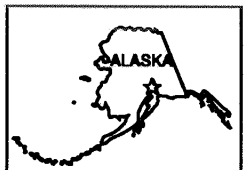
Standard Steel

Anchorage, Alaska
Region 10
AK980978787

Site Exposure Potential

Standard Steel occupies 2.5 hectares along Ship Creek in a heavily industrialized area of Anchorage, Alaska (Figure 1). Since 1972, recycling and salvage operations have been conducted on the site, including reclaiming of transformers contaminated with PCBs, salvaging batteries, and processing equipment and drums from nearby military bases. From 1972 to 1981, an on-site incinerator burned excess oil on copper wires salvaged from the inside of electrical transformers, generating dioxin-contaminated ash. Transformer oil was also reportedly used to ignite large piles of debris on-site, which may have included transformer carcasses or cores. The majority of the site is covered haphazardly with heavy salvage debris extending into Ship Creek. In 1986, a rip-rap erosion wall was built along the creek adjacent to the site to prevent roadbed erosion and the transport of potentially contaminated soils and materials into the creek. Groundwater at the site is very shallow, from 0.9 to 2.9 m below ground surface, and generally flows south-southwest towards Ship Creek. On-site soils are highly permeable, making transport of contaminants in surface soils very probable (Ecology and Environment 1986).



Prepared from USGS Anchorage NW, AK 1:25,000

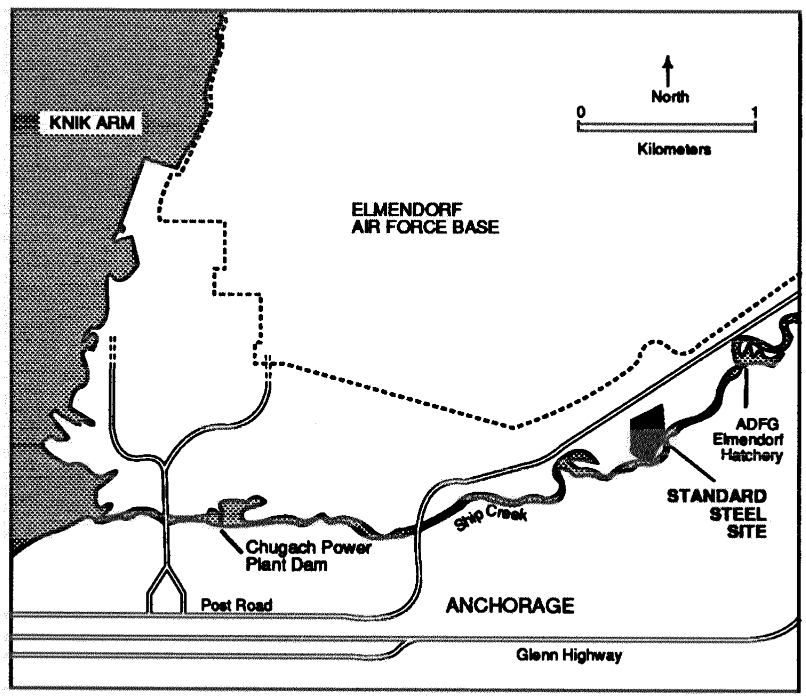


Figure 1. Standard Steel, Anchorage, Alaska.

Site Exposure Potential, *cont.*

The primary pathways of contaminant transport that may affect NOAA resources or habitats are groundwater discharge and, for the western portion of the site, surface water runoff. Contaminated soils and sediments may represent a secondary source of contamination.

Site-Related Contamination

Surface and subsurface soils, groundwater, surface water, and sediment samples were collected during a series of preliminary studies (Table 1; Ecology and Environment 1986, 1987, 1988; Roy F. Weston 1986; EPA 1987; Robinson-Wilson personal communication 1990). Samples were analyzed for priority pollutant metals, organic compounds, and PCBs. Ash samples collected from the on-site incinerator were analyzed for dioxins and furans. Results indicated that trace metals, PCBs, dioxins, and related furans are the contaminants of concern to NOAA at the Standard Steel site. Maximum concentrations of contaminants in the various matrices analyzed are presented in Table 1 along with applicable screening levels.

Copper, lead, nickel, and zinc were detected at high levels in groundwater. The maximum concentrations of copper, lead, and zinc were observed in a monitoring well located on the southwest boundary of the site. The maximum concentration of nickel was

Table 1. Maximum concentrations of major contaminants in the vicinity of the site compared with applicable screening levels.

	Water			Soil	
	Groundwater µg/l	Surface Water µg/l	AWQC[1] µg/l	Soil mg/kg	Average U.S. Soil[2] mg/kg
INORGANIC SUBSTANCES					
arsenic	ND	NT	190	53	5
cadmium	ND	NT	1.1+	750	0.06
chromium	ND	NT	11	1,600	100
copper	650	NT	12+	7,700	30
lead	760	NT	3.2+	11,000	10
mercury	ND	NT	0.012	180	0.03
nickel	100	NT	160+	650	40
silver	ND	NT	0.12	32	0.05
zinc	1,900	NT	110+	10,000	50
ORGANIC COMPOUNDS					
Total PCBs	2,025	<0.10	0.014	165,000	NA

1: Ambient water quality criteria for the protection of aquatic life, freshwater chronic criteria presented (EPA 1986).
2: Lindsay (1979).
+ Hardness-dependent criteria; 100 mg/l $CaCO_3$ used.
ND: Not detected at method detection limit; detection limit not reported
NT: Not analyzed
NA: Screening level not available.

Site-Related Contamination, *cont.*

observed in a monitoring well near the main transformer storage area. Elevated levels of nine trace metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc) were observed in soil samples on site. Surface water and sediment samples were not analyzed for trace metals.

Groundwater and three soil samples were analyzed for volatile and semi-volatile organic compounds, but only very low levels of contamination were detected in any of the samples. Surface water and sediment samples were not analyzed for volatile or semi-volatile organic compounds.

Elevated levels of PCBs (primarily Aroclor 1260) were observed in groundwater, on-site soil, and sediment. PCBs in groundwater were measured at very high levels in a monitoring well near the main transformer storage area. Floating oil containing extremely high levels of PCBs (9,040,000 µg/l) was detected in another nearby groundwater monitoring well. The maximum concentration of PCBs in soil was measured in a sample collected from the main transformer storage area. PCBs in sediment had a maximum value of 2.5 mg/kg and were detected in a sample collected 45 m downstream of the Standard Steel site. PCBs were not detected in any surface water samples, but detection limits (0.10 µg/l) were higher than the screening levels for this contaminant. Groundwater, soil, and sediment were not analyzed for pesticides, so no evaluation of Standard Steel as a potential source can be made at present (Tetra Tech 1988).

Ash samples collected from the on-site incinerator were found to contain up to 4.2 µg/kg tetrachlorinated dioxins (TCDD); however, the samples did not contain the most toxic isomer, 2,3,7,8-TCDD. Because this isomer was not present, and dioxin isomers have different toxicities, all dioxin concentrations reported for the Standard Steel site are expressed as concentrations equivalent to the 2,3,7,8-TCDD isomer. A concentration equivalent to 5.71 µg/kg 2,3,7,8-TCDD was found in an ash sample collected from inside the incinerator. Significant levels of chlorinated dioxins and furans were present in all samples collected in and around the incinerator. Groundwater, surface water, and soil outside of the incinerator area were not analyzed for dioxins (Ecology and Environment 1986).

Site Related Contamination, *cont.*

Tissue samples of Dolly Varden trout from Ship Creek immediately downstream of the Standard Steel site were tested for PCBs, DDE, and the dioxin concentration equivalents to 2,3,7,8-TCDD (Table 2; Tetra Tech 1988). Maximum levels of DDE and TCDD were higher than those from tissue samples of trout collected from other surface waters in the vicinity of Anchorage.

Table 2. Maximum concentrations of contaminants in Dolly Varden trout from Ship Creek compared with fish from nearby surface water.

	Collection Site	
Contaminant	Ship Creek µg/kg	Anchorage Area µg/kg
PCBs	143.0	218.0
DDE	50.5	17.2
2,3,7,8-TCDD	0.87	0.000685

NOAA Trust Habitats and Species

Ship Creek and Knik Arm in upper Cook Inlet form the primary habitats of concern to NOAA. Intermittent pockets of riparian wetlands are found along Ship Creek from the mouth of the creek to the site (Brna personal communication 1990). Ship Creek is a spawning and migratory corridor for adult chinook, coho, pink, and chum salmon, and Dolly Varden. Chinook and coho salmon also use the creek for spawning and early juvenile rearing. Knik Arm is a juvenile rearing area. Anadromous Dolly Varden use Ship Creek as a migratory corridor and may spawn near the Standard Steel site (Wiedmer personal communication 1990).

Prior to 1989, the Alaska Department of Health and Human Services posted signs on Ship Creek stating, "The municipality of Anchorage recommends against the eating of fish taken from these waters because of chemical contamination of stream sediments." The signs were removed in 1989 for administrative reasons.

Cook Inlet is one of eight recognized wintering areas worldwide for beluga whales. The Cook Inlet population is resident year-round, and may contain 300 to 500 whales. No comprehensive surveys have been done, so these numbers may be conservative (Morris 1988). Belugas are known to concentrate at the mouth of Ship Creek and feed on anadromous fish there from mid-May through September (Smith personal communication 1990).

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