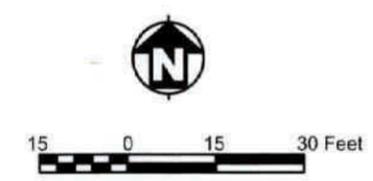


- UNDERGROUND STORAGE TANK (UST), REMOVED
 - CATCH BASIN
 - OIL-WATER SEPARATOR (OWS)
 - FENCE
 - FUEL LINE
 - SANITARY SEWER LINE
 - STORM SEWER LINE
 - CORRECTIVE ACTION AREA (CAA)
 - CERCLA SITE BOUNDARY
 - ENVIRONMENTAL BASELINE SURVEY (EBS) PARCEL AND NUMBER
- LAND COVER**
- Unpaved
 - Paved
 - Road
- BUILDING**
- Present
 - Removed

Notes:
 CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act of 1980

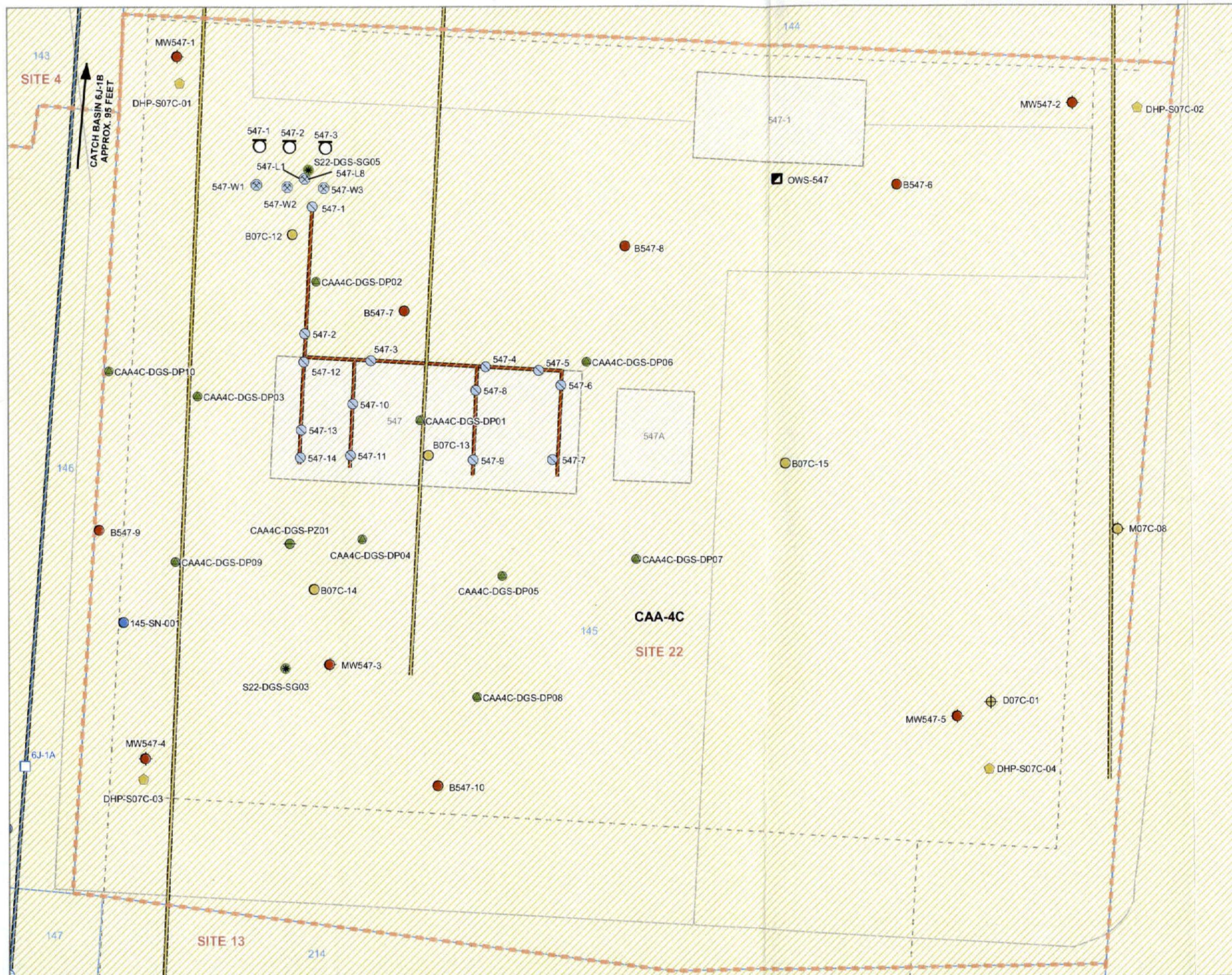


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FIGURE 8-1
SITE 22 FEATURES

Operable Unit 2A
 Remedial Investigation Report



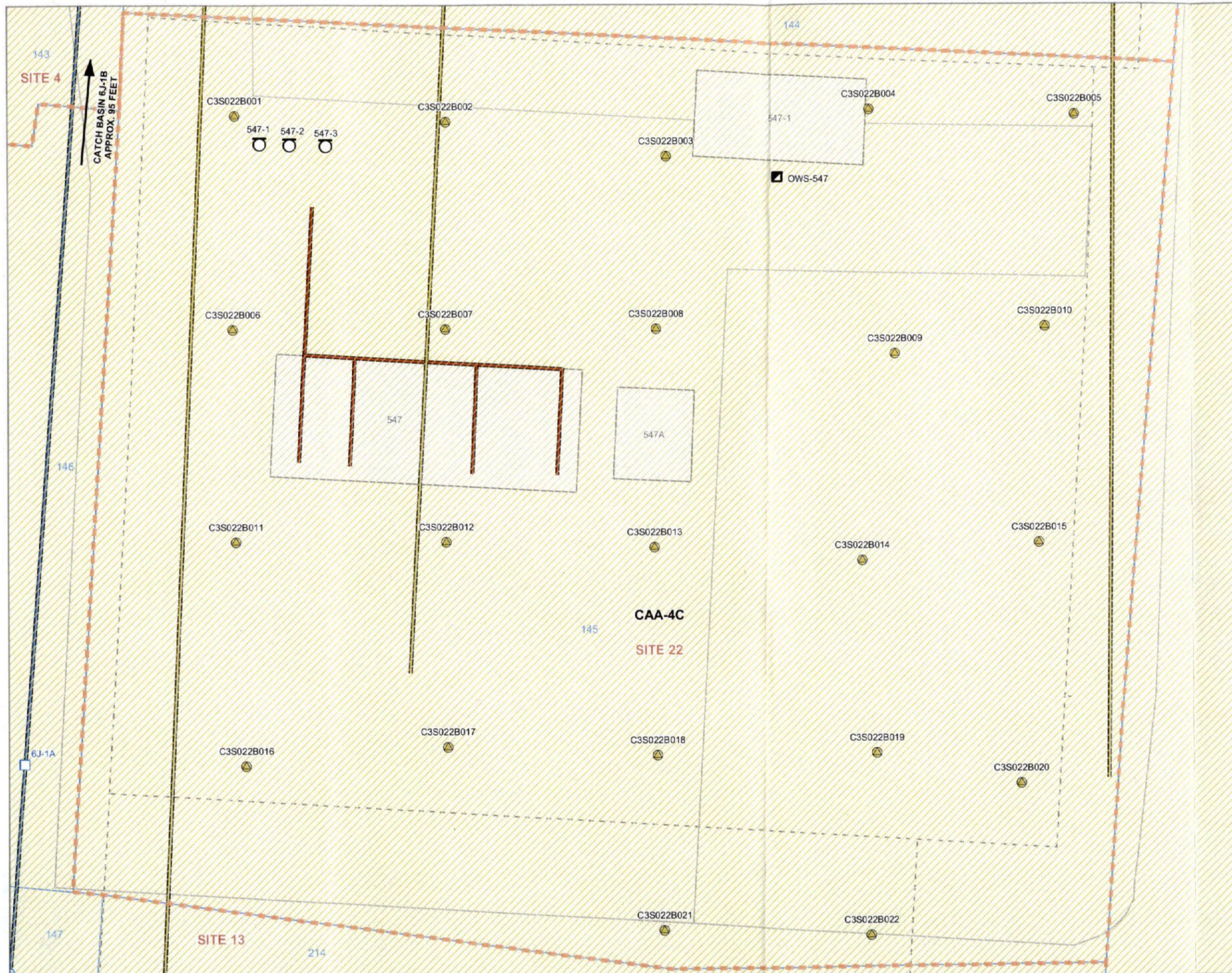
- SAMPLE LOCATION**
- ⊕ Direct-Push
 - ⊗ Excavation
 - ⊙ Hydropunch
 - ⊕ Monitoring Well
 - ⊖ Piezometer
 - ⊖ Pipe
 - ⊗ Soil Gas
 - Soil Boring
- SAMPLE INVESTIGATION**
- Total Petroleum Hydrocarbon Program
 - Phase 1 & 2A, 1991
 - Follow-On Investigation 1994
 - Data Gap Sampling 2001
 - EBS Phase 2A
- INFRASTRUCTURE**
- UNDERGROUND STORAGE TANK (UST), REMOVED
 - CATCH BASIN
 - OIL-WATER SEPARATOR (OWS)
 - - - FENCE
 - FUEL LINE
 - SANITARY SEWER LINE
 - STORM SEWER LINE
 - CORRECTIVE ACTION AREA (CAA)
 - ⊔ CERCLA SITE BOUNDARY
 - ⊔ ENVIRONMENTAL BASELINE SURVEY (EBS) PARCEL AND NUMBER
 - LAND COVER
- BUILDING**
- Present
 - Removed

Notes:
 CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act of 1980

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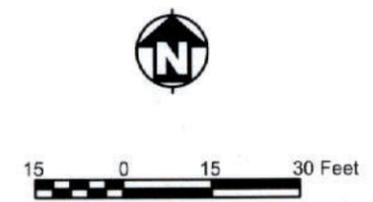
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FIGURE 8-2
SITE 22 RI, TPH AND EBS SOIL AND GROUNDWATER SAMPLE LOCATIONS
 Operable Unit 2A
 Remedial Investigation Report



- PAH SAMPLE LOCATION**
- Direct-Push
 - UNDERGROUND STORAGE TANK (UST), REMOVED
 - CATCH BASIN
 - OIL-WATER SEPARATOR (OWS)
 - FENCE
 - FUEL LINE
 - SANITARY SEWER LINE
 - STORM SEWER LINE
 - CORRECTIVE ACTION AREA (CAA)
 - CERCLA SITE BOUNDARY
 - ENVIRONMENTAL BASELINE SURVEY (EBS) PARCEL AND NUMBER
 - LAND COVER
- BUILDING**
- Present
 - Removed

Notes:
 CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act of 1980
 PAH = Polynuclear aromatic hydrocarbon

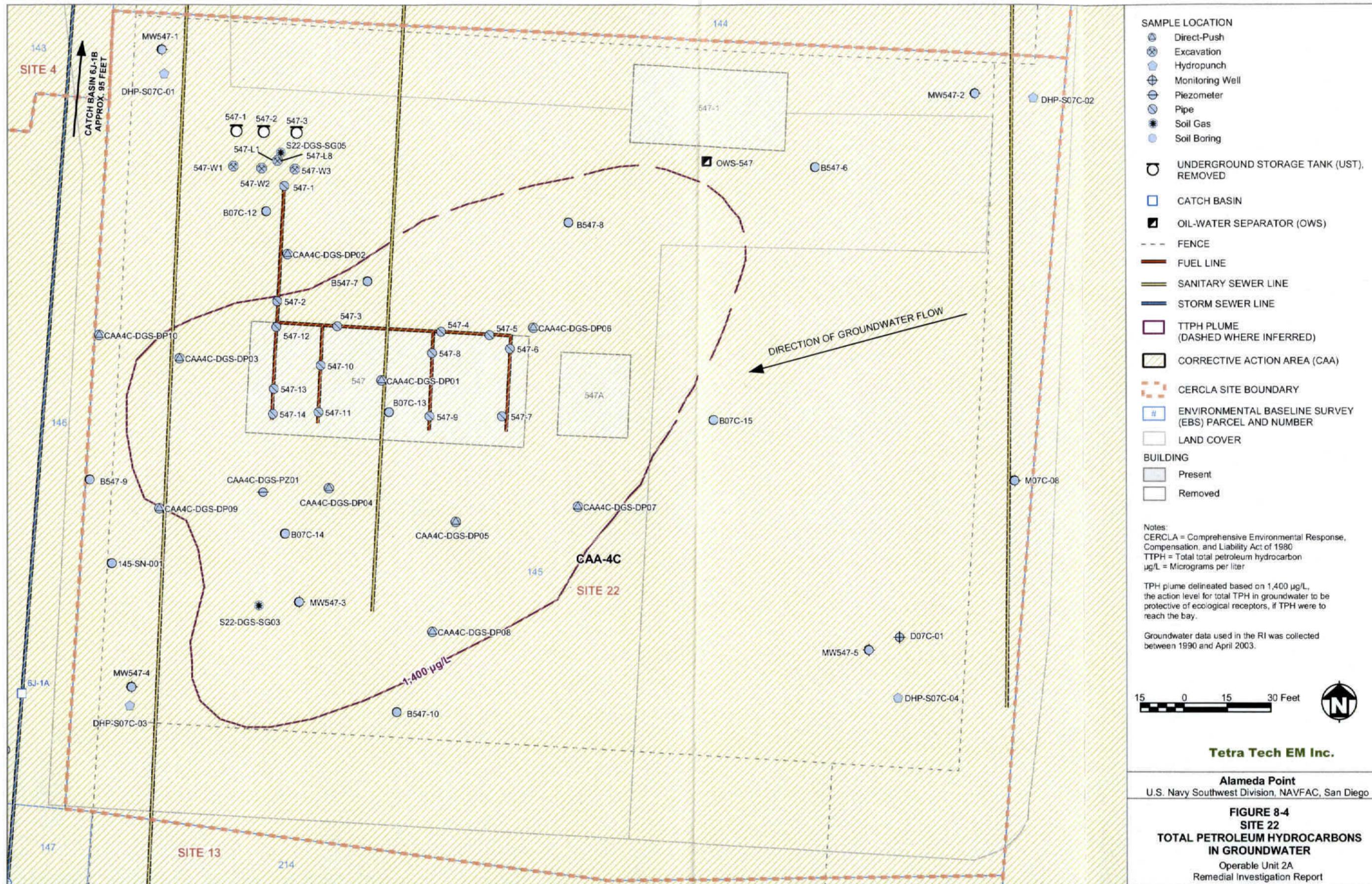


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FIGURE 8-3
SITE 22 REMEDIAL INVESTIGATION
POLYNUCLEAR AROMATIC HYDROCARBON
INVESTIGATION SAMPLE LOCATIONS

Operable Unit 2A
 Remedial Investigation Report



- SAMPLE LOCATION**
- ⊗ Direct-Push
 - ⊗ Excavation
 - ⊗ Hydropunch
 - ⊕ Monitoring Well
 - ⊗ Piezometer
 - ⊗ Pipe
 - ⊗ Soil Gas
 - ⊗ Soil Boring

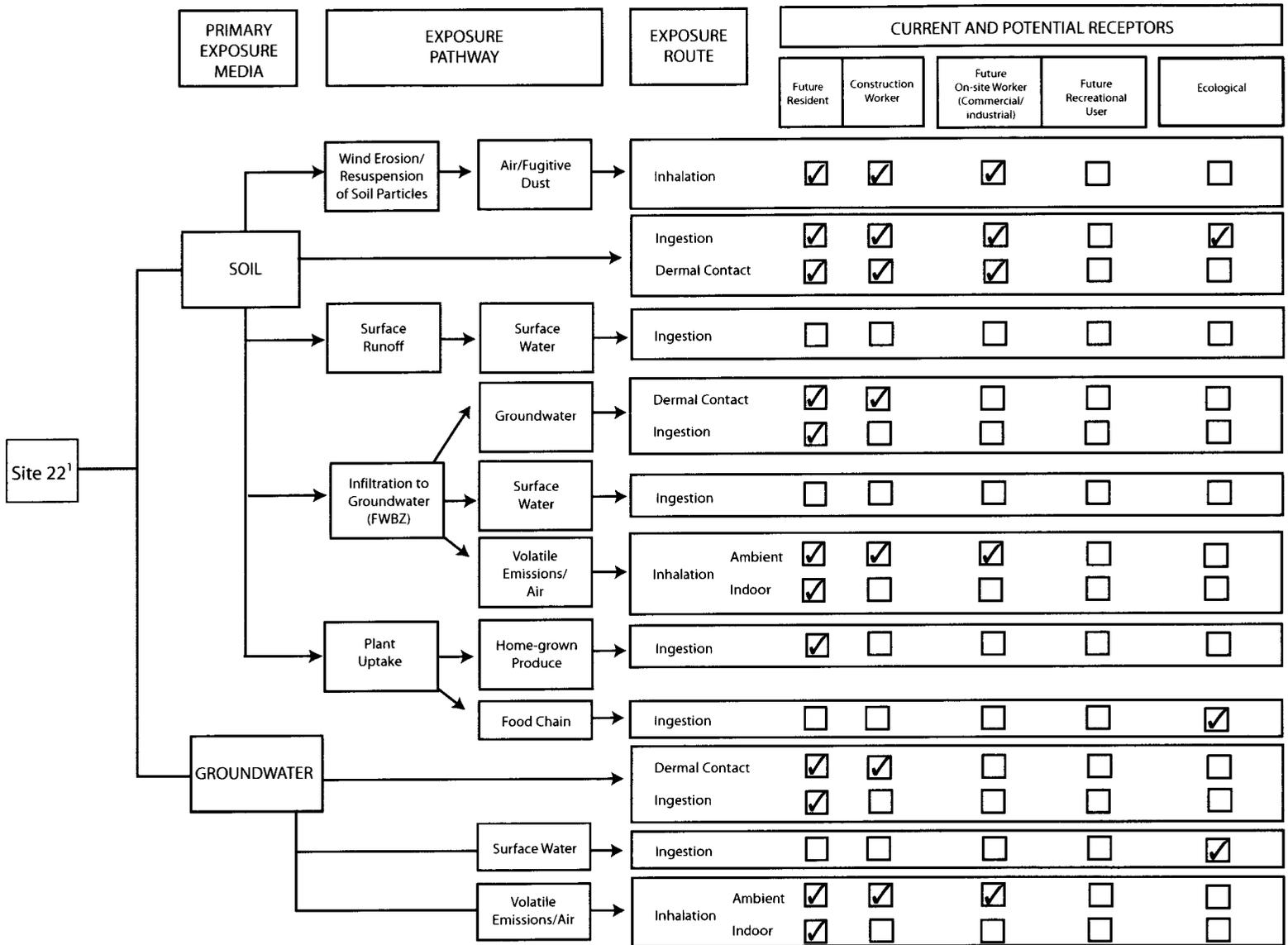
- ⊗ UNDERGROUND STORAGE TANK (UST), REMOVED
- CATCH BASIN
- ▣ OIL-WATER SEPARATOR (OWS)
- - - FENCE
- FUEL LINE
- SANITARY SEWER LINE
- STORM SEWER LINE
- ▭ TTPH PLUME (DASHED WHERE INFERRED)
- ▭ CORRECTIVE ACTION AREA (CAA)

- ⊡ CERCLA SITE BOUNDARY
- ⊡ ENVIRONMENTAL BASELINE SURVEY (EBS) PARCEL AND NUMBER
- LAND COVER
- BUILDING**
- ▭ Present
- Removed

Notes:
 CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act of 1980
 TTPH = Total total petroleum hydrocarbon µg/L = Micrograms per liter
 TPH plume delineated based on 1,400 µg/L, the action level for total TPH in groundwater to be protective of ecological receptors, if TPH were to reach the bay.
 Groundwater data used in the RI was collected between 1990 and April 2003.



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FIGURE 8-4
SITE 22
TOTAL PETROLEUM HYDROCARBONS
IN GROUNDWATER
 Operable Unit 2A
 Remedial Investigation Report



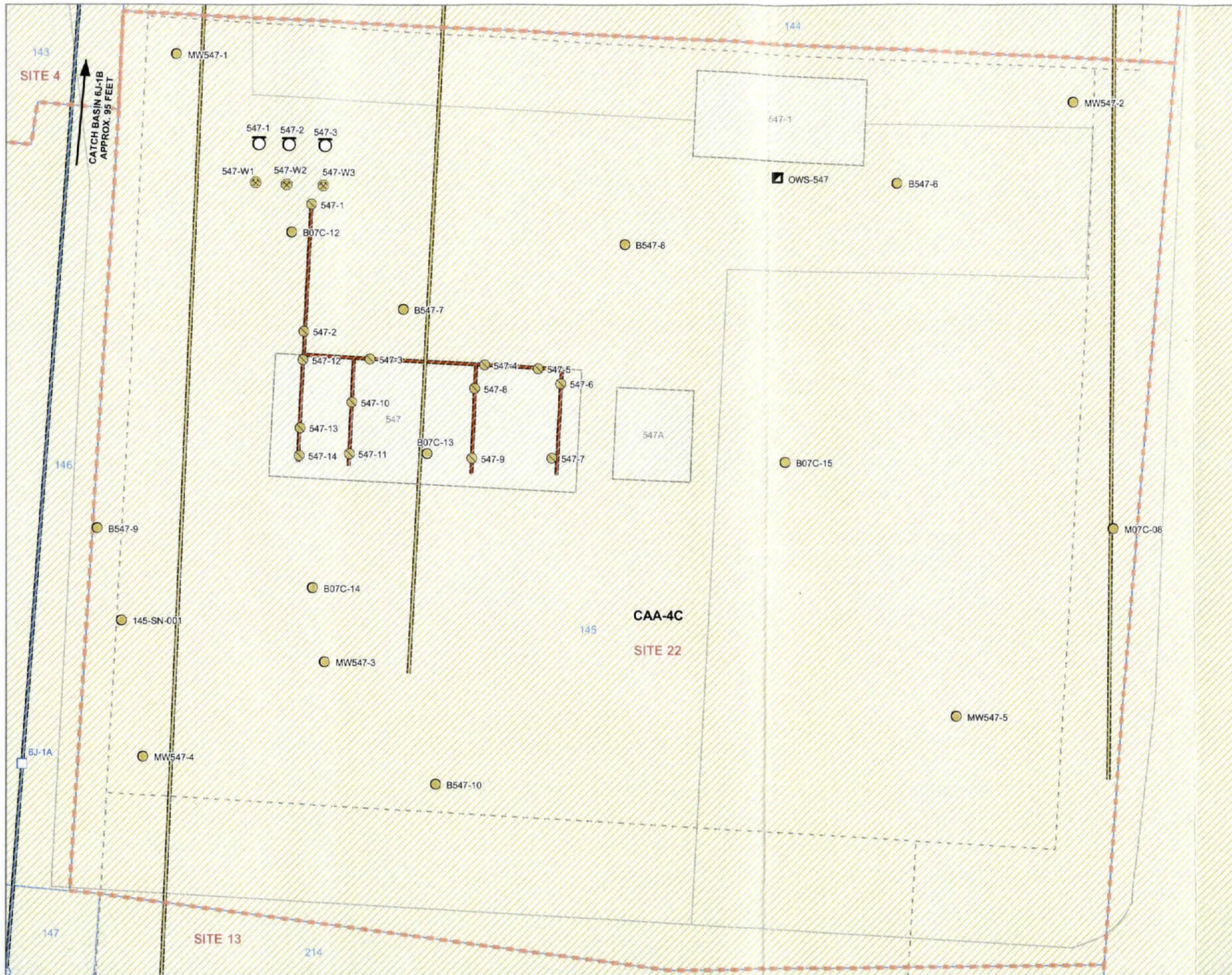
¹Former gas station USTs 547-1 through 547-3 and fuel lines, car wash OWS 547, fill material

Potentially Complete Exposure Pathway

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FIGURE 8-5
CONCEPTUAL SITE MODEL
Operable Unit 2A
Remedial Investigation Report



- SAMPLING LOCATION**
- ⊗ Excavation
 - Pipe
 - Soil Boring
 - UNDERGROUND STORAGE TANK (UST), REMOVED
 - CATCH BASIN
 - ▣ OIL-WATER SEPARATOR (OWS)
 - - - FENCE
 - FUEL LINE
 - SANITARY SEWER LINE
 - STORM SEWER LINE
 - ▭ CORRECTIVE ACTION AREA (CAA)
 - ⋯ CERCLA SITE BOUNDARY
 - # ENVIRONMENTAL BASELINE SURVEY (EBS) PARCEL AND NUMBER
 - LAND COVER
 - BUILDING, REMOVED

Notes:
 CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act of 1980
 VOC = Volatile Organic Compound

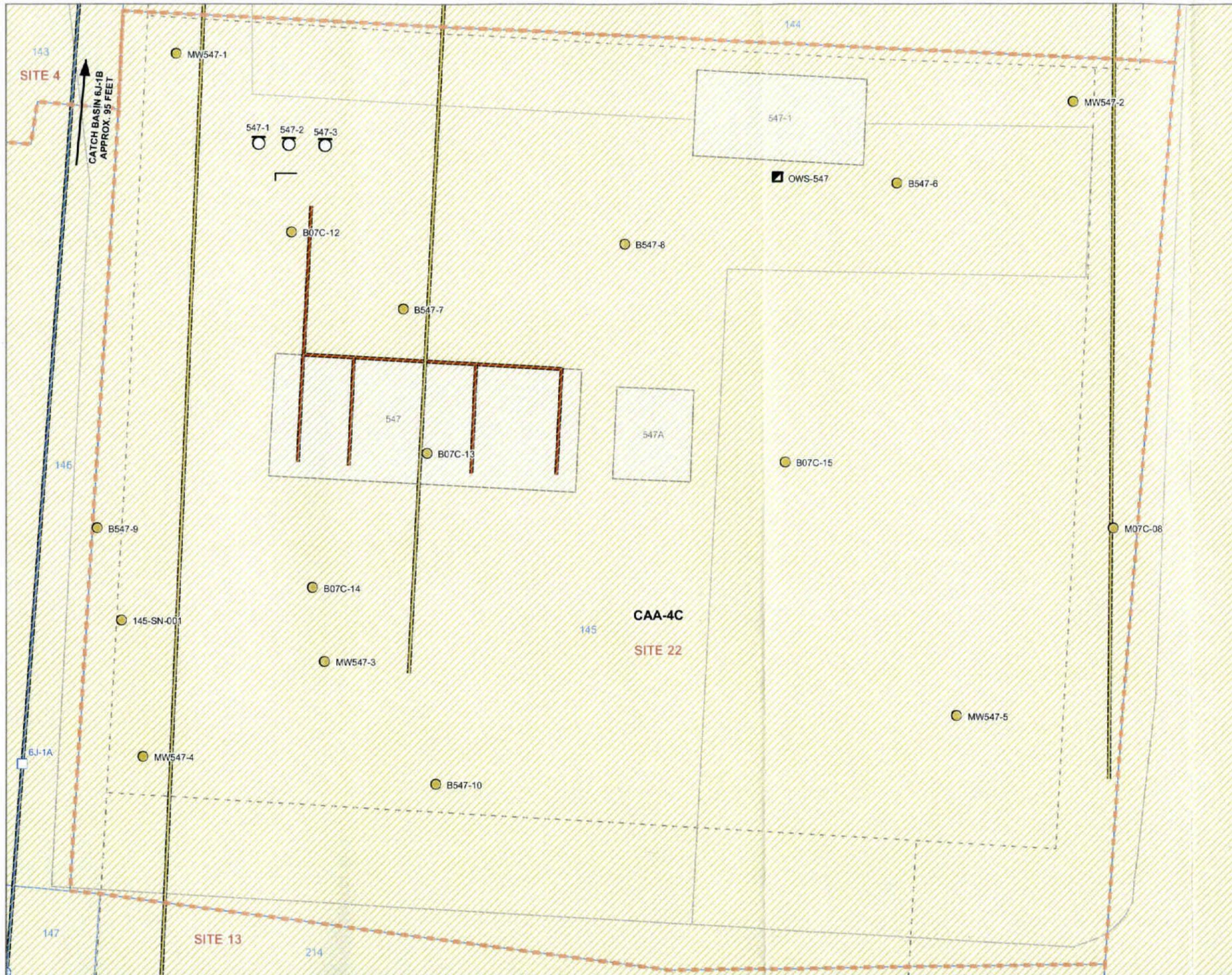


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FIGURE 8-6A
SITE 22 SAMPLING LOCATIONS
FOR VOCs IN SOIL

Operable Unit 2A
 Remedial Investigation Report



- SAMPLING LOCATION**
- Soil Boring
 - UNDERGROUND STORAGE TANK (UST), REMOVED
 - CATCH BASIN
 - OIL-WATER SEPARATOR (OWS)
 - - - FENCE
 - FUEL LINE
 - SANITARY SEWER LINE
 - STORM SEWER LINE
 - CORRECTIVE ACTION AREA (CAA)
 - CERCLA SITE BOUNDARY
 - # ENVIRONMENTAL BASELINE SURVEY (EBS) PARCEL AND NUMBER
 - LAND COVER
 - BUILDING, REMOVED

Notes:
 CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act of 1980
 SVOC = Semivolatile Organic Compound



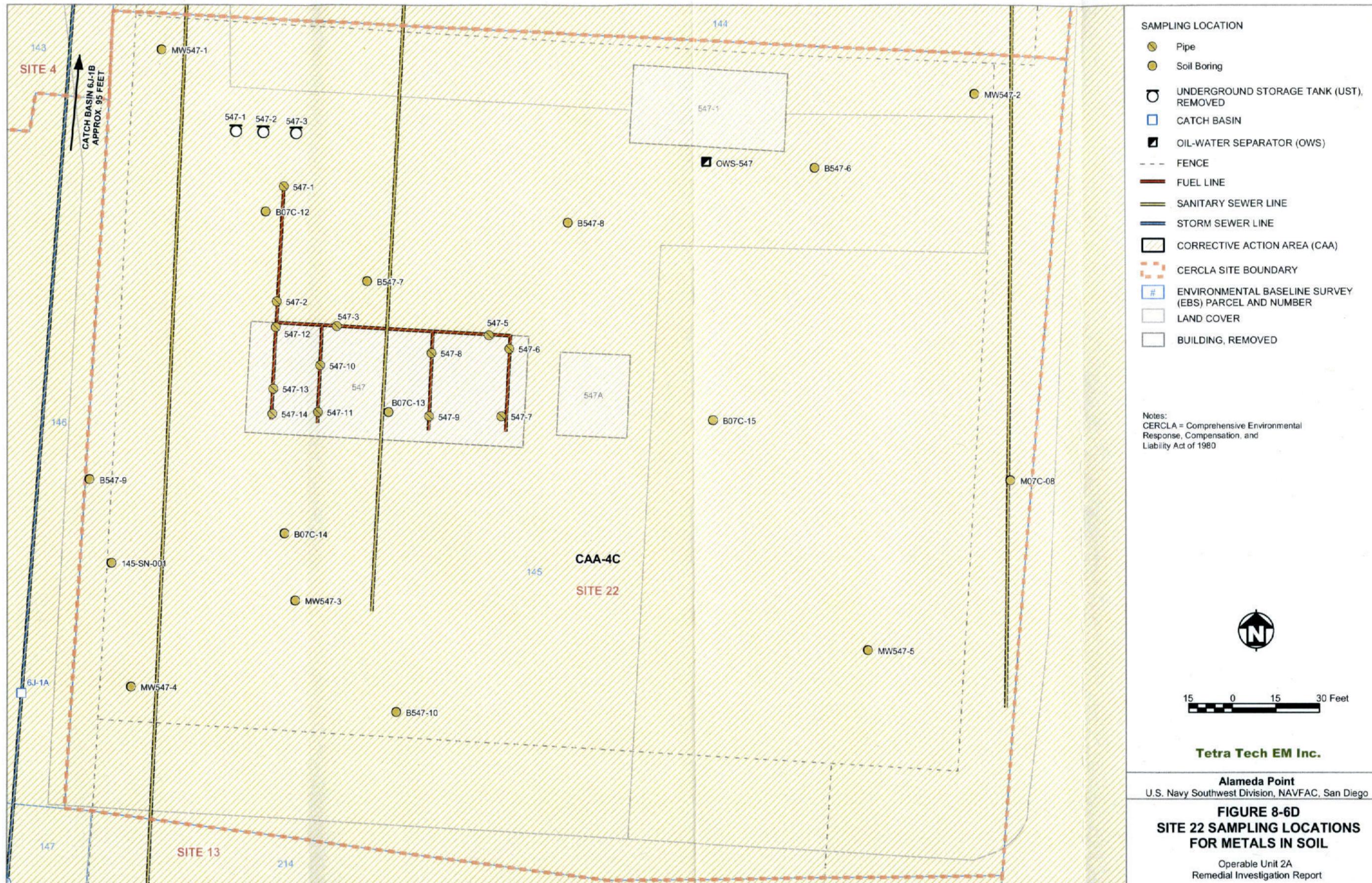
Tetra Tech EM Inc.

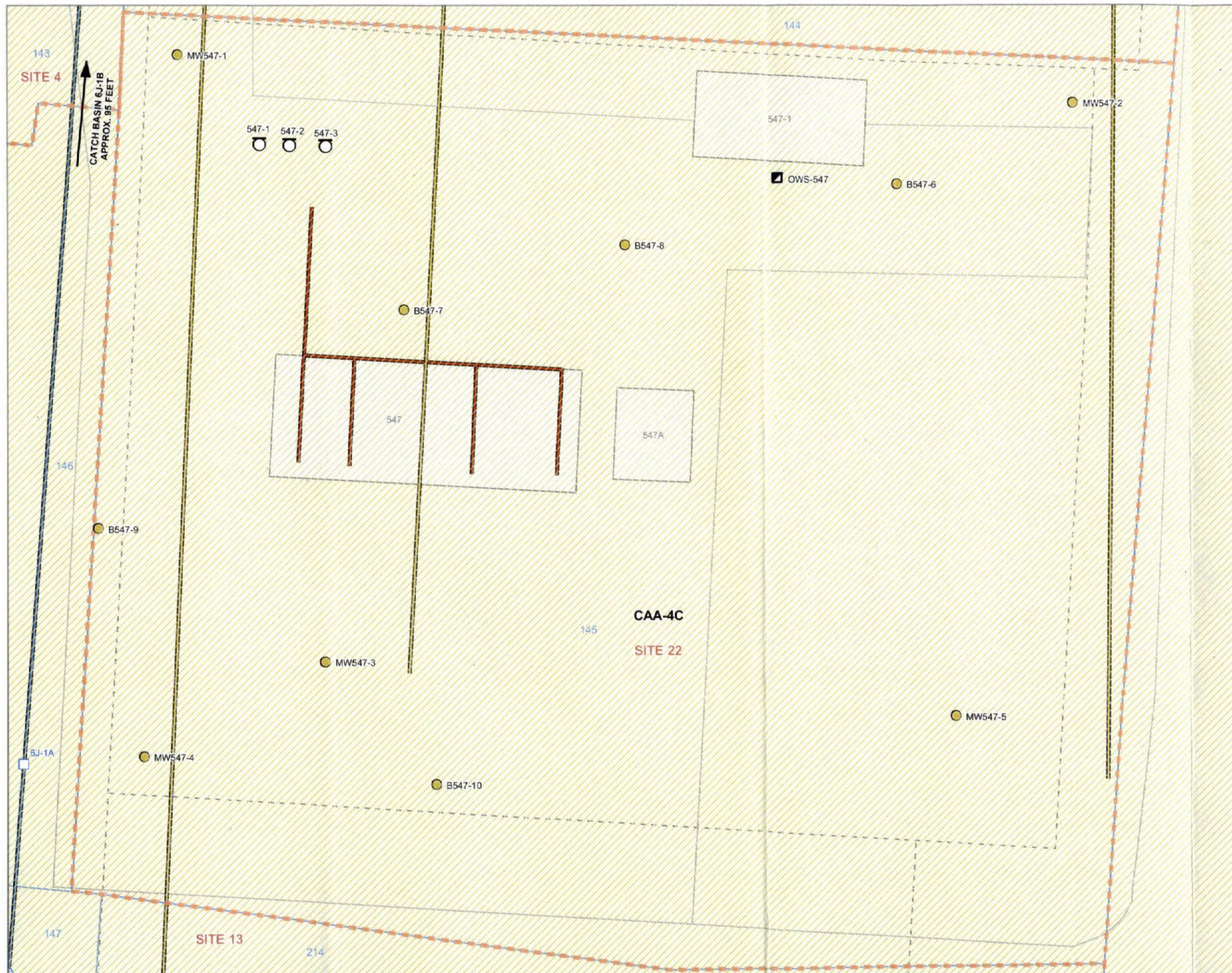
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FIGURE 8-6B
SITE 22 SAMPLING LOCATIONS
FOR SVOCs IN SOIL

Operable Unit 2A
 Remedial Investigation Report

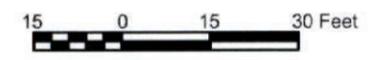






- SAMPLING LOCATION**
- Soil Boring
 - UNDERGROUND STORAGE TANK (UST), REMOVED
 - CATCH BASIN
 - OIL-WATER SEPARATOR (OWS)
 - FENCE
 - FUEL LINE
 - SANITARY SEWER LINE
 - STORM SEWER LINE
 - CORRECTIVE ACTION AREA (CAA)
 - CERCLA SITE BOUNDARY
 - ENVIRONMENTAL BASELINE SURVEY (EBS) PARCEL AND NUMBER
 - LAND COVER
 - BUILDING, REMOVED

Notes:
 CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act of 1980

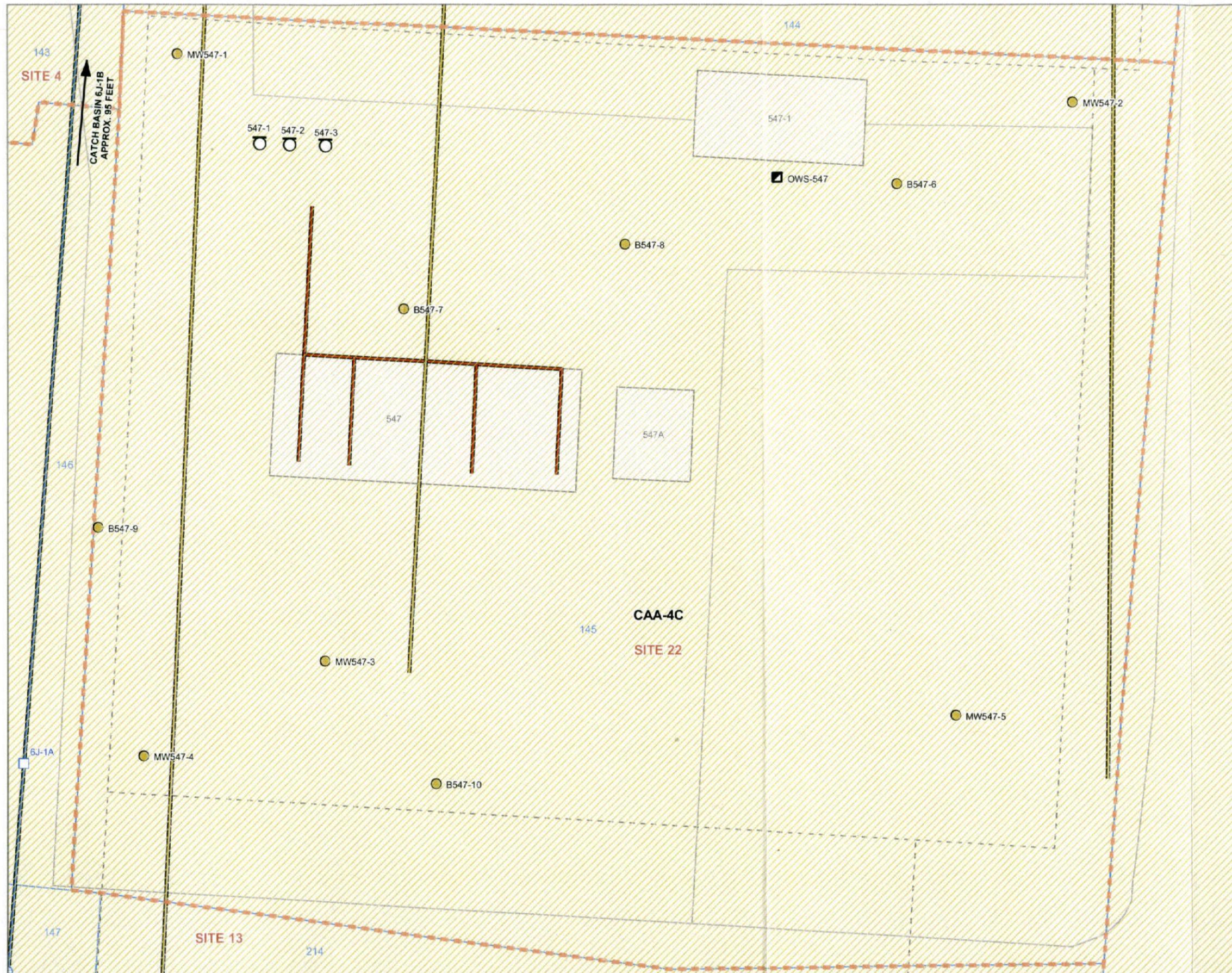


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FIGURE 8-6E
SITE 22 SAMPLING LOCATIONS
FOR PESTICIDES IN SOIL

Operable Unit 2A
 Remedial Investigation Report



SAMPLING LOCATION

- Soil Boring
- UNDERGROUND STORAGE TANK (UST), REMOVED
- CATCH BASIN
- OIL-WATER SEPARATOR (OWS)
- FENCE
- FUEL LINE
- SANITARY SEWER LINE
- STORM SEWER LINE
- CORRECTIVE ACTION AREA (CAA)
- CERCLA SITE BOUNDARY
- ENVIRONMENTAL BASELINE SURVEY (EBS) PARCEL AND NUMBER
- LAND COVER
- BUILDING, REMOVED

Notes:
 CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act of 1980
 PCB = Polychlorinated biphenyl



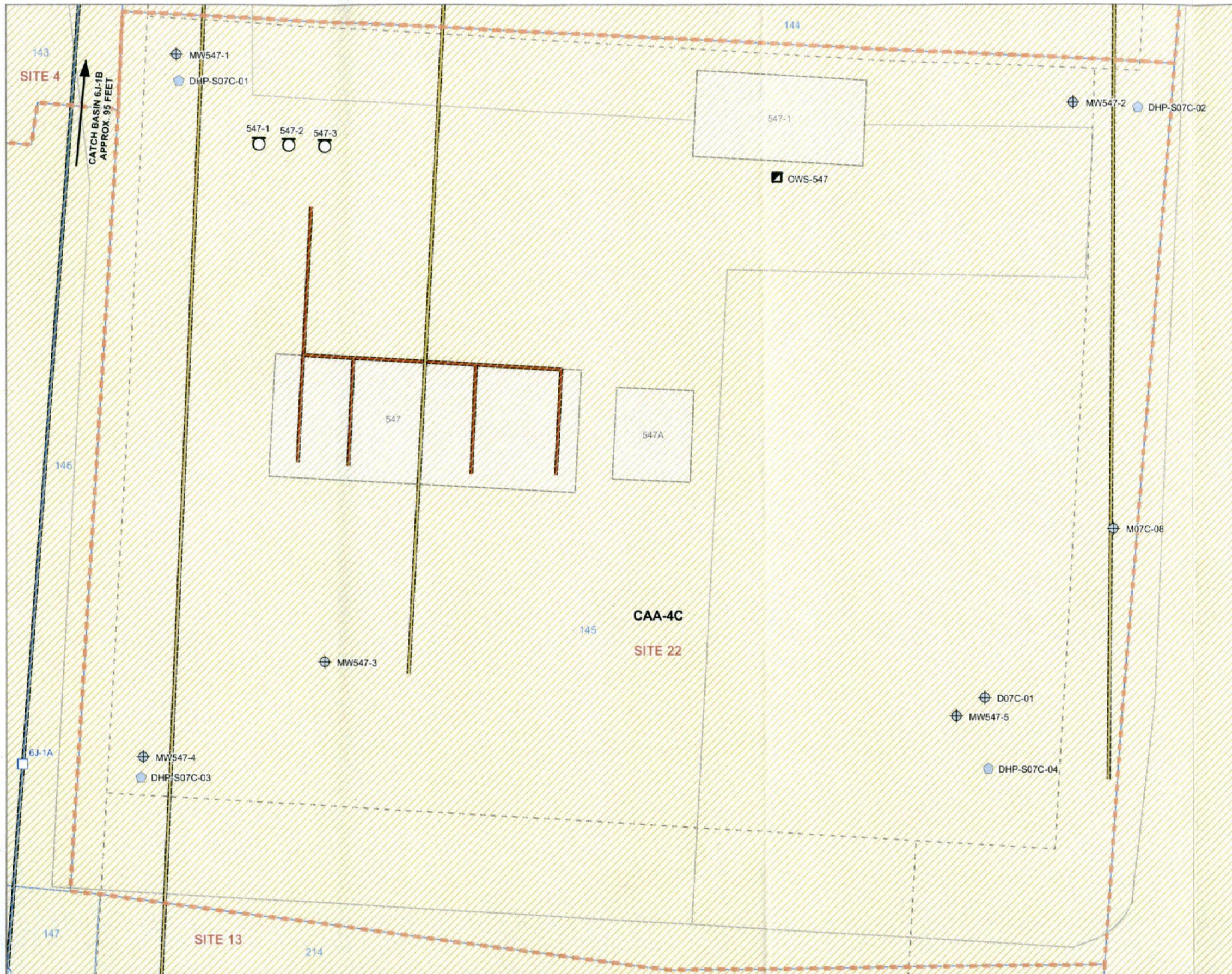
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FIGURE 8-6F
SITE 22 SAMPLING LOCATIONS
FOR PCBs IN SOIL

Operable Unit 2A
 Remedial Investigation Report





- SAMPLING LOCATION**
- Hydropunch
 - Monitoring Well
 - UNDERGROUND STORAGE TANK (UST), REMOVED
 - CATCH BASIN
 - OIL-WATER SEPARATOR (OWS)
 - FENCE
 - FUEL LINE
 - SANITARY SEWER LINE
 - STORM SEWER LINE
 - CORRECTIVE ACTION AREA (CAA)
 - CERCLA SITE BOUNDARY
 - ENVIRONMENTAL BASELINE SURVEY (EBS) PARCEL AND NUMBER
 - LAND COVER
 - BUILDING, REMOVED

Notes:
 CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act of 1980
 SVOC = Semivolatile Organic Compound



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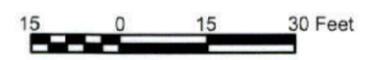
FIGURE 8-6H
SITE 22 SAMPLING LOCATIONS
FOR SVOCs IN GROUNDWATER

Operable Unit 2A
 Remedial Investigation Report



- PAH SAMPLE LOCATION**
- Direct-Push
 - UNDERGROUND STORAGE TANK (UST), REMOVED
 - CATCH BASIN
 - OIL-WATER SEPARATOR (OWS)
 - FENCE
 - FUEL LINE
 - SANITARY SEWER LINE
 - STORM SEWER LINE
 - CORRECTIVE ACTION AREA (CAA)
 - CERCLA SITE BOUNDARY
 - ENVIRONMENTAL BASELINE SURVEY (EBS) PARCEL AND NUMBER
 - LAND COVER
- BUILDING**
- Present
 - Removed

Notes:
 CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act of 1980
 PAH = Polynuclear aromatic hydrocarbon

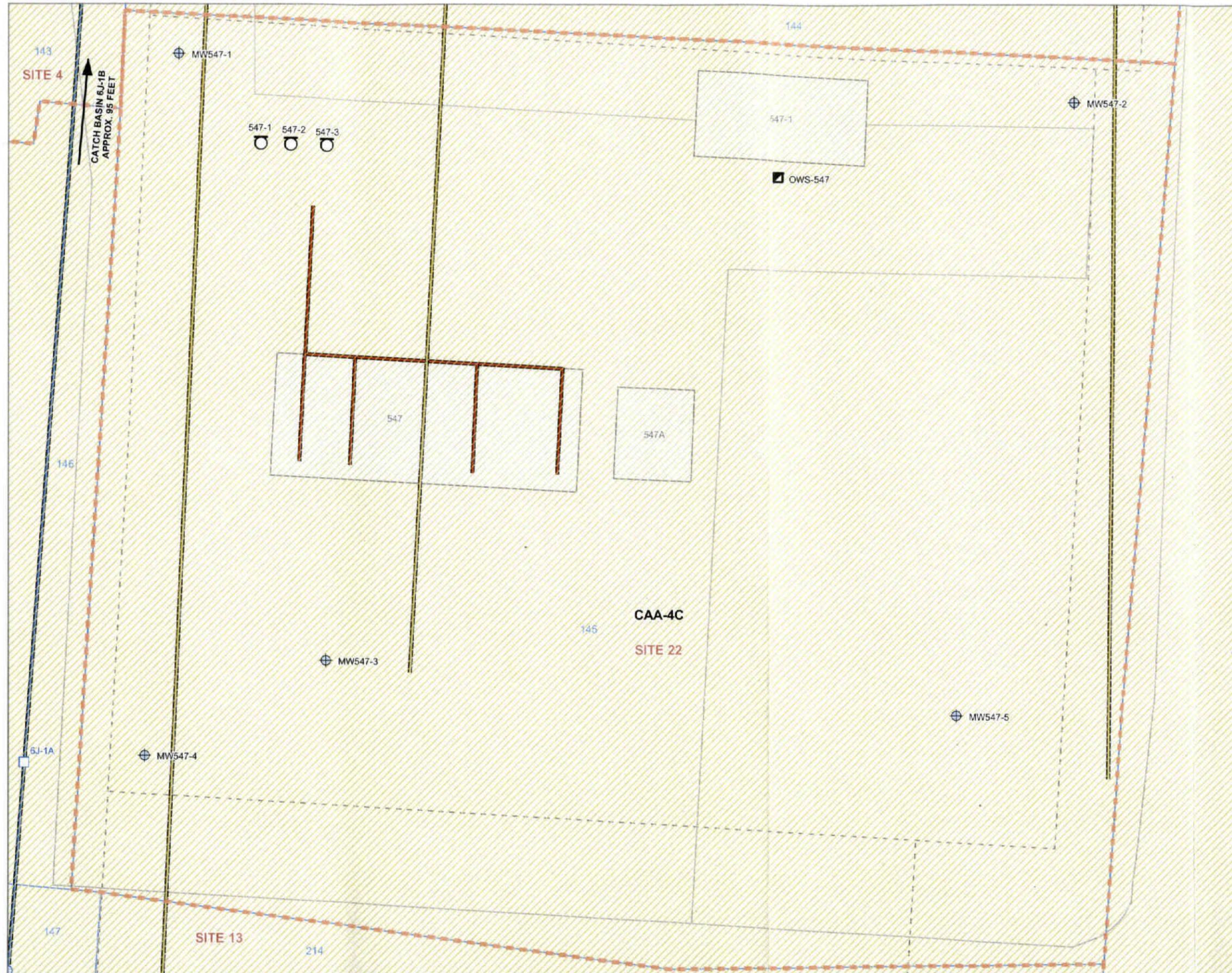


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FIGURE 8-6I
SITE 22 SAMPLING LOCATIONS
FOR PAHs IN GROUNDWATER

Operable Unit 2A
 Remedial Investigation Report



- SAMPLING LOCATION**
- ⊕ Monitoring Well
 - UNDERGROUND STORAGE TANK (UST), REMOVED
 - CATCH BASIN
 - OIL-WATER SEPARATOR (OWS)
 - - - FENCE
 - FUEL LINE
 - SANITARY SEWER LINE
 - STORM SEWER LINE
 - CORRECTIVE ACTION AREA (CAA)
 - ⊞ CERCLA SITE BOUNDARY
 - # ENVIRONMENTAL BASELINE SURVEY (EBS) PARCEL AND NUMBER
 - LAND COVER
 - BUILDING, REMOVED

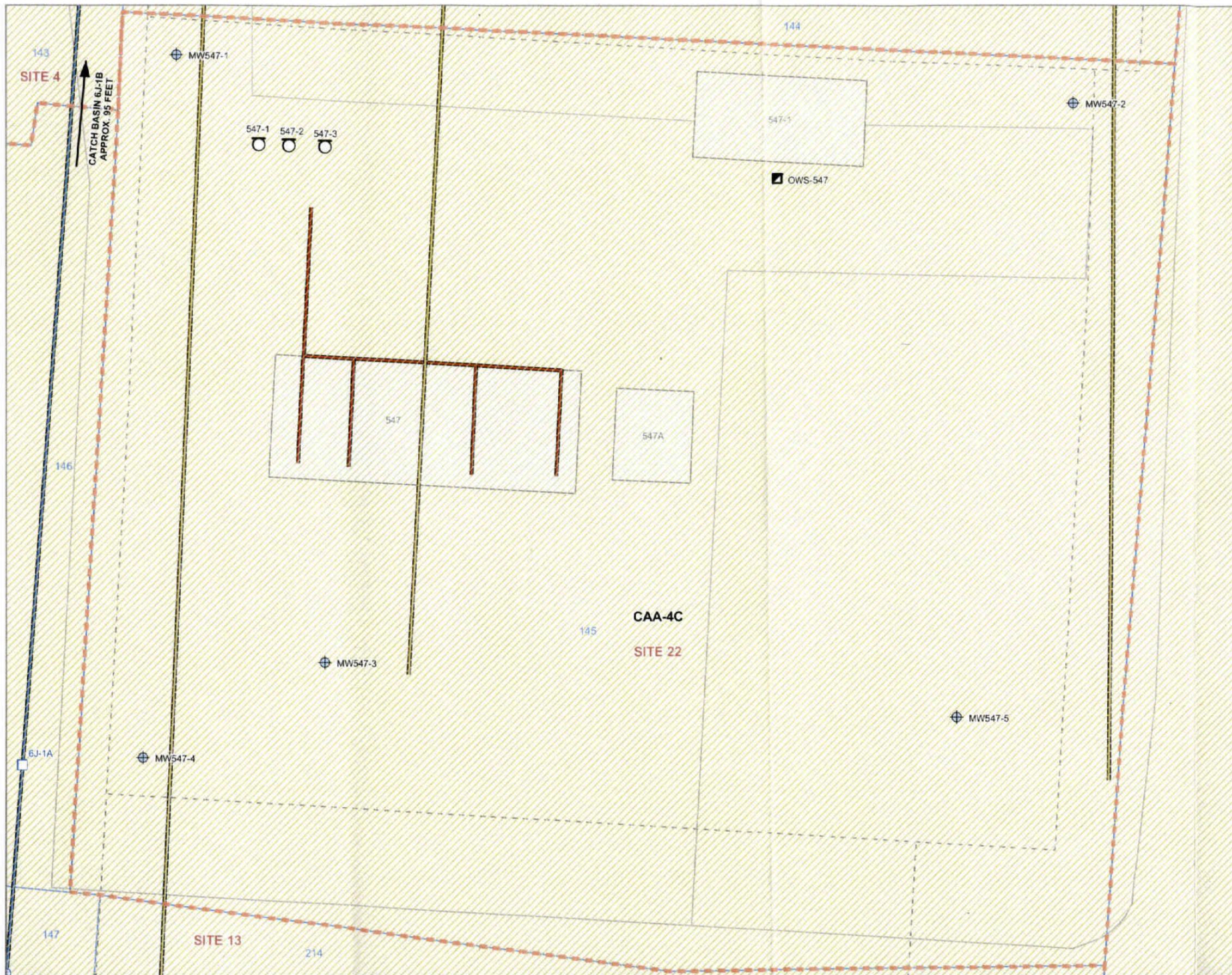
Notes:
 CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act of 1980



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FIGURE 8-6J
SITE 22 SAMPLING LOCATIONS
FOR PESTICIDES IN GROUNDWATER
 Operable Unit 2A
 Remedial Investigation Report



- SAMPLING LOCATION**
- ⊕ Monitoring Well
 - UNDERGROUND STORAGE TANK (UST), REMOVED
 - CATCH BASIN
 - ▣ OIL-WATER SEPARATOR (OWS)
 - - - FENCE
 - FUEL LINE
 - SANITARY SEWER LINE
 - STORM SEWER LINE
 - ▭ CORRECTIVE ACTION AREA (CAA)
 - ⬢ CERCLA SITE BOUNDARY
 - # ENVIRONMENTAL BASELINE SURVEY (EBS) PARCEL AND NUMBER
 - LAND COVER
 - BUILDING, REMOVED

Notes:
 CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act of 1980
 PCB = Polychlorinated biphenyl

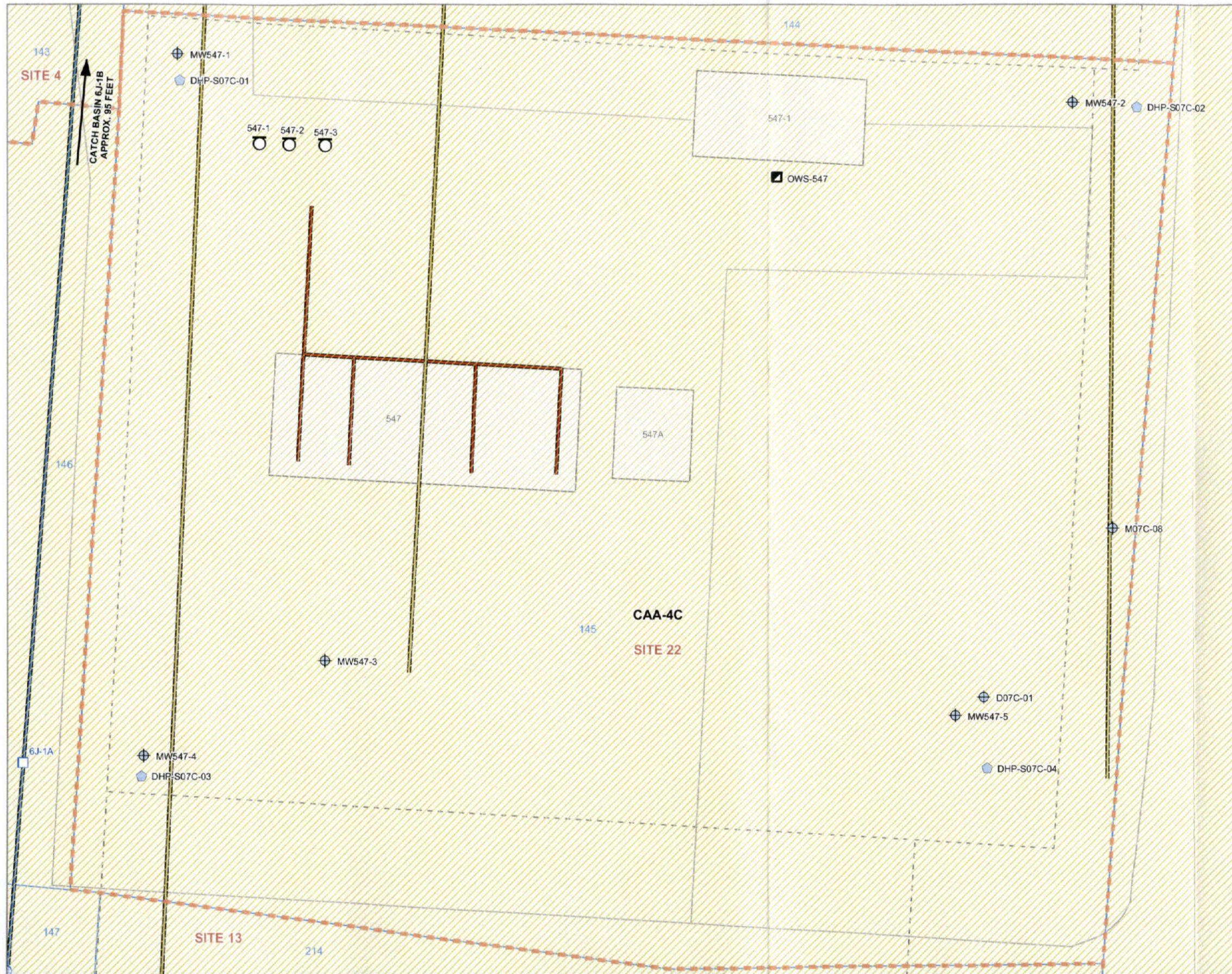


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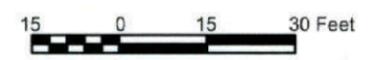
FIGURE 8-6K
SITE 22 SAMPLING LOCATIONS
FOR PCBs IN GROUNDWATER

Operable Unit 2A
 Remedial Investigation Report



- SAMPLING LOCATION**
- Hydropunch
 - Monitoring Well
 - UNDERGROUND STORAGE TANK (UST), REMOVED
 - CATCH BASIN
 - OIL-WATER SEPARATOR (OWS)
 - FENCE
 - FUEL LINE
 - SANITARY SEWER LINE
 - STORM SEWER LINE
 - CORRECTIVE ACTION AREA (CAA)
 - CERCLA SITE BOUNDARY
 - ENVIRONMENTAL BASELINE SURVEY (EBS) PARCEL AND NUMBER
 - LAND COVER
 - BUILDING, REMOVED

Notes:
 CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act of 1980

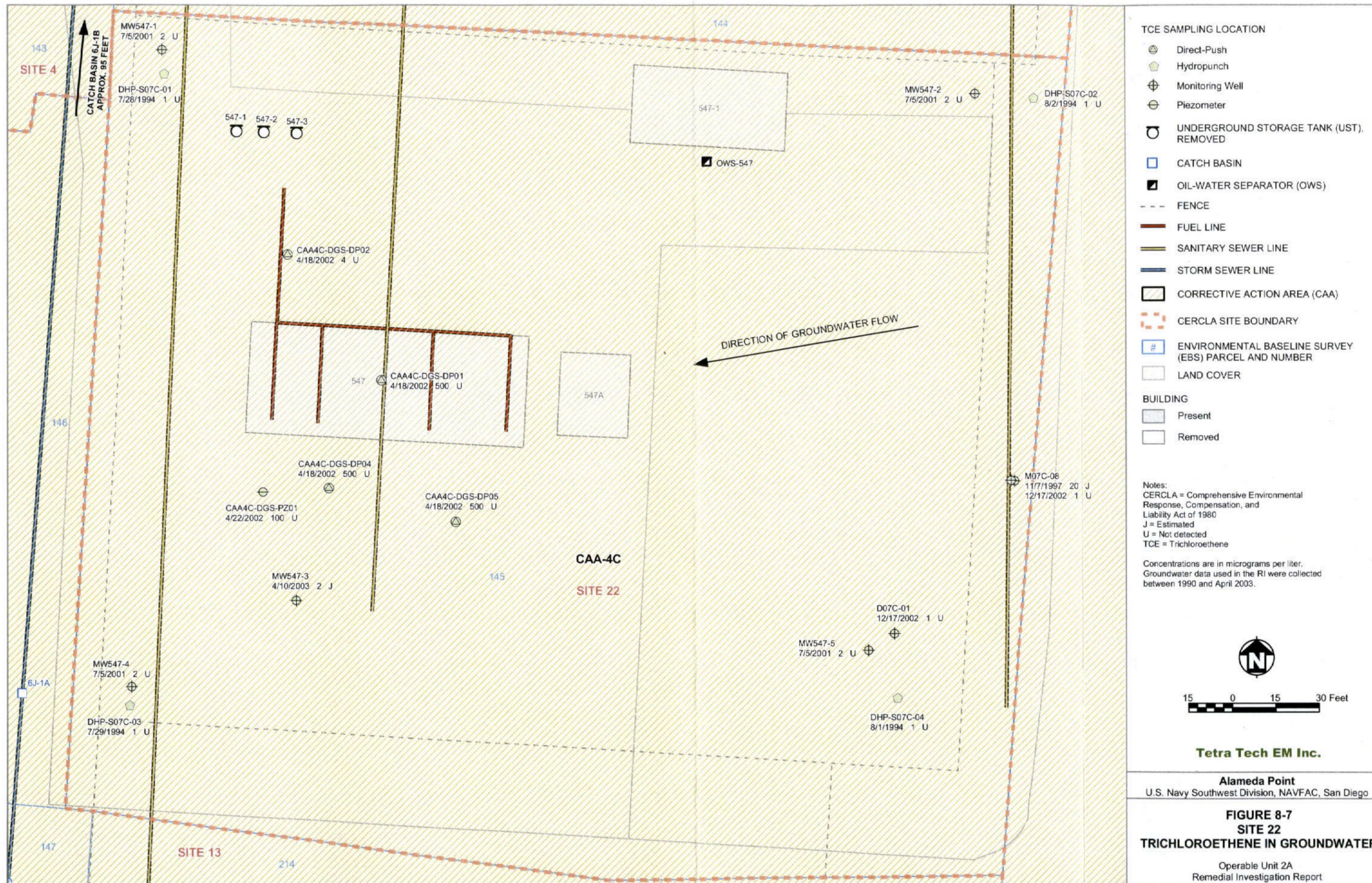


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FIGURE 8-6L
SITE 22 SAMPLING LOCATIONS
FOR METALS IN GROUNDWATER

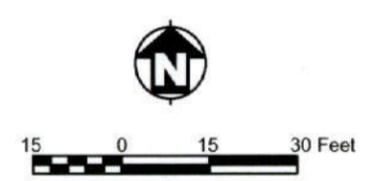
Operable Unit 2A
 Remedial Investigation Report



- TCE SAMPLING LOCATION**
- ⊕ Direct-Push
 - ⊕ Hydropunch
 - ⊕ Monitoring Well
 - ⊕ Piezometer
 - UNDERGROUND STORAGE TANK (UST), REMOVED
 - CATCH BASIN
 - ▣ OIL-WATER SEPARATOR (OWS)
 - - - FENCE
 - FUEL LINE
 - SANITARY SEWER LINE
 - STORM SEWER LINE
 - ▨ CORRECTIVE ACTION AREA (CAA)
 - ⋯ CERCLA SITE BOUNDARY
 - # ENVIRONMENTAL BASELINE SURVEY (EBS) PARCEL AND NUMBER
 - LAND COVER
- BUILDING**
- ▨ Present
 - Removed

Notes:
 CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act of 1980
 J = Estimated
 U = Not detected
 TCE = Trichloroethene

Concentrations are in micrograms per liter.
 Groundwater data used in the RI were collected between 1990 and April 2003.



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FIGURE 8-7
SITE 22
TRICHLOROETHENE IN GROUNDWATER

Operable Unit 2A
 Remedial Investigation Report

TABLE 8-1: SITE 22 SOIL SAMPLING SUMMARY

Remedial Investigation Report for Sites 9, 13, 19, 22, and 23, Alameda Point, Alameda, California

Page 1 of 8

SAMPLE LOCATION	SAMPLE IDENTIFICATION	DATE SAMPLED	DEPTH (ft bgs)	ANALYSES PERFORMED						
				SVOC	VOC	PAH	Pesticides/PCB	Total Metals	General Chemistry	TPH
REMEDIAL INVESTIGATION										
Phases 1 & 2A Investigation, 1991										
B547-6	B547-6 [2.0-2.5]	07/02/1990	2 - 2.5	X	--	--	X	X	--	--
	B547-6 [2.5-3.0]	07/02/1990	2.5 - 3	--	--	--	--	--	X	X
	B547-6 [3.5-4.0]	07/02/1990	3.5 - 4	--	--	--	--	--	X	X
	B547-6 [4.5-5.0]	07/02/1990	4.5 - 5	X	X	--	--	--	--	--
	B547-6 [5.0-5.5]	07/02/1990	5 - 5.5	--	--	--	X	X	--	X
	B547-6 [6.0-6.5]	07/02/1990	6 - 6.5	X	X	--	--	--	--	--
	B547-6 [6.5-7.0]	07/02/1990	6.5 - 7	--	--	--	X	X	--	X
	B547-6 [9.0-9.5]	07/02/1990	9 - 9.5	X	X	--	--	--	--	--
	B547-6 [9.5-10.0]	07/02/1990	9.5 - 10	--	--	--	X	X	--	X
	B547-6 [11.0-11.5]	07/02/1990	11 - 11.5	X	X	--	--	--	--	--
	B547-6 [11.5-12.0]	07/02/1990	11.5 - 12	--	--	--	X	X	--	X
	B547-6 [14.0-14.5]	07/02/1990	14 - 14.5	X	X	--	--	--	--	--
	B547-6 [14.5-15.0]	07/02/1990	14.5 - 15	--	--	--	X	X	--	X
B547-7	B547-7 [0.5-1.0]	06/28/1990	0.5 - 1	X	--	--	X	X	--	X
	B547-7 [1.0-1.5]	06/28/1990	1 - 1.5	--	--	--	--	--	X	--
	B547-7 [2.0-2.5]	06/28/1990	2 - 2.5	X	X	--	--	--	--	--
	B547-7 [2.5-3.0]	06/28/1990	2.5 - 3	--	--	--	X	X	X	X
	B547-7 [5.0-5.5]	06/28/1990	5 - 5.5	X	X	--	--	--	--	--
	B547-7 [5.5-6.0]	06/28/1990	5.5 - 6	--	--	--	X	X	--	X
	B547-7 [8.0-8.5]	06/28/1990	8 - 8.5	X	X	--	--	--	--	--
	B547-7 [8.5-9.0]	06/28/1990	8.5 - 9	--	--	--	X	X	--	X
	B547-7 [9.0-9.5]	06/28/1990	9 - 9.5	--	--	--	X	X	--	X
	B547-7 [11.0-11.5]	06/28/1990	11 - 11.5	X	X	--	--	--	--	--
	B547-7 [11.5-12.0]	06/28/1990	11.5 - 12	--	--	--	X	X	--	X
	B547-7 [14.0-14.5]	06/28/1990	14 - 14.5	X	X	--	--	--	--	--
	B547-7 [14.5-15.0]	06/28/1990	14.5 - 15	--	--	--	X	X	--	X
B547-8	B547-8 [1.0-1.5]	07/03/1990	1 - 1.5	X	--	--	X	X	--	--
	B547-8 [2.0-2.5]	07/03/1990	2 - 2.5	--	--	--	--	--	X	X
	B547-8 [3.5-4.0]	07/03/1990	3.5 - 4	X	X	--	--	--	--	--
	B547-8 [4.0-4.5]	07/03/1990	4 - 4.5	--	--	--	X	X	X	X
	B547-8 [5.0-5.5]	07/03/1990	5 - 5.5	X	X	--	--	--	--	--
	B547-8 [5.5-6.0]	07/03/1990	5.5 - 6	--	--	--	X	X	--	X

TABLE 8-1: SITE 22 SOIL SAMPLING SUMMARY

Remedial Investigation Report for Sites 9, 13, 19, 22, and 23, Alameda Point, Alameda, California

Page 2 of 8

SAMPLE LOCATION	SAMPLE IDENTIFICATION	DATE SAMPLED	DEPTH (ft bgs)	ANALYSES PERFORMED						
				SVOC	VOC	PAH	Pesticides/PCB	Total Metals	General Chemistry	TPH
Phases 1 & 2A Investigation, 1991 (Continued)										
B547-8	B547-8 [8.0-8.5]	07/03/1990	8 - 8.5	X	X	--	--	--	--	--
(Continued)	B547-8 [8.5-9.0]	07/03/1990	8.5 - 9	--	--	--	X	X	--	X
	B547-8 [11.0-11.5]	07/03/1990	11 - 11.5	X	X	--	--	--	--	--
	B547-8 [11.5-12.0]	07/03/1990	11.5 - 12	--	--	--	X	X	--	X
	B547-8 [12.5-13.0]	07/03/1990	12.5 - 13	X	X	--	--	--	--	--
	B547-8 [13.0-13.5]	07/03/1990	13 - 13.5	--	--	--	X	X	--	X
B547-9	B547-9 [1.0-1.5]	07/02/1990	1 - 1.5	X	--	--	X	X	--	--
	B547-9 [2.5-3.0]	07/03/1990	2.5 - 3	--	--	--	--	--	X	X
	B547-9 [3.5-4.0]	07/02/1990	3.5 - 4	X	X	--	--	--	--	--
	B547-9 [4.0-4.5]	07/02/1990	4 - 4.5	--	--	--	X	X	X	X
	B547-9 [5.0-5.5]	07/02/1990	5 - 5.5	X	X	--	--	--	--	--
	B547-9 [5.5-6.0]	07/02/1990	5.5 - 6	--	--	--	X	X	--	X
	B547-9 [8.0-8.5]	07/02/1990	8 - 8.5	X	X	--	--	--	--	--
	B547-9 [8.5-9.0]	07/02/1990	8.5 - 9	--	--	--	X	X	--	X
	B547-9 [11.0-11.5]	07/02/1990	11 - 11.5	X	--	--	--	--	--	--
	B547-9 [11.5-12.0]	07/02/1990	11.5 - 12	--	--	--	--	X	--	X
	B547-9 [14.0-14.5]	07/02/1990	14 - 14.5	X	X	--	--	--	--	--
	B547-9 [14.5-15.0]	07/02/1990	14.5 - 15	--	--	--	X	X	--	X
B547-10	B547-10 [0.5-1.0]	07/02/1990	0.5 - 1	X	--	--	X	X	--	--
	B547-10 [1.0-1.5]	07/02/1990	1 - 1.5	--	--	--	--	--	X	X
	B547-10 [2.0-2.5]	07/02/1990	2 - 2.5	X	X	--	--	--	--	--
	B547-10 [2.5-3.0]	07/02/1990	2.5 - 3	--	--	--	X	X	X	X
	B547-10 [5.0-5.5]	07/02/1990	5 - 5.5	X	X	--	--	--	--	--
	B547-10 [5.5-6.0]	07/02/1990	5.5 - 6	--	--	--	X	X	--	X
	B547-10 [8.0-8.5]	07/02/1990	8 - 8.5	X	X	--	--	--	--	--
	B547-10 [8.5-9.0]	07/02/1990	8.5 - 9	--	--	--	X	X	--	X
	B547-10 [11.0-11.5]	07/02/1990	11 - 11.5	X	X	--	--	--	--	--
	B547-10 [11.5-12.0]	07/02/1990	11.5 - 12	--	--	--	X	X	--	X
	B547-10 [14.0-14.5]	07/02/1990	14 - 14.5	X	X	--	--	--	--	--
	B547-10 [14.5-15.0]	07/02/1990	14.5 - 15	--	--	--	X	X	--	X
MW547-1	MW547-1 [0.5-1.0]	06/29/1990	0.5 - 1	X	--	--	X	X	--	X
	MW547-1 [1.0-1.5]	06/29/1990	1 - 1.5	--	--	--	--	--	X	--
	MW547-1 [2.0-2.5]	06/29/1990	2 - 2.5	X	X	--	--	--	--	--

TABLE 8-1: SITE 22 SOIL SAMPLING SUMMARY

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SAMPLE LOCATION	SAMPLE IDENTIFICATION	DATE SAMPLED	DEPTH (ft bgs)	ANALYSES PERFORMED						
				SVOC	VOC	PAH	Pesticides/PCB	Total Metals	General Chemistry	TPH
Phases 1 & 2A Investigation, 1991 (Continued)										
MW547-1	MW547-1 [2.5-3.0]	06/29/1990	2.5 - 3	--	--	--	X	X	X	X
(Continued)	MW547-1 [4.5-5.0]	06/29/1990	4.5 - 5	X	X	--	--	--	--	--
	MW547-1 [5.0-5.5]	06/29/1990	5 - 5.5	--	--	--	X	X	--	X
	MW547-1 [8.0-8.5]	06/29/1990	8 - 8.5	X	X	--	--	--	--	--
	MW547-1 [8.5-9.0]	06/29/1990	8.5 - 9	--	--	--	X	X	--	X
	MW547-1 [11.0-11.5]	06/29/1990	11 - 11.5	X	X	--	--	--	--	--
	MW547-1 [11.5-12.0]	06/29/1990	11.5 - 12	--	--	--	X	X	--	X
	MW547-1 [14.0-14.5]	06/29/1990	14 - 14.5	X	X	--	--	--	--	--
	MW547-1 [14.5-15.0]	06/29/1990	14.5 - 15	--	--	--	X	X	--	X
MW547-2	MW547-2 [0.5-1.0]	06/29/1990	0.5 - 1	X	--	--	X	X	--	X
	MW547-2 [1.5-2.0]	06/29/1990	1.5 - 2	--	--	--	--	--	X	--
	MW547-2 [2.0-2.5]	06/29/1990	2 - 2.5	X	X	--	--	--	--	--
	MW547-2 [2.5-3.0]	06/29/1990	2.5 - 3	--	--	--	X	X	X	X
	MW547-2 [5.0-5.5]	06/29/1990	5 - 5.5	X	--	--	--	--	--	--
	MW547-2 [5.5-6.0]	06/29/1990	5.5 - 6	X	X	--	--	--	--	--
	MW547-2 [6.0-6.5]	06/29/1990	6 - 6.5	--	--	--	X	X	--	X
	MW547-2 [6.5-7.0]	06/29/1990	6.5 - 7	--	--	--	X	X	--	X
	MW547-2 [9.5-10.0]	06/29/1990	9.5 - 10	X	X	--	--	--	--	--
	MW547-2 [10.0-10.5]	06/29/1990	10 - 10.5	--	--	--	X	X	--	X
	MW547-2 [12.5-13.0]	06/29/1990	12.5 - 13	X	X	--	--	--	--	--
	MW547-2 [13.0-13.5]	06/29/1990	13 - 13.5	--	--	--	X	X	--	X
	MW547-2 [14.0-14.5]	06/29/1990	14 - 14.5	X	X	--	--	--	--	--
	MW547-2 [14.5-15.0]	06/29/1990	14.5 - 15	--	--	--	X	X	--	X
MW547-3	MW547-3 [1.0-1.5]	07/02/1990	1 - 1.5	X	--	--	X	X	--	--
	MW547-3 [2.0-2.5]	07/13/1990	2 - 2.5	--	--	--	--	--	X	X
	MW547-3 [3.5-4.0]	07/02/1990	3.5 - 4	X	X	--	--	--	--	--
	MW547-3 [4.0-4.5]	07/02/1990	4 - 4.5	--	--	--	X	X	X	X
	MW547-3 [5.0-5.5]	07/02/1990	5 - 5.5	X	X	--	--	--	--	--
	MW547-3 [5.5-6.0]	07/02/1990	5.5 - 6	--	--	--	X	X	--	X
	MW547-3 [8.0-8.5]	07/02/1990	8 - 8.5	X	X	--	--	--	--	--
	MW547-3 [8.5-9.0]	07/02/1990	8.5 - 9	--	--	--	X	X	--	X
	MW547-3 [10.5-11.0]	07/02/1990	10.5 - 11	X	X	--	--	--	--	--
	MW547-3 [11.0-11.5]	07/13/1990	11 - 11.5	--	--	--	X	--	--	X

TABLE 8-1: SITE 22 SOIL SAMPLING SUMMARY

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SAMPLE LOCATION	SAMPLE IDENTIFICATION	DATE SAMPLED	DEPTH (ft bgs)	ANALYSES PERFORMED						
				SVOC	VOC	PAH	Pesticides/PCB	Total Metals	General Chemistry	TPH
Phases 1 & 2A Investigation, 1991 (Continued)										
MW547-3	MW547-3 [11.5-12.0]	07/02/1990	11.5 - 12	X	--	--	X	--	--	X
(Continued)	MW547-3 [14.0-14.5]	07/02/1990	14 - 14.5	X	X	--	--	--	--	--
	MW547-3 [14.5-15.0]	07/02/1990	14.5 - 15	--	--	--	X	X	--	X
MW547-4	MW547-4 [0.5-1.0]	06/28/1990	0.5 - 1	X	--	--	X	X	--	X
	MW547-4 [1.0-1.5]	06/28/1990	1 - 1.5	--	--	--	--	--	X	--
	MW547-4 [2.0-2.5]	06/28/1990	2 - 2.5	--	X	--	--	--	--	--
	MW547-4 [2.5-3.0]	06/29/1990	2.5 - 3	X	--	--	X	X	X	X
	MW547-4 [5.0-5.5]	06/28/1990	5 - 5.5	--	X	--	--	--	--	--
	MW547-4 [5.5-6.0]	06/28/1990	5.5 - 6	X	--	--	X	X	--	X
	MW547-4 [8.0-8.5]	06/28/1990	8 - 8.5	--	X	--	--	--	--	--
	MW547-4 [8.5-9.0]	06/28/1990	8.5 - 9	X	--	--	X	X	--	X
	MW547-4 [10.5-11.0]	06/28/1990	10.5 - 11	--	X	--	--	--	--	--
	MW547-4 [11.0-11.5]	06/28/1990	11 - 11.5	X	--	--	X	X	--	X
	MW547-4 [14.0-14.5]	06/28/1990	14 - 14.5	--	X	--	--	--	--	X
	MW547-4 [14.5-15.0]	06/28/1990	14.5 - 15	X	--	--	X	X	--	X
MW547-5	MW547-5 [0.5-1.0]	06/29/1990	0.5 - 1	X	--	--	X	X	--	X
	MW547-5 [1.0-1.5]	06/29/1990	1 - 1.5	--	--	--	--	--	X	--
	MW547-5 [2.0-2.5]	06/29/1990	2 - 2.5	X	X	--	--	--	--	--
	MW547-5 [2.5-3.0]	06/29/1990	2.5 - 3	--	--	--	X	X	X	X
	MW547-5 [5.0-5.5]	06/29/1990	5 - 5.5	X	X	--	--	--	--	--
	MW547-5 [5.5-6.0]	06/29/1990	5.5 - 6	--	--	--	X	X	--	X
	MW547-5 [8.0-8.5]	06/29/1990	8 - 8.5	X	X	--	--	--	--	--
	MW547-5 [8.5-9.0]	06/29/1990	8.5 - 9	--	--	--	X	X	--	X
	MW547-5 [10.5-11.0]	06/29/1990	10.5 - 11	X	--	--	--	--	--	--
	MW547-5 [11.0-11.5]	06/29/1990	11 - 11.5	X	X	--	--	--	--	--
	MW547-5 [11.5-12.0]	06/29/1990	11.5 - 12	--	--	--	X	X	--	X
	MW547-5 [12.0-12.5]	06/29/1990	12 - 12.5	--	--	--	X	X	--	X
	MW547-5 [14.0-14.5]	07/13/1990	14 - 14.5	X	X	--	--	--	--	--
	MW547-5 [14.5-15.0]	06/29/1990	14.5 - 15	--	--	--	X	X	--	X
Follow-on Investigation, 1994										
B07C-12	280-S7C-004	08/17/1994	0.5 - 1.5	X	X	--	--	X	X	X
	280-S7C-005	08/17/1994	2.5 - 3.5	X	X	--	--	X	X	X
	280-S7C-006	08/17/1994	5 - 6	X	X	--	--	X	X	X

TABLE 8-1: SITE 22 SOIL SAMPLING SUMMARY

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SAMPLE LOCATION	SAMPLE IDENTIFICATION	DATE SAMPLED	DEPTH (ft bgs)	ANALYSES PERFORMED						
				SVOC	VOC	PAH	Pesticides/PCB	Total Metals	General Chemistry	TPH
Follow-on Investigation, 1994 (Continued)										
B07C-13	280-S7C-007	08/23/1994	0.5 - 1.5	X	X	--	--	X	X	X
	280-S7C-008	08/23/1994	1.5 - 2.5	X	X	--	--	X	X	X
	280-S7C-009	08/23/1994	2.5 - 3.5	X	X	--	--	X	X	X
	280-S7C-010	08/23/1994	5 - 6	X	--	--	--	X	X	X
B07C-14	280-S7C-011	08/17/1994	0.5 - 1.5	X	X	--	--	X	X	X
	280-S7C-012	08/17/1994	2.5 - 3.5	X	X	--	--	X	X	X
	280-S7C-013	08/17/1994	5 - 6	X	X	--	--	X	X	X
B07C-15	280-S7C-014	08/17/1994	0.5 - 1.5	X	X	--	--	X	X	X
	280-S7C-015	08/17/1994	2.5 - 3.5	X	X	--	--	X	X	X
	280-S7C-016	08/17/1994	5 - 6	X	X	--	--	X	X	X
M07C-08	280-S7C-024	08/18/1994	0.5 - 1.5	X	X	--	--	X	X	X
	280-S7C-025	08/18/1994	2.5 - 3.5	X	X	--	--	X	X	X
	280-S7C-026	08/18/1994	5 - 5.5	X	X	--	--	X	X	X
PAH Study, 2003										
C3S022B001	C0590947	7/31/2003	0 - 0.5	--	--	X	--	--	--	--
	C0590948	7/31/2003	0.5 - 2	--	--	X	--	--	--	--
	C0590949	7/31/2003	2 - 4	--	--	X	--	--	--	--
	C0590950	7/31/2003	4 - 8	--	--	X	--	--	--	--
C3S022B002	C0590951	7/31/2003	0 - 0.5	--	--	X	--	--	--	--
	C0590952	7/31/2003	0.5 - 2	--	--	X	--	--	--	--
	C0590953	7/31/2003	2 - 4	--	--	X	--	--	--	--
	C0590954	7/31/2003	4 - 8	--	--	X	--	--	--	--
C3S022B003	C0590955	7/31/2003	0 - 0.5	--	--	X	--	--	--	--
	C0590957	7/31/2003	0.5 - 2	--	--	X	--	--	--	--
	C0590958	7/31/2003	2 - 4	--	--	X	--	--	--	--
	C0590959	7/31/2003	4 - 8	--	--	X	--	--	--	--
C3S022B004	C0590960	7/31/2003	0 - 0.5	--	--	X	--	--	--	--
	C0590961	7/31/2003	0.5 - 2	--	--	X	--	--	--	--
	C0590962	7/31/2003	2 - 4	--	--	X	--	--	--	--
C3S022B005	C0590963	7/31/2003	4 - 8	--	--	X	--	--	--	--
	C0590964	7/31/2003	0 - 0.5	--	--	X	--	--	--	--
	C0590965	7/31/2003	0.5 - 2	--	--	X	--	--	--	--
	C0590967	7/31/2003	2 - 4	--	--	X	--	--	--	--
	C0590968	7/31/2003	4 - 8	--	--	X	--	--	--	--

TABLE 8-1: SITE 22 SOIL SAMPLING SUMMARY

Remedial Investigation Report for Sites 9, 13, 19, 22, and 23, Alameda Point, Alameda, California

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SAMPLE LOCATION	SAMPLE IDENTIFICATION	DATE SAMPLED	DEPTH (ft bgs)	ANALYSES PERFORMED							
				SVOC	VOC	PAH	Pesticides/PCB	Total Metals	General Chemistry	TPH	
PAH Study, 2003 (Continued)											
C3S022B006	C0590969	7/31/2003	0 - 0.5	--	--	X	--	--	--	--	
	C0590970	7/31/2003	0.5 - 2	--	--	X	--	--	--	--	
	C0590971	7/31/2003	2 - 4	--	--	X	--	--	--	--	
	C0590972	7/31/2003	4 - 8	--	--	X	--	--	--	--	
C3S022B007	C0590973	7/31/2003	0 - 0.5	--	--	X	--	--	--	--	
	C0590974	7/31/2003	0.5 - 2	--	--	X	--	--	--	--	
	C0590975	7/31/2003	2 - 4	--	--	X	--	--	--	--	
	C0590977	7/31/2003	4 - 8	--	--	X	--	--	--	--	
C3S022B008	C0590978	7/31/2003	0 - 0.5	--	--	X	--	--	--	--	
	C0590979	7/31/2003	0.5 - 2	--	--	X	--	--	--	--	
	C0590980	7/31/2003	2 - 4	--	--	X	--	--	--	--	
	C0590981	7/31/2003	4 - 8	--	--	X	--	--	--	--	
C3S022B009	C0590982	7/31/2003	0 - 0.5	--	--	X	--	--	--	--	
	C0590983	7/31/2003	0.5 - 2	--	--	X	--	--	--	--	
	C0590984	7/31/2003	2 - 4	--	--	X	--	--	--	--	
	C0590985	7/31/2003	4 - 8	--	--	X	--	--	--	--	
C3S022B010	C0590987	7/31/2003	0 - 0.5	--	--	X	--	--	--	--	
	C0590988	7/31/2003	0.5 - 2	--	--	X	--	--	--	--	
	C0590989	7/31/2003	2 - 4	--	--	X	--	--	--	--	
	C0590990	7/31/2003	4 - 8	--	--	X	--	--	--	--	
C3S022B011	C0590991	7/31/2003	0 - 0.5	--	--	X	--	--	--	--	
	C0590992	7/31/2003	0.5 - 2	--	--	X	--	--	--	--	
	C0590993	7/31/2003	2 - 4	--	--	X	--	--	--	--	
	C0590994	7/31/2003	4 - 8	--	--	X	--	--	--	--	
C3S022B012	C0590995	7/31/2003	0 - 0.5	--	--	X	--	--	--	--	
	C0590997	7/31/2003	0.5 - 2	--	--	X	--	--	--	--	
	C0590998	7/31/2003	2 - 4	--	--	X	--	--	--	--	
	C0590999	7/31/2003	4 - 8	--	--	X	--	--	--	--	
C3S022B013	C0591000	7/31/2003	0 - 0.5	--	--	X	--	--	--	--	
	C0591001	7/31/2003	0.5 - 2	--	--	X	--	--	--	--	
	C0591002	7/31/2003	2 - 4	--	--	X	--	--	--	--	
	C0591003	7/31/2003	4 - 8	--	--	X	--	--	--	--	

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SAMPLE LOCATION	SAMPLE IDENTIFICATION	DATE SAMPLED	DEPTH (ft bgs)	ANALYSES PERFORMED						
				SVOC	VOC	PAH	Pesticides/PCB	Total Metals	General Chemistry	TPH
PAH Study, 2003 (Continued)										
C3S022B014	C0591004	7/31/2003	0 - 0.5	--	--	X	--	--	--	--
	C0591005	7/31/2003	0.5 - 2	--	--	X	--	--	--	--
	C0591007	7/31/2003	2 - 4	--	--	X	--	--	--	--
	C0591008	7/31/2003	4 - 8	--	--	X	--	--	--	--
C3S022B015	C0591009	7/31/2003	0 - 0.5	--	--	X	--	--	--	--
	C0591010	7/31/2003	0.5 - 2	--	--	X	--	--	--	--
	C0591011	7/31/2003	2 - 4	--	--	X	--	--	--	--
	C0591012	7/31/2003	4 - 8	--	--	X	--	--	--	--
C3S022B016	C0591013	7/31/2003	0 - 0.5	--	--	X	--	--	--	--
	C0591014	7/31/2003	0.5 - 2	--	--	X	--	--	--	--
	C0591015	7/31/2003	2 - 4	--	--	X	--	--	--	--
	C0591017	7/31/2003	4 - 8	--	--	X	--	--	--	--
C3S022B017	C0591018	7/31/2003	0 - 0.5	--	--	X	--	--	--	--
	C0591019	7/31/2003	0.5 - 2	--	--	X	--	--	--	--
	C0591020	7/31/2003	2 - 4	--	--	X	--	--	--	--
	C0591021	7/31/2003	4 - 8	--	--	X	--	--	--	--
C3S022B018	C0591022	7/31/2003	0 - 0.5	--	--	X	--	--	--	--
	C0591023	7/31/2003	0.5 - 2	--	--	X	--	--	--	--
	C0591024	7/31/2003	2 - 4	--	--	X	--	--	--	--
	C0591025	7/31/2003	4 - 8	--	--	X	--	--	--	--
C3S022B019	C0591027	7/31/2003	0 - 0.5	--	--	X	--	--	--	--
	C0591028	7/31/2003	0.5 - 2	--	--	X	--	--	--	--
	C0591029	7/31/2003	2 - 4	--	--	X	--	--	--	--
	C0591030	7/31/2003	4 - 8	--	--	X	--	--	--	--
C3S022B020	C0591031	7/31/2003	0 - 0.5	--	--	X	--	--	--	--
	C0591032	7/31/2003	0.5 - 2	--	--	X	--	--	--	--
	C0591033	7/31/2003	2 - 4	--	--	X	--	--	--	--
	C0591034	7/31/2003	4 - 8	--	--	X	--	--	--	--
C3S022B021	C0591035	7/31/2003	0 - 0.5	--	--	X	--	--	--	--
	C0591037	7/31/2003	0.5 - 2	--	--	X	--	--	--	--
	C0591038	7/31/2003	2 - 4	--	--	X	--	--	--	--
	C0591039	7/31/2003	4 - 8	--	--	X	--	--	--	--

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SAMPLE LOCATION	SAMPLE IDENTIFICATION	DATE SAMPLED	DEPTH (ft bgs)	ANALYSES PERFORMED						
				SVOC	VOC	PAH	Pesticides/PCB	Total Metals	General Chemistry	TPH
PAH Study, 2003 (Continued)										
C3S022B022	C0591040	7/31/2003	0 - 0.5	--	--	X	--	--	--	--
	C0591041	7/31/2003	0.5 - 2	--	--	X	--	--	--	--
	C0591042	7/31/2003	2 - 4	--	--	X	--	--	--	--
	C0591043	7/31/2003	4 - 8	--	--	X	--	--	--	--
ENVIRONMENTAL BASELINE SURVEY										
Phase IIA Environmental Baseline Survey										
145-SN-001	145S-001	01/27/1995	4.5 - 5.5	X	--	--	--	--	X	--
	145S-001M	01/27/1995	4.5 - 5.5	--	X	--	--	X	--	X
TOTAL PETROLEUM HYDROCARBON INVESTIGATIONS										
Fuel Line and Underground Storage Tank Investigations										
547-1	547-1	01/20/1995	2	--	X	--	--	X	--	X
547-2	547-2	01/20/1995	2	--	X	--	--	X	--	X
547-3	547-3	01/20/1995	2	--	X	--	--	X	--	X
547-4	547-4	01/20/1995	2	--	X	--	--	--	--	X
547-5	547-5	01/20/1995	2	--	X	--	--	X	--	X
547-6	547-6	01/20/1995	2	--	X	--	--	X	--	X
547-7	547-7	01/20/1995	2	--	X	--	--	X	--	X
547-8	547-8	01/20/1995	2	--	X	--	--	X	--	X
547-9	547-9	01/20/1995	2	--	X	--	--	X	--	X
547-10	547-10	01/20/1995	2	--	X	--	--	X	--	X
547-11	547-11	01/20/1995	2	--	X	--	--	X	--	X
547-12	547-12	01/20/1995	2	--	X	--	--	X	--	X
547-13	547-13	01/20/1995	2	--	X	--	--	X	--	X
547-14	547-14	01/20/1995	2	--	X	--	--	X	--	X
547-W1	547-W1	11/03/1994	9.5	--	X	--	--	--	--	X
547-W2	547-W2	11/03/1994	9.5	--	X	--	--	--	--	X
547-W3	547-W3	11/03/1994	9.5	--	X	--	--	--	--	X

Notes:

-- These analyses were not performed.
 ft bgs Feet below ground surface
 General chemistry Flashpoint, major anions, percent moisture, pH, reactivity, TKN, and/or TOC
 PAH Polynuclear aromatic hydrocarbon
 PCB Polychlorinated biphenyl
 SVOC Semivolatile organic compound

TKN Total Kjeldahl nitrogen
 TOC Total organic carbon
 TPH Total petroleum hydrocarbons
 VOC Volatile organic compound
 X These analyses were performed.

TABLE 8-2: SITE 22 GROUNDWATER SAMPLING SUMMARY

Remedial Investigation Report for Sites 9, 13, 19, 22, and 23, Alameda Point, Alameda, California

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SAMPLE LOCATION	SAMPLE IDENTIFICATION	DATE SAMPLED	DEPTH (ft bgs)	ANALYSES PERFORMED								
				SVOC	VOC	Dissolved Metals	Total Metals	Pesticides/PCBs	General Chemistry	TPH	Landfill Gases	PAH
REMEDIAL INVESTIGATION												
Phases 1 & 2A Investigation, 1991												
MW547-1	MW547-1 [08/07/90]	08/07/1990		X	X	X	--	X	--	X	--	--
MW547-2	MW547-2 [08/08/90]	08/08/1990		X	X	X	--	X	--	X	--	--
MW547-3	MW547-3 [08/07/90]	08/07/1990		X	X	X	--	X	--	X	--	--
MW547-4	MW547-4 [08/06/90]	08/06/1990		X	X	--	--	X	--	X	--	--
MW547-5	MW547-5 [08/06/90]	08/06/1990		X	X	X	--	X	--	X	--	--
	MW547-5A [08/06/90]	08/06/1990		--	--	X	--	--	--	--	--	--
Follow-on Investigation, 1994												
D07C-01	280-S7C-088	12/16/1994		X	X	X	--	--	X	X	--	--
	280-S7C-089	02/20/1995		--	X	X	--	--	X	X	--	--
	280-S7C-090	06/22/1995		--	X	X	--	--	X	--	--	--
	280-S7C-091	09/20/1995		--	X	X	--	--	X	--	--	--
DHP-S07C-01	280-S7C-066	07/28/1994	22.5	X	X	X	--	--	X	X	--	--
DHP-S07C-02	280-S7C-067	08/02/1994	21	X	X	X	--	--	X	X	--	--
DHP-S07C-03	280-S7C-069	07/29/1994	26	X	X	X	--	--	X	X	--	--
DHP-S07C-04	280-S7C-070	08/01/1994	16	X	X	X	--	--	X	X	--	--
M07C-08	280-S7C-058	11/07/1994		X	X	X	--	--	X	X	--	--
	280-S7C-059	02/17/1995		--	X	X	--	--	X	X	--	--
	280-S7C-060	06/21/1995		X	X	X	--	--	X	X	--	--
	280-S7C-061	08/31/1995		--	X	X	--	--	X	X	--	--
MW547-1	280-S7C-028	11/08/1994		X	X	X	--	--	X	X	--	--
	280-S7C-029	02/20/1995		--	X	X	--	--	X	X	--	--
	280-S7C-030	06/20/1995		X	X	X	--	--	X	X	--	--
	280-S7C-031	08/31/1995		--	X	X	--	--	X	X	--	--
MW547-2	280-S7C-032	11/08/1994		X	X	X	--	--	X	X	--	--
	280-S7C-033	02/20/1995		--	X	X	--	--	X	X	--	--
	280-S7C-034	06/20/1995		X	X	X	--	--	X	X	--	--
	280-S7C-035	08/29/1995		--	X	X	--	--	X	X	--	--
MW547-3	280-S7C-036	11/07/1994		X	X	X	--	--	X	X	--	--
	280-S7C-037	02/17/1995		--	X	X	--	--	X	X	--	--
	280-S7C-038	06/21/1995		X	X	X	--	--	X	X	--	--
	280-S7C-039	08/31/1995		--	X	X	--	--	X	X	--	--
MW547-4	280-S7C-040	11/07/1994		X	X	X	--	--	X	X	--	--
	280-S7C-042	02/17/1995		--	X	X	--	--	X	X	--	--
	280-S7C-043	06/21/1995		X	X	X	--	--	X	X	--	--
	280-S7C-044	08/29/1995		--	X	X	--	--	X	X	--	--
MW547-5	280-S7C-045	11/10/1994		X	X	X	--	--	X	X	--	--
	280-S7C-046	02/20/1995		--	X	X	--	--	X	X	--	--
	280-S7C-047	06/21/1995		X	X	X	--	--	X	X	--	--
	280-S7C-048	08/29/1995		--	X	X	--	--	X	X	--	--
Follow-on Investigation, 1998												
D07C-01	108-S22-003	11/11/1997		--	X	X	--	--	X	X	--	--
	108-S22-005	02/04/1998		--	X	X	--	--	X	X	--	--
	108-S22-009	05/14/1998		--	X	X	--	--	X	--	--	--
	108-S22-013	08/07/1998		--	X	--	X	--	X	X	--	--

TABLE 8-2: SITE 22 GROUNDWATER SAMPLING SUMMARY

Remedial Investigation Report for Sites 9, 13, 19, 22, and 23, Alameda Point, Alameda, California

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SAMPLE LOCATION	SAMPLE IDENTIFICATION	DATE SAMPLED	DEPTH (ft bgs)	ANALYSES PERFORMED								
				SVOC	VOC	Dissolved Metals	Total Metals	Pesticides/PCBs	General Chemistry	TPH	Landfill Gases	PAH
Follow-on Investigation, 1998 (Continued)												
M07C-08	108-S22-002	11/07/1997		--	X	X	--	--	X	X	--	--
	108-S22-007	02/11/1998		--	X	X	--	--	X	X	--	--
	108-S22-011	05/13/1998		--	X	X	--	--	X	X	--	--
	108-S22-014	08/11/1998		--	X	--	X	--	X	X	--	--
	108-S22-004	11/10/1997		--	X	X	--	--	X	X	--	--
MW547-4	108-S22-008	02/11/1998		--	X	X	--	--	X	X	--	--
	108-S22-012	05/13/1998		--	X	X	--	--	X	X	--	--
	108-S22-015	08/11/1998		--	X	--	X	--	X	X	--	--
Supplemental Remedial Investigation Data Gap Sampling, 2001												
CAA4C-DGS-DP01	385-CAA4C-001	04/18/2002	10	--	X	--	X	--	--	X	--	--
	385-CAA4C-002	04/18/2002	15	--	X	--	X	--	--	X	--	--
CAA4C-DGS-DP02	385-CAA4C-003	04/18/2002	12	--	X	--	X	--	--	X	--	--
	385-CAA4C-004	04/18/2002	17	--	X	--	X	--	--	X	--	--
CAA4C-DGS-DP03	385-CAA4C-005	04/17/2002	7	--	X	--	X	--	--	X	--	--
	385-CAA4C-006	04/17/2002	12	--	X	--	X	--	--	X	--	--
CAA4C-DGS-DP04	385-CAA4C-007	04/18/2002	8	--	X	--	X	--	--	X	--	--
	385-CAA4C-008	04/18/2002	13	--	X	--	X	--	--	X	--	--
CAA4C-DGS-DP05	385-CAA4C-009	04/18/2002	8	--	X	--	X	--	--	X	--	--
	385-CAA4C-010	04/18/2002	14	--	X	--	X	--	--	X	--	--
CAA4C-DGS-DP06	385-CAA4C-011A	05/08/2002	4 - 8	--	X	--	--	--	--	X	--	--
CAA4C-DGS-DP07	385-CAA4C-012	05/08/2002	8 - 12	--	X	--	--	--	--	X	--	--
CAA4C-DGS-DP08	385-CAA4C-013	05/08/2002	4 - 8	--	X	--	--	--	--	X	--	--
CAA4C-DGS-DP09	385-CAA4C-014	05/08/2002	4 - 8	--	X	--	--	--	--	X	--	--
CAA4C-DGS-DP10	385-CAA4C-015	05/08/2002	4 - 8	--	X	--	--	--	--	X	--	--
CAA4C-DGS-PZ01	385-CAA4C-011	04/22/2002	5	--	X	--	--	--	--	X	--	--
D07C-01	385-S22-010	07/09/2001		X	X	--	--	--	--	X	--	X
M07C-08	385-S22-008	07/05/2001		X	X	--	--	--	--	X	--	X
MW547-1	385-S22-001	07/05/2001		X	X	--	--	--	--	X	--	X
MW547-2	385-S22-002	07/05/2001		X	X	--	--	--	--	X	--	X
MW547-3	385-S22-003	07/05/2001		X	X	--	--	--	--	X	--	X
MW547-4	385-S22-004	07/05/2001		X	X	--	--	--	--	X	--	X
MW547-5	385-S22-005	07/05/2001		X	X	--	--	--	--	X	--	X
S22-DGS-SG03	385-S22-013	07/26/2001	1.5	--	X	--	--	--	--	--	X	--
	385-S22-014	07/26/2001	4	--	X	--	--	--	--	--	X	--
S22-DGS-SG05	385-S22-016	09/13/2001	1.5	--	X	--	--	--	--	--	X	--
	385-S22-017	09/13/2001	4	--	X	--	--	--	--	--	X	--
Basewide Groundwater Monitoring, 2002												
D07C-01	D07C-01-A1135	07/11/2002		--	X	X	--	--	X	X	X	--
	D07C-01-A1636	12/17/2002		--	X	X	--	--	X	X	X	--
M07C-08	M07C-08-A1140	07/24/2002		--	X	X	--	--	X	X	X	--
	M07C-08-A1310	07/24/2002		--	X	X	--	--	X	X	X	--
	M07C-08-A1641	12/17/2002		--	X	X	--	--	X	X	X	--
MW547-3	MW547-3-A1156	06/20/2002		--	X	X	--	--	X	X	X	--
	MW547-3-A1348	09/05/2002		--	X	--	--	--	--	X	--	--
	MW547-3-A1657	12/17/2002		--	X	X	--	--	X	X	X	--
	MW547-3-A2000	04/10/2003		--	X	--	--	--	--	X	--	--

TABLE 8-2: SITE 22 GROUNDWATER SAMPLING SUMMARY

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SAMPLE LOCATION	SAMPLE IDENTIFICATION	DATE SAMPLED	DEPTH (ft bgs)	ANALYSES PERFORMED								
				SVOC	VOC	Dissolved Metals	Total Metals	Pesticides/PCBs	General Chemistry	TPH	Landfill Gases	PAH
TOTAL PETROLEUM HYDROCARBON INVESTIGATIONS												
Fuel Line and Underground Storage Tank Investigations												
547-L1	547-L1	11/03/1994	9.5	--	X	X	--	--	--	--	X	--
547-L8	547L8	11/03/1994	9.5	--	X	--	--	--	--	--	X	--
M07C-08	030-CAP-063	04/27/2000		--	X	--	--	--	--	--	--	--
MW547-1	030-CAP-062	04/27/2000		--	X	--	--	--	--	--	--	--
	030-CAP-064	04/27/2000		--	X	--	--	--	--	--	--	--
MW547-4	030-CAP-066	04/27/2000		--	X	--	--	--	--	--	--	--

Notes:

- These analyses were not performed.
- ft bgs Feet below ground surface
- General chemistry Acidity, alkalinity, conductivity, hardness, major anions, oxydation, pH, TDS, TOC, and/or sulfide
- PAH Polynuclear aromatic hydrocarbon
- PCB Polychlorinated biphenyl
- SVOC Semivolatile organic compound
- TDS Total dissolved solids
- TOC Total organic carbon
- TPH Total petroleum hydrocarbons
- VOC Volatile organic compound
- X These analyses were performed.

TABLE 8-3: SITE 22 STATISTICAL SUMMARY OF SOIL ANALYSES

Phases 1 and 2A Investigation, 1991

Remedial Investigation Report for Sites 9, 13, 19, 22, and 23, Alameda Point, Alameda, California

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detects Over PRG	Residential PRG
Volatile Organic Compounds (µg/kg)											
1,1,1-TRICHLOROETHANE	42	0	0	--	--	--	5	7,200	0	0	1,200,000
1,1,2,2-TETRACHLOROETHANE	42	0	0	--	--	--	5	7,200	0	3	410
1,1,2-TRICHLOROETHANE	42	0	0	--	--	--	5	7,200	0	2	730
1,1-DICHLOROETHANE	48	0	0	--	--	--	5	7,200	0	2	2,800 (CAL-modified)
1,1-DICHLOROETHENE	42	0	0	--	--	--	5	7,200	0	0	120,000
1,2-DICHLOROBENZENE	19	0	0	--	--	--	5	7	0	0	370,000
1,2-DICHLOROETHANE	47	2	4	11	7	14	5	7,200	0	4	280
1,2-DICHLOROETHENE (TOTAL)	42	0	0	--	--	--	5	7,200	0	0	43,000 (cis)
1,2-DICHLOROPROPANE	42	0	0	--	--	--	5	7,200	0	3	340
1,3-DICHLOROBENZENE	19	0	0	--	--	--	5	7	0	0	16,000
1,4-DICHLOROBENZENE	19	0	0	--	--	--	5	7	0	0	3,400
2-BUTANONE	42	0	0	--	--	--	10	14,000	--	--	NA
2-CHLOROETHYLVINYLETHER	18	0	0	--	--	--	10	13	--	--	NA
2-HEXANONE	42	0	0	--	--	--	10	14,000	--	--	NA
4-METHYL-2-PENTANONE	40	1	3	72,000	72,000	72,000	6	6,600	--	--	NA
ACETONE	42	1	2	690	690	690	10	14,000	0	0	1,600,000
BENZENE	42	5	12	140	13	430	5	7,200	0	3	600
BROMODICHLOROMETHANE	42	0	0	--	--	--	5	7,200	0	2	820
BROMOFORM	42	0	0	--	--	--	5	7,200	0	0	62,000
BROMOMETHANE	42	0	0	--	--	--	10	14,000	0	2	3,900
CARBON DISULFIDE	42	0	0	--	--	--	5	7,200	0	0	360,000
CARBON TETRACHLORIDE	42	0	0	--	--	--	5	7,200	0	3	250
CHLOROBENZENE	42	0	0	--	--	--	5	7,200	0	0	150,000
CHLOROETHANE	42	0	0	--	--	--	10	14,000	0	2	3,000
CHLOROFORM	42	0	0	--	--	--	5	7,200	0	2	940 (CAL-modified)
CHLOROMETHANE	42	0	0	--	--	--	10	14,000	0	3	1,200
CIS-1,3-DICHLOROPROPENE	42	0	0	--	--	--	5	7,200	0	2	780 (not cis)
DIBROMOCHLOROMETHANE	42	0	0	--	--	--	5	7,200	0	2	1,100
ETHYLBENZENE	42	8	19	6,700	3J	52,000	5	6,600	1	0	8,900
METHYLENE CHLORIDE	42	0	0	--	--	--	5	54,000	0	1	9,100
STYRENE	42	0	0	--	--	--	5	7,200	0	0	1,700,000

TABLE 8-3: SITE 22 STATISTICAL SUMMARY OF SOIL ANALYSES (Continued)

Phases 1 and 2A Investigation, 1991

Remedial Investigation Report for Sites 9, 13, 19, 22, and 23, Alameda Point, Alameda, California

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detects Over PRG	Residential PRG
Volatile Organic Compounds (µg/kg)											
TETRACHLOROETHENE	42	0	0	--	--	--	5	7,200	0	2	1,500
TOLUENE	47	44	94	1,600	2J	39,000	6	6	0	0	520,000
TRANS-1,3-DICHLOROPROPENE	42	0	0	--	--	--	5	7,200	0	2	780 (not trans)
TRICHLOROETHENE	42	3	7	5	2J	11	5	7,200	0	3	53
TRICHLOROFUOROMETHANE	18	0	0	--	--	--	5	7	0	0	390,000
VINYL ACETATE	42	0	0	--	--	--	10	14,000	0	0	430,000
VINYL CHLORIDE	42	0	0	--	--	--	10	14,000	0	3	79 (child or adult)
XYLENE (TOTAL)	42	12	29	5,300	2J	33,000	5	7	0	0	270,000
Semivolatile Organic Compounds (µg/kg)											
1,2,4-TRICHLOROENZENE	63	0	0	--	--	--	330	14,000	0	0	650,000
1,2-DICHLOROENZENE	63	0	0	--	--	--	330	14,000	0	0	370,000
1,2-DIPHENYLHYDRAZINE	32	0	0	--	--	--	330	720	0	1	610
1,3-DICHLOROENZENE	63	0	0	--	--	--	330	14,000	0	0	16,000
1,4-DICHLOROENZENE	63	0	0	--	--	--	330	14,000	0	1	3,400
2,4,5-TRICHLOROPHENOL	63	0	0	--	--	--	1,600	67,000	0	0	6,100,000
2,4,6-TRICHLOROPHENOL	63	0	0	--	--	--	330	14,000	0	1	6,900 (CAL-modified)
2,4-DICHLOROPHENOL	63	0	0	--	--	--	330	14,000	0	0	180,000
2,4-DIMETHYLPHENOL	63	0	0	--	--	--	330	14,000	0	0	1,200,000
2,4-DINITROPHENOL	63	0	0	--	--	--	1,600	67,000	0	0	120,000
2,4-DINITROTOLUENE	62	0	0	--	--	--	330	14,000	0	0	120,000
2,6-DINITROTOLUENE	63	0	0	--	--	--	330	14,000	0	0	61,000
2-CHLORONAPHTHALENE	63	0	0	--	--	--	330	14,000	--	--	NA
2-CHLOROPHENOL	63	0	0	--	--	--	330	14,000	0	0	63,000
2-METHYLNAPHTHALENE	63	5	8	7,100	1,500	16,000	330	14,000	--	--	NA
2-METHYLPHENOL	63	0	0	--	--	--	330	14,000	--	--	NA
2-NITROANILINE	63	0	0	--	--	--	1,600	67,000	0	52	1,700
2-NITROPHENOL	63	0	0	--	--	--	330	14,000	--	--	NA
3,3'-DICHLOROENZIDINE	63	0	0	--	--	--	660	28,000	0	8	1,100
3-NITROANILINE	63	0	0	--	--	--	1,600	67,000	--	--	NA
4,6-DINITRO-2-METHYLPHENOL	63	0	0	--	--	--	1,600	67,000	--	--	NA

TABLE 8-3: SITE 22 STATISTICAL SUMMARY OF SOIL ANALYSES (Continued)

Phases 1 and 2A Investigation, 1991

Remedial Investigation Report for Sites 9, 13, 19, 22, and 23, Alameda Point, Alameda, California

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detections Over PRG	Residential PRG
Semivolatile Organic Compounds (µg/kg)											
4-BROMOPHENYL-PHENYLETHER	63	0	0	--	--	--	330	14,000	--	--	NA
4-CHLORO-3-METHYLPHENOL	63	0	0	--	--	--	330	14,000	--	--	NA
4-CHLOROANILINE	63	0	0	--	--	--	330	14,000	0	0	240,000
4-CHLOROPHENYL-PHENYLETHER	63	0	0	--	--	--	330	14,000	--	--	NA
4-METHYLPHENOL	63	0	0	--	--	--	330	14,000	0	0	310,000
4-NITROANILINE	63	0	0	--	--	--	1,600	67,000	--	--	NA
4-NITROPHENOL	63	0	0	--	--	--	1,600	67,000	--	--	NA
ACENAPHTHENE	63	2	3	83	46J	120 J	330	14,000	0	0	3,700,000
ACENAPHTHYLENE	63	0	0	--	--	--	330	14,000	--	--	NA
ANTHRACENE	63	2	3	73	50J	96 J	330	14,000	0	0	22,000,000
BENZO(A)ANTHRACENE	63	4	6	76	56J	100 J	330	14,000	0	7	620
BENZO(A)PYRENE	63	2	3	94	48J	140	330	14,000	1	61	62
BENZO(B)FLUORANTHENE	63	1	2	94	94J	94 J	330	14,000	0	8	620
BENZO(G,H,I)PERYLENE	63	1	2	160	160J	160 J	330	14,000	--	--	NA
BENZO(K)FLUORANTHENE	63	1	2	120	120J	120 J	330	14,000	0	43	380 (CAL-modified)
BENZOIC ACID	63	0	0	--	--	--	1,600	67,000	0	0	100,000,000
BENZYL ALCOHOL	63	0	0	--	--	--	330	14,000	0	0	18,000,000
BIS(2-CHLOROETHOXY)METHANE	63	0	0	--	--	--	330	14,000	--	--	NA
BIS(2-CHLOROETHYL)ETHER	63	0	0	--	--	--	330	14,000	0	63	210
BIS(2-ETHYLHEXYL)PHTHALATE	63	0	0	--	--	--	330	14,000	0	0	35,000
BUTYLBENZYLPHTHALATE	63	0	0	--	--	--	330	14,000	0	0	12,000,000
CHRYSENE	63	3	5	95	58J	140 J	330	14,000	0	1	3,800 (CAL-modified)
DI-N-BUTYLPHTHALATE	63	1	2	6,300	6,300	6,300	330	14,000	--	--	NA
DI-N-OCTYLPHTHALATE	63	0	0	--	--	--	330	14,000	--	--	NA
DIBENZO(A,H)ANTHRACENE	63	0	0	--	--	--	330	14,000	0	63	62
DIBENZOFURAN	63	0	0	--	--	--	330	14,000	0	0	290,000
DIETHYLPHTHALATE	63	0	0	--	--	--	330	14,000	0	0	49,000,000
DIMETHYLPHTHALATE	63	0	0	--	--	--	330	14,000	0	0	100,000,000
FLUORANTHENE	63	4	6	180	76J	300 J	330	14,000	0	0	2,300,000
FLUORENE	63	2	3	88	46J	130 J	330	14,000	0	0	2,700,000
HEXACHLOROENZENE	63	0	0	--	--	--	330	14,000	0	63	300

TABLE 8-3: SITE 22 STATISTICAL SUMMARY OF SOIL ANALYSES (Continued)

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detects Over PRG	Residential PRG
Semivolatile Organic Compounds (µg/kg)											
HEXACHLOROBUTADIENE	63	0	0	--	--	--	330	14,000	0	1	6,200
HEXACHLOROCYCLOPENTADIENE	63	0	0	--	--	--	330	14,000	0	0	370,000
HEXACHLOROETHANE	63	0	0	--	--	--	330	14,000	0	0	35,000
INDENO(1,2,3-CD)PYRENE	63	1	2	140	140 J	140 J	330	14,000	0	8	620
ISOPHORONE	63	0	0	--	--	--	330	14,000	0	0	510,000
N-NITROSO-DI-N-PROPYLAMINE	63	0	0	--	--	--	330	14,000	0	63	69
N-NITROSODIPHENYLAMINE	63	0	0	--	--	--	330	14,000	0	0	99,000
NAPHTHALENE	63	5	8	6,200	100 J	16,000	330	14,000	0	0	56,000
NITROBENZENE	63	0	0	--	--	--	330	14,000	0	0	20,000
PENTACHLOROPHENOL	63	0	0	--	--	--	1,600	67,000	0	8	3,000
PHENANTHRENE	63	3	5	220	57 J	410 J	330	14,000	--	--	NA
PHENOL	63	2	3	200	100 J	300 J	330	14,000	0	0	37,000,000
PYRENE	63	4	6	180	93 J	340 J	330	14,000	0	0	2,300,000
PCBs/Pesticides (µg/kg)											
4,4'-DDD	61	2	3	6	2	9 J	2	200	0	0	2,400
4,4'-DDE	61	4	7	14	6	23 J	2	200	0	0	1,700
4,4'-DDT	61	3	5	22	3 J	53 J	2	200	0	0	1,700
ALDRIN	61	0	0	--	--	--	1	99	0	6	29
ALPHA-BHC	61	0	0	--	--	--	1	99	--	--	NA
ALPHA-CHLORDANE	31	2	6	14	0.9 J	27 J	82	990	0	0	1,600 (chlordanes)
AROCLOR-1016	61	0	0	--	--	--	26	990	0	0	3,900
AROCLOR-1221	61	0	0	--	--	--	26	990	0	6	220
AROCLOR-1232	61	0	0	--	--	--	26	990	0	6	220
AROCLOR-1242	61	0	0	--	--	--	26	990	0	6	220
AROCLOR-1248	61	0	0	--	--	--	26	990	0	6	220
AROCLOR-1254	61	0	0	--	--	--	53	2,000	0	8	220
AROCLOR-1260	61	0	0	--	--	--	53	2,000	0	8	220
BETA-BHC	61	0	0	--	--	--	1	99	--	--	NA
CHLORDANE	30	0	0	--	--	--	11	52	0	0	1,600
DELTA-BHC	61	0	0	--	--	--	1	99	--	--	NA

TABLE 8-3: SITE 22 STATISTICAL SUMMARY OF SOIL ANALYSES (Continued)

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detects Over PRG	Residential PRG
PCBs/Pesticides (µg/kg)											
DIELDRIN	61	0	0	--	--	--	2	200	0	7	30
ENDOSULFAN I	60	0	0	--	--	--	2	99	0	0	370,000
ENDOSULFAN II	62	0	0	--	--	--	2	200	0	0	370,000 (endosulfan)
ENDOSULFAN SULFATE	61	0	0	--	--	--	2	200	--	--	NA
ENDRIN	61	0	0	--	--	--	2	200	0	0	18,000
ENDRIN ALDEHYDE	30	0	0	--	--	--	2	10	--	--	NA
ENDRIN KETONE	32	0	0	--	--	--	17	200	--	--	NA
GAMMA-BHC (LINDANE)	61	0	0	--	--	--	1	99	--	--	NA
GAMMA-CHLORDANE	31	2	6	12	1 J	22 J	82	990	0	0	1,600 (chlordane)
HEPTACHLOR	61	0	0	--	--	--	1	99	0	0	110
HEPTACHLOR EPOXIDE	63	0	0	--	--	--	1	99	0	4	53
METHOXYCHLOR	61	2	3	16	11	20	5	990	0	0	310,000
TOXAPHENE	61	0	0	--	--	--	53	2,000	0	6	440
Metals (mg/kg)											
ALUMINUM	62	62	100	8,700	3,120	26,800	0.0	0.0	0	0	76,000
ANTIMONY	62	0	0	--	--	--	2.1	10.0	0	0	31.0
ARSENIC	62	30	48	9.2	2.7	24.0	2.5	13.0	30	32	0.39
BARIUM	62	62	100	67.4	0.30	200	0.0	0.0	0	0	5,400
BERYLLIUM	62	21	34	0.34	0.20	0.50	0.20	1.7	0	0	150
CADMIUM	62	26	42	0.43	0.20	1.0	0.20	1.7	0	0	37.0
CALCIUM	62	62	100	2,540	15.3	15,500	0.0	0.0	--	--	NA
CHROMIUM	62	62	100	38.5	11.4	71.8	0.0	0.0	0	0	210
COBALT	62	46	74	6.9	3.6	17.0	5.2	6.1	0	0	900
COPPER	62	62	100	16.2	5.6	86.2	0.0	0.0	0	0	3,100
IRON	62	62	100	12,700	760	29,600	0.0	0.0	1	0	23,000
LEAD	62	26	42	394	6.1	9,890	5.2	60.0	1	0	150 (CAL-modified)
MAGNESIUM	62	62	100	3,570	1,510	42,400	0.0	0.0	--	--	NA
MANGANESE	62	62	100	174	72.4	734	0.0	0.0	0	0	1,800
MOLYBDENUM	62	0	0	--	--	--	1.0	8.4	0	0	390
NICKEL	62	62	100	38.3	11.6	89.0	0.0	0.0	0	0	1,600

TABLE 8-3: SITE 22 STATISTICAL SUMMARY OF SOIL ANALYSES (Continued)

Phases 1 and 2A Investigation, 1991

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detects Over PRG	Residential PRG
Metals (mg/kg)											
POTASSIUM	62	59	95	958	497	2,300	530	610	--	--	NA
SELENIUM	62	1	2	5.7	5.7	5.7	4.3	17.0	0	0	390
SILVER	62	2	3	0.95	0.70	1.2	0.60	8.4	0	0	390
SODIUM	62	40	65	557	112	1,810	520	630	--	--	NA
THALLIUM	62	0	0	--	--	--	2.7	17.0	0	29	5.2
TITANIUM	62	62	100	439	183	704	0.0	0.0	--	--	NA
VANADIUM	62	62	100	26.2	13.9	62.3	0.0	0.0	0	0	550
ZINC	62	62	100	97.1	14.0	3,880	0.0	0.0	0	0	23,000

NOTES:

Bold denotes values elevated above the PRG

-- Not detected

BHC Benzene Hexachloride

DDD Dichlorodiphenyldichloroethane

DDE Dichlorodiphenyldichloroethene

DDT Dichlorodiphenyltrichloroethane

J Estimated value

mg/kg Milligrams per kilogram

NA No PRG available

PCB Polychlorinated biphenyl

PRG Preliminary Remediation Goal, U.S. Environmental Protection Agency, Region 9 or CAL-modified

µg/kg Micrograms per kilogram

TABLE 8-4: SITE 22 STATISTICAL SUMMARY OF GROUNDWATER ANALYSES

Phases 1 and 2A Investigation, 1991

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detections Over PRG	Tap Water PRG	MCL
Volatile Organic Compounds (µg/L)												
1,1,1-TRICHLOROETHANE	5	0	0	--	--	--	5	50	0	0	3,200	200
1,1,2,2-TETRACHLOROETHANE	5	0	0	--	--	--	5	50	0	5	0.06	1
1,1,2-TRICHLOROETHANE	5	0	0	--	--	--	5	50	0	5	0.2	5
1,1-DICHLOROETHANE	5	0	0	--	--	--	5	50	0	5	2 (CAL-modified)	5
1,1-DICHLOROETHENE	5	0	0	--	--	--	5	50	0	0	340	6
1,2-DICHLOROETHANE	5	0	0	--	--	--	5	50	0	5	0.1	0.5
1,2-DICHLOROETHENE (TOTAL)	5	0	0	--	--	--	5	50	0	0	61 (cis)	NA
1,2-DICHLOROPROPANE	5	0	0	--	--	--	5	50	0	5	0.2	5
2-BUTANONE	5	0	0	--	--	--	10	100	--	--	NA	NA
2-HEXANONE	5	0	0	--	--	--	10	100	--	--	NA	NA
4-METHYL-2-PENTANONE	5	0	0	--	--	--	10	100	--	--	NA	NA
ACETONE	5	0	0	--	--	--	10	100	0	0	610	NA
BENZENE	5	3	60	660	530	900	5	5	3	2	0.3	1
BROMODICHLOROMETHANE	5	0	0	--	--	--	5	50	0	5	0.2	80
BROMOFORM	5	0	0	--	--	--	5	50	0	3	9	80
BROMOMETHANE	5	0	0	--	--	--	10	100	0	5	9	NA
CARBON DISULFIDE	5	0	0	--	--	--	5	50	0	0	1,000	NA
CARBON TETRACHLORIDE	5	0	0	--	--	--	5	50	0	5	0.2	0.5
CHLORO BENZENE	5	0	0	--	--	--	5	50	0	0	110	70
CHLOROETHANE	5	0	0	--	--	--	10	100	0	5	5	NA
CHLOROFORM	5	0	0	--	--	--	5	50	0	5	0.5 (CAL-modified)	80
CHLOROMETHANE	5	0	0	--	--	--	10	100	0	5	2	NA
CIS-1,3-DICHLOROPROPENE	5	0	0	--	--	--	5	50	0	5	0.4 (not cis)	0.5
DIBROMOCHLOROMETHANE	5	0	0	--	--	--	5	50	0	5	0.1	80
ETHYLBENZENE	5	3	60	1,500	1,100	1,800	5	5	3	2	3	300
METHYLENE CHLORIDE	5	0	0	--	--	--	5	190	0	5	4	NA
STYRENE	5	0	0	--	--	--	5	50	0	0	1,600	100
TETRACHLOROETHENE	5	0	0	--	--	--	5	50	0	5	0.7	5
TOLUENE	5	0	0	--	--	--	5	50	0	0	720	150
TRANS-1,3-DICHLOROPROPENE	5	0	0	--	--	--	5	50	0	5	0.4 (not trans)	0.5
TRICHLOROETHENE	5	0	0	--	--	--	5	50	0	5	0.03	5

TABLE 8-4: SITE 22 STATISTICAL SUMMARY OF GROUNDWATER ANALYSES

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detections Over PRG	Tap Water PRG	MCL
Volatile Organic Compounds (µg/L)												
VINYL ACETATE	5	0	0	--	--	--	5	50	0	0	410	NA
VINYL CHLORIDE	5	0	0	--	--	--	10	100	0	5	0.02 (child or adult)	0.5
XYLENE (TOTAL)	5	1	20	110	110	110	5	50	0	0	210	1,800
Semivolatile Organic Compounds (µg/L)												
1,2,4-TRICHLOROBENZENE	5	0	0	--	--	--	10	10	0	0	190	5
1,2-DICHLOROBENZENE	5	0	0	--	--	--	10	10	0	0	370	600
1,2-DIPHENYLHYDRAZINE	3	0	0	--	--	--	10	10	--	--	NA	NA
1,3-DICHLOROBENZENE	5	0	0	--	--	--	10	10	0	5	6	NA
1,4-DICHLOROBENZENE	5	0	0	--	--	--	10	10	0	5	0.5	5
2,4,5-TRICHLOROPHENOL	5	0	0	--	--	--	10	50	0	0	3,600	50
2,4,6-TRICHLOROPHENOL	5	0	0	--	--	--	10	10	0	5	1 (CAL-modified)	NA
2,4-DICHLOROPHENOL	5	0	0	--	--	--	10	10	0	0	110	NA
2,4-DIMETHYLPHENOL	5	1	20	39	39	39	10	10	0	0	730	NA
2,4-DINITROPHENOL	5	0	0	--	--	--	10	50	0	0	73	NA
2,4-DINITROTOLUENE	5	0	0	--	--	--	10	10	0	0	73	NA
2,6-DINITROTOLUENE	5	0	0	--	--	--	10	10	0	0	36	NA
2-CHLORONAPHTHALENE	5	0	0	--	--	--	10	10	--	--	NA	NA
2-CHLOROPHENOL	5	0	0	--	--	--	10	10	0	0	30	NA
2-METHYLNAPHTHALENE	5	2	40	8	6J	9J	10	10	--	--	NA	NA
2-METHYLPHENOL	5	0	0	--	--	--	10	10	0	0	1,800	NA
2-NITROANILINE	5	0	0	--	--	--	50	50	0	5	1	NA
2-NITROPHENOL	5	0	0	--	--	--	10	10	--	--	NA	NA
3,3'-DICHLOROENZIDINE	5	0	0	--	--	--	20	20	0	5	0.2	NA
3-NITROANILINE	5	0	0	--	--	--	50	50	--	--	NA	NA
4,6-DINITRO-2-METHYLPHENOL	5	0	0	--	--	--	10	50	--	--	NA	NA
4-BROMOPHENYL-PHENYLETHER	5	0	0	--	--	--	10	10	--	--	NA	NA
4-CHLORO-3-METHYLPHENOL	5	0	0	--	--	--	10	10	--	--	NA	NA
4-CHLOROANILINE	5	0	0	--	--	--	10	10	0	0	150	NA
4-CHLOROPHENYL-PHENYLETHER	5	0	0	--	--	--	10	10	--	--	NA	NA
4-METHYLPHENOL	5	0	0	--	--	--	10	10	0	0	180	NA

TABLE 8-4: SITE 22 STATISTICAL SUMMARY OF GROUNDWATER ANALYSES

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detections Over PRG	Tap Water PRG	MCL
Semivolatile Organic Compounds (µg/L)												
4-NITROANILINE	5	0	0	--	--	--	50	50	--	--	NA	NA
4-NITROPHENOL	5	0	0	--	--	--	10	50	--	--	NA	NA
ACENAPHTHENE	5	0	0	--	--	--	10	10	0	0	370	NA
ACENAPHTHYLENE	5	0	0	--	--	--	10	10	--	--	NA	NA
ANILINE	5	0	0	--	--	--	10	10	--	--	NA	NA
ANTHRACENE	5	0	0	--	--	--	10	10	0	0	1,800	NA
BENZO(A)ANTHRACENE	5	0	0	--	--	--	10	10	0	5	0.09	0.1
BENZO(A)PYRENE	5	0	0	--	--	--	10	10	0	5	0.009	0.2
BENZO(B)FLUORANTHENE	5	0	0	--	--	--	10	10	0	5	0.09	NA
BENZO(G,H,I)PERYLENE	5	0	0	--	--	--	10	10	--	--	NA	NA
BENZO(K)FLUORANTHENE	5	0	0	--	--	--	10	10	0	5	0.06 (CAL-modified)	NA
BENZOIC ACID	5	0	0	--	--	--	50	50	0	0	150,000	NA
BENZYL ALCOHOL	5	0	0	--	--	--	10	10	0	0	11,000	NA
BIS(2-CHLOROETHOXY)METHANE	5	0	0	--	--	--	10	10	--	--	NA	NA
BIS(2-CHLOROETHYL)ETHER	5	0	0	--	--	--	10	10	0	5	0.01	NA
BIS(2-ETHYLHEXYL)PHTHALATE	5	0	0	--	--	--	10	10	0	5	5	NA
BUTYLBENZYLPHthalATE	5	0	0	--	--	--	10	10	0	0	7,300	NA
CHRYSENE	5	0	0	--	--	--	10	10	0	5	0.6 (CAL-modified)	NA
DI-N-BUTYLPHthalATE	5	0	0	--	--	--	10	10	--	--	NA	NA
DI-N-OCTYLPHthalATE	5	0	0	--	--	--	10	10	--	--	NA	NA
DIBENZO(A,H)ANTHRACENE	5	0	0	--	--	--	10	10	0	5	0.009	NA
DIBENZOFURAN	5	0	0	--	--	--	10	10	0	0	24	NA
DIETHYLPHthalATE	5	0	0	--	--	--	10	10	0	0	29,000	NA
DIMETHYLPHthalATE	5	0	0	--	--	--	10	10	0	0	360,000	NA
FLUORANTHENE	5	0	0	--	--	--	10	10	0	0	1,500	NA
FLUORENE	5	0	0	--	--	--	10	10	0	0	240	NA
HEXACHLOROENZENE	5	0	0	--	--	--	10	10	0	5	0.04	1
HEXACHLOROBUTADIENE	5	0	0	--	--	--	10	10	0	5	0.9	NA
HEXACHLOROCYCLOPENTADIENE	5	0	0	--	--	--	10	10	0	0	220	NA
HEXACHLOROETHANE	5	0	0	--	--	--	10	10	0	5	5	NA
INDENO(1,2,3-CD)PYRENE	5	0	0	--	--	--	10	10	0	5	0.09	NA

TABLE 8-4: SITE 22 STATISTICAL SUMMARY OF GROUNDWATER ANALYSES

Phases 1 and 2A Investigation, 1991

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detects Over PRG	Tap Water PRG	MCL
Semivolatile Organic Compounds (µg/L)												
ISOPHORONE	5	0	0	--	--	--	10	10	0	0	71	NA
N-NITROSO-DI-N-PROPYLAMINE	2	0	0	--	--	--	10	10	0	2	0.01	NA
N-NITROSODIMETHYLAMINE	5	0	0	--	--	--	10	10	--	--	NA	NA
N-NITROSODIPHENYLAMINE	5	0	0	--	--	--	10	10	0	0	14	NA
NAPHTHALENE	5	2	40	55	53	56	10	10	2	3	6	NA
NITROBENZENE	5	0	0	--	--	--	10	10	0	5	3	NA
PENTACHLOROPHENOL	5	0	0	--	--	--	50	50	0	5	0.6	1
PHENANTHRENE	5	0	0	--	--	--	10	10	--	--	NA	NA
PHENOL	5	2	40	9	4J	13	10	10	0	0	22,000	NA
PYRENE	5	0	0	--	--	--	10	10	0	0	180	NA
PCBs/Pesticides (µg/L)												
4,4'-DDD	3	0	0	--	--	--	0.1	1	0	1	0.3	NA
4,4'-DDE	3	0	0	--	--	--	0.1	1	0	1	0.2	NA
4,4'-DDT	3	0	0	--	--	--	0.1	1	0	1	0.2	NA
ALDRIN	3	0	0	--	--	--	0.05	0.5	0	3	0.004	NA
ALPHA-BHC	3	0	0	--	--	--	0.05	0.5	--	--	NA	NA
AROCLOR-1016	3	0	0	--	--	--	0.8	8	0	1	1	NA
AROCLOR-1221	3	0	0	--	--	--	2	20	0	3	0.03	NA
AROCLOR-1232	3	0	0	--	--	--	2	20	0	3	0.03	NA
AROCLOR-1242	3	0	0	--	--	--	0.8	8	0	3	0.03	NA
AROCLOR-1248	3	0	0	--	--	--	0.5	5	0	3	0.03	NA
AROCLOR-1254	3	0	0	--	--	--	1	10	0	3	0.03	NA
AROCLOR-1260	3	0	0	--	--	--	1	10	0	3	0.03	NA
BETA-BHC	3	0	0	--	--	--	0.05	0.5	--	--	NA	NA
CHLORDANE	3	0	0	--	--	--	0.2	2	0	3	0.2	NA
DELTA-BHC	3	0	0	--	--	--	0.05	0.5	--	--	NA	NA
DIELDRIN	3	0	0	--	--	--	0.02	0.2	0	3	0.004	NA
ENDOSULFAN I	3	0	0	--	--	--	0.05	0.5	0	0	220	NA
ENDOSULFAN II	5	0	0	--	--	--	0.1	1	--	--	NA	NA
ENDOSULFAN SULFATE	3	0	0	--	--	--	0.1	1	--	--	NA	NA

TABLE 8-4: SITE 22 STATISTICAL SUMMARY OF GROUNDWATER ANALYSES

Phases 1 and 2A Investigation, 1991

Remedial Investigation Report for Sites 9, 13, 19, 22, and 23, Alameda Point, Alameda, California

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detects Over PRG	Tap Water PRG	MCL
PCBs/Pesticides (µg/L)												
ENDRIN	3	0	0	--	--	--	0.06	0.6	0	0	11	2
ENDRIN ALDEHYDE	5	0	0	--	--	--	0.1	1	--	--	NA	NA
ENDRIN KETONE	5	0	0	--	--	--	0.05	0.5	--	--	NA	NA
GAMMA-BHC (LINDANE)	3	0	0	--	--	--	0.05	0.5	--	--	NA	NA
HEPTACHLOR	3	0	0	--	--	--	0.02	0.2	0	3	0.02	0.01
HEPTACHLOR EPOXIDE	5	0	0	--	--	--	0.05	0.5	0	5	0.007	0.01
METHOXYCHLOR	5	0	0	--	--	--	0.1	1	0	0	180	30
TOXAPHENE	3	0	0	--	--	--	1	10	0	3	0.06	3
Metals (µg/L)												
Filtered												
ALUMINUM	5	5	100	186,000	137,000	305,000	0.0	0.0	5	0	36,000	NA
ANTIMONY	5	0	0	--	--	--	60.0	60.0	0	5	15.0	6.0
ARSENIC	5	3	60	67.0	54.0	86.0	50.0	100	3	2	0.045	10.0
BARIUM	5	5	100	1,120	710	1,900	0.0	0.0	0	0	2,600	1,000
BERYLLIUM	5	1	20	7.0	7.0	7.0	5.0	5.0	0	0	73.0	4.0
CADMIUM	5	0	0	--	--	--	5.0	5.0	0	0	18.0	5.0
CALCIUM	5	5	100	45,200	24,000	91,000	0.0	0.0	--	--	NA	NA
CHROMIUM	5	5	100	8,250	370	39,000	0.0	0.0	--	--	NA	50.0
COBALT	5	5	100	93.4	57.0	160	0.0	0.0	0	0	730	NA
COPPER	5	5	100	152	100	260	0.0	0.0	0	0	1,500	1,300
IRON	5	5	100	222,000	152,000	376,000	0.0	0.0	5	0	11,000	NA
LEAD	5	2	40	69.0	56.0	82.0	50.0	50.0	--	--	NA	15.0
MAGNESIUM	5	5	100	67,200	46,000	94,000	0.0	0.0	--	--	NA	NA
MANGANESE	5	5	100	3,340	1,900	4,900	0.0	0.0	5	0	880	NA
MOLYBDENUM	5	0	0	--	--	--	50.0	50.0	0	0	180	NA
NICKEL	5	5	100	676	490	1,100	0.0	0.0	1	0	730	100
POTASSIUM	5	5	100	17,200	10,000	23,000	0.0	0.0	--	--	NA	NA
SELENIUM	5	2	40	113	75.0	150	50.0	59.0	0	0	180	50.0
SILVER	5	2	40	14.5	12.0	17.0	10.0	10.0	0	0	180	NA
SODIUM	5	5	100	254,000	203,000	388,000	0.0	0.0	--	--	NA	NA
THALLIUM	5	0	0	--	--	--	50.0	100	0	5	2.4	2.0

TABLE 8-4: SITE 22 STATISTICAL SUMMARY OF GROUNDWATER ANALYSES

Phases 1 and 2A Investigation, 1991

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detects Over PRG	Tap Water PRG	MCL
Metals (µg/L)												
Filtered												
TITANIUM	5	5	100	4,340	2,500	7,700	0.0	0.0	--	--	NA	NA
VANADIUM	5	5	100	398	280	690	0.0	0.0	5	0	260	NA
ZINC	5	5	100	390	270	680	0.0	0.0	0	0	11,000	NA

NOTES:

Bold denotes values elevated above the PRG

-- Not detected

BHC Benzene Hexachloride

DDD Dichlorodiphenyldichloroethane

DDE Dichlorodiphenyldichloroethene

DDT Dichlorodiphenyltrichloroethane

J Estimated value

MCL Maximum Contaminant Level

NA No criteria available

PCB Polychlorinated biphenyl

PRG Preliminary Remediation Goal, U.S. Environmental Protection Agency, Region 9 or CAL-modified

µg/L Micrograms per liter

TABLE 8-5: SITE 22 STATISTICAL SUMMARY OF SOIL ANALYSES

Follow-on Investigation, 1994

Remedial Investigation Report for Sites 9, 13, 19, 22, and 23, Alameda Point, Alameda, California

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detections Over PRG	Residential PRG
Volatile Organic Compounds (µg/kg)											
1,1,1-TRICHLOROETHANE	13	0	0	--	--	--	10	140,000	0	0	1,200,000
1,1,2,2-TETRACHLOROETHANE	13	0	0	--	--	--	10	140,000	0	2	410
1,1,2-TRICHLOROETHANE	13	0	0	--	--	--	10	140,000	0	2	730
1,1-DICHLOROETHANE	13	0	0	--	--	--	10	140,000	0	1	2,800 (CAL-modified)
1,1-DICHLOROETHENE	13	0	0	--	--	--	10	140,000	0	1	120,000
1,2-DICHLOROETHANE	13	0	0	--	--	--	10	140,000	0	2	280
1,2-DICHLOROETHENE (TOTAL)	13	0	0	--	--	--	10	140,000	0	1	43,000 (cis)
1,2-DICHLOROPROPANE	13	0	0	--	--	--	10	140,000	0	2	340
2-BUTANONE	13	0	0	--	--	--	10	140,000	--	--	NA
2-HEXANONE	13	0	0	--	--	--	10	140,000	--	--	NA
4-METHYL-2-PENTANONE	13	0	0	--	--	--	10	140,000	--	--	NA
ACETONE	13	0	0	--	--	--	10	170,000	0	0	1,600,000
BENZENE	13	2	15	1,700	6J	3,300	10	140,000	1	1	600
BROMODICHLOROMETHANE	13	0	0	--	--	--	10	140,000	0	2	820
BROMOFORM	13	0	0	--	--	--	10	140,000	0	1	62,000
BROMOMETHANE	13	0	0	--	--	--	10	140,000	0	1	3,900
CARBON DISULFIDE	13	0	0	--	--	--	10	140,000	0	0	360,000
CARBON TETRACHLORIDE	13	0	0	--	--	--	10	140,000	0	2	250
CHLOROBENZENE	13	0	0	--	--	--	10	140,000	0	0	150,000
CHLOROETHANE	13	0	0	--	--	--	10	140,000	0	1	3,000
CHLOROFORM	13	0	0	--	--	--	10	140,000	0	2	940 (CAL-modified)
CHLOROMETHANE	13	0	0	--	--	--	10	140,000	0	2	1,200
CIS-1,3-DICHLOROPROPENE	13	0	0	--	--	--	10	140,000	0	2	780 (not cis)
DIBROMOCHLOROMETHANE	13	0	0	--	--	--	10	140,000	0	2	1,100
ETHYLBENZENE	13	6	46	100,000	12	570,000	10	13	2	0	8,900
ETHYLENE DIBROMIDE	15	0	0	--	--	--	5	72,000	--	--	NA
METHYLENE CHLORIDE	13	0	0	--	--	--	10	140,000	0	1	9,100
STYRENE	13	0	0	--	--	--	10	140,000	0	0	1,700,000
TETRACHLOROETHENE	13	0	0	--	--	--	10	140,000	0	2	1,500
TOLUENE	13	3	23	290,000	20	840,000	10	160	1	0	520,000
TRANS-1,3-DICHLOROPROPENE	13	0	0	--	--	--	10	140,000	0	2	780 (not trans)

TABLE 8-5: SITE 22 STATISTICAL SUMMARY OF SOIL ANALYSES (Continued)

Follow-on Investigation, 1994

Remedial Investigation Report for Sites 9, 13, 19, 22, and 23, Alameda Point, Alameda, California

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detects Over PRG	Residential PRG
Volatile Organic Compounds (µg/kg)											
TRICHLOROETHENE	13	0	0	--	--	--	10	140,000	0	3	53
VINYL CHLORIDE	13	0	0	--	--	--	10	140,000	0	2	79 (child or adult)
XYLENE (TOTAL)	13	5	38	550,000	70	2,600,000	10	27	1	0	270,000
Semivolatile Organic Compounds (µg/kg)											
1,2,4-TRICHLOROBENZENE	16	1	6	2,000	2,000J	2,000 J	340	410	0	0	650,000
1,2-DICHLOROBENZENE	16	0	0	--	--	--	340	24,000	0	0	370,000
1,3-DICHLOROBENZENE	16	0	0	--	--	--	340	24,000	0	1	16,000
1,4-DICHLOROBENZENE	16	0	0	--	--	--	340	24,000	0	1	3,400
2,2'-OXYBIS(1-CHLOROPROPANE)	16	0	0	--	--	--	340	24,000	--	--	NA
2,4,5-TRICHLOROPHENOL	16	0	0	--	--	--	820	59,000	0	0	6,100,000
2,4,6-TRICHLOROPHENOL	16	0	0	--	--	--	340	24,000	0	1	6,900 (CAL-modified)
2,4-DICHLOROPHENOL	16	0	0	--	--	--	340	24,000	0	0	180,000
2,4-DIMETHYLPHENOL	16	0	0	--	--	--	340	24,000	0	0	1,200,000
2,4-DINITROPHENOL	16	0	0	--	--	--	820	59,000	0	0	120,000
2,4-DINITROTOLUENE	16	0	0	--	--	--	340	24,000	0	0	120,000
2,6-DINITROTOLUENE	16	0	0	--	--	--	340	24,000	0	0	61,000
2-CHLORONAPHTHALENE	16	0	0	--	--	--	340	24,000	--	--	NA
2-CHLOROPHENOL	16	1	6	3,100	3,100J	3,100 J	340	410	0	0	63,000
2-METHYLNAPHTHALENE	16	11	69	12,000	20J	110,000 J	360	390	--	--	NA
2-METHYLPHENOL	16	0	0	--	--	--	340	24,000	--	--	NA
2-NITROANILINE	16	0	0	--	--	--	820	59,000	0	1	1,700
2-NITROPHENOL	16	0	0	--	--	--	340	24,000	--	--	NA
3,3'-DICHLOROBENZIDINE	16	0	0	--	--	--	340	24,000	0	1	1,100
3-NITROANILINE	16	0	0	--	--	--	820	59,000	--	--	NA
4,6-DINITRO-2-METHYLPHENOL	16	0	0	--	--	--	820	59,000	--	--	NA
4-BROMOPHENYL-PHENYLETHER	16	0	0	--	--	--	340	24,000	--	--	NA
4-CHLORO-3-METHYLPHENOL	16	1	6	5,700	5,700J	5,700 J	340	410	--	--	NA
4-CHLOROANILINE	16	0	0	--	--	--	340	24,000	0	0	240,000
4-CHLOROPHENYL-PHENYLETHER	16	0	0	--	--	--	340	24,000	--	--	NA
4-METHYLPHENOL	16	0	0	--	--	--	340	24,000	0	0	310,000

TABLE 8-5: SITE 22 STATISTICAL SUMMARY OF SOIL ANALYSES (Continued)

Follow-on Investigation, 1994

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detects Over PRG	Residential PRG
Semivolatile Organic Compounds (µg/kg)											
4-NITROANILINE	16	0	0	--	--	--	820	59,000	--	--	NA
4-NITROPHENOL	16	0	0	--	--	--	820	59,000	--	--	NA
ACENAPHTHENE	16	4	25	830	18J	3,200 J	340	390	0	0	3,700,000
ACENAPHTHYLENE	16	1	6	44	44J	44 J	340	24,000	--	--	NA
ANTHRACENE	16	3	19	62	41J	76 J	340	24,000	0	0	22,000,000
BENZO(A)ANTHRACENE	16	4	25	140	24J	350	340	24,000	0	1	620
BENZO(A)PYRENE	16	5	31	140	26J	400	340	24,000	3	11	62
BENZO(B)FLUORANTHENE	16	7	44	130	19J	520	340	24,000	0	1	620
BENZO(G,H,I)PERYLENE	16	5	31	130	24J	390	340	24,000	--	--	NA
BENZO(K)FLUORANTHENE	16	3	19	51	34J	73 J	340	24,000	0	3	380 (CAL-modified)
BIS(2-CHLOROETHOXY)METHANE	16	0	0	--	--	--	340	24,000	--	--	NA
BIS(2-CHLOROETHYL)ETHER	16	0	0	--	--	--	340	24,000	0	16	210
BIS(2-ETHYLHEXYL)PHTHALATE	16	0	0	--	--	--	340	24,000	0	0	35,000
BUTYLBENZYLPHTHALATE	16	0	0	--	--	--	340	24,000	0	0	12,000,000
CARBAZOLE	16	2	13	21	18J	24 J	340	24,000	0	0	24,000
CHRYSENE	16	5	31	120	24J	350	340	24,000	0	1	3,800 (CAL-modified)
DI-N-BUTYLPHTHALATE	16	0	0	--	--	--	340	24,000	--	--	NA
DI-N-OCTYLPHTHALATE	16	0	0	--	--	--	340	24,000	--	--	NA
DIBENZO(A,H)ANTHRACENE	16	0	0	--	--	--	340	24,000	0	16	62
DIBENZOFURAN	16	0	0	--	--	--	340	24,000	0	0	290,000
DIETHYLPHTHALATE	16	0	0	--	--	--	340	24,000	0	0	49,000,000
DIMETHYLPHTHALATE	16	0	0	--	--	--	340	24,000	0	0	100,000,000
FLUORANTHENE	16	9	56	350	29J	1,400 J	340	390	0	0	2,300,000
FLUORENE	16	3	19	43	35J	60 J	340	24,000	0	0	2,700,000
HEXACHLOROBENZENE	16	0	0	--	--	--	340	24,000	0	16	300
HEXACHLOROBUTADIENE	16	0	0	--	--	--	340	24,000	0	1	6,200
HEXACHLOROCYCLOPENTADIENE	16	0	0	--	--	--	340	24,000	0	0	370,000
HEXACHLOROETHANE	16	0	0	--	--	--	340	24,000	0	0	35,000
INDENO(1,2,3-CD)PYRENE	16	5	31	130	19J	420	340	24,000	0	1	620
ISOPHORONE	16	0	0	--	--	--	340	24,000	0	0	510,000
N-NITROSO-DI-N-PROPYLAMINE	16	0	0	--	--	--	340	24,000	0	16	69

TABLE 8-5: SITE 22 STATISTICAL SUMMARY OF SOIL ANALYSES (Continued)

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detections Over PRG	Residential PRG
Semivolatile Organic Compounds (µg/kg)											
N-NITROSODIPHENYLAMINE	16	0	0	--	--	--	340	24,000	0	0	99,000
NAPHTHALENE	16	11	69	11,000	22J	110,000	360	390	1	0	56,000
NITROBENZENE	16	0	0	--	--	--	340	24,000	0	1	20,000
PENTACHLOROPHENOL	16	0	0	--	--	--	820	59,000	0	1	3,000
PHENANTHRENE	16	7	44	550	20J	2,700 J	340	390	--	--	NA
PHENOL	16	0	0	--	--	--	340	24,000	0	0	37,000,000
PYRENE	16	9	56	780	37J	4,900 J	340	390	0	0	2,300,000
Metals (mg/kg)											
ALUMINUM	16	16	100	6,200	4,140	9,460	0.0	0.0	0	0	76,000
ANTIMONY	16	0	0	--	--	--	0.48	3.0	0	0	31.0
ARSENIC	16	10	63	2.7	1.4J	8.8	0.59	2.7	10	6	0.39
BARIUM	16	16	100	63.0	24.5J	140	0.0	0.0	0	0	5,400
BERYLLIUM	16	16	100	0.88	0.52J	1.8	0.0	0.0	0	0	150
CADMIUM	16	9	56	0.66	0.10J	4.3	0.080	0.10	0	0	37.0
CALCIUM	16	16	100	3,610	1,400	6,960	0.0	0.0	--	--	NA
CHROMIUM	16	16	100	33.3	19.9J	48.1 J	0.0	0.0	0	0	210
COBALT	16	10	63	5.4	4.0J	7.1 J	5.1	7.9	0	0	900
COPPER	16	16	100	11.6	5.7	27.0	0.0	0.0	0	0	3,100
IRON	16	16	100	9,620	7,150	13,700	0.0	0.0	0	0	23,000
LEAD	16	14	88	21.1	2.1J	67.8	2.5	2.9	0	0	150 (CAL-modified)
MAGNESIUM	16	16	100	2,330	1,570	3,510	0.0	0.0	--	--	NA
MANGANESE	16	16	100	161	89.2	312	0.0	0.0	0	0	1,800
MERCURY	16	1	6	0.46	0.46	0.46	0.15	0.19	0	0	23.0
MOLYBDENUM	16	0	0	--	--	--	2.8	3.5	0	0	390
NICKEL	16	14	88	26.3	20.3	39.4	17.1	18.7	0	0	1,600
POTASSIUM	16	16	100	819	530J	1,470	0.0	0.0	--	--	NA
SELENIUM	16	5	31	0.78	0.66J	1.0 J	0.54	0.63	0	0	390
SILVER	16	0	0	--	--	--	0.18	2.8	0	0	390
SODIUM	16	16	100	201	74.6J	739 J	0.0	0.0	--	--	NA
THALLIUM	16	0	0	--	--	--	0.40	0.58	0	0	5.2

TABLE 8-5: SITE 22 STATISTICAL SUMMARY OF SOIL ANALYSES (Continued)

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detects Over PRG	Residential PRG
Metals (mg/kg)											
VANADIUM	16	16	100	23.9	19.7	32.0	0.0	0.0	0	0	550
ZINC	16	16	100	39.7	15.8	126	0.0	0.0	0	0	23,000

NOTES:

Bold denotes values elevated above the PRG

-- Not detected

J Estimated value

mg/kg Milligrams per kilogram

NA No PRG available

PRG Preliminary Remediation Goal, U.S. Environmental Protection Agency, Region 9 or CAL-modified

µg/kg Micrograms per kilogram

TABLE 8-6: SITE 22 STATISTICAL SUMMARY OF GROUNDWATER ANALYSES

Follow-on Investigation, 1994

Remedial Investigation Report for Sites 9, 13, 19, 22, and 23, Alameda Point, Alameda, California

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detects Over PRG	Tap Water PRG	MCL
Volatile Organic Compounds (µg/L)												
1,1,1-TRICHLOROETHANE	32	2	6	2	0.7J	3	1	17	0	0	3,200	200
1,1,2,2-TETRACHLOROETHANE	32	0	0	--	--	--	1	17	0	32	0.06	1
1,1,2-TRICHLOROETHANE	32	0	0	--	--	--	1	17	0	32	0.2	5
1,1-DICHLOROETHANE	32	0	0	--	--	--	1	17	0	1	2 (CAL-modified)	5
1,1-DICHLOROETHENE	32	0	0	--	--	--	1	17	0	0	340	6
1,2-DICHLOROETHANE	32	1	3	10	10	10	0.5	8	1	31	0.1	0.5
1,2-DICHLOROETHENE (TOTAL)	32	0	0	--	--	--	1	17	0	0	61 (cis)	NA
1,2-DICHLOROPROPANE	32	0	0	--	--	--	1	17	0	32	0.2	5
2-BUTANONE	1	0	0	--	--	--	18	18	--	--	NA	NA
2-HEXANONE	31	0	0	--	--	--	2	33	--	--	NA	NA
4-METHYL-2-PENTANONE	32	0	0	--	--	--	2	33	--	--	NA	NA
ACETONE	2	1	50	65	65J	65J	4	4	0	0	610	NA
BENZENE	32	8	25	490	2	1,600	0.5	1	8	24	0.3	1
BROMODICHLOROMETHANE	32	0	0	--	--	--	1	17	0	32	0.2	80
BROMOFORM	32	0	0	--	--	--	1	17	0	1	9	80
BROMOMETHANE	32	0	0	--	--	--	1	33	0	1	9	NA
CARBON DISULFIDE	32	0	0	--	--	--	1	17	0	0	1,000	NA
CARBON TETRACHLORIDE	32	0	0	--	--	--	0.5	8	0	32	0.2	0.5
CHLOROBENZENE	32	0	0	--	--	--	1	17	0	0	110	70
CHLOROETHANE	32	0	0	--	--	--	2	33	0	1	5	NA
CHLOROFORM	32	0	0	--	--	--	1	17	0	32	0.5 (CAL-modified)	80
CHLOROMETHANE	32	0	0	--	--	--	2	33	0	32	2	NA
CIS-1,3-DICHLOROPROPENE	32	0	0	--	--	--	0.5	8	0	32	0.4 (not cis)	0.5
DIBROMOCHLOROMETHANE	32	0	0	--	--	--	1	17	0	32	0.1	80
ETHYLBENZENE	32	9	28	210	0.8J	910	1	1	8	0	3	300
ETHYLENE DIBROMIDE	10	0	0	--	--	--	1	17	--	--	NA	0.05
METHYLENE CHLORIDE	32	0	0	--	--	--	1	17	0	1	4	NA
STYRENE	32	0	0	--	--	--	1	17	0	0	1,600	100
TETRACHLOROETHENE	32	0	0	--	--	--	1	17	0	32	0.7	5
TOLUENE	32	3	9	1	0.9J	1	1	17	0	0	720	150
TRANS-1,3-DICHLOROPROPENE	32	0	0	--	--	--	0.5	8	0	32	0.4 (not trans)	0.5

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detects Over PRG	Tap Water PRG	MCL
Volatile Organic Compounds (µg/L)												
TRICHLOROETHENE	32	0	0	--	--	--	1	17	0	32	0.03	5
VINYL CHLORIDE	32	0	0	--	--	--	0.5	8	0	32	0.02 (child or adult)	0.5
XYLENE (TOTAL)	32	2	6	5	4	6	1	17	0	0	210	1,800
Semivolatile Organic Compounds (µg/L)												
1,2,4-TRICHLOROENZENE	17	0	0	--	--	--	10	30	0	0	190	5
1,2-DICHLOROENZENE	17	0	0	--	--	--	5	15	0	0	370	600
1,3-DICHLOROENZENE	17	0	0	--	--	--	5	15	0	1	6	NA
1,4-DICHLOROENZENE	17	0	0	--	--	--	5	15	0	17	0.5	5
2,2'-OXYBIS(1-CHLOROPROPANE)	17	0	0	--	--	--	10	30	--	--	NA	NA
2,4,5-TRICHLOROPHENOL	17	0	0	--	--	--	25	75	0	0	3,600	50
2,4,6-TRICHLOROPHENOL	17	0	0	--	--	--	10	30	0	17	1 (CAL-modified)	NA
2,4-DICHLOROPHENOL	17	0	0	--	--	--	10	30	0	0	110	NA
2,4-DIMETHYLPHENOL	17	0	0	--	--	--	10	30	0	0	730	NA
2,4-DINITROPHENOL	11	0	0	--	--	--	25	75	0	1	73	NA
2,4-DINITROTOLUENE	17	0	0	--	--	--	10	30	0	0	73	NA
2,6-DINITROTOLUENE	17	0	0	--	--	--	10	30	0	0	36	NA
2-CHLORONAPHTHALENE	17	0	0	--	--	--	10	30	--	--	NA	NA
2-CHLOROPHENOL	17	0	0	--	--	--	10	30	0	0	30	NA
2-METHYLNAPHTHALENE	17	4	24	12	1J	31	10	30	--	--	NA	NA
2-METHYLPHENOL	17	0	0	--	--	--	10	30	0	0	1,800	NA
2-NITROANILINE	17	0	0	--	--	--	25	75	0	17	1	NA
2-NITROPHENOL	17	0	0	--	--	--	10	30	--	--	NA	NA
3,3'-DICHLOROBENZIDINE	17	0	0	--	--	--	10	30	0	17	0.2	NA
3-NITROANILINE	17	0	0	--	--	--	25	75	--	--	NA	NA
4,6-DINITRO-2-METHYLPHENOL	17	0	0	--	--	--	25	75	--	--	NA	NA
4-BROMOPHENYL-PHENYLETHER	17	0	0	--	--	--	10	30	--	--	NA	NA
4-CHLORO-3-METHYLPHENOL	17	0	0	--	--	--	10	30	--	--	NA	NA
4-CHLOROANILINE	17	0	0	--	--	--	10	30	0	0	150	NA
4-CHLOROPHENYL-PHENYLETHER	17	0	0	--	--	--	10	30	--	--	NA	NA
4-METHYLPHENOL	17	0	0	--	--	--	10	30	0	0	180	NA

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Semivolatile Organic Compounds (µg/L)												
4-NITROANILINE	17	0	0	--	--	--	25	75	--	--	NA	NA
4-NITROPHENOL	17	0	0	--	--	--	25	75	--	--	NA	NA
ACENAPHTHENE	17	0	0	--	--	--	10	30	0	0	370	NA
ACENAPHTHYLENE	17	0	0	--	--	--	10	30	--	--	NA	NA
ANTHRACENE	17	0	0	--	--	--	10	30	0	0	1,800	NA
BENZO(A)ANTHRACENE	17	0	0	--	--	--	10	30	0	17	0.09	0.1
BENZO(A)PYRENE	17	0	0	--	--	--	10	30	0	17	0.009	0.2
BENZO(B)FLUORANTHENE	17	0	0	--	--	--	10	30	0	17	0.09	NA
BENZO(G,H,I)PERYLENE	17	0	0	--	--	--	10	30	--	--	NA	NA
BENZO(K)FLUORANTHENE	17	0	0	--	--	--	10	30	0	17	0.06 (CAL-modified)	NA
BIS(2-CHLOROETHOXY)METHANE	17	0	0	--	--	--	10	30	--	--	NA	NA
BIS(2-CHLOROETHYL)ETHER	17	0	0	--	--	--	10	30	0	17	0.01	NA
BIS(2-ETHYLHEXYL)PHTHALATE	17	0	0	--	--	--	4	32	0	3	5	NA
BUTYLBENZYLPHTHALATE	17	0	0	--	--	--	10	30	0	0	7,300	NA
CARBAZOLE	17	0	0	--	--	--	10	30	0	17	3	NA
CHRYSENE	17	0	0	--	--	--	10	30	0	17	0.6 (CAL-modified)	NA
DI-N-BUTYLPHTHALATE	17	0	0	--	--	--	10	30	--	--	NA	NA
DI-N-OCTYLPHTHALATE	17	0	0	--	--	--	10	30	--	--	NA	NA
DIBENZO(A,H)ANTHRACENE	17	0	0	--	--	--	10	30	0	17	0.009	NA
DIBENZOFURAN	17	0	0	--	--	--	10	30	0	1	24	NA
DIETHYLPHTHALATE	17	0	0	--	--	--	10	30	0	0	29,000	NA
DIMETHYLPHTHALATE	17	0	0	--	--	--	10	30	0	0	360,000	NA
FLUORANTHENE	17	0	0	--	--	--	10	30	0	0	1,500	NA
FLUORENE	17	0	0	--	--	--	10	30	0	0	240	NA
HEXACHLOROBENZENE	17	0	0	--	--	--	10	30	0	17	0.04	1
HEXACHLOROBUTADIENE	17	0	0	--	--	--	10	30	0	17	0.9	NA
HEXACHLOROCYCLOPENTADIENE	17	0	0	--	--	--	10	30	0	0	220	NA
HEXACHLOROETHANE	17	0	0	--	--	--	10	30	0	17	5	NA
INDENO(1,2,3-CD)PYRENE	17	0	0	--	--	--	10	30	0	17	0.09	NA
ISOPHORONE	17	0	0	--	--	--	10	30	0	0	71	NA
N-NITROSO-DI-N-PROPYLAMINE	17	0	0	--	--	--	10	30	0	17	0.01	NA

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Semivolatile Organic Compounds (µg/L)												
N-NITROSODIPHENYLAMINE	17	0	0	--	--	--	10	30	0	1	14	NA
NAPHTHALENE	17	4	24	63	22	140	10	30	4	13	6	NA
NITROBENZENE	17	0	0	--	--	--	10	30	0	17	3	NA
PENTACHLOROPHENOL	17	1	6	100	100	100	25	75	1	16	0.6	1
PHENANTHRENE	17	0	0	--	--	--	10	30	--	--	NA	NA
PHENOL	17	2	12	45	36	54	10	30	0	0	22,000	NA
PYRENE	17	0	0	--	--	--	10	30	0	0	180	NA
Metals (µg/L)												
Filtered												
ALUMINIUM	32	3	9	606	304	1,140	8.4	60.7	0	0	36,000	NA
ANTIMONY	32	3	9	5.1	3.7J	7.1J	2.2	7.3	0	0	15.0	6.0
ARSENIC	32	22	69	12.7	2.7J	32.3	2.6	5.0	22	10	0.045	10.0
BARIUM	32	30	94	138	17.4J	311	9.9	14.6	0	0	2,600	1,000
BERYLLIUM	32	8	25	1.2	0.75J	1.4J	0.10	2.7	0	0	73.0	4.0
CADMIUM	32	4	13	3.3	0.36J	9.0	0.30	1.2	0	0	18.0	5.0
CALCIUM	32	32	100	71,400	7,170	156,000	0.0	0.0	--	--	NA	NA
CHROMIUM	32	1	3	3.1	3.1J	3.1J	0.40	1.6	--	--	NA	50.0
COBALT	32	1	3	8.5	8.5J	8.5J	3.8	10.2	0	0	730	NA
COPPER	32	5	16	20.1	16.1J	25.1	2.0	21.5	0	0	1,500	1,300
IRON	32	13	41	3,060	71.1J	9,520	3.2	172	0	0	11,000	NA
LEAD	32	0	0	--	--	--	1.0	1.5	--	--	NA	15.0
MAGNESIUM	32	32	100	51,200	5,890	132,000	0.0	0.0	--	--	NA	NA
MANGANESE	32	32	100	2,330	10.6J	12,100	0.0	0.0	25	0	880	NA
MERCURY	32	0	0	--	--	--	0.20	0.20	0	0	11.0	2.0
MOLYBDENUM	32	2	6	15.7	14.0J	17.4J	7.9	34.4	0	0	180	NA
NICKEL	32	6	19	21.3	12.6J	33.6J	7.5	23.0	0	0	730	100
POTASSIUM	32	27	84	12,500	2,250J	32,600	1,420	2,840	--	--	NA	NA
SELENIUM	32	0	0	--	--	--	2.4	3.0	0	0	180	50.0
SILVER	31	0	0	--	--	--	0.90	2.0	0	0	180	NA
SODIUM	32	32	100	166,000	19,200J	306,000	0.0	0.0	--	--	NA	NA
THALLIUM	32	5	16	9.6	4.2J	20.3	2.0	5.8	5	21	2.4	2.0

TABLE 8-6: SITE 22 STATISTICAL SUMMARY OF GROUNDWATER ANALYSES

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detects Over PRG	Tap Water PRG	MCL
Metals (µg/L)												
Filtered												
VANADIUM	32	3	9	7.4	7.2J	7.6J	3.7	11.9	0	0	260	NA
ZINC	32	4	13	110	23.1	268	5.3	50.7	0	0	11,000	NA

NOTES:

Bold denotes values elevated above the PRG

-- Not detected

J Estimated value

MCL Maximum Contaminant Level

NA No criteria available

PRG Preliminary Remediation Goal, U.S. Environmental Protection Agency, Region 9 or CAL-modified

µg/L Micrograms per liter

TABLE 8-7: SITE 22 STATISTICAL SUMMARY OF GROUNDWATER ANALYSES

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Volatile Organic Compounds (µg/L)												
1,1,1-TRICHLOROETHANE	12	0	0	--	--	--	1	1	0	0	3,200	200
1,1,2,2-TETRACHLOROETHANE	12	0	0	--	--	--	1	1	0	12	0.06	1
1,1,2-TRICHLOROETHANE	12	0	0	--	--	--	1	1	0	12	0.2	5
1,1-DICHLOROETHANE	12	0	0	--	--	--	1	1	0	0	2 (CAL-modified)	5
1,1-DICHLOROETHENE	12	0	0	--	--	--	1	1	0	0	340	6
1,2,4-TRICHLOROBENZENE	12	0	0	--	--	--	1	1	0	0	190	5
1,2-DIBROMO-3-CHLOROPROPANE	12	0	0	--	--	--	1	1	0	12	0.002 (CAL-modified)	0.2
1,2-DICHLOROBENZENE	12	1	8	3	3J	3J	1	1	0	0	370	600
1,2-DICHLOROETHANE	12	0	0	--	--	--	0.5	0.5	0	12	0.1	0.5
1,2-DICHLOROPROPANE	12	0	0	--	--	--	1	1	0	12	0.2	5
1,3-DICHLOROBENZENE	12	0	0	--	--	--	1	1	0	0	6	NA
1,4-DICHLOROBENZENE	12	0	0	--	--	--	1	1	0	12	0.5	5
2-BUTANONE	2	0	0	--	--	--	5	5	--	--	NA	NA
2-HEXANONE	9	0	0	--	--	--	5	5	--	--	NA	NA
4-METHYL-2-PENTANONE	12	0	0	--	--	--	5	5	--	--	NA	NA
BENZENE	12	2	17	13	12J	13	0.5	0.5	2	10	0.3	1
BROMOCHLOROMETHANE	12	0	0	--	--	--	1	1	--	--	NA	NA
BROMODICHLOROMETHANE	12	0	0	--	--	--	1	1	0	12	0.2	80
BROMOFORM	12	0	0	--	--	--	1	1	0	0	9	80
BROMOMETHANE	12	0	0	--	--	--	1	1	0	0	9	NA
CARBON DISULFIDE	12	0	0	--	--	--	1	1	0	0	1,000	NA
CARBON TETRACHLORIDE	12	0	0	--	--	--	0.5	0.5	0	12	0.2	0.5
CHLOROBENZENE	12	0	0	--	--	--	1	1	0	0	110	70
CHLOROETHANE	12	0	0	--	--	--	1	1	0	0	5	NA
CHLOROFORM	12	0	0	--	--	--	1	1	0	12	0.5 (CAL-modified)	80
CHLOROMETHANE	12	0	0	--	--	--	1	1	0	0	2	NA
CIS-1,2-DICHLOROETHENE	12	0	0	--	--	--	1	1	0	0	61	6
CIS-1,3-DICHLOROPROPENE	12	0	0	--	--	--	0.5	0.5	0	12	0.4 (not cis)	0.5
DIBROMOCHLOROMETHANE	12	0	0	--	--	--	1	1	0	12	0.1	80
ETHYLBENZENE	12	2	17	5	3	7	1	1	2	0	3	300
ETHYLENE DIBROMIDE	12	0	0	--	--	--	1	1	--	--	NA	0.05

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Volatile Organic Compounds (µg/L)												
METHYLENE CHLORIDE	12	0	0	--	--	--	2	2	0	0	4	NA
STYRENE	12	0	0	--	--	--	1	1	0	0	1,600	100
TETRACHLOROETHENE	12	0	0	--	--	--	1	1	0	12	0.7	5
TOLUENE	12	0	0	--	--	--	1	1	0	0	720	150
TRANS-1,2-DICHLOROETHENE	12	0	0	--	--	--	1	1	0	0	120	10
TRANS-1,3-DICHLOROPROPENE	12	0	0	--	--	--	0.5	0.5	0	12	0.4 (not trans)	0.5
TRICHLOROETHENE	12	1	8	20	20J	20J	1	1	1	11	0.03	5
VINYL CHLORIDE	12	0	0	--	--	--	0.5	0.5	0	12	0.02 (child or adult)	0.5
XYLENE (TOTAL)	12	1	8	1	1	1	1	1	0	0	210	1,800
Metals (µg/L)												
Filtered												
ALUMINUM	9	2	22	1,450	291	2,600	8.7	66.6	0	0	36,000	NA
ANTIMONY	9	1	11	1.9	1.9J	1.9J	0.70	2.8	0	0	15.0	6.0
ARSENIC	9	6	67	14.2	2.6J	35.7	0.80	1.0	6	3	0.045	10.0
BARIUM	9	9	100	177	62.3J	353	0.0	0.0	0	0	2,600	1,000
BERYLLIUM	9	0	0	--	--	--	0.10	0.15	0	0	73.0	4.0
CADMIUM	9	6	67	0.54	0.18J	1.7J	0.20	0.32	0	0	18.0	5.0
CALCIUM	9	9	100	69,300	33,700	99,000	0.0	0.0	--	--	NA	NA
CHROMIUM	9	2	22	5.6	1.7J	9.5	0.20	1.9	--	--	NA	50.0
COBALT	9	7	78	1.2	0.44J	1.7J	0.26	0.50	0	0	730	NA
COPPER	9	4	44	14.2	2.8J	25.1	0.35	2.1	0	0	1,500	1,300
IRON	9	4	44	6,220	3,160	8,920	5.6	211	0	0	11,000	NA
LEAD	9	0	0	--	--	--	0.50	3.6	--	--	NA	15.0
MAGNESIUM	9	9	100	45,300	4,770	101,000	0.0	0.0	--	--	NA	NA
MANGANESE	9	8	89	1,660	141	3,850	3.9	3.9	3	0	880	NA
MERCURY	9	0	0	--	--	--	0.10	0.10	0	0	11.0	2.0
MOLYBDENUM	9	4	44	3.4	0.30J	8.1	0.55	4.6	0	0	180	NA
NICKEL	9	9	100	11.6	1.3J	29.4	0.0	0.0	0	0	730	100
POTASSIUM	9	9	100	10,900	2,300J	21,900J	0.0	0.0	--	--	NA	NA
SELENIUM	6	1	17	1.6	1.6J	1.6J	1.0	1.8	0	0	180	50.0
SILVER	9	1	11	0.21	0.21J	0.21J	0.15	0.77	0	0	180	NA

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Metals (µg/L)												
Filtered												
SODIUM	9	9	100	109,000	8,300J	200,000	0.0	0.0	--	--	NA	NA
THALLIUM	9	0	0	--	--	--	0.90	1.4	0	0	2.4	2.0
VANADIUM	9	1	11	12.4	12.4J	12.4J	0.43	7.0	0	0	260	NA
ZINC	9	6	67	40.8	9.7J	105	1.4	11.4	0	0	11,000	NA

NOTES:

Bold denotes values elevated above the PRG

-- Not detected

J Estimated value

MCL Maximum Contaminant Level

NA No criteria available

PRG Preliminary Remediation Goal, U.S. Environmental Protection Agency, Region 9 or CAL-modified

µg/L Micrograms per liter

TABLE 8-8: SITE 22 STATISTICAL SUMMARY OF GROUNDWATER ANALYSES

Supplemental Remedial Investigation Data Gap Sampling, 2001

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detects Over PRG	Tap Water PRG	MCL
Volatile Organic Compounds (µg/L)												
1,1,1-TRICHLOROETHANE	16	0	0	--	--	--	2	500	0	0	3,200	200
1,1,2,2-TETRACHLOROETHANE	16	0	0	--	--	--	1	250	0	16	0.06	1
1,1,2-TRICHLOROETHANE	16	0	0	--	--	--	2	500	0	16	0.2	5
1,1-DICHLOROETHANE	16	0	0	--	--	--	0.5	130	0	8	2 (CAL-modified)	5
1,1-DICHLOROETHENE	16	0	0	--	--	--	2	500	0	4	340	6
1,2-DICHLOROBENZENE	16	0	0	--	--	--	2	500	0	4	370	600
1,2-DICHLOROETHANE	16	5	31	18	0.8	38	0.5	130	5	11	0.1	0.5
1,2-DICHLOROETHENE (TOTAL)	16	0	0	--	--	--	2	500	0	6	61 (cis)	NA
1,2-DICHLOROPROPANE	16	0	0	--	--	--	2	500	0	16	0.2	5
1,3-DICHLOROBENZENE	16	0	0	--	--	--	2	500	0	8	6	NA
1,4-DICHLOROBENZENE	16	0	0	--	--	--	2	500	0	16	0.5	5
2-BUTANONE	16	0	0	--	--	--	2	500	--	--	NA	NA
2-HEXANONE	16	0	0	--	--	--	2	500	--	--	NA	NA
4-METHYL-2-PENTANONE	16	0	0	--	--	--	2	500	--	--	NA	NA
ACETONE	16	1	6	9,100	9,100J	9,100J	2	500	1	0	610	NA
BENZENE	23	18	78	8,500	0.3J	34,000	0.5	0.5	17	5	0.3	1
BROMODICHLOROMETHANE	16	0	0	--	--	--	2	500	0	16	0.2	80
BROMOFORM	16	0	0	--	--	--	2	500	0	8	9	80
BROMOMETHANE	16	0	0	--	--	--	2	500	0	8	9	NA
CARBON DISULFIDE	16	2	13	2,900	1,200	4,600	2	500	2	0	1,000	NA
CARBON TETRACHLORIDE	16	0	0	--	--	--	0.5	130	0	16	0.2	0.5
CHLOROENZENE	16	0	0	--	--	--	2	500	0	4	110	70
CHLOROETHANE	16	0	0	--	--	--	2	500	0	8	5	NA
CHLOROFORM	16	0	0	--	--	--	2	500	0	16	0.5 (CAL-modified)	80
CHLOROMETHANE	16	0	0	--	--	--	2	500	0	16	2	NA
CIS-1,3-DICHLOROPROPENE	16	0	0	--	--	--	0.5	130	0	16	0.4 (not cis)	0.5
DIBROMOCHLOROMETHANE	16	0	0	--	--	--	2	500	0	16	0.1	80
ETHYLBENZENE	23	16	70	1,400	0.7J	7,100	1	400	14	1	3	300
METHYL-T-BUTYL ETHER	18	5	28	2	0.7J	5J	5	1,300	0	7	6 (CAL-modified)	13
METHYLENE CHLORIDE	16	0	0	--	--	--	2	500	0	8	4	NA
STYRENE	16	0	0	--	--	--	2	500	0	0	1,600	100

TABLE 8-8: SITE 22 STATISTICAL SUMMARY OF GROUNDWATER ANALYSES

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detects Over PRG	Tap Water PRG	MCL
Volatile Organic Compounds (µg/L)												
TETRACHLOROETHENE	16	0	0	--	--	--	2	500	0	16	0.7	5
TOLUENE	23	14	61	7,500	0.3J	34,000	0.7	400	6	0	720	150
TRANS-1,3-DICHLOROPROPENE	16	0	0	--	--	--	0.5	130	0	16	0.4 (not trans)	0.5
TRICHLOROETHENE	16	0	0	--	--	--	2	500	0	16	0.03	5
VINYL CHLORIDE	16	0	0	--	--	--	0.5	130	0	16	0.02 (child or adult)	0.5
XYLENE (TOTAL)	23	15	65	6,400	6	36,000	2	100	8	0	210	1,800
Semivolatile Organic Compounds (µg/L)												
1,2,4-TRICHLOROBENZENE	7	0	0	--	--	--	10	10	0	0	190	5
1,2-DICHLOROBENZENE	7	0	0	--	--	--	5	5	0	0	370	600
1,3-DICHLOROBENZENE	7	0	0	--	--	--	5	5	0	0	6	NA
1,4-DICHLOROBENZENE	7	0	0	--	--	--	5	5	0	7	0.5	5
2,2'-OXYBIS(1-CHLOROPROPANE)	7	0	0	--	--	--	10	10	--	--	NA	NA
2,4,5-TRICHLOROPHENOL	7	0	0	--	--	--	25	25	0	0	3,600	50
2,4,6-TRICHLOROPHENOL	7	0	0	--	--	--	10	10	0	7	1 (CAL-modified)	NA
2,4-DICHLOROPHENOL	7	0	0	--	--	--	10	10	0	0	110	NA
2,4-DIMETHYLPHENOL	7	0	0	--	--	--	10	10	0	0	730	NA
2,4-DINITROPHENOL	7	0	0	--	--	--	25	50	0	0	73	NA
2,4-DINITROTOLUENE	7	0	0	--	--	--	10	10	0	0	73	NA
2,6-DINITROTOLUENE	7	0	0	--	--	--	10	10	0	0	36	NA
2-CHLORONAPHTHALENE	7	0	0	--	--	--	10	10	--	--	NA	NA
2-CHLOROPHENOL	7	0	0	--	--	--	10	10	0	0	30	NA
2-METHYLNAPHTHALENE	7	1	14	60	60	60	10	10	--	--	NA	NA
2-METHYLPHENOL	7	0	0	--	--	--	10	10	0	0	1,800	NA
2-NITROANILINE	7	0	0	--	--	--	25	25	0	7	1	NA
2-NITROPHENOL	7	0	0	--	--	--	10	10	--	--	NA	NA
3,3'-DICHLOROBENZIDINE	7	0	0	--	--	--	12	12	0	7	0.2	NA
3-NITROANILINE	7	0	0	--	--	--	25	25	--	--	NA	NA
4,6-DINITRO-2-METHYLPHENOL	7	0	0	--	--	--	25	25	--	--	NA	NA
4-BROMOPHENYL-PHENYLETHER	7	0	0	--	--	--	10	10	--	--	NA	NA
4-CHLORO-3-METHYLPHENOL	7	0	0	--	--	--	10	10	--	--	NA	NA

TABLE 8-8: SITE 22 STATISTICAL SUMMARY OF GROUNDWATER ANALYSES

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Semivolatile Organic Compounds (µg/L)												
4-CHLOROANILINE	7	0	0	--	--	--	17	19	0	0	150	NA
4-CHLOROPHENYL-PHENYLEETHER	7	0	0	--	--	--	10	10	--	--	NA	NA
4-METHYLPHENOL	7	0	0	--	--	--	10	10	0	0	180	NA
4-NITROANILINE	7	0	0	--	--	--	25	25	--	--	NA	NA
4-NITROPHENOL	7	0	0	--	--	--	25	25	--	--	NA	NA
ACENAPHTHENE	7	0	0	--	--	--	10	10	0	0	370	NA
ACENAPHTHYLENE	7	0	0	--	--	--	10	10	--	--	NA	NA
ANTHRACENE	7	0	0	--	--	--	10	10	0	0	1,800	NA
BENZO(A)ANTHRACENE	7	0	0	--	--	--	10	10	0	7	0.09	0.1
BENZO(A)PYRENE	7	0	0	--	--	--	1	3	0	7	0.009	0.2
BENZO(B)FLUORANTHENE	7	0	0	--	--	--	10	10	0	7	0.09	NA
BENZO(G,H,I)PERYLENE	7	0	0	--	--	--	10	10	--	--	NA	NA
BENZO(K)FLUORANTHENE	7	0	0	--	--	--	10	10	0	7	0.06 (CAL-modified)	NA
BIS(2-CHLOROETHOXY)METHANE	7	0	0	--	--	--	10	10	--	--	NA	NA
BIS(2-CHLOROETHYL)ETHER	7	0	0	--	--	--	10	10	0	7	0.01	NA
BIS(2-ETHYLHEXYL)PHTHALATE	7	0	0	--	--	--	4	4	0	0	5	NA
BUTYLBENZYLPHTHALATE	7	0	0	--	--	--	10	10	0	0	7,300	NA
CARBAZOLE	7	0	0	--	--	--	10	14	0	7	3	NA
CHRYSENE	7	0	0	--	--	--	10	10	0	7	0.6 (CAL-modified)	NA
DI-N-BUTYLPHTHALATE	7	0	0	--	--	--	10	10	--	--	NA	NA
DI-N-OCTYLPHTHALATE	7	0	0	--	--	--	10	10	--	--	NA	NA
DIBENZO(A,H)ANTHRACENE	7	0	0	--	--	--	20	20	0	7	0.009	NA
DIBENZOFURAN	7	0	0	--	--	--	10	10	0	0	24	NA
DIETHYLPHTHALATE	7	0	0	--	--	--	10	10	0	0	29,000	NA
DIMETHYLPHTHALATE	7	0	0	--	--	--	10	10	0	0	360,000	NA
FLUORANTHENE	7	0	0	--	--	--	10	10	0	0	1,500	NA
FLUORENE	7	0	0	--	--	--	10	10	0	0	240	NA
HEXACHLOROENZENE	7	0	0	--	--	--	10	10	0	7	0.04	1
HEXACHLOROBUTADIENE	7	0	0	--	--	--	10	10	0	7	0.9	NA
HEXACHLOROCYCLOPENTADIENE	7	0	0	--	--	--	11	16	0	0	220	NA
HEXACHLOROETHANE	7	0	0	--	--	--	10	10	0	7	5	NA

TABLE 8-8: SITE 22 STATISTICAL SUMMARY OF GROUNDWATER ANALYSES

Supplemental Remedial Investigation Data Gap Sampling, 2001

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Semivolatile Organic Compounds (µg/L)												
INDENO(1,2,3-CD)PYRENE	7	0	0	--	--	--	10	10	0	7	0.09	NA
ISOPHORONE	7	0	0	--	--	--	10	10	0	0	71	NA
N-NITROSO-DI-N-PROPYLAMINE	7	0	0	--	--	--	10	10	0	7	0.01	NA
N-NITROSODIPHENYLAMINE	7	0	0	--	--	--	10	18	0	6	14	NA
NAPHTHALENE	7	2	29	200	15	380	10	10	2	5	6	NA
NITROBENZENE	7	0	0	--	--	--	10	10	0	7	3	NA
PENTACHLOROPHENOL	7	0	0	--	--	--	25	25	0	7	0.6	1
PHENANTHRENE	7	0	0	--	--	--	10	10	--	--	NA	NA
PHENOL	7	1	14	42	42	42	10	10	0	0	22,000	NA
PYRENE	7	0	0	--	--	--	10	10	0	0	180	NA
Polynuclear Aromatic Hydrocarbons (µg/L)												
ACENAPHTHENE	7	0	0	--	--	--	5	25	0	0	370	NA
ACENAPHTHYLENE	7	0	0	--	--	--	2	10	--	--	NA	NA
ANTHRACENE	7	0	0	--	--	--	0.2	1	0	0	1,800	NA
BENZO(A)ANTHRACENE	7	0	0	--	--	--	0.2	1	0	7	0.09	0.1
BENZO(A)PYRENE	7	0	0	--	--	--	0.2	1	0	7	0.009	0.2
BENZO(B)FLUORANTHENE	7	0	0	--	--	--	0.2	1	0	7	0.09	NA
BENZO(G,H,I)PERYLENE	7	0	0	--	--	--	0.2	1	--	--	NA	NA
BENZO(K)FLUORANTHENE	7	0	0	--	--	--	0.2	1	0	7	0.06 (CAL-modified)	NA
CHRYSENE	7	0	0	--	--	--	0.2	1	0	1	0.6 (CAL-modified)	NA
DIBENZO(A,H)ANTHRACENE	7	0	0	--	--	--	0.5	3	0	7	0.009	NA
FLUORANTHENE	7	0	0	--	--	--	0.2	1	0	0	1,500	NA
FLUORENE	7	0	0	--	--	--	1	5	0	0	240	NA
INDENO(1,2,3-CD)PYRENE	7	0	0	--	--	--	0.2	1	0	7	0.09	NA
NAPHTHALENE	7	1	14	140	140	140	5	5	1	0	6	NA
PHENANTHRENE	7	0	0	--	--	--	1	5	--	--	NA	NA
PYRENE	7	0	0	--	--	--	0.2	1	0	0	180	NA

TABLE 8-8: SITE 22 STATISTICAL SUMMARY OF GROUNDWATER ANALYSES

Supplemental Remedial Investigation Data Gap Sampling, 2001

Remedial Investigation Report for Sites 9, 13, 19, 22, and 23, Alameda Point, Alameda, California

NOTES:

Bold denotes values elevated above the PRG

-- Not detected

J Estimated value

MCL Maximum Contaminant Level

NA No criteria available

PRG Preliminary Remediation Goal, U.S. Environmental Protection Agency, Region 9 or CAL-modified

µg/L Micrograms per liter

TABLE 8-9: SITE 22 STATISTICAL SUMMARY OF GROUNDWATER ANALYSES

Basewide Groundwater Monitoring, 2002 and 2003

Remedial Investigation Report for Sites 9, 13, 19, 22, and 23, Alameda Point, Alameda, California

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detects Over PRG	Tap Water PRG	MCL
Volatile Organic Compounds (µg/L)												
1,1,1,2-TETRACHLOROETHANE	8	0	0	--	--	--	0.5	8	0	8	0.4	NA
1,1,1-TRICHLOROETHANE	8	0	0	--	--	--	0.5	8	0	0	3,200	200
1,1,2,2-TETRACHLOROETHANE	8	0	0	--	--	--	0.5	8	0	8	0.06	1
1,1,2-TRICHLOROETHANE	8	0	0	--	--	--	0.5	8	0	8	0.2	5
1,1-DICHLOROETHANE	8	0	0	--	--	--	0.5	8	0	3	2 (CAL-modified)	5
1,1-DICHLOROETHENE	8	0	0	--	--	--	0.5	8	0	0	340	6
1,1-DICHLOROPROPENE	8	0	0	--	--	--	0.5	8	--	--	NA	NA
1,2,3-TRICHLOROBENZENE	8	0	0	--	--	--	0.5	8	--	--	NA	NA
1,2,3-TRICHLOROPROPANE	8	0	0	--	--	--	0.5	8	0	8	0.006	NA
1,2,4-TRICHLOROBENZENE	8	0	0	--	--	--	0.5	8	0	0	190	5
1,2,4-TRIMETHYLBENZENE	8	0	0	--	--	--	0.5	8	0	0	12	NA
1,2-DIBROMO-3-CHLOROPROPANE	8	0	0	--	--	--	0.5	8	0	8	0.002 (CAL-modified)	0.2
1,2-DICHLOROBENZENE	8	2	25	2	0.8J	2J	0.5	8	0	0	370	600
1,2-DICHLOROETHANE	8	0	0	--	--	--	0.5	8	0	8	0.1	0.5
1,2-DICHLOROPROPANE	8	0	0	--	--	--	0.5	8	0	8	0.2	5
1,3,5-TRIMETHYLBENZENE	8	0	0	--	--	--	0.5	8	0	0	12	NA
1,3-DICHLOROBENZENE	8	0	0	--	--	--	0.5	8	0	1	6	NA
1,3-DICHLOROPROPANE	8	0	0	--	--	--	0.5	8	--	--	NA	NA
1,4-DICHLOROBENZENE	8	0	0	--	--	--	0.5	8	0	3	0.5	5
2,2-DICHLOROPROPANE	8	0	0	--	--	--	0.5	8	--	--	NA	NA
2-BUTANONE	8	0	0	--	--	--	10	170	--	--	NA	NA
2-CHLOROTOLUENE	8	0	0	--	--	--	0.5	8	--	--	NA	NA
2-HEXANONE	8	0	0	--	--	--	10	170	--	--	NA	NA
4-CHLOROTOLUENE	8	0	0	--	--	--	0.5	8	--	--	NA	NA
4-METHYL-2-PENTANONE	8	0	0	--	--	--	10	170	--	--	NA	NA
ACETONE	8	2	25	5	1J	8J	0.9	170	0	0	610	NA
BENZENE	8	4	50	1,500	690	2,800	0.5	0.5	4	4	0.3	1
BROMOBENZENE	8	0	0	--	--	--	0.5	8	0	0	20	NA
BROMOCHLOROMETHANE	8	0	0	--	--	--	0.5	8	--	--	NA	NA
BROMODICHLOROMETHANE	8	0	0	--	--	--	0.5	8	0	8	0.2	80
BROMOFORM	8	0	0	--	--	--	1	17	0	1	9	80

TABLE 8-9: SITE 22 STATISTICAL SUMMARY OF GROUNDWATER ANALYSES

Basewide Groundwater Monitoring, 2002 and 2003

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Volatile Organic Compounds (µg/L)												
BROMOMETHANE	8	1	13	0.6	0.6J	0.6J	1	17	0	1	9	NA
CARBON DISULFIDE	8	0	0	--	--	--	0.5	8	0	0	1,000	NA
CARBON TETRACHLORIDE	8	0	0	--	--	--	0.5	8	0	8	0.2	0.5
CHLOROBENZENE	8	0	0	--	--	--	0.5	8	0	0	110	70
CHLOROETHANE	8	0	0	--	--	--	1	17	0	3	5	NA
CHLOROFORM	8	1	13	19	19	19	0.5	8	1	2	0.5 (CAL-modified)	80
CHLOROMETHANE	8	1	13	0.2	0.2J	0.2J	1	17	0	3	2	NA
CIS-1,2-DICHLOROETHENE	8	0	0	--	--	--	0.5	8	0	0	61	6
DIBROMOCHLOROMETHANE	8	0	0	--	--	--	0.5	8	0	8	0.1	80
DIBROMOMETHANE	8	0	0	--	--	--	0.5	8	--	--	NA	NA
DICHLORODIFLUOROMETHANE	8	0	0	--	--	--	1	17	0	0	390	NA
DIISOPROPYL ETHER	8	1	13	0.3	0.3J	0.3J	0.5	8	--	--	NA	NA
ETHYL TERT-BUTYL ETHER	8	0	0	--	--	--	0.5	8	--	--	NA	NA
ETHYLBENZENE	8	4	50	33	26	38	0.5	0.5	4	0	3	300
ETHYLENE DIBROMIDE	8	0	0	--	--	--	0.5	8	--	--	NA	0.05
HEXACHLOROBUTADIENE	8	0	0	--	--	--	0.5	8	0	3	0.9	NA
ISOPROPYLBENZENE	8	4	50	110	100	120	0.5	0.5	--	--	NA	NA
M,P-XYLENE	8	3	38	4	2	8J	0.5	4	0	0	210 (xylenes)	NA
METHYL-T-BUTYL ETHER	8	0	0	--	--	--	0.5	4	0	0	6 (CAL-modified)	13
METHYLENE CHLORIDE	8	0	0	--	--	--	0.2	36	0	7	4	NA
N-BUTYLBENZENE	8	4	50	20	18	21	0.5	0.5	--	--	NA	NA
N-PROPYLBENZENE	8	4	50	270	260	280	0.5	0.5	4	0	240	NA
NAPHTHALENE	8	4	50	330	280	380	2	2	4	0	6	NA
O-XYLENE	8	1	13	0.7	0.7	0.7	0.5	8	0	0	210 (xylenes)	NA
P-ISOPROPYLTOLUENE	8	0	0	--	--	--	0.5	8	--	--	NA	NA
SEC-BUTYLBENZENE	8	4	50	14	3J	18	0.5	0.5	0	0	240	NA
STYRENE	8	0	0	--	--	--	0.5	8	0	0	1,600	100
TERT-AMYL METHYL ETHER	8	0	0	--	--	--	0.5	8	--	--	NA	NA
TERT-BUTANOL	8	3	38	150	110J	210	10	330	--	--	NA	NA
TERT-BUTYLBENZENE	8	0	0	--	--	--	0.5	8	0	0	240	NA
TETRACHLOROETHENE	8	1	13	3	3J	3J	0.5	8	1	2	0.7	5

TABLE 8-9: SITE 22 STATISTICAL SUMMARY OF GROUNDWATER ANALYSES

Basewide Groundwater Monitoring, 2002 and 2003

Remedial Investigation Report for Sites 9, 13, 19, 22, and 23, Alameda Point, Alameda, California

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detections Over PRG	Tap Water PRG	MCL
Volatile Organic Compounds (µg/L)												
TOLUENE	8	3	38	1	0.7J	1J	0.5	8	0	0	720	150
TRANS-1,2-DICHLOROETHENE	8	0	0	--	--	--	0.5	8	0	0	120	10
TRICHLOROETHENE	8	1	13	2	2J	2J	0.5	8	1	7	0.03	5
TRICHLOROFUOROMETHANE	8	0	0	--	--	--	1	17	--	--	NA	NA
VINYL CHLORIDE	8	0	0	--	--	--	0.5	8	0	8	0.02 (child or adult)	0.5
Metals (µg/L)												
Filtered												
ALUMINUM	6	6	100	58.8	3.5J	210	0.0	0.0	0	0	36,000	NA
ANTIMONY	6	4	67	1.3	0.079J	3.2J	50.0	60.0	0	2	15.0	6.0
ARSENIC	6	6	100	14.5	0.96J	41.0	0.0	0.0	6	0	0.045	10.0
BARIUM	6	6	100	232	72.0	490J	0.0	0.0	0	0	2,600	1,000
BERYLLIUM	6	0	0	--	--	--	2.0	2.0	0	0	73.0	4.0
CADMIUM	6	1	17	0.78	0.78J	0.78J	0.11	5.0	0	0	18.0	5.0
CALCIUM	6	6	100	76,300	40,000	100,000	0.0	0.0	--	--	NA	NA
CHROMIUM	6	2	33	0.97	0.23J	1.7J	5.8	10.0	--	--	NA	50.0
COBALT	6	5	83	2.7	0.34J	6.3J	20.0	20.0	0	0	730	NA
COPPER	6	5	83	10.5	0.62J	38.0	10.0	10.0	0	0	1,500	1,300
IRON	6	5	83	10,500	46.0J	26,000	100	100	2	0	11,000	NA
LEAD	6	1	17	0.33	0.33J	0.33J	0.25	3.0	--	--	NA	15.0
MAGNESIUM	6	6	100	56,300	4,900	94,000	0.0	0.0	--	--	NA	NA
MANGANESE	6	6	100	3,790	2.1J	11,000J	0.0	0.0	2	0	880	NA
MERCURY	6	1	17	0.15	0.15J	0.15J	0.20	0.20	0	0	11.0	2.0
MOLYBDENUM	6	5	83	3.5	0.50J	6.7J	20.0	20.0	0	0	180	NA
NICKEL	6	2	33	13.9	6.8J	21.0	20.0	20.0	0	0	730	100
POTASSIUM	6	6	100	12,400	1,200	26,000	0.0	0.0	--	--	NA	NA
SELENIUM	6	3	50	1.1	0.38J	2.2J	5.0	5.0	0	0	180	50.0
SILVER	6	0	0	--	--	--	5.0	5.0	0	0	180	NA
SODIUM	6	6	100	138,000	13,000	240,000	0.0	0.0	--	--	NA	NA
THALLIUM	6	0	0	--	--	--	0.056	5.0	0	1	2.4	2.0
VANADIUM	6	4	67	6.7	3.4J	8.6J	10.0	10.0	0	0	260	NA
ZINC	6	4	67	11.8	4.1J	26.0J	20.0	20.0	0	0	11,000	NA

TABLE 8-9: SITE 22 STATISTICAL SUMMARY OF GROUNDWATER ANALYSES

Basewide Groundwater Monitoring, 2002 and 2003

Remedial Investigation Report for Sites 9, 13, 19, 22, and 23, Alameda Point, Alameda, California

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NOTES:

Bold denotes values elevated above the PRG

-- Not detected

J Estimated value

MCL Maximum Contaminant Level

NA No criteria available

PRG Preliminary Remediation Goal, U.S. Environmental Protection Agency, Region 9 or CAL-modified

µg/L Micrograms per liter

TABLE 8-10: SITE 22 STATISTICAL SUMMARY OF SOIL ANALYSES

Basewide Polynuclear Aromatic Hydrocarbon Investigation, 2003

Remedial Investigation Report for Sites 9, 13, 19, 22, and 23, Alameda Point, Alameda, California

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detects Over PRG	Residential PRG
Polynuclear Aromatic Hydrocarbons (µg/kg)											
2-METHYLNAPHTHALENE	88	67	76	630	0.001J	22,000	0.005	5	--	--	NA
ACENAPHTHENE	74	31	42	6	0.001J	49	0.02	55	0	0	3,700
ACENAPHTHYLENE	88	38	43	4	0.002J	30	0.01	55	--	--	NA
ANTHRACENE	74	45	61	7	0.002J	59	0.005	55	0	0	22,000
BENZ(A)ANTHRACENE	79	68	86	12	0.003J	160	0.005	55	--	--	NA
BENZO(A)PYRENE	79	72	91	19	0.002J	510	0.005	6	51	3	0.06
BENZO(B)FLUORANTHENE	82	74	90	14	0.002J	300	0.005	6	39	4	0.6
BENZO(G,H,I)PERYLENE	81	71	88	17	0.003J	440 J	0.005	55	--	--	NA
BENZO(K)FLUORANTHENE	78	67	86	12	0.003J	240	0.005	6	38	5	0.4 (CAL-modified)
CHRYSENE	81	74	91	14	0.002J	220	0.005	6	28	3	4 (CAL-modified)
DIBENZ(A,H)ANTHRACENE	88	47	53	4	0.002J	51	0.005	55	--	--	NA
FLUORANTHENE	82	74	90	28	0.002J	460	0.005	55	0	0	2,300
FLUORENE	74	33	45	9	0.002J	81	0.01	55	0	0	2,700
INDENO(1,2,3-CD)PYRENE	76	63	83	16	0.003J	330	0.005	55	35	11	0.6
NAPHTHALENE	88	69	78	620	0.001J	25,000	0.01	5	7	0	56
PHENANTHRENE	78	66	85	27	0.002J	540 J	0.005	55	--	--	NA
PYRENE	83	71	86	41	0.002J	820	0.005	6	0	0	2,300

NOTES:

Bold denotes values elevated above the PRG

J Estimated value

NA No PRG available

PRG Preliminary Remediation Goal, U.S. Environmental Protection Agency, Region 9 or CAL-modified

µg/kg Micrograms per kilogram

TABLE 8-11: SITE 22 STATISTICAL SUMMARY OF SOIL

TPH Investigations

Remedial Investigation Report for CERCLA Sites 9, 13, 19, 22, and 23, Alameda Point, Alameda, California

Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Detection Limit	Maximum Detection Limit	Number of Detection Over PRG	Number of Detection Limits Over PRG	Residential PRG
Volatile Organic Compounds (mg/kg)											
BENZENE	17	7	41	1	0.009	4	0.005	5	3	2	0.6
ETHYLBENZENE	17	10	59	7	0.02	35	0.005	0.005	2	0	9
TOLUENE	17	8	47	15	0.02	52	0.005	0.005	0	0	520
XYLENE (TOTAL)	17	12	71	44	0.005	260	0.005	0.005	0	0	270

NOTES:

Bold denotes values elevated above the PRG

mg/kg Milligram per kilogram

NA No PRG available

PRG Preliminary Remediation Goal, U.S. Environmental Protection Agency, Region 9 or CAL-modified

TABLE 8-12: SITE 22 STATISTICAL SUMMARY OF GROUNDWATER

TPH Investigations

Remedial Investigation Report for CERCLA Sites 9, 13, 19, 22, and 23, Alameda Point, Alameda, California

Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Detection Limit	Maximum Detection Limit	Number of Detections Over PRG	Number of Detection Limits Over PRG	Tap Water PRG	MCL
Volatile Organic Compounds (ug/l)												
1,1,1-TRICHLOROETHANE	4	0	0	--	--	--	1	1	0	0	3,200	200
1,1,2,2-TETRACHLOROETHANE	4	0	0	--	--	--	1	1	0	4	0.06	1
1,1,2-TRICHLOROETHANE	4	0	0	--	--	--	1	1	0	4	0.2	5
1,1-DICHLOROETHANE	4	0	0	--	--	--	1	1	0	0	2 (CAL-modified)	5
1,1-DICHLOROETHENE	4	0	0	--	--	--	1	1	0	0	340	6
1,2,4-TRIMETHYLBENZENE	4	0	0	--	--	--	1	1	0	0	12	NA
1,2-DICHLOROETHANE	4	0	0	--	--	--	1	1	0	4	0.1	0.5
1,2-DICHLOROPROPANE	4	0	0	--	--	--	1	1	0	4	0.2	5
1,3,5-TRIMETHYLBENZENE	4	0	0	--	--	--	1	1	0	0	12	NA
BENZENE	6	1	17	2,200	2,200	2,200	0.5	20	1	5	0.3	1
BROMODICHLOROMETHANE	4	0	0	--	--	--	1	1	0	4	0.2	80
BROMOFORM	4	0	0	--	--	--	1	1	0	0	9	80
BROMOMETHANE	4	0	0	--	--	--	5	5	0	0	9	NA
CARBON TETRACHLORIDE	4	0	0	--	--	--	1	1	0	4	0.2	0.5
CHLOROBENZENE	4	0	0	--	--	--	1	1	0	0	110	70
CHLOROETHANE	4	0	0	--	--	--	5	5	0	4	5	NA
CHLOROFORM	4	0	0	--	--	--	1	1	0	4	0.5 (CAL-modified)	80
CHLOROMETHANE	4	0	0	--	--	--	5	5	0	4	2	NA
CIS-1,2-DICHLOROETHENE	4	0	0	--	--	--	1	1	0	0	61	6
CIS-1,3-DICHLOROPROPENE	4	0	0	--	--	--	1	1	0	4	0.4 (not cis)	0.5
DIBROMOCHLOROMETHANE	4	0	0	--	--	--	1	1	0	4	0.1	80
ETHYLBENZENE	6	1	17	70	70	70	1	20	1	1	3	300
M,P-XYLENE	1	0	0	--	--	--	1	1	0	0	210 (xylenes)	NA
METHYL-T-BUTYL ETHER	4	0	0	--	--	--	2	2	0	0	6 (CAL-modified)	13
METHYLENE CHLORIDE	4	0	0	--	--	--	2	5	0	3	4	NA
O-XYLENE	1	0	0	--	--	--	1	1	0	0	210 (xylenes)	NA
STYRENE	4	0	0	--	--	--	1	1	0	0	1,600	100
TETRACHLOROETHENE	4	0	0	--	--	--	1	1	0	4	0.7	5
TOLUENE	6	1	17	310	310	310	1	20	0	0	720	150
TRANS-1,2-DICHLOROETHENE	4	0	0	--	--	--	1	1	0	0	120	10
TRANS-1,3-DICHLOROPROPENE	4	0	0	--	--	--	1	1	0	4	0.4 (not trans)	0.5
TRICHLOROETHENE	4	0	0	--	--	--	1	1	0	4	0.03	5
VINYL CHLORIDE	4	0	0	--	--	--	0.5	0.5	0	4	0.02 (child or adult)	0.5

TABLE 8-12: SITE 22 STATISTICAL SUMMARY OF GROUNDWATER (Continued)

TPH Investigations

Remedial Investigation Report for CERCLA Sites 9, 13, 19, 22, and 23, Alameda Point, Alameda, California

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Detection Limit	Maximum Detection Limit	Number of Detection Over PRG	Number of Detection Limits Over PRG	Tap Water PRG	MCL
Volatile Organic Compounds (µg/l)												
XYLENE (TOTAL)	5	1	20	640	640	640	1	20	1	0	210	1,800

NOTES:

Bold denotes values elevated above the PRG

-- Not detected

MCL Maximum Contaminant Level

NA No criteria available

PRG Preliminary Remediation Goal, U.S. Environmental Protection Agency, Region 9 or CAL-modified

µg/L Microgram per liter

TABLE 8-13: SITE 22 STATISTICAL SUMMARY OF SOIL ANALYSES

All Soil Investigations

Remedial Investigation Report for Sites 9, 13, 19, 22, and 23, Alameda Point, Alameda, California

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detections Over PRG	Residential PRG
Volatile Organic Compounds (µg/kg)											
1,1,1-TRICHLOROETHANE	55	0	0	--	--	--	5	140,000	0	0	1,200,000
1,1,2,2-TETRACHLOROETHANE	55	0	0	--	--	--	5	140,000	0	5	410
1,1,2-TRICHLOROETHANE	55	0	0	--	--	--	5	140,000	0	4	730
1,1-DICHLOROETHANE	61	0	0	--	--	--	5	140,000	0	3	2,800 (CAL-modified)
1,1-DICHLOROETHENE	55	0	0	--	--	--	5	140,000	0	1	120,000
1,2-DICHLOROBENZENE	19	0	0	--	--	--	5	7	0	0	370,000
1,2-DICHLOROETHANE	60	2	3	11	7	14	5	140,000	0	6	280
1,2-DICHLOROETHENE (TOTAL)	55	0	0	--	--	--	5	140,000	0	1	43,000 (cis)
1,2-DICHLOROPROPANE	55	0	0	--	--	--	5	140,000	0	5	340
1,3-DICHLOROBENZENE	19	0	0	--	--	--	5	7	0	0	16,000
1,4-DICHLOROBENZENE	19	0	0	--	--	--	5	7	0	0	3,400
2-BUTANONE	55	0	0	--	--	--	10	140,000	--	--	NA
2-CHLOROETHYLVINYLETHER	18	0	0	--	--	--	10	13	--	--	NA
2-HEXANONE	55	0	0	--	--	--	10	140,000	--	--	NA
4-METHYL-2-PENTANONE	53	1	2	72,000	72,000	72,000	6	140,000	--	--	NA
ACETONE	55	1	2	690	690	690	10	170,000	0	0	1,600,000
BENZENE	55	7	13	570	6J	3,300	5	140,000	1	4	600
BROMODICHLOROMETHANE	55	0	0	--	--	--	5	140,000	0	4	820
BROMOFORM	55	0	0	--	--	--	5	140,000	0	1	62,000
BROMOMETHANE	55	0	0	--	--	--	10	140,000	0	3	3,900
CARBON DISULFIDE	55	0	0	--	--	--	5	140,000	0	0	360,000
CARBON TETRACHLORIDE	55	0	0	--	--	--	5	140,000	0	5	250
CHLOROBENZENE	55	0	0	--	--	--	5	140,000	0	0	150,000
CHLOROETHANE	55	0	0	--	--	--	10	140,000	0	3	3,000
CHLOROFORM	55	0	0	--	--	--	5	140,000	0	4	940 (CAL-modified)
CHLOROMETHANE	55	0	0	--	--	--	10	140,000	0	5	1,200
CIS-1,3-DICHLOROPROPENE	55	0	0	--	--	--	5	140,000	0	4	780 (not cis)
DIBROMOCHLOROMETHANE	55	0	0	--	--	--	5	140,000	0	4	1,100
ETHYLBENZENE	55	14	25	47,000	3J	570,000	5	6,600	3	0	8,900
ETHYLENE DIBROMIDE	15	0	0	--	--	--	5	72,000	--	--	NA
METHYLENE CHLORIDE	55	0	0	--	--	--	5	140,000	0	2	9,100

TABLE 8-13: SITE 22 STATISTICAL SUMMARY OF SOIL ANALYSES (Continued)

All Soil Investigations

Remedial Investigation Report for Sites 9, 13, 19, 22, and 23, Alameda Point, Alameda, California

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detections Over PRG	Residential PRG
Volatile Organic Compounds (µg/kg)											
STYRENE	55	0	0	--	--	--	5	140,000	0	0	1,700,000
TETRACHLOROETHENE	55	0	0	--	--	--	5	140,000	0	4	1,500
TOLUENE	60	47	78	20,000	2J	840,000	6	160	1	0	520,000
TRANS-1,3-DICHLOROPROPENE	55	0	0	--	--	--	5	140,000	0	4	780 (not trans)
TRICHLOROETHENE	55	3	5	5	2J	11	5	140,000	0	6	53
TRICHLOROFLUOROMETHANE	18	0	0	--	--	--	5	7	0	0	390,000
VINYL ACETATE	42	0	0	--	--	--	10	14,000	0	0	430,000
VINYL CHLORIDE	55	0	0	--	--	--	10	140,000	0	5	79 (child or adult)
XYLENE (TOTAL)	55	17	31	170,000	2J	2,600,000	5	27	1	0	270,000
Semivolatile Organic Compounds (µg/kg)											
1,2,4-TRICHLOROENZENE	79	1	1	2,000	2,000J	2,000 J	330	14,000	0	0	650,000
1,2-DICHLOROENZENE	79	0	0	--	--	--	330	24,000	0	0	370,000
1,2-DIPHENYLHYDRAZINE	32	0	0	--	--	--	330	720	0	1	610
1,3-DICHLOROENZENE	79	0	0	--	--	--	330	24,000	0	1	16,000
1,4-DICHLOROENZENE	79	0	0	--	--	--	330	24,000	0	2	3,400
2,2'-OXYBIS(1-CHLOROPROPANE)	16	0	0	--	--	--	340	24,000	--	--	NA
2,4,5-TRICHLOROPHENOL	79	0	0	--	--	--	820	67,000	0	0	6,100,000
2,4,6-TRICHLOROPHENOL	79	0	0	--	--	--	330	24,000	0	2	6,900 (CAL-modified)
2,4-DICHLOROPHENOL	79	0	0	--	--	--	330	24,000	0	0	180,000
2,4-DIMETHYLPHENOL	79	0	0	--	--	--	330	24,000	0	0	1,200,000
2,4-DINITROPHENOL	79	0	0	--	--	--	820	67,000	0	0	120,000
2,4-DINITROTOLUENE	78	0	0	--	--	--	330	24,000	0	0	120,000
2,6-DINITROTOLUENE	79	0	0	--	--	--	330	24,000	0	0	61,000
2-CHLORONAPHTHALENE	79	0	0	--	--	--	330	24,000	--	--	NA
2-CHLOROPHENOL	79	1	1	3,100	3,100J	3,100 J	330	14,000	0	0	63,000
2-METHYLPHENOL	79	0	0	--	--	--	330	24,000	--	--	NA
2-NITROANILINE	79	0	0	--	--	--	820	67,000	0	53	1,700
2-NITROPHENOL	79	0	0	--	--	--	330	24,000	--	--	NA
3,3'-DICHLOROENZIDINE	79	0	0	--	--	--	340	28,000	0	9	1,100
3-NITROANILINE	79	0	0	--	--	--	820	67,000	--	--	NA

TABLE 8-13: SITE 22 STATISTICAL SUMMARY OF SOIL ANALYSES (Continued)

All Soil Investigations

Remedial Investigation Report for Sites 9, 13, 19, 22, and 23, Alameda Point, Alameda, California

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detections Over PRG	Residential PRG
Semivolatile Organic Compounds (ug/kg)											
4,6-DINITRO-2-METHYLPHENOL	79	0	0	--	--	--	820	67,000	--	--	NA
4-BROMOPHENYL-PHENYLETHER	79	0	0	--	--	--	330	24,000	--	--	NA
4-CHLORO-3-METHYLPHENOL	79	1	1	5,700	5,700 J	5,700 J	330	14,000	--	--	NA
4-CHLOROANILINE	79	0	0	--	--	--	330	24,000	0	0	240,000
4-CHLOROPHENYL-PHENYLETHER	79	0	0	--	--	--	330	24,000	--	--	NA
4-METHYLPHENOL	79	0	0	--	--	--	330	24,000	0	0	310,000
4-NITROANILINE	79	0	0	--	--	--	820	67,000	--	--	NA
4-NITROPHENOL	79	0	0	--	--	--	820	67,000	--	--	NA
BENZOIC ACID	63	0	0	--	--	--	1,600	67,000	0	0	100,000,000
BENZYL ALCOHOL	63	0	0	--	--	--	330	14,000	0	0	18,000,000
BIS(2-CHLOROETHOXY)METHANE	79	0	0	--	--	--	330	24,000	--	--	NA
BIS(2-CHLOROETHYL)ETHER	79	0	0	--	--	--	330	24,000	0	79	210
BIS(2-ETHYLHEXYL)PHTHALATE	79	0	0	--	--	--	330	24,000	0	0	35,000
BUTYLBENZYLPHTHALATE	79	0	0	--	--	--	330	24,000	0	0	12,000,000
CARBAZOLE	16	2	13	21	18 J	24 J	340	24,000	0	0	24,000
DI-N-BUTYLPHTHALATE	79	1	1	6,300	6,300	6,300	330	24,000	--	--	NA
DI-N-OCTYLPHTHALATE	79	0	0	--	--	--	330	24,000	--	--	NA
DIBENZOFURAN	79	0	0	--	--	--	330	24,000	0	0	290,000
DIETHYLPHTHALATE	79	0	0	--	--	--	330	24,000	0	0	49,000,000
DIMETHYLPHTHALATE	79	0	0	--	--	--	330	24,000	0	0	100,000,000
HEXACHLOROENZENE	79	0	0	--	--	--	330	24,000	0	79	300
HEXACHLOROBUTADIENE	79	0	0	--	--	--	330	24,000	0	2	6,200
HEXACHLOROCYCLOPENTADIENE	79	0	0	--	--	--	330	24,000	0	0	370,000
HEXACHLOROETHANE	79	0	0	--	--	--	330	24,000	0	0	35,000
ISOPHORONE	79	0	0	--	--	--	330	24,000	0	0	510,000
N-NITROSO-DI-N-PROPYLAMINE	79	0	0	--	--	--	330	24,000	0	79	69
N-NITROSODIPHENYLAMINE	79	0	0	--	--	--	330	24,000	0	0	99,000
NITROBENZENE	79	0	0	--	--	--	330	24,000	0	1	20,000
PENTACHLOROPHENOL	79	0	0	--	--	--	820	67,000	0	9	3,000
PHENOL	79	2	3	200	100 J	300 J	330	24,000	0	0	37,000,000

TABLE 8-13: SITE 22 STATISTICAL SUMMARY OF SOIL ANALYSES (Continued)

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detects Over PRG	Residential PRG
Polynuclear Aromatic Hydrocarbons (µg/kg)											
2-METHYLNAPHTHALENE	88	67	76	630	0.001J	22,000	0.005	5	--	--	NA
ACENAPHTHENE	74	31	42	6	0.001J	49	0.02	55	0	0	3,700
ACENAPHTHYLENE	88	38	43	4	0.002J	30	0.01	55	--	--	NA
ANTHRACENE	74	45	61	7	0.002J	59	0.005	55	0	0	22,000
BENZ(A)ANTHRACENE	79	68	86	12	0.003J	160	0.005	55	--	--	NA
BENZO(A)PYRENE	79	72	91	19	0.002J	510	0.005	6	51	3	0.06
BENZO(B)FLUORANTHENE	82	74	90	14	0.002J	300	0.005	6	39	4	0.6
BENZO(G,H,I)PERYLENE	81	71	88	17	0.003J	440 J	0.005	55	--	--	NA
BENZO(K)FLUORANTHENE	78	67	86	12	0.003J	240	0.005	6	38	5	0.4 (CAL-modified)
CHRYSENE	81	74	91	14	0.002J	220	0.005	6	28	3	4 (CAL-modified)
DIBENZ(A,H)ANTHRACENE	88	47	53	4	0.002J	51	0.005	55	--	--	NA
FLUORANTHENE	82	74	90	28	0.002J	460	0.005	55	0	0	2,300
FLUORENE	74	33	45	9	0.002J	81	0.01	55	0	0	2,700
INDENO(1,2,3-CD)PYRENE	76	63	83	16	0.003J	330	0.005	55	35	11	0.6
NAPHTHALENE	88	69	78	620	0.001J	25,000	0.01	5	7	0	56
PHENANTHRENE	78	66	85	27	0.002J	540 J	0.005	55	--	--	NA
PYRENE	83	71	86	41	0.002J	820	0.005	6	0	0	2,300
PCBs/Pesticides (µg/kg)											
4,4'-DDD	61	2	3	6	2	9 J	2	200	0	0	2,400
4,4'-DDE	61	4	7	14	6	23 J	2	200	0	0	1,700
4,4'-DDT	61	3	5	22	3J	53 J	2	200	0	0	1,700
ALDRIN	61	0	0	--	--	--	1	99	0	6	29
ALPHA-BHC	61	0	0	--	--	--	1	99	--	--	NA
ALPHA-CHLORDANE	31	2	6	14	0.9J	27 J	82	990	0	0	1,600 (chlordan)
AROCLOR-1016	61	0	0	--	--	--	26	990	0	0	3,900
AROCLOR-1221	61	0	0	--	--	--	26	990	0	6	220
AROCLOR-1232	61	0	0	--	--	--	26	990	0	6	220
AROCLOR-1242	61	0	0	--	--	--	26	990	0	6	220
AROCLOR-1248	61	0	0	--	--	--	26	990	0	6	220
AROCLOR-1254	61	0	0	--	--	--	53	2,000	0	8	220

TABLE 8-13: SITE 22 STATISTICAL SUMMARY OF SOIL ANALYSES (Continued)

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detects Over PRG	Residential PRG
PCBs/Pesticides (µg/kg)											
AROCLOR-1260	61	0	0	--	--	--	53	2,000	0	8	220
BETA-BHC	61	0	0	--	--	--	1	99	--	--	NA
CHLORDANE	30	0	0	--	--	--	11	52	0	0	1,600
DELTA-BHC	61	0	0	--	--	--	1	99	--	--	NA
DIELDRIN	61	0	0	--	--	--	2	200	0	7	30
ENDOSULFAN I	60	0	0	--	--	--	2	99	0	0	370,000
ENDOSULFAN II	62	0	0	--	--	--	2	200	0	0	370,000 (endosulfan)
ENDOSULFAN SULFATE	61	0	0	--	--	--	2	200	--	--	NA
ENDRIN	61	0	0	--	--	--	2	200	0	0	18,000
ENDRIN ALDEHYDE	30	0	0	--	--	--	2	10	--	--	NA
ENDRIN KETONE	32	0	0	--	--	--	17	200	--	--	NA
GAMMA-BHC (LINDANE)	61	0	0	--	--	--	1	99	--	--	NA
GAMMA-CHLORDANE	31	2	6	12	1J	22 J	82	990	0	0	1,600 (chlordane)
HEPTACHLOR	61	0	0	--	--	--	1	99	0	0	110
HEPTACHLOR EPOXIDE	63	0	0	--	--	--	1	99	0	4	53
METHOXYCHLOR	61	2	3	16	11	20	5	990	0	0	310,000
TOXAPHENE	61	0	0	--	--	--	53	2,000	0	6	440
Metals (mg/kg)											
ALUMINUM	78	78	100	8,190	3,120	26,800	0.0	0.0	0	0	76,000
ANTIMONY	78	0	0	--	--	--	0.48	10.0	0	0	31.0
ARSENIC	78	40	51	7.6	1.4J	24.0	0.59	13.0	40	38	0.39
BARIUM	78	78	100	66.5	0.30	200	0.0	0.0	0	0	5,400
BERYLLIUM	78	37	47	0.57	0.20	1.8	0.20	1.7	0	0	150
CADMIUM	78	35	45	0.49	0.10J	4.3	0.080	1.7	0	0	37.0
CALCIUM	78	78	100	2,760	15.3	15,500	0.0	0.0	--	--	NA
CHROMIUM	78	78	100	37.5	11.4	71.8	0.0	0.0	0	0	210
COBALT	78	56	72	6.7	3.6	17.0	5.1	7.9	0	0	900
COPPER	78	78	100	15.2	5.6	86.2	0.0	0.0	0	0	3,100
IRON	78	78	100	12,100	760	29,600	0.0	0.0	1	0	23,000
LEAD	78	40	51	264	2.1J	9,890	2.5	60.0	1	0	150 (CAL-modified)

TABLE 8-13: SITE 22 STATISTICAL SUMMARY OF SOIL ANALYSES (Continued)

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detections Over PRG	Residential PRG
Metals (mg/kg)											
MAGNESIUM	78	78	100	3,310	1,510	42,400	0.0	0.0	--	--	NA
MANGANESE	78	78	100	172	72.4	734	0.0	0.0	0	0	1,800
MERCURY	16	1	6	0.46	0.46	0.46	0.15	0.19	0	0	23.0
MOLYBDENUM	78	0	0	--	--	--	1.0	8.4	0	0	390
NICKEL	78	76	97	36.1	11.6	89.0	17.1	18.7	0	0	1,600
POTASSIUM	78	75	96	929	497	2,300	530	610	--	--	NA
SELENIUM	78	6	8	1.6	0.66J	5.7	0.54	17.0	0	0	390
SILVER	78	2	3	0.95	0.70	1.2	0.18	8.4	0	0	390
SODIUM	78	56	72	455	74.6J	1,810	520	630	--	--	NA
THALLIUM	78	0	0	--	--	--	0.40	17.0	0	29	5.2
TITANIUM	62	62	100	439	183	704	0.0	0.0	--	--	NA
VANADIUM	78	78	100	25.7	13.9	62.3	0.0	0.0	0	0	550
ZINC	78	78	100	85.3	14.0	3,880	0.0	0.0	0	0	23,000

NOTES:

Bold denotes values elevated above the PRG

-- Not detected

BHC Benzene Hexachloride

DDD Dichlorodiphenyldichloroethane

DDE Dichlorodiphenyldichloroethene

DDT Dichlorodiphenyltrichloroethane

J Estimated value

mg/kg Milligrams per kilogram

NA No PRG available

PCB Polychlorinated biphenyl

PRG Preliminary Remediation Goal, U.S. Environmental Protection Agency, Region 9 or CAL-modified

µg/kg Micrograms per kilogram

TABLE 8-14: SITE 22 STATISTICAL SUMMARY OF GROUNDWATER ANALYSES

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detects Over PRG	Tap Water PRG	MCL
Volatile Organic Compounds (ug/L)												
1,1,1,2-TETRACHLOROETHANE	8	0	0	--	--	--	0.5	8	0	8	0.4	NA
1,1,1-TRICHLOROETHANE	73	2	3	2	0.7J	3	0.5	500	0	0	3,200	200
1,1,2,2-TETRACHLOROETHANE	73	0	0	--	--	--	0.5	250	0	73	0.06	1
1,1,2-TRICHLOROETHANE	73	0	0	--	--	--	0.5	500	0	73	0.2	5
1,1-DICHLOROETHANE	73	0	0	--	--	--	0.5	130	0	17	2 (CAL-modified)	5
1,1-DICHLOROETHENE	73	0	0	--	--	--	0.5	500	0	4	340	6
1,1-DICHLOROPROPENE	8	0	0	--	--	--	0.5	8	--	--	NA	NA
1,2,3-TRICHLOROBENZENE	8	0	0	--	--	--	0.5	8	--	--	NA	NA
1,2,3-TRICHLOROPROPANE	8	0	0	--	--	--	0.5	8	0	8	0.006	NA
1,2,4-TRICHLOROBENZENE	20	0	0	--	--	--	0.5	8	0	0	190	5
1,2,4-TRIMETHYLBENZENE	8	0	0	--	--	--	0.5	8	0	0	12	NA
1,2-DIBROMO-3-CHLOROPROPANE	20	0	0	--	--	--	0.5	8	0	20	0.002 (CAL-modified)	0.2
1,2-DICHLOROBENZENE	36	3	8	2	0.8J	3J	0.5	500	0	4	370	600
1,2-DICHLOROETHANE	73	6	8	17	0.8	38	0.5	130	6	67	0.1	0.5
1,2-DICHLOROETHENE (TOTAL)	53	0	0	--	--	--	1	500	0	6	61 (cis)	NA
1,2-DICHLOROPROPANE	73	0	0	--	--	--	0.5	500	0	73	0.2	5
1,3,5-TRIMETHYLBENZENE	8	0	0	--	--	--	0.5	8	0	0	12	NA
1,3-DICHLOROBENZENE	36	0	0	--	--	--	0.5	500	0	9	6	NA
1,3-DICHLOROPROPANE	8	0	0	--	--	--	0.5	8	--	--	NA	NA
1,4-DICHLOROBENZENE	36	0	0	--	--	--	0.5	500	0	31	0.5	5
2,2-DICHLOROPROPANE	8	0	0	--	--	--	0.5	8	--	--	NA	NA
2-BUTANONE	32	0	0	--	--	--	2	500	--	--	NA	NA
2-CHLOROTOLUENE	8	0	0	--	--	--	0.5	8	--	--	NA	NA
2-HEXANONE	69	0	0	--	--	--	2	500	--	--	NA	NA
4-CHLOROTOLUENE	8	0	0	--	--	--	0.5	8	--	--	NA	NA
4-METHYL-2-PENTANONE	73	0	0	--	--	--	2	500	--	--	NA	NA
ACETONE	31	4	13	2,300	1J	9,100J	0.9	500	1	0	610	NA
BENZENE	80	35	44	4,700	0.3J	34,000	0.5	5	34	45	0.3	1
BROMOBENZENE	8	0	0	--	--	--	0.5	8	0	0	20	NA
BROMOCHLOROMETHANE	20	0	0	--	--	--	0.5	8	--	--	NA	NA
BROMODICHLOROMETHANE	73	0	0	--	--	--	0.5	500	0	73	0.2	80

TABLE 8-14: SITE 22 STATISTICAL SUMMARY OF GROUNDWATER ANALYSES

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detects Over PRG	Tap Water PRG	MCL
Volatile Organic Compounds (ug/L)												
BROMOFORM	73	0	0	--	--	--	1	500	0	13	9	80
BROMOMETHANE	73	1	1	0.6	0.6J	0.6J	1	500	0	15	9	NA
CARBON DISULFIDE	73	2	3	2,900	1,200	4,600	0.5	500	2	0	1,000	NA
CARBON TETRACHLORIDE	73	0	0	--	--	--	0.5	130	0	73	0.2	0.5
CHLOROBENZENE	73	0	0	--	--	--	0.5	500	0	4	110	70
CHLOROETHANE	73	0	0	--	--	--	1	500	0	17	5	NA
CHLOROFORM	73	1	1	19	19	19	0.5	500	1	67	0.5 (CAL-modified)	80
CHLOROMETHANE	73	1	1	0.2	0.2J	0.2J	1	500	0	56	2	NA
CIS-1,2-DICHLOROETHENE	20	0	0	--	--	--	0.5	8	0	0	61	6
CIS-1,3-DICHLOROPROPENE	65	0	0	--	--	--	0.5	130	0	65	0.4 (not cis)	0.5
DIBROMOCHLOROMETHANE	73	0	0	--	--	--	0.5	500	0	73	0.1	80
DIBROMOMETHANE	8	0	0	--	--	--	0.5	8	--	--	NA	NA
DICHLORODIFLUOROMETHANE	8	0	0	--	--	--	1	17	0	0	390	NA
DIISOPROPYL ETHER	8	1	13	0.3	0.3J	0.3J	0.5	8	--	--	NA	NA
ETHYL TERT-BUTYL ETHER	8	0	0	--	--	--	0.5	8	--	--	NA	NA
ETHYLBENZENE	80	34	43	870	0.7J	7,100	0.5	400	31	3	3	300
ETHYLENE DIBROMIDE	30	0	0	--	--	--	0.5	17	--	--	NA	0.05
HEXACHLOROBUTADIENE	8	0	0	--	--	--	0.5	8	0	3	0.9	NA
ISOPROPYLBENZENE	8	4	50	110	100	120	0.5	0.5	--	--	NA	NA
M,P-XYLENE	8	3	38	4	2	8J	0.5	4	0	0	210 (xylenes)	NA
METHYL-T-BUTYL ETHER	26	5	19	2	0.7J	5J	0.5	1,300	0	7	6 (CAL-modified)	13
METHYLENE CHLORIDE	73	0	0	--	--	--	0.2	500	0	21	4	NA
N-BUTYLBENZENE	8	4	50	20	18	21	0.5	0.5	--	--	NA	NA
N-PROPYLBENZENE	8	4	50	270	260	280	0.5	0.5	4	0	240	NA
NAPHTHALENE	8	4	50	330	280	380	2	2	4	0	6	NA
O-XYLENE	8	1	13	0.7	0.7	0.7	0.5	8	0	0	210 (xylenes)	NA
P-ISOPROPYLTOLUENE	8	0	0	--	--	--	0.5	8	--	--	NA	NA
SEC-BUTYLBENZENE	8	4	50	14	3J	18	0.5	0.5	0	0	240	NA
STYRENE	73	0	0	--	--	--	0.5	500	0	0	1,600	100
TERT-AMYL METHYL ETHER	8	0	0	--	--	--	0.5	8	--	--	NA	NA
TERT-BUTANOL	8	3	38	150	110J	210	10	330	--	--	NA	NA

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detections Over PRG	Tap Water PRG	MCL
Volatile Organic Compounds (µg/L)												
TERT-BUTYLBENZENE	8	0	0	--	--	--	0.5	8	0	0	240	NA
TETRACHLOROETHENE	73	1	1	3	3J	3J	0.5	500	1	67	0.7	5
TOLUENE	80	20	25	5,200	0.3J	34,000	0.5	400	6	0	720	150
TRANS-1,2-DICHLOROETHENE	20	0	0	--	--	--	0.5	8	0	0	120	10
TRANS-1,3-DICHLOROPROPENE	65	0	0	--	--	--	0.5	130	0	65	0.4 (not trans)	0.5
TRICHLOROETHENE	73	2	3	11	2J	20J	0.5	500	2	71	0.03	5
TRICHLOROFLUOROMETHANE	8	0	0	--	--	--	1	17	--	--	NA	NA
VINYL ACETATE	5	0	0	--	--	--	5	50	0	0	410	NA
VINYL CHLORIDE	73	0	0	--	--	--	0.5	130	0	73	0.02 (child or adult)	0.5
XYLENE (TOTAL)	72	19	26	5,100	1	36,000	1	100	8	0	210	1,800
Semivolatile Organic Compounds (µg/L)												
1,2,4-TRICHLOROENZENE	29	0	0	--	--	--	10	30	0	0	190	5
1,2-DICHLOROENZENE	29	0	0	--	--	--	5	15	0	0	370	600
1,2-DIPHENYLHYDRAZINE	3	0	0	--	--	--	10	10	--	--	NA	NA
1,3-DICHLOROENZENE	29	0	0	--	--	--	5	15	0	6	6	NA
1,4-DICHLOROENZENE	29	0	0	--	--	--	5	15	0	29	0.5	5
2,2'-OXYBIS(1-CHLOROPROPANE)	24	0	0	--	--	--	10	30	--	--	NA	NA
2,4,5-TRICHLOROPHENOL	29	0	0	--	--	--	10	75	0	0	3,600	50
2,4,6-TRICHLOROPHENOL	29	0	0	--	--	--	10	30	0	29	1 (CAL-modified)	NA
2,4-DICHLOROPHENOL	29	0	0	--	--	--	10	30	0	0	110	NA
2,4-DIMETHYLPHENOL	29	1	3	39	39	39	10	30	0	0	730	NA
2,4-DINITROPHENOL	23	0	0	--	--	--	10	75	0	1	73	NA
2,4-DINITROTOLUENE	29	0	0	--	--	--	10	30	0	0	73	NA
2,6-DINITROTOLUENE	29	0	0	--	--	--	10	30	0	0	36	NA
2-CHLORONAPHTHALENE	29	0	0	--	--	--	10	30	--	--	NA	NA
2-CHLOROPHENOL	29	0	0	--	--	--	10	30	0	0	30	NA
2-METHYLNAPHTHALENE	29	7	24	17	1J	60	10	30	--	--	NA	NA
2-METHYLPHENOL	29	0	0	--	--	--	10	30	0	0	1,800	NA
2-NITROANILINE	29	0	0	--	--	--	25	75	0	29	1	NA
2-NITROPHENOL	29	0	0	--	--	--	10	30	--	--	NA	NA

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Semivolatile Organic Compounds (µg/L)												
3,3'-DICHLOROBENZIDINE	29	0	0	--	--	--	10	30	0	29	0.2	NA
3-NITROANILINE	29	0	0	--	--	--	25	75	--	--	NA	NA
4,6-DINITRO-2-METHYLPHENOL	29	0	0	--	--	--	10	75	--	--	NA	NA
4-BROMOPHENYL-PHENYLETHER	29	0	0	--	--	--	10	30	--	--	NA	NA
4-CHLORO-3-METHYLPHENOL	29	0	0	--	--	--	10	30	--	--	NA	NA
4-CHLOROANILINE	29	0	0	--	--	--	10	30	0	0	150	NA
4-CHLOROPHENYL-PHENYLETHER	29	0	0	--	--	--	10	30	--	--	NA	NA
4-METHYLPHENOL	29	0	0	--	--	--	10	30	0	0	180	NA
4-NITROANILINE	29	0	0	--	--	--	25	75	--	--	NA	NA
4-NITROPHENOL	29	0	0	--	--	--	10	75	--	--	NA	NA
ACENAPHTHENE	29	0	0	--	--	--	10	30	0	0	370	NA
ACENAPHTHYLENE	29	0	0	--	--	--	10	30	--	--	NA	NA
ANILINE	5	0	0	--	--	--	10	10	--	--	NA	NA
ANTHRACENE	29	0	0	--	--	--	10	30	0	0	1,800	NA
BENZO(A)ANTHRACENE	29	0	0	--	--	--	10	30	0	29	0.09	0.1
BENZO(A)PYRENE	29	0	0	--	--	--	1	30	0	29	0.009	0.2
BENZO(B)FLUORANTHENE	29	0	0	--	--	--	10	30	0	29	0.09	NA
BENZO(G,H,I)PERYLENE	29	0	0	--	--	--	10	30	--	--	NA	NA
BENZO(K)FLUORANTHENE	29	0	0	--	--	--	10	30	0	29	0.06 (CAL-modified)	NA
BENZOIC ACID	5	0	0	--	--	--	50	50	0	0	150,000	NA
BENZYL ALCOHOL	5	0	0	--	--	--	10	10	0	0	11,000	NA
BIS(2-CHLOROETHOXY)METHANE	29	0	0	--	--	--	10	30	--	--	NA	NA
BIS(2-CHLOROETHYL)ETHER	29	0	0	--	--	--	10	30	0	29	0.01	NA
BIS(2-ETHYLHEXYL)PHTHALATE	29	0	0	--	--	--	4	32	0	8	5	NA
BUTYLBENZYLPHTHALATE	29	0	0	--	--	--	10	30	0	0	7,300	NA
CARBAZOLE	24	0	0	--	--	--	10	30	0	24	3	NA
CHRYSENE	29	0	0	--	--	--	10	30	0	29	0.6 (CAL-modified)	NA
DI-N-BUTYLPHTHALATE	29	0	0	--	--	--	10	30	--	--	NA	NA
DI-N-OCTYLPHTHALATE	29	0	0	--	--	--	10	30	--	--	NA	NA
DIBENZO(A,H)ANTHRACENE	29	0	0	--	--	--	10	30	0	29	0.009	NA
DIBENZOFURAN	29	0	0	--	--	--	10	30	0	1	24	NA

TABLE 8-14: SITE 22 STATISTICAL SUMMARY OF GROUNDWATER ANALYSES

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detects Over PRG	Tap Water PRG	MCL
Semivolatile Organic Compounds (µg/L)												
DIETHYLPHTHALATE	29	0	0	--	--	--	10	30	0	0	29,000	NA
DIMETHYLPHTHALATE	29	0	0	--	--	--	10	30	0	0	360,000	NA
FLUORANTHENE	29	0	0	--	--	--	10	30	0	0	1,500	NA
FLUORENE	29	0	0	--	--	--	10	30	0	0	240	NA
HEXACHLOROBENZENE	29	0	0	--	--	--	10	30	0	29	0.04	1
HEXACHLOROBUTADIENE	29	0	0	--	--	--	10	30	0	29	0.9	NA
HEXACHLOROCYCLOPENTADIENE	29	0	0	--	--	--	10	30	0	0	220	NA
HEXACHLOROETHANE	29	0	0	--	--	--	10	30	0	29	5	NA
INDENO(1,2,3-CD)PYRENE	29	0	0	--	--	--	10	30	0	29	0.09	NA
ISOPHORONE	29	0	0	--	--	--	10	30	0	0	71	NA
N-NITROSO-DI-N-PROPYLAMINE	26	0	0	--	--	--	10	30	0	26	0.01	NA
N-NITROSODIMETHYLAMINE	5	0	0	--	--	--	10	10	--	--	NA	NA
N-NITROSODIPHENYLAMINE	29	0	0	--	--	--	10	30	0	7	14	NA
NAPHTHALENE	29	8	28	94	15	380	10	30	8	21	6	NA
NITROBENZENE	29	0	0	--	--	--	10	30	0	29	3	NA
PENTACHLOROPHENOL	29	1	3	100	100	100	25	75	1	28	0.6	1
PHENANTHRENE	29	0	0	--	--	--	10	30	--	--	NA	NA
PHENOL	29	5	17	30	4J	54	10	30	0	0	22,000	NA
PYRENE	29	0	0	--	--	--	10	30	0	0	180	NA
Polynuclear Aromatic Hydrocarbons (µg/L)												
ACENAPHTHENE	7	0	0	--	--	--	5	25	0	0	370	NA
ACENAPHTHYLENE	7	0	0	--	--	--	2	10	--	--	NA	NA
ANTHRACENE	7	0	0	--	--	--	0.2	1	0	0	1,800	NA
BENZO(A)ANTHRACENE	7	0	0	--	--	--	0.2	1	0	7	0.09	0.1
BENZO(A)PYRENE	7	0	0	--	--	--	0.2	1	0	7	0.009	0.2
BENZO(B)FLUORANTHENE	7	0	0	--	--	--	0.2	1	0	7	0.09	NA
BENZO(G,H,I)PERYLENE	7	0	0	--	--	--	0.2	1	--	--	NA	NA
BENZO(K)FLUORANTHENE	7	0	0	--	--	--	0.2	1	0	7	0.06 (CAL-modified)	NA
CHRYSENE	7	0	0	--	--	--	0.2	1	0	1	0.6 (CAL-modified)	NA
DIBENZO(A,H)ANTHRACENE	7	0	0	--	--	--	0.5	3	0	7	0.009	NA

TABLE 8-14: SITE 22 STATISTICAL SUMMARY OF GROUNDWATER ANALYSES

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detects Over PRG	Tap Water PRG	MCL
Polynuclear Aromatic Hydrocarbons (µg/L)												
FLUORANTHENE	7	0	0	--	--	--	0.2	1	0	0	1,500	NA
FLUORENE	7	0	0	--	--	--	.1	5	0	0	240	NA
INDENO(1,2,3-CD)PYRENE	7	0	0	--	--	--	0.2	1	0	7	0.09	NA
NAPHTHALENE	7	1	14	140	140	140	5	5	1	0	6	NA
PHENANTHRENE	7	0	0	--	--	--	1	5	--	--	NA	NA
PYRENE	7	0	0	--	--	--	0.2	1	0	0	180	NA
PCBs/Pesticides (µg/L)												
4,4'-DDD	3	0	0	--	--	--	0.1	1	0	1	0.3	NA
4,4'-DDE	3	0	0	--	--	--	0.1	1	0	1	0.2	NA
4,4'-DDT	3	0	0	--	--	--	0.1	1	0	1	0.2	NA
ALDRIN	3	0	0	--	--	--	0.05	0.5	0	3	0.004	NA
ALPHA-BHC	3	0	0	--	--	--	0.05	0.5	--	--	NA	NA
AROCLOR-1016	3	0	0	--	--	--	0.8	8	0	1	1	NA
AROCLOR-1221	3	0	0	--	--	--	2	20	0	3	0.03	NA
AROCLOR-1232	3	0	0	--	--	--	2	20	0	3	0.03	NA
AROCLOR-1242	3	0	0	--	--	--	0.8	8	0	3	0.03	NA
AROCLOR-1248	3	0	0	--	--	--	0.5	5	0	3	0.03	NA
AROCLOR-1254	3	0	0	--	--	--	1	10	0	3	0.03	NA
AROCLOR-1260	3	0	0	--	--	--	1	10	0	3	0.03	NA
BETA-BHC	3	0	0	--	--	--	0.05	0.5	--	--	NA	NA
CHLORDANE	3	0	0	--	--	--	0.2	2	0	3	0.2	NA
DELTA-BHC	3	0	0	--	--	--	0.05	0.5	--	--	NA	NA
DIELDRIN	3	0	0	--	--	--	0.02	0.2	0	3	0.004	NA
ENDOSULFAN I	3	0	0	--	--	--	0.05	0.5	0	0	220	NA
ENDOSULFAN II	5	0	0	--	--	--	0.1	1	--	--	NA	NA
ENDOSULFAN SULFATE	3	0	0	--	--	--	0.1	1	--	--	NA	NA
ENDRIN	3	0	0	--	--	--	0.06	0.6	0	0	11	2
ENDRIN ALDEHYDE	5	0	0	--	--	--	0.1	1	--	--	NA	NA
ENDRIN KETONE	5	0	0	--	--	--	0.05	0.5	--	--	NA	NA
GAMMA-BHC (LINDANE)	3	0	0	--	--	--	0.05	0.5	--	--	NA	NA

TABLE 8-14: SITE 22 STATISTICAL SUMMARY OF GROUNDWATER ANALYSES

All Groundwater Investigations

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Analyte	Number of Samples Analyzed	Number of Detections	Percent of Detections	Average of Detected Concentration	Minimum Detected Concentration	Maximum Detected Concentration	Minimum Non-detected Concentration	Maximum Non-detected Concentration	Number of Detections Over PRG	Number of Non-detects Over PRG	Tap Water PRG	MCL
PCBs/Pesticides (µg/L)												
HEPTACHLOR	3	0	0	--	--	--	0.02	0.2	0	3	0.02	0.01
HEPTACHLOR EPOXIDE	5	0	0	--	--	--	0.05	0.5	0	5	0.007	0.01
METHOXYCHLOR	5	0	0	--	--	--	0.1	1	0	0	180	30
TOXAPHENE	3	0	0	--	--	--	1	10	0	3	0.06	3
Metals (µg/L)												
Filtered												
ALUMINUM	52	16	31	58,400	3.5J	305,000	8.4	66.6	5	0	36,000	NA
ANTIMONY	52	8	15	2.8	0.079J	7.1J	0.70	60.0	0	7	15.0	6.0
ARSENIC	52	37	71	17.6	0.96J	86.0	0.80	100	37	15	0.045	10.0
BARIUM	52	50	96	254	17.4J	1,900	9.9	14.6	0	0	2,600	1,000
BERYLLIUM	52	9	17	1.9	0.75J	7.0	0.10	5.0	0	0	73.0	4.0
CADMIUM	52	11	21	1.5	0.18J	9.0	0.11	5.0	0	0	18.0	5.0
CALCIUM	52	52	100	69,100	7,170	156,000	0.0	0.0	--	--	NA	NA
CHROMIUM	52	10	19	4,120	0.23J	39,000	0.20	10.0	--	--	NA	50.0
COBALT	52	18	35	27.7	0.34J	160	0.26	20.0	0	0	730	NA
COPPER	52	19	37	51.0	0.62J	260	0.35	21.5	0	0	1,500	1,300
IRON	52	27	52	45,400	46.0J	376,000	3.2	211	7	0	11,000	NA
LEAD	52	3	6	46.1	0.33J	82.0	0.25	50.0	--	--	NA	15.0
MAGNESIUM	52	52	100	52,300	4,770	132,000	0.0	0.0	--	--	NA	NA
MANGANESE	52	51	98	2,490	2.1J	12,100	3.9	3.9	35	0	880	NA
MERCURY	47	1	2	0.15	0.15J	0.15J	0.10	0.20	0	0	11.0	2.0
MOLYBDENUM	52	11	21	5.7	0.30J	17.4J	0.55	50.0	0	0	180	NA
NICKEL	52	22	42	165	1.3J	1,100	7.5	23.0	1	0	730	100
POTASSIUM	52	47	90	12,700	1,200	32,600	1,420	2,840	--	--	NA	NA
SELENIUM	49	6	12	38.3	0.38J	150	1.0	59.0	0	0	180	50.0
SILVER	51	3	6	9.7	0.21J	17.0	0.15	10.0	0	0	180	NA
SODIUM	52	52	100	161,000	8,300J	388,000	0.0	0.0	--	--	NA	NA
THALLIUM	52	5	10	9.6	4.2J	20.3	0.056	100	5	27	2.4	2.0
TITANIUM	5	5	100	4,340	2,500	7,700	0.0	0.0	--	--	NA	NA
VANADIUM	52	13	25	158	3.4J	690	0.43	11.9	5	0	260	NA
ZINC	52	19	37	141	4.1J	680	1.4	50.7	0	0	11,000	NA

TABLE 8-14: SITE 22 STATISTICAL SUMMARY OF GROUNDWATER ANALYSES

All Groundwater Investigations

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NOTES:

Bold denotes values elevated above the PRG

-- Not detected

BHC Benzene Hexachloride

DDD Dichlorodiphenyldichloroethane

DDE Dichlorodiphenyldichloroethene

DDT Dichlorodiphenyltrichloroethane

J Estimated value

MCL Maximum Contaminant Level

NA No criteria available

PCB Polychlorinated biphenyl

PRG Preliminary Remediation Goal, U.S. Environmental Protection Agency, Region 9 or CAL-modified

µg/L Micrograms per liter

TABLE 8-15: SITE 22 SUMMARY OF HUMAN HEALTH RISKS; REASONABLE MAXIMUM EXPOSURE

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EXPOSURE PATHWAY	CANCER RISK					NONCANCER HAZARD				
	Current/ Future Industrial Worker (0-2 ft)	Future Construction Worker (0-2 ft)	Future Resident (Adult + Child) (0-2 ft)	Future Construction Worker (0-8 ft)	Future Resident (Adult + Child) (0-8 ft)	Current/ Future Industrial Worker (0-2 ft)	Future Construction Worker (0-2 ft)	Future Resident (Child) (0-2 ft)	Future Construction Worker (0-8 ft)	Future Resident (Child) (0-8 ft)
	Soil Exposure Pathways									
Soil Ingestion	6E-06	7E-07	3E-05	6E-07	2E-05	0.03	0.1	0.4	0.1	0.4
Dermal Contact with Soil	1E-06	7E-08	3E-06	5E-08	2E-06	0.007	0.01	0.04	0.007	0.03
Inhalation of Particulates and Volatiles Released from Soil to Outdoor Air	8E-09	3E-10	2E-08	3E-07	2E-05	0.00000008	0.00000008	0.0000003	0.7	2
Ingestion of Homegrown Produce	--	--	3E-05	--	2E-05	--	--	0.2	--	0.1
Soil Total	7E-06	8E-07	6E-05	9E-07	6E-05	0.04	0.1	0.7	0.8	3
Groundwater Exposure Pathways										
Inhalation of Volatiles Released from Groundwater to Indoor Air	3E-06	--	6E-05	--	6E-05	0.06	--	2	--	2
Groundwater Ingestion	--	--	2E-03	--	2E-03	--	--	71	--	71
Dermal Contact with Groundwater	--	--	2E-04	--	2E-04	--	--	5	--	5
Inhalation of Volatiles Released from Household Use of Groundwater	--	--	1E-04	--	1E-04	--	--	8	--	8
Groundwater Total	3E-06	--	3E-03	--	3E-03	0.06	--	85	--	85
Multipathway Total	1E-05	8E-07	3E-03	9E-07	3E-03	0.1	0.1	86	0.8	88

Notes:

- Not applicable; exposure pathway is not complete for this receptor.
- (0-2 ft) Interval of soil below ground surface evaluated in this exposure scenario
- (0-8 ft) Interval of soil below ground surface evaluated in this exposure scenario

TABLE 8-16: SITE 22 SUMMARY OF HUMAN HEALTH RISKS; CENTRAL TENDENCY EXPOSURE

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EXPOSURE PATHWAY	CANCER RISK					NONCANCER HAZARD				
	Current/ Future Industrial Worker (0-2 ft)	Future Construction Worker (0-2 ft)	Future Resident (Adult + Child) (0-2 ft)	Future Construction Worker (0-8 ft)	Future Resident (Adult + Child) (0-8 ft)	Current/ Future Industrial Worker (0-2 ft)	Future Construction Worker (0-2 ft)	Future Resident (Child) (0-2 ft)	Future Construction Worker (0-8 ft)	Future Resident (Child) (0-8 ft)
Soil Exposure Pathways										
Soil Ingestion	2E-07	2E-08	5E-06	2E-08	4E-06	0.007	0.004	0.1	0.004	0.1
Dermal Contact with Soil	8E-09	3E-09	2E-07	3E-09	2E-07	0.0003	0.0004	0.0033	0.0003	0.003
Inhalation of Particulates and Volatiles Released from Soil to Outdoor Air	7E-11	4E-11	2E-10	7E-09	4E-08	2.E-09	4.E-09	2.E-09	0.01	0.002
Ingestion of Homegrown Produce	--	--	1E-06	--	1E-06	--	--	0.01	--	0.01
Soil Total	2E-07	3E-08	6E-06	3E-08	6E-06	0.007	0.004	0.1	0.02	0.1
Groundwater Exposure Pathways										
Inhalation of Volatiles Released from Groundwater to Indoor Air	6E-08	--	2E-06	--	2E-06	0.006	--	0.08	--	0.08
Groundwater Ingestion	--	--	4E-04	--	4E-04	--	--	28	--	28
Dermal Contact with Groundwater	--	--	1E-05	--	1E-05	--	--	0.6	--	0.6
Inhalation of Volatiles Released from Household Use of Groundwater	--	--	4E-07	--	4E-07	--	--	0.04	--	0.04
Groundwater Total	6E-08	--	4E-04	--	4E-04	0.006	--	29	--	29
Multipathway Total	3E-07	3E-08	4E-04	3E-08	4E-04	0.01	0.004	29	0.02	29

Notes:

-- Not applicable; exposure pathway is not complete for this receptor.

(0-2 ft) Interval of soil below ground surface evaluated in this exposure scenario

(0-8 ft) Interval of soil below ground surface evaluated in this exposure scenario

**TABLE 8-17: RESULTS OF THE CHEMICAL OF POTENTIAL ECOLOGICAL CONCERN
SCREENING FOR SOIL AT SITE 22**

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CHEMICAL OF POTENTIAL ECOLOGICAL CONCERN	SCREENING EVALUATION	
	Rejected	Retained
Metals		
Aluminum	CSB	--
Antimony	--	--
Arsenic	CSB	--
Barium	--	X
Beryllium	CSB	--
Cadmium	CSB	--
Chromium	CSB	--
Cobalt	CSB	--
Copper	--	X
Iron	EN	--
Lead	--	X
Manganese	CSB	--
Mercury	CSB	--
Molybdenum	--	--
Nickel	--	X
Selenium	--	X
Silver	FOD	--
Thallium	--	--
Titanium	CSB	--
Vanadium	CSB	--
Zinc	--	X
Pesticides and Polychlorinated Biphenyls		
alpha-Chlordane	--	X
Aroclor-1260	--	--
4,4'-Dichlorodiphenyldichloroethane	--	X
4,4'-Dichlorodiphenyldichloroethylene	--	X
4,4'-Dichlorodiphenyltrichloroethane	--	X
gamma-Chlordane	--	X
Heptachlor epoxide	--	--
Semivolatile Organic Compounds		
1,2,4-Trichlorobenzene	--	--
2,4-Dimethylphenol	--	--
2-Chlorophenol	--	--
2-Methylnaphthalene	--	X
2-Methylphenol	--	--
4-Chloro-3-Methylphenol	--	--
4-Methylphenol	--	--
Acenaphthene	--	X
Acenaphthylene	--	X

TABLE 8-17: RESULTS OF THE CHEMICAL OF POTENTIAL ECOLOGICAL CONCERN SCREENING FOR SOIL AT SITE 22

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CHEMICAL OF POTENTIAL ECOLOGICAL CONCERN	SCREENING EVALUATION	
	Rejected	Retained
Semivolatile Organic Compounds (Continued)		
Anthracene	--	X
Benzo(a)anthracene	--	X
Benzo(a)pyrene	--	X
Benzo(b)fluoranthene	--	X
Benzo(g,h,i)perylene	--	X
Benzo(k)fluoranthene	--	X
Bis(2-ethylhexyl)phthalate	--	--
Carbazole	--	X
Chrysene	--	X
Dibenzo(a,h)anthracene	--	X
Di-n-butylphthalate	--	--
Fluoranthene	--	X
Fluorene	--	X
Indeno(1,2,3-cd)pyrene	--	X
Naphthalene	--	X
n-Nitroso-diphenylamine	--	--
Pentachlorophenol	--	--
Phenanthrene	--	X
Pyrene	--	X
Volatile Organic Compounds		
1,2-Dichloroethene	--	--
1,3-Dichlorobenzene	--	--
2-Butanone	--	--
4-Methyl-2-Pentanone	--	X
Acetone	--	--
Benzene	--	X
Carbon Disulfide	--	--
Ethylbenzene	--	X
Methylene Chloride	--	--
Tetrachloroethene	--	--
Toluene	--	X
Trichloroethene	--	--
Xylene	--	X

Notes:

- These analyses were not performed.
- CSB Concentrations within statistical background
- EN Essential nutrient
- FOD Frequency of detection five percent or lower
- NB Non-bioaccumulating
- X These analyses were performed.

TABLE 8-18: SITE 22 ECOLOGICAL RISK ASSESSMENT SOIL HAZARD QUOTIENTS

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CHEMICAL OF POTENTIAL ECOLOGICAL CONCERN	MEASUREMENT ENDPOINTS							
	Reproductive or physiological impacts to the California ground squirrel		Reproductive or physiological impacts to the Alameda song sparrow		Reproductive or physiological impacts to the American robin		Reproductive or physiological impacts to the Red-tailed hawk	
	HAZARD QUOTIENT							
	High TRV	Low TRV	High TRV	Low TRV	High TRV	Low TRV	High TRV	Low TRV
Barium	<1	<1	<1	<1	<1	<1	<1	<1
Copper	<1	1.6E+00	<1	<1	<1	<1	<1	<1
Lead	<1	2.4E+01	<1	6.4E+02	<1	2.1E+03	<1	1.3E+03
Lead alternate low TRV	NA	NA	NA	1.8E+00	NA	5.9E+00	NA	3.5E+00
Selenium	<1	3.2E+00	<1	<1	<1	<1	<1	<1
Zinc	<1	2.4E+00	<1	<1	<1	<1	<1	<1
alpha-Chlordane	1.9E+00	3.9E+00	<1	2.8E+00	<1	8.5E+00	<1	<1
gamma-Chlordane	1.6E+00	3.2E+00	<1	2.2E+00	<1	6.9E+00	<1	<1
DDTt	<1	<1	<1	<1	<1	<1	<1	<1
HMW PAHs	<1	<1	QE	QE	QE	QE	QE	QE
LMW PAHs	<1	<1	QE	QE	QE	QE	QE	QE
Carbazole	QE	QE	QE	QE	QE	QE	QE	QE
4-Methyl-2-pentanone	<1	<1	QE	QE	QE	QE	QE	QE
Benzene	<1	<1	QE	QE	QE	QE	QE	QE
Ethylbenzene	QE	QE	QE	QE	QE	QE	QE	QE
Toluene	<1	2.3E+00	QE	QE	QE	QE	QE	QE
Xylene	3.0E+01	3.7E+01	QE	QE	QE	QE	QE	QE

Notes:

Hazard quotient exceeds 1.0

DDTt Summed concentration of 4,4'-dichlorodiphenyldichloroethane, 4,4'-dichlorodiphenyldichloroethene, and 4,4,-dichlorodiphenyltrichloroethane

HMW High molecular weight

LMW Low molecular weight

NA Not applicable

PAH Polynuclear aromatic hydrocarbon

QE No TRV developed for Ecological COPC and endpoint-qualitative evaluation only

TRV Toxicity reference value

TABLE 8-19: ECOLOGICAL RISK ASSESSMENT HAZARD QUOTIENTS FOR SOIL BACKGROUND

Remedial Investigation Report for Sites 9, 13, 19, 22, and 23, Alameda Point, Alameda, California

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CHEMICAL OF POTENTIAL ECOLOGICAL CONCERN	MEASUREMENT ENDPOINTS							
	Reproductive or physiological impacts to the California ground squirrel		Reproductive or physiological impacts to the Alameda song sparrow		Reproductive or physiological impacts to the American robin		Reproductive or physiological impacts to the Red-tailed hawk	
	HAZARD QUOTIENT							
	High TRV	Low TRV	High TRV	Low TRV	High TRV	Low TRV	High TRV	Low TRV
Antimony	4.2E-02	2.2E-01	1.1E-04	4.6E-04	3.6E-04	1.4E-03	1.7E-03	6.7E-03
Arsenic	5.1E-02	2.6E-01	1.4E-04	5.8E-04	4.7E-04	1.9E-03	1.9E-03	7.7E-03
Barium	6.9E-02	2.2E-01	2.0E-02	3.9E-02	6.2E-02	1.3E-01	2.9E-01	5.9E-01
Beryllium	1.3E-03	1.3E-02	NV	NV	NV	NV	NV	NV
Cadmium	5.5E-02	2.4E+00	5.5E-04	4.8E-03	1.8E-03	1.6E-02	6.0E-02	5.2E-01
Chromium	1.7E-02	6.8E-02	1.4E-03	6.7E-03	4.6E-03	2.3E-02	7.2E-03	3.6E-02
Copper	5.3E-03	1.1E+00	4.3E-04	5.8E-03	1.4E-03	1.9E-02	2.9E-03	3.8E-02
Lead	4.1E-03	1.0E-01	3.7E-04	2.7E+00	1.2E-03	9.1E+00	3.0E-03	2.2E+01
Lead, alternate TRV	NA	NA	NA	7.5E-03	NA	2.5E-02	NA	6.0E-02
Mercury	ND	ND	ND	ND	ND	ND	ND	ND
Selenium	8.4E-01	2.0E+01	4.3E-03	1.7E-02	1.4E-02	5.5E-02	6.8E-02	2.8E-01
Zinc	5.2E-03	1.4E+00	4.0E-04	4.0E-03	1.3E-03	1.3E-02	7.2E-03	7.2E-02

Notes:

- NA Not applicable
- ND Not detected in background samples
- NV Reference value not available, HQ could not be calculated
- TRV Toxicity reference value

9.0 BACKGROUND AND RI RESULTS FOR CERCLA SITE 23 BUILDING 530 (MISSILE REWORK OPERATIONS)

Section 9.0 provides a comprehensive site summary and analysis of contamination located at CERCLA Site 23. The physical features and history of the site are presented in Section 9.1. The environmental investigations conducted at Site 23 are presented in Section 9.2, and the initial data evaluation, which includes the site-specific CSM, data quality assessment, and background comparison, are presented in Section 9.3. The nature and extent evaluation is presented in Section 9.4, and the fate and transport analysis is included in Section 9.5. The HHRA and ERA are summarized in Sections 9.6 and 9.7, respectively. Conclusions and recommendations for Site 23 are identified in Section 9.8.

9.1 PHYSICAL FEATURES AND SITE HISTORY

This section summarizes the physical features, history, and activities at Site 23. The physical features of Site 23 are summarized in Section 9.1.1. The history and activities, including hazardous wastes generated and past disposal and storage practices associated with the wastes, conducted at Site 23 are described in Section 9.1.2. The Site 23 regulatory history is summarized in Section 9.1.3.

9.1.1 Site 23 Physical Features

Site 23 is located in the southern portion of OU-2A, approximately 1,100 feet east of Seaplane Lagoon and 1,200 feet north of Breakwater Beach. The site is approximately 14 acres in size, relatively flat, and mostly paved, as shown on Figure 9-1. Site 23 includes Buildings 530 and 600; a self storage area known as OTH211 (consisting of Buildings MS-11 through MS-19); Structures 529, 561, and 586; OWSs 529 and 530; and several storm sewer, industrial waste, and fuel lines.

Historic site features include the plane defueling area west of Building 530 and may include the Pacific Coast Oil Works Company Refinery. The refinery operated from 1879 to 1903, and no structures from the refinery remain at Site 23. In addition, Buildings 352, 460A, and 606; and ASTs 530A, 530B, and 530C were formerly located at Site 23.

Currently, approximately 80 percent of Site 23 consists of open space. Most of the ground surface is paved with asphalt or concrete, with some minor areas of exposed soil and weeds. Current uses include vehicle parking and storage.

9.1.2 Site 23 History

Between 1879 and 1903, the Pacific Coast Oil Works Company Refinery operated in Alameda at the current location of Site 13 and possibly portions of adjoining CERCLA Sites 19, 22, and 23. Most operations occurred in the southern part of Site 13. The refinery used an acid-sludge process for refining fresh crude oil. Wastes from this type of operation would be expected to

include heavier-end hydrocarbons. Although the type and quantity of wastes and the disposal locations are not documented, it is reasonable to assume that the refinery wastes and asphaltic residues may have been disposed of at Sites 13 and 23 and the surrounding tidal lands. The wastes and residues are considered a potential source of the hydrocarbon-rich material observed coming to the surface in two locations at Site 13 that may also be present at Site 23

The northeast corner of Site 23 is the only area that existed before the Navy obtained the property in 1936. Up until 1936, the original portion of Site 23 was used for agricultural purposes. From 1942 to 1946, the rest of Site 23 was filled in with material dredged from the Oakland Inner Harbor and the Bay. In 1945, Building 352, a 1,002-ft² wood and metal Quonset hut, was constructed. The building was used to store explosives and warheads. No servicing or maintenance of the explosives was conducted, and the building was demolished in 1977.

In 1947, the western half of Site 23 was used as a staging area for planes, missiles, and bombs. Between 1958 and 1963, the material and equipment storage yard and defueling area was constructed and used for defueling activities and storage. The defueling activities took place directly west of Building 530, as shown on aerial photographs taken from 1953 to 1958. These photographs show heavily stained soils in this area of Site 23. The area was used for equipment and materials storage from 1947 through 1994. The eastern half of the area is currently paved with concrete (approximately 30 percent), and the remainder is paved with asphalt (see Figure 9-1).

In 1961, Building 460A was built on the east side of the plane defueling area. It housed the control equipment for the defueling facility. The 196-ft² building was removed in January 2001. The exact location of this building is unknown.

In 1974, Building 529, located at the southern end of Building 530, was constructed to supply auxiliary power for Building 530. Building 529 is a 3,200-ft² structure consisting of concrete construction over a concrete slab. During an inspection conducted as part of the EBS (IT 2001), several oil-like stains were noted and nine 55-gallon drums containing petroleum products and miscellaneous chemicals were stored in the building.

Built in 1975, Structure 561 is electrical substation 11 (transformer pad), located on the west side of Building 530. The transformer located on this pad was labeled as containing less than 1 part per million of PCBs.

Built in 1975, Structure 586 is a 1,000-ft² sewage lift station.

In 1973, Building 530, the main building present on Site 23, was built. The 82,251-ft² building has a concrete floor and walls and a steel frame roof with corrugated metal roofing. The building was used for missile rework operations until the base closed in 1997. Operations historically performed in Building 530 included missile rework operations, overhauling aviation components, electrical maintenance, cleaning, grinding, welding, painting, paint stripping, drum storage, and parts fabrication. Hazardous materials known to have been used in the building

include lead-based paint, hydraulic fluid, silver solder, ethylene glycol, lead, zinc, silver, tin, chromium, nickel, mercury, TCE, and petroleum (E&E 1983).

The waste streams generated by the missile rework processes were controlled and all wastes and paint stripping bath liquids were disposed of in 55-gallon drums at an off-site facility (Canonie 1990). Building 530 houses three RCRA sites: NADEP GAP 63, NADEP GAP 63A, and NADEP GAP 64. The three SWMUs are no longer active; a letter from DTSC recommended NFA for each unit (DTSC 1999a). Building 530 is being leased from the ARRA. Alameda Aerospace is currently leasing Building 530 as a repair shop for commercial flight instruments.

The three ASTs (530A, 530B, and 530C) were associated with Building 530 and had capacities of 10,000 gallons, 10,000 gallons, and 15,000 gallons, respectively. All three tanks were located in the plane defueling area, near the southwest corner of Building 530. The tanks have been dismantled and removed. AST 530A stored 1010 oil, AST 530B stored fuel or oil, and AST 530C stored jet fuel.

OWS 529 is located at the east end of Avenue M, west of the former ASTs (530A, 530B, and 530C) and was associated with the plane defueling area. Also once associated with the plane defueling area, OWS 530 is located at the northwest corner of a fenced area, west of Building 530. The material stored and disposed of and the capacity of OWS 529 and OWS 530 are unknown.

Building 600 was constructed in 1975 as a support building for Building 530. It is approximately 343 ft² in size and is located directly east of Building 530. The building contains cooling towers and associated cooling equipment. During the EBS (IT 2001), several 55-gallon drums of lubricating oil and canisters of freon and minor oil stains were observed in Building 600. These drums have been removed.

Building 606 was a portable type structure with aluminum siding and a wood roof. The building appeared to be an administration building and was located near the northwest corner of Building 530. The building was removed between 1988 and 1996.

The Navy exchange mini-storage area was built in 1987. The separate buildings within the mini-storage area have been designated MS-01 through MS-19; only MS-11 through MS-19 are located within Site 23.

Nearly all the open space, which is roughly 80 percent of Site 23, is paved with asphalt. Areas not paved generally consist of exposed soil. PCB oil was used for weed control in the mini-storage area until 1963. Former uses included a material and equipment storage yard, a defueling facility, aircraft parking (1947 to 1970), vehicle parking, and surrounding roadways (1975 to present) (IT 2001).

9.1.3 Regulatory History

Several facilities and areas within Site 23 are regulated by different programs. These programs include the CERCLA program, the TPH program, and the RCRA program. The sections below briefly describe the history of each of these programs at Site 23.

9.1.3.1 CERCLA Program

The location of the former oil refinery was initially reviewed (as Site 11, Oil Refinery) during the IAS in 1983 for inclusion in the NACIP program (E&E 1983), as discussed in Section 3.3. The IAS concluded, however, that the former location of the oil refinery was not a site that required further investigation. On June 6, 1988, the Navy received an RAO from the California Department of Health Services (now known as DTSC) that identified a total of 20 sites, which included the former location of the oil refinery, as needing an RI/FS in accordance with CERCLA requirements. The former location of the oil refinery became Site 13. The original Site 13, as defined in the Phase 1 and 2A (see Section 9.2.2), included the current Site 13 and Site 23 boundaries, excluding Building 530. In October 2000, the boundaries for Site 13 and Site 23 were redefined to the existing boundaries based on locations of groundwater plumes. Site 23 currently encompasses the southern half of the original Site 13 and Building 530, which was formerly called Site 10B.

9.1.3.2 RCRA Program

Several areas were identified in the RFA at Site 23, including NADEP GAP 63, NADEP GAP 63A, and NADEP GAP 64. OWSs 529 and 530 were later added as SWMUs.

The RFIs were implemented through the coordination of other ongoing programs, including the TPH program and the CERCLA program. A letter received from DTSC on November 4, 1999, recommended NFA for the three GAPS (DTSC 1999a). The SWMU Evaluation Report (see Appendix G) also recommends NFA for the three GAPS and further action under the TPH program for OWSs 529 and 530.

9.1.3.3 TPH Program

After Alameda Point was identified for closure in September 1993, the TPH program was implemented to decommission all USTs and other fuel-related items. As part of the program, TPH contamination was evaluated at 16 sites, known as CAAs. Several investigations have occurred at Site 23 under the TPH program, as summarized in Section 9.2.4. Site 23 was included in CAA 13 under the TPH program. Corrective action is currently underway for aircraft fuel contamination in soil and groundwater in the defueling area.

9.2 SITE 23 ENVIRONMENTAL INVESTIGATIONS

This section describes the environmental investigations conducted at Site 23, which include investigations conducted before the IRP, under CERCLA, under the EBS and TPH Programs, and during removal actions.

Tables 9-1 and 9-2 summarize the soil and groundwater samples collected by the environmental investigations conducted at Site 23 and the types of analyses conducted. Sampling locations are shown on Figures 9-7A through 9-9 and are categorized by investigation. Results for each of the investigations are presented in Tables 9-11 and 9-12. The tables are organized by analytical group and detail the number and percent of detections; the minimum, average, and maximum detected concentration; the minimum and maximum detection limit; the number of detections exceeding either the residential (for soil) or tap water (for groundwater) PRGs (EPA 2002a); the number of detection limits for nondetected samples exceeding the PRG; and the PRG.

The following subsections summarize investigations conducted at Site 23 prior to the IRP (Section 9.2.1), under the CERCLA (Section 9.2.2), EBS (Section 9.2.3), and TPH programs (Section 9.2.4), and as a part of removal actions (Section 9.2.5).

9.2.1 Investigations Conducted Before the IRP

No documented investigations occurred within the current Site 23 boundaries before the IRP. Site 23 boundaries previously included an area that is now within the Site 13 boundaries, and two investigations were conducted in the area that is currently Site 13. Because neither of these investigations was completed within the current Site 23 boundaries, they are not discussed in this section.

9.2.2 CERCLA Investigations

The following subsections summarize investigations conducted at Site 23 under CERCLA. These investigations include the Phase I and 2A investigation performed in 1991, the follow-on investigations conducted in 1994 and 1998, the storm sewer investigation in 2000, the supplemental RI data gaps sampling performed in 2001, the basewide groundwater monitoring conducted in 2002 and 2003, and the basewide PAH study in 2003.

Boring logs for all investigations are presented in Appendix B.

9.2.2.1 Phase 1 and 2A Investigation, 1991

At the time of this investigation, the site boundaries for Site 13 encompassed the current Site 13 and Site 23 boundaries, and Building 530 made up Site 10B (Canonie 1989). Subsequently, in October 2000, as the limits of contamination from the former oil refinery became more apparent, the boundaries for Site 13 and Site 10B were redefined. The location of the former oil refinery is shown on Figure 9-2. Site 10B was eliminated, and the boundaries for Site 13 were redefined to

the existing boundaries based on locations of groundwater plumes. The remainder of Sites 13 and 10B became the current Site 23.

The Navy contracted with Canonie to conduct an investigation at former Site 13 to determine whether contamination from the oil refinery operations leached into groundwater (Canonie 1989, 1990). Canonie also conducted an investigation at Building 530 to evaluate the soil and groundwater in the vicinity of Building 530.

Soil

The 1991 investigation included drilling 12 soil borings (BOR-20, BOR-22, BOR-23, BOR-25, BOR-26, BOR-27, MWOR-5, MW530-1, MW530-2, MW530-3, B410-6, and MW410-4) and installing 5 groundwater monitoring wells at 5 of the boring locations (MWOR-5, MW530-1, MW530-2, MW530-3, and MW410-4). To evaluate if contaminants were present in the areas investigated, 143 soil samples were collected and analyzed for VOCs, SVOCs, pesticide and PCB compounds, metals, TRPH, TOC, cations and anions, pH, cyanide, flash point, total kjeldahl nitrogen, and general chemistry parameters. The table below summarizes the chemicals detected at concentrations exceeding the residential PRG (EPA 2002a) and the sampling location with the highest detected concentration for each chemical.

Site 23 1991 Phase 1 and 2a Investigation Soil Summary		
Analytical Group	Chemicals Exceeding 2002 Residential PRG	Location of Highest Concentration
VOCs	None	Not Applicable
SVOCs	Benzo(a)pyrene	BOR-23
Pesticides and PCBs	Toxaphene	BOR-26
Metals	Arsenic	MW530-15
	Iron	BOR-22

Note:

PAH data collected for soil during this investigation were not used in this RI because of high detection limits; data from additional PAH sampling conducted in 2003 were used.

No VOCs or PCBs were detected in soil at concentrations exceeding their respective PRGs (EPA 2002a) at Site 23. PAHs, analyzed with the SVOC analytical group, were detected at concentrations exceeding the 2002 residential PRG in samples from location BOR-23 at a depth of 11.0 to 11.5 feet bgs.

The pesticide toxaphene was detected at concentrations exceeding the 2002 residential PRG (EPA 2002a) in samples from location BOR-26 at a depth of 10.5 at 11.0 feet bgs.

PCBs were not detected in Site 23 soils.

Arsenic was detected at concentrations exceeding the 2002 residential PRG (EPA 2002a) in samples from location MW530-1 (12.0 to 12.5 feet bgs), and iron was detected at concentrations exceeding the 2002 residential PRG in samples from location BOR-22 (11.5-12.0 feet bgs).

TRPH was identified in several samples collected at Site 23.

Groundwater

Five groundwater monitoring wells are located across Site 23. MWOR-5 is located on the eastern boundary of Site 23, and monitoring wells M09-05 and MW410-4 are located near the western boundary of the Site 23. Monitoring wells MW530-1 and MW530-2 are located on the northeast corner and the west side of Building 530, and well MW530-3 is located at the southwest corner of Building 586. One groundwater sample was collected from each monitoring well. All of the groundwater samples were analyzed for SVOCs, VOCs, dissolved metals, and general chemistry parameters. In addition, a groundwater sample collected from well MWOR-5 was analyzed for pesticides and PCBs and TRPH, and groundwater samples collected from wells MW-530-1 through MW530-3 were analyzed for TRPH and oil and grease. Monitoring well locations are presented on Figure 9-3. The table below summarizes the chemicals detected at concentrations exceeding the tap water PRG (EPA 2002a) and the sampling location with the highest detected concentration for each chemical.

Site 23 1991 Phase 1 and 2A Investigation Groundwater Summary		
Analytical Group	Chemicals Exceeding 2002 Tap Water PRG	Location of Highest Concentration
VOC	Benzene and ethylbenzene	MW530-1
SVOC	Naphthalene	MW530-1
Pesticides and PCBs	None	Not Applicable
Metals	Aluminum, iron, manganese, nickel, and vanadium	MWOR-5
	Arsenic	MW530-3

BTEX was detected in groundwater samples from well MW530-1, and methylene chloride, believed to be a laboratory contaminant, was detected in several samples and four travel blanks. Two PAHs were detected in groundwater samples from well MW530-1. Dissolved metals were detected in all samples. No pesticides and PCBs were detected in samples from well MWOR-5, the only well at Site 23 analyzed for pesticides and PCBs. TRPH and oil and grease were detected in samples from wells MW530-1 and MW530-3.

Recommendations for future work included collecting additional soil samples to evaluate the extent of VOCs, SVOCs and petroleum hydrocarbons at Site 25. Sufficient metals data have been collected for soil. The report recommended that additional groundwater monitoring wells be installed to further characterize VOCs, SVOCs, petroleum hydrocarbons, and metals in

groundwater (PRC and JMM 1992). The collection of additional groundwater samples was also recommended to evaluate tidal influence on the shallow and deep water-bearing zone, to better characterize TDS in groundwater, and to evaluate whether groundwater beneath Site 23 was considered a potential drinking water source.

9.2.2.2 Follow-On Investigation, 1994

As stated previously, the boundaries for Site 23 have changed over time. Samples were collected at Site 23 during the 1994 investigation at Buildings 530 and 410 (west of Building 530 at Site 9).

Based on the recommendations of the 1991 investigation and discussions with the regulatory agencies, a follow-on investigation was conducted to provide additional lithologic, chemical, and hydrogeologic information to assess the nature and extent of soil and groundwater contamination for the RI/FS (PRC and JMM 1994). Analytical results from previous investigations indicated the presence of VOCs, SVOCs, petroleum hydrocarbons, and metals above background concentrations at several locations at Site 23. Activities conducted under the follow-on investigation consisted of soil sampling, nonpoint sampling (sediment in storm drain catch basins), CPT and direct-push groundwater sampling, well installation, and four quarters of groundwater monitoring (PRC and MW 1996). Sampling locations are presented on Figure 9-3.

The objective of the CPT sampling program was to evaluate the lithologic and hydrogeologic characteristics below 15 feet bgs and to identify the shallow water-bearing zone. Seven CPT points (CPT-S10B-01 through CPT-S10B-06 and CPT-S09-09) were driven across Site 23. No soil samples were collected using the CPT; however, CPT resistivity readings were used to evaluate lithology.

Soil

Soil samples were collected from two soil borings (B10B-04 and B10B-06) and two monitoring wells (M10B-01 and M09-05) to further evaluate the vertical extent and nature of contamination in soil (see Figure 9-3). Soil samples were collected at the surface, at 2.5 feet bgs, and at 5 feet bgs from each boring except M10B-01, which was sampled at 1, 2, and 3 feet bgs. Samples from borings B10B-04 and B10B-06 were analyzed for SVOCs, VOCs, and general chemistry parameters. Samples from boring M09-05 were analyzed for VOCs, metals, and general chemistry parameters. Samples from boring M10B-01 were analyzed for VOCs, SVOCs, and TPH-E, and TPH-P. The table below summarizes the chemicals detected at concentrations exceeding the residential PRG (EPA 2002a) and the sampling location with the highest detected concentration for each chemical.

Site 23 1994 Follow-on Investigation Soil Summary

Analytical Group	Chemicals Exceeding 2002 Residential PRG	Location of Highest Concentration
VOCs	None	Not Applicable
SVOCs	None	Not Applicable
Pesticides and PCBs	None	Not Applicable
Metals	Arsenic	M09-05

Note:

PAH data collected for soil during this investigation were not used in this RI because of high detection limits; data from additional PAH sampling conducted in 2003 were used.

No VOCs, SVOCs, or PCBs were detected in soil at concentrations exceeding their respective PRGs (EPA 2002a) at Site 23.

TPH as motor oil was detected in soil samples collected at the north end of Building 530 (B10B-07) and the northwest corner of the building (M10B-01) (PRC and MW 1995).

Groundwater

Based on soil sampling results, two soil borings were completed as shallow monitoring wells (M10B-01 and M09-05), and two deep monitoring wells (D10B-01 and D10B-02) were installed at Site 23 at locations shown on Figure 9-3. Well construction details and boring logs for these wells are included in Appendix B.

A quarterly groundwater monitoring program was conducted from October 1994 to August 1995. Groundwater samples were collected each quarter from the following monitoring wells: MW530-1, MW530-2, MW530-3, M10B-01, D10B-01, D10B-02, M09-05, and MWOR-5. Samples were analyzed for VOCs, SVOCs, pesticides and PCBs, dissolved metals, TPH-E and TPH-P, general chemistry parameters, TOC and COD, and sulfide.

Groundwater samples (DHP-S10B-01 through DHP-S10B-05 and DHP-S09-04) were collected from the SWBZ from CPT locations (CPT-S10B-01 through CPT-S10B-05 and DPH-S09-04) using a Hydropunch sampling device. In addition, two shallow groundwater samples (SHP-S10B-05 and SPH-S10B-06) were collected from CPT-S10B-05 and CPT-S10B-06, respectively, using a Hydropunch sampling device. Analyses performed for groundwater samples varied by sampling location but generally included VOCs, SVOCs, metals, TPH-E and TPH-P, general chemistry parameters, TOC, chemical oxygen demand (COD), and sulfides analyses. In addition, two shallow piezometers were installed adjacent to CPT-S10B-05 and CPT-S10B-06 to monitor groundwater elevations. Samples from boring M10B-01 were analyzed for VOCs, SVOCs, and TPH-E and TPH-P. The table below summarizes the chemicals detected at concentrations exceeding the tap water PRGs (EPA 2002a) and the sampling location with the highest detected concentration for each chemical.

Site 23 1994 Follow-on Investigation Groundwater Summary

Analytical Group	Chemicals Exceeding 2002 Tap Water PRG	Location of Highest Concentration
VOCs	Benzene	DHP-S10B-01
	Ethylbenzene	MW530-1
	TCE	MW410-4
SVOCs	Benzo(a)pyrene, benzo(b)fluoranthene, and chrysene	SHP-S10B-05
	Naphthalene	MW530-1
Pesticides and PCBs	None	Not Applicable
Metals	Aluminum, cadmium, cobalt, iron, manganese, and nickel	DHP-S10B-01
	Arsenic	MW530-3
	Thallium	DHP-S10B-03

VOCs were detected in groundwater at concentrations exceeding their respective tap water PRGs in samples from DHP-S10B-01, MW530-1, and MW410-4.

SVOCs were detected in groundwater at concentrations exceeding their respective tap water PRGs in samples from location SHP-S10B-05 and well MW530-1. SVOCs also were detected at the southwest corner of Building 530 (location B10B-06).

No PCBs or pesticides were detected in groundwater at concentrations exceeding their respective tap water PRGs.

Metals were detected in a sample from monitoring well MW530-3 and in Hydropunch samples from locations DHP-S10B-01 and DHP-S10B-03.

TPH-mo was detected at locations SHP-10B-05 and SHP-S10B-06, and TPH-P was detected in a sample from monitoring well MW530-1 and in a shallow Hydropunch sample from location SHP-S10B-05. TPH-mo was detected in soil samples from the north end and the northeast corner of Building 530 (locations B10B-07 and M10B-01, respectively). TPH-E as motor oil was detected in soil samples collected location B10B-07 at the north end of Building 530 and from location M10B-01 at the northwest corner of Building 530 (PRC and MW 1995). TPH-associated compounds were detected in two groundwater samples collected from locations MW530-1 and SHP-S10B-06 at the northwest corner of Building 530. TPH-E (diesel fraction) was detected in a deep Hydropunch sample from location DHP-S10B-01. TPH-E (motor-oil fraction) was detected in deep Hydropunch samples from locations DHP-S10B-02, DHP-S10B-03, and DHP-S10B-04. TPH-P was detected in a deep Hydropunch sample from location DHP-S10B-01.

2-Butanone was detected in a groundwater sample from location SHP-S10B-05, collected west of Building 530; this chemical is a common laboratory contaminant.

Two storm drain sediment samples (NPS-S10B-01 and NPS-S10B-02) also were collected from Site 23 during this investigation. The samples were collected along the sanitary sewer line running along the northern and southern part of Site 23. The samples were analyzed for VOCs, SVOCs, metals, TPH-E, and TPH-P.

The investigation report concluded that chemicals detected in soil and groundwater are similar in nature to those found during the previous (1991) investigation (PRC and JMM 1992).

9.2.2.3 Follow-On Investigation, 1998

The 1998 follow-on investigation consisted of 1 year of basewide quarterly groundwater monitoring to assess and monitor plumes at various sites at Alameda Point (U&A 1998). Samples were collected each quarter from monitoring wells MW530-2 and D10B-02. Analyses varied from quarter to quarter and well to well but generally included VOCs, dissolved metals, TPH-E and TPH-P, TOC, and general chemistry parameters. The table below summarizes the chemicals detected at concentrations exceeding the tap water PRGs (EPA 2002a) and the sampling location with the highest detected concentration for each chemical.

Site 23 1998 Follow-on Investigation Groundwater Summary		
Analytical Group	Chemicals Exceeding 2002 Tap Water PRG	Location of Highest Concentration
VOC	None	Not Applicable
Metals	Filtered arsenic	MW530-2

VOCs in groundwater were not detected at concentrations above MCLs. Dissolved metals concentrations in groundwater samples generally exceeded MCLs at Site 23. TPH-mo and TPH-d were detected at low concentrations in samples from well MW530-2.

Additionally, a tidal influence study was conducted as part of this investigation to establish tidal effects (if any) on groundwater at Alameda Point; however, no data were collected for Site 23.

9.2.2.4 Storm Sewer Investigation, 2000

The basewide storm sewer investigation evaluated the physical conditions of storm sewers, identified the places where storm sewers are submerged below groundwater, identified locations where contaminated groundwater intercepts submerged and damaged sections of storm sewers, and identified data gaps for further evaluation (Tetra Tech 2000b).

The storm sewer investigation concluded that most of the storm sewer lines at Site 23 were likely partially submerged. The investigation also evaluated the need for repairing the lines by level of priority based on whether the lines were damaged and intersected by groundwater contaminant plume(s). Site 23 contained one segment of pipe with a low priority listing for repair. The information on this line is summarized in the table below and included on Figure 9-4.

Damaged Storm Sewer Line Segments					
Segment		Diameter (inches)	Length (feet)	Material	Chemical of Concern
From	To				
Low Priority					
5-JF	6-J	36	234	Reinforced Concrete	BTEX and PAHs

9.2.2.5 Supplemental Data Gaps Sampling, 2001

Based on identified data gaps, a supplemental data gap sampling effort was conducted at OU-2A to address two primary data gaps categories: (1) the status of groundwater contaminant plumes and (2) preferential flow paths associated with the storm sewer system (Tetra Tech 2002a). The sampling effort included collecting samples of groundwater and bedding material at the storm sewers. Additional sampling for secondary data gaps was conducted within Site 23. The sampling effort included collecting one soil gas sample and one soil sample for analysis of chemicals of concern; the soil sample was analyzed for total chromium and hexavalent chromium to allow for proper assessment of human health risk relative to chromium concentrations in soil.

Soil

To determine whether storm sewer bedding materials are acting as a preferential pathway for contaminant migration, two soil and one groundwater sample were collected from along storm sewer line J (see Figure 9-4), in the northern portion of Site 23. A vacuum excavation boring was advanced immediately adjacent to storm sewer lines, and an undisturbed soil sample of the bedding material was collected. For comparison purposes, samples of the native soil were collected at the approximate depth of the storm sewer, 10 feet away from the vacuum excavation locations. Soil samples were analyzed for geotechnical parameters.

One soil sample, location S23-DGS-DP01, was collected and analyzed for total chromium and hexavalent chromium. Chromium speciation results for this sample were used to assess human health risk relative to chromium concentrations in soil. Table 9-8 is a statistical summary of the soil sample collected during the 2001 data gaps sampling investigation. The table below summarizes the chemicals detected at concentrations exceeding the residential PRG (EPA 2002a) and the sampling location with the highest detected concentration for each chemical.

Site 23 2001 Supplemental Data Gaps Sampling Investigation Soil Summary

Analytical Group	Chemicals Exceeding 2002 Residential PRG	Location of Highest Concentration
Metals	None	Not Applicable

Analytical results indicated a small portion of the total chromium was actually hexavalent chromium; however, the hexavalent chromium results were rejected based on zero recovery in the matrix spikes. In addition, because of reducing soil conditions at Site 23, hexavalent chromium once released to soil or groundwater at Site 23 would have been reduced to less toxic and practically immobile trivalent chromium.

Groundwater

One round of groundwater samples was collected at Site 23 during the data gaps sampling to obtain more recent groundwater data. Samples were collected from monitoring wells D10B-02, M10B-01, MW410-4, MW530-2, and MW530-3. Samples were analyzed for VOCs, SVOCs, PAHs, metals, TPH-E and TPH-P, and field parameters. The table below summarizes the chemicals detected at concentrations exceeding the tap water PRGs (EPA 2002a) and the sampling location with the highest detected concentration for each chemical.

Site 23 2001 Supplemental Data Gaps Sampling Investigation Groundwater Summary

Analytical Group	Detected Compounds Exceeding 2002 Tap Water PRG	Location of Highest Concentration
VOCs	1,2,4-trimethylbenzene, ethylbenzene, naphthalene, sec-butylbenzene, vinyl chloride, and total xylenes	S23-DGS-VE01
SVOCs	Naphthalene	S23-DGS-VE01
PAHs	Benzo(a)anthracene	MW530-1

TPH-mo was detected in the groundwater sample collected from monitoring well D10B-02. All other groundwater samples contained detectable concentrations of VOCs, mainly acetone, with one sample containing petroleum-related compounds.

Groundwater samples were collected from the vacuum extraction location and analyzed for VOCs and TPH-E and TPH-P. One sample, location S23-DGS-VE01, was collected from the storm sewer bedding. The storm sewer corridor sample contained elevated concentrations of vinyl chloride, PAHs, and TPH-related compounds. In addition, hydraulic conductivity was measured at two sampling locations, S23-DGS-VE01 (in the storm sewer corridor) and S23-DGS-DP02 (in native material just west of Building 606). The storm sewer bedding material at sampling location S23-DGS-VE01 has a lower hydraulic conductivity than the soils located approximately 10 feet from the storm sewer corridor at sampling location S23-DGS-DP02.

Soil Gas

One boring for soil gas sampling was advanced at a location selected with assistance from the BCT for use in future risk assessment. The boring was advanced near the northwest corner of Building 360 (see Figure 9-3). At the soil gas sampling location, two continuous core soil borings were completed to determine specific groundwater depths and evaluate physical soil parameters required for the risk assessment model. Samples were collected at depths of 1.5 and 4.0 feet bgs.

Chlorinated hydrocarbons and BTEX compounds were detected in the soil gas samples.

9.2.2.6 Basewide Groundwater Monitoring, 2002 and 2003

The specific objectives of the 2002 and 2003 basewide monitoring investigation were (1) to evaluate contaminant plumes in groundwater and (2) to determine the main chemicals of concern (Shaw 2003a). The monitoring scheme for OU-2A included 23 of the 46 wells located within the 5 sites of OU-2A (Sites 9, 13, 19, 22, and 23). Five monitoring wells (D10B-02, M10B-01, MW410-4, MW530-2, and MW530-3) located within Site 23 were identified for quarterly or semiannual (twice per year) monitoring. Sampling was conducted in June, September, and December 2002 and April 2003. Samples were analyzed for VOCs, dissolved metals, TPH-E and TPH-P, and general chemistry parameters. The table below summarizes the chemicals detected at concentrations exceeding the tap water PRG (EPA 2002a) and the sampling location with the highest detected concentration for each chemical.

Site 23 2002 to 2003 Basewide Groundwater Monitoring Investigation		
Analytical Group	Chemicals Exceeding 2002 Tap Water PRG	Location of Highest Concentration
VOCs	None	Not Applicable
Metals	Arsenic	MW530-3

No VOCs were detected in groundwater at concentrations exceeding their respective PRGs (EPA 2002a) or MCLs at Site 23.

Petroleum and petroleum-related compounds were detected in two of five monitoring wells.

9.2.2.7 Basewide PAH Study, 2003

The primary objective of the 2003 PAH study was to collect sufficient PAH data to calculate EPCs for the risk assessments at CERCLA sites (Bechtel 2003). The historical PAH data collected at each CERCLA site were used to estimate the mean and standard deviation of BaP concentrations to determine the appropriate number of PAH samples to collect at each site. The

data collected in 2003 replaced all previous PAH samples for use in the risk assessment and site characterization. At Site 23, 61 soil borings were advanced across the site using direct-push sample methods. Samples were collected from each of the following four depth intervals: 0 to 0.5, 0.5 to 2, 2 to 4, and 4 to 8 feet bgs. The table below summarizes the chemicals detected at concentrations exceeding the residential PRG (EPA 2002a) and the sampling location with the highest detected concentration for each chemical

Site 23 2003 Basewide PAH Investigation		
Analytical Group	Detected Compounds Exceeding 2002 Residential PRG	Location of Highest Concentration
PAH	Benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and indeno(1,2,3-cd)pyrene	C3S023B016

In general, the concentrations of individual PAH compounds were low at Site 23. However, PAH concentrations, expressed as BaP equivalents, in three samples out of 61 exceeded the action level of 0.62 mg/kg (Navy 2001d). PAHs were detected in two samples at concentrations greater than 1 mg/kg. Sampling locations for this investigation are presented on Figure 9-5.

9.2.3 EBS

The EBS was performed to identify the environmental condition of all base property and structures to help transfer the land to the community as quickly as possible. Two phases of EBS were conducted at the Alameda Point.

Phase 1. The first phase of the EBS comprised an examination of aerial photographs and historical records as well as the performance of site inspections and interviews with current and former employees involved in operations. The Phase 1 EBS concluded that many parcels had insufficient information to classify them as transferable; therefore, recommendations for additional investigation were prepared and presented in the zone analysis plans and parcel evaluation plans (ERM-West 1995a, 1995b).

Phase 2A. As recommended by the IAS (E&E 1983), the Phase 2 investigations did not focus on areas already under evaluation. Other Navy land uses or areas that may impact transfer were the subject of the investigations. Site 23 lies within Zone 22 and comprises Parcels 148 and 211 (see Figure 9-3). Samples were collected from Parcels 148 and 211 during the EBS Phase 2A sampling effort. Three soil gas samples and three subsurface soil samples were collected from Parcel 148 in February 1995 as part of the EBS Phase 2A. Soil sampling was conducted at Parcel 211 in January, March, April and May 1995 to investigate the former plane defueling area, the former incinerator, the storm sewer corridor, the sanitary sewer corridor, and the industrial storm sewer corridor as part of the EBS Phase 2A. Tables 9-1 and 9-2 list the analyses performed.

Phase 2B. EBS samples were collected from Parcel 211 during the EBS Phase 2B sampling effort. Soil and groundwater samples were collected in the plane defueling area during the EBS Phase 2B to further investigate TPH contamination in that area.

9.2.4 TPH Program

Site 23 was identified as part of CAA 13. In 2000, sampling was conducted during the data gaps investigation at Site 23 in relation to CAA 13 under the TPH program (Tetra Tech 2001e). This investigation identified 12 different data gap types. Site 23 sampling involved collection of data gap types II, III, and IV samples, as discussed below. Figure 9-3 shows the location for each sample.

Five data gap type III samples were collected to investigate the current TTPH concentrations in groundwater near the storm drains. Two samples were collected from monitoring wells MW530-1 and M10B-01, located near the storm drain and running east and west along the northern end of Site 23. In addition, two data gap type III samples, locations CA13-07 and CA13-08, were collected in the middle of the defueling area to assess TPH contamination entering the storm drain connected to Outfall J. One data gap type II sample, location CA13-09, was collected along the storm drain located in the southern portion of Site 23 to assess possible TPH contamination entering the storm drain connected to Outfall P. Because the data gap type III samples collected in association with Outfall J contained elevated concentrations of TPH and TPH-associated compounds, one data gap type II sample was collected from catch basin 5-JF. This sample also contained elevated concentrations of TPH compounds.

One Type IV groundwater sample (CA13-10) was collected to investigate OWS-530 located west of Building 530. The groundwater sample was analyzed for BTEX, MTBE, lead, and TPH-E and TPH-P. TPH-d and TPH-mo were detected in the sample.

A concurrent analysis is being completed to analyze TPH constituents as part of the TPH program and CERCLA chemicals as part of the RI program. In locations where TPH and CERCLA chemicals are commingled, the commingled area is addressed as part of the CERCLA program. Any residual TPH contamination remaining after remediation of the CERCLA chemicals will be addressed under the TPH program.

As stated in Section 9.1.3, the TPH contamination associated with the plane defueling area is not commingled and is further addressed under the TPH screening strategy in Appendix F.

9.2.5 Removal Actions

As part of a corrective action for free TPH product in groundwater located at CAA 13 (see Appendix F), 22 extraction wells of the DVE system, covering a treatment area of 40 feet by 400 feet, were installed along the western edge of Building 530. Thirty piezometers were installed within the treatment area for monitoring of the plume. A biosparging system was installed in the same area as the DVE system; however, the DVE system was determined to be more efficient in

removing petroleum at Site 23. Additional extraction wells and piezometers have been installed as needed. Since early 2004, both the DVE and biosparge systems have operated at Site 23.

As of October 31, 2004, the DVE system had removed 56,500 pounds of TPH. Periodic operations and maintenance sampling activity show that the concentrations of TPH in groundwater are steadily decreasing.

9.2.6 Treatability Studies

DVE is the only treatability study conducted at Site 23 to determine the viability of this technology for cleanup and assessment of the plane defueling area at Site 23. A DVE pilot test was conducted in 2001 to demonstrate the capability of the DVE system to recover free product from the groundwater surface and to capture hydrocarbon vapors from soil. The pilot test indicated that the DVE system was successfully removing hydrocarbon contaminants from soil; therefore, in June 2002, the pilot scale system was converted into a full-scale DVE system using equipment previously installed along the western edge of Building 530.

9.3 INITIAL DATA EVALUATION

Based on the investigations described in Section 9.2, the Navy completed an initial data evaluation for Site 23. This evaluation included (1) a site-specific CSM, (2) a data quality assessment, (3) and a background comparison. The complete background comparison is provided in Appendix A.

9.3.1 Site 23 Conceptual Site Model

The initial CSM was refined in an iterative process that involved conducting environmental investigations, identifying areas of known or potential releases of chemicals to the environment, and filling data gaps. This iterative process resulted in a CSM specific to Site 23 and identification of remaining data gaps. This site-specific CSM was used to support the nature and extent evaluations and risk assessments by identifying potential sources of contamination, media affected, exposure pathways, and future receptors. The CSM for Site 23 is described below and presented on Figure 9-6.

Through environmental investigations and literature searches for Site 23, physical features and activities at Site 23 that might have generated hazardous waste or released chemicals to the environment were identified. The following Site 23 physical features and activities were identified as potential sources of contamination:

- Building 530 (missile rework operations): Operations included missile rework operations, overhauling aviation components, electrical maintenance, cleaning, grinding, welding, painting, paint stripping, drum storage, and parts fabrication;

chemicals used included lead-based paint, hydraulic fluid, silver solder, ethylene glycol, lead, zinc, silver, tin, chromium, nickel, mercury, TCE, and petroleum; currently leased as a repair shop for commercial flight instruments.

- NADEP GAPs 63, 63A, and 64: Located within Building 530; missile rework and paint stripping wastes and bath liquids were placed in various size drums and transferred to Yard D-13 for eventual off-site facility disposal or recycling.
- Building 529: Located at the southern end of Building 530 and supplied auxiliary power; observed nine 55-gallon drums containing petroleum products and miscellaneous chemicals and several oil-like stains during EBS; potential source of petroleum products.
- Plane defueling area and associated OWSs 529 and 530, ASTs 530A, 530B, and 530C, and former Building 460A: Located west of Building 530; ASTs had capacities of 10,000 gallons, 10,000 gallons, and 15,000 gallons and stored 1010 oil, fuel or oil, and jet fuel; potential source of petroleum products (see Appendix G); ongoing remediation of the petroleum hydrocarbons.
- Structure 561: Electrical substation 11 (transformer pad); potential source of PCBs.
- Open space: Uses include a material and equipment storage yard, a defueling facility, aircraft parking, and vehicle parking; PCB oil was used for weed control; potential source of PCBs.
- Oil refinery operations and disposal practices: Former location of the Pacific Coast Oil Works Company Refinery; used an acid-sludge process for refining fresh crude oil; potential source of crude oil, kerosene, lubricating and fuel oils, heavier-end hydrocarbons, including black TRW.
- Placement of dredged fill material used to build the island: Potential source of PAHs.

Former storage areas, Structure 586, former Buildings 606, 352, 460A, and the Navy exchange mini-storage area were not considered potential sources. The former storage areas related to the material and equipment storage yard were used only to store vehicles and large boxes. Structure 586 is a sewage lift station. Former Building 606 served as an administration building. Former Building 352 was used to store packaged explosives to support naval operations, and there are no documented spills or releases associated within the building. Building 460A was built on the east side of the plane defueling area; it housed the control equipment for the defueling facility. The Navy exchange mini-storage area is located in the far northwestern corner of Site 23 and consists of Buildings MS-11 through MS-19.

Because several oil-like stains were observed at Building 529 during the EBS, samples were collected in the vicinity of this building. Petroleum hydrocarbons were detected in soil and groundwater.

Structure 561, electrical substation 11 (transformer pad), was investigated along with other transformers in 2002 (ITSI 2002). Further action was not recommended for this transformer pad.

NADEP GAPS 63, 63A, and 64 were located within Building 530 on the concrete floor. A letter from DTSC dated November 4, 1999 recommended NFA for the GAPS (DTSC 1999a). Appendix G, the SWMU Evaluation Report, discusses the GAPS in more detail.

Of these potential sources, (1) the defueling area and associated OWSs 529 and 530 and ASTs 530A, 530B, and 530C and (2) the former oil refinery activities were identified as likely sources of contaminants in soil and groundwater at Site 23. The following exposure pathways and primary and secondary release mechanisms were identified:

- Direct release of petroleum products from spills around OWSs 529 and 530 to soil and groundwater.
- Direct release of petroleum products from spills around ASTs 530A, 530B, and 530C to soil and groundwater from spills around ASTs 324 through 328.
- Direct release of petroleum products acids (such as sulphuric acid), PAHs, and possibly metals associated with oil refinery activities to soil.
- Secondary release from soil to air through volatilization or resuspension of particulates.
- Secondary release from soil into the food chain from plant uptake.
- Secondary release from soil to groundwater through infiltration uptake.
- Secondary release from groundwater to air through volatilization.
- Secondary release from groundwater into domestic use through a well.

As shown in the CSM for Site 23 (see Figure 9-6), residential, commercial/industrial, and construction worker receptors were identified as potential human receptors, and exposure scenarios including ingestion of homegrown produce and ingestion, inhalation, and dermal contact with soil and groundwater are evaluated in the HHRA (see Appendix H). Exposure of potential ecological receptors to contaminants through direct contact with soil and the food chain were also evaluated in the ERA (see Appendix I).

Exposure of potential ecological receptors to groundwater from migration to surface water was considered an incomplete pathway. Tidal influence studies indicated that only two wells in the

FWBZ (MW530-1 and M10B-01) and one well in the SWBZ (D10B-01) at Site 23 are tidally influenced (Tetra Tech 1997a). The wells in the FWBZ are located near the storm sewer main lines and exfiltration of water could be the cause of tidal influence at these wells. Groundwater contamination has not migrated to the San Francisco Bay (including the Seaplane Lagoon), and the storm sewer system at Site 23 was not considered a preferential pathway for contaminant migration. In addition, samples collected from the storm drain bedding downstream at Site 23 did not contain VOCs at concentrations exceeding detection limits, indicating that the bedding is not serving as a migration pathway.

Site 23 is approximately 1,100 feet east of the Seaplane Lagoon, and the storm sewer lines that cross the site were identified as requiring repair in two segments. No petroleum-impacted water was detected in catch basin 5JF. The storm sewers downstream from Site 23 (in Site 9) were surveyed and found to contain VOCs at concentrations at least 2 orders of magnitude below the ecological risk values (Tetra Tech 2002a); those VOCs were not the same compounds that were detected at Site 23. Storm sewer main line (sewer line J) extends through the northern portion of Site 23. Three additional lateral lines (originating at 6J-b, 6J-C and 6J-G) flow into the main line from the eastern portion of Site 23. The line from 6J-B to the main line was replaced with new PVC piping in 1991. The line from 6J-C to the main line was cleaned in 1997, but has been identified as a high priority for repair. Additional line cleaning was conducted in 2003. The line from 6J-G to the mainline was cleaned in 1997 and was noted to be in good condition. The area where refinery waste is present intersects portions of this line. Data collected from storm drain manhole 3J (downstream on Site 9) indicate that very low concentrations of VOCs are present in storm water.

9.3.2 Site 23 Data Quality Assessment

As discussed in Section 9.2, several environmental investigations were conducted at Site 23 as a part of the CERCLA program and EBS to identify and assess the extent of contamination in soil and groundwater and to determine risk. Data were collected over a period of approximately 13 years from 1990 through 2003 using a biased and phased sampling approach. Sampling focused on the following:

- Groundwater suspected to be impacted by oil refinery operations
- Soil and groundwater in the vicinity of Buildings 530 and the plane defueling area
- SVOCs, VOCs, and metals in soil, and VOCs, SVOCs, TPH, and metals in groundwater
- Industrial, sanitary, and storm sewers
- Fill material and native sediments to assess the presence of PAHs

These data, through an iterative process, were used to construct and refine the site-specific CSM presented in Section 9.3.1 and to identify and fill data gaps until the quantity and quality of the

data at Site 23 were judged to be sufficient to complete the RI report, as determined by applying the DQOs presented in Section 3.4.

Detection limits for some of the data used to evaluate Site 23 are elevated over residential PRGs (EPA 2002a); these elevated detection limits are the consequence of one or more of the following circumstances: (1) the evolution of lower detection limits as technology improves, (2) the revision of PRGs over time (which are not always technologically feasible), (3) and matrix interference. The first two of these circumstances generally do not result in significantly elevated detection limits. However, matrix interferences sometimes cause significant elevations in the detection limits for a chemical contaminant, which leads to uncertainty as to whether that undetected compound could be present in significant concentrations at a site. Although some detection limits (SQL) were elevated above 2002 residential PRGs, detection limits for nondetected chemicals were typically sufficiently low to permit identification of potential health risks. However, because detection limits for some nondetected VOCs in groundwater were elevated, further sampling and analysis of groundwater may be needed to confirm that VOCs are not present in groundwater at Site 23. Because detection limits were elevated in both soil and groundwater for some nondetected SVOCs, further sampling and analysis of soil and groundwater for SVOCs may be needed to confirm SVOCs are not present in soil or groundwater at Site 23. Additionally, sampling and analyses of soil for PCBs is recommended to confirm PCBs are not present in soil at levels that would pose risk. PCB oil was used for weed control in the mini-storage area until 1963; however, soil samples were not collected within the vicinity of the mini-storage area and analyzed for PCBs.

Although soil and groundwater data gaps were identified, it was determined that the types and numbers of samples collected at Site 23 (see Figures 9-7A through 9-7L) and the analyses conducted (see Tables 9-11 and 9-12) were sufficient to characterize the site and to conduct risk assessments because data collection at the site focused mainly on potential sources and was conducted in phases. This phased approach afforded stakeholders opportunities to provide feedback on the suitability or adequacy of the collected data and the need to collect additional data to identify releases and complete the RI report. It is unlikely that the RI would recommend NFA if the site poses a potential significant risk to human health or the environment.

Both definitive and screening-level data were generated. Screening data were considered appropriate for use only in evaluations of nature and extent and fate and transport of chemicals. Section 3.4.2 provides further detail on the assessment of data quality and the use of definitive and screening-level data.

Data generated during the environmental investigations that were considered to be of sufficient quality for use in the RI report are presented in Appendix E and in the subsections below. Tables 9-11 and 9-12 summarize results of the CERCLA and EBS investigations for soil and groundwater. Soil gas results are presented in Appendix E. The summaries are organized according to analytical group and include the following: (1) the number and percent of detections of chemicals; (2) the average, minimum, and maximum detected concentrations; (3) minimum and maximum detection limits for nondetected samples; and (4) whether the maximum detected concentrations or detection limits exceed Region 9 residential PRGs or Cal-

modified PRGs (EPA 2002a). Cal-modified PRGs are used for some chemicals if the California EPA PRG is more protective than the federal EPA value. PRGs and MCLs are provided in the tables for comparison only

9.3.2.1 Soil

At Site 23, soil samples collected under the environmental investigations were analyzed for VOCs, SVOCs, PAHs, pesticides and PCBs, and metals as well as selected organic metals, TPH, pH, dioxins, TOC, and percent moisture (see Table 9-11). Of the samples collected and analyzed, 1 sample for dioxins, 84 samples for VOCs, 100 samples for SVOCs, 240 samples from the additional PAH sampling conducted in 2003, 50 samples for pesticides and PCBs, and 85 samples for metals were considered acceptable for use in this RI report. PAH data for soil samples collected during previous investigations were not evaluated because of the high detection limits associated with these data. Laboratory detection limits for some other chemicals exceeded residential PRGs (EPA 2002a) and are noted in Table 9-11. Detection limits for a few of the nondetected VOCs in soil were also elevated above residential PRGs (EPA 2002a); however, most of the nondetected samples had detection limits below residential PRGs. Detection limits for some of the nondetected SVOCs in soil were also elevated above residential PRGs (EPA 2002a). Samples that were nondetected for arsenic and thallium in soil were also elevated above residential PRGs (EPA 2002a). However, Site 23 was not identified as a source of arsenic or thallium and concentrations detected in soil at Site 23 are similar to concentrations detected in background soil. Detection limits for VOCs and SVOCs were sufficiently low to permit identification of potential health risks except for the SVOCs 2-nitroaniline, bis(2-chloroethyl)ether, hexachlorobenzene, and n-nitroso-di-n-propylamine, which had more than 50 percent of the detection limits above PRGs in soil.

A subset of the soil data was selected for use in the risk assessments (see table below). Data were considered to be appropriate for use if they (1) were validated, (2) could be used to characterize CERCLA releases, and (3) reflected current site conditions. Only data collected under the IRP with the objective of characterizing CERCLA activities were used. Data were collected for screening purposes as part of the EBS, and inclusion of these data could add more uncertainty to the risk assessments. Risk from TPH was assessed separately (see Appendix F). Data for soils that are no longer present at Site 23 due to removal actions were not included because they do not reflect the current conditions at the site. Soil samples collected from petroleum-saturated soil were not included in the risk assessment; therefore the risk presented is underestimated. Petroleum-saturated soil was encountered in the area of the plane defueling area, and active remediation was ongoing during the groundwater monitoring events. Considering that active remediation of petroleum contamination is ongoing, the level of uncertainty would be much greater if the petroleum-saturated soil or free product on groundwater were included in the risk assessment. Risk from TPH was assessed separately (see Appendix F).

Soil data for each site were aggregated in depth intervals of 0 to 2, 0 to 4, and 0 to 8 feet bgs. The depth intervals evaluate potential exposures associated with site use. The 0- to 2-foot and 0- to 8-foot bgs depth intervals were used to evaluate potential human health exposures, and the 0- to 4-foot bgs depth interval was used to evaluate potential ecological exposures. The table

below summarizes the total number of samples for each analytical group included in the data set for each risk assessment and depth interval.

Number of Suitable Soil Data for Site 23 Risk Assessments			
Analytical Group	(0 to 2 feet bgs)	(0 to 4 feet bgs)	(0 to 8 feet bgs)
VOCs	5	23	40
SVOCs	19	36	52
PAHs	120	180	240
Pesticides and PCBs	10	17	22
Metals	17	31	45

Dioxins in soil were not evaluated in the risk assessments because only one EBS sample was analyzed for dioxins. This EBS sample was collected for screening purposes, and the need for additional sampling for dioxins was not identified. Therefore, the lack of dioxin data was not perceived as a data gap.

The minimal data for VOCs in soil from 0 to 2 feet bgs is not perceived as a data gap because Site 23 is predominantly paved, and VOCs in surface soil would likely volatilize and no longer be present in soil at the site. Data for 2 to 8 feet bgs are sufficient to assess the nature and extent and risk from VOCs at Site 23.

9.3.2.2 Groundwater

Groundwater samples collected at Site 23 were analyzed for VOCs, SVOCs, PAHs, pesticides and PCBs, and metals (see Table 9-12) as well as physical parameters (hardness, acidity, pH, anions, specific conductance, and TDS, dissolved gases, sulphides, BOD and COD). Of the samples collected and analyzed, 107 samples for VOCs, 75 samples for SVOCs, 6 samples for pesticides and PCBs, and 76 samples for metals were considered acceptable for use in this RI report. Laboratory detection limits for some chemicals in groundwater exceeded residential PRGs (EPA 2002a) as shown in Table 9-12. Some VOCs detected in groundwater at a low frequency or nondetected had detection limits significantly elevated over tap water PRGs (EPA 2002a) and MCLs. Detection limits for some of the nondetected SVOCs and arsenic and thallium concentrations detected at a low frequency in groundwater were also elevated, and detection limits for nondetected samples were elevated in over 50 percent of the samples. Concentrations of arsenic and thallium detected in groundwater at Site 23 are similar to concentrations detected in ambient groundwater. Detection limits for some of the nondetected PAHs and pesticides and PCBs in groundwater had detection limits elevated over tap water PRGs (EPA 2002a); however, they were not significantly elevated and are due to the revision of PRGs over time and detection limits that are not always technologically feasible. Detection limits for PAHs were equivalent to MCLs.

A subset of the groundwater data was selected for use in the risk assessments, as shown in the table below. Data were considered to be appropriate for use if they (1) were validated, (2) could be used to characterize CERCLA releases, and (3) reflected current site conditions. Groundwater data were aggregated by contaminant plume rather than site. Groundwater data later replaced with more current data were not included because they do not reflect the current conditions at Site 23. Only data collected under the IRP to characterize CERCLA activities were used. Data collected as part of the EBS were not used to evaluate risk because they were collected with DQOs that differ from the CERCLA investigations. At least four quarters of groundwater data from monitoring wells were used. However, if data were lacking for an analytical group, older data were included for all analytical groups. Groundwater data included samples collected from August 1990 to April 2003. Field data and screening-level data typically were not used; however, direct-push groundwater data were used because of a lack of monitoring well data in the concentrated plume areas. Trend analyses of historic data were completed to ensure the appropriate data set accurately characterizes the plume. Groundwater samples collected from floating product areas were not included in the risk assessments. Floating product encountered in the west of Building 530 was associated with historical plane defueling activities. The table below summarizes the total number of samples for each analytical group, the data suitable for analysis in the RI report, and data used in the risk assessments.

Number of Suitable Groundwater Data for Site 23		
Analytical Group	Suitable for RI Report	Used in Risk Assessment
VOCs	107	41
SVOCs	75	20
Pesticides/PCBs	6	1
Metals	76	26

Although six samples were analyzed for pesticides and PCBs, they were not included in the risk assessments because the results were nondetected. The limited PCB and pesticide data were not perceived as a data gap because pesticide and PCB use (weed control) would not be expected to impact groundwater and no other pesticide and PCB related-activities were identified at Site 23.

Most of the VOC, SVOC, and metals data were excluded from the risk assessments because they were not reflective of current site conditions.

9.3.2.3 Soil Gas

Soil gas data were collected to evaluate indoor air risk in the HHRA (see Appendix H). At Site 23, two soil gas samples were collected at depths of 1.5 and 4 feet bgs. The samples were collected from within the TPH plume, near the high concentrations of VOCs, to the northwest of Building 530. The samples were analyzed for VOCs and SVOCs. Detection limits for many of the nondetected VOCs exceeded ambient air PRGs; however, SQLs were not set to meet the PRGs.

9.3.3 Site 23 Background Comparison

A background comparison was conducted for Site 23 by comparing a background data set with analytical results for metals in samples representative of Site 23. This comparison was used to determine which metals in soil and groundwater are statistically similar to background and could be considered to be either naturally occurring (background) or potentially resulting from historical site activities. The complete approach is presented in Appendix A and summarized previously in Section 3.4.3.

Antimony, copper, and lead concentrations exceed background in soil at Site 23.

Aluminum, chromium, iron, manganese, selenium, vanadium, and zinc concentrations exceed background in groundwater at Site 23.

9.4 NATURE AND EXTENT OF CHEMICALS IN SOIL AND GROUNDWATER

The evaluation of the nature and extent comprises the following components: (1) a presentation of TPH detected at Site 23, (2) a presentation of the types and concentrations of CERCLA chemicals believed to have been used at Site 23, and (3) detailed descriptions of the CERCLA chemicals that demonstrate significant risk to human health or the environment (risk drivers). Only chemicals that pose risk to human health or the environment (see Appendices H and I) or relate to past site activity are discussed in this section. Section 9.4.2, Chemicals Believed to be Used at Site 23, provides additional information about the nature and extent of chemicals used at the site other than the risk drivers. This additional evaluation assisted the Navy in determining whether hot spots of contamination were present at Site 23. Risk drivers are defined as chemicals that pose a cancer risk above $1E-06$ or an HI above 1.0. The evaluation of risk drivers primarily includes (1) site-specific figures to assess the spatial distribution and concentration patterns of the chemicals and (2) a review of the figures, data, and site hydrology to identify the boundaries of the contamination, the volume of the affected media, and, if possible, the suspected source of these chemicals.

9.4.1 TPH

Even though TPH is not a CERCLA contaminant, soil and groundwater were sampled at various locations across Site 23 for TTPH, which includes all TPH-fractions (TPH-d, -g, -jet fuel, or -mo) and TPH-associated constituents (BTEX, lead, and MTBE) (see Figures 9-8 and 9-9).

Site 23 was considered significantly impacted by TPH, and corrective action for free TPH product in soil and groundwater was conducted using DVE and biosparging. The system extracts groundwater at rate of approximately 12 gallons per minute and vapor at approximately 350 cubic feet per second. In addition, oxygen-enriched sparge air is being injected at Site 23 to enhance bioremediation. As of November 2003, approximately 55,000 pounds of TPH had been extracted by the DVE system. The mass of hydrocarbons destroyed through biosparging is

unknown. Further action is recommended for TTPH and TPH-associated constituent concentrations present in soil and groundwater at Site 23.

The following potential sources of TPH contamination were identified at Site 23:

- ASTs 530A, 530B, and 530C, which are located in the plane defueling area
- OWSs 529 and 530, which are located in the plane defueling area
- Plane defueling area
- Former Building 460A, which housed the control equipment for the defueling facility
- Building 600, where several 55-gallon drums containing lubricating oil were stored
- Building 529, which supplied auxiliary power to Building 530 and in which nine 55-gallon drums containing petroleum products were stored
- Refinery wastes from Site 13 that were likely deposited in surrounding areas, including Site 23
- Building 530, as a result of lead and petroleum usage
- NADEP GAPs 63, 63A, and 64, which are located in Building 530

A TPH plume exists at Site 23 on the west side of Building 530 in the plane defueling area (see Figure 9-10). The plume is approximately 600 feet from north to south and 200 feet east to west and is confined to the FWBZ. The plume includes floating petroleum.

Nine soil samples, ranging in depth from 1 to 5.5 feet bgs, collected from sampling locations 211-001-008, 211-SS-001, 211-SS-003, 211-SS-004, 530-1-MOJ, 530-3-MOJ, 530-15-MOJ, 530-22-MOJ, and 530-25-MOJ exhibited TTPH concentrations ranging from 14,700 to 72,000 mg/kg, which exceed the floating product screening level of 14,000 mg/kg.

Groundwater samples collected at nine sampling locations, 530-3-MOJ through 530-5-MOJ, 530-12-MOJ, 530-15-MOJ, 530-25-MOJ, 530-MJ-MW-1, 530-MJ-MW-2, and CA13-08, exhibited TTPH concentrations ranging from 23,800, which exceeds the floating product screening level of 20,000 $\mu\text{g/L}$, to pure product.

Maximum detected concentrations for benzene in groundwater ranged from 1 to 180 $\mu\text{g/L}$. Xylene was detected in groundwater designated as a potential drinking water source at location 530-MJ-MW-2 at a concentration of 11,000 $\mu\text{g/L}$. Lead was detected in groundwater samples from locations DHP-S10B-03, MW410-4, MW530-1, MW530-2, and MWOR-5 at concentrations ranging from 55 to 360 $\mu\text{g/L}$. Sampling locations and the TPH plume, based on groundwater monitoring data, are depicted on Figure 9-9.

Elevated concentrations of TPH-fractions in soil indicate a potential risk to human health for residential reuse. The TPH concentration exceeded the floating product screening level of 14,000 mg/kg in soil and 20,000 µg/L in groundwater, indicating a continuing source of groundwater contamination.

9.4.2 Chemicals Used at Site 23

This section focuses on chemicals detected in soil and groundwater that were used historically at Site 23. Chemicals that most likely were used at Site 23 and their breakdown products include petroleum products, lead-based paint, hydraulic fluid, silver solder, ethylene glycol, lead, zinc, silver, tin, chromium, nickel, mercury, TCE, and PCBs. Most of the chemicals detected across Site 23 are consistent with the historical activities known to occur at the site, which included plane defueling and storage of petroleum products and the former oil refinery. Operations in Building 530 included overhauling aviation components, electrical maintenance, cleaning, grinding, welding, painting, paint stripping, drum storage, and parts fabrication. Petroleum was handled and stored in the plane defueling area immediately to the west of Building 530. The concentrations of these chemicals and a general description of their extent are presented below by medium. Statistical summaries of all soil, groundwater, and soil gas results are presented in Tables 9-11 through 9-12.

Soil

The table below lists the chemicals that most likely were used at Site 13 (or their breakdown components), the residential PRG (EPA 2002a), the range of concentrations detected in soil at the site, and the sampling locations where the maximum concentration of each chemical was detected. It also lists chemicals not detected in soil but detected in groundwater at Site 13. Figure 9-3 shows the sampling locations.

Soil Analytical Results for Chemicals Used at Site 23			
Chemical	Residential PRG (mg/kg)	Range of Concentrations (mg/kg)	Sampling Location of Maximum Concentration
Aroclor-1260	0.22	0.038	S16-70
PAHs (represented as BaP equivalent)	0.062	0.001 to 2.979	C3S023B016
TCE	0.053	Not detected	Not applicable
Benzene	0.6	0.001 to 0.59	211-SS-002
Ethylbenzene	8.9	0.036 to 16.0	211-SS-003
Toluene	520	0.001 to 16.0	530-2-MOJ
Xylene (total)	270	0.003 to 12.0	MW530-1
Lead	150*	1.3 to 120	BOR-26
Zinc	23,000	10 to 130	MW530-3
Silver	390	0.38	B410-06

Soil Analytical Results for Chemicals Used at Site 23

Chemical	Residential PRG (mg/kg)	Range of Concentrations (mg/kg)	Sampling Location of Maximum Concentration
Chromium	210	7.3 to 89	BOR-22
Nickel	1,600	4.7 to 91	BOR-22
Mercury	6.1	Not detected	Not applicable
Tin (dibutyl, monobutyl, and tetrabutyl)	47,000	Not detected	Not applicable

Notes: Residential PRG is provided for reference only. Risks are quantified in Section 9.6 of this RI report.

* Denote modified California PRG

Previous site activities associated with plane defueling and the operation of the former refinery were identified as a source of TPH in soil. Elevated concentrations of CERCLA contaminants were not identified in soil at Site 23. Concentrations of chromium, lead, mercury, nickel, silver, and zinc were all detected below their respective PRGs (EPA 2002a)) and are present at concentrations considered to be background. Aroclor-1260 was detected in one soil sample (location S16-70) at a concentration below the residential PRG (EPA 2002a). Location S16-70 is near the southern border of the site (near site 16) and adjacent to a storm sewer line that runs from Site 23 to Site 16. No other PCBs were detected in soil at Site 23. TCE was not detected.

PAHs may be attributed to the presence of petroleum contamination. PAHs, expressed as BaP equivalents, for soil are above the action level of 0.62 mg/kg (Navy 2001d) in three samples. Two samples were collected at the same sampling location, C3A023B016, which is located in the plane defueling area near a TPH plume. BaP equivalent concentrations are 2.979 mg/kg for soil collected from a depth of 0.5 to 2 feet bgs and 2.553 mg/kg from a depth of 4 to 8 feet bgs. The third sample was collected from location C3A023B026 in the northeastern corner of Site 23 at a depth of 4 to 8 feet bgs and is likely associated with TRW.

TRW is present in soil in the southeastern corner of Site 13 and likely extends onto Site 23. Black material was noted in the boring log for sampling location C3A023B026 at 2 feet bgs. Data are limited, and it can not be determined whether the material is moving in soil. Based on the data collected at Site 13, TRW may move to the surface through preferential pathways, and the material moves to the surface along preferential flow paths between the original soil of the former shoreline and the fill material. Even though this flow path exists, the material has not been observed coming to the surface at Site 23.

TRW does not appear to be easily mobilized in groundwater unless unusual conditions are present such as low pH environments or the presence of jet fuel-, diesel fuel-, or gasoline-range organic compounds. Low pH environments may cause lead in TRW to dissolve in groundwater and become mobile. Commingling of TRW with jet fuel, diesel fuel, or gasoline will cause the TRW to dissolve and become mobile in groundwater. Based on data collected at Site 13 just north of where the black material was identified at Site 23, TRW at Site 23 is not commingled with free product petroleum hydrocarbons; therefore, it is not likely mobilizing in groundwater.

Groundwater

The table below lists the chemicals believed to be used at Site 23, the tap water PRGs (EPA 2002a), the range of concentrations detected in groundwater at the site, and the sampling location of the maximum concentration detected (see Figure 9-3 for sampling locations).

Groundwater Analytical Results for Chemicals used at Site 23			
Chemical	Tap Water PRG (µg/L)	Range of Concentrations (µg/L)	Sampling Location of Maximum Concentration
TCE	0.028	2	MW410-4
Benzene	0.34	0.2 to 67	211-002-11
Ethylbenzene	2.9	1.6 to 79	MW530-1
Toluene	720	0.9 to 11	211-0002-11
Xylene (total)	210	4.4 to 660	530-MJ-MW-1
Sec-butylbenzene	240	0.2 to 1,000	530-MJ-MW-1
1,2,4-Trimethylbenzene	12	4.1 to 860	530-MJ-MW-1
BaP	0.0092	0.6	SHP-S10B-05
Benzo(b)fluoranthene	0.092	0.8	SHP-S10B-05
Naphthalene	6.2	21 to 1,100	530-MJ-MW-1
Lead	NA	0.029 to 360	D10B-01
Zinc	11,000	1.7 to 7,340	DHP-S10B-01
Silver	180	0.019 to 18	MW530-1
Tin	22,000	Not analyzed	Not Applicable
Chromium	55,000	0.16 to 650	MWOR-5
Nickel	730	0.42 to 11,400	DHP-S10B-01
Mercury	3.6	0.12 to 1.7	M10B-01

Notes: Residential PRG is provided for reference only. Risks are quantified in Section 9.6 of this RI report.

* Denotes modified California PRG

Plane defueling activities and Site 13 were identified as potential sources of contaminants to groundwater at Site 23 in the form of petroleum contamination and associated chemicals such as BTEX, naphthalene, trimethylbenzenes, and lead. In general, groundwater in the western portion of Site 23 is impacted with these chemicals.

The maximum concentrations of benzene, xylene, sec-butylbenzene, naphthalene, and 1,2,4-trimethylbenzene were detected in a sample from location 530-MJ-MW-1, which is within the petroleum plume associated with the plane defueling area (see Figure 9-10). Benzene was historically detected in groundwater at concentrations exceeding the PRG of 0.34 µg/L (EPA 2002a) (see Figure 9-3). Naphthalene, a petroleum hydrocarbon commonly associated with petroleum fuels such as jet fuel, was detected at a maximum concentration of 2,900 µg/L in a sample from location 530-MJ-MW-1. The compound 1,2,4-trimethylbenzene was detected in

2 of 22 groundwater samples from wells 530-MJ-MW-1 and MW530. It was detected in monitoring well 530-MJ-MW-1 at a concentrations of 860 µg/L, which exceeds the tap water PRG (EPA 2002a).

From 1990 to present, benzene, xylene, ethylbenzene, and 1,2,4-trimethylbenzene also were detected in groundwater samples from well MW530-1 (located northeast of Building 530). The compound 1,2,4-trimethylbenzene was detected at a concentration of 4.1 µg/L in a sample from monitoring well MW530-1, located northeast of Building 530. Benzene was historically detected in groundwater at concentrations exceeding the PRG of 0.34 µg/L (EPA 2002a) in samples from monitoring well MW530-1 (see Figure 9-3). The highest concentrations (79 µg/L in 1990 and 3 µg/L in 2001) of ethylbenzene was detected in samples from well MW530-1. Benzene and ethylbenzene are the only chemicals that exceeded PRGs at well MW530-1. However, the concentrations of benzene and ethylbenzene appear to be decreasing over time, meaning the compounds in the plume are degrading. Based on the decreasing concentrations of benzene and ethylbenzene in the area around well MW530-1, it is expected that benzene, ethylbenzene, and other associated petroleum products will naturally attenuate to nondetect levels.

It is likely that petroleum contamination in the northeast corner of Site 23 is associated with the petroleum plume at Site 13. Figure 6-14 in Section 6.0 shows the core of the benzene plume is approximately between Buildings MS-04 and MS-05. It is possible that the nearby storm sewer line, which is damaged (see Figure 9-4), serves as a conduit for migration of benzene and other petroleum compounds to well MW530-1. In addition, the groundwater flow direction at Site 13 in the area of the petroleum plume is west and southwest. This places well MW530-1 within the area of plume migration. Based on this information, the petroleum contamination located at MW530-1 is attributable to plume migration from Site 13. Concentrations of benzene in this well have decreased to below detection limits.

TCE was detected at Site 23 in samples from only one sampling location, and multiple subsequent sampling events documented the absence of TCE in groundwater at Site 23. In 1994, TCE was detected in one groundwater sample from well MW410-4 at 2 µg/L, which exceeds the tap water PRG (EPA 2002a). Since that time, this well has been sampled and analyzed for TCE a total of eight times, and TCE has not been detected again. Site 23 TCE analytical results are presented in Table 9-12.

9.4.3 Risk Drivers

Although numerous chemicals were detected at Site 23, most of these chemicals do not pose significant risk as defined by the risk assessments; therefore, this section further characterizes the nature and extent of CERCLA chemicals driving risk at Site 23. Selection of these chemicals was based on the background comparison for metals and results of the HHRA and ERA (see Appendices H and I, respectively). Based on the HHRA, arsenic, BaP, and dibenzo(a,h)anthracene were identified as risk drivers in soil and arsenic, 1,2,4-trimethylbenzene, BaP, ethylbenzene, naphthalene, sec-butylbenzene, and thallium were identified as risk drivers in groundwater. Cadmium in soil was determined to pose risk to

terrestrial ecological receptors. Arsenic, cadmium, and thallium in soil and arsenic and thallium in groundwater are attributed to background, so these metals were not evaluated further.

9.4.3.1 Risk Drivers in Soil

This section summarizes the nature and extent of BaP and dibenzo(a,h)anthracene in soil at Site 23.

The PAHs BaP and dibenzo(a,h)anthracene may be attributed to the presence of petroleum contamination. BaP was detected in soil above the action level of 0.62 mg/kg (Navy 2001d) in three samples. Two samples were collected at the same sampling location, C3A023B016, which is located in the plane defueling area near a TPH plume. BaP equivalent concentrations are 2.979 mg/kg for soil collected from a depth of 0.5 to 2 feet bgs and 2.553 mg/kg from a depth of 4 to 8 feet bgs. Because the samples were collected within an area impacted by petroleum hydrocarbons, which is evaluated under the TPH program (see Appendix F), the concentrations may be attributed to the presence of petroleum contamination.

The third sample was collected from location C3A023B026 in the northeastern corner of Site 23 at a depth of 4 to 8 feet bgs; results for this sample are likely associated with TRW. A BaP equivalent concentration of 0.901 mg/kg was detected in soil from sampling location C3A023B026, and black material was noted in the boring log at 2 feet bgs. TRW has been identified in the southeastern corner of Site 13 and likely extends onto Site 23 in this area (see Figure 9-9).

9.4.3.2 Risk Drivers in Groundwater

This section summarizes the nature and extent of 1,2,4-trimethylbenzene, BaP, benzo(b)fluoranthene, ethylbenzene, naphthalene, and sec-butylbenzene in groundwater at Site 23.

1,2,4-Trimethylbenzene

The compound 1,2,4-trimethylbenzene may be attributed to the presence of petroleum contamination associated with defueling activities and the petroleum plume at Site 13. It was detected in 2 of 22 groundwater samples. One sample was collected from location 530-MJ-MW-1 within the defueling area west of Building 530 and from location MW530-1 northeast of Building 530 (see Figure 9-3). In monitoring well 530-MJ-MW-1, 1,2,4-trimethylbenzene was detected at a concentration of 860 µg/L, and in well MW530-1 it was detected at a concentration of 4.1 µg/L. Appendix F provides further discussion of the petroleum contamination.

BaP and Benzo(b)fluoranthene

BaP and benzo(b)fluoranthene are almost insoluble in water; however, they were detected in one grab groundwater sample from location SHP-S10B-05 (see Figure 9-3). The detection of these compounds is likely associated with the presence of soil particles in groundwater.

Ethylbenzene

Ethylbenzene may be attributed to the presence of petroleum contamination associated with the petroleum plume at Site 13. Ethylbenzene was detected in groundwater northeast of Building 530 (MW530-1) from 1990 to present at concentrations of 79 $\mu\text{g/L}$ in 1990 and 3 $\mu\text{g/L}$ in 2001. Benzene and ethylbenzene are the only compounds that exceed tap water PRGs (EPA 2002a) at sampling location MW530-1. It is possible that the nearby storm sewer line, which is damaged (see Figure 9-4), serves as a conduit for migration of benzene, ethylbenzene, and other petroleum compounds to Site 23 in the vicinity of well MW530-1. In addition, the groundwater flow direction at Site 13 within the vicinity of the petroleum plume is to the west and southwest, placing MW530-1 within the area of plume migration.

The concentrations of benzene and ethylbenzene appear to be decreasing over time, indicating the compounds in the plume are degrading. Based on the decreasing concentrations of benzene and ethylbenzene in the area around well MW530-1, it is expected that benzene, ethylbenzene, and other associated petroleum products will naturally attenuate to nondetect levels.

Naphthalene

Naphthalene may be attributed to the presence of petroleum contamination associated with the defueling activities west of Building 530. The maximum concentration of naphthalene (2,900 $\mu\text{g/L}$) was detected in a groundwater sample from well 530-MJ-MW-1, which is located within the petroleum plume associated with the plane defueling area (see Figure 9-10). Naphthalene is a petroleum hydrocarbon commonly associated with petroleum fuels such as jet fuel. Appendix F provides further discussion of the petroleum contamination.

Sec-butylbenzene

Sec-butylbenzene is associated with petroleum hydrocarbon contamination. The compound sec-butylbenzene was detected in 2 of 16 groundwater samples. It was detected at a concentration of 1,000 $\mu\text{g/L}$ in monitoring well 530-MJ-MW-1, which is associated with defueling activities, and at a concentration of 0.2 $\mu\text{g/L}$ in monitoring well MW530-3, which is west of Building 530 (see Figure 9-3). Appendix F provides further discussion of the petroleum contamination.

9.5 FATE AND TRANSPORT

The objective of this evaluation is to determine whether chemicals driving risk at Site 23 (1) have migrated or degraded, (2) are being released from a continuing source of contamination, and (3) are likely to be distributed by groundwater or along other potential pathways. The chemicals driving risk at Site 23 are BaP and dibenzo(a,h)anthracene in soil and BaP, benzo(b)fluoranthene in groundwater.

The fate and transport of 1,2,4-trimethylbenzene, ethylbenzene, naphthalene, and sec-butylbenzene in groundwater are not discussed in this section because these contaminants are related to plane defueling activities and are not a CERCLA waste or commingled with a CERCLA waste. Appendix F provides further discussion on these TPH contaminants.

9.5.1 BaP and Dibenzo(a,h)anthracene in Soil

PAHs, quantified as BaP equivalents, degrade extremely slowly in the environment and bind to organic matter in soil. In addition, they are mostly insoluble in water; therefore, they exhibit low potential for migration. The PAHs found at Site 23 likely will remain in their present state (ATSDR 1995a).

9.5.2 BaP and Benzo(b)fluoranthene in Groundwater

BaP and benzo(b)fluoranthene were detected in one grab groundwater sample. Because these compounds are almost insoluble in water, their detection is likely associated with the presence of soil particles in groundwater. PAHs degrade extremely slowly in the environment and bind to organic matter in soil. In addition, they are mostly insoluble in water; therefore, they exhibit low potential for migration (ATSDR 1995a).

9.6 HHRA

A summary of the HHRA methodology is presented in Section 3.4.6. The summary includes details pertaining to selection of the data set, selection of COPCs, the exposure assessment, the toxicity assessment, and the risk characterization. Additional detailed information is provided in the HHRA (see Appendix H).

Various data were used to characterize risk at Site 23. These data included collecting soil samples, groundwater samples from wells, and grab groundwater samples, where necessary. Grab groundwater samples collected from 1994 to 2001 were used to represent the spatial distribution of the risk at Site 23.

Carcinogenic risks and noncancer health hazards calculated for Site 23 are summarized in this section on a media-by-media basis, including surface soil, subsurface soil, soil gas and groundwater (vapor intrusion pathways), and groundwater (domestic use pathways). As noted in Section 3.4.6, the following receptors were evaluated in the HHRA: current/future

commercial/industrial worker, future construction worker, future hypothetical resident, future construction worker intrusive exposure scenario (deep soil 0 to 8 feet bgs), and future hypothetical resident intrusive exposure scenario.

The total RME carcinogenic risks and noncancer HIs for Site 23 are summarized in Table 9-13. The total CTE carcinogenic risks and noncancer HIs for Site 23 are summarized in Table 9-14. Risk for each media and pathway also is presented in these tables.

9.6.1 Risks from Soil

Commercial/industrial and construction worker scenarios are considered the most likely exposure scenarios. For soil, the highest total RME carcinogenic risk (including background) based on the industrial worker scenario is $4E-06$, which is within the risk management range. The total RME HI (including background) based on the construction worker scenario is 0.05 , which is less than an HI of 1.0. The RME risk results are summarized in Table 9-13 and detailed in Appendix H. For soil, the highest total CTE carcinogenic risk (including background) based on the industrial worker scenario is $2E-07$, which is less than the risk management. The total CTE HI (including background) based on the industrial worker scenario is 0.005 , which is less than an HI of 1. The CTE risk results are summarized in Table 9-14 and detailed in Appendix H.

The residential scenario is considered the most conservative estimate of risk. Soil data were aggregated in depth intervals of 0 to 2 feet bgs (surface soil) and 0 to 8 feet bgs (subsurface soil). For surface soil, the total RME carcinogenic risk (including background) based on the residential scenario is $3E-05$, which is within the risk management range. The total RME HI (including background) based on the residential scenario is 0.3 , which is less than an HI of 1 (see Table 9-13). Arsenic, BaP, and dibenzo(a,h)anthracene were identified as carcinogenic risk drivers for surface soil using the residential scenario. No noncancer risk drivers were identified in surface soil.

For surface soil, the total CTE carcinogenic risk (including background) based on the residential scenario is $5E-06$, which is within the risk management range. The total CTE HI (including background) based on the residential scenario is 0.08 , which is less than an HI of 1 (see Table 9-14).

For subsurface soil (0 to 8 feet bgs), the total RME carcinogenic risk (including background) based on the residential scenario is $3E-05$, which is within the risk management range. The total RME HI (including background) based on the residential scenario is 0.3 , which is less than an HI of 1. Arsenic, BaP, and dibenzo(a,h)anthracene were identified as carcinogenic risk drivers for subsurface soil using the residential scenario. No noncancer risk drivers were identified in subsurface soil.

The total CTE carcinogenic risk (including background) based on the residential scenario for subsurface soil is $5E-06$, which is within the risk management range. The total CTE HI

(including background) based on the residential scenario is **0.1**, which is less than an HI of 1. Tables 9-13 and 9-14 present the RME and CTE risks for each subsurface soil pathway.

Soil risks are primarily attributed to BaP, arsenic, and dibenzo(a,h)anthracene. Arsenic in soil at Site 23 is attributed to background; therefore, risk posed by arsenic at Site 23 is no greater than would be expected at any other part of Alameda Point.

Lead was not selected as a COPC in subsurface soil because the EPC for lead (55 mg/kg in subsurface soil) did not exceed the California-modified residential PRG (EPA 2002a). This suggests that no receptor would have unacceptable blood lead levels associated with exposure to soils (that is, there is a low potential for unacceptable effects).

9.6.2 Risks from Groundwater

The groundwater pathway for the construction worker receptor was not considered complete. Groundwater was evaluated for the commercial/industrial and residential scenarios.

A Tier 1 risk screening did not detect vapor intrusion COPCs for Site 23. This evaluation did not include floating product.

For groundwater, using the residential scenario, the total RME carcinogenic risk (including background) is **6E-04**, which exceeds the risk management range. The total RME HI (including background) based on the residential scenario is **15**, which exceeds an HI of 1. The following carcinogenic and noncancer risk drivers were identified for groundwater:

- 1,2,4-Trimethylbenzene
- BaP
- Ethylbenzene
- Sec-Butylbenzene
- Arsenic
- Benzo(b)fluoranthene
- Naphthalene
- Thallium

The total CTE carcinogenic risk (including background) based on the residential scenario is **2E-04**, which exceeds the risk management range. The total CTE HI (including background) based on the residential scenario is **3**, which exceeds an HI of 1.

The total carcinogenic risk from exposure to groundwater from domestic use is **6E-04**, which exceeds the risk management range. Most of this risk (6E-04) is associated with ingestion of arsenic and BaP in groundwater. The portion of carcinogenic risk attributed to arsenic is 3E-04. The remaining carcinogenic risk not attributable to arsenic (4E-04) is mostly associated with ingestion and dermal contact with BaP in groundwater (3E-04), which was detected in 1 of 20 groundwater samples.

Most of the HI is associated with ingestion of arsenic and thallium and inhalation of VOCs from groundwater. Arsenic and thallium in Site 23 groundwater are attributed to background; nevertheless, the HI not related to arsenic and thallium in groundwater is 10, which is greater than an HI of 1.

9.6.3 HHRA Conclusions

Commercial/industrial and construction worker scenarios are considered the most likely exposure scenarios. The most conservative carcinogenic risk for soil for these two scenarios is within the risk management range. The most conservative HI is less than 1 for soil. The most conservative carcinogenic risk for groundwater for these two scenarios is below the risk management range. This pathway was incomplete for the construction worker scenario.

The tables below summarize HHRA results for carcinogenic and noncancer risks under the residential scenario. The tables also list the risk drivers and their relative contributions to carcinogenic risk and the noncancer HI for soil and groundwater exposures under the RME residential exposure scenario.

Site 23 Cancer Risk, Residential Scenario Receptor: Potential Future Adult/Child		
Medium	Risk Drivers	RME Cancer Risk
Surface Soil	Arsenic ^a	2E-05
	BaP	4E-06
	Dibenzo(a,h)anthracene	2E-06
Groundwater	BaP	3E-04
	Arsenic ^a	3E-04
	Benzo(b)fluoranthene	4E-05
	Ethylbenzene	1E-06
Subtotal Risk (risk drivers only)^b:		7E-04
Total Site Risk (all chemicals):		7E-04

Notes

- a Background, as discussed in Section 9.3.3 and Appendix A
- b Risk drivers are chemicals that individually pose risk greater than 1E-06

**Site 23 Noncancer Risk, Residential Scenario
Receptor: Potential Future Child**

Medium	Risk Drivers	Noncancer HI
Soil	None	0.3
Groundwater	Naphthalene	4
	Thallium	3
	1,2,4-Trimethylbenzene	3
	Arsenic	2
	Sec-butylbenzene	1
Subtotal Risk (risk drivers only^b):		14
Total Site Noncancer Risk:		15

Notes

- a Background, as discussed in Section 9.3.3 and Appendix A
b Risk drivers are compounds that individually have HI values greater than 1.0

The HHRA indicated carcinogenic risks from exposure to soil are within the risk management range and that noncancer risks from soil are less than 1; furthermore, risk in soil is attributable to PAHs and background concentrations of arsenic. The carcinogenic and noncancer risks for groundwater exceed the risk management range.

9.7 ERA RESULTS

This section summarizes results of the modified screening-level ERA conducted for Site 23 (see Appendix I). A modified screening-level ERA was conducted because Site 23 has limited habitat and because site-specific ecological sampling to support a baseline ERA is not feasible. This ERA is intended to be a conservative estimate, using more realistic exposure parameters for the ecological endpoints defined than would typically be used for a screening-level ERA.

The process used to conduct the modified ERA comprises the following components:

- Screening for COPEC
- Problem formulation
- Exposure estimates and risk evaluation
- Evaluation of assessment results

The sections below summarize each component.

9.7.1 Screening for COPECs

COPECs are organic and inorganic chemicals that are defined as potentially related to site activity and potentially causing adverse effects to ecological receptors. Evaluating site-specific data is the first step in quantifying risks and identifying potential hazards at each site. Data for the ERA were selected using the approach described in Section 3.4.7. Soil data for each site were aggregated at a depth interval of 0 to 4 feet bgs. Summaries of the soil data used for Site 23 are presented in Appendix I.

Groundwater at Site 13 was not assessed because (1) groundwater does not discharge to surface water and (2) groundwater occurs at depths such that exposure to burrowing animals is expected to be minimal. For aquatic receptors, it is unlikely that chemicals in groundwater at Site 23 will reach surface water and affect ecological receptors because the site is more than 1,000 feet from the Bay and the Seaplane Lagoon. Therefore, an exposure pathway for aquatic receptors was considered incomplete.

Table 9-15 presents the data used to develop COPECs for Site 23. Chemicals detected in soil were screened to focus the ERA on chemicals that are related to site activity and that pose the greatest potential risk to ecological receptors. The screening was a sequential process that considered factors such as frequency of detection, spatial distribution of detected chemicals, statistical comparison to background concentrations for inorganic chemicals, and chemical properties such as bioaccumulation and toxicity. The COPEC approach is described in further detail in Section 3.4.7.

9.7.2 Problem Formulation

Problem formulation represents the stage of the ERA process where the goals, breadth, and focus of the assessment are determined. The major goal of the problem formulation component is to develop an ecological CSM.

Current and reasonable future uses of Site 23 were evaluated to determine the presence and potential future formation of habitat and to identify complete exposure pathways that might exist at the site. Ecological habitat capable of supporting significant wildlife is not currently present at Site 23; however, exposure pathways for terrestrial receptors were considered complete to provide a conservative estimate of risk. Using a fully exposed soil scenario, the following complete exposure pathways for Site 23 were evaluated:

- Direct exposure to soil
- Food chain exposure

An exposure pathway for aquatic receptors was not considered complete because chemicals in groundwater from Site 23 are not likely to reach the Bay (including the Seaplane Lagoon). Selected assessment and measurement endpoints for soil are presented in Section 3.6.7.

9.7.3 Exposure Estimates and Risk Evaluation

The exposure estimate and risk calculation step results in a conservative estimate of potential risk to the selected measurement endpoints. Using risk calculations, soil doses were compared to TRVs or ERVs to evaluate potential risks to each ecological receptor, and an HQ (a ratio that is indicative of potential risks to ecological receptors) was derived. HQ results for soil for Site 23, using high and low TRVs, are presented in Table 9-16 and presented in detail in Appendix I.

9.7.4 Evaluation of ERA Results

High and low TRVs were used to provide a bounding estimate of risk to each endpoint. The high TRV represents an upper bounding limit, which is the lowest concentration where adverse effects are known to occur. The low TRV represents the lower bounding limit, which is the highest concentration an ecological receptor can be exposed to where adverse effects are known not to occur. If both HQ values for a chemical in soil were below 1.0, then the chemical is not considered to pose a potential risk to ecological receptors. Metals with one or both bounding limit HQs exceeding 1.0 were further compared to calculated background HQs for metals in soil (see Table 9-16). Chemicals with HQs above 1.0 and above background concentrations were further evaluated based on each chemical's frequency of detection and distribution at Site 23, the range of concentrations detected, and its absorption potential and toxicity to each ecological receptor. This type of analysis provides additional weight-of-evidence data to support risk management decisions for Site 23.

9.7.4.1 Risk to Small Mammals

All soil COPECs were evaluated at Site 22 for small mammal populations (California ground squirrel is the measurement endpoint). Literature data were not adequate to develop an ERV for n-nitroso-diphenylamine for small mammals; therefore, these chemicals were evaluated qualitatively. All other COPECs evaluated at Site 23 were determined to pose no significant risk based on an HQ less than 1.0, using both the low and high TRVs. This section briefly summarizes the evaluation of risk to small mammals from COPECs with HQs above 1.0 as well as those that were qualitatively evaluated.

COPECs with HQs above 1.0 included cadmium. The high TRV HQ for cadmium was below 1.0. The low TRV HQ was 15.2, which was less than 7 times above the background HQ of 2.37. Cadmium was detected in 14 of 30 soil samples collected at Site 23. The calculated EPC was 1.43 mg/kg, while the calculated background EPC was 0.49 mg/kg. Cadmium is a known teratogen in mammals; however, the gastrointestinal absorption of cadmium in mammals is very limited. Based on the ATSDR (1999) toxicological profile for cadmium, gastrointestinal absorption of cadmium in mammals ranges from 0.5 to 3 percent for monkeys, 1 to 2 percent for mice and rats, 2 percent for goats, 5 percent for pigs and lambs, and 16 percent for cattle. Assuming a conservative absorption rate of 16 percent, a revised low TRV HQ value for cadmium would be 2.43. Based on these factors, cadmium may pose a potential risk to small mammals at Site 23.

The qualitative evaluation of risk to small mammals from exposure to n-nitroso-diphenylamine involved assessing the weight-of-evidence parameters discussed in Section 9.7.4. Based on the low detection frequency and relatively low concentrations detected at Site 23 and that SVOCs generally only will have toxic effects at higher doses, risk to small mammals from these chemicals is expected to be low.

9.7.4.2 Risks to Passerines

All soil COPECs were evaluated at Site 22 for passerine populations (Alameda song sparrow and the American robin are the measurement endpoints). Literature data were not adequate to develop avian ERVs for HMW and LMW PAHs, n-nitroso-diphenylamine, and toluene. This section briefly summarizes the evaluation of risk to passerines from COPECs with HQs above 1.0 and those that were qualitatively evaluated.

COPECs with HQs above 1.0 included lead. The HQs for the Alameda song sparrow and the American robin using the high TRV for lead were below 1.0. The song sparrow and the robin's low HQs for lead were 7.7 and 25.8, respectively, which exceeded the background HQs of 2.71 and 9.07. These HQs may be driven by the overly conservative low TRV, as described in Section 9.7.2. Using the allometrically converted TRVs for the passerines, the low TRV lead HQs at Site 23 were below 1.0 for both the song sparrow and the robin. Based on this information, lead at Site 23 poses a low potential risk to passerines.

The qualitative evaluation of risk to passerines from exposure to HMW and LMW PAHs, n-nitroso-diphenylamine, and toluene involved assessing the weight-of-evidence parameters discussed previously in Section 9.7.4. Studies indicated that PAH chemicals do not appear to bioaccumulate in mammals and birds (Eisler 1987a). Additionally, based on the relatively low frequency of detection and low concentration of PAHs and the SVOC, n-nitroso-diphenylamine, risk posed to passerines from these COPECs is expected to be low. Only residual concentrations of VOCs are present in soils at Site 23. Mammals and birds generally metabolize VOCs quickly; therefore, risk posed to passerines from residual concentrations of VOCs is expected to be low.

9.7.4.3 Risk to Raptors

All soil COPECs were evaluated at Site 22 for raptor populations (red-tailed hawk is the measurement endpoint). Literature data were not adequate to develop avian ERVs for HMW and LMW PAHs, n-nitroso-diphenylamine, and toluene. All other COPECs evaluated at Site 23 were determined to pose no significant risk based on an HQ less than 1.0, using both the low and high TRVs. This section briefly summarizes the evaluation of risk to raptors from COPECs with HQs above 1.0 and those that were qualitatively evaluated.

COPECs with HQs above 1.0 included cadmium and lead. The low TRVs for cadmium and lead exceeded 1.0. These COPECs were further considered in a weight-of-evidence approach. After consideration of background concentrations at Alameda Point, alternate TRVs (for lead), the

absorption potential of the chemical, the frequency of detection, and the concentrations detected at Site 23, cadmium and lead were determined to pose a low potential risk to raptors.

The qualitative evaluation of risk to raptors from exposure to HMW and LMW PAHs, n-nitroso-diphenylamine, and toluene involved assessing the weight-of-evidence parameters. Studies indicated that PAHs do not appear to bioaccumulate in mammals and birds (Eisler 1987a). Additionally, based on the relatively low frequency of detection and low concentration of PAHs and the SVOC, n-nitroso-diphenylamine, risk posed to raptors from these COPECs is expected to be low. Only residual concentrations of VOCs are present in soils at Site 23. Mammals and birds generally metabolize VOCs quickly; therefore, the risk posed to raptors from such residual concentrations of VOCs is expected to be low.

9.7.5 Uncertainty

The screening-level ERA process involves a large number of uncertainties and extrapolations to evaluate potential risk to ecological receptors. Many of the assumptions in the screening-level ERA process are conservative and result in overestimates of site-specific parameters. Uncertainties associated with the ERA conducted for Site 23 are identified in Section 3.4.7.5.

9.7.6 ERA Conclusions

Results of the HQ calculations and qualitative evaluations indicated potential risk to small mammals and raptors from cadmium. No significant risk is posed to passerines from exposure to Site 23 soils. Based on the lack of habitat at Site 23 and the planned future use of the site, no risks to ecological receptors were identified that require further evaluation or mitigation.

9.8 CONCLUSIONS AND RECOMMENDATIONS

The conclusions of the evaluations conducted in support of the CERCLA risk management process are presented in Sections 9.8.1 (nature and extent) and 9.8.2 (risk assessments), and the overall recommendations for Site 23 are presented in Section 9.8.3.

9.8.1 Nature and Extent of Chemicals

The nature and extent evaluation concluded that most of the chemicals detected across Site 23 are consistent with historical activities known to occur at the site, which included plane defueling and the former oil refinery. In addition, the petroleum plume at Site 13 is another likely source of petroleum contamination at Site 23. Physical features of Site 23, along with specific details on the hazardous waste generated and past disposal and storage practices associated with these wastes, were used to identify potential sources of CERCLA chemicals. Environmental investigations were conducted in these areas to identify and assess the extent of CERCLA chemicals in soil and groundwater, and the analytical results were evaluated. The following physical features and site activities were considered likely sources at Site 23:

- Defueling area and associated OWSs 529 and 530 and ASTs 530A, 530B, and 530C
- Former oil refinery activities

Previous site activities associated with plane defueling and the operation of the former refinery were identified as a source of TPH in soil. Elevated concentrations of CERCLA chemicals were not identified in soil at Site 23. Concentrations of chromium, lead, mercury, nickel, silver, and zinc were all detected below their respective residential PRGs (EPA 2002a) and are present at concentrations considered to be background. Aroclor-1260 was detected in one soil sample at a concentration below the residential PRG (EPA 2002a). No other PCBs were detected in soil at Site 23. TCE was not detected.

BaP in soil may be attributed to the presence of petroleum contamination. BaP was detected in soil above the action level of 0.62 mg/kg in three samples. Two samples were collected at the same sampling location within the plane defueling area near a TPH plume. The third sample was collected in the northeastern corner of Site 23 at a depth of 4 to 8 feet bgs and is likely associated with TRW. TRW is present in soil in the southeastern corner of Site 13 and likely extends onto Site 23. Based on data collected at Site 13 just north of where the TRW was identified at Site 23, the material at Site 23 is not commingled with free product petroleum hydrocarbons; therefore, it is not likely mobilizing in groundwater.

PAHs BaP and benzo(b)fluoranthene also were detected in one grab groundwater sample. The detection of these compounds is likely associated with the presence of soil particles in groundwater.

Plane defueling activities and Site 13 were identified as potential sources of contamination in Site 23 groundwater. Chemicals identified in groundwater at Site 23 included petroleum and associated chemicals such as BTEX, naphthalene, trimethylbenzenes, and lead. In general, groundwater in the western portion of Site 23, the plane defueling area, is impacted with these chemicals, and a petroleum plume is present. The maximum concentrations of benzene, xylene, sec-butylbenzene, naphthalene, and 1,2,4-trimethylbenzene were detected within the petroleum plume.

Benzene, xylene, ethylbenzene, and 1,2,4-trimethylbenzene were also detected in groundwater northeast of Building 530 from 1990 to present. It is likely that petroleum contamination is associated with the petroleum plume at Site 13, and it is possible that the nearby storm sewer line, which is damaged, serves as a conduit. In addition, the groundwater flow direction at Site 13 in the area of the petroleum plume is to the west and southwest. Concentrations of benzene and ethylbenzene appear to be decreasing over time, indicating the chemicals in the plume are degrading. It is expected that benzene, ethylbenzene, and other associated petroleum products will naturally attenuate to nondetect levels.

Although numerous chemicals were detected at Site 23, some of these chemicals do not pose significant risk as defined by the risk assessments. Significant risk to human health is potentially posed by arsenic, BaP, and dibenzo(a,h)anthracene in soil and arsenic, 1,2,4-trimethylbenzene,

BaP, ethylbenzene, naphthalene, sec-butylbenzene, and thallium in groundwater. Cadmium was determined to pose risk to terrestrial ecological receptors. Arsenic, cadmium, and thallium in soil and arsenic and thallium groundwater are attributed to background concentrations that exist in the environment.

Data gaps for soil and groundwater at Site 23 were also identified. Because of elevated detection limits for some nondetected VOCs in groundwater and SVOCs in soil and groundwater, further sampling and analysis of groundwater may be needed to confirm that these chemicals are not present in groundwater at Site 23. Additionally, sampling and analyses of soil for PCBs is recommended to confirm PCBs are not present in soil at levels that would pose risk. PCB oil was used for weed control in the mini-storage area until 1963; however, soil samples were not collected within the vicinity of the mini-storage area and analyzed for PCBs.

Although these data gaps were identified, it was determined that the types and numbers of samples collected at Site 23 and the analytical suite were adequate to characterize the site and conduct risk assessments because data collection at the site focused mainly on potential sources and was conducted in phases. This phased approach afforded stakeholders opportunities to provide feedback on the suitability or adequacy of the data collected and the need for additional data to identify releases and complete the RI report. There is a low potential that any source at Site 23 was not adequately evaluated or that NFA would be recommended if it poses a potential risk to human health or the environment.

9.8.2 Risk Assessments Conclusions

An HHRA and modified screening-level ERA were conducted to evaluate risk from chemicals detected at Site 23. The sections below present the conclusions for the HHRA and ERA, respectively.

9.8.2.1 HHRA Conclusions

According to reuse plans for Alameda Point (EDAW 1996), commercial/industrial and construction worker exposures are the most likely future exposures at Site 23. Human health risk was evaluated for commercial/industrial and construction worker exposures, along with residential exposures. The residential exposure scenario was evaluated to allow for flexibility in implementing the reuse plan (or modifications thereto) at Alameda Point and because EPA risk assessment guidance (EPA 1989) includes a strong preference for evaluation of the residential pathway.

For the commercial/industrial and construction worker scenarios, the most conservative carcinogenic risk for soil for these two scenarios is within the risk management range. The most conservative HI is less than 1 for soil. The most conservative carcinogenic risk for groundwater for these two scenarios is below the risk management range. This pathway was incomplete for the construction worker scenario.

The tables in Section 9.6.3 summarized the HHRA results for carcinogenic and noncancer risks under the residential scenario. Those tables also list risk drivers and their relative contributions to carcinogenic risk and the noncancer HI for exposure to soil and groundwater under the RME (residential exposure) scenario. For the residential scenario, the HHRA indicated carcinogenic risks from exposure to soil are within the risk management range and that noncancer risks from soil are less than 1; furthermore, risk in soil is attributable to PAHs (BaP and dibenzo[a,h]anthracene) and background concentrations of arsenic. The carcinogenic and noncancer risks for groundwater exceed the risk management range and are attributable to the following:

- 1,2,4-Trimethylbenzene
- BaP
- Ethylbenzene
- Sec-Butylbenzene
- Arsenic
- Benzo(b)fluoranthene
- Naphthalene
- Thallium

Lead was not selected as a COPC in subsurface soil because the EPC for lead (55 mg/kg in subsurface soil) did not exceed the California-modified residential PRG (EPA 2002a). This suggests that no receptor would have unacceptable blood lead levels associated with exposure to soils (that is, there is a low potential for unacceptable effects).

9.8.2.2 ERA Conclusions

A site-specific ERA was conducted for Site 23 to estimate potential risks to the environment. Currently, ecological habitat capable of supporting significant wildlife is not present at Site 23; therefore, exposure pathways for terrestrial receptors were considered potentially complete to provide a conservative estimate of risk. Risk to marine receptors was not evaluated because exposure pathways for aquatic receptors were considered incomplete. Assessment endpoints included small mammals, passerines, and raptors.

Results of the HQ calculations and qualitative evaluations indicated potential risk to small mammals and raptors from cadmium. Based on the low magnitude of the low HQ, the limited habitat at Site 23, and the planned future use of the site, no risks to ecological receptors were identified that require further evaluation or mitigation.

9.8.3 Recommendations

Based on the data and risks discussed previously, soil and groundwater at Site 23 are recommended for further evaluation in an FS, as defined under CERCLA, to address risks to residential receptors under the unrestricted reuse scenario. Total site risk to residential receptors (including background) is above the risk management range. BaP and dibenzo(a,h)anthracene were identified as COCs for soil. Arsenic in soil was identified as risk driver but is attributed to

background. BaP and dibenzo(a,h)anthracene in soil were attributed to the presence of petroleum contamination. 1,2,4-Trimethylbenzene, BaP, benzo(b)fluoranthene, ethylbenzene, naphthalene, and sec-butylbenzene were identified as COCs for groundwater. BaP and benzo(b)fluoranthene were attributed to the presence of soil particles in groundwater and the remaining groundwater COCs were attributed to petroleum contamination. Although arsenic and thallium were identified as groundwater risk drivers, they are attributed to background.

An evaluation of TPH in soil and groundwater also was conducted based on the TPH strategy for Alameda Point (Navy 2001a) (see Appendix F). Based on this evaluation, further action is recommended for TTPH and TPH-associated chemical concentrations present in soil and groundwater at Site 23. Site 23 was considered significantly impacted by TPH, and corrective action for free TPH product in soil and groundwater was conducted using DVE and biosparging.

Recommendations for further action under CERCLA will be based only on CERCLA contaminants; TPH-related chemicals are being addressed under a CAP.