering the UST (Figures 4 and 5). The top of the UST was encountered at approximately 3.5 feet bgs.

After exposing the top of the UST, approximately 1,400 gallons of diesel fuel was pumped from it into a tank truck provided by Delta Western. The fuel was in good condition and was donated to the Village of St. Paul.

The UST was then fully exposed and removed from the ground by attaching a cable to its lifting ring and the excavator bucket. The excavator lifted the UST from the excavation and placed it directly on a flat bed truck for transport to the BSE garage facility at the St. Paul airport.

After removing the UST, gray soil with a strong petroleum odor was discovered at the bottom of the excavation (Figure 6). Contaminated soils were removed to the greatest extent practicable. Maintaining the integrity of the nearby building foundation was a factor in the extent of excavation. Also, groundwater intrusion occurred at approximately 8 feet bgs (Figures 7). Because the rate of groundwater seepage was relatively slow, the excavation continued to a depth of 10 feet in order to remove as much contaminated soil as possible before the water volume caused the soils to become too fluid for effective removal.

Excavated soils were placed in dump trucks and transported to the Blubber Dump petroleum-contaminated soil (PCS) stockpile. At this location, the soil was placed on a lined cell pending treatment in NOAA's enhanced thermal conduction (ETC) system (BSE 2003). Approximately 160 cubic yards (yd^3) of soil were removed from the UST excavation.

While removing contaminated soil at the east end of the UST excavation, the excavator bucket broke a 2-inch underground water line that was not identified during the utility locate performed prior to project startup. After

consulting with the city's Public Works Department, the shutoff valve was located and closed about 80 minutes after the water line was broken.

Six confirmation samples were collected and analyzed at a fixed laboratory for benzene, toluene, ethylbenzene, total xylenes (BTEX); DRO; GRO; RRO; and selected polynuclear aromatic hydrocarbons (PAHs; Tables 1 and 2). Results indicated DRO concentrations varied from not detected to 13,800 mg/kg. Four samples exceeded the ADEC Method Two cleanup level of 250 mg/kg DRO and also exceeded the alternative cleanup level of 2,500 mg/kg. These samples were collected from the bottom of the excavation at the level of the water table. NOAA is not required by ADEC to excavate into the water table (18 AAC 75.325 (f)). Concentrations for all other contaminants were below the ADEC Method Two cleanup levels. Laboratory reporting limits were below applicable cleanup levels for all analyses except for three PAHs (Table 2). The benzene reporting limit was below its alternative cleanup level of 0.5 mg/kg, though above its ADEC Method Two cleanup level of 0.02 mg/kg.

The removed UST was cleaned with soap and water and cut into manageable pieces for recycling. In accordance with Section 6.2.6 in the CAP, the rinsate generated during UST cleaning was transported to the Blubber Dump PCS stockpile and discharged onto the stockpile and ultimately treated.

The UST excavation was backfilled with clean fill material obtained from the scoria quarry at Telegraph Hill on St. Paul Island. The fill was placed in the excavation, compacted with the excavator bucket, and the site restored to grade.

Recommend Action:
In accordance with paragraph 59 of the Two Party Agreement (NOAA 1996), NOAA requests written confirmation that NOAA completed all appropriate corrective actions at the Former Alaska Dormitory, TPA Site 9h/Site 23 in accordance with the Agreement and that Alaska Department of Environmental Conservation (ADEC) requires no further remedial action plan from NOAA.

References:

Alaska Department of Environmental Conservation (ADEC). 1991. *Interim Guidance for Non-UST Contaminated Soil Cleanup Levels, Contaminated Sites Program*. July 17, 1991.

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Columbia Environmental Sciences, Inc. 2001. *Draft Site Characterization Report, Tract 46 and Vicinity (TPA Site 9), St. Paul Island, Alaska*. Version 2.1 December 16, 2001. Kennewick, WA.

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NOAA. 1996. *Pribilof Islands Environmental Restoration Two-Party Agreement*, Attorney General's Office File No. 66 1-95-0126. National Oceanic and Atmospheric Administration. January 26, 1996.

NOAA. 2002. *Corrective Action Plan, UST Removals, Selected U.S. Government Sites*, St Paul Island, Alaska. August 13, 2002.

NOAA. 2003. *Draft UST Removal and Corrective Action Report TPA Site 9-H Former Alaska Dormitory, St. Paul Island, Alaska*. March 31, 2003

For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

9/16/04
Date

Approvals: In accordance with Paragraph 59 of the Two Party Agreement, this is to confirm that all corrective action has been completed at the Former Alaska Dormitory, TPA Site 9h/Site 23, in accordance with the Agreement and that no plan for further remedial action is required.

For the Alaska Department of Environmental Conservation

Louis Howard
Alaska Department of Environmental Conservation
Remedial Project Manager

9/17/04
Date

Tables and Figures

Table 1. Petroleum Hydrocarbon Analytical Data Summary for Confirmation Samples from the Former Alaska Dormitory- TPA 9h/Site 23, St. Paul Island, Alaska

Sample #	Sample Depth (feet)	GRO (AK101)	Benzene (EPA 8021B)	Toluene (EPA 8021B)	Ethylbenzene (EPA 8021B)	Total Xylene (EPA 8021B)	DRO (AK102)	RRO (AK103)
SNPT46DMSS01	8	64.2	ND(0.159)	1.580	0.794	5.640	**13,900**	1,480
SNPT46DMSS02	8	44.2	ND(0.0137)	0.189	0.171	1.101	**3,620**	ND(257)
SNPT46DMSS03	8	76.6	ND(0.0131)	ND(0.0876)	0.13	1.909	**4,440**	ND(231)
SNPT46DMSS04	8	86.7	ND(0.0296)	ND(0.118)	0.126	1.786	**3,340**	ND(235)
SNPT46DMSS05	6	ND(2.86)	ND(0.0143)	ND(0.0571)	ND(0.0571)	ND(0.0571)	ND(21.8)	ND(21.8)
SNPT46DMSS06	7	ND(3.61)	ND(0.0181)	ND(0.0723)	ND(0.0723)	ND(0.0723)	ND(21.8)	ND(21.8)
SNPTB01	Trip blank	ND(2.58)	ND(0.0129)	ND(0.0516)	ND(0.0516)	ND(0.0516)	NA	NA

Notes:
1. analytical results in milligrams per kilogram.
2. ND = non-detect. The number provided in parentheses is the practical quantitation limit.
3. NA = not analyzed
4. **Bold** text indicates analytical result above the applicable cleanup level.

Table 2. Polynuclear Aromatic Hydrocarbon Analytical Data Summary for Confirmation Samples from the Former Alaska Dormitory - TPA 9h/Site 23, St. Paul Island, Alaska

Sample #	Sample Depth (feet)	Benzo(a) Anthracene	Benzo(a) pyrene	Benzo(b) Fluoranthene	Benzo(k) fluoranthene	Chrysene	Dibenzo (a,h) anthracene	Fluorene	Indeno (1,2,3-c,d) pyrene	Naphthalene
SNPT46DMSS01	8	ND(6.55)	ND(6.55)	ND(6.55)	ND(13.1)	ND(6.55)	ND(9.17)	ND(6.55)	ND(6.55)	ND(9.17)
SNPT46DMSS02	8	ND(0.646)	ND(0.646)	ND(0.646)	ND(1.29)	ND(0.646)	ND(0.905)	ND(0.646)	ND(0.646)	ND(0.905)
SNPT46DMSS03	8	ND(0.582)	ND(0.582)	ND(0.582)	ND(1.16)	ND(0.582)	ND(0.815)	ND(0.582)	ND(0.582)	ND(0.815)
SNPT46DMSS04	8	ND(0.592)	ND(0.592)	ND(0.592)	ND(1.18)	ND(0.592)	ND(0.828)	ND(0.592)	ND(0.592)	ND(0.828)
SNPT46DMSS05	6	ND(0.546)	ND(0.546)	ND(0.546)	ND(1.09)	ND(0.546)	ND(0.764)	ND(0.546)	ND(0.546)	ND(0.764)
SNPT46DMSS06	7	ND(0.544)	ND(0.544)	ND(0.544)	ND(1.09)	ND(0.544)	ND(0.762)	ND(0.544)	ND(0.544)	ND(0.762)
SNPTB01	Trip blank	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
1. analytical results in milligrams per kilogram.
2. ND = non-detect. The number provided in parentheses is the practical quantitation limit (PQL).
3. Shading indicates instances when the PQL is higher than applicable cleanup limits.
4. NA = not analyzed

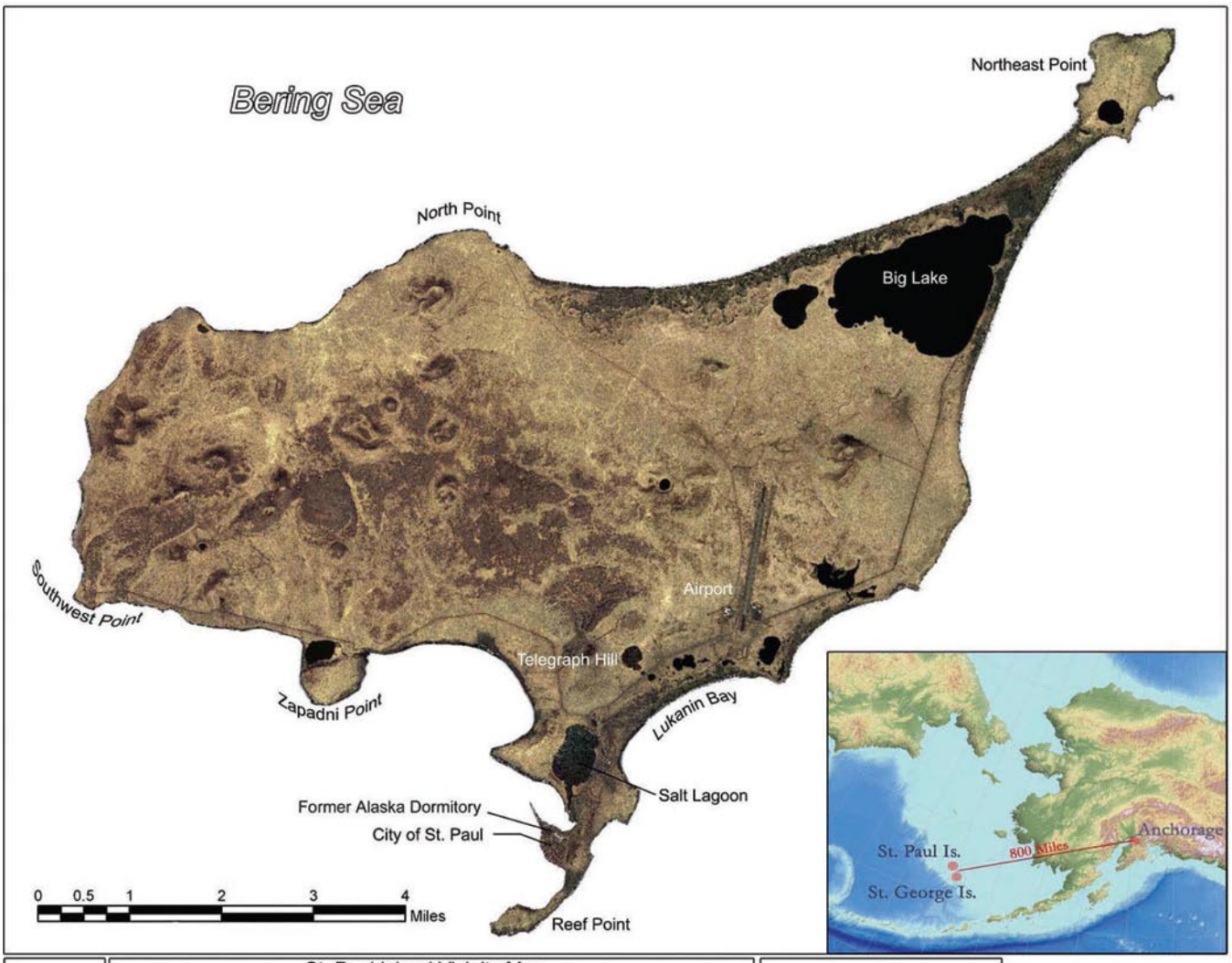

Figure 1	St. Paul Island Vicinity Map Former Alaska Dormitory NOAA Site 23/TPA Site 9h St. Paul Island, Alaska	Source: Ikonos Satellite Imagery, 2001	Pribilof Islands Restoration Project

Figure 2	Legal Property Description Map Former Alaska Dormitory NOAA Site 23/TPA Site 9h St. Paul Island, Alaska	Sources: BLM Tracts (BLM MTPs 1983), TPA 9h Boundary (NOAA GIS 2004), Aerial Photo (Aeromap US 1996).

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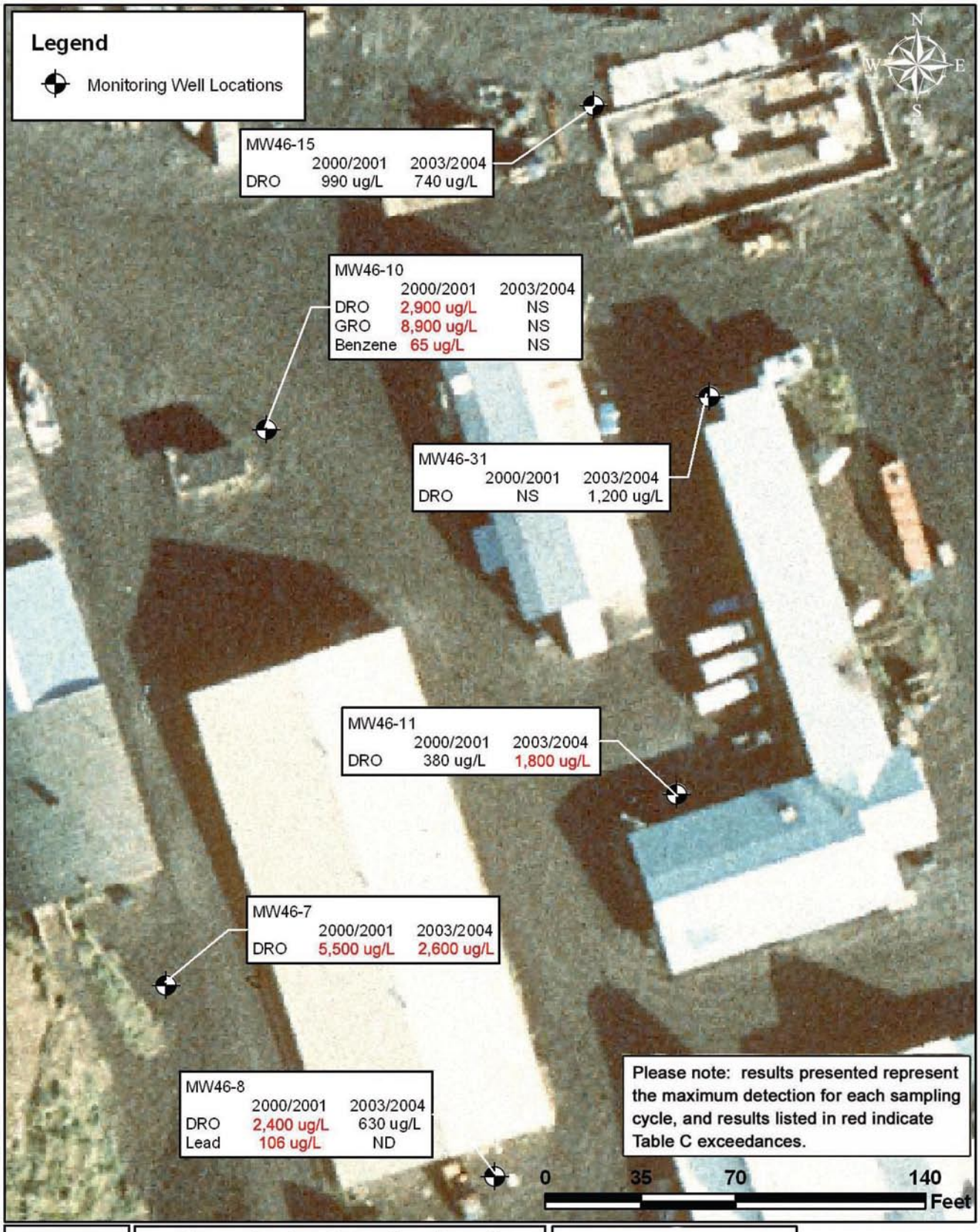

Figure 3	Groundwater Sampling Results Former Alaska Dormitory NOAA Site 23/TPA Site 9h St. Paul Island, Alaska	Sources: Well Locations (NOAA GPS 2004), Aerial Photo (Aeromap US 1996).

Pribilof Islands Restoration Project

Figure 4. General view, UST site at Former Alaska Dormitory

Figure 5. Excavator exposing 2000-gallon UST

Figure 6. Gray soil containing petroleum contamination

Figure 7. Excavation containing 2 feet of groundwater

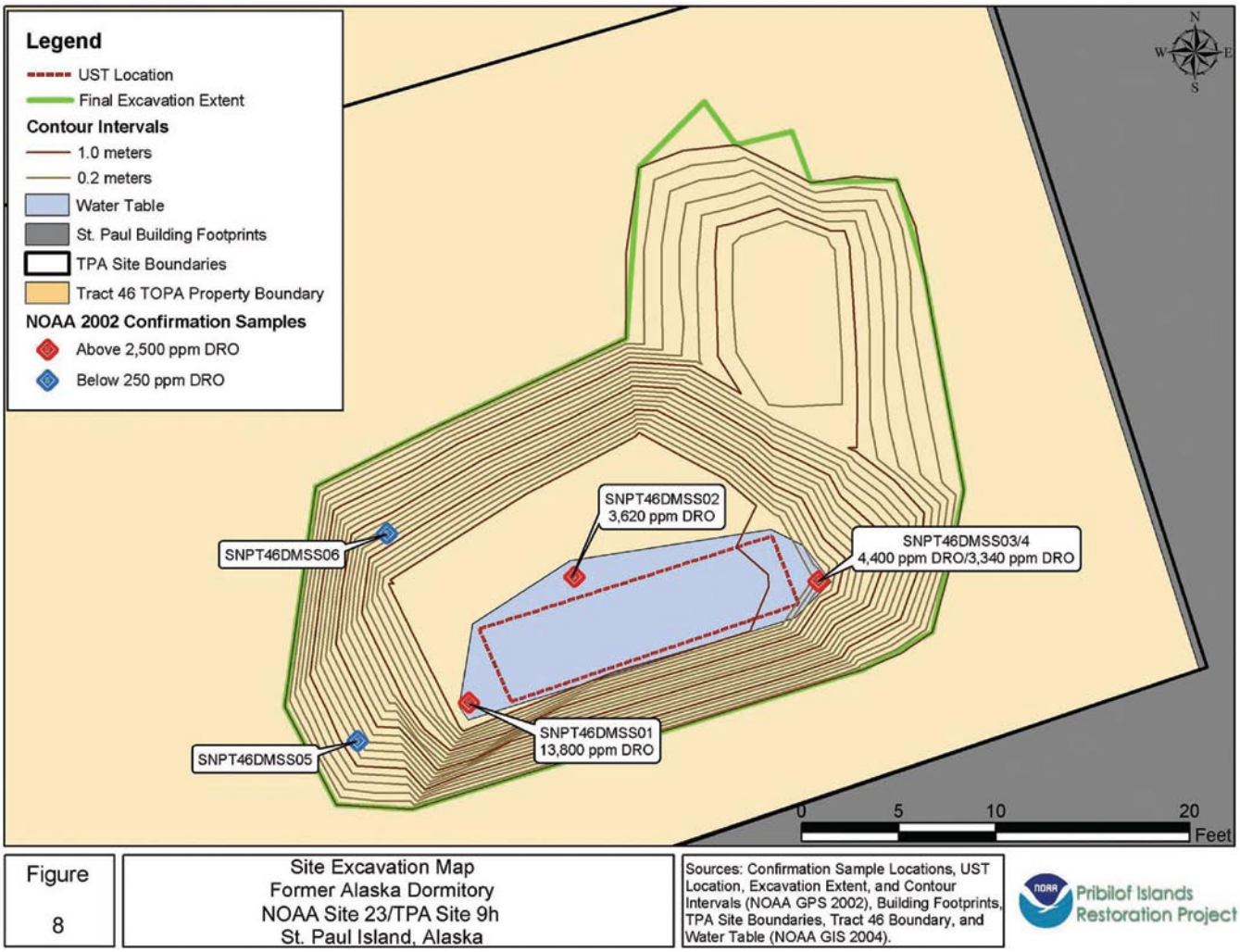

Figure 8

Site Excavation Map
Former Alaska Dormitory
NOAA Site 23/TPA Site 9h
St. Paul Island, Alaska

Sources: Confirmation Sample Locations, UST Location, Excavation Extent, and Contour Intervals (NOAA GPS 2002), Building Footprints, TPA Site Boundaries, Tract 46 Boundary, and Water Table (NOAA GIS 2004).

Pribilof Islands Restoration Project

NOAA Site 24
TPA Site 9i: E-Shop/Radio Building and Duplex

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Letter from Louis Howard to John Lindsay RE: Request for Corrective Action at Duplex 109, St. Paul Island. Dated December 2, 2005.....643

Subject: Review and Approval of *Corrective Action Plan for the Removal of Lead Contaminated Soil at Teacher Houses 101 and 103, and the Duplex, Lead Contaminated Soils Site (NOAA Site 60, Non-TPA)*, St. Paul Island, Alaska, dated May 15, 2006. Dated May 15, 2006.....645

Request for Conditional Closure
TPA Site 9i, NOAA Site 24 - Duplex Building and E-Shop
St. Paul Island, Alaska

Request for Conditional Closure

Site:
The Duplex Building and Former Electrical Shop (E-Shop), also known as Two Party Agreement (TPA) Site 9i and National Oceanic and Atmospheric Administration (NOAA) Site 24.

Location:
St. Paul Island, Alaska is approximately 800 miles southwest of Anchorage in the Bering Sea. On St. Paul Island, the Duplex Building and Former E-Shop are situated east of Village Hill in the central portion of the city of St. Paul east the community grocery store (57°07'21'' latitude, 170°16'50" longitude). The building and immediately adjacent lands are located on U.S. Government property in Tract 46 (Figures 1, 2, and 3).

Legal Description: Lots 4 and 5, Block 20, U.S. Survey No. 4943, Alaska, Tract "A", St Paul Townsite, accepted by the Bureau of Land Management August 2, 1968. The sites are owned by NOAA. However, Tanadgusix Corporation (TDX) occupies the Duplex Building, and the Tribal Government of St. Paul (Tribe) occupies the Former E-Shop.

Type of Release:
The Duplex Building is a residential structure, with heating oil underground storage tanks (USTs) formerly located along the east and west walls supplying each unit. When removed by NOAA in 2003, no release was observed in or around the location of the east UST. Upon removal of the west tank, petroleum contaminated soil was observed underneath the tank, indicating a release had occurred. The Former E-Shop had formerly been a powerhouse, with fuel oil supplied by above ground storage tanks (ASTs) some time after 1911. In 2000, NOAA removed a small 55 gallon (gal.) drum used as a UST from the site. NOAA found petroleum contamination at that location and in other nearby locations sampled in 2001 (NOAA 2003). On June 17, NOAA learned that a vandal had disconnected the fuel line leading from an approximate 75 gal. AST to the Head Start Program building (E-Shop) operated by the Tribe (Figure 7). NOAA verbally reported the incident on June 17 to ADEC, then followed the same day with a written notification via a completed Alaska Department of Environmental Conservation (ADEC) "Oil and Hazardous Substances Spill Notification" form (NOAA 2004a). This activity resulted in a presumptive 75 gal. spill of Jet A fuel.

History:
The Duplex Building and Former E-Shop are situated between Bartlett Boulevard (Blvd.) and Sandy Lane in the east portion of the City of St. Paul. Sometime after 1951, the Duplex Building was moved to this site from its original location on the easterly side of what is now Bartlett Blvd., and two USTs were installed at that time to store fuel for heating purposes (NOAA 2003). This building originally served as quarters for a Navy radio station complex.

The Former E-Shop was originally constructed in 1911, when it was used as the powerhouse for a former Navy radio station complex. On August 10, 1937, the radio station complex was transferred from the DoD to the Department of Commerce. At that time, the powerhouse was fueled by an aboveground storage tank (AST) farm that was removed at some later date. An UST was subsequently installed to provide fuel oil to the building. Since that time, the building has been converted for use as a Head Start program school for children on St. Paul Island (NOAA 2003).

In 2003, DoD identified the former Navy electrical shop as a Formerly Used Defense Site (FUDS) (DOD 2003). Public Law 106-562 prohibits NOAA from undertaking any cleanup actions at FUDS on the Pribilof Islands.

Following the NOAA removal of the USTs at the Duplex Building in 2003, the occupant (TDX) installed 250 gal. ASTs in their place (Figure 7). The Head Start Program building (E-Shop) is currently serviced by an approx. 500 gal. AST located on the southeast corner of the building, and an approx. 75 gal. AST on the northwesterly corner of the building (Figure 7).

Summary of Site Investigations:
In 2000 and 2001, Columbia Environmental Sciences, Inc. (CESI) advanced soil borings and installed and sampled groundwater monitoring wells in the vicinity of the Duplex Building and Former E-Shop (CESI 2001). Additionally, IT Alaska Corporation conducted groundwater sampling in 2001 (IT Alaska Corporation 2002). Analytical data for soil samples collected during these events revealed the presence of petroleum contamination including diesel-range organic compounds (DRO) and residual range organic compounds (RRO) at maximum concentrations of 1,500 milligrams per kilogram (mg/kg) and 15,000 mg/kg, respectively. The area of contamination was centered between the Duplex Building and Former E-Shop; no contamination was identified on the east side of the Duplex Building. An UST in the form of a 55-gallon drum was removed from the northeast corner of the Former E-Shop in 2000; analytical data for a soil sample collected from the bottom of the excavation at refusal revealed the presence of DRO at a concentration of 480 mg/kg and RRO at a concentration of 4,800 mg/kg (CESI 2001).

CESI installed one groundwater monitoring well (MW46-20) upgradient of the Duplex Building and Former E-Shop, and five monitoring wells (MW46-13, MW46-17, MW46-18, MW46-19, and MW46-26) downgradient (Figure 4). Analytical data for groundwater samples collected between September 2000 and September 2001 indicated the presence of DRO (up to 12,000 micrograms per liter [µg/L]) at concentrations above the cleanup criterion (1,500 µg/L) in monitoring wells MW46-13, MW46-18, and MW46-19 located downgradient of the Duplex Building. In addition, analyses detected gasoline range organics (GRO) at concentrations above the cleanup criterion (1,300 µg/L) in monitoring well MW46-19. Concentrations of other analytes among all monitoring wells in the vicinity of the Duplex Building and Former E-Shop were below cleanup levels (CESI 2001).

Cleanup of the petroleum contamination was conducted during July and August of 2003. NOAA collected and analyzed confirmation samples for several organic constituents and lead as described below in the Summary of Cleanup Actions section. Results of the confirmation samples indicated high levels of lead at 2 samples (Table 1). In 2004, following a request by the tribe, NOAA collected additional samples around the Head Start building (E-Shop) and analyzed them for lead on-site using an X-ray Fluorescence meter (XRF). All twelve samples analyzed detected lead concentrations well below the 400 mg/kg cleanup level (Table 2).

NOAA examined soil lead data from other petroleum contaminated sites on St. Paul and found that there was no association between high lead levels and high petroleum levels. Presumptively, NOAA concluded that the lead contamination found at depth at the E-Shop was associated with FUDS activities (NOAA 2004b). Activities at the Former E-Shop leading to lead contamination could include battery disposal, battery acid spillage, or soldering.

Summary of Applied Cleanup Levels:
NOAA employed ADEC Method Two cleanup criteria, discussed at 18 AAC 75.341(c) (ADEC 2000). Alternative cleanup levels were also applied for some compounds. For benzene, under the TPA, NOAA had the option to cleanup to the less stringent State of Alaska cleanup level in effect in 1991 (ADEC 1991). Additionally, NOAA proposed and ADEC approved the use of alternative cleanup levels under 18 AAC 75.345 and 18 AAC 75.350, commonly referred to as the Ten Times Rule (ADEC 2002, Mitretek Systems 2002). According to these regulations, if groundwater beneath a site contains contaminant concentrations above the cleanup levels provided in ADEC Table C, then the soil may be remediated to levels ten times higher than those provided in Method Two Tables B1 and B2 for the migration to groundwater pathway for those contaminants found in groundwater at concentrations above the cleanup levels provided in ADEC Table C; however, if the inhalation or ingestion pathway values are more stringent than the migration to groundwater pathway, then the more stringent value is to be applied. ADEC uses 15 feet below ground surface (bgs) to define subsurface soil to which residents will have a reasonable potential to be exposed through the inhalation or ingestion pathways (ADEC 2000; 18 Alaska Administrative Code 75.340 (j)(2)). Therefore NOAA is not obligated to excavate contaminated soil occurring at depths

deeper than 15 feet to address the inhalation and ingestion pathways. Cleanup criteria were applied to the maximum extent practicable (18 AAC 75.325 (f), 18 AAC 75.990).

Summary of Cleanup Actions:

As described in the Corrective Action Plan (NOAA 2004b), excavation activities for the Duplex Building and Former E-Shop commenced on July 29, 2003, and were completed on August 4, 2003. The two 1,000-gallon USTs at the Duplex Building were removed after they had been uncovered and the contents pumped into a tanker truck for future use. Initial areas of excavation were selected based on the UST locations and suspected contamination identified during previous site investigations. Screening analyses, including thin layer chromatography (TLC) screening sample analyses, and visual and olfactory observations determined the extent of excavation. Also, the extent of soil excavation was driven by Method Two cleanup levels, and not the alternative cleanup levels affored under the Ten Times Rule, unless obstructions prevented further excavation.

Following UST removal, the excavation along the east side of the Duplex Building was advanced to a maximum depth of 7 feet bgs (Figure 3). No evidence of contamination was observed either in the excavation or in soil removed from the excavation. NOAA collected five confirmation samples from the excavation for laboratory analyses; target analytes included benzene, toluene, ethylbenzene, and total xylenes (BTEX), DRO, GRO, RRO, select polynuclear aromatic hydrocarbons (PAHs), and lead (Figure 4). None of these samples exceeded the Method Two cleanup levels (Tables 1 and 3).

During this corrective action, NOAA removed approximately 50 CY of soil from the excavation along the east side of the Duplex Building.

The excavation along the west side of the Duplex Building focused around the UST in that area (Figure 3). The building and the presence of numerous utility lines, several of which could not be positively identified as active or inactive, restricted the extent of excavation. Lines that were encountered included multiple water lines and a junction box, a sewer line, and a phone line, as well as other unidentified utility lines. The excavation was advanced to a maximum depth of 7.5 feet bgs and was expanded to the west based on TLC screening sample results; due to the presence of utility lines, the depths of excavation generally became shallower as the excavation progressed west toward the Former E-Shop. Further excavation with available equipment was not technically feasible. NOAA collected seven confirmation samples from the excavation for laboratory analyses. Target analytes included BTEX, DRO, GRO, RRO, select PAHs, and lead (Figure 4). DRO concentrations varied from not detected to 840 mg/kg among the seven samples; four of the seven samples (SP24-CS-001-075, SP24-CS-003-020, SP24-CS-014-060, and SP24-CS-015-040) collected from this area exceeded the ADEC Method Two cleanup level of 250 mg/kg, but none of these samples exceeded the alternative cleanup level of 2,500 mg/kg. In addition, one sample (SP24-CS-003-020) contained lead at a concentration of 627 mg/kg, exceeding the ADEC Method Two cleanup level of 400 mg/kg; all other lead concentrations were below the ADEC Method Two cleanup level. Concentrations for all other analytes were below the Method Two criteria.

During this corrective action, NOAA removed approximately 70 CY of soil from the west side of the Duplex Building.

In conjunction with activities at the Duplex Building, personnel conducted excavation activities at the Former E-Shop based on analytical data from previous site investigations focused at the northeast corner and the southeast corner UST locations (Figures 3 and 4). The excavation at the northeast corner of the Former E-Shop was conducted in the area of a former UST (55-gallon drum) that had been removed in 2000. The excavation was advanced to a maximum depth of 10 feet bgs; although evidence of contamination was present along the east wall, the excavation could not be expanded in that direction due to the presence of an active phone line, which was broken and repaired during the corrective action, and the likely presence of an active water line. An active electrical line was also present near the northern boundary of the excavation (Figure 4). Three confirmation samples and two field duplicate samples were collected from the excavation at the northeast corner of the Former E-Shop for laboratory analyses, including BTEX, DRO, GRO, RRO, select PAHs, and lead (Figure 4). These samples indicated DRO concentrations that varied from not detected to 2,700 mg/kg (Table 1). One of the three confirmation samples (SP24-CS-013-050) collected from this area exceeded both the ADEC Method Two cleanup level of 250 mg/kg and the alternative cleanup level of 2,500 mg/kg, however no further removal is practicable at this loca-

tion due to the proximity of a buried water line (Figure 4); all other DRO concentrations were below the ADEC Method Two cleanup level. No other contaminants were identified at concentrations above the soil cleanup levels (Table 3).

During this corrective action, NOAA removed approximately 20 CY of soil from the northeast corner of the Former E-Shop.

Excavation at the southeast corner of the Former E-Shop was conducted beneath an active AST (temporarily moved) to investigate contamination identified during a previous investigation (Figures 3 and 4). During excavation, numerous copper rods were uncovered, presumably grounding rods associated with activities at the former radio station complex. The excavation was advanced to a maximum depth of approximately 7 feet bgs. Further excavation in this area was restricted because of the building to the west, and the presence of utility lines including a previously unidentified, but active water line at the north end of the excavation, a phone line along the east edge of the excavation, and an unknown pipeline along the south edge of the excavation (Figure 4). The active water line along the north edge of the excavation was inadvertently ruptured during excavation activities, but was subsequently repaired. Five confirmation samples and two field duplicate samples were collected from the excavation for laboratory analyses including BTEX, DRO, GRO, RRO, select PAHs, and lead (Figure 4).

Confirmation samples collected from the excavation at the southeast corner of the Former E-Shop indicated DRO concentrations varied from 200 mg/kg to 620 mg/kg; three of the five samples (SP24-CS-002-050, SP24-CS-016-070, and SP24-CS-019-050) exceeded the ADEC Method Two cleanup level of 250 mg/kg, but none of the samples exceeded the alternative cleanup level of 2,500 mg/kg. In addition, one sample (SP24-CS-002-050) contained lead at a concentration of 4,090 mg/kg, exceeding the ADEC Method Two cleanup level of 400 mg/kg; all other lead concentrations were below the ADEC Method Two cleanup level. No other analytes were identified at concentrations above the soil cleanup levels.

During this corrective action, NOAA removed approximately 30 CY of soil from the excavation at the southeast corner of the Former E-Shop.

The June/July 2004 spill incident at the Head Start Program building (E-Shop) was quickly followed by a time critical removal action performed by NOAA and the Tribe. NOAA and the Tribe removed approximately 15 CY of contaminated soil from the site. Various obstructions limited the excavation within Parcel 6F. Obstructions included the building concrete footer, and buried telephone and electric lines. Contamination from this incident spread onto adjacent property owned by Mr. John R. Merculief. Obstructions, including electrical and possible telephone, sewer and water lines limited the immediate excavation on the adjacent property. NOAA contends that the contamination on the private property adjacent to Parcel 6F bears the responsibility of the Tribe.

Recommended Action:

In accordance with paragraph 59 of the Two Party Agreement (NOAA 1996), and in recognition that NOAA is precluded by Public Law 106-562 from conducting restoration activities at FUDS, and that NOAA is not responsible for that portion of the June/July 2004 Jet A fuel release that migrated onto an adjacent private property, NOAA requests written confirmation that NOAA completed all appropriate corrective action, to the maximum extent practicable, at the Duplex Building and E-Shop, TPA Site 9i, NOAA Site 24 in accordance with the Agreement and that 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 contamination that remains does not protect human health, safety, or welfare, or the environment.

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IT Alaska Corporation. 2002. *Draft Annual Groundwater Monitoring Report 2001, St. Paul Island, Alaska*. March.

Mitretek. 2002. *Groundwater Use and Classification in the Vicinity of Tract 46, St. Paul Island, Pribilof Islands, Alaska*. Prepared by Mitretek Systems, for the National Oceanic and Atmospheric Administration. June 5.

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NOAA. 2004a. *Oil and Hazardous Substances Spill Notification, Old Village St. Paul Island Head Start Building*. June 17.

NOAA. 2004b. *Draft Corrective Action Report Site 24/TPA Site 9i – Duplex Building and Former E-Shop, St. Paul Island, Alaska*. June 4.

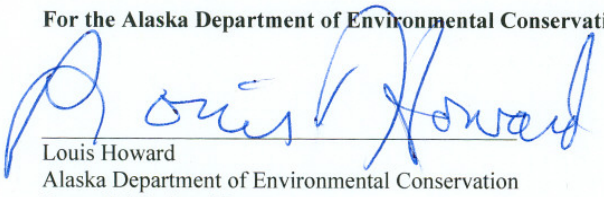
For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

1/21/05
Date

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 Duplex Building and Former Electrical Shop, TPA Site 9i/NOAA Site 24, in accordance with the Agreement and that no further remedial action is required 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

2/1/05
Date

Figures

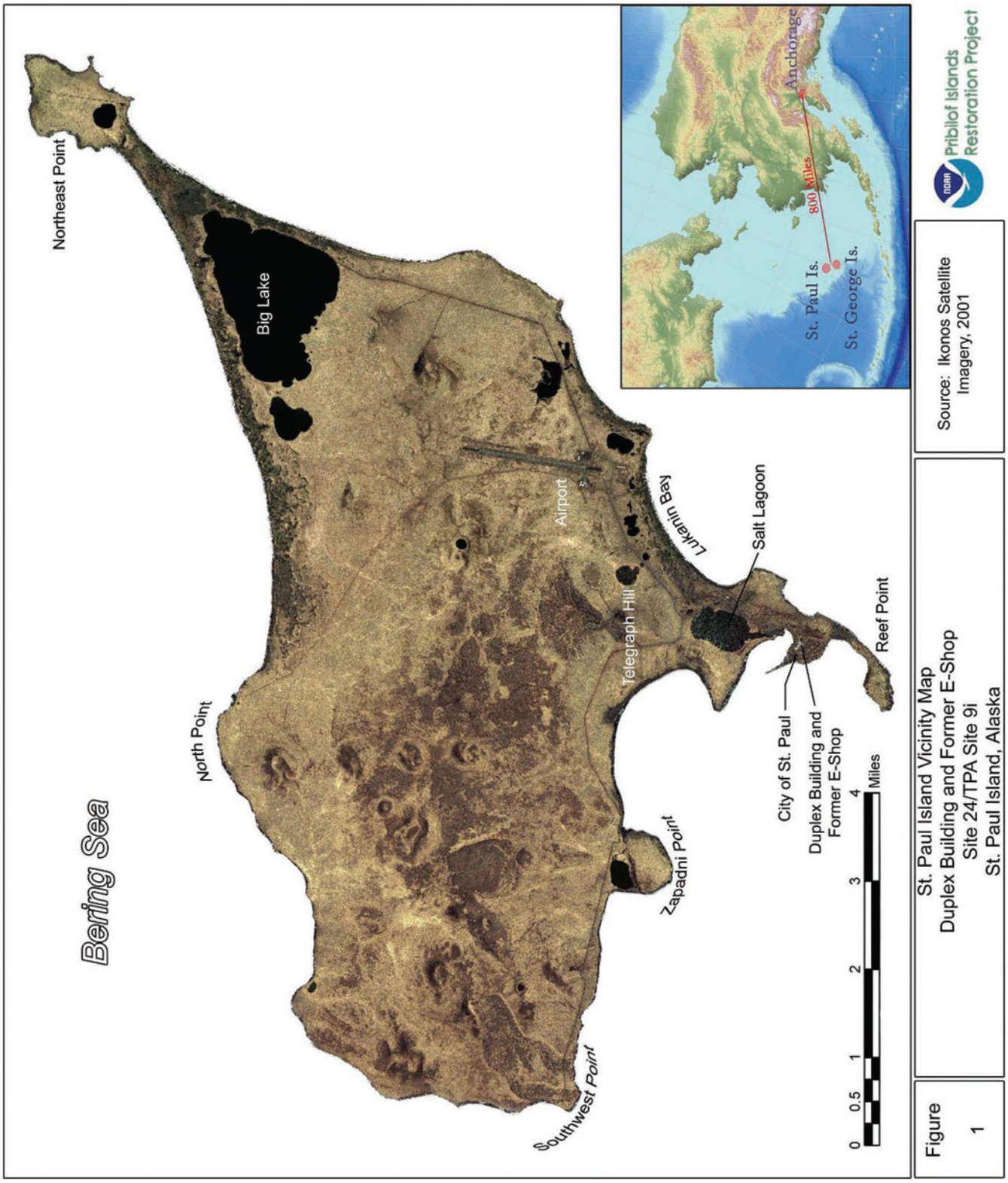

Bering Sea
Northeast Point
Big Lake
North Point
Airport
Telegraph Hill
Lukanin Bay
Salt Lagoon
Reef Point
City of St. Paul
Duplex Building and Former E-Shop
Zapadni Point
Southwest Point
0 0.5 1 2 3 4 Miles
Anchorage
800 Miles
St. Paul Is.
St. George Is.
Pribilof Islands Restoration Project
Source: Ikonos Satellite Imagery, 2001
Figure 1
St. Paul Island Vicinity Map
Duplex Building and Former E-Shop
Site 24/TPA Site 9i
St. Paul Island, Alaska

Figure 2	Legal Property Description Map Duplex and Former E-Shop Site 24/TPA Site 9i St. Paul Island, Alaska	Sources: BLM Tract (BLM MTPs 1983), TPA 9i Boundary (NOAA GIS 2004), Aerial Photo (Aeromap US 1996).

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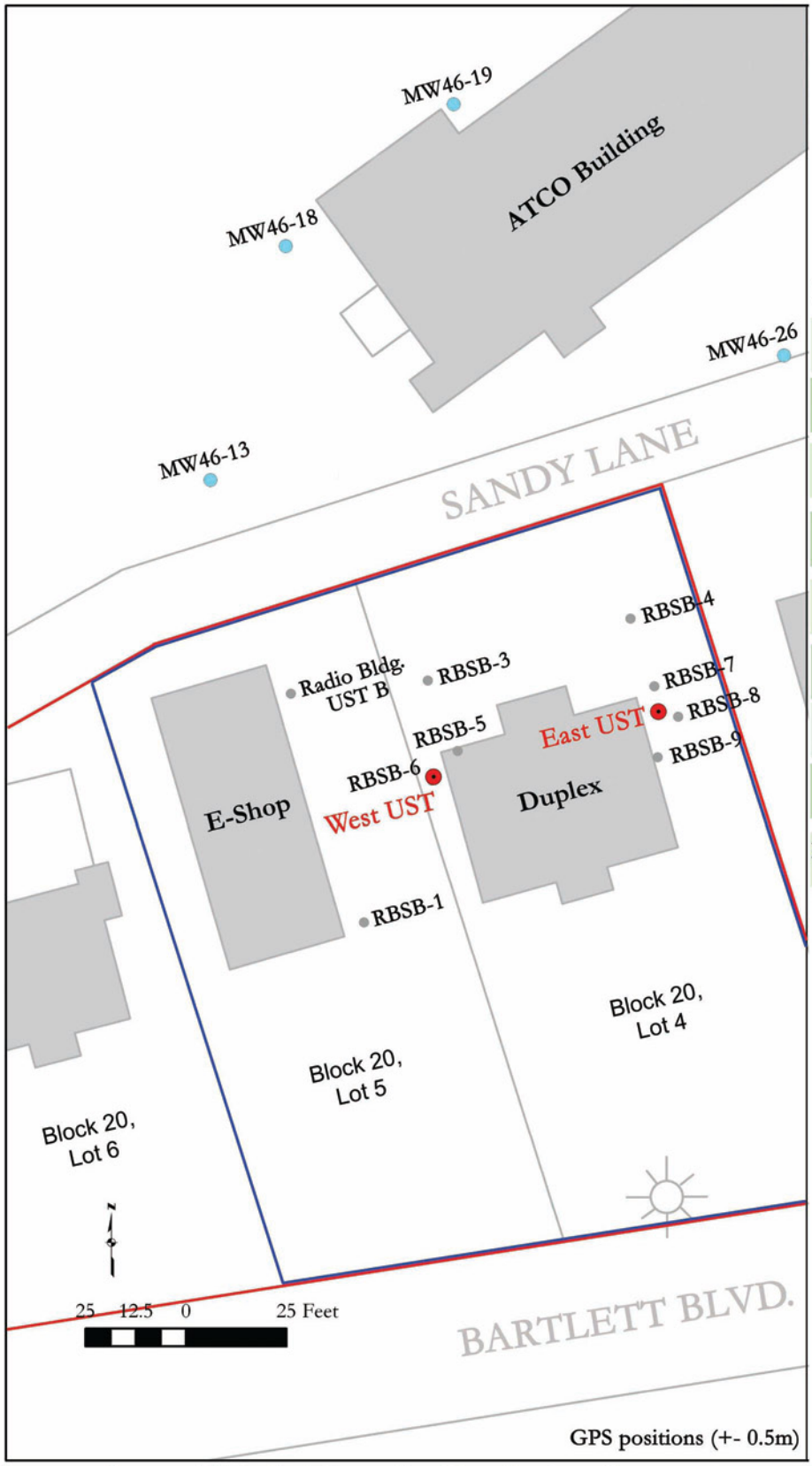

Sample Location	Depth Interval (feet bgs)	DRO (PPM)	RRO (PPM)
RBSB-1	6-8	260	400
RBSB-3	6-8 10-12	<10 29	<50 150
RBSB-4	8-10 10-12	11 <10	11 <10
RBSB-5	2-4 6-8	1500 830	15000 8700
RBSB-6	4-6 9-11	130 310	1100 260
RBSB-7	8-10	<10	<50
RBSB-8	6-8 10-12	12 <10	12 <50
RBSB-9	6-8 10-12	<10 13	<50 13
Radio Bldg UST B	5-6	480	4400

TPA Site 9i Boundary (NOAA)

Parcel 6f TOPA Property (BLM) Housing and Airport Road Shop

Figure 3	Historical Sampling Results Duplex Building and Former E-Shop Site 24/TPA Site 9i St. Paul Island, Alaska	Sources: Boundaries and Buildings (Hart Crowser 1997), Sample Locations and Wells (NOAA Pribilof Project Database 2004), USTs are approximate.

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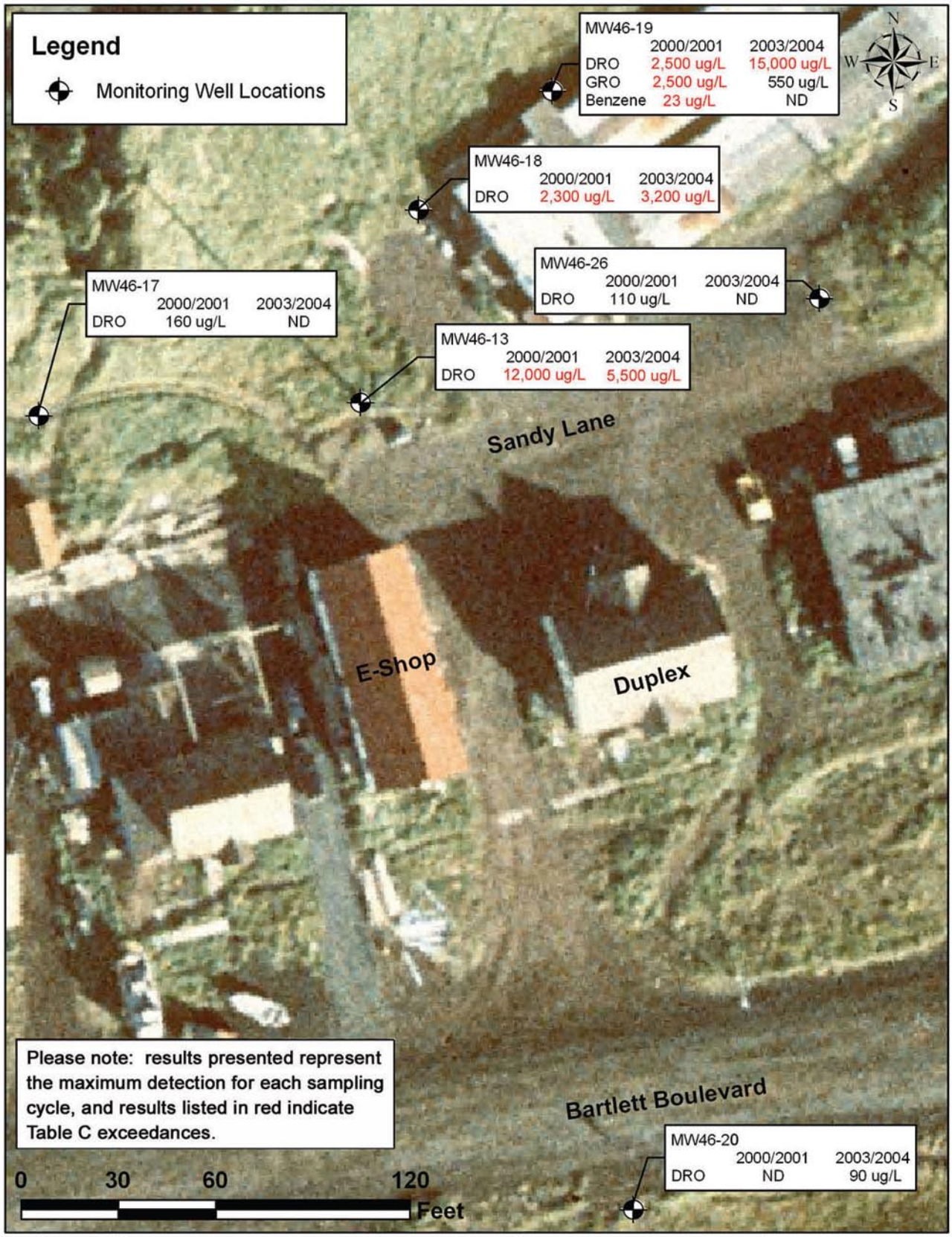

Figure 4	Groundwater Sampling Results Duplex Building and Former E-Shop Site 24/TPA Site 9i St. Paul Island, Alaska	Sources: Monitoring Well Locations (NOAA GPS 2003), Aerial Photo (Aeromap US 1996).

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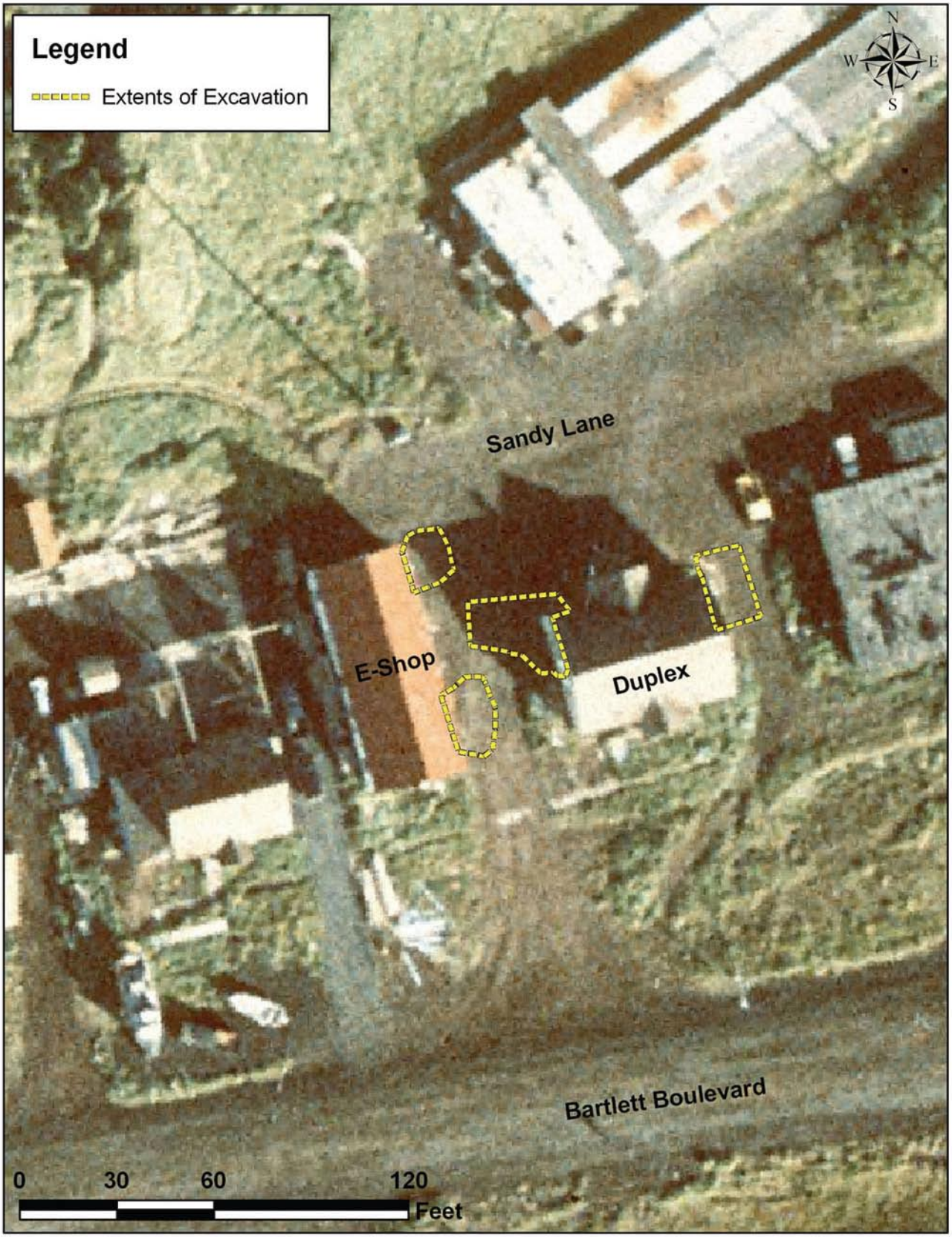

Figure 5	Areas of Excavation Duplex Building and Former E-Shop Site 24/TPA Site 9i St. Paul Island, Alaska	Sources: Excavation Extents and Well Locations (NOAA GPS 2003), Aerial Photo (Aeromap US 1996).	Pribilof Islands Restoration Project

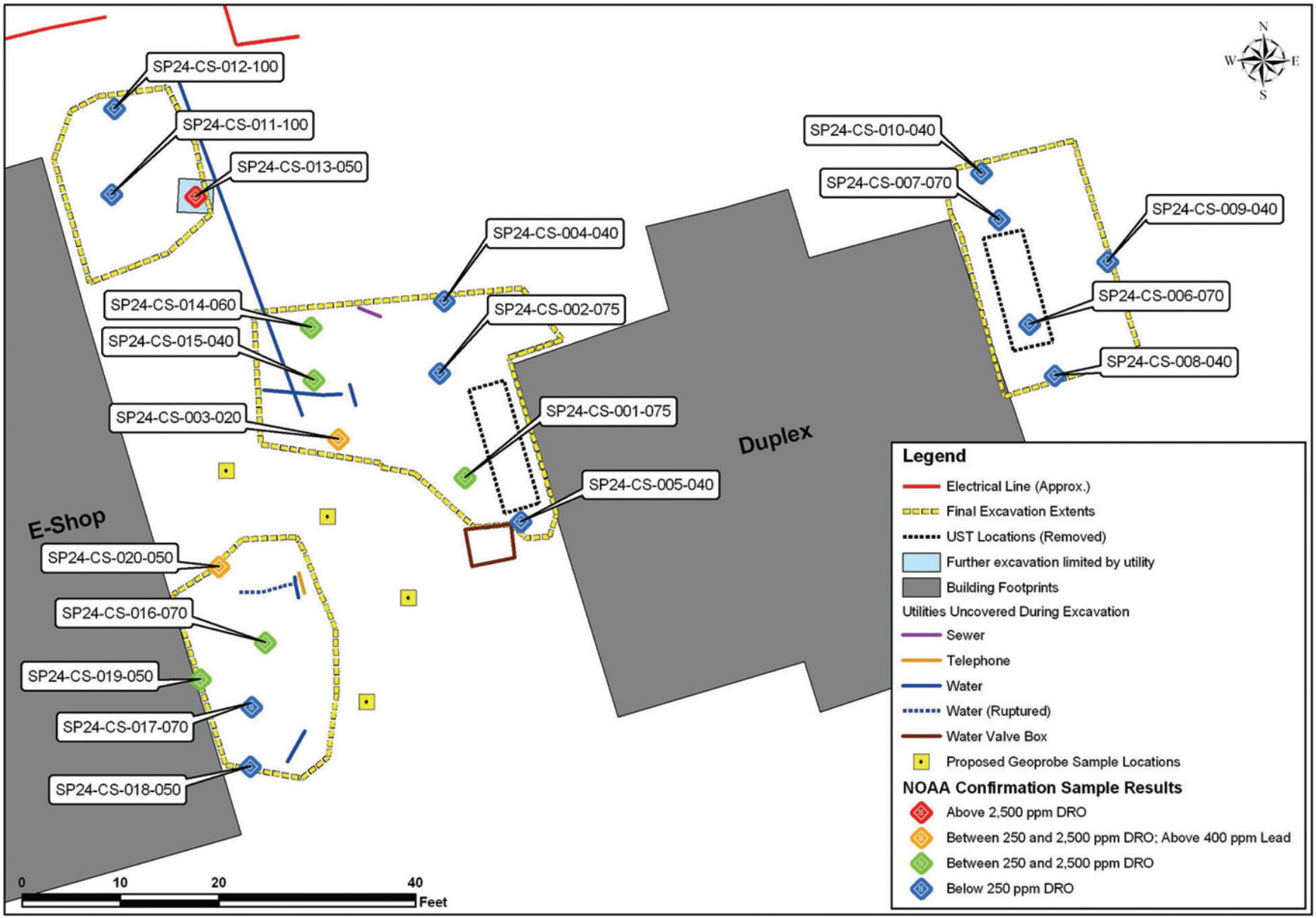

Figure 6	Sampling Location Map Duplex Building and Former E-Shop Site 24/TPA Site 9i St. Paul Island, Alaska	Sources: Excavation Extents, Confirmation Samples, UST and Utility Locations (NOAA GPS, 2003), Building Locations (NOAA GIS, 2003), Proposed Geoprobe Sample Locations (NOAA GIS 2004).

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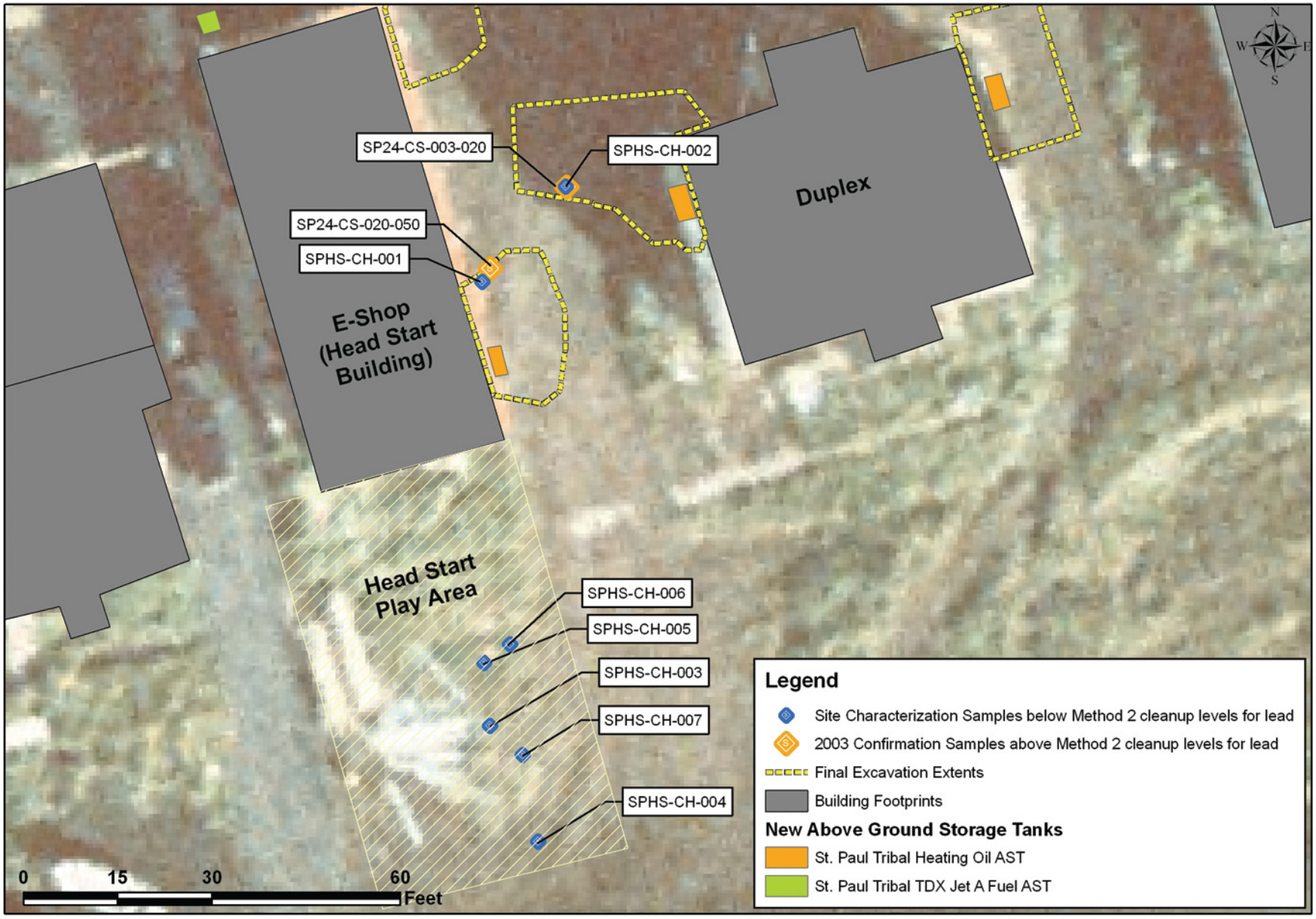

Figure 7	X-Ray Fluorescence Site Characterization Sampling Location Map Duplex Building and Former E-Shop Site 24/TPA Site 9i St. Paul Island, Alaska	Sources: Excavation Extents and Confirmation Samples (NOAA GPS 2003), Building Locations (NOAA GIS 2003), Site Characterization Sample Locations (NOAA GPS 2004), Aerial Photo (Aeromap US 1996).

Pribilof Islands Restoration Project

Tables

Table 1: Analytical Data Summary - BTEX, GRO, DRO, RRO, And Lead Site 24/TPA Site 9i - Duplex Building And Former E-Shop, St. Paul Island, Alaska

Sample Number	Sample Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Total Xylenes (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	RRO (mg/kg)	Lead (mg/kg)
TPA Site 9i Confirmation Samples									
		Duplex Building							
SP24-CS-001-075	7.5	0.12 U	0.12 U	0.12 U	0.12 U	6 U	**610**	3,900	50.6
SP24-CS-002-075	7.5	0.03 U	0.03 U	0.03 U	0.03 U	2 U	10 U	50 U	1.86
SP24-CS-003-020	2	0.18 U	0.18 U	0.18 U	0.18 U	9 U	**780**	4,600	**627**
SP24-CS-004-040	4	0.04 U	0.04 U	0.04 U	0.04 U	2 U	10 U	50 U	1.86
SP24-CS-005-040	4	0.14 U	0.14 U	0.14 U	0.14 U	7 U	180	1,300	278
SP24-CS-006-070	7	0.04 U	0.04 U	0.04 U	0.04 U	2 U	10 U	50 U	1.90
SP24-CS-007-070	7	0.02 U	0.02 U	0.02 U	0.02 U	1 U	58	120	30.6
SP24-CS-008-040	4	0.03 U	0.03 U	0.03 U	0.03 U	2 U	10 U	50 U	2.89
SP24-CS-009-040	4	0.04 U	0.04 U	0.04 U	0.04 U	2 U	10 U	50 U	2.87
SP24-CS-010-040	4	0.03 U	0.03 U	0.03 U	0.03 U	2 U	150	250	2.39
SP24-CS-014-060	6	0.14 U	0.14 U	0.14 U	0.14 U	7 U	**800**	5,300	50.8
SP24-CS-015-040	4	0.26 U	0.26 U	0.26 U	0.26 U	13 U	**840**	5,100	129
		Former E-Shop							
SP24-CS-011-100	10	0.04 U	0.13	0.04 U	0.17	2 U	180	600	22.8
SP24-CS-011-250[a]	10	0.04 U	0.04 U	0.04 U	0.04 U	2 U	160	520	14.9
SP24-CS-012-100	10	0.02 U	0.02 U	0.02 U	0.02 U	1 U	10 U	50 U	1.79
SP24-CS-012-250[b]	10	0.03 U	0.03 U	0.03 U	0.03 U	2 U	10 U	50 U	2.83
SP24-CS-013-050	5	0.11 U	0.11 U	0.11 U	0.11 U	6 U	**2,700 J**	5,300	177
SP24-CS-016-070	7	0.07 U	0.07 U	0.07 U	0.07 U	4 U	**530**	440	4.51
SP24-CS-016-250[c]	7	0.05 U	0.05 U	0.05 U	0.05 U	3 U	**620**	450	9.33
SP24-CS-017-070	7	0.06 U	0.06 U	0.06 U	0.06 U	3 U	240	960	18.0
SP24-CS-017-250[d]	7	0.06 U	0.06 U	0.06 U	0.06 U	3 U	200	840	26.0
SP24-CS-018-050	5	0.07 U	0.07 U	0.07 U	0.07 U	4 U	220	430	120
SP24-CS-019-050	5	0.11 U	0.11 U	0.11 U	0.11 U	6 U	**480**	3,800	15.9
SP24-CS-020-050	5	0.08 U	0.08 U	0.08 U	0.08 U	4 U	**580**	1,800	**4,090**
Trip Blank Sample									
Trip blank	--	0.02 U	0.02 U	0.02 U	0.02 U	1 U	--	--	--
Method Two Cleanup Level[e]		*0.02*	*5.4*	*5.5*	*78*	*300*	*250*	*10,000*	*400*
Alternative Cleanup Level[f]		*0.5*[g]	*54*	*NA*	*NA*	*1,400*[h]	*2,500*	*NA*	*400*

Notes:
bold Indicates concentration above one or both cleanup levels
bgs Below ground surface
BTEX Benzene, toluene, ethylbenzene, and total xylenes
DRO Diesel-range organic compounds
GRO Gasoline-range organic compounds
mg/kg Milligram per kilogram
-- Not analyzed

NA Not available
RRO Residual-range organic compounds
TPA Two-Party Agreement
U The analyte was analyzed for, but not detected above the sample reporting limit
J The analyte was positively identified, but the numerical value is the estimated concentration; the result is considered qualitatively acceptable, but quantitatively unreliable
a Duplicate of sample number SP24-CS-011-100
b Duplicate of sample number SP24-CS-012-100
c Duplicate of sample number SP24-CS-016-070
d Duplicate of sample number SP24-CS-017-070
e Cleanup level is from Title 18 of the *Alaska Administrative Code* 75, "Oil and Hazardous Substances Pollution Control Regulations," published by the State of Alaska and amended through October 28, 2000.
f Cleanup level obtained from ADEC Method Two based on the "Ten Times Rule" applied to the migration to groundwater pathway, as discussed in Section 5.0 of the corrective action plan (National Oceanic and Atmospheric Administration [NOAA] 2003a).
g Under the TPA, NOAA is obligated to comply with the 1991 ADEC cleanup level for benzene (0.5 mg/kg).
h Cleanup level is selected based on the more stringent value associated with ingestion and inhalation pathways.

Table 2: Soil Sample Results - XRF Analysis For Lead Head Start Building (Former E-Shed), St. Paul Island

Sample	Sample ID Number	Sample Depth (bgs)	ADEC Cleanup Level (ppm)	1st Run Results (ppm)	2nd Run Results (ppm)
HS Ramp, 0" - 6"	SPHS-CH-001-005	0" – 6"	400	68	96
HS Ramp, 6" - 12"	SPHS-CH-001-010	6" – 12"	400	97.5	153
HS Driveway, 0" - 6"	SPHS-CH-002-005	0" – 6"	400	49.2	84.2
HS Driveway, 6" -12"	SPHS-CH-002-010	6" – 12"	400	BD 28	BD 26
HS 3, 0"-6"	SPHS-CH-003-005	0" – 6"	400	35.9	BD 28
HS 3, 6"-12"	SPHS-CH-003-010	6" – 12"	400	BD 27	BD 27
HS 4, 0" - 6"	SPHS-CH-004-005	0" – 6"	400	BD 30	BD 34
HS 4, 6"-12"	SPHS-CH-004-010	6" – 12"	400	BD 28	BD 33
HS 5, 0" - 6"	SPHS-CH-005-005	0" – 6"	400	BD 32	BD30
HS 5, 6" - 12"	SPHS-CH-005-010	6" – 12"	400	BD 26	BD 27
HS 6, Surface Comp	SPHS-CH-006-000	0"	400	BD 30	BD 31
HS 7, Surface Comp	SPHS-CH-007-000	0"	400	BD 34	BD 34

Notes:
ADEC Soil Cleanup Level, Residential: 400 mg/kg (400 ppm), Total Lead (Pb)
Samples Collected – Soil Exterior to Head Start Building:
Surface 12" X 12" Surface Composite
Direct Push, Subsurface Hand driven Geoprobe, Composites from 0"-6" bgs & 6"-12" bgs

Sample Preparation: Samples air dried and tested through sample bag
Analysis: Total Lead (Pb)
Analysis Period: A minimum of 60 seconds, all test runs.
Instrument Used: NITON 700 Series, XRF Spectrum Analyzer Multi-Elemental, Version 5.2
Results Units: Parts per million (ppm)
Samples taken: Wednesday, July 7, 2004
Samplers: Nir Barnea, NOAA NOS OR&R & Jeffry Rodin, USEPA Region X
Samples analyzed: Saturday, July 10, 2004
Analyzer: Jeffry Rodin, USEPA Region X
Abbreviations:
BD = below detection limit indicated
HS = Head Start Building
bgs = below ground surface

Table 3: Analytical Data Summary - Polynuclear Aromatic Hydrocarbons Site 24/TPA Site 9i - Duplex Building And Former E-Shop, St. Paul Island, Alaska

Sample Number	Sample Depth (feet bgs)	Naph-thalene (mg/kg)	Acenaph-thylene (mg/kg)	Acenaph-thene (mg/kg)	Fluorene (mg/kg)	Phenan-threne (mg/kg)	Anthracene (mg/kg)	Fluoran-thene (mg/kg)	Pyrene (mg/kg)
TPA Site 9i Confirmation Samples									
Duplex Building									
SP24-CS-001-075	7.5	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
SP24-CS-002-075	7.5	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP24-CS-003-020	2	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
SP24-CS-004-040	4	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP24-CS-005-040	4	0.050	0.050 U	0.070	0.096	0.890	0.200	0.380	0.700
SP24-CS-006-070	7	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP24-CS-007-070	7	0.005 U	0.005 U	0.005 U	0.006	0.018	0.005 U	0.005 U	0.005 U
SP24-CS-008-040	4	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP24-CS-009-040	4	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP24-CS-010-040	4	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP24-CS-014-060	6	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
SP24-CS-015-040	4	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Former E-Shop									
SP24-CS-011-100	10	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP24-CS-011-250[a]	10	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP24-CS-012-100	10	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP24-CS-012-250[b]	10	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP24-CS-013-050	5	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
SP24-CS-016-070	7	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.022
SP24-CS-016-250[c]	7	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.023
SP24-CS-017-070	7	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
SP24-CS-017-250[d]	7	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
SP24-CS-018-050	5	0.009	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP24-CS-019-050	5	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
SP24-CS-020-050	5	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Method Two Cleanup Level[e]		*43*	*NA*	*210*	*270*	*NA*	*4300*	*NA*	*1500*

Sample Number	Sample Depth (feet bgs)	Benz(a) anthracene (mg/kg)	Chrysene (mg/kg)	Benzo(b) fluoran-thene (mg/kg)	Benzo(k) fluoran-thene (mg/kg)	Benzo(a) pyrene (mg/kg)	Indeno (1,2,3- cd) pyrene (mg/kg)	Dibenzo (a,h) anthracene (mg/kg)	Benzo (g,h,i) perylene (mg/kg)
TPA Site 9i Confirmation Samples									
Duplex Building									
SP24-CS-001-075	7.5	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
SP24-CS-002-075	7.5	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP24-CS-003-020	2	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
SP24-CS-004-040	4	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP24-CS-005-040	4	0.220	0.210	0.160	0.050 U	0.180	0.051	0.050 U	0.072
SP24-CS-006-070	7	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP24-CS-007-070	7	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP24-CS-008-040	4	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP24-CS-009-040	4	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP24-CS-010-040	4	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP24-CS-014-060	6	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
SP24-CS-015-040	4	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Former E-Shop									
SP24-CS-011-100	10	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP24-CS-011-250[a]	10	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP24-CS-012-100	10	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP24-CS-012-250[b]	10	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP24-CS-013-050	5	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
SP24-CS-016-070	7	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP24-CS-016-250[c]	7	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP24-CS-017-070	7	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
SP24-CS-017-250[d]	7	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
SP24-CS-018-050	5	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP24-CS-019-050	5	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
SP24-CS-020-050	5	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Method Two Cleanup Level[e]		*6*	*620*	*11*	*110*	*1*	*11*	*1*	*NA*

Notes
bgs Below ground surface
mg/kg Milligram per kilogram
NA Not available
TPA Two-Party Agreement
U The analyte was analyzed for, but not reported above the sample reporting limit
a Duplicate of sample number SP24-CS-011-100
b Duplicate of sample number SP24-CS-012-100
c Duplicate of sample number SP24-CS-016-070
d Duplicate of sample number SP24-CS-017-070
e Cleanup level is obtained from Title 18 of the *Alaska Administrative Code 75*, "Oil and Hazardous Substances Pollution Control Regulations," published by the State of Alaska and amended through October 28, 2000.

FRANK H. MURKOWSKI, GOVERNOR

555 Cordova Street
Anchorage, AK 99501-2617
Phone: (907) 269-7578
Fax: (907) 269-7649
http://www.dec.state.ak.us/

DEPT. OF ENVIRONMENTAL CONSERVATION
DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITES PROGRAM

File No.: 2644.38.023

December 2, 2005

Mr. John Lindsay
Pribilof Project Manager
U.S. Department of Commerce, NOAA
National Ocean Service
Office of Response and Restoration
7600 Sand Point Way NE BIN C15700
Seattle, WA 98115-0070

RE: Request for Corrective Action at Duplex 108, St. Paul Island

Dear Mr. Lindsay:

The Alaska Department of Environmental Conservation (ADEC) received electronically the November 15, 2005, LBP – Risk Assessment and Asbestos Air Monitoring Report which identified lead contaminated soil present at the Duplex 108 site. The lead contamination ranged from 1,600 mg/kg (SP-108-S2) to 3,900 mg/kg (SP-108-S3), ADEC is exercising its rights under A.S. 46.03, 18 AAC 75, to require NOAA to conduct additional site assessment, remediation, and/or other necessary actions deemed appropriate by ADEC.

The unrestricted use or residential cleanup level for lead in soil is 400 mg/kg which is being exceeded at the site. ADEC is requiring NOAA to submit a corrective action plan for review and comment.

Please contact me with any questions or concerns directly at (907) 269-7552.

RECEIVED
DEC 0 5 2005

Sincerely,

Louis Howard
Project Manager
Federal Facilities Section

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1200-01-C.2.a-0982

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STATE OF ALASKA

FRANK H. MURKOWSKI, GOVERNOR

DEPT. OF ENVIRONMENTAL CONSERVATION
DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITES PROGRAM

555 Cordova Street
Anchorage, AK 99501-2617
Phone: (907) 269-7578
Fax: (907) 269-7649
http://www.dec.state.ak.us/

File No.: 2644.38.023

December 2, 2005

Mr. John Lindsay
Pribilof Project Manager
U.S. Department of Commerce, NOAA
National Ocean Service
Office of Response and Restoration
7600 Sand Point Way NE BIN C15700
Seattle, WA 98115-0070

RE: Request for Corrective Action at Duplex 109, St. Paul Island

Dear Mr. Lindsay:

The Alaska Department of Environmental Conservation (ADEC) received electronically the November 15, 2005, LBP – Risk Assessment and Asbestos Air Monitoring Report which identified lead contaminated soil present at the Duplex 109 site. The lead contamination ranged from 1,900 mg/kg (SP-109-S3) to 28,000 mg/kg (SP-109-S2), ADEC is exercising its rights under A.S. 46.03, 18 AAC 75, to require NOAA to conduct additional site assessment, remediation, and/or other necessary actions deemed appropriate by ADEC.

The unrestricted use or residential cleanup level for lead in soil is 400 mg/kg which is being exceeded at the site. ADEC is requiring NOAA to submit a corrective action plan for review and comment.

Please contact me with any questions or concerns directly at (907) 269-7552.

Sincerely,

Louis Howard
Project Manager
Federal Facilities Section

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DEC 0 5 2005

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U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Pribilof Project Office
7600 Sand Point Way N.E
Seattle, Washington 98115
Ph 206-526-6965, fax 206-526-4819

May 15, 2006

Mr. Louis Howard
Project Manager
Alaska Department of Environmental Conservation
Division of Spill Prevention and Response
Contaminated Sites Program
555 Cordova Street
Anchorage, AK 99501-2617

Subject: Review and Approval of *Corrective Action Plan for the Removal of Lead Contaminated Soil at Teacher Houses 101 and 103, and the Duplex, Lead Contaminated Soils Site (NOAA Site 60, Non-TPA)*, St. Paul Island, Alaska, dated May 15, 2006

Dear Mr. Howard:

Attached please find two hard copies and one CD containing a copy of the corrective action plan (CAP). NOAA requests your review at the earliest possible time. NOAA will finalize this CAP when in receipt of your approval.

The site within the scope of this CAP is located at three residential buildings in St. Paul village. Teacher Houses 101 and 103 reside on Village Hill, east of the City of St. Paul administrative building while the Duplex is located east of the Headstart Building. NOAA removed underground storage tanks (USTs) and petroleum contaminated soil (PCS) to the extent practicable from these locations in 2002 and 2003 as the corrective actions for NOAA Sites 24, 53, and 55. NOAA received conditional closure status from ADEC for these three UST/PCS sites in 2004 and 2005.

NOAA identified lead contamination in surface and near-surface soil along the buldings' drip lines during environmental due diligence activities associated with property transfer. NOAA suspects peeling lead-based paint (LBP) from these structures as the lead soil contamination source. Consistent with our recent discussions, NOAA Site 60 includes the lead contaminated soil at these buildings.

NOAA will characterize surface and near-surface soil along the buildings' drip lines for lead. NOAA will remove lead contaminated soil greater than the State of Alaska residential cleanup

level of 400 milligrams per kilogram, to a maximum depth of two feet below ground surface. Lead contamination deeper than two feet will not be removed, but its presence will be delineated using a visible marker such as perforated plastic, prior to backfilling lead soil excavations with clean scoria. The corrective action will involve disposing of lead contaminated soil off-island if designated a characteristic hazardous waste, or on-island by landfilling in NOAA's Tract 42 if not designated a hazardous waste. NOAA anticipates completing the corrective action at this site during the 2006 field season.

If you have any questions, please do not hesitate to contact me either in writing, or at (206) 526-4560.

Sincerely,

John A. Lindsay, Manager
Pribilof Project Office

Enclosures

cc: St. Paul RAB Members (CD only)
Leslie Simmons, ADEC
NOAA Administrative Record

NOAA and ADEC agreed that lead contaminated soil around the building drip line at this location would be addressed by NOAA Site 60 / NTPA: Lead Contaminated Soils. Accordingly, NOAA Site 24 / TPA Site 9i has retained its conditional closure status.

NOAA Site 25
TPA Site 9j: 5 Car Garage and Anderson Bldg

Request for NFRAP, TPA Site 9j - Five Car Garage and
Anderson Building, St. Paul Island, Alaska.....651

Request for NFRAP
TPA Site 9j - Five Car Garage and Anderson Building
St. Paul Island, Alaska

Request for No Further Remedial Action Planned

Site:
The Five Car Garage and Anderson Building, also unknown as Two Party Agreement (TPA) Site 9j and National Oceanic and Atmospheric Administration (NOAA) Site 25

Location:
St. Paul Island, Alaska is approximately 800 miles southwest of Anchorage in the Bering Sea. On St. Paul Island, the Five Car Garage and Anderson Building are situated at the bottom of Village Hill in the central portion of the city of St. Paul near the community grocery store (57°07'21'' latitude, 170°16'50" longitude). The building and immediately adjacent lands are located on U.S. Government property in Tract 46 (Figures 1 and 2).

Legal Description:
Tract 46, Township 35 South, Range 132 West, of the Seward Meridian, Alaska, as shown on the dependent resurvey of a portion of U.S. Survey No. 4943, Alaska, Tract "A", St Paul Townsite, officially filed June 3, 1997 See Figure 2.

Type of Release:
The Five Car Garage utilized an underground storage tank (UST) located on the east side of the building; the UST was removed in August 2000 and contaminated soils were documented, but were not removed at the time due to concerns regarding buried utilities in the vicinity. Three aboveground storage tanks are staged at the Anderson Building and were believed to have contributed to contamination of the area. Drums containing antifreeze, diesel fuel, lubrication oil, hydraulic oil, waste oil, and brake fluid have been observed at the facility (NOAA 2003).

History:
The Five Car Garage is situated along Sandy Lane in the northeast portion of the City of St. Paul, northeast of the community grocery store. The building was likely constructed in the early 1950s. In recent years, the Five Car Garage has been used as an automotive repair shop known locally as "Mike's Auto;" the facility includes an oil-changing pit in the floor with no known drain. A suspected floor drain was traced from the north side of the building to the south into Sandy Lane where it terminated at the City of St. Paul sewer line (NOAA 2003).

The Anderson Building is situated immediately northwest of the Five Car Garage. It was constructed in 1987 by the Tanadgusix Corporation, which leased the building for use as a seafood storage facility by Unipak and currently by Trident Seafoods. The Anderson Building is located on ground that was formerly occupied by three buildings used in commercial fur seal harvest operations; these buildings were known as Salt House B, Wash House A, and Wash House B (NOAA 2003).

Summary of Site Investigations:
In August 2000, an underground storage tank (UST) was removed from the east side of the Five Car Garage; the UST was in deteriorated condition and analytical data for soil samples indicated that a release of petroleum had occurred. However, no further excavation of contaminated soil was conducted at that time because of concerns regarding buried water, sewer, and telephone lines in the immediate area (NOAA 2003).

During the summer of 2000, CESI advanced soil borings, and installed and sampled groundwater monitoring wells in the vicinity of the Five Car Garage and Anderson Building (CESI 2001). Additionally, IT Alaska conducted groundwater sampling in 2001 (IT Alaska 2002), while TTEMI performed groundwater sampling in 2003 and 2004 (report pending).

Soil analytical data collected during these events revealed the presence of petroleum contamination including diesel-range organic compounds (DRO) and residual range organic compounds (RRO) at maximum concentrations of 4,700 milligrams per kilogram (mg/kg) and 15,600 mg/kg, respectively. These concentrations exceed the ADEC levels under Method 2 and alternate method cleanup levels (ADEC 2000). The results and locations of these historical soil samples are shown on Figure 3.

NOAA contractors conducted quarterly groundwater monitoring at 3 monitoring wells in the vicinity of the Five Car Garage and Anderson Building (Figure 4). Results detected diesel range organics (DRO) at low levels during all sampling events, but never above the Table C cleanup levels. No other contaminants exceeded the Table C cleanup levels (NOAA 2003).

Mitretek Systems (2002) evaluated the 2000-2001 groundwater data for the St. Paul Village area, which includes the Decommissioned Power Plant Annex. The Mitretek report demonstrated that groundwater in the vicinity of St. Paul Village has high total dissolved solids and can be brackish. Consequently, the groundwater in the area is not suitable for drinking water. The evaluation, in part, provided a rationale for using alternative groundwater cleanup levels that are protective of human health and the environment where the groundwater is not potable. Mitretek concluded in accordance with 18 AAC 75.350 (ADEC 2000) that groundwater in the Village area is not currently used and does not afford any potential future use as a drinking water source. These findings provided the basis for the application of the Ten Times Rule discussed below.

Summary of Applied Cleanup Levels:

NOAA employed ADEC Method Two cleanup criteria, discussed at 18 AAC 75.341(c) (ADEC 2000). Alternative cleanup levels were also applied for some compounds. For benzene, under the TPA, NOAA had the option to cleanup to the less stringent State of Alaska cleanup level in effect in 1991 (ADEC 1991). Additionally, NOAA proposed and ADEC approved the use of alternative cleanup levels under 18 AAC 75.345 and 18 AAC 75.350, commonly referred to as the Ten Times Rule (ADEC 2002, Mitretek Systems 2002). According to these regulations, if groundwater beneath a site contains contaminant concentrations above the cleanup levels provided in ADEC Table C, then the soil may be remediated to levels ten times higher than those provided in Method Two Tables B1 and B2 for the migration to groundwater pathway for those contaminants found in groundwater at concentrations above the cleanup levels provided in ADEC Table C; however, if the inhalation or ingestion pathway values are more stringent than the migration to groundwater pathway, then the more stringent value is to be applied. ADEC uses 15 feet below ground surface (bgs) to define subsurface soil to which residents will have a reasonable potential to be exposed through the inhalation or ingestion pathways (ADEC 2000; 18 Alaska Administrative Code 75.340 (j)(2)). Therefore NOAA is not obligated to excavate contaminated soil occurring at depths deeper than 15 feet to address the inhalation and ingestion pathways.

Summary of Cleanup Actions:

NOAA contractor Tetra Tech EM Inc. (Tetra Tech) and its subcontractor Bering Sea Eccotech (BSE) initiated corrective actions at the Former Fouke Bunkhouse on July 28, 2003 (NOAA 2004). Excavation activities began along the east side of the Five Car Garage, where the former UST was located (see Figure 5). Clean overburden was removed from the area and the excavation was advanced to a maximum depth of 12 feet bgs, where groundwater was encountered at the north end of the excavation. During excavation activities, personnel uncovered a satellite cable and internet service trunk line to the island along the east side of the excavation. Additional excavation was prevented in this area due to the presence of groundwater and various utility lines, including a live electrical line and the cable line (see Figure 6). Five confirmation samples were collected from the excavation including two from the bottom and three from the sidewalls. Confirmation samples were shipped for laboratory analyses, including benzene, toluene, ethylbenzene, and total xylenes (BTEX), DRO, gasoline-range organic compounds (GRO), RRO, select polynuclear aromatic hydrocarbons (PAH), and lead (see Figure 6).

In addition, two test pits were excavated south of the Five Car Garage on either side of Sandy Lane to investigate reports from local officials regarding contaminated soil identified during previous construction activities in the area (Figure 6). First, a shallow test pit was excavated along the north side of Sandy Lane near the southeast corner of the Five Car Garage, but it could not be advanced beyond 2 feet bgs because of extensive, unknown utility lines; no evidence of contamination was observed and a TLC screening sample was collected from this location.

Second, a test pit was excavated to a maximum depth of 6 feet bgs along the south side of Sandy Lane across from the Five Car Garage; no evidence of contamination was observed and one confirmation sample was collected from the bottom of the excavation for laboratory analyses including BTEX, DRO, GRO, RRO, select PAHs, and lead (Figure 6, Tables 1 and 2).

Results from analysis of the confirmation samples indicated DRO concentrations varied from not detected to 250 mg/kg; only one of the samples collected from this site equaled or exceeded the ADEC Method Two cleanup level of 250 mg/kg, and no samples exceeded the alternative cleanup level of 2,500 mg/kg (Table 1). The elevated concentration of DRO was detected in sample SP25-CS-002-120, collected from the bottom of the north side of the excavation at 12 feet bgs. Concentrations for all other contaminants were below the ADEC Method Two cleanup levels except for one sample that exceeded the method 2 cleanup level for benzene of .02 mg/kg, sample SP25-CS-003-060, which had benzene at .41 mg/kg. Laboratory reporting limits were below ADEC Method Two cleanup levels for all analyses except benzene. For benzene, reporting limits of at most 0.03 mg/kg were achieved, which is above the ADEC Method Two cleanup level of 0.02 mg/kg, but below the alternative cleanup level of 0.5 mg/kg. No samples exceeded the alternate cleanup level for benzene of .5 mg/kg. None of the samples exceeded the ADEC method 2 levels for PAHs (see Table 2).

During the corrective action, a total of approximately 15 CY of PCS was removed from excavations at the Five Car Garage. This soil was stockpiled at the Tract 42 landfill site, pending final disposal at the National Weather Service land spreading site, or other ADEC approved disposal alternative. Following excavation and collection of confirmation samples, the site was backfilled to grade with clean fill soil.

On July 30, 2003, personnel initiated excavation activities at the Anderson Building in the vicinity of an AST located on the east side of the building (Figure 5); the AST was moved temporarily to allow excavation in this area, and was replaced upon completion of excavation activities. The area of excavation was selected based on the presence of the AST as well as historical sampling information. The excavation was advanced to a maximum depth of 7 feet bgs based on the results of TLC screening sample analyses. Six confirmation samples were collected from the excavation, including three from the bottom and three from the sidewalls. Confirmation samples were shipped for laboratory analyses including BTEX, DRO, GRO, RRO, select PAHs, and lead (see Figure 6, Tables 1 and 2).

Results from analysis of the confirmation samples indicated DRO was not detected, with detection limits of 10 mg/kg, which is below the ADEC Method Two cleanup level of 250 mg/kg, (Table 1). Concentrations for all other contaminants were below the ADEC Method Two cleanup levels. Laboratory reporting limits were below ADEC Method Two cleanup levels for all analyses except benzene. For benzene, reporting limits of at most 0.04 mg/kg were achieved, which is above the ADEC Method Two cleanup level of 0.02 mg/kg, but below the alternative cleanup level of 0.5 mg/kg. No benzene was detected.

During the corrective action, a total of approximately 65 CY of PCS was removed from excavations at the Anderson Building. This soil was stockpiled at the Tract 42 landfill site, pending final disposal at the National Weather Service land spreading site, or other ADEC approved disposal alternative. Following excavation and collection of confirmation samples, the site was backfilled to grade with clean fill soil.

Recommended Action:

In accordance with paragraph 59 of the Two Party Agreement (NOAA 1996), NOAA requests written confirmation that NOAA completed all appropriate corrective action at the Five Car Garage and Anderson Building, TPA Site 9j/NOAA Site 25, in accordance with the Agreement and that ADEC requires no further remedial action plan from NOAA

References:

Alaska Department of Environmental Conservation (ADEC). 1991. *Interim Guidance for Non-UST Contaminated Soil Cleanup Levels, Contaminated Sites Program*. July 17, 1991.

ADEC. 2000. Title 18 of the *Alaska Administrative Code 75*, Articles 3 and 9. Oil and Hazardous Substances Pollution Control Regulations. State of Alaska. Effective date January 30, 2003.

ADEC. 2002. *Letter from Louis Howard (ADEC) to John Lindsay (NOAA Pribilof Project Office)*. May 30.

Columbia Environmental Sciences, Inc. (CESI). 2001. Draft Site Characterization Report, Tract 46 and Vicinity (TPA Site 9), St. Paul Island, Alaska. Version 2.1. Kennewick, WA.

December 16.

IT Alaska Corporation (IT Alaska). 2002. Draft Annual Groundwater Monitoring Report 2001, St. Paul Island, Alaska. March.

Mitretek. 2002. *Groundwater Use and Classification in the Vicinity of Tract 46, St. Paul Island, Pribilof Islands, Alaska*. Prepared by Mitretek Systems, for the National Oceanic and Atmospheric Administration. June 5.

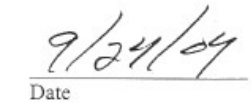
NOAA. 1996. *Pribilof Islands Environmental Restoration Two Party Agreement*. Attorney General's Office File No. 66 1-95-0126, National Oceanic and Atmospheric Administration. January 26.

NOAA. 2003. Final Corrective Action Plan, Anderson Building and Five Car Garage (TPA Site 9j) Petroleum Contaminated Soils, St. Paul Island, Alaska. July 15.

NOAA. 2004. *Draft Corrective Action Report Site 25/TPA Site 9j – Five Car Garage and Anderson Building, St. Paul Island, Alaska*. June 25.

For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

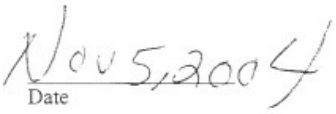


Date

Approvals: In accordance with Paragraph 59 of the Two Party Agreement, this is to confirm that all corrective action has been completed at the Five Car Garage and Anderson Building, TPA Site 9j/NOAA Site 25, in accordance with the Agreement and that no plan for further remedial action is required.

For the Alaska Department of Environmental Conservation

Louis Howard
Alaska Department of Environmental Conservation
Remedial Project Manager



Date

FIGURES

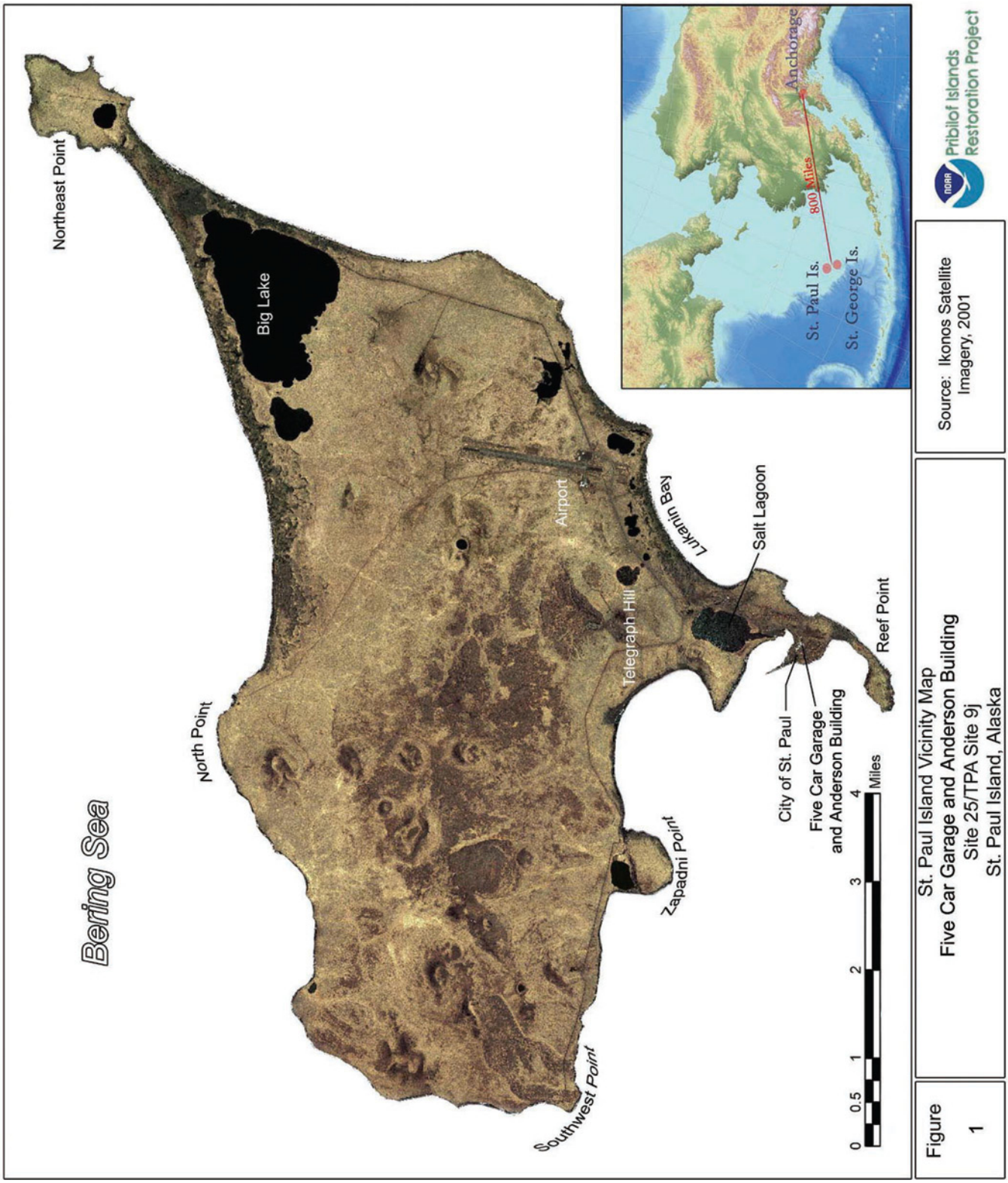

Bering Sea
Northeast Point
Big Lake
North Point
Airport
Telegraph Hill
Lukanin Bay
Salt Lagoon
Reef Point
City of St. Paul
Five Car Garage and Anderson Building
Zapadni Point
Southwest Point
0 0.5 1 2 3 4 Miles
Anchorage
800 Miles
St. Paul Is.
St. George Is.
Pribilof Islands Restoration Project
Source: Ikonos Satellite Imagery, 2001
Figure 1
St. Paul Island Vicinity Map
Five Car Garage and Anderson Building
Site 25/TPA Site 9j
St. Paul Island, Alaska

Figure 2	Legal Property Description Map Five Car Garage and Anderson Building Site 25/TPA Site 9j St. Paul Island, Alaska	Sources: BLM Tract (BLM MTPs 1983), TPA 9j Boundary (NOAA GIS 2004), Aerial Photo (Aeromap US 1996).

Pribilof Islands Restoration Project

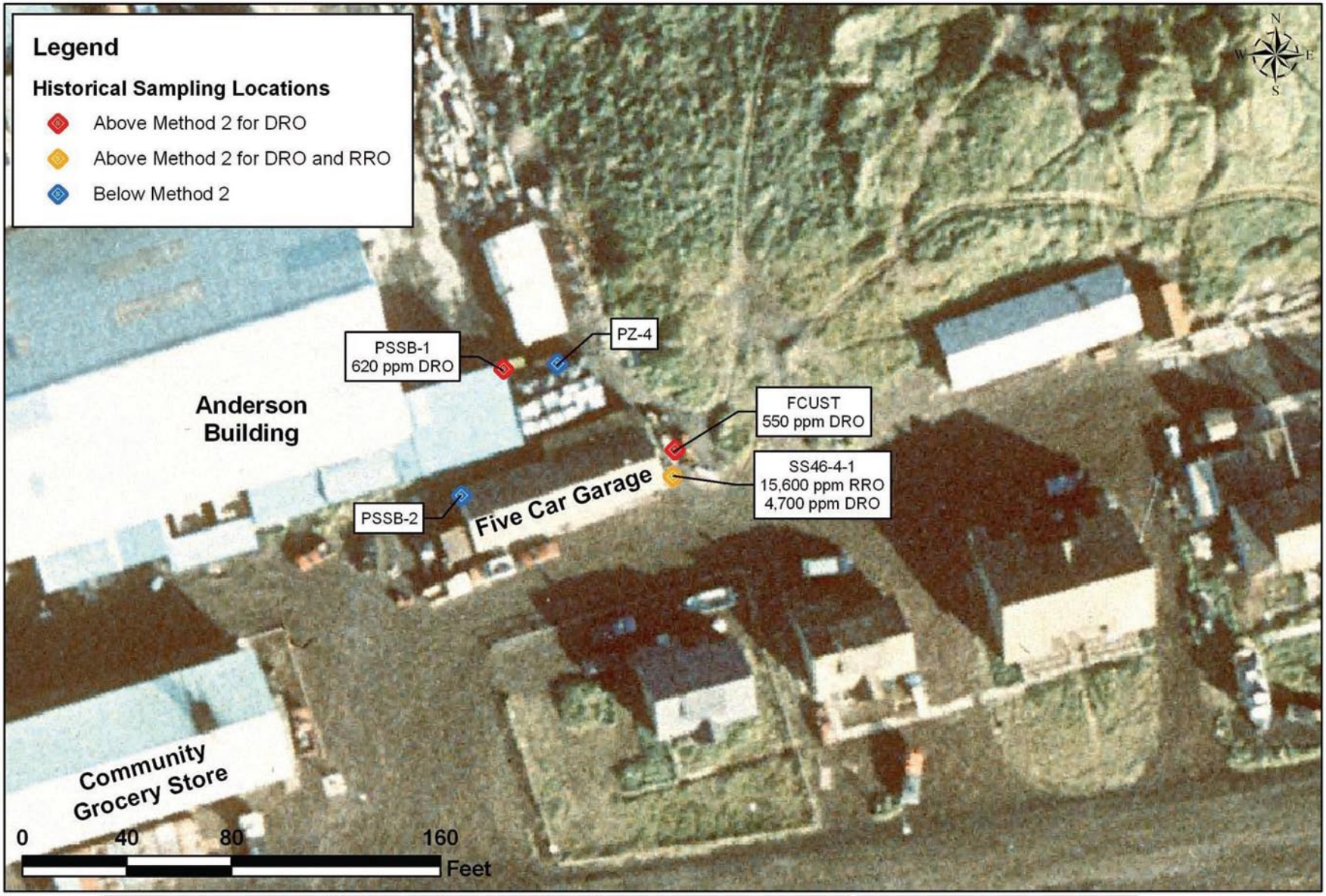


Figure 3	Historical Sampling Results Five Car Garage and Anderson Building Site 25/TPA Site 9j St. Paul Island, Alaska	Sources: Historical Sampling Locations (NOAA GIS 2004), Aerial Photo (Aeromap US 1996).

Pribilof Islands Restoration Project

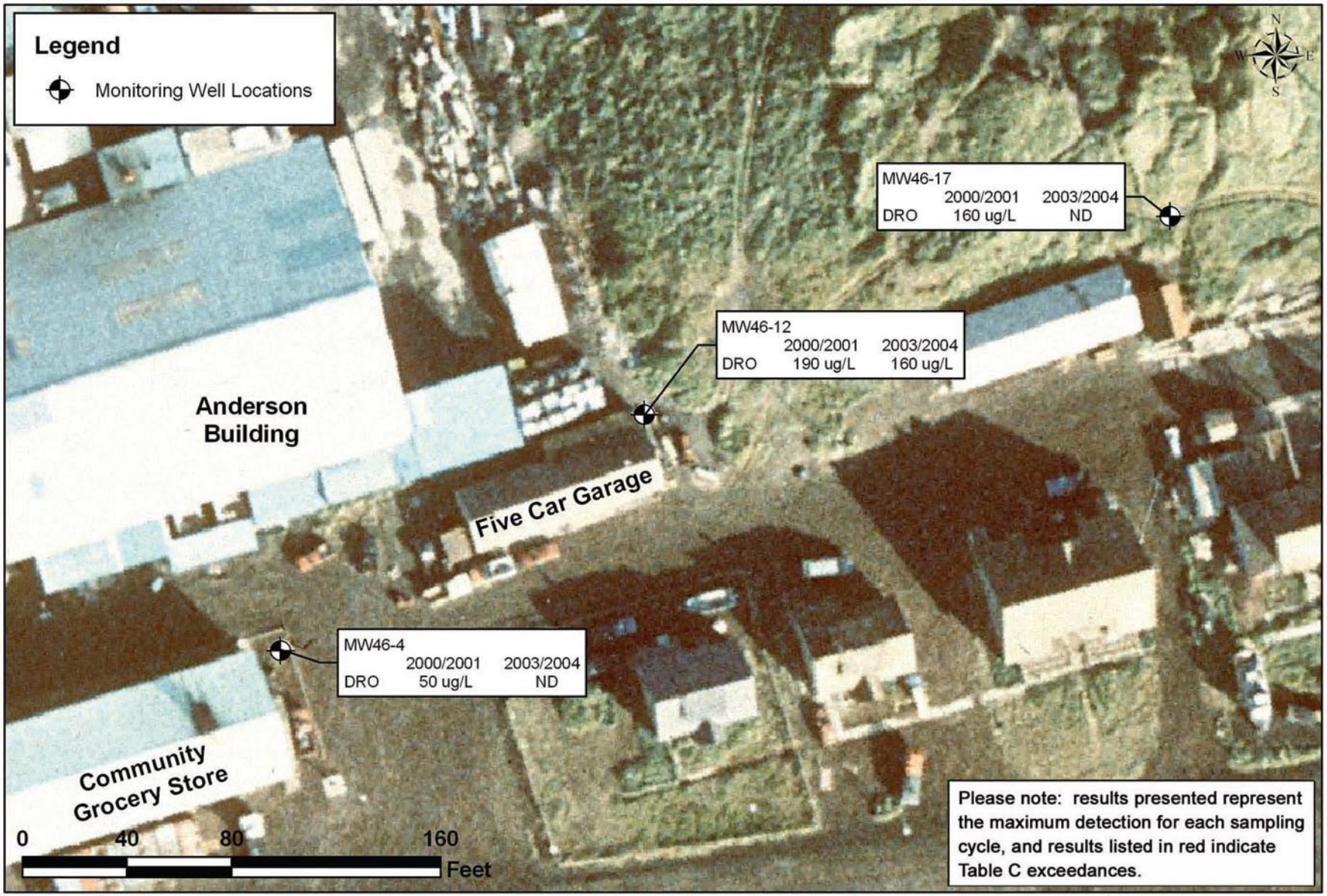


Figure 4	Groundwater Sampling Results Five Car Garage and Anderson Building Site 25/TPA Site 9j St. Paul Island, Alaska	Sources: Well Locations (NOAA GPS 2003), Aerial Photo (Aeromap US 1996).

Pribilof Islands Restoration Project

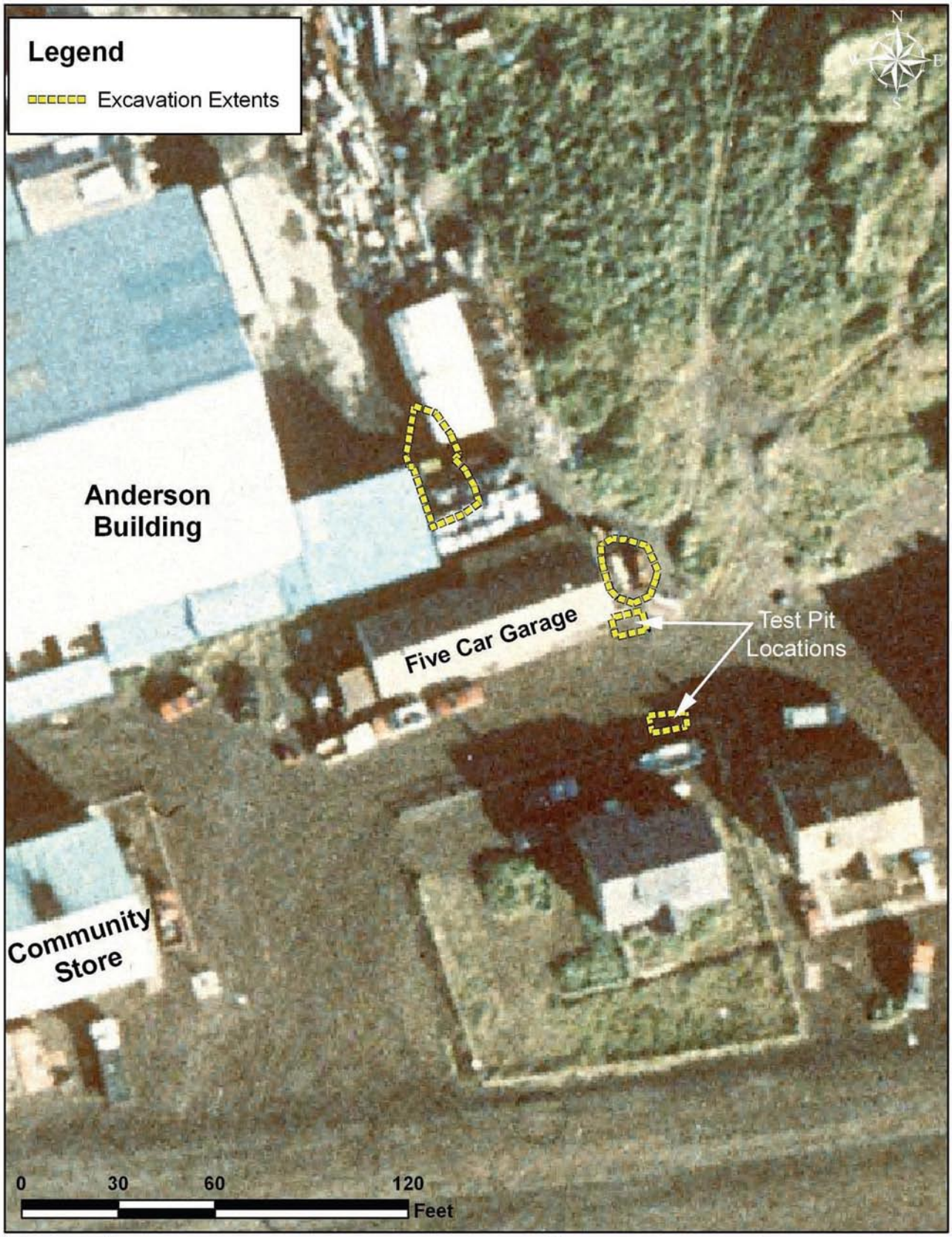


Figure 5	Areas of Excavation Anderson Building and Five Car Garage Site 25/TPA Site 9j St. Paul Island, Alaska	Sources: Excavation Extents (NOAA GPS 2003), Aerial Photo (Aeromap US 1996).	Pribilof Islands Restoration Project

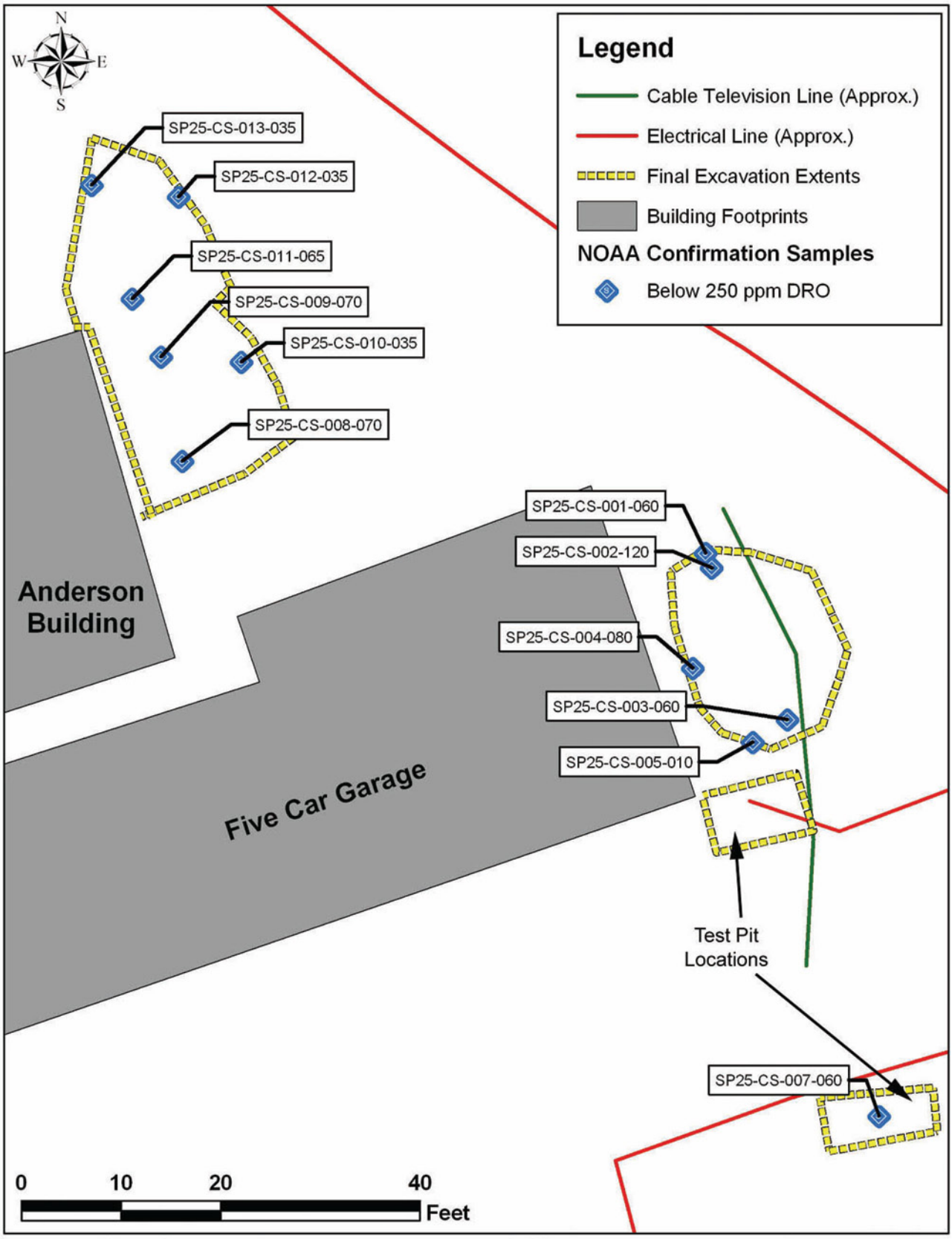


Figure 6	Sampling Location Map Five Car Garage and Anderson Building Site 25/TPA Site 9j St. Paul Island, Alaska	Sources: Excavation Extents, Confirmation Sample Locations, and Utility Locations (NOAA GPS, 2003), Aerial Photo (Aeromap US, 1996).

Pribilof Islands Restoration Project

TABLES

Table 1: Analytical Data Summary - BTEX. GRO, DRO, RRO, and Lead Site 25/TPA Site 9j - Five Car Garage and Anderson Building, St. Paul Island, Alaska.

Sample Number	Sample Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	RRO (mg/kg)	Lead (mg/kg)
TPA Site 9j Confirmation Samples - Five Car Garage									
SP25-CS-001-060	6	0.02 U	0.03	0.02 U	0.04	1 U	49	110	19.4
SP25-CS-002-120	12	**0.03** U	0.03	0.03 U	0.06	2 U	**250**	50 U	6.34
SP25-CS-003-060	6	**0.41**	0.86	0.19	0.97	14	50	85	47.4
SP25-CS-004-080	8	0.02 U	0.02 U	0.02 U	0.02 U	1 U	10 U	50 U	5.94
SP25-CS-005-010	10	**0.03** U	0.03 U	0.03 U	0.03 U	2 U	43	76	26.9
SP25-CS-007-060	6	**0.03** U	0.03	0.03 U	0.04	2 U	10 U	50 U	18.3
TPA Site 9j Confirmation Sample - Five Car Garage Clean Overburden Material									
SP25-CS-006 a	--	**0.03**	0.11	0.03 U	0.17	1	20	130	13.9
TPA Site 9j Confirmation Samples - Anderson Building									
SP25-CS-008-070	7	**0.04** U	0.04 U	0.04 U	0.04 U	2 U	10 U	50 U	1.98
SP25-CS-009-070	7	**0.04** U	0.04 U	0.04 U	0.04 U	2 U	10 U	50 U	1.93
SP25-CS-010-035	3.5	**0.04** U	0.04	0.04 U	0.04 U	2 U	10 U	50 U	4.74
SP25-CS-011-065	6.5	**0.04** U	0.04 U	0.04 U	0.04 U	2 U	10 U	50 U	1.75
SP25-CS-012-035	3.5	**0.03** U	0.03 U	0.03 U	0.03 U	2 U	10 U	50 U	1.65
SP25-CS-013-035	3.5	**0.04** U	0.04 U	0.04 U	0.04 U	2 U	10 U	50 U	7.21
Trip Blank Sample									
Trip blank	--	0.02 U	0.02 U	0.02 U	0.02 U	1 U	--	--	--
Method Two Cleanup Level [b]		*0.02*	*5.4*	*5.5*	*78*	*300*	*250*	*10,000*	*400* [f]
Alternative Cleanup Level [c]		*0.5* [d]	*54*	*NA*	*NA*	*1,400* [e]	*2,500*	*NA*	*NA*

Notes

bold Indicates a concentration exceeding one or more of the applicable cleanup levels. In addition, bold text is used to indicate those results that were not detected (identified with a U) with a laboratory reporting limit above the Method Two cleanup level; however, no laboratory reporting limits exceeded the alternative cleanup levels.

bgs Below ground surface

BTEX Benzene, toluene, ethylbenzene, and total xylenes

DRO Diesel-range organic compounds

GRO Gasoline-range organic compounds

mg/kg Milligram per kilogram

-- Not analyzed

NA Not available

RRO Residual-range organic compounds

TPA Two-Party Agreement

U The analyte was analyzed for, but not detected above the sample reporting limit

a Sample number SP25-CS-006 was collected from the clean overburden that was placed back into the excavation upon completion.

b Cleanup level is from Title 18 of the *Alaska Administrative Code 75*, "Oil and Hazardous Substances Pollution Control Regulations," published by the State of Alaska and amended through October 28, 2000.

c Cleanup level obtained from ADEC Method Two based on the "Ten Times Rule" applied to the migration to groundwater pathway, as discussed in Section 5.0 of the corrective action plan (National Oceanic and Atmospheric Administration [NOAA] 2003a).

d Under the TPA, NOAA is obligated to comply with the 1991 ADEC cleanup level for benzene (0.5 mg/kg).
e Cleanup level selected is based on more stringent value associated with ingestion and inhalation pathways.
f Lead, although not a contaminant of concern identified in the corrective action plan for this site, is included because some samples collected from these sites were analyzed for lead. Although these sites are in an industrial area, NOAA is using the residential cleanup level for lead (400 mg/kg).

Table 2: Analytical Data Summary - Polynuclear Aromatic Hydrocarbons Site 25/TPA Site 9j - Five Car Garage and Anderson Building, St. Paul Island, Alaska.

Sample Number	Sample Depth (feet bgs)	Naphthalene (mg/kg)	Acenaphthylene (mg/kg)	Acenaphthene (mg/kg)	Fluorene (mg/kg)	Phenanthrene (mg/kg)	Anthracene (mg/kg)	Fluoranthene (mg/kg)	Pyrene (mg/kg)
TPA Site 9j Confirmation Samples, -Five Car Garage									
SP25-CS-001-060	6	0.017	0.005 U	0.005 U	0.005 U	0.012	0.005 U	0.005 U	0.005 U
SP25-CS-002-120	12	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.006
SP25-CS-003-060	6	1.100 D	0.018	0.012	0.022	0.230 D	0.060 D	0.031	0.039
SP25-CS-004-080	8	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP25-CS-005-010	10	0.005 U	0.005 U	0.005 U	0.005 U	0.017	0.005 U	0.008	0.013
SP25-CS-007-060	6	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
TPA Site 9j Confirmation Sample - Five Car Garage Clean Overburden Material									
SP25-CS-006[a]	--	0.021	0.005 U	0.005 U	0.005 U	0.023	0.005 U	0.017	0.018
TPA Site 9j Confirmation Samples - Anderson Building									
SP25-CS-008-070	7	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP25-CS-009-070	7	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP25-CS-010-035	3.5	0.005 U	0.005 U	0.005 U	0.005 U	0.005	0.005 U	0.006	0.006
SP25-CS-011-065	6.5	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP25-CS-012-035	3.5	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP25-CS-013-035	3.5	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Method Two Cleanup Level[b]		*43*	*NA*	*210*	*270*	*NA*	*4,300*	*NA*	*1,500*

Sample Number	Sample Depth (feet bgs)	Benz(a)anthracene (mg/kg)	Chrysene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Benzo(a)pyrene (mg/kg)	Indeno (1,2,3-cd) pyrene (mg/kg)	Dibenzo (a,h) anthracene (mg/kg)	Benzo (g,h,i) perylene (mg/kg)
TPA Site 9j Confirmation Samples, -Five Car Garage									
SP25-CS-001-060	6	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP25-CS-002-120	12	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP25-CS-003-060	6	0.030	0.024	0.020	0.005 U	0.019	0.005 U	0.005 U	0.007
SP25-CS-004-080	8	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP25-CS-005-010	10	0.005	0.007	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP25-CS-007-060	6	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
TPA Site 9j Confirmation Sample - Five Car Garage Clean Overburden Material									
SP25-CS-006[a]	--	0.010	0.011	0.015	0.005 U	0.011	0.006	0.005 U	0.008

Sample Number	Sample Depth (feet bgs)	Benz(a) anthra-cene (mg/kg)	Chrysene (mg/kg)	Benzo(b) fluoran-thene (mg/kg)	Benzo(k) fluoran-thene (mg/kg)	Benzo(a) pyrene (mg/kg)	Indeno (1,2,3-cd) pyrene (mg/kg)	Dibenzo (a,h) anthracene (mg/kg)	Benzo (g,h,i) perylene (mg/kg)
TPA Site 9j Confirmation Samples - Anderson Building									
SP25-CS-008-070	7	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP25-CS-009-070	7	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP25-CS-010-035	3.5	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP25-CS-011-065	6.5	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP25-CS-012-035	3.5	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP25-CS-013-035	3.5	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Method Two Cleanup Level[b]		*6*	*620*	*11*	*110*	*1*	*11*	*1*	*NA*

Notes

bgs Below ground surface
D Result reported from diluted sample
mg/kg Milligram per kilogram
NA Not available
TPA Two-Party Agreement
U The analyte was analyzed for, but not reported above the sample reporting limit
a Sample number SP25-CS-006 was collected from the clean overburden that was placed back into the excavation upon completion.
b Cleanup level is from Title 18 of the *Alaska Administrative Code 75*, "Oil and Hazardous Substances Pollution Control Regulations," published by the State of Alaska and amended through October 28, 2000.

NOAA Site 26
TPA Site 9k: AST Saddle Complex

Request for NFRAP, AST Saddle Complex,
TPA Site 9k/Site 26, St. Paul Island, Alaska.....667

Notice of Environmental Cleanup and Residual Soil and Groundwater
Contamination at TPA9k, (Former) AST Saddles Site, St. Paul Island, Alaska ..683

Request for NFRAP
AST Saddle Complex, TPA Site 9k/Site 26
St. Paul Island, Alaska

Request for No Further Remedial Action Planned

Site: AST Saddle Complex, also known as Two Party Agreement (TPA) Site 9k, National Oceanic and Atmospheric Administration (NOAA) Site 26, and the AST Saddles Complex. 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. On the island, the site is situated in St. Paul Village on the eastern slopes of Village Hill (Figures 1 and 2), south of the Machine Shop building (57°07'21.09" North Latitude, 170°16'53.32" West Longitude).

Legal Property Description: The area of excavation is located in Lot 1, Block 1A, U.S. Survey Number 4943, Alaska Tract "A", St. Paul Townsite, accepted by the Bureau of Land Management August 2, 1968 (Figure 2). Within the area of excavation, Tanadgusix Corporation (TDX) owns property. [Note: TPA site boundaries are not defined in the TPA. At its discretion, NOAA established a boundary for this TPA site based on site characterization data and historic information. A portion of this site is found within Lot 3, Section 25, Township 35 South, Range 132 West, of the Seward Meridian, Alaska as shown on the plat of rectangular survey officially filed May 14, 1986 (Figure 2), in addition to the property in Tract A owned by TDX.]

Type of Release: Potential release mechanisms include: 1) leaks associated with the storage of diesel fuel in up to 33 aboveground fuel storage tanks; and 2) leaks associated with fuel transfers between fuel pipelines and the ASTs.

History and Background:
The site is located on the slope of Village Hill between Short Street and Church Street, about 80 feet (ft) south of the Machine Shop (Figures 3 and 4). TDX currently owns this property. Previously, up to 33 ASTs were located on concrete saddles at the site, with the ASTs used to store fuel for nearby facilities like the Former Power Plant (TPA Site 9b) to the south of the site (Figures 3 and 4). A 1959 map created by the Department of Interior (DoI 1959) depicts an above ground pipeline extending from the Former Gasoline/Diesel Fuel Drum Storage Site (DSS, also known as TPA Site 9o) located on the northeastern prominence of Village Hill above the site (Figures 3 and 4). According to Hart Crowser (1997), 55-gallon drums of gasoline and diesel fuels were reportedly stored at the DSS. Based upon an interview with a former island employee, Hart Crower stated that a funnel fabricated from a 55-gallon drum facilitated the transfer of diesel via the pipeline to the ASTs at the site prior to the 1960s (Figure 4).

The actual construction date of the saddles at the site is not known although the saddles can be seen in a 1948 aerial photograph, as well as in a circa 1950s side view photograph (Figure 5). The site was abandoned when a new power plant was put into operation in the 1960s (Hart Crowser 1995). The PCS found at the site (Hart Crowser 1997 and CESI 2001) is thought to have resulted from spillage or leakage during transfer operations and storage.

The site is currently unused and lies in close proximity to residences and the industrial area of St. Paul Village (Figure 4).

Summary of Site Investigations:
In 1995, Hart Crowser collected soil samples to assess the potential nature and extent of chemical contamination in soils at several locations on St. Paul Island, including the AST Saddle Complex site (Hart Crowser 1997). Samples (Figure 3) were collected from five hand auger borings (HA-11 to HA-13, HA-25, and HA-26) and four test pits (TP-18, TP-19, TP-22, and TP-23) at depths ranging from 0-10 ft below ground surface (bgs). All samples were analyzed for petroleum hydrocarbons and benzene, toluene, ethylbenzene, and xylenes (BTEX) in the field laboratory, and a subset of samples were sent to the project laboratory for confirmation analysis for the same constituents. Additionally, the project laboratory analyzed one sample from each location for lead.

Hart Crowser detected diesel-range organics (DRO) above the State of Alaska Department of Environmental Conservation (ADEC) Method Two cleanup level of 250 mg/kg in five samples (Figure 3) with a maximum concentration of 8,400 mg/kg. Three of these samples also exceeded the Alternative Cleanup Standard of 2,500 mg/kg DRO (Mitretek 2002, NOAA 2003) discussed below. The maximum concentration of gasoline-range organics (GRO) detected was 160 mg/kg, which is below the ADEC Method Two cleanup level of 300 mg/kg. Benzene was detected in one sample (HA-13) at 4.1 mg/kg, above the Method Two cleanup level of 0.02 mg/kg. However, the project laboratory data for this sample was inconsistent with the data from the field laboratory, which detected no benzene, and the presence of benzene is also inconsistent with the nature of the fuels detected at the site (Hart Crowser 1997).

One Hart Crowser sample (HA-13) exceeded the lead cleanup level of 400 mg/kg for ADEC regulatory limit for residential land use (Figure 3). This sample contained 1,400 mg/kg lead, which is also above the ADEC regulatory limit of 1,000 mg/kg for industrial land use. Lead was detected at lower levels in all other samples with concentrations ranging from 4.6 mg/kg to 140 mg/kg.

In 2000 and 2001, Columbia Environmental Sciences Inc. (CESI) installed monitoring wells and took soil borings in the City of St. Paul as part of a site characterization effort (CESI 2001). Soil samples were collected from five locations (AST-1, SBA-14, SBA-15, SBA-19, and SBA-29) at this site by CESI (Figure 3). The samples were analyzed at a fixed laboratory for petroleum hydrocarbons, volatile organic carbons (VOCs), semi-volatile organic carbons (SVOCs), and heavy metals.

Three CESI soil samples exceeded the ADEC Method Two cleanup level of 250 mg/kg for DRO (Figure 6). These samples also exceeded the Alternate Cleanup Standard for DRO, with a maximum detection of 12,000 mg/kg.

Arsenic exceeded its ADEC Method Two cleanup level of 2.0 mg/kg in four CESI soil samples, with a maximum concentration of 6.3 mg/kg. Total chromium exceeded its ADEC Method Two cleanup level of 26 mg/kg at all five sampling locations, with a maximum concentration of 66 mg/kg. No known anthropogenic sources of arsenic or chromium exist on St. Paul Island. In accordance with ADEC guidance (ADEC 1998), arsenic and chromium concentrations are within background concentrations for St. Paul Island as determined in previous studies by Tetra Tech EM Inc. (Tetra Tech 2000) and Hart Crowser (1997). For these reasons, arsenic and chromium are not contaminants of concern. No other constituents exceeded their ADEC Method Two regulatory limits.

NOAA contractors conducted quarterly groundwater monitoring from September 2000 to September 2001 and from October 2003 to July 2004 in the vicinity of the site. During the sampling events, Monitoring well MWA-2, located at the downgradient portion of the site, did not reveal any contamination above Table C levels of concern (Figure 4). The depth to groundwater at MWA-2 is approximately 24 ft bgs.

Groundwater in the vicinity of the site is thought to flow northerly away from the site, toward St. Paul Harbor (Figure 6), according to Mitretek Systems (Mitretek 2002). DRO were detected above their ADEC Table C cleanup level of 1,500 micrograms per liter (µg/L) in upgradient well MWA-1 with a maximum detected concentration of 4,000 µg/L (Figure 4). No other contaminants were encountered in MWA-1 above their ADEC Table C cleanup levels. The depth to groundwater at MWA-1 is approximately 80 ft. Downgradient well MWA-2 DRO concentrations did not exceed the Table C criterion in the 2000 to 2004 samples (Figure 4).

Monitoring well MWA- 1 and MWA-3 (upgradient), and MW46-7 and MW46-8 (downgradient) demonstrated contaminants above ADEC Table C levels of concern. At MWA-3, DRO were found at a maximum concentration of 17,000 µg/L (Figure 4); no other contaminants were found at MWA-3 above their ADEC Table C cleanup levels. At MW46-8, DRO were found at a maximum concentration of 2,400 µg/L in 2000 and 2001, though recent monitoring events (2003 and 2004) found the DRO concentration no greater than 630 µg/L. Lead was also found in MW46-8 in 2000 and 2001 up to 106 µg/L, which exceeds the ADEC Table C cleanup level of 15 µg/L. Lead was not detected in MW46-8 in the recent monitoring events. No other contaminants were found at MW46-8 above their ADEC Table C cleanup levels (Figure 4). At MW46-7, DRO were found at a maximum concentration of 5,500 µg/L; no other contaminants were found at MW46-7 above their ADEC Table C cleanup levels (Figure 4). One should note that MW46-7 and MW46-8, while downgradient of the site (Figure 6), are also within or po-

tentially downgradient of other source areas including TPA Site 9g (Former Fouke Bunkhouse), TPA 9b (Former Power Plant), and TPA Site 9o (Former Gasoline/Diesel Drum Storage Area).

Mitretek Systems (2002) evaluated the 2000-2001 groundwater data for the St. Paul Village area, which includes the site. The Mitretek report demonstrated that groundwater in the vicinity of St. Paul Village has high total dissolved solids and can be brackish. Consequently, the groundwater in the area is not suitable for drinking water. The evaluation, in part, provided a rationale for using alternative groundwater cleanup levels that are protective of human health and the environment where the groundwater is not potable. Mitretek concluded in accordance with 18 AAC 75.350 (ADEC 2003) that groundwater in the Village area is not currently used and does not afford any potential future use as a drinking water source.

These findings provided the basis for the application of the Ten Times Rule discussed below.

Summary of Applied Cleanup Levels:
NOAA employed ADEC Method Two cleanup criteria, discussed at 18 AAC

75.341(c) (ADEC 2003). Alternative cleanup levels were also applied for some compounds. For benzene, under the TPA, NOAA had the option to cleanup to the less stringent State of Alaska cleanup level in effect in 1991 (ADEC 1991). Additionally, NOAA proposed and ADEC approved the use of alternative cleanup levels under 18 AAC 75.345 and 18 AAC 75.350, commonly referred to as the Ten Times Rule (ADEC 2002, Mitretek Systems 2002). According to these regulations, if groundwater beneath a site contains contaminant concentrations above the cleanup levels provided in ADEC Table C, then the soil may be remediated to levels ten times higher than those provided in Method Two Tables B1 and B2 for the migration to groundwater pathway for those contaminants found in groundwater at concentrations above the cleanup levels provided in ADEC Table C; however, if the inhalation or ingestion pathway values are more stringent than the migration to groundwater pathway, then the more stringent value is to be applied. ADEC uses 15 feet below ground surface (bgs) to define subsurface soil to which residents will have a reasonable potential to be exposed through the inhalation or ingestion pathways (ADEC 2003; 18 AAC 75.340 (j)(2)). Therefore NOAA is not obligated to excavate contaminated soil occurring at depths deeper than 15 feet to address the inhalation and ingestion pathways. Cleanup criteria were applied to the maximum extent practicable (18 AAC 75.325 (f), 18 AAC 75.990).

Summary of Cleanup Actions:
Corrective action activities for the site were initiated on October 28, 2003 and completed on November 12, 2003 (NOAA 2003, Tetra Tech 2004a). Initial areas of excavation were selected based on contamination identified during previous investigations (Figure 3), while the extent of excavation was determined based on thin layer chromatography (TLC) screening sample analyses as well as visual and olfactory observations.

Prior to removing PCS from this site, personnel conducted excavation in the area between the two southernmost concrete saddles to remove lead-contaminated soil that was identified during a previous investigation (Figure 7). The area of excavation was delineated using Lead Check® test kits to analyze soil samples for total lead. Based on the results obtained from these kits, a subset of the samples was shipped for laboratory confirmation analyses. A total of approximately three cubic yards (yd^3) of lead-contaminated soil was removed from this area and placed in large, plastic tote bags ("Super Sacks") pending laboratory analysis of a soil sample for total and leachable lead using the Toxicity Characteristic Leachate Procedure (TCLP) (EPA 1996).

Following removal of the lead-contaminated soils, personnel began demolishing and removing the concrete saddles that formerly supported the ASTs. Each saddle, which extended to a depth of approximately 4 feet bgs, was broken into sections as necessary, and loaded onto a flatbed truck. The saddles were then transported to NOAA's Tract 42 landfill for staging prior to beneficial reuse.

After the lead-contaminated soil and all concrete saddles were removed, PCS excavation activities were initiated in the northern portion of the site, and progressed to the south, east, and west based on TLC screening sample analyses as well as visual and olfactory observations. Signs of contamination, including petroleum staining and odors, were noted throughout the excavation. If contaminant concentrations remained above ADEC Method Two cleanup levels based on TLC screening sample analyses, additional excavation was conducted even if the concentrations were below alternative cleanup levels unless further excavation was prevented by the presence of

obstructions. The excavation was advanced vertically to a maximum depth of 17 feet bgs, where rocks and large boulders were encountered; shallower depths were attained in the northern portion of the excavation because of the presence of shallow rocks and large boulders. In addition, one test pit was excavated to a depth of 5 feet bgs in the middle of Short Street, immediately east of monitoring well MWA-2, to investigate potential contamination in this area. No signs of contamination were observed in the test pit (Figures 7 and 8).

Excavation was limited at this site by the presence of obstructions, including the steep slopes of Village Hill, rocks and large boulders, and the main road east of the site. The excavation could not be expanded any further to the west because of safety concerns related to the steep slope of Village Hill. In addition, access to the City of St. Paul ambulance stored in the Machine Shop just north of the site had to be maintained, thereby precluding further excavation into the road along the east side of the site.

The excavation was backfilled after TLC screening sample analyses indicated contaminant concentrations below Method Two cleanup levels, or further excavation was prevented by the presence of obstructions including boulders, and the collection of fixed laboratory confirmation samples. If remaining contamination was suspected but further excavation was prevented by the presence of obstructions including boulders. Backfill operations involved transporting clean fill material from portions of the Telegraph Hill quarry owned by NOAA to the site (Tetra Tech 2004c), dumping the material into the excavation, and compacting the fill material with the excavator bucket or by track-walking the excavator over the area. The area of excavation was restored to its original grade. Backfilling and site restoration activities were completed on November 12, 2003.

During this corrective action, approximately 1,370 yd^3 of PCS was removed from the site.

Fifteen confirmation samples were collected from the bottom and sidewalls of the excavation and the test pit for laboratory analyses including benzene, toluene, ethylbenzene, and total xylenes (BTEX); DRO; select polynuclear aromatic hydrocarbons (PAHs); and total lead (Figure 8). In addition, one confirmation sample was collected from the suspected lead-contaminated soil that was removed from the area prior to excavation of PCS; this sample was analyzed only for total lead and leachable lead.

Table 1 provides a summary of the confirmation sample data, excluding non-PAH analytes. PAHs are not presented in Table 1 as no samples contained PAHs above their ADEC Method Two cleanup levels. Numeric PAHs results can be found in the corrective action report for this site (Tetra Tech 2004a). Stockpile samples were not collected during the corrective action. The lack of stockpile samples for this site does not impact data usability (Tetra Tech 2004b).

Confirmation samples collected from the excavation at the site indicated DRO concentrations varying from not detected to 9,100 mg/kg. Samples collected from 8 of the 15 sampling locations contained concentrations of DRO above the ADEC Method Two cleanup level of 250 mg/kg, and seven of these samples exceeded the alternative cleanup level of 2,500 mg/kg. The elevated concentrations of DRO were identified at the bottom and along the west sidewall, where excavation was halted because maximum depths (up to 17 feet bgs) were obtained, large boulders were encountered, and stability of the steep wall of the excavation posed health and safety concerns.

Concentrations of all other contaminants, including lead, were below the ADEC Method Two cleanup levels in the confirmation samples.

Stockpile samples collected from PCS transported directly to Tract 42 stockpile indicated DRO concentrations varied from 180 mg/kg to 1,800 mg/kg. All other contaminants were below ADEC Method Two cleanup levels. A summary of PCS stockpile activities conducted during the 2003 field season was provided under separate cover by Tetra Tech (2004b).

The stockpile sample (SP26-SS-001) collected from lead-contaminated soil contained DRO at a concentration of 10,000 mg/kg and total lead at a concentration of 995 mg/kg, above the ADEC Method Two cleanup levels. Leachable lead analysis by TCLP indicated a concentration of 2.5 milligrams per liter (mg/L), below the federal Resource Conservation and Recovery Act (RCRA) limit of 5 mg/L for leachable lead. Based on these analyses, the lead-contaminated soil was transported off-island for disposal in August 2004 as a solid waste. The soil will ultimately be disposed in a RCRA Subtitle D solid waste landfill in Oregon.

Laboratory reporting limits were below ADEC Method Two cleanup levels for all contaminants except benzene. For benzene, reporting limits of 0.05 mg/kg or lower were achieved, which is above the ADEC Method Two cleanup level of 0.02 mg/kg, but below the alternative cleanup level of 0.5 mg/kg. Concentrations of all other contaminants in confirmation samples collected were below the ADEC Method Two cleanup levels.

Recommended Action:
In accordance with paragraph 59 of the Two Party Agreement (NOAA 1996), NOAA requests written confirmation that NOAA completed all appropriate corrective action at the AST Saddle Complex, TPA Site 9k/NOAA Site 26 in accordance with the Agreement and that ADEC requires no further remedial action plan from NOAA.

References:

Alaska Department of Environmental Conservation (ADEC). 1991. Interim Guidance for Non-UST Contaminated Soil Cleanup Levels, Contaminated Sites Program. July 17, 1991.

ADEC. 2002. Letter from Louis Howard, Project Manager, Alaska Department of Environmental Conservation, to John Lindsay, Project Manager, NOAA Pribilof Project Office regarding ADEC conditional approval for applying the Ten Times Rule. May 30.

ADEC. 2003. Title 18 of the Alaska Administrative Code 75, Articles 3 and 9. Oil and Hazardous Substances Pollution Control Regulations. State of Alaska. Amended through January 30.

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National Oceanic and Atmospheric Administration (NOAA). 1996. Pribilof Islands Environmental Restoration Two Party Agreement. Attorney General's Office File No. 66 1-95-0126, National Oceanic and Atmospheric Administration. January 26.

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Tetra Tech. 2004b. Letter Report, Summary of 2003 Field Season Stockpile Activities, St. Paul Island, Alaska. July 23.

Tetra Tech. 2004c. Letter Report, Summary of 2003 Field Season Backfill Activities, St. Paul Island, Alaska. July 23.

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U.S. Environmental Protection Agency (EPA). 1996. Test Methods for Evaluating Solid Waste. EPA/SW-846. Third Edition and Updates. December.

Woodward-Clyde Consultants, Inc. 1994. Site Inspection Report, St. Paul Island, Alaska. Contract No. DACA67-92-D-1017. Delivery Order No. 36. November.

For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

10/6/04
Date

Approvals: In accordance with Paragraph 59 of the Two Party Agreement, this is to confirm that all corrective action has been completed at the AST Saddle Complex, TPA Site 9k/NOAA Site 26, in accordance with the Agreement and that no plan for further remedial action is required.

For the Alaska Department of Environmental Conservation

Louis Howard
Alaska Department of Environmental Conservation
Remedial Project Manager

Nov 5, 2004
Date

Tables and Figures

Figures

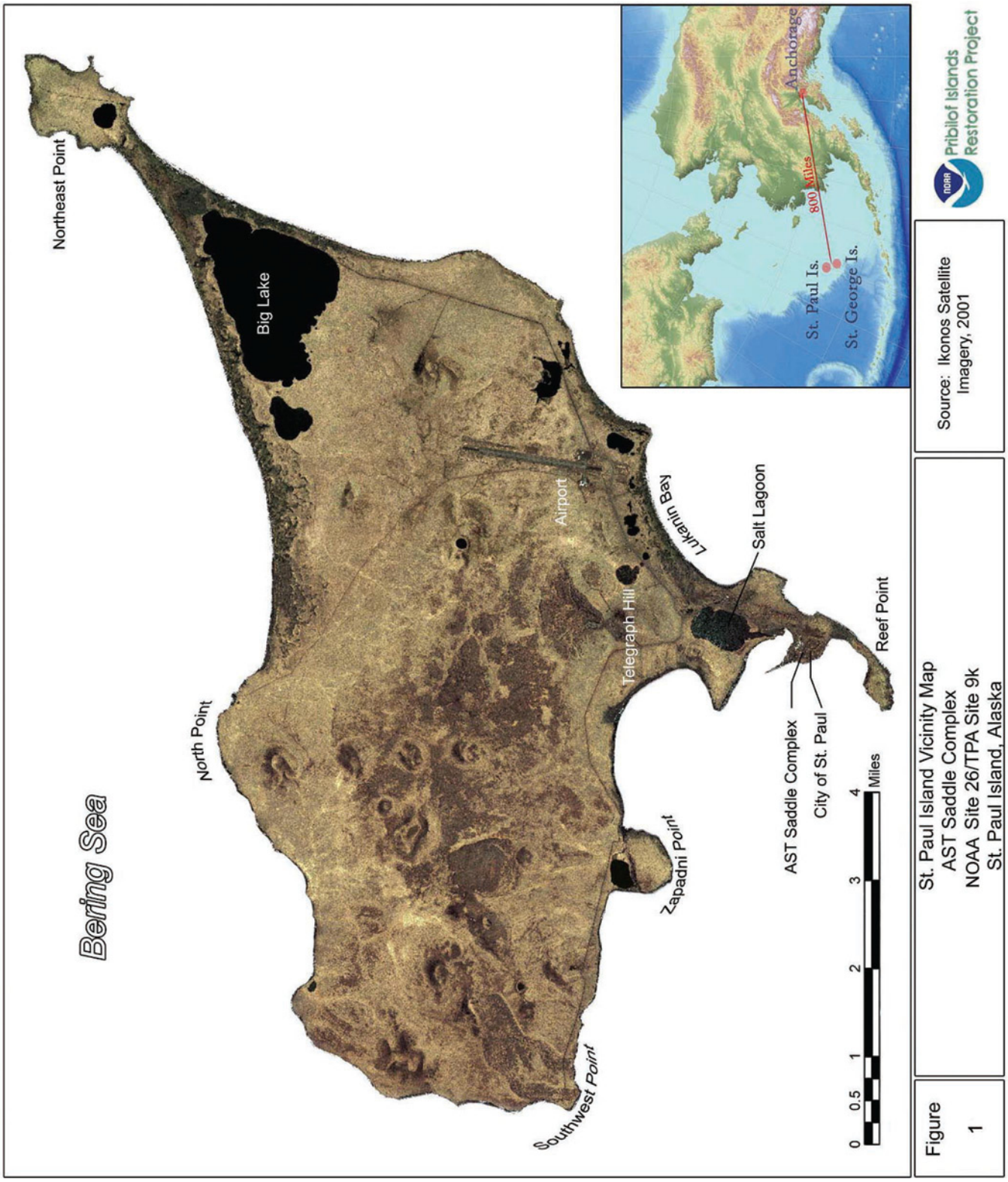


Figure 2	Legal Property Description Map AST Saddles Complex Site 26/TPA Site 9k St. Paul Island, Alaska	Sources: BLM Tracts (BLM MTPs 1983), TPA 9k Boundary (NOAA GIS 2004), Aerial Photo (Aeromap US 1996).

Pribilof Islands Restoration Project

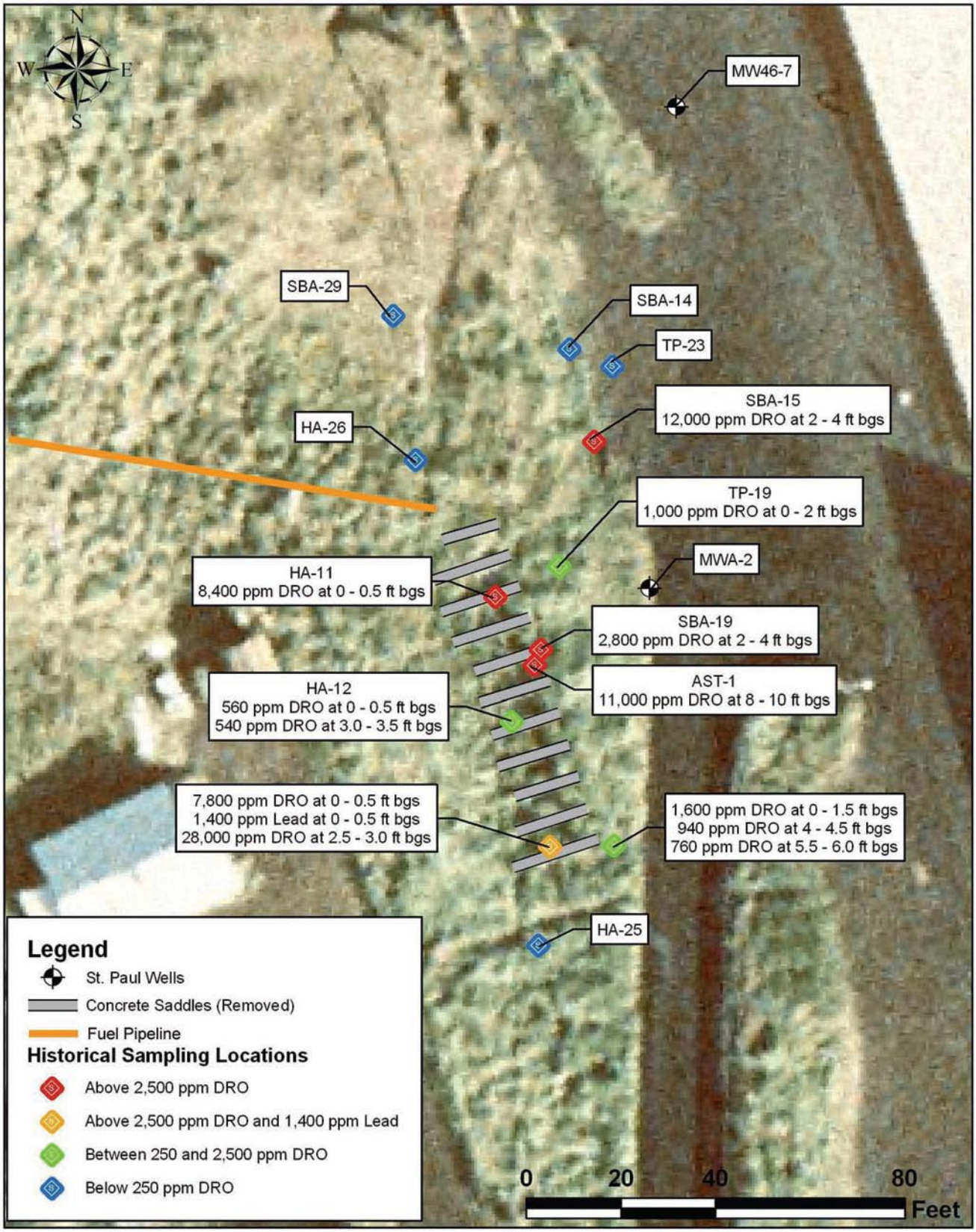


Figure 3

Historical Sampling Locations
AST Saddle Complex
NOAA Site 26/TPA Site 9k
St. Paul Island, Alaska

Sources: Concrete saddles (NOAA GPS 2003), Well locations (NOAA GPS 2003), Historical Sampling Locations (NOAA GIS 2004), Aerial photo (Aeromap US 1996).

Pribilof Islands Restoration Project

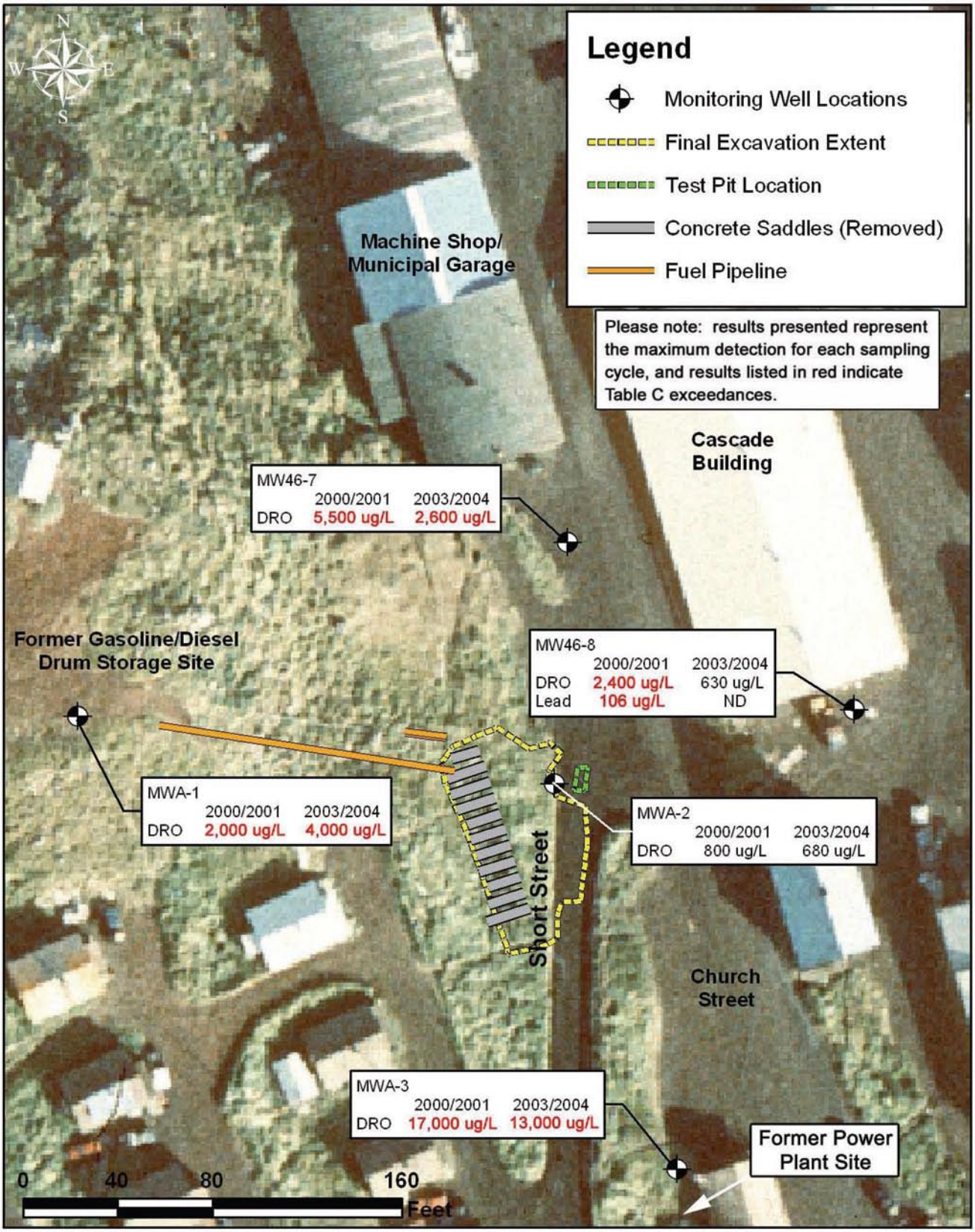
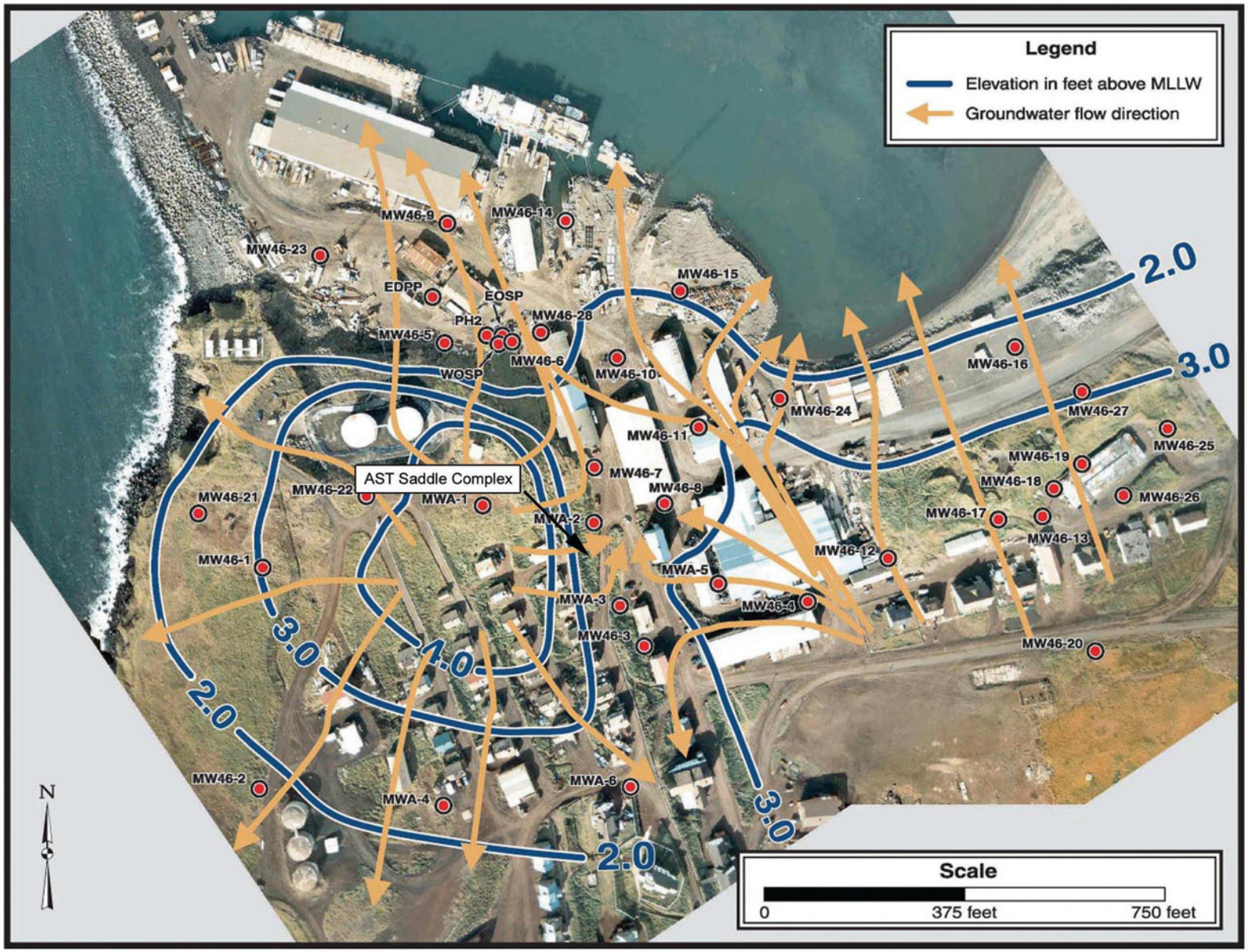


Figure 4	Groundwater Sampling Results AST Saddle Complex NOAA Site 26/TPA Site 9k St. Paul Island, Alaska	Sources: Final excavation extent, test pit location, and concrete saddle locations (NOAA GPS 2003), Well locations (NOAA GPS 2002), Aerial photo (Aeromap US 1996).

Pribilof Islands Restoration Project

Figure 5	View of AST Saddle Complex Site and Former Gasoline/Diesel Drum Storage Site from the north side of the Fur Seal Plant, circa 1950s. NOAA Site 26/TPA Site 9k St. Paul Island, Alaska	Source: Historical Photo (NOAA).

Pribilof Islands Restoration Project



From CESI 2001b

Figure 6	Mean Groundwater Level Contours and Flow Direction AST Saddle Complex NOAA Site 26/TPA Site 9k St. Paul Island, Alaska	Source: Mitretek, 2002.

Pribilof Islands Restoration Project

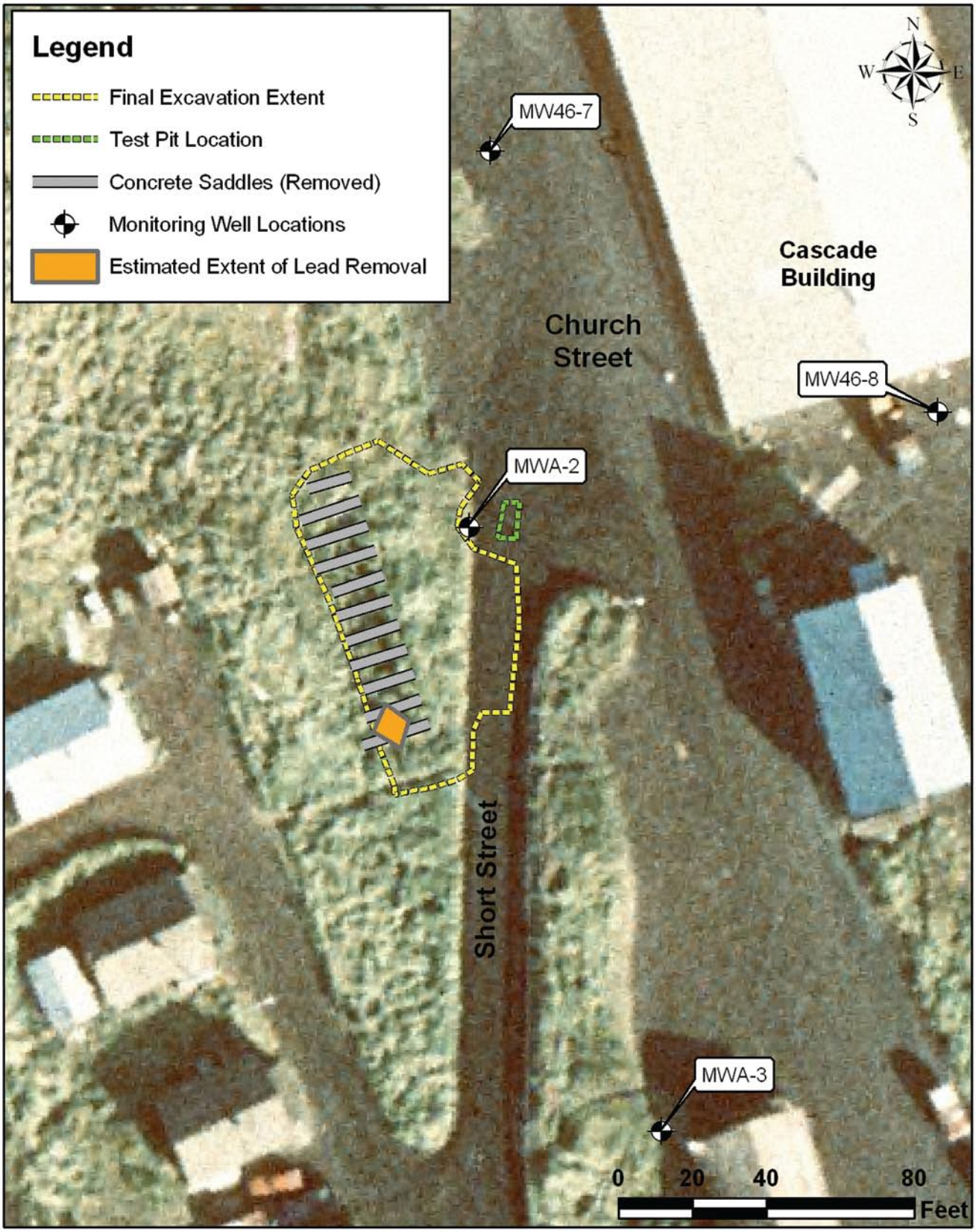


Figure 7	Area of Excavation AST Saddle Complex NOAA Site 26/TPA Site 9k St. Paul Island, Alaska	Sources: Final excavation extent, test pit location, concrete saddle locations, and area oflead removal (NOAA GPS 2003), Well locations (NOAA GPS 2002), Aerial photo (Aeromap US 1996).

Pribilof Islands Restoration Project

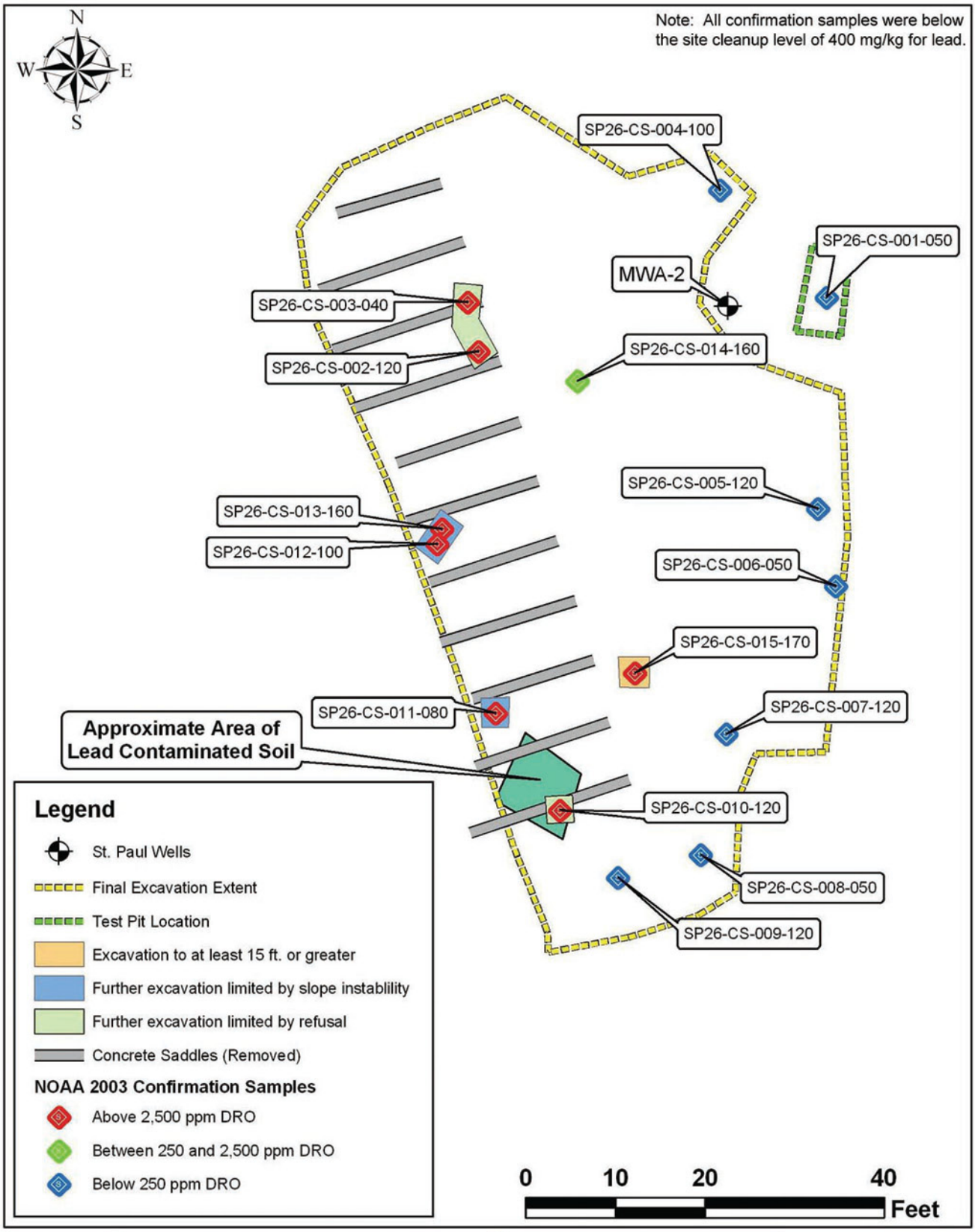


Figure 8

Sampling Location Map
AST Saddle Complex
NOAA Site 26/TPA Site 9k
St. Paul Island, Alaska

Sources: Final excavation extent, test pit location, concrete saddle locations, and confirmaiton sample locations, (NOAA GPS 2003), Well locations (NOAA GPS 2002), Aerial photo (Aeromap US 1996).

Pribilof Islands Restoration Project

Table 1. Analytical Data Summary for Confirmation Samples from the AST Saddle Complex, TPA Site 9k/Site 26, St. Paul Island, Alaska

Sample Number	Sample Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Total Xylenes (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	RRO (mg/kg)	Lead (mg/kg)	TCLP Lead (mg/L)
Site 26/TPA Site 9k Confirmation Samples										
SP26-CS-001-030[a]	3	--	--	--	--	--	--	--	69.0	--
SP26-CS-001-250[a]	3	--	--	--	--	--	--	--	83.7	--
SP26-CS-001-050	5	0.02 U	0.02 U	0.02 U	0.06 U	--	10 U	--	7.04	--
SP26-CS-002-120	12	0.05 U	0.05 U	0.05 U	0.15 U	--	**9,100**	--	3.01	--
SP26-CS-003-040	4	0.03 U	0.03 U	0.03 U	0.09 U	--	**4,600**	--	1.36	--
SP26-CS-004-100	10	0.03 U	0.03 U	0.03 U	0.09 U	--	10 U	--	2.39	--
SP26-CS-005-120	12	0.02 U	0.02 U	0.02 U	0.06 U	--	10 U	--	1.95	--
SP26-CS-005-250[b]	12	0.02 U	0.02 U	0.02 U	0.06 U	--	10 U	--	1.86	--
SP26-CS-006-050	5	0.03 U	0.03 U	0.03 U	0.09 U	--	10 U	--	3.08	--
SP26-CS-007-120	12	0.02 U	0.02 U	0.02 U	0.06 U	--	10 U	--	1.62	--
SP26-CS-008-050	5	0.02 U	0.02 U	0.02 U	0.06 U	--	170	--	4.06	--
SP26-CS-009-120	12	0.02 U	0.02 U	0.02 U	0.06 U	--	10 U	--	3.67	--
SP26-CS-010-120	12	0.04 U	0.04 U	0.04 U	0.12 U	--	**8,100**	--	7.61	--
SP26-CS-011-080	8	0.05 U	0.05 U	0.05 U	0.15 U	--	**4,000** J	--	1.44	--
SP26-CS-012-100	10	0.03 U	0.03 U	0.03 U	0.09 U	--	**8,900**	--	1.15	--
SP26-CS-013-160	16	0.03 U	0.03 U	0.03 U	0.09 U	--	**4,400** J	--	17.4	--
SP26-CS-014-160	16	0.02 U	0.02 U	0.02 U	0.06 U	--	**530**	--	2.56	--
SP26-CS-015-170	17	0.04 U	0.04 U	0.04 U	0.12 U	--	**7,000**	--	1.60	--
Site 26/TPA Site 9k Stockpile Samples										
SP26-SS-001 [c]	--	0.72 U	0.72 U	0.72 U	0.72 U	--	**10,000**	--	**995**	2.50 U
SP26-SS-002	--	1.2 U	1.2 U	1.2 U	3.6 U	59	**7,600**	1,800	30.4	--
SP26-SS-003	--	0.02 U	0.02 U	0.02 U	0.06 U	1 U	180 J	50 U	2.30	--
Trip Blank Samples										
Trip blank	--	0.02 U	0.02 U	0.02 U	0.06 U	1 U	--	--	--	--
Trip blank	--	0.02 U	0.02 U	0.02 U	0.06 U	1 U	--	--	--	--
Method Two Cleanup Level [d]		*0.02*	*5.4*	*5.5*	*78*	*300*	*250*	*10,000*	*400* [h]	*NA*
Alternative Cleanup Level [e]		*0.5* [f]	*54*	*NA*	*NA*	*1,400* [g]	*2,500*	*NA*	*NA*	*NA*

Notes

bold Indicates concentration above one or both cleanup levels. Although reporting limits for benzene sometimes exceeded the Method Two cleanup level of 0.02 mg/kg, all reporting limits were below the 1991 cleanup level of 0.5 mg/kg.

AST Aboveground storage tank

bgs Below ground surface

BTEX Benzene, toluene, ethylbenzene, and total xylenes

DRO Diesel-range organic compounds

GRO Gasoline-range organic compounds

J Analyte was positively identified, but the numerical value is an estimated concentration

mg/kg Milligram per kilogram

mg/L Milligram per liter

-- Not analyzed

NA Not available

PAH Polynuclear aromatic hydrocarbon

RRO Residual-range organic compounds

TCLP Toxicity Characteristic Leachate Procedure
TPA Two-Party Agreement
U The analyte was analyzed for, but not detected above the sample reporting limit
a Field duplicate samples collected from suspected lead-contaminated soil removed prior to excavation of petroleum-contaminated soil.
b Duplicate of sample number SP26-CS-005-120.
c Sample collected from lead-cotnaminated soil that was placed in "Super Sacks".
d Cleanup level is from Title 18 of the *Alaska Administrative Code* 75 "Oil and Hazardous Substances Pollution Control Regulations," published by the State of Alaska and amended through October 28, 2000. Contaminants of concern for this site are limited to
e Cleanup level obtained from ADEC Method Two based on the "Ten Times Rule" applied to the migration to groundwater pathway, as discussed in Section 5.0 of the corrective action plan (National Oceanic and Atmospheric Administration [NOAA] 2003a).
f Under the TPA, NOAA is required to comply with the 1991 ADEC cleanup level for benzene (0.5 mg/kg).
g Cleanup level selected is based on more stringent value associated with ingestion and inhalation pathways.
h Although this site is in an industrial area, NOAA is using the residential cleanup level for lead (400 mg/kg).

ALASKA

2008-000211-0
Recording Dist: 305 - Aleutian Islands
5/1/2008 2:24 PM Pages: 1 of 7

NOTICE OF ENVIRONMENTAL CLEANUP AND RESIDUAL SOIL AND GROUNDWATER CONTAMINATION AT TPA9k, (FORMER) AST SADDLES SITE, ST. PAUL ISLAND, ALASKA

Pursuant to 18 AAC 75.375, Tanadgusix Corporation and The Aleut Corporation, as the owners, and the U.S. Department of Commerce/National Oceanic and Atmospheric Administration (NOAA), as the operator of the subject property hereby provide public notice that the property located at Short Street, St. Paul, St. Paul Island, Alaska 99660 is contaminated with petroleum products. More specifically, the site described as follows: Township 35 South, Range 132 West, Section 25 Tract A Block 1A of the Seward Meridian, Alaska and is located at 57° 7' 21.22" North Latitude; 170°16' 53.09" West Longitude (Figures 1 and 2) has been subjected to petroleum contaminated soil and potential groundwater contamination, as a result of a discharge, or release and subsequent cleanup of oil or other hazardous substances, regulated under 18 AAC 75, Article 3 as amended October 2005. If contaminated soil or solid wastes are exposed in the future they must be managed in accordance with laws applicable at that time. These releases and cleanup are documented in the Alaska Department of Environmental Conservation (ADEC) contaminated sites database under site number *CS Reckey* # 1994250119613; File ID 2644.38.023.11

The AST Saddles Site was identified as a potential site of concern pursuant to the *Pribilof Islands Environmental Restoration Two Party Agreement* (TPA) between the State of Alaska and NOAA (NOAA 1996). NOAA addressed the AST Saddles Site as TPA Site 9k and NOAA Site 26. Following corrective action, NOAA submitted a request for conditional closure to the ADEC Division of Spill Prevention and Response, Contaminated Sites Program. NOAA's request stated further cleanup was impracticable because contaminated soils remain buried at the soil horizon where consolidated material (rock) impeded excavation (NOAA 2004). ADEC determined, in accordance with 18 AAC 75.325(f)(1) that site cleanup has been performed to the maximum extent practicable even though residual petroleum contaminated soils, primarily diesel range organics and benzene exist on the site property. ADEC granted a conditional closure, in part subject to this institutional control (deed notice), and confirmed that no further remedial action was required at the site unless new information becomes available that indicates to ADEC that the site may pose an unacceptable risk to human health, safety, welfare to the environment (NOAA 2004).

Grantor, the US Bureau of Land Management.

Grantees:

- the Tanadgusix Corporation (grantee of the surface estate),
  4300 B Street, Suite 402
  Anchorage, AK 99503-5946

- The Aleut Corporation (grantee of the subsurface estate)
  4000 Old Seward Highway, Suite 300
  Anchorage, AK 99503

Recording District
Aleutian Islands

Remedial Actions and Residual Contamination

The AST Saddle site was used by the federal government to hold thirty-three (33) aboveground storage tanks (AST), which sat upon concrete saddles from the 1940s to the early 1960s. The ASTs held fuels, primarily diesel fuels, for distribution on the island. During 2003, NOAA removed the concrete saddles and approximately 1,370 cubic yards of petroleum contaminated soils from the site; the soil horizon at which consolidated material was found varied from approximately four to seventeen feet below ground surface (Figure 3) Tetra Tech, 2005. The site covered a surface area of approximately one-quarter of an acre.

NOAA has several groundwater (GW) monitoring wells in the vicinity of the site (Figure 4), which are maintained under its long-term groundwater monitoring plan (NOAA 2005). GW beneath the site maybe contaminated with diesel range organic compounds. Figure 4 depicts the location of GW wells, groundwater flow direction (Mitretek 2002 and Mitretek 2005), and wells with contamination detected during the most recent sampling in the vicinity of the site (Tutka 2007). The AST Saddle site lies within a Critical Water Management Area (CWMA) determined by the Alaska Department of Natural Resources in accordance with 11 Alaska Administrative Code [AAC] 93.500 - 11 AAC 93.530 (ADNR 2006). The CWMA acts as a management or institutional control necessary before a party can apply alternative cleanup levels to a site (18 AAC 75.345). ADEC acceptance of the CWMA determination by ADNR allowed groundwater cleanup criteria and soil cleanup criteria to increase to ten times the Table C and Method Two (18 AAC 75.341) cleanup levels, respectively, for those compounds listed above (ADEC 2002).

Site Use

In the event that information becomes available which indicates that the site may pose an unacceptable risk to human health, safety, welfare or the environment, the land owner and/or operator is required under 18 AAC 75.300 to notify ADEC and evaluate the environmental status of the contamination in accordance with applicable laws and regulations. Further site characterization and cleanup may be necessary under 18 AAC 75.325-.390 and 18 AAC 78.600. Also, any transport, treatment, or disposal of any potentially contaminated soil or water from the site or use of the groundwater at or near the contaminated area requires notification to and approval from the Department in accordance with 18 AAC 75.370(b) and 18 AAC 78.600(h).

In the future, if contaminated soil or wastes are removed from the site it must be characterized and managed following regulations applicable at that time. Pursuant to 18 AAC 75.325(i)(1) and (2) 18 AAC 75.370. ADEC approval is required prior to moving soil or groundwater that is, or has been, subject to the cleanup rules found at 18 AAC 75.325-.390.

This notice remains in effect until a written determination from ADEC is recorded that states that soil [and/or groundwater] at the site has been shown to meet the most stringent soil cleanup levels in Method Two of 18 AAC 75.341(c) and/or groundwater meets the cleanup levels in Table C in 18 AAC 75.345 and that off-site transportation of soil [and/or groundwater] is not a concern.

References:

Alaska Department of Environmental Conservation (ADEC). 2002. Letter from Jennifer Roberts to John Lindsay NOAA. Re: *Draft Final Groundwater Use and Classification in the Vicinity of Tract 46 TPA 9, April 30, 2002.* May 30.

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2008-000211-0

Alaska Department of Natural Resources (ADNR). 2006. *CWMA Commissioner's Order and Record of Decision, St. Paul Island, Alaska: Title Townsite of the City of St. Paul: Critical Water Management Area Department Order 148.* Includes cover memorandum by Commissioner Michael L. Mange. April 10.

Mitretek Systems. 2002. *Groundwater Use and Classification in the Vicinity of Tract 46, St. Paul Island, Pribilof Islands, Alaska.* May.

Mitretek Systems. 2005. *Tidal Corrections for Groundwater Flow in the Critical Water Management Area and the Diesel Seep, St. Paul Island, Pribilof Islands, Alaska.* August 10.

National Oceanic and Atmospheric Administration (NOAA). 1996. *Pribilof Islands Environmental Restoration Two Party Agreement*, Attorney General's Office File No. 66 1-95-0126. National Oceanic and Atmospheric Administration. January 26.

NOAA. 2004. *Request for No Further Remedial Action Planned, NOAA Site 26/TPA Site 9k, St. Paul Island, Alaska.* Signed by John Lindsay (NOAA) and submitted October 6. Signed by Louis Howard of ADEC Contaminated Sites Program, November 5, 2004.

NOAA. 2005. *Final Long Term Groundwater Monitoring Plan, St. Paul Island, Alaska.* Prepared by National Oceanic and Atmospheric Administration, National Ocean Service, Office of Response and Restoration, 7600 Sand Point Way NE, Seattle, WA. 98115. August 29.

Tetra Tech. (Tetra Tech EM Inc. 2005. *Draft Corrective Action Report Site 26/TPA Site 9k, St. Paul Island, Alaska.* . Prepared for National Oceanic and Atmospheric Administration, National Ocean Service, Office of Response and Restoration, 7600 Sand Point Way NE, Seattle, WA. 98115. August 23.

Tutka. 2007. *Annual Groundwater Monitoring Report 2007, St. Paul Island, Alaska.* December 21. Prepared for NOAA, Office of Response and Restoration, 7600 Sand Point Way NE, Seattle, WA. 98115.

Please return original copy of this notice to the (operator) address below:

Signature: _____

Printed Name: JOHN A. LINDSAY

Mailing Address:
Attn: John Lindsay

US DOC, NOAA, NOS, OR&R, PPO
7600 Sand Point Way NE
Bldg 3, RM 1301
Seattle, WA 98115

(seal) Subscribed and sworn to before me this ___ day of _____, 19___.
Notary Public in and for the State of _____
My commission expires:_____

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2008-000211-0

Figure
1

St. Paul Island Vicinity Map
AST Saddle Complex
NOAA Site 26/TPA Site 9k
St. Paul Island, Alaska

Source: Ikonos Satellite Imagery (Space Imaging 2001)
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Date: 4/30/2008

Figure 2

Legal Property Description Map
Tract A, Block 1A
AST Saddle Complex
NOAA Site 26/TPA Site 9k
St. Paul Island, Alaska

Source: TPA 9k Layers (NOAA Pribilof Project GIS, 2003), Aero-Metric 1ft 2006 Aerial Photo, 1983 Bureau of Land Management Land Survey Plat Officially filed February 15, 1985
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Pribilof Islands Restoration Project

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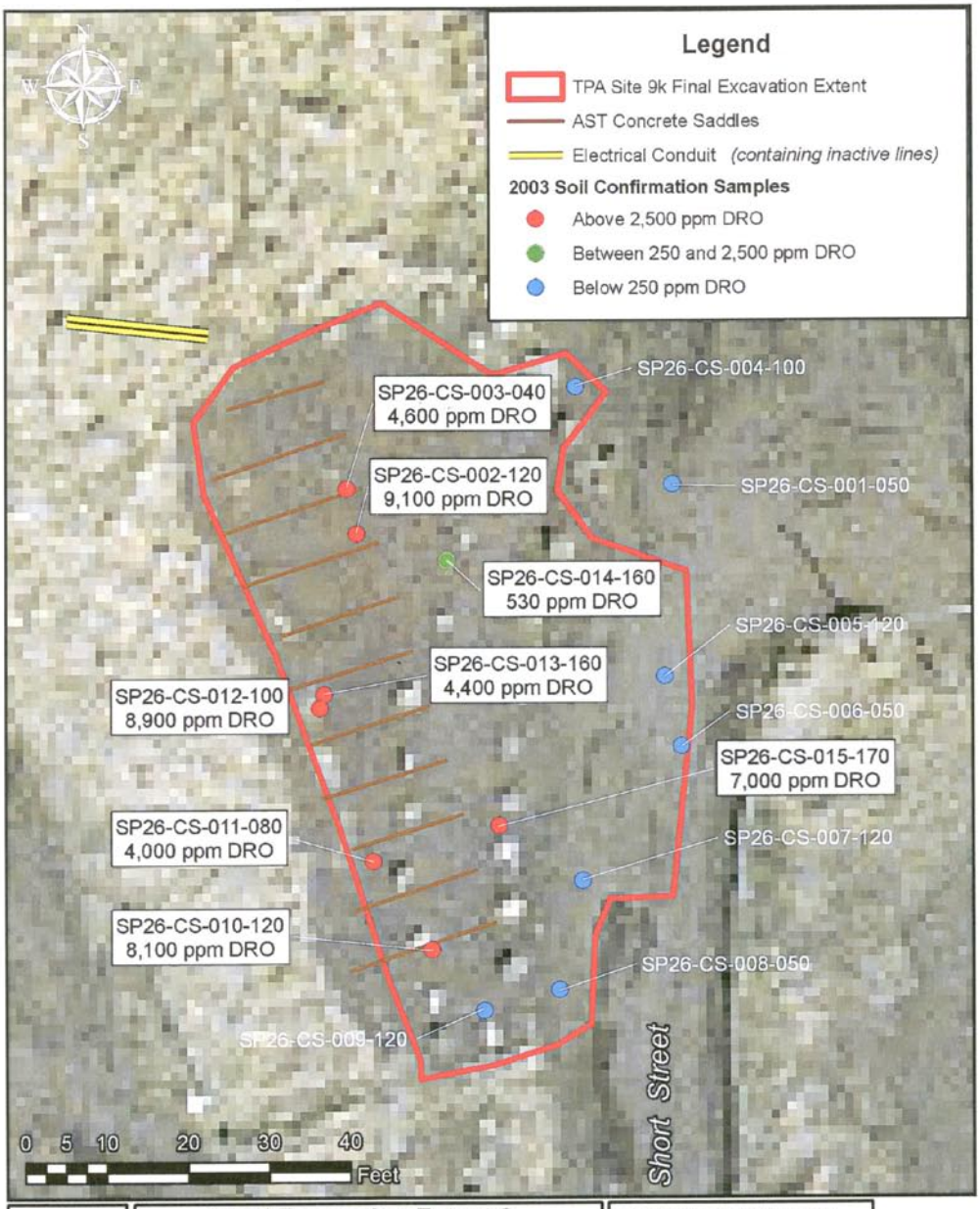

Figure 3	Final Excavation Extent & Confirmation Sampling Results AST Saddle Complex NOAA Site 26/TPA Site 9k St. Paul Island, Alaska	Sources: All layers (NOAA Pribilof Project GIS, 2003), Samples (2003 Chemical Database), Aero-Metric 1ft 2006 Aerial Photo Path: C:\KP_GIS Data\Maps & Figures\SNP\Deed Notices\Site 26, TPA 9k\AST_Sample&Excavation_Fig3.mxd Date: 4/30/2008 @ 1:58:50 PM

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Figure 4

Location of Groundwater Wells & Gradient
AST Saddle Complex
NOAA Site 26/TPA Site 9k
St. Paul Island, Alaska

Source: All Layers (NOAA Pribilof Project GIS 2002-2007), Aero-Metric 2006 1 ft Aerial
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Pribilof Islands Restoration Project

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NOAA Site 27
TPA Site 9l: Old Sealing Plant (Barreling Shed)

Request for NFRAP, Old Sealing Plant/Barreling Shed,
TPA Site 9ℓ/Site27, St. Paul Island, Alaska 693

Request for NFRAP
Old Sealing Plant/Barreling Shed
TPA Site 9ℓ/Site27
St. Paul Island, Alaska

Request for No Further Remedial Action Planned

Site: Old Sealing Plant/Barreling Shed, also known as Two Party Agreement (TPA) Site 9ℓ and National Oceanic and Atmospheric Administration (NOAA) Site 27

Location: St. Paul Island, Alaska is approximately 800 miles southwest of Anchorage in the Bering Sea. On St. Paul Island, the Old Sealing Plant/Barreling Shed is situated at the bottom of Village Hill, just north of Sandy Lane and northeast of the community grocery store (57 07'21" N latitude, 170 16'49" W longitude; Figure 1).

Legal Property Description: The location of the former building and the area of excavation is within the southern portion of Tract 46, Township 35 South, Range 132 West, of the Seward Meridian, Alaska, as shown on the dependent resurvey of a portion of U.S. Survey No. 4943, Alaska, Tract "A", St. Paul Townsite, officially filed June 3, 1997 (Figure 2).

Type of Release:
No historical sources of contamination are believed to be present at the Old Sealing Plant/Barreling Shed. Potential release mechanisms contributing to the observed contamination include miscellaneous spills and leaks from vehicles and equipment that may have been staged at the Old Sealing Plant/Barreling Shed.

History and Background:
At the Barreling Shed, fur seal skins were packed into wooden barrels or boxes for shipment off-island. The building was a two-story wooden structure with a metal corrugated roof constructed on a cement pad. Built in 1923, the building was used until 1984 and demolished in 2000 (Nortech 2001). NOAA took measures to preserve historically significant structural elements of the building and to photo-document the building prior to demolition.

Summary of Site Investigations:
Columbia Environmental Sciences, Inc. (CESI) conducted a building assessment in August 2000 (CESI 2001b). The exterior paint of the Old Sealing Plant/Barreling Shed was severely weathered and determined to contain 9 wt% total lead. The floor of the abandoned building was filled with wooden and metal debris. Nortech Environmental & Engineering Consultants (Nortech) removed materials and wastes from the building, including 15 drums of hazardous and non-hazardous chemical materials, which were manifested and shipped off-island for disposal on November 22, 2000 (Nortech 2001). On November 2, 2000, the building was demolished (Nortech 2001).

During the summer of 2000, CESI also conducted site characterization activities in the City of St. Paul. These activities included the installation of monitoring wells and the advancement of soil borings at various locations. Soil samples collected from a boring located just north of the Old Sealing Plant/Barreling Shed (FBSB-2) revealed the presence of diesel-range organic compounds (DRO) in the 2 to 4 foot interval at a concentration of 310 milligrams per kilogram (mg/kg), exceeding the Alaska Department of Environmental Conservation (ADEC) Method Two cleanup levels of 250 mg/kg (CESI 2001; Figure 2).

NOAA contractors conducted quarterly groundwater monitoring from September 2000 to September 2001 and from October 2003 to July 2004 at monitoring well MW46-8, located north of and down gradient (Mitretek Systems 2002) from the Old Sealing Plant/Barreling Shed (Figure 4). During 2000-2001 sampling events, DRO were detected above their Alaska Department of Environmental Conservation (ADEC) Table C cleanup level of 1,500 micrograms per liter (µg/L), with a maximum detection of 2,400 µg/L (IT Alaska Corp. 2002). Lead was also detected above its Table C cleanup level of 15 µg/L, with a maximum detection of 106 µg/L. During the first three quarters of the 2003-2004 sampling, DRO were detected, but at a much lower concentration and below the

Table C clean up level. The maximum concentration detected was 630 µg/L. Lead was not detected. Contaminants have not been detected above Table C cleanup levels at MWA-5 located 5 meters east of and up gradient of the site (Figure 4). [Note that NOAA's contractor for the 2001 sampling analyzed for residual-range organic compounds (RRO) by adapting soil analytical method AK103. The adapted method was never approved by ADEC, and no ADEC approved method exists. Thus, although the contractor reported detecting RRO above its ADEC Table C cleanup level in MW46-8, ADEC has indicated it does not consider this data to be valid, and the results are not included herein.]

Mitretek Systems (2002) evaluated the 2000-2001 groundwater data for wells in the St. Paul Village area, which includes the Old Sealing Plant/Barreling Shed site. The Mitretek Systems report demonstrated that groundwater in the vicinity of St. Paul Village has high total dissolved solids and can be brackish. Consequently, the groundwater in the area is not suitable for drinking water. The evaluation, in part, provided a rationale for using alternative groundwater cleanup levels that are protective of human health and the environment where the groundwater is not potable. Mitretek concluded in accordance with 18 Alaska Administrative Code (AAC) 75.350 (ADEC 2000) that groundwater in the Village area is not currently used and does not afford any potential future use as a drinking water source. Subsequently, NOAA proposed and ADEC approved (REF) NOAA to proceed with corrective actions at the Old Sealing Plant/Barreling Shed site under the guidelines of 18 AAC 75.345 and 18 AAC 350, commonly referred to as the Ten Times Rule. These findings provided the basis for the application of the Ten Times Rule discussed below.

Summary of Applied Cleanup Levels:

NOAA employed ADEC Method Two cleanup criteria, discussed at 18 AAC 75.341(c) (ADEC 2000). Alternative cleanup levels were also applied for some compounds. For benzene, under the TPA, NOAA had the option to cleanup to the less stringent State of Alaska cleanup level in effect in 1991 (ADEC 1991). Additionally, NOAA proposed and ADEC approved the use of alternative cleanup levels under 18 AAC 75.345 and 18 AAC 75.350, commonly referred to as the Ten Times Rule (ADEC 2002, Mitretek Systems 2002). According to these regulations, if groundwater beneath a site contains contaminant concentrations above the cleanup levels provided in ADEC Table C, then the soil may be remediated to levels ten times higher than those provided in Method Two Tables B1 and B2 for the migration to groundwater pathway for those contaminants found in groundwater at concentrations above the cleanup levels provided in ADEC Table C; however, if the inhalation or ingestion pathway values are more stringent than the migration to groundwater pathway, then the more stringent value is to be applied. ADEC uses 15 feet below ground surface (bgs) to define subsurface soil to which residents will have a reasonable potential to be exposed through the inhalation or ingestion pathways (ADEC 2000; 18 Alaska Administrative Code 75.340 (j)(2)). Therefore NOAA is not obligated to excavate contaminated soil occurring at depths deeper than 15 feet to address the inhalation and ingestion pathways.

Summary of Cleanup Actions:

NOAA contractor Tetra Tech EM Inc. (Tetra Tech) and its subcontractor Bering Sea Eccotech commenced excavation activities for the Old Sealing Plant/Barreling Shed on July 23, 2003, and completed them on July 24, 2003 (Tetra Tech 2004a). The initial area of excavation was selected based on suspected contamination identified during a previous investigation (CESI 2001), while the extent of excavation was based upon thin-layer chromatography (TLC) screening sample analyses as well as visual and olfactory observations.

The excavation was advanced to a maximum depth of 7 feet below ground surface (bgs). No signs of contamination were observed, and TLC screening results indicated contamination was below ADEC Method Two cleanup levels. Two confirmation samples were collected, one from the bottom and one from the side of the excavation (Figure 3). These were analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX), DRO, gasoline-range organic compounds (GRO), residual-range organic compounds (RRO), select polynuclear aromatic hydrocarbons (PAHs), and lead. No contaminants were identified at concentrations above ADEC Method Two cleanup levels (Tables 1 and 2). Laboratory reporting limits were below ADEC Method Two cleanup levels for all analyses except benzene. For benzene, reporting limits of 0.03 mg/kg were achieved, which is above the ADEC Method Two cleanup level of 0.02 mg/kg, but below the alternative cleanup level of 0.5 mg/kg.

During the corrective action, a total of approximately 10 cubic yards of petroleum-contaminated soil (PCS) was removed from the excavation at the Old Sealing Plant/Barreling Shed (Figure 3). The excavated PCS was transported to the lined stockpiled at Tract 42, pending final disposal at the National Weather Service land spreading site, or other ADEC approved disposal alternative. Samples collected from PCS stockpiled from this site, the Former Fouke Bunkhouse (TPA Site 9g/ Site 22), and Tract A House 102 (TPA Site 9r/Site 54) contained DRO concentrations that varied from not detected to 350 mg/kg (Tetra Tech 2004b).

The site was backfilled with clean fill material from the Telegraph Hill quarry. The material was compacted with the excavator bucket and by track-walking the excavator over the area. The area of excavation was restored to its original grade.

Recommended Action:
In accordance with paragraph 59 of the Two Party Agreement (NOAA 1996), NOAA requests written confirmation that NOAA completed all appropriate corrective action at the Old Sealing Plant/Barreling Shed, TPA Site 9ℓ/ Site 27 in accordance with the Agreement and that ADEC requires no further remedial action plan from NOAA.

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Columbia Environmental Sciences, Inc. 2001. *Draft Site Characterization Report, Tract 46 and Vicinity (TPA Site 9), St. Paul Island, Alaska*. Version 2.1 December 16, 2001. Columbia Environmental Sciences, Inc. Kennewick, WA.

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NOAA. 2003. *Final Corrective Action Plan, Barreling Shed (Old Sealing Plant, TPA 9ℓ) Petroleum Contaminated Soils, St. Paul Island, Alaska*. October 8, 2003.

Nortech Environmental & Engineering Consultants. 2001. *Site Salvage and Demolition Report- Draft, Boxing/Barreling Shed Cleanup, Historical Items Salvage and Demolition (Two-Party Agreement Site 9, Tract 46), Pribilof Islands Site Restoration, St. Paul Island, Alaska*. May 23, 2001.

Tetra Tech EM Inc. (Tetra Tech). 2004a. *Final Corrective Action Report, Site 27/TPA Site 9ℓ- Old Sealing Plant/ Barreling Shed, St. Paul Island, Alaska*.

Tetra Tech. 2004b. *Letter Report, Summary of 2003 Field Season Stockpile Activities, St. Paul Island, Alaska*. July 23.

For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

9/15/04
Date

Approvals: In accordance with Paragraph 59 of the Two Party Agreement, this is to confirm that all corrective action has been completed at the Old Sealing Plant/Barreling Shed, TPA Site 9ℓ/Site 27 in accordance with the Agreement and that no plan for further remedial action is required.

For the Alaska Department of Environmental Conservation

Louis Howard
Alaska Department of Environmental Conservation
Remedial Project Manager

9-14-04
Date

Tables and Figures

Table 1. Organic Compound and Lead Confirmation Sample Results for the Old Sealing Plant/Barreling Shed-TPA 9ℓ/Site 27, St. Paul Island, Alaska

Sample Number	Sample Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	RRO (mg/kg)	Lead (mg/kg)
Site 27/TPA Site 9L Confirmation Sampless									
SP27-CS-001-060	6	0.03 U	0.03 U	0.03 U	0.03 U	2 U	10 U	50 U	3.90
SP27-CS-002-070	7	0.02 U	0.03	0.02 U	0.13	1	10 U	50 U	28.5
Site 27/TPA Site 9L Stockpile Samples									
SP22-SS-901	1.5	0.02	0.02	0.02 U	0.03	1 U	80	91	39.3
SP22-SS-902	1.5	0.03 U	0.03 U	0.03 U	0.04	2 U	110	77	46.0
SP22-SS-903	1.5	0.02 U	0.02	0.02 U	0.04	1 U	**350**	75	45.4
SP22-SS-904	1.5	0.02 U	0.04	0.02 U	0.07	1 U	250	69	62.4
SP22-SS-905	1.5	0.02 U	0.02 U	0.02 U	0.03	1	140	79	43.7
SP22-SS-906	1.5	0.02 U	0.02	0.02 U	0.03	1 U	10 U	77	21.7
Trip Blank Sample									
Trip blank	--	0.02 U	0.02 U	0.02 U	0.02 U	1 U	--	--	--
ADEC Method Two Cleanup Level [a]		*0.02*	*5.4*	*5.5*	*78*	*300*	*250*	*10,00*	*400*[e]
Alternative Cleanup Level [b]		*0.5*[c]	*54*	*NA*	*NA*	*1,400*[d]	*2,500*	*NA*	*NA*

Notes:

bold Indicates concentration above one or both cleanup levels. Although reporting limits for benzene sometimes exceeded the ADEC Method Two cleanup level of 0.02 mg/kg, all reporting limits were equal to or below the alternative cleanup level of 0.5 mg/kg.

ADEC Alaska Department of Environmental Conservation
bgs Below ground surface
BTEX Benzene, toluene, ethylbenzene, and total xylenes
DRO Diesel-range organic compounds
GRO Gasoline-range organic compounds
mg/kg Milligram per kilogram
-- Not analyzed
NA Not available
PAH Polynuclear aromatic hydrocarbon
RRO Residual-range organic compounds
TPA Two-Party Agreement
U The analyte was analyzed for, but not detected above the sample reporting limit

a Cleanup level is from Title 18 of the Alaska Administrative Code 75 "Oil and Hazardous Substances Pollution Control Regulations," published by the State of Alaska and amended through October 28, 2000. Contaminants of concern for this site are limited to BTEX, DRO, and select PAHs; although not identified as contaminants of concern in the corrective action plan, GRO, RRO, and lead are included because these analyses were conducted on some samples.

b Cleanup level obtained from ADEC Method Two based on the "Ten Times Rule" applied to the migration to groundwater pathway, as discussed in Section 5.0 of the corrective action plan (NOAA 2003a).

c Under the TPA, NOAA is required to comply with the 1991 ADEC cleanup level for benzene (0.5 mg/kg).

d Cleanup level selected is based on more stringent value associated with ingestion and inhalation pathways.

e Although this site is located in an industrial area, NOAA is using the residential cleanup level for lead (400 mg/kg).

Table 2. Polynuclear Aromatic Hydrocarbon Confirmation Sample Results for the Old Sealing Plant/Barreling Shed - TPA 9ℓ/Site 27, St. Paul Island, Alaska

Sample Number	Sample Depth (feet bgs)	Naphthalene (mg/kg)	Acenaph-thylene (mg/kg)	Acenaph-thlene (mg/kg)	Fluorene (mg/kg)	Phenan-threne (mg/kg)	Anthracene (mg/kg)	Fluoranthene (mg/kg)
Site 27/TPA Site 9L Confirmation Samples								
SP27-CS-001-060	6	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP27-CS-002-070	7	0.006	0.005 U	0.005 U	0.005 U	0.008	0.005 U	0.005
Site 27/TPA Site 9L Stockpile Samples								
SP22-SS-901	1.5	0.016 J	0.005 U	0.005 U	0.005 U	0.039 J	0.006	0.035 J
SP22-SS-902	1.5	0.012	0.005 U	0.005 U	0.005 U	0.021	0.005 U	0.016
SP22-SS-903	1.5	0.069	0.005 U	0.005 U	0.005 U	0.017	0.005 U	0.014
SP22-SS-904	1.5	0.006	0.005 U	0.005 U	0.005 U	0.010	0.005 U	0.013
SP22-SS-905	1.5	0.029	0.005 U	0.005 U	0.005 U	0.015	0.005 U	0.010
SP22-SS-906	1.5	0.012	0.005 U	0.005 U	0.005 U	0.021	0.005 U	0.015
ADEC Method Two Cleanup Level[a]		*43*	*NA*	*210*	*270*	*NA*	*4,300*	*NA*

Sample Number	Sample Depth (feet bgs)	Pyrene (mg/kg)	Benz(a) anthracene (mg/kg)	Chrysene (mg/kg)	Benzo(b) fluoranthene (mg/kg)	Benzo(k) fluoranthene (mg/kg)	Benzo(a) pyrene (mg/kg)
Site 27/TPA Site 9L Confirmation Samples							
SP27-CS-001-060	6	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP27-CS-002-070	7	0.006	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Site 27/TPA Site 9L Stockpile Samples							
SP22-SS-901	1.5	0.044 J	0.015 J	0.016 J	0.022	0.006	0.017
SP22-SS-902	1.5	0.024	0.008	0.009	0.017	0.005 U	0.017
SP22-SS-903	1.5	0.021	0.005 U	0.006	0.008	0.005 U	0.006
SP22-SS-904	1.5	0.015	0.007	0.007	0.010	0.005 U	0.007
SP22-SS-905	1.5	0.015	0.005 U	0.005	0.008	0.005 U	0.005
SP22-SS-906	1.5	0.016	0.009	0.008	0.013	0.005 U	0.009
ADEC Method Two Cleanup Level[a]		*1,500*	*6*	*620*	*11*	*110*	*1*

Notes:

bgs Below ground surface

J Analyte was positively identified, but numerical value is estimated concentration. Result is considered qualitatively acceptable, but qualitatively unreliable.

mg/kg Milligrams per kilogram

NA Not available

TPA Two-Party Agreement

U The analyte was analyzed for but not detected above the sample reporting limit.

a Cleanup level is from Title 18 of the *Alaska Administrative Code* 75, "Oil and Hazardous Substances Pollution Control Regulations," published by the State of Alaska and amended through October 28, 2000.

Bering Sea
Northeast Point
Big Lake
North Point
Airport
Telegraph Hill
Lukanin Bay
Salt Lagoon
Reef Point
Zapadni Point
Southwest Point
Old Sealing Plant/Barreling Shed
City of St. Paul
0
0.5
1
2
3
4
Miles
Anchorage
800 Miles
St. Paul Is.
St. George Is.
Pribilof Islands Restoration Project
Source: Ikonos Satellite Imagery, 2001
Figure 1
St. Paul Island Vicinity Map
Old Sealing Plant/Barreling Shed
Site 27/TPA Site 9I
St. Paul Island, Alaska

Figure 2	Legal Property Description Map Old Sealing Plant/Barreling Shed Site 27/TPA Site 9I St. Paul Island, Alaska	Sources: BLM Tract (BLM MTPs 1983), TPA 9I Boundary (NOAA GIS 2004), Aerial Photo (Aeromap US 1996).

Pribilof Islands Restoration Project

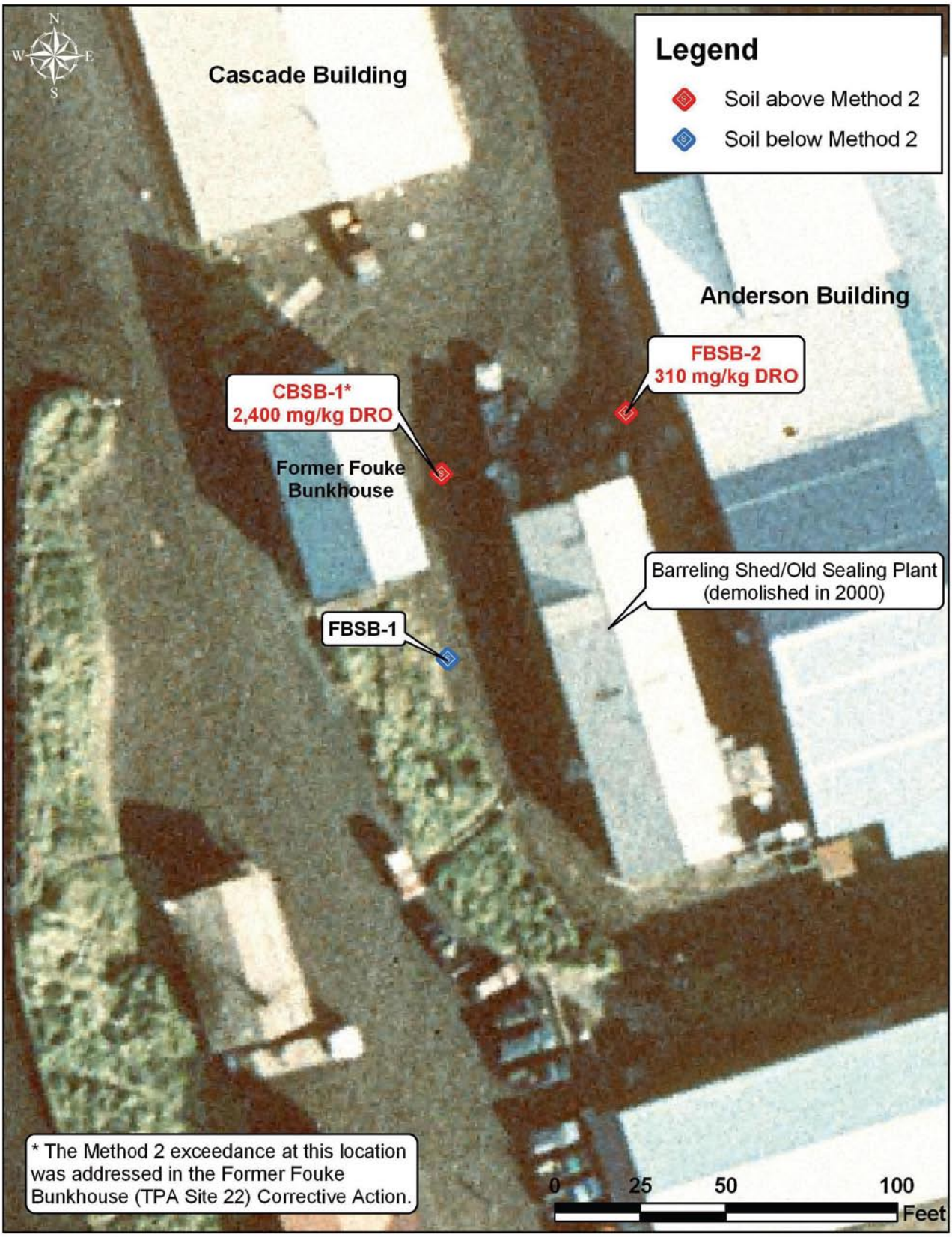


Figure 3	Historical Sampling Results Old Sealing Plant/Barreling Shed Site 27/TPA Site 9l St. Paul Island, Alaska	Sources: Historical Sampling Locations (Pribilof Islands GIS Project 2003), Aerial Photo (Aeromap US, 1996).

Pribilof Islands Restoration Project

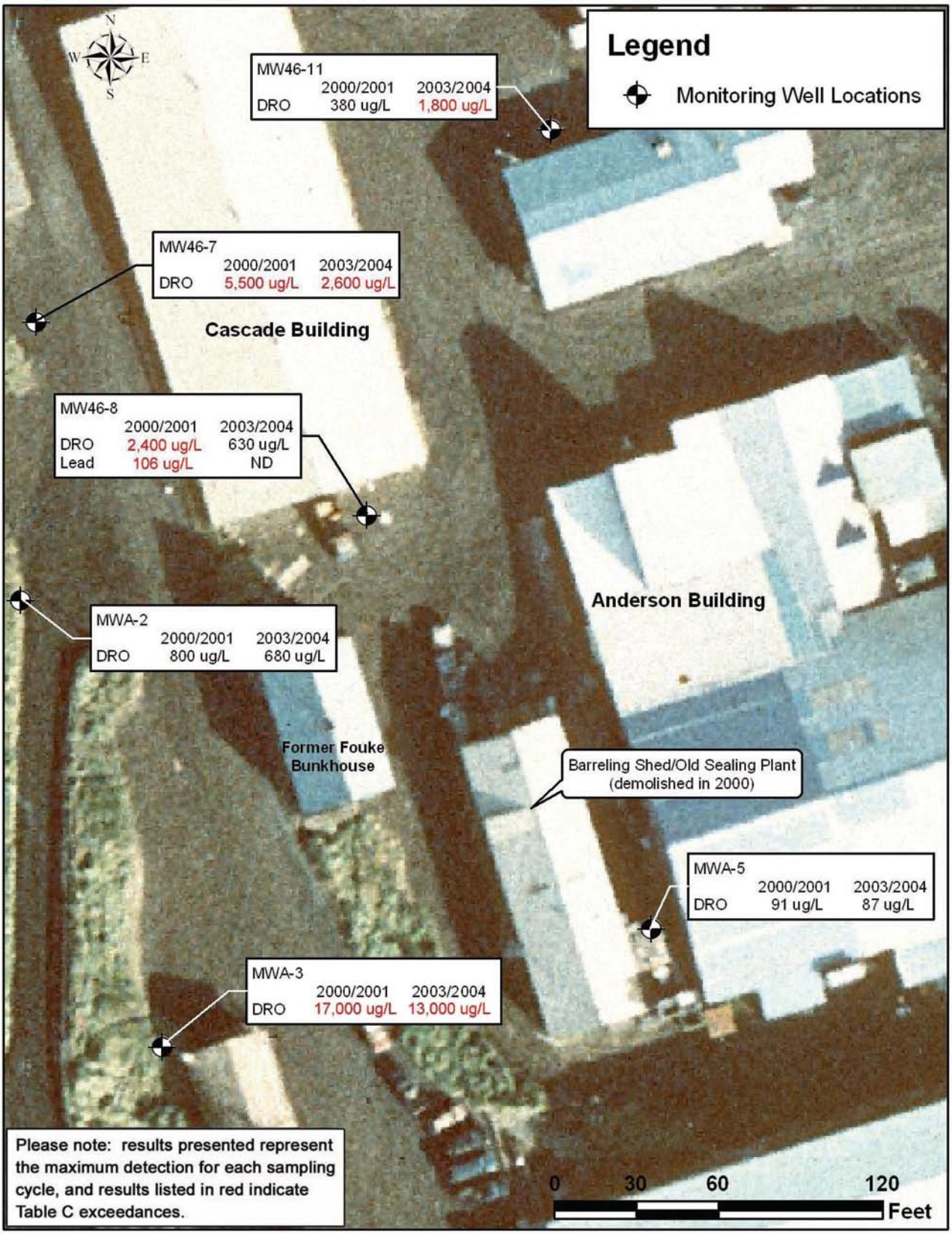


Figure 4	Groundwater Sampling Results Old Sealing Plant/Barreling Shed TPA Site 9I/Site 27 St. Paul Island, Alaska	Sources: Monitoring Well Location and Historical Sampling Locations (Pribilof Islands GIS Project 2003), Aerial Photo (Aeromap US, 1996).

Pribilof Islands Restoration Project

Figure 5	Area of Excavation Old Sealing Plant/Barreling Shed Site 27/TPA Site 9I St. Paul Island, Alaska	Sources: Excavation Extent (NOAA GPS 2003), Aerial Photo (Aeromap US, 1996).

Pribilof Islands Restoration Project

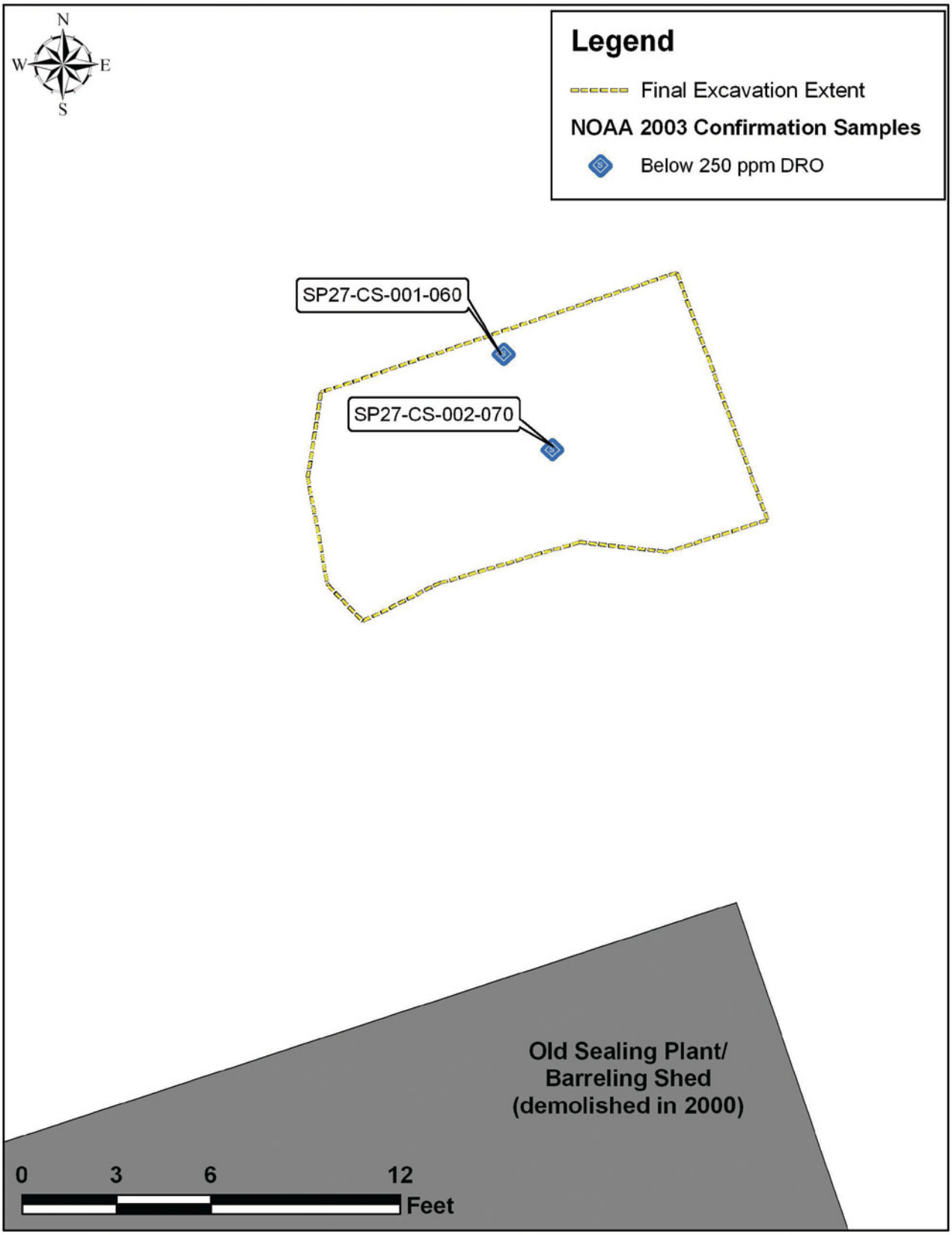


Figure 6	Sampling Location Map Old Sealing Plant/Barreling Shed Site 27/TPA Site 9l St. Paul Island, Alaska	Sources: Excavation Extent and Confirmation Samples (NOAA GPS 2003), Building Footprint (NOAA Pribilof Project GIS Database).

Pribilof Islands Restoration Project

NOAA Site 28
TPA Site 9m: Salt Water Wells
(Contaminated Salt water Wells TPA 9e; TPA Attachment A)

Request for Conditional Closure, Saltwater Wells,
NOAA Site 28/TPA Site 9m, St. Paul Island, Alaska 707

Request for Conditional Closure
Saltwater Wells, NOAA Site 28/TPA Site 9m
St. Paul Island, Alaska

Request for Conditional Closure

Site: The Saltwater Wells, also known as the National Oceanic and Atmospheric Administration (NOAA) Site 28 and Two Party Agreement (TPA) Site 9m. The site will be referred to as the Saltwater Wells herein.

Location: St. Paul Island, Alaska is approximately 800 miles southwest of Anchorage in the Bering Sea. On the island, the Salt Water Wells are 5 wells located at the northern extent of the old village area of St. Paul near the shores of the village harbor entrance, near the Former Diesel Power Plant. (Figures 1 and 2). The 5 wells are named and located as described below:

- West Old Sealing Plant (WOSP) well: 57 07 24.83 N 170 16 56.00 W
- East Old Sealing Plant (EOSP) well: 57 07 24.88 N 170 16 55.69 W
- West Decommissioned Power Plant (WDPP) well: 57 07 25.63 N 170 16 58.27 W
- East Decommissioned Power Plant (EDPP) well: 57 07 25.56 N 170 16 58.11 W
- Pump House-2 (PH-2) well: 57 07 24.91 N 170 16 58.35 W.

Legal Property Description: The Saltwater Wells are located in Tract 46, Township 35 South,

Range 132 West, of the Seward Meridian, Alaska, as shown on the dependent resurvey of a portion of U.S. Survey No. 4943, Alaska, Tract "A", St Paul Townsite, officially filed June 3, 1997. The surface and subsurface is owned by the US Government.

Type of Release: NOAA has measured petroleum compounds at levels exceeding ADEC Table C cleanup levels in every one of these wells, with reports of free product having been found in the past in every well either as a floating layer or entrained in the groundwater, except PH-2 (ADEC 1998, CESI 1999). However, no free product has been found in these wells since 1999, except for a viscous paint like liquid found in EDPP in 1999 (Colombia Environmental Sciences, Inc. [CESI] 1999). NOAA believes that the presence of petroleum in groundwater mostly originates from releases at other adjacent facilities including underground storage tanks and associated piping systems or from surface spills. The viscous, paint like material found in the EDPP was removed in 2000, and empty containers of motor oil were retrieved from WOSP. However, the EDPP well may have been used for disposal of some wastes, and may be a source of groundwater contamination (CESI 1999, and CESI 2001).

History and Background:
NOAA believes that several production wells existed within the City of St. Paul, originally intended as sources of both fresh and salt water. Only the 5 wells listed above have been proven to exist. The oldest of the wells may be two "Old Sealing Plant" wells, WOSP and EOSP, which may date from 1961 to 1962 based on dates found on the electrical panels inside the pump house that contains them. Two other wells (EDPP and WDPP) were installed in the fall of 1963 reportedly intended to provide water for processing fur seal pelts, or as coolant for the Decommissioned Power Plant that was in service at the time (CESI 1999). However, other documents suggest that EDPP and WDPP may have been used for fish processing water (NOAA 1990). NOAA reported that EDPP and WDPP had been abandoned in 1984 or 1985 because they became contaminated with diesel fuel (E&E 1993). The well in Pump House –2, known as PH-2 has not been described or a date of construction identified in available sources, but appears to be several decades old judging on the apparent age of the pump house itself. It is possible that this well was constructed in 1955, based on a photograph from that year that shows a drilling rig set up in that area, said to be showing the installation one of the saltwater wells (CESI 1998).

Summary of Site Investigations and Removals:
August 1990, NOAA Environmental Compliance Survey: In early August 1990, NOAA Western Administrative Support Center Civil Engineer Steve Buckel P.E. conducted an environmental survey at the request of the NOAA

National Marine Fisheries Service (NMFS) on St. Paul and St. George Islands. NMFS requested the survey after receiving letters from the City of St. George, the St. Paul Tanadgusix Corporation, and the St. George Tanaq Corporation. The letters had requested that NOAA address several sites that the letter writers believed to be in violation of environmental regulations. The resulting compliance survey report (NOAA 1990) stated that a city official, John R. Merculief, had told NOAA that "two salt water wells near the power plant….had become contaminated with petroleum products and are no longer used." The NOAA environmental compliance survey report went on to recommend site and risk assessments to determine if further action was necessary.

October 1992, Ecology and Environment Preliminary Assessment: On October 5 through October 8, 1992, Ecology and Environment, Inc. (E&E) conducted a Preliminary Assessment of several sites on St. Paul and St. George Islands, including the Contaminated Saltwater Wells Site (E&E 1993). The report describes WDPP and EDPP and a third salt water well said to exist to the north of the diesel power plant closer to the waterfront. It is not clear from the report whether any of these wells was actually visited or verified by E&E. The report states that the wells were abandoned in 1984 or 1985 because they had become contaminated with diesel fuel.

December 1998, ADEC Sampling of EOSP: On December 4, 1998, Ray Dronenburg of ADEC collected a sample from a saltwater well "near the power house" (ADEC 1998). From the description provided, the well sampled is most likely EOSP, though it is not identified as such. A later report by CESI states that the well sampled by ADEC was EOSP (CESI 1999). ADEC stated that the well they sampled was next to a second well, contained in a flat roofed, concrete building, one well to the west, and one well to the east side of the building, with a large pump installed in the west well. ADEC removed the pump and sampled the groundwater with a bailer, noting the presence of "approximately 2 to 3 inches of a black substance inside the bailer floating on approximately 12 inches of water." ADEC collected a sample of this material. Although the ADEC report did not report the results of the analysis of the sample, CESI apparently obtained those results from ADEC and reported them in their 1999 site investigation (CESI 1999). Although CESI did not provide a reference from the actual document they obtained these results from, they stated that GRO was not measured, RRO was absent, and DRO was simply reported as "present". The analytical results determined that two VOCs exceeded ADEC Table C cleanup levels (ethylbenzene and xylenes). The ADEC report also mentions that a city employee had informed Mr. Dronenburg that another salt water well existed at the "south east corner of the old power plant" and that "a wooden floor was built over the well". ADEC did not attempt to inspect this well.

January 1999, CESI Site Investigation: NOAA's contractor CESI conducted a site investigation on St. Paul Island from January 25 to February 4, 1999. The scope of work called for the contractor to measure the construction details and sample the water from two wells known to exist (WOSP and EOSP), and to search for five other wells thought to exist, measuring construction details and collecting groundwater samples at these wells if they were found. The site visit succeeded in locating the two known wells, and verifying the existence of 2 of the 3 suspected wells (WDPP and EDPP). However, CESI did not locate several other saltwater wells that were suspected to exist in or near town. CESI sampled three of the four located wells and found them to contain petroleum product either entrained in the groundwater, or as a floating layer in one case (EDPP), where a viscous, paint like material was found floating in the well casing. A water sample was not collected from the EDPP. At least one petroleum constituent exceeded ADEC Table C cleanup levels in each of the three wells (Figure 3). Gasoline range organics (GRO) in water ranged from undetected to 2.6 miligrams/liter (mg/l), diesel range organics (DRO) in water ranged from 2.7 to 10.0 mg/l, and residual range organics (RRO) in water ranged from not detected to 3.1 mg/l. Floating product sampled from EDPP was found to contain 59,000 mg/l DRO and 510,000 mg/l RRO. At least 2 volatile organic compounds (VOCs) exceeded ADEC Table C cleanup levels in three of the wells.

2000-2001, CESI Site Characterization: CESI (2001) conducted a site characterization on St. Paul Island during the field seasons of 2000 and 2001, focusing on Tract 46 (TPA 9). The report describes an interim action conducted to remove the paint like product found in EDPP, and provides data from samples collected in four of the saltwater wells, EOSP, WOSP, EDPP, and PH-2 (Figure 3).

Summary of Applied Cleanup Levels:
Contamination associated with the saltwater wells will be addressed by NOAA along with the overall groundwater contamination of Tract 46. The objective of this report is to document the history, analytical sampling findings, and physical decommissioning of saltwater wells EOSP, WOSP, WDPP, EDPP, and PH-2.

Summary of Decommissioning Actions:
TTEMI decommissioned wells EOSP, WOSP, EDPP, and WDPP on September 26, 2003, and well PH-2 on 9/23/04, by filling the casings with bentonite chips or powdered bentonite. The Well Abandonment Forms documenting these procedures were submitted to the Alaska Department of Natural Resources, Drinking Water Program office on February 11, 2005 by Tetra Tech, and are included in Appendix A.

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, at the Saltwater Wells, NOAA Site 28/TPA Site 9m, St. Paul Island, Alaska in accordance with the Agreement and that ADEC grant a conditional closure that will not require further remedial action from NOAA. ADEC will/may require additional containment, investigation, or cleanup if subsequent information indicates that the level of contamination that remains does not protect human health, safety, or welfare, or the environment.

References:
Alaska Department of Environmental Conservation (ADEC). 1998. *Memorandum Salt Water Wells; St. Paul Island*. December 7. Ray Dronenburg. 1998.

Colombia Environmental Sciences, Inc.(CESI). 1998. Preliminary Assessment (PA) For St. Paul Former Fish Processing Plant and Gas Station Additional UST St. Paul Island, Alaska. January.

CESI. 1999. Site Investigation Report, St. Paul Groundwater and Potential Source Investigation St. Paul Island, Alaska. March.

CESI. 2001. Draft Site Characterization Report, Tract 46 and Vicinity (TPA Site 9) St. Paul Island, Alaska. May 3.

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

National Oceanic and Atmospheric Administration (NOAA). 1990. Environmental Compliance Survey Report Pribilof Islands, Alaska. National Marine Fisheries Service. S Buckel P.E. August 31.

NOAA. 1996. *Pribilof Islands Environmental Restoration Two Party Agreement*, Attorney General's Office File No. 66 1-95-0126. National Oceanic and Atmospheric Administration. January 26, 1996.

NOAA. 2004. Final Corrective Action Report TPA Site 9c/Site 18 - Decommissioned Power Plant St. Paul Island, Alaska. December 21.

For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

3/18/05
Date

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 Saltwater Wells, NOAA Site 28/TPA Site 9m, St. Paul Island, Alaska, in accordance with the Agreement and that no further remedial action is required 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

3/22/05
Date

Figures

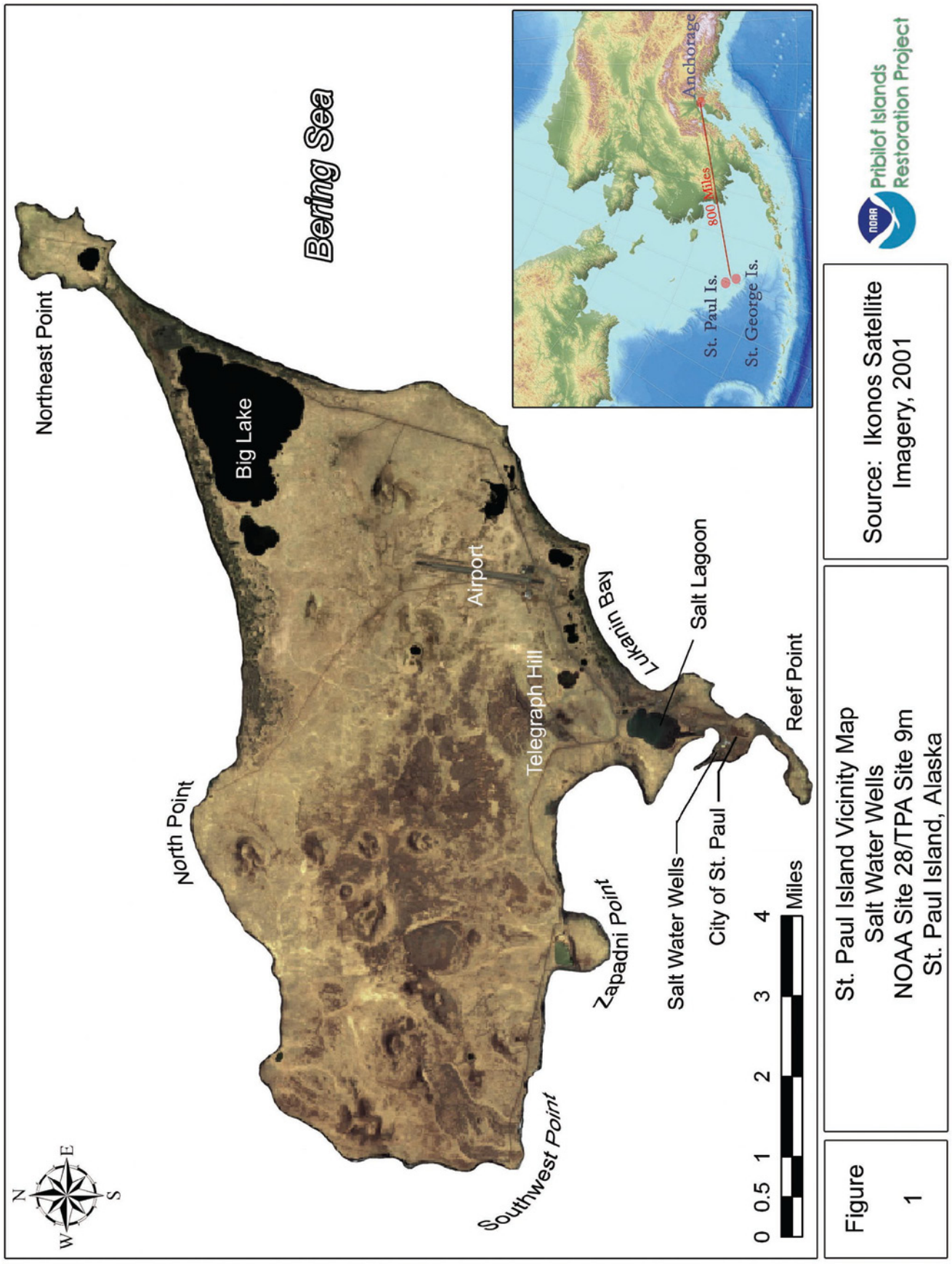

Bering Sea
Northeast Point
Big Lake
Airport
North Point
Telegraph Hill
Lukanin Bay
Salt Lagoon
Reef Point
Zapadni Point
Salt Water Wells
City of St. Paul
Southwest Point
0 0.5 1 2 3 4 Miles
N
E
S
W
Anchorage
800 Miles
St. Paul Is.
St. George Is.
Pribilof Islands Restoration Project
Source: Ikonos Satellite Imagery, 2001
St. Paul Island Vicinity Map
Salt Water Wells
NOAA Site 28/TPA Site 9m
St. Paul Island, Alaska
Figure 1

Figure 2	Legal Property Description Map Saltwater Wells NOAA Site 28/TPA Site 9m St. Paul Island, Alaska	Source: BLM Tracts (BLM MTPs 1983), Aerial Photo (Aeromap US 1996)

Pribilof Islands Restoration Project

Figure 3	Salt Water Well 2000 Sample Results NOAA Site 28/TPA Site 9m St. Paul Island, Alaska	Source: Aerial Photograph (Aeromap US 1996); CESI Draft Site Characterization Report Tract 46 & Vicinity (TPA Site 9) Dec. 16, 2001

Pribilof Islands Restoration Project

APPENDIX A
WELL DECOMMISSIONING FORMS

10/10

WELL ABANDONMENT FORM

CONTRACTOR/AGENT: TEMI REGISTRATION NO. _____

DATE: 9/26/03 TYPE OF SITE OR PROGRAM: _____

1. WELL LOCATION: (Show sketch of location on back of this form.) Salt water well

Municipality _____ County _____

Quadrangle _____ _____
(Road, community, subdivision, lot no.)

Latitude _____ Longitude _____

2. OWNER AND ADDRESS: WDPP

3. TOPOGRAPHY: (Circle) hilltop, slope, stream terrace, valley, stream channel, draw, local depression, (flat)

4. USE OF WELL: _____

5. DEPTH OF WELL: 35.5' DIAMETER OF WELL: 8" cement

WELL DIAGRAM: sketch a diagram showing depths of well, casing (if present), grouting materials, perforations, etc.

see reverse

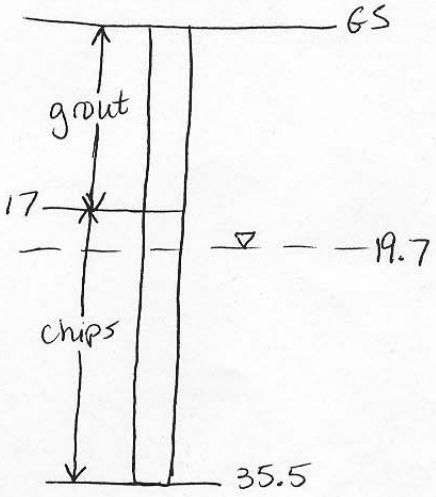
6. AMOUNT OF CASING REMOVED: — DIAMETER: —

7. SEALING MATERIAL:			
	bags (94 lb):	Bentonite ~~neat~~ chips ~~cement~~ 9 bags	Bentonite ~~sand~~ grout ~~cement~~ 1½ bags
	gals of water:	_____	_____
	yds of sand:	_____	_____

OTHER MATERIAL: _____ amount: _____

8. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

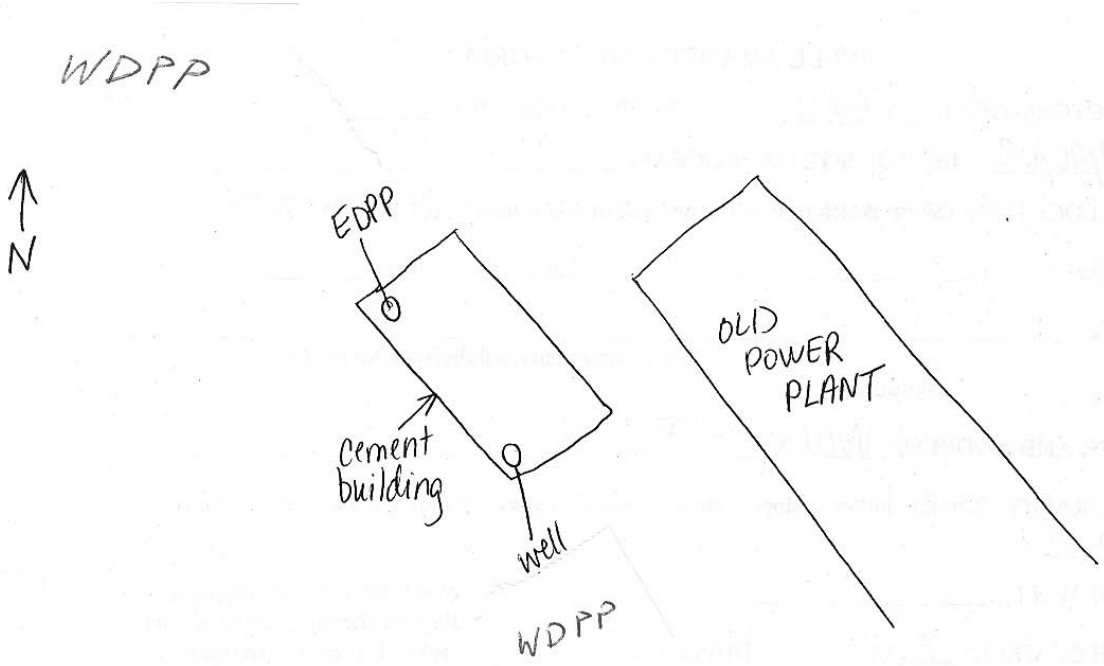
poured



9. CERTIFICATION: We hereby certify that this well abandonment record is true and exact, and was accomplished on 26th day of the month of September, 2003, with our active participation and that we are qualified to participate in such abandonment actions.

1. Signature of Participant: Sharon Gelinas 2. Signature of Participant: _____

Date: _____ Address: _____ Date: _____ Address: _____


WDPP
N
EDPP
cement building
well
OLD POWER PLANT
WDPP

10/10

WELL ABANDONMENT FORM

CONTRACTOR/AGENT: TIEMI REGISTRATION NO. _____ EDPP

DATE: 9/26/03 TYPE OF SITE OR PROGRAM: _____

1. WELL LOCATION: (Show sketch of location on back of this form.) Salt water well

Municipality _____ County _____

Quadrangle _____ _____
(Road, community, subdivision, lot no.)

Latitude _____ Longitude _____

2. OWNER AND ADDRESS: EDPP

3. TOPOGRAPHY: (Circle) hilltop, slope, stream terrace, valley, stream channel, draw, local depression, (flat)

4. USE OF WELL: _____

5. DEPTH OF WELL: 36.45 DIAMETER OF WELL: 8" cement

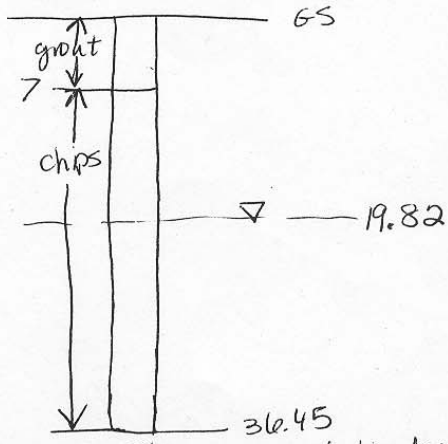
WELL DIAGRAM: sketch a diagram showing depths of well, casing (if present), grouting materials, perforations, etc.

6. AMOUNT OF CASING REMOVED: — DIAMETER: —

7. SEALING MATERIAL:

		Bentonite ~~neat cement~~ chips	Bentonite ~~sand cement~~ grout
bags	(94 lb):	14½ bags	3½ bags
gals of	water:	_____	_____
yds of	sand:	_____	_____

OTHER MATERIAL: _____ amount: _____



Note: chipped to 18', 2 bags grout displaced added 5 more bags of chips to 7'

8. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

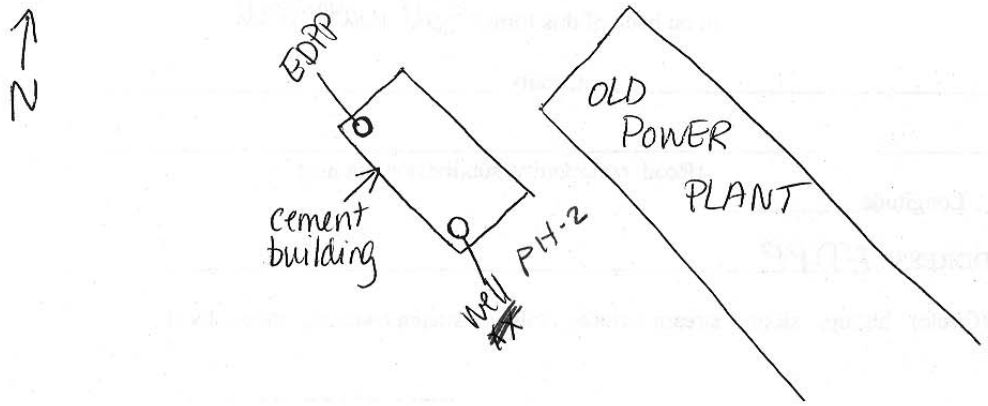
poured

9. CERTIFICATION: We hereby certify that this well abandonment record is true and exact, and was accomplished on 26th day of the month of September, 2003, with our active participation and that we are qualified to participate in such abandonment actions.

1. Signature of Participant: Sharon Gilinas 2. Signature of Participant: _____

Date: 9/26/03 Address: _____ Date: _____ Address: _____

EDPP



WELL ABANDONMENT FORM

CONTRACTOR/AGENT: TetraTech EM Inc REGISTRATION NO. _____

DATE: 8/6/04 TYPE OF SITE OR PROGRAM: _____

1. WELL LOCATION: (Show sketch of location on back of this form.) Well PH-2

Municipality St. Paul, Alaska County _____

Quadrangle _____ _____
(Road, community, subdivision, lot no.)

Latitude _____ Longitude _____

2. OWNER AND ADDRESS: NOAA PPO,

3. TOPOGRAPHY: (Circle) hilltop, slope, stream terrace, valley, stream channel, draw, local depression, flat

4. USE OF WELL: salt water supply

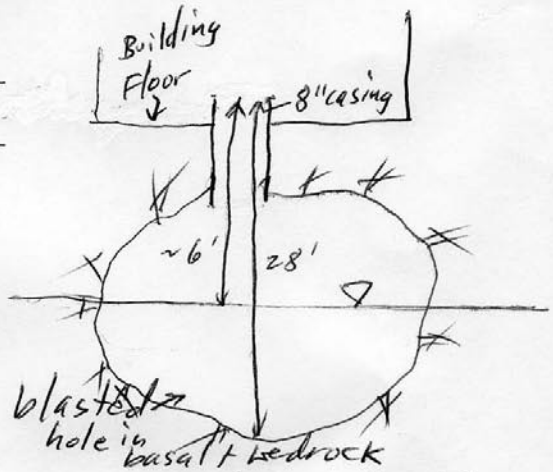
5. DEPTH OF WELL: ~28+ DIAMETER OF WELL: 8"

6. AMOUNT OF CASING REMOVED: 0 DIAMETER: ____
well is in building; no casing removal attempted

7. SEALING MATERIAL:	bags (94 lb):	neat cement	sand cement
Wyoming Bentonite 3/8" Chips (Hole Plug			
	gals of water:	53 bags	
	yds of sand:		

OTHER MATERIAL: bentonite chips amount: _____

WELL DIAGRAM: sketch a diagram showing depths of well, casing (if present), grouting materials, perforations, etc.



8. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

Well depth measured at 28' however after 18 bags, depth was up to 26'. There may have been an obstruction or centralizer at 28', or well is blasted as shown

9. CERTIFICATION: We hereby certify that this well abandonment record is true and exact, and was accomplished on 6th day of the month of August, 2004, with our active participation and that we are qualified to participate in such abandonment actions.

1. Signature of Participant: [signature] 2. Signature of Participant: _____

Date: 9/23/04 Address: TetraTech EM Inc, 6100 219th St SW Suite 550 Mountlake Terr, WA 98043 Date: _____ Address: _____

10/10

WELL ABANDONMENT FORM

CONTRACTOR/AGENT: ITEM1 REGISTRATION NO. _____ EOSP

DATE: 9/26/03 TYPE OF SITE OR PROGRAM: _____

1. WELL LOCATION: (Show sketch of location on back of this form.) Salt Water Wells

Municipality _____ County _____

Quadrangle _____ _____
(Road, community, subdivision, lot no.)

Latitude _____ Longitude _____

2. OWNER AND ADDRESS: EOSP

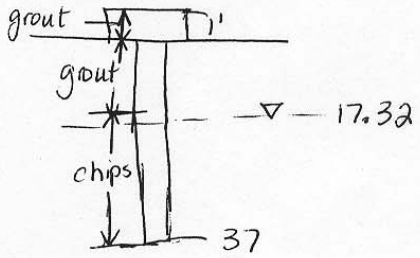
3. TOPOGRAPHY: (Circle) hilltop, slope, stream terrace, valley, stream channel, draw, local depression, (flat)

4. USE OF WELL: _____

5. DEPTH OF WELL: 36.7 DIAMETER OF WELL: 18" cement

WELL DIAGRAM: sketch a diagram showing depths of well, casing (if present), grouting materials, perforations, etc.

6. AMOUNT OF CASING REMOVED: — DIAMETER: —



7. SEALING MATERIAL:			
		~~neat~~ Bentonite chips ~~cement~~	~~sand~~ Bentonite grout ~~cement~~
	bags (94 lb):	13½ bags	3 bags
	gals of water:	_____	_____
	yds of sand:	_____	_____

OTHER MATERIAL: — amount: —

8. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

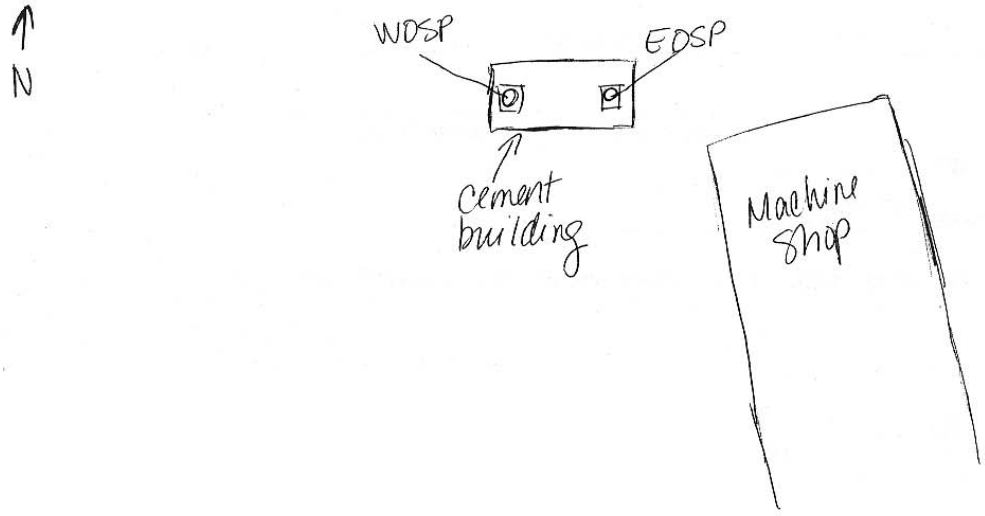
Poured

9. CERTIFICATION: We hereby certify that this well abandonment record is true and exact, and was accomplished on 26th day of the month of September, 2003, with our active participation and that we are qualified to participate in such abandonment actions.

1. Signature of Participant: Thomas Galinas 2. Signature of Participant: _____

Date: 9/26/03 Address: _____ Date: _____ Address: _____

EOSP



10/10

WELL ABANDONMENT FORM

CONTRACTOR/AGENT: TEMI REGISTRATION NO. _____ WOSP

DATE: _____ TYPE OF SITE OR PROGRAM: _____

1. WELL LOCATION: (Show sketch of location on back of this form.) Salt Water Wells

Municipality _____ County _____

Quadrangle _____ _____
(Road, community, subdivision, lot no.)

Latitude _____ Longitude _____

2. OWNER AND ADDRESS: WOSP

3. TOPOGRAPHY: (Circle) hilltop, slope, stream terrace, valley, stream channel, draw, local depression, (flat)

4. USE OF WELL: _____

5. DEPTH OF WELL: 19.8 DIAMETER OF WELL: 12" cement

WELL DIAGRAM: sketch a diagram showing depths of well, casing (if present), grouting materials, perforations, etc.

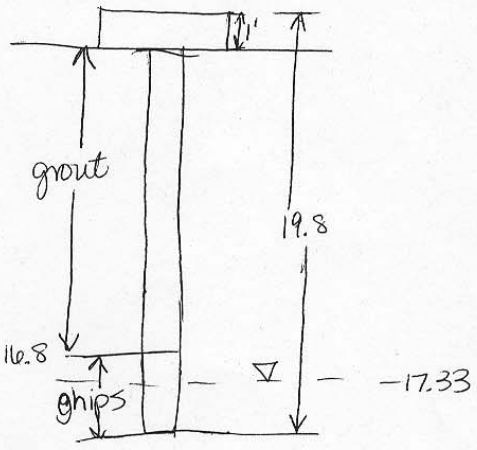
6. AMOUNT OF CASING REMOVED: _____ DIAMETER: _____

7. SEALING MATERIAL:		Bentonite ~~neat~~ chips ~~cement~~	Bentonite ~~sand~~ grout ~~cement~~
	bags (94 lb):	5 bags	2 bags
	gals of water:	_____	_____
	yds of sand:	_____	_____

OTHER MATERIAL: _____ amount: _____

8. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

poured

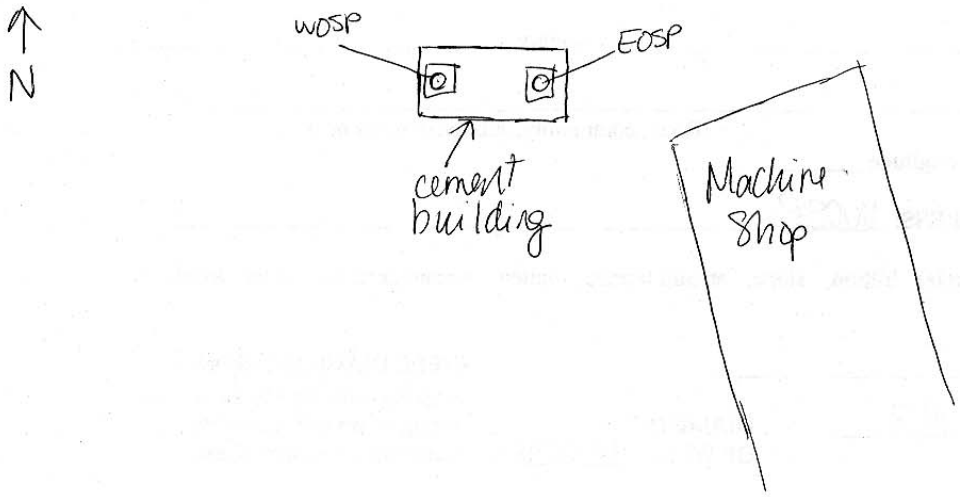


9. CERTIFICATION: We hereby certify that this well abandonment record is true and exact, and was accomplished on 26th day of the month of September, 2003, with our active participation and that we are qualified to participate in such abandonment actions.

1. Signature of Participant: Sharon Gelinas 2. Signature of Participant: _____

Date: 9/26/03 Address: _____ Date: _____ Address: _____

WOSP



NOAA Site 29
TPA Site 10: Former Gasoline Tank Farm

Final Site Characterization Report Former Gasoline Tank Farm,
Two-Party Agreement Site No. 10, Pribilof Islands Site Restoration,
St. Paul Island, Alaska 727

Letter from Louis Howard to John Lindsay RE: Draft Site Characterization
Report Former Gasoline Tank Farm TPA Site No. 10, St. Paul Island,
January 13, 2000. Dated February 24, 2000.. 747

FINAL

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

TETRA TECH EM INC.
600 University Street, Suite 800
Seattle, Washington 98101

NOAA Region	:	Western Administrative Support Center
Date Prepared	:	November 20, 2000
Contract No.	:	50WCNA906018
Modification No.	:	56WCNA901077
Tetra Tech Task Order No.	:	G1063 0021
Tetra Tech Project Manager	:	Ken Valder
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NOAA Contracting Officer	:	Mamie Wandick
Telephone	:	(816) 426-7267, Ext. 237
NOAA Project Manager	:	John Lindsay
Telephone	:	(206) 526-4560

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2 FORMER SAMPLING LOCATIONS
3 SAMPLING LOCATIONS AND LEAD CONCENTRATIONS
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1.0 INTRODUCTION

The National Oceanic and Atmospheric Administration (NOAA), 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 Former Gasoline Tank Farm (TPA Site No. 10). Tetra Tech conducted the work at the Former Gasoline Tank Farm and several other TPA and non-TPA sites on St. Paul Island during the 1999 field season. Site-specific field work requirements are outlined in the site characterization 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 at the Former Gasoline Tank Farm, 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), and conclusions (Section 7.0) and recommendations (Section 8.0). Appendixes to the report include photographs taken at the site (Appendix A), borehole logs (Appendix B), the general field and laboratory methodology used for the project (Appendix C), the laboratory report (Appendix D), and a data quality evaluation report (Appendix E).

2.0 PROJECT OBJECTIVES

The overall project objective for the Former Gasoline Tank Farm site characterization 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:

- Fill analytical and spatial data gaps to fully evaluate the nature and horizontal and vertical extent of contamination at the site.
- Update the conceptual site model to assist in determining appropriate cleanup levels.
- Quantify contaminant concentrations to evaluate whether corrective action is required pursuant to applicable regulations and stipulations set forth in the TPA.
- Collect an adequate number of samples to provide NOAA and ADEC with an estimate of the volume of contaminated soil associated with the site.
- Identify the location and boundaries of the site.

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 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 TPA classifies the Former Gasoline Tank Farm (TPA Site No. 10) as an unregulated underground storage tank (UST) site. However, no investigations conducted at the site to date have revealed the presence of any USTs, and city government officials who were informally interviewed during the 1999 field season were not aware of any USTs at the site.

The site is located in the city of St. Paul, on the hill southwest of the harbor. The tank farm once contained four, single-wall, 25,000 gallon aboveground storage tanks (AST) mounted on concrete saddles. The tank farm reportedly fed gasoline to two USTs in Tract 46 through underground and aboveground pipelines. In 1991, the tank

farm was abandoned, and the pipelines were purged (Paulus 1992). Gasoline storage was relocated to its existing location along Airport Road, west of Lukanin Bay.

In 1997, Bristol Environmental Services Corporation (Bristol) removed the ASTs. Neither fluids nor vapors were present in the tanks at the time of removal, and all tanks were reportedly in good condition (Bristol 1997).

During the 1999 site characterization, Tetra Tech observed miscellaneous small debris scattered throughout the Former Gasoline Tank Farm, including wood debris and concrete demolition rubble. The concrete rubble may have been part of the concrete cradles that supported the tanks. Surface soil was mostly gravel scoria fill, and Tetra Tech did not note any stained soil. The area within the former tank farm was unvegetated, but outside of the tank farm, tundra vegetation typical of the surrounding bluff top area was present. In addition, Bristol did not report revegetating the site after the tanks were removed and site structures were demolished in 1997.

3.3.1 Soil and Geology

Data on site-specific geology and soil is derived from observations made during the August 1999 site characterization effort. Soil beneath the Former Gasoline Tank Farm consists of brown, silty, fine- to medium-grained sand, with some interbedded black and red scoriaceous gravel from the ground surface to about 4 feet below ground surface (bgs). Interbedded red and black scoriaceous sand and gravel, along with silty, fine-grained brown sand, was encountered from about 4 to 10 feet bgs. The depth to bedrock is unknown.

3.3.2 Surface Water

The nearest surface water body is the Bering Sea, at the base of the bluff on which the site is located.

3.3.3 Groundwater

Groundwater was not encountered during 1999 site characterization activities, but because of the site's proximity to the Bering Sea, it is likely present at a depth close to sea level. The depth to groundwater is estimated to be about 80 feet.

4.0 PREVIOUS INVESTIGATIONS AND OTHER ACTIVITIES

Previous activities conducted at the Former Gasoline Tank Farm include a 1992 preliminary assessment by Ecology & Environment, Inc. (E&E) and a 1997 AST removal by Bristol. These investigations and activities are summarized in the following sections.

4.1 PRELIMINARY ASSESSMENT (1992)

E&E performed a preliminary assessment at the Former Gasoline Tank Farm in 1992. At that time, the ASTs were present, and the site was surrounded by a fence topped with barbed wire. E&E reported that no visible containment features were present. Pipes lay on the ground near a valve pit located at the eastern end of the site, and five rusted drums were scattered about the site. Based on their markings, two of the drums likely contained motor oil at one time. E&E did not observe visibly stained soil during the preliminary assessment (E&E 1993).

4.2 ABOVEGROUND STORAGE TANK REMOVAL (1997)

In 1997, Bristol contracted with Aleutian Enterprises to remove the four, 25,000-gallon ASTs at the Former Gasoline Tank Farm. Bristol oversaw removal activities and collected soil samples. At the time of removal, all four tanks appeared to be in good condition, with no apparent leaks or holes. The ASTs were transported to one of the island boneyards for later cleaning. Aleutian Enterprises reported that no sludge was present in the tanks (Bristol 1997). Tanks ultimately were disposed offsite at General Metals in Tacoma, Washington.

A total of 15 shallow soil samples (0.7 to 1.5 feet bgs) were collected beneath the tanks and near a valve pit located at the eastern end of the site (see Figure 2). Samples 1 through 4 were collected beneath tank discharge line valves, at the northern end of each tank, and were analyzed for gasoline-range organics (GRO); benzene, toluene, ethylbenzene, and total xylenes (BTEX); and lead. To differentiate Bristol samples from Tetra Tech samples, each

numeric Bristol sampling location reported in the AST removal document (Bristol 1997) is preceded with "BESC" in this report. Analytical results from the tank removal sampling are summarized in Table 1.

GRO, total BTEX, and benzene results did not exceed the site-specific Method One soil cleanup levels calculated by Bristol in accordance with 18 AAC 75.341(a). Lead detected at 530 mg/kg near one of the tank's discharge line valves exceeded the cleanup level of 400 mg/kg for residential land use identified at 18 AAC 75.341(b), but did not exceed the cleanup level of 1,000 mg/kg for commercial and industrial land use.

5.0 SAMPLING STRATEGY

During the 1997 sampling event conducted by Bristol at the Former Gasoline Tank Farm, target parameters were GRO, total BTEX, benzene, and lead. GRO and total BTEX concentrations detected at all sampling locations were lower than the applicable Method One cleanup levels defined at 18 AAC 75.341(a). Benzene was not detected. Therefore, Tetra Tech did not consider GRO, total BTEX, or benzene to be target parameters for the 1999 field effort.

At sampling location BESC 01, directly north of the westernmost AST, lead was detected at 530 mg/kg. Although this concentration is well below the applicable soil cleanup level of 1,000 mg/kg for commercial and industrial sites defined at 18 AAC 75.341(b), it is more than twice as high as the concentrations in the other lead samples collected at the site. NOAA conservatively decided to investigate the area further to ensure that lead concentrations in this area were below the applicable cleanup level of 1,000 mg/kg.

To evaluate the extent of lead contamination in site soils, Tetra Tech proposed in its site characterization plan (Tetra Tech 1999d) to collect soil samples around the area containing elevated lead levels. Bristol collected sample BESC 17 about 5 feet south of BESC 01; this sample contained only 32 mg/kg lead, effectively bounding the area of high lead concentrations to the south. Therefore, Tetra Tech planned to install four boreholes, one adjacent to BESC 01 and three within 10 feet west, north, and east of BESC 01. At each borehole location, Tetra Tech proposed to collect samples at 2-foot intervals to a maximum depth of 10 feet bgs, or until groundwater or refusal was encountered.

Tetra Tech elected to use 400 mg/kg as a screening level for lead in site soils. This level is defined at 18 AAC 75.341(b) as the cleanup level for residential land use. Although the site has a commercial/industrial land use and a corresponding lead cleanup level of 1,000 mg/kg, the 400 mg/kg benchmark provides a reasonably conservative screening level. The sample collected from the upper 2 foot interval at each borehole was to be analyzed for lead. If concentrations exceeding 400 mg/kg were detected in these surface soil samples, the sample interval from 2 to 4 feet bgs was to be analyzed. This procedure was to be followed until soil concentrations dropped below the 400 mg/kg screening level or until the deepest sample collected was analyzed. If the horizontal or vertical extent of contamination was not adequately delineated based on the proposed sampling effort, additional boreholes were to be installed around areas of lead contamination until the extent of contamination was well defined.

To meet project objectives, Tetra Tech installed four boreholes as planned. One borehole was installed adjacent to Bristol sampling location BESC 01 (10SS02). Three other boreholes were installed within 10 feet west (10SS01), north (10SS04), and east (10SS03) of BESC 01 (see Figure 3). Tetra Tech collected a total of 20 soil and 1 duplicate soil samples from these boreholes at the planned depths. All of these samples were sent offsite for lead analysis according to the procedure described above.

6.0 ANALYTICAL RESULTS AND DATA EVALUATION

The following sections discuss the analytical data collected during the 1999 field effort, followed by a detailed evaluation of the data.

6.1 SAMPLE RESULTS

Tetra Tech contracted with Columbia Analytical Services, Inc. (Columbia), an ADEC-approved laboratory, to analyze the four soil and one duplicate soil samples collected at the Former Gasoline Tank Farm. Because all lead levels were below the screening level of 400 mg/kg, additional samples were not analyzed. A copy of the Columbia laboratory data report, including chain-of-custody forms, is provided in Appendix D. A data quality evaluation report is included in Appendix E.

As shown in the following table, samples collected from the upper 2 feet at boreholes 10SS01, 10SS02, and 10SS03 contained lead at levels of 2.8 to 3.9 mg/kg. The sample collected from borehole 10SS04, located about 10 feet north of Bristol sampling location BESC 01, contained the highest lead concentration (23.7 mg/kg).

6.2 DATA EVALUATION

Based on the samples collected during the 1999 field effort, lead levels in the suspected area of lead contamination are well below the applicable cleanup level of 1,000 mg/kg defined at 18 AAC 75.341(b). These concentrations also are well within the range of lead concentrations detected at the site during the 1997 Bristol sampling event. For that study, lead at the site was detected at an average concentration of 84 mg/kg.

Of note, the lead concentration in the surface soil sample collected at 10SS02 was 2.8 mg/kg, but the sample collected in 1997 at adjacent sampling location BESC 01 contained 530 mg/kg. The reason for the drastic reduction in concentration is unknown. However, Tetra Tech believes that at some time after the 1997 tank removal project, the site most likely was graded. If so, grading operations would have effectively "diluted" lead concentrations at the site by mixing soil containing relatively high lead levels with soil that contained much lower concentrations. In any case, lead concentrations were below the commercial/industrial cleanup level in 1997, and they appear to be even lower now.

NOAA requested that, at the conclusion of the 1999 field effort, Tetra Tech update the conceptual site model that was first prepared during the planning phases of the field effort and was incorporated into the site characterization plan (Tetra Tech 1999d). The updated conceptual site model is presented below in Section 6.2.1. In addition, NOAA requested that Tetra Tech evaluate the volume of soil requiring corrective action. That analysis is provided in Section 6.2.2.

6.2.1 CONCEPTUAL SITE MODEL

In preparing the conceptual site model, Tetra Tech evaluated all potential exposure pathways to describe those pathways by which receptors might be exposed to site contaminants. Each exposure pathway has four fundamental components: (1) a source and mechanism of chemical release, (2) an effected environmental medium and potential chemical migration process, (3) an exposure point, and (4) an exposure route by which humans come in contact with site contaminants. If any one of these components does not exist, the potential exposure pathway is considered to be incomplete.

Potential receptors at all TPA sites include residents, recreational users, subsistence users, industrial workers, and construction workers. Tetra Tech evaluated potential receptors based on current and probable future land use patterns.

The Former Gasoline Tank Farm is located on commercial/industrial property in an area zoned "harbor district" (City of St. Paul 1995). It is near existing fuel tanks immediately southwest of the St. Paul harbor area. During the 1999 field effort, Tetra Tech did not observe anyone at the site over a 3-month period. However, workers clearly gained access to the fuel tanks located adjacent to the site; workers also graded the road leading past the site on at least one occasion during the 1999 field effort.

Land use patterns at nearby sites are industrial in nature and consist of harbor and fuel storage operations. Therefore, the site is not attractive as a potential residential or recreational area. The site also is not useful for subsistence purposes. Industrial and construction worker occasionally gain access to nearby properties and may potentially enter the site. Therefore, workers are considered to be potential site receptors. Based on zoning and land use patterns at the site, it is unlikely that land use at the site will change in the foreseeable future.

The site was a fuel storage facility where gasoline leaks or spills may have occurred. If such leaks did occur, they potentially could affect three identified media of concern at all TPA sites: soil, groundwater, and surface water. Based on the data collected during the 1999 field effort, as well as previous investigations, the following conditions apply to the various environmental media.

Soil. Soil contamination has not been identified at levels exceeding appropriate cleanup levels for commercial/industrial sites defined at 18 AAC 75.341(a) and (b). Therefore, all potential exposure pathways associated with this medium are incomplete.

Groundwater. Soil contamination has not been identified at levels exceeding appropriate cleanup levels for commercial/industrial sites defined at 18 AAC 75.341(a) and (b). These soil cleanup levels are considered to be protective of groundwater. Therefore, all potential exposure pathways associated with this medium are incomplete.

Surface Water. Soil contamination has not been identified at levels exceeding appropriate cleanup levels for commercial/industrial sites defined at 18 AAC 75.341(a) and (b). These soil cleanup levels are considered to be protective of surface water, considering dissolution mechanisms that would allow soil contaminants to enter the surface water pathway. Because soil contamination is not present above the regulatory levels, surface water is not threatened, and all potential exposure pathways associated with this medium are incomplete.

The site characterization plan (Tetra Tech 1999d) included a preliminary conceptual site model for the site. The conceptual site model has been updated and is shown in Figure 4. As shown in the figure, the lack of a contaminant source at the site precludes completion of evaluated exposure pathways.

6.2.2 RESIDUAL CONTAMINATION REQUIRING CORRECTIVE ACTION

As discussed in Section 6.2, soil contaminant levels are all below their respective cleanup levels, as defined at 18 AAC 75.341(a) and (b). Therefore, the site does not require corrective action.

7.0 CONCLUSIONS

Based on historic analytical data collected at the site by Bristol in 1997, as well as the supplemental data collected by Tetra Tech during the 1999 field effort, contaminant concentrations at the Former Gasoline Tank Farm are well below all applicable cleanup levels. The 1997 tank removal sampling activities focused on GRO, total BTEX, benzene, and lead as target parameters. GRO and total BTEX were detected at levels below the Method One cleanup levels defined at 18 AAC 75.341(a) and are therefore not considered to be contaminants of concern at the site. Benzene was not detected and therefore, also is not a contaminant of concern.

Lead was not detected at concentrations above the 1,000 mg/kg cleanup level for commercial/industrial sites defined at 18 AAC 75.341(b). However, it was considered to be a contaminant of potential concern for the 1999 field effort, because the concentration at one location (BESC 01) was more than twice the lead concentrations of all the other soil samples collected during the Bristol investigation. The results from the 1999 sampling, however, indicate that lead levels in surface soil around BESC 01 are not at levels of concern. The highest lead concentration detected during the 1999 field effort was 23.7 mg/kg.

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

- **Fill analytical and spatial data gaps to evaluate the nature and horizontal and vertical extent of contamination at the site.** Tetra Tech installed boreholes and collected samples in an area of potential lead contamination. Based on the analytical data, the horizontal and vertical extent of contamination has been defined.

- **Update the conceptual site model to assist in determining appropriate cleanup levels.** Based on data collected during the 1999 field season, Tetra Tech has updated the conceptual site model (see Section 6.2.1).
- **Quantify contaminant concentrations to evaluate whether corrective action or remedial action is required pursuant to applicable regulations and stipulations set forth in the TPA.** Based on data collected during the 1997 Bristol investigation and the 1999 Tetra Tech site characterization, corrective action is not required at the site.
- **Provide NOAA and ADEC with an estimate of the volume of contaminated soil associated with the site.** Based on the data collected, Tetra Tech has determined that the site does not require corrective action; no soil is contaminated above applicable cleanup levels.
- **Identify the location and boundaries of the site.** The site's location and approximate boundaries have been adequately mapped using GPS methods.

8.0 RECOMMENDATIONS

Based on previous investigations, field observations, and information obtained during the 1999 sampling event at the Former Gasoline Tank Farm, neither further investigative work nor corrective action are warranted at the site.

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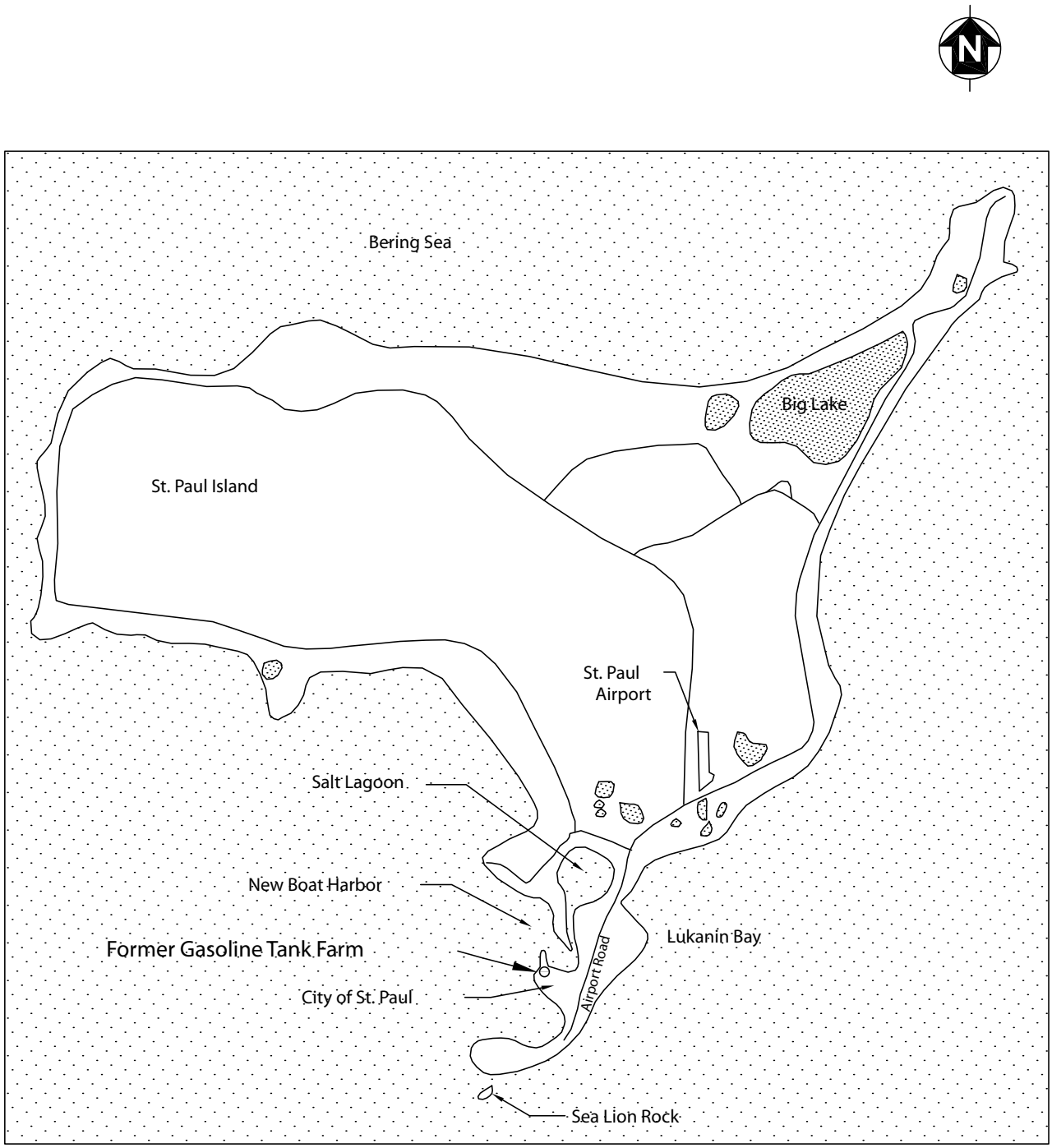
FIGURES



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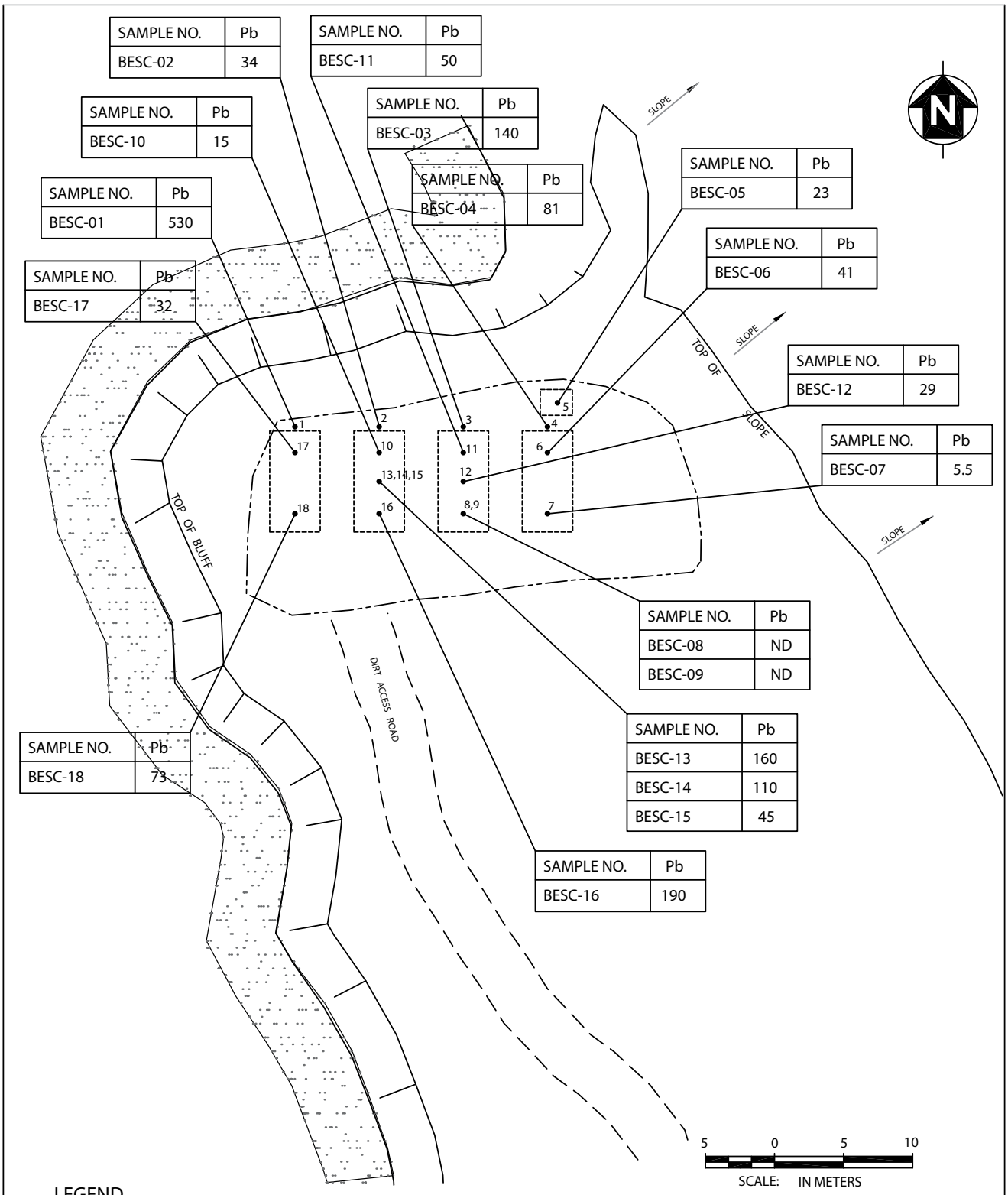
NOT TO SCALE

FORMER GASOLINE TANK FARM ST. PAUL ISLAND, ALASKA
FIGURE 1 SITE LOCATION
Tetra Tech EM Inc.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SAMPLE NO. Pb
BESC-11 50
SAMPLE NO. Pb
BESC-10 15
SAMPLE NO. Pb
BESC-03 140
SAMPLE NO. Pb
BESC-04 81
SAMPLE NO. Pb
BESC-01 530
SAMPLE NO. Pb
BESC-05 23
SAMPLE NO. Pb
BESC-06 41
SAMPLE NO. Pb
BESC-17 32
SAMPLE NO. Pb
BESC-12 29
SAMPLE NO. Pb
BESC-07 5.5
SAMPLE NO. Pb
BESC-08 ND
BESC-09 ND
SAMPLE NO. Pb
BESC-13 160
BESC-14 110
BESC-15 45
SAMPLE NO. Pb
BESC-18 73
SAMPLE NO. Pb
BESC-16 190
SLOPE
TOP OF BLUFF
DIRT ACCESS ROAD
1
2
3
4
5
6
7
8,9
10
11
12
13,14,15
16
17
18
N
5 0 5 10
SCALE: IN METERS
LEGEND
BOREHOLE LOCATION
EDGE OF ROAD
LIMITS OF DISTURBED AREA
Pb LEAD (MEASURED IN mg/kg)
FORMER GASOLINE TANK FARM
ST. PAUL ISLAND, ALASKA
FIGURE 2
PREVIOUS SAMPLING LOCATIONS
AND LEAD CONCENTRATIONS
Tetra Tech EM Inc.
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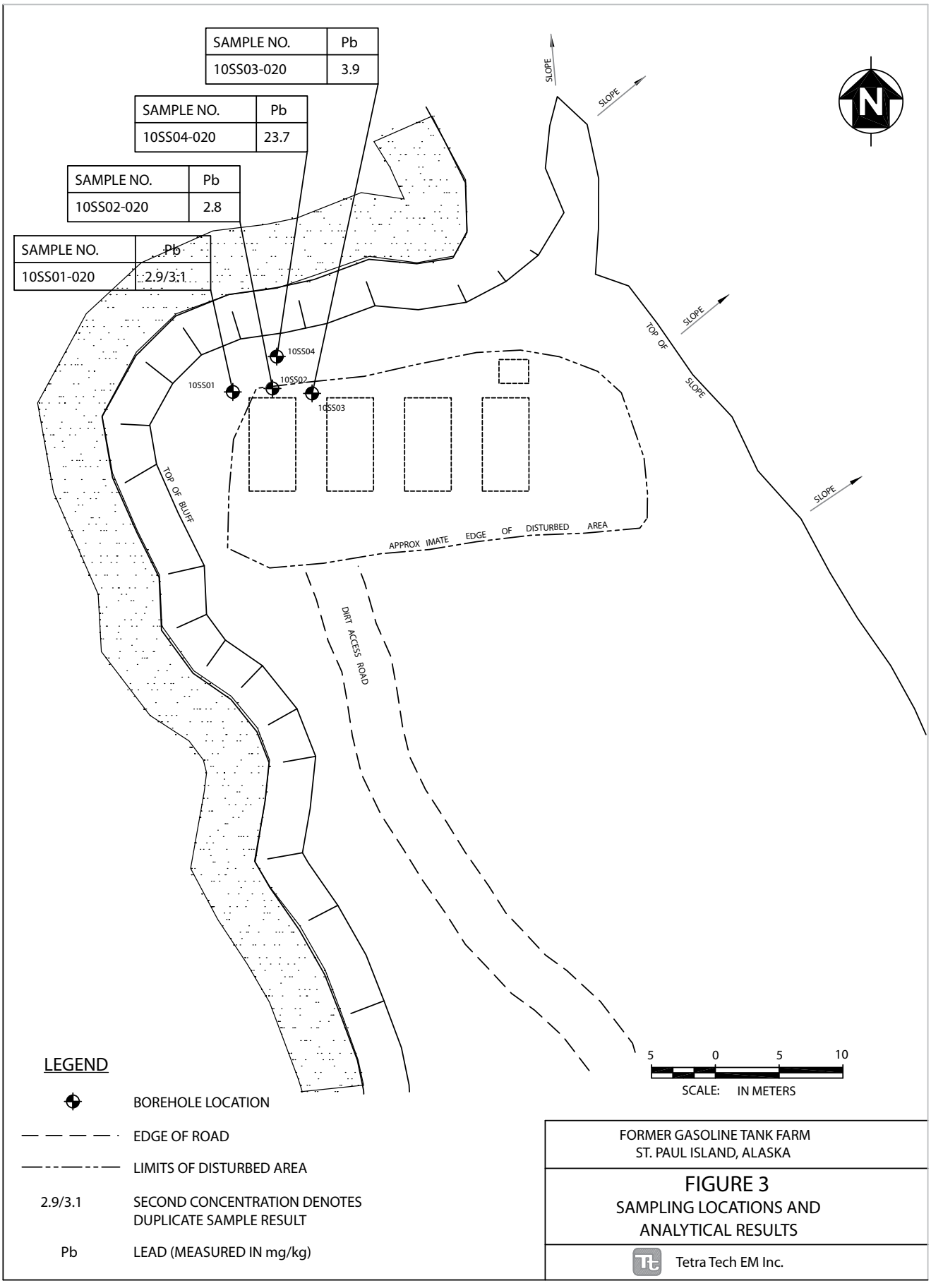
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10SS04
10SS02
10SS01
10SS03
SLOPE
SLOPE
SLOPE
SLOPE
SLOPE
TOP OF BLUFF
TOP OF
APPROX IMATE EDGE OF DISTURBED AREA
DIRT ACCESS ROAD
N
5 0 5 10
SCALE: IN METERS
LEGEND
BOREHOLE LOCATION
EDGE OF ROAD
LIMITS OF DISTURBED AREA
2.9/3.1 SECOND CONCENTRATION DENOTES DUPLICATE SAMPLE RESULT
Pb LEAD (MEASURED IN mg/kg)
FORMER GASOLINE TANK FARM
ST. PAUL ISLAND, ALASKA
FIGURE 3
SAMPLING LOCATIONS AND ANALYTICAL RESULTS
Tetra Tech EM Inc.
FILE NAME: R:\PRIBILOF\SAINT PAUL\NEW DRAWINGS\SITE_10\SNP_10_03.DWG
DATE: 12/28/99 JAY DN

TABLES

TABLE 1. 1997 SOIL SAMPLING RESULTS

Sample Number	GRO (mg/kg)	Total BTEX (mg/kg)	Benzene (mg/kg)	Lead (mg/kg)
BESC-01	4.2	0.056	ND	530
BESC-02	9.3	0.091	ND	34
BESC-03	1.4	0.04	ND	140
BESC-04	ND	ND	ND	61
BESC-05	0.7	0.019	ND	23
BESC-06	ND	ND	ND	41
BESC-07	0.74	ND	ND	5.5
BESC-08	ND	ND	ND	ND
BESC-09	ND	ND	ND	ND
BESC-10	ND	ND	ND	15
BESC-11	0.78	ND	ND	50
BESC-12	0.8	0.047	ND	29
BESC-13	1.5	0.022	ND	160
BESC-14	1.4	ND	ND	110
BESC-15	1.6	0.072	ND	45
BESC-16	2.1	0.024	ND	190
BESC-17	8.5	0.13	ND	32
BESC-18	2.0	0.05	ND	73

Notes:
BTEX Benzene, toluene, ethylbenzene, and total xylenes
GRO Gasoline range organics
mg/kg Milligrams per kilogram
ND Not detected
Source: Bristol 1997

TABLE 2. 1999 SOIL SAMPLING RESULTS

Sample Number	Lead (mg/kg)
10SS01-010 [a]	2.9 / 3.1
10SS02-010	2.8
10SS03-010	3.9
10SS04-010	28.7

Notes:
a Second concentration denotes duplicate sample
mg/kg Milligrams per kilogram

APPENDIX A: PHOTOGRAPHS

Photograph No. 1 August 26, 1999

Description: This photograph was taken from several hundred feet to the east of the Former Gasoline Tank Farm and shows Tetra Tech employees using the Geoprobe to collect soil samples from boring 10SS01.

Photograph No. 2 August 26, 1999

Description: This photograph is a close-up of the Geoprobe collecting soil samples from boring 10SS01 at the Former Gasoline Tank Farm.

Photograph No. 3 August 26, 1999

Description: Tetra Tech employees retrieving Geoprobe sampler from boring 10SS01 at the Former Gasoline Tank Farm.

STATE OF ALASKA

DEPT. OF ENVIRONMENTAL CONSERVATION
DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITES REMEDIATION PROGRAM

TONY KNOWLES, GOVERNOR

555 Cordova Street, Second Floor
Anchorage, AK 99501-2617
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http://www.state.ak us

February 24, 2000

RECEIVED
FEB 2 9 2000

Mr. John Lindsay
Pribilof Project Manager
U.S. Department of Commerce, NOAA
National Ocean Service
Office of Restoration and Response
7600 Sand Point Way, N.E. Bldg. 4 BIN Cl 5700
Seattle, WA 98115-0070

RE: Draft Site Characterization Report Former Gasoline Tank Farm TPA Site No. 10 St. Paul Island, January 13, 2000.

Dear Mr. Lindsay:

The Department of Environmental Conservation (DEC) has received the above document on February 2, 2000. Based on a review of the data presented in the document, there are no contaminants at the site above action levels for unrestricted use as listed in 18 AAC 75 Oil and Hazardous Substances Pollution Control Regulations (as amended through January 22, 1999). DEC will not require NOAA to conduct further investigation or remedial action at this time. The site will be considered closed out and no further action is necessary. However, please note that DEC reserves all of its rights under 18 AAC 75 and Alaska Statute 46 to require NOAA to conduct further investigation and/or remedial action if information indicates the site conditions are not protective of human health, safety, and welfare, and of the environment.

If you have any questions regarding this letter, please don't hesitate to call me at (907) 269-7552.

Sincerely,

Louis Howard
Project Manager

cc: Jennifer Roberts, DEC Anchorage
Breck Tostevin, AGO
Pribilof Islands RAB Members

NOAA Site 30
TPA Site 11: Diesel Tank Farm
(Demolished Diesel Tank Farm (Tract 43), TPA 11; TPA Attachment A)

Request for NFRAP Former Diesel Tank Farm, TPA Site 11/Site 30
St. Paul Island, Alaska 751

Request for NFRAP
Former Diesel Tank Farm, TPA Site 11/Site 30
St. Paul Island, Alaska

Request for No Further Remedial Action Planned

Site:
The Former Diesel Tank Farm, also known as Two Party Agreement (TPA) Site 11 and National Oceanic and Atmospheric Administration (NOAA) Site 30.

Location:
St. Paul Island, Alaska is approximately 800 miles southwest of Anchorage in the Bering Sea. The Former Diesel Tank Farm is a .95 acre site, situated on St. Paul Island, on top of Village Hill (57°07'21" latitude, 170°16'50" longitude) and is U.S. Government property. (Figures 1 and 2).

Legal Description: Tract 43, Township 35 South, Range 132 West, of the Seward Meridian, Alaska, as shown on the plat of rectangular net survey, officially filed May 14, 1986 (Figure 2).

Type of Release:
The Former Diesel Tank Farm (FDTF) contained seven large (81,000 to 127,000 gallon) aboveground storage tanks (AST) installed in the 1950s and removed in 1988 (Figure 3). In 1992, Ecology and Environment, Inc. (Ecology and Environment) conducted a preliminary assessment at the FDTF. Interviews conducted with local residents during the assessment revealed that a fuel spill of unknown quantity occurred at the FDTF sometime in the past, resulting in a fish kill in the Bering Sea to the west (Ecology and Environment, Inc. 1993).

History:
During the 1950s, seven aboveground storage tanks (AST) were installed at the FDTF; six 81,000-gallon ASTs were used for the storage of diesel fuel, while one 127,000-gallon AST was used for the storage of arctic diesel. Historically, fuel was pumped from vessels docked in Village Cove up to the ASTs located at the FDTF. Fuel was then distributed from the ASTs to other locations through pipelines using gravity; various sized pipelines were used, including 2.5-inch, 4-inch, and 12-inch diameters. In 1988, the ASTs were dismantled, reconditioned, and transported to their current location east of the Salt Lagoon, where they are used by the City of St. Paul to fuel the island's power generation system (NOAA 2003).

The TPA allows NOAA to apply cleanup levels using the methods described in the 1991 non-UST regulations (ADEC 1991); however, with ADEC approval, NOAA has elected to use current regulations (ADEC 2000) to address soil cleanup. The cleanup methods applied by NOAA were presented in the CAP for Site 24/TPA Site 9i (NOAA 2003). The cleanup method selected by NOAA was Method Two, discussed at 18 AAC 75.341(c). Method Two employs two separate tables including one for individual contaminants (Table B1) and one for petroleum hydrocarbon contaminants (Table B2).

Summary of Site Investigations:
In 1992, Ecology and Environment, Inc. (Ecology and Environment) conducted a preliminary assessment at the FDTF. Interviews conducted with local residents during the assessment revealed that a fuel spill of unknown quantity occurred at the FDTF sometime in the past, resulting in a fish kill in the Bering Sea to the west (Ecology and Environment, Inc. 1993).

Also in 1992, Dames and Moore, Inc. (Dames and Moore) conducted an environmental investigation that included the excavation of a single test pit at the FDTF. Analytical data for soil samples collected from the test pit indicated the presence of total extractable petroleum hydrocarbons and total recoverable petroleum hydrocarbons at concentrations that exceeded 6,800 milligrams per kilogram (mg/kg) at a depth of 1.5 feet bgs (Dames and Moore 1992).

In 1997, Hart Crowser conducted an expanded site inspection that included the excavation of nine test pits to depths up to 10 feet bgs in the vicinity of the FDTF. Soil samples were collected from varying depths and analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX); diesel-range organic compounds (DRO); gasoline-range organic compounds (GRO); and residual-range organic compounds (RRO). Analytical data indicated the presence of DRO, including arctic diesel, at concentrations up to 20,800 mg/kg. All other analytes were below cleanup levels established by ADEC (Hart Crowser 1997).

In 2000, Tetra Tech conducted a site characterization at the FDTF that included the advancement of 12 soil borings to depths up to 23 feet bgs. Analytical data for soil samples collected from the borings indicated the presence of DRO at concentrations exceeding ADEC cleanup levels; polynuclear aromatic hydrocarbons (PAH) were not detected above ADEC cleanup levels. Based on analytical results, the area of contamination was estimated to cover 17,700 square feet (Tetra Tech 2000).

NOAA contractors conducted quarterly groundwater monitoring between June 2000 to September 2001 and between October 2003 and July 2004 in the vicinity of the FDTF CESI 2001; IT Alaska (2002; TTEMI report pending). During 2000-2001 sampling events, diesel range organic compounds (DRO) were detected above their Alaska Department of Environmental Conservation (ADEC) Table C cleanup level of 1,500 mg/l in well MW46-21, with maximum detected concentrations of 1,600 mg/l (IT Alaska Inc. 2002), Figure 4. Groundwater from MW 46-1 exceeded Table C cleanup level of 15 micrograms per liter for lead (Figure 4). During the first two quarters of 2003-2004 sampling, no analytes were detected above its ADEC Table C cleanup level in the 4 wells at the site MW46-1, MW46-21, MW46-22 and MW46-29, (Figure 4). Note, MW46-29 was installed after 2001 and thus not included in 2000-2001 monitoring. A full report on 2003-2004 sampling events will be available in late 2004.

Summary of Applied Cleanup Levels:
NOAA employed ADEC Method Two cleanup criteria, discussed at 18 AAC 75.341(c) (ADEC 2000). Alternative cleanup levels were also applied for some compounds. For benzene, under the TPA, NOAA had the option to cleanup to the less stringent State of Alaska cleanup level in effect in 1991 (ADEC 1991). ADEC uses 15 feet below ground surface (bgs) to define subsurface soil to which residents will have a reasonable potential to be exposed through the inhalation or ingestion pathways (ADEC 2000; 18 Alaska Administrative Code 75.340 (j)(2)). Therefore NOAA is not obligated to excavate contaminated soil occurring at depths deeper than 15 feet to address the inhalation and ingestion pathways.

Summary of Cleanup Actions:
Excavation activities for the FDTF commenced on August 7, 2003, and were completed on October 20, 2003. Initial areas of excavation were selected based on contamination identified during previous investigations, while the extent of excavation was determined based on TLC screening sample analyses as well as visual and olfactory observations (see Figure 5). Sections of abandoned fuel pipelines associated with past operations at the FDTF were uncovered and removed during various phases of this corrective action. Signs of contamination, including petroleum staining and odors, were noted throughout the excavation. If contaminant concentrations remained above ADEC Method Two cleanup levels based on TLC screening analyses, additional excavation was conducted even if the concentrations were below alternative cleanup levels unless further excavation was prevented by the presence of obstructions.

Maximum depths of excavation varied from 15 to 20 feet bgs throughout the majority of the excavation; shallower depths were attained in the eastern portion of the excavation because of the need to leave supporting soil under the 10-inch-diameter water main and to not encroach on Rim Rock Drive (Figures 5 and 6).

Although confirmation samples indicated that contamination remains in some areas of the excavation, no further excavation could be conducted in these areas because of the presence of obstructions, including large boulders; the 10-inch-diameter, high-density polyethylene water main; Rim Rock Drive along the eastern portion of the excavation; and excavation depths of 15 feet bgs and greater. Excavation around the water main, specifically in the area of confirmation sample SP30-CS-041-080, was conducted in a manner to preserve the integrity of the pipeline and Rim Rock Drive; based on discussions with representatives from NOAA and the City of St. Paul, the

decision was made to not excavate PCS from beneath the line because of concerns related to Rim Rock Drive and the lack of control valves along the affected section of the water main.

During this corrective action, a total of approximately 6,550 CY of PCS was removed from the excavation at the FDTF.

Forty-six confirmation samples and eight field duplicate samples were collected during corrective action activities at the FDTF. In addition, four split samples and one field duplicate sample were collected in coordination with North Wind, Inc., a contractor hired by Tanadgusix Corporation. All samples were analyzed for the following constituents:

- BTEXby U.S. Environmental Protection Agency (EPA) SW-846 (EPA 1996) Method 8021B
- DRO by Method AK102

In addition, the following analyses were conducted on subsets of the confirmation samples collected at the FDTF:

- GRO by Method AK101
- RRO by Method AK103
- PAHs by EPA SW-846 (EPA 1996) Method 8270C Selected Ion Monitoring
- Total lead by EPA SW-846 (EPA 1996) Method 6020

Tables 1 and 2 provide a summary of the samples collected during this corrective action. Figure 6 illustrates the sampling locations.

Confirmation samples collected from the excavation at the FDTF indicated DRO concentrations varying from not detected to 42,000 mg/kg. Fourteen of the 46 confirmation samples collected from this area contained concentrations of DRO above the ADEC Method Two cleanup level of 250 mg/kg, and 9 of the 42 samples exceeded the alternative cleanup level of 2,500 mg/kg (Figure 6). One of the four split samples contained a concentration of DRO above just the ADEC Method Two cleanup level, and one of the four split samples exceeded the method 2 and the alternative cleanup level. The other 2 samples did not exceed either cleanup level.

Concentrations of all other contaminants in confirmation samples were below ADEC Method Two cleanup levels. Laboratory reporting limits were below ADEC Method Two cleanup levels for all analyses except benzene. For benzene, reporting limits varied from 0.03 mg/kg to 0.5 mg/kg, which is above the ADEC Method Two cleanup level of 0.02 mg/kg, but below or equal to the alternative cleanup level of 0.5 mg/kg. Higher detection limits were realized for samples with relatively high levels of DRO.

Throughout the corrective action, excavation was conducted at each location to the maximum extent practicable. However, due to the presence of obstructions, contamination was left in place at some locations. The following paragraphs summarize the rationale for leaving contamination in various sections of the excavation (see Figure 4).

Contamination remaining in three areas of the excavation was not removed because of maximum depths attained in those areas. The three areas include: (1) the area encompassed by confirmation sampling locations SP30-CS-011-200 through SP30-CS-015-200 in the west portion of the excavation, where depths reached 20 feet bgs; (2) the area encompassed by confirmation sampling locations SP30-CS-017-150 through SP30-CS-021-150 and SP30-CS-023-160 in the central portion of the excavation, where depths varied from 15 to 16 feet bgs; and (3) the area encompassed by confirmation sampling locations SP30-CS-022-150, SP30-CS-025-150, SP30-CS-035-150, and SP30-CS-037-150 in the central portion of the excavation, where depths reached 15 feet bgs. ADEC uses 15 feet bgs to define subsurface soil to which residents will have a reasonable potential to be exposed through the inhalation or ingestion pathways (ADEC 2000); 18 Alaska Administrative Code 75.340 (j)(2). Based on the depths of excavation attained in these areas, risks associated with the inhalation and ingestion pathways have been mitigated.

Contaminated soil associated with confirmation sampling location SP30-CS-041-080, located along the east edge of the excavation, was not removed because of concerns regarding the integrity of the 10-inch diameter water main and Rim Rock Drive.

Contaminated soil associated with confirmation sampling location SP30-CS-024-100, located in the south-central portion of the excavation, was subsequently removed. The excavation was advanced to a depth of 15 feet bgs in this area.

Recommended Action:
In accordance with paragraph 59 of the Two Party Agreement (NOAA 1996), NOAA requests written confirmation that NOAA completed all appropriate corrective action at the Former Diesel Tank Farm, TPA Site 11/ NOAA Site 30, in accordance with the Agreement and that ADEC requires no further remedial action plan from NOAA.

References:

Alaska Department of Environmental Conservation (ADEC). 1991. *Interim Guidance for Non-UST Contaminated Soil Cleanup Levels. Contaminated Sites Program*. July 17.

ADEC. 2000. Title 18 of the *Alaska Administrative Code 75*, Articles 3 and 9. Oil and Hazardous Substances Pollution Control Regulations. State of Alaska. Effective date January 30, 2003.

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Columbia Environmental Sciences, Inc. (CESI). 2001. Draft Site Characterization Report, Tract 46 and Vicinity (TPA Site 9), St. Paul Island, Alaska. Version 2.1. Kennewick, WA. December 16.

Dames and Moore, Inc. 1992. *Limited Environmental Evaluation, Test Pit Excavation, St. Paul Island*. June 23

Ecology and Environment, Inc. 1993. *Preliminary Assessment of the National Oceanic and Atmospheric Administration Sites, Pribilof Islands, Alaska*. February.

U.S. Environmental Protection Agency (EPA). 1996. *Test Methods for Evaluating Solid Waste*. EPA/SW-846. Third Edition and Updates. December

Hart Crowser, Inc. 1997. *Expanded Site Inspection of St. Paul Island, Pribilof Islands, Alaska*. January.

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Mitretek. 2002. *Groundwater Use and Classification in the Vicinity of Tract 46, St. Paul Island, Pribilof Islands, Alaska*. Prepared by Mitretek Systems, for the National Oceanic and Atmospheric Administration. June 5.

NOAA. 1996. *Pribilof Islands Environmental Restoration Two Party Agreement*. Attorney General's Office File No. 66 1-95-0126, National Oceanic and Atmospheric Administration. January 26.

NOAA. 2003. *Draft Corrective Action Plan, Petroleum Contaminated Soil Removal at the Former Diesel Tank Farm (TPA Site 11), St. Paul Island, Alaska*. June 3.

NOAA. 2004. Initial Draft Corrective Action Report Site 30/TPA Site 11 – Former Diesel Tank Farm, St. Paul Island, Alaska. June 3.

Tetra Tech EM Inc. (Tetra Tech). 2000. *Site Characterization Report, Former Diesel Tank Farm (Two-Party Agreement Site No. 11), Pribilof Islands Site Restoration, St. Paul Island, Alaska*. December.

For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

9/24/04
Date

Approvals: In accordance with Paragraph 59 of the Two Party Agreement, this is to confirm that all corrective action has been completed at the Former Diesel Tank Farm, TPA Site 11/NOAA Site 30, in accordance with the Agreement and that no plan for further remedial action is required.

For the Alaska Department of Environmental Conservation

Louis Howard
Alaska Department of Environmental Conservation
Remedial Project Manager

Nov 5, 2004
Date

Figures

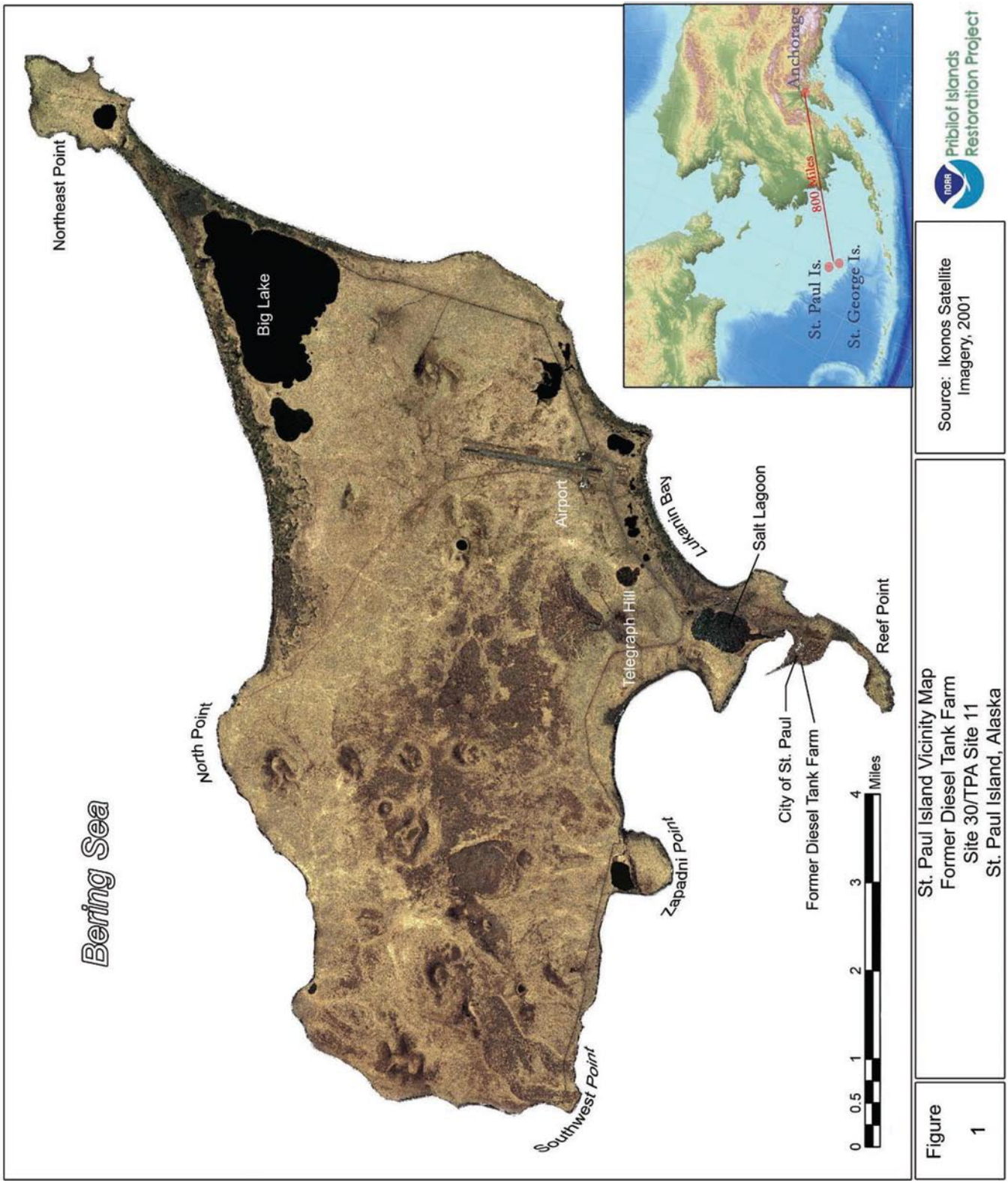
Bering Sea
Northeast Point
Big Lake
North Point
Airport
Telegraph Hill
Lukanin Bay
Salt Lagoon
Reef Point
Zapadni Point
City of St. Paul
Former Diesel Tank Farm
Southwest Point
0 0.5 1 2 3 4 Miles
Anchorage
800 Miles
St. Paul Is.
St. George Is.
Pribilof Islands Restoration Project
Source: Ikonos Satellite Imagery, 2001
Figure 1
St. Paul Island Vicinity Map
Former Diesel Tank Farm
Site 30/TPA Site 11
St. Paul Island, Alaska

Figure 2	Legal Property Description Map Former Diesel Tank Farm Site 30/TPA Site 11 St. Paul Island, Alaska	Sources: TOPA Properties (NOAA GIS 2004), Aerial Photo (Aeromap US 1996).	Pribilof Islands Restoration Project

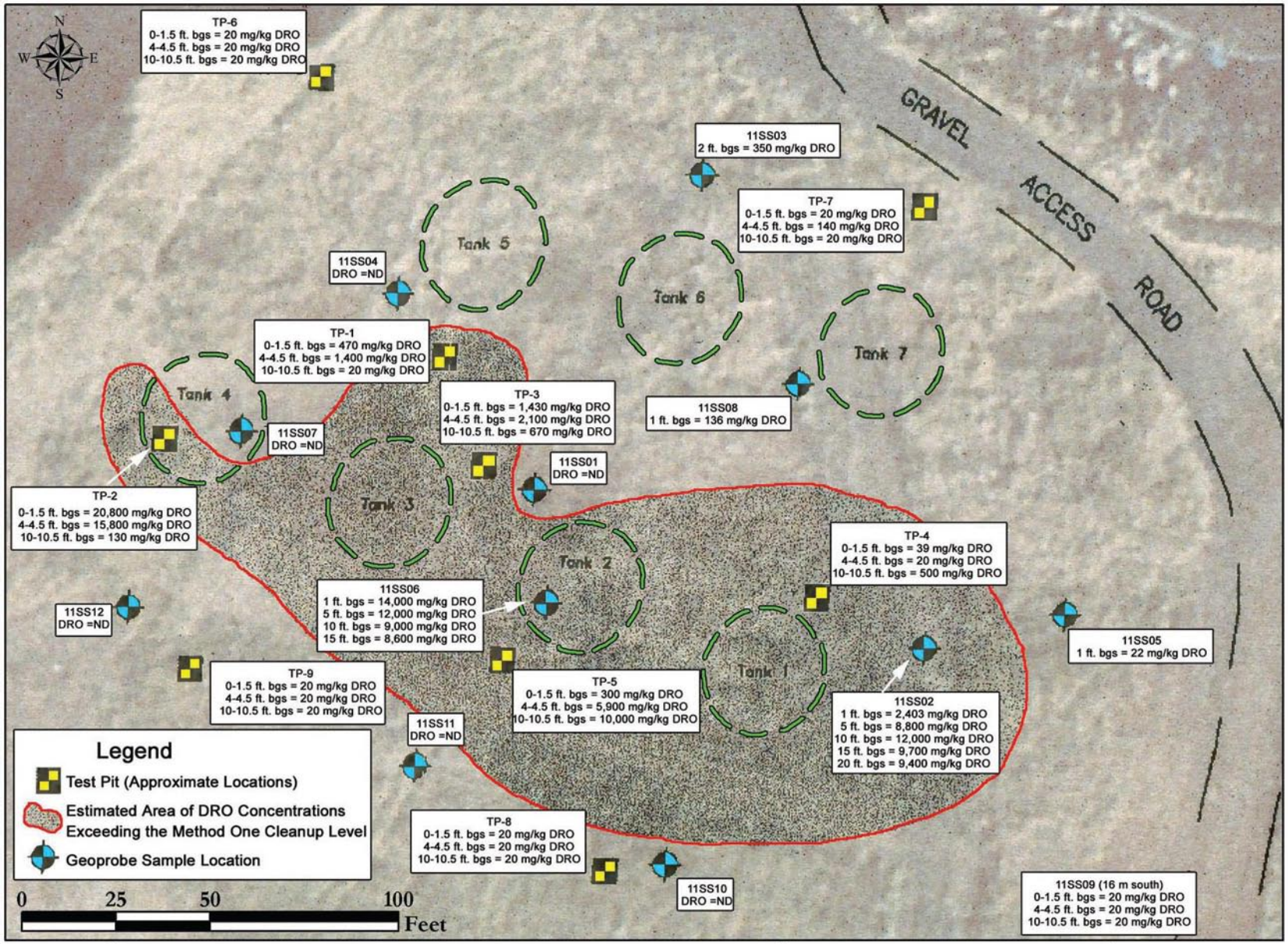

Figure 3	Historical Sampling Locations Former Diesel Tank Farm Site 30/TPA Site 11 St. Paul Island, Alaska	Sources: CAD Diagram (TTEMI 2000), Aerial Photo (Aeromap 1996), Sample Locations and Results (NOAA 2003).

Pribilof Islands Restoration Project

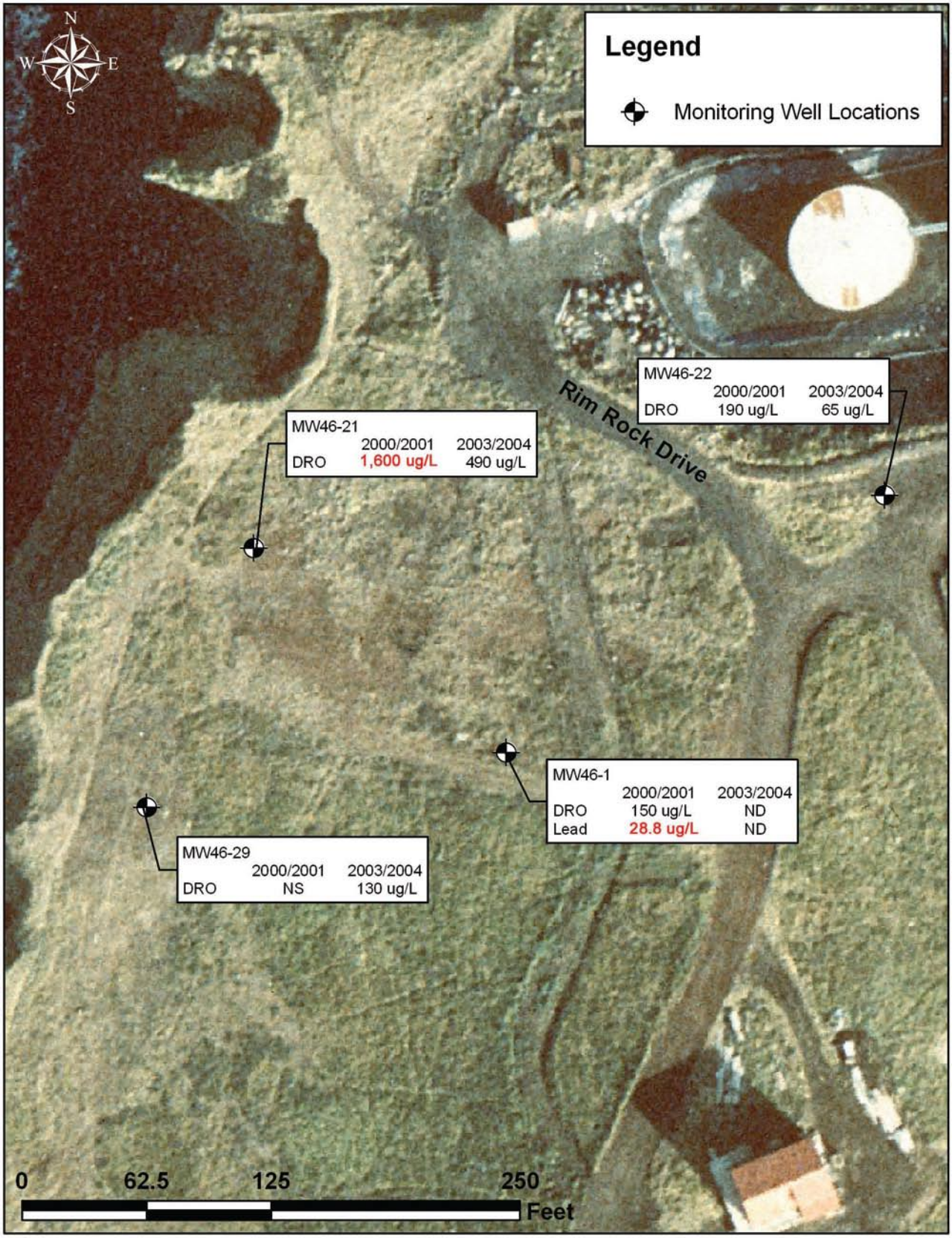

Figure 4	Groundwater Sampling Results Former Diesel Tank Farm Site 30/TPA Site 11 St. Paul Island, Alaska	Sources: Well Locations (NOAA GPS 2004), Aerial Photo (Aeromap US 1996).	Pribilof Islands Restoration Project

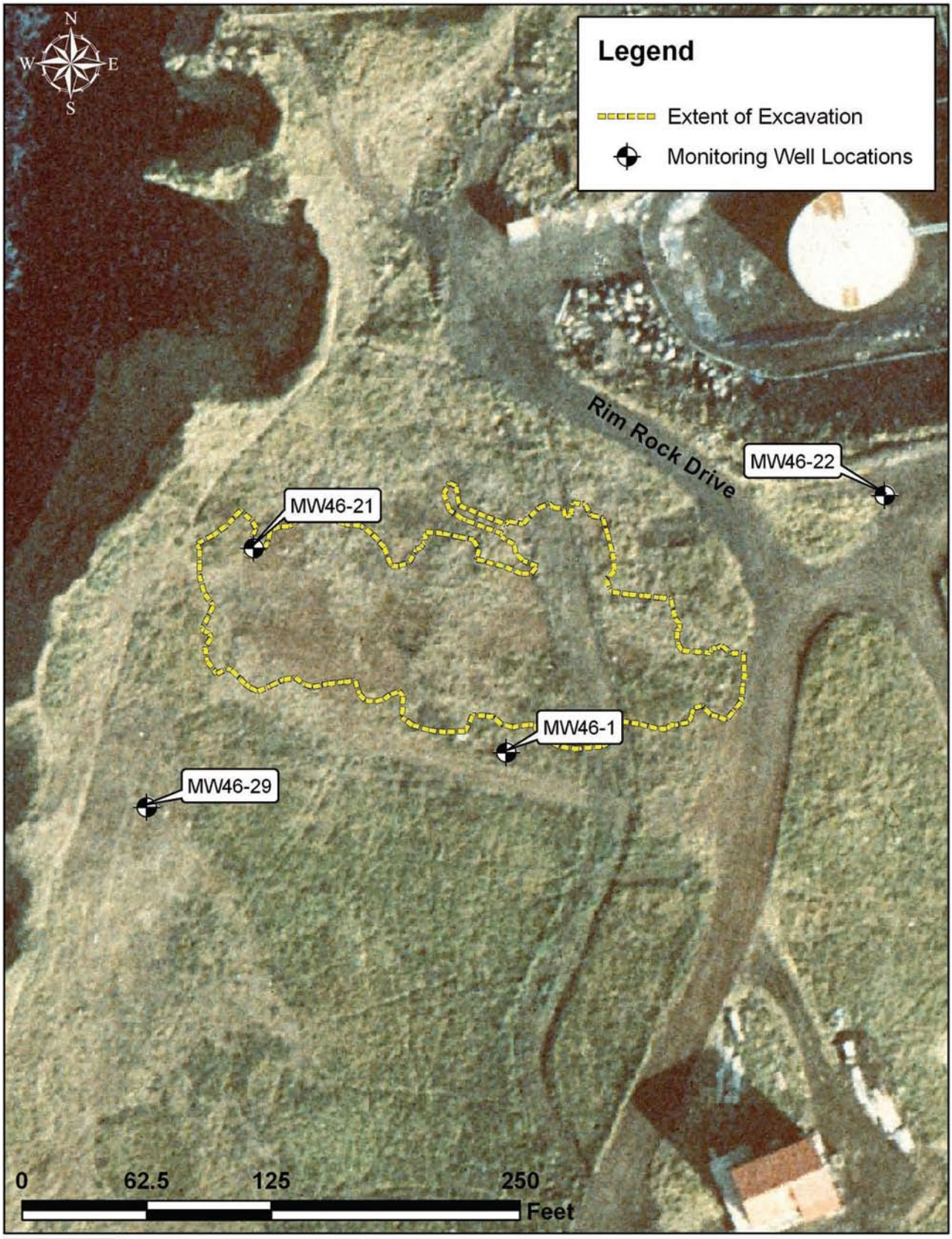

Figure 5	Area of Excavation Former Diesel Tank Farm Site 30/TPA Site 11 St. Paul Island, Alaska	Sources: Excavation Extent and Well Locations (NOAA GPS 2003), Aerial Photo (Aeromap US 1996).

Pribilof Islands Restoration Project

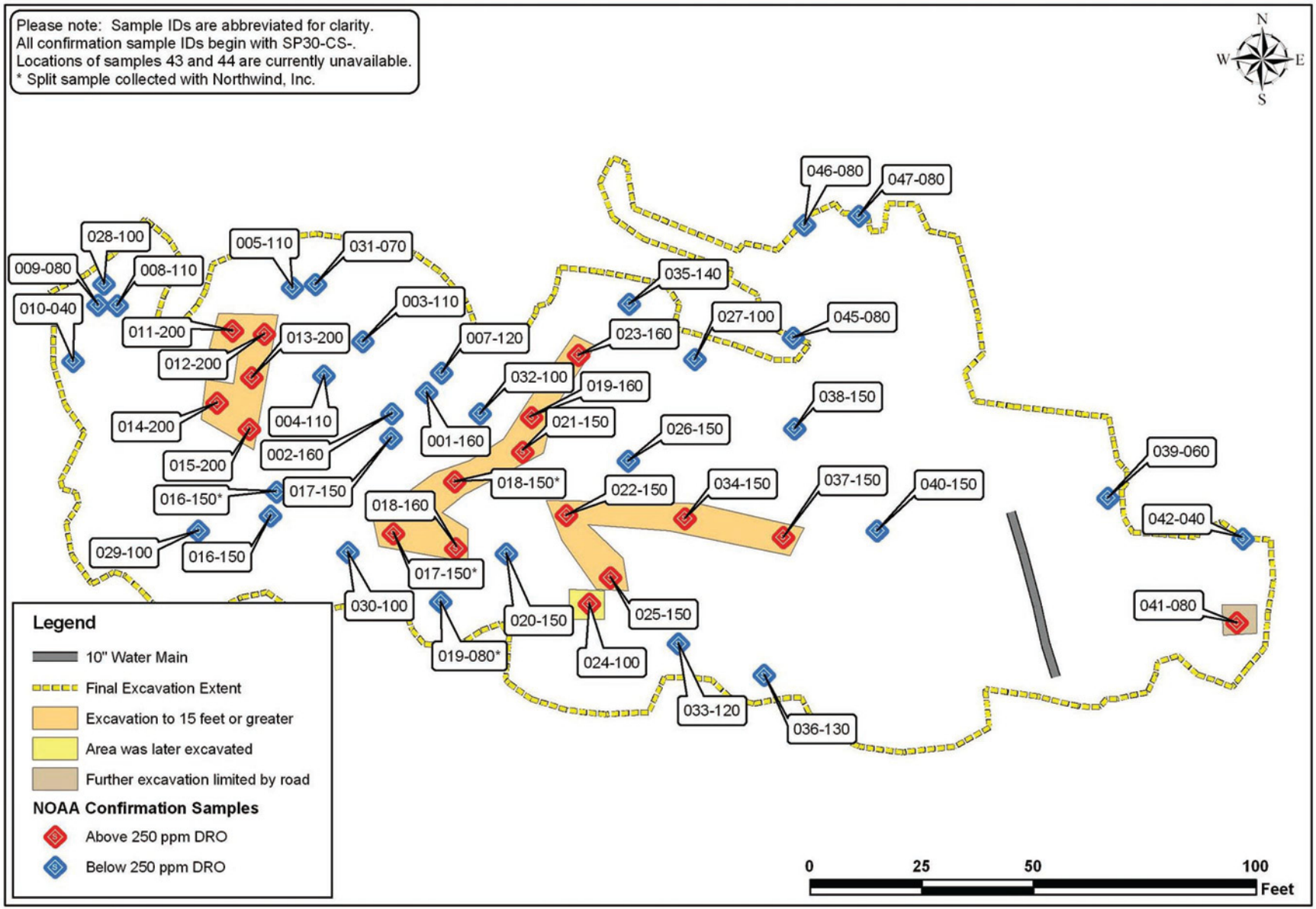

Figure 6	Sampling Location Map Former Diesel Tank Farm Site 30/TPA Site 11 St. Paul Island, Alaska	Sources: Excavation Extent, Confirmation Samples, and Water Main Location(NOAA GPS 2003), Aerial Photo (Aeromap US, 1996).

Pribilof Islands Restoration Project

Tables

Table 1: Analytical Data Summary - BTEX, GRO, DRO, RRO, and Lead Site 30/TPA Site 11 - Former Diesel Tank Farm, St. Paul Island, Alaska

Sample Number	Sample Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	RRO (mg/kg)	Lead (mg/kg)
Site 22/TPA Site 11 Confirmation Samples									
SP30-CS-001-160	16	0.03 U	0.03 U	0.03 U	0.03 U	2 U	10 U	--	--
SP30-CS-002-160	16	0.03 U	0.03 U	0.03 U	0.03 U	2 U	14	--	--
SP30-CS-003-110	11	0.04 U	0.04 U	0.04 U	0.04 U	2 U	10 U	--	--
SP30-CS-004-110	11	0.03 U	0.03 U	0.03 U	0.03 U	2 U	10 U	--	--
SP30-CS-005-110	11	0.03 U	0.03 U	0.03 U	0.03 U	2 U	10 U	--	--
SP30-CS-007-120	12	0.03 U	0.03 U	0.03 U	0.03 U	2 U	10 U	--	--
SP30-CS-008-110	11	0.03 U	0.03 U	0.03 U	0.03 U	--	10 U	--	--
SP30-CS-009-080	8	0.03 U	0.03 U	0.03 U	0.03 U	--	10 U	--	--
SP30-CS-010-040	4	0.05 U	0.05 U	0.05 U	0.05 U	--	10 U	--	--
SP30-CS-010-250 [a]	4	0.04 U	0.04 U	0.04 U	0.04 U	--	10 U	--	--
SP30-CS-011-200	20	0.07 U	0.07 U	0.07 U	0.49	--	**7,300**	--	--
SP30-CS-012-200	20	0.14 U	0.14 U	0.14 U	0.31	--	**12,000**	--	--
SP30-CS-013-200	20	0.03 U	0.03 U	0.03 U	0.20	--	**980**	--	--
SP30-CS-014-200	20	0.04 U	0.04 U	0.24	3.1	--	**4,600**	--	--
SP30-CS-015-200	20	0.06 U	0.06 U	0.23	2.8	--	**2,700**	--	--
SP30-CS-015-250[b]	20	0.05 U	0.05 U	0.31	4.1	--	**1,600**	--	--
SP30-CS-016-150	15	0.03 U	0.03 U	0.03 U	0.03 U	--	10 U	--	--
SP30-CS-016-150[c]	15	0.03 U	0.03 U	0.03 U	0.03 U	--	10 U	--	--
SP30-CS-017-150	15	0.03 U	0.03 U	0.03 U	0.03 U	--	10 U	--	--
SP30-CS-017-150[c]	15	0.10 U	0.10 U	0.10 U	1.30	--	**3,900**	--	--
SP30-CS-017-250[c,d]	15	0.09 U	0.09 U	0.09 U	1.30	--	**4,300**	--	--
SP30-CS-018-160	16	0.05 U	0.05 U	0.05 U	0.21	--	**4,100**	--	--
SP30-CS-018-150[c]	15	0.03 U	0.03 U	0.03 U	0.03 U	--	**700**	--	--
SP30-CS-019-160	16	0.03 U	0.03 U	0.03 U	0.03 U	--	**1,200**	--	--
SP30-CS-019-080[c]	8	0.03 U	0.03 U	0.03 U	0.03 U	--	19	--	--
SP30-CS-020-150	15	0.03 U	0.03 U	0.03 U	0.03 U	--	92	--	--
SP30-CS-021-150	15	0.11 U	0.11 U	0.11 U	0.78	--	**4,000**	--	--
SP30-CS-022-150	15	0.04 U	0.04 U	0.04 U	0.04 U	--	**2,300**	--	--
SP30-CS-023-160	16	0.03 U	0.03 U	0.03 U	0.11	--	**530**	--	--
SP30-CS-024-100	10	0.14 U	0.14 U	0.14 U	0.44	--	**7,800**	--	--
SP30-CS-025-150	10	0.14 U	0.14 U	0.15	13	--	**8,300**	--	--
SP30-CS-026-150	15	0.03 U	0.03 U	0.03 U	0.03	--	120	--	--
SP30-CS-027-100	10	0.03 U	0.03 U	0.03 U	0.03 U	--	10 U	--	--
SP30-CS-028-100	10	0.03 U	0.03 U	0.03 U	0.03 U	--	10 U	--	--
SP30-CS-029-100	10	0.03 U	0.03 U	0.03 U	0.03 U	--	10 U	--	--
SP30-CS-030-100	10	0.03 U	0.03 U	0.03 U	0.03 U	--	10 U	--	--
SP30-CS-030-250[e]	10	0.03 U	0.03 U	0.03 U	0.03 U	--	10 U	--	--

Sample Number	Sample Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	RRO (mg/kg)	Lead (mg/kg)
SP30-CS-031-070	7	0.03 U	0.03 U	0.03 U	0.03 U	--	10 U	--	--
SP30-CS-031-250[f]	7	0.03 U	0.03 U	0.03 U	0.03 U	--	10 U	--	--
SP30-CS-032-100	10	0.03 U	0.03 U	0.03 U	0.03 U	--	10 U	--	--
SP30-CS-032-250[g]	10	0.03 U	0.03 U	0.03 U	0.03 U	--	10 U	--	--
SP30-CS-033-120	12	0.03 U	0.03 U	0.03 U	0.04	--	10 U	--	--
SP30-CS-033-250[h]	12	0.04 U	0.04 U	0.04 U	0.04 U	--	10 U	--	--
SP30-CS-034-150	15	0.04 U	0.04 U	0.04 U	0.27	--	**430** U	--	--
SP30-CS-035-140	14	0.03 U	0.03 U	0.03 U	0.03 U	--	10 U	--	--
SP30-CS-036-130	13	0.04 U	0.04 U	0.04 U	0.04 U	--	10 U	--	--
SP30-CS-037-150	15	0.03 U	0.03 U	0.09	1.10	--	**2,000**	--	--
SP30-CS-038-150	15	0.03 U	0.03 U	0.03 U	0.03 U	--	10 U	--	--
SP30-CS-038-250[i]	15	0.03 U	0.03 U	0.03 U	0.03 U	--	10 U	--	--
SP30-CS-039-060	6	0.03 U	0.03 U	0.03 U	0.03 U	--	10 U	--	--
SP30-CS-039-250[j]	6	0.03 U	0.03 U	0.03 U	0.03 U	--	10 U	--	--
SP30-CS-040-150	15	0.03 U	0.03 U	0.03 U	0.03 U	--	40	--	--
SP30-CS-041-080	8	0.5 U	0.5 U	0.5 U	2.5	--	**42,000**	--	--
SP30-CS-042-040	5	0.03 U	0.03 U	0.03 U	0.03 U	--	10 U	--	--
SP30-CS-043-120	12	0.04 U	0.04 U	0.04 U	0.04 U	--	10 U	--	--
SP30-CS-044-150	15	0.03 U	0.03 U	0.03 U	0.03 U	--	10 U	--	--
SP30-CS-045-080	8	0.06 U	0.06 U	0.06 U	0.06 U	3 U	14	50 U	1.90
SP30-CS-046-080	8	0.04 U	0.04 U	0.04 U	0.04 U	2 U	10 U	50 U	1.19
SP30-CS-047-080	8	0.03 U	0.03 U	0.03 U	0.03 U	2 U	10 U	50 U	1.35
Trip Blank Samples									
Trip blank	--	0.02 U	0.02 U	0.02 U	0.02 U	1 U	--	--	--
Trip blank	--	0.02U	0.02U	0.02U	0.02U	--	--	--	--
Method Two Cleanup Level [l]		*0.02*	*5.4*	*5.5*	*78*	*300*	*250*	*10,000*	*400* [p]
Alternative Cleanup Level [m]		*0.5* [n]	*54*	*NA*	*NA*	*1,400* [o]	*2,500*	*NA*	*NA*

Notes

bgs Below ground surface
BTEX Benzene, toluene, ethylbenzene, and total xylenes
DRO Diesel-range organic compounds
GRO Gasoline-range organic compounds
mg/kg Milligram per kilogram
-- Not analyzed
NA Not available
RRO Residual-range organic compounds
TPA Two-Party Agreement
J The analyte was positively identified, but the numerical value is an estimated concentration
U The analyte was analyzed for but not detected above the sample reporting limit
a Duplicate of sample number SP30-CS-010-040
b Duplicate of sample number SP30-CS-015-200
c Split samples collected with representative of North Wind, Inc., a contractor hired by Tanadgusix Corporation
d Duplicate of sample number SP30-CS-017-050
e Duplicate of sample number SP30-CS-030-100
f Duplicate of sample number SP30-CS-031-070
g Duplicate of sample number SP30-CS-032-100

h Duplicate of sample number SP30-CS-033-120
i Duplicate of sample number SP30-CS-038-150
j Duplicate of sample number SP30-CS-039-060
k Duplicate of sample number SP30-SS-009
l Cleanup level is from Title 18 of the *Alaska Administrative Code 75* "Oil and Hazardous Substances Pollution Control Regulations," published by the State of Alaska and amended through October 28, 2000.
m Cleanup level is obtained from ADEC Method Two based on the "Ten Times Rule" applied to the migration to groundwater pathway, as discussed in Section 5.0 of the corrective action plan (National Oceanic and Atmospheric Administration [NOAA] 2003).
n Under the TPA, NOAA is obligated to comply with the 1991 ADEC cleanup level for benzene (0.5 mg/kg).
o Cleanup level selected is based on the more stringent value associated with ingestion and inhalation pathways.
p Lead, although not a contaminant of concern identified in the corrective action plan for this site, is included because some samples were analyzed for lead; although this site is in an industrial area, NOAA is using the residential cleanup level for lead (400 mg/kg).

Table 2: Analytical Data Summary - Polynuclear Aromatic Hydrocarbons Site 30/TPA Site 11 - Former Diesel Tank Farm, St. Paul Island, Alaska

Sample Number	Sample Depth (feet bgs)	Naphthalene (mg/kg)	Acenaphthylene (mg/kg)	Acenaphthene (mg/kg)	Fluorene (mg/kg)	Phenanthrene (mg/kg)	Anthracene (mg/kg)	Fluoranthene (mg/kg)	Pyrene (mg/kg)
Site 22/TPA Site 11 Confirmation Samples									
SP30-CS-001-160	16	--	--	--	--	--	--	--	--
SP30-CS-002-160	16	--	--	--	--	--	--	--	--
SP30-CS-003-110	11	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP30-CS-004-110	11	--	--	--	--	--	--	--	--
SP30-CS-005-110	11	--	--	--	--	--	--	--	--
SP30-CS-007-120	12	--	--	--	--	--	--	--	--
SP30-CS-008-110	11	--	--	--	--	--	--	--	--
SP30-CS-009-080	8	--	--	--	--	--	--	--	--
SP30-CS-010-040	4	--	--	--	--	--	--	--	--
SP30-CS-010-250[a]	4	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP30-CS-011-200	20	--	--	--	--	--	--	--	--
SP30-CS-012-200	20	--	--	--	--	--	--	--	--
SP30-CS-013-200	20	--	--	--	--	--	--	--	--
SP30-CS-014-200	20	--	--	--	--	--	--	--	--
SP30-CS-015-200	20	--	--	--	--	--	--	--	--
SP30-CS-015-250[b]	20	0.97	0.050 U	0.14	0.25	0.15	0.050 U	0.050 U	0.050 U
SP30-CS-016-150	15	--	--	--	--	--	--	--	--
SP30-CS-016-150[c]	15	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP30-CS-017-150	15	--	--	--	--	--	--	--	--
SP30-CS-017-150[c]	15	--	--	--	--	--	--	--	--
SP30-CS-017-250[cd]	15	--	--	--	--	--	--	--	--
SP30-CS-018-160	16	--	--	--	--	--	--	--	--
SP30-CS-018-150[c]	15	--	--	--	--	--	--	--	--
SP30-CS-019-160	16	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
SP30-CS-019-080[c]	8	--	--	--	--	--	--	--	--
SP30-CS-020-150	15	--	--	--	--	--	--	--	--
SP30-CS-021-150	15	--	--	--	--	--	--	--	--

Sample Number	Sample Depth (feet bgs)	Naph-thalene (mg/kg)	Acenaph-thylene (mg/kg)	Acenaph-thene (mg/kg)	Fluorene (mg/kg)	Phenan-threne (mg/kg)	Anthra-cene (mg/kg)	Fluoran-thene (mg/kg)	Pyrene (mg/kg)
SP30-CS-022-150	15	--	--	--	--	--	--	--	--
SP30-CS-023-160	16	0.005 U	0.005 U	0.022	0.025	0.025	0.005 U	0.005 U	0.005 U
SP30-CS-024-100	10	--	--	--	--	--	--	--	--
SP30-CS-025-150	10	--	--	--	--	--	--	--	--
SP30-CS-026-150	15	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP30-CS-027-100	10	--	--	--	--	--	--	--	--
SP30-CS-028-100	10	--	--	--	--	--	--	--	--
SP30-CS-029-100	10	--	--	--	--	--	--	--	--
SP30-CS-030-100	10	--	--	--	--	--	--	--	--
SP30-CS-030-250[e]	10	--	--	--	--	--	--	--	--
SP30-CS-031-070	7	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U
SP30-CS-031-250[f]	7	--	--	--	--	--	--	--	--
SP30-CS-032-100	10	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP30-CS-032-250[g]	10	--	--	--	--	--	--	--	--
SP30-CS-033-120	12	--	--	--	--	--	--	--	--
SP30-CS-033-250[h]	12	--	--	--	--	--	--	--	--
SP30-CS-034-150	15	--	--	--	--	--	--	--	--
SP30-CS-035-140	14	--	--	--	--	--	--	--	--
SP30-CS-036-130	13	--	--	--	--	--	--	--	--
SP30-CS-037-150	15	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U
SP30-CS-038-150	15	--	--	--	--	--	--	--	--
SP30-CS-038-250[i]	15	--	--	--	--	--	--	--	--
SP30-CS-039-060	6	--	--	--	--	--	--	--	--
SP30-CS-039-250[j]	6	--	--	--	--	--	--	--	--
SP30-CS-040-150	15	--	--	--	--	--	--	--	--
SP30-CS-041-080	8	19	0.25 U	2.5	--	18	0.25 U	1.2	4.4
SP30-CS-042-040	5	--	--	--	--	--	--	--	--
SP30-CS-043-120	12	--	--	--	--	--	--	--	--
SP30-CS-044-150	15	--	--	--	--	--	--	--	--
SP30-CS-045-080	8	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP30-CS-046-080	8	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP30-CS-047-080	8	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Trip Blank Samples									
Trip blank	--	--	--	--	--	--	--	--	--
Trip blank	--	--	--	--	--	--	--	--	--
Method Two Cleanup Level[1]		*43*	*NA*	*210*	*270*	*NA*	*4300*	*NA*	*1500*

Sample Number	Sample Depth (feet bgs)	Benz(a) anthra-cene (mg/kg)	Chrysene (mg/kg)	Benzo(b) fluoran-thene (mg/kg)	Benzo(k) fluoran-thene (mg/kg)	Benzo(a) pyrene (mg/kg)	Indeno (1,2,3-cd) pyrene (mg/kg)	Dibenzo (a,h) anthracene (mg/kg)	Benzo(g,h,i) perylene (mg/kg)
Site 22/TPA Site 11 Confirmation Samples									
SP30-CS-001-160	16	--	--	--	--	--	--	--	--
SP30-CS-002-160	16	--	--	--	--	--	--	--	--
SP30-CS-003-110	11	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP30-CS-004-110	11	--	--	--	--	--	--	--	--
SP30-CS-005-110	11	--	--	--	--	--	--	--	--
SP30-CS-007-120	12	--	--	--	--	--	--	--	--
SP30-CS-008-110	11	--	--	--	--	--	--	--	--
SP30-CS-009-080	8	--	--	--	--	--	--	--	--
SP30-CS-010-040	4	--	--	--	--	--	--	--	--
SP30-CS-010-250[a]	4	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP30-CS-011-200	20	--	--	--	--	--	--	--	--
SP30-CS-012-200	20	--	--	--	--	--	--	--	--
SP30-CS-013-200	20	--	--	--	--	--	--	--	--
SP30-CS-014-200	20	--	--	--	--	--	--	--	--
SP30-CS-015-200	20	--	--	--	--	--	--	--	--
SP30-CS-015-250[b]	20	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
SP30-CS-016-150	15	--	--	--	--	--	--	--	--
SP30-CS-016-150[c]	15	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP30-CS-017-150	15	--	--	--	--	--	--	--	--
SP30-CS-017-150[c]	15	--	--	--	--	--	--	--	--
SP30-CS-017-250[cd]	15	--	--	--	--	--	--	--	--
SP30-CS-018-160	16	--	--	--	--	--	--	--	--
SP30-CS-018-150[c]	15	--	--	--	--	--	--	--	--
SP30-CS-019-160	16	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
SP30-CS-019-080[c]	8	--	--	--	--	--	--	--	--
SP30-CS-020-150	15	--	--	--	--	--	--	--	--
SP30-CS-021-150	15	--	--	--	--	--	--	--	--
SP30-CS-022-150	15	--	--	--	--	--	--	--	--
SP30-CS-023-160	16	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP30-CS-024-100	10	--	--	--	--	--	--	--	--
SP30-CS-025-150	10	--	--	--	--	--	--	--	--
SP30-CS-026-150	15	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP30-CS-027-100	10	--	--	--	--	--	--	--	--
SP30-CS-028-100	10	--	--	--	--	--	--	--	--
SP30-CS-029-100	10	--	--	--	--	--	--	--	--
SP30-CS-030-100	10	--	--	--	--	--	--	--	--
SP30-CS-030-250[e]	10	--	--	--	--	--	--	--	--
SP30-CS-031-070	7	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U
SP30-CS-031-250[f]	7	--	--	--	--	--	--	--	--
SP30-CS-032-100	10	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP30-CS-032-250[g]	10	--	--	--	--	--	--	--	--
SP30-CS-033-120	12	--	--	--	--	--	--	--	--

Sample Number	Sample Depth (feet bgs)	Benz(a) anthra-cene (mg/kg)	Chrysene (mg/kg)	Benzo(b) fluoran-thene (mg/kg)	Benzo(k) fluoran-thene (mg/kg)	Benzo(a) pyrene (mg/kg)	Indeno (1,2,3-cd) pyrene (mg/kg)	Dibenzo (a,h) anthracene (mg/kg)	Benzo(g,h,i) perylene (mg/kg)
SP30-CS-033-250[h]	12	--	--	--	--	--	--	--	--
SP30-CS-034-150	15	--	--	--	--	--	--	--	--
SP30-CS-035-140	14	--	--	--	--	--	--	--	--
SP30-CS-036-130	13	--	--	--	--	--	--	--	--
SP30-CS-037-150	15	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U
SP30-CS-038-150	15	--	--	--	--	--	--	--	--
SP30-CS-038-250[i]	15	--	--	--	--	--	--	--	--
SP30-CS-039-060	6	--	--	--	--	--	--	--	--
SP30-CS-039-250[j]	6	--	--	--	--	--	--	--	--
SP30-CS-040-150	15	--	--	--	--	--	--	--	--
SP30-CS-041-080	8	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
SP30-CS-042-040	5	--	--	--	--	--	--	--	--
SP30-CS-043-120	12	--	--	--	--	--	--	--	--
SP30-CS-044-150	15	--	--	--	--	--	--	--	--
SP30-CS-045-080	8	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP30-CS-046-080	8	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP30-CS-047-080	8	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Trip Blank Samples									
Trip blank	--	--	--	--	--	--	--	--	--
Trip blank	--	--	--	--	--	--	--	--	--
Method Two Cleanup Level [l]		*6*	*620*	*11*	*110*	*1*	*11*	*1*	*NA*

Notes

bgs Below ground surface
mg/kg Milligram per kilogram
-- Not analyzed
NA Not available
TPA Two-Party Agreement
J The analyte was positively identified, but the numerical value is an estimated concentration
U The analyte was analyzed for but not detected above the sample reporting limit
a Duplicate of sample number SP30-CS-010-040
b Duplicate of sample number SP30-CS-015-200
c Split samples collected with representative of North Wind, Inc., a contractor hired by Tanadgusix Corporation
d Duplicate of sample number SP30-CS-017-050
e Duplicate of sample number SP30-CS-030-100
f Duplicate of sample number SP30-CS-031-070
g Duplicate of sample number SP30-CS-032-100
h Duplicate of sample number SP30-CS-033-120
i Duplicate of sample number SP30-CS-038-150
j Duplicate of sample number SP30-CS-039-060
k Duplicate of sample number SP30-SS-009
l Cleanup level is from Title 18 of the *Alaska Administrative Code 75* "Oil and Hazardous Substances Pollution Control Regulations," published by the State of Alaska and amended through October 28, 2000.

NOAA Sites 31–33

(Lukanin Bay Debris, TPA 12; TPA Attachment A)

NOAA Site 31 – TPA Site 12a: Lukanin Bay Debris Area A
NOAA Site 32 – TPA Site 12b: Lukanin Bay Debris Area B
NOAA Site 33 – TPA Site 12c: Lukanin Bay petroleum contaminated soil

Request for Conditional Closure, Lukanin Bay Site
TPA Sites 12a, 12b, 12c/NOAA Sites 31, 32, 33, St. Paul Island, Alaska.....771

Request for Conditional Closure
Lukanin Bay Site
TPA Sites 12a, 12b, 12c/NOAA Sites 31, 32, 33
St. Paul Island, Alaska

Request for Conditional Closure

Site:
The site, consisting of three subsites, is collectively known as the Lukanin Bay Site or Two Party Agreement (TPA) Site 12. The subsites are referred to as Lukanin Bay Debris Area A (TPA Site 12a, National Oceanic and Atmospheric Administration [NOAA] Site 31), Lukanin Bay Debris Area B (TPA Site 12b, NOAA Site 32), and Lukanin Bay Petroleum-Contaminated Soil (PCS) Area (TPA Site 12c, NOAA Site 33).

Herein, the individual subsites are referred to by the names listed above; collectively, they are referred to as the "site."

Location:
St. Paul Island, Alaska is approximately 800 miles southwest of Anchorage in the Bering Sea. Lukanin Bay is located on the island's southeast side, approximately one mile northeast of the City of St. Paul (Figure 1). The Lukanin Bay Debris Area A is located on the eastern side of Diamond Hill Road near the old beach access roads, approximately 200 feet from the bay (57° 08' 07.32" N latitude, 170° 15' 46.05" W longitude; Figure 2). The Lukanin Bay Debris Area B (57° 08' 09.14" N latitude, 170° 15' 50.10" W longitude) and the Lukanin Bay PCS Area (57° 08' 09.36" N latitude, 170° 15' 50.20" W longitude) are located on the western side of Diamond Hill Road, approximately 450 feet west of the bay (Figure 2). There is some overlap in the extent of the Lukanin Bay Debris Area B and the PCS Area.

Legal Property Description:
The site is located in Section 19, Township 35 South, Range 131 West, of the Seward Meridian, Alaska as shown on the plat of rectangular survey officially filed May 14, 1986. The Tanadgusix Corporation (TDX) owns the surface estate and The Aleut Corporation owns the subsurface estate of the site.

Type of Release:
The site was used for the disposal of metal and wood debris, electrical cabling and controls, general household refuse, 55-gallon drums, government vehicles, heavy equipment, industrial machinery, fire fighting and suppression systems, and steel storage tanks. Soil petroleum contamination evidently resulted from the leaking of debris contents.

History and Background:
Debris was purportedly deposited at the site on both sides of Diamond Hill Road within approximately 200 feet of the road. Based on 2000 closure activities (Nortech 2001), in a February 11, 2002 letter to NOAA, the Alaska Department of Environmental Conservation (ADEC) stated that no further remedial action was required at this site and that the site could be considered closed. Subsequently, on April 5, 2002, ADEC withdrew comments made in the February letter stating, "A no-further-action determination will not be granted until all of the contamination discovered during IT Corporation's site characterization is properly addressed in accordance with cleanup regulations."

Summary of Site Investigations:

Preliminary Assessment (1992)
Ecology and Environment, Inc. (E&E) conducted a preliminary assessment that identified the three areas that comprise TPA Site 12, although the exact locations of these three areas were not documented (E&E 1993). One

area was noted as being northeast of the tank farm, with debris scattered within some of the dunes adjacent to the road and on the beach. The debris included radiators, drums, engines, rusted metal fragments, and a tank. No visibly stained soil or stressed vegetation was observed. Following E&E's site visit, representatives of TDX reportedly told E&E during a telephone conversation that two additional areas of buried debris existed, one on the left and one on the right side of the road that leads away from Lukanin Bay and up to Diamond Hill (E&E 1993). The TDX representatives reported that the areas were vegetated.

Expanded Site Inspection (1995-1996)

Between 1995 and 1996, Hart Crowser, Inc. (Hart Crowser) conducted an expanded site inspection that included the excavation of 12 test pits and the advancement of four soil borings to depths up to 10 feet below ground surface (bgs). Analytical data for soil samples collected during the expanded site inspection indicated the presence of residual-range organic compounds (RRO) and diesel-range organic compounds (DRO) at concentrations up to 19,700 milligrams per kilogram (mg/kg) and 8,300 mg/kg, respectively. Hart Crowser estimated approximately 900 cubic yards of soil contained RRO and DRO at concentrations exceeding the ADEC Method Two cleanup levels (Hart Crowser 1997).

Site Characterization (1999)

Tetra Tech EM, Inc. (Tetra Tech) conducted site characterization activities at TPA Site 12 (Tetra Tech 2000), including the screening of soil samples using a photoionization detector (PID) and the removal of metal debris (see *Summary of Cleanup Actions* below). Tetra Tech identified four locations potentially contaminated with petroleum and collected screening samples from 0-2 feet bgs at each location. PID screening results for the samples (12TP01-12TP04) ranged from 8.0-12.0 parts per million (ppm) compared to about 10 ppm in background soil samples. Tetra Tech concluded that off-site soil sample analysis was not warranted and that no corrective action (other than removal of remaining debris) was warranted.

Tetra Tech did not provide a map or sketch of the sample locations, but the locations were described as follows.

12TP01: beneath the 1,500 gallon tank

12TP02: 15 feet away from the tank and 55-gallon drums (for comparison with 12TP03 and 12TP04)

12TP03: beneath the buried 55-gallon drums

12TP04: beneath the buried 55-gallon drums

Tetra Tech attempted to reach groundwater using a Geoprobe direct-push sampler. One borehole was advanced to 17 feet bgs, where refusal was encountered before reaching groundwater.

Site Characterization (2001)

IT Alaska Corporation (IT Alaska) conducted further site characterization activities at the site, including the collection of soil samples and the installation and sampling of two monitoring wells (MWLB-1 and MWLB-2; IT Alaska 2002). IT Alaska attempted to use soil borings to delineate the contamination identified by Hart Crowser, despite difficulties decisively locating the previously sampling locations. Analytical data for soil samples revealed that three sampling locations (SP12-SB2, SP12-SB10, and SP12-SB29) contained DRO (up to 2,500 mg/kg) exceeding the ADEC Method Two cleanup level (Figure 3). Sample SP12-SB10 also contained 23,000 mg/kg RRO, exceeding the ADEC Method Two cleanup level for RRO. Additionally, one sampling location (SP12-SB32) contained the polynuclear aromatic hydrocarbon (PAH) benzo(a)pyrene above the Method Two cleanup level, with a concentration of 5.6 mg/kg (Figure 3). Chlorinated pesticides were also detected in soil above Method Two cleanup levels; however, the detections were suspected to be false positives due to the elevated petroleum concentrations.

Groundwater samples collected from monitoring wells MWLB-1 and MWLB-2 (Figure 2) found RRO exceeding the ADEC Table C cleanup level in a field duplicate collected from MWLB-2. The corresponding sample did not exceed the Table C cleanup level for RRO. Results for RRO are considered questionable because ADEC does not have an approved method for the analysis of RRO in water.

Based on soil sampling results, IT Alaska estimated that 52 cubic yards of soil required removal, including an estimated 18 cubic yards of PAH-contaminated soil.

Remedial Design Investigation (2003)
NOAA collected 63 samples from 11 soil boring locations at the site (NOAA 2003). All samples were analyzed for DRO using thin-layer chromatography (TLC) at NOAA's on-island laboratory, and six samples, collected by a qualified third party sampler, were analyzed for DRO, RRO, and chlorinated pesticides at an off-island fixed laboratory. Semi-quantitative TLC data indicated that in all but three samples DRO concentrations were below 100 mg/kg. The estimated DRO concentrations for samples SP33-CH-005-2-4, SP33-TLC-006-008, SP33-CH-007-020 were 5,000-10,000 mg/kg, 250 mg/kg, and 250-500 mg/kg, respectively. Sample SP33-CH-005-2-4 (Figure 3) was also analyzed in the fixed laboratory and determined to contain only 440 mg/kg DRO (above the ADEC Method Two cleanup level) as well as 3,100 mg/kg RRO, and 0.00184 mg/kg Aldrin. The only other analyte detected in fixed laboratory analyses was 4,4' dichlorodiphenyltrichloroethane (DDT) in samples SP33-CH-009-050 and SP33-CH-011-010 at concentrations of 0.00329 mg/kg and 0.0117 mg/kg, respectively. These concentrations are below the ADEC Method Two cleanup level.

Groundwater Monitoring (2003-2004)
A Tetra Tech subcontractor installed a third monitoring well (MWLB-3) at the site in September 2003 (Figure 2). Between October 2003 and July 2004, Tetra Tech conducted four rounds of groundwater monitoring. During these sampling events, only chromium was detected above the ADEC Table C cleanup levels in samples collected from the site's three wells (Tetra Tech 2005). The chromium exceedance occurred only in MWLB-3 during one of the four sampling events.

Remedial Design Investigation (2004)
NOAA and a qualified third party sampler collected additional soil samples from 16 soil boring locations to investigate the potential pesticide contamination identified by IT Alaska in 2001 and NOAA in 2003 (NOAA 2004a). To eliminate the potential for matrix interference caused by the presence petroleum hydrocarbons, a sample cleanup procedure was conducted prior pesticide analyses. Analytical results indicated no chlorinated pesticides were present at concentrations above the ADEC Method Two cleanup levels (NOAA 2004b).

Summary of Applied Cleanup Levels:
Based on analytical data and the possibility of site-derived contamination (*i.e.*, RRO) in groundwater, NOAA employed ADEC Method Two cleanup criteria, discussed at 18 AAC 75.341(c) (ADEC 2003).

Summary of Cleanup Actions:

Debris Removal (1986)
Debris removal activities conducted by Chase Construction, Inc. included the removal of the following items: twenty-six 500-gallon steel tanks; one 1,500-gallon empty steel tank; two to five 10,000-gallon steel tanks; twelve empty 55-gallon drums; six 1.5-ton trucks; 100 feet of 1.5-inch diameter steel pipe; 170 cubic yards of miscellaneous pipe, scrap wood, concrete, and metal debris; and a wood foundation and floor (U.S. Army 1991).

Debris Removal (1997)
Bering Sea Eccotech, Inc. removed surface debris from the site. Sub-surface debris were noted at that time but were not removed (Aleutian Enterprises 1997). No contaminated soils were identified during the removal action.

Debris Removal (1999)
During site characterization activities at the site, Tetra Tech removed metal debris from both sides of Diamond Hill Road (Tetra Tech 2000). Removed debris included a large engine block, pipe, cable, vehicle parts, wood, and concrete from the west side of Diamond Hill Road (*i.e.*, Lukanin Bay Debris Area B), and five 55-gallon drums, steel scrap, vehicle parts, and pipe from the east side of Diamond Hill Road (*i.e.*, Lukanin Bay Debris Area A). Approximately 3,200 pounds of debris were removed. A 1,500-gallon steel tank, largely buried, was left in place on the east side of the road because no equipment was available to remove it.

Site Closure Activities (2000)

Nortech Environmental and Engineering Consultants (Nortech) removed the 1,500-gallon steel tank as well as other metal debris from Lukanin Bay Debris Area A. PID readings in the area of the tank excavation revealed no indications of soil contamination. No soil staining or stressed vegetation was observed. A single soil sample collected from inside the tank for fixed laboratory analysis did not contain detectable levels of petroleum hydrocarbons. Nortech installed erosion control matting in the areas disturbed by heavy equipment and transplanted native plants and grasses to restore a vegetative cover (Nortech 2001).

PCS Corrective Action (2004)

Focusing on five previously identified hot spot locations, excavation activities for the Lukanin Bay PCS Area commenced on July 3, 2004 (Figure 3). NOAA used its survey grade global positioning system (GPS) to relocate and mark these sampling locations before the start of excavation activities.

As excavation at the hot spot locations was expanded based on the results of TLC screening sample analyses as well as visual and olfactory observations, four of the hot spot excavations merged into one. This area, located in the southern portion of the Lukanin Bay PCS Area, became known as Area 1. The area of the remaining hot spot, located in the northeastern portion of the site, became known as Area 2 (Figure 4).

Area 1, which encompasses former sampling locations SP12-SB2, SP12-SB10, SP12-SB29, and SP12-SB32, was expanded horizontally to a size of approximately 4,500 square feet and vertically to a depth of 15 feet bgs throughout most of the excavation. Excavation at Area 1 was expanded significantly based on TLC screening sample analyses slightly above the ADEC Method Two cleanup level of 250 mg/kg. It was determined, however, that false positive results were being obtained from the TLC procedure because of interference associated with rubber-lined lids on the glass vials used in the analyses. This issue was subsequently resolved by using only paper- or Teflon-lined lids. Because of the false positive results, it is likely that a larger quantity of soil was removed than would have been required. A total of 18 confirmation samples were collected from Area 1 (Figure 4).

Area 2, which included former sampling location SP33-CH-005, was expanded horizontally to a size of approximately 200 square feet and vertically to a depth of approximately 4 feet bgs. A total of two confirmation samples were collected from this excavation (Figure 4).

Throughout excavation activities at the Lukanin Bay PCS Area, significant quantities of wood and metal debris were encountered and removed from up to 7 feet bgs. Debris included drums and miscellaneous pieces of scrap wood and metal. Twenty-four empty and extremely corroded drums were removed from Area 2. Along with large quantities of debris, balls of sand bound with residual oil were encountered and removed from several locations in Area 2; a stockpile sample (SP33-SS-009-000) collected from the sand balls indicated concentrations of DRO at 2,600 mg/kg and RRO at 9,100 mg/kg. In addition, an unidentified material was encountered and removed from the northern portion of Area 2. NOAA and Tetra Tech representatives reported that the unidentified material smelled like hydraulic or differential fluid, and irritated the eyes and mucous membranes; analysis of a TLC sample collected from the unidentified material indicated DRO concentrations below soil cleanup levels.

Confirmation samples collected from the bottom and sidewalls of the excavations at the Lukanin Bay PCS Area indicated all analyte concentrations are below ADEC Method Two cleanup levels (Tables 1 and 2). Laboratory reporting limits were below ADEC Method Two cleanup levels for all analyses except benzene. For benzene, reporting limits of 0.05 mg/kg or lower were achieved, which is above the ADEC Method Two cleanup level of 0.02 mg/kg, but below the soil cleanup level of 0.5 mg/kg established under the TPA (ADEC 1991, NOAA 1996).

During the corrective action, an estimated 1,778 cubic yards of PCS were removed from the excavations at the Lukanin Bay PCS Area. In addition, an estimated 395 cubic yards of debris were removed from the excavations.

PCS from the Lukanin Bay PCS Area was transported to the lined stockpile located at Tract 42 (Figure 1). Initially, PCS removed from the vicinity of former sampling location SP12 SB32 was placed on a separate liner because of concerns regarding elevated concentrations of PAHs. This material was subsequently incorporated into the existing PCS stockpile based on fixed laboratory analytical data, which indicated that concentrations of PAHs were consistent with existing material in the PCS stockpile (Table 2).

Wood and metal debris removed from the excavations were disposed on Tract 42, where two holes were excavated within the 50-foot setback area. Debris was placed in the holes and covered with fill material, thereby incorporating the debris with existing municipal solid waste during closure activities conducted at Tract 42 later in the 2004 field season.

Clean fill material for excavations at the Lukanin Bay PCS Area consisted of sand and pieces of concrete. The approximately 1,210 cubic yards of sand backfill originated from the Salt Lagoon Channel. Kelly Ryan, Inc., under contract to the U.S. Army Corps of Engineers, removed the sand during a harbor-dredging project (Kelly Ryan, Inc. 2004). The concrete originated from the foundation of a former drum pad on Tract 50 (Non-TPA Site 58) demolished by NOAA in 2004. The areas of excavation were restored to original grade. Site restoration activities included the placement of a native seed mixture and fertilizer and the installation of erosion control matting. Large rocks were also placed along the eastern boundary of the site to restrict vehicle access. Backfill and site restoration activities were completed on September 29, 2004.

Recommended Action:
In accordance with paragraph 59 of the Two Party Agreement (NOAA 1996), NOAA requests written confirmation that NOAA completed all appropriate corrective action, to the maximum extent practicable, at the Lukanin Bay Site (TPA Sites 12a, 12b, and 12c/NOAA Sites 31, 32, and 33) in accordance with the Agreement and that ADEC grant a conditional closure not requiring further remedial action from NOAA. NOAA understands ADEC will/may require additional containment, investigation, or cleanup if subsequent information indicates that the level of contamination that remains does not protect human health, safety, or welfare, or the environment.

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For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

5/2/05
Date

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 Lukanin Bay Site (TPA Sites 12a, 12b, and 12c/NOAA Sites 31, 32, and 33) in accordance with the Agreement and that no further remedial action is required 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

5/5/05
Date

Tables and Figures

Table 1. Analytical Data Summary - BTEX, GRO, DRO, RRO, and Lead, Site 33/TPA Site 12c - Lukanin Bay Pcs, St. Paul Island, Alaska

Sample Number	Sample Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Total Xylenes (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	RRO (mg/kg)	Lead (mg/kg)
Site 33/TPA Site 12c Confirmation Samples									
SP33-CS-001-040	4	0.02 U	0.02 U	0.02 U	0.06 U	--	10 U	50 U	--
SP33-CS-001-300[a]	4	0.03 U	0.03 U	0.03 U	0.09 U	--	--	--	--
SP33-CS-002-040	4	0.02 U	0.02 U	0.02 U	0.06 U	--	84	50 U	--
SP33-CS-003-060	6	0.02 U	0.02 U	0.02 U	0.06 U	--	10 U	50 U	--
SP33-CS-007-150	15	0.02 U	0.02 U	0.02 U	0.06 U	--	10 U	50 U	--
SP33-CS-008-150	15	0.03 U	0.03 U	0.03 U	0.09 U	--	10 U	50 U	--
SP33-CS-009-080	8	0.05 U	0.05 U	0.05 U	0.15 U	--	10 U	50 U	--
SP33-CS-010-080	8	0.05 U	0.05 U	0.05 U	0.15 U	--	10 U	50 U	--
SP33-CS-017-150	15	0.05 U	0.05 U	0.05 U	0.15 U	--	10 U	50 U	--
SP33-CS-021-150	15	0.05 U	0.05 U	0.05 U	0.15 U	--	10 U	50 U	--
SP33-CS-023-150	15	0.05 U	0.05 U	0.05 U	0.15 U	--	10 U	50 U	--
SP33-CS-024-150	15	0.05 U	0.05 U	0.05 U	0.15 U	--	10 U	50 U	--
SP33-CS-028-120	12	0.05 U	0.05 U	0.05 U	0.15 U	--	10 U	50 U	--

Sample Number	Sample Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Total Xylenes (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	RRO (mg/kg)	Lead (mg/kg)
SP33-CS-029-120	12	0.05 U	0.05 U	0.05 U	0.15 U	--	10 U	50 U	--
SP33-CS-033-150	15	0.05 U	0.05 U	0.05 U	0.15 U	--	10 U	50 U	--
SP33-CS-034-150	15	0.05 U	0.05 U	0.05 U	0.15 U	--	10 U	50 U	--
SP33-CS-034-315[b]	15	0.05 U	0.05 U	0.05 U	0.15 U	--	10 U	50 U	--
SP33-CS-035-150	15	0.05 U	0.05 U	0.05 U	0.15 U	--	10 U	50 U	--
SP33-CS-035-320[c]	15	--	--	--	--	--	10 U	50 U	--
SP33-CS-036-150	15	0.05 U	0.05 U	0.05 U	0.15 U	--	10 U	50 U	--
SP33-CS-037-150	15	0.05 U	0.05 U	0.05 U	0.15 U	--	10 U	50 U	--
SP33-CS-038-150	15	0.05 U	0.05 U	0.05 U	0.15 U	--	10 U	50 U	--
SP33-CS-039-150	15	0.05 U	0.05 U	0.05 U	0.15 U	--	12	50 U	--
Site 33/TPA Site 12c Stockpile Samples									
SP33-SS-001-000	0	0.02 U	0.02 U	0.02 U	0.06 U	--	150	340	--
SP33-SS-002-000	0	0.02 U	0.02 U	0.02 U	0.06 U	--	**280**	680	--
SP33-SS-003-000	0	0.02 U	0.02 U	0.02 U	0.06 U	--	**310**	2,300	--
SP33-SS-004-000	0	0.02 U	0.02 U	0.02 U	0.06 U	--	**6,900**	3,200 J	--
SP33-SS-005-000	0	0.02 U	0.02 U	0.02 U	0.06 U	--	170	630	--
SP33-SS-006-000	0	0.02 U	0.02 U	0.02 U	0.06 U	--	23	120	--
SP33-SS-007-000	0	0.05 U	0.05 U	0.05 U	0.15 U	--	**380**	1,700	--
SP33-SS-008-000	0	0.05 U	0.05 U	0.05 U	0.15 U	--	110	640	--
SP33-SS-009-000	0	0.05 U	0.05 U	0.05 U	0.15 U	--	**2,600**	9,100 J	--
SP33-SS-010-000	0	0.05 U	0.05 U	0.05 U	0.15 U	--	**300**	99	--
SP33-SS-010-305[d]	0	0.05 U	0.05 U	0.05 U	0.15 U	--	250	130	--
SP33-SS-011-000	0	0.05 U	0.05 U	0.05 U	0.15 U	--	10 U	50 U	--
SP33-SS-012-000	0	0.05 U	0.05 U	0.05 U	0.15 U	--	52	340	--
SP33-SS-013-000	0	0.05 U	0.05 U	0.05 U	0.15 U	--	25	50 U	--
SP33-SS-014-000	0	0.05 U	0.05 U	0.05 U	0.15 U	--	120	530	--
SP33-SS-015-000	0	0.02 U	0.02 U	0.02 U	0.06 U	1 U	**300**	1,500	--
SP33-SS-016-000	0	0.02 U	0.02 U	0.02 U	0.06 U	1 U	**2,100**	4,600	--
SP33-SS-017-000	0	0.02 U	0.02 U	0.02 U	0.06 U	1 U	100	370	--
SP33-SS-018-000	0	0.02	0.08	0.03	0.11	1 U	94	110	--
SP33-SS-019-000	0	0.1 U	0.2	0.1 U	0.4	5 U	**310**	1,300	--
SP33-SS-020-000	0	0.02 U	0.02 U	0.02 U	0.06 U	1 U	22	78	--
SP33-SS-021-000	0	0.02 U	0.07	0.02 U	0.06 U	1 U	**380**	980	--
SP33-SS-022-000	0	0.02 U	0.38	0.05	0.27	2	120	570	--
SP33-SS-023-000	0	0.02 U	0.06	0.02 U	0.06 U	1 U	10 U	50 U	--
SP33-SS-024-000	0	0.02 U	0.06 U	0.02 U	0.06 U	2 U	110	410	--
SP33-SS-024-305[e]	0	0.02 U	0.02 U	0.02 U	0.06 U	1 U	130	570	--
SP33-SS-025-000	0	0.02 U	0.02	0.02 U	0.06 U	1 U	10 U	50 U	--
SP33-SS-026-000	0	0.02 U	0.17	0.04	0.17	1	39	150	--
SP33-SS-027-000	0	0.02	0.05	0.03	0.08	1 U	39	130	--
SP33-SS-028-000	0	0.02 U	0.21	0.03	0.15	1 U	22	66	--
SP33-SS-029-000	0	0.02 U	0.02	0.02 U	0.06 U	1 U	10 U	50 U	--

Sample Number	Sample Depth (feet bgs)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Total Xylenes (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	RRO (mg/kg)	Lead (mg/kg)
SP33-SS-030-000	0	0.02 U	0.02 U	0.02 U	0.06 U	1 U	10 U	50 U	--
SP33-SS-031-000	0	0.02 U	0.46	0.06	0.33	2	13	65	--
SP33-SS-032-305[f]	0	0.02 U	0.06	0.02 U	0.06 U	1 U	17	74	--
SP33-SS-033-000	0	0.1 U	0.4	0.1	0.4	5 U	31	67	--
SP33-SS-034-000	0	0.02 U	0.02 U	0.02 U	0.06 U	1 U	13	50 U	--
SP33-SS-034-305[g]	0	0.02 U	0.02 U	0.02 U	0.06 U	1 U	10 U	50 U	--
SP33-SS-035-000	0	0.02U	0.02 U	0.02 U	0.06 U	1 U	10 U	50 U	--
SP33-SS-036-000	0	0.02 U	0.02	0.02 U	0.06 U	1 U	28	50 U	--
SP33-SS-037-000	0	0.02 U	0.02 U	0.02 U	0.06 U	1 U	10 U	50 U	--
Site 33/TPA Site 12c Backfill Characterization Samples									
SPSL-CH-001-015	1.5	--	--	--	--	--	--	--	2.93[h]
SPSL-CH-002-015	1.5	--	--	--	--	--	--	--	3.49[h]
SPSL-CH-003-015	1.5	--	--	--	--	--	--	--	3.38[h]
Trip Blank Samples									
SP33-TB-001-000	0	0.02 U	0.02 U	0.02 U	0.06 U	--	--	--	--
SP33-TB-002-000	0	0.06 U	0.06 U	0.06 U	0.18 U	--	--	--	--
SP33-TB-001-000	0	0.02 U	0.04 U	0.04 U	0.12 U	2 U	--	--	--
ADEC Method Two Cleanup Level[i]		*0.5*[j]	*5.4*	*5.5*	*78*	*300*	*250*	*10,000*	*400*[k]

Notes

bold Indicates concentration above one or both cleanup levels. Although reporting limits for benzene sometimes exceeded the ADEC Method Two cleanup level of 0.02 mg/kg, all reporting limits were equal to or below the soil cleanup level of 0.5 mg/kg established under the TPA.

ADEC Alaska Department of Environmental Conservation
bgs Below ground surface
BTEX Benzene, toluene, ethylbenzene, and total xylenes
DRO Diesel-range organic compounds
GRO Gasoline-range organic compounds
mg/kg Milligram per kilogram
-- Not analyzed
PAH Polynuclear aromatic hydrocarbon
RRO Residual-range organic compounds
TPA Two-Party Agreement
U Analyte was analyzed for, but not detected above the sample reporting limit
J Analyte was positively identified, but the numerical value is an estimated concentration; result is considered qualitatively acceptable, but quantitatively unreliable
a Duplicate of sample number SP33-CS-001-040
b Duplicate of sample number SP33-CS-034-150
c Duplicate of sample number SP33-CS-035-150
d Duplicate of sample number SP33-SS-010-000
e Duplicate of sample number SP33-SS-024-000
f Duplicate of sample number SP33-SS-031-000
g Duplicate of sample number SP33-SS-034-000
h Lead concentration is consistent with island background levels (Tetra Tech EM Inc. 2000. *Soil Background Study, Pribilof Islands Site Restoration, St. Paul Island, Alaska*.).
i Unless otherwise noted, cleanup level is from Title 18 of the *Alaska Administrative Code* 75 "Oil and Hazardous Substances Pollution Control Regulations," published by the State of Alaska and effective January 30, 2003. Contaminants of concern for this site are limited to BTEX, DRO, RRO, and select PAHs; although not identified as

contaminants of concern in the corrective action plan, GRO and lead are included in this table because these analyses were conducted on some samples.

j Under the TPA, NOAA is required to comply with the 1991 ADEC cleanup level for benzene (0.5 mg/kg). However, NOAA has attempted to remove benzene to within the current ADEC Method Two cleanup level (0.02 mg/kg) to the maximum extent practicable.

k Although this site is located within an industrial area, NOAA is using the residential cleanup level.

Table 2. Analytical Data Summary - Polynuclear Aromatic Hydrocarbons, Site 33/TPA Site 12c - Lukanin Bay Pcs Site, St. Paul Island, Alaska

Sample Number	Sample Depth (feet bgs)	Naphthalene (mg/kg)	Acenaph-thylene (mg/kg)	Acenaph-thene (mg/kg)	Fluorene (mg/kg)	Phenan-threne (mg/kg)	Anthracene (mg/kg)	Fluoran-thene (mg/kg)	Pyrene (mg/kg)
Site 33/TPA Site 12c Confirmation Samples									
SP33-CS-001-040	4	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-002-040	4	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-003-060	6	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-007-150	15	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-008-150	15	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-009-080	8	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-010-080	8	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-017-150	15	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-021-150	15	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-023-150	15	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-024-150	15	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-028-120	12	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-029-120	12	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-033-150	15	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-034-150	15	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-034-315[a]	15	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-035-150	15	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-035-320[b]	15	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-036-150	15	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-037-150	15	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-038-150	15	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-039-150	15	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Site 33/TPA Site 12c Stockpile Samples									
SP33-SS-001-000	0	0.005 U	0.005 U	0.005 U	0.005 U	0.036	0.067	0.043	0.1
SP33-SS-002-000	0	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
SP33-SS-003-000	0	0.05 U	0.05 U	0.05 U	0.05 U	0.16	0.18 U	0.15	0.37
SP33-SS-004-000	0	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
SP33-SS-005-000	0	0.005 U	0.005 U	0.005 U	0.005 U	0.081	0.17	0.084	0.21
SP33-SS-006-000	0	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.006
SP33-SS-007-000	0	0.005 U	0.005 U	0.005 U	0.005 U	0.011	0.005 U	0.011	0.056
SP33-SS-008-000	0	0.005 U	0.005 U	0.005 U	0.005 U	0.033	0.008	0.041	0.11
SP33-SS-009-000	0	0.25 U	0.5	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
SP33-SS-010-000	0	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-SS-010-305[c]	0	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-SS-011-000	0	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U

Sample Number	Sample Depth (feet bgs)	Naphthalene (mg/kg)	Acenaph-thylene (mg/kg)	Acenaph-thene (mg/kg)	Fluorene (mg/kg)	Phenan-threne (mg/kg)	Anthracene (mg/kg)	Fluoran-thene (mg/kg)	Pyrene (mg/kg)
SP33-SS-012-000	0	0.005 U	0.005 U	0.005 U	0.005 U	0.018	0.005 U	0.011	0.023
SP33-SS-013-000	0	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-SS-014-000	0	0.005 U	0.005 U	0.005 U	0.005 U	0.013	0.005 U	0.011	0.029
SP33-SS-015-000	0	0.05 U	0.05 U	0.05 U	0.05 U	0.22	0.05 U	0.16	0.34
SP33-SS-016-000	0	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
SP33-SS-017-000	0	0.005 U	0.005 U	0.005 U	0.005 U	0.015	0.005 U	0.015	0.03
SP33-SS-018-000	0	0.005	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-SS-019-000	0	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
SP33-SS-020-000	0	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-SS-021-000	0	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.011	0.013
SP33-SS-022-000	0	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.01	0.024
SP33-SS-023-000	0	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-SS-024-000	0	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-SS-024-305[d]	0	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-SS-025-000	0	0.005 U	0.005 U	0.005 U	0.005 U	0.006	0.005 U	0.005 U	0.008
SP33-SS-026-000	0	0.014	0.005 U	0.005 U	0.005 U	0.025	0.006	0.023	0.025
SP33-SS-027-000	0	0.009	0.005 U	0.006	0.008	0.082	0.022	0.056	0.091
SP33-SS-028-000	0	0.005 U	0.005 U	0.005 U	0.005 U	0.014	0.005 U	0.015	0.023
SP33-SS-029-000	0	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005
SP33-SS-030-000	0	0.007	0.005 U	0.005 U	0.005 U	0.016	0.005 U	0.015	0.018
SP33-SS-031-000	0	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005
SP33-SS-032-305[e]	0	0.005 U	0.005 U	0.005 U	0.005 U	0.039	0.007	0.054	0.072
SP33-SS-033-000	0	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.007	0.012
SP33-SS-034-000	0	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-SS-034-305[f]	0	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-SS-035-000	0	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-SS-036-000	0	0.005 U	0.005 U	0.005 U	0.005 U	0.015	0.005 U	0.012	0.019
SP33-SS-037-000	0	0.005 U	0.005 U	0.005 U	0.005 U	0.013	0.005 U	0.018	0.019
Site 33/TPA Site 12c Backfill Characterization Samples									
SPSL-CH-001-015	1.5	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SPSL-CH-002-015	1.5	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SPSL-CH-003-015	1.5	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Method Two Cleanup Level[g]		*43*	*NA*	*210*	*270*	*NA*	*4,300*	*NA*	*1,500*

Sample Number	Benz(a) anthracene (mg/kg)	Chrysene (mg/kg)	Benzo(b) fluoran-thene (mg/kg)	Benzo(k) fluoran-thene (mg/kg)	Benzo(a) pyrene (mg/kg)	Indeno (1,2,3-cd) pyrene (mg/kg)	Dibenzo(a,h) anthracene (mg/kg)	Benzo(g,h,i) perylene (mg/kg)
Site 33/TPA Site 12c Confirmation Samples								
SP33-CS-001-040	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-002-040	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-003-060	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-007-150	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-008-150	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-009-080	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-010-080	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-017-150	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-021-150	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-023-150	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-024-150	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-028-120	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-029-120	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-033-150	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-034-150	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-034-315[a]	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-035-150	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-035-320[b]	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-036-150	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-037-150	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-038-150	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-CS-039-150	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Site 33/TPA Site 12c Stockpile Samples								
SP33-SS-001-000	0.056	0.008	0.069	0.023	0.079	0.019	0.007	0.019
SP33-SS-002-000	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
SP33-SS-003-000	0.16	0.05 U	0.22	0.089	0.24	0.071	0.05 U	0.084
SP33-SS-004-000	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
SP33-SS-005-000	0.13	0.023	0.24	0.067	0.3	0.09	0.054	0.12
SP33-SS-006-000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-SS-007-000	0.019	0.019	0.020	0.005 U	0.023	0.008	0.005 U	0.022
SP33-SS-008-000	0.039	0.048	0.055	0.016	0.055	0.025	0.013	0.037
SP33-SS-009-000	0.25 U	0.32	0.25 U	0.25 U	**1.1**	0.34	0.25 U	0.38
SP33-SS-010-000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-SS-010-305[c]	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-SS-011-000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-SS-012-000	0.008	0.009	0.008	0.005 U	0.007	0.005 U	0.005 U	0.005 U
SP33-SS-013-000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-SS-014-000	0.01	0.013	0.015	0.005 U	0.015	0.007	0.005 U	0.008
SP33-SS-015-000	0.12	0.15	0.17	0.072	0.25	0.074	0.05 U	0.1
SP33-SS-016-000	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
SP33-SS-017-000	0.015	0.018	0.031	0.005 U	0.021	0.006	0.005 U	0.006
SP33-SS-018-000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-SS-019-000	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U

Sample Number	Benz(a) anthracene (mg/kg)	Chrysene (mg/kg)	Benzo(b) fluoran-thene (mg/kg)	Benzo(k) fluoran-thene (mg/kg)	Benzo(a) pyrene (mg/kg)	Indeno (1,2,3-cd) pyrene (mg/kg)	Dibenzo(a,h) anthracene (mg/kg)	Benzo(g,h,i) perylene (mg/kg)
SP33-SS-020-000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-SS-021-000	0.005	0.009	0.011	0.01	0.006	0.005 U	0.005 U	0.005 U
SP33-SS-022-000	0.01	0.012	0.018	0.005 U	0.014	0.005	0.005 U	0.007
SP33-SS-023-000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-SS-024-000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-SS-024-305[d]	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-SS-025-000	0.005 U	0.007	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-SS-026-000	0.013	0.018	0.018	0.005 U	0.005 U	0.006	0.005 U	0.005 U
SP33-SS-027-000	0.053	0.079	0.085	0.01	0.013	0.014	0.006	0.005 U
SP33-SS-028-000	0.015	0.021	0.023	0.008	0.02	0.011	0.006	0.013
SP33-SS-029-000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-SS-030-000	0.01	0.013	0.012	0.005 U	0.01	0.005 U	0.005 U	0.005
SP33-SS-031-000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-SS-032-305[e]	0.061	0.086	0.093	0.024	0.074	0.032	0.018	0.029
SP33-SS-033-000	0.007	0.01	0.008	0.005 U	0.005 U	0.005 U	0.005 U	0.006
SP33-SS-034-000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-SS-034-305[f]	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-SS-035-000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SP33-SS-036-000	0.009	0.014	0.008	0.005 U	0.009	0.005 U	0.005 U	0.005 U
SP33-SS-037-000	0.011	0.011	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Site 33/TPA Site 12c Backfill Characterization Samples								
SPSL-CH-001-015	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SPSL-CH-002-015	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SPSL-CH-003-015	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Method Two Cleanup Level[g]	*6*	*620*	*11*	*110*	*1*	*11*	*1*	*NA*

Notes

bold Indicates concentration exceeding ADEC Method Two cleanup level
bgs Below ground surface
mg/kg Milligram per kilogram
NA Not available
PCS Petroleum-contaminated soil
TPA Two Party Agreement
U The analyte was analyzed for but not detected above the sample reporting limit.
a Duplicate of sample number SP33-CS-034-150
b Duplicate of sample number SP33-CS-035-150
c Duplicate of sample number SP33-SS-010-000
d Duplicate of sample number SP33-SS-024-000
e Duplicate of sample number SP33-SS-031-000
f Duplicate of sample number SP33-SS-034-000
g Cleanup level is from Title 18 of the *Alaska Administrative Code* 75, "Oil and Hazardous Substances Pollution Control Regulations," published by the State of Alaska and effective January 30, 2003.

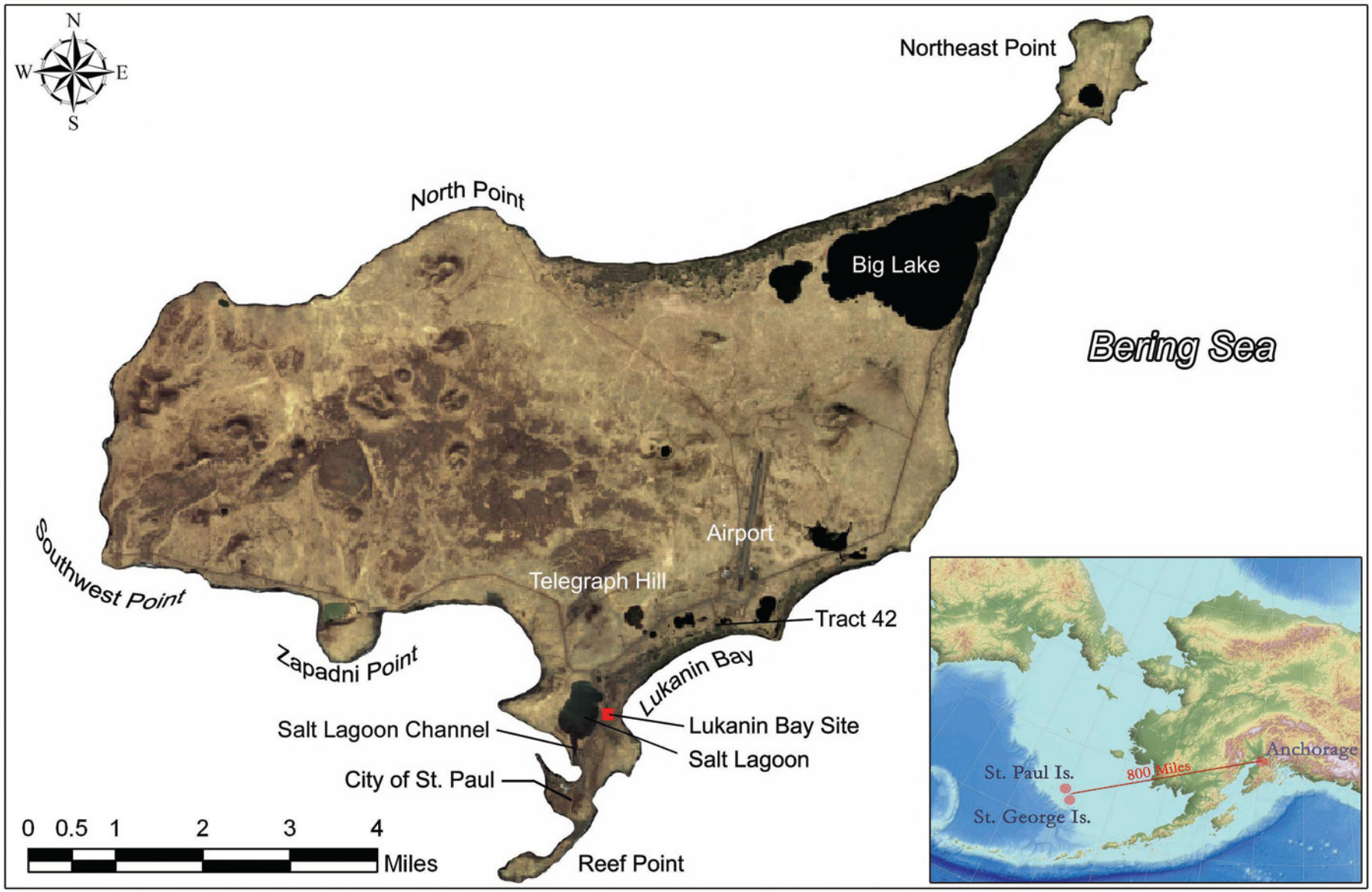

Figure 1	St. Paul Island Vicinity Map Lukanin Bay Site Sites 31, 32, 33/TPA Sites 12a, b, and c St. Paul Island, Alaska	Source: Ikonos Satellite Imagery, 2001

Pribilof Islands Restoration Project

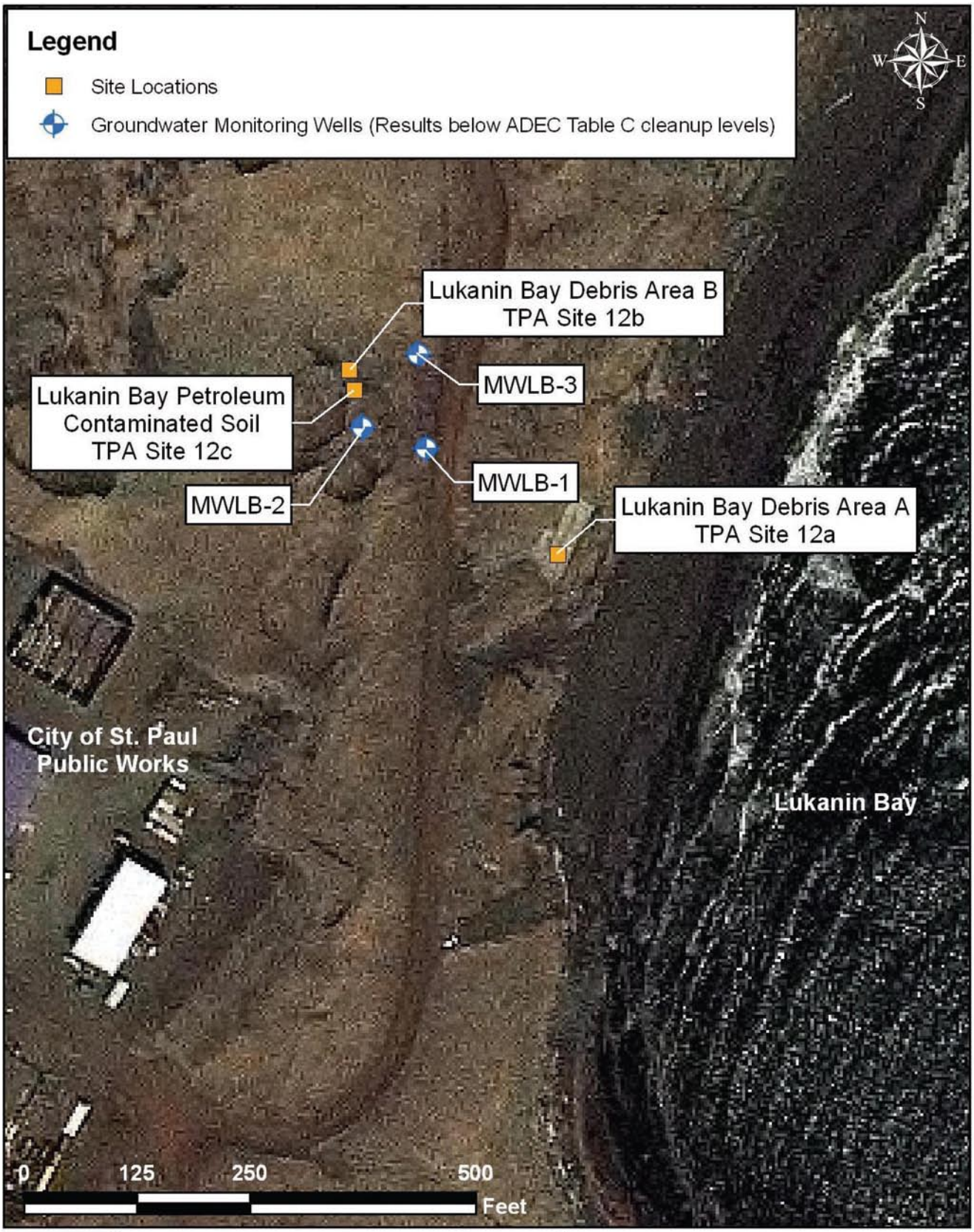

Figure 2	Lukanin Bay Site Vicinity Sites 31, 32, 33/TPA Sites 12a, b, and c St. Paul Island, Alaska	Sources: Site Locations (NOAA Pribilof Project GIS), Satellite Imagery (Ikonos 2001).

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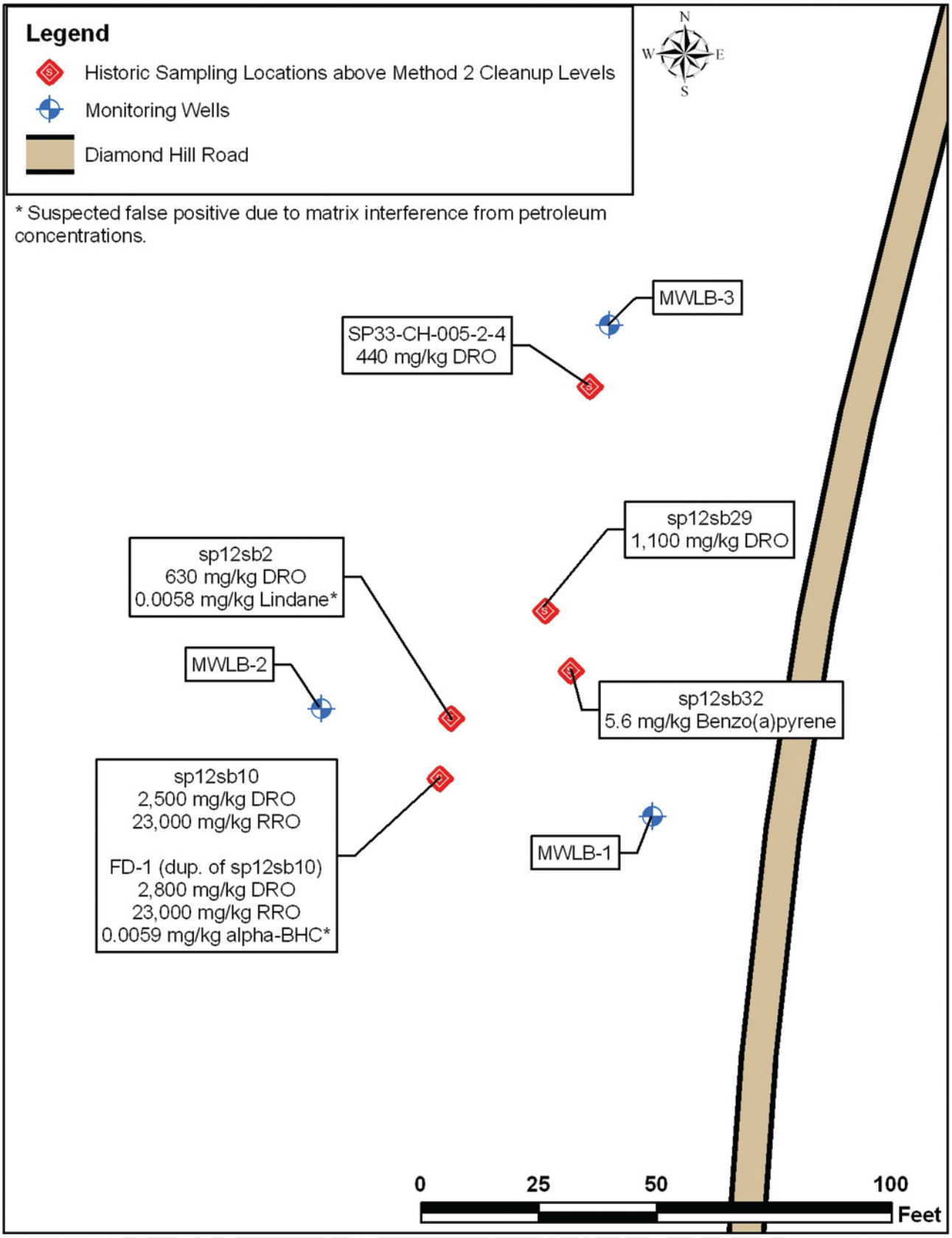

Figure 3	Historical Sampling Locations Above Method 2 Lukanin Bay Petroleum Contaminated Soil Area Site 33/TPA Site 12c St. Paul Island, Alaska	Source: NOAA Pribilof Project GIS, 2005.

Pribilof Islands Restoration Project

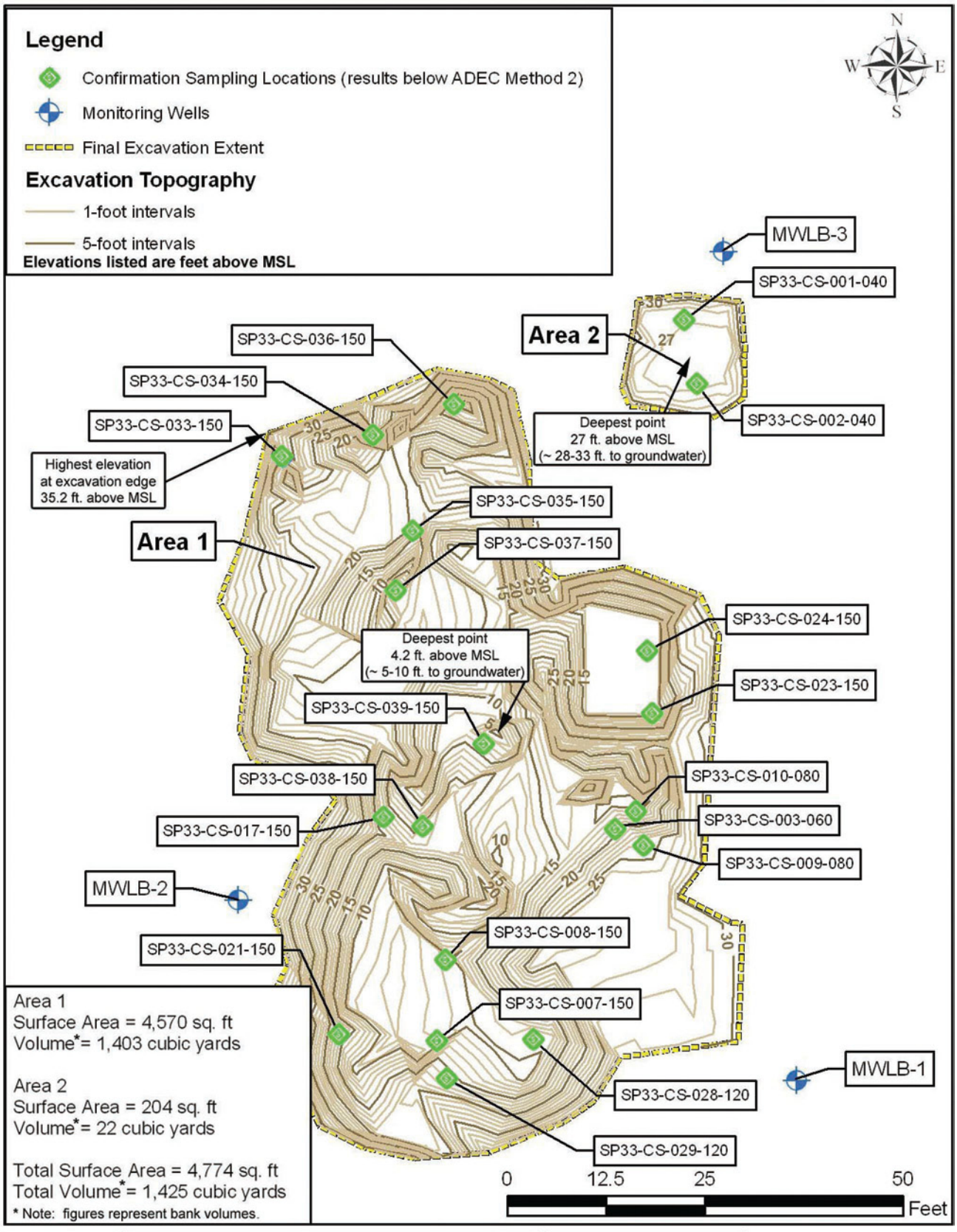

Figure 4	Confirmation Sampling Location Map Lukanin Bay Petroleum Contaminated Soil Area Site 33/TPA Site 12c St. Paul Island, Alaska	Sources: NOAA Pribilof Project GIS (2004), Ikonos Satellite Imagery (2001).

Pribilof Islands Restoration Project

NOAA Sites 34–35

(Salt Lagoon Diesel Deep, TPA 13; TPA Attachment A)

NOAA Site 34 – TPA Site 13a: Salt Lagoon Diesel Seep (uplands)
NOAA Site 35 – TPA Site 13b: Salt Lagoon Diesel Seep Channel

Request for Conditional Closure, Salt Lagoon Diesel Seep,
NOAA Sites 34 and 35/TPA Sites 13a and 13b, St. Paul Island, Alaska 789

Notice of Environmental Cleanup and Groundwater Contamination at
TPA13, Salt Lagoon Diesel Seep, St. Paul Island, Alaska.....803

Request for Conditional Closure
Salt Lagoon Diesel Seep, NOAA Sites 34 and 35/TPA Sites 13a and 13b
St. Paul Island, Alaska

Request for Conditional Closure

Site:
Salt Lagoon Diesel Seep, also known as National Oceanic and Atmospheric Administration (NOAA) Sites 34 and 35/Two-Party Agreement (TPA) Sites 13a and 13b). NOAA designated the Salt Lagoon Diesel Seep as Site 34/ TPA Site 13a (the uplands portion) and Site 35/TPA Site 13b (the channel portion). The site will be referred to herein as the Salt Lagoon Diesel Seep.

Location:
St. Paul Island, Alaska is approximately 800 miles southwest of Anchorage in the Bering Sea (Figure 1). The Salt Lagoon Diesel Seep is situated within and adjacent to the eastern portion of the Salt Lagoon Channel north of the NOAA administrative complex at Tract 50 (Figure 2).

Legal Property Description:
The Salt Lagoon Diesel Seep is located in Township 35 South, Range 132 West, Section 25, of the Seward Meridian, Alaska as shown on the plat of rectangular survey officially filed May 14, 1986 (Figure 2). Tanadgusix Corporation (TDX) owns the surface estate and The Aleut Corporation owns the subsurface estate.

Type of Release:
Petroleum products had been used at a seal carcass by-products plant that once occupied the Salt Lagoon Diesel Seep site. An oil sheen emanated along the former by-products plant Salt Lagoon Channel shoreline for several years. This sheen constituted a violation of the federal Clean Water Act (U.S. Code 2002) and State of Alaska surface water quality standards (ADEC 2003).

History and Background:
The Salt Lagoon Diesel Seep is along the east bank of the Salt Lagoon Channel, which is tidally connected to the Salt Lagoon, St. Paul Harbor, and the Bering Sea. Presently, the site is undeveloped and no aboveground structures are present. The site was formerly the location of a seal by-products processing plant that dates to 1918. The plant rendered fur seal carcasses to oil, and animal feed or meal. In 1977, the Tanadgusix (TDX) corporation reached an agreement to take control of the plant, though the actual transfer of ownership did not take place at that time [US Army Corps of Engineers (USACE) 1990]. When government management of commercial fur seal harvests ended in the early 1980s, the by-products plant ceased operation, and the building was demolished in 1988 (NOAA undated).

During its period of operation, the by-products plant relied on 55-gallon drums to transfer diesel fuel to steel pipelines and aboveground and underground storage tanks for heating purposes. Historic releases of diesel fuel from the drums, tanks, and piping are suspected as the original source of contamination to the uplands portion of the site. Purportedly, a release of 10,000 gallons of diesel fuel occurred in 1957 as a result of a cracked valve with only 2,000 gallons recovered. In 1983, an asphalt substance was reported leaking from 197 drums stored on their sides within 100 feet of the Salt Lagoon Channel (IT 2002a).

While sheen may have been occurring as early as the early 1970s (NOAA undated), petroleum sheen was first reported emanating from the east bank of the Salt Lagoon Channel adjacent to the former by-products plant in early June 1989 (USACE 1990). This sheen constituted a violation of the federal Clean Water Act (U.S. Code 2002) and State of Alaska surface water quality standards (ADEC 2003c). On June 8, 1989, NOAA was issued a Notice of Violation/Request for Corrective Action by ADEC (ADEC 1989). NOAA responded to the *Notice of Violation/ Request for Corrective Action* and implemented corrective action in 1994. ADEC issued NOAA a *No Further Ac-*

tion determination for the Salt Lagoon Diesel Seep on November 2, 1995. Subsequently, ADEC reopened the Salt Lagoon Diesel Seep Site (ADEC 1999) amid concerns expressed by the St. Paul community over the continuation of sheening and its potential threat to human health and welfare.

Summary of Previous Site Investigations and Removal Actions:

NOAA Preliminary Investigation – 1989: In response to the June 1989 *Notice of Violation/Request for Corrective Action*, NOAA engineer X. A. Chavez, P.E. visited the site on June 20, 1989, and subsequently issued a report (NOAA undated). NOAA observed that the City of St. Paul had already dug an intercept trench parallel to the shore along the Salt Lagoon Channel that smelled of diesel and contained sheen on top of the groundwater. Additional digging by the City in the area of the former by-products plant in search of a tank failed to find one. Still believing there was a leaking UST, NOAA directed the City to dig 5 more test pits, each of which revealed sheen on the groundwater and other evidence of petroleum contamination. NOAA concluded that the site conditions (likely meaning the shallow groundwater at 3 feet below ground surface (bgs) precluded the installation of USTs, and suggested that the petroleum contamination was instead the result of surface spills and leaks from the fueling operations of the former by-products plant. NOAA recommended further soil sampling and analysis to determine the extent of contamination, and to evaluate cleanup alternatives.

USACE Site Investigation – 1989: The USACE performed a preliminary assessment of petroleum contamination on NOAA's behalf in response to the aforementioned *Notice of Violation* (USACE 1990). USACE used equipment and labor from the City of St. Paul and dug 18 more test pits in and around the site of the former by-products plant. From these they concluded that soil was contaminated from the surface down to groundwater. They recommended placing sorbant boom along a 150-foot length of the Salt Lagoon Channel, and lengthening the intercept trench dug by the City, along with the installation of a perforated drainage line in the trench. They also recommended excavation of the contaminated soils down to groundwater, suggesting the soil could be used as landfill cover material.

Oil Spill Consultants Removal Action – 1994: Oil Spill Consultants (OSC) performed a PCS removal from the uplands portion of the Site in 1994 (OSC 1995). They removed approximately 9,000 yd^3 of PCS from the vadose zone and upper saturated zone (Figure 3). OSC stockpiled PCS at the Blubber Dump Site where it was treated using NOAA's enhanced thermal conduction system during 2000, 2001, and 2002. Excavation did not extend significantly deeper than the top of the water table. The shoreline along the Salt Lagoon Channel was not removed during the 1994 work to allow for a 5 to 15 foot wide soil barrier to prevent tidal channel water intrusion to the upland excavations. OSC encountered floating oil (diesel fuel and suspected animal fat) atop the groundwater that seeped into the excavations. OSC used a skimming system to remove the floating oil, and an oil-water separation process to collect approximately 150 gallons of oil. The site was backfilled with clean soil and large chunks of concrete from earlier demolition of the by-products plant.

TTEMI Preliminary Site Investigation – 1999: Tetra Tech Environmental Management, Inc. (TTEMI) conducted a preliminary site investigation in 1999 (TTEMI 2000) following ADEC's demand to reopen the site. Results of this investigation documented that significant diesel-range organics (DRO) contamination existed in soil to depths of at least 5 feet bgs, if not more (Figure 3). TTEMI did not determine the overall vertical and horizontal extent of DRO contamination in soil. The nature and extent of contamination in groundwater was also not determined for the site.

CESI Historical Review – 1999: In 1999, Columbia Environmental Sciences, Inc. (CESI) conducted a historical review of the operational history of the by-products plant and potential sources at the adjacent National Marine Fisheries Service compound at Tract 50, as well as, the Salt Lagoon Diesel Seep. The Historical Review is discussed in a later CESI site characterization report (CESI 2001). CESI indicated that features of interest included fuel transfer piping, USTs, above ground storage tanks (ASTs), and a saltwater well that may have been installed for a facility that was never completed.

CESI Site Characterization – 2000: In 2000, CESI conducted a site investigation of the Salt Lagoon Diesel Seep. NOAA found much of the data generated from PetroFlag® analysis of suspect quality and potentially unreliable. The draft report was not submitted to ADEC (CESI 2001). CESI also installed five groundwater monitoring wells at the Diesel Seep Site (Figure 4). In well MWDS-2* they found DRO contamination at 9,000 micrograms per

liter (µg/L). In the other four wells, DRO varied from 82 to 400 µg/L. The only other analyte detected was GRO in MWDS-2* at 190 µg/L.

IT Site Characterization– 2001: In 2001, IT Alaska Corporation (IT) performed a comprehensive site characterization on behalf of NOAA (IT 2002a). IT collected 231 soil samples from 57 sampling locations, and 65 sediment samples from 14 locations using a direct-push exploration rig (Figure 3). IT collected samples at each location in 2-foot depth intervals and sent samples for analysis to an off site laboratory for DRO, gasoline-range organics (GRO), residual-range organics (RRO), benzene, toluene, ethylbenzene, total xylenes (BTEX), and semi-volatile organic compounds (SVOCs), including select polynuclear aromatic hydrocarbons (PAHs). Of the 65 sediment samples taken from in the Salt Lagoon Channel only six detected DRO; concentrations varied from 19 to 470 milligrams per kilogram (mg/kg). In addition, IT collected three surface water and five groundwater samples. The surface water samples did not reveal detectable levels of DRO, GRO, BTEX, or SVOCs. Only monitoring well MWDS-2* had an exceedance above the ADEC Table C cleanup levels with DRO at 2,500 µg/L. No other analytes tested exceeded Table C levels.

NOAA Sediment Characterization– 2002: In 2002, NOAA collected sediment samples from within the Salt Lagoon Channel to supplement the characterization work performed previously by IT (Figure 3). Sediment sampling results indicated that concentrations of DRO varied from <13 mg/kg to 80 mg/kg (NOAA 2002).

TTEMI Groundwater Monitoring – 2004/2005 In April and July 2004, Tetra Tech collected groundwater samples from the five Salt Lagoon Diesel Seep Site monitoring wells (Figure 4). Analytical data for groundwater samples indicated the presence of DRO at a maximum concentration of 2,900 µg/L in monitoring well MWDS-2*, exceeding the ADEC Table C cleanup level; no other groundwater samples contained analytes at concentrations above the cleanup levels (Tetra Tech 2005).

Summary of Applied Cleanup Levels:

The presence of a petroleum sheen observed emanating from the east bank of the Salt Lagoon Channel constituted a violation of the federal Clean Water Act (U.S. Code 2002), as well as, State of Alaska surface water quality standards (ADEC 2003). As a result, the primary objective of the corrective action was to eliminate the petroleum sheen and mitigate risk to potential receptors.

NOAA employed ADEC Method Two cleanup criteria, discussed at 18 AAC 75.341(c) (ADEC 2000). ADEC uses 15 feet below ground surface (bgs) to define subsurface soil to which residents will have a reasonable potential to be exposed through the inhalation or ingestion pathways (ADEC 2000; 18 Alaska Administrative Code 75.340 (j)(2)). However, excavating to this depth is difficult because the groundwater at the Salt Lagoon Diesel Seep is very shallow, ranging from 2 to 5 feet below ground surface. Excavation into the groundwater is generally not required, in part because free petroleum product contamination usually does not penetrate significantly deeper than the surface of the water table, floating on the surface instead, and because building foundations do not normally extend below the water table. Further, excavation into the groundwater is difficult because groundwater entering the excavation causes the side slopes to slough into the site making further excavation difficult. Also, excavations below the water table can become filled with contaminated groundwater and the water that leaches from the excavated soil is difficult to manage. However, NOAA determined that high levels of diesel contamination remained at depths several feet below the water table following the removal of 9,000 yd^3 of PCS from above the water table in 1994 (OSC 1995). Sufficient diesel remained at the site to continue to cause petroleum sheen in the Salt Lagoon Channel. Therefore, NOAA decided to excavate below the water table at the Salt Lagoon Diesel Seep in order to eliminate as much of the source of the diesel contamination as practical.

Summary of 2004 Cleanup Actions:

TTEMI Corrective Action – 2004: In 2004, NOAA returned to the Salt Lagoon Diesel Seep to excavate additional PCS. (NOAA 2005). The area excavated covered much of the same area excavated by OSC in 1994, except that the latter excavation extended up to 5 feet below the water table. Also, more excavation extended to the north, and removal included the shoreline bank and a zone of sediments within the Salt Lagoon Channel (Figure 5). NOAA received authorization from USACE to conduct work under Nationwide Permits 13 (Bank Stabilization) and 38 (Cleanup of Hazardous and Toxic Waste).

TTEMI removed approximately 9,234cubic yards of PCS and sediments from the Salt Lagoon Diesel Seep Areas 1, 2, 3A, 3B, 3C, and 3D, (Figure 6) according to the corrective action report, (NOAA 2005). They removed PCS down to elevations that varied from -1 ft mean lower low water (MLLW) to -4 ft MLLW. They removed sediments extending approximately 15 feet out into the channel along the east shoreline of the Salt Lagoon Channel (Figure 6). Excavation efforts continued in these areas until either no petroleum sheen was observed, or until further excavation was impracticable because of groundwater and sloughing of excavation sidewalls. NOAA attempted to investigate potential contamination in Area 4 by excavating two test pits. Subsurface debris prevented NOAA from completing this investigation and no soil was removed from Area 4. Past site characterization data (CESI 2001, IT 2002) indicate Area 4 soil is contaminated at depths ranging approximately +4.5 ft MLLW to +0.0 ft MLLW (*i.e.*, approximately 3.5 ft bgs to 8.0 ft bgs), which includes both the vadose and saturated zones. Concentrations of DRO were found during the past site characterizations of Area 4 as high as 17,000 mg/kg.

TTEMI restored the Salt Lagoon Channel bank using a combination of rock, sand, and filter fabric (Figure 7). The restored bank was designed to resist erosion of the backfill material that could not be consolidated or held by vegetation as with the original shoreline. The top of the shoreline was restored using topsoil, which was seeded, fertilized, and wrapped with erosion control matting.

Because excavation activities involved the removal of sediments with elevated levels of DRO from the Salt Lagoon Channel and PCS from the saturated zone, TTEMI constructed a dewatering cell for the temporary stockpiling and drainage of water (Figures 5 and 6). When dewatering was complete, PCS was transported to the designated disposal site. Initially, dewatered PCS was transported to the lined stockpile located at Tract 42. Upon receiving ADEC approval for a draft landspreading work plan (NOAA 2004b), NOAA directed excavated PCS to the National Weather Service landspreading area. The PCS was leveled to a maximum thickness of 18 inches ±0.5 ft and later tilled by a tractor and rotary disc attachment to enhance volatilization of the DRO.

Two underground granular activated carbon (GAC) barriers were installed at the site to provide treatment of potentially contaminated groundwater flowing toward the Salt Lagoon Channel (Figure 6). The GAC trench was designed to allow the groundwater to flow through sandbags filled with GAC, which are expected to absorb petroleum migrating along with the groundwater.

Flow of groundwater is from east to west across the site. The trenches were oriented from north to south across the site. The sandbags containing GAC were stacked between elevations of 1 feet MLLW and +5 ft MLLW (Figure 7). The surface of the groundwater is at approximately +3 feet MLLW.

Recommended Action:
In accordance with paragraph 59 of the TPA (NOAA 1996), NOAA requests ADEC to grant a conditional closure confirming that NOAA completed all appropriate corrective action, to the maximum extent practicable, at the Salt Lagoon Diesel Seep, NOAA Sites 34 and 35/TPA Sites 13a and 13b, St. Paul Island, Alaska. The conditional closure will relieve NOAA from further remedial action. NOAA understands ADEC will/may require additional containment, investigation, or cleanup if subsequent information indicates that the level of contamination that remains does not protect human health, safety, or welfare, or the environment.

***FOOTNOTE:**
Three consulting firms investigated groundwater at the Diesel Seep Site since the installation of five monitoring wells in 2000. The consultants included Columbia Environmental Services, Inc. (CESI 2001) IT Alaska, Inc, (IT 2002), and Tetra Tech (Tetra Tech 2005). IT's and Tetra Tech's investigation reports conflict with the CESI report regarding well identification of monitoring wells 1 and 2. Also, IT's analytical results for monitoring wells 2 and 3 are inconsistent with results from the CESI and Tetra Tech investigations for these wells. The following table and discussion summarizes the history of groundwater monitoring at the Diesel Seep Site, and proposes explanations for noted report discrepancies.

SAMPLING EVENT		CURRENT WELL ID				
		Well 1	**Well 2**	**Well 3**	**Well 4**	**Well 5**
CESI 2000	Reported Well ID	MWDS-2	MWDS-1	MWDS-3	MWDS-4	MWDS-5
	GRO (µg/L)	ND	190	ND	ND	ND
	DRO (µg/L)	83	**9000**	400	130	150
IT 2001	Reported Well ID	MWDS-1	MWDS-2	MWDS-3	MWDS-4	MWDS-5
	GRO (µg/L)	ND	ND	ND	ND	ND
	DRO (µg/L)	ND	320	**2500**	130	ND
Tetra Tech April 2004	Reported Well ID	MWDS-1	MWDS-2	MWDS-3	MWDS-4	MWDS-5
	GRO (µg/L)	ND	85	ND	ND	ND
	DRO (µg/L)	ND	**2900**	370	110	75
Tetra Tech July 2004	Reported Well ID	MWDS-1	MWDS-2	MWDS-3	MWDS-4	MWDS-5
	GRO (µg/L)	ND	76	ND	ND	ND
	DRO (µg/L)	ND	**2700**	240	100	ND

Bold Result– Above ADEC Table C criteria.
ND – Not detected above Practical Quantitation Limit.

CESI installed five monitoring wells at the Diesel Seep Site in 2000 (CESI 2001). As shown in the table above, Figure No. 5 in the CESI 2001 report identified the well now known as "Well 1" as "MWDS-2" and the well now known as "Well 2" as "MWDS-1". As indicated in the above table, Figure No. 3 in the IT 2002 report reversed the identification of these two wells. All reports generated subsequent to the IT 2002 report used IT's identification, which has become NOAA's accepted designation for these 5 wells.

A possible error also exists with IT's assignment of the IT 2001 analytical results relative to "Well 2" and "Well 3". The IT MWDS-2 result of 320 µg/L DRO differs significantly from the CESI and Tetra Tech DRO results for that well. Similarly, the IT MWDS-3 DRO result of 2,500 µg/L differs significantly from CESI's and Tetra Tech's DRO results for that well. As indicated by the table above, if IT's DRO results for MWDS-2 and MWDS-3 results were reversed, then they would closely match the corresponding levels found at those wells by CESI and Tetra Tech. IT's report does not provide clues that the wells were misidentified during sampling, or sample labels/results were inadvertently switched in the field or the lab. However, DRO results shown in the above table suggest that IT inadvertently misidentified the two wells.

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Columbia Environmental Sciences, Inc. 2001 (CESI). *Draft Site Characterization Report, The Salt Lagoon Diesel Seep (TPA Site 13), St. Paul Island, Alaska. Version 1.3*. April 26.

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Tetra Tech EM Incorporated (TTEMI). 2000. *Technical Memorandum Investigative Sampling Diesel Seep Area St. Paul Island, Alaska*. December 26.

TTEMI. 2005. *Draft Field Investigation Report St. Paul Island, Alaska*. May 2.

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For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

Jan 30, 2006
Date

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 Salt Lagoon Diesel Seep, NOAA Sites 34 and 35/TPA Sites 13a and 13b, St. Paul Island, Alaska, in accordance with the Agreement and that no further remedial action is required 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

Feb. 13, 2006
Date

Figures

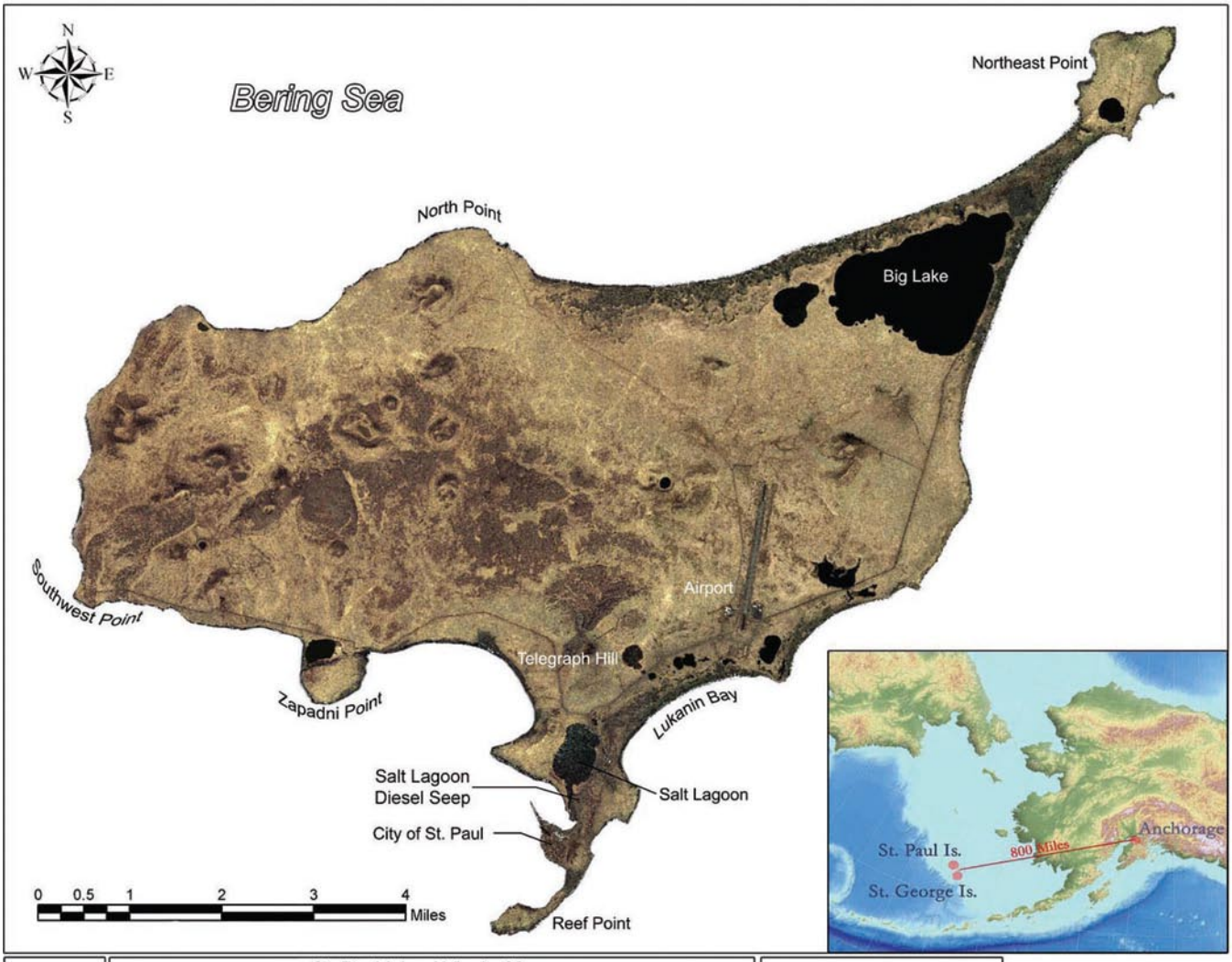

Figure 1	St. Paul Island Vicnity Map Salt Lagoon Diesel Seep Site Location NOAA Sites 34 and 35/TPA Sites 13a and 13b St. Paul Island, Alaska	Source: Ikonos Satellite Imagery, 2001	Pribilof Islands Restoration Project

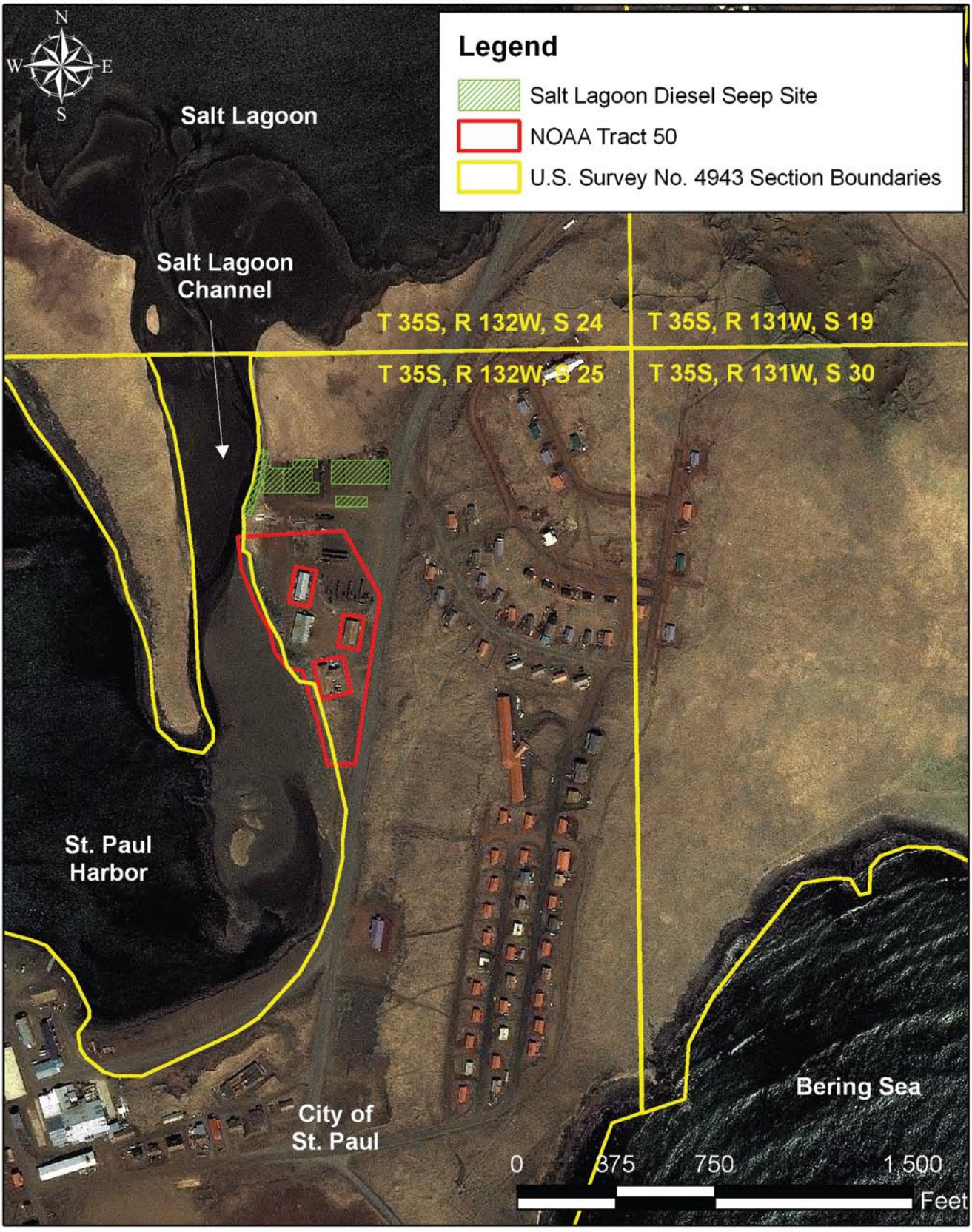

Figure 2	Legal and Property Description Salt Lagoon Diesel Seep NOAA Sites 34 and 35/TPA Sites 13a and 13b St. Paul Island, Alaska	Sources: Public Land Survey Sections (BLM 1983), Diesel Seep Site (NOAA 2004), Satellite Imagery (Ikonos 2001).

Pribilof Islands Restoration Project

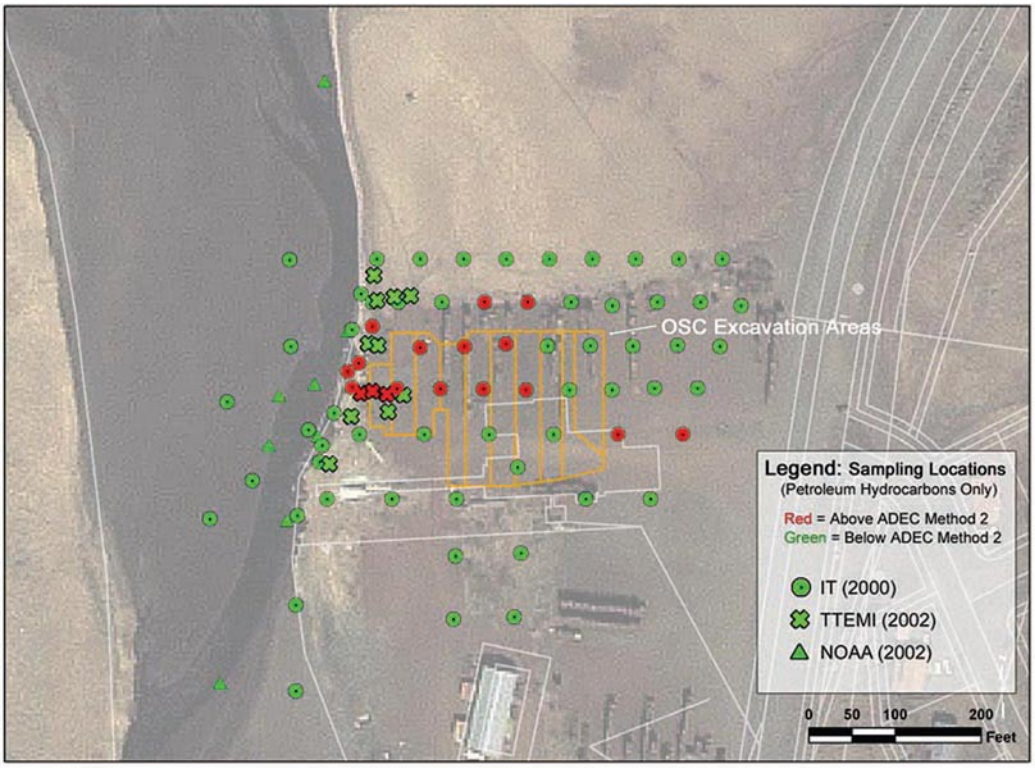

Figure 3	Historical Soil Sampling Locations Salt Lagoon Diesel Seep NOAA Sites 34 and 35/TPA Sites 13a and 13b St. Paul Island, Alaska	Sources: Soil Sampling Locations (NOAA Pribilof Project Database 2005), OSC Excavation Areas (NOAA GIS 2000), Satellite Imagery (Ikonos 2001).

Pribilof Islands Restoration Project

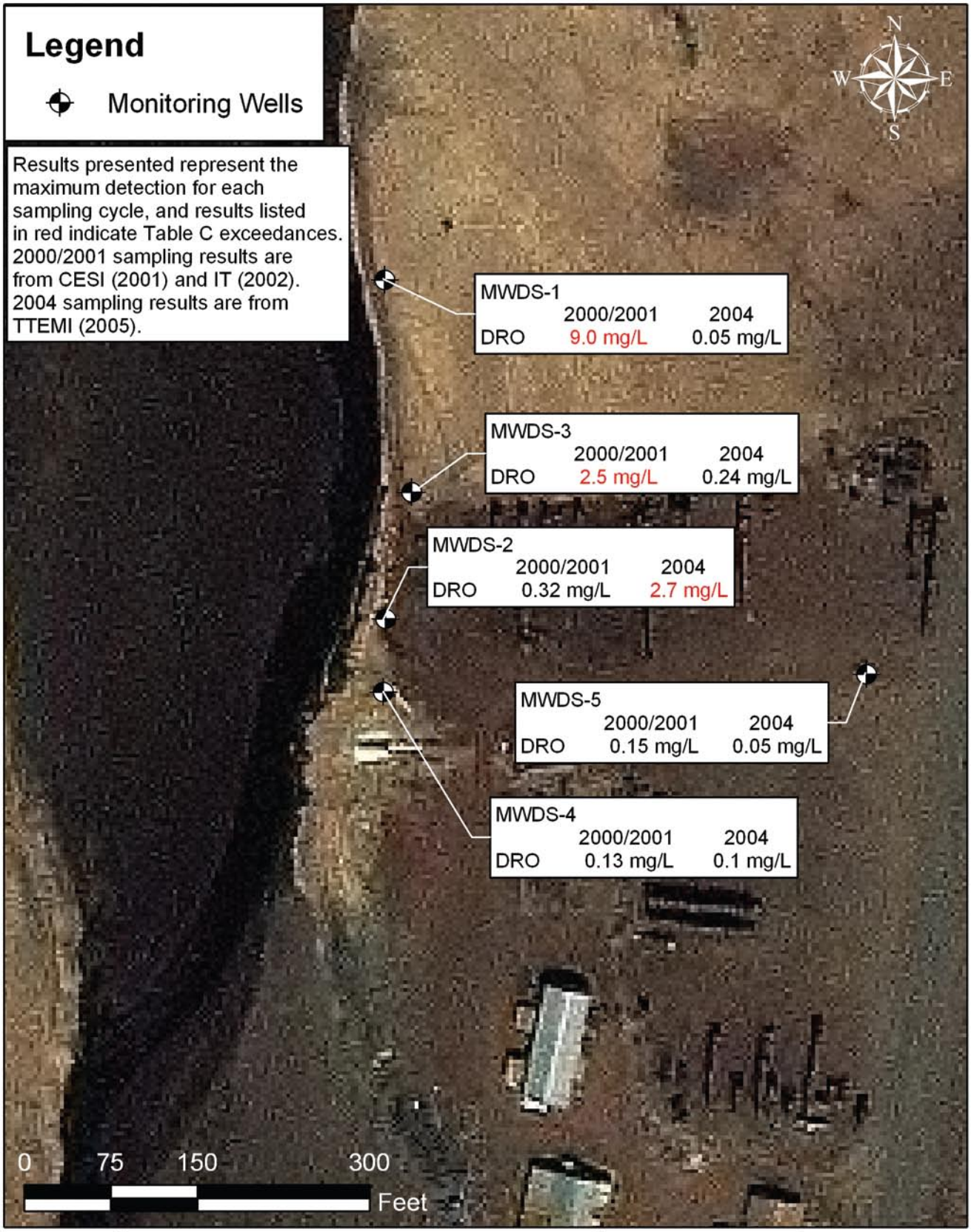

Figure 4	Groundwater Sampling Locations and Results Salt Lagoon Diesel Seep NOAA Sites 34 and 35/TPA Sites 13a and 13b St. Paul Island, Alaska	Sources: Monitoring Well Locations and Sampling Results (NOAA 2005), Satellite Imagery (Ikonos 2001).

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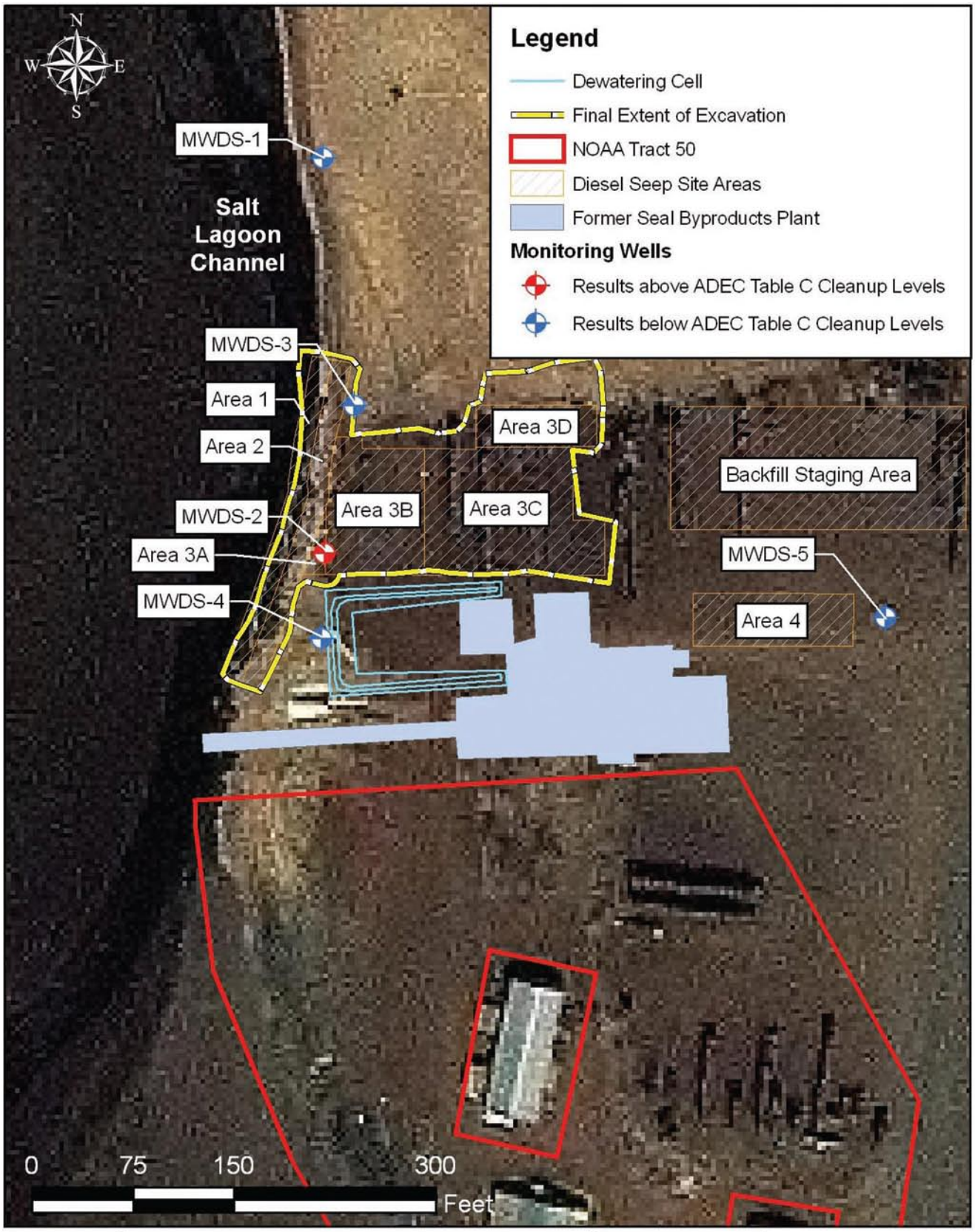

Figure 5	Site Layout Salt Lagoon Diesel Seep NOAA Sites 34 and 35/TPA Sites 13a and 13b St. Paul Island, Alaska	Sources: NOAA Pribilof Project GIS/GPS (2005), Ikonos Satellite Imagery (2001).

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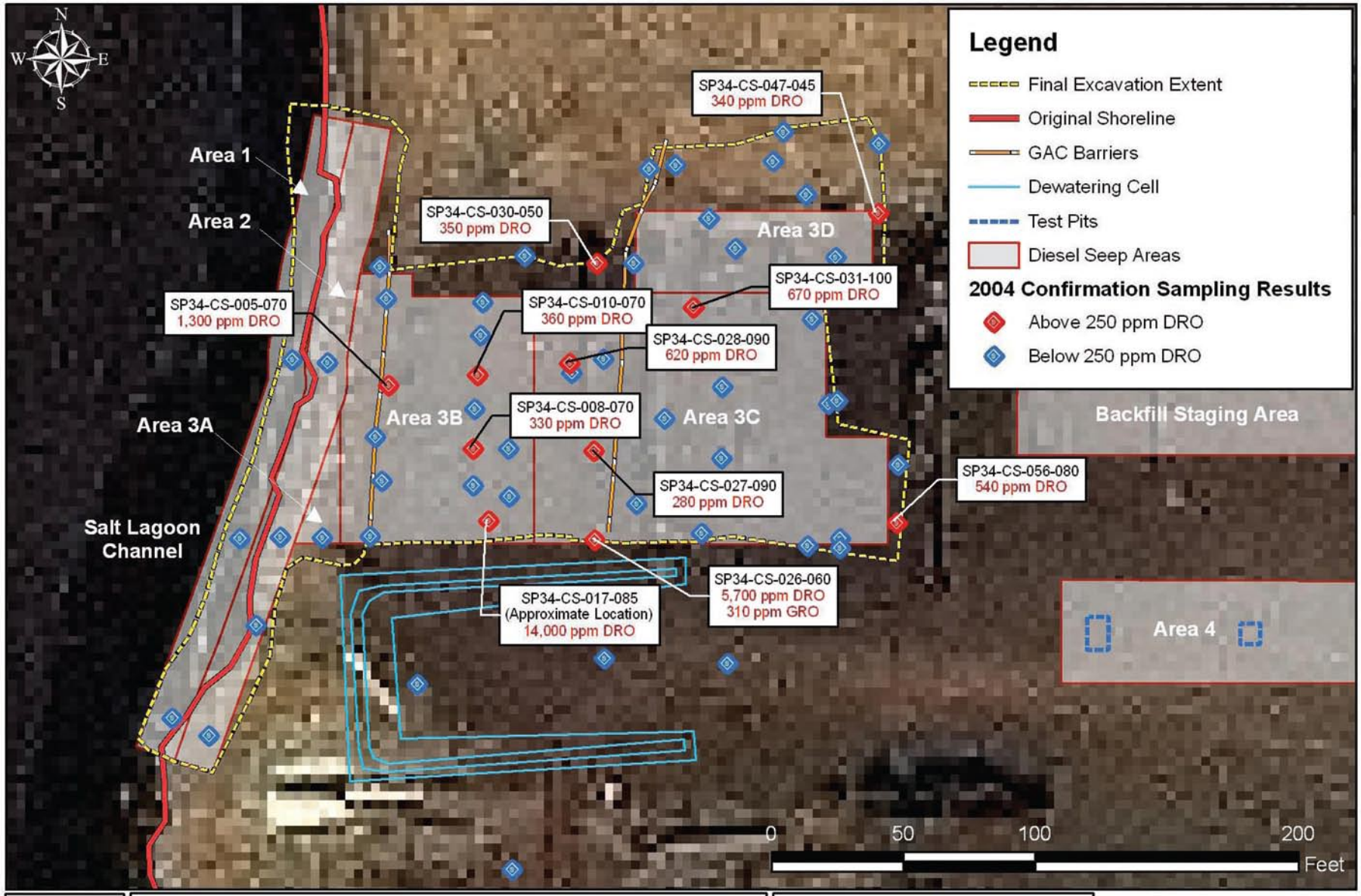

Figure 6	Sampling Location Map Salt Lagoon Diesel Seep NOAA Sites 34 & 35/TPA Sites 13a and 13b St. Paul Island, Alaska	Sources: NOAA GPS (2004), Ikonos Satellite Imagery (2001).

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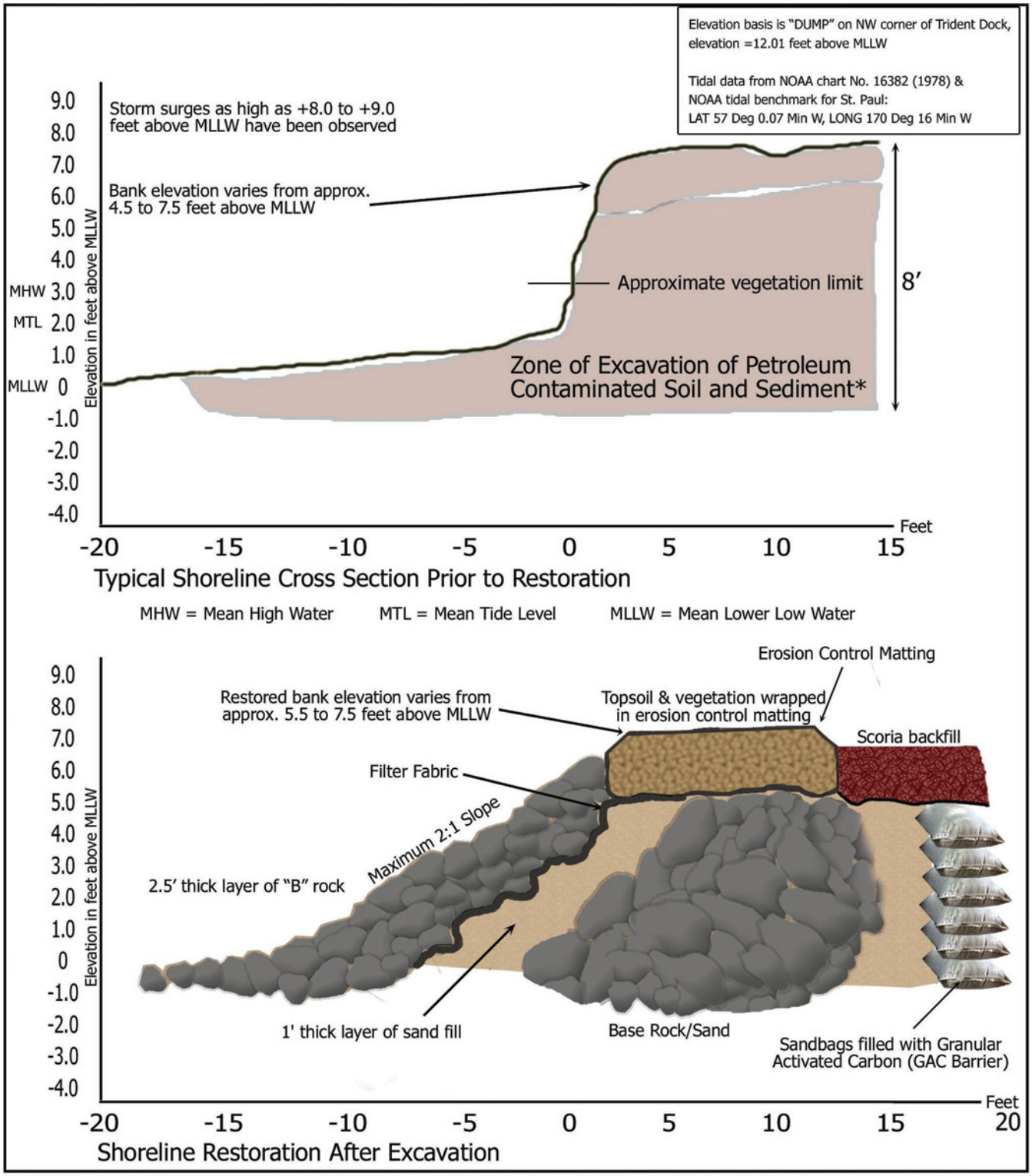

Figure 7	Cross-Section for Areas 1 and 2 Salt Lagoon Diesel Seep NOAA Sites 34 and 35/TPA Sites 13a and 13b St. Paul Island, Alaska	Source: NOAA Pribilof Project Office, 2005.

Pribilof Islands Restoration Project

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NOTICE OF ENVIRONMENTAL CLEANUP AND GROUNDWATER CONTAMINATION AT TPA13, SALT LAGOON DIESEL SEEP, ST. PAUL ISLAND, ALASKA

Pursuant to 18 AAC 75.375, Tanadgusix Corporation as the owner, and the U.S. Department of Commerce/National Oceanic and Atmospheric Administration (NOAA), as the operator of the subject property hereby provide public notice that the property located 0.65 miles N. of the City of St. Paul on the west side of Polovina Turnpike and on the east shore of the Salt Lagoon Channel, St. Paul Island, Alaska 99660 is contaminated with petroleum products. More specifically, the site described as follows; Township 35 South, Range 132 West, Lot 1 Section 25 of the Seward Meridian, Alaska; Patent No. 50-90-0669 Tanadgusix Corporation, 57° 7' 44.90" North Latitude; 170°16' 31.95" West Longitude (Figures 1 and 2) has been subjected to petroleum contaminated soil and groundwater contamination, as a result of a discharge, or release and subsequent cleanup of oil or other hazardous substances, regulated under 18 AAC 75, Article 3 as amended October 2005. If contaminated soil or solid wastes are exposed in the future they must be managed in accordance with laws applicable at that time. These releases and cleanup are documented in the Alaska Department of Environmental Conservation (ADEC) contaminated sites database under site number *CS Reckey* # 1989250115201; File ID 2644.38.027

The Salt Lagoon Diesel Seep Site was identified as the *Salt Lagoon Diesel Seep Site 13* pursuant to the *Pribilof Islands Environmental Restoration Two Party Agreement* (TPA) between the State of Alaska and NOAA as Site 13 (NOAA 1996). NOAA addressed the Salt Lagoon Diesel Site as TPA Site 13 and NOAA Sites 34 (uplands) and 35 (lagoon channel), NOAA 2005. Following corrective action, NOAA submitted a request for conditional closure to the ADEC Division of Spill Prevention and Response, Contaminated Sites Program. NOAA's request stated further cleanup was impracticable because contaminated soils remained within the saturated zone or within areas with buried demolition debris associated with the former By-Products Plant (seal carcass processing) on the site (NOAA 2006). ADEC determined, in accordance with 18 AAC 75.325(f)(1) that site cleanup has been performed to the maximum extent practicable even though soils and groundwater remained contaminated with diesel range organics (and potentially animal fats) on the property (NOAA 2006). ADEC granted a conditional closure, in part subject to this institutional control (deed notice), and confirmed that no further remedial action was required at the site unless new information becomes available that indicates to ADEC that the site may pose an unacceptable risk to human health, safety, welfare to the environment (NOAA 2006).

Grantor, the US Bureau of Land Management.
Grantees:

- the Tanadgusix Corporation (grantee of the surface estate),
  4300 B Street, Suite 402
  Anchorage, AK 99503-5946

- The Aleut Corporation (grantee of the subsurface estate)
  4000 Old Seward Highway, Suite 300
  Anchorage, AK 99503

Recording District: Aleutian Islands

Remedial Actions and Residual Contamination

The Salt Lagoon Diesel Site was used by the federal government as the site of a By-Products Plant to render seal carcasses from 1918 to 1983. Petroleum hydrocarbon releases resulted from spillage by drums containing fuel and seal oil, spillage within the building washed into floor sumps discharging directly into soil, and releases from pipes conveying heating oil and seal oil. These releases resulted in soil and groundwater contamination of the site's uplands. Besides soil, the petroleum products contaminated groundwater which discharged as a chronic sheen into the adjacent Salt Lagoon Channel. NOAA divided the site into two components, Site 34 (uplands) and Site 35 (the channel). During 2004, NOAA removed approximately 9,200 cubic yards of petroleum contaminated soils and restored the compacted soil shoreline with boulders (Figure 3) NOAA, 2005a. The restored shoreline is intended to inhibit erosion, and during 2007 it was used by fur seals as a haulout. Also, NOAA installed two permeable granulated activated carbon (GAC) adsorption trenches in parallel series within the water table (Figure 3). The GAC serves to adsorb dissolved petroleum analytes to prevent the continuation of oil sheening in the adjacent Salt Lagoon Channel. The site covered a surface area of approximately two acres.

Groundwater (GW) beneath the site is contaminated with diesel range organic compounds. Groundwater lies approximately three to four feet below ground surface. NOAA has two groundwater monitoring wells on the site (Figure 4), which are maintained under its long-term groundwater monitoring plan (NOAA 2005b). The groundwater gradient (Mitretek 2005) is also depicted in Figure 4. Since June 2006, site groundwater has not exceeded ADEC Table C cleanup levels for DRO or any other contaminant analyte. Contamination was not detected during the most recent sampling (Tutka 2007).

Site Use

In the event that information becomes available which indicates that the site may pose an unacceptable risk to human health, safety, welfare or the environment, the land owner and/or operator is required under 18 AAC 75.300 to notify ADEC and evaluate the environmental status of the contamination in accordance with applicable laws and regulations. Further site characterization and cleanup may be necessary under 18 AAC 75.325-.390 and 18 AAC 78.600. Also, any transport, treatment, or disposal of any potentially contaminated soil or water from the site or use of the groundwater at or near the contaminated area requires notification to and approval from the Department in accordance with 18 AAC 75.370(b) and 18 AAC 78.600(h).

In the future, if contaminated soil or wastes are removed from the site it must be characterized and managed following regulations applicable at that time. Pursuant to 18 AAC 75.325(i)(1) and (2) 18 AAC 75.370. ADEC approval is required prior to moving soil or groundwater that is, or has been, subject to the cleanup rules found at 18 AAC 75.325-.390.

This notice remains in effect until a written determination from ADEC is recorded that states that soil and/or groundwater at the site has been shown to meet the most stringent soil cleanup levels in Method Two of 18 AAC 75.341(c) and/or groundwater meets the cleanup levels in Table C in 18 AAC 75.345, and that off-site transportation of soil and/or groundwater is not a concern.

References:

Mitretek Systems. 2005. *Tidal Corrections for Groundwater Flow in the Critical Water Management Area and the Diesel Seep, St. Paul Island, Pribilof Islands, Alaska.* August 10.

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National Oceanic and Atmospheric Administration (NOAA). 1996. *Pribilof Islands Environmental Restoration Two Party Agreement*, Attorney General's Office File No. 66 1-95-0126. National Oceanic and Atmospheric Administration. January 26.

NOAA 2005a. *Final Corrective Action Report, Salt Lagoon Diesel Seep, NOAA Sites 34 and 35/TPA Sites 13a and 13b, St. Paul Island, Alaska.* Prepared by National Oceanic and Atmospheric Administration, National Ocean Service, Office of Response and Restoration, 7600 Sand Point Way NE, Seattle, WA. 98115. October 13.

NOAA. 2005. *Final Long Term Groundwater Monitoring Plan, St. Paul Island, Alaska.* Prepared by National Oceanic and Atmospheric Administration, National Ocean Service, Office of Response and Restoration, 7600 Sand Point Way NE, Seattle, WA. 98115, and Tetra Tech EM Inc. August 29.

NOAA. 2006. *Request for No Further Remedial Action Planned, NOAA Site 34 and 35/TPA Site 13, St. Paul Island, Alaska.* Signed by John Lindsay (NOAA) and submitted January 30. Signed by Louis Howard of ADEC Contaminated Sites Program, February, 13, 2006.

Tutka. 2007. *Annual Groundwater Monitoring Report 2007, St. Paul Island, Alaska.* December 21. Prepared for NOAA, Office of Response and Restoration, 7600 Sand Point Way NE, Seattle, WA. 98115.

Please return original copy of this notice to the (operator) address below:

Signature: _____

Printed Name: JOHN H. LINDSAY

Mailing Address:
Attn: John Lindsay

US DOC, NOAA, NOS, OR&R, PPO
7600 Sand Point Way NE
Bldg 3, RM 1301
Seattle, WA 98115

(seal) Subscribed and sworn to before me this ___ day of _____, 19___.
Notary Public in and for the State of _____
My commission expires:_____

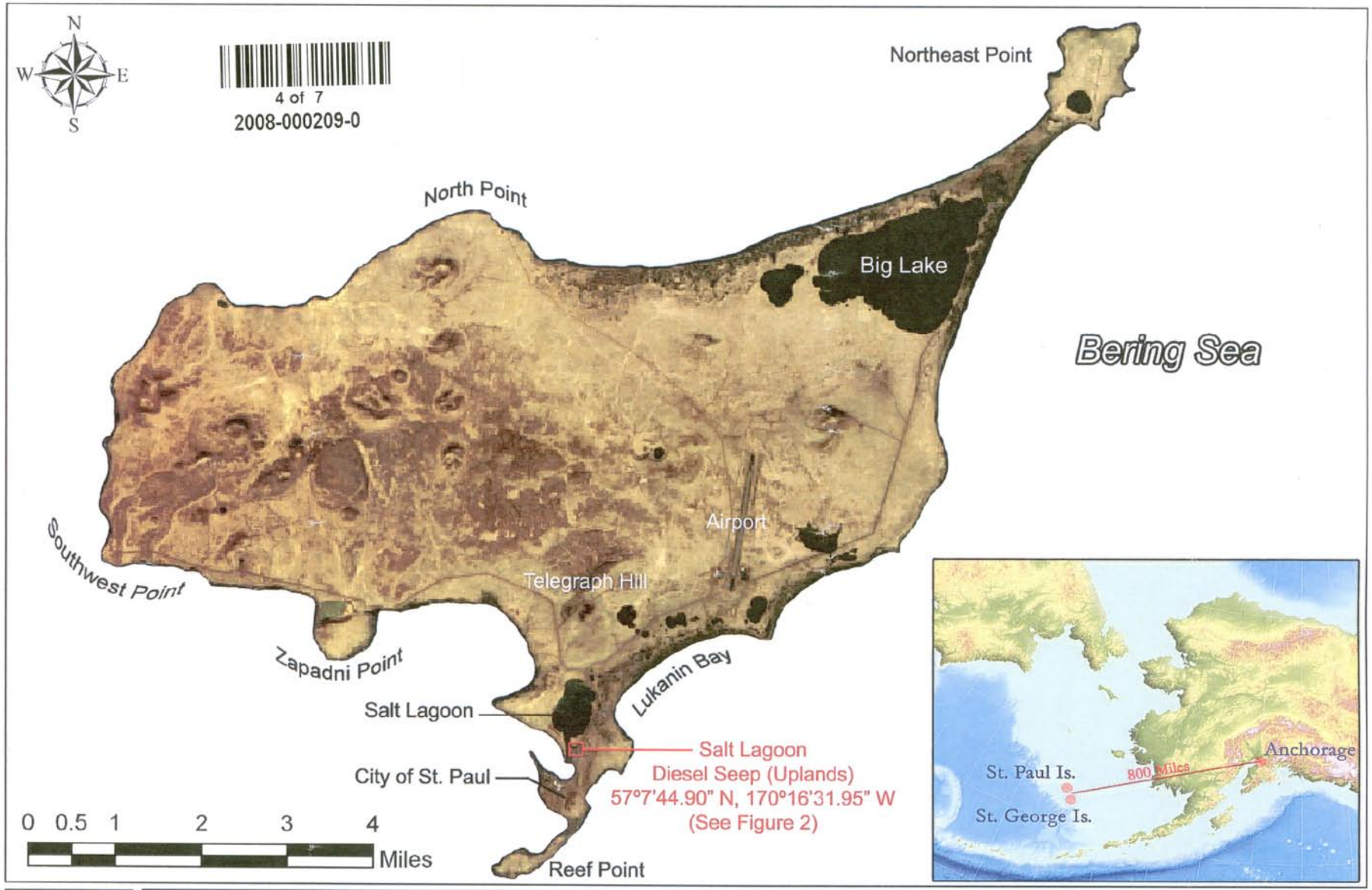

Figure 1	St. Paul Island Vicinity Map Salt Lagoon Diesel Seep (Uplands) NOAA Site 34/TPA Site 13a St. Paul Island, Alaska	**Source:** Ikonos Satellite Imagery (Space Imaging 2001) **Path:** C:\KP_GIS Data\Maps & Figures\SNP\Deed Notices\Site 34, TPA 13a\SNP Standard Fig 1 - Diesel Seep (Uplands).psd **Date:** 4/16/2008	Pribilof Islands Restoration Project

Figure 2

Legal Property Description Map
Lot of T35S, R132W, S25
Salt Lagoon Diesel Seep (Uplands)
NOAA Site 34/TPA Site 13a
St. Paul Island, Alaska

Sources: Excavation (NOAA PPO GIS, 2004), Aero-Metric 2006 1 ft Aerial Photo, Bureau of Land Management Land Survey Plat Officially filed February 15, 1985.
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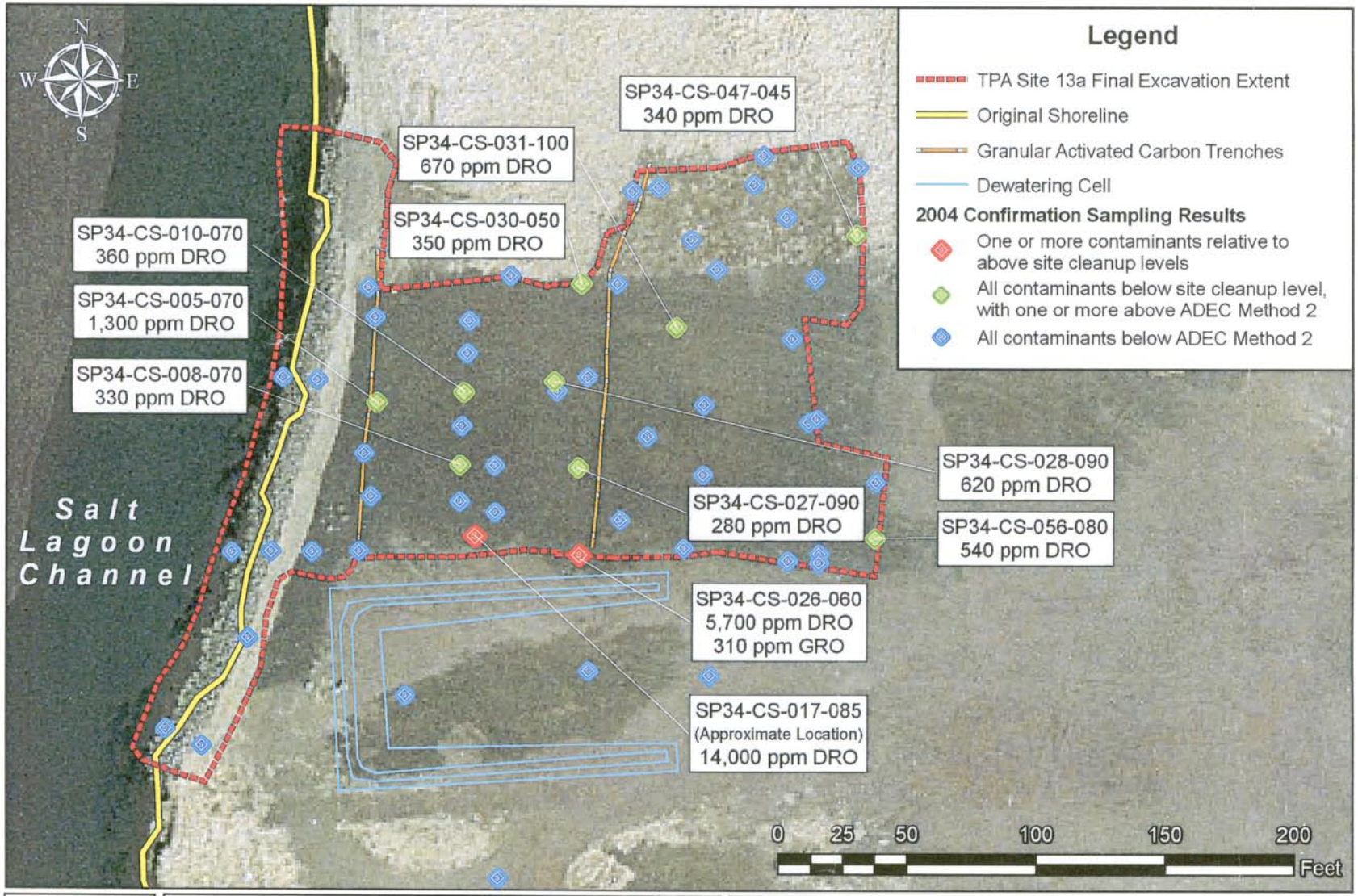

Figure 3	Final Excavation Extent & Confirmation Sampling Results Salt Lagoon Diesel Seep (Uplands) NOAA Site 34/TPA Site 13a St. Paul Island, Alaska	Sources: Samples (NOAA Chemical Database 2004), Excavations, GAC Barriers, Shoreline, Dewatering Cell (NOAA GIS 2004), Aero-Metric 2006 1 ft Aerial. Path: C:\KP_GIS Data\Maps & Figures\SNP\Deed Notices\Site 34, TPA 13a\DieselSeep_Sample&Excavate_Fig3.mxd Date: 4/17/2008 @ 2:52:57 PM	Pribilof Islands Restoration Project

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