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 on-site 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.

References:

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

ADEC. 2002. *Cumulative Risk Guidance*. November 7.

ADEC. 2003a. *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.

ADEC. 2003b. 18 AAC 78. *Underground Storage Tanks*. State of Alaska. Amended through January 30.

Bristol Environmental Services Corporation (BESC). 1997. *UST Removal and Closure Report, St. Paul Island, Alaska, Facility Identification Number 3048, USTs Numbers 1 and 2.* September 24.

Columbia Environmental Sciences, Inc. (CESI). 2001. *Draft Site Characterization Report, Tract 46 and Vicinity (TPA Site 9), St. Paul Island, Alaska.* Version 2.1. CESI, Kennewick, WA. December 16.

United States Department of Commerce (DOC). 1984. *Transfer of Property on the Pribilof Islands*. February 10.

Mitretek Systems. 2002. *Groundwater Use and Classification in the Vicinity of Tract 46, St. Paul Island, Pribilof Islands, Alaska*. Final. May.

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. 2002. *Preliminary Soil Gas Survey for Assessment of Hydrocarbons Contamination at St. Paul Island.* October 31.

NOAA. 2003. *Final Corrective Action Plan, Site 21/TPA Site 9f – Cascade Building.* St. Paul Island, Alaska. October 15.

NOAA. 2004. *Final Addendum #1 to the Corrective Action Plan, Site 21/TPA Site 9f – Cascade Building.* St. Paul Island, Alaska. October 25.

NOAA. 2005. *Draft Closure Report, Site 5/TPA Site 5a – St. Paul Landfill Cell C.* St. Paul Island, Alaska. March.

Tetra Tech EM Inc. (TTEMI). 2005a. *Initial Draft Field Investigation Report, St. Paul Island, Alaska*. Pribilof Islands Environmental Restoration Project. St. Paul Island, Alaska. January 11.

TTEMI. 2005b. *Final Corrective Action Report, Site 21/TPA Site 9f – Cascade Building.* St. Paul Island, Alaska. February 22.

For the National Oceanic and Atmospheric Administration

John Lindsay
NOAA, Pribilof Project Office

22 March 2005
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

April 1, 2005
Date

Tables

Table 1 – Groundwater Monitoring Sample Results

Well	Samping 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*

See Page 13 for table notes

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	--

Table 2 – Corrective Action Sample Results (cont'd…)

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	--

Table 2 – Corrective Action Sample Results (cont'd…)

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

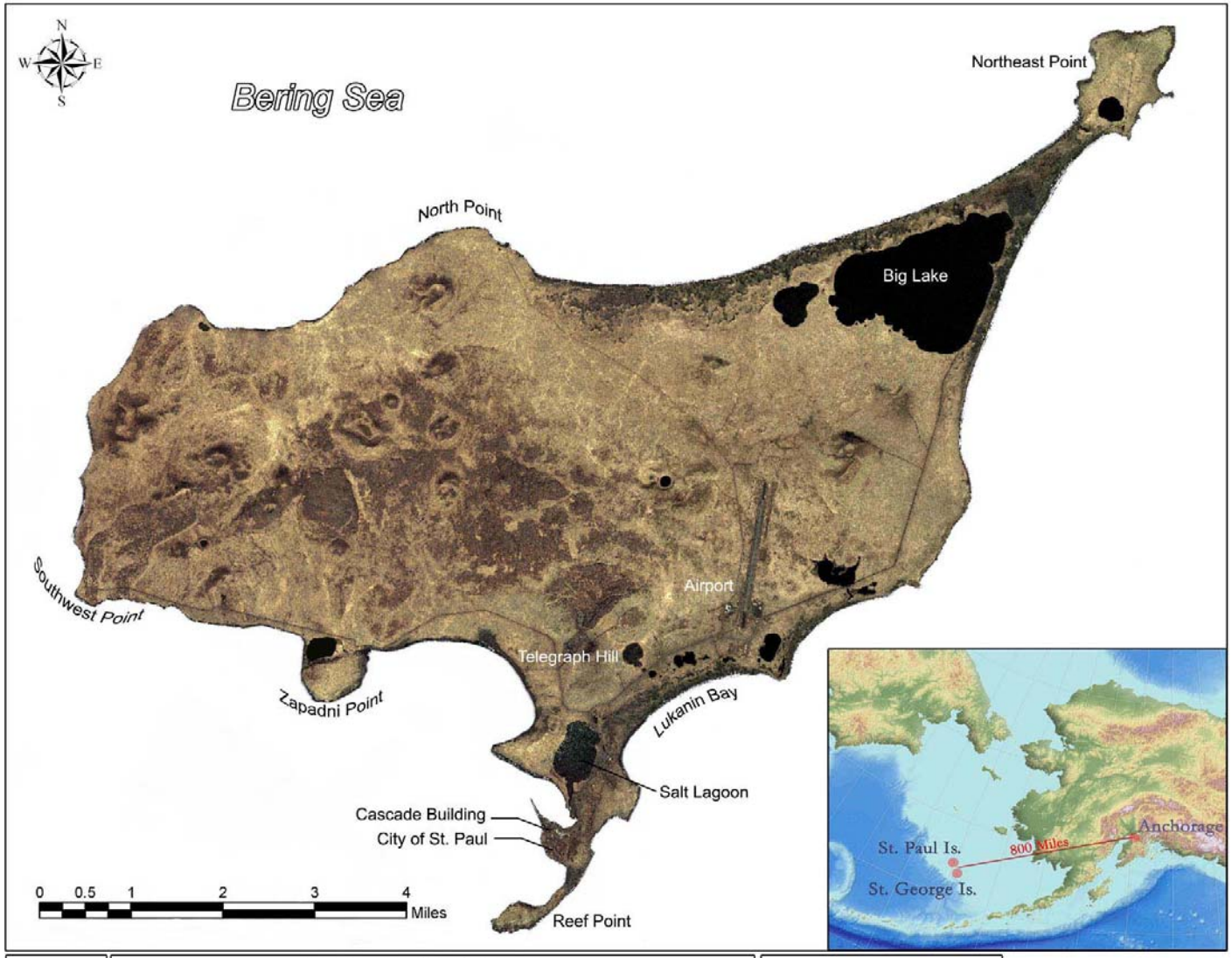

Figure 1	St. Paul Island Vicinity Map Cascade Building Site Site 21/TPA Site 9f St. Paul Island, Alaska	Source: Ikonos Satellite Imagery, 2001	Pribilof Islands Restoration Project

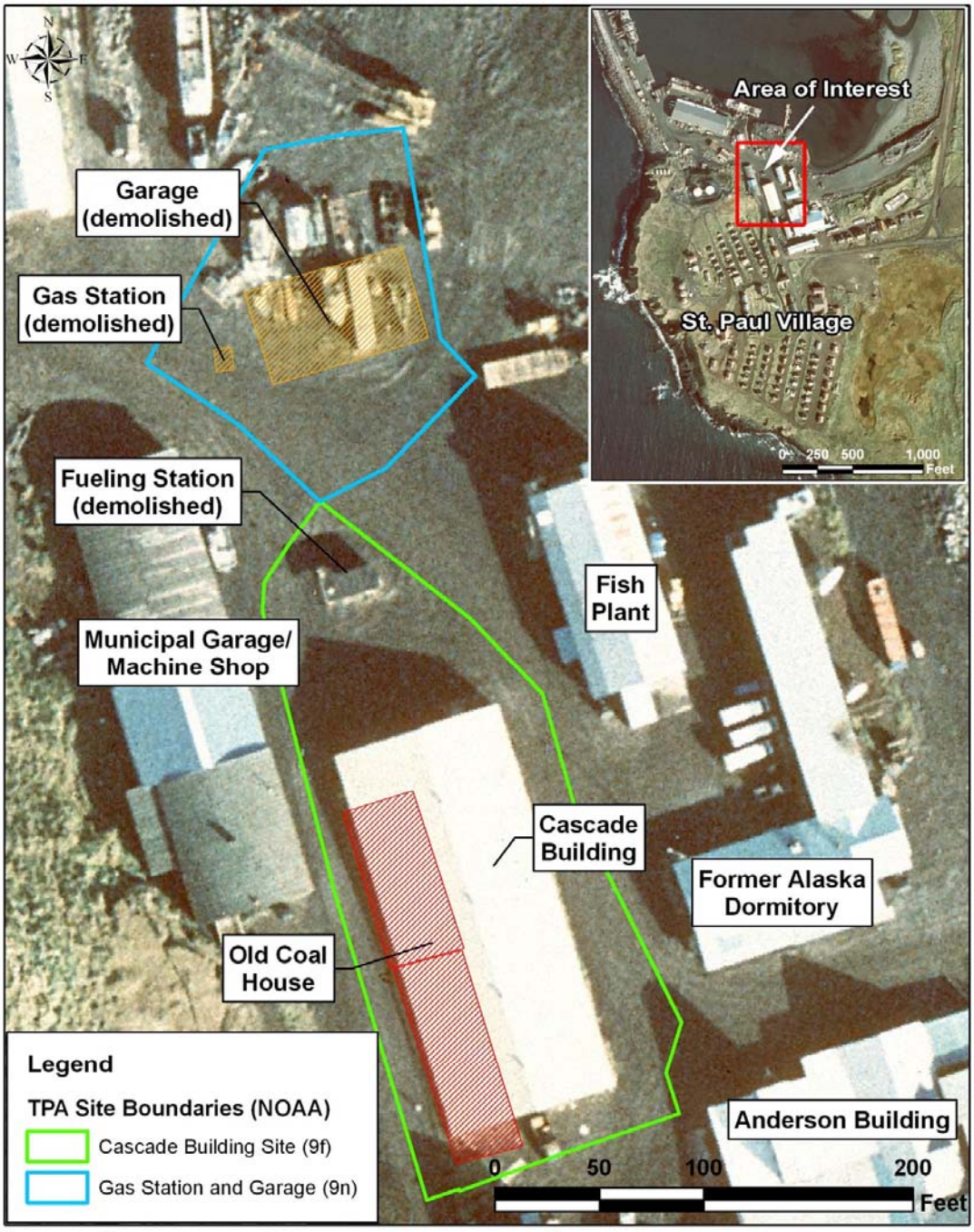

Figure 2	Site Location Cascade Building Site Site 21/TPA Site 9f St. Paul Island, Alaska	Sources: NOAA Pribilof Project GIS, 2005, Aerial Photo (Aeromap US, 1996).

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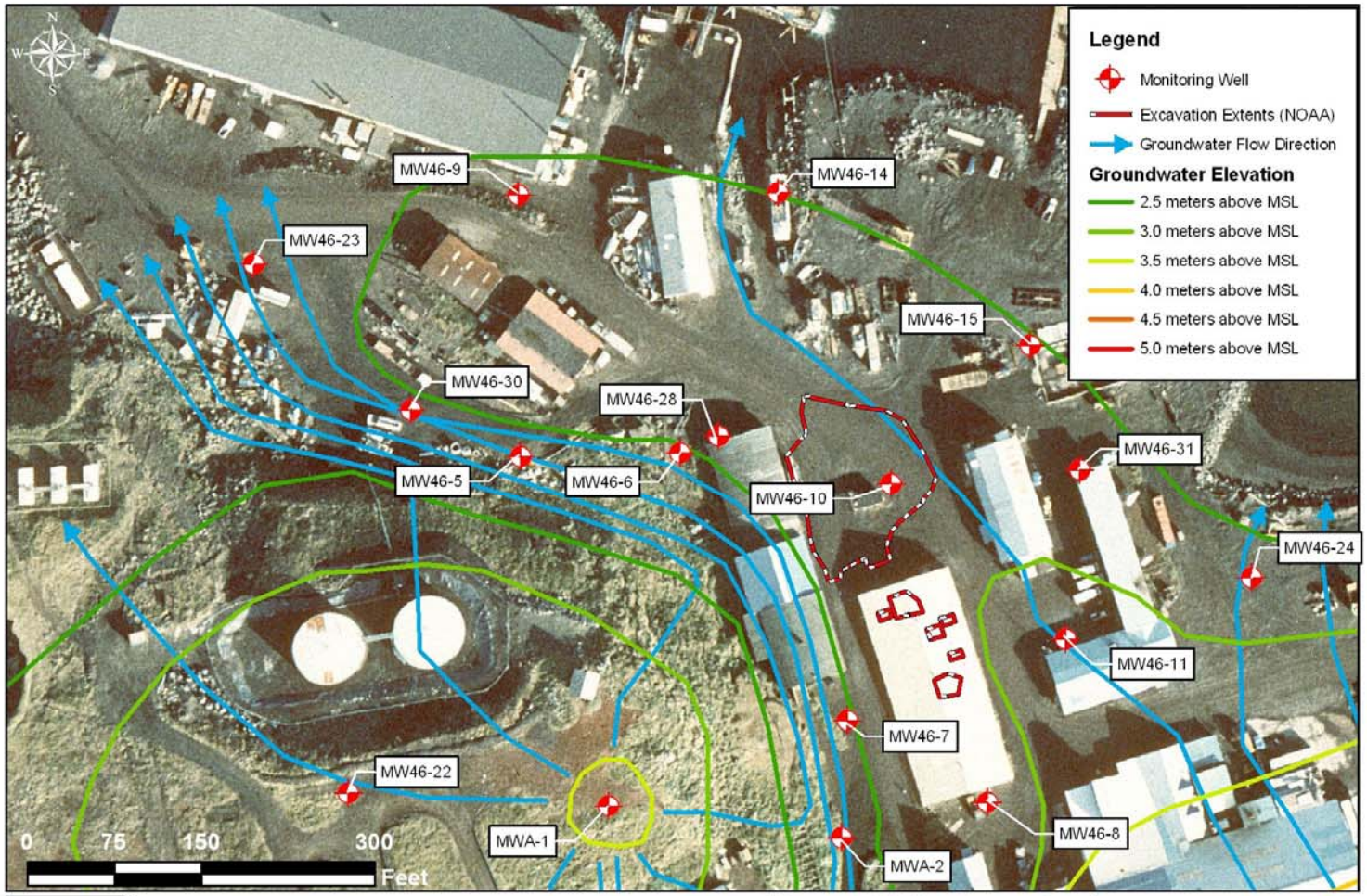

Figure 3	Monitoring Well Locations and Groundwater Gradient Cascade Building Site Site 21/TPA Site 9f St. Paul Island, Alaska	Sources: Well Locations and Excavation Extents (NOAA GIS 2005), Groundwater Data (CESI 2001), Aerial Imagery (Aeromap US 1996)

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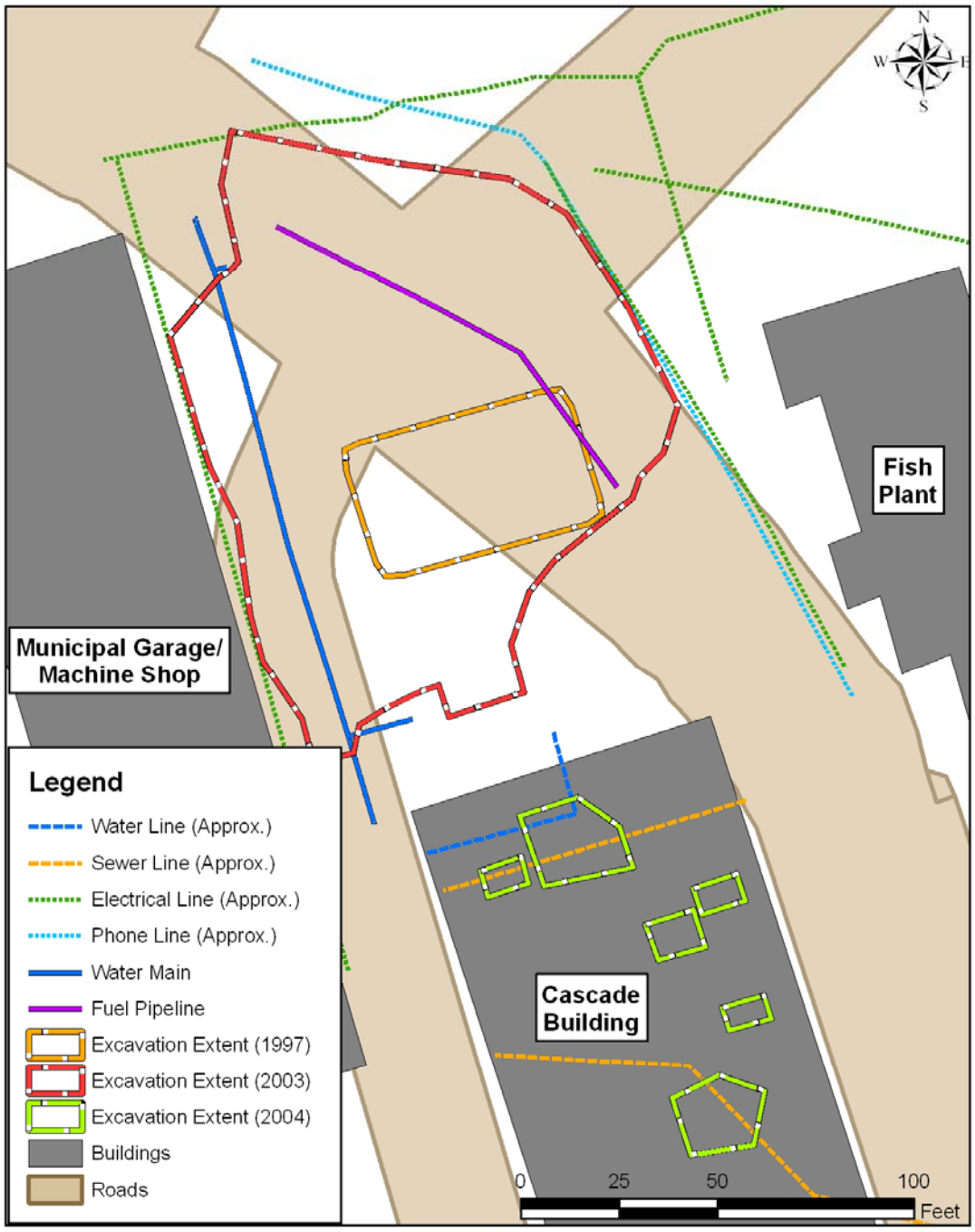

Figure 4	Areas of Excavation in 1997, 2003, and 2004 Cascade Building Site Site 21/TPA Site 9f St. Paul Island, Alaska	Source: NOAA Pribilof Project GIS, 2005

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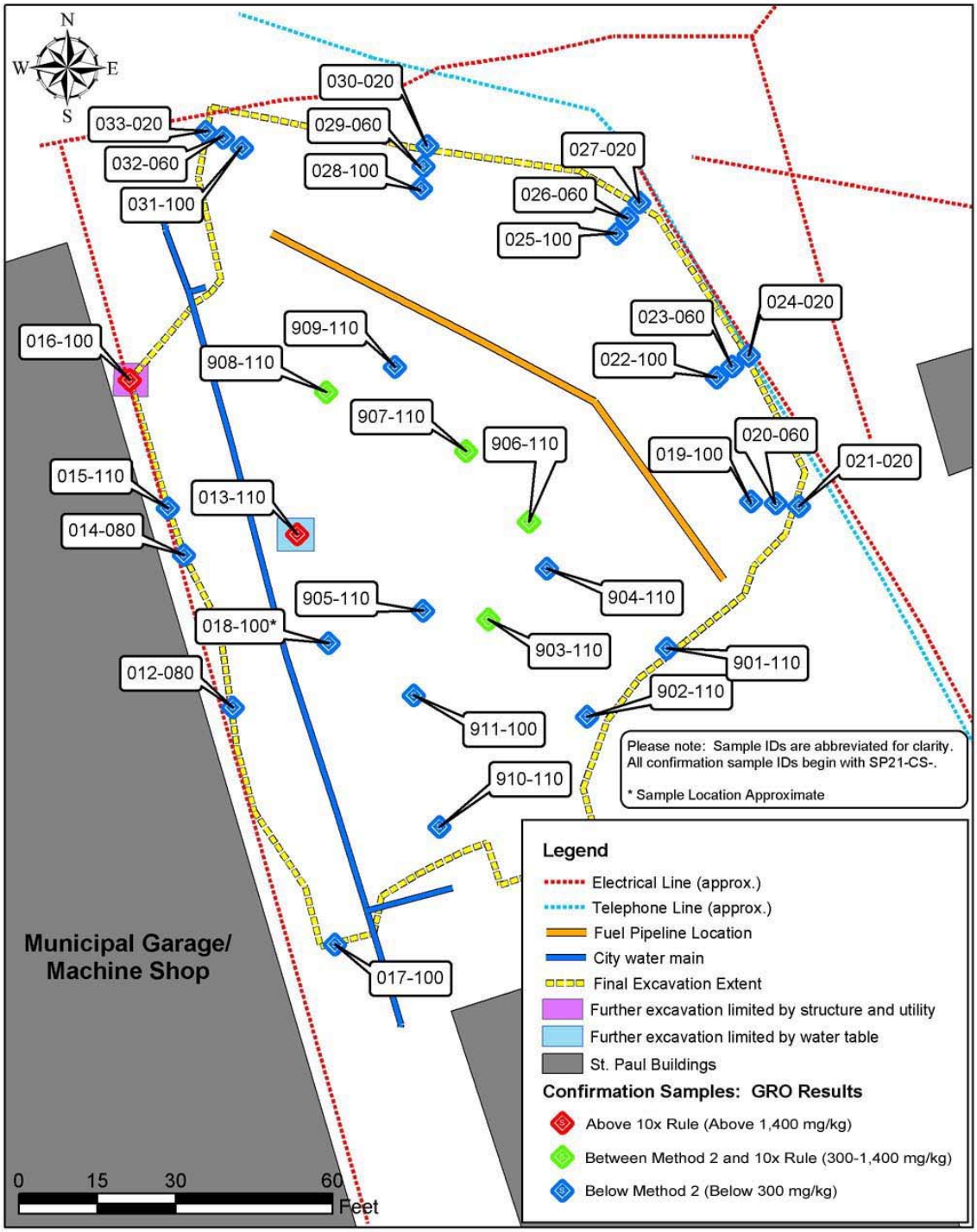

Figure 5	2003 Removal GRO Confirmation Samples Cascade Building Site Site 21/TPA Site 9f St. Paul Island, Alaska	Sources: Final excavation extent, utility locations, and sample locations, (NOAA GPS 2003), Well location (NOAA GPS 2002).

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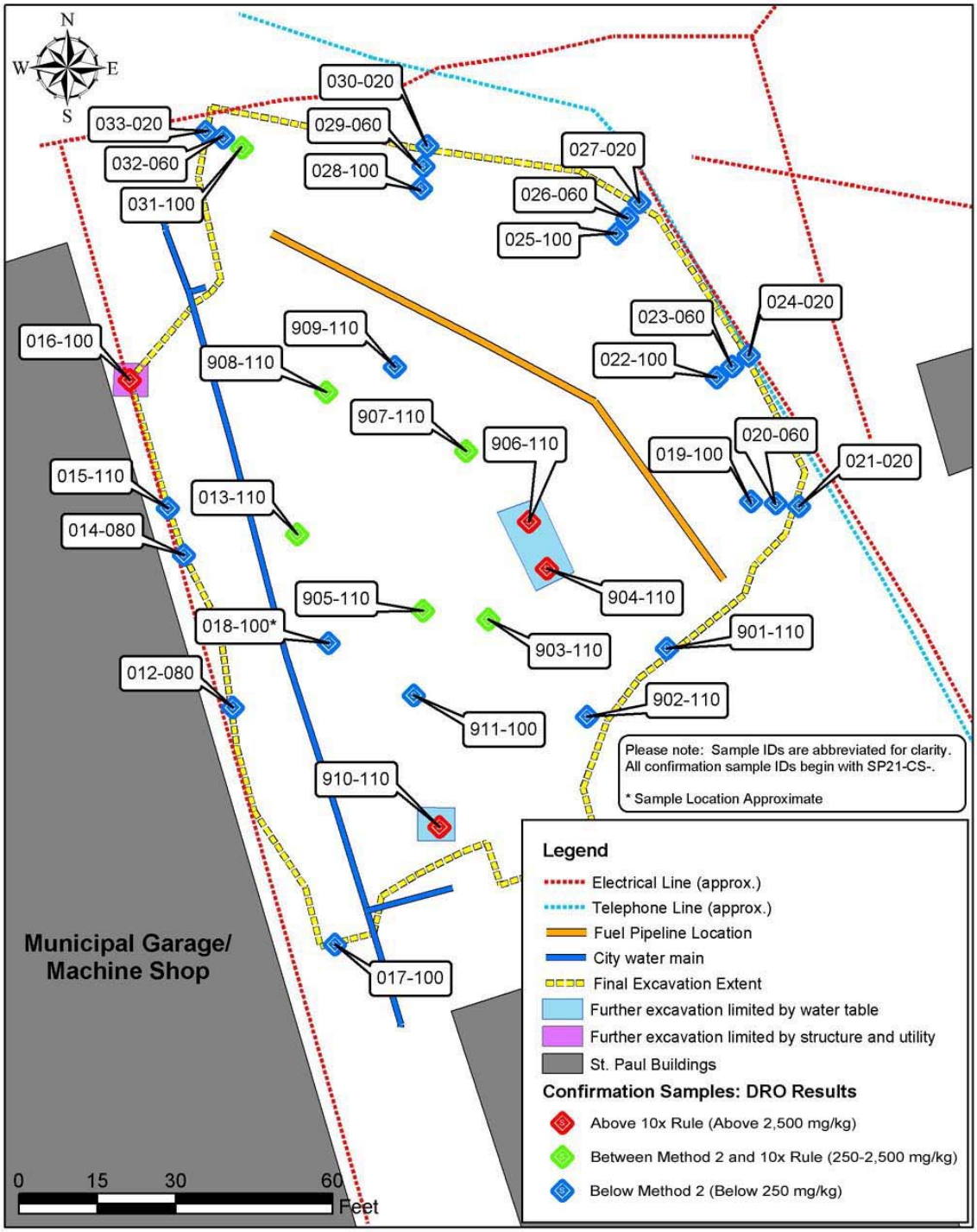

Figure 6	2003 Removal DRO Confirmation Samples Cascade Building Site Site 21/TPA Site 9f St. Paul Island, Alaska	Sources: Final excavation extent, utility locations, and sample locations, (NOAA GPS 2003), Well location (NOAA GPS 2002).

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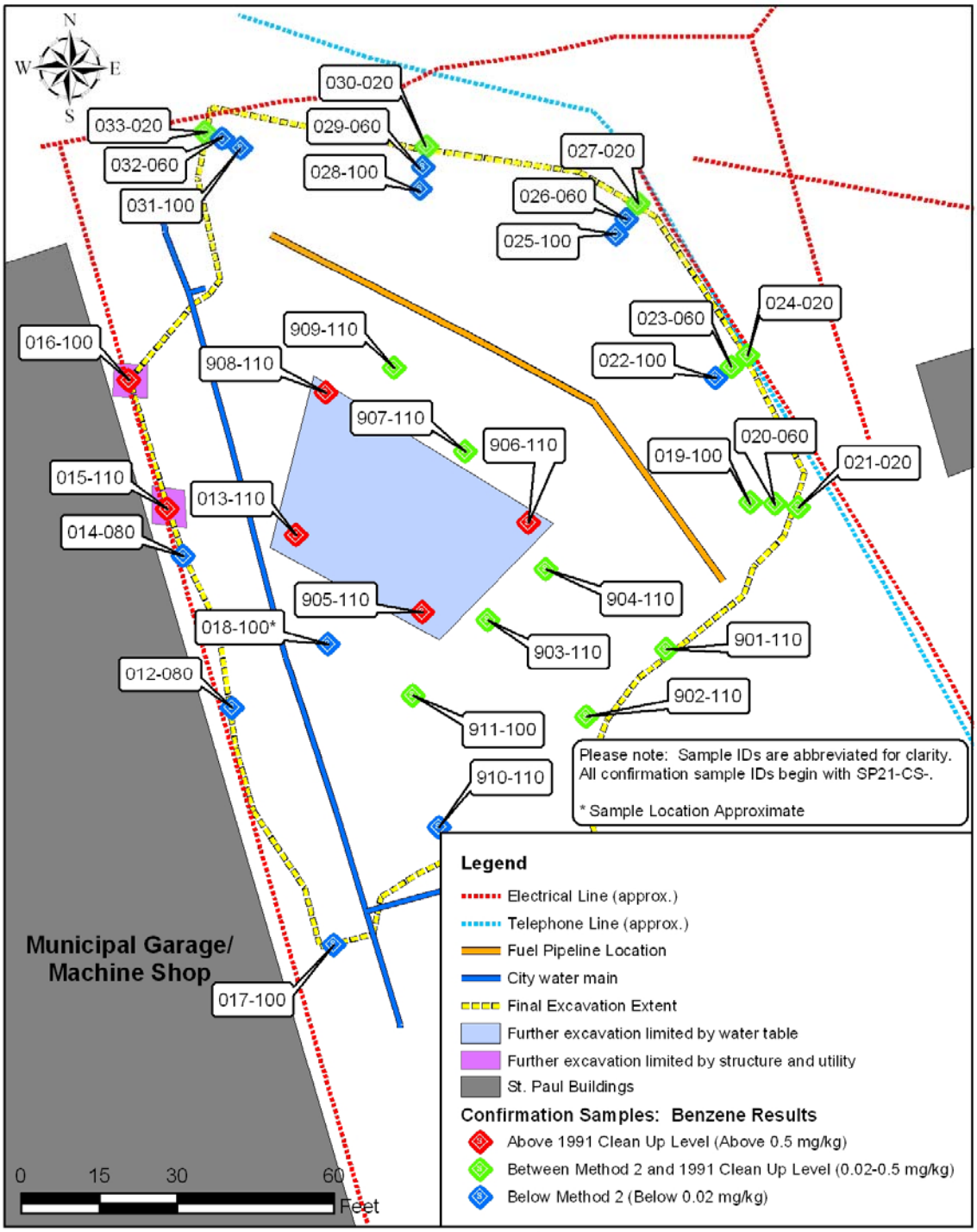

Figure 7	2003 Removal Benzene Confirmation Samples Cascade Building Site Site 21/TPA Site 9f St. Paul Island, Alaska	Sources: Final excavation extent, utility locations, and sample locations, (NOAA GPS 2003), Well location (NOAA GPS 2002).

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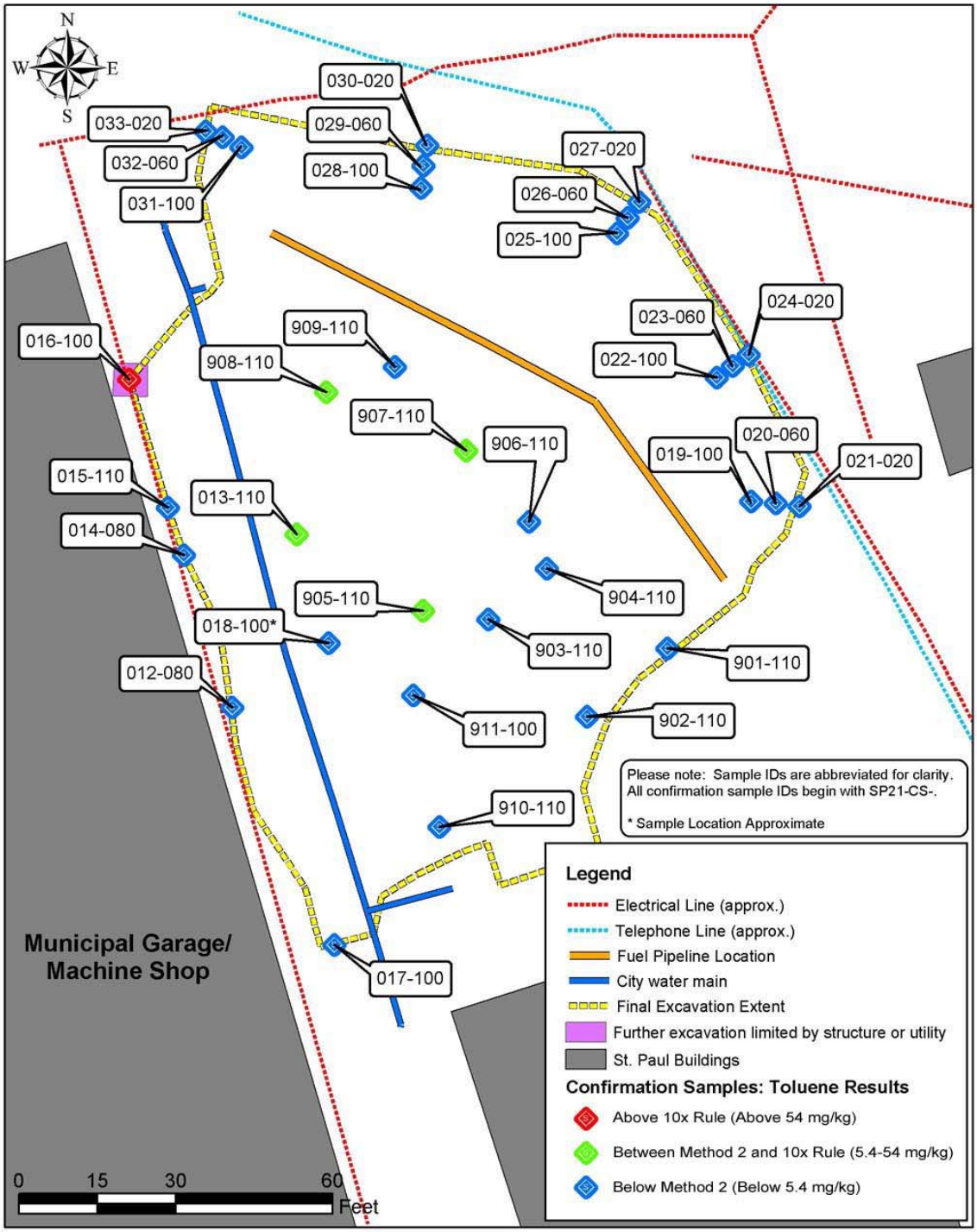

Figure 8	2003 Removal Toluene Confirmation Samples Cascade Building Site Site 21/TPA Site 9f St. Paul Island, Alaska	Sources: Final excavation extent, utility locations, and sample locations, (NOAA GPS 2003), Well location (NOAA GPS 2002).

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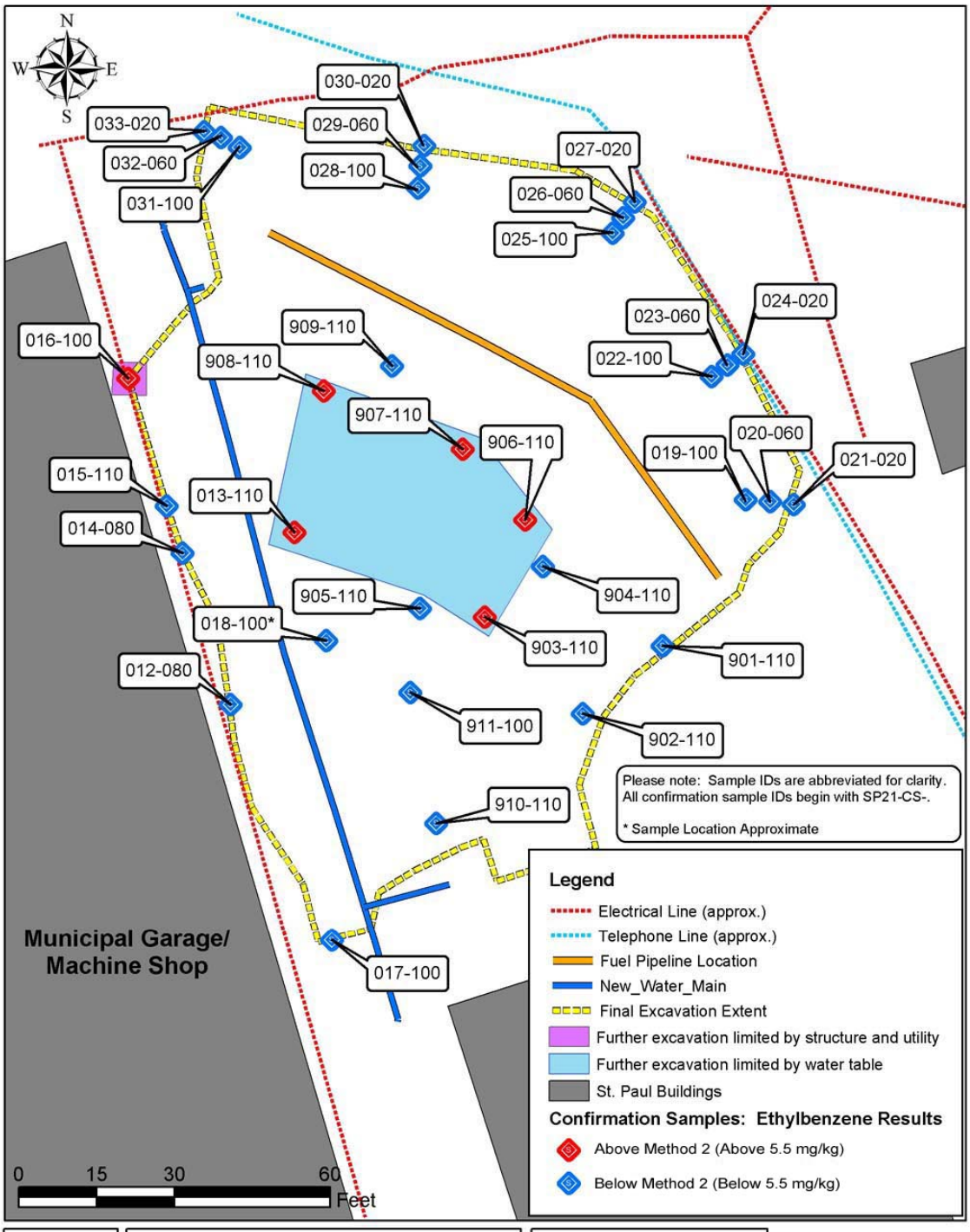

Figure 9	2003 Removal Ethylbenzene Confirmation Samples Cascade Building Site Site 21/TPA Site 9f St. Paul Island, Alaska	Sources: Final excavation extent, utility locations, and sample locations, (NOAA GPS 2003), Well location (NOAA GPS 2002).	Pribilof Islands Restoration Project

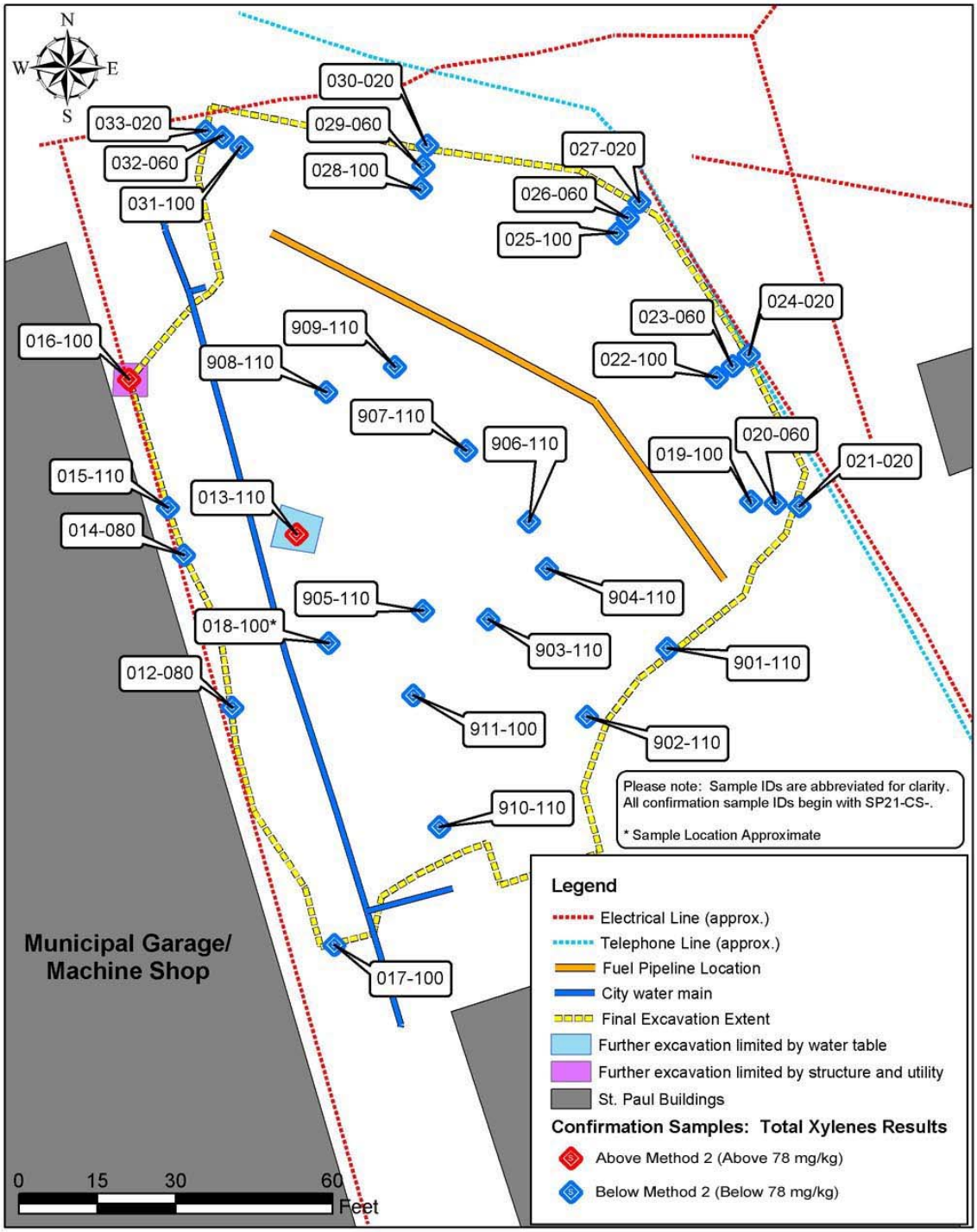

Figure 10	2003 Removal Total Xylenes Confirmation Samples Cascade Building Site Site 21/TPA Site 9f St. Paul Island, Alaska	Sources: Final excavation extent, utility locations, and sample locations, (NOAA GPS 2003), Well location (NOAA GPS 2002).

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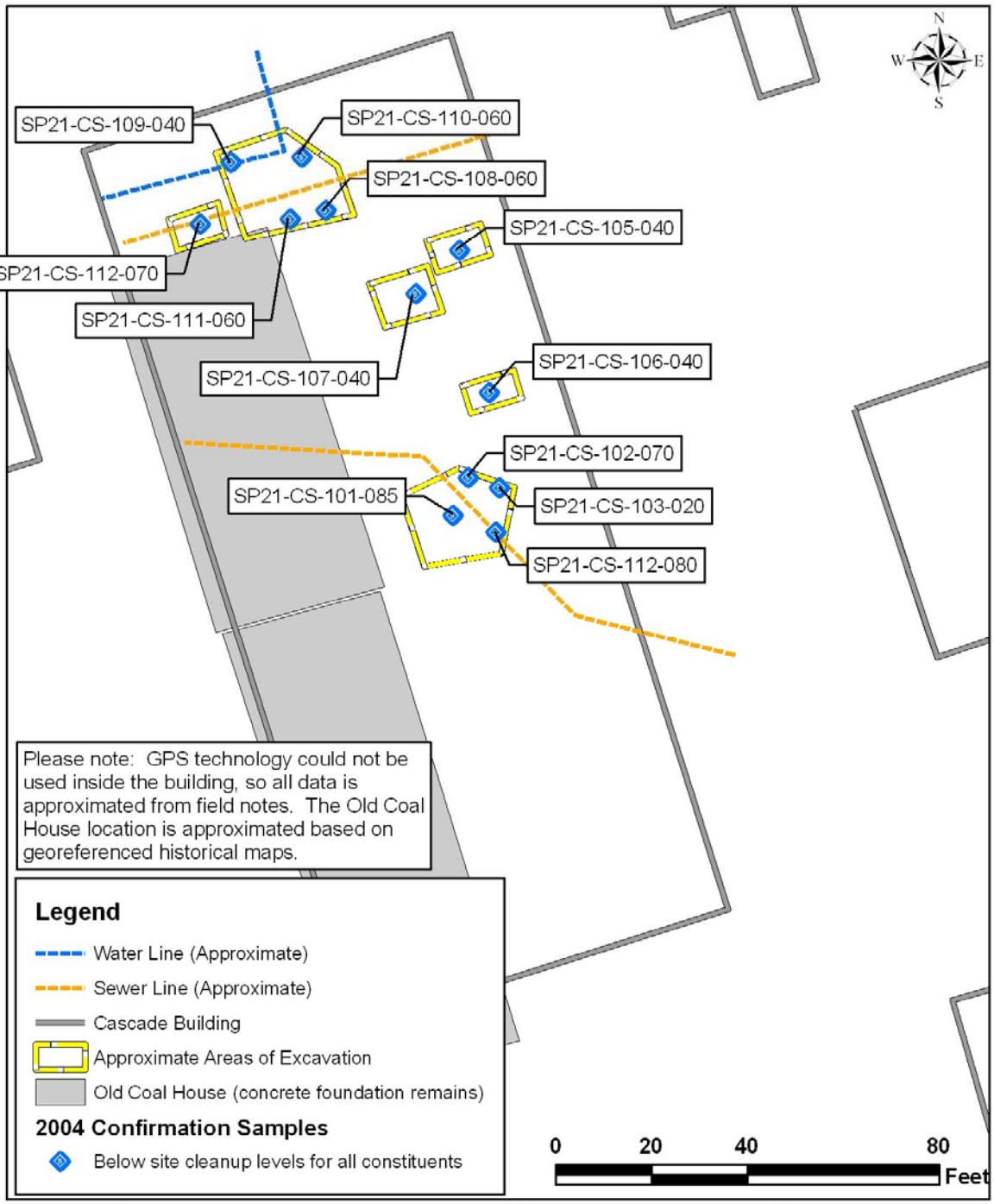

Figure 11	2004 Confirmation Sampling Results Cascade Building Site Site 21/TPA Site 9f St. Paul Island, Alaska	Sources: Building Footprints, Excavation Extents, Utilities, and Sampling Locations (NOAA Pribilof Project GIS 2005).

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