

CORRESPONDENCE/MEMORANDUM**State of Wisconsin**

DATE: May 17, 1994
TO: Connie Antonuk NCD
FROM: Amy Parkinson SW/3 *Amy*
SUBJECT: C. M. Christiansen Site Data

Attached is workable summary of the data collected at the C. M. Christiansen site in Phelps, WI. Let me know if you have any questions. I will be out of the office until friday so leave me a voice message and I'll get back to you. Thanks!

C. M. Christiansen Site Summary of Data

The following is a summary of the data results of samples collected during a Site Inspection of the C. M. Christiansen Site on September 29, 1993. Four matrices were sampled: nearby residential wells, monitoring wells on-site, soils on-site and sediments in Military Creek and North Twin Lake. All samples were analyzed by the U.S. Environmental Protection Agency Contract Laboratory Program (CLP). The samples were analyzed for numerous chemical compounds including volatile organic compounds (VOCs), semivolatile compounds, pesticides, polychlorinated biphenyls (PCBs) and metals. A complete list of parameters is attached.

Residential Wells

Three residential wells located west and northwest of the site, were shown to be free of contaminants attributable to the site.

Monitoring Wells

Five monitoring wells were installed at the site to determine the presence of on-site groundwater contamination due to site operations (see map). Two semi-volatile chemicals were detected: 2-methylnaphthalene (MW1 at 51 parts per billion (ppb)) and bis(2-ethylhexyl)phthalate (MW2, MW3 and MW5 ranging from 33-1200 ppb). The highest level of bis(2-ethylhexyl)phthalate was in MW2 originally designated as a background well¹. These contaminants are man-made and indicate contamination of the groundwater at the site. In addition, there are elevated levels of barium in MW3 at 666 ppb. Elevated levels of barium were detected in the soil samples S12, S14 and S18.

Soils

Soil samples were collected in areas of stained soils throughout the site. The stained areas appeared to have been utilized as pole dipping pits or drying areas for the wood treating operation. Samples were collected at three dipping pits, an area of heavily stained soils and a pole drying area.

The soil samples analyzed for semi-volatiles and PCB/Pesticides were scheduled for low level analysis but due to high concentrations of contaminants had to be diluted even to be analyzed under the medium level detection limits.

Samples S11, S12 and S13/19 were collected in the low lying wetland area northwest of the road in areas with heavily stained soils. Sample S14 was collected at a suspected pole dipping pit located southeast of the road within 50 feet of Military Creek. Pentachlorophenol (PCP) was highly elevated as samples S11, S12, S13, and S14 had to be diluted 50 -1000 times in order to be analyzed under the medium

¹The concentration of bis(2-ethylhexyl)phthalate was high and was diluted 5 times to allow for a low level analysis.

detection limits. These areas appeared to be used as dipping pits. The PCP levels in samples S11, S12, S13, and S14 are 87,000,000 parts per billion (ppb); 3,000,000 ppb; 1,400,000 ppb and 2,300,000 ppb respectively. N-nitrosodiphenylamine was detected in samples S12, S13 and S14 at 42,000 ppb, 29,000 ppb and 18,000 ppb. Pyrene was detected in S13/S19 and S14 at 21,000/16,000 ppb, and 1,700 ppb respectively.

Sample S11 contains high levels of PCP, and a number of pesticides including beta-BHC, delta-BHC, Aldrin, 4'4' DDD and 4'4' DDT and metals including chromium, copper, lead and zinc.

Sample S12 contains high levels of PCP and numerous pesticides including beta-BHC, delta-BHC, Aldrin, heptachlor epoxide, endosulfan sulphate, endosulfan I, endrin, dieldrin, endrin keytone, 4'4'DDE, endrin aldehyde, 4'4' DDD, alpha-chlordane, 4'4' DDT, gamma-chlordane and methxychlor, and metals including barium, chromium, copper, lead and zinc.

Sample 13 contains high levels of PCP and a number of semi-volatiles and one pesticides including N-nitrosodiphenylamine, fluoranthene, pyrene, and heptachlor epoxide, and metals including chromium, copper, lead and zinc.

Sample S14 contains high levels of semi-volatiles including PCP, N-nitrosodiphenylamine, pyrene, bis(2-ethylhexyl)phthalate and numerous pesticides including beta-BHC, delta-BHC, Aldrin, heptachlor epoxide, endosulfan sulphate, endosulfan I, endrin, dieldrin, endrin keytone, 4'4'DDE, endrin aldehyde, 4'4' DDD, alpha-chlordane, 4'4' DDT, gamma-chlordane and methxychlor, and metals including barium, chromium, copper, lead and zinc.

Sample S15 was collected at the drying area at the crest of the hill. This sample contained Pyrene at 19,000 ppb and a number of pesticides including heptachlor epoxide, endosulfan I, dieldrin, and gamma-chlordane, and metals including chromium, copper, lead and zinc.

Methylene chloride and acetone were detected in the wetland and upland soils on the westside of the road that bisects the site (S13/S19, S14, S15 & S18). Methylene chloride ranged from 31 - 41 ppb. Acetone ranged from 34 to 160 ppb.

Sediments

The sediment samples were collected from the outlet of Military Creek into North Twin Lake and along the creek, upstream to a portion of the creek that was thought to be out of the influence of the site. Sediment samples were analyzed for dioxins/furans as these substances are associated with pentachlorophenol use at wood treating sites. The treating solution was heating in the treating process which can result in dioxins/furans. Dioxins sampled were the polychlorinated dibenzo-p-dioxins and

polychlorinated dibenzofurans (PCDD/PCDF). These dioxins are present in the sediments. The data is currently being evaluated by Charlene Khazae.²

Sediment samples indicated the presence of volatiles, semi-volatiles, and pesticides that were detected in the soils samples. Metals detected in the sediments include aluminum, chromium, lead, and zinc.

² Charlene Khazae, Superfund Chemist, can be reached at (608) 267-0543.

C.M. CHRISTENSEN
PHELPS, WI
SAMPLE LOCATIONS

Two

1800

1709

35

BM

1742

20

* SOIL & SEDIMENT SAMPLE LOCATIONS
MW = MONITORING WELLS

Gravel

SENT BY:

5-17-94 12:48PM

DNR SOLID WASTE

715 369 8932: # 6/15

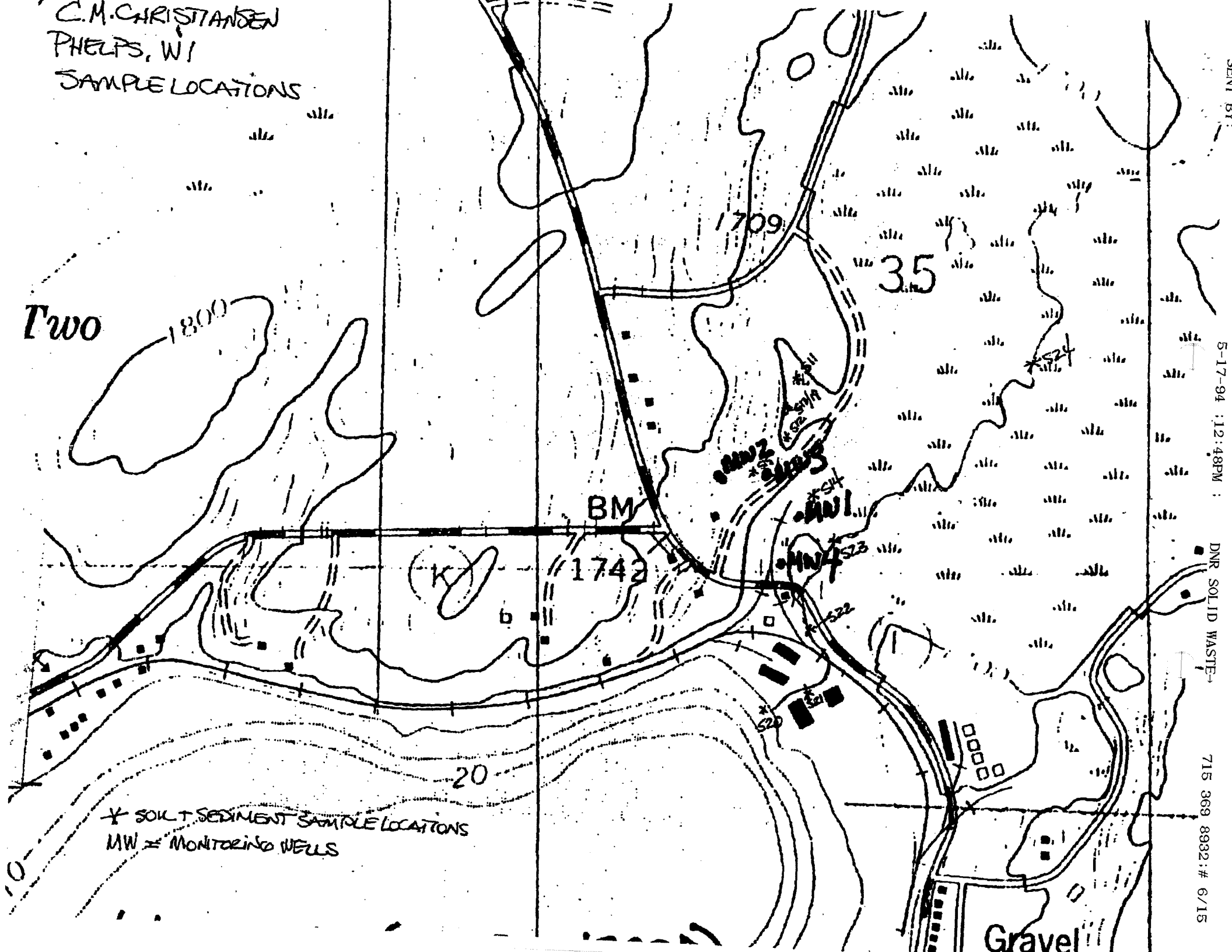


TABLE 3-1

TARGET COMPOUND LIST (TCL) AND CONTRACT REQUIRED QUANTITATION LIMITS (CROL)

Volatiles	CAS Number	Quantitation Limits*			
		Water ug/L	Low Soil ug/Kg	Med. Soil ug/Kg	On Column (ng)
1. Chloromethane	74-87-3	10	10	1200	(50)
2. Bromomethane	74-83-9	10	10	1200	(50)
3. Vinyl Chloride	75-01-4	10	10	1200	(50)
4. Chloroethane	75-00-3	10	10	1200	(50)
5. Methylene Chloride	75-09-2	10	10	1200	(50)
6. Acetone	67-64-1	10	10	1200	(50)
7. Carbon Disulfide	75-15-0	10	10	1200	(50)
8. 1,1-Dichloroethene	75-35-4	10	10	1200	(50)
9. 1,1-Dichloroethane	75-34-3	10	10	1200	(50)
10. 1,2-Dichloroethene(total)	540-59-0	10	10	1200	(50)
11. Chloroform	67-66-3	10	10	1200	(50)
12. 1,2-Dichloroethane	107-06-2	10	10	1200	(50)
13. 2-Butanone	78-93-3	10	10	1200	(50)
14. 1,1,1-Trichloroethane	71-55-6	10	10	1200	(50)
15. Carbon Tetrachloride	56-23-5	10	10	1200	(50)
16. Bromodichloromethane	75-27-4	10	10	1200	(50)
17. 1,2-Dichloropropane	78-87-5	10	10	1200	(50)
18. Cis-1,3-Dichloropropane	10061-01-5	10	10	1200	(50)
19. Trichloroethene	79-01-6	10	10	1200	(50)
20. Dibromochloromethane	124-48-1	10	10	1200	(50)
21. 1,1,2-Trichloroethane	79-00-5	10	10	1200	(50)
22. Benzene	71-43-2	10	10	1200	(50)
23. Trans-1,3-Dichloropropane	10061-02-6	10	10	1200	(50)
24. Bromoform	75-25-2	10	10	1200	(50)
25. 4-Methyl-2-pentanone	108-10-1	10	10	1200	(50)
26. 2-Hexanone	591-78-6	10	10	1200	(50)
27. Tetrachloroethene	127-18-4	10	10	1200	(50)
28. Toluene	108-88-3	10	10	1200	(50)
29. 1,1,2,2-Tetrachloroethane	79-34-5	10	10	1200	(50)
30. Chlorobenzene	108-90-7	10	10	1200	(50)

TABLE 3-1

TARGET COMPOUND LIST (TCL) AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)
(Continued)

Volatiles	CAS Number	Quantitation Limits*			
		Water ug/L	Low Soil ug/Kg	Med. Soil ug/Kg	On Column (ng)
31. Ethyl benzene	100-41-4	10	10	1200	(50)
32. Styrene	100-42-5	10	10	1200	(50)
33. Xylenes (total)	1330-20-7	10	10	1200	(50)

* Quantitation limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment, calculated on dry weight basis as required by the contract, will be higher.

TABLE 3-2

TARGET COMPOUND LIST (TCL) AND CONTRACT REQUIRED QUANTITATION LIMITS (CROL).

Semivolatiles	CAS Number	Quantitation Limits*			On Column (ng)
		Water ug/L	Low Soil ug/Kg	Med. Soil ug/Kg	
34. Phenol	108-95-2	10	330	10000	(20)
35. bis(2-Chloroethyl) ether	111-44-4	10	330	10000	(20)
36. 2-Chlorophenol	95-57-8	10	330	10000	(20)
37. 1,3-Dichlorobenzene	541-73-1	10	330	10000	(20)
38. 1,4-Dichlorobenzene	106-46-7	10	330	10000	(20)
39. 1,2-Dichlorobenzene	95-50-1	10	330	10000	(20)
40. 2-Methylphenol	95-48-7	10	330	10000	(20)
41. 2,2'-oxybis-(1-Chloropropane)**	108-60-1	10	330	10000	(20)
42. 4-Methylphenol	106-44-5	10	330	10000	(20)
43. N-Nitroso-di-n-dipropylamine	621-64-7	10	330	10000	(20)
44. Hexachloroethane	67-72-1	10	330	10000	(20)
45. Nitrobenzene	98-95-3	10	330	10000	(20)
46. Isophorone	78-59-1	10	330	10000	(20)
47. 2-Nitrophenol	88-75-5	10	330	10000	(20)
48. 2,4-Dimethylphenol	105-67-9	10	330	10000	(20)
49. bis(2-Chloroethoxy) methane	111-91-1	10	330	10000	(20)
50. 2,4-Dichlorophenol	120-83-2	10	330	10000	(20)
51. 1,2,4-Trichlorobenzene	120-82-1	10	330	10000	(20)
52. Naphthalene	91-20-3	10	330	10000	(20)
53. 4-Chloroaniline	106-47-8	10	330	10000	(20)
54. Hexachlorobutadiene	87-68-3	10	330	10000	(20)
55. 4-Chloro-3-methylphenol	59-50-7	10	330	10000	(20)
56. 2-Methylnaphthalene	91-57-6	10	330	10000	(20)
57. Hexachlorocyclopentadiene	77-47-4	10	330	10000	(20)
58. 2,4,6-Trichlorophenol	88-06-2	10	330	10000	(20)
59. 2,4,5-Trichlorophenol	95-95-4	50	1700	50000	(100)
60. 2-Chloronaphthalene	91-58-7	10	330	10000	(20)
61. 2-Nitroaniline	88-74-4	50	1700	50000	(100)
62. Dimethylphthalate	131-11-3	10	330	10000	(20)
63. Acenaphthylene	208-96-8	10	330	10000	(20)

TABLE 3-2

TARGET COMPOUND LIST (TCL) AND CONTRACT REQUIRED QUANTIFICATION LIMITS (CRQL)
(Continued)

Semivolatiles	CAS Number	Quantitation Limits			on Column (ng)
		Water ug/L	Low Soil ug/Kg	Med. Soil ug/Kg	
64. 2,6-Dinitrotoluene	606-20-2	10	330	10000	(20)
65. 3-Nitroaniline	99-09-2	50	1700	50000	(100)
66. Acenaphthene	83-32-9	10	330	10000	(20)
67. 2,4-Dinitrophenol	51-28-5	50	1700	50000	(100)
68. 4-Nitrophenol	100-02-7	50	1700	50000	(100)
69. Dibenzofuran	132-64-9	10	330	10000	(20)
70. 2,4-Dinitrotoluene	121-14-2	10	330	10000	(20)
71. Diethylphthalate	84-66-2	10	330	10000	(20)
72. 4-Chlorophenyl-phenyl ether	7005-72-3	10	330	10000	(20)
73. Fluorene	86-73-7	10	330	10000	(20)
74. 4-Nitroaniline	100-01-6	50	1700	50000	(100)
75. 4,6-Dinitro-2-methylphenol	534-52-1	50	1700	50000	(100)
76. N-Nitrosodiphenylamine	86-30-6	10	330	10000	(20)
77. 4-Bromophenyl-phenyl ether	101-55-3	10	330	10000	(20)
78. Hexachlorobenzene	118-74-1	10	330	10000	(20)
79. Pentachlorophenol	87-86-5	50	1700	50000	(100)
80. Phenanthrene	85-01-8	10	330	10000	(20)
81. Anthracene	120-12-7	10	330	10000	(20)
82. Carbazole	86-74-8	10	330	10000	(20)
83. Di-n-butylphthalate	86-74-2	10	330	10000	(20)
84. Fluoranthene	206-44-0	10	330	10000	(20)
85. Pyrene	129-00-0	10	330	10000	(20)
86. Butylbenzylphthalate	85-68-7	10	330	10000	(20)
87. 3,3-Dichlorobenzidine	91-94-1	10	330	10000	(20)
88. Benzo(a)anthracene	56-55-3	10	330	10000	(20)
89. Chrysene	210-81-9	10	330	10000	(20)
90. bis(2-Ethylhexyl)phthalate	117-81-7	10	330	10000	(20)
91. Di-n-Octylphthalate	117-84-0	10	330	10000	(20)
92. Benzo(b)fluoranthene	205-99-2	10	330	10000	(20)
93. Benzo(k)fluoranthene	207-08-9	10	330	10000	(20)

TABLE 3-2

TARGET COMPOUND LIST (TCL) AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)

Semivolatiles	CAS Number	Quantitation Limits *			
		Water ug/L	Low Soil ug/Kg	Med. Soil ug/Kg	On Column (ng)
94. Benzo(a)pyrene	50-32-8	10	330	10000	(20)
95. Indeno(1,2,3-cd)pyrene	193-39-5	10	330	10000	(20)
96. Dibenzo(a,h)anthracene	53-70-3	10	330	10000	(20)
97. Benzo(g,h,i)perylene	191-24-2	10	330	10000	(20)

* Quantitation limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment, calculated on dry weight basis as required by the contract, will be higher.

** Previously known by the name of bis(2-chloroisopropyl) ether.

TABLE 3-3

TARGET COMPOUND LIST (TCL) AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)

Pesticides/Aroclors	CAS Number	Quantitation Limits		
		Water ug/L	Soil ug/Kg	On Column (ng)
98. alpha-BHC	319-84-6	0.05	1.7	5
99. beta-BHC	319-85-7	0.05	1.7	5
100. delta-BHC	319-86-8	0.05	1.7	5
101. gamma-BHC (Lindane)	58-89-9	0.05	1.7	5
102. Heptachlor	76-44-8	0.05	1.7	5
103. Aldrin	309-00-2	0.05	1.7	5
104. Heptachlor epoxide	1024-57-3	0.05	1.7	5
105. Endosulfan I	959-98-8	0.05	1.7	5
106. Dieldrin	60-57-1	0.10	3.3	10
107. 4,4'-DDE	72-55-9	0.10	3.3	10
108. Endrin	72-20-8	0.10	3.3	10
109. Endosulfan II	33213-65-9	0.10	3.3	10
110. 4,4'-DDD	72-54-8	0.10	3.3	10
111. Endosulfan sulfate	1031-07-8	0.10	3.3	10
112. 4,4'-DDT	50-29-3	0.10	3.3	10
113. Methoxychlor	72-43-5	0.50	17.0	50
114. Endrin ketone	53494-70-5	0.10	3.3	10
115. Endrin aldehyde	7421-36-3	0.10	3.3	10
116. alpha-chlordane	5103-71-9	0.05	1.7	5
117. gamma-chlordane	5103-74-2	0.05	1.7	5
118. Toxaphene	8001-35-2	5.0	170.0	500
119. Aroclor-1016	12674-11-2	1.0	33.0	100
120. Aroclor-1221	11104-28-2	1.0	33.0	100
121. Aroclor-1232	11141-16-5	2.0	67.0	200
122. Aroclor-1242	53469-21-9	1.0	33.0	100
123. Aroclor-1248	12672-29-6	1.0	33.0	100
124. Aroclor-1254	11097-69-1	1.0	33.0	100
125. Aroclor-1260	11096-82-5	1.0	33.0	100

* Quantitation limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment, calculated on dry weight basis as required by the contract, will be higher.

There is no differentiation between the preparation of low and medium soil samples in this method for the analysis of Pesticides/Aroclors.

TABLE 3-4

INORGANIC TARGET ANALYTE LIST (TAL)

Analyte	Contract Required ^{1,2} Detection Limit (ug/L)
Aluminum	200
Antimony	60
Arsenic	10
Barium	200
Beryllium	5
Cadmium	5
Calcium	5000
Chromium	10
Cobalt	50
Copper	25
Iron	100
Lead	3
Magnesium	5000
Manganese	15
Mercury	0.2
Nickel	40
Potassium	5000
Selenium	5
Silver	10
Sodium	5000
Thallium	10
Vanadium	50
Zinc	20
Cyanide	10

- (1) Subject to the restrictions specified in the first page of Part G, Section IV of Exhibit D (Alternate Methods - Catastrophic Failure) any analytical method specified in SOW Exhibit D may be utilized as long as the documented instrument or method detection limits meet the Contract Required Detection Limit (CRDL) requirements. Higher detection limits may only be used in the following circumstances:

If the sample concentration exceeds five times the detection

TARGET COMPOUND LIST (TCL) AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)

PCDD/PCDF	GAS Number	Quantitation Limits ¹			
		Water (ng/L)	Soil (ug/Kg)	Fly Ash (ug/Kg)	Chemical Waste ² (ug/Kg)
2378-TCDD	1746-01-6	10	1.0	1.0	10
2378-TCDF	51207-31-9	10	1.0	1.0	10
12378-PeCDF	57117-41-6	25	2.5	2.5	25
12378-PeCDD	40321-76-4	25	2.5	2.5	25
23478-PeCDF	57117-31-4	25	2.5	2.5	25
123478-HxCDF	70648-26-9	25	2.5	2.5	25
123678-HxCDF	57117-44-9	25	2.5	2.5	25
123478-HxCDD	39227-28-6	25	2.5	2.5	25
123678-HxCDD	57653-85-7	25	2.5	2.5	25
123789-HxCDD	19408-74-3	25	2.5	2.5	25
234678-HxCDF	60851-34-5	25	2.5	2.5	25
123789-HxCDF	72918-21-9	25	2.5	2.5	25
1234678-HpCDF	67562-39-4	25	2.5	2.5	25
1234678-HpCDD	35822-46-9	25	2.5	2.5	25
1234789-HpCDF	55673-89-7	25	2.5	2.5	25
OCDD	3268-87-9	50	5.0	5.0	50
OCDF	39001-02-0	50	5.0	5.0	50

¹ All CRQL values listed here are based on the wet weight of the sample.

² Chemical waste includes the matrices of oils, stillbottoms, oily sludge, wet fuel oil, oil-laced soil, and surface water heavily contaminated with these matrices.

In addition, data are reported for the total concentration of all detected PCDDs or PCDFs in the following homologues. However, because the number of non-2,3,7,8-substituted isomers that might be detected in a sample is unpredictable, it is not possible to assign CRQL values to the total homologue concentrations.

Homologue	CAS Number	Number of Possible Isomers	Number of 2,3,7,8-Substituted Isomers
Total TCDD	41903-57-5	22	1
Total TCDF	55722-27-5	38	1
Total PeCDD	36088-22-9	14	1
Total PeCDF	30402-15-4	28	2
Total HxCDD	34465-4608	10	3
Total HxCDF	55684-94-1	16	4
Total HpCDD	37871-00-4	2	1
Total HpCDF	38998-75-3	4	2

There is only one isomer in both the OCDD and OCDF homologues, hence the total concentration is the same as the 2,3,7,8-substituted concentration listed on the previous page.

TCDD	-	Tetrachlorinated dibenzo-p-dioxin
TCDF	-	Tetrachlorinated dibenzofuran
PeCDD	-	Pentachlorinated dibenzo-p-dioxin
PeCDF	-	Pentachlorinated dibenzofuran
HxCDD	-	Hexachlorinated dibenzo-p-dioxin
HxCDF	-	Hexachlorinated dibenzofuran
HpCDD	-	Heptachlorinated dibenzo-p-dioxin
HpCDF	-	Heptachlorinated dibenzofuran
OCDD	-	Octachlorinated dibenzo-p-dioxin
OCDF	-	Octachlorinated dibenzofuran