

Table 1: Analytical Data (June and September, 1990) Summary of Drum Contents (as obtained from Disposal Profile Sheets)

Waste Description	Unit	Waste Oil (oil & sludge)	Water & oil	Water & Antifreeze	Speedy Dry, Rags, Cloth, Gloves	Oil, Water, Antifreeze	Waste Oil
pH	--- ¹	8.0	6.0	8.0	7.0	6.0	---
Chlorine, Total	% weight	0.9	6.6	0.2	< 0.1	0.2	---
Bromine, Total		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	---
Sulfur, Total		1	< 0.1	< 0.1	0.1	< 0.1	---
Fluorine, Total		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	---
Polyethylene glycol (Brake fluid)		ND ²	ND	7.2	ND	10	* ³
Hexanes (C6)		ND	ND	4.9	ND	0.3	*
Hexylene glycol		ND	ND	1	ND	ND	*
Toluene		ND	ND	0.2	ND	ND	5
1,1,1-Trichloroethane		ND	12.8	ND	ND	ND	*
Trace VOCs (< 1% each) ⁴		11.9	0.2	ND	ND	ND	*
Aroclor 1254		ppm	55	25	7	10	8
Aroclor 1262	7		3	ND	ND	ND	---
Arsenic	---		---	---	< 5	---	---
Barium	---		---	---	400	---	---

Table 1: (Cont'd.)

Waste Description	Unit	Waste Oil (oil & sludge)	Water & oil	Water & Antifreeze	Speedy Dry, Rags, Cloth, Gloves	Oil, Water, Antifreeze	Waste Oil
Beryllium	ppm	---	---	---	2	---	---
Cadmium		---	---	---	12	---	---
Chromium		---	---	---	130	---	---
Iron		---	---	---	55,460	---	---
Lead		---	---	---	939	---	---
Mercury		---	---	---	< 5	---	---
Phosphorus		---	---	---	915	---	---
Selenium		---	---	---	< 5	---	---
Silver		---	---	---	< 5	---	---
Titanium		---	---	---	2203	---	---
Zinc		---	---	---	172	---	---

¹Not analyzed; ²Not detected; ³Analytical data of VOC scan was not provided on the disposal profile sheets; ⁴No single volatile organic compound (VOC) represented greater than or equal to 1% by weight of the total VOC portion of the sample

Table 2: Results of Soil samples collected (July 1984) from Test Pits at the Ringwood Mines/Landfill site

Contaminant	TP-3 (mg/kg)	TP-12 (mg/kg)	Environmental Guideline CV (mg/kg)	Selected for Further Evaluation
Volatile Organic Compounds (VOCs)				
Benzene	34	NS ¹	10 (CREG)	Yes
Ethylbenzene	140	NS	5,000 (RMEG)	No
Methylene Chloride	NA ²	NS	90 (CREG)	No
Tetrachloroethylene	26	NS	500 (RMEG)	No
Toluene	510	NS	1,000 (EMEG)	No
Metals³				
Arsenic	NA	NA	0.5 (CREG)	No
Barium	0.7	0.2	4,000 (RMEG)	No
Cadmium	NA	NA	10 (EMEG)	No
Lead	0.56	NA	400 (RDCSCC)	No

¹Not submitted; ²Not available, ³Metals were reported using EP Toxicity data, Not available

Table 3: Analytical Results of Paint Sludge samples¹ collected (March/April, 1987) from Ringwood Mines/Landfill site

Contaminant	Concentration (mg/kg)		Environmental Guideline CV (mg/kg)	COC ²
	Range	Mean		
Volatile Organic Compounds (VOCs)				
Acetone	ND ³ - 56	24.5	100,000 (EMEG ⁴)	No
Benzene	ND - 1.6	1.1	10 (CREG ⁵)	No
Ethylbenzene	0.25 - 810	340	5,000 (RMEG ⁶)	No
4-Methyl-2-pentanone	ND - 39	18.7	1,000 (RDCSCC ⁷)	No
Methylene Chloride	ND - 50	15.6	90 (CREG)	No
Tetrachloroethene	ND - 95	57.4	500 (RMEG)	No
Toluene	0.17 - 610	276	1,000 (EMEG)	No
Trichloroethene	ND - 140	57.7	400 (EMEG)	No
m-Xylene	ND - 8,200	1,617	10,000 (EMEG)	No
o,p-Xylene	ND - 8,300	1,583	10,000 (EMEG)	No
Semi Volatile Organic Compounds (SVOCs)				
Aroclor 1248	0.077 – 1.38	0.5	0.49 (RDCSCC)	Yes
Aroclor 1254	0.097 – 2.2	0.9	0.49 (RDCSCC)	Yes
2-Chlorophenol	ND – 2	2	300 (RMEG)	No
2-Methylnaphthalene	6.2 – 140	66.8	3,000 (EMEG)	No
4-Nitrophenol	ND – 2.8	2.8	630 (RBC ⁸)	No
Benzyl Alcohol	ND – 21	8.5	10,000 (RDCSCC)	No
Bis(2-ethylhexyl)phthalate	9.2 – 380	120	49 (RDCSCC)	Yes
Butylbenzyl Phthalate	ND – 4.2	4.1	10,000 (RMEG)	No
Di-n-butyl Phthalate	ND – 6.8	3.8	5,000 (RMEG)	No
Fluoranthene	ND – 2.4	2.4	2,000 (RMEG)	No
Naphthalene	43 – 350	158	1,000 (RMEG)	No
N-Nitrosodiphenylamine	ND – 5.2	5.2	100 (CREG)	No
Phenanthrene	ND – 4.6	3.7	NA ⁹	No
Phenol	ND – 7.6	4.4	20,000 (RMEG)	No
Pyrene	ND – 3	2.5	2,000 (RMEG)	No
Metals				
Antimony	160 – 460,000	47,137	20 (RMEG)	Yes
Arsenic	0.22 – 16	4.3	0.5 (CREG)	Yes
Cadmium	1.8 – 32	10.5	10 (EMEG)	Yes
Chromium	436 – 2,400	1,639	200 (RMEG)	Yes
Copper	110 – 2,100	565	1,000 (EMEG)	Yes
Lead	5,900 – 310,000	64,880	400 (RDCSCC)	Yes
Mercury	ND – 3.17	1.2	14 (RDCSCC)	No

Table 3: (Cont'd.)

Contaminant	Concentration (mg/kg)		Environmental Guideline CV (mg/kg)	COC ²
	Range	Mean		
Metals				
Nickel	25 – 82	59	1,000 (RMEG)	No
Selenium	ND – 4.5	1.9	300 (EMEG)	No
Silver	ND – 16.1	4.6	300 (RMEG)	No
Zinc	620 – 3,500	2,437	20,000 (EMEG)	No
Other				
Cyanide	ND - 5.05	3.5	1,000 (RMEG)	No
Phenol	1.06 - 10	4.3	20,000 (RMEG)	No

¹No. of samples taken =10; ²Contaminant of Concern; ³Not detected; ⁴ATSDR Environmental Media Evaluation Guide; ⁵ATSDR Cancer Risk Evaluation Guide; ⁶ATSDR Reference Media Evaluation Guide; ⁷NJDEP Residential Direct Contact Soil Cleanup Criteria; ⁸EPA Region 3 Risk-Based Concentration; ⁹Not available

Table 4: Post-Remedial Soil Sampling (March 1988) Results from Paint Sludge Disposal Areas

Contaminant	No. of Detection ¹	Concentration (mg/kg)		Environmental Guideline CV (mg/kg)	COC ²
		Range	Mean		
Volatile Organic Compounds (VOCs)					
trans 1,2-Dichloroethene	1	0.003	0.003	1,000 (RMEG ³)	No
Tetrachloroethene	3	0.001- 0.002	0.002	500 (RMEG)	No
4-methyl-2-pentanone	3	0.002 - 0.033	0.012	1,000 (RDCSCC ⁴)	No
m-xylene	2	0.002 - 0.004	0.003	10,000 (EMEG ⁵)	No
o,p xylene	1	0.004	0.004	10,000 (EMEG)	No
Semi Volatile Organic Compounds (SVOCs)					
Bis[2-ethylhexyl]phthalate	9	0.042 - 5.6	0.75	49 (RDCSCC)	No
Di-n-butyl phthalate	1	0.11	0.11	5,000 (RMEG)	No
Phenanthrene	3	0.077 - 0.2	0.132	NA ⁶	
Anthracene	1	0.035	0.035	20,000 (RMEG)	No
Fluoranthene	4	0.046 - 0.36	0.165	2,000 (RMEG)	No
Pyrene	4	0.046 - 0.37	0.174	2,000 (RMEG)	No
Chrysene	3	0.042 - 0.18	0.114	9 (RDCSCC)	No
Indeno[1,2,3-cd]pyrene	2	0.049 - 0.066	0.058	0.9 (RDCSCC)	No
Benzo[g,h,i]perylene	2	0.056 - 0.077	0.067	NA	No
Benzo[a]anthracene	3	0.046 - 0.17	0.115	0.9 (RDCSCC)	No
Benzo[b]fluoranthene	2	0.2 - 0.32	0.26	0.9 (RDCSCC)	No
Benzo[k]fluoranthene	2	0.2 - 0.32	0.26	0.9 (RDCSCC)	No
Benzo[a]pyrene	2	0.099 - 0.18	0.14	0.1 (CREG ⁷)	Yes
Naphthalene	1	2.1	2.1	1,000 (RMEG)	No
2-methylnapthalene	1	1.1	1.1	200 (RMEG)	No
Metals					
Antimony	3	0.6 - 6.3	2.54	20 (RMEG)	No
Arsenic	12	0.95 - 9.6	2.03	0.5 (CREG)	Yes
Barium	12	24 - 400	75.9	4,000 (RMEG)	No
Chromium	12	9.1 - 50	23.42	200 (RMEG)	No
Copper	12	0.319 - 72	19.36	1,000 (EMEG)	No
Lead	12	3 - 1,300	129.6	400 (RDCSCC)	Yes
Nickel	12	0.26 - 16	8.8	1,000 (RMEG)	No
Silver	1	0.7	0.7	300 (RMEG)	No
Thallium	1	19	19	2 (RDCSCC)	Yes
Zinc	12	29 - 140	48.66	20,000 (EMEG)	No

Table 4: (Cont'd.)

Contaminant	No. of Detection ¹	Concentration (mg/kg)		Environmental Guideline CV (mg/kg)	COC ²
		Range	Mean		
Other					
Cyanide	2	0.0008 - 0.0009	0.0008	1,000 (RMEG)	No

¹No. of samples taken =12; ²Contaminant of Concern; ³ATSDR Reference Media Evaluation Guide; ⁴NJDEP Residential Direct Contact Soil Cleanup Criteria; ⁵ATSDR Environmental Media Evaluation Guide; ⁶Not Available

Table 5: Concentration of Contaminants detected in the Stream Sediment collected (July 1984 and March 1988) from the Ringwood Mines/Landfill site

Contaminant	No. of Detection ¹	Concentration (mg/kg)		Environmental Guideline CV (mg/kg)	COC ²
		Range	Mean		
Volatile Organic Compounds (VOCs)					
4-methylphenol	1	0.16	0.16	2,800 (RDCSCC ³)	No
4-nitrophenol	1	0.9	0.9	630 (RBC ⁴)	No
Semi Volatile Organic Compounds (SVOCs)					
Benzo[a]anthracene	2	0.062 – 0.35	0.206	0.9 (RDCSCC)	No
Benzo[k]fluoranthene	1	0.42	0.42	0.9 (RDCSCC)	No
Benzo[a]pyrene	1	0.61	0.61	0.1 (CREG ⁵)	Yes
Bis[2-ethylhexyl]phthalate	2	0.083 – 0.12	0.1015	50 (CREG)	No
Chrysene	4	0.079 – 0.41	0.2	9 (RDCSCC)	No
Di-n-octylphthalate	1	0.22	0.22	20,000 (EMEG ⁶)	No
Fluoranthene	3	0.11 – 0.51	0.24	20,000 (EMEG)	No
Phenanthrene	1	0.17	0.17	NA ⁸	No
Pyrene	3	0.12 – 0.47	0.26	2,000 (RMEG)	No
Silvex	1	0.0075	0.0075	400 (RMEG ⁷)	No
Metals					
Antimony	1	2.2	2.2	20 (RMEG)	No
Arsenic	14	0.79 – 31.4	9.13	0.5 (CREG)	Yes
Barium	16	21 – 410	83.5	4,000 (RMEG)	No
Beryllium	9	0.46 - 2	0.92	100 (EMEG)	No
Cadmium	8	0.91 – 3.4	2.26	10 (EMEG)	No
Chromium	16	4.1 – 24	16.4	200 (RMEG)	No
Copper	16	0.163 – 39	12.37	1,000 (EMEG)	No
Iron	10	14,000 – 86,000	34,100	2,300 (RBC)	No
Lead	14	2.8 – 20	13.44	400 (RDCSCC)	No
Manganese	10	340 – 5,200	1,513	3,000 (RMEG)	No
Mercury	7	0.015 - 0.037	0.023	14 (RDCSCC)	No
Nickel	16	0.135 – 26	9.96	1,000 (RMEG)	No
Selenium	2	0.07 – 4.5	2.28	300 (EMEG)	No
Silver	9	0.5 – 0.95	0.72	300 (RMEG)	No
Thallium	10	5 – 14	9.45	2 (RDCSCC)	Yes
Zinc	16	17 – 130	61.25	20,000 (EMEG)	No

Table 5: (Cont'd.)

Contaminant	No. of Detection ¹	Concentration (mg/kg)		Environmental Guideline CV (mg/kg)	COC ²
		Range	Mean		
Other					
Cyanide	3	0.29 – 0.42	0.34	1,000 RMEG)	No
Phenolics	1	0.13	0.13	20,000 (RMEG)	No

¹No. of samples taken = 16; ²Cotaminant of Concern; ³NJDEP Residential Direct Contact Soil Cleanup Criteria; ⁴EPA Region 3 Risk-Based Concentration; ⁵ATSDR Cancer Risk Evaluation Guide; ⁶ATSDR Environmental Media Evaluation Guide; ⁷ATSDR Reference Media Evaluation Guide; ⁸Not Available

Table 6: Results of Brook Samples collected (July 1984, April 1985 and March 1988) from the Ringwood Mines/Landfill site

Contaminant	No. of Detection ¹	Concentration (µg/L)		Environmental Guideline CV (µg/L)	COC ²
		Range	Mean		
Semi Volatile Organic Compounds (SVOCs)					
Di-n-octyl phthalate	2	14 - 18	16	730 (RBC ³)	No
Metals					
Arsenic	1	40	40	10 (NJMCL ⁴)	Yes
Barium	1	150	150	2,000 (NJMCL)	No
Iron	20	64 – 4,200	957	11,000 (RBC)	No
Manganese	14	20 – 1,700	395	730 (RBC)	No
Zinc	14	10 - 520	133	3,000 (EMEG ⁵)	No
Other					
Nitrate (as N)	9	50 - 450	144	10,000	No
Phenolics	2	6 - 121	63.5	5,000 (RUL)	No

¹No. of samples taken = 20; ²Contaminant of Concern; ³EPA Region 3 Risk-Based Concentration; ⁴New Jersey Maximum Contaminant Level; ⁵ATSDR Environmental Media Evaluation Guide

Table 7: Results of Spring/Seep samples collected (July 1984 and March 1988) from the Ringwood Mines/Landfill site

Contaminant	No. of Detection ¹	Concentration (µg/L)		Environmental Guideline CV (µg/L)	COC ²
		Range	Mean		
Semi Volatile Organic Compounds (SVOCs)					
Benzene	2	1 – 2	1.5	1 (NJMCL ³)	Yes
Chlorobenzene	4	2 – 14	6.5	50 (NJMCL)	No
Chloroethane	1	2	2	3.6 (RBC ⁴)	No
1,2-Dichloropropane	1	12	12	5 (NJMCL)	Yes
Silvex	3	0.13 – 0.68	0.4	50 (NJMCL)	No
Metals					
Arsenic	6	10 – 21	12.66	5 (NJMCL)	Yes
Barium	10	100 – 400	210	2,000 (NJMCL)	No
Copper	1	330	330	1,300 (AL ⁵)	No
Iron	10	260 – 150,000	46,286	11,000 (RBC)	Yes
Lead	2	90 – 120	105	15 (AL)	Yes
Manganese	10	60 – 10,000	4,396	730 (RBC)	Yes
Mercury	6	0.4 – 8.7	2.43	2 (NJMCL)	Yes
Zinc	8	10 – 40	23.75	5,000 (NJMCL)	No
Other					
Fluoride	7	180 – 1,230	353	4,000 (NJMCL)	No
Nitrate (as N)	8	60 – 380	164	10,000 (NJMCL)	No
Phenolics	3	11 – 14	12	3,000 (RMEG ⁶)	No
Sulfate	10	6.4 – 18,000	12,005	250,000 (RUL)	No

¹No. of samples taken = 20; ²Contaminant of Concern; ³Maximum Contaminant Level; ⁴EPA Region 3 Risk-Based Concentration; ⁵Action Level; ⁶ATSDR Reference Media Evaluation Guide

Table 8: Results of Groundwater samples collected (August and September 1984, June 1986 and March 1988) from the Ringwood Mines/Landfill site

Contaminant	No. of Detection ¹	Concentration (µg/L)		Environmental Guideline CV (µg/L)	COC ²
		Range	Mean		
Volatile Organic Compounds (VOCs)					
Benzene	1	9.1	9.1	1 (NJMCL ³)	Yes
Methylene Chloride	1	19	19	3 (NJMCL)	Yes
1,1-dichloroethane	3	4 – 13	9.7	50 (NJMCL)	No
Chloroethane	2	2 – 3	2.5	3.6 (RBC ⁴)	No
Toluene	1	19	19	1,000 (NJMCL)	No
o,p-xylene	1	4	4	1,000 (NJMCL)	No
Ethylbenzene	1	2	2	700 (NJMCL)	No
Semi Volatile Organic Compounds (SVOCs)					
Benzoic Acid	3	2 - 11	6.3	40,000 (RMEG ⁵)	No
Bis(2-ethylhexyl) phthalate	3	5 - 5	5	4.8 (RBC)	Yes
Di-n-octyl phthalate	1	11	11	730 (RBC)	No
Pentachlorophenol	1	4	4	1 (NJMCL)	Yes
4-nitrophenol	1	3	3	60 (LTHA ⁶)	No
Metals					
Arsenic	8	2.2 - 56	16.4	5 (NJMCL)	Yes
Barium	8	100 - 700	247	2,000 (NJMCL)	No
Cadmium	3	20 – 93,000	41,000	5 (NJMCL)	Yes
Chromium	1	58	58	100 (NJMCL)	No
Copper	6	23 - 410	130	1,300 (AL ⁷)	No
Iron	14	160 – 33,000	9,630	11,000 (RBC)	Yes
Lead	4	50 - 85	65	15 (AL)	Yes
Manganese	13	50 – 5,400	1,316	730 (RBC)	Yes
Mercury	1	0.8	0.8	2 (NJMCL)	No
Nickel	1	50	50	200 (RMEG)	No
Thallium	1	100	100	2 (NJMCL)	Yes
Zinc	20	10 - 600	67.2	5,000 (RUL)	No

Table 8: (Cont'd.)

Contaminant	No. of Detection ¹	Concentration (µg/L)		Environmental Guideline CV (µg/L)	COC ²
		Range	Mean		
Other					
Fluoride	11	120 – 300	173.6	2,000 (RUL)	No
Nitrate (as N)	8	50 – 1,900	546.2	10,000 (NJMCL)	No
Phenolics	3	6 – 20	11.7	3,000 (RMEG)	No
Sulfate	13	7,700 – 30,000	15,238	250,000 (RUL)	No

¹No. of samples taken = 45; ²Contaminant of Concern; ³New Jersey Maximum Contaminant Level; ⁴EPA Region 3 Risk-Based Concentration; ⁵ATSDR Reference Media Evaluation Guide for child; ⁶ATSDR Lifetime Health Advisory for Drinking water; ⁷Action Level

Table 9: Results of off-site Potable Well samples collected during Environmental Monitoring Program (1989 – 95)

Contaminant	No. of Detection ¹	Concentration (µg/L)		Environmental Guideline CV (µg/L)	COC ²
		Range	Mean		
Volatile Organic Compounds (VOCs)					
Acetone	7	20.4 - 54.5	36.54	4,000 (RMEG ³)	No
2-Butanone (MEK)	2	9 - 41	25	6,000 (RMEG)	No
Carbon Disulfide	1	1	1	1,000 (RMEG)	No
Di-n-octyl phthalate	2	8.27 - 14.1	11.2	730 (RBC)	No
Tetrachloroethene	4	1 - 2.55	1.64	1 (NJMCL)	Yes
1,1,1-Trichloroethane	3	1 - 2.34	1.45	30 (NJMCL)	No
Metals					
Antimony	8	1.6 - 14.9	5.45	6 (NJMCL)	Yes
Arsenic	3	2.3 - 8.4	5.83	5 (NJMCL)	No
Barium	95	1.2 - 59.6	11.1	2,000 (NJMCL)	No
Beryllium	30	0.06 - 26	1.6	4 (NJMCL)	Yes
Cadmium	2	0.52 - 2.1	1.31	5 (NJMCL)	No
Chromium	17	0.41 - 11.3	1.88	100 (NJMCL)	No
Copper	146	2 – 1,200	80.14	1,300 (AL ⁶)	No
Iron	120	7.4 – 38,300	470	11,000 (RBC)	Yes
Lead	55	0.5 - 127	12.4	15 (AL)	Yes
Manganese	76	0.4 - 684	13	730 (RBC)	No
Mercury	2	0.5 - 0.62	0.56	2 (NJMCL)	No
Nickel	20	0.61 - 20	4	200 (RMEG)	No
Selenium	3	3.79 - 6.65	5.5	50 (NJMCL)	No

Table 9: (Cont'd.)

Contaminant	No. of Detection ¹	Concentration (µg/L)		Environmental Guideline CV (µg/L)	COC ²
		Range	Mean		
Metals					
Silver	7	0.15 – 5,850	2000	100 (RUL)	Yes
Tin	12	10.7 - 39.5	20.58	22,000 (RBC)	No
Vanadium	12	0.93 - 12	2.83	37 (RBC)	No
Zinc	137	3.9 – 1,500	188	5,000 (RUL)	No
Other					
Cyanide	1	29	29	200 (RMEG)	No

¹No. of potable wells tested = 9; chloroform, methylene chloride and bis(2-ethylhexyl) phthalate were detected but were qualified as invalid due to their presence in the blanks; ²Contaminant of Concern; ³ATSDR Reference Media Evaluation Guide; ⁴New Jersey Maximum Contaminant Level; ⁵EPA Region 3 Risk-Based Concentration; ⁶Action Level (New Jersey); ⁷Recommended Upper Limit (New Jersey Secondary Standards)

Table 10: Results of Groundwater samples collected (1989 - 1995) from the Ringwood Mines/Landfill site

Contaminant	No. of Detection ¹	Concentration (µg/L)		Environmental Guideline CV (µg/L)	COC ²
		Range	Mean		
Volatile Organic Compounds (VOCs)					
Benzene	7	1 - 9.1	3.73	1 (NJMCL ⁴)	Yes
2-Butanone (MEK)	3	4 - 37	20	6,000 (RMEG)	No
Carbon Disulfide	1	14.2	14.2	1,000 (RMEG)	No
Chloroethane	3	2 - 4	3	3.6 (RBC ⁵)	Yes
1,1-Dichloroethane	16	4 - 23	9.2	50 (NJMCL)	No
1,2-Dichloroethene	1	2	2	2 (NJMCL)	No
Di-n-octylphthalate	1	11	11	4,000 (EMEG ⁶)	No
Ethylbenzene	4	2 - 4	2.7	700 (NJMCL)	No
o, xylene	4	1 - 7	2.75	1,000 (NJMCL)	No
m,p xylene	4	1 - 9	4.25	1,000 (NJMCL)	No
4-Nitrophenol	1	3	3	60 (LTHA ⁷)	No
1,1,2,2-Tetrachloroethane	1	4	4	1 (NJMCL)	Yes
Toluene	5	2 - 160	37.6	1,000 (NJMCL)	No
1,1,1-Trichloroethane	2	2 - 4	3	30 (NJMCL)	No
Semi Volatile Organic Compounds (VOCs)					
Benzoic Acid	2	6 - 11	8.5	40,000 (RMEG)	No
Metals					
Aluminum	85	113 – 50,300	6,348	20,000 (RMEG)	Yes
Antimony	10	0.59 - 24.9	11.7	6 (NJMCL)	Yes
Arsenic	62	1.1 - 65	16.26	5 (NJMCL)	Yes
Barium	75	16 – 1,700	223	2,000 (NJMCL)	No
Beryllium	14	0.04 - 6.1	1.11	4 (NJMCL)	Yes
Cadmium	9	1.4 - 20	11.4	5 (NJMCL)	Yes
Chromium	54	2.1 - 272	26.8	100 (NJMCL)	Yes
Cobalt	26	0.18 - 144	30.45	100 (EMEG)	Yes
Copper	68	2.5 - 491	46.2	1,300 (AL ⁸)	No
Iron	108	160 – 376,000	30,930	11,000 (RBC)	Yes

Table 10: (Cont'd.)

Contaminant	No. of Detection ¹	Concentration (µg/L)		Environmental Guideline CV (µg/L)	COC ²
		Range	Mean		
Metals					
Lead	53	0.61 - 117	23.13	15 (AL)	Yes
Manganese	102	12 – 20,200	2,328	730 (RBC)	Yes
Mercury	3	0.37 - 2.51	1.23	2 (NJMCL)	Yes
Nickel	40	0.96 - 320	35.15	200 (RMEG)	Yes
Selenium	81	3.1 - 4.45	3.78	50 (NJMCL)	No
Silver	3	5 - 10	8.33	50 (RMEG)	No
Thallium	6	0.19 - 100	21	2 (NJMCL)	Yes
Tin	12	10.7 – 45.6	41.16	22,000 (RBC)	No
Vanadium	33	1.3 - 274	58	37 (RBC)	Yes
Zinc	99	4.8 - 785	69	3,000 (EMEG)	No
Cyanide	3	11.4 - 25	18.8	200 (NJMCL)	No

¹Number of wells tested = 8; acetone, methylene chloride and bis(2-ethylhexyl)phthalate were detected but were qualified as invalid due to their presence in the blanks; ²Contaminant of Concern; ³ATSDR Reference Media Evaluation Guide; ⁴New Jersey Maximum Contaminant Level; ⁵EPA Region 3 Risk-Based Concentration; ⁶ATSDR Environmental Media Evaluation Guide; ⁷Lifetime Health Advisory for drinking water (EPA); ⁸Action Level (New Jersey); ⁹Recommended Upper Limit, New Jersey Secondary Drinking Water Standard

Table 11: Summary of Exposure Pathways

Medium	Point of Exposure	Exposure Route	Exposed Population	Exposure Pathway Classification		
				Past	Present	Future
Paint sludge	Site (including residential properties)	Ingestion, skin	Residents, hunters, recreators	Completed	Completed	Completed
Surface soils	Site, including residential properties	Ingestion, skin	Residents, hunters, recreators	Completed	Completed	Completed
Sediments	Site	Ingestion, skin	Residents, hunters, recreators	Completed	Completed	Completed
Surface water	Site (Springs/Seeps, Brooks)	Ingestion, inhalation, skin	Residents	Completed	Eliminated	Eliminated
Groundwater	Site	Ingestion, inhalation, skin	Residents	Eliminated	Eliminated	Eliminated
	Off-site (Potable wells)			Potential	Potential	Potential
Ambient air	Site (including residential properties)	Inhalation	Residents, hunters, recreators	Potential	Potential	Potential
Biota	Site	Ingestion	Residents, hunters, recreators	Potential	Potential	Potential

Table 12: Comparison of Calculated Exposure Dose Based on Maximum and Mean Concentration of Contaminants Detected in the Paint Sludge with Non-Cancer Health Guideline CV at the Ringwood Mine/Landfill site

Contaminant	Concentration (mg/kg)		Exposure Dose ¹ (mg/kg/day)				Health Guideline CV (mg/kg/day)			Non Cancer Effects
	Max.	Mean	Maximum		Mean		ATSDR MRL ²	RfD ³	Reg 3 RfD ⁴	
			Child	Adult	Child	Adult				
Semi Volatile Organic Compounds (SVOCs)										
Bis(2-ethylhexyl) phthalate	380	120	1.53 x10 ⁻³	1.74 x10 ⁻⁴	4.85 x10 ⁻⁴	5.54 x10 ⁻⁵	NA ⁵	NA	0.02	No
Aroclor 1248	1.38	0.56	1.45 x10 ⁻⁵	1.65 x10 ⁻⁶	6.02 x10 ⁻⁶	6.88 x10 ⁻⁷	NA	0.00002	NA	No
Aroclor 1254	2.22	0.93								
Metals										
Antimony	460,000	47,137	1.85	2.11 x10 ⁻¹	1.89 x10 ⁻¹	2.16 x10 ⁻²	NA	0.0004	NA	Yes
Arsenic	16	4.33	6.43 x10 ⁻⁵	7.35 x10 ⁻⁶	1.74 x10 ⁻⁵	1.99 x10 ⁻⁶	0.0003	NA	NA	No
Cadmium	32	10.51	1.29 x10 ⁻⁴	1.47 x10 ⁻⁵	4.22 x10 ⁻⁵	4.83 x10 ⁻⁶	0.0002	NA	NA	No
Chromium ⁶	2,400	1,639	9.64 x10 ⁻³	1.10 x10 ⁻³	6.59 x10 ⁻³	7.53 x10 ⁻⁴	NA	0.003	NA	Yes
Copper	2,100	565	8.44 x10 ⁻³	9.64 x10 ⁻⁴	2.27 x10 ⁻³	2.59 x10 ⁻⁴	NA	NA	0.04	No
Lead	310,000	64,880	1.25	1.42 x10 ⁻¹	2.61 x10 ⁻¹	2.98 x10 ⁻²	NA	NA	NA	Yes

¹Adult Exposure scenario: 3 days/week, 9 month/year, 100 mg/day ingestion rate, 70 kg body weight and 7 year exposure duration, Child Exposure scenario: 3 days/week, 9 month/year, 200 mg/day ingestion rate, 16 kg body weight and 7 year exposure duration; ²Minimal Risk Level; ³EPA Reference Dose; ⁴EPA Region 3 Reference Dose; ⁵Not Available; ⁶as Chromium (VI)

Table 13: Comparison of Calculated Exposure Dose Based on Maximum and Mean Concentration of Contaminants Detected in the soil with Non-Cancer Health Guideline CV at the Ringwood Mine/Landfill site

Contaminant	Concentration (mg/kg)		Exposure Dose ¹ (mg/kg/day)				Health Guideline CV (mg/kg/day)			Non Cancer Effects
	Max.	Mean	Maximum		Mean		ATSDR MRL ²	RfD ³	Reg 3 RfD ⁴	
			Child	Adult	Child	Adult				
Volatile Organic Compound (VOCs)										
Benzene	34	34	1.37 x10 ⁻⁴	1.56 x10 ⁻⁵	1.37 x10 ⁻⁴	1.56 x10 ⁻⁵	NA ⁵	0.004	0.004	No
Semi Volatile Organic Compound (SVOCs)										
Benzo[a]pyrene	0.18	0.14	7.23 x10 ⁻⁷	8.27 x10 ⁻⁸	5.6 x10 ⁻⁷	6.4 x10 ⁻⁸	NA	NA	NA	No
Metals										
Arsenic	9.6	2.03	3.85 x10 ⁻⁵	4.4 x10 ⁻⁶	8.16 x10 ⁻⁶	9.3 x10 ⁻⁷	0.0003	NA	NA	No
Lead	1,300	129.6	5.22 x10 ⁻³	6 x10 ⁻⁴	5.21 x10 ⁻⁴	6 x10 ⁻⁵	NA	NA	NA	Yes
Thallium	19	19	7.63 x10 ⁻⁵	8.72 x10 ⁻⁶	7.63 x10 ⁻⁵	8.72 x10 ⁻⁶	NA	NA	0.00007	No

¹Adult Exposure scenario: 3 days/week, 9 month/year, 100 mg/day ingestion rate, 70 kg body weight and 40 year exposure duration, Child Exposure scenario: 3 days/week, 9 month/year, 200 mg/day ingestion rate, 16 kg body weight and 10 year exposure duration; ²Minimal Risk Level; ³EPA Reference Dose; ⁴EPA Region 3 Reference Dose; ⁵Not available

Table 14: Comparison of Calculated Exposure Dose Based on Maximum and Mean Concentration of Contaminants Detected in the sediment with Non-Cancer Health Guideline Values at the Ringwood Mines/Landfill site

Contaminant	Concentration (mg/kg)		Exposure Dose ¹ (mg/kg/day)				Health Guideline CV (mg/kg/day)			Non Cancer Effects
	Max.	Mean	Maximum		Mean		ATSDR MRL ²	RfD ³	Reg 3 RfD ⁴	
			Child	Adult	Child	Adult				
Semi Volatile Organic Compounds										
Benzo[a]pyrene	0.61	0.61	2.45 x10 ⁻⁶	2.08 x10 ⁻⁷	2.45 x10 ⁻⁶	2.08 x10 ⁻⁷	NA ⁵	NA	NA	No
Metals										
Arsenic	31.4	9.13	1.26 x10 ⁻⁴	1.44 x10 ⁻⁵	3.67 x10 ⁻⁵	4.19 x10 ⁻⁶	0.0003	NA	NA	No
Thallium	14	9.45	5.63 x10 ⁻⁵	6.43 x10 ⁻⁶	3.8 x10 ⁻⁵	4.34 x10 ⁻⁶	NA	NA	0.00007	No

¹Adult Exposure scenario: 3 days/week, 9 month/year, 100 mg/day ingestion rate, 70 kg body weight and 40 year exposure duration, Child Exposure scenario: 3 days/week, 9 month/year, 200 mg/day ingestion rate, 16 kg body weight and 10 year exposure duration; ²Minimal Risk Level; ³EPA Reference Dose; ⁴EPA Region 3 Reference Dose; ⁵Not Available

Table 15: Comparison of Calculated Exposure Dose Based on Maximum and Mean Concentration of Contaminants Detected in the Surface Water (Springs/Seeps, Brooks) with Non-Cancer Health Guideline Values at the Ringwood Mine/Landfill site

Contaminant	Concentration (µg/L)		Exposure Dose ¹ (mg/kg/day)				Health Guideline CV (mg/kg/day)			Non Cancer Effects
	Max.	Mean	Maximum		Mean		ATSDR MRL ²	RfD ³	Reg 3 RfD ⁴	
			Child	Adult	Child	Adult				
Volatile Organic Compounds (VOCs)										
Benzene	2	1.5	0.00013	0.00006	0.00009	0.00004	NA ⁵	0.004	NA	No
1,2-Dichloropropane	12	12	0.00075	0.00034	0.00075	0.00034	0.09	NA	NA	No
Metals										
Arsenic	40	16.56	0.0025	0.0011	0.001	0.00047	0.0003	NA	NA	Yes
Lead	120	105	0.0075	0.0034	0.0065	0.003	NA	NA	NA	Yes
Mercury	8.7	2	0.00054	0.00025	0.00015	0.00007	NA	NA	NA	Yes

¹Adult Exposure scenario: 3 days/week, 9 month/year, 2 L/day ingestion rate, 70 kg body weight and 20 year exposure duration, Child Exposure scenario: 3 days/week, 9 month/year, 1 L/day ingestion rate, 16 kg body weight and 10 year exposure duration; ²Minimal Risk Level; ³EPA Reference Dose; ⁴EPA Region 3 Reference Dose; ⁵Not Applicable

Table 16: Calculated Lifetime Excess Cancer Risk (LECR) based on the Maximum Concentration of Contaminants detected in the paint sludge

Contaminant	Concentration (mg/kg)		Cancer Exposure Dose ¹ (mg/kg/day)		DHHS Cancer Class ²	CSF ³	LECR ⁴	
	Maximum	Mean	Maximum	Mean			Max	Mean
Semi Volatile Organic Compounds (SVOCs)								
Bis(2-ethylhexyl) Phthalate	380	120	1.74 x10 ⁻⁵	5.54 x10 ⁻⁶	NA ⁵	0.014	2.44 x10 ⁻⁷	7.75 x10 ⁻⁸
Aroclor 1248	1.38	0.565	6.34 x10 ⁻⁸	2.6 x10 ⁻⁸	2	2	1.27 x10 ⁻⁷	5.2 x10 ⁻⁸
Aroclor 1254	2.219	0.932	1.02 x10 ⁻⁷	4.28 x10 ⁻⁸	2	2	2.04 x10 ⁻⁷	8.6 x10 ⁻⁸
Metals								
Antimony	460,000	47,137	2.1 x10 ⁻²	2.16 x10 ⁻³	3	NA	NA	NA
Arsenic	16	4.33	7.35 x10 ⁻⁷	2 x10 ⁻⁷	1	1.5	1.1 x10 ⁻⁶	3 x10 ⁻⁷
Cadmium	32	10.51	1.47 x10 ⁻⁶	4.83 x10 ⁻⁷	1 ⁶	NA	NA	NA
Chromium	2,400	1,639	1.1 x10 ⁻⁴	7.53 x10 ⁻⁵	1 ⁷	NA	NA	NA
Copper	2,100	565	9.64 x10 ⁻⁵	2.6 x10 ⁻⁵	3	NA	NA	NA
Lead	310,000	64,880	1.42 x10 ⁻²	3 x10 ⁻⁴	3	NA	NA	NA

¹Exposure scenario: 3 days/week, 9 month/year, 100 mg/day ingestion rate, 70 kg body weight and 7 year exposure duration; ²Department of Health and Human Services Cancer Class: 1 = known human carcinogen; 2 = reasonably anticipated to be a carcinogen; 3 = not classified; ³Cancer Slope Factor; ⁴Lifetime Excess Cancer Risk; ⁵Not available; ⁶Information on the carcinogenicity of chromium by oral exposure in humans was unavailable; ⁷Limited epidemiologic studies have indicated that exposure to cadmium in food or drinking water is not carcinogenic

Table 17: Calculated Lifetime Excess Cancer Risk (LECR) based on the Maximum and Mean Concentration of Contaminants detected in the soil

Contaminant	Concentration (mg/kg)		Cancer Exposure Dose ¹ (mg/kg/day)		DHHS Cancer Class ²	CSF ³	LECR ⁴	
	Maximum	Mean	Maximum	Mean			Max	Mean
Volatile Organic Compounds (VOCs)								
Benzene	34	34	1.56 x10 ⁻⁵	1.56 x10 ⁻⁵	1	0.055	8.6 x10 ⁻⁷	8.6 x10 ⁻⁷
Semi Volatile Organic Compounds (SVOCs)								
Benzo[a]pyrene	0.18	0.14	8.27 x10 ⁻⁸	6.43 x10 ⁻⁸	2	7.3	6 x10 ⁻⁷	4.7 x10 ⁻⁷
Metals								
Arsenic	9.6	2.03	4.4 x10 ⁻⁶	9.32 x10 ⁻⁷	1	1.5	6.6 x10 ⁻⁶	1.4 x10 ⁻⁶
Lead	1,300	129.6	6 x10 ⁻⁴	5.95 x10 ⁻⁵	3	NA ⁵	NA	NA
Thallium	19	19	8.72 x10 ⁻⁶	8.72 x10 ⁻⁶	3	NA	NA	NA

¹Exposure scenario: 3 days/week, 9 month/year, 100 mg/day ingestion rate, 70 kg body weight and 7 year exposure duration; ²Department of Health and Human Services Cancer Class: 1 = known human carcinogen; 2 = reasonably anticipated to be a carcinogen; 3 = not classified; ³Cancer Slope Factor; ⁴Lifetime Excess Cancer Risk; ⁵Not Applicable

Table 18: Calculated Lifetime Excess Cancer Risk (LECR) based on Maximum and Mean Concentration of Contaminants detected in the Sediment at the Ringwood Mines/Landfill Site

Contaminant	Concentration (mg/kg)		Cancer Exposure Dose ¹ (mg/kg/day)		DHHS Cancer Class ²	CSF ³	LECR ⁴	
	Maximum	Mean	Maximum	Mean			Max	Mean
Semi Volatile Organic Compounds (SVOCs)								
Benzo[a]pyrene	0.61	0.61	1.6 x10 ⁻⁷	1.6 x10 ⁻⁷	2	7.3	1.17 x10 ⁻⁶	1.17 x10 ⁻⁶
Metals								
Arsenic	31.4	9.13	8.24 x10 ⁻⁶	2.4 x10 ⁻⁶	1	1.5	1.24 x10 ⁻⁵	3.6 x10 ⁻⁶
Thallium	14	9.45	3.67 x10 ⁻⁶	2.48 x10 ⁻⁶	3	NA	NA	NA

¹Exposure scenario: 3 days/week, 9 month/year, 100 mg/day ingestion rate, 70 kg body weight and 7 year exposure duration; ²Department of Health and Human Services Cancer Class: 1 = known human carcinogen; 2 = reasonably anticipated to be a carcinogen; 3 = not classified; ³Cancer Slope Factor; ⁴Lifetime Excess Cancer Risk; ⁵Not available

Table 19: Calculated Lifetime Excess Cancer Risk (LECR) based on Maximum Concentration of Contaminants detected in the Surface Water (Springs/Seeps, Brooks)

Contaminant	Concentration (µg/L)		Cancer Exposure Dose (mg/kg/day) ¹		DHHS Cancer Class ²	CSF ³	LECR ⁴	
	Maximum	Mean	Maximum	Mean			Max	Mean
Volatile Organic Compounds (VOCs)								
Benzene	2	1.5	0.00002	0.00001	1	0.055	9 x10 ⁻⁷	6.73 x10 ⁻⁷
1,2-Dichloropropane	12	12	0.00114	0.00034	3	NA ⁵	NA	NA
Metals								
Arsenic	40	16.56	0.00033	0.00014	1	1.5	4.9 x10 ⁻⁴	2.03 x10 ⁻⁴
Lead	120	105	0.00098	0.00086	3	NA	NA	NA
Mercury	8.7	2	0.00007	0.00002	3	NA	NA	NA

¹Exposure scenario: 2 L/day ingestion rate, 70 kg body weight and 20 year exposure duration; ²Department of Health and Human Services Cancer Class: 1 = known human carcinogen; 2 = reasonably anticipated to be a carcinogen; 3 = not classified; ³Cancer Slope Factor; ⁴Lifetime Excess Cancer Risk; ⁵Not available