9

GBF/Pittsburg Landfill

Antioch, California

CERCLIS #CAD980498562

Site Exposure Potential

The 24-hectare GBF/Pittsburg Landfill site is in Antioch, California (Figure 1) about 4 km south of the San Joaquin River. The site consists of two former landfills: the Pittsburg Landfill and the GBF Landfill (Figure 2). The San Joaquin River merges with the Sacramento River about 8 km north of the site and subsequently enters Suisun Bay 3.5 km further downstream. Suisun Bay connects the delta region of the Sacramento and San Joaquin rivers with San Francisco Bay.

The Pittsburg Landfill has operated as a municipal solid waste disposal site since the late 1940s. Since 1960, GBF Landfill has operated as both a municipal waste disposal site and an industrial and chemical (solid and liquid) waste disposal site. The sites were consolidated into the Contra Costa Landfill, which operated as a Class III solid waste facility.

Hazardous liquid wastes were disposed of in ten solar evaporation ponds. These unlined, uncovered ponds allowed wastes to evaporate into the air and percolate into the ground. Wastes disposed of in these ponds included waste oils, chlorinated and non-chlorinated solvents, acids, pesticides, PCBs, and beryllium and phosphorous wastes. There is only limited information about

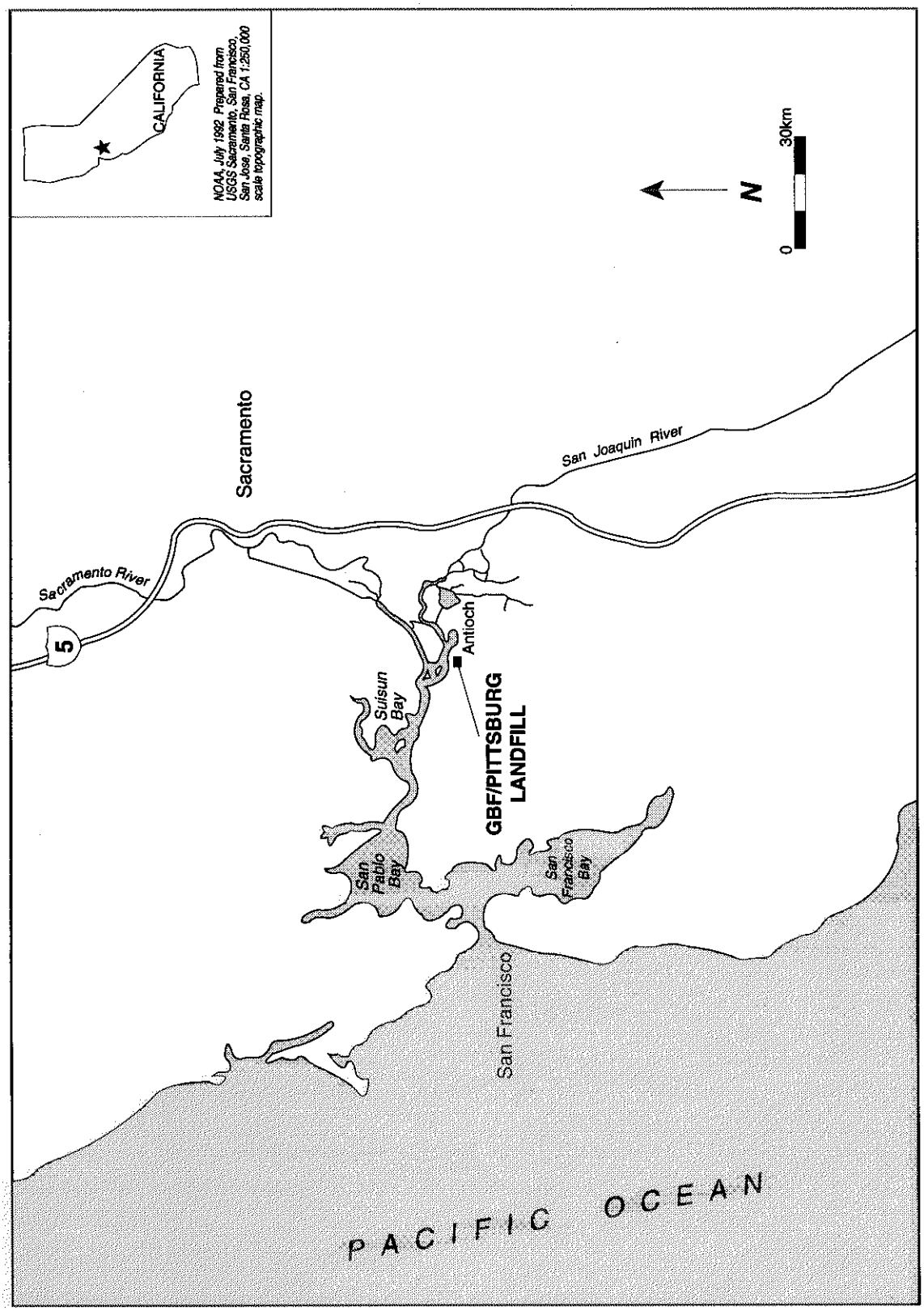

Figure 1. The GBF/Pittsburg site in Antioch, California.

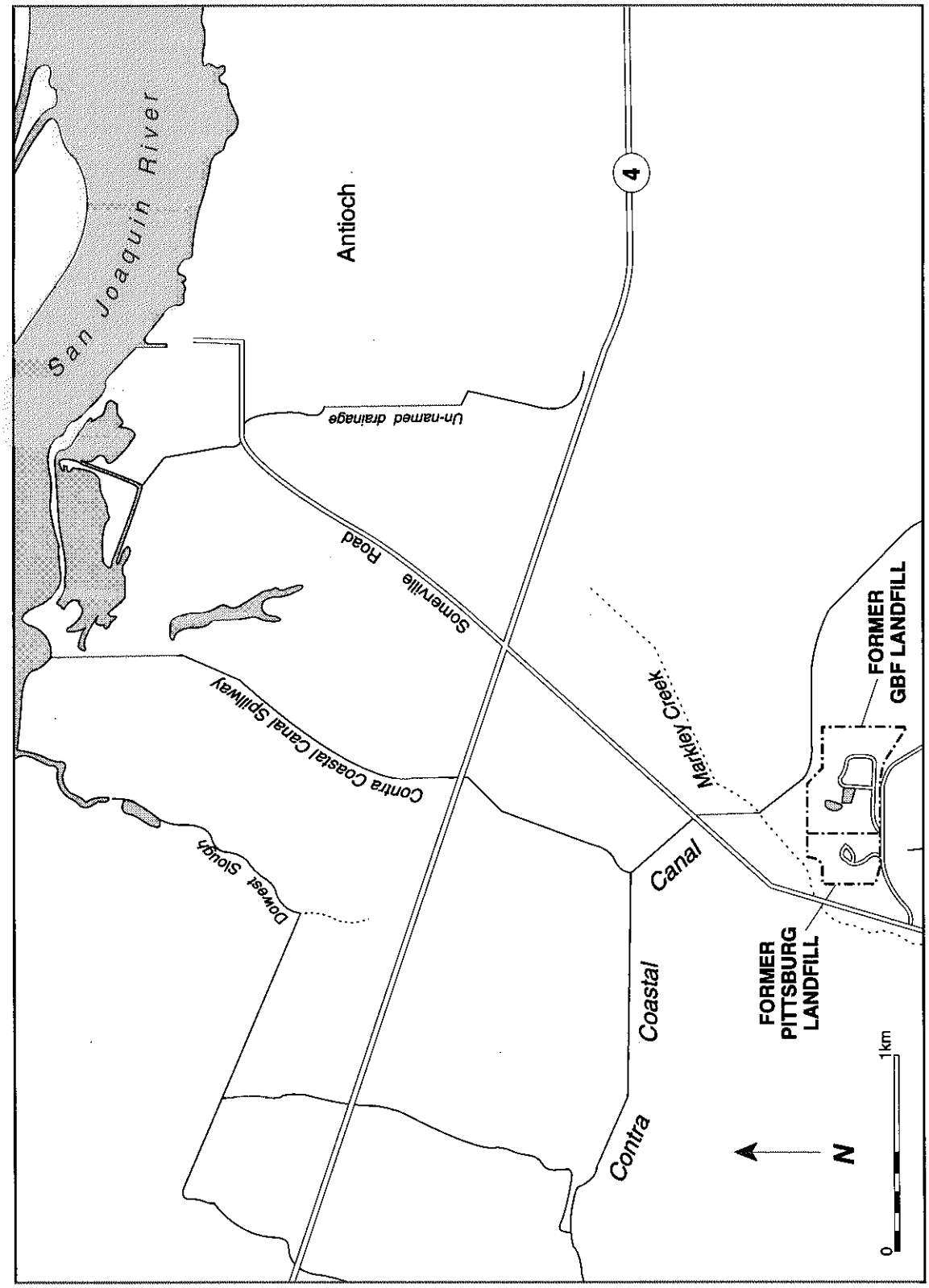

Figure 2. Detail of the GBF/Pittsburg site.

spills and hazardous materials disposed of at the landfill. A June 1968 inspection report cited an area of the Pittsburg site where synthetic liquid rubber was reportedly discharged regularly. A March 1975 inspection report documented the disposal of approximately 9,100 kg of oil thickener in the Pittsburg Landfill.

Both the former GBF and Pittsburg landfills have had numerous fires, explosions, odor complaints, and related violations associated with previous waste disposal activities, particularly during the 1960s and 1970s. Metal surfaces on landfill structures and residential buildings north and east of the GBF disposal site were reported to be corroded in 1973. In the early 1970s, the local community filed additional complaints of strong oil and chemical odors, burning eyes, and irritated lungs.

Contaminant migration pathways include groundwater flow to the San Joaquin River and surface water runoff to Markley Creek. There is groundwater beneath the site from 6 to 100 m below the ground surface. Regional groundwater flows north towards the San Joaquin River and Suisun Bay (U.S. EPA 1987).

Markley Creek is an intermittent stream 60 m northwest and downgradient of the site (U.S. EPA 1987). The creek intersects the Contra Costa Canal where the majority of stream flow is diverted into the canal through a mechanized siphon (USGS 1978, 1980; Kokkos personal communication 1992). Runoff from the canal should theoretically reach the San Joaquin River during high rain events via the 3.5- km Contra Costa Canal Spillway, about 1 km downstream from the siphon. Historically, the canal overflows into the spillway about twice a year. Downstream flow in the spillway is now impeded by a series of inoperable gates. Due to extended drought conditions in northern California, there are no plans to restore the gate system in the spillway (Kokkos personal communication 1992).

NOAA Trust Habitats and Species

Habitats of concern to NOAA are surface water, associated bottom substrates, and wetlands of the San Joaquin and Sacramento rivers, and Suisun Bay. Suisun Bay is a transition zone between the freshwater ecosystems of the Sacramento and San Joaquin rivers and the saltwater ecosystem of San Francisco Bay. Salinities within this tidal area generally range from 2 to 16 ppt, but fluctuate throughout the year due to rainfall, saltwater intrusion, and agricultural runoff (Nichols and Pamatmat 1988). Near the site, the San Joaquin River is 0.8 to 5 km wide, 4.5 to 9 m deep, and has a silty sand substrate (Rugg 1988).

The surface waters of the San Joaquin and Sacramento rivers, and Suisun Bay near the site provide spawning, nursery, and adult habitat for numerous species (Table 1; Kholhorst 1992). There are estuarine-emergent wetlands at the confluence of the San Joaquin and Sacramento rivers and Suisun Bay. Vegetation here is primarily bulrush

(*Scirpus* spp.), cattail (*Typha augustifolia*), and rush (*Juncus* spp.; Kholhorst 1992). Parts of the Suisun Bay wetlands were designated as a California Wetland Preserve in 1984 (Lee et al. 1984).

Suisun Bay is a migration corridor and nursery area for seven species of anadromous fish: green sturgeon, white sturgeon, delta smelt, chinook salmon, steelhead trout, striped bass, and American shad (Table 2; Bybee 1990; Kholhorst 1992). Winter-run chinook salmon have been designated as a federally threatened species; the U.S. Fish and Wildlife Service is petitioning for similar status for delta smelt (Martin Marietta 1992). All seven of these species spawn in the Sacramento and San Joaquin rivers upstream of the site. The confluence of these rivers is an important congregation area during upstream and downstream anadromous fish migrations, particularly for chinook salmon, steelhead trout, and sturgeon. These species and American shad spawn in the upper reaches and tributaries of the Sacramento and San Joaquin rivers, with the largest populations found in the mainstem of the Sacramento River. Striped bass and delta smelt spawn in Suisun Bay. During periods of high salinity, Dungeness crab and bay shrimp are also present near the site (Wooster 1989; Kholhorst 1992).

There are no commercial fisheries near the site, although commercial bait fishing for Bay shrimp extends into the lower reaches of Suisun Bay during periods of abnormally high salinity (Hergeshell 1989). All anadromous fish, except delta smelt, are fished recreationally during seasonal runs. In general, chinook salmon are fished in the fall and steelhead trout during the winter. These fisheries are not restricted other than by general regulations on take limit and minimum sizes (Wolcott 1989; Kholhorst 1992).

Table 1. Fish species in the San Joaquin River, Upper Suisun Bay, and Sacramento River near the site.

Species		Habitat				Fisheries	
Common Name	Scientific Name	Spawning Ground	Nursery Ground	Adult Forage	Migratory Route	Comm. Fishery	Recr. Fishery
ANADROMOUS SPECIES							
Green sturgeon	*Acipenser medirostris*		♦	♦	♦		♦
White sturgeon	*Acipenser transmontanus*		♦	♦	♦		♦
American shad	*Alosa sapidissima*		♦	♦	♦		♦
Delta smelt	*Hypomesus transpacificus*	♦	♦	♦			
Striped bass	*Morone saxatilis*	♦	♦	♦	♦		♦
Steelhead trout	*Oncorhynchus mykiss*		♦	♦	♦		♦
Chinook salmon	*Oncorhynchus tshawytscha*		♦	♦	♦		♦
NON-ANADROMOUS SPECIES							
Shiner perch	*Cymatogaster aggregata*	♦	♦	♦			
Starry flounder	*Platichthys stellatus*		♦	♦			
INVERTEBRATE SPECIES							
Dungeness crab	*Cancer magister*		♦	♦			
Bay shrimp	*Crangon franciscorum*			♦		♦	

Site-Related Contamination

Trace elements and pesticides are the contaminants of primary concern to NOAA identified at the site in preliminary investigations. Trace elements were measured in on-site groundwater at concentrations that exceeded chronic AWQC by one to two orders of magnitude (U.S. EPA 1986; Mark Group 1991; Table 2). High concentrations of pesticides were detected in groundwater, though AWQC are not available for screening comparison (Table 2). Elevated concentrations of acetone (440,000 µg/l) were detected in groundwater, but VOCs are not normally of concern to NOAA trust resources due to their volatility and comparatively low toxicity. No data were available regarding the levels of contaminants in on-site soil. PCBs have been disposed of at the site, but there have been no analyses for these substances. In addition, the threat to natural resources posed by many of the waste products disposed at the site (e.g., oil thickener and liquid rubber) may be poorly characterized by normal chemical testing.

Table 2. Maximum concentrations (µg/l) of contaminants at the GBF/Pittsburg Landfill Site (Mark Group 1991).

Contaminant	Groundwater	AWQC	
		Fresh. Chronic	Marine Chronic
ORGANIC COMPOUNDS			
Pesticides			
2,4-D	120,000	N/D	N/D
2,4,5-T	5,400	N/D	N/D
Silvex	720	N/D	N/D
Dicamba	6,700	N/D	N/D
Dichlorprop	3,100	N/D	N/D
INORGANIC SUBSTANCES			
Trace Elements			
Cadmium	260	1.1*	9.3
Chromium	520	11	50
Copper	4,100	12*	N/D
Lead	190	3.2*	8.5
Mercury	3.7	0.012	0.025
Nickel	4,700	160*	8.3
Silver	190	0.12	0.92
Zinc	1,300	110*	86

N/D: Not determined
* : Hardness-dependent criteria (100 mg/kg $CaCO_3$ used).

Summary

A plume of groundwater contaminated with pesticides and trace metals is migrating toward the San Joaquin River and Suisun Bay may threaten sensitive life stages of several trust resources in these habitats. These areas are used as a migratory corridor, transition zone, and nursery ground for seven species of anadromous fish, including a federally threatened run of chinook salmon. Other contaminants may also be present in the groundwater. Elevated levels of VOCs may not pose a toxic threat to NOAA trust resources but could increase the likelihood that other contaminants of concern will migrate.

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