



**U.S. Army  
Environmental  
Center**

# **Phase 2 Remedial Investigation Report Army Materials Technology Laboratory**

## **Task Order 1 Remedial Investigation/Feasibility Study**

Contract Number DAAA15-90-D-0009

### **Volume 2 - Tables**

May 1994

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FINAL


Task Order 1


PHASE 2 REMEDIAL INVESTIGATION FOR BASE CLOSURE  
REMEDIAL INVESTIGATION/FEASIBILITY STUDY  
ARMY MATERIALS TECHNOLOGY LABORATORY  
WATERTOWN, MASSACHUSETTS

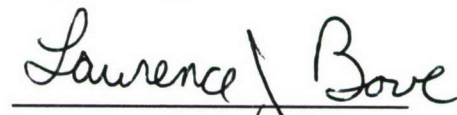
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**Table 1-1**  
**Summary of Findings of Previous Investigations at MTL**

Investigation Citation	Findings
Dady and Foley, September 1968	Liquid wastes generated by the reactor were collected in a 440-gallon sump located in the reactor basement. The liquid was then transferred into three 3,000-gallon tanks located in Building 97 and a 40,000-gallon UST for storage and possible treatment. Prior to discharge into the Metropolitan District Commission (MDC) sanitary sewer system, the liquid was sampled by reactor personnel to determine compliance with radiation concentration levels (10 CFR 20 Appendix B). (Note: the Dady and Foley report was an environmental radiological monitoring work plan. No conclusions, except for past operational history, can be obtained.)
Tanner and Associates, September 1978	Treatment facilities for removal of hexavalent chromium from rinse wastewaters were seldom used since their installation. Samples were collected from the effluent of the wastewater treatment facilities during normal operations. These samples indicate either concentrated plating solution had been discharged or treatment of wastewater was ineffective. These samples also indicated that discharged rinsewater exceeded state and federal levels for hexavalent chromium and cadmium. MDC sewer user regulations prohibit the discharge of concentrated plating solutions, treated or not.
Coffin and Richardson, Inc., July 1979	Wet weather flow for some storm sewer water exceeded limits for oil, grease, copper, and zinc. Floor drains in Buildings 37 and 311 and parking lots could have contributed to oil and grease contamination. Elevated copper levels may be attributed to copper downspouts and roof flashings on various MTL buildings. Elevated zinc levels may be attributed to the reaction of acidic rainwater and various on-site metal objects. Elevated mercury levels were noted but were not attributed to a particular source.
Camp, Dresser & McKee, Inc., May 1980	Evidence of dumping from the mid-1800s was found at the east end of the excessed Arsenal property. Potable water, historically, was supplied by a cistern located under Building 313. One known well, located southwest of Building 60, which tapped a sand and gravel aquifer, was permanently capped in 1969. No air problems were identified; however, two areas should be investigated further: compliance with 1) particulate emission standards for upgraded burners in Building 60 and 2) vapor loss regulations for the gasoline storage tanks should be confirmed. The storage areas for nonradioactive hazardous wastes and radioactive/beryllium wastes should be secured and have roofs installed to protect the barrels. Chemical storage violations occurred and were noted. Greatest potential health hazard was the syntron vibrating polishing facility. Dry weather storm sewer flows should be monitored to determine if AMMRC is contributing to the flow.

**Table 1-1**  
**Summary of Findings of Previous Investigations at MTL**  
**(Continued)**

Investigation Citation	Findings
USATHAMA, April 1980	<p>Review of records identified depleted uranium, beryllium, heavy metals, and organic reagents as major potential contaminants. Portions of MTL have been used as landfills as late as the mid-1800s. An ash burial pit existed prior to the 1930s near Building 60. Argon-41 released from the reactor did not exceed existing Atomic Energy Commission levels. Wastewater discharged into the sanitary sewer system include boiler blowdown containing low concentrations of caustic soda, phosphate, tannin, and pretreated (neutralized, dilution) photographic solutions. Stormwater runoff samples showed higher than expected level of copper, mercury, zinc, grease, and oil during wet weather flow. The cistern underneath Building 313 appeared to have had pipes leading into the system. Origination of the pipes is unknown.</p>
U.S. Army Environmental Hygiene Agency, January 1981	<p>All air emission sources investigated were found to be in compliance with federal and state air pollution emission standards. Sampling locations included the following (Building, Description): 312, Beryllium Process; 312, Depleted Uranium; 312, Metal Plating Shop; 39, Dynamic Corrosion Test Area; 39, Acid Scrubber (on roof); 37, Vehicle Maintenance Shop; 43, Depleted Uranium Incinerator; 43, Electric Arch Furnace; 60, Main Boiler Plant; 60, Petroleum Tank Farm. Procedural inadequacies that existed include late submission of state emission registration forms and requirements for source emission testing of the main boiler plant (Building 60).</p>

**Table 1-2**  
**MTL Buildings and Potential Contaminants**

Building	Present Function	Known or Potential Contaminants/Contents	Past Functions
36	Photo laboratory, cafeteria, and offices	Silver compounds	Explosives from weapon manufacturing
37	Auto repair, paint shop, and carpenter shop	Volatile organic compounds (VOCs), various gases, particulate, lead metals, and radionuclides	Machine shop, vehicle storage foundry, and gasoline storage
39	Organic synthesis, crystallography, JP-4 and oil storage tanks	VOCs, other chemical reagents, organics, radionuclides, and asbestos	Piano factory, steam plant reagents, USACE geophysics laboratory
43	DU foundry, machine shop presses, furnace, and quench tanks	Radionuclides, metals, hydrocarbons, CO, NO <sub>x</sub> , and SO <sub>x</sub>	Metals from forging construction additions
60	Oil-fired powerplant and oil and gasoline storage tanks	Criteria gases, VOCs, particulate, smoke, and asbestos	Boiler since 1915
97	Access to Building 100, chemistry laboratory, particle accelerator	Radionuclides, VOCs, chemical reagents, and asbestos	Wastewater tank effluent from locomotive repair
100	Reactor containment and neutron radiography	Radionuclides	Building for reactor
111	Commanding Officer's quarters and aboveground heating oil tank	Hydrocarbons and VOCs	Unknown
117	Military housing and aboveground heating oil tank	Hydrocarbons and VOCs	Cow barn
118	Military housing	None identified	Unknown
131	Administrative	Asbestos	Office buildings
146	Security post	None identified	Unknown
147	Vehicle access gate	None identified	Security post, purchased from mattress factory
226	Fuel storage tanks	VOCs	Underground vault

**Table 1-2  
MTL Buildings and Potential Contaminants  
(Continued)**

Building	Present Function	Known or Potential Contaminants/Contents	Past Functions
227	Oil pumping equipment	Hydrocarbons and VOCs	Oil pump house
229	Cooling oil pump and oil storage tank	VOCs	Oil pump house
241	Storage for barrels of DU and Be wastes awaiting shipment	Radionuclides, Be	Radiological waste storage
242	Low-level waste storage tank	Radionuclides and contaminated water	Cooling water storage
243	Storage for used chemicals, such as acids, awaiting shipment; an oil storage area is located just west of the building	VOCs and other chemicals, such as acids	Chemical storage; additions constructed in 1950s and 1980s
244	Empty explosives storage bunker	Various explosives	Storage of explosives
245	Bunker for storage of propellants	Drums, barrels, and boxes of various propellant powders	Storage of propellants
246	Storage for road and grounds equipment	Salt and sand components	Sand shed
292	Materials characterization, x-ray diffraction, and analytical chemistry	Metals, chemical reagents, and radionuclides	Plating operations prior to 1950
295	Tank farm	Hydrocarbons and VOCs	Coal storage bin; may be ash dump near building
311	Machine shops, laboratories, industrial x-ray facility, fiber composite laboratories, detonon facility, DU storage area, and warehouse	Radionuclides, explosive chemicals, metal particulate, organic chemicals, fiber composite reagents, and asbestos	Metals from gun milling and solvents from cold-metal working
312	Metals and ceramics laboratory plating, DU/Be machining, crystal growth laboratory, wave physics laboratory, ballistics range	VOCs, chemical reagents, radionuclides, metals, and asbestos	Metals from machine tool shop
313 S,C,N	Foundry, ceramic research welding, and ballistics range	Hydrogen, VOCs, particulate and lead gases from ballistics, radionuclides, and asbestos	Rainwater cistern; still in place
652/654	Abandoned in place	Unknown	Pump houses for fire protection system
656	Cooling equipment	Unknown	Chiller and A/C equipment building

(Source: Environmental Investigation Status Report, EG&G, 1990, except Building 245 information from Lange, 1992.)

Table 2-1  
Well Development Summary

Well ID	Development Dates	Approx. Recharge (gpm)	Volume Pumped (gallons)	Specific Conductivity (mmhos)			pH			Comments
				Start	Mid	End	Start	Mid	End	
MW-15	Start - 10/25/91 End - 11/21/91	< 1	90	2,400	2,400	2,310	8.2	7.4	7.2	To develop, well pumped dry 5 times.
MW-15A	Start - 10/25/91 End - 11/15/91	< 1	214	1,000	1,700	1,720	11.8	10.8	11.2	To develop, well pumped dry 5 times.
MW-16	11/21/91	~ 1.3	160	160	200	200	6.3	6.2	6.2	Pumped 160 gallons in 120 minutes.
MW-16A	Start - 10/25/91 End - 12/05/91	< 1	142	215	210	210	6.8	6.8	6.8	To develop, well pumped dry 5 times.
MW-17	Start - 10/25/91 End - 11/15/91	< 1	99	290	289	280	5.0	7.0	6.6	To develop, well pumped dry 6 times.
MW-17A	Start - 10/25/91 End - 11/15/91	< 1	290	1,000	428	440	-	8.2	7.6	To develop, well pumped dry 6 times.
MW-18	11/12/91	~ 0.7	140	265	310	310	6.3	6.2	6.2	Pumped 140 gallons in 200 minutes.
MW-19	Start - 10/27/91 End - 12/07/91	< 1	61	191	190	180	7.8	8.0	7.8	To develop, well pumped dry 6 times.
MW-19A	12/06/91	~ 2	320	325	360	360	10.0	9.0	9.0	Pumped 320 gallons in 180 minutes.
MW-19B	Start - 11/10/91 End - 12/06/91	< 1	175	340	320	320	7.6	8.2	8.2	To develop, well pumped dry 5 times.
MW-20	10/25/91	~ 10	1,200	470	470	470	7.2	6.4	6.4	Pumped 1,200 gallons in 110 minutes.
MW-21	Start - 10/24/91 End - 12/04/91	< 1	264	1,100	1,410	1,320	10.2	11.1	10.2	To develop, well pumped dry 5 times.
MW-22	11/12/91	~ 1	165	830	890	890	6.2	6.3	6.3	Pumped 165 gallons in 135 minutes.
MW-23	11/11/91	~ 2	170	150	160	160	5.8	5.8	5.8	Pumped 170 gallons in 100 minutes.
MW-24	11/11/91	~ 4	250	160	180	180	5.2	5.8	5.8	Pumped 250 gallons in 70 minutes.

Table 2-2  
Groundwater Monitoring Summary

Well ID	Well Purging Date/Time	Sample Collection Date/Time	Volume Purged (gallons)	Specific Conductivity (mmhos)			pH			Comments
				Start	Mid	End	Start	Mid	End	
C-2	12/14/91 1335	12/14/91 1410	75	650	550	550	6.7	6.4	6.4	VOCs detected, water containerized.
C-3	12/13/91 1113	12/13/91 1540	177	295	290	290	7.2	6.8	6.8	
MW-1	12/10/91 1016	12/10/91 1030	92	370	450	450	7.0	7.0	6.8	
MW-2	12/10/91 1255	12/10/91 1415	65	260	270	270	7.4	7.6	7.4	
MW-3	12/12/91 1045	12/12/91 1300	4.6	900	900	950	6.6	6.5	6.8	To purge, well pumped dry 2 times.
MW-4	12/12/91 1605	12/13/91 0845	8	440	480	440	6.7	6.7	6.7	To purge, well pumped dry 2 times.
MW-5	12/14/91 1220	12/14/91 1400	88	115	109	105	4.4	5.2	5.2	
MW-6	12/12/91 1221	12/12/91 1355	68	700	900	900	6.0	5.6	5.6	
MW-7	12/13/91 1227	12/13/91 1615	60	130	130	130	6.2	6.2	6.2	
MW-8	12/13/91 1030	12/14/91 0810	71	410	400	400	7.2	6.4	6.4	
MW-9	12/15/91 1015	12/16/91 1050	80	310	290	295	6.4	6.4	6.4	
MW-10	12/11/91 1440	12/11/91 1610	18.9	170	380	285	6.6	6.8	6.6	To purge, well pumped dry 3 times.
MW-11	12/14/91 1415	12/14/91 1445	88	220	181	181	5.8	5.8	6.0	
MW-12	12/15/91 1207	12/16/91 1230	52	1,000	900	1,000	6.8	7.0	7.0	
MW-13	12/11/91 1500	12/11/91 1515	84	1,000	1,050	1,050	6.4	6.4	-	
MW-14	12/10/91 1055	12/10/91 1100	82	329	310	310	7.2	7.3	7.2	

Table 2-2  
Groundwater Monitoring Summary  
(Continued)

Well ID	Well Purging Date/Time	Sample Collection Date/Time	Volume Purged (gallons)	Specific Conductivity (mmhos)			pH			Comments
				Start	Mid	End	Start	Mid	End	
MW-15	12/13/91 1230	12/14/91 0900	124	3,110	2,800	2,750	7.3	7.4	7.4	
MW-15A	12/10/91 1600	12/10/91 1615	49	1,100	850	850	11.0	10.0	10.0	To purge, well pumped dry 2 times.
MW-16	12/15/91 1030	12/16/91 0810	109	148	150	150	6.5	6.4	6.4	
MW-16A	12/15/91 1530	12/16/91 0820	21	340	341	340	7.0	6.8	7.0	To purge, well pumped dry 2 times.
MW-17	12/11/91 1230	12/11/91 1400	91.2	321	340	340	6.7	6.6	6.6	
MW-17A	12/11/91 1620	12/12/91 0930	60	480	480	475	9.0	9.0	9.2	To purge, well pumped dry 2 times.
MW-18	12/11/91 1600	12/12/91 0845	70	221	255	255	6.6	6.6	6.6	To purge, well pumped dry 2 times.
MW-19	12/15/91 1325	12/16/91 1120	8	155	160	160	6.8	6.8	7.0	VOCs detected, water containerized.
MW-19A	12/12/91 1440	12/12/91 1500	304	351	351	351	7.6	7.6	7.4	To purge, well pumped dry 2 times.
MW-19B	12/12/91 1530	12/12/91 1550	30	381	370	350	7.4	7.5	7.4	To purge, well pumped dry 2 times.
MW-20	12/13/91 1010	12/13/91 1530	193	414	429	429	6.2	6.2	6.4	
MW-21	12/10/91 1430	12/10/91 1440	80	720	500	490	22.6	11.2	11.6	To purge, well pumped dry 2 times.
MW-22	12/15/91 1310	12/16/91 0945	133	700	710	700	6.5	6.5	6.5	
MW-23	12/15/91 1450	12/16/91 1005	94	235	239	237	6.2	6.2	6.2	VOCs detected, water containerized.
MW-24	12/15/91 1200	12/16/91 0910	134	174	171	170	6.2	6.1	6.1	

**Table 2-3**

**Water Sample Containers, Preservation, and Holding Times**

Analysis	Container	Volume	Preservation	Holding Time (days)
TAL metals	Polyethylene bottle	1 liter	HNO <sub>3</sub> to pH <2, Cool to <4 °C Filter for dissolved metals	180
Cyanide	Polyethylene bottle	1 liter	NaOH to pH >12, Cool to <4 °C	14
Nitrates	Polyethylene bottle	1 liter	H <sub>2</sub> SO <sub>4</sub> to pH <2 Cool to <4 °C	28
Explosives	Polyethylene bottle	1 liter	Cool to <4 °C	7 until extraction, 40 until analysis
TCL semivolatiles	Amber glass bottle with Teflon-lined cap	1 liter	Cool to <4 °C	7 until extraction, 40 until analysis
TCL volatiles	Glass, septum-sealed vial	40 mL (2)	HCl to pH <2	14
Pesticides, PCBs	Amber glass bottle with Teflon-lined cap	1 liter	Cool to <4 °C	7 until extraction, 40 until analysis
TOC	Amber glass bottle with Teflon-lined cap	1 liter	HCl or H <sub>2</sub> SO <sub>4</sub> to pH <2 Cool to <4 °C	28
pH	Polyethylene bottle	500 mL	None	Immediate
Hardness	Polyethylene bottle	500 mL	HNO <sub>3</sub> to pH <2	180
Gross Alpha/ Gross Beta	Polyethylene bottle	1 liter	HNO <sub>3</sub> to pH <2	None
Radionuclides	Polyethylene bottle	1 liter	HNO <sub>3</sub> to pH <2 for Th-230, Cs-137 HCl to pH <2 for isotopic uranium	None

**Table 2-4**

**Summary of Phase 2 Surface Soil Samples**

Sample	Location	Past/Present Use	Sample Type	Analyses
01SS-1 01SS-1D	Northwest corner of site	Background	Discrete	TAL metals, TCL semivolatiles, pesticides, PCBs, gross alpha, gross beta, isotopic uranium, pH
02SS-1	Northern fence line	Background	Discrete	TAL metals, TCL semivolatiles, pesticides, PCBs, gross alpha, gross beta, isotopic uranium, pH
02SS-2	Northern fence line, approximately halfway along the length of Building 311	Storage, testing, manufacturing, machining	Discrete	TAL metals, gross alpha, gross beta, isotopic uranium, pH
02SS-3	Building 226 (transformer)	Transformer	2-point composite	TAL metals, pesticides, PCBs, gross alpha, gross beta, isotopic uranium, pH
03SS-1	Building 226 (transformer)	Transformer	2-point composite	TAL metals, pesticides, PCBs, gross alpha, gross beta, isotopic uranium, pH
03SS-2	North of Building 243	DU foundry/heat treating	Discrete	TAL metals, gross alpha, gross beta, isotopic uranium, pH
03SS-3 03SS-3D	Northeast corner of site	Background	Discrete	TAL metals, TCL semivolatiles, PCBs, gross alpha, gross beta, isotopic uranium, pH
04SS-1	Western fence line	Possible pesticide application	4-point composite	TAL metals, pesticides, gross alpha, gross beta, isotopic uranium
05SS-1	Adjacent to (east of) Building 39	Laboratories	Discrete	TAL metals, TCL semivolatiles, gross alpha, gross beta, isotopic uranium, pH
05SS-2	Southeast corner of Building 39	Laboratories	Discrete	TAL metals, TCL semivolatiles, gross alpha, gross beta, isotopic uranium, pH

**Table 2-4**

**Summary of Phase 2 Surface Soil Samples  
(Continued)**

<b>Sample</b>	<b>Location</b>	<b>Past/Present Use</b>	<b>Sample Type</b>	<b>Analyses</b>
06SS-1	Transformer northeast of reactor	Transformer	3-point composite	TAL metals, PCBs, gross alpha, gross beta, isotopic uranium, cesium-137, thorium-230, pH
06SS-2	Transformer northeast of reactor	Transformer	3-point composite	TAL metals, PCBs, gross alpha, gross beta, isotopic uranium, cesium-137, thorium-230, pH
06SS-3	South of reactor, east of Building 97	Laboratories, storage, testing (reactor)	Discrete	TAL metals, gross alpha, gross beta, isotopic uranium, cesium-137, thorium-230, pH
06SS-4	South of Building 292	Possible pesticide application	2-point composite	TAL metals, pesticides
08SS-1	Adjacent to southeast corner of Building 312	DU/Be machining, plating	Discrete	TAL metals, gross alpha, gross beta, isotopic uranium, pH
09SS-1	Building 313N/C transformer	Transformer	3-point composite	TAL metals, pesticides, PCBs, gross alpha, gross beta, isotopic uranium, pH
09SS-2	Building 313C/S transformer	Transformer	3-point composite	TAL metals, PCBs, gross alpha, gross beta, isotopic uranium, pH
13SS-1	Adjacent to Building 118	Residence	Discrete	TAL metals, semivolatile organics, gross alpha, gross beta, isotopic uranium, pH
13SS-2	Adjacent to Building 117	Residence	Discrete	TAL metals, semivolatile organics, gross alpha, gross beta, isotopic uranium, pH
13SS-3	Building 131 transformer	Transformer	3-point composite	TAL metals, PCBs, pH
13SS-5	Eastern fence line	Possible pesticide application	3-point composite	TAL metals, pesticides
13SS-6	Victory Garden	Garden	Discrete	TAL metals, semivolatile organics, gross alpha, gross beta, isotopic uranium, pH

**Table 2-4**

**Summary of Phase 2 Surface Soil Samples  
(Continued)**

<b>Sample</b>	<b>Location</b>	<b>Past/Present Use</b>	<b>Sample Type</b>	<b>Analyses</b>
13SS-7	Victory Garden	Garden	Discrete	TAL metals, semivolatile organics, gross alpha, gross beta, isotopic uranium, pH
13SS-8	Building 111	Residence	Discrete	TAL metals, semivolatile organics, gross alpha, gross beta, isotopic uranium, pH
14SS-1 14SS-1D	Building 654 transformer	Transformer	5-point composite	TAL metals, pesticides, PCBs
14SS-2	Building 652	Former powder house (close to fence line)	2-point composite	TAL metals, pesticides, explosives, nitrate
14SS-3	Building 652	Former powder house	3-point composite	TAL metals, explosives, nitrate
16SS-1	Bunkers	Storage magazines for propellants/explosives	3-point composite	TAL metals, pesticides, explosives, nitrate
16SS-2	Bunkers	Storage magazines for propellants/explosives	2-point composite	TAL metals, pesticides, explosives, nitrate

**Table 2-5**

**Soil Sample Containers, Preservation, and Holding Times**

<b>Analysis</b>	<b>Container</b>	<b>Volume</b>	<b>Preservation</b>	<b>Holding Time (days)</b>
TAL metals	Amber glass bottle with Teflon-lined cap	8 oz.	Cool to <4 °C	180
Cyanide	Amber glass bottle with Teflon-lined cap	8 oz.	Cool to <4 °C	14
Nitrates	Amber glass bottle with Teflon-lined cap	8 oz.	Cool to <4 °C	2
Explosives	Amber glass bottle with Teflon-lined cap	8 oz.	Cool to <4 °C	7 until extraction, 40 until analysis
TCL semivolatiles	Amber glass bottle with Teflon-lined cap	8 oz.	Cool to <4 °C	7 until extraction, 40 until analysis
Petroleum fingerprint	Amber glass bottle with Teflon-lined cap	8 oz.	Cool to <4 °C	7 until extraction, 40 until analysis
TCL volatiles	Glass, septum-sealed vial	40 ml (2)	Cool to <4 °C	
Pesticides	Amber glass bottle with Teflon-lined cap	8 oz.	Cool to <4 °C	7 until extraction, 40 until analysis
PCBs	Amber glass bottle with Teflon-lined cap	8 oz.	Cool to <4 °C	7 until extraction, 40 until analysis
TOC	Amber glass bottle with Teflon-lined cap	8 oz.	HCl or H <sub>2</sub> SO <sub>4</sub> to pH <2; Cool to <4 °C	28
Gross Alpha/ Gross Beta, Radionuclides	Plastic Ziploc bag	1 liter	None	None

**Table 2-6**  
**Summary of Phase 2 Surface Water and Sediment Samples**  
**Collected from the Charles River at MTL**  
**28-29 October and 5-6 November 1991**

Sample No.	Location	Description	Rationale	Analyses Requested	Water Collection Method	Sediment Collection Method	River/Outfall
SW/SD-2	Middle of Charles River, upstream of first outfall.	Sediment sample from riverbed and aqueous sample from river.	Upstream data from main flow of river for comparison with data downstream of the site.	TAL metals, TCL volatile organics, TCL semivolatile organics, pesticides/PCBs, gross alpha, gross beta, uranium, TOC, hardness.	Surface grab	Ponar grabs	River
SW/SD-3	Charles River, approximately 50 ft from the MTL shoreline, and just upstream of the western end of the island.	Sediment sample from riverbed and aqueous sample from river.	Data from an area where the river bend and island begin to influence the flow regime. This area is also just upstream of the first outfall.	TAL metals, TCL volatile organics, TCL semivolatile organics, pesticides/PCBs, gross alpha, gross beta, uranium, TOC, hardness.	Surface grab	Ponar grabs	River
SD-4 (0-6 inches) SD-4d (12-18 inches) SD-4p (from outfall pipe)	Furthest upstream MTL outfall.	Sediment from riverbed at two depths. Sediment from riverbed near outfall.	Data from MTL storm sewer outfall for comparison with general river quality.	TAL metals, TCL volatile organics, TCL semivolatile organics, pesticides/PCBs, gross alpha, gross beta, uranium.	None collected	Ponar and bucket auger	Outfall
SD-5 (0-6 inches) SD-5d (12-18 inches) SD-5p (from outfall pipe)	Outfall approximately 250 ft downstream of SD-4.	Sediment from riverbed at two depths. Sediment from riverbed at outfall.	Data from MTL storm sewer outfall for comparison with general river quality.	TAL metals, TCL volatile organics, TCL semivolatile organics, pesticides/PCBs, gross alpha, gross beta, uranium.	None collected	Ponar and bucket auger	Outfall

**Table 2-6**  
**Summary of Phase 2 Surface Water and Sediment Samples at MTL**  
**28-29 October and 5-6 November 1991**  
**((Continued))**

Sample No.	Location	Description	Rationale	Analyses Requested	Water Collection Method	Sediment Collection Method	River/ Outfall
SW/SD-6 (0-6 inches) SD-6d (12-18 inches) SD-6p (from outfall pipe)	Shoreline sample approximately 250 ft downstream of SD-5.	Sediment samples from riverbed at two depths and aqueous sample from river. Sediment from outfall.	Data from the approximately 400-ft stretch of shoreline between SW/SD-5 and SW/SD-7.	TAL metals, TCL volatile organics, TCL semivolatile organics, pesticides/PCBs, gross alpha, gross beta, uranium, TOC, hardness, hexavalent chromium.	Surface grab	Ponar, bucket auger, and ss scoop	River
SW-7 SD-7	Outfall approximately 400 ft downstream of SD-5.	Sediment from riverbed and aqueous sample from river.	Data from MTL storm sewer outfall for comparison with general river quality. Outfall pipe not located.	TAL metals, TCL volatile organics, TCL semivolatile organics, pesticides/PCBs, gross alpha, gross beta, uranium.	Surface grab	Ponar grabs	Outfall
SW/SD-8 (0-6 inches) SD-8d (12-18 inches)	Sample location at downstream end of island. Measurement of cumulative effects of first three outfalls and other upstream sources.	Sediment samples from riverbed at two depths and aqueous sample from river.	Measurement of cumulative effects of first three outfalls and other upstream sources. Outfall pipe not located.	TAL metals, TCL volatile organics, TCL semivolatile organics, pesticides/PCBs, gross alpha, gross beta, uranium, TOC, hardness, hexavalent chromium.	Kemmerer @ mid-depth	Ponar and bucket auger	River
SW-9 SD-9 SD-9p	Outfall approximately 550 ft downstream of SD-5.	Sediment from riverbed and aqueous sample from river. Sediment from riverbed near outfall.	Data from MTL storm sewer outfall for comparison with general river quality.	TAL metals, TCL volatile organics, TCL semivolatile organics, pesticides/PCBs, gross alpha, gross beta, uranium.	Surface grab	Ponar grabs	Outfall
SD-10 SD-10p	Outfall approximately 700 ft downstream of SD-5.	Sediment sample from riverbed. Sediment from outfall.	Data from MTL storm sewer outfall for comparison with general river quality.	TAL metals, TCL volatile organics, TCL semivolatile organics, pesticides/PCBs, gross alpha, gross beta, uranium.	None collected	Ponar grabs	Outfall

**Table 2-6**  
**Summary of Phase 2 Surface Water and Sediment Samples at MTL**  
**28-29 October and 5-6 November 1991**  
**(Continued)**

Sample No.	Location	Description	Rationale	Analyses Requested	Water Collection Method	Sediment Collection Method	River/Outfall
SW/SD-11	Middle of Charles River, downstream of island.	Sediment sample from riverbed and aqueous sample from river.	Data from main flow of river for comparison with data upstream and downstream of the site. Data from main flow of the river downstream of the island's influence on the flow regime.	TAL metals, TCL volatile organics, TCL semivolatile organics, pesticides/PCBs, gross alpha, gross beta, uranium.	Kemmerer @ mid-depth	Ponar grabs	River
SD-12 SD-12d (12-18 inches)	Outfall approximately 1,000 ft downstream of SD-5.	Sediment sample from riverbed at two depths.	Data from MTL storm sewer for comparison with general river quality. Outfall pipe not located.	TAL metals, TCL volatile organics, TCL semivolatile organics, pesticides/PCBs, gross alpha, gross beta, uranium.	None collected	Bucket auger	Outfall
SW/SD-13	Charles River along oblique transect 50 ft down from SD-12.	Sediment sample from riverbed and aqueous sample from river.	Data to show possible contaminant concentration gradient along transect from outfall to main flow of river.	TAL metals, TCL volatile organics, TCL semivolatile organics, pesticides/PCBs, gross alpha, gross beta, uranium, TOC, hardness, hexavalent chromium.	Surface grab	Ponar grabs	River
SD-14 SD-14p (from outfall pipe)	Outfall approximately 2,000 ft downstream of SD-5. Farthest downstream MTL outfall.	Sediment sample from riverbed. Sediment from riverbed just below pipe.	Data from MTL storm sewer outfall for comparison with general river quality.	TAL metals, TCL volatile organics, TCL semivolatile organics, pesticides/PCBs, gross alpha, gross beta, uranium.	None collected	Ponar grabs	Outfall
SW/SD-15	Transect samples downstream of the facility.	Sediment samples from riverbed and aqueous samples from river. No sediment sample collected at SD-16.	Data to provide information of cumulative effects of MTL and other upstream sources. Data for comparison with upstream conditions.	TAL metals, TCL volatile organics, TCL semivolatile organics, pesticides/PCBs, gross alpha, gross beta, uranium, TOC, hardness.	Kemmerer @ mid-depth	Ponar grabs	River

**Table 2-6**  
**Summary of Phase 2 Surface Water and Sediment Samples at MTL**  
**28-29 October and 5-6 November 1991**  
**(Continued)**

Sample No.	Location	Description	Rationale	Analyses Requested	Water Collection Method	Sediment Collection Method	River/Outfall
SW-16				TAL metals, TCL volatile organics, TCL semivolatile organics, pesticides/PCBs, gross alpha, gross beta, uranium, TOC, hardness.	Kemmerer @ mid-depth	None collected: No sediment fines present	River
SW/SD-17				TAL metals, TCL volatile organics, TCL semivolatile organics, pesticides/PCBs, gross alpha, gross beta, uranium, TOC, hardness, hexavalent chromium.	Kemmerer @ mid-depth	Ponar	River
SW/SD-18	Samples from southern shoreline of island.	Sediment samples from riverbed and aqueous samples from river.	Data from an area similar in depositional characteristics to the MTL shoreline just north of the island which is sheltered from site activities.	TAL metals, TCL volatile organics, TCL semivolatile organics, pesticides/PCBs, gross alpha, gross beta, uranium.	Surface grab	Ponar grab	River
SW/SD-19 (0-6 inches)				TAL metals, TCL volatile organics, TCL semivolatile organics, pesticides/PCBs, gross alpha, gross beta, uranium.	Surface grab	Ponar and bucket auger	River
SW/SD-20				TAL metals, TCL volatile organics, TCL semivolatile organics, pesticides/PCBs, gross alpha, gross beta, uranium, TOC, hardness, hexavalent chromium.	Surface grab	Ponar grab	River

**Table 2-7**

**Radiation Detection Equipment**

<b>Instrument</b>	<b>Type of Radiation</b>	<b>Lower Limit of Detection (LLD) or Ranges of Operation</b>
NaI gamma 1" x 1" crystal	Gamma and x-ray	1 $\mu$ R/hr
ZnS alpha field instrument	Alpha	32 dpm/100 cm <sup>2</sup>
Pancake G-M detector	Beta, gamma, and x-ray	2,700 dpm/100 cm <sup>2</sup>
ZnS alpha swipe counter	Alpha	2 dpm/100 cm <sup>2</sup>
Plastic scintillator beta swipe counter	Beta	30 dpm/100 cm <sup>2</sup>
Pressurized ionization chamber	Gamma and x-ray	Less than 1 $\mu$ R/hr

**Table 2-8**

**Locations of Off-Site Background Readings**

<b>Site Number</b>	<b>Location</b>	<b>Address</b>	<b>Structural Type</b>
1	Office Building	Van de Graff Drive, Burlington	Modern stone and concrete structure
2	JFK Federal Record Building	Trapelo Road, Waltham	Brick and concrete; Date of construction unknown
3	Newton City Hall	Commonwealth Avenue, Newton	Brick and concrete; built 1951
4	North Watertown Fire Station	Watertown	Brick and concrete; built 1951
5	Building Materials Supplier	Arsenal Street, Watertown	Brick and concrete; built 1930s
6	Hellenic Church	Bigelow Street, Watertown	Brick and concrete; built 1957
7	Watertown City Hall	Main Street, Watertown	Brick and concrete; built 1930s
8	Watertown Library	Arlington Street, Watertown	Brick and concrete; built 1890s
9	Watertown Incinerator	Arlington Street, Watertown	Brick and concrete; built 1958
10	Cunnif School	Warren Street, Watertown	Brick and concrete; built 1958

**Table 2-9**

**Summary of Phase 2 Chemical Wipe Samples at MTL**

<b>Building Number</b>	<b>Number of Rooms Sampled</b>	<b>Number of Wipe Sample Locations</b>	<b>Number of QA/QC Samples</b>
36	8	14	1 duplicate
37	20	54	2 blanks, 3 duplicates
39	86	251	22 blanks, 27 duplicates
43	8	17	1 blank, 1 duplicate
60	3	10	None
97	9	33	2 blanks, 2 duplicates
111	4	5	1 blank, 1 duplicate
117	1	2	1 blank, 1 duplicate
118	3	4	None
131	5	11	1 blank
243	1	10	1 blank, 1 duplicate
292	32	85	5 blanks, 8 duplicates
311	43	90	5 blanks, 8 duplicates
312	36	113	3 blanks, 8 duplicates
313	39	143	3 blanks, 9 duplicates
619	1	1	None
Bunkers	2	4	1 blank, 1 duplicate
Off-Site Background	4	8	3 blanks, 3 duplicates
<b>Total</b>	<b>305</b>	<b>855</b>	<b>51 blanks, 74 duplicates</b>

**Table 2-10**

**Chemical Wipe Sample Solvents, Preservation, and Holding Times**

Analyte	Solvent	Container	Preservation	Holding Time (days)
TCL semivolatiles	Methylene Chloride	4-oz./8-oz. amber glass	Cool to <4 °C	7 until extraction
TAL metals	Distilled water	4-oz./8-oz. amber glass	Cool to <4 °C	180
Cyanide	Distilled water	4-oz./8-oz. amber glass	Cool to <4 °C	14
Nitrate	Distilled water	4-oz./8-oz. amber glass	Cool to <4 °C	2
Explosives	Methanol	4-oz./8-oz. amber glass	Cool to <4 °C	40 until analysis
Pesticides, PCBs	Hexane	4-oz./8-oz. amber glass	Cool to <4 °C	7 until extraction, 40 until analysis

**Table 2-11**

**Summary of Phase 2 Air Samples at MTL**

<b>Building Number</b>	<b>Number of Samples</b>	<b>Analyses</b>
43	3	VOC, SEMI, RAD, MET, (1 PCB)
313	3	VOC, SEMI, MET, RAD, PCB, EXP, NIT
37	1	VOC, SEMI, MET
131	1	VOC, SEMI
312	3	VOC, SEMI, MET, RAD, CYN
36	1	VOC, SEMI, MET, PROP/EXP
60	1	VOC, SEMI
311	3	VOC, SEMI, MET, RAD, CYN, PCB, EXP, NIT
97	2	VOC, SEMI, MET, RAD, (1 PCB)
292	2	VOC, SEMI, MET, RAD, EXP/NIT
39	3	VOC, SEMI, MET, RAD, EXP/NIT
243	1	VOC, SEMI, MET, CYN
241	1	RAD
Background	3	VOC, SEMI, MET, CYN, RAD, PCB, EXP, NIT

**Analyte Key:**

- VOC = Volatile organic compounds
- SEMI = Semivolatile organic compounds
- MET = TAL metals
- RAD = Gross alpha, gross beta, U-234, U-235, U-238
- EXP/NIT = Explosives, with nitrates used as indicator
- PCB = Polychlorinated biphenyls
- CYN = Cyanide

**Table 2-12**

**QA/QC Samples for Air Investigation**

<b>Analysis</b>	<b>Field Blank</b>	<b>Trip Blank</b>
VOCs		2
PAHs	2	
PCBs	2	
Uranium		2
Metals		2
Explosives/nitrates	1	
Cyanide	1	

**Table 2-13**

**Summary of Containers Sampling at MTL**

<b>Building</b>	<b>Container Type</b>	<b>Container Description</b>	<b>Sample Number(s)</b>
36	Sump	Located outside the northwest corner of the building. Approximately 10 ft deep. Liquid was scarce.	36SW01, 36SED01
37	Basin	Catch basin outside the southeast corner of Building 37.	37CBSD01
39	Sump	Sump located in "H-shaped" tunnel beneath the building.	39SW01
43	Tank	Outdoor tank between Buildings 43 and 226.	43SW01
	Sump	Indoor sump at west entrance of the building.	43SW02, 43SED01
	Tank	Adjacent to ACME bolt and nut machine in center of building.	43SED02
	Sump	Oil sample beneath 1,000-ton press at east end of building.	43SW03
97	Sump	Located in southwest corner of the ion implantation lab. Received flows (via three 1,000-gallon holding tanks) from the reactor and the decontamination showers in Building 97.	97SW01
100	Sump	Water collected from a sump in the west side of the reactor basement.	100SW01
	Sump	Water collected from a sump in the east side of the reactor basement.	100SW02-W
	Sump	Oil collected from layer on top of water in sump in the east side of the reactor basement.	100SW02-oily layer

**Summary of Containers Sampling at MTL  
(Continued)**

<b>Building</b>	<b>Container Type</b>	<b>Container Description</b>	<b>Sample Number(s)</b>
242	Cistern	Water collected from a fenced-in cistern outside the reactor. Cistern is approximately 25 ft deep.	242SW01
	Basin	Sediment collected from a manhole receiving flow from the cistern where 242SW01 was collected.	242SED01
243	Cistern	Located adjacent (east) to Chemical Storage Building 243. Hole is approximately 10 ft deep. Receives flows from floor drains in Building 243.	243SW01, 243SED01
311	Sump	Outside southwest corner of Building 311. Hole is approximately 10 ft deep.	311SW01
	Sump	Sump located between Columns 37 and 38 in southeast portion of the building. Hole is 25 ft deep.	311SW02
	Sump	Sump located below a grate at Column 29 along south wall, just west of center.	311SW03
	Tank	Sump located at the junction between Columns 20 and 21 in southwest portion of building. Hole is approximately 5 ft deep.	311SW04
	Basin	Dry well located outside the north wall of the building.	311SED01
	Basin	Dry well located outside the north wall of the building (west of 311SED01).	311SED02

**Table 2-13**

**Summary of Containers Sampling at MTL  
(Continued)**

<b>Building</b>	<b>Container Type</b>	<b>Container Description</b>	<b>Sample Number(s)</b>
	Sump	Outside southwest corner of building. 5 ft X 4 ft X 2.5 ft. Sediment very scarce.	311SED03
	Tank	Trench located along south wall at Column 28. 6 ft X 1.3 ft X 0.8 ft.	311SED04
	Tank	Rectangular tank along at Column 19. 5 ft X 2.5 ft x 4 ft. No signs of sediment.	311SW05
312	Basin	Dry well in plate shop.	312SED01
313	Cistern	Large (10 compartments) cistern accessed through an office (Room 144). Approximately 10-15 ft deep. 70 ft long X 25 ft wide.	313CSW01, 313CSED01
	Basin	Brick-lined hole in Building 313N basement. Approximately 25-30 ft deep with 3-ft diameter. No liquid present.	313NSDO1
Bunkers	Basin	Dry well outside of bunkers. 1.5 ft inside diameter X 8 ft deep.	000SED01

**Table 2-14**  
**Container Sample Analyses**

Site Type	Site ID	Volatiles	Semivolatiles	Metals	Cyanide	Pesticides	PCBs	Gross Alpha/Beta	Isotopic Uranium	Thorium-230	Cesium-137
Sump	36SW01	X	X	X	X	X	X	X	X		
Sump	36SED01		X	X	X	X	X	X	X		
Basin	37CBSD		X	X	X	X	X	X	X		
Sump	39SW01	X	X	X	X	X	X	X	X		
Tank	43SW01	X	X	X	X	X	X	X	X		
Sump	43SW02 and 43SED01		X	X	X	X	X	X	X		
Tank	43SED02		X	X	X	X	X	X	X		
Sump	43SW03 (oil)						X	X	X		
Sump	43SD03							X	X		
Sump	97SW01 97SW01D	X	X	X	X	X	X	X	X	X	X
Tank	100SW01	X	X	X	X	X	X	X	X		
Sump	100SW02-W	X	X	X	X	X	X	X	X		
Sump	100SW02-oily layer							X	X		
Cistern	242SW01	X	X	X	X	X	X	X	X		
Basin	242SED01	X	X	X	X	X	X	X	X	X	X
Cistern	243SW01	X	X	X	X	X	X	X	X		
Cistern	243SED01		X	X	X	X	X	X	X	X	X
Sump	311SW01	X	X	X	X	X	X	X	X		
Sump	311SW02	X	X	X	X	X	X	X	X		

**Table 2-14  
Container Samples Analyses  
(Continued)**

Site Type	Site ID	Volatiles	Semivolatiles	Metals	Cyanide	Pesticides	PCBs	Gross Alpha/Beta	Isotopic Uranium	Thorium-230	Cesium-137
Sump	311SW03 311SW03D	X	X	X	X	X	X	X			
Tank	311SW04	X	X	X	X	X	X	X			
Basin	311SED01		X	X	X	X	X	X	X		
Basin	311SED02		X	X	X	X	X	X	X		
Sump	311SED03		X	X	X	X	X	X	X		
Tank	311SED04		X	X	X	X	X	X	X		
Tank	311SW05	X	X	X	X	X	X	X	X		
Basin	312SED01		X	X	X	X	X	X	X		
Cistern	313CSW01	X	X	X	X	X	X	X	X		
Cistern	313CSED01 313CSED01D	X	X	X	X	X	X	X	X		
Basin	313NSD01	X	X	X	X	X	X	X	X		
Basin	000SED01		X	X	X	X	X	X	X	X	X

Table 3-1

Groundwater Level Summary

Well ID	Ground	TOC	09 Dec 91		24 Jan 92		6 March 92	
	Elevation <sup>a</sup>	Elevation <sup>b</sup>	Level	Elevation	Level	Elevation	Level	Elevation
C-2	37.49	37.04	30.65	6.39	30.95	6.09	31.20	5.84
C-3	11.90	11.44	7.86	3.58	8.16	3.28	8.09	3.35
MW-1	24.98	24.11	5.78	18.33	5.87	18.24	6.15	17.96
MW-2	24.04	23.59	8.84	14.75	8.35	15.24	9.16	14.43
MW-3	36.63	36.14	22.42	13.72	22.43	13.71	22.97	13.17
MW-4	36.52	35.90	28.65	7.25	28.52	7.38	28.87	7.03
MW-5	15.93	15.24	8.80	6.44	8.63	6.61	8.94	6.30
MW-6	11.96	11.52	7.13	4.39	7.10	4.42	7.44	4.08
MW-7	34.84	34.16	29.40	4.76	29.49	4.67	29.78	4.38
MW-8	39.48	38.89	32.70	6.19	32.87	6.02	33.08	5.81
MW-9	37.03	36.63	14.24	22.39	14.65	21.98	15.20	21.43
MW-10	32.86	32.10	8.37	23.73	9.18	22.92	9.76	22.34
MW-11	11.01	10.59	4.70	5.89	4.54	6.05	5.04	5.55
MW-12	38.52	38.07	31.87	6.20	32.13	5.94	32.30	5.77
MW-13	35.30	34.70	11.76	22.94	12.05	22.65	12.21	22.49
MW-14	35.49	35.06	15.46	19.60	13.90	21.16	16.43	18.63
MW-15	34.85	34.04	15.40	18.64	15.55	18.49	16.03	18.01
MW-15A	34.90	34.09	24.58	9.51	24.27	9.82	25.00	9.09
MW-16	34.40	33.45	12.22	21.23	12.63	20.82	12.73	20.72
MW-16A	34.76	33.91	18.85	15.06	18.38	15.53	19.36	14.55
MW-17	32.75	31.80	19.40	12.40	19.38	12.42	20.23	11.57
MW-17A	33.02	32.10	23.80	8.30	23.73	8.37	24.11	7.99
MW-18	22.89	22.13	16.35	5.78	16.19	5.94	16.41	5.72
MW-19	35.77	34.87	30.00	4.87	30.27	4.60	30.45	4.42
MW-19A	35.81	34.97	30.20	4.77	30.53	4.44	30.65	4.32
MW-19B	35.72	34.87	30.23	4.64	30.60	4.27	30.80	4.07
MW-20	39.49	38.49	32.47	6.02	32.79	5.70	32.95	5.54
MW-21	24.96	23.85	14.75	9.10	14.14	9.71	15.17	8.68
MW-22	30.54	29.80	13.05	16.75	12.94	16.86	13.26	16.54
MW-23	36.70	35.98	12.79	23.19	12.58	23.40	13.30	22.68
MW-24	31.76	30.92	8.20	22.72	7.92	23.00	8.69	22.23

<sup>a</sup> All elevations referenced to National Geodetic Vertical Datum of 1929 (NGVD).

<sup>b</sup> TOC indicates top of 4-inch PVC casing.

Note: All measurements in feet.

Table 3-2

Hydraulic Gradient Summary

Couplet	Vertical Flow Gradients				Comments
	Water Elevation <sup>a</sup>		Vertical Distance <sup>b</sup> (ft)	Vertical Gradient	
	Shallow (ft)	Deep (ft)			
MW-15/MW-15A	18.64	9.51	32.1	0.284	
MW-16/MW-16A	21.23	15.06	9.6	0.643	
MW-17/MW-17A	12.40	8.30	40.0	0.102	
MW-19/MW-19A	4.87	4.64	58.8	0.0039	

Location	Horizontal Flow Gradients			Comments
	Change In Elevation <sup>a</sup> (ft)	Horizontal Distance (ft)	Horizontal Gradient	
Shallow aquifer, eastern part of site	20.8	890	0.023	See Flow Path A, Figure 3-10
Shallow aquifer, western part of site	17.9	1740	0.010	See Flow Path B, Figure 3-10
Deep aquifer, middle of site	8.0	975	0.008	See Flow Path, Figure 3-9

<sup>a</sup> Water elevations based on water-level measurements obtained on December 9, 1991.

<sup>b</sup> Vertical distance taken as distance between midpoints of upper and lower well screens.

**Table 3-3**

**Phase 1 Hydraulic Conductivity Summary**

Monitor Well	Strata	Hydraulic Conductivity (cm/sec)		
		Rising Head	Falling Head	Laboratory
C-1 <sup>a</sup>	Silty sand	--	--	2.2 x 10 <sup>-6</sup>
C-2	Silty sand	9.53 x 10 <sup>-3</sup>	3.35 x 10 <sup>-2</sup>	--
C-3	Silty sand	9.53 x 10 <sup>-3</sup>	9.18 x 10 <sup>-3</sup>	1.0 x 10 <sup>-7</sup>
MW-1	Medium coarse sand	1.20 x 10 <sup>-2</sup>	2.75 x 10 <sup>-2</sup>	2.5 x 10 <sup>-7</sup>
MW-2	Fine coarse sand	2.82 x 10 <sup>-2</sup>	3.53 x 10 <sup>-3</sup>	1.5 x 10 <sup>-6</sup>
MW-3	Silty sand	4.24 x 10 <sup>-2</sup>	*	--
MW-4	Fine coarse sand	2.47 x 10 <sup>-2</sup>	*	--
MW-5	Silty sand	1.34 x 10 <sup>-2</sup>	*	--
MW-6	Silty sand	1.06 x 10 <sup>-2</sup>	1.06 x 10 <sup>-3</sup>	--
MW-7	Fine coarse sand	6.35 x 10 <sup>-2</sup>	*	--
MW-8	Medium sand	3.32 x 10 <sup>-2</sup>	1.66 x 10 <sup>-2</sup>	--
MW-9	Silty sand	4.24 x 10 <sup>-3</sup>	3.04 x 10 <sup>-2</sup>	--
MW-10	Medium sand	4.24 x 10 <sup>-3</sup>	6.71 x 10 <sup>-3</sup>	--
MW-11	Silty sand	7.06 x 10 <sup>-4</sup>	1.41 x 10 <sup>-3</sup>	--
MW-12	Fine medium sand	3.00 x 10 <sup>-2</sup>	6.00 x 10 <sup>-2</sup>	--
MW-13	Fine coarse sand	2.29 x 10 <sup>-2</sup>	3.07 x 10 <sup>-2</sup>	--
MW-14	Silty sand	1.09 x 10 <sup>-2</sup>	*	6.0 x 10 <sup>-7</sup>

-- Indicates laboratory test could not be run.

\* Indicates erratic or insufficient data or insufficient displacement of water level.

<sup>a</sup>Well not installed.

(Source: EG&G, June 1990)

Table 3--4  
Phase 2 Hydraulic Conductivity Summary

Monitoring Well	Hydraulic Conductivity				Test Type
	Bouwer & Rice (1976)		Hvorslev (1951)		
	(ft/day)	(cm/sec)	(ft/day)	(cm/sec)	
MW - 15	1.14	4.02E-04	1.83	6.5E-04	Rising head
MW - 15A	0.09	3.2E-05	0.12	4.3E-05	Falling head
MW - 15A	0.06	2.1E-05	0.08	2.8E-05	Rising head
MW - 16	3.90	1.4E-03	6.60	2.3E-03	Rising head
MW - 16A	0.79	2.8E-04	1.50	5.3E-04	Falling head
MW - 16A	0.61	2.2E-04	1.10	3.9E-04	Rising head
MW - 17	0.33	1.16E-04	0.51	1.8E-04	Rising head
MW - 17A	0.04	1.4 x 10 <sup>-5</sup>	0.05	1.8E-05	Falling head
MW - 19	0.93	3.3E-04	1.60	5.6E-04	Rising head
MW - 19A	62.29	2.2E-02	14.46	5.1E-03	Falling head
MW - 19A	77.20	2.7E-02	39.60	1.4E-02	Rising head

Note: Hydraulic conductivity computed by Bouwer & Rice (1976) used for prediction of groundwater velocities.

Table 3-5  
Travel Time Summary

Well	Change in Elevation (ft)	Flow Distance (ft)	Hydraulic Gradient	Flow Velocity <sup>a</sup> (ft/day)	Travel Time <sup>b</sup>		Comments
					(days)	(years)	
MW-1	16.2	480	0.0338	1.33	362	1.0	See Flow Path T1, Figure 3-10
MW-2	12.3	270	0.0456	1.79	268	0.7	See Flow Path T2, Figure 3-10
MW-5	4.3	270	0.0159	0.63	766	2.1	See Flow Path T5, Figure 3-10
MW-6	2.3	285	0.0081	0.32	1512	4.1	See Flow Path T7, Figure 3-10
MW-11	3.8	420	0.0090	0.36	1349	3.7	See Flow Path T6, Figure 3-10
MW-17	10.3	270	0.0381	1.50	320	0.9	See Flow Path T3, Figure 3-10
MW-18	3.7	270	0.0137	0.54	891	2.4	See Flow Path T4, Figure 3-10

<sup>a</sup>Flow velocity computed as a function of hydraulic gradient, hydraulic conductivity, and soil porosity using Darcy's Law, where:

Hydraulic conductivity (11.8 ft/day) was computed as the average (geometric mean) hydraulic conductivity from MW-1, MW-2, MW-5, MW-6, MW-11, and MW-17.  
Soil porosity is assumed to be equal to 0.3.

<sup>b</sup>Travel times computed between shallow monitor wells and the Charles River as ratio of flow distance to flow velocity.

**Regulatory Basis for Chemical-Specific ARARs for the MTL Site**

Resource Conservation and Recovery Act (RCRA)

Massachusetts Hazardous Waste Management Rules

Federal Safe Drinking Water Act

Federal Water Quality Criteria

State Surface Water Quality Standards

State Groundwater Quality Standards

Massachusetts Contingency Plan Groundwater Standards

Federal Draft National Sediment Quality Criteria

Massachusetts Contingency Plan Soil Standards

Nuclear Regulatory Commission and State Standards for Protection Against Radiation

Federal and State Air Quality Standards

**Table 4-2  
Summary of Water Quality ARARs for the MTL Site**

	MCP Groundwater Standards (µg/L)			Drinking Water (µg/L)			EPA Ambient Water Quality Criteria				
	GW2	GW3	MAGW <sup>b</sup>	EPA MCLG	EPA MCL	MMCL	Protection of Human Health (µg/L) <sup>a</sup>		Protection of Freshwater Aquatic Life (µg/L)		
							Toxicity Protection (Ingesting Organisms Only)	Carcinogenic Protection (Ingesting Organisms Only)	Acute	Chronic	
<b>Volatile Organics</b>											
Acetone	50,000	50,000	700 <sup>c</sup>								
Benzaldehyde	NS	---									
Benzene	2,000	7,000	5 <sup>c</sup>	0	5	5		71			
Bromomethane	2.0	50,000	10								
Carbontetrachloride	20	50,000	5	0	5	5		4.4			
Chlorobenzene	1,000	1,000		100	100		21,000				
Chloroform	400	10,000							470		
Chloromethane											
Cyclohexane											
1,2-Dichlorobenzene	10,000	8,000	600	600	600		17,000				
1,3-Dichlorobenzene	10,000	80,000					2,600				
1,4-Dichlorobenzene	30,000	8,000	5	75	75	75	2,600				
1,1-Dichloroethane	9,000	50,000									
1,2-Dichloroethane	20	50,000	5 <sup>c</sup>	0	5	5			99		
1,1-Dichloroethene	1.0	50,000	7	7	7	7			3.2		
trans-1,2-Dichloroethene	NA	50,000		100	100						
cis-1,2-Dichloroethene	NA	50,000		70	70						
1,2-Dichloropropane	9.0	30,000	1	0	5						
Ethylbenzene	30,000	4,000	700 <sup>c</sup>	700	700		29,000				
Hexane											
Methylene Chloride	50,000	50,000	350 <sup>c</sup>	0	5				1,600		

**Table 4-2  
Summary of Water Quality ARARs for the MTL Site  
(Continued)**

	MCP Groundwater Standards (µg/L)			Drinking Water (µg/L)			EPA Ambient Water Quality Criteria			
	GW2	GW3	MAGW <sup>b</sup>	EPA MCLG	EPA MCL	MMCL	Protection of Human Health (µg/L) <sup>a</sup>		Protection of Freshwater Aquatic Life (µg/L)	
							Toxicity Protection (Ingesting Organisms Only)	Carcinogenic Protection (Ingesting Organisms Only)		Acute
Methylethyl Ketone	50,000	50,000	350 <sup>c</sup>							
Methylisobutyl Ketone	50,000	50,000	350							
Methyl-n-butyl Ketone	---	---								
Pentane										
Styrene	900	50,000	5	100	100					
1,1,2,2-Tetrachloroethane	20	20,000					11			
Tetrachloroethene	3,000	5,000	5 <sup>c</sup>	0	5		8.85			
Tetrahydrofuran										
Toluene	6,000	50,000	2000 <sup>c</sup>	1,000	1,000		200,000			
1,2,4-Trichlorobenzene	600	500		70	70					
1,1,1-Trichloroethane	4,000	50,000	200 <sup>c</sup>	200	200	200				
1,1,2-Trichloroethane	20,000	50,000		3	5			42		
Trichloroethene	300	20,000	5	0	5	5		81		
Vinyl Chloride	2	600	2 <sup>c</sup>	0	2	2		525		
Total Xylenes	6,000	50,000	1000 <sup>c</sup>	10,000	10,000					
<b>Semivolatile Organics</b>										
Acenaphthene	NA	2,000								
Anthracene	NA	600					110,000			
Benzo(b)-Fluoranthene	NA	7.0						0.0311		
Benzo(k)-Fluoranthene	NA	0.4						0.0311		
Benzo(a)-Anthracene	NA	5.0						0.0311		

**Table 4-2**  
**Summary of Water Quality ARARs for the MTL Site**  
**(Continued)**

	MCP Groundwater Standards (µg/L)				Drinking Water (µg/L)			EPA Ambient Water Quality Criteria			
	GW3		MAGW <sup>b</sup>		EPA MCLG	EPA MCL	MMCL	Protection of Human Health (µg/L) <sup>a</sup>		Protection of Freshwater Aquatic Life (µg/L)	
	GW2	GW3	MAGW <sup>b</sup>	MAGW <sup>b</sup>	EPA MCLG	EPA MCL	MMCL	Toxicity Protection (Ingesting Organisms Only)	Carcinogenic Protection (Ingesting Organisms Only)	Acute	Chronic
Benzo(g,h,i)-perylene	NA	0.1									
Benzo(a)pyrene	NA	2.0			0	0.2			0.0311		
Benzy(b)thiopene											
Butylbenzyl-phthalate											
Chloroacetophenone											
Chrysene	NA	3							0.0311		
Dibenzo(a,h)-anthracene	NA	0.3							0.0311		
Dibenzofuran											
Dibromochloropropane			.2		0	.2					
Di-n-Butyl Phthalate								12,000			
Dimethyl Naphthalene											
Di-n-octyl Phthalate											
1,2-Diphenyl Benzene											
Bis-2-Ethylhexyl Phthalate	700	30	10		0	6			5.9		
Fluoranthene	NA	100						370			
Fluorene	NA	1,000						14,000			
Hexachlorobenzene	NA	40			0	1			0.00077		
Hexachlorbiphenyl											
Hexachlorocyclopentadiene					50	50		17,000			
Indeno(1,2,3-cd)pyrene	NA	0.3							0.0311		
2-Methylnaphthalene	10,000	3,000									

**Table 4-2  
Summary of Water Quality ARARs for the MTL Site  
(Continued)**

	MCP Groundwater Standards (µg/L)			Drinking Water (µg/L)			EPA Ambient Water Quality Criteria				
	GW2	GW3	MAGW <sup>b</sup>	EPA MCLG	EPA MCL	MMCL	Protection of Human Health (µg/L) <sup>a</sup>		Protection of Freshwater Aquatic Life (µg/L)		
							Toxicity Protection (Ingesting Organisms Only)	Carcinogenic Protection (Ingesting Organisms Only)	Acute	Chronic	
Naphthalene	6,000	6,000									
Methylcyclohexane											
Methylcyclopentane											
2-Methylphenol											
4-Methylphenol											
Pentachlorobiphenyl											
Pentachlorophenol	NA	80		0	1			8.2		20	13
Phenanthrene	NA	50									
Pyrene	NA	80						11,000			
Tetrachlorobiphenyl											
Tetrazine											
Trichlorobiphenyl											
Trimethyl Benzene											
Trimethyl-naphthalene											
<b>Pesticides/PCBs</b>											
Aldrin	0.5	9						0.00014		3.0	
Aroclor 1016								0.000045			0.014
Aroclor 1254								0.000045			0.014
Aroclor 1260								0.000045			0.014
Chlordane	NA	2	4	0	2			0.00059		2.4	0.0043
4,4'-DDD	NA	6						0.00084			

**Table 4-2  
Summary of Water Quality ARARs for the MTL Site  
(Continued)**

	MCP Groundwater Standards (µg/L)			Drinking Water (µg/L)			EPA Ambient Water Quality Criteria			
	GW2	GW3	MAGW <sup>b</sup>	EPA MCLG	EPA MCL	MMCL	Protection of Human Health (µg/L) <sup>a</sup>		Protection of Freshwater Aquatic Life (µg/L)	
							Toxicity Protection (Ingesting Organisms Only)	Carcinogenic Protection (Ingesting Organisms Only)		Acute
2,4,4'-DDE	NA	20						0.00059		
4,4'-DDT	NA	0.3						0.00059	1.1	0.001
Delta Benzene Hexachloride										
Dieldrin	NA	0.1						0.00014	2.5	0.0019
Endrin	NA	5	.2	2	2	.2	0.81		0.18	0.0023
Heptachlor	NA	1.0		0	0.4			0.00021	0.52	0.0038
Heptachlor Epoxide	NA	2		0	0.2			0.00011	0.52	0.0038
Isodrin										
Lindane	NA	.8	4	.2	.2	4		0.063	2	0.08
Methoxychlor	NA	2	100	40	40	100				
Toxaphene			5	0	3	5		0.00075	0.73	0.0002
Total PCBs	NA	0.3		0	0.5					
<b>Inorganics</b>										
Aluminum										
Antimony	NA	300		6	6		4,300			
Arsenic	NA	400	50			50		0.14	360	190
Barium			1000	2,000	2,000	1000				
Beryllium	NA	50		4	4					
Cadmium	NA	10	10	5	5	10			3.9	1.1
Calcium	0	0								

**Table 4-2  
Summary of Water Quality ARARs for the MTL Site  
(Continued)**

	MCP Groundwater Standards (µg/L)				Drinking Water (µg/L)			EPA Ambient Water Quality Criteria			
	GW2	GW3	MAGW <sup>a</sup>	EPA MCLG	EPA MCL	MMCL	Protection of Human Health (µg/L) <sup>a</sup>		Protection of Freshwater Aquatic Life (µg/L)		
							Toxicity Protection (Ingesting Organisms Only)	Carcinogenic Protection (Ingesting Organisms Only)	Acute	Chronic	
Chromium	NA	2,000	50	100	100	50			Cr <sup>+3</sup> 1,700, Cr <sup>+6</sup> 16	Cr <sup>+3</sup> 210, Cr <sup>+6</sup> 11	
Cobalt											
Copper			1000	1,300					18	12	
Iron			300								
Lead	NA	30	50	0		50			82	3.2	
Magnesium											
Manganese			50				100				
Mercury	NA	1.0	2	2	2	2	0.15		2.4	0.012	
Nickel	NA	80		100	100		1,600		1,400	160	
Potassium											
Selenium	NA	80	10	50	50	10			20	5	
Silver	NA	7	50			50			4.1		
Sodium			20,000			20,000					
Thallium	NA	400		0.5	2		6.3				
Tin											
Vanadium											
Zinc	NA	900	5,000						120	110	
Cyanide	NA	10		200	200		220,000		22	5.2	
Sulfide											

**Table 4-2  
Summary of Water Quality ARARs for the MTL Site  
(Continued)**

	MCP Groundwater Standards (µg/L)			Drinking Water (µg/L)			EPA Ambient Water Quality Criteria			
	GW2	GW3	MAGW <sup>b</sup>	EPA MCLG	EPA MCL	MMCL	Protection of Human Health (µg/L) <sup>a</sup>		Protection of Freshwater Aquatic Life (µg/L)	
							Toxicity Protection (Ingesting Organisms Only)	Carcinogenic Protection (Ingesting Organisms Only)		Acute
Nitrate (as Nitrogen)			10,000	10,000	10,000	10,000				
Nitrite (as Nitrogen)				1,000	1,000					
Total Nitrate and Nitrite (as Nitrogen)				10,000	10,000					
Gross Alpha			15 pCi/L		15 pCi/L	15 pCi/L				
Gross Beta			4 mrem/yr		4 mrem/yr	4 mrem/yr				
Radium (226 + 228)			5 pCi/L		5 pCi/L	5 pCi/L				
Asbestos (longer than 10 µm)				7 MFL	7 MFL					
PM-10										
Uranium (natural)			10 pCi/L		10 pCi/L					
U-238										

All units are µg/L unless otherwise noted.

<sup>a</sup>From FR 60848 (December 22, 1992) Water Quality Standards, 110 CFR 131.

<sup>b</sup>Based on 314 CMR 6.06 for Class 1 and Class 2 groundwaters except where noted.

<sup>c</sup>From 314 CMR 6.07.

GW-2 from 310 CMR 40.0932(6)

GW-3 from 310 CMR 40.0932(3)

Abbreviations

pCi/L = Picouries per Liter

MCL = Maximum Contaminant Level

MCLG = Maximum Contaminant Level Goal

MAGW = Massachusetts Groundwater Standards

MMCL = Massachusetts Maximum Contaminant Level

MFL = Million Fibers per Liter

mrem/yr = Millirems per Year

ND = Not Detected

PM-10 = Particulate Matter, 0 to 10 microns in diameter GW-2

**NRC Applicable Regulations and Requirements<sup>a</sup>**

Requirement	Value	Reference
Surface Contamination Limit for Uranium or Beta Emitter <sup>b</sup>		
Maximum Fixed	15,000 dpm/100 cm <sup>2</sup>	NRC, 1987
Average Fixed	5,000 dpm/100 cm <sup>2</sup>	
Maximum Removable	1,000 dpm/100 cm <sup>2</sup>	
Average Beta-Gamma Radiation	0.2 mrad/hr	
Maximum Beta-Gamma Radiation	1.0 mrad/hr	
Maximum Soil Concentration for DU	35 pCi/g	46 FR 52061
Average Concentration of U-238 Released to Water	4 x 10 <sup>-5</sup> µCi/mL	10 CFR 20.106
Average Concentration of U-238 Released to Air	3 x 10 <sup>-12</sup> µCi/mL	10 CFR 20.106
Average Concentration of U-238 Released to Sanitary Sewer	See referenced text	10 CFR 20.303
Maximum Concentration of Uranium in Sanitary Sewer Sediment	360 pCi/g	Appendix 5 of MTL Decommissioning Plan (WESTON, 1992)

<sup>a</sup>Source: WESTON, 1992.

<sup>b</sup>The following notes (taken from the reference) apply:

1. Where surface contamination by both alpha- and beta-gamma-emitting nuclides exists, the limits established for alpha- and beta-gamma-emitting nuclides should apply independently.
2. As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.
3. Measurements of average activity should not be averaged over more than 1 m<sup>2</sup>. For objects of less surface area, the average should be derived for each such subject.
4. The amount of removable radioactive material per 100 cm<sup>2</sup> of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.
5. The average and maximum radiation levels associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 mrad/hr at 1 cm and 1.0 mrad/hr at 1 cm, respectively, measured through not more than 7 mg/cm<sup>2</sup> of total absorber.

**Table 4-4**

**Allowable Radioactivity Limits Based on  
Massachusetts DPH Guidelines<sup>a</sup>**

Location/Medium	Allowable Radioactivity Limits
Surface Contamination Limit for Uranium <sup>b</sup>  Average Fixed Maximum Removable	  4,545 dpm/100 cm <sup>2</sup> 909 dpm/100 cm <sup>2</sup>
Maximum Soil Concentration for Uranium	164 pCi/g
Average Concentration of U-238 Released to Water	6 x 10 <sup>-8</sup> μCi/mL
Average Concentration of U-238 Released to Air	1.2 x 10 <sup>-14</sup> μCi/mL
Average Concentration of U-238 Released to Sanitary Sewer	6 x 10 <sup>-7</sup> μCi/mL

<sup>a</sup>Note: Values derived from maximum annual dose of 10 mrem. See Appendix 2 of WESTON, 1992 for derivation of these values.

<sup>b</sup>Applicable to values that are above background.

**Table 4-5  
ARARs for Airborne Contaminants**

	Occupational Health			Public Health	
	ACGIH TLV-TWA <sup>a</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	OSHA PEL-TWA <sup>c</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	NIOSH REL-TWA <sup>d</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	WHO <sup>e</sup> ( $\mu\text{g}/\text{m}^3$ )	ASHRAE <sup>f</sup> ( $\mu\text{g}/\text{m}^3$ )
<b>Volatile Organics</b>					
Acetone	1,780,000	1,800,000	590,000		7,000 (24 hr) 24,000 (30 min)
Benzaldehyde	---	---	---		
Benzene	32,000 proposed: 300	3,000	320		
Bromodichloromethane	---	---	---		
Bromoform	5,200 (skin)	5,000 (skin)	---		
Carbon Disulfide	31,000 (skin)	12,000	3,000	100	
Carbon Tetrachloride	31,000	12,600	12,600 (60-minute ceiling)		
Chlorobenzene	345,000	350,000	---		
Chlorodibromomethane					
Chloroform	49,000	9,780			
2-Chloroethyl Vinyl Ether					
Chloromethane	103,000	105,000	---		
Cyclohexane	1,030,000	1,050,000	---		
1,1-Dichloroethane	810,000	400,000			
1,2-Dichloroethane	40,000	4,000	4,000	700 $\text{mg}/\text{m}^3$	2,000 (24 hr) 6,000 (30 minutes)

**Table 4-5  
ARARs for Airborne Contaminants  
(Continued)**

	Occupational Health			Public Health	
	ACGIH TLV-TWA <sup>a</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	OSHA PEL-TWA <sup>c</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	NIOSH REL-TWA <sup>d</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	WHO <sup>e</sup> ( $\mu\text{g}/\text{m}^3$ )	ASHRAE <sup>f</sup> ( $\mu\text{g}/\text{m}^3$ )
1,2-Dibromo-3-Chloropropane	---	1 ppb			
1,1-Dichloroethene	20,000	4,000			
1,2-Dichloroethene	793,000				
1,2-Dichloropropane	347,000	350,000			
cis-1,3-Dichloropropylene					
trans-1,3-Dichloropropylene					
Dioxane	90,000	90,000	3,600 (30-minute ceiling)		
Ethylbenzene	434,000	435,000			
Ethylene Dibromide	A2 <sup>g</sup>	(20 ppm)	38		
Ethylene Glycol	127,000 <sup>i</sup>	125,000 <sup>i</sup>	---		
n-Hexane	176,000	180,000	180,000		
Hexane (other isomers)	1,760,000	1,800,000	180,000		
Methylene Chloride	174,000	1,740,000 (87,000 proposed)	Lowest feasible level		
Methylethyl Ketone	590,000	590,000	590,000		
Methylisobutyl Ketone	205,000	205,000	205,000		
Methyl-n-butyl Ketone	20,000	20,000	4,000		
Methyl Tertiary Butyl Ether					

**Table 4-5  
ARARs for Airborne Contaminants  
(Continued)**

	Occupational Health			Public Health	
	ACGIH TLV-TWA <sup>a</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	OSHA PEL-TWA <sup>c</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	NIOSH REL-TWA <sup>d</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	WHO <sup>e</sup> ( $\mu\text{g}/\text{m}^3$ )	ASHRAE <sup>f</sup> ( $\mu\text{g}/\text{m}^3$ )
Pentane	1,770,000	1,800,000	350,000		
Styrene	213,000	215,000	213,000	70 (30 min) 800 (24 hr)	
1,1,2,2-Tetrachloroethane	6,900 (skin)	7,000 (skin)	Carcinogen - lowest feasible level		
1,1,2-Trichloroethane	55,000	45,000	Carcinogen-minimize exposure		
Tetrachloroethene	339,000	170,000	Carcinogen - minimize exposure	5,000 (24 hr) 8,000 (30 min)	
Tetrahydrofuran	590,000	590,000	---		
Toluene	377,000 proposed: 147,000	375,000	375,000	8,000 (24 hr) 1,000 (30 min)	
Total Trihalomethanes					
1,1,1-Trichloroethane	1,910,000	1,900,000	1,900,000 <sup>i</sup>	1,000 (24 hr)	2,000 (annual) 5,000 (24 hr)
Vinyl Acetate	35,000, A2	30,000	15,000 <sup>i</sup>		
Vinyl Chloride	13,000	2,600 (carcinogen)	Carcinogen - lowest feasible level		
Total Xylenes	434,000	435,000	434,000		
<b>Semivolatle Organics</b>					
Acenaphthene					

**Table 4-5  
ARARs for Airborne Contaminants  
(Continued)**

	Occupational Health			Public Health	
	ACGIH TLV-TWA <sup>a</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	OSHA PEL-TWA <sup>c</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	NIOSH REL-TWA <sup>d</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	WHO <sup>e</sup> ( $\mu\text{g}/\text{m}^3$ )	ASHRAE <sup>f</sup> ( $\mu\text{g}/\text{m}^3$ )
Acenaphthylene					
Anthracene					
Alpha-Benzene Hexachloride					
Benzo(b)Fluoranthene	(proposed: A2)				
Benzo(k)Fluoranthene					
Benzo(a)Anthracene					
Benzo(g,h,i)perylene					
Benzo(a)pyrene	A2 <sup>g</sup>	200	100		
Benzoic Acid					
Benzyl Alcohol					
Benzyl(b)thiopene					
Bis(2-Chloroethoxy) Methane					
Bis(2-Chloroethyl) Ether	29,000	30,000			
Bis(2-Chloroisopropyl) Ether					
4-Bromophenyl Phenyl Ether					
Butylbenzylphthalate					
Carbofuran	100	100	---		
Chloroacetophenone	320	300	---		
Chloroaniline					

**Table 4-5  
ARARs for Airborne Contaminants  
(Continued)**

	Occupational Health			Public Health	
	ACGIH TLV-TWA <sup>a</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	OSHA PEL-TWA <sup>c</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	NIOSH REL-TWA <sup>d</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	WHO <sup>e</sup> ( $\mu\text{g}/\text{m}^3$ )	ASHRAE <sup>f</sup> ( $\mu\text{g}/\text{m}^3$ )
Chlorodibromomethane					
4-Chloro-3-Methylphenol					
Chloronaphthalene					
2-Chlorophenol					
4-Chlorophenyl Phenyl Ether					
Chrysene	A2	200	100 - Carcinogen		
Delta-benzo-hexachloride					
Dibenzo(a,h) anthracene					
Dibenzofuran					
Di-n-Butyl Phthalate	500	500	---		
1,2-Dichlorobenzene	301,000 <sup>i</sup> proposed: 150,000 <sup>i</sup>	300,000 <sup>i</sup>	---		
1,3-Dichlorobenzene	---	---			
1,4-Dichlorobenzene	451,000	450,000 proposed: 60,000	---		
3,3-Dichlorobenzidine	A2 <sup>g</sup>				
2,4-Dichlorophenol					
Diethyl Phthalate	5,000	5,000			
Dimethyl Phthalate	5,000	5,000			

**Table 4-5  
ARARs for Airborne Contaminants  
(Continued)**

	Occupational Health			Public Health	
	ACGIH TLV-TWA <sup>a</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	OSHA PEL-TWA <sup>c</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	NIOSH REL-TWA <sup>d</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	WHO <sup>e</sup> ( $\mu\text{g}/\text{m}^3$ )	ASHRAE <sup>f</sup> ( $\mu\text{g}/\text{m}^3$ )
2,4-Dimethylphenol					
4,6-Dinitro-2-Methylphenol	200	200			
2,4-Dinitrophenol					
2,4-Dinitrotoluene	1,500 (skin) proposed: 150	1,500 (skin)	Carcinogen - reduce exposure to lowest feasible concentration		
2,6-Dinitrotoluene					
Dimethyl Naphthalene					
Di-n-octyl Phthalate					
1,2-Diphenyl Benzene					
Bis-2-Ethylhexyl Phthalate					
Fluoranthene					
Fluorene					
Hexachlorobenzene	proposed: 25, A2				
Hexachlorobiphenyl					
Hexachlorobutadiene	210	240	---		
Hexachlorocyclopentadiene	110	100	---		
Hexachloroethane	proposed: 9,700	10,000	---		
Hexachlorobiphenyl					

Table 4-5  
ARARs for Airborne Contaminants  
(Continued)

	Occupational Health			Public Health	
	ACGIH TLV-TWA <sup>a</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	OSHA PEL-TWA <sup>c</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	NIOSH REL-TWA <sup>d</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	WHO <sup>e</sup> ( $\mu\text{g}/\text{m}^3$ )	ASHRAE <sup>f</sup> ( $\mu\text{g}/\text{m}^3$ )
Indeno(1,2,3-cd)pyrene					
Isophorone	28,000 <sup>i</sup>	23,000	23,000		
2-Methylnaphthalene					
Naphthalene	52,000	50,000	---		
Pentachlorobiphenyl					
Methylcyclohexane	1,610,000	1,600,000	---		
Methylcyclopentane					
Methylphenol (cresol) - All isomers	2,200	2,200	1,000		100 (24 hrs)
N-Nitroso-Dipropylamine					
N-Nitrosodiphenylamine					
2-Nitroaniline					
3-Nitroaniline					
4-Nitroaniline	3,000	3,000	---		
Nitrobenzene	5,000 (skin)	5,000 (skin)			
2-Nitrophenol					
4-Nitrophenol					
Pentachlorophenol	500	500	---		
Phenanthrene					
Pyrene					

**Table 4-5**  
**ARARs for Airborne Contaminants**  
**(Continued)**

	Occupational Health			Public Health	
	ACGIH TLV-TWA <sup>a</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	OSHA PEL-TWA <sup>c</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	NIOSH REL-TWA <sup>d</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	WHO <sup>e</sup> ( $\mu\text{g}/\text{m}^3$ )	ASHRAE <sup>f</sup> ( $\mu\text{g}/\text{m}^3$ )
Tetrachlorobiphenyl					
Tetrazine					
1,2,4-Trichlorobenzene	37,000 <sup>i</sup>	40,000 <sup>i</sup>	---		
Trichlorobiphenyl					
2,4,5-Trichlorophenol					
2,4,6-Trichlorophenol					
Trimethyl Benzene (All isomers)	123,000	125,000	---		
Trimethylnaphthalene					
<b>Herbicides/Pesticides/PCBs</b>					
Alachlor					
Aldicarb					
Aldrin	250	250	Ca - lowest detectable level		
Atrazine	5,000	5,000	---		
Dieldrin	250	250	Ca - lowest detectable level		
Dinoseb					
Chlordane	500	500	---		100 (24 hr.) 300 (30 min)
Alpha-Chlordane					

Table 4-5  
ARARs for Airborne Contaminants  
(Continued)

	Occupational Health			Public Health	
	ACGIH TLV-TWA <sup>a</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	OSHA PEL-TWA <sup>c</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	NIOSH REL-TWA <sup>d</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	WHO <sup>e</sup> ( $\mu\text{g}/\text{m}^3$ )	ASHRAE <sup>f</sup> ( $\mu\text{g}/\text{m}^3$ )
Gamma-Chlordane					
4,4'-DDE					
4,4'-DDD					
4,4'-DDT	1,000	1,000	500		
2-4D	10,000	10,000	---		
2,4,5-TD					
Delta-Benzo-Hexachloride					
Endosulfan	100	100	---		
Endosulfan Sulfate					
Endrin	100	100	---		
Heptachlor and Heptachlor Epoxide	500 proposed: 50, A2	500	---		
Isodrin					
Methoxychlor	10,000	10,000 (total dust) 5,000 (resp. fraction)			
Metolachlor					
Oxamyl					
Endrin Ketone					
Alpha-BHC					

**Table 4-5  
ARARs for Airborne Contaminants  
(Continued)**

	Occupational Health			Public Health	
	ACGIH TLV-TWA <sup>a</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	OSHA PEL-TWA <sup>c</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	NIOSH REL-TWA <sup>d</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	WHO <sup>e</sup> ( $\mu\text{g}/\text{m}^3$ )	ASHRAE <sup>f</sup> ( $\mu\text{g}/\text{m}^3$ )
Beta-BHC					
Gamma-BHC (Lindane)	500	500			
Delta-BHC					
PCB-1242 42% chlorine	1,000	1,000	1 <sup>h</sup>		
PCB-1254 52% chlorine	500	500	1 <sup>h</sup>		
PCB-1221 21% chlorine					
PCB-1232 32% chlorine					
PCB-1248 48% chlorine					
PCB-1260 60% chlorine					
PCB-1016					
Toxaphene	500	500	---		
<b>Inorganics</b>					
Aluminum	10,000	15,000 (total dust) 5,000 (resp. fraction)			
Antimony	500	500	500 (skin)		
Arsenic (and soluble compounds, as As)	200	500 (organic compounds) 10 (inorganic compounds)	2 <sup>i</sup>		
Barium	500 (soluble compounds as Ba)	500	---		

**Table 4-5  
ARARs for Airborne Contaminants  
(Continued)**

	Occupational Health			Public Health	
	ACGIH TLV-TWA <sup>a</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	OSHA PEL-TWA <sup>c</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	NIOSH REL-TWA <sup>d</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	WHO <sup>e</sup> ( $\mu\text{g}/\text{m}^3$ )	ASHRAE <sup>f</sup> ( $\mu\text{g}/\text{m}^3$ )
Beryllium (and compounds, as Be)	2	2	Carcinogen - not to exceed 0.5		0.01
Cadmium	50 proposed: 10 (total dust) 2 (respirable fraction)	200 dust 100 fume	Carcinogen - lowest feasible concentration	0.01-0.02 (annual)	2 (24 hr)
Calcium	2,000	5,000			20-30 (oxide)
Chromium	500 (chromium metal)	1,000 (chromium metal)	25 (chromium metal)		0.0015 (24 hr)
Cobalt	50	50	100		
Copper	1,000	1,000	---		
Fluoride					
Iron	5,000	10,000			
Lead	150	50	<100	0.5-1 $\mu\text{g}/\text{m}^3$ (annual)	1.5 $\mu\text{g}/\text{m}^3$ (24 hr)
Manganese	5,000	1,000			
Magnesium				0.001 $\mu\text{g}/\text{m}^3$ (annual)	
MBAS					
Mercury (all forms except alkyl vapor)	50	50	50	1 $\mu\text{g}/\text{m}^3$ (annual)	2 $\mu\text{g}/\text{m}^3$ (24 hr)

**Table 4-5**  
**ARARs for Airborne Contaminants**  
**(Continued)**

	Occupational Health			Public Health	
	ACGIH TLV-TWA <sup>a</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	OSHA PEL-TWA <sup>c</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	NIOSH REL-TWA <sup>d</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	WHO <sup>e</sup> ( $\mu\text{g}/\text{m}^3$ )	ASHRAE <sup>f</sup> ( $\mu\text{g}/\text{m}^3$ )
Nickel	1,000 (metal and soluble compounds) 100 (soluble compounds, proposed: 50)	1,000 (metal and insoluble compounds) 100 (soluble compounds)	15		2 $\text{mg}/\text{m}^3$ (annual)
Potassium	---	---	---		
Selenium	200	200	---		
Silver	100 (metal) 100 (soluble compounds)	10 (metal) 100 (soluble compounds)	---		
Sodium	---	---	---		
Thallium	100 (soluble compounds)	100 (soluble compounds)	---		
Tin (metal)	2,000	2,000			
Vanadium, as $\text{V}_2\text{O}_5$	50	50	50	1 $\mu\text{g}/\text{m}^3$ (24 hr)	2 $\mu\text{g}/\text{m}^3$ (24 hr)
Zinc oxide, dust	10,000 (oxide dust)	10,000 (total dust) 5,000 (respirable dust)			
Cyanide					
Sulfide					
Nitrate					
PM-10 Respirable Particulates	10,000	5,000		50 $\mu\text{g}/\text{m}^3$ 150 $\mu\text{g}/\text{m}^3$ (EPA, not WHO or ASHRAE)	
Asbestos, Amosite	0.5 f/cc	0.2 f/cc	0.1 f/cc		

**Table 4-5  
ARARs for Airborne Contaminants  
(Continued)**

	Occupational Health			Public Health	
	ACGIH TLV-TWA <sup>a</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	OSHA PEL-TWA <sup>c</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	NIOSH REL-TWA <sup>d</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	WHO <sup>e</sup> ( $\mu\text{g}/\text{m}^3$ )	ASHRAE <sup>f</sup> ( $\mu\text{g}/\text{m}^3$ )
Asbestos, Chrysotile	2 f/cc	0.2 f/cc	0.1 f/cc		
Asbestos, Crocidolite	0.2 f/cc	0.2 f/cc	0.1 f/cc		
Asbestos, other forms	2 f/cc	0.2 f/cc	0.1 f/cc		
Gross Alpha					
Gross Beta					
Americium					
Californium					
Cesium-137					
Plutonium					
Radium (266 + 228)					
Radon					
Thorium-230					
Uranium (natural)	200 (133 pCi/m <sup>3</sup> ) [7.38 (5 pCi/m <sup>3</sup> ) <sup>y</sup> ]	50 (soluble) 250 (insoluble)			
Uranium	200	50 (soluble) 250 (insoluble)			
U-234					

**Table 4-5  
ARARs for Airborne Contaminants  
(Continued)**

	Occupational Health			Public Health	
	ACGIH TLV-TWA <sup>a</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	OSHA PEL-TWA <sup>c</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	NIOSH REL-TWA <sup>d</sup> ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	WHO <sup>e</sup> ( $\mu\text{g}/\text{m}^3$ )	ASHRAE <sup>f</sup> ( $\mu\text{g}/\text{m}^3$ )
U-235					
U-238	8.17 (3 pCi/m <sup>3</sup> ) <sup>j</sup> 0.014 (0.0053 pCi/m <sup>3</sup> ) <sup>k</sup>				

**Notes:**

<sup>a</sup>ACGIH = American Conference of Governmental Industrial Hygienists. Data from Threshold Limit Values and Biological Exposure Indices, ACGIH, 1991-1992. TLV = Threshold Limit Value. TWA = Time-Weighted Average.

<sup>b</sup>Some references report values for volatile organics in parts per billion (ppb) instead. The ppb designation is valid only for gases and vapors, and is defined as ppb of substance in air by volume. The conversion, based on 1 atm and 25 °C (77 °F), is:

$$\text{TWA in } \mu\text{g}/\text{m}^3 = \frac{\text{TWA in ppb} \times (\text{gram molecular weight of substance})}{24.45}$$

<sup>c</sup>OSHA = Occupational Safety and Health Administration. Data from 29 CFR Part 1910.1000 (OSHA Standards for Air Contaminants). PEL = Permissible Exposure Level.

<sup>d</sup>NIOSH = National Institute for Occupational Safety and Health. Data from Morbidity and Mortality Weekly Report, 35 (1S), NIOSH, 1986. REL = Recommended Exposure Level.

<sup>e</sup>WHO = World Health Organization. Data from Air Quality Guidelines for Europe, WHO, 1987.

<sup>f</sup>ASHRAE = American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc. Data from Ventilation for Acceptable Indoor Air Quality, ASHRAE Standard 62-1981.

<sup>g</sup>No level given; however, ACGIH classifies the compound as a suspected carcinogen. Levels should be maintained as low as reasonably achievable (ALARA).

<sup>h</sup>ACGIH Documentation of the TLVs and Biological Exposure Indices, 6th Edition, Vol. 1.

<sup>i</sup>Ceiling Limit: Exposure concentration that should not be exceeded during any part of the workday.

<sup>j</sup>From 10CFR20 for natural uranium at NRC-licensed facilities.

<sup>k</sup>Proposed EPA rule 40CFR61 for NRC-licensed facilities.

**Table 4-6  
Calculated Guidelines for Accessible Residual Surface Contamination**

Chemical Compound	Carcinogenic ug/cm2	Non-Carcinogenic ug/cm2	Values used for Comparison ***
1,3-Dichlorobenzene	N/A	N/A	N/A
1,2-Dichlorobenzene	N/A	834	834
1,2,4-Trichlorobenzene	N/A	121	121
1,4-Dichlorobenzene	16.1	N/A	16.1
2-Fluorophenol	N/A	N/A	N/A
2-Methylnaphthalene	N/A	371	371
2,4-Dinitrotoluene	0.0567	18.5	0.0567
2,4,6-Trinitrotoluene	12.8	4.63	4.63
4-Methylphenol	N/A	463	463
Acenaphthene	NA	556	556
Acenaphthylene	N/A	556	556
Aldrin	0.00227	0.278	0.00227
alpha-Benzenehexachloride	0.00612	N/A	0.00612
alpha-Endosulfan	N/A	0.38	0.38
Aluminum	N/A	N/A	N/A
Anthracene	N/A	2780	2780
Antimony *	N/A	-9.53	3
Aroclor-1254	0.00501	N/A	0.00501
Aroclor-1260 *	0.00501	N/A	0.00501
Arsenic *	0.0214	-3.97	0.022
Barium	N/A	414	414
Benzo [a] anthracene	0.00665	278	0.00665
Benzo [a] pyrene	0.00665	278	0.00665
Benzo [b]fluoranthene	0.00665	278	0.00665
Benzo [g,h,i] perylene	N/A	278	278
Benzo [k] fluoranthene	0.00665	278	0.00665
Benzoic Acid	N/A	37100	37100
Benzyl Alcohol	N/A	2780	2780
Beryllium	0.00896	46.3	0.00896
Beta-Endosulfan	N/A	0.343	0.343
bis (2-Ethylhexyl) Phthalate	2.75	150	2.75
Butylbenzyl Phthalate	N/A	1850	1850
Cadmium *	N/A	0.662	2.8
Calcium	N/A	N/A	N/A
Chromium (VI)	N/A	38.1	38.1
Chrysene	0.00665	278	0.00665
Cobalt	N/A	N/A	N/A
Copper	N/A	86	86
Cyanide	N/A	185	185
Cyclotetramethylenetetranitramine	N/A	463	463
DDD	0.161	N/A	0.161
DDE	0.113	N/A	0.113
DDT	0.113	4.34	0.113
delta-Benzenehexachloride	N/A	N/A	N/A
Di-n-butyl Phthalate	N/A	926	926
Di-n-octyl Phthalate	N/A	185	185
Dibenz [a,h] anthracene	0.00665	278	0.00665
Dieldrin	0.00241	0.389	0.00241

**Table 4-6  
Calculated Guidelines for Accessible Residual Surface Contamination  
(Continued)**

Diethylphthalate	N/A	7410	7410
Diisopropylmethyl phosphonate	N/A	N/A	N/A
Dimethylphenol	N/A	185	185
Endosulfan sulfate	N/A	N/A	N/A
Endrin	N/A	2.78	2.78
Endrin aldehyde	N/A	N/A	N/A
Endrin ketone	N/A	N/A	N/A
Fluoranthene	N/A	371	371
Fluorene	N/A	371	371
Gamma-BHC (Lindane)	0.0297	-0.662	0.0297
Heptachlor	0.00857	4.47	0.00857
Heptachlor epoxide	0.00424	0.0945	0.00424
Iron	N/A	N/A	N/A
Isodrine	N/A	N/A	N/A
Lead **	N/A	N/A	0.21
Magnesium	N/A	N/A	N/A
Manganese	N/A	422	422
Mercury *	N/A	2.78	2.4
Methoxychlor	N/A	46.3	46.3
Naphthalene	N/A	370	370
Nickel	N/A	163	163
Nitrate	N/A	14800	14800
Nitrite	N/A	926	926
Pentachlorophenol	0.321	79.4	0.321
Phenanthrene	N/A	278	278
Phenol	N/A	5560	5560
Potassium	N/A	N/A	N/A
Pyrene	N/A	278	278
RDX	3.5	27.8	3.5
Selenium	N/A	26.2	26.2
Silver	N/A	34.7	34.7
Sodium	N/A	N/A	N/A
Thallium	N/A	-14.6	-0.1456
Vanadium	N/A	64.9	64.9
Zinc	N/A	-1950	-1945

\* Published NJDEPE guidelines (January 1992)

\*\* September 1990 HUD clearance criteria for lead abatement projects

\*\*\* The more conservative value was used for comparison purposes

**Table 4-7  
Soil Sample Criteria Comparison Categories**

Sample ID	Zone	Depth	Surface	Category
<b>Unit 1</b>				
BORE 01SB-1	1	0	unpaved	S-1
BORE 01SB-1	1	16	unpaved	S-3
BORE 01SB-2	1	8	paved	S-2
BORE 01SB-2	1	19	paved	S-3
BORE GRSB-1	1	0	unpaved	S-1
BORE GRSB-1	1	8	unpaved	S-2
<b>Unit 2</b>				
BORE 02SB-2	2	1	paved	S-2
BORE 02SB-2	2	14	paved	S-2
BORE 02SB-3	2	1	paved	S-2
BORE 02SB-3	2	14	paved	S-2
BORE 02SB-4	2	2	paved	S-2
BORE 02SB-4	2	16	paved	S-3
BORE GRSB-2	2	0	paved	S-2
BORE GRSB-2	2	14	paved	S-2
CMPH 02SS-3	2	0	unpaved	S-1
PLUG 02SS-2	2	0	unpaved	S-1
<b>Unit 3</b>				
BORE 03SB-1	2	1	paved	S-2
BORE 03SB-2	2	0	paved	S-2
BORE 03SB-2	2	22	paved	S-3
CMPH 03SS-1	2	0	unpaved	S-1
PLUG 03SS-2	2	0	unpaved	S-1
<b>Unit 4</b>				
BORE 04SB-1	1	0	paved	S-2
CMPH 04SS-1	1	0	unpaved	S-1
<b>Unit 5</b>				
BORE 05SB-1	2	0	unpaved	S-1
BORE 05SB-1	2	30	unpaved	S-3
BORE 05SB-2	2	0	unpaved	S-1
BORE 05SB-2	2	10	unpaved	S-2
BORE GRSB-5	2	0	unpaved	S-1
BORE GRSB-5	2	12	unpaved	S-2
PLUG 05SS-1	2	0	unpaved	S-1
PLUG 05SS-2	2	0	unpaved	S-1
<b>Unit 6</b>				
BORE 06SB-1	2	0	unpaved	S-1
BORE 06SB-1	2	18	unpaved	S-3
BORE 06SB-2	2	0	unpaved	S-1
BORE 06SB-2	2	16	unpaved	S-3
BORE 06SB-3	2	4	paved	S-2
BORE 06SB-3	2	18	paved	S-3
BORE 06SB-4	2	0	unpaved	S-1
BORE 06SB-4	2	10	unpaved	S-2
BORE 06SB-4	2	16	unpaved	S-3
BORE 06SB-5	2	0	unpaved	S-1
BORE 06SB-5	2	25	unpaved	S-3
BORE GRSB-6	2	0	unpaved	S-1
BORE GRSB-6	2	12	unpaved	S-2

**Table 4-7  
Soil Sample Criteria Comparison Categories  
(Continued)**

Sample ID	Zone	Depth	Surface	Category
CMPH 06SS-1	2	0	unpaved	S-1
CMPH 06SS-2	2	0	unpaved	S-1
CMPH 06SS-4	2	0	unpaved	S-1
PLUG 06SS-3	2	0	unpaved	S-1
<b>Unit 7</b>				
BORE 07SB-1	2	0	unpaved	S-1
BORE 07SB-1	2	14	unpaved	S-2
BORE GRSB-7	2	0	unpaved	S-1
BORE GRSB-7	2	14	unpaved	S-2
BORE GRSB-8	2	0	unpaved	S-1
BORE GRSB-8	2	14	unpaved	S-2
<b>Unit 8</b>				
BORE 08SB-2	2	1	paved	S-2
BORE 08SB-2	2	4	paved	S-2
BORE 08SB-3	2	1	paved	S-2
BORE 08SB-3	2	6	paved	S-2
BORE 08SB-3	2	10	paved	S-2
PLUG 08SS-1	2	0	unpaved	S-1
<b>Unit 9</b>				
BORE 09SB-1	3	0	unpaved	S-1
BORE 09SB-1	3	2	unpaved	S-1
BORE 09SB-1	3	18	unpaved	S-3
BORE 09SB-1	3	34	unpaved	S-3
BORE GRSB-10	3	0	unpaved	S-1
BORE GRSB-10	3	34	unpaved	S-3
BORE GRSB-9	3	0	unpaved	S-1
CMPH 09SS-1	3	0	unpaved	S-1
CMPH 09SS-2	3	0	unpaved	S-1
<b>Unit 10</b>				
BORE 10SB-1	2	0.2	paved	S-2
BORE 10SB-1	2	18	paved	S-3
BORE 10SB-2	2	0.5	paved	S-2
BORE 10SB-2	2	20	paved	S-3
BORE 10SB-2	2	26	paved	S-3
<b>Unit 11</b>				
BORE 11SB-1	3	1	paved	S-2
BORE 11SB-1	3	24	paved	S-3
BORE 11SB-2	3	0.5	paved	S-2
BORE 11SB-2	3	4	paved	S-2
BORE 11SB-2	3	22	paved	S-3
BORE 11SB-2	3	24	paved	S-3
BORE 11SB-3	3	0.5	paved	S-2
BORE 11SB-3	3	4	paved	S-2
BORE 11SB-3	3	22	paved	S-3
BORE 11SB-3	3	32	paved	S-3
BORE 11SB-4	3	0	unpaved	S-1
BORE 11SB-4	3	34	unpaved	S-3
BORE 11SB-4D	3	34	unpaved	S-3
BORE GRSB-15	3	0	unpaved	S-1
BORE GRSB-15	3	32	unpaved	S-3

**Table 4-7  
Soil Sample Criteria Comparison Categories  
(Continued)**

Sample ID	Zone	Depth	Surface	Category
BORE GRSB-15D	3	0	unpaved	S-1
<b>Unit 12</b>				
BORE 12SB-1	2	0.5	paved	S-2
BORE 12SB-1	2	8	paved	S-2
BORE 12SB-1	2	18	paved	S-3
BORE 12SB-1	2	26	paved	S-3
BORE 12SB-2	2	4	unpaved	S-2
BORE 12SB-2	2	8	unpaved	S-2
BORE 12SB-2	2	18	unpaved	S-3
BORE 12SB-2	2	28	unpaved	S-3
BORE 12SB-2D	2	28	unpaved	S-3
BORE 12SB-3	2	0	paved	S-2
BORE 12SB-3	2	20	paved	S-3
BORE GRSB-12	2	0	unpaved	S-1
BORE GRSB-12	2	16	unpaved	S-3
BORE GRSB-13	2	0	unpaved	S-1
BORE GRSB-13	2	22	unpaved	S-3
<b>Unit 13</b>				
BORE 13SB-1	4	0	unpaved	S-1
BORE 13SB-1	4	8	unpaved	S-1
BORE 13SB-1	4	14	unpaved	S-1
BORE 13SB-1	4	32	unpaved	S-3
BORE 13SB-2	4	0	unpaved	S-1
BORE 13SB-2	4	24	unpaved	S-3
BORE 13SB-3	4	2	unpaved	S-1
BORE 13SB-3	4	25	unpaved	S-3
BORE GRSB-17	4	0	unpaved	S-1
BORE GRSB-17	4	30	unpaved	S-3
BORE GRSB-21	4	0	unpaved	S-1
BORE GRSB-21	4	24	unpaved	S-3
CMPH 13SS-3	4	0	unpaved	S-1
PLUG 13SS-1	4	0	unpaved	S-1
PLUG 13SS-2	4	0	unpaved	S-1
PLUG 13SS-5	4	0	unpaved	S-1
PLUG 13SS-6	4	0	unpaved	S-1
PLUG 13SS-7	4	0	unpaved	S-1
PLUG 13SS-8	4	0	unpaved	S-1
<b>Unit 14</b>				
BORE 14SB-1	2	0	unpaved	S-1
BORE 14SB-1	2	8	unpaved	S-2
BORE 14SB-1	2	14	unpaved	S-2
BORE 14SB-1	2	16	unpaved	S-3
CMPH 14SS-1	2	0	unpaved	S-1
CMPH 14SS-1D	2	0	unpaved	S-1
CMPH 14SS-2	2	0	unpaved	S-1
CMPH 14SS-3	2	0	unpaved	S-1
<b>Unit 15</b>				
BORE 15SB-1	4	0	unpaved	S-1
BORE 15SB-1	4	8	unpaved	S-1
BORE 15SB-2	4	0	unpaved	S-1

**Table 4-7  
Soil Sample Criteria Comparison Categories  
(Continued)**

Sample ID	Zone	Depth	Surface	Category
BORE 15SB-2	4	4	unpaved	S-1
<b>Unit 16</b>				
BORE GRSB-24	4	2	paved	S-1
BORE GRSB-24	4	12	paved	S-1
CMPH 16SS-1	4	0	unpaved	S-1
CMPH 16SS-2	4	0	unpaved	S-1
<b>Unit 17</b>				
BORE 17SB-1	4	0	unpaved	S-1
BORE 17SB-1	4	6	unpaved	S-1
BORE 17SB-2	4	0	unpaved	S-1
BORE 17SB-2	4	8	unpaved	S-1
BORE 17SB-3	4	0	unpaved	S-1
BORE 17SB-3	4	14	unpaved	S-1
BORE GRSB-19	4	0	unpaved	S-1
BORE GRSB-19	4	9	unpaved	S-1
BORE GRSB-22	4	0	unpaved	S-1
BORE GRSB-22	4	4	unpaved	S-1
BORE GRSB-23	4	0	unpaved	S-1
BORE GRSB-23	4	4	unpaved	S-1
<b>Unit 18</b>				
BORE 18SB-1	4	0.5	unpaved	S-1
BORE 18SB-1	4	14	unpaved	S-1
BORE GRSB-11	4	0	unpaved	S-1
BORE GRSB-11	4	6	unpaved	S-1
<b>Background</b>				
BORE 01SB-3	1	2	paved	S-2
BORE 01SB-3	1	4	paved	S-2
BORE 01SB-3	1	6	paved	S-2
BORE 01SB-3	1	8	paved	S-2
BORE 01SB-3	1	12	paved	S-2
BORE 01SB-3	1	14	paved	S-2
BORE BKSB-1	*	0	unpaved	S-1
BORE BKSB-1	*	16	unpaved	S-3
BORE BKSB-2	*	0	unpaved	S-1
BORE BKSB-2	*	14	unpaved	S-2
BORE BKSB-3	*	0	unpaved	S-1
BORE BKSB-3	*	4	unpaved	S-2
BORE BKSB-3	*	8	unpaved	S-2
BORE BKSB-3	*	12	unpaved	S-2
BORE BKSB-3	*	14	unpaved	S-2
BORE BKSB-3	*	20	unpaved	S-3
BORE BKSB-4	*	0	unpaved	S-1
BORE BKSB-4	*	12	unpaved	S-2
BORE GRSB-3	2	0	unpaved	S-1
BORE GRSB-3	2	12	unpaved	S-2
PLUG 01SS-1	1	0	unpaved	S-1
PLUG 01SS-1D	1	0	unpaved	S-1
PLUG 02SS-1	2	0	unpaved	S-1
PLUG 03SS-3	2	0	unpaved	S-1

TABLE 4-8

MCP Method 1 - Soil Category S-1 Standards

		Applicable When Soil And Groundwater Categories are:		
Oil and/or Hazardous Material	CAS Number	S-1 Soil & GW-1 (µg/g)	S-1 Soil & GW-2 (µg/g)	S-1 Soil & GW-3 (µg/g)
Acenaphthene	83329	20	1,000	1,000
Acenaphthylene	208968	100	100	100
Acetone	67641	3	60	60
Aldrin	309002	0.03	0.03	0.03
Anthracene	120127	1,000	1,000	1,000
Antimony	7440360	10	10	10
Arsenic	7440382	30	30	30
Benzene	71432	10	30	30
Benzo(a) Anthracene	56553	0.7	0.7	0.7
Benzo (a) Pyrene	50328	0.7	0.7	0.7
Benzo (b) Fluoranthene	205992	0.7	0.7	0.7
Benzo (g,h,i) Perylene	191242	100	1,000	30
Benzo (k) Fluoranthene	207089	0.7	0.7	0.7
Beryllium	7440417	0.4	0.4	0.4
Biphenyl, 1,1-	92524	1	1,000	10
Bis (2-chloroethyl) Ether	111444	0.7	0.7	0.7
Bis (2-chloroisopropyl) Ether	39638329	0.7	2	2
Bis (2-Ethylehexyl) Phthalate	117817	100	100	100
Bromodichloromethane	75274	0.1	10	10
Bromoform	75252	0.1	20	100
Bromomethane	74839	10	3	50
Cadimium	7440439	30	30	30
Carbon Tetrachloride	56235	1	4	7
Chlordane	57749	1	1	1
Chloroaniline, p-	106478	1	100	30
Chlorobnezene	108907	8	80	40
Chloroform	67663	0.1	10	100
Chlorophenol, 2-	95578	0.7	100	20
Chromium (Total)	7440473	1,000	1,000	1,000
Chromium (III)	16065831	1,000	1,000	1,000
Chromium (VI)	18540299	200	200	200
Chrysne	218019	0.7	0.7	0.7
Cyanide*	57125	100	100	100

**TABLE 4-8**

**MCP Method 1 - Soil Category S-1 Standards  
(Continued)**

		Applicable When Soil And Groundwater Categories are:		
Oil and/or Hazardous Material	CAS Number	S-1 Soil & GW-1 (µg/g)	S-1 Soil & GW-2 (µg/g)	S-1 Soil & GW-3 (µg/g)
Dibenzo (a, h) Anthracene	53703	0.7	0.7	0.7
Dibromochloromethane	124481	0.09	10	10
Dichlorobenzene, 1,2- (o-DCB)	95501	100	100	100
Dichlorobenzene, 1,3- (m-DCB)	541731	100	100	100
Dichlorobenzene, 1,4- (p-DCB)	106467	2	40	40
Dichlorobenzidine, 3,3'-	91941	1	1	1
DDD	72548	2	2	2
DDE	72559	2	2	2
DDT	50293	2	2	2
Dichloroethane, 1,1-	75343	3	100	100
Dichloroethane, 1,2-	107062	0.05	0.2	10
Dichloroethylene, 1,1-	75354	0.7	0.1	1
Dichloroethylene, CIS-1,2-	156592	2	100	100
Dichloroethylene, Trans-1,2-	1556605	4	500	500
Dichlorophenol, 2,4-	120832	10	40	40
Dichloropropane, 1,2-	78875	0.1	0.2	8
Dichloropropene, 1,3-	542756	0.01	0.1	3
Dieldrin	60571	0.03	0.03	0.03
Diethyl Phthalate	84662	100	1,000	0.7
Dimethyl Phthalate	131113	30	1,000	0.7
Dimethylphenol, 2,4-	105679	0.7	400	10
Dinitrophenol, 2,4-	51285	3	40	6
Dinitrotoluene, 2,4-	121142	0.7	1	1
Dioxin	1746016	4.00E-06	4.00E-06	4.00E-06
Endosulfan	115297	0.2	1	0.05
Endrin	72208	0.6	6	1
Ethylbenzene	100414	80	500	500
Ethylene Dibromide	106934	0.005	0.01	0.01
Fluoranthene	206440	600	900	600
Fluorene	86737	400	900	900
Heptachlor	76448	0.1	0.1	0.1
Heptachlor Epoxide	1024573	0.06	0.06	0.06
Hexachlorobenzene	118741	0.7	0.7	0.7
Hexachlorobutadiene	87683	3	3	7
Hexachlorocyclohexane, Gamma	58899	0.1	0.4	0.4

TABLE 4-8

MCP Method 1 - Soil Category S-1 Standards  
(Continued)

Oil and/or Hazardous Material	CAS Number	Applicable When Soil And Groundwater Categories are:		
		S-1 Soil & GW-1 (µg/g)	S-1 Soil & GW-2 (µg/g)	S-1 Soil & GW-3 (µg/g)
Hexachlorethane	67721	6	6	6
Indeno(1,2,3-cd)Pyrene	193395	0.7	0.7	0.7
Lead	7439921	300	300	300
Mercury	7439976	10	10	10
Methoxychlor	72435	100	100	30
Methyl Ethyl Keotone	78933	0.3	40	40
Methyl Isobutyle Ketone	108101	0.5	70	70
Methyl Mercury	22967926	7	7	7
Methyl t-Butyl Ether	1634044	3	100	100
Methylene Chloride	75092	0.1	100	100
Methylnaphthalene, 2-	91576	0.7	20	7
Naphthalene	91203	4	100	100
Nickel	7440020	300	300	300
Pentachlorophenol	87865	5	7	7
Phenanthrene	85018	700	1,000	100
Phenol	108952	60	500	500
Polychlorinated Biphenyls (PCBs)	1336363	2	2	2
Pyrene	129000	500	700	500
Selenium	7782492	300	300	300
Silver	7440224	100	100	100
Styrene	100425	2	2	20
Tetrachloroethane, 1,1,1,2-	630206	0.4	0.5	4
Tetrachloroethane, 1,1,2,2,	79345	0.02	0.2	0.5
Tetrachloroethylene	127184	0.5	200	200
Thallium	7440280	8	8	8
Toluene	108883	90	500	500
Total Petroleum Hydrocarbon ***	NA	500	500	500
Trichlorobenzene, 1,2,4-	102821	100	400	400
Trichloroethane, 1,1,1-	71556	30	100	100
Trichloroethane, 1,1,2-	79005	0.3	2	2
Trichloroethylene	79016	0.4	20	70
Trichlorophenol, 2,4,5-	95954	3	1,000	2
Trichlorophenol 2,4,6-	88062	3	40	40

**TABLE 4-8**

**MCP Method 1 - Soil Category S-1 Standards  
(Continued)**

		Applicable When Soil And Groundwater Categories are:		
Oil and/or Hazardous Material	CAS Number	S-1 Soil & GW-1 (µg/g)	S-1 Soil & GW-2 (µg/g)	S-1 Soil & GW-3 (µg/g)
Vinyl Chloride	75014	0.3	0.3	0.3
Xylenes (mixed isomers)	1330207	500	500	500
Zinc	7440666	2,500	2,500	2,500

Note: All concentrations of oil and/or hazardous material in soil are calculated and presented on a dry weight/dry weight basis.

NA - Not Applicable

\* - Cyanide expressed as free, or physiologically available cyanide.

\*\* - Dioxins expressed as 2,3,7,8-TCDD equivalents.

\*\*\* - Total Petroleum Hydrocarbon excluding benzene, toluene, ethylbenzene, xylenes and specific polycyclic aromatic hydrocarbons (PAHs), and expressed as a weighted average of the individual constituents if sufficient analytical and toxicological data are available.

TABLE 4-9

MCP Method 1 - Soil Category S-2 Standards

Oil and/or Hazardous Material	CAS Number	Applicable When Soil And Groundwater Categories are:		
		S-2 Soil & GW-1 (µg/g)	S-2 Soil & GW-2 (µg/g)	S-2 Soil & GW-3 (µg/g)
Acenaphthene	83329	20	2,500	2,000
Acenaphthylene	208968	100	2,500	800
Acetone	67641	3	60	60
Aldrin	309002	0.04	0.04	0.04
Anthracene	120127	1,000	2,500	1,000
Antimony	7440360	40	40	40
Arsenic	7440382	30	30	30
Benzene	71432	10	60	60
Benzo (a) Anthracene	56553	0.7	0.7	0.7
Benzo (a) Pyrene	50328	0.7	0.7	0.7
Benzo (b) Fluoranthene	205992	0.7	0.7	0.7
Benzo (g, h, i) Perylene	191242	100	2,500	30
Benzo (k) Fluoranthene	207089	0.7	0.7	0.7
Beryllium	7440417	0.8	0.8	0.8
Biphenyl, 1,1 -	92524	1	2,500	10
Bis (2-Chloroethyl) Ether	111444	0.7	0.7	0.7
Bis (2-Chloroisopropyl) Ether	39638329	0.7	3	3
Bis (2-Ethylhexyl) Phthalate	117817	100	300	300
Bromodichloromethane	75274	0.1	20	20
Bromoform	75252	0.1	20	200
Bromomethane	74839	10	3	200
Cadmium	7440439	80	80	80
Carbon Tetrachloride	56235	1	4	10
Chlordane	57749	2	2	2
Chloroaniline, p -	106478	1	400	30
Chlorobenzene	108907	8	80	40
Chloroform	67663	0.1	10	200
Chlorophenol, 2 -	95578	0.7	200	20
Chromium (Total)	7440473	2,500	2,500	2,500
Chromium (III)	16065831	2,500	2,500	2,500
Chromium (VI)	18540299	600	600	600
Chrysene	218019	0.7	0.7	0.7
Cyanide *	57125	100	100	100

TABLE 4-9

MCP Method 1 - Soil Category S-2 Standards  
(Continued)

Oil and/or Hazardous Material	CAS Number	Applicable When Soil And Groundwater Categories are:		
		S-2 Soil & GW-1 (µg/g)	S-2 Soil & GW-2 (µg/g)	S-2 Soil & GW-3 (µg/g)
Dibenzo (a,b) Anthracene	53703	0.7	0.7	0.7
Dibromochloromethane	124481	0.09	20	20
Dichlorobenzene, 1,2 - (o-DCB)	95501	200	500	500
Dichlorobenzene, 1,3 - (m-DCB)	541731	200	500	500
Dichlorobenzene, 1,4 - (p-DCB)	106467	2	60	60
Dichlorobenzidine, 3,3' -	91941	1	1	1
DDD	72546	3	3	3
DDE	72559	2	2	2
DDT	50293	2	2	2
Dichloroethane, 1,1 -	75343	3	400	500
Dichloroethane, 1,2 -	107062	0.05	0.2	20
Dichloroethylene, 1,1 -	75354	0.7	0.1	2
Dichloroethylene, cis-1,2 -	156592	2	500	500
Dichloroethylene, trans-1,2 -	156605	4	1,000	1,000
Dichlorophenol, 2,4 -	120832	10	90	90
Dichloropropane, 1,2 -	78875	0.1	0.2	10
Dichloropropene, 1,3 -	542756	0.01	0.1	5
Dieldrin	60571	0.04	0.04	0.04
Diethyl Phthalate	84662	100	2,500	0.7
Dimethyl Pethalate	131113	30	2,500	0.7
Dimethylphenol, 2,4 -	105679	0.7	900	10
Dinitrophenol, 2,4 -	51285	3	90	6
Dinitrotoluene, 2,4 -	121142	0.7	2	2
Dioxin **	1746016	6.00E-06	6.00E-06	6.00E-06
Endosulfan	115297	0.2	3	0.05
Endrin	72208	0.6	10	1
Ethylbenzene	100414	80	1,000	500
Ethylene Dibromide	106934	0.005	0.02	0.02
Fluoranthene	206440	600	2,000	600
Fluorene	86737	400	2,000	1,000
Heptachlor	76448	0.2	0.2	0.2
Heptachlor Epoxide	1024573	0.09	0.09	0.09
Hexachlorobenzene	118741	0.8	0.8	0.8
Hexachlorobutadiene	87683	3	3	10
Hexachlorocyclohexane, Gamma	58899	0.1	0.6	0.5

TABLE 4-9

MCP Method 1 - Soil Category S-2 Standards  
(Continued)

Oil and/or Hazardous Material	CAS Number	Applicable When Soil And Groundwater Categories are:		
		S-2 Soil & GW-1 (µg/g)	S-2 Soil & GW-2 (µg/g)	S-2 Soil & GW-3 (µg/g)
Hexachloroethane	67721	10	10	10
Indeno (1,2,3-cd) Pyrene	193395	0.7	0.7	0.7
Lead	7439921	600	600	600
Mercury	7439976	60	60	60
Methoxychlor	72435	300	30	30
Methyl Ethyl Ketone	78933	0.3	40	40
Methyl Isobutyl Ketone	108101	0.5	70	70
Methyl Mercury	22967926	20	20	20
Methyl t-Butyl Ether	1634044	3	200	200
Methylene Chloride	75092	0.1	200	200
Methylnaphthalene, 2 -	91576	0.7	7	7
Naphthalene	91203	4	1,000	1,000
Nickel	7440020	700	700	700
Pentachlorophenol	87865	5	10	10
Phenanthrene	85018	700	100	100
Phenol	108952	60	500	500
Polychlorinated Biphenyls (PCBs)	1336363	2	2	2
Pyrene	129000	500	500	500
Selenium	7782492	2,500	2,500	2,500
Silver	7440224	200	200	200
Styrene	100425	20	30	30
Tetrachloroethane, 1,1,1,2 -	630206	0.5	6	5
Tetrachloroethane, 1,1,2,2 -	79345	0.2	0.6	0.6
Tetrachloroethylene	127184	300	300	300
Thallium	7440280	30	30	30
Toluene	108883	500	1,000	1,000
Total Petroleum Hydrocarbon ***	NA	2,500	2,500	2,500
Trichlorobenzene, 1,2,4 -	120821	900	800	800
Trichloroethane, 1,1,1 -	71556	30	500	500
Trichloroethane, 1,1,2 -	79005	0.3	3	3
Trichloroethylene	79016	0.4	20	100
Trichlorophenol, 2,4,5 -	95954	3	2,500	2
Trichlorophenol, 2,4,6 -	88062	3	60	60

**TABLE 4-9**

**MCP Method 1 - Soil Category S-2 Standards  
(Continued)**

		Applicable When Soil And Groundwater Categories are:		
Oil and/or Hazardous Material	CAS Number	S-2 Soil & GW-1 (µg/g)	S-2 Soil & GW-2 (µg/g)	S-2 Soil & GW-3 (µg/g)
Vinyl Chloride	75014	0.4	0.3	0.5
Xylenes (mixed isomers)	1330207	800	500	1,000
Zinc	7550666	2,500	2,500	2,500

Note: All concentrations of oil and/or hazardous material in soil are calculated and presented on a dry weight/dry weight basis.

NA - Not Applicable

\* - Cyanide expressed as free, or physiologically available cyanide.

\*\* - Dioxins expressed as 2,3,7,8-TCDD equivalents.

\*\*\* - Total Petroleum Hydrocarbon excluding benzene, toluene, ethylbenzene, xylenes and specific polycyclic aromatic hydrocarbons (PAHs), and expressed as a weighted average of the individual constituents if sufficient analytical and toxicological data are available.

TABLE 4-10

MCP Method 1 - Soil Category S-3 Standards

Oil and/or Hazardous Material	CAS Number	Applicable When Soil And Groundwater Categories are:		
		S-3 Soil & GW-1 (µg/g)	S-3 Soil & GW-2 (µg/g)	S-3 Soil & GW-3 (µg/g)
Acenaphthene	83329	20	5,000	2,000
Acenaphthylene	208968	100	2,500	800
Acetone	67641	3	60	60
Aldrin	309002	0.1	0.1	0.1
Anthracene	120127	1,000	5,000	1,000
Antimony	7440360	40	40	40
Arsenic	7440382	30	30	30
Benzene	71432	10	100	200
Benzo (a) Anthracene	56553	0.7	0.7	0.7
Benzo (a) Pyrene	50328	0.7	0.7	0.7
Benzo (b) Fluoranthene	205992	0.7	0.7	0.7
Benzo (g, h, i) Perylene	191242	100	2,500	30
Benzo (k) Fluoranthene	207089	0.7	0.7	0.7
Beryllium	7440417	3	3	3
Biphenyl, 1,1 -	92524	1	3,000	10
Bis (2-Chloroethyl) Ether	111444	0.7	0.7	0.7
Bis (2-Chloroisopropyl) Ether	39638329	0.7	4	9
Bis (2-Ethylhexyl) Phthalate	117817	100	1,000	500
Bromodichloromethane	75274	0.1	90	90
Bromoform	75252	0.1	20	700
Bromomethane	74839	10	3	700
Cadmium	7440439	80	80	80
Carbon Tetrachloride	56235	1	4	40
Chlordane	57749	5	5	5
Chloroaniline, p -	106478	1	400	30
Chlorobenzene	108907	8	80	40
Chloroform	67663	0.1	10	300
Chlorophenol, 2 -	95578	1	1,000	20
Chromium (Total)	7440473	5,000	5,000	5,000
Chromium (III)	16065831	5,000	5,000	5,000
Chromium (VI)	18540299	1,000	1,000	1,000
Chrysene	218019	0.7	0.7	0.7
Cyanide *	57125	400	400	400

TABLE 4-10

MCP Method 1 - Soil Category S-3 Standards  
(Continued)

		Applicable When Soil And Groundwater Categories are:		
Oil and/or Hazardous Material	CAS Number	S-3 Soil & GW-1 (µg/g)	S-3 Soil & GW-2 (µg/g)	S-3 Soil & GW-3 (µg/g)
Dibenzo (a,b) Anthracene	53703	0.8	0.8	0.8
Dibromochloromethane	124481	0.09	70	70
Dichlorobenzene, 1,2 - (o-DCB)	95501	200	500	500
Dichlorobenzene, 1,3 - (m-DCB)	541731	200	500	500
Dichlorobenzene, 1,4 - (p-DCB)	106467	2	200	200
Dichlorobenzidine, 3,3' -	91941	3	3	3
DDD	72548	10	10	10
DDE	72559	9	9	9
DDT	50293	9	9	9
Dichloroethane, 1,1 -	75343	3	400	500
Dichloroethane, 1,2 -	107062	0.05	0.2	60
Dichloroethylene, 1,1 -	75354	0.7	0.1	9
Dichloroethylene, cis-1,2 -	156592	2	500	500
Dichloroethylene, trans-1,2 -	156605	4	2,500	2,000
Dichlorophenol, 2,4 -	120832	10	90	90
Dichloropropane, 1,2 -	78875	0.1	0.2	40
Dichloropropene, 1,3 -	542756	0.01	0.1	20
Dieldrin	60571	0.1	0.2	0.1
Diethyl Phthalate	84662	100	5,000	0.7
Dimethyl Pethalate	131113	30	5,000	0.7
Dimethylphenol, 2,4 -	105679	0.7	4,000	10
Dinitrophenol, 2,4 -	51285	3	90	6
Dinitrotoluene, 2,4 -	121142	0.7	7	7
Dioxin **	1746016	2.00E-05	2.00E-05	2.00E-05
Endosulfan	115297	0.2	6	0.05
Endrin	72208	0.6	10	1
Ethylbenzene	100414	80	2,500	500
Ethylene Dibromide	106934	0.005	0.04	0.07
Fluoranthene	206440	600	5,000	600
Fluorene	86737	400	5,000	1,000
Heptachlor	76448	0.7	0.7	0.7
Heptachlor Epoxide	1024573	0.3	0.3	0.3
Hexachlorobenzene	118741	3	3	3
Hexachlorobutadiene	87683	3	3	40
Hexachlorocyclohexane, Gamma	58899	0.1	2	0.5

TABLE 4-10

MCP Method 1 - Soil Category S-3 Standards  
(Continued)

Oil and/or Hazardous Material	CAS Number	Applicable When Soil And Groundwater Categories are:		
		S-3 Soil & GW-1 (µg/g)	S-3 Soil & GW-2 (µg/g)	S-3 Soil & GW-3 (µg/g)
Hexachloroethane	67721	30	30	50
Indeno (1,2,3-cd) Pyrene	193395	0.7	0.7	0.7
Lead	7439921	600	600	600
Mercury	7439976	60	60	60
Methoxychlor	72435	300	300	30
Methyl Ethyl Ketone	78933	0.3	40	40
Methyl Isobutyl Ketone	108101	0.5	70	70
Methyl Mercury	22967926	20	20	20
Methyl t-Butyl Ether	1634044	3	200	200
Methylene Chloride	75092	0.1	700	700
Methylnaphthalene, 2 -	91575	0.7	20	7
Naphthalene	91203	4	1,000	1,000
Nickel	7440020	700	700	700
Pentachlorophenol	87865	5	40	40
Phenanthrene	85018	700	2,500	100
Phenol	108952	60	800	500
Polychlorinated Biphenyls (PCBs)	1336363	2	2	2
Pyrene	129000	500	5,000	500
Selenium	7782492	2,500	2,500	2,500
Silver	7440224	200	200	200
Styrene	100425	2	20	100
Tetrachloroethane, 1,1,1,2 -	630206	0.4	0.5	20
Tetrachloroethane, 1,1,2,2 -	79345	0.02	0.2	2
Tetrachloroethylene	127184	0.5	300	500
Thallium	7440280	100	100	100
Toluene	108883	90	500	2,500
Total Petroleum Hydrocarbon ***	NA	5,000	5,000	5,000
Trichlorobenzene, 1,2,4 -	120821	100	900	800
Trichloroethane, 1,1,1 -	71556	30	500	500
Trichloroethane, 1,1,2 -	79005	0.3	10	10
Trichloroethylene	79016	0.4	20	500
Trichlorophenol, 2,4,5 -	95954	3	5,000	2
Trichlorophenol, 2,4,6 -	88062	3	200	200

**TABLE 4-10**

**MCP Method 1 - Soil Category S-3 Standards  
(Continued)**

		Applicable When Soil And Groundwater Categories are:		
Oil and/or Hazardous Material	CAS Number	S-3 Soil & GW-1 (µg/g)	S-3 Soil & GW-2 (µg/g)	S-3 Soil & GW-3 (µg/g)
Vinyl Chloride	75014	0.4	0.3	2
Xylenes (mixed isomers)	1330207	800	500	2,500
Zinc	7440666	5,000	5,000	5,000

Note: All concentrations of oil and/or hazardous material in soil are calculated and presented on a dry weight/dry weight basis.

NA - Not Applicable

- \* - Cyanide expressed as free, or physiologically available cyanide.
- \*\* - Dioxins expressed as 2,3,7,8-TCDD equivalents.
- \*\*\* - Total Petroleum Hydrocarbon excluding benzene, toluene, ethylbenzene, xylenes and specific polycyclic aromatic hydrocarbons (PAHs), and expressed as a weighted average of the individual constituents if sufficient analytical and toxicological data are available.

**Table 4-11**  
**MTL Phase 2 RI Background Soil Sample Results**

SITE ID DEPTH (ft)	BORE 01SB-3	BORE 01SB-3	BORE 01SB-3	BORE 01SB-3	BORE 01SB-3	BORE 01SB-3
	2	4	6	8	12	14
<b>COMPOUND</b>						
BNA						
2-Methylnaphthalene						
Acenaphthene	0.0948					
Acenaphthylene						
Anthracene						
Benzo [A] Anthracene	0.433					
Benzo [A] Pyrene						
Benzo [B] Fluoranthene						
Benzo [G.H.I] Perylene						
Benzo [K] Fluoranthene	0.36					
bis (2-Ethylhexyl) Phthalate						
Butylbenzyl Phthalate						
Chrysene	0.515					
Dibenz [A.H] Anthracene						
Fluoranthene	1.04					
Fluorene						
Indeno [1.2.3-C.D] Pyrene						
Phenanthrene	1.86					
Pyrene	1.05					
<b>PEST/PCB</b>						
alpha-Endosulfan (Endosulfan I)						
beta-Endosulfan						
Chlordane						
delta-Benzenehexachloride						
Dieldrin	0.005					
Endrin						
Heptachlor						
Heptachlor Epoxide						
PCB 1260						
ppDDD						
ppDDE						
ppDDT						
<b>INORGANIC/METAL</b>						
Aluminum	19900	16200	32100	38400	27900	30700
Arsenic	4.04	3.17	6.18	7.81	3.59	4.94
Barium	35.2	37.7	124	176	123	130
Beryllium	0.884	1.17	1.9	2.17	1.57	1.67
Cadmium						
Calcium	5680	7840	6930	6780	6190	6820
Chromium	25.3	18.2	47.4	61.8	127	48.5
Cobalt	19.4	13.9	21	23.5	18.2	20.6
Copper	31.8	15.9	27.6	31.7	24.3	28
Cyanide						
Iron	43200	27700	45500	50800	38800	43700
Lead	46.8	24.5	38	45.1	33.7	40
Magnesium	9080	5250	10600	13400	10300	11700
Manganese	652	374	554	592	426	571
Mercury						
Nickel	22.6	13.6	32.2	41.3	29.4	31.4
Potassium	1230	1490	7020	10400	7300	7920
Selenium						
Sodium	357	523	652	751	581	625
Vanadium	57.5	48.8	74	86.1	66.3	73.9
Zinc	72.5	46.9	90	101	78	86.1
<b>CONVENTIONAL</b>						
pH	8.2	6.9	6.7	6.7	6.9	7.2
Total Organic Carbon	8440	1250	3750	3820	5130	6450
<b>RADIOLOGICAL (pCi/g)</b>						
Alpha gross	8	16	21	27	20	15
Beta gross	12	27	26	37	28	38
Uranium 234	0.4	0.5	0.7	1.2	1.2	1.3
Uranium 235						0.1
Uranium 238	0.4	0.5	0.9	1.1	1	1.2

**Table 4-11**  
**MTL Phase 2 RI Background Soil Sample Results**  
**(Continued)**

SITE ID	BORE BKS-1	BORE BKS-1	BORE BKS-2	BORE BKS-2	BORE BKS-3	BORE BKS-3
DEPTH (ft)	0	16	0	14	0	4
<b>COMPOUND</b>						
<b>BNA</b>						
2-Methylnaphthalene	0.505				0.553	
Acenaphthene	0.157		0.108		2	
Acenaphthylene	1.27		0.259		7.5	
Anthracene	1.49				GT 6.20e+00	
Benzo [A] Anthracene	2		0.48		6.05	
Benzo [A] Pyrene					4.77	
Benzo [B] Fluoranthene	2.18				6.78	
Benzo [G.H.I] Perylene	1.88		0.656		3.83	
Benzo [K] Fluoranthene	1.89		0.369		4.47	
bis (2-Ethylhexyl) Phthalate						
Butylbenzyl Phthalate			2.12			
Chrysene	1.73		0.404		5.06	
Dibenz [A.H] Anthracene	0.494					
Fluoranthene	3.05		0.803		5.1	
Fluorene	0.31		0.217		0.45	
Indeno [1.2.3-C.D] Pyrene					6.2	
Phenanthrene	2.74		1.47		2.57	
Pyrene	4.79		1.38		9.33	
<b>PEST/PCB</b>						
alpha-Endosulfan (Endosulfan I)						
beta-Endosulfan	0.00551		0.00119		0.0194	
Chlordane					0.308	
delta-Benzenehexachloride						
Dieldrin	0.013		0.00324		0.0453	
Endrin					0.0216	
Heptachlor						
Heptachlor Epoxide	0.00513				0.0172	
PCB 1260	0.321					
ppDDD						
ppDDE	0.0037				0.0115	
ppDDT	0.0104				0.0235	
<b>INORGANIC/METAL</b>						
Aluminum	6600	19100	7040	27800	8650	69700
Arsenic	5.14				57.9	
Barium	93.5	51.1	30.6	104	39.3	141
Beryllium		0.805		1.33		2.7
Cadmium						
Calcium	4160	12100	2450	5630	2360	31000
Chromium	11.4	30.5	10.6	35	21	114
Cobalt	5.28	18.8	6.76	15.6	9.84	76.3
Copper	34.8	44.8	16.6	18.8	66.2	136
Cyanide	0.396					
Iron	24300	57000	12500	33500	33900	161000
Lead	62.2	18	36.7	17.1	158	69.6
Magnesium	1610	8900	3140	7580	3710	34600
Manganese	147	581	192	432	274	2560
Mercury	0.0743				0.0794	
Nickel	13	23.2	9.79	26.9	22.3	90.8
Potassium	483	2190	750	4700	668	4930
Selenium			37.8			
Sodium	294	366	94.3	327	113	1270
Vanadium	25.2	81.5	20.2	53.6	31.7	222
Zinc	69.4	88.2	38.9	56.4	104	290
<b>CONVENTIONAL</b>						
pH						
Total Organic Carbon						
<b>RADIOLOGICAL (pCi/g)</b>						
Alpha gross	23	11	17	23	9	6
Beta gross	18	23	27	21	31	17
Uranium 234	1	1.1	0.3	0.8	0.4	0.6
Uranium 235					0.1	
Uranium 238	0.8	0.5	0.6	0.8	0.5	0.4

**Table 4-11**  
**MTL Phase 2 RI Background Soil Sample Results**  
**(Continued)**

SITE ID DEPTH (ft)	BORE BKS3-3	BORE BKS3-3	BORE BKS3-3	BORE BKS3-3	BORE BKS4-4	BORE BKS4-4
	8	12	14	20	0	12
<b>COMPOUND</b>						
<b>BNA</b>						
2-Methylnaphthalene						
Acenaphthene						
Acenaphthylene					0.187	
Anthracene						
Benzo [A] Anthracene					0.144	
Benzo [A] Pyrene						
Benzo [B] Fluoranthene						
Benzo [G.H.I] Perylene						
Benzo [K] Fluoranthene						
bis (2-Ethylhexyl) Phthalate			4.1			
Butylbenzyl Phthalate						
Chrysene					0.166	
Dibenz [A.H] Anthracene						
Fluoranthene					0.295	
Fluorene						
Indeno [1.2.3-C.D] Pyrene						
Phenanthrene					0.215	
Pyrene					0.297	
<b>PEST/PCB</b>						
alpha-Endosulfan (Endosulfan I)						
beta-Endosulfan					0.00263	
Chlordane						
delta-Benzenehexachloride						
Dieldrin					0.00452	
Endrin						
Heptachlor						
Heptachlor Epoxide					0.00183	
PCB 1260						
ppDDD						
ppDDE						
ppDDT						
<b>INORGANIC/METAL</b>						
Aluminum	11600	12000	21300	8170	13100	3160
Arsenic			3.66		5.56	
Barium	29.2	36.9	57.1	19.5	40.2	7.65
Beryllium	0.568		0.974		0.689	
Cadmium						
Calcium	4910	5270	3290	4110	4810	1120
Chromium	14.4	16	26.4	15.5	20.5	6.79
Cobalt	12.3	6.2	12.7	8.89	12.7	
Copper	25.2	7.99	16.8	10.2	30.4	
Cyanide						
Iron	27500	15900	30800	17900	30300	4510
Lead	12				27.7	
Magnesium	5600	3430	6090	2760	5710	1040
Manganese	386	200	268	220	419	41.3
Mercury						
Nickel	14.6	8.16	21.1	11.1	19.2	
Potassium	1080	1230	2690	727	1110	378
Selenium						
Sodium	209	294	161	173	189	71.2
Vanadium	42.8	30.7	43.3	26.3	36.4	5.79
Zinc	45.5	22.2	46.9	26	69.3	7.65
<b>CONVENTIONAL</b>						
pH						
Total Organic Carbon						
<b>RADIOLOGICAL (pCi/g)</b>						
Alpha gross	7	22	14	13	15	2
Beta gross	16	33	26	16	21	14
Uranium 234	0.4	0.9	0.6	0.6	0.4	0.1
Uranium 235		0.1				
Uranium 238	0.4	0.9	0.8	0.8	0.6	0.2

**Table 4-11**  
**MTL Phase 2 RI Background Soil Sample Results**  
**(Continued)**

SITE ID DEPTH (ft)	BORE GR5B-3	BORE GR5B-3	PLUG 01SS-1	PLUG 01SS-1D	PLUG 02SS-1	PLUG 03SS-3
	0	12	0-0.2	0-0.2	0-0.2	0.1
<b>COMPOUND</b>						
BNA						
2-Methylnaphthalene			0.0577		0.0989	
Acenaphthene			0.342	0.247	0.599	0.0906
Acenaphthylene			0.425	0.374	0.428	0.183
Anthracene					2.8	
Benzo [A] Anthracene			1.67	1.74	5.86	0.914
Benzo [A] Pyrene			3.39	3.15	6.87	
Benzo [B] Fluoranthene			7.08	3.29	7.57	1.83
Benzo [G.H.I] Perylene			3.6	2.79	4.4	1.36
Benzo [K] Fluoranthene				3.15	6.29	1.44
bis (2-Ethylhexyl) Phthalate						3
Butylbenzyl Phthalate						
Chrysene	0.482		4.55		9.24	
Dibenz [A.H] Anthracene			0.639	0.511	0.967	
Fluoranthene	0.099		3.44	3.4	GT 6.20e+00	1.76
Fluorene			0.408	0.341	0.996	
Indeno [1.2.3-C.D] Pyrene			5.14	4.42	7.66	
Phenanthrene	0.131		3.3	3.26	12.6	1.33
Pyrene			4.87	5.17	GT 6.20e+00	2.4
<b>PEST/PCB</b>						
alpha-Endosulfan (Endosulfan I)	0.00237				0.01	
beta-Endosulfan	0.004		0.00389	0.00625	0.014	
Chlordane	0.259			0.102	1.9	1.73
delta-Benzenehexachloride					0.0216	
Dieldrin	0.0169		0.0181	0.0225	0.0668	
Endrin	0.037			0.0121	0.16	
Heptachlor	0.00248					
Heptachlor Epoxide	0.00642			0.00594	0.023	
PCB 1260			0.316	0.406	1.56	
ppDDD	0.00905		0.00835	0.043	0.0466	
ppDDE	0.00363		0.00918	0.0245	0.0434	0.251
ppDDT	0.0222		0.0775	0.0991	0.191	
<b>INORGANIC/METAL</b>						
Aluminum	14500	27600	5900	6000	9710	7410
Arsenic		9.28	13.1	4.5	4.5	55.9
Barium	53.4	121	46	42.7	56.8	38.2
Beryllium	0.976	1.69			0.512	
Cadmium					2.18	
Calcium	8210	6020	5230	2220	2670	2220
Chromium	19.8	41.8	19	19.7	23.3	25.2
Cobalt	10.4	15.6	4.84	4.23	6.65	5.36
Copper	30	23.7	45.8	47.5	47.7	48.4
Cyanide						
Iron	23700	35800	19800	18500	22400	20800
Lead	54	17.6	471	506	496	355
Magnesium	5790	8720	3950	2180	3120	2380
Manganese	327	495	158	161	223	184
Mercury			0.0882	0.0846	0.119	0.108
Nickel	15.6	30.3	11.4	10.4	14.8	12.5
Potassium	1490	6470	665	738	833	674
Selenium						
Sodium	235	417	79.6	75.2	212	76
Vanadium	44.5	58.9	22.7	22.3	36.7	29.1
Zinc	60.4	66.9	247	189	278	180
<b>CONVENTIONAL</b>						
pH			7.73	7.2	6.65	7.72
Total Organic Carbon						
<b>RADIOLOGICAL (pCi/g)</b>						
Alpha gross	12	41				16
Beta gross	26	34				22
Uranium 234	0.7	1.3	0.4	0.6	0.6	0.5
Uranium 235	0.1	0.1				
Uranium 238	0.5	1.2	0.5	0.5	0.7	0.5

**Table 4-12  
MTL Phase 2 RI Unit 1 Soil Sample Results**

SITE ID	BORE 01SB-1	BORE 01SB-1	BORE 01SB-2	BORE 01SB-2	BORE GRSB-1	BORE GRSB-1
DEPTH (ft)	0	16	8	19	0	8
<b>COMPOUND</b>						
<b>VOA</b>						
Tetrachloroethylene		0.187				
<b>BNA</b>						
2-Methylnaphthalene	0.0918					
Acenaphthylene	0.161				0.0942	
Benzo [A] Anthracene	0.349	0.146	0.204		0.207	0.212
Benzo [B] Fluoranthene	0.679				0.99	
Benzo [G.H.I] Perylene	1.3				0.476	
Benzo [K] Fluoranthene	0.773				0.619	
Chrysene	0.279	0.137	0.196		0.276	0.112
Fluoranthene	0.893	1.06e-01/ 5.06e-01	0.407		0.527	0.261
Phenanthrene	0.87	1.78e-01/ 8.15e-01	0.378		0.468	0.231
Pyrene	1.28	0.582	0.488		0.602	0.331
<b>PEST/PCB</b>						
beta-Endosulfan	0.000987				0.00767	
Chlordane	0.123				0.325	
Dieldrin	0.00435				0.0267	
Endrin					0.0472	
Heptachlor	0.00309					
Heptachlor Epoxide	0.00194				0.0171	
PCB 1260		0.0894				
ppDDD					0.0165	
ppDDE	0.00261				0.0229	
ppDDT		0.011			0.0759	
<b>INORGANIC/METAL</b>						
Aluminum	8840	4.78e+03/ 6.94e+03	19300	28400	21200	11500
Arsenic				5.99	5.5	
Barium	33.3	1.64e+01/ 1.67e+01	55.5	129	58.4	60.2
Beryllium	0.68		1	1.58	0.975	
Calcium	5530	2.10e+03/ 3.45e+03	3830	5820	9910	4110
Chromium	18	1.02e+01/ 1.25e+01	23.3	52.2	26.6	11.5
Cobalt	8.64	4.00e+00/ 4.99e+00	7.82	18.8	15.4	7.21
Copper	31.2	7.89e+00/ 8.88e+00	15.8	26.6	27.7	16.3
Iron	18800	8.34e+03/ 1.08e+04	22400	41600	32100	14100
Lead	57.5	1.04e+01/ 2.13e+01	44.3	16.8	68	65.2
Magnesium	4100	1.64e+03/ 2.59e+03	3490	11800	7350	2120
Manganese	289	8.37e+01/ 1.14e+02	268	564	349	102
Mercury			0.123		0.119	
Nickel	15.7	4.97e+00/ 5.93e+00	12.2	34.4	23.1	11.2
Potassium	963	6.57e+02/ 8.75e+02	1300	7550	1780	1120
Sodium	141	2.41e+02/ 3.64e+02	302	477	657	199
Vanadium	25.2	1.17e+01/ 1.55e+01	36.4	64.9	61.8	23.1
Zinc	41.5	1.88e+01/ 2.91e+01	62	74.4	114	229
<b>CONVENTIONAL</b>						
pH	7	7.40e+00/ 7.50e+00	6.2	7.7		
Total Organic Carbon		3.41e+03/ 3.41e+03		4910		
<b>RADIOLOGICAL (pCi/g)</b>						
Alpha gross	14	5	12	24	24	26
Beta gross	22	15	20	39	23	19
Uranium 234	0.5	0.3	0.7	1.4	0.7	0.6
Uranium 238	0.7	0.2	0.5	1.3	0.8	0.4



**Table 4-13**  
**MTL Phase 2 RI Unit 2 Soil Sample Results**

SITE ID DEPTH (ft)	BORE 02SB-2	BORE 02SB-2	BORE 02SB-3	BORE 02SB-3	BORE 02SB-4	BORE 02SB-4
	1	14	1	14	2	16
<b>COMPOUND</b>						
<b>VOA</b>						
Tetrachloroethylene			0.741			
Trichloroethylene			0.934		0.348	
<b>BNA</b>						
Acenaphthylene			0.138			
Benzo [A] Anthracene			0.612		0.103	
Benzo [B] Fluoranthene			1.02			
Benzo [G.H.I] Perylene						
Benzo [K] Fluoranthene			1.18			
bis (2-Ethylhexyl) Phthalate	GT 6.20e+00		5.65			7.01
Chrysene					0.13	
Di-n-Octyl Phthalate						1.09
Fluoranthene			0.792		0.24	
Indeno [1.2.3-C.D] Pyrene						
Phenanthrene			0.44		0.252	
Pyrene			0.778		0.278	
<b>PEST/PCB</b>						
beta-Endosulfan					0.000968	
Chlordane						
Dieldrin			0.0237		0.00268	
Endrin						
Endrin Ketone		0.00101	0.00826			
Heptachlor					0.00247	
Heptachlor Epoxide						
Methoxychlor			0.0452			
PCB 1260						
ppDDD			0.0304			
ppDDE						
ppDDT						
<b>INORGANIC/METAL</b>						
Aluminum	21900	32800	18500	30800	15400	23.5
Arsenic	2.96	5.96	6.58			10.7
Barium	71.6	159	59.5	142	51.1	107
Beryllium	1.06	1.96	0.995	1.69	0.742	1.38
Cadmium					1.74	
Calcium	4120	5620	3570	6160	3360	6030
Chromium	22	52.5	25.8	49.4	25.6	37.3
Cobalt	7.55	18.7	6.22	16.4	6.5	14.9
Copper	28.5	30.8	57.1	37.8	459	20
Cyanide	0.988		0.485			
Iron	24200	45600	20800	39300	19300	32400
Lead	57.4	13.3	187	14.4	114	11.2
Magnesium	3910	11600	3620	10500	2610	7720
Manganese	367	499	286	442	245	408
Mercury	0.208		0.169			
Nickel	15	36.6	12.9	32.6	23.6	23.1
Potassium	1310	8960	1280	7550	864	5830
Sodium	343	426	738	532	454	714
Vanadium	40.9	74.3	33.4	63.4	29	51.4
Zinc	50.9	82.4	69.8	77.3	1240	61.8
<b>CONVENTIONAL</b>						
pH	5.4	7.8		6.7	7.1	6.8
<b>RADIOLOGICAL (pCi/g)</b>						
Alpha gross	20	30	23	24	17	19
Beta gross	18	30	13	31	26	32
Uranium 234	0.6	1.6	0.8	1.2	1	0.9
Uranium 235		0.3	0.1	0.1	0.1	0.1
Uranium 238	0.8	1.5	0.7	1.1	1	1.3

**Table 4-13  
MTL Phase 2 RI Unit 2 Soil Sample Results  
(Continued)**

SITE ID DEPTH (ft)	BORE GRSB-2 0	BORE GRSB-2 14	CMPH 02SS-3 0-0.1	PLUG 02SS-2 0-0.2
<b>COMPOUND</b>				
<b>VOA</b>				
Tetrachloroethylene				
Trichloroethylene				
<b>BNA</b>				
Acenaphthylene				
Benzo [A] Anthracene	0.14			
Benzo [B] Fluoranthene	3.9			
Benzo [G.H.I] Perylene	3.55			
Benzo [K] Fluoranthene	3.35			
bis (2-Ethylhexyl) Phthalate				
Chrysene	1.1			
Di-n-Octyl Phthalate				
Fluoranthene	0.503			
Indeno [1.2.3-C.D] Pyrene	5.64			
Phenanthrene	0.305			
Pyrene	0.601			
<b>PEST/PCB</b>				
beta-Endosulfan	0.0121		0.0105	
Chlordane			0.159	
Dieldrin	0.0393		0.0379	
Endrin	0.0151		0.0139	
Endrin Ketone				
Heptachlor				
Heptachlor Epoxide			0.0108	
Methoxychlor				
PCB 1260			4.54	
ppDDD	0.01		0.0166	
ppDDE			0.00653	
ppDDT			0.317	
<b>INORGANIC/METAL</b>				
Aluminum	18500	12200	9230	10000
Arsenic			5.58	8.86
Barium	31	24.1	49.3	99.7
Beryllium	0.724			
Cadmium			1.58	
Calcium	8240	7820	3390	2740
Chromium	27.2	16.6	47.4	26.5
Cobalt	6.87	10.9	14.7	7.2
Copper	17	25.5	142	67.4
Cyanide				
Iron	22500	27200	61200	22800
Lead	24.7	10.1	234	1120
Magnesium	6640	6180	2790	3520
Manganese	257	308	347	216
Mercury	0.0688		0.191	0.184
Nickel	13.7	15.8	120	19.2
Potassium	1220	1100	894	528
Sodium	584	427	170	103
Vanadium	52	48	47.1	61.7
Zinc	44.1	50.7	152	345
<b>CONVENTIONAL</b>				
pH			7.25	7.08
<b>RADIOLOGICAL (pCi/g)</b>				
Alpha gross	8	14		
Beta gross	26	16		
Uranium 234	1.2	0.4	1.2	0.8
Uranium 235			0.2	
Uranium 238	0.7	0.4	0.9	0.7

**Table 4-14  
MTL Phase 2 RI Unit 3 Soil Sample Results**

SITE ID	BORE 03SB-1	BORE 03SB-2	BORE 03SB-2	CMPH 03SS-1	PLUG 03SS-2
DEPTH (ft)	1	0	22	0-0.2	0.2
<b>COMPOUND</b>					
<b>VOA</b>					
Methylene Chloride		GT 1.00e+01			
Tetrachloroethylene		0.36			
<b>BNA</b>					
bis (2-Ethylhexyl) Phthalate		12.7			
Fluoranthene	0.807				
Phenanthrene	0.701	1.39			
<b>PEST/PCB</b>					
Aldrin		0.00613			
beta-Endosulfan	0.00184			0.00652	
Dieldrin	0.00572	0.0135		0.0159	
Endrin				0.0103	
Endrin Ketone	0.00125	0.01			
Heptachlor Epoxide				0.0069	
Methoxychlor		0.0644			
PCB 1260				0.97	
ppDDD		0.00673			
ppDDE				0.0138	
ppDDT	0.00581	0.00533	0.0043	0.0713	
<b>INORGANIC/METAL</b>					
Aluminum	6200	5890	11600	10400	10300
Arsenic	6.13	4.64		3.4	14.4
Barium	19.5	39.3	34.5	58.8	127
Beryllium			0.792	0.542	
Cadmium		2.01		2.08	
Calcium	6810	4440	4610	4560	14800
Chromium	11.1	384	22.7	26.8	33.7
Cobalt	4.69	41.7	14.5	13.3	6.87
Copper	14.7	322	18.9	154	392
Iron	12800	194000	30600	38100	26600
Lead	10.1	259	11.9	328	1530
Magnesium	2580	1970	3930	3700	4070
Manganese	170	1340	210	297	285
Mercury		0.0784		0.14	0.269
Nickel	12.3	1780	17.8	70.7	30
Potassium	863	715	917	970	745
Silver		1.17			
Sodium	93.7	282	282	140	172
Vanadium	13.8	36.4	41.8	38.6	58.5
Zinc	25.6	99.3	48.1	164	314
<b>CONVENTIONAL</b>					
pH	7.4			7.92	8.37
Total Organic Carbon	15200				
<b>RADIOLOGICAL (pCi/g)</b>					
Alpha gross	12	6	21		23
Beta gross	16	13	31		20
Uranium 234	0.5	0.6	1	0.9	0.9
Uranium 235	0.1				0.1
Uranium 238	0.5	0.5	1.1	3.4	0.7

**Table 4-15  
MTL Phase 2 RI Unit 4 Soil Sample Results**

SITE ID DEPTH (ft)	BORE 04SB-1	CMPH 04SS-1
	0	0-0.2
<b>COMPOUND</b>		
<b>BNA</b>		
Benzo [A] Anthracene	0.301	
Chrysene	0.33	
Fluoranthene	0.492	
Phenanthrene	0.572	
Pyrene	0.739	
<b>PEST/PCB</b>		
beta-Endosulfan	0.00398	0.00333
Chlordane	0.186	0.17
Dieldrin	0.0105	0.0189
Endrin		0.0126
Heptachlor Epoxide	0.0053	0.00545
PCB 1260	0.127	0.573
ppDDD		0.0177
ppDDE	0.00746	0.208
ppDDT		0.166
<b>INORGANIC/METAL</b>		
Aluminum	26600	11900
Arsenic		4.12
Barium	70.3	47.7
Beryllium	1.2	0.577
Calcium	11600	2270
Chromium	40.6	25.4
Cobalt	19.9	8.38
Copper	42.9	26.4
Iron	55900	20900
Lead	74.5	67.3
Magnesium	12900	5070
Manganese	761	249
Mercury		0.342
Nickel	34.2	17.1
Potassium	2100	723
Sodium	342	114
Vanadium	77.5	31.5
Zinc	130	68.7
<b>CONVENTIONAL</b>		
pH	16.8	
Total Organic Carbon	37300	
<b>RADIOLOGICAL (pCi/g)</b>		
Alpha gross	14	
Beta gross	21	
Uranium 234	0.6	0.7
Uranium 238	0.6	0.8

**Table 4-16**  
**MTL Phase 2 RI Unit 5 Soil Sample Results**

SITE ID	BORE 05SB-1	BORE 05SB-1	BORE 05SB-2	BORE 05SB-2	BORE GRSB-5	BORE GRSB-5
DEPTH (ft)	0	30	0	10	0	12
<b>COMPOUND</b>						
<b>VOA</b>						
1,1,2,2-Tetrachloroethane		0.391				
Dichlorobenzene - unspecified		0.277				
<b>BNA</b>						
2-Methylnaphthalene						
Acenaphthene						
Acenaphthylene			0.103			
Anthracene						
Benzo [A] Anthracene	0.308		0.365		0.167	
Benzo [A] Pyrene						
Benzo [B] Fluoranthene					0.709	
Benzo [G.H.I] Perylene			0.461		0.809	
Benzo [K] Fluoranthene	0.265		0.361		0.519	
Chrysene	0.374		0.328		0.252	
Dibenz [A.H] Anthracene						
Fluoranthene	0.485		0.756		0.543	
Fluorene						
Indeno [1.2.3-C.D] Pyrene						
Phenanthrene	0.437		0.0765		0.417	
Pyrene	0.526		0.837		0.592	
<b>PEST/PCB</b>						
beta-Endosulfan	0.00369		0.00267		0.00487	
Chlordane						
Dieldrin	0.016		0.00943		0.0197	
Heptachlor			0.00391			
Heptachlor Epoxide	0.00648					
Lindane	0.00144		0.00827			
ppDDD	0.0359		0.00332		0.0169	
ppDDE	0.219				0.0121	
ppDDT	0.416				0.0344	
<b>INORGANIC/METAL</b>						
Aluminum	12800	11500	10800	22300	8770	22900
Arsenic	4.8	4.9	8.33	10.4	4.39	3.65
Barium	34.9	38.1	81.9	91.9	34.8	98
Beryllium	0.81	0.808	0.906	1.06		1.09
Cadmium						
Calcium	2580	4260	4290	4960	2230	7990
Chromium	14.3	17.7	20.7	37.8	14.5	32.4
Cobalt	5.69	9.28	10.2	14.5	4.36	11.6
Copper	15.4	14.8	621	23.4	13.2	16.8
Iron	15200	19000	38000	35300	10800	28900
Lead	75.1	18.5	7160	10.6	41.8	
Magnesium	2480	4300	2660	7610	1890	6770
Manganese	222	229	179	413	126	383
Mercury	0.185				0.0661	
Nickel	7.44	13.5	21.3	25.2	8.44	20
Potassium	848	2180	959	4730	638	5170
Silver					14.3	
Sodium	239	262	170	274	150	577
Vanadium	30	29.8	36.4	51.7	19.1	53.7
Zinc	50.4	36.6	95.6	56.7	36.2	47.6
<b>CONVENTIONAL</b>						
pH	6.3	7				
<b>RADIOLOGICAL (pCi/g)</b>						
Alpha gross	15	21	38	29	20	29
Beta gross	24	33	23	32	12	33
Uranium 234	0.7	0.9	2.4	1.2	0.8	1.7
Uranium 235			0.1	0.1		
Uranium 238	0.6	1	2.2	1.2	0.9	1.1

**Table 4-16**  
**MTL Phase 2 RI Unit 5 Soil Sample Results**  
**(Continued)**

SITE ID DEPTH (ft)	PLUG 05SS-1 0-0.2	PLUG 05SS-2 0-0.2
<b>COMPOUND</b>		
<b>VOA</b>		
1,1,2,2-Tetrachloroethane		
Dichlorobenzene - unspecific		
<b>BNA</b>		
2-Methylnaphthalene	0.108	
Acenaphthene	0.806	0.234
Acenaphthylene	0.384	0.18
Anthracene	2.96	
Benzo [A] Anthracene	11.8	2.14
Benzo [A] Pyrene	10.7	3.34
Benzo [B] Fluoranthene	11.6	3.96
Benzo [G,H,I] Perylene	8.09	2.69
Benzo [K] Fluoranthene	8.58	2.85
Chrysene		4.69
Dibenz [A,H] Anthracene	1.65	
Fluoranthene	GT 6.20e+00	3.97
Fluorene	0.99	0.274
Indeno [1,2,3-C,D] Pyrene	14.3	
Phenanthrene	15	3.46
Pyrene	GT 6.20e+00	5.64
<b>PEST/PCB</b>		
beta-Endosulfan		
Chlordane	1.52	3.36
Dieldrin		
Heptachlor		
Heptachlor Epoxide		
Lindane		
ppDDD		
ppDDE		
ppDDT		
<b>INORGANIC/METAL</b>		
Aluminum	27300	9440
Arsenic	5.28	5.34
Barium	56.2	41.8
Beryllium		
Cadmium	2.26	
Calcium	2940	3770
Chromium	54.2	17
Cobalt	33.6	8.38
Copper	1060	57.1
Iron	15600	15300
Lead	176	95.6
Magnesium	3840	2320
Manganese	275	186
Mercury	4.54	0.143
Nickel	40.4	11.8
Potassium	722	749
Silver		
Sodium		82.9
Vanadium	32.4	27.7
Zinc	248	72.6
<b>CONVENTIONAL</b>		
pH	7.59	8.4
<b>RADIOLOGICAL (pCi/g)</b>		
Alpha gross		
Beta gross		
Uranium 234	0.8	0.7
Uranium 235	0.1	
Uranium 238	1.2	0.7

**Table 4-17**  
**MTL Phase 2 RI Unit 6 Soil Sample Results**

SITE ID	BORE 06SB-1	BORE 06SB-1	BORE 06SB-2	BORE 06SB-2	BORE 06SB-3	BORE 06SB-3
DEPTH (ft)	0	18	0	16	4	18
<b>COMPOUND</b>						
<b>BNA</b>						
2-Methylnaphthalene	0.19		0.139			
Acenaphthene	0.75		0.176			
Acenaphthylene	0.28					
Anthracene	3.43					
Benzo [A] Anthracene	4.62		1.28		0.1	
Benzo [A] Pyrene	6.15					
Benzo [B] Fluoranthene	3.61		0.922			
Benzo [G.H.I] Perylene	6.56					
Benzo [K] Fluoranthene	2.66					
bis (2-Ethylhexyl) Phthalate				1.08		
Chrysene	3.16		1.32		0.101	
Dibenz [A.H] Anthracene	1.3					
Fluoranthene	GT 6.20e+00		2.04		0.332	
Fluorene	1.06		0.242			
Indeno [1.2.3-C.D] Pyrene	6.8					
Phenanthrene	12.9		2.45		0.375	
Pyrene	GT 6.20e+00		1.73		0.391	
<b>PEST/PCB</b>						
alpha-Endosulfan (Endosulfan I)	0.00603					
beta-Endosulfan	0.0474		0.00747		0.00881	
Chlordane						
delta-Benzenehexachloride						
Dieldrin	0.418	0.118	0.00641		0.0338	
Endrin	0.0372					
Heptachlor						
Heptachlor Epoxide			0.00263		0.00802	
Isodrin	0.00676					
Lindane						
PCB 1260						
ppDDD	0.0373		0.0386		0.0123	
ppDDE	0.0174		0.181			
ppDDT	0.0849		0.334	0.012	0.0144	
<b>INORGANIC/METAL</b>						
Aluminum	12300	15000	17400	1.54e+04/ 3.03e+04	16600	10100
Arsenic	6.35		5.83	5.46	8.92	
Barium	62.4	63.6	72.9	5.46e+01/ 1.49e+02	69.9	32.2
Beryllium	0.682	0.988	1.1	1.12e+00/ 1.81e+00	1.07	0.822
Cadmium						
Calcium	3730	5680	4370	6.47e+03/ 8.14e+03	3810	6160
Chromium	23.6	25.5	26.8	2.42e+01/ 5.02e+01	37.6	18.5
Cobalt	8.67	12.1	10.9	1.32e+01/ 2.06e+01	11.6	10
Copper	81.9	14.8	31.7	1.43e+01/ 2.68e+01	75.2	10.1
Cyanide						
Iron	20800	24200	28100	2.53e+04/ 4.24e+04	34600	18200
Lead	138	23.4	66.8	2.29e+01/ 3.72e+01	116	
Magnesium	3760	5810	4840	6.00e+03/ 1.17e+04	4130	4130
Manganese	247	287	400	3.45e+02/ 6.24e+02	426	249
Mercury	0.0672		0.0994		0.181	
Nickel	20	16.8	20.7	1.58e+01/ 3.42e+01	44.3	13
Potassium	1280	3680	2870	3.04e+03/ 8.36e+03	1130	1640
Silver						
Sodium	366	538	252	5.19e+02/ 5.61e+02	199	310
Vanadium	34.4	40.9	41.2	4.73e+01/ 6.98e+01	38.8	32.3
Zinc	89.6	45.4	65.2	4.39e+01/ 8.28e+01	133	28.7
<b>CONVENTIONAL</b>						
pH	6.8	6.6		7.00e+00/ 7.10e+00		
Total Organic Carbon						3910
<b>RADIOLOGICAL (pCi/g)</b>						
Alpha gross	15	19	27	25	26	37
Beta gross	26	31	26	33	19	33
Cesium 137						
Thorium 230			1.1	1.2	1.1	1
Uranium 234	0.7	1.1	1.2	1	0.6	0.8
Uranium 235	0.1		0.1			
Uranium 238	0.7	0.8	1.3	1.1	0.6	0.7

Units are ug/g unless noted

**Table 4-17**  
**MTL Phase 2 RI Unit 6 Soil Sample Results**  
**(Continued)**

SITE ID DEPTH (ft)	BORE 06SB-4	BORE 06SB-4	BORE 06SB-4	BORE 06SB-5	BORE 06SB-5	BORE GRSB-6
	0	10	16	0	25	0
<b>COMPOUND</b>						
<b>BNA</b>						
2-Methylnaphthalene				0.19		0.0628
Acenaphthene	0.0892			0.201		0.347
Acenaphthylene				0.345		0.258
Anthracene						1.77
Benzo [A] Anthracene	0.797			2.95		2.39
Benzo [A] Pyrene				3.46		2.68
Benzo [B] Fluoranthene				3.41		1.74
Benzo [G.H.I] Perylene				3.47		2.11
Benzo [K] Fluoranthene				2.25		2.04
bis (2-Ethylhexyl) Phthalate						
Chrysene	0.895					1.93
Dibenz [A.H] Anthracene				0.788		0.528
Fluoranthene	1.42			3.74		5.76
Fluorene				0.393		0.51
Indeno [1.2.3-C.D] Pyrene				5.51		
Phenanthrene	1.32			3.98		4.76
Pyrene	1.13			4.19		GT 6.20e+00
<b>PEST/PCB</b>						
alpha-Endosulfan (Endosulfan I)						
beta-Endosulfan	0.00436			0.0109		0.0292
Chlordane	0.281			0.546		
delta-Benzenehexachloride						
Dieldrin	0.0175			0.0516		4.01
Endrin	0.0226			0.0369		0.014
Heptachlor				0.0308		
Heptachlor Epoxide	0.00653			0.0165		0.867
Isodrin						0.406
Lindane				0.00149		
PCB 1260						
ppDDD	1.16e-01/ 1.34e-01			0.0163		0.121
ppDDE	2.12e-01/ 1.98e-01			0.0198		0.0882
ppDDT	1.21			0.0921		9.61
<b>INORGANIC/METAL</b>						
Aluminum	13500	8280	16000	10300	22400	16300
Arsenic			3.97	8.29	5.01	3.78
Barium	51.3	31.4	63.6	54.6	94.6	54
Beryllium	0.889	0.621	1.02	0.631	1.25	0.762
Cadmium						10
Calcium	4700	3500	4970	3610	5920	4350
Chromium	32.7	12	34.5	19.5	36.3	112
Cobalt	9.56	8.82	12.2	9.22	16	8.68
Copper	305	164	25.7	38.6	26	61.3
Cyanide						2.07
Iron	26400	15600	25100	23100	33200	23600
Lead	72.4	17	25	96.2	32.8	177
Magnesium	4040	4390	5690	5120	7940	4680
Manganese	288	234	363	254	450	333
Mercury	0.0876			0.126		0.0714
Nickel	21.2	11.3	21.7	22.9	25.1	42.1
Potassium	1800	1800	3040	1220	5540	1120
Silver						
Sodium	197	205	408	147	436	285
Vanadium	37.7	26.3	41	31	53.5	51.2
Zinc	158	39.7	52.5	77.6	66.2	172
<b>CONVENTIONAL</b>						
pH	8	7.2	7.2	6.4	7.3	
Total Organic Carbon				158000	2510	
<b>RADIOLOGICAL (pCi/g)</b>						
Alpha gross	28	8	19	21	27	32
Beta gross	28	27	26	24	25	25
Cesium 137						
Thorium 230	0.9	0.8	1.2	2.5	1.2	
Uranium 234	1	0.6	1.1	0.6	1	0.8
Uranium 235	0.1	0.1	0.1			
Uranium 238	0.8	0.6	1	0.7	1.2	0.7

Units are ug/g unless noted

**Table 4-17**  
**MTL Phase 2 RI Unit 6 Soil Sample Results**  
**(Continued)**

SITE ID DEPTH (ft)	BORE GR5B-6 12	CMPH 06SS-1 0-0.2	CMPH 06SS-2 0-0.2	CMPH 06SS-4 0-0.2	PLUG 06SS-3 0-0.2
<b>COMPOUND</b>					
BNA					
2-Methylnaphthalene					
Acenaphthene					
Acenaphthylene					
Anthracene					
Benzo [A] Anthracene					
Benzo [A] Pyrene					
Benzo [B] Fluoranthene					
Benzo [G.H.I] Perylene					
Benzo [K] Fluoranthene					
bis (2-Ethylhexyl) Phthalate					
Chrysene					
Dibenz [A.H] Anthracene					
Fluoranthene					
Fluorene					
Indeno [1.2.3-C.D] Pyrene					
Phenanthrene					
Pyrene					
<b>PEST/PCB</b>					
alpha-Endosulfan (Endosulfan I)				0.011	
beta-Endosulfan				0.00732	
Chlordane				3.09	
delta-Benzenehexachloride				0.0261	
Dieldrin	0.00614			0.0438	
Endrin				0.177	
Heptachlor					
Heptachlor Epoxide	0.00323			0.0866	
Isodrin					
Lindane					
PCB 1260				0.701	
ppDDD				0.0153	
ppDDE				0.102	
ppDDT	0.00705			0.147	
<b>INORGANIC/METAL</b>					
Aluminum	13400	13600	13500	11700	11000
Arsenic		4.25	7.71	3.93	6.88
Barium	40.2	34.5	74.5	76.1	35.8
Beryllium	0.736			0.553	0.556
Cadmium				1.8	
Calcium	6710	1910	2460	2260	1390
Chromium	29.4	20.4	27.2	23.8	16.2
Cobalt	13.3	7.04	5.78	5.79	6.84
Copper	47.6	26.1	47.1	58.2	63.3
Cyanide					
Iron	27300	16200	19000	17100	21500
Lead	13.4	73	250	424	90
Magnesium	6000	3830	2240	2500	2780
Manganese	442	215	215	263	309
Mercury		0.228	0.224	0.999	0.0981
Nickel	18.2	15.5	13.8	15.3	17.9
Potassium	1460	557	773	749	674
Silver		1.19			
Sodium	281	57.2	84.4	107	56.6
Vanadium	43.8	31.5	39.5	37.9	29.2
Zinc	91.4	700	512	123	75.9
<b>CONVENTIONAL</b>					
pH		6.91			6.4
Total Organic Carbon					
<b>RADIOLOGICAL (pCi/g)</b>					
Alpha gross	18				
Beta gross	20				
Cesium 137		0.44	0.87		0.07
Thorium 230		1	0.8		0.8
Uranium 234	0.5	0.8	0.6		0.5
Uranium 235					
Uranium 238	0.7	0.6	0.6		0.4

Units are ug/g unless noted

**Table 4-18**  
**MTL Phase 2 RI Unit 7 Soil Sample Results**

SITE ID DEPTH (ft)	BORE 07SB-1	BORE 07SB-1	BORE GRSB-7	BORE GRSB-7	BORE GRSB-8	BORE GRSB-8
	0	14	0	14	0	14
<b>COMPOUND</b>						
<b>VOA</b>						
1,1,2,2-Tetrachloroethane	0.211					
<b>BNA</b>						
Acenaphthene	0.234					
Acenaphthylene	0.115					
Benzo [A] Anthracene	0.827	0.178	0.113		0.0852	
Benzo [B] Fluoranthene	1.58					
Benzo [G.H.I] Perylene	2.47					
Benzo [K] Fluoranthene	2.4	0.486				
bis (2-Ethylhexyl) Phthalate		1.18				
Chrysene	0.637	0.152	0.116		0.133	
Dibenz [A.H] Anthracene	0.565					
Fluoranthene	2.85	0.406	0.169		0.157	
Fluorene	0.336					
Phenanthrene	4.24	0.378	0.09		0.16	
Pyrene	3.4	0.538	0.212		0.181	
<b>PEST/PCB</b>						
beta-Endosulfan	0.00612				0.000765	
Chlordane	0.173					
Dieldrin	0.0305				0.00417	
Endrin	0.00829					
Heptachlor	0.0129					
Heptachlor Epoxide	0.00698					
Lindane			0.0013		0.00312	
ppDDE	0.00841				0.00476	
ppDDT	0.0198				0.00401	
<b>INORGANIC/METAL</b>						
Aluminum	7720	1.09e+04/ 2.92e+04	7010	40100	14800	28100
Arsenic		5.13		13.9	4.86	
Barium	42	3.22e+01/ 1.26e+02	25.2	199	57.1	118
Beryllium	0.559	7.57e-01/ 1.60e+00		2.22	1.02	1.8
Calcium	3470	6.77e+03/ 7.90e+03	3040	4530	4450	7440
Chromium	15.8	2.10e+01/ 4.93e+01	14	56.1	241	44
Cobalt	6.86	9.78e+00/ 1.96e+01	7.02	22.7	15.8	18.4
Copper	15.9	1.02e+01/ 2.81e+01	12.4	35.3	194	26.1
Iron	17200	1.76e+04/ 4.11e+04	14300	50000	42900	37200
Lead	43.2	9.89e+00/ 1.67e+01	11.1	17.4	116	16
Magnesium	3750	4.25e+03/ 1.17e+04	3270	11500	5460	8960
Manganese	248	2.29e+02/ 6.10e+02	234	580	451	472
Nickel	13.2	1.21e+01/ 3.40e+01	9.98	45.4	270	33.1
Potassium	760	1.78e+03/ 6.59e+03	760	9020	1370	5810
Sodium	95.8	4.11e+02/ 6.26e+02	301	594	194	471
Vanadium	19.9	3.23e+01/ 6.65e+01	20.6	81.6	42.1	65.6
Zinc	33	2.98e+01/ 7.84e+01	25.5	97.7	136	67.2
<b>CONVENTIONAL</b>						
Total Organic Carbon		3.85e+03/ 3.94e+03				
<b>RADIOLOGICAL (pCi/g)</b>						
Alpha gross	5	26	20	19	20	29
Beta gross	20	29	23	41	30	32
Uranium 234	0.7	1.3	0.7	1.2	0.7	1.3
Uranium 235			0.1			
Uranium 238	0.6	1.5	0.6	1.4	0.5	1.1



**Table 4-19**  
**MTL Phase 2 RI Unit 8 Soil Sample Results**

SITE ID	BORE 08SB-2	BORE 08SB-2	BORE 08SB-3	BORE 08SB-3	BORE 08SB-3	PLUG 08SS-1
DEPTH (ft)	1	4	1	6	10	0-0.2
<b>COMPOUND</b>						
<b>VOA</b>						
Chloroform	0.57					
Trichloroethylene			1.04			
<b>BNA</b>						
2-Methylnaphthalene	71.6	1.22	0.939			
Acenaphthene	74.6	1.91	1.89			
Acenaphthylene	141	2.66	2.67			
Anthracene	GT 1.24e+02	6.13	4.59			
Benzo [A] Anthracene	338	10.7	13.5		0.116	
Benzo [A] Pyrene	GT 1.24e+02	6.75	5.96			
Benzo [B] Fluoranthene	299	3.62	13.3			
Benzo [G.H.I] Perylene	169	5.86	6.98			
Benzo [K] Fluoranthene	292	5.24	10.6			
Chrysene	283	8.34	9.26		1.11	
Dibenz [A.H] Anthracene	46.7	1.31				
Dibenzofuran	72.6	1.98	2.03			
Fluoranthene	GT 1.24e+02	GT 6.20e+00	GT 6.20e+00			
Fluorene	168	4.11	3.46			
Indeno [1.2.3-C.D] Pyrene	236	8.02	9.87			
Naphthalene	163	2.39	2			
Phenanthrene	GT 2.40e+02	GT 1.20e+01	GT 1.20e+01			
Pyrene	GT 1.24e+02	GT 6.20e+00	GT 6.20e+00			
<b>PEST/PCB</b>						
Aldrin	0.0941					
alpha-Benzenehexachloride	0.00395					
alpha-Endosulfan (Endosulfan I)		0.00143				
beta-Endosulfan	0.127	0.00208	0.0211			
Dieldrin	0.617	0.00577	0.11			
Endrin	0.0204		0.0111			
Heptachlor	0.0073					
Heptachlor Epoxide	0.065		0.0176			
Isodrin	0.0523		0.00419			
ppDDD	0.0393					
ppDDE	0.0118					
<b>INORGANIC/METAL</b>						
Aluminum	13200	13800	12000	17600	17200	7800
Arsenic	2.94		7.78			3.6
Barium	117	36	87.7	30.1	71	28.4
Beryllium	0.836	0.981	0.686	1.03	1.05	
Cadmium	1.64		2.35			
Calcium	8740	5760	13000	6170	7420	2100
Chromium	54.4	53.8	20.5	23.4	21.8	14
Cobalt	24.8	13.1	9.2	16.1	14.4	4.35
Copper	90.2	34.2	50.1	23.5	26.7	99.1
Cyanide	0.279					
Iron	63300	32000	26100	33700	29200	9910
Lead	146	32.8	80.8	8.09		139
Magnesium	12700	6360	2990	8200	8870	1780
Manganese	458	359	336	467	401	123
Mercury	0.169					0.113
Nickel	52	20.1	23.8	20.4	21.6	7.83
Potassium	995	1190	756	1100	2020	655
Silver			0.928			
Sodium	420	282	315	208	288	280
Vanadium	52.6	46.7	22	54.8	52.6	19
Zinc	45.4	43.1	60.2	62	60.4	79.5
<b>CONVENTIONAL</b>						
pH	10.3	7.9		7.46	6.28	6.94
<b>RADIOLOGICAL (pCi/g)</b>						
Alpha gross	15	20	19	11	20	
Beta gross	19	21	26	22	24	
Uranium 234	0.6	0.3	1.1	0.3	0.6	0.7
Uranium 235			0.1	0.1	0.1	0.1
Uranium 238	0.7	0.4	1.5	0.5	0.6	1.5

**Table 4-20  
MTL Phase 2 RI Unit 9 Soil Sample Results**

SITE ID	BORE 09SB-1	BORE 09SB-1	BORE 09SB-1	BORE 09SB-1	BORE GRSB-10	BORE GRSB-10
DEPTH (ft)	0	2	18	34	0	34
<b>COMPOUND</b>						
<b>BNA</b>						
2-Methylnaphthalene					1.63	
Acenaphthene	0.125				1.39	
Acenaphthylene	0.168				0.3	
Anthracene					2.65	
Benzo [A] Anthracene	0.649	0.178			0.933	
Benzo [A] Pyrene						
Benzo [B] Fluoranthene	1.8				3.04	
Benzo [G.H.I] Perylene	2.05					
Benzo [K] Fluoranthene					2.69	
bis (2-Ethylhexyl) Phthalate			1.46			
Chrysene	0.524	0.18			2.13	
Dibenzofuran					1.09	
Fluoranthene	2	0.533			4.43	
Fluorene					2.39	
Indeno [1.2.3-C.D] Pyrene						
Naphthalene					5.1	
Phenanthrene	2.33	0.749			10.9	
Pyrene	2.68	0.669			7.46	
<b>PEST/PCB</b>						
Aldrin						
alpha-Endosulfan (Endosulfan I)	0.0334					
beta-Endosulfan	0.027	0.0033	0.00161	0.00533	0.00202	
Chlordane	1.08	0.134				
Dieldrin	0.0106	0.0101	0.00339		0.0177	
Endrin	0.0503					
Heptachlor	0.00453	0.00471			0.00453	
Heptachlor Epoxide	0.019	0.0061			0.00214	
Isodrin						
Lindane					0.0315	
Methoxychlor						
PCB 1260						
ppDDD	0.0276	0.00326				
ppDDE	0.0427	0.00539	0.00315			
ppDDT	0.118	0.0217	0.00603			
<b>INORGANIC/METAL</b>						
Aluminum	14200	17100	14700	9930	19200	7750
Arsenic	4.23	4.18	4.21			
Barium	56.4	51.2	50.8	25.1	66.9	21.8
Beryllium	0.982	0.988	1.05	0.702	0.909	
Cadmium						
Calcium	16700	6170	4240	4140	5560	3220
Chromium	22.1	19.9	26.7	17.8	59.2	14.8
Cobalt	8.12	8.39	13	9.98	16	10.7
Copper	36.2	55	21.4	17.8	26.5	16
Iron	20000	24300	27700	26000	23600	25000
Lead	83.2	82.9	14.2	12.9	20.6	
Magnesium	4020	3480	5790	4400	14900	3700
Manganese	265	263	398	314	541	575
Mercury	0.292	0.229				
Nickel	19.9	16	16.4	11.9	41.6	16.5
Potassium	1060	1080	1740	801	1190	660
Silver						
Sodium	229	221	272	215	250	216
Vanadium	38.6	31.9	40.4	26.6	46.2	25.1
Zinc	62.1	61	47.4	46.7	41.4	40.4
<b>CONVENTIONAL</b>						
pH						
<b>RADIOLOGICAL (pCi/g)</b>						
Alpha gross	24	14	22	16	14	17
Beta gross	20	27	24	19	23	22
Uranium 234	0.8	0.9	0.6	0.6	0.7	0.5
Uranium 235	0.1		0.2	0.1		
Uranium 238	0.9	0.7	0.6	0.5	0.6	0.3

**Table 4-20**  
**MTL Phase 2 RI Unit 9 Soil Sample Results**  
**(Continued)**

SITE ID DEPTH (ft)	BORE GRSB-9	CMPH 09SS-1	CMPH 09SS-2
	0	0-0.1	0-0.1
<b>COMPOUND</b>			
<b>BNA</b>			
2-Methylnaphthalene	0.119		
Acenaphthene	0.38		
Acenaphthylene	0.135		
Anthracene	1.73		
Benzo [A] Anthracene	5.94		
Benzo [A] Pyrene	6.94		
Benzo [B] Fluoranthene	6.66		
Benzo [G.H.I] Perylene	2.82		
Benzo [K] Fluoranthene	5.19		
bis (2-Ethylhexyl) Phthalate			
Chrysene	4.28		
Dibenzofuran			
Fluoranthene	5.84		
Fluorene	0.326		
Indeno [1.2.3-C.D] Pyrene	5.02		
Naphthalene			
Phenanthrene	5.43		
Pyrene	GT 6.20e+00		
<b>PEST/PCB</b>			
Aldrin		0.05	
alpha-Endosulfan (Endosulfan I)		0.014	
beta-Endosulfan		0.127	
Chlordane		0.105	
Dieldrin		0.486	
Endrin			
Heptachlor			
Heptachlor Epoxide		0.0666	
Isodrin		0.0136	
Lindane	0.0131		
Methoxychlor		0.069	
PCB 1260		0.593	
ppDDD		0.0573	
ppDDE		0.0226	
ppDDT		0.207	
<b>INORGANIC/METAL</b>			
Aluminum	10200	8630	9120
Arsenic	7.01	4.67	7.3
Barium	42.1	48	78
Beryllium	0.649		0.513
Cadmium		10.1	13
Calcium	5680	4750	2760
Chromium	18.9	35.5	274
Cobalt	10.4	11.3	704
Copper	13.6	906	1390
Iron	18400	26200	50300
Lead	9.4	504	792
Magnesium	5030	3660	3270
Manganese	353	298	375
Mercury		0.269	GT 1.00e+00
Nickel	16.8	40.1	744
Potassium	1220	868	751
Silver			38.9
Sodium	271	148	160
Vanadium	35.9	68.8	112
Zinc	34.8	520	446
<b>CONVENTIONAL</b>			
pH		8.16	7.55
<b>RADIOLOGICAL (pCi/g)</b>			
Alpha gross	20		
Beta gross	24		
Uranium 234	0.7	0.4	0.7
Uranium 235			
Uranium 238	0.6	0.4	0.7

**Table 4-21  
MTL Phase 2 RI Unit 10 Soil Sample Results**

SITE ID	BORE 10SB-1	BORE 10SB-1	BORE 10SB-2	BORE 10SB-2	BORE 10SB-2
DEPTH (ft)	0.2	18	0.5	20	26
<b>COMPOUND</b>					
<b>VOA</b>					
Ethylbenzene				0.535	
<b>BNA</b>					
2-Methylnaphthalene				1.37	
Acenaphthene				1.8	
Benzo [A] Anthracene	0.489				
Benzo [B] Fluoranthene	0.768				
Benzo [G.H.I] Perylene	0.738				
Benzo [K] Fluoranthene	0.782				
Chrysene	0.46				
Fluoranthene	1.04		0.147		
Fluorene				6.24	
Phenanthrene	0.819		0.311	12.8	
Pyrene	1.28		0.164	6.98	
<b>PEST/PCB</b>					
alpha-Benzenehexachloride				0.0347	
beta-Endosulfan	0.00238			0.0292	
Dieldrin	0.00686			0.0735	
Heptachlor	0.00451				
Lindane			0.00185	0.0203	
<b>INORGANIC/METAL</b>					
Aluminum	5210	26800	7900	11800	25400
Arsenic		3.7			5.63
Barium	26.1	137	37.2	46.6	119
Beryllium		1.48	0.766	0.675	1.52
Calcium	3080	5660	3380	6050	4540
Chromium	9.24	47.8	11.1	14.2	40.8
Cobalt	5.56	17.4	5.35	12.6	16.6
Copper	5.78	21.7	6.17	22.9	21.6
Iron	10300	38300	16200	27300	34000
Lead	10.8	15.2		9.53	15.9
Magnesium	2760	9760	2410	6100	7490
Manganese	337	713	337	251	640
Nickel	6.69	33.4	6.39	16.5	27.1
Potassium	349	6940	1070	1150	5500
Sodium	115	615	177	233	446
Vanadium	15.4	58.6	19.8	48.6	57
Zinc	25.9	73.2	34	51.5	64.1
<b>CONVENTIONAL</b>					
pH		7.3			
<b>RADIOLOGICAL (pCi/g)</b>					
Alpha gross	9	24	25	4	29
Beta gross	28	34	35	14	21
Uranium 234	0.5	1.4	0.5	0.3	0.3
Uranium 235	0.1	0.1			
Uranium 238	0.4	1.4	0.5	0.2	0.3

**Table 4-22**  
**MTL Phase 2 RI Unit 11 Soil Sample Results**

SITE ID	BORE 11SB-1	BORE 11SB-1	BORE 11SB-2	BORE 11SB-2	BORE 11SB-2	BORE 11SB-2
DEPTH (ft)	1	24	0.5	4	22	24
<b>COMPOUND</b>						
<b>BNA</b>						
2-Methylnaphthalene			0.128	0.0706		
Acenaphthene				0.0709		
Acenaphthylene						
Anthracene						
Benzo [A] Anthracene			0.447	0.152		
Benzo [A] Pyrene						
Benzo [B] Fluoranthene			0.797			
Benzo [G.H.I] Perylene			0.64			
Benzo [K] Fluoranthene			0.52			
bis (2-Ethylhexyl) Phthalate		1.17				
Chrysene			0.442	0.118		
Di-n-Butyl Phthalate						
Dibenz [A.H] Anthracene						
Dibenzofuran			0.0583			
Fluoranthene			1	0.0323		
Fluorene						
Indeno [1.2.3-C.D] Pyrene						
n-Nitroso Diphenylamine						
Phenanthrene			1.41	0.601		
Pyrene			1.36	0.428		
<b>PEST/PCB</b>						
Aldrin						
beta-Endosulfan						
Chlordane						
Dieldrin				0.00295		
Endrin						
Heptachlor			0.0136	0.00413		
Heptachlor Epoxide			0.00256			
Lindane						
PCB 1260		0.101	0.281			
ppDDD						
ppDDE						
ppDDT		0.01	0.0288			
<b>EXPLOSIVE</b>						
2,4-Dinitrotoluene						
2,6-Dinitrotoluene						
<b>INORGANIC/METAL</b>						
Aluminum	6240	13800	8350	9480	16400	8460
Arsenic	7.91			3.86		
Barium	24.7	34	37.6	23.1	46.2	21.2
Beryllium		0.874	0.666	0.673	1.12	0.796
Calcium	2090	7400	5470	4140	6540	4760
Chromium	8.45	81.1	14.8	16.2	45.7	15.3
Cobalt	3.05	15	8.9	8.43	17	11.4
Copper	45.1	24.1	67.2	10.7	28.5	8.13
Iron	15100	33100	23300	13000	41000	15100
Lead	471	8.26	857	8.99	15.4	
Magnesium	1130	8560	3330	3580	8280	2560
Manganese	127	513	303	166	580	278
Mercury						
Nickel	11.8	36.7	13.8	11.2	22.4	7.56
Potassium	1020	844	788	924	1650	946
Sodium	660	175	380	431	347	272
Vanadium	13.5	44.6	22.6	24.1	47.8	26.9
Zinc	64.8	60.5	156	22.2	71.8	22.4
<b>CONVENTIONAL</b>						
pH	7.8	7.6				
Total Organic Carbon	21500	3120				
<b>RADIOLOGICAL (pCi/g)</b>						
Alpha gross	14	9	13	15	32	19
Beta gross	9	16	24	24	30	19
Uranium 234	0.3	0.7	0.3	1.1	1	0.6
Uranium 235				0.1		
Uranium 238	0.3	0.6	0.4	0.8	0.9	0.7

Units are ug/g unless noted

**Table 4-22**  
**MTL Phase 2 RI Unit 11 Soil Sample Results**  
**(Continued)**

SITE ID	BORE 11SB-3	BORE 11SB-3	BORE 11SB-3	BORE 11SB-3	BORE 11SB-4	BORE 11SB-4
DEPTH (ft)	0.5	4	22	32	0	34
<b>COMPOUND</b>						
<b>BNA</b>						
2-Methylnaphthalene					0.185	
Acenaphthene					0.251	
Acenaphthylene					0.186	
Anthracene						
Benzo [A] Anthracene		0.124			1.73	
Benzo [A] Pyrene					2.63	
Benzo [B] Fluoranthene					2.75	
Benzo [G.H.I] Perylene					2.24	
Benzo [K] Fluoranthene					2.59	
bis (2-Ethylhexyl) Phthalate				1.49		
Chrysene		0.12			3.7	
Di-n-Butyl Phthalate					GT 6.20e+00	
Dibenz [A.H] Anthracene					0.619	
Dibenzofuran						
Fluoranthene	0.493	0.271			3.16	
Fluorene					0.332	
Indeno [1.2.3-C.D] Pyrene						
n-Nitroso Diphenylamine					10.8	
Phenanthrene	0.399	0.194			3.57	
Pyrene	0.774	0.36			4.6	
<b>PEST/PCB</b>						
Aldrin						
beta-Endosulfan	0.00199				0.00814	
Chlordane						
Dieldrin	0.00802				0.0496	
Endrin						
Heptachlor	0.00496					
Heptachlor Epoxide	0.00196					
Lindane					0.0333	
PCB 1260						
ppDDD						
ppDDE						
ppDDT						
<b>EXPLOSIVE</b>						
2,4-Dinitrotoluene					GT 6.20e+00	
2,6-Dinitrotoluene					8.15	
<b>INORGANIC/METAL</b>						
Aluminum	12300	11600	10200	6.72e+03/ 1.08e+04	11800	5010
Arsenic	3.12	2.98			10.5	
Barium	35.1	39.7	28	2.54e+01/ 2.76e+01	59.9	15.7
Beryllium	0.718	0.738	0.656	5.24e-01/ 7.02e-01	0.771	
Calcium	2960	4810	3940	2.35e+03/ 2.71e+03	5010	2860
Chromium	23.7	20.9	18.1	9.74e+00/ 1.10e+01	35.4	13.2
Cobalt	36.1	11.3	9.56	7.93e+00/ 9.87e+00	7.63	6.56
Copper	848	35.8	16.5	9.90e+00/ 1.36e+01	56.9	7.99
Iron	116000	25500	18500	2.29e+04/ 3.03e+04	20500	11700
Lead	62.6	16.1	12.9	8.72e+00/ 9.75e+00	121	
Magnesium	3820	5430	3630	3.13e+03/ 5.34e+03	2930	2880
Manganese	464	280	278	2.73e+02/ 4.52e+02	297	137
Mercury	0.573				GT 1.00e+00	
Nickel	52.8	12.3	12.3	1.00e+01/ 1.34e+01	19.6	7.49
Potassium	890	1680	1250	5.98e+02/ 7.02e+02	896	535
Sodium	202	266	230	1.21e+02/ 1.59e+02	124	139
Vanadium	32	31.5	28	1.83e+01/ 2.40e+01	37	20
Zinc	162	38.3	32.3	3.93e+01/ 4.99e+01	85.1	22.7
<b>CONVENTIONAL</b>						
pH						
Total Organic Carbon				4.36e+03/ 4.39e+03		
<b>RADIOLOGICAL (pCi/g)</b>						
Alpha gross	16	11	7	10	10	1
Beta gross	26	25	17	24	21	23
Uranium 234	0.6	0.6	0.3	0.4	1.3	0.5
Uranium 235						0.1
Uranium 238	0.5	0.4	0.4	0.4	1.2	0.4

**Table 4-22**  
**MTL Phase 2 RI Unit 11 Soil Sample Results**  
**(Continued)**

SITE ID DEPTH (ft)	BORE 11SB-4D 34	BORE GRSB-15 0	BORE GRSB-15 32	BORE GRSB-15D 0
<b>COMPOUND</b>				
<b>BNA</b>				
2-Methylnaphthalene		0.17		0.218
Acenaphthene		0.742		0.691
Acenaphthylene		0.399		0.37
Anthracene		3.04		2.54
Benzo [A] Anthracene		7.69		7.18
Benzo [A] Pyrene		8.23		7.91
Benzo [B] Fluoranthene		8.13		7.34
Benzo [G.H.I] Perylene		7.37		7.05
Benzo [K] Fluoranthene		5.21		6.08
bis (2-Ethylhexyl) Phthalate				
Chrysene		7.11		6.62
Di-n-Butyl Phthalate				
Dibenz [A.H] Anthracene		0.796		0.819
Dibenzofuran				
Fluoranthene		GT 6.20e+00		6.85
Fluorene		1.02		0.922
Indeno [1.2.3-C.D] Pyrene		10.8		11.1
n-Nitroso Diphenylamine				
Phenanthrene		10.4		9.09
Pyrene		GT 6.20e+00		GT 6.20e+00
<b>PEST/PCB</b>				
Aldrin		0.00443		0.0102
beta-Endosulfan		0.0198		0.0247
Chlordane		0.786		2.74
Dieldrin		0.0477		0.0816
Endrin		0.0406		0.133
Heptachlor				
Heptachlor Epoxide		0.0207		0.0555
Lindane				
PCB 1260				
ppDDD		0.0796		2.70e-01/ 3.82e-01
ppDDE		0.131		4.18e-01/ 5.77e-01
ppDDT		0.392		1.25
<b>EXPLOSIVE</b>				
2,4-Dinitrotoluene				
2,6-Dinitrotoluene				
<b>INORGANIC/METAL</b>				
Aluminum	6950	16000	5480	15600
Arsenic		1.16e+01/ 3.10e+01		11.2
Barium	24.7	56.5	20.1	53.9
Beryllium		0.802		0.723
Calcium	4270	3830	3190	3870
Chromium	12.9	28.8	9.18	26.5
Cobalt	8.44	8.05	4.97	7.24
Copper	11.2	83.8	5.85	80.7
Iron	15000	20300	12500	19200
Lead		190		192
Magnesium	3560	3130	2250	3310
Manganese	164	260	150	260
Mercury		0.12		0.12
Nickel	9.69	17.7	7.63	17.1
Potassium	1060	1030	460	888
Sodium	215	161	150	148
Vanadium	25.9	41	18.6	39.5
Zinc	29.9	103	20	103
<b>CONVENTIONAL</b>				
pH				
Total Organic Carbon				
<b>RADIOLOGICAL (pCi/g)</b>				
Alpha gross	2	36	11	28
Beta gross	20	26	16	23
Uranium 234	1	0.8	0.4	1.1
Uranium 235		0.1		
Uranium 238	1.1	1	0.2	1.2

Units are ug/g unless noted

**Table 4-23**  
**MTL Phase 2 RI Unit 12 Soil Sample Results**

SITE ID	BORE 12SB-1	BORE 12SB-1	BORE 12SB-1	BORE 12SB-1	BORE 12SB-2	BORE 12SB-2
DEPTH (ft)	0.5	8	18	26	4	8
<b>COMPOUND</b>						
<b>VOA</b>						
1,3-Dimethylbenzene				0.286		
Toluene				0.517		
<b>BNA</b>						
2-Methylnaphthalene					0.105	0.617
Acenaphthene					0.254	1.77
Acenaphthylene					0.0921	0.266
Anthracene						2.69
Benzo [A] Anthracene	0.153				1.18	4.55
Benzo [A] Pyrene						3.35
Benzo [B] Fluoranthene					2.06	3.92
Benzo [G.H.I] Perylene					1.71	4.36
Benzo [K] Fluoranthene					1.57	3.57
Chrysene	0.246				1.09	3.97
Dibenz [A.H] Anthracene						0.838
Dibenzofuran						1.08
Fluoranthene	0.193				2.28	GT 6.20e+00
Fluorene					0.441	2.02
Indeno [1.2.3-C.D] Pyrene						7.16
Naphthalene						
Phenanthrene	0.183				3.19	GT 1.20e+01
Pyrene	0.218				2.69	GT 6.20e+00
<b>PEST/PCB</b>						
Aldrin						
alpha-Benzenhexachloride						
beta-Benzenhexachloride						
beta-Endosulfan	0.0119				0.0105	
Dieldrin	0.0519				0.0536	
Heptachlor						0.00437
Heptachlor Epoxide						
Isodrin						
Lindane	0.0131	0.00136				0.0139
ppDDD						
ppDDT						0.00899
<b>INORGANIC/METAL</b>						
Aluminum	13200	6370	8300	9070	8010	7140
Arsenic	21.2			3.38	7.26	
Barium	110	21.2	30.8	23.3	81.9	31.6
Beryllium	0.633	0.491	0.568		0.73	
Cadmium					2.16	
Calcium	4600	1950	2700	2760	3910	2080
Chromium	36.3	11.7	15.8	13.1	15.4	13.5
Cobalt	11.3	6.45	8.24	9.45	10.5	6.45
Copper	226	11.6	14.3	12.9	278	88.2
Cyanide	0.786	0.269	0.28	0.308	0.33	0.317
Iron	50400	10700	16500	18600	27800	25200
Lead	187	8.55			763	478
Magnesium	5870	2750	3450	3270	2510	1420
Manganese	654	159	256	317	404	298
Mercury	0.319				0.0721	
Nickel	28.9	8	11.4	14.4	155	80.7
Potassium	3260	960	794	782	876	708
Sodium	551	205	186	132	176	171
Vanadium	44.4	16.1	26.4	26	41.3	26
Zinc	246	32	41	48.1	426	151
<b>CONVENTIONAL</b>						
Total Organic Carbon				2450		
<b>RADIOLOGICAL (pCi/g)</b>						
Alpha gross					15	5
Beta gross					29	21
Uranium 234					0.7	0.5
Uranium 235					0.1	
Uranium 238					0.7	0.5

**Table 4-23**  
**MTL Phase 2 RI Unit 12 Soil Sample Results**  
**(Continued)**

SITE ID	BORE 12SB-2	BORE 12SB-2	BORE 12SB-2D	BORE 12SB-3	BORE 12SB-3	BORE GR5B-13
DEPTH (ft)	18	28	28	0	20	0
<b>COMPOUND</b>						
<b>VOA</b>						
1,3-Dimethylbenzene						
Toluene						
<b>BNA</b>						
2-Methylnaphthalene				0.242		0.355
Acenaphthene				0.137		0.0924
Acenaphthylene				0.184		
Anthracene						
Benzo [A] Anthracene				1.34		0.466
Benzo [A] Pyrene						
Benzo [B] Fluoranthene				1.95		
Benzo [G,H,I] Perylene				1.76		
Benzo [K] Fluoranthene				1.94		
Chrysene				3.92		0.55
Dibenz [A,H] Anthracene						
Dibenzofuran						
Fluoranthene				1.97		0.615
Fluorene				0.16		
Indeno [1,2,3-C,D] Pyrene						
Naphthalene						
Phenanthrene		0.467	0.164	1.68		1.23
Pyrene				2.93		0.965
<b>PEST/PCB</b>						
Aldrin				0.0119		
alpha-Benzenhexachloride						
beta-Benzenhexachloride						
beta-Endosulfan				0.00717		
Dieldrin				0.00872		
Heptachlor						
Heptachlor Epoxide				0.0237		
Isodrin				0.00792		
Lindane						0.0127
ppDDD				0.00762		
ppDDT						
<b>INORGANIC/METAL</b>						
Aluminum	11400	20800	9310	9690	11500	8600
Arsenic		4.67	4.11	10.9		
Barium	36.1	75.2	31.5	97.1	38.5	38.5
Beryllium	0.774	1.41	0.681			
Cadmium						
Calcium	4980	4510	3470	12400	5960	5860
Chromium	18.8	31.5	19.4	25.6	18	14.8
Cobalt	13.4	13.9	9.33	9.54	8.67	8.05
Copper	28	18	15.9	321	12.6	25.5
Cyanide	0.274	0.356	0.344	0.462	0.32	
Iron	30400	29700	20200	78200	18500	19900
Lead	9.13	13.1		311		48.6
Magnesium	6140	6530	3230	2920	3610	3040
Manganese	415	462	276	565	305	276
Mercury				0.208		
Nickel	30.6	21.9	13.6	34.9	11.1	15.1
Potassium	1120	4120	1290	1010	2060	835
Sodium	270	298	222	219	534	454
Vanadium	41	50.1	33	28.9	32.2	31.1
Zinc	59.7	54.7	36.3	132	26.8	64.6
<b>CONVENTIONAL</b>						
Total Organic Carbon		4010	3820			
<b>RADIOLOGICAL (pCi/g)</b>						
Alpha gross	9	18	31	28	20	3
Beta gross	24	26	25	32	19	21
Uranium 234	0.5	1.1	0.9	1.7	1.3	0.5
Uranium 235				0.1		
Uranium 238	0.3	0.6	0.8	1.4	0.6	0.3

**Table 4-23**  
**MTL Phase 2 RI Unit 12 Soil Sample Results**  
**(Continued)**

SITE ID DEPTH (ft)	BORE GRSB-13 22
<b>COMPOUND</b>	
<b>VOA</b>	
1,3-Dimethylbenzene	
Toluene	
<b>BNA</b>	
2-Methylnaphthalene	7.52
Acenaphthene	
Acenaphthylene	
Anthracene	
Benzo [A] Anthracene	0.393
Benzo [A] Pyrene	
Benzo [B] Fluoranthene	
Benzo [G.H.I] Perylene	
Benzo [K] Fluoranthene	
Chrysene	
Dibenz [A.H] Anthracene	
Dibenzofuran	
Fluoranthene	
Fluorene	1.06
Indeno [1.2.3-C.D] Pyrene	
Naphthalene	2.89
Phenanthrene	
Pyrene	1.11
<b>PEST/PCB</b>	
Aldrin	
alpha-Benzenehexachloride	0.027
beta-Benzenehexachloride	0.0214
beta-Endosulfan	
Dieldrin	0.00583
Heptachlor	0.00907
Heptachlor Epoxide	
Isodrin	
Lindane	
ppDDD	
ppDDT	
<b>INORGANIC/METAL</b>	
Aluminum	9500
Arsenic	
Barium	29.7
Beryllium	
Cadmium	
Calcium	5400
Chromium	18.1
Cobalt	11.6
Copper	17.4
Cyanide	
Iron	24000
Lead	
Magnesium	4310
Manganese	194
Mercury	
Nickel	11.7
Potassium	903
Sodium	268
Vanadium	43.6
Zinc	38.4
<b>CONVENTIONAL</b>	
Total Organic Carbon	
<b>RADIOLOGICAL (pCi/g)</b>	
Alpha gross	10
Beta gross	25
Uranium 234	0.5
Uranium 235	
Uranium 238	0.7

**Table 4-24  
MTL Phase 2 RI Unit 13 Soil Sample Results**

SITE ID DEPTH (ft)	BORE 13SB-1 0	BORE 13SB-1 8	BORE 13SB-1 14	BORE 13SB-1 32	BORE 13SB-2 0	BORE 13SB-2 24
<b>COMPOUND</b>						
<b>BNA</b>						
2-Methylnaphthalene						
Acenaphthene						
Acenaphthylene						
Anthracene						
Benzo [A] Anthracene	0.334					
Benzo [A] Pyrene						
Benzo [B] Fluoranthene						
Benzo [G.H.I] Perylene	1.27					
Benzo [K] Fluoranthene	1.32					
Benzyl Alcohol						
bis (2-Ethylhexyl) Phthalate						1.48
Chrysene	0.457					
Di-n-Butyl Phthalate						1.68
Dibenz [A.H] Anthracene						
Fluoranthene	0.884				0.41	
Fluorene						
Indeno [1.2.3-C.D] Pyrene						
Phenanthrene	1.13				0.501	
Pyrene	1.31				0.974	
<b>PEST/PCB</b>						
Aldrin						
alpha-Endosulfan (Endosulfan I)					0.0241	
beta-Endosulfan	0.00462				0.0018	
Chlordane	0.492					
delta-Benzenehexachloride						
Dieldrin	0.0504				0.0349	
Endrin	0.247				0.0168	
Heptachlor Epoxide	0.0336				0.00228	
Lindane					0.0108	
Methoxychlor	0.0607					
PCB 1260						
ppDDD	0.468				0.0051	
ppDDE	1.07e+00/ 1.55e+00				0.00448	
ppDDT	3.87				0.0123	
<b>INORGANIC/METAL</b>						
Aluminum	16700	9890	6820	9380	20200	8830
Arsenic	19.7	2.79			9.75	3.24
Barium	50.3	33	24.2	25.2	79.1	29.9
Beryllium					1.41	
Calcium	2980	2930	1850	4640	3580	3060
Chromium	19.7	24.5	10.4	15.8	27.3	14.1
Cobalt	7.09	6.86	5.62	7.66	41.6	6.77
Copper	28.8	20.4	14	12.9	34.9	10.1
Iron	21200	17800	17800	17500	35700	16200
Lead	226				326	
Magnesium	3140	4510	2930	3100	5590	3050
Manganese	250	210	349	232	1090	266
Mercury	0.288					
Nickel	13.6	20.1	8.83	9.5	20.7	11.9
Potassium	934	1760	793	1320	1760	1120
Sodium	137	177	112	237	312	143
Vanadium	48.8	24.1	18.4	28.2	52	25.3
Zinc	58.6	27.6	28.3	26.6	90.3	28
<b>CONVENTIONAL</b>						
pH						
Total Organic Carbon						
<b>RADIOLOGICAL (pCi/g)</b>						
Alpha gross						
Beta gross						
Cesium 137						
Thorium 230						
Uranium 234						
Uranium 235						
Uranium 238						

**Table 4-24**  
**MTL Phase 2 RI Unit 13 Soil Sample Results**  
**(Continued)**

SITE ID	BORE 13SB-3	BORE 13SB-3	BORE GRSB-17	BORE GRSB-17	BORE GRSB-21
DEPTH (ft)	2	25	0	30	0
<b>COMPOUND</b>					
<b>BNA</b>					
2-Methylnaphthalene					
Acenaphthene					
Acenaphthylene					
Anthracene					
Benzo [A] Anthracene			0.646		
Benzo [A] Pyrene					
Benzo [B] Fluoranthene			0.793		
Benzo [G.H.I] Perylene					
Benzo [K] Fluoranthene			1.29		
Benzyl Alcohol					
bis (2-Ethylhexyl) Phthalate					
Chrysene			0.714		
Di-n-Butyl Phthalate					
Dibenz [A.H] Anthracene					
Fluoranthene	0.0416		0.773		0.188
Fluorene					
Indeno [1.2.3-C.D] Pyrene					
Phenanthrene			0.629		
Pyrene			0.966		0.315
<b>PEST/PCB</b>					
Aldrin			0.00639		0.00762
alpha-Endosulfan (Endosulfan I)	0.00278				
beta-Endosulfan	0.00305		0.000912		
Chlordane	0.364		0.912		2.25
delta-Benzenehexachloride					
Dieldrin	0.011		0.0283		0.0569
Endrin	0.0377		0.0551		GT 5.00e-01
Heptachlor Epoxide	0.00845		0.0443		0.0829
Lindane					
Methoxychlor					
PCB 1260		0.0745			
ppDDD	0.00342		0.00949		0.203
ppDDE	0.0134		0.0215		0.71
ppDDT	0.0346	0.0186	0.05		1.1
<b>INORGANIC/METAL</b>					
Aluminum	11400	7.91e+03/ 7.93e+03	17700	5110	22300
Arsenic	5.43	6.85e+00/ 7.41e+00	1.63e+01/ 2.70e+01		8.36
Barium	69.5	2.08e+01/ 2.30e+01	55.4	16.5	50.3
Beryllium	0.963		0.622		1.04
Calcium	2490	2.57e+03/ 3.28e+03	2550	3920	2070
Chromium	14.8	1.29e+01/ 1.49e+01	23.8	10	24.2
Cobalt	5.66	5.26e+00/ 5.54e+00	7.62	6.47	6.42
Copper	33.2	9.99e+00/ 1.15e+01	37.3	5.6	23
Iron	19700	1.82e+04/ 1.92e+04	20800	10700	22800
Lead	161		215		62.2
Magnesium	1940	2.59e+03/ 3.02e+03	3610	1900	3590
Manganese	190	1.36e+02/ 1.49e+02	341	146	365
Mercury	0.151		0.177		0.101
Nickel	12.1	7.37e+00/ 8.99e+00	20.9	6.7	14.6
Potassium	647	7.48e+02/ 7.79e+02	754	587	732
Sodium	92.4	1.30e+02/ 1.50e+02	113	199	123
Vanadium	25.1	2.46e+01/ 2.64e+01	46.2	20.4	41.1
Zinc	62.5	2.45e+01/ 2.80e+01	67.8	17.4	55
<b>CONVENTIONAL</b>					
pH					
Total Organic Carbon		2.43e+03/ 2.49e+03			
<b>RADIOLOGICAL (pCi/g)</b>					
Alpha gross			16	21	37
Beta gross			24	26	32
Cesium 137					1.2
Thorium 230				0.9	1
Uranium 234			0.8	0.5	0.7
Uranium 235				0.1	0.1
Uranium 238			0.7	0.7	1.1

Units are ug/g unless noted

**Table 4-24**  
**MTL Phase 2 RI Unit 13 Soil Sample Results**  
**(Continued)**

SITE ID	BORE GR	CMPH	PLUG	PLUG	PLUG	PLUG
DEPTH (ft)	GRSB-21	13SS-3	13SS-1	13SS-2	13SS-5	13SS-6
COMPOUND	24	0-0.1	0-0.2	0-0.2	0-0.2	0.1
<b>BNA</b>						
2-Methylnaphthalene			0.118	0.1		
Acenaphthene			0.479	0.271		
Acenaphthylene			0.611	0.27		
Anthracene			2.42			
Benzo [A] Anthracene			6.04	2.52		0.214
Benzo [A] Pyrene			6.08	3.28		
Benzo [B] Fluoranthene			6.79	3.66		
Benzo [G.H.I] Perylene			4.21	3.08		
Benzo [K] Fluoranthene			5.13	3.26		0.71
Benzyl Alcohol			1.29			
bis (2-Ethylhexyl) Phthalate	1.1					
Chrysene				6.6		
Di-n-Butyl Phthalate						
Dibenz [A.H] Anthracene				0.604		
Fluoranthene			GT 6.20e+00	4.38		0.458
Fluorene			0.751	0.426		
Indeno [1.2.3-C.D] Pyrene			7.21			
Phenanthrene			8.68	4.76		0.322
Pyrene			11	5.35		0.796
<b>PEST/PCB</b>						
Aldrin						
alpha-Endosulfan (Endosulfan I)						
beta-Endosulfan					0.00472	
Chlordane			1.58	9.36	5.05	
delta-Benzenehexachloride					0.0336	
Dieldrin					0.0502	
Endrin					0.221	
Heptachlor Epoxide					0.119	
Lindane						
Methoxychlor						
PCB 1260					4.87	
ppDDD				3.48	0.358	
ppDDE				5.94	0.257	
ppDDT				0.701	0.364	
<b>INORGANIC/METAL</b>						
Aluminum	7440	15700	16000	9850	13900	18300
Arsenic	8.26	9.25	10.7	52.5	14.2	
Barium	19.3	41.4	79.5	41	56.4	71.2
Beryllium	0.556	0.71	0.612			
Calcium	2890	5950	2980	1970	2310	7210
Chromium	11.8	19.9	35	14.6	21.3	16.2
Cobalt	7.93	10.4	8.14	6.87	5.76	8.63
Copper	13.5	31.2	88.9	56.3	58.1	34.8
Iron	15500	23100	24400	40400	19700	25200
Lead	125	372	206	404	138	
Magnesium	3000	4920	3560	1820	2590	4910
Manganese	232	263	267	300	250	323
Mercury	0.134	0.453	0.268	0.567	0.439	
Nickel	11	13.9	24.6	29.1	18.6	12.2
Potassium	611	1100	1260	486	811	1250
Sodium	126	151	187	65.5	181	137
Vanadium	23.1	46.2	74.3	38.6	48.2	41.8
Zinc	26.8	73.4	109	71.3	119	141
<b>CONVENTIONAL</b>						
pH		7.51	4.71	6.89		8.25
Total Organic Carbon						
<b>RADIOLOGICAL (pCi/g)</b>						
Alpha gross	15					18
Beta gross	23					25
Cesium 137						
Thorium 230						
Uranium 234	0.3		1.2	0.7		0.6
Uranium 235						
Uranium 238	0.4		1.3	0.6		0.8

Units are ug/g unless noted

**Table 4-24**  
**MTL Phase 2 RI Unit 13 Soil Sample Results**  
**(Continued)**

SITE ID DEPTH (ft)	PLUG 13SS-7	PLUG 13SS-8
	0.1-0.2	0.1
<b>COMPOUND</b>		
<b>BNA</b>		
2-Methylnaphthalene		0.129
Acenaphthene		
Acenaphthylene		
Anthracene		
Benzo [A] Anthracene	0.344	0.57
Benzo [A] Pyrene		
Benzo [B] Fluoranthene	0.747	1.6
Benzo [G.H.I] Perylene		1.17
Benzo [K] Fluoranthene	0.928	1.13
Benzyl Alcohol		
bis (2-Ethylhexyl) Phthalate		
Chrysene	1.08	1.88
Di-n-Butyl Phthalate		
Dibenz [A.H] Anthracene		
Fluoranthene	0.634	1.13
Fluorene		
Indeno [1.2.3-C.D] Pyrene		
Phenanthrene	0.393	0.856
Pyrene	0.878	1.57
<b>PEST/PCB</b>		
Aldrin		
alpha-Endosulfan (Endosulfan I)		
beta-Endosulfan		
Chlordane		
delta-Benzenehexachloride		
Dieldrin		
Endrin		
Heptachlor Epoxide		
Lindane		
Methoxychlor		
PCB 1260		
ppDDD		0.241
ppDDE	0.189	0.324
ppDDT		
<b>INORGANIC/METAL</b>		
Aluminum	19300	17700
Arsenic	22.2	17.4
Barium	84.9	52.4
Beryllium	0.596	
Calcium	4620	1660
Chromium	22.6	18.8
Cobalt	7.98	5.74
Copper	48.1	38.9
Iron	23200	20300
Lead	240	339
Magnesium	4430	2820
Manganese	513	278
Mercury	0.475	0.296
Nickel	14.8	15.6
Potassium	1140	549
Sodium	97.6	68.8
Vanadium	45.9	45
Zinc	147	84.2
<b>CONVENTIONAL</b>		
pH	7.79	5.13
Total Organic Carbon		
<b>RADIOLOGICAL (pCi/g)</b>		
Alpha gross	28	28
Beta gross	27	19
Cesium 137		
Thorium 230		
Uranium 234	0.6	0.8
Uranium 235		
Uranium 238	0.7	0.6

**Table 4-25**  
**MTL Phase 2 RI Unit 14 Soil Sample Results**

SITE ID DEPTH (ft)	BORE 14SB-1 0	BORE 14SB-1 8	BORE 14SB-1 14	BORE 14SB-1 16	CMPH 14SS-1 0-0.1	CMPH 14SS-1D 0-0.1
<b>COMPOUND</b>						
<b>VOA</b>						
Benzene	0.258	0.1				
Toluene	0.205	0.102				
<b>BNA</b>						
2-Methylnaphthalene	0.113					
Acenaphthene	0.136					
Benzo [A] Anthracene	0.56	0.111				
Benzo [G.H.I] Perylene	1.44	0.41				
Benzo [K] Fluoranthene	0.649					
Chrysene	0.63	0.127				
Fluoranthene	1.05	0.217				
Fluorene	0.176					
Phenanthrene	1.95	0.307				
Pyrene	1.32	0.194				
<b>PEST/PCB</b>						
Aldrin	0.00381	0.0022				
alpha-Endosulfan (Endosulfan I)	0.00248					
beta-Endosulfan	0.0063	0.00261			0.0236	0.00197
Chlordane					1.67	1.7
delta-Benzenehexachloride					0.0218	0.0183
Dieldrin	0.027	0.0105			0.312	0.0177
Endrin	0.0185				0.115	0.0495
Heptachlor	0.00987	0.006				
Heptachlor Epoxide	0.00382	0.00287			0.016	0.018
Lindane	0.0288	0.0126				
PCB 1260					0.52	0.537
ppDDD	0.014	0.00451			0.0567	0.0205
ppDDE	0.0291	0.00629			0.0215	0.0208
ppDDT	0.0309	0.00801			0.175	0.214
<b>INORGANIC/METAL</b>						
Aluminum	14200	10300	7320	15200	9600	8480
Arsenic	12.9	4.37	3.88	8.85	8.8	10.1
Barium	58.1	44.1	16.8	34.6	51.4	48.4
Beryllium	0.943	0.785		0.73	0.505	
Calcium	5100	3300	1670	2280	2240	1770
Chromium	28	18.5	12.6	28.2	24.2	19.4
Cobalt	14.6	8.25	5.4	8.06	7.84	6.82
Copper	123	91.8	22.1	21.1	139	129
Iron	77400	22100	16300	34400	19700	19400
Lead	263	53			211	199
Magnesium	4100	4400	2580	4940	3020	2740
Manganese	478	325	117	221	296	291
Mercury					0.68	0.226
Nickel	29.4	20.1	9.3	15	34.1	28.8
Potassium	1220	1310	623	2140	835	850
Sodium	150	103	89.5	153	141	97
Vanadium	46	31.3	20.8	41.1	73.6	76.1
Zinc	156	66.2	22.5	31.5	319	311
<b>CONVENTIONAL</b>						
Nitrite/Nitrate - nonspecific						

**Table 4-25**  
**MTL Phase 2 RI Unit 14 Soil Sample Results**  
**(Continued)**

SITE ID DEPTH (ft)	CMPH 14SS-2	CMPH 14SS-3
	0-0.2	0.2
<b>COMPOUND</b>		
<b>VOA</b>		
Benzene		
Toluene		
<b>BNA</b>		
2-Methylnaphthalene		
Acenaphthene		
Benzo [A] Anthracene		
Benzo [G.H.I] Perylene		
Benzo [K] Fluoranthene		
Chrysene		
Fluoranthene		
Fluorene		
Phenanthrene		
Pyrene		
<b>PEST/PCB</b>		
Aldrin		
alpha-Endosulfan (Endosulfan I)		
beta-Endosulfan	0.0011	
Chlordane	0.55	
delta-Benzenehexachloride		
Dieldrin	0.0174	
Endrin	0.0298	
Heptachlor		
Heptachlor Epoxide	0.0088	
Lindane		
PCB 1260	0.0844	
ppDDD	0.0042	
ppDDE	0.0281	
ppDDT	0.0241	
<b>INORGANIC/METAL</b>		
Aluminum	6680	10100
Arsenic	7.39	11.1
Barium	34.5	64.3
Beryllium		
Calcium	1830	3220
Chromium	14.4	58
Cobalt	5.09	7.5
Copper	51.4	94.5
Iron	14200	22800
Lead	120	275
Magnesium	2680	3180
Manganese	196	262
Mercury	0.087	0.226
Nickel	14.8	99.2
Potassium	948	929
Sodium	162	79
Vanadium	23.7	51.9
Zinc	95.7	149
<b>CONVENTIONAL</b>		
Nitrite/Nitrate - nonspecific	6.13	4.45

**Table 4-26**  
**MTL Phase 2 RI Unit 15 Soil Sample Results**

SITE ID DEPTH (ft)	BORE 15SB-1 0	BORE 15SB-1 8	BORE 15SB-2 0	BORE 15SB-2 4
<b>COMPOUND</b>				
<b>BNA</b>				
2-Methylnaphthalene			0.323	
Acenaphthene			0.17	
Acenaphthylene			0.247	
Benzo [A] Anthracene			0.535	
Benzo [B] Fluoranthene			1.84	
Benzo [G.H.I] Perylene			1.01	
Chrysene	0.0759		2.24	
Fluoranthene	0.132		1.13	
Phenanthrene	0.164		2.19	
Pyrene	0.148		1.67	
<b>PEST/PCB</b>				
alpha-Endosulfan (Endosulfan I)			0.00682	
beta-Endosulfan			0.0217	
Chlordane	0.907		0.942	
Dieldrin	0.0323		0.0748	
Endrin	0.233		0.243	
Heptachlor Epoxide	0.0233		0.0533	
ppDDD	0.137		1.11e+00/ 5.39e-01	
ppDDE	0.0824		1.44e+00/ 6.04e-01	
ppDDT	0.242		5.2	
<b>INORGANIC/METAL</b>				
Aluminum	14400	9860	9590	12100
Arsenic	3.2		22	
Barium	24	10.3	52	13.3
Calcium	4110	2140	2450	3160
Chromium	19.7	14.3	22	16.4
Cobalt	9.12	5.06	7.32	5.93
Copper	32.3	11.5	148	10.8
Cyanide			0.319	
Iron	26200	16400	28800	16800
Lead	55.4	8.29	521	
Magnesium	6110	2990	2390	3380
Manganese	264	137	224	153
Mercury	0.141		0.34	
Nickel	13	6.62	52	9.16
Potassium	1110	844	839	1110
Sodium	169	129	198	160
Vanadium	43	24.3	70.6	28.2
Zinc	58.8	20.2	113	24.6
<b>CONVENTIONAL</b>				
pH	6.02	7.25	5.51	8.14
Total Organic Carbon	36800	7500	350000	6560
<b>RADIOLOGICAL (pCi/g)</b>				
Alpha gross	19	20	13	21
Beta gross	19	22	18	20
Uranium 234	0.3	0.4	1.3	0.5
Uranium 238	0.4	0.5	1.1	0.6

**Table 4-27  
MTL Phase 2 RI Unit 16 Soil Sample Results**

SITE ID DEPTH (ft)	BORE GRSB-24 2	BORE GRSB-24 12	CMPH 16SS-1 0-0.5	CMPH 16SS-2 0-0.5
<b>COMPOUND</b>				
<b>BNA</b>				
Benzo [A] Anthracene	0.139			
Chrysene	0.128			
Di-n-Butyl Phthalate	GT 6.20e+00			
Fluoranthene	0.19			
Phenanthrene	0.142			
Pyrene	0.282			
<b>PEST/PCB</b>				
alpha-Endosulfan (Endosulfan I)				0.0143
beta-Endosulfan				0.00626
Chlordane			3.36	3.5
delta-Benzenehexachloride				0.0242
Dieldrin				0.029
Endrin			0.343	0.141
Heptachlor Epoxide				0.103
PCB 1260				2.08
ppDDD				0.092
ppDDE			0.0857	0.523
ppDDT			0.154	0.742
<b>INORGANIC/METAL</b>				
Aluminum	12500	26100	10100	9280
Arsenic			15.8	18.9
Barium	31.4	70	88.9	38.3
Beryllium		1.3		0.557
Cadmium			3.53	
Calcium	6590	5260	3110	1730
Chromium	12.2	44.3	71.2	13.9
Cobalt	10	10	16.3	7.53
Copper	16.6	9.52	58.9	38.3
Iron	24300	31800	130000	15900
Lead	13.9	20.2		190
Magnesium	5840	6110	3480	2690
Manganese	298	297	724	197
Mercury			0.189	0.212
Nickel	12	24.5	45.2	13.4
Potassium	992	5200	723	613
Sodium	361	2690	178	53.1
Vanadium	36.9	55.8	34	32.3
Zinc	46.5	53.4	849	124
<b>CONVENTIONAL</b>				
Nitrite/Nitrate - nonspecific			6.28	5.03
<b>RADIOLOGICAL (pCi/g)</b>				
Alpha gross	24	32		
Beta gross	22	24		
Uranium 234	0.6	1.4		
Uranium 235	0.1			
Uranium 238	0.5	1.2		

**Table 4-28**  
**MTL Phase 2 RI Unit 17 Soil Sample Results**

SITE ID	BORE 17SB-1	BORE 17SB-1	BORE 17SB-2	BORE 17SB-2	BORE 17SB-3	BORE 17SB-3
DEPTH (ft)	0	6	0	8	0	14
<b>COMPOUND</b>						
<b>BNA</b>						
2-Methylnaphthalene						
Acenaphthene					0.337	
Acenaphthylene	0.3		4.19		0.507	
Anthracene			5.3		1.59	
Benzo [A] Anthracene	0.257		5.93		1.83	
Benzo [A] Pyrene			8.41		3.14	
Benzo [B] Fluoranthene			4.88		1.62	
Benzo [G.H.I] Perylene			5.25		2.76	
Benzo [K] Fluoranthene	0.406		6.17		1.8	
Chrysene	0.279		4.61		1.62	
Dibenz [A.H] Anthracene					0.468	
Fluoranthene	0.393		GT 6.20e+00		4.59	
Fluorene			1.05		0.503	
Indeno [1.2.3-C.D] Pyrene			8.22		4.51	
Phenanthrene	0.415		14		5.49	
Pyrene	0.516		GT 6.20e+00		3.94	
<b>PEST/PCB</b>						
Aldrin					0.00343	
alpha-Endosulfan (Endosulfan I)						
beta-Endosulfan					0.0145	0.0541
Chlordane	1.16					
Dieldrin					0.0472	0.188
Endrin	0.0778					
Heptachlor					0.0105	0.0683
Heptachlor Epoxide						
Lindane	0.0172				0.036	0.255
Methoxychlor					0.131	0.698
ppDDD					1.93	0.0562
ppDDE					6.33	
ppDDT					3.83	
<b>INORGANIC/METAL</b>						
Aluminum	9080	16000	14400	13500	9910	16500
Arsenic	5.51	6.55	4.21	4.16	8.54	6.54
Barium	52.6	53.2	65.4	33.8	65.8	42.7
Beryllium	0.644	0.887	0.812	0.972	0.812	1.06
Calcium	3740	2820	9820	2660	2750	4170
Chromium	20.9	38.6	22.8	29.1	15.7	36.6
Cobalt	8.87	7.32	12.7	8.26	9.72	9.99
Copper	31.8	14.4	23.1	10.4	40.6	11.2
Cyanide	0.397					
Iron	27900	30000	31400	30200	23000	33500
Lead	406	46.5	92.7		227	
Magnesium	4410	5420	6130	4890	3290	7080
Manganese	260	227	398	204	288	285
Mercury						
Nickel	17.6 <sup>a</sup>	14.2	18.8	17	14.6	16.7
Potassium	1200	3970	2230	3060	566	3880
Sodium	126	333	202	616	105	2540
Vanadium	45.4	42.7	53.6	31.4	38.7	38.2
Zinc	107	59.7	77.2	78.6	69.4	48.7
<b>CONVENTIONAL</b>						
pH				7.13		
Total Organic Carbon				104000		
<b>RADIOLOGICAL (pCi/g)</b>						
Alpha gross	16	24	7	19	16	14
Beta gross	15	25	18	21	14	24
Uranium 234	0.8	1.3	0.4	1.2	0.5	1.1
Uranium 235		0.1		0.1		
Uranium 238	0.7	1.3	0.3	0.9	0.7	1

**Table 4-28**  
**MTL Phase 2 RI Unit 17 Soil Sample Results**  
**(Continued)**

SITE ID	BORE GRSB-12	BORE GRSB-12	BORE GRSB-19	BORE GRSB-19	BORE GRSB-22
DEPTH (ft)	0	16	0	9	0
<b>COMPOUND</b>					
<b>BNA</b>					
2-Methylnaphthalene				0.436	0.0641
Acenaphthene				1.47	0.36
Acenaphthylene			0.193		0.495
Anthracene					
Benzo [A] Anthracene	0.0854		0.428	0.357	1.96
Benzo [A] Pyrene					
Benzo [B] Fluoranthene					1.71
Benzo [G.H.I] Perylene			0.777		2
Benzo [K] Fluoranthene			0.453		1.99
Chrysene	0.109		0.495	0.365	1.77
Dibenz [A.H] Anthracene					
Fluoranthene	0.147		0.819	0.969	3.86
Fluorene				0.848	0.602
Indeno [1.2.3-C.D] Pyrene					
Phenanthrene	0.196		0.862	1.86	4.78
Pyrene	0.215		0.879	1.17	7.15
<b>PEST/PCB</b>					
Aldrin					
alpha-Endosulfan (Endosulfan I)					
beta-Endosulfan	0.00351		0.00433		0.0131
Chlordane	0.568		1.7		1.01
Dieldrin	0.0141		0.0223	0.00297	0.0856
Endrin	0.0267		0.116		0.0986
Heptachlor					
Heptachlor Epoxide	0.00366		0.0298		0.024
Lindane			0.00862	0.00381	
Methoxychlor			0.47		
ppDDD	0.0137		9.18e-02/ 1.46e-01		
ppDDE	0.082		9.53e-02/ 1.48e-01		0.0171
ppDDT	0.0805		0.188		0.0101
<b>INORGANIC/METAL</b>					
Aluminum	20200	22900	11100	19900	22100
Arsenic	4.46	7.38	7.95	6.17	5.17
Barium	146	93.2	53.5	56.2	69.5
Beryllium	1.03	1.1	0.809	1.4	0.916
Calcium	5380	6670	2260	4920	4550
Chromium	27.5	33.8	22.5	40.8	27.1
Cobalt	12	11.1	7.43	11.9	11.9
Copper	54.7	17.4	38.5	12.8	30.6
Cyanide			0.429		
Iron	28700	28800	19100	35400	35800
Lead	126	12.7	218		95.3
Magnesium	6000	6620	3650	8150	7300
Manganese	429	334	251	382	436
Mercury	0.0835				0.101
Nickel	22.6	23.7	17.8	21.8	21.4
Potassium	2540	4790	962	4910	1690
Sodium	355	536	182	1080	210
Vanadium	54.1	50.4	34.8	44.9	59.8
Zinc	95.9	48.3	107	66.8	118
<b>CONVENTIONAL</b>					
pH					
Total Organic Carbon					
<b>RADIOLOGICAL (pCi/g)</b>					
Alpha gross	8	23	14	23	12
Beta gross	20	21	30	26	27
Uranium 234	1	0.6	1	0.9	0.5
Uranium 235	0.1				
Uranium 238	0.6	0.7	0.8	0.7	0.6

**Table 4-28**  
**MTL Phase 2 RI Unit 17 Soil Sample Results**  
**(Continued)**

SITE ID DEPTH (ft)	BORE GRSB-22	BORE GRSB-23	BORE GRSB-23
	4	0	4
<b>COMPOUND</b>			
<b>BNA</b>			
2-Methylnaphthalene		0.0785	0.107
Acenaphthene		0.084	
Acenaphthylene		0.163	0.228
Anthracene			
Benzo [A] Anthracene		0.706	0.605
Benzo [A] Pyrene			
Benzo [B] Fluoranthene		0.878	
Benzo [G.H.I] Perylene		1.18	
Benzo [K] Fluoranthene		0.827	0.387
Chrysene		0.768	1.06
Dibenz [A.H] Anthracene			
Fluoranthene		1.64	1.33
Fluorene		0.159	0.186
Indeno [1.2.3-C.D] Pyrene			
Phenanthrene		1.98	0.15
Pyrene		1.72	1.65
<b>PEST/PCB</b>			
Aldrin			
alpha-Endosulfan (Endosulfan I)		0.00254	
beta-Endosulfan		0.00512	0.00154
Chlordane		0.324	
Dieldrin		0.0252	0.00445
Endrin		0.043	
Heptachlor		0.00429	
Heptachlor Epoxide		0.0023	
Lindane		0.018	0.00485
Methoxychlor		0.0509	
ppDDD		0.0444	
ppDDE		0.123	
ppDDT		0.0583	
<b>INORGANIC/METAL</b>			
Aluminum	22000	17400	8810
Arsenic		11.3	8.98
Barium	54	105	94.3
Beryllium		0.824	0.744
Calcium	3930	7750	5760
Chromium	44.4	17.3	16.1
Cobalt	7.95	10.1	10.3
Copper	10.4	49.4	410
Cyanide			
Iron	33200	37100	35200
Lead	16	188	373
Magnesium	7410	5530	2130
Manganese	280	371	1340
Mercury			
Nickel	19.3	16.5	25
Potassium	4740	881	792
Sodium	606	249	254
Vanadium	50	38	27.6
Zinc	57.3	156	272
<b>CONVENTIONAL</b>			
pH			
Total Organic Carbon			
<b>RADIOLOGICAL (pCi/g)</b>			
Alpha gross	25	23	5
Beta gross	25	23	4
Uranium 234	1.4	0.6	0.6
Uranium 235			
Uranium 238	1.3	0.6	

**Table 4-29**  
**MTL Phase 2 RI Unit 18 Soil Sample Results**

SITE ID	BORE 18SB-1	BORE 18SB-1	BORE GR5B-11	BORE GR5B-11
DEPTH (ft)	0.5	14	0	6
<b>COMPOUND</b>				
<b>BNA</b>				
2-Methylnaphthalene			0.794	
4-Methylphenol			1.49	
Acenaphthene			0.699	
Acenaphthylene	0.151		GT 1.20e+01	0.478
Anthracene			GT 6.20e+00	
Benzo [A] Anthracene	0.42		GT 1.20e+01	0.95
Benzo [A] Pyrene			GT 6.20e+00	
Benzo [B] Fluoranthene			14.8	1.11
Benzo [G,H,I] Perylene	0.743		23.7	2.14
Benzo [K] Fluoranthene	0.445		24.7	0.846
Chrysene	0.416		GT 1.20e+01	0.868
Dibenzofuran			0.635	
Fluoranthene	0.877		GT 6.20e+00	2.16
Fluorene				0.196
Naphthalene			2.1	
Phenanthrene	1.04		GT 1.20e+01	1.87
Pyrene	1.36		GT 6.20e+00	2.2
<b>PEST/PCB</b>				
beta-Endosulfan	0.00246		0.14	0.00481
Dieldrin	0.0121		0.44	0.0196
Heptachlor			0.0316	
Heptachlor Epoxide	0.00342		0.0319	
Lindane			0.131	0.00691
ppDDD	0.005		0.0804	0.0044
ppDDE	0.0171			
ppDDT	0.102			
<b>INORGANIC/METAL</b>				
Aluminum	8840	25400	21700	9910
Arsenic	2.77	4.23	15.5	
Barium	40.8	75.6	468	32.4
Beryllium		1.41	1.4	0.567
Cadmium			2.12	
Calcium	2680	5220	4770	5600
Chromium	16.6	31.1	51.1	18.6
Cobalt	5.78	13.6	17.7	9.98
Copper	22.2	20	438	24.3
Cyanide	0.306		0.506	
Iron	14900	30800	45200	23600
Lead	132		1330	29.1
Magnesium	2900	6670	7600	5480
Manganese	203	492	520	216
Mercury	0.085			
Nickel	10.4	23.9	32.4	12.6
Potassium	959	3680	1830	993
Sodium	257	1490	212	240
Vanadium	28.2	54.4	64.6	33.6
Zinc	65	54.2	1390	82.4
<b>RADIOLOGICAL (pCi/g)</b>				
Alpha gross	18	29	23	9
Beta gross	22	36	23	21
Uranium 234	0.5	0.9	0.7	0.6
Uranium 235			0.1	
Uranium 238	0.4	0.9	0.8	0.6

Table 4-30  
MTL Phase 2 RI Northern Monitor Wells Sampling Results

SITE ID	WELL MW-09	WELL MW-10	WELL MW-13	WELL MW-16	WELL MW-16A	WELL MW-22	WELL MW-23	WELL MW-24
MCP Comparison Category	GW-2	GW-2	GW-2	GW-2	GW-3	GW-2	GW-2	GW-2
COMPOUND								
VOA								
1,1-Dichloroethane						8.06		
1,1-Dichloroethylene						26.8		
1,1,1-Trichloroethane						GT 1.00e+02		6.37
1,2-Dichloroethylene								
1,3-Dimethylbenzene			8.86				3030	
Benzene							GT 3.00e+03	
Carbon Tetrachloride							1260	
Ethylbenzene						22.9		
Tetrachloroethylene			17.6	17.6				
Toluene							GT 3.00e+03	
Trichloroethylene		1.1	2.2		10		3760	
Xylenes								
BNA							39.8	
2-Methylnaphthalene							GT 1.00e+02	
Naphthalene								
PEST/PCB								
Aldrin	0.0108		0.0176	0.0247	0.0156	0.0142	0.014	0.0135
alpha-Benzenhexachloride						0.00313	0.0139	
alpha-Endosulfan (Endosulfan I)			0.00883					
delta-Benzenhexachloride			0.0251	0.011		0.00461	0.0409	
Heptachlor			0.016					
Heptachlor Epoxide			0.0305					
Isodrin								
Lindane		0.00388				0.00425	0.03	
ppDDD								
ppDDE								
INORGANIC/METAL								
Aluminum		146	215					
Barium	10.9	31.4	53.3	11.5	11.5	6.06	34	12.7
Calcium	14700	34900	29300	21400	28300	18500	25600	27200
Chromium							24.2	
Copper								
Cyanide		4.97			21.1		6.63	
Iron							937	
Magnesium	1720	15200	3980	2320	9190	5990	3150	5990
Manganese	20.4	48.6			276	11.4	2620	26
Potassium		3580	4260	4440	5330	4220	2690	2120
Sodium	64800	106000	193000	106000	188000	166000	33300	9190
Zinc	97.1				23.8		27.1	41.4
CONVENTIONAL								
Nitrite/Nitrate - nonspecific					1940000		1430000	
RADIOLOGICAL (pCi/l)								
Alpha gross	1	11	8	7	1	4	1	8
Beta gross	1	16	21	13	7	6	6	9
Uranium 234	0.1	0.5	0.6	0.6	0.1			0.2
Uranium 235		0.1						
Uranium 238		0.7	0.3	0.3			0.1	0.3

Units are ug/l unless noted

Table 4-31  
 MTL Phase 2 RI Western Monitor Wells Sampling Results

SITE ID	WELL MW-01	WELL MW-02	WELL MW-14	WELL MW-15	WELL MW-15A	WELL MW-17	WELL MW-17A	WELL MW-21
MCP Comparison Category	GW-2	GW-2	GW-2	GW-2	GW-3	GW-2	GW-3	GW-3
COMPOUND								
VOA								
1,1-Dichloroethane	2.83							3.35
1,1-Dichloroethylene								3.14
1,1,1-Trichloroethane				5.19				
1,2-Dichloroethylene								
Acetone							GT 1.00e+02	
Benzene				44.4	40.7	1.48	2.95	13
Tetrachloroethylene		3.61		94	2.9		11	70
Trichloroethylene								
PEST/PCB								
Aldrin				0.0173				
delta-Benzenhexachloride						0.00356		
Dieldrin			0.0179					
Isodrin	0.00393	0.0177	0.00546		0.0044			
Lindane						0.00556		
ppDDD			0.00799					
ppDDT	0.004	0.00513	0.00848					
INORGANIC/METAL								
Aluminum								
Barium	45.6	23.7	4.73	105	33.1	14.6	200	144
Cadmium		31.9					37.5	65.4
Calcium	44900	38500	8990	213000	37800	52300	16800	46600
Chromium		59.9						
Copper				22.3				
Cyanide		34.7						
Iron		179						
Lead	49.7				44.6	53.5		
Magnesium	5050	3650	4240	96700	13400	10100	17200	19400
Manganese	1260			482	48		24.8	420
Potassium	7480	3100		9150	80300	3260	50400	13900
Sodium	99000	37400	51900	253000	84100	13900	43200	34000
Zinc				44.6	42.8	29.7		29.6
CONVENTIONAL								
Nitrite/Nitrate - nonspecific								
RADIOLOGICAL (pCi/l)								
Alpha gross		21	7	1	15	1		
Beta gross	13	32	12	5	110	5	52	17
Uranium 234		0.4	0.5	1.3	0.9	0.4	0.3	0.4
Uranium 235						0.1		0.1
Uranium 238	0.2	0.5	0.4	1.1	0.6	0.8	0.4	0.2

Table 4-32  
MTL Phase 2 RI Central Monitor Wells Sampling Results

SITE ID MCP Comparison Category COMPOUND	WELL C-02 GW-2	WELL MW-03 GW-2	WELL MW-04 GW-2	WELL MW-08 GW-2	WELL MW-12 GW-2	WELL MW-19 GW-3	WELL MW-19A GW-3	WELL MW-19B GW-3	WELL MW-20 GW-3
VOA									
1,3-Dimethylbenzene	1700								
Benzene	21.7			1.7	2.3		6.8		2.9
Chloroform									
Ethylbenzene	780								
Tetrachloroethylene	2200	1.67	12			5	3.43		16.7
Toluene									
Trichloroethylene	1390		7.6			4.4	5.3		3.3
Xylenes									
BNA									
2-Methylnaphthalene	18.6								
4-Methylphenol	10.4								
Benzo [A] Anthracene						29			37.5
Naphthalene									
PEST/PCB	GT 1.00e+02								
Aldrin	0.0813		0.016	0.0137	0.0181	0.0217		0.0174	0.0216
alpha-Benzenhexachloride		0.0204		0.0065					0.0111
Chlordane									
delta-Benzenhexachloride		0.252		0.00786	0.00383	0.0505			
Dieldrin	0.0306								
Heptachlor		0.186							
Isodrin		0.168					0.00559		
Lindane	0.0286								
Methoxychlor									
ppDDE									0.165
ppDDT	0.176	0.275	0.0131						0.00966
INORGANIC/METAL									
Aluminum		440				156			
Arsenic	5.32								
Barium	10.3	31	15.2	28.5	44.9	8.8	12.1		30.9
Calcium	22700	74800	27000	40600	51700	13400	14700		33800
Chromium	25		18.7	25.7		40.1			21.2
Copper		48.1	32.2						
Iron	7050	98		89.9					
Lead		45							
Magnesium	4710	15600	4080	8000	13600	4850	3460		8430
Manganese	3230	210		347	48.6	78.2	262		176
Potassium	1960	2740	4380	3060	6480	10100	2590		22800
Selenium							119		
Sodium	126000	157000	65300	84900	199000	57000	62600		42600
Zinc	23.3	20.8	23.8	23.8					41.3
CONVENTIONAL									
Nitrite/Nitrate - nonspecific									2930000
RADIOLOGICAL (pCi/l)									
Alpha gross	13	6	8	6	9	11	13		
Beta gross	14	8	11	12	15	13	11		27
Uranium 234	0.3	1.1	0.1	0.2	0.1	0.4	1		0.1
Uranium 238	0.2	1.1	0.1	0.1	0.1	0.3	0.8		

Units are ug/l unless noted

Table 4-33  
 MTL Phase 2 RI Southeastern Monitor Wells Sampling Results

SITE ID	WELL C-03	WELL MW-05	WELL MW-06	WELL MW-07	WELL MW-11	WELL MW-18
MCP Comparison Category	GW-2	GW-2	GW-2	GW-2	GW-2	GW-2
<b>COMPOUND</b>						
<b>VOA</b>						
Tetrachloroethylene					1.48	
Trichloroethylene					1.5	
<b>PEST/PCB</b>						
Aldrin	0.0212	0.0262	0.022	0.0239	0.0238	0.0142
delta-Benzenehexachloride				0.00478		
ppDDE				0.00577		0.00831
ppDDT		0.01	0.0388			
<b>EXPLOSIVE</b>						
1,3,5-Trinitrobenzene			0.5			
<b>INORGANIC/METAL</b>						
Aluminum			270		184	
Barium	3.64	4.25	5.74	9.1	3.57	
Calcium	8920	11500	21900	12800	5190	9560
Chromium						25
Copper	23.6					
Iron		294	35700			124
Lead			53.7			46.1
Magnesium	8800	1020	7450	2360	4700	1630
Manganese		115	528		347	129
Potassium	2680	1850	6840	2050	3830	2790
Sodium	66900	6530	223000	19600	21000	39100
Zinc	32.5	44.7	48.9	21.8	52.3	
<b>CONVENTIONAL</b>						
Nitrite/Nitrate - nonspecific	1980000		26.9			
<b>RADIOLOGICAL (pCi/l)</b>						
Alpha gross	3	5	6	18	24	3
Beta gross	5	8	6	20	23	7
Uranium 234	0.1	0.3	0.2	0.4	1.1	
Uranium 235					0.1	
Uranium 238	0.1	0.2	0.3	0.4	1.2	

**Table 4-34**

**Summary of In Situ Water Chemistry  
Characteristics for Surface Water and Sediment Sampling  
Stations in the Charles River**

<b>Sample Point</b>	<b>Sample Date</b>	<b>Water Temp (°C)</b>	<b>pH</b>	<b>Specific Conductance μmhos</b>
SW/SD-2*	11/6/91	9°	7.2	140
SW/SD-3*	11/6/91	6°	7.1	145
SD-4	11/5/91	10°	7.6	149
SD-5	11/5/91	10°	7.4	140
SW/SD-6	11/5/91	10°	7.8	140
SD-7	10/30/91	12°	6.4	195
SW/SD-8	10/29/91	12°	6.2	190
SD-9	10/29/91	12°	6.4	195
SD-10	10/29/91	12°	7.0	185
SW/SD-11	10/29/91	11.5°	6.8	190
SD-12	10/29/91	11°	6.8	180
SW/SD-13	10/28/91	15°	7.3	200
SD-14	10/28/91	15°	7.6	195
SW/SD-15	10/28/91	15°	7.5	195
SW-16	10/28/91	14°	8	195
SW/SD-17	10/28/91	14°	7.9	195
SW/SD-18*	11/6/91	9°	7.0	140
SW/SD-19*	11/6/91	8°	7.2	137
SW/SD-20*	11/6/91	8°	7.2	135

\*Upstream sampling location.

Note: Water outfall samples collected as part of storm sewer investigation (see Subsection 4.6).

**Table 4-35**  
**MTL Phase 2 RI Charles River Upstream Surface Water Sampling Results**

SITE ID	RVER SW-18	RVER SW-19	RVER SW-2	RVER SW-20	RVER SW-3	RVER SW-3DUP
DEPTH (ft)	0	0	0	0	0	0
<b>COMPOUND</b>						
<b>VOA</b>						
Methylene Chloride						33.3
<b>BNA</b>						
bis (2-Ethylhexyl) Phthalate				61.6		
<b>PEST/PCB</b>						
Isodrin	0.00374	0.00382			0.00607	
Lindane		0.00333	0.00341			
<b>TOTAL METALS</b>						
Aluminum	169	160	168	254		292
Barium	27.3	27.4	27.3	26.3	27	25.8
Cadmium		0.1	0.18		0.15	
Calcium	12800	12700	12600	13000	13000	13000
Chromium			2.53		2.09	
Copper			4.58	19.6	10.7	
Iron	568	528	536	439	503	565
Lead	1.62	2.21			9.52	
Magnesium	2980	2930	2820	2990	2970	2900
Manganese	36.8	46.1	54.4	33.3	42.3	39.1
Potassium	2370	2290	2040	2510	2810	2290
Sodium	20600	20600	20000	21100	20900	20500
Zinc			49.1	31.6		23.2
<b>FILTERED METALS</b>						
Aluminum	164		164			118
Antimony					14.3	
Barium	27.3	27.7	110	31.6	21.3	22.8
Beryllium	1.23					
Cadmium	2.69	0.48	2.33			
Calcium	12500	12700	12600	12500	12800	12900
Chromium			1.74		1.4	
Copper	6.02		19.8		7.65	
Iron	181	168	328	161	309	306
Lead		0.83			2.21	
Magnesium	2820	2800	2850	2830	2880	2940
Manganese	39.8	39.8	46	38.8	40.6	42.9
Potassium	3380	3510	3030	3740	2180	3100
Sodium	21400	21500	20300	21500	20600	20500
Zinc	31.9	38.1	55.2	61.8	24.6	
<b>CONVENTIONAL</b>						
Hardness			44.9		46.1	
Total Organic Carbon			5.61		5.85	
<b>RADIOLOGICAL (pCi/l)</b>						
Alpha gross	1			2		1
Beta gross	1	5	2	1	1	4
Uranium 234	0.1	0.1		0.1	0.1	
Uranium 238		0.1				0.1

**Table 4-36**  
**MTL Phase 2 RI Charles River Upstream Sediment Sampling Results**

SITE ID	RVER SD-18	RVER SD-19	RVER SD-19D	RVER SD-2	RVER SD-20	RVER SD-3	RVER SD-3DUP
DEPTH (ft)	0	0	0	0	0	0	0
<b>COMPOUND</b>							
<b>BNA</b>							
2-Methylnaphthalene		0.534		0.145			
Acenaphthene				0.454			
Acenaphthylene	0.426	0.32		1.6		0.564	0.573
Benzo [A] Anthracene		9.96		6.65	2.54	2.82	
Benzo [A] Pyrene		17.3		9.09			
Benzo [B] Fluoranthene	3.06	11.7		8.59		3.86	
Benzo [G.H.I] Perylene				6.08			
Benzo [K] Fluoranthene	3.26				2.82		2.54
bis (2-Ethylhexyl) Phthalate	5.91				7.43	20.4	18.3
Chrysene	2.13				2.82		3.01
Di-n-Butyl Phthalate					17.7		
Fluoranthene	2.78	13	0.158	8.19	3.85	3.81	3.76
Fluorene				0.886			
Phenanthrene	2.21	8.94	0.152	8.51	3.35	3.39	3.24
Pyrene	3.78	21.9		14.4	4.88	6.09	5.61
<b>PEST/PCB</b>							
alpha-Endosulfan	0.094						
Dieldrin	0.094			1.9			
ppDDD	0.13			0.14	0.073	0.25	
ppDDE	0.1			0.095	0.06	0.18	
ppDDT				0.15		0.31	
<b>INORGANIC/METAL</b>							
Aluminum	14600	11300	25200	8300	23700	12800	18300
Arsenic		14.8	5.51				
Barium	166	296	78.2	123	250	160	238
Beryllium			1.23				
Cadmium	6.93	10.5		4.06		7.88	13.1
Calcium	6900	11400	6010	4890	10800	5320	7700
Chromium	71.6	70.1	55.2	43	92.7	80.2	122
Cobalt	20.5	13.4	13.7	11		15.2	22.9
Copper	133	180	12.7	97.6	166	189	280
Iron	28200	43600	32500	20800	40100	22600	31900
Lead	386	604	23.1	352	377	500	779
Magnesium	5310	2370	9140	3220	6760	4090	5740
Manganese	486	1050	368	470	753	373	548
Mercury	0.569	1.65		0.354	0.78	0.545	0.969
Nickel	29	27.5	23	19.8	39	30.8	37
Potassium	1370	773	4580	898	2940	1420	1800
Sodium	484	460	1200	353	926	440	506
Vanadium	51.6	45.8	54.5	34.3	72.4	44.4	65.7
Zinc	464	689	70.2	405	546	469	687
<b>CONVENTIONAL</b>							
Total Organic Carbon	99000	210000	53000	73000	75000	120000	120000
<b>RADIOLOGICAL (pCi/g)</b>							
Alpha gross	26	22	25	32		32	35
Beta gross	24	22	63	20		25	32
Uranium 234	0.9	1.3	1.2	0.8		1	1
Uranium 235		0.1		0.1			
Uranium 238	0.8	1.2	1	0.7		1	0.9

**Table 4-37  
Draft National Sediment Quality Criteria Based on Organic Carbon Concentrations at MTL**

CHEMICAL	CRITERIA ug/g OC	SD-4, OC= 0.08		SD-4D, OC= 0.079		SD-4P, OC= 0.066		SD-5, OC= 0.12		SD-5D, OC= 0.11		SD-5P, OC= 0.077	
		Criteria ug/g	Sample ug/g	Criteria ug/g	Sample ug/g	Criteria ug/g	Sample ug/g	Criteria ug/g	Sample ug/g	Criteria ug/g	Sample ug/g	Criteria ug/g	Sample ug/g
Acenaphthene	138	11.04	0.986	10.902	0.397	9.108	0.397	16.56	0.645	15.18	3.95	10.626	4.69
Dieldrin	9.03	0.7224	0.15	0.71337	ND	0.59598	ND	1.0836	0.0726	0.9933	0.028	0.69531	0.0205
Endrin	4.03	0.3224	ND	0.31837	ND	0.26598	ND	0.4836	0.0336	0.4433	ND	0.31031	ND
Fluoranthene	1022	81.76	14	80.738	4.4	67.452	4.4	122.64	12.1	112.42	7.45	78.694	> 6.2
Phenanthrene	123	9.84	13.4	9.717	5.22	8.118	5.22	14.76	13.1	13.53	29.9	9.471	> 12

CHEMICAL	CRITERIA ug/g OC	SD-6, OC= 0.12		SD-6D, OC= 0.12		SD-6P, OC= 0.075		SD-7, OC= 0.12		SD-8, OC= 0.391		SD-8D, OC= 0.274	
		Criteria ug/g	Sample ug/g	Criteria ug/g	Sample ug/g	Criteria ug/g	Sample ug/g	Criteria ug/g	Sample ug/g	Criteria ug/g	Sample ug/g	Criteria ug/g	Sample ug/g
Acenaphthene	138	16.56	0.629	16.56	ND	10.35	0.113	16.56	ND	53.958	0.324	37.812	0.697
Dieldrin	9.03	1.0836	ND	1.0836	ND	0.67725	ND	1.0836	0.0566	3.53073	ND	2.47422	0.48
Endrin	4.03	0.4836	ND	0.4836	ND	0.30225	ND	0.4836	0.0308	1.57573	ND	1.10422	ND
Fluoranthene	1022	122.64	10.1	122.64	8.91	76.65	0.839	122.64	5.82	399.602	6.57	280.028	10.3
Phenanthrene	123	14.76	8.38	14.76	6.51	9.225	0.117	14.76	4.51	48.093	4.24	33.702	9.59

CHEMICAL	CRITERIA ug/g OC	SD-9, OC= 0.586		SD-9-1D, OC= 0.14		SD-9P, OC= 0.656		SD-10, OC= 0.845		SD-10P, OC= 0.845		SD-11, OC= 0.12	
		Criteria ug/g	Sample ug/g	Criteria ug/g	Sample ug/g	Criteria ug/g	Sample ug/g	Criteria ug/g	Sample ug/g	Criteria ug/g	Sample ug/g	Criteria ug/g	Sample ug/g
Acenaphthene	138	80.868	0.553	19.32	0.883	90.528	ND	116.61	1.43	116.61	ND	16.56	0.157
Dieldrin	9.03	5.29158	ND	1.2642	ND	5.92368	0.0437	7.63035	0.0521	7.63035	0.00915	1.0836	0.0466
Endrin	4.03	2.36158	ND	0.5642	ND	2.64368	ND	3.40535	0.0476	3.40535	ND	0.4836	0.0538
Fluoranthene	1022	598.892	6.21	143.08	14.6	670.432	2.8	863.59	30.7	863.59	ND	122.64	2.8
Phenanthrene	123	72.078	4.7	17.22	10	80.688	2.2	103.935	28.5	103.935	ND	14.76	2.2

Table 4-37  
Draft National Sediment Quality Criteria Based on Organic Carbon Concentrations at MTL  
(Continued)

CHEMICAL	CRITERIA ug/g OC	SD-12, OC= 0.0981		SD-12D, OC= 0.0957		SD-13, OC= 0.0569		SD-14, OC= 0.2		SD-14P, OC= 0.0356		SD-15, OC= 0.488	
		Criteria ug/g	Sample ug/g	Criteria ug/g	Sample ug/g	Criteria ug/g	Sample ug/g	Criteria ug/g	Sample ug/g	Criteria ug/g	Sample ug/g	Criteria ug/g	Sample ug/g
Acenaphthene	138	13.5378	ND	13.2066	ND	7.8522	ND	27.6	ND	4.9128	ND	67.344	0.36
Dieldrin	9.03	0.885843	0.0418	0.864171	ND	0.513807	0.02	1.806	0.0352	0.321468	0.0611	4.40664	0.02
Endrin	4.03	0.395343	ND	0.385671	ND	0.229307	0.01	0.806	ND	0.143468	0.0354	1.96664	0.007
Fluoranthene	1022	100.2582	0.0876	97.8054	ND	58.1518	0.12	204.4	1.78	36.3832	0.406	498.736	5.8
Phenanthrene	123	12.0663	ND	11.7711	ND	6.9987	0.11	24.6	1.84	4.3788	0.529	60.024	5

CHEMICAL	CRITERIA ug/g OC	SD-17, OC= 0.323		SD-17-1D, OC= 0.333	
		Criteria ug/g	Sample ug/g	Criteria ug/g	Sample ug/g
Acenaphthene	138	44.574	1.23	45.954	0.753
Dieldrin	9.03	2.91669	0.048	3.00699	ND
Endrin	4.03	1.30169	ND	1.34199	ND
Fluoranthene	1022	330.106	> 6.2	340.326	ND
Phenanthrene	123	39.729	17.4	40.959	8.7

**Table 4-38  
MTL Phase 2 RI Charles River Downstream Surface Water Sampling Results**

SITE ID DEPTH (ft)	OTFL SW-7 0	OTFL SW-9-1D 0	RVER SW-11 0	RVER SW-13 0	RVER SW-15 0	RVER SW-16 0
<b>COMPOUND</b>						
<b>VOA</b>						
1,3-Dimethylbenzene	2.32	2.93			1.31	
Ethylbenzene		1.2				
Toluene	3.8	4.3			1.9	
Trichloroethylene	2.3	2.6		2.2	2.3	2.6
Xylenes	2.18	2.87				
<b>BNA</b>						
bis (2-Ethylhexyl) Phthalate	33.7					
<b>PEST/PCB</b>						
Isodrin						
Lindane						0.00366
<b>TOTAL METALS</b>						
Aluminum	237				145	414
Barium	29	29.9	30.7	33.4	25.4	32.7
Cadmium	0.1		0.32		0.25	4.84
Calcium	16300	16600	17000	17400	12800	16300
Copper						
Chromium				19.2		
Chromium (+6)				4.2		
Iron	663	637	620	686	453	872
Lead	2.25		2.19	2.67	3.6	4.09
Magnesium	3650	3610	3630	3900	2900	3730
Manganese	68.2	53.3	60.1	81	59.2	80.5
Potassium	2670	3230	3190	3480	2720	3370
Sodium	27500	27300	27600	30100	23600	27900
Zinc				19.1		22.5
<b>FILTERED METALS</b>						
Aluminum					146	
Antimony	14.1					
Barium	22.9	26.8	23.3	27.9	27.2	25.4
Cadmium	0.19		0.64	0.65		0.2
Calcium	16100	18000	15100	17100	16800	15400
Chromium						
Copper				5.41		
Iron	372	308		357	365	322
Lead	1.6			0.86	0.51	2.21
Magnesium	3640	3870	743	3850	3790	3460
Manganese	59.2	30.8		63.6	62.5	57.5
Potassium	2840	3250	3520	3520	3760	3230
Sodium	27700	29900	230000	30100	29500	27200
Zinc					26.1	
<b>CONVENTIONAL</b>						
Hardness				45.6	0.454	
Total Organic Carbon				5.99	5.61	
<b>RADIOLOGICAL (pCi/l)</b>						
Alpha gross	2			1		
Beta gross	10	3	5	4	1	3
Uranium 234	0.4	0.1		0.1	0.4	0.2
Uranium 238			0.1	0.1	0.2	0.1

**Table 4-38**  
**MTL Phase 2 RI Charles River Downstream Surface Water Sampling Results**  
**(Continued)**

SITE ID	RVER SW-17	RVER SW-17-1D	RVER SW-6	RVER SW-8
DEPTH (ft)	0	0	0	0
<b>COMPOUND</b>				
<b>VOA</b>				
1,3-Dimethylbenzene				1.61
Ethylbenzene				
Toluene				2.4
Trichloroethylene	2.5	2.7		2.4
Xylenes				
<b>BNA</b>				
bis (2-Ethylhexyl) Phthalate				
<b>PEST/PCB</b>				
Isodrin	0.00406			
Lindane				0.00321
<b>TOTAL METALS</b>				
Aluminum	132	139	148	
Barium	35.5	32.8	28.9	29.5
Cadmium	0.48			0.18
Calcium	17500	16400	13200	18200
Copper			4.57	
Chromium				
Chromium (+6)				
Iron	727	658	569	288
Lead	3.54		4.4	4.27
Magnesium	3950	3640	2990	3890
Manganese	88.3	81.6	58.9	
Potassium	3720	2940	2150	3500
Sodium	31100	28100	21100	29500
Zinc		27.9	43.8	
<b>FILTERED METALS</b>				
Aluminum				174
Antimony			15	13.1
Barium	27.2	28.6	25.9	21.1
Cadmium	0.59			0.18
Calcium	16400	16600	13100	15100
Chromium			1.28	
Copper			4.59	
Iron	366	370	134	156
Lead	0.67		1.33	0.96
Magnesium	3690	3740	3010	
Manganese	62	63.6	27.9	
Potassium	3500	3520	4310	2960
Sodium	28700	28900	23500	24800
Zinc		26.1	28	
<b>CONVENTIONAL</b>				
Hardness			46.4	0.472
Total Organic Carbon			5.78	5.57
<b>RADIOLOGICAL (pCi/l)</b>				
Alpha gross				
Beta gross	3	4	2	5
Uranium 234	0.2	0.4	0.1	0.9
Uranium 238	0.1	0.1	0.1	0.5

**Table 4-39**  
**MTL Phase 2 RI Charles River Downstream Sediment Sampling Results**

SITE ID	OTFL SD-10	OTFL SD-10P	OTFL SD-12	OTFL SD-12D	OTFL SD-14	OTFL SD-14P	OTFL SD-4
DEPTH (ft)	0	0	0	0	0	0	0
<b>COMPOUND</b>							
<b>BNA</b>							
1,2-Dichlorobenzene	0.821						
2-Methylnaphthalene	0.688						0.321
Acenaphthene	1.43						0.986
Acenaphthylene	3.8				0.408		2.32
Anthracene							
Benzo [A] Anthracene	18.1				1.28	0.234	11.2
Benzo [A] Pyrene	17.5						10.4
Benzo [B] Fluoranthene	14.4				2.87		12.8
Benzo [G.H.I] Perylene	12.3				1.34		
Benzo [K] Fluoranthene	11.9				1.42		10.3
bis (2-Ethylhexyl) Phthalate					6.09	3.45	
Chrysene	17.2					0.245	12.4
Di-n-Butyl Phthalate							
Dibenz [A.H] Anthracene							
Dibenzofuran							
Fluoranthene	30.7		0.0876		1.78	0.406	14
Fluorene	2.82				0.294		1.79
Indeno [1.2.3-C.D] Pyrene							
Naphthalene							
Phenanthrene	28.5				1.84	0.529	13.4
Pyrene	58				3.04	0.574	15.2
<b>PEST/PCB</b>							
Aldrin	0.0515					0.026	
alpha-Endosulfan	0.0253						0.11
beta-Endosulfan	0.0126		0.0132		0.00861	0.0173	
delta-Benzenehexachloride							
Dieldrin	0.0521	0.00915	0.0418		0.0352	0.0611	0.15
Endrin	0.0476					0.0354	
Heptachlor Epoxide	0.052				0.0189	0.0308	
Isodrin	0.0137						
Lindane							
ppDDD	0.0331	0.024	0.0172		0.0358	0.157	0.45
ppDDE	0.143		0.0168		0.0266	0.0988	0.26
ppDDT	0.172	0.0119	0.0196		0.0423	0.111	0.41
<b>INORGANIC/METAL</b>							
Aluminum	15400		23300	21100	5410	16700	15600
Arsenic				5.86		5.04	
Barium	218		75.8	56	66.7	44.2	197
Beryllium						1.08	
Cadmium	9.81						
Calcium	10200		5300	4350	2820	8840	14100
Chromium	98.7		41.3	40.7	22.4	15.8	105
Cobalt			11.3	10.9		16.2	13.9
Copper	1010		8.38	9.24	43.9	19.7	398
Cyanide							
Iron	43500		34800	35900	14600	53300	30700
Lead	624		18.9	16.7	118	72.4	686
Magnesium	5870		7820	8070	2160	8990	5500
Manganese	878		326	294	302	432	472
Mercury	0.535				0.221		1.63
Nickel	51		20.8	20.2		16.2	32.5
Potassium	1700		5010	437	428	895	1700
Silver	21.2						
Sodium	813		886	812	175	415	589
Vanadium	68.9		49.5	43.4	19.4	75.2	57.6
Zinc	651		53	56.4	165	142	621
<b>CONVENTIONAL</b>							
Total Organic Carbon	845000		98100	95700	200000	35600	80000
<b>RADIOLOGICAL (pCi/g)</b>							
Alpha gross	20	11	19	12	24	15	18
Beta gross	23	24	26	24	23	16	25
Uranium 234	1	0.5	1.1	1.2	0.7	0.2	0.8
Uranium 235							
Uranium 238	1.5	0.6	1	0.8	0.5	0.4	0.7

Units are ug/g unless noted

**Table 4-39**  
**MTL Phase 2 RI Charles River Downstream Sediment Sampling Results**  
**(Continued)**

SITE ID DEPTH (ft)	OTFL SD-4D 0	OTFL SD-4P 0	OTFL SD-5 0	OTFL SD-5D 0	OTFL SD-5P 0	OTFL SD-7 0	OTFL SD-9 0
<b>COMPOUND</b>							
<b>BNA</b>							
1,2-Dichlorobenzene							
2-Methylnaphthalene	0.65			0.823	1.09		0.182
Acenaphthene	2.25	0.397	0.645	3.95	4.69		0.553
Acenaphthylene	2.09	0.788	2.19	2.03	2.01	0.969	1.92
Anthracene	5.3			7.26	10.1		
Benzo [A] Anthracene	14.2	3.58	9.7	23.2	20.4	3.35	3.08
Benzo [A] Pyrene	11.4	3.07		19	GT 6.20e+00		
Benzo [B] Fluoranthene	9.56	3.67	12	21.7	17.6	1.56	3.89
Benzo [G.H.I] Perylene				12.6	14.6		2.91
Benzo [K] Fluoranthene	10.1	2.57	9.65	14.7	17.7	6.68	2.77
bis (2-Ethylhexyl) Phthalate	10.1	3.11	32.6	15.3	2.12	21.6	11.2
Chrysene	12.4	3.41	11.5	22.1	20.4	4.22	3.54
Di-n-Butyl Phthalate				3.06			
Dibenz [A.H] Anthracene					2.13		
Dibenzofuran	0.787			1.46	2.49		
Fluoranthene	GT 6.20e+00	4.4	12.1	7.45	GT 6.20e+00	5.82	6.21
Fluorene	2.81		1.29	4.33	5.84	0.607	0.991
Indeno [1.2.3-C.D] Pyrene	GT 1.20e+01			GT 1.20e+01	23.1		
Naphthalene					2.47		
Phenanthrene	20.9	5.22	13.1	29.9	GT 1.20e+01	4.51	4.7
Pyrene	GT 6.20e+00	5.74	19	GT 6.20e+00	GT 6.20e+00	7.54	7.8
<b>PEST/PCB</b>							
Aldrin	0.00735		0.0294	0.11	0.00873	0.0229	
alpha-Endosulfan	0.0089		0.0247	0.083	0.0101		
beta-Endosulfan	0.00891		0.0144			0.0153	
delta-Benzenehexachloride							
Dieldrin	8.54e-03/ 4.06e-02		0.0726	0.028	0.0205	0.0566	
Endrin			0.0336			0.0308	
Heptachlor Epoxide						0.0259	
Isodrin							
Lindane	0.00144						
ppDDD	6.52e-03/ 2.77e-02	0.25	0.196	0.048	0.048	0.121	
ppDDE	0.0112	0.1	0.0937	0.17	0.0303	0.0766	
ppDDT	1.76e-02/ 2.35e-02	0.19	0.126	0.38	0.0495	0.109	0.019
<b>INORGANIC/METAL</b>							
Aluminum	11300	10200	21900	11200	10900	18700	9910
Arsenic					13.2		
Barium	94.3	42.3	274	418	202	240	126
Beryllium		0.658					
Cadmium			10.1	9.48	1.97	10.2	
Calcium	4930	7230	9170	5160	5140	8100	6300
Chromium	33.3	14.6	124	84.9	36.8	108	66
Cobalt	10.7	9.06	21.1	13.3	7.84	20.5	
Copper	99.2	66.2	690	445	345	255	133
Cyanide	0.493			2.34			
Iron	23800	25900	47900	41600	31300	36700	22600
Lead	354	89.9	750	1850	566	550	370
Magnesium	4880	4180	6860	4430	3330	5830	3810
Manganese	215	202	614	224	216	667	316
Mercury	0.258	0.722	0.884	2.23	1.21	0.663	0.391
Nickel	17.4	11	54.7	45.4	28.6	30	19.9
Potassium	1450	1630	769	1150	1070	2070	1170
Silver				3.33			
Sodium	355	295	767	385	381	594	540
Vanadium	39.9	37.4	77.6	67.4	33.6	60.5	35
Zinc	200	105	730	427	526	628	404
<b>CONVENTIONAL</b>							
Total Organic Carbon	79000	66000	120000	110000	77000	120000	586000
<b>RADIOLOGICAL (pCi/g)</b>							
Alpha gross	13	1	19	20	15	35	22
Beta gross	21	20	25	19	15	37	24
Uranium 234	0.6	0.4	1.1	0.5	0.5	1.4	0.8
Uranium 235						0.1	
Uranium 238	0.6	0.3	0.7	0.8	0.5	0.9	0.6

Units are ug/g unless noted

**Table 4-39**  
**MTL Phase 2 RI Charles River Downstream Sediment Sampling Results**  
**(Continued)**

SITE ID	OTFL SD-9-1D	OTFL SD-9P	RVER SD-11	RVER SD-13	RVER SD-15	RVER SD-17
DEPTH (ft)	0	0	0	0	0	0
<b>COMPOUND</b>						
<b>BNA</b>						
1,2-Dichlorobenzene						
2-Methylnaphthalene		0.319				0.622
Acenaphthene	0.883		0.157		0.364	1.23
Acenaphthylene	3.09	3.6	1.09		2.04	8.07
Anthracene						9.07
Benzo [A] Anthracene	6.74	5	1.8		3.34	16.1
Benzo [A] Pyrene						28.8
Benzo [B] Fluoranthene	8.38		1.92		7.8	25.1
Benzo [G.H.I] Perylene		4.49	1.94		3.48	23.1
Benzo [K] Fluoranthene	6.27		1.81		2.86	11.2
bis (2-Ethylhexyl) Phthalate	24.4	15.5				
Chrysene	6.87	6.04	1.73	0.0558		
Di-n-Butyl Phthalate					8.52	
Dibenz [A.H] Anthracene						4.29
Dibenzofuran						
Fluoranthene	14.6	10.3	2.8	0.117	5.8	GT 6.20e+00
Fluorene	2.05	1.39	0.357		0.977	4.27
Indeno [1.2.3-C.D] Pyrene						32.1
Naphthalene						
Phenanthrene	10	80	2.2	0.113	5.03	17.4
Pyrene	18.6	13.6	4.73	0.152	6.36	GT 6.20e+00
<b>PEST/PCB</b>						
Aldrin			0.054		0.0978	
alpha-Endosulfan			0.0238		0.0344	
beta-Endosulfan		0.00876	0.00988	0.00843	0.0192	
delta-Benzenehexachloride			0.0433			
Dieldrin		0.0437	0.0466	0.0385	0.0818	0.048
Endrin			0.0538		0.0266	
Heptachlor Epoxide		0.0153	0.0468		0.0679	
Isodrin			0.0122		0.0159	
Lindane						
ppDDD		0.0979	0.17	0.0187	0.37	0.045
ppDDE		0.0497	0.121	0.0147	0.225	0.042
ppDDT		0.0603	0.141	0.0203	0.286	0.11
<b>INORGANIC/METAL</b>						
Aluminum	20400	10300	4180	7910	25500	19500
Arsenic						10.9
Barium	227	146	48.3	34.2	313	139
Beryllium				0.526		
Cadmium	10.3	7.5	2.45		13.6	3.76
Calcium	11100	6790	1730	2480	2460	7400
Chromium	130	78.9	24.6	19.2	125	159
Cobalt			3.36	4.12	24.9	16.7
Copper	284	193	46.4	10.2	218	172
Cyanide					4.35	
Iron	41500	26600	7560	14800	46700	40500
Lead	685	434	139	15.8	860	503
Magnesium	6680	3970	1490	3000	7580	7170
Manganese	618	366	173	167	972	507
Mercury	0.613	1.73	0.183	0.0551	0.741	0.621
Nickel	34.6	16.2	8.88	9.38	54.1	33.4
Potassium	2950	1120	411	1570	3270	1930
Silver			1.14			
Sodium	1150	587	147	214	978	971
Vanadium	64.5	41.3	14.3	18	85.3	55.7
Zinc	894	508	134	34.4	770	475
<b>CONVENTIONAL</b>						
Total Organic Carbon	140000	656000	120000	56900	488000	323000
<b>RADIOLOGICAL (pCi/g)</b>						
Alpha gross	16	16	31	11	19	20
Beta gross	20	20	25	22	22	25
Uranium 234	1.1	0.7	1.1	0.9	0.9	1.1
Uranium 235	0.2					0.1
Uranium 238	1.1	0.5	0.9	0.8	0.8	0.6

**Table 4-39**  
**MTL Phase 2 RI Charles River Downstream Sediment Sampling Results**  
**(Continued)**

SITE ID	RVER SD-17-1D	RVER SD-6	RVER SD-6D	RVER SD-6P	RVER SD-8	RVER SD-8D
DEPTH (ft)	0	0	0	0	0	0
<b>COMPOUND</b>						
<b>BNA</b>						
1,2-Dichlorobenzene						
2-Methylnaphthalene	0.317					0.483
Acenaphthene	0.753	0.629		0.113	0.324	0.697
Acenaphthylene	4.38	2.15	1.6	0.162		5.03
Anthracene	4.67					4.35
Benzo [A] Anthracene	12.3	9.01	7.7		3.34	6.56
Benzo [A] Pyrene	13.3					8.77
Benzo [B] Fluoranthene	13.9	10.1		1.4	4.21	2.55
Benzo [G,H,I] Perylene	8.43				3.14	5.87
Benzo [K] Fluoranthene	8.42	9.87		0.929	3.4	4.83
bis (2-Ethylhexyl) Phthalate		48.2	GT 6.20e+00	2.81	11.1	
Chrysene		10.7	6.8	0.72	3.94	7.13
Di-n-Butyl Phthalate						
Dibenz [A,H] Anthracene	1.81					1.6
Dibenzofuran						
Fluoranthene	13.5	10.1	8.91	0.839	6.57	10.3
Fluorene	2.58	1.05			0.996	2
Indeno [1.2.3-C,D] Pyrene	12.8	36.7	13.1			
Naphthalene						
Phenanthrene	8.7	8.38	6.51	0.117	4.24	9.59
Pyrene	24.2	12.1	8.49	1.21	7.28	20.8
<b>PEST/PCB</b>						
Aldrin			0.088			0.2
alpha-Endosulfan						0.11
beta-Endosulfan						
delta-Benzenhexachloride						
Dieldrin						0.48
Endrin						
Heptachlor Epoxide						
Isodrin						
Lindane						
ppDDD		0.17	0.12		0.26	0.62
ppDDE		0.18	0.14		0.16	0.38
ppDDT		0.4	0.29		0.28	0.7
<b>INORGANIC/METAL</b>						
Aluminum	21000	26900	17600	4150	20300	22700
Arsenic				8.02		11.2
Barium	125	308	211	37.9	252	160
Beryllium	1.62					
Cadmium		17.9	25.1		11.2	4.08
Calcium	8420	11200	8120	2650	8760	5800
Chromium	135	150	153	13.4	148	134
Cobalt	16.5	27	15.5	4.04	19	16.5
Copper	127	457	322	25.9	254	186
Cyanide			1.04	5.9		
Iron	38200	45200	31600	20700	43000	39500
Lead	326	848	872	38.5	605	536
Magnesium	7010	7800	5970	2050	7170	7310
Manganese	496	740	391	125	775	344
Mercury	0.594	1.2	1.19		0.868	1.04
Nickel	34.9	55.4	39.5	6.69	46	35
Potassium	2740	3060	1990	592	2320	2660
Silver	2.47	5.98	5.61		3.37	5.01
Sodium	1150	956	626	68.4	575	375
Vanadium	61.7	94.9	87	27	59.1	72.4
Zinc	370	818	549	64.7	638	380
<b>CONVENTIONAL</b>						
Total Organic Carbon	333000	120000	120000	75000	391000	274000
<b>RADIOLOGICAL (pCi/g)</b>						
Alpha gross	25	35	25	13	32	18
Beta gross	24	26	27	38	23	22
Uranium 234	0.9	1.3	1.3	0.4	1.2	0.9
Uranium 235		0.2				0.1
Uranium 238	0.8	1	1.3	0.4	0.9	1.1

**Table 4-40**

**Recorded Rainfall and Storm Sewer Flow Rates**

Date	Period Beginning	Period Ending	Rainfall (inches)	Average Flowrate (gpm)						
				Outfall 1 SW-4P	Outfall 2 SW-5P	Outfall 3 SW-7P	Outfall 5 SW-10P	Outfall 7 SW-14P	Background 1 SW-1	Background 2 SW-21
14-Dec	0:00	1:00	0	9	0	0	0	13	9	29
	1:00	2:00	0	9	0	0	0	13	9	30
	2:00	3:00	0.01	12	0	0	0	13	9	30
	3:00	4:00	0	9	0	0	0	13	8	28
	4:00	5:00	0	11	0	0	0	14	11	29
	5:00	6:00	0	11	0	0	0	13	10	31
	6:00	7:00	0.01	25	9	0	2	13	17	31
	7:00	8:00	0.05	300	57	27	8	14	47	29
	8:00	9:00	0.03	299	61	6	24	A	509(B)	31
	9:00	10:00	0.02	303	64	2	21	198(B)	184	37
	10:00	11:00	0.07	428	92	6	21	234(B)	285	23
	11:00	12:00	0.04	A	A	5	23	237(B)	335	28
	12:00	13:00	0.02	A	A	5	24	218(B)	488	A
	13:00	14:00	0.02	A	A	2	21	A	A	A

A - Instrumentation inactivated at this time

B - Recorded flow reading believed to erroneous

Table 4-41  
MTL Phase 2 RI Storm Sewer Surface Water Sampling Results

LOCATION SITE ID	Outfall 1 STSW SW-4P	Outfall 2 STSW SW-5P	Outfall 3 STSW SW-7P	Outfall 4 STSW SW-10P	Outfall 5 STSW SW-14P	Background 1 STSW SW-1	Background 2 STSW SW-21	Background Maximum
<b>COMPOUND</b>								
<b>VOA</b>								
Acetone							GT 1.00e+02	GT 1.00e+02
Chloroform							1.4	1.4
<b>BNA</b>								
bis (2-Ethylhexyl) Phthalate	55.7			33.7		26.4		26.4
<b>PEST/PCB</b>								
Aldrin	0.0273	0.0203	0.0377	0.0152	0.0136	0.036	0.0226	0.036
alpha-Benzenehexachloride					0.0588			
alpha-Endosulfan	0.0393		0.00964					
beta-Benzenehexachloride			0.00973				0.0371	0.0371
Chlordane					0.507			
delta-Benzenehexachloride					0.0502			
Heptachlor		0.0146			0.0306			
Isodrin							0.183	0.183
Lindane	0.0357	0.0293	0.0138	0.0143		0.0367		0.0367
Methoxychlor	0.127							
ppDDD				0.00869	0.0787		0.848	0.848
ppDDE	0.031				0.0381	0.00606		0.00606
ppDDT	0.0838	0.0176			0.0815	0.0463		0.0463
<b>INORGANIC/METAL</b>								
Aluminum	2640		1590	471	812	2650	1150	2650
Arsenic	3.75		2.69		4.74		2.49	2.49
Barium	32.5		12.5	8.48	12.5	32.5	25.5	32.5
Calcium	4770		4510	2650	4030	4240	8520	8520
Copper	123		112	584		125	154	154
Cyanide	8.89					7.78	5.71	7.78
Iron	4440		1770	769	2880	4020	1910	4020
Lead	73.5		56.8		49.4	62.7		62.7
Magnesium	1130		528	280	726	1030	1170	1170
Manganese	76.1		48	19.5	124	74.6	73.6	74.6
Potassium	1740				3490		2340	2340
Sodium	89000		3120	13900	15600	85000	29000	85000
Zinc	206		97.4	496	23.1	200	198	200
<b>METALS, dissolved</b>								
Aluminum	138	237	143			149		149
Barium	13.4	8.04	3.57	5.36	5.36	13	16.5	16.5

units are ug/l unless noted

**Table 4-41  
MTL Phase 2 RI Storm Sewer Surface Water Sampling Results  
(Continued)**

LOCATION SITE ID	Outfall 1 STSW SW-4P	Outfall 2 STSW SW-5P	Outfall 3 STSW SW-7P	Outfall 4 STSW SW-10P	Outfall 5 STSW SW-14P	Background 1 STSW SW-1	Background 2 STSW SW-21	Background Maximum
Calcium	4190	2420	4300	2530	3810	3800	8480	8480
Copper	56.9	382	42.6	513		65.3	89.6	89.6
Iron	223	209		102	254	178	102	178
Magnesium	366	191	257	178	557	352	938	938
Manganese	35.4	24.2	14.5	12.4	83.8	36	59.5	59.5
Potassium					3060	1540	2080	2080
Sodium	94000	17400	3610	13500	16000	87000	74000	87000
Zinc	132	165	93.6	483		125		125
<b>CONVENTIONAL</b>								
Hardness	16.2	7.78	13.2	7.63	12.8	14.5	25.6	25.6
Nitrite/Nitrate - nonspecific	980	1100	390	580	440	900	980	980
Total Organic Carbon	8000	4400	3400	2800	9100	16500	11000	16500
<b>RADIOLOGICAL (pCi/l)</b>								
Alpha gross	1	1	2	3		1	2	2
Beta gross	3	2	4	1	4	2	5	5
Uranium 234	0.2	0.1	0.2	0.1		0.2	0.1	0.2
Uranium 238	0.1		0.1			0.1		0.1

**Table 4-42**

**Building Drain Dye Testing**

<b>Building</b>	<b>Location</b>	<b>Drain Type</b>	<b>Conduit</b>	<b>Destination</b>
39	Fifth Floor	Sink	5-inch line to MDC	Manhole 01
39	Room 101A	Floor	5-inch line to MDC	Manhole 01
43	Lean-to	Shower	4-inch line to MDC	Manhole 93
43	Main Bay	Floor (2 drains)	Unknown	Manhole 93
43	Southeast Wall	Sink	Unknown	Manhole 93
243	Sink	Sink	6-inch pipe	Outdoor Cistern
243	Eyewash	Eyewash	6-inch pipe	Outdoor Cistern
243	Floor	Floor	6-inch pipe	Outdoor Cistern
292	Room 244	Sink	6-inch pipe	Manhole 82
312	DU Machine Room	Floor	6-inch line	Manhole 74
312	Shower	Floor	6-inch line	Manhole 74

**Table 4-43**  
**MTL Phase 2 RI Sanitary Sewer Sediment Sampling Results**

SITE ID	SWER SWRSD01	SWER SWRSD02	SWER SWRSD91	SWER SWRSD93
DEPTH (ft)	0	0	0	0
<b>COMPOUND</b>				
<b>BNA</b>				
1,4-Dichlorobenzene		3.82	6.56	3.68
4-Methylphenol			0.597	
Acenaphthylene			0.134	
Benzo [A] Anthracene			0.858	16.3
Benzo [B] Fluoranthene			0.794	38.3
Benzo [K] Fluoranthene			0.587	
bis (2-Ethylhexyl) Phthalate		68.1	8.09	
Chrysene			0.678	17.7
Fluoranthene			0.698	26.2
Fluorene		1.31	0.253	
Phenanthrene		3.39	1.04	22.5
Pyrene			1.06	32
<b>PEST/PCB</b>				
PCB 1260		1.12		
<b>INORGANIC/METAL</b>				
Aluminum		2030	5420	21100
Barium		64.5	161	49.6
Cadmium				6.15
Calcium		9260	4760	4320
Chromium		122	44.2	454
Cobalt			7.04	13.9
Copper		15000	462	844
Cyanide			2.8	
Iron		20800	23200	41400
Lead		560	330	279
Magnesium		1360	2730	2420
Manganese		213	179	348
Mercury		5.22	0.417	15
Nickel		28.2	19.7	233
Potassium			684	953
Silver		41.5	41.8	42.1
Sodium		359	333	198
Vanadium		13.3	28.7	44.6
Zinc		416	1030	287
<b>RADIOLOGICAL (pCi/g)</b>				
Alpha gross	17	8	7	110
Beta gross	33	12	16	120
Cesium 137	0.5		0.1	0.2
Thorium 230	0.8	0.1	0.9	0.3
Uranium 234	1.1	0.9	0.7	7.9
Uranium 235	0.1		0.1	0.9
Uranium 238	6.5	1.8	2.3	55

**Table 4-44**

**Radiological Results of Sanitary Sewer Sampling (pCi/g)**

<b>Manhole No.</b>	<b>Gross Alpha</b>	<b>Gross Beta</b>	<b>U-234</b>	<b>U-235</b>	<b>U-238</b>
01	17	33	1.1	0.1	6.5
93	110	120	7.9	0.9	55
82	8	12	0.9	0	1.8
91	7	16	0.7	0.1	2.3
92	6	26	0.5	0	1.1
120	68	130	4.3	0.9	53
02	30	49	2.9	0.5	17
67	72	120	8.9	1.6	73
39	20	47	3.1	0.4	20
53	13	27	1.1	0.2	7.1
95	5	20	0.6	0	0.8
54	18	22	0.1	0.1	1.7

**Table 4-45**

**Locations of Off-Site Background Readings**

<b>Site Number</b>	<b>Location</b>	<b>Address</b>	<b>Structural Type</b>
1	Office Building	Van de Graff Drive, Burlington	Modern stone and concrete structure
2	JFK Federal Record Building	Trapelo Road, Waltham	Brick and concrete; Date of construction unknown
3	Newton City Hall	Commonwealth Avenue, Newton	Brick and concrete; built 1932
4	North Watertown Fire Station	Watertown	Brick and concrete; built 1951
5	Building Materials Supplier	Arsenal Street, Watertown	Brick and concrete; built 1960s
6	Hellenic Church	Bigelow Street, Watertown	Brick and concrete; built 1957
7	Watertown City Hall	Main Street, Watertown	Brick and concrete; built 1930s
8	Watertown Library	Main Street, Watertown	Brick and concrete; built 1890s
9	Watertown Incinerator	Arlington Street, Watertown	Brick and concrete; built early 1960s
10	Cunniff School	Warren Street, Watertown	Brick and concrete; built 1958
11	Playground	Trapelo Road, Belmont	Outdoor
12	Cambridge Cemetery	Cambridge	Outdoor

**Table 4-46**

**Building Background Radiological Readings**

	<b>Number of Readings</b>	<b>Alpha (dpm/100 cm<sup>2</sup>)</b>	<b>Beta-Gamma (dpm/100 cm<sup>2</sup>)</b>	<b>Gamma (μR/hr)</b>
All off-site locations	51	14 ± 17 <sup>a</sup>	1,635 ± 875	12.5 ± 2.3
Buildings built 1957 to 1960 <sup>b</sup>	15	30 ± 19	1,368 ± 509	11.9 ± 1.7
Buildings built before 1957 <sup>c</sup>	17	7 ± 7	1,309 ± 365	13.5 ± 2.3
Buildings built after 1960 <sup>d</sup>	10	3 ± 3.5	1,213 ± 326	11.9 ± 2.4

<sup>a</sup>One standard deviation

<sup>b</sup>Sites 6 and 10.

<sup>c</sup>Sites 4, 7, and 8.

<sup>d</sup>Sites 5 and 9.

**Table 4-47**

**Outdoor FIDLER Survey Results**

<b>Surface Material</b>	<b>Number of Readings</b>	<b>Average Reading (cpm)</b>
Asphalt	8,051	6,203 ±1,027*
Grass	6,468	5,417 ±9.45
Concrete	607	6,221 ±1,166
Gravel	43	6,000 ±1,063
Granite	25	11,008 ±5,979
Brick	21	6,833 ±811

\*One standard deviation.

**Table 4-48**  
**Summary of Building Surface Total Activity Results**

Building	Floor	Alpha				Beta-Gamma			
		n	mean	s	u	n	mean	s	u
111	1	120	-12.083	6.519	-11.097	120	481.875	720.611	590.926
111	2	135	-8.556	4.242	-7.951	135	119.948	493.633	190.316
111	3	110	-8.609	4.751	-7.858	110	-97.318	424.196	-30.221
111	B	130	-7.300	4.074	-6.708	130	987.531	722.486	1092.513
117	1	55	-12.436	6.082	-11.064	54	131.926	752.955	303.463
117	2	40	-8.425	7.726	-6.367	45	243.956	605.087	395.514
117	B	30	6.867	15.668	11.727	30	382.667	483.393	532.623
118	AA	65	-10.538	3.865	-9.738	65	-104.200	537.764	7.126
118	AB	50	-10.060	6.261	-8.576	50	-262.280	425.243	-161.455
118	AC	59	-10.492	5.903	-9.207	60	-127.950	634.151	8.860
118	AD	55	-9.836	5.636	-8.564	55	-112.127	825.105	74.069
118	AE	64	-9.359	5.948	-8.118	65	-333.769	531.197	-223.803
118	B	60	-9.500	5.391	-8.337	60	503.650	687.509	651.971
131	1	756	-4.923	9.807	-4.336	765	-500.524	551.437	-467.691
131	2	628	-4.268	9.552	-3.640	628	-615.131	467.836	-584.378
131	3	99	25.424	48.607	33.536	99	428.889	1437.654	668.821
131	A	78	39.051	51.209	48.705	84	696.476	1281.252	929.016
131	B	508	4.799	12.932	5.745	508	-28.504	631.562	17.671
229	1	10	-11.300	5.677	-8.009	10	1027.800	637.586	1397.396
243	1	40	0.150	11.222	3.139	40	624.750	811.571	840.954
246	1	45	-13.067	5.189	-11.767	45	575.333	902.790	801.459
36	1	795	-6.689	7.470	-6.253	795	22.389	550.357	54.532
36	2	60	-7.383	5.539	-6.188	60	201.267	548.825	319.669
36	B	223	-5.834	9.337	-4.801	224	440.112	600.552	506.388
60	1	205	-5.980	4.846	-5.421	205	199.824	796.402	291.734
60	2	20	-2.900	12.924	2.097	20	-20.450	521.597	181.223
60	T	10	-7.000	5.164	-4.007	10	302.300	851.060	795.643
656	1	30	-11.933	6.454	-9.931	30	476.833	589.392	659.673

Notes: n = Number of measurement points.  
 mean = Arithmetic mean of survey points after background is subtracted  
 s = Standard deviation.  
 u = Upper bound of the mean at 95% confidence interval.

**Table 4-49**  
**Summary of Building Surface Removable Activity Results**

Building	Floor	Alpha				Beta			
		n	mean	s	u	n	mean	s	u
111	1	26	0.586	0.423	0.728	26	1.462	3.105	2.502
111	2	27	0.812	0.673	1.033	27	3.907	5.376	5.672
111	3	22	0.598	0.471	0.771	22	0.523	1.562	1.096
111	B	25	0.026	0.132	0.072	25	3.740	6.972	6.126
117	1	11	0.000	0.000	0.000	11	3.000	5.464	5.986
117	2	9	0.000	0.000	0.000	9	9.111	7.865	13.986
117	B	6	0.000	0.000	0.000	6	2.417	2.672	4.615
118	AA	13	0.110	0.219	0.218	13	11.038	13.141	17.534
118	AB	10	0.000	0.000	0.000	10	5.650	7.594	10.052
118	AC	12	0.000	0.000	0.000	12	4.458	7.924	8.566
118	AD	11	0.000	0.000	0.000	11	0.136	0.452	0.384
118	AE	13	0.000	0.000	0.000	13	1.192	3.326	2.837
118	B	12	0.000	0.000	0.000	12	0.000	0.000	0.000
131	1	155	0.220	0.692	0.312	155	3.523	6.479	4.384
131	2	130	0.339	0.590	0.425	130	12.246	13.057	14.143
131	3	40	0.281	0.723	0.473	40	6.245	5.951	7.830
131	A	3	0.000	0.000	0.000	3	11.000	12.440	31.972
131	B	105	1.245	3.859	1.870	105	7.276	11.389	9.121
229	1	2	0.000	0.000	0.000	2	15.500	7.778	50.226
243	1	8	0.000	0.000	0.000	8	6.437	10.321	13.351
246	1	9	0.000	0.000	0.000	9	4.444	6.673	8.581
36	1	156	0.397	0.489	0.462	156	8.929	9.320	10.164
36	2	12	0.297	0.455	0.533	12	6.125	6.829	9.666
36	B	44	0.497	0.469	0.616	44	7.466	6.024	8.992
60	1	41	0.000	0.000	0.000	41	2.256	5.397	3.675
60	2	4	0.000	0.000	0.000	4	0.000	0.000	0.000
60	T	2	0.000	0.000	0.000	2	5.000	7.071	36.569
656	1	6	0.000	0.000	0.000	6	5.333	7.257	11.303

Notes: n = Number of measurement points.  
 mean = Arithmetic mean of survey points after background is subtracted  
 s = Standard deviation.  
 u = Upper bound of the mean at 95% confidence interval.

Table 4-50  
Radiological Wipe Sampling Results

Sample I.D.	Date Collected	Gross Alpha (pCi/g)	Gross Beta (pCi/g)	U-234 (pCi/g)	U-235 (pCi/g)	U-238 (pCi/g)	Tritium	Pu-239 & 240	Am-241	Cs-137	Ra-226	Cf	C-14
111RW01	11/4/91	0	0	0.1	0	0.1							
111RW02	11/4/91	0	0	0	0	0							
117RW01	11/21/91	0	0	0	0	0							
118RW01	11/19/91	0	0	0	0	0							
131RW01	12/7/91			0	0	0							
131RW02	12/8/91			0	0	0							
131RW03	12/9/91			0.6	0.2	0.5							
131RW04	12/9/91			0	0	0							
241RW01	12/19/91			0	0	0	0	0.01	0	0	0	0	0.3
241RW02	12/19/91			0.1	0	0	0	0.01	0.02	0	0	0	0.2
292RW01	12/15/91			0.2	0	0							
292RW02	12/15/91			0	0	0							
292RW03	12/15/91			0	0	0							
292RW04	12/15/91			0	0	0							
311RW01	11/21/91	2	4	0.3	0	2.2							
311RW02	11/21/91	0	1	0	0	0.4							
311RW03	11/21/91	1	2	0.1	0	1.4							
311RW04	11/21/91	3	6	0.7	0.1	3.3							
312RW01	12/19/91						0						
312RW02	12/19/91						0.7						
312RW03	12/19/91						0						
312RW04	12/19/91						0.7						
312RW05	11/7/91			8.4	1.3	72					0		
312RW06	11/10/91			2.9	0.3	22					0		
313RW01	12/16/91			0	0	0							
313RW02	12/19/91			0	0	0.1							
36RW01	11/23/91			0	0	0							
36RW02	11/23/91			0	0	0							

**Table 4-50**  
**Radiological Wipe Sampling Results**  
**(Continued)**

Sample I.D.	Date Collected	Gross Alpha (pCi/g)	Gross Beta (pCi/g)	U-234 (pCi/g)	U-235 (pCi/g)	U-238 (pCi/g)	Tritium	Pu-239 & Am-241	Cs-137	Ra-226	Cf	C-14
36RW03	11/23/91			0.1	0	0						
36RW04	11/25/91			0	0	0.1						
37RW01	12/11/91			0.3	0	0.3						
37RW02	12/11/91			0	0	0						
39RW01	10/29/91	0	0	0	0	0						
39RW02	10/29/91	0	0	0	0	0						
39RW03	11/6/91	0	0	0.1	0	0.1						
39RW04	11/6/91	0	0	0	0	0						
43RW01	12/18/91			3.1	0.3	25				0		
43RW02	12/18/91			4.4	0.4	35				0		
60RW01	11/11/91	0	0	0	0	0						
60RW02	11/11/91	0	0	0	0	0						
97RW01	12/10/91			0	0	0	0	0	0	0.2	0	0
97RW02	12/10/91			0	0	0	0.7	0	0	0	0.01	0
97RW03	12/10/91			0	0	0	0.7	0	0.01	0	0.01	0
97RW04	12/10/91			0	0	0	0.8	0.04	0	0	0	0
97RW05	12/10/91			0	0	0	1.8	0	0	0	0.05	0
97RW06	12/10/91			0	0	0	1.8	0	0.01	0.1	0	1.1
97RW07	12/10/91			0	0	0						
97RW08	12/10/91			0	0	0						



**Table 4-51**

**Borehole Gamma Screening Survey**

BORE HOLE	SAMPLING DATE	COUNT TIME (min)	COORDINATE LOCATION (depth, ft)	INSTRUMENT	INSTRUMENT
				READING GROSS COUNTS	READING GROSS COUNTS
12SB2	10/18/91	0.5	0.5	4047	8094
12SB2	10/18/91	0.5	1.0	4748	9496
12SB2	10/18/91	0.5	1.5	5209	10418
12SB2	10/18/91	0.5	2.0	5040	10080
12SB2	10/18/91	0.5	2.5	5088	10176
12SB2	10/18/91	0.5	3.0	4899	9798
12SB2	10/18/91	0.5	3.5	4923	9846
12SB2	10/18/91	0.5	4.0	4938	9876
12SB2	10/18/91	0.5	4.5	5166	10332
12SB2	10/18/91	0.5	5.0	5056	10112
12SB2	10/18/91	0.5	5.5	4937	9874
12SB2	10/18/91	0.5	6.0	4977	9954
12SB2	10/18/91	0.5	6.5	4908	9816
12SB2	10/18/91	0.5	7.0	4762	9524
12SB2	10/18/91	0.5	7.5	4726	9452
12SB3	10/23/91	0.5	0.0	3276	6552
12SB3	10/23/91	0.5	0.5	4457	8914
12SB3	10/23/91	0.5	1.0	4821	9642
12SB3	10/23/91	0.5	1.5	4867	9734
12SB3	10/23/91	0.5	2.0	5069	10138
12SB3	10/23/91	0.5	2.5	5129	10258
12SB3	10/23/91	0.5	3.0	5016	10032
12SB3	10/23/91	0.5	3.5	5332	10664
12SB3	10/23/91	0.5	4.0	5385	10770
12SB3	10/23/91	0.5	4.5	5270	10540
12SB3	10/23/91	0.5	5.0	5380	10760
12SB3	10/23/91	0.5	5.5	5575	11150
17SB2	10/24/91	0.5	0.5	6036	12072
17SB2	10/24/91	0.5	1.0	6766	13532
17SB2	10/24/91	0.5	1.5	6558	13116
17SB2	10/24/91	0.5	2.0	6336	12672
17SB2	10/24/91	0.5	2.5	6350	12700

**Category 3 Rooms or Areas**

Building	Room or Area
39	101A
39	108
39	109
39	110
39	114
39	117
39	121
39	122
39	123
39	125
39	127
39	130
39	131
39	132
39	133
39	134
39	142
39	143
39	145
39	155A
39	155B
39	156
39	1st Floor, Hallway 2
39	1st Floor, Hallway 3
39	1st Floor, Hallway 6
39	1st Floor, Men's Restroom
39	247
39	2nd Floor, Hallway 2
39	2nd Floor, Men's Restroom
39	3rd Floor, Women's Restroom
39	4th Floor, Women's Restroom
39	501
39	502
39	503A
39	512
39	5th Floor, Men's Restroom

**Category 3 Rooms or Areas  
(Continued)**

Building	Room or Area
292 311 311 311 311 311 311 311 311 311	North Staircase Area 17 Area 19 Area 20 Area 21 Area 22 Area 24 Area 26 Area 5 Loft-All Areas
312 312 312 312	137 139 219 225

**Table 4-53  
Chemical Wipe Sample Results Exceeding Calculated Guidelines**

BUILDING	ROOM	SITE	COMPOUND	CONCENTRATION
36	102	WIPE 36WP14	Chrysene	1.20e-02
36	102	WIPE 36WP14	Zinc	3.81e+00
36	Auditorium	WIPE 36WP04	PCB260	5.03e-03
36	Basement	WIPE 36WP10	Arsenic	5.57e-02
36	Basement	WIPE 36WP10	PCB254	5.15e-03
36	Basement	WIPE 36WP10	Zinc	3.24e+00
36	Basement	WIPE 36WP10	Lead	4.88e+00
36	Basement	WIPE 36WP09	Arsenic	8.25e-03
36	Basement	WIPE 36WP09	Lead	5.88e+02
36	Basement	WIPE 36WP08	Arsenic	3.22e-02
36	Basement	WIPE 36WP08	PCB254	4.47e-02
36	Basement	WIPE 36WP08	PCB260	2.63e-02
36	Basement	WIPE 36WP08	Thallium	9.68e-02
36	Basement	WIPE 36WP08	Zinc	2.13e+01
36	Basement	WIPE 36WP08	Lead	6.18e+01
36	Basement	WIPE 36WP07B	Arsenic	2.94e-02
36	Basement	WIPE 36WP07B	PCB254	1.91e-02
36	Basement	WIPE 36WP07B	PCB260	1.57e-02
36	Basement	WIPE 36WP07B	Zinc	3.90e+00
36	Basement	WIPE 36WP07B	Lead	6.42e+00
36	Basement	WIPE 36WP07	Arsenic	3.49e-02
36	Basement	WIPE 36WP07	PCB254	1.47e-02
36	Basement	WIPE 36WP07	PCB260	1.68e-02
36	Basement	WIPE 36WP07	Zinc	4.20e+00
36	Basement	WIPE 36WP07	Lead	1.65e+01
36	Basement	WIPE 36WP06	Arsenic	2.37e-02
36	Basement	WIPE 36WP06	PCB254	3.37e-02
36	Basement	WIPE 36WP06	PCB260	2.14e-02
36	Basement	WIPE 36WP06	Lead	1.33e+00
36	Basement	WIPE 36WP05B	Arsenic	1.98e-02
36	Basement	WIPE 36WP05B	PCB260	6.64e-03
36	Basement	WIPE 36WP05B	Zinc	6.48e+00
36	Basement	WIPE 36WP05B	Lead	4.36e+01
36	Basement	WIPE 36WP05	Zinc	1.45e+01
36	Basement	WIPE 36WP05	Lead	1.60e+02
37	5	WIPE 37WP24	Arsenic	1.94e-02
37	5	WIPE 37WP24	Lindane	1.09e-04
37	5	WIPE 37WP24	Zinc	6.65e+00
37	5	WIPE 37WP24	Lead	3.59e+00
37	5	WIPE 37WP23	Lead	5.78e-01
37	6	WIPE 37WP27	Arsenic	8.61e-02
37	6	WIPE 37WP27	Zinc	3.07e+00
37	6	WIPE 37WP27	Lead	3.09e+00
37	6	WIPE 37WP22B	Aldrin	5.87e-03
37	6	WIPE 37WP22B	Dieldrin	6.65e-03
37	6	WIPE 37WP22B	Lead	6.43e-01
37	6	WIPE 37WP22	Aldrin	3.00e-03
37	6	WIPE 37WP22	Dieldrin	2.74e-03
37	6	WIPE 37WP22	Zinc	1.78e+00
37	6	WIPE 37WP22	Lead	9.32e-01
37	6	WIPE 37WP20	Zinc	1.84e+00
37	6	WIPE 37WP20	Lead	3.10e+00
37	6	WIPE 37WP19	Lead	7.77e-01
37	8	WIPE 37WP18	Benzo [A] Anthracene	8.00e-03
37	8	WIPE 37WP18	Chromium	4.46e+01

**Table 4-53**  
**Chemical Wipe Sample Results Exceeding Calculated Guidelines**  
**(Continued)**

BUILDING	ROOM	SITE	COMPOUND	CONCENTRATION
37	8	WIPE 37WP18	Zinc	1.84e+00
37	8	WIPE 37WP18	Lead	8.76e-01
37	8	WIPE 37WP17	Arsenic	1.61e-02
37	8	WIPE 37WP17	Zinc	2.09e+00
37	8	WIPE 37WP17	Lead	9.97e-01
37	8	WIPE 37WP16	Arsenic	1.37e-02
37	8	WIPE 37WP15	Arsenic	8.40e-03
37	103	WIPE 37WP50	Arsenic	2.39e-02
37	103	WIPE 37WP50	Benzo [A] Anthracene	2.30e-02
37	103	WIPE 37WP50	Chrysene	2.80e-02
37	103	WIPE 37WP50	PCB260	7.92e-03
37	103	WIPE 37WP50	Zinc	2.24e+01
37	103	WIPE 37WP50	Lead	1.42e+00
37	104	WIPE 37WP35B	Zinc	1.91e+00
37	104	WIPE 37WP35B	Lead	5.70e-01
37	104	WIPE 37WP35	Chrysene	1.30e-02
37	104	WIPE 37WP35	Zinc	1.55e+00
37	104	WIPE 37WP35	Lead	4.16e-01
37	106	WIPE 37WP38	Arsenic	1.71e-02
37	106	WIPE 37WP38	Zinc	3.98e+00
37	106	WIPE 37WP38	Lead	2.76e+00
37	107	WIPE 37WP40	Arsenic	1.59e-02
37	107	WIPE 37WP40	PCB260	2.67e-02
37	107	WIPE 37WP40	Zinc	2.18e+00
37	107	WIPE 37WP40	Lead	1.41e+00
37	108	WIPE 37WP11	Arsenic	1.56e-02
37	108	WIPE 37WP11	PCB254	6.33e-03
37	108	WIPE 37WP11	Zinc	9.40e+00
37	108	WIPE 37WP11	Lead	2.16e+00
37	110	WIPE 37WP10	Lead	2.67e+00
37	111	WIPE 37WP12	Arsenic	2.51e-02
37	111	WIPE 37WP12	Lindane	2.83e-04
37	111	WIPE 37WP12	PCB254	7.75e-03
37	111	WIPE 37WP12	Zinc	3.94e+00
37	111	WIPE 37WP12	Lead	6.75e-01
37	113	WIPE 37WP42	Zinc	2.63e+00
37	113	WIPE 37WP42	Lead	1.11e+00
37	115	WIPE 37WP47	Arsenic	1.29e-02
37	115	WIPE 37WP47	PCB260	7.31e-03
37	115	WIPE 37WP47	Zinc	1.36e+01
37	115	WIPE 37WP47	Lead	8.92e-01
37	115	WIPE 37WP14	Arsenic	2.30e-02
37	115	WIPE 37WP14	Lindane	1.57e-04
37	115	WIPE 37WP14	PCB254	8.15e-03
37	115	WIPE 37WP14	Zinc	3.62e+00
37	115	WIPE 37WP14	Lead	2.57e+00
37	115	WIPE 37WP13	Zinc	2.38e+00
37	116	WIPE 37WP44	Copper	1.04e+02
37	116	WIPE 37WP44	Zinc	1.66e+00
37	116	WIPE 37WP44	Lead	1.36e+00
37	121	WIPE 37WP33	Arsenic	2.80e-02
37	121	WIPE 37WP33	PCP	5.00e-01
37	121	WIPE 37WP33	Zinc	1.35e+00
37	121	WIPE 37WP33	Lead	6.91e-01
37	127	WIPE 37WP31	Arsenic	3.84e-02

**Table 4-53**  
**Chemical Wipe Sample Results Exceeding Calculated Guidelines**  
**(Continued)**

BUILDING	ROOM	SITE	COMPOUND	CONCENTRATION
37	127	WIPE 37WP31	Lindane	1.32e-04
37	127	WIPE 37WP31	Zinc	1.32e+00
37	127	WIPE 37WP30	Lindane	6.65e-05
37	128	WIPE 37WP29	Lindane	1.48e-04
37	128	WIPE 37WP28	Lindane	8.87e-05
37	113A	WIPE 37WP37	Arsenic	8.98e-02
37	113A	WIPE 37WP37	Zinc	6.15e+00
37	113A	WIPE 37WP37	Lead	3.21e+00
37	IB	WIPE 37WP54	Aldrin	3.50e-03
37	IB	WIPE 37WP54	Arsenic	2.64e-01
37	IB	WIPE 37WP54	PCB260	2.66e-02
37	IB	WIPE 37WP54	Zinc	2.55e+01
37	IB	WIPE 37WP54	Lead	1.80e+01
37	IB	WIPE 37WP53	Aldrin	2.55e-03
37	IB	WIPE 37WP53	Arsenic	1.82e-01
37	IB	WIPE 37WP53	PCB260	1.48e-02
37	IB	WIPE 37WP53	Zinc	4.22e+01
37	IB	WIPE 37WP53	Lead	1.66e+01
37	IB	WIPE 37WP52	Arsenic	9.04e-02
37	IB	WIPE 37WP52	PCB260	3.07e-02
37	IB	WIPE 37WP52	Zinc	1.14e+01
37	IB	WIPE 37WP52	Lead	1.18e+01
37	IB	WIPE 37WP51	Aldrin	3.12e-03
37	IB	WIPE 37WP51	Arsenic	2.50e-01
37	IB	WIPE 37WP51	Benzo [K] Fluoranthene	2.60e-02
37	IB	WIPE 37WP51	Copper	9.70e+01
37	IB	WIPE 37WP51	Dieldrin	3.00e-03
37	IB	WIPE 37WP51	PCB260	4.87e-02
37	IB	WIPE 37WP51	Zinc	3.72e+01
37	IB	WIPE 37WP51	Lead	2.71e+01
37	Ind eq shop	WIPE 37WP08	Lead	5.31e-01
37	Ind eq shop	WIPE 37WP06	Arsenic	1.72e-02
37	Ind eq shop	WIPE 37WP06	Lindane	1.43e-04
37	Ind eq shop	WIPE 37WP06	PCB254	1.48e-02
37	Ind eq shop	WIPE 37WP06	Zinc	1.33e+00
37	Ind eq shop	WIPE 37WP06	Lead	7.30e-01
37	Ind eq shop	WIPE 37WP05	Arsenic	1.65e-02
37	Ind eq shop	WIPE 37WP05	Lead	5.71e-01
37	Sheet Metal Shop	WIPE 37WP04B	Arsenic	1.86e-02
37	Sheet Metal Shop	WIPE 37WP04B	Lindane	2.06e-04
37	Sheet Metal Shop	WIPE 37WP04B	Zinc	6.65e+00
37	Sheet Metal Shop	WIPE 37WP04B	Lead	4.42e+00
37	Sheet Metal Shop	WIPE 37WP04	Lindane	1.81e-04
37	Sheet Metal Shop	WIPE 37WP04	Zinc	7.80e+00
37	Sheet Metal Shop	WIPE 37WP04	Lead	4.57e+00
37	Sheet Metal Shop	WIPE 37WP03	Lindane	1.32e-04
37	Sheet Metal Shop	WIPE 37WP03	Zinc	2.01e+00
37	Sheet Metal Shop	WIPE 37WP03	Lead	1.95e+00
37	Sheet Metal Shop	WIPE 37WP02	Lead	7.53e-01
37	Sheet Metal Shop	WIPE 37WP01	Lead	4.86e-01
39	104	WIPE 39WP10	Benzo [A] Anthracene	1.30e-02
39	104	WIPE 39WP10	Chrysene	1.90e-02
39	104	WIPE 39WP09	Lindane	4.50e-05
39	108	WIPE 39WP16	Benzo [A] Anthracene	1.70e-02
39	108	WIPE 39WP16	Chrysene	4.80e-02

**Table 4-53**  
**Chemical Wipe Sample Results Exceeding Calculated Guidelines**  
**(Continued)**

BUILDING	ROOM	SITE	COMPOUND	CONCENTRATION
39	113	WIPE 39WP22	Chrysene	8.00e-03
39	113	WIPE 39WP22	Zinc	1.27e+00
39	113	WIPE 39WP21	Zinc	1.94e+00
39	141	WIPE 39WP247	Arsenic	1.25e-02
39	141	WIPE 39WP247	Zinc	1.59e+00
39	141	WIPE 39WP247	Lead	2.94e+00
39	142	WIPE 39WP27	Zinc	4.18e+00
39	142	WIPE 39WP27	Lead	9.51e-01
39	144	WIPE 39WP29	Zinc	1.47e+00
39	145	WIPE 39WP32	Zinc	4.61e+00
39	145	WIPE 39WP32	Lead	1.06e+00
39	153	WIPE 39WP40	Benzo [A] Anthracene	1.70e-02
39	153	WIPE 39WP40	Chrysene	4.40e-02
39	153	WIPE 39WP39	Zinc	4.90e+00
39	153	WIPE 39WP39	Zinc	2.06e+01
39	156	WIPE 39WP44	Zinc	1.26e+00
39	156	WIPE 39WP43	Zinc	3.12e+00
39	156	WIPE 39WP43	Lead	2.19e+00
39	159	WIPE 39WP46	Zinc	1.44e+00
39	159	WIPE 39WP46	Lead	9.76e-01
39	161	WIPE 39WP48	Benzo [A] Anthracene	4.00e-01
39	161	WIPE 39WP48	Zinc	2.29e+00
39	161	WIPE 39WP48	Lead	5.07e-01
39	162	WIPE 39WP50	Arsenic	7.10e+00
39	162	WIPE 39WP50	Benzo [A] Anthracene	7.00e-03
39	162	WIPE 39WP50	Chrysene	1.30e-02
39	162	WIPE 39WP50	Thallium	2.69e+00
39	162	WIPE 39WP50	Zinc	4.42e+00
39	162	WIPE 39WP50	Lead	7.35e+00
39	163	WIPE 39WP58B	PCB254	1.72e-01
39	163	WIPE 39WP58	PCB254	1.61e-01
39	163	WIPE 39WP57	Lindane	9.50e-05
39	164	WIPE 39WP52	Lead	2.50e+00
39	171	WIPE 39WP56B	Zinc	2.25e+00
39	171	WIPE 39WP56B	Lead	8.84e-01
39	171	WIPE 39WP56	Zinc	4.17e+00
39	171	WIPE 39WP56	Lead	1.91e+00
39	206	WIPE 39WP75B	Lead	2.03e+00
39	206	WIPE 39WP75	Lead	4.32e-01
39	206	WIPE 39WP74B	bis (2-Ethylhexyl) Phthalate	3.30e+00
39	206	WIPE 39WP74	bis (2-Ethylhexyl) Phthalate	3.30e+00
39	206	WIPE 39WP74	Lead	6.36e-01
39	206	WIPE 39WP72	Zinc	1.57e+00
39	227	WIPE 39WP76	Zinc	3.02e+00
39	227	WIPE 39WP76	Lead	5.13e-01
39	243	WIPE 39WP93	Zinc	3.96e+00
39	243	WIPE 39WP93	Lead	8.46e-01
39	243	WIPE 39WP92	Arsenic	1.18e-02
39	243	WIPE 39WP92	Benzo [A] Anthracene	6.00e-02
39	243	WIPE 39WP92	Chrysene	6.00e-02
39	243	WIPE 39WP92	Zinc	5.58e+00
39	243	WIPE 39WP92	Lead	1.32e+00
39	243	WIPE 39WP91	Zinc	3.30e+00
39	243	WIPE 39WP91	Lead	5.60e-01
39	243	WIPE 39WP90	Zinc	2.06e+00

**Table 4-53**  
**Chemical Wipe Sample Results Exceeding Calculated Guidelines**  
**(Continued)**

BUILDING	ROOM	SITE	COMPOUND	CONCENTRATION
39	244	WIPE 39WP89B	Zinc	6.24e+00
39	244	WIPE 39WP89B	Lead	1.92e+00
39	244	WIPE 39WP89	Arsenic	1.08e-02
39	244	WIPE 39WP89	Zinc	1.98e+01
39	244	WIPE 39WP89	Lead	1.63e+00
39	244	WIPE 39WP88	Zinc	4.91e+00
39	244	WIPE 39WP88	Lead	1.81e+00
39	247	WIPE 39WP85	Zinc	4.98e+00
39	247	WIPE 39WP85	Lead	1.14e+00
39	247	WIPE 39WP84	Zinc	2.12e+00
39	247	WIPE 39WP84	Lead	6.15e-01
39	301	WIPE 39WP112	Zinc	4.01e+00
39	301	WIPE 39WP109	Zinc	1.18e+00
39	301	WIPE 39WP107	Zinc	1.86e+00
39	301	WIPE 39WP107	Lead	4.08e+00
39	328	WIPE 39WP118	Benzo [A] Anthracene	8.00e-03
39	328	WIPE 39WP118	Chrysene	7.00e-03
39	331	WIPE 39WP126	Zinc	1.31e+00
39	331	WIPE 39WP124B	Zinc	1.24e+00
39	331	WIPE 39WP124	Zinc	1.51e+00
39	331	WIPE 39WP124	Lead	4.23e-01
39	332	WIPE 39WP132	Benzo [A] Anthracene	2.10e-02
39	332	WIPE 39WP130	Benzo [A] Anthracene	1.10e-02
39	403	WIPE 39WP139	Zinc	2.42e+00
39	403	WIPE 39WP139	Lead	2.07e+00
39	413	WIPE 39WP142	Zinc	1.24e+00
39	419	WIPE 39WP152	Zinc	3.22e+00
39	419	WIPE 39WP152	Lead	7.23e+00
39	448	WIPE 39WP239	Zinc	1.19e+00
39	450	WIPE 39WP156	Cadmium	1.27e+01
39	450	WIPE 39WP156	Zinc	3.42e+00
39	450	WIPE 39WP156	Lead	1.06e+00
39	501	WIPE 39WP159	Lead	4.14e-01
39	505	WIPE 39WP163	Zinc	1.49e+00
39	505	WIPE 39WP163	Lead	7.05e-01
39	505	WIPE 39WP162	Lindane	1.20e-04
39	506	WIPE 39WP167	Zinc	1.29e+00
39	509	WIPE 39WP172	Zinc	2.50e+00
39	509	WIPE 39WP172	Lead	5.79e-01
39	509	WIPE 39WP171	Zinc	1.61e+01
39	509	WIPE 39WP171	Lead	4.78e+00
39	509	WIPE 39WP170	Zinc	1.75e+00
39	509	WIPE 39WP170	Lead	1.91e+00
39	512	WIPE 39WP179B	Antimony	3.63e+00
39	512	WIPE 39WP178	Zinc	2.19e+01
39	512	WIPE 39WP178	Lead	6.80e+00
39	512	WIPE 39WP177	Zinc	1.48e+00
39	513	WIPE 39WP258	Zinc	1.14e+01
39	513	WIPE 39WP181	Zinc	1.34e+00
39	513	WIPE 39WP180	Lead	4.41e-01
39	514	WIPE 39WP183	Zinc	3.51e+00
39	514	WIPE 39WP182	Zinc	1.17e+00
39	514	WIPE 39WP182	Lead	8.42e-01
39	521	WIPE 39WP206	Zinc	2.88e+00
39	521	WIPE 39WP206	Lead	7.91e-01

**Table 4-53  
Chemical Wipe Sample Results Exceeding Calculated Guidelines  
(Continued)**

BUILDING	ROOM	SITE	COMPOUND	CONCENTRATION
39	521	WIPE 39WP201	Lead	8.21e-01
39	521	WIPE 39WP199	Zinc	1.60e+00
39	521	WIPE 39WP199	Lead	2.29e+00
39	521	WIPE 39WP196	Lead	8.22e-01
39	521	WIPE 39WP195	Zinc	1.77e+00
39	521	WIPE 39WP195	Lead	4.32e+00
39	521	WIPE 39WP194	Zinc	1.48e+00
39	521	WIPE 39WP194	Lead	2.02e+00
39	527	WIPE 39WP208	Zinc	1.16e+00
39	527	WIPE 39WP207	Arsenic	6.74e-01
39	529	WIPE 39WP213	Zinc	2.53e+01
39	529	WIPE 39WP210	Zinc	2.05e+00
39	529	WIPE 39WP210	Lead	5.01e-01
39	531	WIPE 39WP217	bis (2-Ethylhexyl) Phthalate	4.20e+00
39	531	WIPE 39WP217	Zinc	1.99e+00
39	531	WIPE 39WP216	Zinc	8.10e+00
39	531	WIPE 39WP215	Benzo [A] Anthracene	7.00e-03
39	532	WIPE 39WP221	Benzo [K] Fluoranthene	2.10e-02
39	532	WIPE 39WP221	bis (2-Ethylhexyl) Phthalate	3.10e+00
39	532	WIPE 39WP221	Zinc	1.16e+00
39	538	WIPE 39WP242	Cadmium	4.36e+00
39	538	WIPE 39WP242	Zinc	1.66e+00
39	538	WIPE 39WP242	Lead	3.01e+01
39	538	WIPE 39WP233	Zinc	1.58e+00
39	538	WIPE 39WP232B	Zinc	3.39e+00
39	538	WIPE 39WP232B	Lead	3.33e+00
39	538	WIPE 39WP232	Zinc	2.57e+00
39	538	WIPE 39WP232	Lead	4.73e+00
39	538	WIPE 39WP231	Zinc	1.07e+01
39	538	WIPE 39WP231	Lead	9.76e-01
39	538	WIPE 39WP230	Cadmium	1.28e+01
39	538	WIPE 39WP230	Chromium	7.04e+01
39	538	WIPE 39WP230	Zinc	1.56e+00
39	538	WIPE 39WP230	Lead	3.82e+01
39	101A	WIPE 39WP04	Zinc	1.94e+01
39	101A	WIPE 39WP04	Lead	1.53e+00
39	101A	WIPE 39WP03	Arsenic	2.92e-02
39	101A	WIPE 39WP03	Chrysene	2.50e-02
39	101A	WIPE 39WP03	Zinc	2.31e+01
39	101A	WIPE 39WP03	Lead	4.61e+00
39	101A	WIPE 39WP02	Chrysene	8.30e-03
39	101A	WIPE 39WP02	Lindane	8.71e-05
39	101A	WIPE 39WP02	Zinc	3.77e+00
39	101B	WIPE 39WP08	Benzo [A] Anthracene	7.50e-03
39	101B	WIPE 39WP08	Chrysene	1.30e-02
39	101B	WIPE 39WP08	Zinc	1.29e+01
39	101B	WIPE 39WP08	Lead	9.86e-01
39	101B	WIPE 39WP07	Zinc	8.02e+01
39	101B	WIPE 39WP07	Lead	1.94e+01
39	107A	WIPE 39WP12	Zinc	1.16e+00
39	155B	WIPE 39WP42	Chrysene	1.00e-02
39	155B	WIPE 39WP42	Zinc	1.21e+01
39	155B	WIPE 39WP42	Lead	2.27e+00
39	155B	WIPE 39WP41	Zinc	3.22e+00
39	155B	WIPE 39WP41	Lead	4.05e-01

**Table 4-53  
Chemical Wipe Sample Results Exceeding Calculated Guidelines  
(Continued)**

BUILDING	ROOM	SITE	COMPOUND	CONCENTRATION
39	201/202	WIPE 39WP64	Copper	1.49e+02
39	201/202	WIPE 39WP64	Zinc	3.06e+01
39	201/202	WIPE 39WP64	Lead	4.17e+01
39	201/202	WIPE 39WP62	Zinc	1.84e+00
39	243A	WIPE 39WP97	Zinc	1.05e+01
39	243A	WIPE 39WP97	Lead	2.46e+00
39	243A	WIPE 39WP96	Arsenic	8.80e-03
39	243A	WIPE 39WP96	Zinc	1.43e+01
39	243A	WIPE 39WP96	Lead	1.11e+00
39	243A	WIPE 39WP94	Zinc	1.87e+00
39	303A	WIPE 39WP261	Benzo [A] Anthracene	6.60e-02
39	403A	WIPE 39WP148	Zinc	2.21e+00
39	403A	WIPE 39WP148	Lead	1.08e+00
39	403A	WIPE 39WP147	Zinc	1.21e+01
39	403A	WIPE 39WP147	Lead	2.34e+00
39	403A	WIPE 39WP146	Zinc	1.29e+00
39	413A	WIPE 39WP143	Lead	1.63e+00
39	501A	WIPE 39WP257	Arsenic	9.38e-03
39	501A	WIPE 39WP257	Zinc	3.04e+01
39	501A	WIPE 39WP257	Lead	3.35e+01
39	501A	WIPE 39WP256	Zinc	1.18e+00
39	501A	WIPE 39WP256	Lead	7.08e-01
39	D	WIPE 39WP99	Arsenic	8.80e-03
39	D	WIPE 39WP99	Chromium	4.71e+01
39	D	WIPE 39WP99	Chrysene	9.00e-03
39	D	WIPE 39WP99	PCB254	2.46e-02
39	D	WIPE 39WP99	Thallium	6.36e-01
39	D	WIPE 39WP99	Zinc	1.79e+00
39	D	WIPE 39WP99	Lead	5.26e-01
39	D	WIPE 39WP98	Zinc	1.22e+00
39	E	WIPE 39WP101	Thallium	1.43e-01
39	E	WIPE 39WP101	Zinc	3.96e+00
39	E	WIPE 39WP101	Lead	5.24e-01
39	E	WIPE 39WP100	PCB260	5.81e-03
39	F	WIPE 39WP103	PCB254	1.11e-01
39	F	WIPE 39WP103	Thallium	1.62e-01
39	F	WIPE 39WP103	Zinc	4.77e+00
39	F	WIPE 39WP103	Lead	9.28e-01
43	Bay Area	WIPE 43WP15	Arsenic	3.84e-02
43	Bay Area	WIPE 43WP15	PCB260	6.59e-03
43	Bay Area	WIPE 43WP15	Zinc	4.63e+00
43	Bay Area	WIPE 43WP15	Lead	4.90e+00
43	Bay Area	WIPE 43WP14	Arsenic	1.47e-02
43	Bay Area	WIPE 43WP14	Zinc	1.99e+00
43	Bay Area	WIPE 43WP14	Lead	2.59e+00
43	Bay Area	WIPE 43WP13	Arsenic	1.94e-02
43	Bay Area	WIPE 43WP13	PCB260	1.30e-02
43	Bay Area	WIPE 43WP13	Lead	2.46e+00
43	IB Bay Area	WIPE 43WP02	Lead	1.09e+00
43	IB Bay Area	WIPE 43WP01	Lead	5.64e-01
43	Incineration Cage	WIPE 43WP09	Arsenic	1.35e-02
43	Incineration Cage	WIPE 43WP09	Zinc	1.71e+00
43	Incineration Cage	WIPE 43WP09	Lead	3.71e+00
43	Machine Area	WIPE 43WP03B	Lead	5.56e-01
43	Machine Area	WIPE 43WP03	Lead	9.95e-01

**Table 4-53  
Chemical Wipe Sample Results Exceeding Calculated Guidelines  
(Continued)**

BUILDING	ROOM	SITE	COMPOUND	CONCENTRATION
43	Storage Room	WIPE 43WP08	Zinc	4.16e+00
43	Storage Room	WIPE 43WP08	Lead	1.32e+00
43	Storage Room	WIPE 43WP07	Arsenic	1.58e-02
43	Storage Room	WIPE 43WP07	Copper	1.10e+02
43	Storage Room	WIPE 43WP07	Zinc	8.90e+01
43	Storage Room	WIPE 43WP07	Lead	1.42e+00
60	105.1	WIPE 60WP08	Benzo [A] Anthracene	3.10e-02
60	105.1	WIPE 60WP08	Chrysene	3.50e-02
60	105.1	WIPE 60WP04	Dieldrin	2.41e-03
60	105.1	WIPE 60WP04	PCB254	4.53e-02
60	105.1	WIPE 60WP03	PCB254	5.56e-03
60	106	WIPE 60WP09	Benzo [A] Anthracene	5.40e-01
60	106	WIPE 60WP09	Benzo [A] Peryene	3.30e-01
60	106	WIPE 60WP09	Chrysene	9.60e-01
97	1.2	WIPE 97WP06	Zinc	1.29e+00
97	2.1	WIPE 97WP30	Zinc	1.91e+00
97	2.1	WIPE 97WP29	Zinc	1.85e+01
97	2.1	WIPE 97WP28	Zinc	1.00e+01
97	2.1	WIPE 97WP28	Lead	4.69e-01
97	2.1	WIPE 97WP27	Benzo [A] Anthracene	7.00e-03
97	2.1	WIPE 97WP27	Benzo [B] Fluoranthene	3.50e-02
97	2.1	WIPE 97WP27	Zinc	3.90e+00
97	145	WIPE 97WP33	Zinc	1.16e+00
97	145	WIPE 97WP33	Lead	3.29e+00
97	145	WIPE 97WP32	Zinc	3.18e+00
97	146	WIPE 97WP21	Lead	4.94e-01
111	0.1	WIPE 111WP05	Lindane	1.25e-04
111	0.1	WIPE 111WP05	Zinc	3.83e+00
111	0.1	WIPE 111WP05	Lead	1.02e+01
111	2.1	WIPE 111WP02	Zinc	1.83e+00
111	3.1	WIPE 111WP03	Arsenic	2.65e-02
111	3.1	WIPE 111WP03	Zinc	3.25e+00
111	3.1	WIPE 111WP03	Lead	3.35e+01
117	1	WIPE 117WP02	Lead	1.44e+00
117	1	WIPE 117WP01	Lindane	5.14e-05
118	0.1	WIPE 118WP04	Lindane	1.24e-04
118	0.1	WIPE 118WP03	Lindane	8.83e-05
131	1	WIPE 117WP02B	Lead	3.89e+00
131	2	WIPE 131WP02	Dieldrin	7.95e-03
131	2	WIPE 131WP02	Zinc	2.05e+01
131	3	WIPE 131WP03	Lindane	5.13e-05
131	39	WIPE 131WP08	Lindane	1.41e-04
243	1	WIPE 243WP03	Zinc	2.19e+00
243	1	WIPE 243WP03	Lead	2.49e+00
243	1	WIPE 243WP02B	Zinc	1.78e+00
243	1	WIPE 243WP02B	Lead	2.48e+00
243	1	WIPE 243WP02	Lead	4.97e-01
243	2	WIPE 243WP06	Dieldrin	7.66e-03
243	2	WIPE 243WP06	PCB254	1.64e-01
243	2	WIPE 243WP06	Zinc	1.86e+00
243	2	WIPE 243WP06	Lead	5.94e-01
243	2	WIPE 243WP05	Dieldrin	8.46e-03
243	2	WIPE 243WP05	PCB254	2.00e-01
243	2	WIPE 243WP05	Lead	4.67e-01
243	2	WIPE 243WP04	PCB260	5.27e-03

**Table 4-53**  
**Chemical Wipe Sample Results Exceeding Calculated Guidelines**  
**(Continued)**

BUILDING	ROOM	SITE	COMPOUND	CONCENTRATION
243	2	WIPE 131WP02	Lead	7.65e-01
243	3	WIPE 243WP08	Arsenic	6.27e-03
243	3	WIPE 243WP08	Dieldrin	3.22e-02
243	3	WIPE 243WP08	PCB254	6.89e-01
243	3	WIPE 243WP08	Zinc	3.58e+00
243	3	WIPE 243WP08	Lead	1.20e+00
243	4	WIPE 243WP10	Arsenic	3.57e-02
243	4	WIPE 243WP10	Zinc	1.16e+01
243	4	WIPE 243WP10	Lead	1.80e+00
243	4	WIPE 243WP09	Zinc	4.13e+01
292	106	WIPE 292WP37	PCB254	9.28e-03
292	106	WIPE 292WP37	PCB260	4.02e-02
292	106	WIPE 292WP37	Zinc	4.88e+00
292	125	WIPE 292WP31	Benzo [K] Fluoranthene	2.30e-02
292	125	WIPE 292WP30	Benzo [B] Fluoranthene	6.10e-02
292	128	WIPE 292WP34	PCB254	5.24e-03
292	132	WIPE 292WP40	Arsenic	1.69e-02
292	132	WIPE 292WP40	Dieldrin	1.00e-02
292	132	WIPE 292WP40	PCB260	2.00e-01
292	132	WIPE 292WP40	Zinc	1.63e+01
292	132	WIPE 292WP40	Lead	2.48e+00
292	132	WIPE 292WP39	PCB260	4.50e-02
292	132	WIPE 292WP39	Zinc	4.40e+00
292	132	WIPE 292WP39	Lead	1.00e+00
292	132	WIPE 292WP38	PCB260	1.49e-02
292	132	WIPE 292WP38	Zinc	1.59e+00
292	132	WIPE 292WP38	Lead	6.44e-01
292	133	WIPE 292WP13	PCB254	9.02e-03
292	133	WIPE 292WP13	PCB260	7.18e-03
292	134	WIPE 292WP21	Lindane	1.15e-04
292	134	WIPE 292WP21	Zinc	3.91e+00
292	205	WIPE 292WP54	Lead	2.23e+00
292	244	WIPE 292WP41	Benzo [A] Anthracene	1.60e-02
292	244	WIPE 292WP41	Benzo [K] Fluoranthene	1.30e-02
292	244	WIPE 292WP41	Chrysene	1.60e-02
292	250	WIPE 292WP83B	Arsenic	4.42e-02
292	250	WIPE 292WP83B	Copper	1.05e+02
292	250	WIPE 292WP83B	Zinc	7.67e+00
292	250	WIPE 292WP83B	Lead	1.69e+01
292	250	WIPE 292WP83	Zinc	4.51e+00
292	250	WIPE 292WP83	Lead	3.60e+00
311	1	WIPE 311WP02	Zinc	1.48e+00
311	1	WIPE 311WP02	Lead	1.22e+00
311	1	WIPE 311WP01	Arsenic	1.30e-02
311	1	WIPE 311WP01	Zinc	3.00e+00
311	1	WIPE 311WP01	Lead	2.16e+00
311	3	WIPE 311WP11	Lead	4.98e-01
311	4	WIPE 311WP13B	Arsenic	2.57e-02
311	4	WIPE 311WP13B	Lindane	6.37e-04
311	4	WIPE 311WP13B	Zinc	4.02e+00
311	4	WIPE 311WP13B	Lead	3.46e+00
311	4	WIPE 311WP13	Arsenic	1.79e-02
311	4	WIPE 311WP13	Lindane	5.76e-04
311	4	WIPE 311WP13	Zinc	9.39e+00
311	4	WIPE 311WP13	Lead	7.83e+00

**Table 4-53  
Chemical Wipe Sample Results Exceeding Calculated Guidelines  
(Continued)**

BUILDING	ROOM	SITE	COMPOUND	CONCENTRATION
311	5	WIPE 311WP15	Arsenic	1.82e-02
311	5	WIPE 311WP15	Lindane	4.21e-03
311	5	WIPE 311WP15	Zinc	4.72e+00
311	5	WIPE 311WP15	Lead	5.98e+00
311	5	WIPE 311WP14	Arsenic	9.30e-03
311	5	WIPE 311WP14	Lead	1.07e+00
311	6	WIPE 311WP17	Arsenic	1.89e-02
311	6	WIPE 311WP17	Benzo [A] Anthracene	6.80e-02
311	6	WIPE 311WP17	Lindane	4.12e-03
311	6	WIPE 311WP17	Zinc	3.67e+00
311	6	WIPE 311WP17	Lead	5.52e+00
311	6	WIPE 311WP16	Zinc	1.62e+00
311	6	WIPE 311WP16	Lead	1.03e+00
311	7	WIPE 311WP19	Benzo [A] Anthracene	3.80e-02
311	7	WIPE 311WP19	Chrysene	3.60e-02
311	7	WIPE 311WP19	Dieldrin	8.84e-03
311	7	WIPE 311WP19	Heptachlor Epoxide	5.38e-03
311	7	WIPE 311WP19	Lindane	1.00e-02
311	7	WIPE 311WP19	Zinc	3.21e+00
311	7	WIPE 311WP19	Lead	3.12e+00
311	7	WIPE 311WP18	Lead	8.46e-01
311	8	WIPE 311WP21	Lindane	3.05e-03
311	8	WIPE 311WP21	Zinc	5.00e+00
311	8	WIPE 311WP21	Lead	6.26e+00
311	8	WIPE 311WP20	Lead	4.37e-01
311	10	WIPE 311WP09	Lindane	2.44e-04
311	10	WIPE 311WP08	bis (2-Ethylhexyl) Phthalate	5.30e+00
311	11	WIPE 311WP05	Lindane	2.99e-04
311	11	WIPE 311WP05	Lead	1.75e+00
311	11	WIPE 311WP04	Arsenic	9.60e-03
311	11	WIPE 311WP04	Lindane	2.65e-04
311	11	WIPE 311WP04	Lead	1.12e+00
311	11	WIPE 311WP03	Arsenic	2.24e-02
311	11	WIPE 311WP03	Zinc	4.74e+01
311	11	WIPE 311WP03	Lead	5.85e+00
311	12	WIPE 311WP26B	Lindane	3.07e-03
311	12	WIPE 311WP26B	Lead	1.44e+00
311	12	WIPE 311WP26	Lindane	2.91e-03
311	12	WIPE 311WP26	Zinc	1.54e+00
311	12	WIPE 311WP26	Lead	1.34e+00
311	12	WIPE 311WP25	Lindane	4.66e-04
311	12	WIPE 311WP25	Zinc	1.46e+00
311	12	WIPE 311WP25	Lead	2.02e+00
311	12	WIPE 311WP24	Arsenic	1.48e-02
311	12	WIPE 311WP24	Dieldrin	2.60e-03
311	12	WIPE 311WP24	Lindane	7.92e-04
311	12	WIPE 311WP24	Zinc	1.96e+00
311	12	WIPE 311WP24	Lead	3.34e+00
311	12	WIPE 311WP23	Arsenic	1.23e-02
311	12	WIPE 311WP23	Thallium	1.21e-01
311	12	WIPE 311WP23	Zinc	1.89e+00
311	12	WIPE 311WP23	Lead	3.16e+00
311	14	WIPE 311WP28	Beryllium	1.03e-02
311	14	WIPE 311WP28	Lindane	3.19e-03
311	14	WIPE 311WP28	Zinc	2.21e+00

**Table 4-53  
Chemical Wipe Sample Results Exceeding Calculated Guidelines  
(Continued)**

BUILDING	ROOM	SITE	COMPOUND	CONCENTRATION
311	14	WIPE 311WP28	Lead	3.87e+00
311	14	WIPE 311WP27	Lead	1.24e+00
311	19	WIPE 311WP32	Arsenic	1.52e-02
311	19	WIPE 311WP32	Zinc	1.17e+00
311	19	WIPE 311WP32	Lead	1.83e+00
311	19	WIPE 311WP31	Lead	1.02e+00
311	19	WIPE 311WP30	Zinc	1.74e+00
311	19	WIPE 311WP30	Lead	1.68e+00
311	20	WIPE 311WP35	Arsenic	1.59e-02
311	20	WIPE 311WP35	Lindane	1.55e-03
311	20	WIPE 311WP35	Thallium	1.69e-01
311	20	WIPE 311WP35	Zinc	6.78e+00
311	20	WIPE 311WP35	Lead	5.16e+00
311	20	WIPE 311WP34	Arsenic	2.32e-02
311	20	WIPE 311WP34	Benzo [A] Anthracene	5.30e-02
311	20	WIPE 311WP34	Lindane	1.67e-03
311	20	WIPE 311WP34	Zinc	3.11e+00
311	20	WIPE 311WP34	Lead	4.42e+00
311	20	WIPE 311WP33	Lead	2.62e+00
311	21	WIPE 311WP36	PCB260	1.33e-02
311	21	WIPE 311WP36	Zinc	1.10e+01
311	21	WIPE 311WP36	Lead	4.42e+00
311	22	WIPE 311WP37	bis (2-Ethylhexyl) Phthalate	3.40e+00
311	22	WIPE 311WP37	Zinc	8.40e+00
311	22	WIPE 311WP37	Lead	2.33e+00
311	23	WIPE 311WP38	Arsenic	1.98e-02
311	23	WIPE 311WP38	Zinc	1.49e+00
311	23	WIPE 311WP38	Lead	1.28e+00
311	25	WIPE 311WP40	Thallium	2.82e-01
311	25	WIPE 311WP40	Lead	6.78e-01
311	25	WIPE 311WP39	Zinc	1.39e+00
311	25	WIPE 311WP39	Lead	2.54e+00
311	26	WIPE 311WP71	Zinc	1.41e+00
311	26	WIPE 311WP71	Lead	1.48e+00
311	26	WIPE 311WP70	Lead	8.22e-01
311	26	WIPE 311WP29	Arsenic	1.56e-02
311	26	WIPE 311WP29	Thallium	1.82e-01
311	26	WIPE 311WP29	Zinc	5.10e+00
311	26	WIPE 311WP29	Lead	3.15e+00
311	27	WIPE 311WP67	Arsenic	1.44e-02
311	27	WIPE 311WP67	Zinc	1.91e+00
311	27	WIPE 311WP67	Lead	2.14e+00
311	28	WIPE 311WP69	Zinc	3.64e+00
311	28	WIPE 311WP69	Lead	1.62e+00
311	28	WIPE 311WP68	Arsenic	1.59e-02
311	28	WIPE 311WP68	Zinc	2.56e+00
311	28	WIPE 311WP68	Lead	2.25e+00
311	31	WIPE 311WP58	Zinc	1.19e+00
311	31	WIPE 311WP58	Lead	4.74e-01
311	31	WIPE 311WP57	Lead	1.14e+00
311	32	WIPE 311WP73	Zinc	1.33e+00
311	32	WIPE 311WP73	Lead	1.25e+00
311	33	WIPE 311WP75	PCB254	6.08e-03
311	33	WIPE 311WP75	Zinc	2.36e+00
311	33	WIPE 311WP75	Lead	1.12e+00

**Table 4-53  
Chemical Wipe Sample Results Exceeding Calculated Guidelines  
(Continued)**

BUILDING	ROOM	SITE	COMPOUND	CONCENTRATION
311	37	WIPE 311WP81	Zinc	3.00e+00
311	37	WIPE 311WP81	Lead	1.77e+00
311	37	WIPE 311WP80	Lead	9.61e-01
311	38	WIPE 311WP83	Lead	4.54e-01
311	39	WIPE 311WP85	Zinc	1.18e+00
311	39	WIPE 311WP85	Lead	2.23e+00
311	102	WIPE 311WP45	Zinc	5.34e+00
311	104	WIPE 311WP49	Zinc	1.32e+00
311	104	WIPE 311WP48	Zinc	3.87e+00
311	105	WIPE 311WP51	Zinc	1.55e+00
311	105	WIPE 311WP51	Lead	4.27e-01
311	105	WIPE 311WP50	Zinc	2.88e+00
311	107	WIPE 311WP54	Zinc	3.24e+01
311	107	WIPE 311WP53	Zinc	4.01e+00
311	107	WIPE 311WP53	Lead	1.49e+00
311	IB E. Central	WIPE 311WP89	Zinc	1.54e+00
311	IB E. Central	WIPE 311WP89	Lead	1.18e+00
311	IB W. Center	WIPE 311WP88	Arsenic	4.48e-02
311	IB W. Center	WIPE 311WP88	Dieldrin	4.62e-03
311	IB W. Center	WIPE 311WP88	Zinc	4.15e+00
311	IB W. Center	WIPE 311WP88	Lead	1.64e+01
311	IB West End	WIPE 311WP87	Arsenic	3.18e-02
311	IB West End	WIPE 311WP87	Benzo [A] Anthracene	7.20e-02
311	IB West End	WIPE 311WP87	Chrysene	7.40e-02
311	IB West End	WIPE 311WP87	Dieldrin	3.55e-03
311	IB West End	WIPE 311WP87	Zinc	5.61e+00
311	IB West End	WIPE 311WP87	Lead	9.60e+00
311	Mezzanine	WIPE 311WP62	Zinc	1.88e+00
311	Mezzanine	WIPE 311WP62	Lead	4.01e+00
311	Mezzanine	WIPE 311WP61	Lead	9.35e-01
312	0.1	WIPE 312WP92B	Zinc	1.51e+00
312	0.1	WIPE 312WP92B	Lead	1.80e+00
312	0.1	WIPE 312WP92	Arsenic	1.71e-02
312	0.1	WIPE 312WP92	Lead	9.22e-01
312	1.2	WIPE 312WP46	Zinc	6.61e+00
312	1.2	WIPE 312WP46	Lead	1.58e+01
312	1.2	WIPE 312WP45	Zinc	2.14e+01
312	1.2	WIPE 312WP45	Lead	3.40e+00
312	1.3	WIPE 312WP34	Arsenic	2.67e-02
312	1.3	WIPE 312WP34	Zinc	3.50e+00
312	1.3	WIPE 312WP34	Lead	4.17e+00
312	1.3	WIPE 312WP33	Arsenic	1.44e-02
312	1.3	WIPE 312WP33	Zinc	2.84e+00
312	1.3	WIPE 312WP33	Lead	2.81e+00
312	1.3	WIPE 312WP31	Beryllium	4.49e-02
312	3	WIPE 312WP111	Arsenic	1.04e-02
312	3	WIPE 312WP111	Beryllium	1.63e-02
312	3	WIPE 312WP111	Zinc	1.24e+01
312	3	WIPE 312WP111	Lead	1.03e+00
312	3	WIPE 312WP110	Beryllium	5.33e-02
312	3	WIPE 312WP110	Zinc	3.63e+00
312	3	WIPE 312WP110	Lead	6.83e-01
312	3.1	WIPE 312WP109	Beryllium	5.50e-01
312	3.1	WIPE 312WP109	Zinc	3.16e+00
312	3.1	WIPE 312WP109	Lead	2.78e+00

**Table 4-53**  
**Chemical Wipe Sample Results Exceeding Calculated Guidelines**  
**(Continued)**

BUILDING	ROOM	SITE	COMPOUND	CONCENTRATION
312	3.2	WIPE 312WP113	Arsenic	1.54e-02
312	3.2	WIPE 312WP113	Beryllium	5.71e-01
312	3.2	WIPE 312WP113	Zinc	3.84e+01
312	3.2	WIPE 312WP113	Lead	1.52e+00
312	101	WIPE 312WP29	Beryllium	2.47e+00
312	101	WIPE 312WP29	Zinc	1.93e+00
312	101	WIPE 312WP27	Beryllium	2.66e-02
312	101	WIPE 312WP26B	PCB260	8.41e-03
312	101	WIPE 312WP26	Beryllium	1.08e-02
312	101	WIPE 312WP26	PCB260	9.80e-03
312	101	WIPE 312WP25	Beryllium	2.86e-02
312	101	WIPE 312WP25	PCB260	8.05e-03
312	101	WIPE 312WP25	Zinc	1.21e+00
312	101	WIPE 312WP25	Lead	4.29e-01
312	101.1	WIPE 312WP94	Zinc	1.50e+00
312	101.1	WIPE 312WP94	Lead	1.91e+00
312	102	WIPE 312WP23	Beryllium	1.28e-02
312	102	WIPE 312WP23	Zinc	1.65e+00
312	103	WIPE 312WP21	Beryllium	1.58e-02
312	103	WIPE 312WP21	Zinc	1.77e+00
312	103	WIPE 312WP21	Lead	7.01e-01
312	111	WIPE 312WP64	Beryllium	1.96e-02
312	111	WIPE 312WP64	Zinc	7.30e+00
312	111	WIPE 312WP64	Lead	9.38e-01
312	111	WIPE 312WP62	Cadmium	5.07e+00
312	111	WIPE 312WP62	Zinc	1.06e+01
312	111	WIPE 312WP62	Lead	1.15e+00
312	113	WIPE 312WP19	Beryllium	4.02e-01
312	113	WIPE 312WP19	Copper	1.12e+02
312	113	WIPE 312WP19	Zinc	1.94e+01
312	113	WIPE 312WP19	Lead	2.08e+00
312	114	WIPE 312WP30	Beryllium	9.55e+00
312	114	WIPE 312WP30	Zinc	3.07e+00
312	114	WIPE 312WP30	Lead	5.70e-01
312	114	WIPE 312WP08	Beryllium	1.64e-02
312	114	WIPE 312WP08	Zinc	1.56e+00
312	114	WIPE 312WP07	Beryllium	5.30e-01
312	114	WIPE 312WP07	Zinc	4.24e+00
312	114	WIPE 312WP06	Beryllium	1.75e-01
312	114	WIPE 312WP06	Cadmium	3.66e+00
312	114	WIPE 312WP06	Zinc	2.36e+00
312	114	WIPE 312WP05	Beryllium	9.96e-03
312	114	WIPE 312WP05	Zinc	2.65e+00
312	114	WIPE 312WP03	Beryllium	4.29e-01
312	114	WIPE 312WP03	Zinc	3.39e+00
312	114	WIPE 312WP02B	Beryllium	4.03e-02
312	114	WIPE 312WP02B	Zinc	4.16e+00
312	114	WIPE 312WP02	Beryllium	6.53e-02
312	114	WIPE 312WP02	Zinc	4.38e+00
312	115	WIPE 312WP14	Beryllium	9.63e-03
312	115	WIPE 312WP14	Zinc	7.16e+00
312	115	WIPE 312WP13	Beryllium	1.64e-02
312	115	WIPE 312WP13	Zinc	2.40e+00
312	115	WIPE 312WP12	Beryllium	1.58e-02
312	115	WIPE 312WP12	Cadmium	2.93e+00

**Table 4-53  
Chemical Wipe Sample Results Exceeding Calculated Guidelines  
(Continued)**

BUILDING	ROOM	SITE	COMPOUND	CONCENTRATION
312	115	WIPE 312WP12	Zinc	1.67e+00
312	115	WIPE 312WP11	Beryllium	3.29e-02
312	115	WIPE 312WP11	Zinc	5.34e+00
312	117	WIPE 312WP60	Beryllium	9.64e-03
312	117	WIPE 312WP60	Cadmium	1.64e+01
312	117	WIPE 312WP60	Zinc	1.16e+00
312	117	WIPE 312WP59	Cadmium	1.02e+01
312	117	WIPE 312WP58	Beryllium	1.30e-02
312	117	WIPE 312WP58	Zinc	3.23e+00
312	117	WIPE 312WP58	Lead	7.96e-01
312	117	WIPE 312WP57	Zinc	1.70e+00
312	117	WIPE 312WP57	Lead	6.39e-01
312	117	WIPE 312WP56	Cadmium	2.99e+00
312	119	WIPE 312WP66	Beryllium	1.11e-02
312	119	WIPE 312WP66	Cadmium	1.24e+01
312	119	WIPE 312WP66	Zinc	4.01e+00
312	119	WIPE 312WP66	Lead	7.24e-01
312	119	WIPE 312WP65	Lead	5.51e-01
312	120	WIPE 312WP77	Beryllium	1.67e-02
312	120	WIPE 312WP74	Beryllium	2.13e-02
312	121	WIPE 312WP69	Benzo [A] Anthracene	1.00e-02
312	121	WIPE 312WP69	Benzo [B] Fluoranthene	1.60e-02
312	121	WIPE 312WP69	Benzo [K] Fluoranthene	1.50e-02
312	121	WIPE 312WP69	Chrysene	8.00e-03
312	126	WIPE 312WP83	Zinc	2.11e+00
312	126	WIPE 312WP83	Lead	9.90e+01
312	126	WIPE 312WP79	Zinc	2.37e+00
312	135	WIPE 312WP38	Arsenic	1.55e-02
312	135	WIPE 312WP38	Cadmium	6.06e+00
312	135	WIPE 312WP38	Zinc	5.45e+00
312	135	WIPE 312WP38	Lead	3.46e+00
312	135	WIPE 312WP37	Zinc	8.25e+00
312	135	WIPE 312WP37	Lead	6.20e+00
312	135	WIPE 312WP36	Lead	1.68e+01
312	135	WIPE 312WP35	Zinc	1.47e+00
312	135	WIPE 312WP35	Lead	6.35e+00
312	137	WIPE 312WP43	Zinc	1.21e+02
312	137	WIPE 312WP43	Lead	3.08e+01
312	145	WIPE 312WP102	Benzo [K] Fluoranthene	8.00e-03
312	145	WIPE 312WP100	Zinc	1.26e+00
312	145	WIPE 312WP100	Lead	5.75e-01
312	147	WIPE 312WP98B	Zinc	3.34e+00
312	147	WIPE 312WP98B	Lead	9.94e+00
312	147	WIPE 312WP98	Zinc	2.13e+00
312	147	WIPE 312WP98	Lead	1.76e+00
312	IB	WIPE 312WP86	Arsenic	1.72e-02
312	IB	WIPE 312WP86	Benzo [K] Fluoranthene	2.50e-02
312	IB	WIPE 312WP86	PCB260	2.68e-02
312	IB	WIPE 312WP86	Zinc	2.91e+00
312	IB	WIPE 312WP86	Lead	5.45e+00
313	0.1	WIPE 313WP90	Lead	4.53e-01
313	0.1	WIPE 313WP89	2,4-Dinitrotoluene	2.89e+00
313	0.1	WIPE 313WP89	Zinc	1.31e+00
313	0.1	WIPE 313WP89	Lead	5.55e-01
313	0.2	WIPE 313WP92	Lead	1.09e+00

**Table 4-53  
Chemical Wipe Sample Results Exceeding Calculated Guidelines  
(Continued)**

BUILDING	ROOM	SITE	COMPOUND	CONCENTRATION
313	0.2	WIPE 313WP91	Zinc	7.75e+00
313	0.2	WIPE 313WP91	Lead	1.58e+00
313	0.2	WIPE 313WP110	Lead	8.61e-01
313	0.2	WIPE 313WP109	Arsenic	1.33e-02
313	0.2	WIPE 313WP109	Lead	1.81e+01
313	0.3	WIPE 313WP68	Arsenic	1.29e-02
313	0.3	WIPE 313WP68	Zinc	1.76e+00
313	0.3	WIPE 313WP66	Arsenic	4.02e-02
313	0.3	WIPE 313WP66	Zinc	5.61e+00
313	0.3	WIPE 313WP64	Arsenic	7.33e-03
313	0.3	WIPE 313WP62	Zinc	2.21e+00
313	0.3	WIPE 313WP62	Lead	3.20e+00
313	0.4	WIPE 313WP114	Lead	8.94e-01
313	0.5	WIPE 313WP87B	2,4-Dinitrotoluene	2.23e+00
313	0.5	WIPE 313WP85	Zinc	4.91e+00
313	0.5	WIPE 313WP70	Arsenic	8.90e-03
313	0.6	WIPE 313WP108	2,4-Dinitrotoluene	1.58e-01
313	0.6	WIPE 313WP107	2,4-Dinitrotoluene	5.89e-02
313	0.6	WIPE 313WP106	Arsenic	6.82e-02
313	0.6	WIPE 313WP106	Lead	6.63e+01
313	0.6	WIPE 313WP104	Lead	8.15e+00
313	0.7	WIPE 313WP99	Lead	4.97e+00
313	0.7	WIPE 313WP103	2,4-Dinitrotoluene	5.69e-01
313	0.7	WIPE 313WP102	2,4-Dinitrotoluene	8.30e-02
313	0.7	WIPE 313WP101	Arsenic	4.31e-02
313	0.7	WIPE 313WP101	Zinc	8.15e+00
313	0.7	WIPE 313WP101	Lead	1.14e+02
313	0.8	WIPE 313WP98	2,4-Dinitrotoluene	2.66e-01
313	0.8	WIPE 313WP96	Lead	2.51e+00
313	0.8	WIPE 313WP93	Lead	1.57e+01
313	0.9	WIPE 313WP112	Lead	1.44e+00
313	1	WIPE 313WP159	PCB260	2.29e-02
313	1.1	WIPE 313WP16	Zinc	1.94e+00
313	1.1	WIPE 313WP14	Lead	7.65e-01
313	1.4	WIPE 313WP11	Lead	2.49e+01
313	1.4	WIPE 313WP09	Zinc	3.86e+00
313	1.4	WIPE 313WP09	Lead	1.20e+01
313	1.5	WIPE 313WP27	Zinc	5.30e+00
313	1.5	WIPE 313WP27	Lead	4.82e-01
313	1.5	WIPE 313WP26	Benzo [A] Anthracene	1.60e-02
313	1.5	WIPE 313WP26	Benzo [K] Fluoranthene	1.30e-02
313	1.5	WIPE 313WP26	Chrysene	1.90e-02
313	1.5	WIPE 313WP26	Zinc	2.29e+00
313	1.5	WIPE 313WP26	Lead	4.77e-01
313	1.5	WIPE 313WP25	Arsenic	2.94e-02
313	1.5	WIPE 313WP25	Zinc	2.30e+01
313	1.5	WIPE 313WP25	Lead	2.53e+00
313	1.5	WIPE 313WP24	Zinc	3.03e+00
313	1.5	WIPE 313WP23	Zinc	1.43e+00
313	1.5	WIPE 313WP22	Zinc	1.32e+01
313	126	WIPE 313WP58	Arsenic	2.64e-02
313	138	WIPE 313WP53B	Zinc	2.68e+00
313	138	WIPE 313WP53B	Lead	3.17e+00
313	138	WIPE 313WP53	Arsenic	2.02e-02
313	138	WIPE 313WP53	Zinc	2.16e+00

**Table 4-53  
Chemical Wipe Sample Results Exceeding Calculated Guidelines  
(Continued)**

BUILDING	ROOM	SITE	COMPOUND	CONCENTRATION
313	138	WIPE 313WP53	Lead	2.34e+00
313	138	WIPE 313WP52	Zinc	4.28e+00
313	138	WIPE 313WP52	Lead	2.11e+00
313	138	WIPE 313WP51	Arsenic	1.84e-02
313	138	WIPE 313WP51	Zinc	2.74e+00
313	138	WIPE 313WP51	Lead	1.45e+00
313	153	WIPE 313WP39	Zinc	2.85e+00
313	153	WIPE 313WP39	Lead	1.19e+00
313	153	WIPE 313WP38	Zinc	1.73e+00
313	153	WIPE 313WP38	Lead	7.25e-01
313	195	WIPE 313WP18	Zinc	9.20e+00
313	195	WIPE 313WP18	Lead	8.70e+00
313	195	WIPE 313WP12	Benzo [A] Anthracene	1.20e-02
313	195	WIPE 313WP12	Benzo [B] Flouranthene	3.30e-01
313	195	WIPE 313WP12	Chrysene	1.40e-02
313	227	WIPE 313WP132	Lead	3.96e+01
313	227	WIPE 313WP131	Lead	4.02e-01
313	138A	WIPE 313WP34B	Zinc	3.13e+00
313	138A	WIPE 313WP34B	Lead	7.91e-01
313	138A	WIPE 313WP34	Zinc	4.13e+00
313	138A	WIPE 313WP34	Lead	5.70e-01
313	IB	WIPE 313WP160B	Zinc	7.72e+01
313	IB	WIPE 313WP160B	Lead	2.70e+00
313	IB	WIPE 313WP160	Arsenic	6.15e-02
313	IB	WIPE 313WP160	Benzo [A] Anthracene	1.60e-02
313	IB	WIPE 313WP160	Benzo [B] Flouranthene	8.30e-02
313	IB	WIPE 313WP160	Dibenz [A,H] Anthracene	6.50e-02
313	IB	WIPE 313WP160	Zinc	6.49e+01
313	IB	WIPE 313WP160	Lead	1.89e+00
Bunkers	Right	WIPE BNKWP01B	2,4-Dinitrotoluene	6.70e-02
Bunkers	Right	WIPE BNKWP01	2,4-Dinitrotoluene	1.50e-01
NOTES:				
units are ug/cm2 unless noted				
GT = concentration is estimated to be greater than value shown				
U = unconfirmed pesticide result				

**Table 4-54  
MTL Phase 2 RI Air Sampling Results**

SITE ID	BLDG 131AIR2-9	BLDG 241AIR3-8	BLDG 243AIR2-7	BLDG 292AIR1-8	BLDG 292AIR2-8
DEPTH (ft)	0	0	0	0	0
<b>COMPOUND</b>					
<b>VOA</b>					
1,1,1-Trichloroethane	1.70E+01		1.00E+01	7.10E+00	5.10E+00
1,3-Butadiene			4.00E-01	9.00E-01	
Acetone	4.20E+01		1.10E+03	5.60E+01	9.30E+01
Benzene	2.70E+00		6.40E+00	6.00E+00	2.00E+00
Carbon Disulfide			4.10E+00	8.20E+00	4.90E+00
Chlorobenzene	1.80E+00				
Chloromethane	1.80E+00		1.80E+00	2.10E+00	1.60E+00
Dichloromethane	2.90E+01				
Ethylbenzene	2.60E+00		1.60E+00	8.60E+00	
Methylethyl Ketone	4.50E+01		1.50E+02	2.80E+01	1.00E+02
Methylisobutyl Ketone	1.50E+02		1.40E+02	1.10E+02	1.10E+02
Styrene	5.90E+00		3.00E+00	4.10E+00	2.20E+00
Tetrachloroethylene	1.60E+01		4.50E+00	4.50E+00	3.70E+00
Toluene	9.90E+00		1.40E+01	2.50E+01	9.20E+00
Trichloroethylene	9.00E-01		1.50E+00	4.00E+00	1.40E+00
Trichlorotrifluoroethane				1.10E+01	5.80E+00
Trichlorofluoromethane	2.50E+00		1.70E+00	2.30E+00	2.50E+00
Xylenes, total	2.00E+01		1.10E+01	4.80E+01	4.70E+00
<b>BNA</b>					
1,4-Dichlorobenzene	1.90E+02		2.90E+00	1.40E+01	2.30E+00
Acenaphthene	1.30E-01		1.38E-01		
Acenaphthylene	1.90E-02		2.40E-02		
Anthracene					
Fluoranthene	1.00E-02			1.60E-02	
Fluorene	9.70E-02				
Methyl Naphthalenes	4.54E-01		1.65E+00	2.03E-01	3.25E-01
Naphthalene	9.07E-01		3.03E+00	3.24E-01	6.18E-01
Phenanthrene	1.94E-01		6.90E-02	8.10E-02	3.30E-02
Pyrene					
<b>PEST/PCB</b>					
PCB 1242					
PCB 1254					
<b>INORGANIC/METAL</b>					
Aluminum	3.39E-01		5.24E-01	3.39E-01	3.16E-01
Antimony			1.13E-03	3.33E-04	
Arsenic			9.53E-04		
Barium	3.76E-03		1.67E-02	6.11E-03	5.69E-03
Cadmium	5.64E-04		8.34E-04	5.00E-04	8.21E-04
Calcium	1.19E+00		2.32E+00	1.33E+00	1.20E+00
Chromium	1.44E-03		2.32E-03		1.77E-03
Copper	1.88E+00		8.34E-01	1.39E+00	6.13E-01
Iron	4.83E-02		2.02E-01	1.00E-01	1.83E-01
Lead	2.26E-03		2.56E-02	7.22E-03	8.84E-03
Magnesium	3.14E-01		6.55E-01	2.78E-01	2.53E-01
Manganese	1.19E-02		4.17E-03		3.16E-03
Mercury	5.02E-04		4.76E-04	3.89E-04	3.16E-04
Nickel			7.15E-03		
Potassium	5.02E-01		5.36E-01	5.00E-01	5.05E-01
Selenium			2.96E-03		
Silver	6.90E-04		8.34E-04	1.00E-04	6.95E-04
Sodium	1.76E+01		2.38E+01	1.72E+01	1.71E+01
Vanadium	3.14E-03		1.07E-02	6.67E-03	6.95E-03
Zinc	1.07E-02		4.82E-02	2.44E-02	3.22E-02
<b>RADIOLOGICAL</b>					
Alpha gross		2.71E-01		5.11E-02	7.02E-02
Beta gross		6.27E-01		2.72E-01	3.58E-01
Uranium 234		6.78E-04		5.67E-05	5.75E-04
Uranium 235					
Uranium 238		6.78E-04		1.70E-04	4.47E-04
<b>CONVENTIONAL</b>					
Nitrate					



**Table 4-54**  
**MTL Phase 2 RI Air Sampling Results**  
**(Continued)**

SITE ID	BLDG 311AIR1-1	BLDG 311AIR1-2	BLDG 311AIR2-1	BLDG 312AIR1-4	BLDG 312AIR2-4
DEPTH (ft)	0	0	0	0	0
<b>COMPOUND</b>					
<b>VOA</b>					
1,1,1-Trichloroethane	1.40E+01	1.10E+01	1.20E+01	5.80E+00	6.10E+00
1,3-Butadiene		9.00E-01	8.00E-01		
Acetone	5.70E+01	6.80E+01	6.80E+01	2.40E+01	2.70E+01
Benzene	4.40E+00	4.10E+00	4.20E+00	4.30E+00	4.00E+00
Carbon Disulfide		3.60E+00	4.20E+00		
Chlorobenzene					
Chloromethane		1.60E+00			
Dichloromethane	1.40E+01	3.30E+01	5.30E+01		
Ethylbenzene	1.30E+00		1.10E+00		1.30E+00
Methylethyl Ketone	2.70E+01	2.30E+01	1.50E+02	1.30E+01	9.50E+01
Methylisobutyl Ketone	1.30E+02	8.40E+01	1.50E+02	5.20E+01	9.60E+01
Styrene	9.00E+00	8.70E+00	1.60E+01	1.50E+00	
Tetrachloroethylene		1.70E+01	3.20E+01	3.70E+00	3.40E+00
Toluene	1.90E+01	1.10E+01	1.20E+01	1.00E+01	1.40E+01
Trichloroethylene	5.00E-01				6.00E-01
Trichlorotrifluoroethane		2.50E+00	2.70E+00		
Trichlorofluoromethane	7.40E+00	9.30E+00	1.10E+01	3.00E+00	2.90E+00
Xylenes, total		5.10E+00	6.10E+00	4.90E+00	7.80E+00
<b>BNA</b>					
1,4-Dichlorobenzene	6.00E+00	3.70E+00	6.80E+00	1.30E+01	1.60E+01
Acenaphthene	4.30E-02	1.00E-02	1.70E-02	2.70E-02	
Acenaphthylene	1.40E-02	6.00E-03	1.00E-02	8.00E-03	
Anthracene					
Fluoranthene		2.90E-02			
Fluorene	3.30E-02	1.60E-02	2.30E-02	2.30E-02	
Methyl Naphthalenes	3.04E-01	7.80E-02	2.19E-01	4.56E-01	4.51E-01
Naphthalene	3.99E-01	1.72E-01	2.52E-01	3.80E-01	3.86E-01
Phenanthrene	5.40E-02	1.30E-01	1.06E-01	4.20E-02	3.20E-02
Pyrene		6.00E-03	7.00E-03		
<b>PEST/PCB</b>					
PCB 1242		1.80E-02	2.70E-02		
PCB 1254		1.30E-02	1.80E-02		
<b>INORGANIC/METAL</b>					
Aluminum	6.25E-01	4.50E-01	5.94E-01	4.10E-01	4.50E-01
Antimony	6.58E-04	8.64E-04	7.96E-04	1.43E-03	
Arsenic	7.24E-04	6.78E-04	6.74E-04	1.11E-03	
Barium	1.91E-02	1.48E-02	1.59E-02	1.37E-02	8.49E-03
Cadmium	6.58E-04	8.02E-04	1.16E-03	1.82E-03	
Calcium	2.83E+00	2.04E+00	2.45E+00	1.95E+00	2.02E+00
Chromium	5.00E-03	3.39E-03	4.16E-03	3.19E-03	2.28E-03
Copper	2.17E-01	2.28E-01	1.65E-01	6.25E-01	1.63E-02
Iron	4.15E-01	2.78E-01	3.43E-01	1.69E-01	3.82E-02
Lead	2.83E-02	2.28E-02	2.02E-02	2.02E-02	3.00E-03
Magnesium	7.24E-01	5.55E-01	6.74E-01	5.21E-01	5.87E-01
Manganese	6.58E-03	4.32E-03	7.96E-03	3.25E-03	
Mercury	7.24E-04	4.32E-04	3.06E-04	4.56E-04	
Nickel	4.61E-03	5.55E-03	8.57E-03	7.16E-03	
Potassium	7.24E-01	4.32E-01	6.12E-01	3.25E-01	4.57E-01
Selenium				2.34E-03	
Silver	6.58E-04	3.70E-04	6.12E-04	9.76E-04	
Sodium	2.90E+01	1.79E+01	2.76E+01	2.02E+01	2.15E+01
Vanadium	3.95E-03	7.40E-03	6.12E-03	1.50E-02	
Zinc	4.08E-02	4.07E-02	4.35E-02	4.10E-02	9.14E-03
<b>RADIOLOGICAL</b>					
Alpha gross	2.33E-01	4.03E-01	1.73E-01	3.62E-01	3.50E-01
Beta gross	4.59E-01	5.60E-01	3.84E-01	7.24E-01	8.58E-01
Uranium 234	2.00E-04	3.15E-04	4.96E-04	3.95E-04	1.06E-03
Uranium 235					
Uranium 238	9.32E-04	2.52E-04	7.43E-04	4.60E-04	3.23E-03
<b>CONVENTIONAL</b>					
Nitrate	6.60E-01	6.00E-01	2.24E+00		

Units are ug/m3 unless noted

**Table 4-54**  
**MTL Phase 2 RI Air Sampling Results**  
**(Continued)**

SITE ID	BLDG 312AIR3-4	BLDG 313AIR1-5	BLDG 313AIR2-5	BLDG 313AIR3-9	BLDG 36AIR3-7
DEPTH (ft)	0	0	0	0	0
<b>COMPOUND</b>					
<b>VOA</b>					
1,1,1-Trichloroethane	6.40E+00	4.20E+00	5.20E+00	3.30E+01	6.20E+00
1,3-Butadiene					8.00E-01
Acetone	2.10E+01	3.40E+01	2.10E+01	6.60E+01	5.20E+01
Benzene	4.10E+00	1.60E+00	1.50E+00	2.40E+00	5.50E+00
Carbon Disulfide	1.90E+00		2.20E+00		1.30E+01
Chlorobenzene					
Chloromethane	7.00E-01	4.00E-01	3.00E-01	1.70E+00	2.00E+00
Dichloromethane				1.40E+01	
Ethylbenzene	1.90E+00	1.00E+00			1.80E+00
Methylethyl Ketone	1.50E+01	1.20E+01	1.00E+02	1.50E+02	2.50E+01
Methylisobutyl Ketone	5.40E+01	4.30E+01	1.10E+02	1.40E+02	9.30E+01
Styrene	1.70E+00	1.10E+00	1.40E+00	2.00E+00	2.50E+00
Tetrachloroethylene	4.30E+00	1.70E+00	1.60E+00	1.90E+00	5.10E+00
Toluene	1.60E+01	5.10E+00	9.90E+00	3.80E+01	1.70E+01
Trichloroethylene	5.00E-01	7.00E-01	7.00E-01	1.40E+00	
Trichlorotrifluoroethane				2.20E+00	
Trichlorofluoromethane	3.10E+00	2.00E+00	2.20E+00	3.70E+00	2.20E+00
Xylenes, total	1.20E+01	6.90E+00	2.20E+00	3.60E+01	1.10E+01
<b>BNA</b>					
1,4-Dichlorobenzene	1.40E+01	3.60E+00	2.80E+00	3.20E+00	2.00E+00
Acenaphthene	2.70E-02	7.00E-03			3.00E-03
Acenaphthylene	1.00E-02	3.00E-03			3.00E-03
Anthracene				1.01E-01	
Fluoranthene	7.00E-03	3.00E-03	4.00E-03		7.00E-03
Fluorene	2.40E-02	1.40E-02	7.00E-03		1.00E-02
Methyl Naphthalenes	4.07E-01	2.36E-01	1.51E-01	1.68E-01	2.02E-01
Naphthalene	3.16E-01	2.01E-01	1.18E-01	3.71E-01	2.65E-01
Phenanthrene	3.40E-02	3.10E-02	1.50E-02	3.40E-02	2.10E-02
Pyrene	3.00E-03	3.00E-03			
<b>PEST/PCB</b>					
PCB 1242					
PCB 1254				9.80E-02	
<b>INORGANIC/METAL</b>					
Aluminum	5.13E-01	4.02E-01	5.73E-01	3.45E-01	4.70E-01
Antimony	1.60E-03			5.11E-04	1.22E-03
Arsenic	1.28E-03	5.84E-04		3.83E-04	1.03E-03
Barium	1.54E-02	6.48E-03	1.12E-02	5.11E-03	1.42E-02
Cadmium	8.98E-04	5.19E-04	5.92E-04	5.11E-04	1.03E-03
Calcium	2.24E+00	1.36E+00	2.24E+00	1.15E+00	1.68E+00
Chromium	2.82E-03	1.56E-03	2.24E-03	2.24E-03	2.45E-03
Copper	4.68E-01	5.25E-01	3.95E-01	1.96E-01	1.48E+00
Iron	2.31E-01	9.08E-02	9.87E-02	1.21E-01	4.06E-01
Lead	2.24E-02	4.99E-03	7.90E-03	6.39E-03	2.38E-02
Magnesium	6.41E-01	3.89E-01	6.58E-02	3.19E-01	3.87E-01
Manganese	4.49E-03	3.24E-03	3.95E-03	1.92E-03	5.80E-03
Mercury	5.13E-04	5.19E-04	3.29E-04	2.55E-04	5.16E-04
Nickel	1.15E-02			3.83E-03	9.67E-03
Potassium	3.85E-01	6.48E-01	4.61E-01	4.47E-01	5.80E-01
Selenium	2.31E-03				2.96E-03
Silver		8.43E-04	8.56E-04	5.75E-04	1.03E-03
Sodium	2.18E+01	2.01E+01	2.50E+01	1.66E+01	2.06E+01
Vanadium	1.15E-02	2.59E-03	1.97E-03	5.75E-03	1.29E-02
Zinc	4.17E-02	1.69E-02	2.96E-02	1.96E-02	4.96E-02
<b>RADIOLOGICAL</b>					
Alpha gross	4.40E-01	1.38E-01	8.65E-02	1.05E-01	
Beta gross	7.75E-01	4.92E-01	3.26E-01	3.86E-01	
Uranium 234	1.76E-04	5.24E-04	5.99E-04	4.39E-04	
Uranium 235					
Uranium 238	8.81E-04	3.28E-04	3.99E-04	3.51E-04	
<b>CONVENTIONAL</b>					
Nitrate		1.91E+00	3.23E+00	6.70E-01	9.20E-01



**Table 4-54**  
**MTL Phase 2 RI Air Sampling Results**  
**(Continued)**

SITE ID	BLDG 37AIR1-9	BLDG 39AIR1-6	BLDG 39AIR1-7	BLDG 39AIR2-6	BLDG 43AIR1-3
DEPTH (ft)	0	0	0	0	0
<b>COMPOUND</b>					
<b>VOA</b>					
1,1,1-Trichloroethane	7.40E+00	3.00E+01	1.30E+01	3.70E+01	3.10E+01
1,3-Butadiene		5.00E-01	8.00E-01	1.30E+00	2.50E+00
Acetone	1.50E+01	2.40E+01	3.70E+01	5.20E+01	2.60E+01
Benzene	1.10E+01	6.00E+00	6.90E+00	7.80E+00	1.50E+01
Carbon Disulfide			2.50E+00	3.70E+00	
Chlorobenzene					
Chloromethane	1.20E+00	1.10E+00	1.70E+00	1.70E+00	2.70E+00
Dichloromethane					
Ethylbenzene	6.00E+00	2.20E+00	5.90E+00	4.80E+00	7.10E+00
Methylethyl Ketone	1.90E+01	1.40E+01	2.20E+01	2.10E+02	1.60E+01
Methylisobutyl Ketone	7.80E+01	4.60E+01	7.40E+01	1.90E+02	6.40E+01
Styrene	3.10E+00	2.30E+00	3.00E+00	6.30E+00	3.20E+00
Tetrachloroethylene	2.10E+00	5.20E+00	4.50E+00	8.10E+00	5.90E+00
Toluene	4.30E+01	1.90E+01	2.10E+01	2.90E+01	4.20E+01
Trichloroethylene		7.00E-01	7.00E-01	9.00E-01	1.50E+00
Trichlorotrifluoroethane	3.50E+00	7.30E+00	2.20E+00	5.00E+00	3.90E+00
Trichlorofluoromethane	2.60E+00	1.00E+01	5.60E+00	7.40E+00	3.30E+00
Xylenes, total	3.60E+01	1.40E+01	3.40E+01	2.80E+01	4.10E+01
<b>BNA</b>					
1,4-Dichlorobenzene		8.60E+00	7.30E+00	4.70E+01	2.40E+00
Acenaphthene	1.50E-02	7.00e-03/ 1.10e-02		7.00E-03	2.20E-02
Acenaphthylene	3.80E-02	1.10e-02/ 3.80e-02		1.40E-02	1.80E-02
Anthracene		1.00E-02			
Fluoranthene		1.10e-02/ 1.40e-02		1.00E-02	7.00E-03
Fluorene	3.80E-02	1.40e-02/ 2.80e-02		1.40E-02	2.50E-02
Methyl Naphthalenes	9.86E-01	1.77e-01/ 3.27e-01		1.89E-01	5.39E-01
Naphthalene	1.02E+00	1.99e-01/ 6.88e-01		3.38E-01	7.19E-01
Phenanthrene	7.60E-02	6.70e-02/ 1.07e-01		6.10E-02	6.10E-02
Pyrene		1.10e-02/ 2.10e-02		7.00E-03	7.00E-03
<b>PEST/PCB</b>					
PCB 1242					8.30E-02
PCB 1254					
<b>INORGANIC/METAL</b>					
Aluminum	4.63E-01	4.15E-01	4.03E-01	4.43E-01	6.08E-01
Antimony		1.64E-03	1.01E-03	1.54E-03	1.42E-03
Arsenic		6.29E-04	4.40E-04	5.78E-04	2.13E-03
Barium	7.08E-03	2.58E-02	1.82E-02	2.50E-02	3.04E-02
Cadmium		8.18E-04	5.03E-04	6.42E-04	2.46E-03
Calcium	1.48E-01	1.89E+00	1.89E+00	2.05E+00	2.65E+00
Chromium	2.45E-03	2.52E-03	3.65E-03	3.21E-03	7.11E-03
Copper	6.24E-01	6.92E-01	6.23E-01	1.28E+00	2.59E-01
Iron	1.48E-01	3.08E-01	1.89E-01	2.83E-01	6.08E-01
Lead	7.72E-03	1.45E-02	1.38E-02	1.54E-02	9.70E-02
Magnesium	3.86E-01	4.41E-01	5.66E-01	5.78E-01	7.11E-01
Manganese	2.57E-03	5.04E-03	3.77E-03	4.49E-03	8.40E-03
Mercury	5.79E-04	3.15E-04	3.77E-04	3.85E-04	3.88E-04
Nickel		9.44E-03	5.03E-03	2.31E-02	9.05E-03
Potassium	5.79E-01	3.78E-01	3.77E-01	3.85E-01	6.46E-01
Selenium		1.20E-03	2.01E-03	1.16E-03	5.82E-04
Silver	9.01E-04	5.66E-04	5.03E-04	8.35E-04	3.88E-04
Sodium	2.19E+01	1.89E+01	2.20E+01	2.25E+01	2.84E+01
Vanadium	7.08E-03	1.20E-02	8.18E-03	1.09E-02	1.49E-02
Zinc	2.51E-02	5.16E-02	3.77E-02	4.82E-02	7.76E-02
<b>RADIOLOGICAL</b>					
Alpha gross		1.34E-01	3.17E-01	2.01E-01	5.63E-01
Beta gross		4.52E-01	5.48E-01	4.67E-01	7.20E-01
Uranium 234		2.54E-04	3.96E-04	3.89E-04	1.31E-03
Uranium 235					
Uranium 238		3.18E-04	3.96E-04	2.60E-04	7.20E-03
<b>CONVENTIONAL</b>					
Nitrate		2.64E+00	3.32E+00	7.60E+00	

**Table 4-54**  
**MTL Phase 2 RI Air Sampling Results**  
**(Continued)**

SITE ID	BLDG 43AIR2-3	BLDG 43AIR3-3	BLDG 60AIR3-8	BLDG 97AIR2-2	BLDG 97AIR3-2	BLDG BGAIR3-1
DEPTH (ft)	0	0	0	0	0	0
<b>COMPOUND</b>						
<b>VOA</b>						
1,1,1-Trichloroethane	3.60E+01	3.20E+01	1.00E+01	5.40E+00	4.40E+00	6.20E+00
1,3-Butadiene	2.10E+00	2.70E+00	3.00E-01			4.00E-01
Acetone	2.80E+01	2.10E+01	3.80E+01	3.20E+01	1.90E+01	1.60E+01
Benzene	2.20E+01	1.70E+01	3.10E+00	3.60E+00	4.70E+00	3.40E+00
Carbon Disulfide	5.00E+00		3.70E+00	2.20E+00		2.00E+00
Chlorobenzene						
Chloromethane	1.40E+00	1.60E+00	2.00E+00		1.00E+00	
Dichloromethane	5.90E+00	5.70E+00	5.40E+00	5.80E+00	5.40E+00	
Ethylbenzene	9.10E+00	7.50E+00	2.10E+00			
Methylethyl Ketone	2.10E+02	2.20E+01	3.50E+01	1.20E+02	2.10E+01	4.70E+01
Methylisobutyl Ketone	2.30E+02	7.60E+01	1.20E+02	1.50E+02	7.20E+01	1.30E+02
Styrene	4.60E+00	3.60E+00	4.80E+00	2.70E+00	2.10E+00	5.70E+00
Tetrachloroethylene	1.00E+01	7.70E+00	7.70E+00	3.90E+00	4.40E+00	1.40E+01
Toluene	6.70E+01	4.30E+01	1.10E+01	7.60E+00	1.10E+01	7.20E+00
Trichloroethylene	1.80E+00	1.60E+00		3.20E+00	4.40E+00	
Trichlorotrifluoroethane	5.70E+00	4.40E+00		3.10E+01	2.30E+01	
Trichlorofluoromethane	4.00E+00	3.60E+00	5.70E+00	1.90E+00	1.20E+00	2.00E+00
Xylenes, total	5.90E+01	5.00E+01	1.20E+01	3.40E+00	3.80E+00	4.00E+00
<b>BNA</b>						
1,4-Dichlorobenzene			2.30E+00	3.20E+00	2.40E+00	
Acenaphthene	2.00E-02	2.70E-02	1.81E-01	6.00E-03	1.20E-02	3.00E-03
Acenaphthylene	1.30E-02	1.40E-02		3.00E-03	6.00E-03	6.00E-03
Anthracene						
Fluoranthene	7.00E-03	7.00E-03	3.30E-02	6.00E-03	2.40E-02	3.00E-03
Fluorene	2.60E-02	3.00E-02	7.20E-02	9.00E-03	1.80E-02	6.00E-03
Methyl Naphthalenes	6.90E-01	5.74E-01	1.84E+00	9.90E-02	7.90E-02	1.42E-01
Naphthalene	9.21E-01	5.74E-01	1.81E+00	1.55E-01	8.60E-02	2.57E-01
Phenanthrene	5.90E-02	6.40E-02	6.15E-01	2.10E-02	1.25E-01	1.60E-02
Pyrene	3.00E-03	3.00E-03	1.80E-02			
<b>PEST/PCB</b>						
PCB 1242	9.50E-02	1.39E-01		5.10E-02	6.10E-02	
PCB 1254				4.50E-02	3.80E-02	
<b>INORGANIC/METAL</b>						
Aluminum	4.64E-01	5.42E-01		3.21E-01	3.67E-01	5.12E-01
Antimony	1.40E-03	1.68E-03		8.02E-04	3.44E-04	6.48E-04
Arsenic	1.65E-03	1.99E-03			3.44E-04	5.18E-04
Barium	2.48E-02	3.43E-02		8.59E-03	8.61E-03	1.43E-02
Cadmium	4.76E-03	5.30E-03		2.29E-02	1.03E-03	3.89E-04
Calcium	2.03E+00	2.47E+00		1.49E+00	1.61E+00	2.14E+00
Chromium	4.64E-03	9.03E-03		2.46E-03	1.61E-03	1.88E-03
Copper	3.62E-01	6.02E-01		1.03E+00	4.31E-01	1.68E-01
Iron	4.19E-01	6.42E-01		1.26E-01	1.15E-01	1.81E-01
Lead	7.62E-02	9.63E-02		8.59E-01	2.07E-02	5.44E-03
Magnesium	5.71E-01	6.02E-01		4.01E-01	4.59E-01	6.48E-01
Manganese	7.62E-03	1.20E-02		2.29E-03	5.17E-03	3.24E-03
Mercury	3.81E-04	7.22E-04		4.01E-04	4.02E-04	6.48E-05
Nickel	1.02E-02	1.38E-02				5.83E-03
Potassium	5.08E-01	4.81E-01		3.44E-01	3.44E-01	5.18E-01
Selenium	5.71E-04	7.82E-04				
Silver	8.89E-04	9.03E-04		6.30E-04		3.89E-04
Sodium	1.97E+01	1.99E+01		1.49E+01	1.55E+01	2.46E+01
Vanadium	1.59E-02	2.05E-02		4.01E-03	3.44E-03	8.42E-03
Zinc	5.33E-02	7.82E-02		3.04E-02	3.56E-02	1.62E-02
<b>RADIOLOGICAL</b>						
Alpha gross	9.63E-01	4.81E-01		2.14E-01	1.60E-01	2.22E-01
Beta gross	8.99E-01	2.82E-01		3.36E-01	5.08E-01	4.05E-01
Uranium 234	2.89E-03	3.40E-03		5.79E-04	2.82E-04	2.62E-04
Uranium 235	4.49E-04	2.00E-01				
Uranium 238	1.86E-02	2.32E-02		1.10E-03	1.03E-03	4.58E-04
<b>CONVENTIONAL</b>						
Nitrate						8.70E-01

**Table 4-54  
MTL Phase 2 RI Air Sampling Results  
(Continued)**

SITE ID	BLDG BGAIR3-5	BLDG BGAIR3-6	BLDG BLPUF4	BLDG BLTSP1	BLDG BLTSP2
DEPTH (ft)	0	0	0	0	0
<b>COMPOUND</b>					
<b>VOA</b>					
1,1,1-Trichloroethane		3.20E+01			
1,3-Butadiene		1.30E+00			
Acetone	1.40E+01	1.70E+01			
Benzene	1.00E+00	6.80E+00			
Carbon Disulfide	3.30E+00				
Chlorobenzene					
Chloromethane	1.50E+00	1.70E+00			
Dichloromethane					
Ethylbenzene	3.50E+00	3.10E+00			
Methylethyl Ketone	7.00E+00	1.30E+01			
Methylisobutyl Ketone	2.90E+01	4.00E+01			
Styrene	1.10E+00	2.30E+00			
Tetrachloroethylene	1.60E+00	6.10E+00			
Toluene	2.80E+00	2.40E+01			
Trichloroethylene		9.00E-01			
Trichlorotrifluoroethane		2.70E+00			
Trichlorofluoromethane	1.30E+00	2.70E+00			
Xylenes, total	2.30E+01	3.20E+01			
<b>BNA</b>					
1,4-Dichlorobenzene	1.00E+00	2.20E+00			
Acenaphthene		1.10E-02			
Acenaphthylene		1.40E-02			
Anthracene					
Fluoranthene					
Fluorene		1.40E-02			
Methyl Naphthalenes	4.00E-02	5.04E-01			
Naphthalene	6.20E-02	8.64E-01	2.00E+01		
Phenanthrene	3.00E-03	2.50E-02			
Pyrene					
<b>PEST/PCB</b>					
PCB 1242					
PCB 1254					
<b>INORGANIC/METAL</b>					
Aluminum	4.77E-01	5.43E-01			
Antimony		1.96E-03			
Arsenic	5.23E-04	8.84E-04			
Barium	1.05E-02	3.22E-02			
Cadmium	5.88E-04	1.14E-03			
Calcium	2.09E+00	2.40E+00			
Chromium	1.89E-03	3.41E-03			
Copper	1.37E-01	3.03E-01			
Iron	9.80E-02	4.67E-01			
Lead	4.38E-03	1.52E-02			
Magnesium	5.88E-01	6.95E-01			
Manganese	2.61E-03	6.32E-03			
Mercury	3.27E-04	1.90E-04			
Nickel		9.48E-03			
Potassium	4.57E-01	5.05E-01			
Selenium		1.33E-03			
Silver	3.92E-04	6.32E-04			
Sodium	2.42E+01	2.34E+01			
Vanadium		1.58E-02			
Zinc	1.89E-02	2.97E-01			
<b>RADIOLOGICAL</b>					
Alpha gross	1.88E-01	2.97E-01		1.00E+00	
Beta gross	4.31E-01	6.03E-01		4.20E+01	3.30E+01
Uranium 234	5.38E-04	2.70E-04		2.00E-01	2.00E-01
Uranium 235					
Uranium 238	7.18E-04	9.00E-05		5.00E-01	2.00E-01
<b>CONVENTIONAL</b>					
Nitrate		6.90E-01			

Table 4-55  
MTL Phase 2 RI Container Sampling Results

SITE ID SAMPLE TYPE COMPOUND	BASN 000SED01 sediment	BASN 242SED01 sediment	BASN 311SED01 sediment	BASN 311SED02 sediment	BASN 312SED01 sediment	BASN 319NSD01 sediment	BASN 37CBSD sediment	CIST 242SW01 surface water
VOA								
1,1-Dichloroethane								
1,1,1-Trichloroethane								
1,2-Dichloroethylene								
Acetone								
Benzene								
Chloroethane								
Chloroform								
Chloromethane								
Methylene Chloride								
Methylisobutyl Ketone								29.3
Tetrachloroethylene								
Trichloroethylene								
Trichlorofluoromethane								
BNA								
1,2-Dichlorobenzene							0.678	
1,2,4-Trichlorobenzene								
1,3-Dichlorobenzene							0.62	
1,4-Dichlorobenzene							2.22	
2-Methylnaphthalene							0.139	
Acenaphthene			0.903	0.988	1.63		0.136	
Acenaphthylene			1.75	2.11	3.39			
Anthracene			2.03		6.19			
Benzo [A] Anthracene		2.3	13.6	9.5	14.8		0.583	
Benzo [A] Pyrene					37.6			
Benzo [B] Fluoranthene					32		2.38	
Benzo [G, H, I] Perylene			21.1		19.6			
Benzo [K] Fluoranthene			5.25	5.81	53			
bis (2-Ethylhexyl) Phthalate			19.8	16	11.5	2.52	11.2	
Chrysene				11.5	30.9			
Dimethyl Phthalate								
Fluoranthene	5.22	4.56	17.9	19	41.6		1.09	
Fluorene			2.83	3.49	4.92		0.234	
n-Nitroso Diphenylamine								
Phenanthrene	3.84	3.09	23.8	24	6.08		1.21	
Pyrene	3.04	4.12	18.4	15.2	62.1		1.74	
PEST/PCB								
Aldrin								
alpha-Benzenehexachloride								
alpha-Endosulfan								
beta-Benzenehexachloride		0.0304						
beta-Endosulfan	0.0238	0.0213		0.0575	0.0272			
Dieldrin	0.0337	0.0207		0.187	0.081	0.00479	0.0139	
Endrin	0.0252	0.0291			0.0158			
Endrin Ketone	0.0301	0.0316		0.106				

Units for sediments are ug/g for chemical and pCi/g for radiological  
Units for surface waters are ug/l for chemical and pCi/l for radiological

Table 4-55  
MTL Phase 2 RI Container Sampling Results  
(Continued)

SITE ID SAMPLE TYPE	BASN 000SED01 sediment	BASN 242SED01 sediment	BASN 311SED01 sediment	BASN 311SED02 sediment	BASN 312SED01 sediment	BASN 313NSD01 sediment	BASN 37CBSD sediment	CIST 242SW01 surface water
Hepchlor	0.00932	0.07			0.0122		0.00246	
Hepchlor Epoxide								
Isodrin	0.0144			0.197				
Lindane								
Methoxychlor								
PCB 1254								
PCB 1260								
ppDDD	0.0557	0.0747	0.829	1.06	0.0924		0.204	
ppDDE	0.148	0.0523	0.174	0.025	0.00428		GT 3.10e+00	
ppDDT	GT 2.00e-01	0.0864	0.739	0.0572	0.0109		0.0294	
<b>INORGANIC/METAL</b>								
Aluminum	9440	11500	16900	10200	6020	5110	131	
Antimony								
Arsenic	4.09	19.6	7.78	32.8	5.74	5.21		
Barium	59.1	119	198	874	56	28.1	9.14	
Beryllium	0.648	0.774	0.898	2.02				
Cadmium		2.24	4.73	10.2				
Calcium	24600	6920	8130	6410	2840	1840	5770	
Chromium	15.8	36.7	83.4	111	428	77.6		
Cobalt	7.46	22.8	15.1	17	336	4.27		
Copper	38	453	1100	8480	686	87.6		
Cyanide					0.297	1.46		
Iron	19900	41300	35500	90200	54000	15000	110	
Lead	156	212	4660	7060		302		
Magnesium	4480	3580	5910	3860	3300	2250	516	
Manganese	379	1420	320	481	384	134		
Mercury	0.125	6.45	0.546	0.702	0.172	0.302		
Nickel	19.2	20.9	55.6	118	338	19.7		
Potassium	1020	1040	1740	749	1080	421	8700	
Selenium								
Silver				1.97	1.06			
Sodium	136	160	325	678	136	66.9	17300	
Vanadium	31.8	50	190	706	38.3	28.9		
Zinc	99.3	246	949	1620	248	212	56.9	
<b>CONVENTIONAL</b>								
Nitrite/Nitrate - nonspecific					7.03			
<b>RADIOLOGICAL</b>								
Alpha gross	15	19	38	35	30	19		
Beta gross	30	22	32	40	42	19		
Cesium 137		0.5						
Thorium 230		0.3						
Uranium 234	1	0.5	0.9	0.9	0.8	0.8		
Uranium 235		0.1	0.1	0.1	0.1	0.1		
Uranium 238	1	0.7	1.1	1.4	0.5	1		

Units for sediments are ug/g for chemical and pCi/g for radiological  
Units for surface waters are ug/l for chemical and pCi/l for radiological

Table 4-55  
 MTL Phase 2 RI Container Sampling Results  
 (Continued)

SITE ID SAMPLE TYPE COMPOUND	CIST 243SED01 sediment	CIST 243SW01 surface water	CIST 313CED01 sediment	CIST 313CED01D sediment	CIST 313CSW01 surface water	SUMP 100SW02-W surface water	SUMP 311SED03 sediment	SUMP 311SW01 surface water
1,1-Dichloroethane								
1,1,1-Trichloroethane								
1,2-Dichloroethylene		143				GT 1.00e+02		170
Acetone		40						
Benzene		6.43						
Chloroethane		22.8						
Chloroform								
Chloromethane						11.4		
Methylene Chloride		23.2				16.7		34.3
Methylisobutyl Ketone								
Tetrachloroethylene		0.926						
Trichloroethylene		GT 1.50e+02						
Trichlorofluoromethane							0.497	
<b>BNA</b>								
1,2-Dichlorobenzene								
1,2,4-Trichlorobenzene								
1,3-Dichlorobenzene							50.8	
1,4-Dichlorobenzene							56.2	
2-Methylnaphthalene	5.87			5.26				
Acenaphthene	13.1			17				
Acenaphthylene			3.12					
Anthracene								
Benzo [A] Anthracene	40.8		8.26	41.7				
Benzo [A] Pyrene								
Benzo [B] Fluoranthene								
Benzo [G,H,I] Perylene								
Benzo [K] Fluoranthene			25.3	43.5				
bis (2-Ethylhexyl) Phthalate	102	46.9	58.6				45.9	
Chrysene								
Dimethyl Phthalate							3.93	
Fluoranthene	70.3		20.6	85.3			3.94	
Fluorene				24.4				
n-Nitroso Diphenylamine								
Phenanthrene	77.2		2.88	132			9.55	
Phenol							3.38	
Pyrene	54.1		14.4	60.9			1.32	
<b>PEST/PCB</b>								
Aldrin	0.175	3.26				0.165		
alpha-Benzenehexachloride								
alpha-Endosulfan		1.63	0.0155		0.00763			
beta-Benzenehexachloride								
beta-Endosulfan			0.0535	0.198	0.0116		0.0332	
Dieldrin	5.25		0.229	0.752	0.0514		0.127	
Endrin	GT 1.00e+00		0.176	0.66			0.133	
Endrin Kelone	GT 5.00e-01	1.05	0.0486	0.241			0.0441	
	3.12							

Units for sediments are ug/g for chemical and pCi/g for radiological  
 Units for surface waters are ug/l for chemical and pCi/l for radiological

Table 4-55  
MTL Phase 2 RI Container Sampling Results  
(Continued)

SITE ID SAMPLE TYPE	CIST 243SED01 sediment	CIST 243SW01 surface water	CIST 313CED01 sediment	CIST 313CED01D sediment	CIST 313CSW01 surface water	SUMP 100SW02-W surface water	SUMP 311SED03 sediment	SUMP 311SW01 surface water
Heptachlor		0.436					0.0127	
Heptachlor Epoxide		0.57						
Isoflin		1.25			0.00705	0.0162		0.00364
Lindane	0.172	0.29		0.267			0.541	
Methoxychlor								
PCB 1254								
PCB 1260	GT 2.00e+01							
ppDDD	1.19	1.57	0.591	1.84			0.0348	
ppDDE		4.3	0.162	0.547		0.0403	0.0646	0.00626
ppDDT	GT 1.00e+00	6.57	0.256	0.918	0.00644	0.015	0.229	0.0396
<b>INORGANIC/METAL</b>								
Aluminum	6070	7770	25700	48500	273	1150	10500	232
Antimony							64.3	
Arsenic		41.6	66.6	76.7			3.88	
Barium	65.7	87.1	434	730	8.58	26.4	1030	5.33
Beryllium		1.22	2.15	3.73				
Cadmium	8.99	13.3	5.18	8.65		29.1	45.1	
Calcium	10300	41600	9590	32600	3320	8020	57100	1310
Chromium	68.3	123	296	348			130	
Cobalt		38.7	84.8	118			21.6	
Copper	521	1140	10900	15900	403	753	4560	61.8
Cyanide								
Iron	21400	31000	68100	103000	660	19800	91000	864
Lead	376	1070	5130	6000		738	6850	
Magnesium	1770	3330	8300	19300	242	1660	3610	
Manganese	106	328	428	805	11.9	276	641	12.4
Mercury	1.13	0.144	1.46	1.86		1.91	GT 1.00e+00	
Nickel	1050	1780	244	358			116	
Potassium		10400	1940	7980		8010	1110	
Selenium		133						
Silver		10.9		15.6			26.3	
Sodium	304	8230	703	1040	4320	8090	600	645
Vanadium	38.4	56.9	1100	1520			46.3	
Zinc	5090	8510	964	1710	175	1310	5210	65.3
<b>CONVENTIONAL</b>								
Nitrite/Nitrate - nonspecific								
<b>RADIOLOGICAL</b>								
Alpha gross	11	29	100	84			17	
Beta gross	25	52	120	91	1	2.00e+01/ 4.20e+01	14	2
Cesium 137	1					3.10e+02/ 4.00e+03		
Thorium 230	0.3							
Uranium 234	1	2.1	7.8	5.9		28	0.9	
Uranium 235	0.1	0.3	0.6	0.5		2.8		
Uranium 238	2.5	5.9	41	33		37	1.5	

Units for sediments are ug/g for chemical and pCi/g for radiological  
Units for surface waters are ug/l for chemical and pCi/l for radiological

Table 4-55  
MTL Phase 2 RI Container Sampling Results  
(Continued)

SITE ID SAMPLE TYPE COMPOUND	SUMP 311SW02 surface water	SUMP 311SW03 surface water	SUMP 311SW03D surface water	SUMP 311SW04 surface water	SUMP 36SED01 sediment	SUMP 39SW01 surface water	SUMP 43SED01 sediment
VOA							
1,1-Dichloroethane			7.08				
1,1,1-Trichloroethane		6.43	3.43				
1,2-Dichloroethylene							
Acetone				84			
Benzene							
Chloroethane							
Chloroform		9.4	12				
Chloromethane							
Methylene Chloride				35.4		29.3	
Methylisobutyl Ketone							
Tetrachloroethylene		35.4	35.4				
Trichloroethylene							
Trichlorofluoromethane							
BNA							
1,2-Dichlorobenzene							0.152
1,2,4-Trichlorobenzene							1.1
1,3-Dichlorobenzene							0.16
1,4-Dichlorobenzene							0.244
2-Methylnaphthalene							1.55
Acenaphthene							0.878
Acenaphthylene							3.52
Anthracene							0.994
Benzo [A] Anthracene							
Benzo [A] Pyrene							
Benzo [B] Fluoranthene							
Benzo [G,H,I] Perylene							
Benzo [K] Fluoranthene							
bis (2-Ethylhexyl) Phthalate							
Chrysene							
Dimethyl Phthalate							
Fluoranthene					1.33		3.12
Fluorene							
n-Nitroso Diphenylamine							
Phenanthrene					1.57		3.38
Phenol							0.182
Pyrene							2.24
PEST/PCB							
Aldrin							0.00855
alpha-Benzenehexachloride						0.0419	
alpha-Endosulfan							
beta-Benzenehexachloride							
beta-Endosulfan					0.00216		0.0473
Dieldrin					0.0121		0.0381
Endrin							0.0157
Endrin Kelone					0.00209		

Units for sediments are ug/g for chemical and pCi/g for radiological  
Units for surface waters are ug/l for chemical and pCi/l for radiological

Table 4-55  
MTL Phase 2 RI Container Sampling Results  
(Continued)

SITE ID SAMPLE TYPE	SUMP 311SW02 surface water	SUMP 311SW03 surface water	SUMP 311SW03D surface water	SUMP 311SW04 surface water	SUMP 36SED01 sediment	SUMP 36SW01 surface water	SUMP 39SW01 surface water	SUMP 49SED01 sediment
Heptachlor Epoxide			0.00359	0.00387				0.0225
Isodrin		0.00519	0.0082				0.051	0.0248
Lindane					0.00579	0.0164		0.0429
Methoxychlor								0.108
PCB 1254	1.31						2.04	0.0842
PCB 1260							0.22	1.01
ppDDD					0.012	0.0522	0.152	
ppDDE	0.208						0.309	GT 2.00e-01
ppDDT								
<b>INORGANIC/METAL</b>								
Aluminum	514	238		178	3360	4810	122	12700
Antimony								
Arsenic					8.66	2.59		23.1
Barium	16.2	6.68	8.58	4.45	9.08	37.7	8.31	364
Beryllium							1.89	0.765
Cadmium								19.1
Calcium	14700	5300	5090	1610	1570	10400	7170	32500
Chromium	17				14.8			187
Cobalt					6.25			19.7
Copper	41.1	75.7	45.8		84.6	73.7	77.6	736
Cyanide								
Iron	441	448	409	179	85300	6140	967	144000
Lead					49.2		151	5830
Magnesium	1010	705	781		1480	1400	368	15500
Manganese	12.2	10.5	15.8	21.7	298	128	46.1	788
Mercury							2.8	50.1
Nickel	2380				14.6		35.1	249
Potassium					277	3160	8670	576
Selenium								
Silver								
Sodium	38600	13400	10600	782		3610	30500	404
Vanadium					16.8			59.1
Zinc	31.6	65.8	24.1	25.2	70.8	81.8	44.4	2930
<b>CONVENTIONAL</b>								
Nitrite/Nitrate - nonspecific								
<b>RADIOLOGICAL</b>								
Alpha gross	3				13	4	20	19
Beta gross	9	3	1		27	4	50	21
Cesium 137								
Thorium 230								
Uranium 234					0.4		0.7	0.6
Uranium 235							0.1	0.1
Uranium 238					0.5	0.1	6.4	2.5

Units for sediments are ug/g for chemical and pCi/g for radiological  
Units for surface waters are ug/l for chemical and pCi/l for radiological

Table 4-55  
 MTL Phase 2 RI Container Sampling Results  
 (Continued)

SITE ID SAMPLE TYPE COMPOUND	SUMP 43SW02 surface water	SUMP 43SW03 surface water	SUMP 97SW01 surface water	SUMP 97SW01 surface water	SUMP 97SW01D surface water	TANK 100SW01 surface water	TANK 311SED04 sediment	TANK 311SW05 surface water	TANK 43SED02 sediment	TANK 43SW01 surface water
VOA										
1,1-Dichloroethane										
1,1,1-Trichloroethane										
1,2-Dichloroethylene										
Acetone			141	133			4.47			
Benzene										11
Chloroethane			1.5							
Chloroform										
Chloromethane										
Methylene Chloride						30.3		23.2		28.3
Methylisobutyl Ketone										
Tetrachloroethylene										
Trichloroethylene										
Trichlorofluoromethane										
BNA										
1,2-Dichlorobenzene										
1,2,4-Trichlorobenzene										
1,3-Dichlorobenzene										
1,4-Dichlorobenzene										
2-Methylnaphthalene										
Acenaphthene										
Acenaphthylene										
Anthracene										
Benzo [A] Anthracene										
Benzo [A] Pyrene										
Benzo [B] Fluoranthene										
Benzo [G,H,I] Perylene										
Benzo [K] Fluoranthene										
bis (2-Ethylhexyl) Phthalate										
Chrysene										
Dimethyl Phthalate										
Fluoranthene										
Fluorene										
n-Nitroso Diphenylamine								265		
Phenanthrene										
Phenol										
Pyrene										
PEST/PCB										
Aldrin			0.00585	0.00596		0.0127			0.478	
alpha-Benzenehexachloride										
alpha-Endosulfan										
beta-Benzenehexachloride										0.0466
beta-Endosulfan										
Dieldrin							0.66		0.33	
Endrin							3.65		0.707	
Endrin Kelone							6.63		0.203	
							2.1			

Units for sediments are ug/g for chemical and pCi/g for radiological  
 Units for surface waters are ug/l for chemical and pCi/l for radiological

Table 4-55  
 MTL Phase 2 RI Container Sampling Results  
 (Continued)

SITE ID	SUMP 43SW02	SUMP 49SW03	SUMP 97SW01	SUMP 97SW01D	TANK 100SW01	TANK 311SED04	TANK 311SW05	TANK 43SED02	TANK 43SW01
SAMPLE TYPE	surface water	surface water	surface water	surface water	surface water	sediment	surface water	sediment	surface water
Heptachlor Epoxide				0.0786					
Isodrin	0.0191			0.0217					0.0136
Lindane						0.192		0.164	
Methoxychlor									
PCB 1254									
PCB 1260	1.25						0.135		0.952
ppDDD			0.013	0.0138	0.374				0.146
ppDDE	0.0857		0.00614	0.0048	0.0108				
ppDDT	0.218		0.0036	0.00586	0.0756	3.55	0.115	0.608	0.152
<b>INORGANIC/METAL</b>									
Aluminum	1480		375	398	19200	3480	272	6490	
Antimony									
Arsenic					10.7	4.44		11	
Barium	36.5	378	14.2	13.8	373	301	22.4	469	8.68
Beryllium					1.54				
Cadmium	11.1				153	89.1		8.38	
Calcium	12100	44	5230	5070	107000	8000	51900	52500	4880
Chromium	17.1				2170	228		74.4	
Cobalt					74.7	126		11	
Copper	387	38.2	119	123	3420	19100		280	63.7
Cyanide									
Iron	6280	22.1	1970	1540	175000	47000	3240	69000	982
Lead	878	10.9		48.6	18700	2890	342	301	
Magnesium	1930		1610	1600	16300	946	3350	3230	896
Manganese	82.5		36.6	30.9	3240	184	296	366	38.7
Mercury					10.6	23.6			
Nickel					2050	373		152	41.9
Potassium	1380				17100	326	16000	1390	
Selenium									
Silver						1.56			
Sodium	13000		20600	20600	61600	124	19000	2720	11400
Vanadium					34.8	12.6		29.3	
Zinc	559	91.4	196	201	8720	4330	117	317	92.4
<b>CONVENTIONAL</b>									
Nitrite/Nitrate - nonspecific									
<b>RADIOLOGICAL</b>									
Alpha gross	2	620	1	4	4	20	16	24	1
Beta gross	7	580	3	2	42	19	16	29	2
Cesium 137									
Thorium 230									
Uranium 234	0.8	2.1			0.4	0.2	0.4	2	
Uranium 235		0.4						0.2	
Uranium 238	1.7	19			0.7	0.7	0.4	11	0.7

Units for sediments are ug/g for chemical and pCi/g for radiological  
 Units for surface waters are ug/l for chemical and pCi/l for radiological

**Table 4-56  
Phase 2 Summary of Contaminants Detected in MTL Containers**

<b>Container</b>	<b>Sample ID</b>	<b>Primary Contaminants</b>
Dry Well Outside Propellant Storage Area	000SED01	Trace concentrations of various pesticides, several PAHs
Building 36 Basin	36SW01	PCB 1260, arsenic, barium, chromium, lead, gross alpha
	36SED01	Arsenic, barium, gross beta
Storm Sewer Catch Basin Outside of Building 37	37CBSD	Various PAHs, barium, beryllium, cobalt, chromium
Building 39 Sump	39SW01	Gross alpha, gross beta, U-234, U-235, U-238
Building 43 Tank	43SW01	U-238
Sump	43SW02	PCB 1260, U-234, U-238
	43SED01	Lead, gross alpha, gross beta, U-238
Tank	43SED02	Barium, cobalt, lead, U-235, U-238
	43SW03 (oil)	Gross beta, U-234, U-235, U-238
Building 97 Sump	97SW01	Barium, thorium, cesium
Building 100 Sump	100SW01	Arsenic, barium, beryllium, cadmium, cobalt, mercury, gross alpha, gross beta, U-234, U-238
Sump	100SW02-W	Gross alpha, gross beta, U-234, U-238
	100SW02-oily layer	Gross alpha, gross beta

**Table 4-56**  
**Phase 2 Summary of Contaminants Detected in MTL Containers**  
**(Continued)**

Container	Sample ID	Primary Contaminants
Cistern 242	242SW01	Barium, gross beta
Basin 242	242SED01	Arsenic, barium, beryllium, cadmium, chromium, cobalt, lead, mercury
Cistern 243	243SW01	Various solvents and pesticides, arsenic, barium, beryllium, cadmium, chromium, cobalt, gross alpha, gross beta, U-234, U-235, U-238
	243SED01	Various pesticides, PCB 1254, barium, cadmium, chromium, lead, mercury, U-238
Building 311 Sump	311SW01	Barium
Building 311 Sump	311SW02	PCB 1260, barium, chromium, zinc, U-234
Building 311 Sump	311SW03	1,1-Dichloroethane, 1,1,1-trichloroethane, PCB 1260, barium
Building 311 Sump	311SW04	Barium
Building 311 Dry Well	311SED01	Barium, cadmium, chromium, cobalt, lead, mercury
Building 311 Dry Well	311SED02	Arsenic, barium, beryllium, cadmium, chromium, cobalt, lead
Building 311 Sump	311SED03	All RCRA metals except selenium; several PAHs
Building 311 Tank	311SED04	All RCRA metals except selenium, various pesticides, one PAH

**Table 4-56**  
**Phase 2 Summary of Contaminants Detected in MTL Containers**  
**(Continued)**

<b>Container</b>	<b>Sample ID</b>	<b>Primary Contaminants</b>
Building 311 Tank	311SW05	Barium, lead, U-234
Building 312 Catch Basin	312SED01	All RCRA metals except mercury and selenium, various PAHs, beryllium, cobalt
Building 313N Catch Basin	313NSD01	Four RCRA metals, gross alpha, gross beta
Building 313C Cistern	313CSED01	All RCRA metals except selenium, gross alpha, gross beta, U-234, U-235, U-238
	313CSW01	Barium

Note: Possible laboratory contaminants not included.

**Table 4-57  
Percent of Duplicate Sample Data Within Given Ranges of Variation**

Medium	Variation in Duplicate Results										
	<10%	10-20%	20-30%	30-40%	40-50%	50-60%	60-70%	70-80%	80-90%	90-100%	>100%
Groundwater	75	13					12				
Surface Water, total	70	9	9	3	7					2	
environmental	94	6									
non-environmental	54	12	15	4	12					3	
Soils	40	16	14	5	5	2	2	3	2	4	7
Sediments, total	8	10	3	24	10	16	6	2			21
environmental	17	10	3	30	17	17	6				
non-environmental		9	3	19	3	16	6	3			41
Wipes	20	18	11	12	9	7	4	3	3	3	10

**Table 4-58**

**Indoor Surface Chemical QA/QC Sample Results**

Compound	No. of Detections	Minimum Value (ug/cm3)	Maximum Value (ug/cm3)	Mean (ug/cm3)
Aluminum	27	0.032	0.372	0.14
Calcium	50	0.199	22.2	2.22
Chromium	23	0.004	0.026	0.013
Copper	17	0.008	0.067	0.029
Iron	47	0.043	0.527	0.132
Magnesium	49	0.104	1.03	0.386
Sodium	48	0.192	11.8	1.189
Zinc	35	0.011	0.555	0.046

**Table 4-59**  
**Frequency of Detected TICs in Various Media**

Sample	Depth	Number of Volatiles	Total Volatiles	Number of Semivolatiles	Total Semivolatiles
<b>SOILS</b>					
<b>Upgradient</b>					
01SB-3	2	0		2	
01SB-3	4	0		0	
01SB-3	6	0		2	
01SB-3	8	0		0	
01SB-3	12	0		0	
01SB-3	14	0		0	
BKSB-1	0	1		35	
BKSB-1	16	1		0	
BKSB-2	0	0		6	
BKSB-2	14	0		2	
BKSB-3	0	0		66	
BKSB-3	4	0		1	
BKSB-3	8	0		2	
BKSB-3	12	0		2	
BKSB-3	14	1		2	
BKSB-3	20	0		0	
BKSB-4	0	0		3	
BKSB-4	12	0		1	
GRSB-2	0	0		6	
GRSB-2	14	0		0	
GRSB-3	0	0		0	
GRSB-3	12	0		0	
01SS-1	0	NA		18	
01SS-1D	0	NA		18	
02SS-1	0	NA		29	
03SS-3	0	NA	3	23	218
<b>Unit 1</b>					
01SB-1	0	0		11	
01SB-1	16	0		1	
01SB-2	8	0		6	
01SB-2	19	0		0	
GRSB-1	0	0		8	
GRSB-1	8	0	0	3	29

**Table 4-59**  
**Frequency of Detected TICs in Various Media**  
**(Continued)**

Sample	Depth	Number of Volatiles	Total Volatiles	Number of Semivolatiles	Total Semivolatiles
<b>Unit 2</b>					
02SB-2	1	0		0	
02SB-2	14	0		3	
02SB-3	1	0		4	
02SB-3	14	0		2	
02SB-4	2	0		4	
02SB-4	16	0	0	5	18
<b>Unit 3</b>					
03SB-1	1	1		0	
03SB-2	0	1		0	
03SB-2	22	0	2	0	0
<b>Unit 4</b>					
04SB-1	0	0	0	17	17
<b>Unit 5</b>					
05SB-1	0	0		3	
05SB-1	30	0		1	
05SB-2	0	0		2	
05SB-2	10	1		0	
GRSB-5	0	0		27	
GRSB-5	12	0		0	
05SS-1	0	NA		40	
05SS-2	0	NA	1	33	106
<b>Unit 6</b>					
06SB-1	0	0		32	
06SB-1	18	1		0	
06SB-2	0	1		12	
06SB-2	16	1		2	
06SB-3	4	0		4	
06SB-3	18	0		0	
06SB-4	0	1		6	
06SB-4	10	0		2	
06SB-4	16	0		2	
06SB-5	0	1		23	
06SB-5	25	1		1	
GRSB-6	0	0		28	
GRSB-6	12	0	6	0	112

**Table 4-59**  
**Frequency of Detected TICs in Various Media**  
**(Continued)**

Sample	Depth	Number of Volatiles	Total Volatiles	Number of Semivolatiles	Total Semivolatiles
<b>Unit 7</b>					
07SB-1	0	2		6	
07SB-1	14	0		2	
GRSB-7	0	0		0	
GRSB-7	14	0		2	
GRSB-8	0	0		11	
GRSB-8	14	0	2	2	23
<b>Unit 8</b>					
08SB-2	1	1		58	
08SB-2	4	0		43	
08SB-3	1	0		32	
08SB-3	6	0		4	
08SB-3	10	0	1	6	143
<b>Unit 9</b>					
09SB-1	0	0		19	
09SB-1	2	0		8	
09SB-1	18	0		28	
09SB-1	34	0		1	
GRSB-10	0	0		25	
GRSB-10	34	0		0	
GRSB-9	0	0	0	32	113
<b>Unit 10</b>					
10SB-1	0	0		2	
10SB-1	18	1		0	
10SB-2	0	0		26	
10SB-2	20	16	17	39	67
<b>Unit 11</b>					
11SB-1	1	0		1	
11SB-1	24	0		3	
11SB-2	0	1		6	
11SB-2	4	0		12	
11SB-2	22	0		1	
11SB-2	24	0		0	
11SB-3	0	0		19	
11SB-3	4	1		1	
11SB-3	22	0		0	
11SB-3	32	0		1	
11SB-4	0	0		20	
11SB-4	34	0		3	
GRSB-15	0	0		32	

**Table 4-59  
Frequency of Detected TICs in Various Media  
(Continued)**

Sample	Depth	Number of Volatiles	Total Volatiles	Number of Semivolatiles	Total Semivolatiles
GRSB-15D	0	0		5	
GRSB-15	32	0	2	29	133
<b>Unit 12</b>					
12SB-1	0	0		15	
12SB-1	8	0		1	
12SB-1	18	0		1	
12SB-1	26	0		1	
12SB-2	4	0		27	
12SB-2	8	0		38	
12SB-2	18	0		1	
12SB-2	28	0		38	
12SB-3	0	0		34	
12SB-3	20	0		2	
GRSB-12	0	0		4	
GRSB-12	16	0		1	
GRSB-13	0	0		52	
GRSB-13	22	0	0	122	337
<b>Unit 13</b>					
13SB-1	0	0		9	
13SB-1	8	0		0	
13SB-1	14	0		0	
13SB-1	32	0		5	
13SB-2	0	0		25	
13SB-2	24	0		3	
13SB-3	2	0		19	
13SB-3	25	0		2	
GRSB-17	0	0		16	
GRSB-17	30	0		1	
GRSB-21	0	0		11	
GRSB-21	24	0		4	
13SS-1	0	NA		38	
13SS-2	0	NA		36	
13SS-6	0	NA		12	
13SS-7	0	NA		19	
13SS-8	0	NA	0	28	228
<b>Unit 14</b>					
14SB-1	0	1		3	
14SB-1	8	0		2	
14SB-1	14	0		1	
14SB-1	16	1	2	0	6

**Table 4-59**  
**Frequency of Detected TICs in Various Media**  
**(Continued)**

Sample	Depth	Number of Volatiles	Total Volatiles	Number of Semivolatiles	Total Semivolatiles
<b>Unit 15</b>					
15SB-1	0	1		11	
15SB-1	8	0		1	
15SB-2	0	0		26	
15SB-2	4	0	1	1	39
<b>Unit 16</b>					
GRSB-24	2	0		5	
GRSB-24	12	0	0	19	24
<b>Unit 17</b>					
17SB-1	0	0		1	
17SB-1	6	1		11	
17SB-2	0	0		16	
17SB-2	8	1		12	
17SB-3	0	1		44	
17SB-3	14	0		5	
GRSB-19	0	0		18	
GRSB-19	9	1		11	
GRSB-22	0	0		15	
GRSB-22	4	0		8	
GRSB-23	0	0		8	
GRSB-23	4	0	4	28	177
<b>Unit 18</b>					
18SB-1	0	0		5	
18SB-1	14	0		1	
GRSB-11	0	1		55	
GRSB-11	6	0	1	6	67
Totals			42		1857
<b>SEDIMENTS</b>					
SD-2		0		34	
SD-3		0		27	
SD-6P		0		45	
SD-7		0		35	
SD-8		0		67	
SD-8D		0		127	
SD-9		0		84	
SD-9P		0		110	
SD-10		1		132	
SD-10P		0		16	

**Table 4-59**  
**Frequency of Detected TICs in Various Media**  
**(Continued)**

Sample	Depth	Number of Volatiles	Total Volatiles	Number of Semivolatiles	Total Semivolatiles
SD-11		0		92	
SD-12		0		12	
SD-12D		0		11	
SD-13		0		4	
SD-14		0		27	
SD-14P		0		2	
SD-15		0		31	
SD-17		0		96	
SD-18		0		22	
SD-19		0		60	
SD-19D		0		11	
SD-20		0		35	
Totals		1		1080	
<b>SURFACE WATER</b>					
SW-1		0		2	
SW-2		0		1	
SW-3		0		1	
SW-3DUP		0		1	
SW-4		0		5	
SW-5		0		3	
SW-6		0		1	
SW-7		0		(?)	
SW-7P		0		1	
SW-8		0		(?)	
SW-9-1D		0		(?)	
SW-10P		0		1	
SW-11		0		(?)	
SW-13		0		0	
SW-14		(?)		0	
SW-14P		1		0	
SW-15		0		0	
SW-16		(?)		0	
SW-17		0		0	
SW-17-1D		0		0	
SW-18		0		0	
SW-19		0		0	
SW-20		0		0	
SW-21		1		6	
Totals		2		22	

**Table 4-60**  
**Semivolatile TICs Detected in Soil Samples > 10 times**

Compound	Unit 1	Unit 2	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8	Unit 9	Unit 10	Unit 11	Unit 12	Unit 13	Unit 14	Unit 15	Unit 16	Unit 17	Unit 18	BK	Totals
Alkane C-18	1										8							1	10
Phthalate											4	1			2	2		1	10
Alkene C-27	1	1			1					4		1				2			11
Cosane, nona-				1							1	4		2	1	1	1	1	11
PNA, MW=230				4							3						3	2	11
PNA, MW=232				5							3						2	1	11
Unk cyclic oxy HC						3			1	3	1	1			1	1		1	11
Alkane C-15	1		1								7							1	12
Dimethyl naphthalene							2	3			5			2					12
Unk polycyclic oxy HC				1	2						2	3						4	12
Cosane, tri-			1	3					1		4	3				1		4	13
Decane, hepta-	1		1			1			2		4							4	13
PNA, MW=206				1			3		2		1	1		1		3		1	13
Alkane C-17			1	2						1	5					1		3	14
Phthalate ester, unk				2			1		1	2	4	2				3		3	14
Adipate C-8	1			1						4	4	4			1	2		3	16
PNA, this MW=234				2			1			1	3	2		2		2	3	2	16
Cosane, hepta-			1	2					1		4			2	1	5		1	17
PNA, MW=204						1	6				4					3	1	2	17
Polynuclear acid					17														17
Alkene C-25	1							2	2	5		4				3		1	18
Benzo[e]pyrene				2	1	1				1	3	3				3	1	3	19
Henitracontane	1			3							6	6		2	1	3		3	19
Alkene C-17	1		1			1		1	3		1	3				6		9	20
Unk cyclic HC				4					3		6					6		1	20
Unk unsat LCHC	1					1		10								8			20
PNA, oxy MW=230							3			1	3	2				4	4	4	21
PNA, MW=252				2	1		7	1			1					3	4	6	25
Unk	2	1		3			2	1		1	2	2				5	6	5	25
Unk LC unsat HC						1						5				12		8	26
PNA, MW=228				3	1		5				2	3				3	3	7	27
PNA, MW=242				3	1		5				2	2				4	5	5	27
Aldehyde			1			5	1				5	6	1		3	6			28
Polycyclic HC	1					1					24	1						1	28
Hexadecanoic acid	1			2	3	3		4	1	5	2	7				2		3	33
Unk oxy HC							2	4	3	2	10	5				3		4	33
Unk polycyclic HC	1				1		2	8	7		4	3				4		3	33
PNA, MW=192				3	4		8	1		1	8	2	1	3		6	1	9	47
PNA, MW=216				7	4		15		1	1	6	5				10	5	17	71
PNA				5	10	1	26				15					1	8	6	72
Unk LCHC	6			10	3		1		1		8	8	2	11		19	1	8	78
Unk LC oxy HC	2			22	1		2			4	50			6		3		11	101
Total (compounds detected > 10x)	22	3	6	84	59	11	72	68	29	29	157	144	4	29	10	129	47	149	1052
Total (compounds detected < 10x)	7	15	11	22	53	12	71	45	38	38	180	56	2	10	14	48	14	69	705

Unk - unknown; LC - long chain; HC - hydrocarbon; PNA - polynuclear-aromatic; BK - Background samples

**Table 5-1  
Chemicals Detected in Site Media**

Chemicals	Media							Indoor Air
	Containers	Soils	Storm Sewers	Surface Water	Charles River Sediments	Groundwater		
<b>Volatiles</b>								
1,1-Dichloroethane	X					X		
1,1-Dichloroethylene						X		
1,1,1-Trichloroethane	X					X		X
1,1,1,2-Tetrachloroethane		X						
1,2-Dichloroethene	X							
1,3-Butadiene								X
1,3-Dimethylbenzene		X		X			X	
Acetone	X		X				X	X
Benzene	X	X				X	X	X
Carbon Disulfide								X
Carbon Tetrochloride						X		
Chlorobenzene								X
Chloroethane	X							
Chloroform	X	X	X				X	
Chloromethane	X							
Dichlorobenzene - unspecified		X						X

**Table 5-1  
Chemicals Detected in Site  
(Continued)**

Chemicals	Media							
	Containers	Soils	Storm Sewers	Surface Water	Charles River Sediments	Groundwater	Indoor Air	
Dichloromethane							X	
Ethylbenzene		X						
Methylene Chloride	X	X		X				
Methylethyl Ketone							X	
Methylisobutyl Ketone	X						X	
Styrene							X	
Tetrachloroethene	X	X				X	X	
Toluene		X		X		X	X	
Trichloroethene	X	X		X		X	X	
Trichlorofluoromethane	X						X	
Trichlorotrifluoroethane							X	
Xylene - unspecified				X		X	X	
<b><u>Semivolatiles</u></b>								
1,1,2-Trichloro-1,2,2-trifluoroethane							X	
1,2-Dichlorobenzene	X				X			
1,2,4-Trichlorobenzene	X							

**Table 5-1  
Chemicals Detected in Site  
(Continued)**

Chemicals	Media							
	Containers	Soils	Storm Sewers	Surface Water	Charles River Sediments	Groundwater	Indoor Air	
1,3-Dichlorobenzene	X							
1,3-Dimethylbenzene (m-Xylene)		X		X		X		
1,4-Dichlorobenzene	X						X	
2-Methylnaphthalene	X	X			X	X	X	
4-Methylphenol		X				X		
Acenaphthene	X	X			X		X	
Acenaphthylene	X	X			X		X	
Anthracene	X	X			X			
Benzo(a)anthracene	X	X			X	X		
Benzo(a)pyrene	X	X			X			
Benzo(b)fluoranthene	X	X			X			
Benzo(g,h,i)perylene	X	X			X			
Benzo(k)fluoranthene	X	X			X			
Benzyl alcohol		X						
bis(2-ethylhexyl)phthalate	X	X	X	X	X			
Butylbenzyl Phthalate		X						

**Table 5-1  
Chemicals Detected in Site  
(Continued)**

Chemicals	Media						
	Containers	Soils	Storm Sewers	Surface Water	Charles River Sediments	Groundwater	Indoor Air
Chrysene	X	X			X		
Di-n-butylphthalate		X			X		
Di-n-Octyl Phthalate		X					
Dibenz(a,h)anthracene		X			X		
Dibenzofuran		X			X		
Dimethyl Phthalate	X						
Fluoranthene	X	X			X		X
Fluorene	X	X			X		X
Indeno(1,2,3-cd)pyrene		X			X		
Methyl ethyl ketone							X
n-Nitroso Diphenylamine	X	X					
Naphthalene		X			X	X	X
Phenanthrene	X	X			X		X
Phenol	X						
Pyrene	X	X			X		X

**Table 5-1  
Chemicals Detected in Site  
(Continued)**

Chemicals	Media							Indoor Air
	Containers	Soils	Storm Sewers	Surface Water	Charles River Sediments	Groundwater		
<u>Pesticides/Aroclors</u>								
Aldrin	X	X	X		X	X		X
alpha endosulfan	X	X	X		X	X		X
alpha-BHC	X	X	X			X		X
Aroclor 1242								X
Aroclor 1254	X							X
Aroclor 1260	X	X						
beta endosulfan	X	X			X			
beta-BHC	X	X	X					
Chlordane		X	X			X		X
DDD	X	X	X		X	X		X
DDE	X	X	X		X	X		X
DDT	X	X	X		X	X		X
delta-BHC		X	X		X	X		X
Dieldrin	X	X			X	X		X
Endrin	X	X			X	X		X

**Table 5-1  
Chemicals Detected in Site  
(Continued)**

Chemicals	Media							
	Containers	Soils	Storm Sewers	Surface Water	Charles River Sediments	Groundwater	Indoor Air	
Endrin ketone	X	X						
gamma-BHC (Lindane)	X	X	X	X	X	X		
Heptachlor	X	X	X			X		
Heptachlor epoxide	X	X			X	X		
Isodrin	X	X	X	X	X	X		
Methoxychlor	X	X	X			X		
<b>Explosives</b>								
1,3,5-Trinitrobenzene						X		
2,4-Dinitrotoluene								
2,6-Dinitrotoluene								
<b>Metals</b>								
Aluminum	X	X	X	X	X	X	X	
Antimony	X						X	
Arsenic	X	X	X		X	X	X	
Barium	X	X	X	X	X	X	X	
Beryllium	X	X		X	X			

**Table 5-1**  
**Chemicals Detected in Site**  
**(Continued)**

Chemicals	Media							Indoor Air
	Containers	Soils	Storm Sewers	Surface Water	Charles River Sediments	Groundwater		
Cadmium	X	X			X		X	X
Calcium	X	X	X	X			X	X
Chromium	X	X		X	X		X	X
Cobalt	X	X			X			
Copper	X	X	X	X			X	X
Iron	X	X	X	X	X		X	X
Lead	X	X	X		X		X	X
Magnesium	X	X	X	X			X	X
Manganese	X	X	X	X	X		X	X
Mercury	X	X			X			X
Nickel	X	X			X			X
Potassium	X	X	X	X			X	X
Selenium	X	X					X	X
Silver	X	X			X			X
Sodium	X	X	X	X			X	X
Vanadium	X	X			X			X

**Table 5-1  
Chemicals Detected in Site  
(Continued)**

Chemicals	Media						
	Containers	Soils	Storm Sewers	Surface Water	Charles River Sediments	Groundwater	Indoor Air
Zinc	X	X	X	X	X	X	X
<b><u>Other Inorganics</u></b>							
Cyanide	X	X	X		X	X	
Nitrate	X	X	X			X	X
Nitrite	X	X	X			X	
<b><u>Radiological</u></b>							
Cesium	X						
Gross $\alpha$	X					X	
Gross $\beta$	X			X	X		
Thorium	X						
U-234	X			X			
U-235	X						
U-238	X			X			

**Table 5-2  
Physicochemical Properties of Organic Chemicals of Potential Concern at MTL**

Chemical Name	Molecular Weight (g/mol)	Solubility in Water 20-25 °C (mg/l)	WSol Source	Vapor Pressure 20-25 °C (mm Hg)	VP Source	Henry's Law Constant 20-25 °C (atm-m <sup>3</sup> /mol)	HL Source	K <sub>oc</sub> (ml/g)	K <sub>oc</sub> Source	Log K <sub>ow</sub>	K <sub>ow</sub> Source
<b><u>Aromatics</u></b>											
Benzene	78.00	1.75E+03	(1)	9.52E+01	(3)	5.43E-03	(7)	8.30E+01	(8)	2.13	(10)
Toluene	92.15	1.55E+03	(1)	2.81E+01	(3)	6.60E-03	(7)	3.00E+02	(4)	2.69	(02)
Xylenes	106.00	1.98E+02	(23)	1.00E+01	(23)	7.04E-03	(7)	2.40E+02	(26)	3.26	(23)
4-Methylphenol	108.15	2.40E+04		4.00E-02		2.38E-07		1.70E+01		1.93	
Benzyl Alcohol											
<b><u>Chlorinated Aliphatics</u></b>											
Chloroform	119.38	7.22E+03	(1)	1.51E+02	(3)	3.80E-03	(7)	4.40E+01	(4)	1.97	(11)
Cis-1,2-Dichloroethylene	96.94	3.50E+03	(27)	2.00E+02	(27)	3.37E-03	(28)	N/A	N/A	1.86	(22)
Trans-1,2-Dichloroethylene	96.94	6.30E+03	(3)	3.24E+02	(3)	6.60E-03	(7)	5.90E+01	(4)	2.09	(4)
Methylene Chloride	84.93	1.80E+04	(5)	3.62E+02	(4)	2.60E-03	(7)	8.80E+00	(4)	1.51	(10)
Tetrachloroethene	165.85	4.84E+02	(1)	1.78E+01	(3)	2.30E-02	(7)	3.64E+02	(4)	2.53	(1)
Trichloroethene	131.29	1.47E+03	(1)	5.79E+01	(3)	8.90E-03	(7)	1.26E+02	(4)	2.42	(1)
Methylene Chloride	50.49	6.50E+03	(4)	4.31E+03	(25)	2.40E-02	(8)	3.51E+01	(26)	0.95	(25)
Chloroethane	64.52	5.74E+03		1.00E+03		2.00E-03		1.50E+01		1.43	
1,1-Dichloroethane	98.96	5.50E+03		1.82E+02		5.70E-03		3.00E+01		1.79	
1,1,2,2-Tetrachloroethane	168	2.90E+03		5.00E+00		3.81E-04		1.18E+02		2.39	
1,1,1-Tri-chloroethane	133.41	1.33E+03		1.23E+02		2.80E-02		1.52E+02		2.47	
<b><u>Phthalates</u></b>											
Bis(2-ethylhexyl) phthalate	391.00	4.00E-01	(12)	2.00E-07	(4)	4.40E-07	(17)	8.74E+04	(19)	5.11	(12)
Di-n-butyl phthalate	278.00	9.20E+00		1.00E-05		1.30E-06		1.39E+03		3.75	

**Table 5-2  
Physicochemical Properties of Organic Chemicals of Potential Concern at MTL  
(Continued)**

Chemical Name	Molecular Weight (g/mol)	Solubility in Water 20-25 °C (mg/l)	WSol Source	Vapor Pressure 20-25 °C (mm Hg)	VP Source	Henry's Law Constant 20-25 °C (atm-m <sup>3</sup> /mol)	HL Source	K <sub>oc</sub> (ml/g)	K <sub>oc</sub> Source	Log K <sub>ow</sub>	K <sub>ow</sub> Source
<b><u>Low Molecular Weight PAHs</u></b>											
Acenaphthene	154.00	3.93E+00		2.15E-03		2.40E-04		4.60E+-3		3.93	
Acenaphthylene	152	3.93+00		2.90E-02		1.48E-03		2.50E+03		3.70	
Anthracene	178.08	7.30E-02	(13)	6.00E-06	(15)	5.90E-05	(7)	1.40E+04	(4)	4.54	(2)
Fluorene	166.08	1.98E+00	(13)	6.00E-04	(15)	8.40E-05	(7)	7.30E+03	(4)	4.18	(10)
Naphthalene	128.06	3.17E+01	(13)	7.80E-02	(15)	4.20E-04	(7)	9.40E+02	(4)	3.36	(10)
Phenanthrene	178.08	1.29E+00	(13)	1.20E-04	(15)	3.90E-05	(7)	1.40E+04	(4)	4.52	(10)
<b><u>High Molecular Weight PAHs</u></b>											
Benzo(a)anthracene	228.09	1.40E-02	(13)	2.10E-07	(15)	4.50E-06	(18)	1.38E+06	(8)	5.61	(10)
Benzo(a)pyrene	252.09	5.00E-05	(14)	5.60E-09	(16)	3.72E-05	(18)	5.50E+06	(4)	6.25	(20)
Benzo(b)fluoranthene	252.00	1.40E-02	(4)	5.00E-07	(4)	1.18E-05	(18)	5.50E+05	(4)	6.06	(20)
Benzo(g,h,i)perylene	276	7.00E-04		7.00E-04		1.03E-10		5.34E-08		6.51	
Benzo(k)fluoranthene	252.32	4.30E-03	(4)	5.10E-07	(4)	3.94E-05	(18)	5.50E+05	(4)	6.06	(20)
Chrysene	228.09	2.00E-03	(13)	6.40E-09	(16)	9.60E-07	(18)	2.00E+05	(4)	5.61	(21)
Dibenz(a,h)anthracene	278.00	1.40E-02	(6)	1.00E-10	(4)	2.61E-09	(18)	3.30E+06	(4)	5.61	(21)
Fluoranthene	202.08	2.60E-01	(13)	9.20E-06	(15)	9.41E-06	(18)	3.80E+04	(4)	5.33	(21)
Indeno(1,2,3-cd)pyrene	276.00	5.30E-04	(4)	1.00E-10	(4)	6.85E-08	(18)	1.60E+06	(4)	6.50	(4)
Pyrene	202.08	1.35E-01	(13)	4.50E-06	(15)	8.86E-06	(18)	3.80E+04	(4)	5.18	(2)

**Table 5-2  
Physicochemical Properties of Organic Chemicals of Potential Concern at MTL  
(Continued)**

Chemical Name	Molecular Weight (g/mol)	Solubility in Water 20-25 °C (mg/l)	WSol Source	Vapor Pressure 20-25 °C (mm Hg)	VP Source	Henry's Law Constant 20-25 °C (atm-m <sup>3</sup> /mol)	HL Source	K <sub>oc</sub> (ml/g)	K <sub>oc</sub> Source	Log K <sub>ow</sub>	K <sub>ow</sub> Source
<b><u>PCBs/Pesticides</u></b>											
Chlordane	410.00	5.60E-01	(3)	1.00E-05	(3)	9.63E-06	(26)	1.40E+05	(4)	3.32	(3)
DDD	320.00	1.00E-01	(4)	1.89E-06	(4)	7.96E-06	(26)	7.70E+05	(4)	6.20	(4)
DDT	355.00	5.00E-03	(3)	5.50E-06	(3)	5.13E-04	(26)	2.43E+05	(8)	6.19	(24)
DDE	318.00	4.00E-02	(4)	6.50E-06	(4)	6.80E-05	(26)	4.40E+06	(4)	7.00	(4)
Endrin	200.59	2.00E-07	(24)	2.00E-03	(24)	N/A	N/A	N/A	N/A	N/A	N/A
Heptachlor	374.00	1.80E-01	(4)	3.00E-04	(4)	8.19E-04	(26)	1.20E+04	(4)	4.40	(4)
Isodrin											
Aldrin	365	1.80E-01		6.00E-06		1.60E-05		9.60E+04		5.30	
Alpha Endosulfan	407										
Alpha-BHC	291	1.63E+00		2.50E-05		5.87E-06		3.80E+03		3.90	
Beta-BHC	291	2.40E-01		2.80E-07		4.47E-07		3.80E+03		3.90	
Delta-BHC	291	3.14E+01		1.70E-05		2.07E-07		6.60E+03		4.10	
Gamma-BHC (Lindane)	291	7.80E+00		1.60E-04		7.85E-06		1.08E+03		3.90	
Dieldrin	381	1.95E-01		1.78E-07		4.58E-07		1.70E+03		3.50	
Endrin Ketone											
Heptachlor Epoxide	389	3.50E-01		3.00E-04		4.39E-04		2.20E+02		2.70	
Methoxychlor											
Polychlorinated Biphenyls (PCBs)	328.0	3.10E-02	(4)	7.70E-05	(4)	1.07E-03	(26)	5.30E+05	(4)	6.40	(4)
<b><u>Miscellaneous Organics</u></b>											
Dibenzofuran											
1,3,5-Trinitrobenzene	213.12	3.85E+02		3.03E-06		2.21E-09		2.00E+01		1.18	

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**Table 5-2**  
**Physicochemical Properties of Organic Chemicals of Potential Concern at MTL**  
**(Continued)**

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**Table 5-2**  
**Physicochemical Properties of Organic Chemicals of Potential Concern at MTL**  
**(Continued)**

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**TABLE 6-1 CHEMICALS NOT DETECTED IN SITE SOIL,  
PARK SOIL, SURFACE WATER AND RIVER SEDIMENTS**

Acrolein	Dinitroaniline, 3,5-
Acrylonitrile	Dinitrobenzene, 1,3-
Amino-4,6-dinitrotoluene, 2-	Dinitrophenol, 2,4-
Atrazine	Diphenylhydrazine, 1,2-
Benzoic acid	Dithiane
Bis (2-chloroethyl) ether	Endosulfan sulfate
Bis (2-chloroethoxy) methane	Endrin aldehyde
Bis (2-chloroisopropyl) ether	Endrin ketone
Bromacil	HMX
Bromodichloromethane	Hexachlorobenzene
Bromofluorobenzene, 4-	Hexachlorobutadiene
Bromoform	Hexachlorocyclopentadiene
Bromomethane	Hexachloroethane
Bromophenylphenyl ether, 4-	Hexanone, 2-
Carbon tetrachloride	Isophorone
Chloroaniline, 4-	Malathion
Chlorobenzene	Methyl-4,6,dinitrophenol, 2-
Chloroethane	Methyl-4-chlorophenol, 3-
Chloroethylvinyl ether, 2-	Methylisobutyl ketone
Chloroform	Methylene chloride
Chloromethane	Methylphenol, 2-
Chloronaphthalene, 2-	Methylphenol, 4-
Chlorophenol, 2-	Mirex
Chlorophenylmethyl sulfide, p-	Molybdenum
Chlorophenylmethyl sulfone, p-	N-Nitrosodi-N-propylamine
Chlorophenylmethyl sulfoxide, p-	N-Nitrosodimethylamine
Chlorophenylphenyl ether, 4-	Nitroaniline, 2-
Dibromochloromethane	Nitroaniline, 3-
Dibromochloropropane	Nitroaniline, 4-
Dibromoethane, 1,2-	Nitrobenzene
Dichlorobenzene, 1,3-	Nitrophenol, 2-
Dichlorobenzene, 1,4-	Nitrophenol, 4-
Dichlorobenzidine, 3,3'-	Nitrosodi-N-propylamine
Dichloroethane, 1,1-	Nitrotoluene, 2-
Dichloroethane, 1,2-	Nitrotoluene, 3-
Dichloroethenes, 1,2- (cis and trans)	Oxathiane, 1,4-
Dichloroethylene, 1,1-	PCB 1221
Dichlorophenol, 2,4-	PCB 1232
Dichloropropane, 1,2-	PCB 1242
Dichloropropane, 1,3-	PCB 1248
Dichloropropene, 1,3- trans	PCB 1254
Dichloropropylene, 1,3- cis	PCB 1262
Dicyclopentadiene	Parathion
Diethyl phthalate	Pentachlorophenol
Diisopropylmethyl phosphonate	Pentaerythritol tetranitrate
Dimethyl phthalate	Pentafluorophenol
Dimethylbenzene, 1,2- / o-Xylene	Phenol
Dimethylmethyl phosphate	Plutonium 238 isotope
Dimethylphenol, 2,4-	Plutonium 239 isotope
Dinitroaniline, 2,6-	RDX

**Table 6-1 - continued**

Selenium  
Styrene  
Supona  
Tetryl  
Tellurium  
Thallium  
Toxaphene  
Trichlorobenzene, 1,2,3-  
Trichlorobenzene, 1,2,4-  
Trichloro-1,2,2-trifluoroethane  
Trichloroethane, 1,1,1-  
Trichloroethane, 1,1,2-  
Trichlorophenol, 2,4,5-  
Trichlorophenol, 2,4,6-  
Trifluorochloromethane  
Trimethylbenzene, 1,3,5-  
Trinitrobenzene, 1,3,5-  
Trinitrophenol, 2,4,6-  
Trinitrotoluene, 2,4,6-  
Vapona  
Vinyl acetate  
Vinyl chloride

**TABLE 6-2 COMPARISON OF SITE-RELATED AND  
BACKGROUND SOIL SAMPLES**

Chemical	Site-related Soils, mg/kg		Background Soils, mg/kg		Retained as Chemical of Potential Concern?
	Geometric Mean	Maximum Hit	Geometric Mean	Maximum Hit	
Acenaphthene	8.1E-02	6.3E+00	4.4E-02	2.0E+00	YES
Acenaphthylene	7.1E-02	4.2E+00	4.8E-02	7.5E+00	NO
Alpha-Endosulfan	2.7E-03	3.3E-02	7.9E-04	2.0E-01	YES
Aluminum	1.1E+04	4.0E+04	1.5E+04	7.0E+04	NO
Anthracene	5.0E-01	1.5E+01	4.7E-01	6.2E+00	YES
Arsenic	5.5E+00	5.2E+01	3.8E+00	5.8E+01	NO
Barium	4.8E+01	3.0E+02	5.3E+01	1.8E+02	NO
Benzo (a) anthracene	3.7E-01	3.2E+01	8.3E-02	6.1E+00	YES
Benzo (a) pyrene	8.2E-01	3.7E+01	7.9E-01	6.9E+00	YES
Benzo (b) fluoranthene	5.2E-01	1.5E+01	3.2E-01	7.6E+00	YES
Benzo (g,h,i) perylene	3.9E-01	1.4E+01	2.1E-01	4.4E+00	YES
Benzo (k) fluoranthene	4.1E-01	2.4E+01	1.5E-01	6.3E+00	YES
Beryllium	4.7E-01	5.0E+00	6.2E-01	2.7E+00	YES
Beta-Endosulfan	2.4E-02	1.3E-01	1.1E-03	1.2E+00	YES
Bis (2-ethylhexyl) phthalate	2.6E-01	7.0E+00	3.0E-01	4.1E+00	NO
Cadmium (food, soil)	6.6E-01	1.3E+01	6.1E-01	2.2E+00	YES
Chlordane	1.8E-01	9.4E+00	5.8E-02	1.9E+00	YES
Chromium	2.2E+01	2.7E+02	2.6E+01	1.3E+02	YES
Chrysene	3.2E-01	3.4E+01	7.3E-02	9.2E+00	YES
Cobalt	9.4E+00	7.0E+02	1.1E+01	7.6E+01	YES
Cyanide	3.4E-01	2.1E+00	1.3E-01	4.0E-01	YES
DDD	1.1E-02	3.5E+00	2.1E-03	4.7E-02	YES
DDE	1.6E-02	6.3E+00	2.6E-03	2.5E-01	YES
DDT	3.8E-02	5.2E+00	4.0E-03	1.9E-01	YES
Dibenz (a,h) anthracene	2.1E-01	3.3E+00	1.9E-01	9.7E-01	YES
Dieldrin	1.0E-02	4.0E+00	2.5E-03	6.7E-02	YES
Endrin	2.1E-02	7.9E-01	5.9E-03	6.5E-01	YES
Fluoranthene	6.7E-01	5.4E+01	9.1E-02	6.2E+00	YES
Fluorene	9.7E-02	2.4E+00	5.7E-02	1.0E+00	YES
Heptachlor	3.2E-03	5.2E-02	1.4E-03	1.2E-01	YES
Heptachlor epoxide	7.2E-03	8.7E-01	1.4E-03	2.4E-01	YES
Indeno (1,2,3-cd) pyrene	1.1E+00	1.4E+01	1.5E+00	7.7E+00	YES
Lead	9.6E+01	7.2E+03	3.6E+01	5.0E+02	YES
Manganese	2.9E+02	1.3E+03	3.3E+02	2.6E+03	NO
Mercury	8.2E-02	4.5E+00	2.9E-02	1.2E-01	YES
Methylnaphthalene, 2-	5.0E-02	1.6E+00	2.5E-02	5.5E-01	NO
Nickel	2.1E+01	7.4E+02	1.8E+01	9.1E+01	YES
PCB 1260	5.9E-02	4.9E+00	3.6E-02	1.6E+00	YES
Phenanthrene	6.3E-01	1.7E+01	9.4E-02	1.3E+01	YES
Pyrene	9.3E-01	5.3E+01	1.7E-01	9.3E+00	YES
Tin	4.8E+00	5.3E+01	1.1E+01	4.2E+01	NO
Vanadium	3.7E+01	1.3E+02	4.1E+01	2.2E+02	NO

**TABLE 6-3 COMPARISON OF SITE-RELATED AND BACKGROUND SEDIMENT SAMPLES**

Chemical	Site-related Sediments, mg/kg		Background Sediments, mg/kg		Retained as Chemical of <u>Potential Concern?</u>
	Geometri c	Maximum Hit	Geometri c	Maximum Hit	
	Mean	Hit	Mean	Hit	
Acenaphthene	2.3E-01	4.0E+00	3.8E-02	4.5E-01	YES
Acenaphthylene	7.0E-01	6.2E+00	2.9E-01	1.6E+00	YES
Alpha-Endosulfan	4.5E-03	1.1E-01	1.4E-03	9.4E-02	YES
Aluminum	1.5E+04	2.7E+04	1.3E+04	2.4E+04	NO
Arsenic	1.7E+00	1.1E+01	2.0E+00	1.5E+01	NO
Barium	1.5E+02	4.2E+02	1.9E+02	3.0E+02	NO
Benzo (a) anthracene	2.5E+00	2.3E+01	1.6E+00	1.0E+01	YES
Benzo (a) pyrene	1.7E+00	2.1E+01	2.0E+00	1.7E+01	YES
Benzo (b) fluoranthene	2.9E+00	2.2E+01	2.8E+00	1.2E+01	YES
Benzo (g,h,i) perylene	6.3E-01	1.6E+01	2.1E-01	6.1E+00	YES
Benzo (k) fluoranthene	2.2E+00	1.5E+01	3.0E-01	3.3E+00	YES
Bis (2-ethylhexyl) phthalate	1.9E+00	4.8E+01	2.2E+00	2.0E+01	NO
Cadmium (food, soil)	3.4E+00	2.5E+01	4.3E+00	1.1E+01	YES
Chromium	7.5E+01	1.5E+02	6.9E+01	9.3E+01	NO
Chrysene	1.1E+00	2.2E+01	1.2E-01	2.8E+00	YES
Cobalt	9.0E+00	2.7E+01	8.9E+00	2.1E+01	YES
DDD	5.9E-02	6.2E-01	5.4E-02	2.5E-01	YES
DDE	5.4E-02	3.8E-01	4.2E-02	1.8E-01	YES
DDT	9.7E-02	7.0E-01	1.2E-02	3.1E-01	YES
Dieldrin	1.8E-02	4.8E-01	9.8E-03	1.9E+00	YES
Fluoranthene	3.4E+00	3.1E+01	5.3E+00	1.3E+01	YES
Fluorene	5.8E-01	4.3E+00	6.3E-02	8.9E-01	YES
Lead	3.0E+02	1.9E+03	4.3E+02	6.0E+02	YES
Manganese	4.1E+02	9.7E+02	5.8E+02	1.1E+03	NO
Mercury	4.1E-01	2.2E+00	6.8E-01	1.7E+00	YES
Methylnaphthalene, 2-	5.7E-02	8.2E-01	5.0E-02	5.3E-01	NO
Nickel	2.5E+01	5.5E+01	2.9E+01	3.9E+01	YES
Phenanthrene	3.3E+00	3.0E+01	4.5E+00	8.9E+00	YES
Pyrene	4.4E+00	5.8E+01	8.1E+00	2.2E+01	YES
Vanadium	5.1E+01	9.5E+01	4.8E+01	7.2E+01	NO

**TABLE 6-4 COMPARISON OF SITE-RELATED AND  
BACKGROUND SURFACE WATER SAMPLES**

Chemical	Site-related Surface Water, mg/L		Background Surface Water, mg/L		Retained as Chemical of <u>Potential Concern?</u>
	Geometri c	Maximum	Geometric	Maximum	
	Mean	Hit	Mean	Hit	
Aluminum	1.1E-01	4.1E-01	1.5E-01	2.5E-01	NO
Aluminum - Filtered	7.1E-02	1.7E-01	8.6E-02	1.6E-01	NO
Barium	3.0E-02	3.4E-02	2.7E-02	2.7E-02	NO
Barium - Filtered	2.5E-02	2.8E-02	3.5E-02	1.1E-01	NO
Bis (2-ethylhexyl) phthalate	4.9E-03	3.4E-02	6.7E-03	6.2E-02	NO
Gamma-Hexachlorocyclohexan e	9.2E-06	3.7E-06	1.9E-06	3.4E-06	YES
Isodrin	1.1E-05	4.8E-06	2.7E-06	6.1E-06	YES
Manganese	5.0E-02	8.5E-02	4.2E-02	5.4E-02	NO
Manganese - Filtered	3.0E-02	6.4E-02	4.1E-02	4.6E-02	NO

TABLE 6-5 CHEMICALS DETECTED INFREQUENTLY AT THE MTL SITE

Chemical	Frequency of Detection (hits/total) <sup>(a)</sup>		Maximum Detected Concentration			
	Soil <sup>(b)</sup>	Surface Water	Sediment	Soil, mg/kg	Surface Water, mg/L	Sediment, mg/kg
Alpha-Hexachlorocyclohexane	2/86	0/9	0/18	0.0347	-- <sup>(c)</sup>	--
Antimony	1/98	0/9	0/18	5.58	--	--
Benzyl alcohol	1/66	0/9	0/18	1.29	--	--
Beta-Hexachlorocyclohexane	1/81	0/9	0/18	0.0214	--	--
Butanone, 2-	1/59	0/9	0/18	0.018	--	--
Delta-Hexachlorocyclohexane	1/83	0/9	1/18	0.020	--	0.0433
Dichlorobenzene, 1,2-	0/80	0/9	1/18	--	--	0.821
Dinitrotoluene, 2,4-	1/75	0/9	0/18	6.2	--	--
Dinitrotoluene, 2,6-	1/75	0/9	0/18	8.15	--	--
Di-N-octyl phthalate	2/71	0/9	0/18	1.09	--	--
Ethylbenzene	1/73	1/9	0/18	0.535	0.0012	--
N-Nitrosodiphenylamine	1/66	0/9	0/18	10.8	--	--
PCB 1016	1/90	0/7	0/18	0.14	--	--
Tetrachloroethane, 1,1,2,2-	2/73	0/9	0/18	0.391	--	--

(a) Total = The number of unique sampling locations.

(b) Soil includes site soils and park soil.

(c) -- = chemical not detected in this medium.

**TABLE 6-6 CHEMICALS EVALUATED AS BENEFICIAL NUTRIENTS**

<u>Chemical Name</u>	<u>Soil Conc., mg/kg<sup>(a)</sup></u>	<u>Soil Daily Intake, mg/day<sup>(b)</sup></u>	<u>MDI, mg/day<sup>(c)</sup></u>	<u>Total Daily Intake, mg/day</u>	<u>RDA, mg/day<sup>(d)</sup></u>	<u>DI &gt; RDA?</u>
Calcium	16,700	2.0	--	2.0	1,200	NO
Copper	2,150	0.2	0.031	0.3	3 <sup>(e)</sup>	NO
Iron	130,000	15.6	--	15.6	30	NO
Magnesium	14,900	1.8	--	1.8	400	NO
Manganese	1,340	0.16	0.054	0.2	5 <sup>(e)</sup>	NO
Potassium	9,020	1.1	--	1.1	2,000 <sup>(f)</sup>	NO
Sodium	2,690	0.32	--	0.32	500 <sup>(f)</sup>	NO
Zinc	1,200	0.14	0.41	0.55	19	NO

(a) Maximum Detected value; all depths.

(b) Assumed ingestion of 120 mg (1.2E-04 kg) soil/day. This is the time-weighted average recommended by EPA which includes six years as a child ingesting soil at a 200 mg/day rate and

24 years as an adult ingesting soil at a 100 mg/day rate.

(c) Mean Daily Intake of food and water.

(d) Recommended Dietary Allowance (NAS, 1989).

(e) Estimated safe and adequate daily dietary intake for adults.

(f) Minimum requirement for healthy person.

**TABLE 6-7 CHEMICALS OF POTENTIAL CONCERN AT THE MTL SITE**

Acenaphthene	Dimethylbenzene, 1,3-/m-Xylene
Acenaphthylene	Endrin
Acetone	Fluoranthene
Aldrin	Fluorene
Alpha-Chlordane	Gamma-Chlordane
Alpha-Endosulfan	Gamma-BHC
Anthracene	Heptachlor
Benzene	Heptachlor epoxide
Benzo(a)anthracene	Indeno (1,2,3-cd) pyrene
Benzo(a)pyrene	Isodrin
Benzo(b)fluoranthene	Lead
Benzo(g,h,i)perylene	Mercury
Benzo(k)fluoranthene	Methoxychlor
Beryllium	Naphthalene
Beta-Endosulfan	Nickel
Boron	Nitrite, nitrate
Butylbenzyl phthalate	PCB 1260
Cadmium	Phenanthrene
Cesium 137	Pyrene
Chlordane	Silver
Chromium	Sulfide
Chrysene	Tetrachloroethene
Cobalt	Tetrazene
Cyanide	Thorium 232
DDD	Toluene
DDE	Trichloroethylene
DDT	Uranium
Di-n-butyl phthalate	Uranium 234
Dibenz(a,h)anthracene	Uranium 235
Dibenzofuran	Uranium 238
Dieldrin	Xylenes

**TABLE 6-8 POTENTIALLY COMPLETE EXPOSURE PATHWAY  
SUMMARY OFF-SITE LAND AND RIVER USES**

<u>Potentially Exposed Population</u>	<u>Exposure Route, Medium and Exposure Point</u>	<u>Pathway Selected for Quantitative Evaluation?</u>	<u>Reason for Selection or Population Exclusion</u>
Sport fishing, yachting population	Inhalation of VOCs from the Charles River	No	Unable to quantify reasonably; exposure potential likely to be very low.
Sport anglers and families	Consumption of fish	Yes	Fish bioconcentrate certain chemicals, pass them up food chain. Class B waters are fish habitat.
Children/Adults	Ingestion of Charles River water or sediment while swimming	Yes	Class B waters suitable for swimming. No barriers prevent entry to water.
Children/Adults	Dermal contact with Charles River water or sediment while swimming	Yes	Class B waters suitable for swimming. No barriers prevent entry to water.
Children/Adults	Ingestion of park surface soil	Yes	Ingestion during recreational activities is likely.
Children/Adults	Dermal contact with park surface soil	Yes	Populations can be exposed during recreational activities.
Children/Adults	Exposure to external radiation from radionuclides in park surface soil	Yes	Exposure during recreational activities is likely.

**TABLE 6-9 POTENTIALLY COMPLETE EXPOSURE PATHWAY  
SUMMARY ON-SITE LAND USES**

<u>Potentially Exposed Population</u>	<u>Exposure Route, Medium and Exposure Point</u>	<u>Pathway Selected for Quantitative Evaluation?</u>	<u>Reason for Selection or Population Exclusion</u>
Residents	Ingestion of site surface or subsurface soil	Yes	- Adults and children may be exposed during residential-type activities.
Residents	Exposure to external radiation from radio-nuclides in site surface or subsurface soil	Yes	Adults and children may be exposed during residential-type activities.
Residents	Inhalation of VOCs from site surface or subsurface soil	No	Very low source concentration.
Residents	Dermal contact with site surface or subsurface soil	Yes	Adults and children may be exposed during gardening or play activities.
Residents	Consumption of garden vegetables	Yes	Garden presently exists on site and additional areas suitable for this use.
Residents	Inhalation of particulates	No	Releases of fugitive dust not likely under current conditions. Worker likely to be more exposed during potential new construction.
Construction Worker	Ingestion and inhalation of soil and dust during new construction	Yes	Although potential is low because of short exposure duration, pathway will be quantified.
Construction Worker	Dermal contact with soil during new construction	No	Not likely to be significant because of protective clothing.
Construction Worker	Dermal exposure to groundwater during new construction	No	A screening calculation indicates that risk is insignificant.

Table 6-9 - continued

<u>Potentially Exposed Population</u>	<u>Exposure Route, Medium and Exposure Point</u>	<u>Pathway Selected for Quantitative Evaluation?</u>	<u>Reason for Selection or Population Exclusion</u>
Construction Worker	Exposure to external radiation from soils during new construction	Yes	- Although potential for exposure is low, pathway will be quantified.
Commercial Worker	Ingestion of soil at workplace	Yes	Some soil is ingested daily. Although exposure is low, pathway will be quantified.
Building Occupants	Contact with interior building surfaces	No	Potential for exposure exists, but methodology for quantification unacceptably uncertain.

**TABLE 6-10 SUMMARY OF EXPOSURE PROFILES**

<u>No.</u>	<u>Potentially Exposed Population</u>	<u>Exposure Point</u>	<u>Exposure Medium</u>	<u>Exposure Route</u>	<u>Exposure Parameters</u>			
1	Resident (Adult & Child)	Zone 1	Soil	Ingestion Dermal External	Continual residence on site for a 30-year period or during the years of childhood			
		Zone 4 Open Area	Vegetables	Ingestion				
			Soil	Ingestion Dermal External				
		River Park	Soil	Ingestion Dermal External				
		Charles River	Surface water	Ingestion Dermal				
			Sediment	Ingestion Dermal				
			Fish	Ingestion				
		2	Resident (Adult & Child)	Zone 2 or 3		Soil	Ingestion Dermal External	Continual residence on site for a 30-year period or during the years of childhood
				River Park		Soil	Ingestion Dermal External	
				Charles River		Surface water	Ingestion Dermal	
Sediment	Ingestion Dermal							
Fish	Ingestion							
Zone 4 Open Area	Soil			Ingestion Dermal External				
3	Resident (Adult & Child)			Zone 4	Soil	Ingestion Dermal External	Continual residence on site for a 30-year period or during the years of childhood	
		River Park	Vegetables	Ingestion				
			Soil	Ingestion Dermal External				
		Charles River	Surface water	Ingestion Dermal				
			Sediment	Ingestion Dermal				
			Fish	Ingestion				

**Table 6-10 - continued**

<u>No.</u>	<u>Potentially Exposed Population</u>	<u>Exposure Point</u>	<u>Exposure Medium</u>	<u>Exposure Route</u>	<u>Exposure Parameters</u>
4	Zone 4 Visitor	Zone 4	Soil	Ingestion Dermal External	Recreational exposures by either on-site or off-site residents
5	Construction Worker	Zone 1 or 4	Soil Particulates	Ingestion External Inhalation	One-year exposure during new building construction
6	Commercial Worker	Zone 1, 2 or 3	Soil	Ingestion External	Continual exposure at work during a 25-year period
7	River Park Visitor	River Park	Soil	Ingestion Dermal External	Recreational exposures by either on-site or off-site residents
		Charles River	Surface water	Ingestion Dermal	
			Sediment	Ingestion Dermal	
			Fish	Ingestion	

**TABLE 6-11 SUMMARY OF SAMPLES USED IN EXPOSURE POINT  
CONCENTRATION CALCULATIONS**

<u>Exposure Point</u>	<u>Exposure Medium</u>	<u>Samples</u>
Zone 1	Soil (0-2 ft)	GRSB-1, 01SB-1, 04SB-1, 04SS-1, 01SOL01
Zone 1	Soil (0-12 ft)	All 0-2 ft Zone 1 soil samples listed above plus sample 01SB-2
Zone 2	Soil (0-2 ft)	MW-01, MW-02, MW-03, MW-14, GRSB-2, GRSB-5 through GRSB-8, GRSB-12, GRSB-13, 05SB-1, 05SB-2, 06SB-1, 06SB-2, 06SB-4, 06SB-5, 07SB-1, 10SB-1, 10SB-2, 12SB-1, 12SB-3, 14SB-1, 02SS-2, 02SS-3, 03SS-1, 03SS-2, 05SS-1, 05SS-2, 06SS-1, 06SS-2, 06SS-3, 06SS-4, 08SS-1, 13SS-1, 13SS-2, 14SS-1, 14SS-2, 14SS-3, 03SOL01, 06SOL01, 06SUB01, 12SUB01, 14SUB01, 14SUB02
Zone 3	Soil (0-2 ft)	C-02, GRSB-9, GRSB-10, GRSB-15, GRSB-17, 09SB-1, 11SB-2, 11SB-3, 11SB-4, 09SS-1, 09SS-2, 09SOL01, 09SOL02, 13SOL01
Zone 4	Soil (0-2 ft)	C-03, MW-05, GRSB-21, 13SB-1, 13SB-2, 15SB-1, 15SB-2, 13SS-3, 13SS-5, 13SS-6, 13SS-7, 13SS-8, 16SS-1, 16SS-2, 15SOL01, 15SOL02
Zone 4	Soil (0-12 ft)	All 0-2 ft Zone 4 soil samples listed above plus the following additional samples: MW-06, MW-07, MW-11, GRSB-24, 13SB-3
Charles River	Surface Water Sediment	SW-6, SW-7, SW-8, SW-9-1D SD-6, SD-7, SD-8, SD-9
Charles River	Fish	SW-6, SW-7, SW-8, SW-9-1D, SW-11, SW-13, SW-15, SW-16, SW-17

Table 6-11 - continued

<u>Exposure Point</u>	<u>Exposure Medium</u>	<u>Samples</u>
River Park	Soil (0-2 ft)	17SB-1, 17SB-2, 17SB-3, GRSB-19, GRSB-22, GRSB-23, 17SOL01, 17SOL02, 17SUB01, 17SUB02, 17SUB03

**TABLE 6-12 HIF CALCULATIONS FOR INCIDENTAL INGESTION OF SOIL BY FUTURE SITE RESIDENTS**

Time-Weighted Equation for Residential Indoor/Outdoor Soil Ingestion

$$\text{HIF} = \frac{\left[ \left[ \left( \text{IR}_1 \times \text{CF} \times \text{EF}_1 \right) + \left( \text{IR}_3 \times \text{CF} \times \text{EF}_2 \right) \right] \times \text{ED}_1 / \text{BW}_1 \right] + \left[ \left( \text{IR}_2 \times \text{CF} \times \text{EF}_1 \times \text{ED}_2 \right) / \text{BW}_2 \right] \right] / \text{AT}$$

Symbol <sup>(a)</sup>	Units	Child		Adult
		Subchronic (Age 1-2 yrs)	Chronic (Age 1-8 yrs)	Lifetime (Age 0-30 yrs)
IR <sub>1</sub> (Outdoors, young child)	mg/day	100	100	100
IR <sub>2</sub> (Outdoors, older child, adult)	mg/day	NA <sup>(b)</sup>	50	50
IR <sub>3</sub> (Indoors, young child)	mg/day	8.8	24	24
CF	kg/mg	1E-06	1E-06	1E-06
FI	unitless	1.0	1.0	1.0
EF <sub>1</sub> (Outdoor)	days/yr	153	153	153
EF <sub>2</sub> (Indoor)	days/yr	212	212	212
ED <sub>1</sub>	yr	1	5	5
ED <sub>2</sub>	yr	NA	2	25
BW <sub>1</sub>	kg	10.5	14.6	14.6
BW <sub>2</sub>	kg	NA	22.3	50.8
AT	yr (days)	1 (365)	7 (2,555)	70 (25,550)
HIF	(day <sup>-1</sup> )	4.5E-06 <sup>(c)</sup>	3.0E-06	4.2E-07

(a) Symbols: IR = Ingestion Rate; CF = Conversion Factor; FI = Fraction Ingested From

Contaminated Source; EF = Exposure Frequency; ED = Exposure Duration; BW = Body Weight; AT = Averaging Time; HIF = Human Intake Factor. The subscripts "1" and "2" in the HIF equation indicate the exposure factor assumed for a certain time period.

(b) NA = Not Applicable.

(c) These numbers are in scientific notation - a method for expressing very small or very large numbers. In this case 4.5E-06 is equal to 4.5 x 10<sup>-6</sup> or 0.0000045. This method will be used for expressing risk numbers throughout the risk assessment.

**TABLE 6-13 HIF CALCULATIONS FOR DERMAL EXPOSURE TO SOIL BY FUTURE SITE RESIDENTS**

$$\text{Basic HIF Equation: HIF} = \frac{\text{SA}_1 \times \text{CF} \times \text{AF} \times \text{EF} \times \text{ED}_1 \times \text{ABS}}{\text{BW}_1 \times \text{AT}}$$

Time-Weighted HIF Equation: HIF =

$$\frac{[(\text{SA}_1 \times \text{EF} \times \text{ED}_1 / \text{BW}_1) + (\text{SA}_2 \times \text{EF} \times \text{ED}_2 / \text{BW}_2)] \times \text{AF} \times \text{CF} \times \text{ABS}}{\text{AT}}$$

<u>Symbol<sup>(a)</sup></u>	<u>Units</u>	<u>Child</u>		<u>Adult</u>
		<u>Subchronic</u> <u>(Age 1-2 yrs)</u>	<u>Chronic</u> <u>(Age 1-8 yrs)</u>	<u>Lifetime</u> <u>(Age 0-30 yrs)</u>
SA <sub>1</sub>	cm <sup>2</sup> /event	2,500	3,700	3,700
SA <sub>2</sub>	cm <sup>2</sup> /event	NA <sup>(b)</sup>	NA	5,500
CF	kg/mg	1E-06	1E-06	1E-06
AF	mg/cm <sup>2</sup>	0.51	0.51	0.51
EF	days/yr	109	109	109
ED <sub>1</sub>	yr	0.54 <sup>(c)</sup>	7	7
ED <sub>2</sub>	yr	NA	NA	23
BW <sub>1</sub>	kg	10.5	16.8	16.8
BW <sub>2</sub>	kg	NA	NA	50.8
AT	yr (days)	0.54 (197)	7 (2,555)	70 (25,550)
HIF <sup>(d)</sup>	(day <sup>-1</sup> )	3.6E-05 ABS	3.4E-05 ABS	8.8E-06 ABS

(a) Symbols: SA = Surface Area; CF = Conversion Factor; AF = Adherence Factor; EF = Exposure Frequency; ED = Exposure Duration; BW = Body Weight; AT = Averaging Time; HIF = Human Intake Factor; ABS = Chemical-Specific Absorption Term. The subscripts "1" and "2" in the HIF equation indicate the exposure factor assumed for a certain time period.

(b) NA = Not Applicable for this exposure scenario.

(c) The 28 weeks of reasonably good weather (see text for further discussion).

(d) HIF must be further multiplied by the chemical-specific absorption (ABS) term.

**TABLE 6-14 HIF CALCULATIONS FOR INCIDENTAL INGESTION  
OF SOIL BY FUTURE WORKERS**

$$\text{Basic HIF Equation: HIF} = \frac{\text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

<u>Symbol*</u>	<u>Units</u>	<u>Construction Worker</u>		<u>Commercial Worker</u>	
		<u>Subchronic</u>	<u>Lifetime</u>	<u>Chronic</u>	<u>Lifetime</u>
IR	mg/day	480	480	50	50
CF	kg/mg	1E-06	1E-06	1E-06	1E-06
FI	unitless	1.0	1.0	1.0	1.0
EF	days/yr	18	18	250	250
ED	yr	1	1	25	25
BW	kg	70	70	70	70
AT	yr (days)	1 (365)	70 (25,550)	25 (9,125)	70 (25,550)
HIF	(day <sup>-1</sup> )	3.4E-07	4.8E-09	4.9E-07	1.7E-07

\* Symbols: IR = Ingestion Rate; CF = Conversion Factor; FI = Fraction Ingested From Contaminated Source; EF = Exposure Frequency; ED = Exposure Duration; BW = Body Weight; AT = Averaging Time; HIF = Human Intake Factor.

**TABLE 6-15 HIF CALCULATIONS FOR INCIDENTAL  
INGESTION OF SOIL BY VISITORS**

Basic HIF Equation:  $HIF = \frac{IR_1 \times CF \times FI \times EF \times ED_1}{BW_1 \times AT}$

Time-Weighted HIF Equation:<sup>(a)</sup>  $HIF =$

$$\frac{[(IR_1 \times EF \times ED_1 / BW_1) + (IR_2 \times EF \times ED_2 / BW_2)] \times FI \times CF}{AT}$$

Symbol <sup>(b)</sup>	Units	Park Visitors			Zone 4 Visitors		
		Child		Adult	Child		Adult
		Subchronic (Age 1-2 yrs)	Chronic (Age 1-8 yrs)	Lifetime (Age 0-30 yrs)	Subchronic (Age 1-2 yrs)	Chronic (Age 1-8 yrs)	Lifetime (Age 0-30 yrs)
IR <sub>1</sub>	mg/day	100	100	100	100	100	100
IR <sub>2</sub>	mg/day	NA <sup>(c)</sup>	50	50	NA	50	50
CF	kg/mg	1E-06	1E-06	1E-06	1E-06	1E-06	1E-06
FI	unitless	1.0	1.0	1.0	1.0	1.0	1.0
EF	days/yr	28	28	28	56	56	56
ED <sub>1</sub>	yr	0.54	5	5	0.54	5	5
ED <sub>2</sub>	yr	NA	2	25	NA	2	25
BW <sub>1</sub>	kg	10.5	14.6	14.6	10.5	14.6	14.6
BW <sub>2</sub>	kg	NA	22.3	50.8	NA	22.3	50.8
AT	yr (days)	0.54 (197)	7 (2,555)	70 (25,550)	0.54 (197)	7 (2,555)	70 (25,550)
HIF	(day <sup>-1</sup> )	7.0E-07	4.2E-07	6.4E-08	1.5E-06	8.5E-07	1.3E-07

(a) Equation for the chronic child and adult.

(b) Symbols: SA = Surface Area; CF = Conversion Factor; FI = Fraction Ingested From Contaminated Source; ET = Exposure Time; EF = Exposure Frequency; ED = Exposure Duration; BW = Body Weight; AT = Averaging Time; HIF = Human Intake Factor.

(c) NA = Not applicable.

**TABLE 6-16 HIF CALCULATIONS FOR DERMAL EXPOSURE TO SOIL BY VISITORS**

Basic HIF Equation:  $HIF = \frac{SA_1 \times CF \times AF \times EF \times ED_1 \times ABS}{BW_1 \times AT}$

Time-Weighted HIF Equation:  $HIF =$

$$\frac{\left[ \left( \frac{SA_1 \times ED_1}{BW_1} \right) + \left( \frac{SA_2 \times ED_2}{BW_2} \right) \right] CF \times AF \times EF \times ABS}{AT}$$

Symbol <sup>(a)</sup>	Units	Park Visitors			Zone 4 Visitors		
		Child	Adult	Child	Adult	Child	Adult
		Subchronic (Age 1-2 yrs)	Chronic (Age 1-8 yrs)	Lifetime (Age 0-30 yrs)	Subchronic (Age 1-2 yrs)	Chronic (Age 1-8 yrs)	Lifetime (Age 0-30 yrs)
SA <sub>1</sub>	cm <sup>2</sup> /event	2,500	3,700	3,700	2,500	3,700	3,700
SA <sub>2</sub>	cm <sup>2</sup> /event	NA <sup>(b)</sup>	3,700	5,500	NA	3,700	5,500
CF	kg/mg	1E-06	1E-06	1E-06	1E-06	1E-06	1E-06
AF	mg/cm <sup>2</sup>	0.51	0.51	0.51	0.51	0.51	0.51
EF	events/yr	28	28	28	56	56	56
ED <sub>1</sub>	yr	0.54	7	7	0.54	7	7
ED <sub>2</sub>	yr	NA	7	23	NA	7	23
BW <sub>1</sub>	kg	10.5	16.8	16.8	10.5	16.8	16.8
BW <sub>2</sub>	kg	NA	16.8	50.8	NA	16.8	50.8
AT	yr (days)	0.54 (197)	7 (2,555)	70 (25,550)	0.54 (197)	7 (2,555)	70 (25,550)

(a) Symbols: SA = Surface Area; CF = Conversion Factor; AF = Adherence Factor; EF = Exposure Frequency; ED = Exposure Duration; BW = Body Weight; AT = Averaging Time; HIF = Human Intake Factor; ABS = Chemical-Specific Absorption Term.

(b) NA = Not applicable.

HIF<sup>(a)</sup> (day<sup>-1</sup>) 9.3E-06 ABS 8.6E-06 ABS 2.3E-06 ABS 1.9E-05 ABS 1.7E-05 ABS 4.5E-06 ABS

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(a) The HIF term must be further multiplied by the chemical-specific absorption (ABS) term.

**TABLE 6-17 HIF CALCULATIONS FOR INGESTION OF  
SURFACE WATER - SWIMMER**

Basic HIF Equation:  $HIF = \frac{IR \times ET \times EF \times ED}{BW \times AT}$

Symbol*	Units	Child		Adult
		Subchronic (Age 1-2 yrs)	Chronic (Age 1-8 yrs)	Lifetime (Age 0-30 yrs)
IR	L/hour	0.05	0.05	0.05
ET	hours/event	0.5	0.5	0.5
EF	events/yr	7	7	7
ED	yr	0.54	7	30
BW	kg	10.5	16.8	42.3
AT	yr(days)	0.54 (197)	7 (2,555)	70 (25,550)
HIF	L/kg-day	4.6E-05	2.9E-05	4.9E-06

\* Symbols: IR = Ingestion Rate; ET = Exposure Time; EF = Exposure Frequency;  
ED = Exposure Duration; BW = Body Weight; AT = Averaging Time; HIF =  
Human Intake Factor.

**TABLE 6-18 HIF CALCULATIONS FOR DERMAL CONTACT WITH SURFACE WATER - SWIMMER**

Basic HIF Equation:  $HIF = \frac{SA_1 \times K_p \times CF \times ET \times EF \times ED}{BW_1 \times AT}$

Time-Weighted HIF Equation:  $HIF =$

$$\frac{\left[ \left( \frac{SA_1 \times ED_1}{BW_1} \right) + \left( \frac{SA_2 \times ED_2}{BW_2} \right) \right] CF \times ET \times EF \times K_p}{AT}$$

Symbol <sup>(a)</sup>	Units	Child		Adult
		Subchronic (Age 1-2 yrs)	Chronic (Age 1-8 yrs)	Lifetime (Age 0-30 yrs)
SA <sub>1</sub>	cm <sup>2</sup>	5,130	7,120	7,120
SA <sub>2</sub>	cm <sup>2</sup>	NA <sup>(b)</sup>	NA	18,200
CF	L/cm <sup>3</sup>	1 x 10 <sup>-3</sup>	1 x 10 <sup>-3</sup>	1 x 10 <sup>-3</sup>
ET	hr/event	0.5	0.5	0.5
EF	events/y r	7	7	7
ED <sub>1</sub>	yr	0.54	7	7
ED <sub>2</sub>	yr	NA	NA	23
BW <sub>1</sub>	kg	23	16.8	16.8
BW <sub>2</sub>	kg	NA	NA	50.8
AT	yr (days)	0.54 (197)	7 (2,555)	70 (25,550)

(a) Symbols: SA = Surface Area; K<sub>p</sub> = Permeability Constant; CF = Conversion Factor;

ET = Exposure Time; EF = Exposure Frequency; ED = Exposure Duration; BW = Body Weight; AT = Averaging Time; HIF = Human Intake Factor.

(b) NA = Not applicable.

HIF<sup>(a)</sup>      L/kg-day    4.7E-03 K<sub>p</sub>    4.1E-03 K<sub>p</sub>    1.5E-03 K<sub>p</sub>

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(a) The HIF term must be further multiplied by the chemical-specific permeability constant (K<sub>p</sub>) (cm/hr).

**TABLE 6-19 HIF CALCULATIONS FOR INCIDENTAL  
INGESTION OF RIVER SEDIMENTS (SWIMMING)**

$$\text{Basic HIF Equation: HIF} = \frac{\text{IR} \times \text{CF} \times \text{FI} \times \text{EF} \times \text{ED}}{\text{BW} \times \text{AT}}$$

<u>Symbol*</u>	<u>Units</u>	<u>Child</u>		<u>Adult</u>
		<u>Subchronic</u> <u>(Age 1-2 yrs)</u>	<u>Chronic</u> <u>(Age 1-8 yrs)</u>	<u>Lifetime</u> <u>(Age 0-30 yrs)</u>
IR	mg/event	50	50	50
CF	kg/mg	1E-06	1E-06	1E-06
FI	unitless	1.0	1.0	1.0
EF	events/yr	7	7	7
ED	yr	0.54	7	30
BW	kg	10.5	16.8	42.3
AT	yr (days)	0.54 (197)	7 (2,555)	70 (25,550)
HIF	(day <sup>-1</sup> )	9.1E-08	5.7E-08	9.7E-09

\* Symbols: IR = Ingestion Rate; CF = Conversion Factor; FI = Fraction Ingested From Contaminated Source; EF = Exposure Frequency; ED = Exposure Duration; BW = Body Weight; AT = Averaging Time; HIF = Human Intake Factor.

**TABLE 6-20 HIF CALCULATIONS FOR DERMAL EXPOSURE TO RIVER SEDIMENTS (SWIMMER)**

$$\text{Basic HIF Equation: HIF} = \frac{\text{SA}_1 \times \text{CF} \times \text{AF} \times \text{EF} \times \text{ED}_1 \times \text{ABS}}{\text{BW}_1 \times \text{AT}}$$

Time-Weighted HIF Equation: HIF =

$$\frac{\left[ \left( \frac{\text{SA}_1 \times \text{ED}_1}{\text{BW}_1} \right) + \left( \frac{\text{SA}_2 \times \text{ED}_2}{\text{BW}_2} \right) \right] \text{CF} \times \text{EF} \times \text{ABS}}{\text{AT}}$$

Symbol <sup>(a)</sup>	Units	Child		Adult
		Subchronic (Age 1-2 yrs)	Chronic (Age 1-8 yrs)	Lifetime (Age 0-30 yrs)
SA <sub>1</sub>	cm <sup>2</sup> /event	2,500	3,700	3,700
SA <sub>2</sub>	cm <sup>2</sup> /event	NA <sup>(b)</sup>	NA	5,500
CF	kg/mg	1E-06	1E-06	1E-06
AF	mg/cm <sup>2</sup>	0.51	0.51	0.51
EF	days/yr	7	7	7
ED <sub>1</sub>	yr	0.54	7	7
ED <sub>2</sub>	yr	NA	NA	23
BW <sub>1</sub>	kg	10.5	16.8	16.8
BW <sub>2</sub>	kg	NA	NA	50.8
AT	yr (days)	0.54 (197)	7 (2,555)	70 (25,550)
HIF <sup>(c)</sup>	(day <sup>-1</sup> )	2.3E-06 ABS	2.2E-06 ABS	5.6E-07 ABS

(a) Symbols: SA = Surface Area; CF = Conversion Factor; AF = Adherence Factor; EF = Exposure Frequency; ED = Exposure Duration; BW = Body Weight; AT = Averaging Time; HIF = Human Intake Factor; ABS = Chemical-Specific Absorption Term.

(b) NA = Not applicable.

(c) HIF must be further multiplied by the chemical-specific absorption (ABS) term.

**TABLE 6-21 HIF CALCULATIONS FOR CONSUMPTION OF CATCHES  
FROM RECREATIONAL FISHING**

Basic HIF Equation:<sup>(a)</sup>  $HIF = \frac{IR_1 \times EF \times ED_1}{BW_1 \times AT}$

Time-Weighted HIF Equation:<sup>(b)</sup>  $HIF =$

$$\frac{[(IR_1 \times EF \times ED_1 / BW_1) + (IR_2 \times EF \times ED_2 / BW_2)]}{AT}$$

<u>Symbol<sup>(c)</sup></u>	<u>Units</u>	<u>Child, Chronic (Age 1-8 yrs)</u>	<u>Adult, Lifetime (Age 0-30 yrs)</u>
IR <sub>1</sub>	kg/event	0.114	0.114
IR <sub>2</sub>	kg/event	NA <sup>(d)</sup>	0.227
EF	events/yr	10	10
ED <sub>1</sub>	yr	7	7
ED <sub>2</sub>	yr	NA	23
BW <sub>1</sub>	kg	16.8	16.8
BW <sub>2</sub>	kg	NA	50.8
AT	yr (days)	7 (2,555)	70 (25550)
HIF	day <sup>-1</sup>	1.9E-04	5.9E-05

(a) Equation for the child.

(b) Equation for the adult.

(c) Symbols: IR = Ingestion Rate; EF = Exposure Frequency; ED = Exposure Duration;

BW = Body Weight; AT = Averaging Time; HIF = Human Intake Factor.

(d) NA = Not applicable.

**TABLE 6-22 HIF CALCULATIONS FOR CONSUMPTION OF HOME-GROWN GARDEN VEGETABLES BY FUTURE SITE RESIDENTS**

Basic HIF Equation: 
$$\text{HIF} = \frac{\text{IR} \times \text{EF} \times \text{ED}_1}{\text{BW}_1 \times \text{AT}}$$

Time-Weighted HIF Equation: 
$$\text{HIF} =$$

$$\frac{[(\text{IR}_1 \times \text{EF} \times \text{ED}_1 / \text{BW}_1) + (\text{IR}_2 \times \text{EF} \times \text{ED}_2 / \text{BW}_2)]}{\text{AT}}$$

Symbol <sup>(a)</sup>	Units	Child		Adult
		Subchronic (Age 1-2 yrs)	Chronic (Age 1-8 yrs)	Lifetime (Age 0-30 yrs)
IR <sub>1</sub>	kg/day	0.0085	0.0116	0.0116
IR <sub>2</sub>	kg/day	NA <sup>(b)</sup>	NA	0.016
EF	day/yr	350	350	350
ED <sub>1</sub>	yr	1	7	7
ED <sub>2</sub>	yr	NA	NA	23
BW <sub>1</sub>	kg	10.5	16.8	16.8
BW <sub>2</sub>	kg	NA	NA	50.8
AT	yr (days)	1 (365)	7 (2,555)	70 (25,550)
HIF	day <sup>-1</sup>	7.8E-04	6.6E-04	1.7E-04

(a) Symbols: IR = Ingestion Rate; EF = Exposure Frequency; ED = Exposure Duration;

BW = Body Weight; AT = Averaging Time; HIF = Human Intake Factor.

(b) NA = Not Applicable for this exposure scenario.

**TABLE 6-23 HIF CALCULATIONS FOR INHALATION OF DUST  
BY FUTURE CONSTRUCTION WORKERS**

Basic HIF Equation:  $HIF = \frac{IR \times EF \times ED}{BW \times AT}$

<u>Symbol*</u>	<u>Units</u>	<u>Adult</u>	
		<u>Subchronic</u>	<u>Lifetime</u>
IR	m <sup>3</sup> /day	20	20
EF	days/yr	18	18
ED	yr	1	1
BW	kg	70	70
AT	yr (days)	1 (365)	70 (25,550)
HIF	m <sup>3</sup> /kg-day	1.4E-02	2.0E-04

\* Symbols: IR = Ingestion Rate; EF = Exposure Frequency; ED = Exposure Duration; BW = Body Weight; AT = Averaging Time; HIF = Human Intake Factor.

TABLE 6-24 SUMMARY OF HUMAN INTAKE FACTOR CALCULATIONS

Exposed Population	Exposure Point	Exposure Medium	Exposure Route	Human Intake Factor <sup>(a)</sup>		
				HIF <sub>S</sub>	HIF <sub>C</sub>	HIF <sub>L</sub>
Site residents Adult Child	Zone 1 - 4	Soil	Ingestion	-- <sup>(b)</sup>	--	4.2E-07
				4.5E-06	3.0E-06	--
Site Residents Adult Child	Zone 1 - 4	Soil	Dermal	--	--	8.8E-06 ABS
				3.6E-05 ABS	3.4E-05 ABS	--
Site Residents Adult Child	Zone 1 - 4	Vegetable	Ingestion	--	--	1.7E-04
				7.8E-04	6.6E-04	--
Recreational anglers and families Adult Child	Charles River	Fish	Ingestion	--	--	--
				--	1.9E-04	5.9E-05
Child Swimmer	Charles River	Water	Ingestion	4.6E-05	2.9E-05	--
		Water	Dermal	4.7E-03 K <sub>p</sub>	4.1E-03 K <sub>p</sub>	--
		Sediment	Ingestion	9.1E-08	5.7E-08	--
		Sediment	Dermal	2.3E-06	2.2E-06 ABS	--

(a) HIF<sub>S</sub> = Subchronic HIF; HIF<sub>C</sub> = Chronic HIF; HIF<sub>L</sub> = Lifetime HIF.  
 (b) "--" = Not Evaluated.

Table 6-24 - continued

<u>Exposed Population</u>	<u>Exposure Point</u>	<u>Exposure Medium</u>	<u>Exposure Route</u>	<u>Human Intake Factor</u>			
				<u>HIF<sub>S</sub></u>	<u>HIF<sub>C</sub></u>	<u>HIF<sub>L</sub></u>	
Adult Swimmer	Charles River	Water	Ingestion	--	--	4.9E-06	
		Water	Dermal	--	--	1.5E-03 K <sub>p</sub>	
		Sediment	Ingestion	--	--	9.7E-09	
		Sediment	Dermal	--	--	5.6E-07 ABS	
Child Visitor	River Park	Soil	Ingestion	7.0E-07	4.2E-07	--	
			Dermal	9.3E-06 ABS	8.6E-06 ABS	--	
Adult Visitor	River Park	Soil	Ingestion	--	--	6.4E-08	
			Dermal	--	--	2.3E-06 ABS	
Child Visitor	Zone 4	Soil	Ingestion	1.5E-06	8.5E-07	--	
			Dermal	1.9E-05 ABS	1.7E-05 ABS	--	
Adult Visitor	Zone 4	Soil	Ingestion	--	--	1.3E-07	
			Dermal	--	--	4.5E-06 ABS	
Construction Worker	Site construction area, Zone 1 or 4	Soil	Ingestion	3.4E-07	--	4.8E-09	
		Air	Inhalation	1.4E-02	--	2.0E-04	
Commercial Worker	Zone 1 - 3	Soil	Ingestion	--	4.9E-07	1.7E-07	

**TABLE 6-25 SUMMARY OF HIF VALUES USED IN  
RADIOLOGICAL RISK CHARACTERIZATION**

<u>Receptor</u>	<u>Pathway</u>	<u>HIF*</u>
Adult Resident	Soil Ingestion	2.9E+02
	Vegetable Ingestion	1.6E+05
Adult River Park Visitor	Soil Ingestion	4.9E+01
	Surface Water Ingestion	5.3E+00
	Sediment Ingestion	1.1E+01
	Fish Ingestion	6.0E+01
Adult Zone 4 Visitor	Soil Ingestion	9.8E+01
Construction Worker	Soil Ingestion	8.6E+00
	Dust Inhalation	3.6E+05
Commercial Worker	Soil Ingestion	3.1E+02

\* Values are obtained by using the same factors in Tables 6-12 through 6-23, without dividing by body weight or averaging time.

**TABLE 6-26 SUMMARY OF NONCARCINOGENIC EFFECTS AND TOXICITY VALUES FOR CONTAMINANTS OF POTENTIAL CONCERN AT THE MTL SITE<sup>(a)</sup>**

Chemical	Effect-Route	Oral CTV			Inhalation CTV		
		RfD <sub>s</sub> , mg/kg-day	RfD <sub>c</sub> , mg/kg-day	Confidence Level	RfD <sub>s</sub> , mg/kg-day	RfD <sub>c</sub> , mg/kg-day	Confidence Level
Acenaphthene	Liver effects-oral	6.0E-01	6.0E-02	Low	--	--	--
Acenaphthylene	Evaluated using the RfD for acenaphthene	4.0E-02 <sup>(b)</sup>	4.0E-02 <sup>(b)</sup>	--	--	--	--
Acetone	Liver and kidney effects-oral	1.0E+00	1.0E-01	Low	--	--	--
Aldrin	Liver toxicity-oral	3.0E-05	3.0E-05	Medium	--	--	--
alpha-Chlordane	Liver necrosis-oral	6.0E-05	6.0E-05	Low	--	--	--
Anthracene	No treatment related effects	3.0E+00	3.0E-01	Low	--	--	--
Arsenic	Mucous membrane irritation-inhalation; liver and kidney effects-oral; keratosis, hyperpigmentation, neurological disorders-both routes (ATSDR, 1991)	3.0E-04	3.0E-04	Medium	--	--	--
Benzene	Hematological effects-oral and inhalation	5.0E-02 <sup>(c)</sup>	5.0E-02 <sup>(c)</sup>	--	--	9.1E-03 <sup>(c)</sup>	--
Benzo(a)anthracene	--	4.0E-02 <sup>(b)</sup>	4.0E-02 <sup>(b)</sup>	--	--	--	--
Benzo(a)pyrene	--	4.0E-02 <sup>(b)</sup>	4.0E-02 <sup>(b)</sup>	--	--	--	--
Benzo(b)fluoranthene	--	4.0E-02 <sup>(b)</sup>	4.0E-02 <sup>(b)</sup>	--	--	--	--
Benzo(g,h,i)perylene	--	4.0E-02 <sup>(b)</sup>	4.0E-02 <sup>(b)</sup>	--	--	--	--
Benzo(k)fluoranthene	--	4.0E-02 <sup>(b)</sup>	4.0E-02 <sup>(b)</sup>	--	--	--	--
Beryllium	None observed-oral	5.0E-03	5.0E-03	Low	--	--	--
Boron	Testicular lesions-oral; respiratory tract irritation and bronchitis inhalation	9.0E-02	9.0E-02	Medium	5.7E-03	5.7E-03	--
Butylbenzylphthalate	Liver weight changes-oral	2.0E+00	2.0E-01	Low	--	--	--
Cadmium (food, soil) (water)	Renal damage-both routes; impaired respiratory function-inhalation; possible immune alterations-oral (ATSDR, 1991)	--	1.0E-03	High	--	--	--
		--	5.0E-04	High	--	--	--

(a) All information from either IRIS Database (EPA, 1993) or HEAST (EPA, 1992b including 11/92 supplemental update) unless otherwise noted.

(b) Evaluated using the RfD for naphthalene.

(c) Information from MDEP (1992).

continued-

Table 6-26 - continued

Chemical	Effect-Route	Oral CTV			Inhalation CTV		
		RfD <sub>s</sub> mg/kg-day	RfD <sub>C</sub> mg/kg-day	Confidence Level	RfD <sub>s</sub> mg/kg-day	RfD <sub>C</sub> mg/kg-day	Confidence Level
Chromium <sup>(a)</sup>	Atrophy of nasal mucosa-inhalation; no effects defined after oral exposure	2.0E-02	5.0E-03	Low	1.1E-06 <sup>(b)</sup>	--	--
Chrysene	-- <sup>(b)</sup>	4.0E-02 <sup>(b)</sup>	4.0E-02 <sup>(b)</sup>	--	--	--	--
Cobalt	Asthma, fibrosis-inhalation.	--	--	--	--	--	--
Cyanide (free)	Cardiomyopathy-oral (ATSDR, 1990)	2.0E-02	2.0E-02	Medium	2.9E-04 <sup>(c)</sup>	2.0E-03 <sup>(a)</sup>	--
4,4'-DDD	Weight loss, thyroid effects, myelin degeneration-oral	--	--	--	--	--	--
4,4'-DDE	Liver damage-oral	--	--	--	--	--	--
4,4'-DDT	Liver damage-oral	5.0E-04	5.0E-04	Medium	--	--	--
Di-n-butyl phthalate	Liver damage-oral	1.0E+00	1.0E-01	Low	--	--	--
Dibenz(a,h)anthracene	Increased mortality-oral	4.0E-02 <sup>(b)</sup>	4.0E-02 <sup>(b)</sup>	--	--	--	--
Dieldrin	-- <sup>(d)</sup>	5.0E-05	5.0E-05	Medium	--	--	--
Endosulfan (alpha, beta)	Liver lesions-oral	2.0E-04	5.0E-05	Medium	--	--	--
Endrin	Mild kidney lesions-oral	3.0E-04	3.0E-04	Medium	--	--	--
	Histological lesions in liver, convulsions-oral	--	--	--	--	--	--
Fluoranthene	Liver and kidney effects-oral	4.0E-01	4.0E-02	Low	--	--	--
Fluorene	Decreased red blood cells, hemoglobin-oral	4.0E-01	4.0E-02	Low	--	--	--
gamma-BHC	Liver and kidney effects-oral	3.0E-03	3.0E-04	--	--	--	--
gamma-Chlordane	Liver necrosis-oral	6.0E-05	6.0E-05	Low	--	--	--
Heptachlor	Increased liver weight-oral	5.0E-04	5.0E-04	--	--	--	--
Heptachlor epoxide	Increased liver weight-oral	1.3E-05	1.3E-05	Low	--	--	--
Indeno(1,2,3-cd)pyrene	--	4.0E-02 <sup>(b)</sup>	4.0E-02 <sup>(b)</sup>	--	--	--	--
Isodrin	--	--	--	--	--	--	--

(a) Assumed to be hexavalent.

(b) Information from Superfund Technical Support Center.

(c) Information from MDEP (1992).

(d) Evaluated using the RfD for naphthalene.

Table 6-26 - continued

Chemical	Effect-Route	Oral CTV		Inhalation CTV		
		RfD <sub>s</sub> mg/kg-day	RfD <sub>c</sub> mg/kg-day	RfD <sub>s</sub> mg/kg-day	RfD <sub>c</sub> mg/kg-day	Confidence Level
Lead	Neurological deficiencies, hypertension, inhibition heme synthesis, reproductive effects-oral and inhalation (ATSDR, 1991)	-- <sup>(a)</sup>	-- <sup>(c)</sup>	--	--	--
Mercury	Neurotoxicity-inhalation; kidney effects-oral	3.0E-04	3.0E-04	--	--	--
Methoxychlor	Development effects-oral	5.0E-03	5.0E-03	--	--	--
2-Methylnaphthalene	-- <sup>(a)</sup>	4.0E-02 <sup>(b)</sup>	4.0E-02 <sup>(a)</sup>	--	--	--
Naphthalene	Hemolytic anemia-oral and inhalation; hepatic, reproductive and other effects-oral	4.0E-02	4.0E-02	--	--	--
Nickel (soluble salts)	Hematological, developmental effects - oral; respiratory, immune and reproductive effects-inhalation (ATSDR, 1991)	2.0E-02	2.0E-02	--	--	Medium
Nitrate	Methemoglobinemia-oral	1.6E+00	1.6E+00	--	--	High
Nitrite	Methemoglobinemia-oral	1.0E-01 <sup>(c)</sup>	1.0E-01	--	--	High
Phenanthrene	--	4.0E-02 <sup>(a)</sup>	4.0E-02 <sup>(a)</sup>	--	--	--
Polychlorinated biphenyls (PCBs)	Liver effects, chloracne-all routes (ATSDR, 1991)	7.0E-05	7.0E-05	--	--	Medium
Pyrene	Kidney damage-oral	3.0E-01	3.0E-02	--	--	Low
Silver	Skin discoloration (argyria)-oral	5.0E-03	5.0E-03	--	--	Low
Sulfide	--	--	--	--	--	--
Tetrachloroethene	Liver and kidney effects-both routes; central nervous system depression-inhalation	1.0E-01	1.0E-02	--	--	Medium
Tetrazone	--	--	--	--	--	--

(a) Lead evaluated based on acceptable blood levels using the UBK model.

(b) Evaluated using RfD for naphthalene.

(c) Based on scientific judgment, the chronic RfD adopted as the subchronic RfD.

continued-

Table 6-26 - continued

Chemical	Effect-Route	Oral CTV			Inhalation CTV		
		RfD <sub>s</sub> mg/kg-day	RfD <sub>c</sub> mg/kg-day	Confidence Level	RfD <sub>s</sub> mg/kg-day	RfD <sub>c</sub> mg/kg-day	Confidence Level
Toluene	Changes in liver and kidney weights-oral; central nervous system effects-inhalation	2.0E+00	2.0E-01	Medium	5.7E-01	1.1E-01	--
Trichloroethylene	Liver, kidney effects-both routes central nervous system depression-inhalation (ATSDR, 1991)	2.0E-02 <sup>(a)</sup>	2.0E-02 <sup>(c)</sup>	--	--	--	--
Uranium Xylenes (total)	Renal tubular damage-oral Central nervous system toxicity-oral and inhalation; developmental effects-oral	--	3.0E-03	Medium	--	--	--
m-Xylene	Liver effects-inhalation; hyperactivity-oral	4.0E+00	2.0E+00	Medium	--	--	--

(a) Value from MDEP (1992).

TABLE 6-27 SUMMARY OF CARCINOGENIC EFFECTS AND SLOPE FACTORS FOR CONTAMINANTS OF POTENTIAL CONCERN AT THE MTL SITE<sup>(a)</sup>

Chemical	Tumor Type - Route	Weight- of- Evidence	Slope Factor, (mg/kg-day) <sup>-1</sup> Oral	Slope Factor, (mg/kg-day) <sup>-1</sup> Inhalation
Aldrin	Liver-oral	B2	1.7E+01	1.7E+01
alpha-Chlordane	Liver-oral	B2	1.3E+00	1.3E+00
Arsenic	Lung-inhalation; skin cancer-oral; limited evidence of other internal cancers-oral and inhalation	A	1.8E+00	1.5E+01
Benzene	Nonlymphocytic leukemia-inhalation and oral	A	2.9E-02	2.9E-02
Benzo(a)anthracene	--	B2	7.3E-00 <sup>(b)</sup>	--
Benzo(a)pyrene	Stomach-oral; respiratory tract- inhalation; skin-dermal	B2	7.3E+00	-- <sup>(c)</sup>
Benzo(b)fluoranthene	--	B2	7.3E+00 <sup>(b)</sup>	--
Benzo(k)fluoranthene	--	B2	7.3E+00 <sup>(b)</sup>	--
Beryllium	Lung-inhalation and oral	B2	4.3E+00	8.4E+00
Cadmium	Lung, prostate-inhalation; insufficient evidence of carcinogenicity-oral	B1 (inhalation)	--	6.3E+00

(a) Information from IRIS Database (EPA, 1993) or HEAST Annual-1992 (EPA, 1992b including 11/92 supplement) unless otherwise noted. Only chemicals with slope factors calculated by EPA are included here.

(b) Evaluated using the slope factor for benzo(a)pyrene.

(c) The EPA's workgroup found the data upon which an inhalation slope factor was based to be unacceptable. Data are undergoing review for use in deriving a slope factor.

Table 6-27 - continued

Chemical	Tumor Type - Route	Weight- of- Evidence	Slope Factor, (mg/kg-day) <sup>-1</sup> Oral	Slope Factor, (mg/kg-day) <sup>-1</sup> Inhalation
Chromium VI	Lung-inhalation	A (inhalation)	--	4.1E+01
Chrysene	--	B2	7.3E+00 <sup>(a)</sup>	--
4,4'-DDD	Lung, liver and thyroid-oral	B2	2.4E-01	--
4,4'-DDE	Liver-oral	B2	3.4E-01	--
4,4'-DDT	Liver-oral	B2	3.4E-01	3.4E-01
Dibenz(a,h)anthracene	--	B2	7.3E+00 <sup>(a)</sup>	--
1,4-Dichlorobenzene	Liver-oral	C	2.4E-02	--
Dieldrin	Liver, lung-oral	B2	1.6E+01	1.6E+01
gamma-BHC	Liver-oral	B2/C	1.3E+00	--
gamma-Chlordane	Liver-oral	B2	1.3E+00	1.3E+00
Heptachlor	Liver-oral	B2	4.5E+00	4.5E+00
Heptachlor epoxide	Liver-oral	B2	9.1E+00	9.1E+00
Indeno(1,2,3-cd)pyrene	--	B2	7.3E+00 <sup>(a)</sup>	--
Lead	Renal tumors-oral (ATSDR, 1991)	B2	--	--

(a) Evaluated using the slope factor for benzo(a)pyrene.

continued-

Table 6-27 - continued

Chemical	Tumor Type - Route	Weight- of- Evidence	Slope Factor, (mg/kg-day) <sup>-1</sup> Oral	Slope Factor, (mg/kg-day) <sup>-1</sup> Inhalation
Methylene chloride	Liver-oral and inhalation	B2	7.5E-03	1.6E-03
Nickel	Lung and nasal cancer-inhalation of nickel refinery dust	A (inhalation)	--	8.4E-01 <sup>(a)</sup>
Polychlorinated biphenyls (PCBs) <sup>(b)</sup>	Liver-oral; inadequate but suggestive evidence of liver cancer-inhalation and dermal	B2	7.7E+00	--
Tetrachloroethene	Liver-inhalation and oral; leukemia-inhalation	B2/C	5.2E-02 <sup>(c)</sup>	2.0E-03 <sup>(d)</sup>
Trichloroethene <sup>(d)</sup>	Liver-oral-inhalation	B2	1.1E-02	6.0E-03

(a) Value for nickel refinery dust.

(b) All PCBs evaluated by using the slope factor for Aroclor 1260.

(c) Provisional values provided by EPA.

(d) The carcinogenicity assessment has been withdrawn by EPA and is under review.

**TABLE 6-28 SUMMARY OF SLOPE FACTORS FOR RADIOLOGICAL CHEMICALS OF CONCERN\***

<u>Chemical</u>	<u>Isotope</u>	<u>Slope Factors</u>		
		<u>Oral, Risk/pCi</u>	<u>Inhalation, Risk/pCi</u>	<u>External, Risk/yr per pCi/g Soil</u>
Cesium	137	2.8E-11	1.9E-11	--
Thorium	232	1.2E-11	2.8E-08	2.6E-11
Uranium	234	1.6E-11	2.6E-08	3.0E-11
Uranium	235	1.6E-11	2.5E-08	2.4E-07
Uranium	238	1.6E-11	2.4E-08	2.1E-11

\* Source of radiological slope factors is HEAST (EPA, 1992b), Table 4A.

**TABLE 6-29 SUMMARY OF CHEMICAL CARCINOGENIC RISKS ZONE 1 RESIDENT**

<u>Potentially Exposed Population</u>	<u>Exposure Point</u>	<u>Exposure Medium</u>	<u>Exposure Route</u>	<u>Cancer Risk</u>
Resident Adult	Zone 1	Soil (not excavated)	Ingestion	7E-06
			Dermal	7E-06
		Vegetables	Ingestion	3E-04
	River Park	Soil	Ingestion	1E-05
			Dermal	1E-06
	Charles River	Surface Water	Ingestion	1E-10
			Dermal	8E-09
		Sediment	Ingestion	2E-06
			Dermal	5E-09
			Ingestion	5E-08
	Zone 4 - Open Area	Soil	Ingestion	4E-06
			Dermal	3E-06
			Total Risk:	3E-04
Resident Adult	Zone 1	Soil (excavated)	Ingestion	6E-06
			Dermal	6E-06
		Vegetables	Ingestion	2E-04
	River Park	Soil	Ingestion	1E-05
			Dermal	1E-06
	Charles River	Surface Water	Ingestion	1E-10
			Dermal	8E-09
		Sediment	Ingestion	2E-06
			Dermal	5E-09
			Ingestion	5E-08
	Zone 4 - Open Area	Soil	Ingestion	4E-06
			Dermal	3E-06
			Total Risk:	2E-04

**TABLE 6-30 SUMMARY OF CHEMICAL CARCINOGENIC RISKS  
ZONES 2 AND 3 RESIDENTS**

<u>Potentially Exposed Population</u>	<u>Exposure Point</u>	<u>Exposure Medium</u>	<u>Exposure Route</u>	<u>Cancer Risk</u>	
Resident Adult	Zone 2	Soil (not excavated)	Ingestion	4E-05	
			Dermal	6E-06	
	River Park	Soil	Ingestion	1E-05	
			Dermal	1E-06	
	Charles River	Surface Water	Ingestion	1E-10	
			Dermal	8E-09	
			Sediment	Ingestion	2E-06
				Dermal	5E-09
				Ingestion	5E-08
	Zone 4 - Open Area	Soil	Ingestion	4E-06	
			Dermal	3E-06	
			Total Risk:	7E-05	
Resident Adult	Zone 3	Soil (not excavated)	Ingestion	5E-05	
			Dermal	6E-06	
	River Park	Soil	Ingestion	1E-05	
			Dermal	1E-06	
	Charles River	Surface Water	Ingestion	1E-10	
			Dermal	8E-09	
			Sediment	Ingestion	2E-06
				Dermal	5E-09
				Ingestion	5E-08
	Zone 4 - Open Area	Soil	Ingestion	4E-06	
			Dermal	3E-06	
			Total Risk:	8E-05	

**TABLE 6-31 SUMMARY OF CHEMICAL CARCINOGENIC RISKS ZONE 4 RESIDENT**

<u>Potentially Exposed Population</u>	<u>Exposure Point</u>	<u>Exposure Medium</u>	<u>Exposure Route</u>	<u>Cancer Risk</u>
Resident Adult	Zone 4	Soil	Ingestion	2E-05
		(excavated)	Dermal	6E-06
		Vegetables	Ingestion	7E-04
	River Park	Soil	Ingestion	1E-05
			Dermal	1E-06
	Charles River	Surface Water	Ingestion	1E-10
			Dermal	8E-09
		Sediment	Ingestion	2E-06
			Dermal	5E-09
		Fish	Ingestion	5E-08
				Total Risk:

**TABLE 6-32 SUMMARY OF CHEMICAL CARCINOGENIC RISKS -  
WORKER POPULATIONS**

<u>Potentially Exposed Population</u>	<u>Exposure Point</u>	<u>Exposure Medium</u>	<u>Exposure Route</u>	<u>Cancer Risk</u>
Commercial Worker	Zone 1	Soil	Ingestion	3E-06
	Zone 2	Soil	Ingestion	1E-05
	Zone 3	Soil	Ingestion	2E-05
Construction Worker	Zone 1	Soil	Ingestion	6E-08
		Dust	Inhalation	9E-07
			Total:	1E-06
	Zone 4	Soil	Ingestion	2E-07
		Dust	Inhalation	9E-07
			Total:	1E-06

**TABLE 6-33 SUMMARY OF CHEMICAL CARCINOGENIC RISKS  
FOR PARK VISITORS**

<u>Potentially Exposed Population</u>	<u>Exposure Point</u>	<u>Exposure Medium</u>	<u>Exposure Route</u>	<u>Cancer Risk</u>	
Resident Adult	River Park	Soil	Ingestion	1E-05	
			Dermal	1E-06	
	Charles River	Surface Water	Ingestion		1E-10
				Dermal	8E-09
			Sediment	Ingestion	2E-06
				Dermal	5E-09
			Fish	Ingestion	5E-08
Total:	1E-05				
Resident Adult	Zone 4 - Open Area	Soil	Ingestion	4E-06	
			Dermal	3E-06	
			Total:	7E-06	

**TABLE 6-34 SUMMARY OF EXCESS CARCINOGENIC RISKS FROM RADIONUCLIDES - ZONE 1 RESIDENT**

<u>Potentially Exposed Population</u>	<u>Exposure Point</u>	<u>Exposure Medium</u>	<u>Exposure Route</u>	<u>Cancer Risk</u>
Resident Adult	Zone 1	Soil	Ingestion	6E-09
		(not excavated)	External	1E-09
		Vegetables	Ingestion	1E-09
	River Park	Soil	Ingestion	1E-09
			External	1E-07
	Charles River	Surface Water	Ingestion	5E-11
		Sediment	Ingestion	4E-10
		Fish	Ingestion	8E-10
	Zone 4 - Open Area	Soil	Ingestion	7E-09
			External	1E-07
Total Radiological Risk:				2E-07
Resident Adult	Zone 1	Soil	Ingestion	6E-09
		(excavated)	External	5E-07
		Vegetables	Ingestion	1E-09
	River Park	Soil	Ingestion	1E-09
			External	1E-07
	Charles River	Surface Water	Ingestion	5E-11
		Sediment	Ingestion	4E-10
		Fish	Ingestion	8E-10
	Zone 4 - Open Area	Soil	Ingestion	7E-09
			External	1E-07
Total Radiological Risk:				7E-07

**TABLE 6-35 SUMMARY OF EXCESS CARCINOGENIC RISKS FROM RADIONUCLIDES - ZONES 2 OR 3 RESIDENT**

<u>Potentially Exposed Population</u>	<u>Exposure Point</u>	<u>Exposure Medium</u>	<u>Exposure Route</u>	<u>Cancer Risk</u>
Resident Adult	Zone 2	Soil (not excavated)	Ingestion	1E-08
			External	3E-07
	River Park	Soil	Ingestion	1E-09
			External	1E-07
	Charles River	Surface Water Sediment Fish	Ingestion	5E-11
			Ingestion	4E-10
			Ingestion	8E-10
	Zone 4 - Open Area	Soil	Ingestion	7E-09
			External	1E-07
	Total Radiological Risk:			
Resident Adult	Zone 3	Soil (not excavated)	Ingestion	7E-09
			External	1E-07
	River Park	Soil	Ingestion	1E-09
			External	1E-07
	Charles River	Surface Water Sediment Fish	Ingestion	5E-11
			Ingestion	4E-10
			Ingestion	8E-10
	Zone 4 - Open Area	Soil	Ingestion	7E-09
			External	1E-07
	Total Radiological Risk:			

**TABLE 6-36 SUMMARY OF EXCESS CARCINOGENIC RISKS FROM  
RADIONUCLIDES - ZONE 4 RESIDENT**

<u>Potentially Exposed Population</u>	<u>Exposure Point</u>	<u>Exposure Medium</u>	<u>Exposure Route</u>	<u>Cancer Risk</u>	
Resident Adult	Zone 4	Soil	Ingestion	6E-09	
		(excavated)	External	5E-07	
		Vegetables	Ingestion	1E-09	
	River Park	Soil	Ingestion	1E-09	
			External	1E-07	
	Charles River	Surface Water	Ingestion	5E-11	
			Sediment	Ingestion	4E-10
			Fish	Ingestion	8E-10
	Total Radiological Risk:				6E-07

TABLE 6-37 SUMMARY OF HI VALUES ZONE 1 RESIDENT

<u>Potentially Exposed Population</u>	<u>Exposure Point</u>	<u>Exposure Medium</u>	<u>Exposure Route</u>	<u>Subchronic Hazard Index</u>	<u>Chronic Hazard Index</u>	
Resident Child	Zone 1	Soil (not excavated)	Ingestion	5E-02	5E-02	
			Dermal	1E-02	1E-02	
	River Park	Soil	Ingestion	7E-01	7E-01	
			Dermal	3E-02	2E-02	
	Charles River	Surface Water	Ingestion	4E-03	4E-03	
			Dermal	4E-06	3E-05	
			Ingestion	1E-04	1E-03	
			Dermal	1E-03	2E-03	
			Ingestion	9E-04	1E-02	
			Dermal	9E-04	1E-02	
	Zone 4 - Open Area	Soil	Ingestion	--	1E-02	
			Dermal	7E-02	4E-02	
				Dermal	2E-02	2E-02
				Total Hazard Index:	9E-01	9E-01
Resident Child	Zone 1	Soil (excavated)	Ingestion	5E-02	4E-02	
			Dermal	9E-03	1E-02	
	River Park	Soil	Ingestion	5E-01	5E-01	
			Dermal	3E-02	2E-02	
	Charles River	Surface Water	Ingestion	4E-03	4E-03	
			Dermal	4E-06	3E-05	
			Ingestion	1E-04	1E-03	
			Dermal	1E-03	2E-03	
			Ingestion	9E-04	1E-02	
			Dermal	9E-04	1E-02	
	Zone 4 - Open Area	Soil	Ingestion	--	1E-02	
			Dermal	7E-02	4E-02	
				Dermal	2E-02	2E-02
				Total Hazard Index:	7E-01	7E-01

**TABLE 6-38 SUMMARY OF HI VALUES - ZONE 2 OR 3 RESIDENT**

<u>Potentially Exposed Population</u>	<u>Exposure Point</u>	<u>Exposure Medium</u>	<u>Exposure Route</u>	<u>Subchronic Hazard Index</u>	<u>Chronic Hazard Index</u>	
Resident Child	Zone 2	Soil (not excavated)	Ingestion	2E-01	2E-01	
			Dermal	3E-02	4E-02	
	River Park	Soil	Ingestion	3E-02	2E-02	
			Dermal	4E-03	4E-03	
	Charles River	Surface Water	Ingestion	4E-06	3E-05	
			Dermal	1E-04	1E-03	
			Ingestion	1E-03	2E-03	
		Sediment	Dermal	9E-04	1E-02	
			Fish	Ingestion	--	1E-02
			Soil	Ingestion	7E-02	4E-02
	Zone 4 - Open Area		Dermal	2E-02	2E-02	
			Total Hazard Index:		4E-01	3E-01
Resident Child	Zone 3	Soil (not excavated)	Ingestion	1E-01	1E-01	
			Dermal	2E-02	6E-02	
	River Park	Soil	Ingestion	3E-02	2E-02	
			Dermal	4E-03	4E-03	
	Charles River	Surface Water	Ingestion	4E-06	3E-05	
			Dermal	1E-04	1E-03	
			Ingestion	1E-03	2E-03	
		Sediment	Dermal	9E-04	1E-02	
			Fish	Ingestion	--	1E-02
			Soil	Ingestion	7E-02	4E-02
	Zone 4 - Open Area		Dermal	2E-02	2E-02	
			Total Hazard Index:		2E-01	3E-01

**TABLE 6-39 SUMMARY OF HI VALUES - ZONE 4 RESIDENT**

<u>Potentially Exposed Population</u>	<u>Exposure Point</u>	<u>Exposure Medium</u>	<u>Exposure Route</u>	<u>Subchronic Hazard Index</u>	<u>Chronic Hazard Index</u>
Resident Child	Zone 4	Soil	Ingestion	2E-01	1E-01
		(excavated)	Dermal	2E-02	3E-02
		Vegetables	Ingestion	2E+00	2E+00
	River Park	Soil	Ingestion	3E-02	2E-02
			Dermal	4E-03	4E-03
	Charles River	Surface Water	Ingestion	4E-06	3E-05
			Dermal	1E-04	1E-03
		Sediment	Ingestion	1E-03	2E-03
			Dermal	9E-04	1E-02
		Fish	Ingestion	--	1E-02
	Total Hazard Index:				2E+00

**TABLE 6-40 SUMMARY OF HI VALUES - WORKER POPULATIONS**

<u>Potentially Exposed Population</u>	<u>Exposure Point</u>	<u>Exposure Medium</u>	<u>Exposure Route</u>	<u>Hazard Index*</u>
Commercial Worker	Zone 1	Soil	Ingestion	7E-03
	Zone 2	Soil	Ingestion	3E-02
	Zone 3	Soil	Ingestion	2E-02
Construction Worker	Zone 1	Soil	Ingestion	4E-03
		Dust	Inhalation	--
			Total:	4E-03
	Zone 4	Soil	Ingestion	1E-02
		Dust	Inhalation	2E-04
		Total:	1E-02	

\* Hazard Index is subchronic for construction worker and chronic for the commercial worker.

TABLE 6-41 SUMMARY OF UBK MODEL RESULTS

<u>Potentially Exposed Population</u>	<u>Exposure Point</u>	<u>Lead Soil/ Concentration, ug/g</u>	<u>Lead Vegetable Concentration, ug/g</u>	<u>Predicted Blood Lead Level, ug/dL*</u>
Resident Child, 12-24 months	Zone 1	67.7	0.068	2.05
Resident Child, 12-84 months	Zone 1	67.7	0.068	2.26
Resident Child, 12-24 months	Zone 1	63.4	0.064	1.91
Resident Child, 12-84 months	(excavated) Zone 1 (excavated)	63.4	0.064	2.19
Resident Child, 12-24 months	Zone 2	128.8	--	2.38
Resident Child, 12-84 months	Zone 2	128.8	--	2.45
Resident Child, 12-24 months	Zone 3	132.9	--	2.42
Resident Child, 12-84 months	Zone 3	132.9	--	2.49
Resident Child, 12-24 months	Zone 4	86.1	0.087	2.27
Resident Child, 12-84 months	Zone 4	86.1	0.087	2.52

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\* EPA has identified 10 ug/dL as a level of concern.