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ENSR Consulting
and Engineering
1320 Harbor Bay Parkway
Alameda, CA 94501
(510) 865-1888
(510) 748-6799 FAX

May 21, 1992

Mr. Ravi Arulanantham
Alameda County Health Agency
Division of Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

Subject: Soil excavation and sampling activities at the Ballena Isle Marina, 1150 Ballena Boulevard, Alameda, California.

Dear Mr. Arulanantham:

ENSR Consulting and Engineering collected soil samples during the excavation of contaminated soil from the former underground tank pit at the Ballena Isle Marina. As you will recall, a 250-gallon underground tank was excavated and removed from this site in 1991 by the owner. The tank was used to temporarily store waste oil from the engines of the boats that are docked at the marina. Soil around the tank was contaminated as a result of spillage from occasional overfilling.

Recent excavation of contaminated soil enlarged the pit, so that the pit currently measures 9.5 feet by 11.5 feet and is approximately 9 feet deep. During excavation of contaminated soil, soil staining appears to have extended beneath the maintenance building adjacent to the pit. The stained soil is at a depth of 5 feet. Further excavation of the stained soil was not possible without incurring possible damage to the foundation of the maintenance building. Groundwater was encountered at a depth of approximately 9.5 feet.

Two soil samples were collected from the pit. One soil sample (PB-1) was collected from the bottom of the pit (approximately 9 feet below grade), and the other soil sample (SW-1), was collected from the base of the sidewall on the north end of the pit. This soil sample was collected from a depth of 8.5 feet.

The soil samples were placed into laboratory-supplied glass jars using stainless steel hand trowels. The jars were placed on ice and transported to the laboratory under chain-of-custody protocol. The soil samples were analyzed by Curtis & Tompkins, Ltd., a California-State certified hazardous waste laboratory. Both soil samples were analyzed for the following:

TPH (gasoline)	EPA Method 8015
TPH (diesel)	EPA Method 8015
Total Oil & Grease	EPA Method SMWW 5520
Volatile Organic Compounds	EPA Method 8240
Metals:	
Cadmium	
Chromium	
Lead	
Nickel	
Zinc	

The excavated soil was stockpiled at the site by placing the soil on visquine sheeting which was then covered by visquine while awaiting the laboratory results.

The analytical results are summarized on Table 1. Oil & grease and diesel were detected at concentrations of 4,200 parts per million (ppm) and 1,800 ppm, respectively, in the sample from the bottom of the pit. Lower amounts of gasoline, xylene, toluene, and ethylbenzene were detected at 79 ppm, 9.2 ppm, 1 ppm, and 0.840 ppm, respectively. Low levels of chromium, nickel, zinc, and lead were detected in this soil sample.

In the soil sample from the base of the sidewall, oil & grease and diesel were detected at 3,500 ppm and 2,200 ppm, respectively. Lower levels of gasoline, and xylene were detected in this sample at 91 ppm, and 1.9 ppm, respectively.

Conclusions and Recommendations

Because contaminated soil remains in the ground, and because of the shallow depth of the groundwater at this location, it is likely that the groundwater has been impacted by the contaminants in the soil. However, it is ENSR's opinion that establishing a groundwater monitoring program involving the installation of one or more monitoring wells is not necessary at this site.

The Ballena Isle Marina is constructed on a narrow, man-made body of land which is bounded on three sides by seawater. The harbor is approximately 30 feet northeast of the contaminated area. San Francisco Bay is approximately 200 feet southwest of the contaminated area. Shallow groundwater in the marina area (including the contaminated area) is probably affected by saltwater intrusion and is therefore saltwater to brackish, at best. As a result, the groundwater has no beneficial uses. Any effects on aquatic wildlife resulting from contaminated groundwater entering San Francisco Bay waters would be neglible because: (1) the extent and scope of contamination is relatively small, and (2) the contaminated groundwater would be greatly diluted upon entering San Francisco Bay.

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The close proximity of the contaminated area to San Francisco Bay and the harbor also means that groundwater flow is strongly influenced by the ebb and flow of the tides. Because the water level changes from high to low tide twice daily, groundwater flow direction in the vicinity of the contaminated area is likely to change over the course of a single day. For these reasons, ENSR believes that groundwater monitoring is not necessary.

Instead, it is our recommendation that the Ballena Isle Marina backfill the open pit with clean fill material, and that an impermeable cap in the form of concrete pavement be placed over the former pit and surrounding area. This barrier would prevent surface runoff and rainwater from infiltrating the soil, thereby preventing further mobilization of the contaminants downward into the water table.

We will call you within the week to seek your response to our recommendation. If you have any questions or comments, please give me a call at (510) 865-1888.

Sincerely,
ENSR Consulting and Engineering

Brian Ho
Project Geologist

Paul Hilbelink, C.E.G.
Manager, Geological Sciences

Attachments

cc Jerry Green, Ballena Isle Marina

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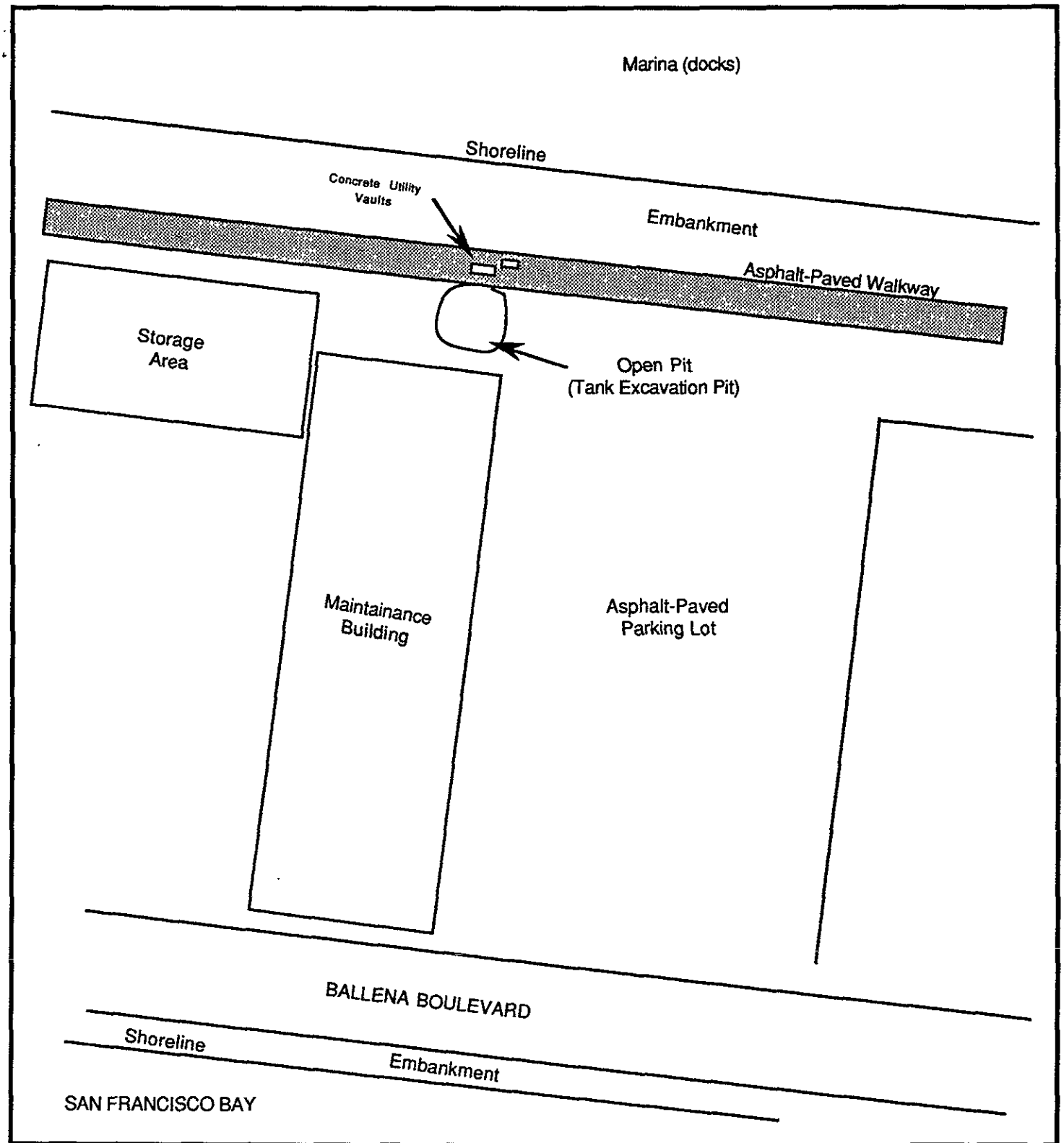
TABLE 1

Summary of Analytical Results of Soil Samples from Ballena Isle Marina

Sample No.	Diesel	Gasoline	Xylene	Toluene	Benzene	Ethylbenzene	Oil & Grease
SW-1	2,200 ppm	91 ppm	1.9 ppm	ND	ND	ND	3,500 ppm
PB-1	1,800 ppm	79 ppm	9.2 ppm	1 ppm	ND	0.840 ppm	4,200 ppm

Metals					
Sample No.	Cadmium	Chromium	Lead	Nickel	Zinc
SW-1	0.41 ppm	16.2 ppm	13 ppm	13.3 ppm	13.7 ppm
PB-1	ND	15.8 ppm	4.5 ppm	14.0 ppm	13.7 ppm

ND = Not Detected at or above the limit of detection of 0.5 ppm.



Not to Scale

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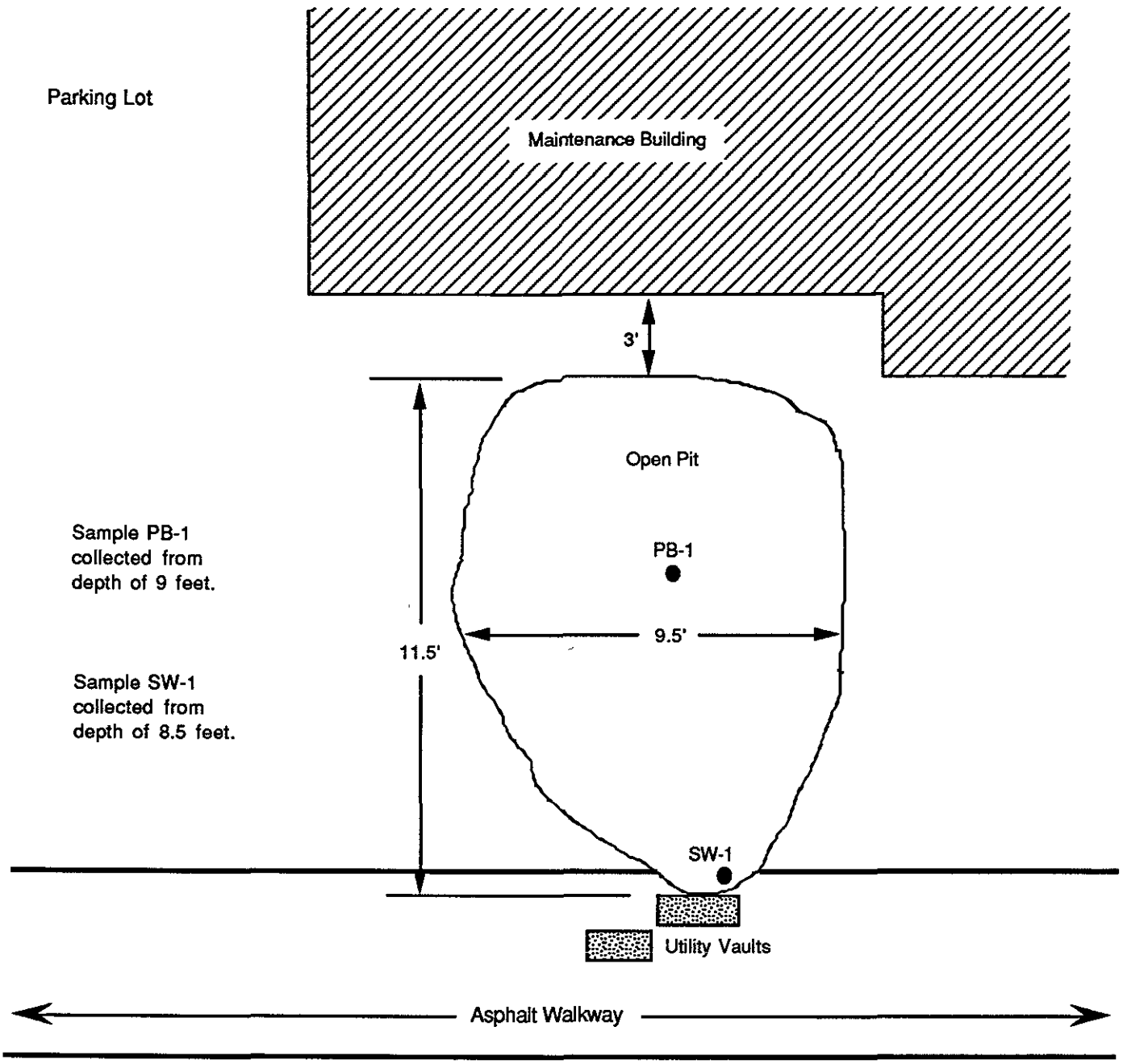
SITE PLAN
BALLENA ISLE MARINA
1150 BALLENA BOULEVARD, ALAMEDA, CALIFORNIA

DRAWN BY: BRIAN HO	DATE: 2/19/92	PROJECT NO.
CHK BY:	REVISED:	FIGURE NO.: 1



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SOIL SAMPLE LOCATION MAP
BALLENA ISLE MARINA
1150 Ballena Boulevard, Alameda, California

DRAWN BY: Brian Ho	DATE: 5/7/92	PROJECT NO. 8700-114.000
CHK BY:	REVISED:	FIGURE NO.: 2