



Dry Muliwai Sample Location Map

Legend

- Sampling Locations

Mākua Military Reservation
O'ahu, Hawai'i

Figure 2-4



North Background Area Sample Location Map

Legend

- Sampling Locations

Mākuā Military Reservation
O'ahu, Hawai'i

Figure 2-5



South Background Area Sample Location Map

Legend

- Sampling Locations

Mākua Military Reservation
O'ahu, Hawai'i

Figure 2-6

sample boring encountered water, both inside and outside of the existing muliwai boundary, the sampling equipment was not always able to penetrate to the desired depth in a single run. Because of the saturated soils at these locations, the test pit or borehole tended to collapse, and maximum sample depths varied. Also, some sample locations were modified in the field due to water depths or obstructions at the planned sample location.

Table 2-1 contains a breakdown of all muliwai samples that were collected and their associated laboratory analytical requests. The Tetra Tech field personnel determined the coordinates of all sampling locations using a GPS instrument. All soil/sediment types observed in the test pits and composite samples were logged by the Tetra Tech field geologist, as summarized in Table 2-2. Copies of the logs are presented in Appendix B.

Table 2-2 shows the sediment samples with their respective sample depth range, and the soil type that was encountered. These soils were classified according to both the visual inspection description from the geologist's logs (Appendix B), and by the contract laboratory sieve analyses, where applicable (Appendix D).

Sediment samples at all of the sampling areas were collected and composited over depth intervals ranging from of 0 to 2 inches (minimum), to 44 to 47 inches (maximum) below the ground surface. In general, the shallowest samples were collected at locations where the sediment was saturated and the walls of the test pits or borings collapsed. Some of the shallow sample intervals were also at locations where large cobbles prevented deeper excavation or drilling. The deeper sample intervals were mostly in areas outside the boundaries of the existing muliwai ponds where test pits were excavated in an attempt to remove the recently deposited aeolian beach sand so that a sediment sample could be collected from the level of the previous pond floor. As noted in Table 2-2, at some sample locations, no visible evidence of the pond floor was observed.

Table 2-1
Muliwai Sampling Location Data

Muliwai (Location ¹)	Number of Sediment Samples Collected	
	Metals & Explosives Only ²	Full Suite of Analyses Including Metals and Explosives ²
North Muliwai Mākua	17 primary samples 0 duplicate samples	5 primary samples 1 duplicate sample
South Muliwai Mākua	13 primary samples 0 duplicate samples	4 primary samples 1 duplicate sample
Dry Muliwai Mākua	3 primary samples 1 duplicate sample	1 primary sample 0 duplicate sample
Background Area (North Stream)	3 primary samples 1 duplicate sample	0 primary samples 0 duplicate samples
Background Area (South Stream)	3 primary samples 1 duplicate sample	0 primary samples 0 duplicate samples

NOTES: ¹See Figures 2-2 through 2-6.

²See Table 2-2.

**Table 2-2
Muliwai Sediment Type Data**

Sample Number	Depth (inches)	Visual Classification (ASTM 2488)		Sieve Analysis Classification (ASTM D422/D4464M)	
		Soil Symbol	Soil Type	Soil Symbol	Soil Type
BMN-01-MX-1	12 to 14	GM	Gravel-sand-silt		
BMN-02-MX-1	18 to 20	SM	Silty sand with gravel		
BMN-03-MX-1	16 to 18	SM	Silty sand with gravel		
BMS-01-MX-2	22 to 24	CL	Clay		
BMS-02-MX-2	18 to 20	CL	Clay		
BMS-03-MX-1	12 to 14	CL	Clay		
DMM-01-FL-3	24 to 30	SP ¹	Gravelly sand	SP	Poorly-graded sand
DMM-02-MX-3	29 to 33	SP ¹	Poorly-graded sand		
DMM-03-MX-1	12 to 16	SP ¹	Poorly-graded sand		
NMM-01-MX-1	At 12	OH	Organic clay		
NMM-02-MX-1	4 to 16	SP ¹	Poorly-graded sand		
NMM-03-MX-1	9 to 12	SP	Poorly-graded sand		
NMM-04-FL-1	12 to 18	SM	Silty sand	SW	Well-graded sand
NMM-05-MX-1	9 to 12	SM	Silty sand		
NMM-06-MX-1	6 to 12	SW	Well-graded sand		
NMM-07-MX-3	30 to 36	SP ¹	Poorly-graded sand		
NMM-08-MX-1	12 to 18	SW	Well-graded sand		
NMM-09-MX-1	4 to 12	SM	Silty sand		
NMM-10-FL-1	0 to 4	SW	Well-graded sand	SW	Well-graded sand
NMM-11-MX-2	18 to 24	SW	Gravelly sand		
NMM-12-FL-3	19 to 33	SW	Gravelly sand	SW	Gravelly sand
NMM-13-MX-3	30 to 33	CL	Clay		
NMM-14-MX-1	6 to 8	CL	Clay		
NMM-15-MX-1	0 to 11	SW	Well-graded sand		
NMM-16-FL-3	38 to 44	SP ¹	Poorly-graded sand	SP	Poorly-graded sand
NMM-17-MX-2	17 to 20	SP	Poorly-graded sand		
NMM-18-MX-3	44 to 47	SP ¹	Poorly-graded sand		
NMM-19-MX-3	36 to 40	SP ¹	Poorly-graded sand		
NMM-20-FL-1	0 to 12	SP	Poorly-graded sand	SP	Poorly-graded sand