APPENDIX B

Tables

Table 1.
Liberty Industrial Finishing Site
On-Site Surface Soil Sampling Results
Remedial Investigation - October 1993
[All values in milligrams per kilogram]
(see Table 7 for Public Health Assessment Comparison Values)

Compound	Frequency of Detection	Range of Detection
Semi-Volatile Organics		
1,2-dichlorobenzene	1/7	0.54J
2-methylnaphthalene	2/7	0.22J; 0.083J
acenaphthene	1/7	0.41J
phenanthrene	4/7	0.11J-3.5
anthracene	2/7	0.098J; 1J
di-n-butylphthalate	2/7	1.1; 5.2
fluoranthrene	4/7	0.16J-4.6
pyrene	4/7	0.16J-3.7
butylbenzylphthalate	4/7	0.09J-4.2
benzo(a)anthracene	3/7	0.12J-2.3J
chrysene	4/7	0.2J-2.5
bis(2-ethylhexyl)phthalate	4/7	0.18J-2.4J
benzo(b)fluoranthene	4/7	0.21J-2.4J
benzo(k)fluoranthene	4/7	0.049J-1.4J
benzo(a)pyrene	4/7	0.097J-1.9J
indeno(1,2,3-cd)pyrene	4/7	0.12J-1.6J
dibenz(a,h)anthracene	3/7	0.046J-0.68J
benzo(g,h,i)perylene	4/7	0.11J-1.3J
Pesticides/PCBs		
Aroclor 1254	1/9	0.40
Aroclor 1260	5/19	0.33-0.7
Inorganics		
arsenic	7/7	0.68-5.3
barium	7/7	10-150
antimony	4/7	2.6-31
aluminum	7/7	1,700-11,000
zinc	7/7	23-370
vanadium	7/7	5.5-50
sodium	7/7	8.2-240
potassium	7/7	140-570
nickel	7/7	6.3-63
manganese	7/7	35-150
magnesium	7/7	200-1,400
iron	7/7	3,400-25,000
cobalt	7/7	0.74-5.0
calcium	7/7	160-11,000
beryllium	3/7	0.28-0.37
cadmium	7/7	1-71
copper	7/7	7.3-220
lead	7/7	7.5-510
silver	3/7	0.45-1.9
chromium	7/7	41-2,100
selenium	4/7	0.4-0.99
mercury	3/7	0.27-0.37

J = estimated value

Table 2.

Liberty Industrial Finishing Site
On-Site and Off-Site Subsurface Soil Sampling Results
Remedial Investigation
(All values in milligrams per kilogram)
[See Table 7 for Public Health Assessment Comparison Values]

Compound	On-Site Soil Borings			On-Site Test Pits		Off-Site Hand Auger Samples	
	Frequency	Range of Detection	Background Range (Sample SB-1)	Frequency	Range of Detection	Frequency	Range of Detection
Volatile Organics							
methylene chloride	3/76	0.011J-0.080J	ND	6/71	0.002J-0.066J	ND	ND
acetone	57/76	0.007J-16	1.1J	11/71	0.006J-0.62J	ND	ND
1,1-dichloroethane	1/76	12J	ND	2/71	0.007J-0.013	ND	ND
1,2-dichloroethene (total)	10/76	0.003J-1100J	ND	8/71	0.001J-15J	ND	ND
chloroform	1/76	0.002J	ND	1/71	0.063J	ND	ND
2-butanone	5/76	0.021J-0.99J	ND	10/71	0.002J-0.036	ND	ND
1,1,1-trichloroethane	2/76	0.039J-56J	ND	4/71	0.001J-0.023	ND	ND
*trichloroethene	23/76	0.001J-1700J	ND	31/71	0.001J-185	ND	ND
benzene	2/76	0.078, 6.1J	ND	ND	ND	ND	ND
tetrachloroethene	5/76	0.002J-7.8J	ND	15/71	0.001J-15J	ND	ND
toluene	13/76	0.001J-24J	ND	10/71	0.001J-190	ND	ND
chlorobenzene	5/76	0.001J-430J	ND	3/71	0.001J-0.26	ND	ND
ethylbenzene	10/76	0.001J-6100J	ND	6/71	0.008J-0.69J	ND	ND
*styrene	3/76	0.47J-2200J	ND	ND	ND	ND	ND
xylene (total)	9/76	0.005J-10	ND	7/81	0.008J-13J	ND	ND
vinyl chloride	ND	ND	ND	1/71	0.14J	ND	ND
1,2-dichloroethane	ND	ND	ND	1/71	0.063J	ND	ND
carbon tetrachloride	ND	ND	ND	1/71	0.063J	ND	ND
bromodichloromethane	ND	ND	ND	1/71	0.063J	ND	ND
1,2-dichloropropane	ND	ND	ND	1/71	0.063J	ND	ND
cis-1,3-dichloropropene	ND	ND	ND	1/71	0.063J	ND	ND
4-methyl-2pentanone	ND	ND	ND	2/71	0.002J-0.046J	ND	ND
2-hexanone	ND	ND	ND	2/71	0.002J-0.046J	ND	ND
Semi-Volatile Organics							
phenol	ND	ND	ND	1/13	0.30J	ND	ND
1,3-dichlorobenzene	1/14	0.016J	ND	ND	ND	ND	ND
1,4-dichlorobenzene	2/14	0.069J, 0.26J	ND	1/13	0.074J	ND	ND
1,2-dichlorobenzene	2/14	0.18j-1.08	ND	1/13	0.084J	ND	ND
naphthalene	2/14	0.024J, 0.074J	ND	4/13	0.022J-0.63J	ND	ND
2-methylphenol	ND	ND	ND	1/13	0.068J	ND	ND
2,4-dimethylphenol	ND	ND	ND	1/13	0.07J	ND	ND
2-methylnaphthalene	1/14	0.19J	ND	6.13	0.04J-2.6J	ND	ND
acenaphthene	1/14	0.071J	ND	1/13	0.38J	ND	ND
dibenzofuran	1/14	0.016J	ND	1/13	0.043J	ND	ND
fluorene	2/14	0.019J-0.12J	ND	1/13	0.50J	ND	ND
phenanthrene	3/14	0.12J-12J	ND	3/13	0.051J-1.2J	ND	ND
anthracene	2/14	0.025J, 11J	ND	3/13	0.045J-0.55J	ND	ND
di-n-butylphthalate	2/14	0.030J, 0.039J	ND	3/13	0.029J-0.15J	ND	ND
fluoranthene	2/14	0.080J, 0.36J	ND	1/13	0.12J	ND	ND
pyrene	2/14	0.103J, 0.34J	ND	2/13	0.12J, 0.50J	ND	ND
butylbenzylphthalate	4/14	0.073J-0.33J	ND	ND	ND	ND	ND

Table 2 (page 2).

Liberty Industrial Finishing Site
On-Site and Off-Site Subsurface Soil Sampling Results
Remedial Investigation
(All values in milligrams per kilogram)
[See Table 7 for Public Health Assessment Comparison Values]

Compound	On-Site Soil Borings			On-Site Test Pits		Off-Site Hand Auger Samples	
	Frequency	Range of Detection	Background Range (Sample SB-1)	Frequency	Range of Detection	Frequency	Range of Detection
Semi-Volatile Organics (continued)							
benzo(a)anthracene	1/14	0.12J	ND	ND	ND	ND	ND
chrysene	3/14	0.24J-1.3J	ND	ND	ND	ND	ND
bis(2-ethylhexyl)phthalate	7/14	0.085J-19	ND	4/13	1.1J-2.8J	ND	ND
di-n-octylphthalate	5/14	0.059J-2.2J	ND	ND	ND	ND	ND
benzo(b)fluoranthene	3/14	0.36J-0.87J	ND	ND	ND	ND	ND
benzo(k)fluoranthene	3/14	0.14J-0.49J	ND	ND	ND	ND	ND
benzo(a)pyrene	1/14	0.14J	ND	ND	ND	ND	ND
benzo(g,h,i)perylene	1/14	0.068J	ND	ND	ND	ND	ND
Pesticides/PCBs							
heptachlor	1/15	0.001J	ND	ND	ND	ND	ND
heptachlor epoxide	1/15	0.084J	ND	ND	ND	ND	ND
4,4'-DDE	1/15	0.016J	ND	2/12	0.0021J, 0.0026J	ND	ND
endrin	2/15	0.002J, 0.004	ND	2/12	0.0021J, 0.0031J	ND	ND
endosulfan II	ND	ND	ND	2/12	0.0015J	ND	ND
4,4'-DDD	1/15	0.018J	ND	ND	ND	ND	ND
endosulfan sulfate	1/15	0.002J	ND	1/12	0.0036J	ND	ND
4,4'-DDT	ND	ND	ND	1/12	0.0069J	ND	ND
methoxychlor	1/15	0.005J	ND	3/12	0.0014J-0.075	ND	ND
endrin ketone	3/15	0.0007J-0.39J	ND	2/12	0.00085J, 0.0011J	ND	ND
endrin aldehyde	ND	ND	ND	1/12	0.0029J	ND	ND
alpha-chlordane	3/15	0.0003J-0.016J	ND	ND	ND	ND	ND
gamma-chlordane	ND	ND	ND	1/12	0.014J	ND	ND
*aroclor-1242	ND	ND	ND	1/12	1.3J	ND	ND
*aroclor-1248	2/15	0.48J, 2.2	ND	1/12	2.6J	ND	ND
*aroclor-1254	3/15	0.27-1.8J	ND	6/12	0.14J-2.2J	ND	ND
*aroclor-1260	4/15	0.12J-200J	ND	1/12	9	ND	ND
Inorganics							
*aluminum	77/77	442-32,900	13,200	71/71	73.4-297,000	11/11	1,160-10,100
antimony	12/77	1.7-22.5	ND	13/71	1.7-709	ND	ND
*arsenic	65/77	0.67-17	3.20J	64/71	0.41J-42.9	11/11	0.82-6
barium	76/77	0.82-591	36.8J	68/71	1.4-500	11/11	2.7-23.3
beryllium	26/77	0.20-0.72	0.42	28/71	0.20-1.9	10/11	0.23-0.54
cadmium	47/77	0.23-197	0.27	55/71	0.20-1180	ND	ND
calcium	77/77	36.7-67,500	157	71/71	40.4-99,700	11/11	8.1-452
*chromium	77/77	2.5-2710J	15.7J	71/71	0.98-43,300	11/11	1.5-68.5
cobalt	52/77	0.62-11.1	4.5	62/71	0.62-14.4J	10/11	0.82-28.7
*copper	62/77	1-2,760	9.8	68/71	1.8-9,120	11/11	2.5-11.3
*iron	77/77	766-19,800	9,440	71/71	99.9-255,000	11/11	2,390-35,300
*lead	71/77	0.67J-1220	8.8	69/71	0.58J-2,670	11/11	0.86J-9.1J

Table 2 (page 3).

Liberty Industrial Finishing Site
On-Site and Off-Site Subsurface Soil Sampling Results
Remedial Investigation
(All values in milligrams per kilogram)
[See Table 7 for Public Health Assessment Comparison Values]

Compound	On-Site Soil Borings			On-Site Test Pits		Off-Site Hand Auger Samples	
	Frequency	Range of Detection	Background Range (Sample SB-1)	Frequency	Range of Detection	Frequency	Range of Detection
Inorganics (continued)							
magnesium	77/77	92.9-2,990	2,060	70/71	32.2-3,390	11/11	154-1,120
manganese	65/77	4.7-217	78.6	66/71	0.70-2,530	Data Rejected	
mercury	22/77	0.10-3.2	0.44	26/71	0.09-1.3	ND	ND
nickel	71/77	0.81-149J	8.3	65/71	1.6-793	1/11	4.9
potassium	77/77	60.5-836	305J	71/71	37.7-22,400	11/11	102-315
selenium	1/77	8.8J	ND	3/71	1.1J-3J	2/11	0.44, 0.48
silver	12/77	0.41-10.9	ND	22/71	0.46-48.3	ND	ND
sodium	74/77	7.5-1,870	60	70/71	10.2-1,330	6/11	40.5-54.9
thallium	ND	ND	ND	4/71	0.60-1.1	4/11	0.27-0.49
vanadium	73/77	1.1-40.8	20.5	69/71	1.2-104	11/11	1.3-19.9
*zinc	64/77	2.6-5,060	23.4	64/71	3.3J-187,000	11/11	3.4-21.2
cyanide	18/77	7.7-228	--	30/71	1.5-1,220	2/11	0.21

ND - not detected
J - estimated value

Soil Sampling Depth: Test Pits (0-13 ft.)
Soil Borings (0-18 ft.)
Hand Auger (1-3.5 ft.)

*Contaminant selected for further evaluation.

NOTE: The off-site hand auger samples were collected at the Ellsworth Allen Park

Table 3.

Liberty Industrial Finishing Site
Summary of Groundwater Data (On-Site Monitoring Wells)
Remedial Investigation
[All values in micrograms per liter (mcg/L)]
(see Table 8 for Public Health Assessment Comparison Values)

Compound	Frequency of Detection	Range of Detection
Volatile Organics		
*1,1-dichloroethane	5/34	1J-58J
*1,2-dichloroethene (total)	10/34	4J-1,800
*1,1,1-trichloroethane	6/34	6J-12
*trichloroethene	12/34	3J-1,400
acetone	1/34	8J
chloroform	1/34	1J
2-hexanone	2/34	10J
*1,2-dichloropropane	1/34	2J
*1,1,2-trichloroethane	1/34	2J
*benzene	2/34	2J
*tetrachloroethene	10/34	2J-24J
Semi-Volatile Organics		
diethylphthalate	2/23	1J-2J
*4-nitroaniline	1/23	25J
*pentachlorophenol	2/23	3J
di-n-butylphthalate	4/23	1J-3J
butylbenzylphthalate	1/23	1J
pyrene	2/23	1J, 2J
chrysene	3/23	0.8J-4J
*bis(2-ethylhexyl)phthalate	7/23	0.6J-400J
naphthalene	1/23	5J
Pesticides/PCBs		
*dieldrin	5/23	0.004J-0.064J
4,4'-DDE	1/23	0.0052J
endosulfan sulfate	2/23	0.0035J, 0.01
alpha-chlordane	2/23	0.0056J, 0.02
Inorganics		
*aluminum	19/31	29J-7,060
*arsenic	12/31	1-5.3
barium	31/31	5-80
beryllium	1/31	0.78J
*cadmium	25/34	1.3-609
calcium	31/31	277-38,200J
*chromium	29/34	2.8-888
cobalt	7/31	3-9.2
copper	16/31	4-149

Table 3 (page 2).

Liberty Industrial Finishing Site
Summary of Groundwater Data (On-Site Monitoring Wells)
Remedial Investigation
[All values in micrograms per liter (mcg/L)]
(see Table 8 for Public Health Assessment Comparison Values)

Compound	Frequency of Detection	Range of Detection
Inorganics (continued)		
*iron	31/31	59.7J-18,000
lead	21/31	1.1J-9.5J
magnesium	31/31	1,750-5,140
*manganese	29/31	2.9-2,890
mercury	1/26	0.20
*nickel	17/31	4J-141
potassium	31/31	1,340-26,000J
selenium	4/31	1J-6.2J
*sodium	30/31	3,800-40,400J
*thallium	3/31	3.6J-40.5J
vanadium	7/31	7.7-13.5
*cyanide	8/34	31.1-540
*hexavalent chromium	6/11	6.3J-130J

Note: Only detected compounds are reported.

J = estimated value
*Contaminant selected for further evaluation.

Table 4.

Liberty Industrial Finishing Site
Off-Site Surface Water Sampling Results - Massapequa Creek
Remedial Investigation
[All values in micrograms per liter (mcg/L)]

Compound	Frequency of Detection	Range of Detection
Volatile Organics		
1,2-dichloroethene (total)	1/11	1J
trichloroethene	3/11	2J-4J
dibromochloromethane	1/11	0.8J
tetrachloroethene	3/11	0.6J-2J
toluene	1/11	0.6J
Inorganics		
aluminum	11/11	103-417
barium	11/11	3.9-44.6
cadmium	3/11	4.9-10.8
calcium	11/11	15,400-20,800
chromium	5/11	8.2-44.9
cobalt	3/11	5.1-6.5
copper	1/11	13J
iron	11/11	191-1,590
lead	11/11	1.4-12
magnesium	11/11	599-4,810
manganese	11/11	13.8-587
potassium	9/11	639-8,280
sodium	11/11	7,540-52,600
zinc	9/11	7.1-110

Note: Only detected compounds are reported.

J = estimated value

Table 5.

Liberty Industrial Finishing Site
Off-Site Sediment Sampling Results - Massapequa Creek
Remedial Investigation
[All values in milligrams per kilogram (mg/kg)]

Compound	Frequency of Detection	Range of Detection
Volatile Organic		
toluene	1/11	.062
Inorganic		
aluminum	11/11	608-2,230J
arsenic	11/11	0.17-5.4J
barium	11/11	2.1-110J
cadmium	6/11	1.1-5.3
calcium	11/11	199J-3,380J
chromium	11/11	4.30-44.10
cobalt	10/11	1.4-15.2J
copper	11/11	1.7-37.1J
iron	11/11	721-16,200J
lead	11/11	10.3-227J
magnesium	11/11	116-1,340J
manganese	11/11	17.4-3,820J
mercury	1/11	0.27J
nickel	5/11	5.6-14.4J
potassium	7/11	163-484J
selenium	2/11	0.14
silver	1/11	1.2
sodium	11/11	23.2-245J
thallium	1/11	0.32J
vanadium	10/11	1.2-14.8J
zinc	11/11	7.2J-188J

Note: Only detected compounds are reported.

J = estimated value

Table 6.

Liberty Industrial Finishing Site
Summary of Groundwater Data (Off-Site Monitoring Wells)
Remedial Investigation
[All values in micrograms per liter (mcg/L)]
(see Table 8 for Public Health Assessment Comparison Values)

Compound	Frequency of Detection	Range of Detection
Volatile Organics		
*vinyl chloride	1/34	13J
acetone	2/34	10J
*methylene chloride	1/34	10J
*1,1-dichloroethane	5/34	1J-8J
carbon disulfide	1/34	4J
*1,2-dichloroethene (total)	7/34	1J-120J
*1,1,1-trichloroethane	5/34	1J-22
chloroform	2/34	0.4J, 2J
*trichloroethene	16/34	1J-1,300J
*tetrachloroethene	10/34	1J-8J
2-hexanone	2/34	10J
*1,1-dichloroethene	3/34	3J-5J
benzene	1/34	1J
*chlorobenzene	1/34	2
Semi-Volatile Organics		
phenol	3/34	1J-3J
di-n-butylphthalate	1/34	0.9J
*bis(2-ethylhexyl)phthalate	6/34	0.5J-19J
Pesticides/PCBs		
delta-BHC	1/34	0.0019J
heptachlor	1/34	0.0055J
*heptachlor epoxide	6/34	0.0078J-0.059
*dieldrin	20/34	0.0058J-0.2J
endrin	1/34	2.5
4,4'-DDD	3/34	0.012J-0.013J
4,4'-DDT	1/34	0.0047J
endrin ketone	11/34	0.0055J-0.087
*alpha-chlordane	10/34	0.0039J-0.021
*gamma-chlordane	4/34	0.0035J-0.026
Inorganics		
*aluminum	21/41	348-4,870
*arsenic	14/41	1-3.7
barium	41/41	13.7-132
beryllium	9/41	0.79J-1.9
*cadmium	24/49	1.2-143
calcium	41/41	5,690-28,700
*chromium	28/49	3.5J-518

Table 6 (page 2).

Liberty Industrial Finishing Site
Summary of Groundwater Data (Off-Site Monitoring Wells)
Remedial Investigation
[All values in micrograms per liter (mcg/L)]
(see Table 8 for Public Health Assessment Comparison Values)

Compound	Frequency of Detection	Range of Detection
Inorganics (continued)		
cobalt	9/41	3.6J-5.9
copper	9/41	5.8-10.9
*iron	41/41	150-14,600
lead	26/41	1J-14.2
magnesium	41/41	1,250-7,610
*manganese	40/41	4.2-2,950J
mercury	1/42	0.25
nickel	6/41	4.8-12.8J
potassium	41/41	913-27,500
selenium	4/41	1.3J-3.7J
*sodium	41/41	7,930-71,500
vanadium	19/41	2.4J-11
zinc	31/41	6.2-30.7
cyanide	4/49	2.75-12.1J
*hexavalent chromium	5/17	15-380J

Note: Only detected compounds are reported.

J = estimated value
*Contaminant selected for further evaluation.

Table 7.
Public Health Assessment Comparison Values that are Exceeded by Contaminants Found in Soils at and Near the Liberty Industrial Finishing Site
[All values in milligrams per kilogram (mg/kg)]

Compound	Typical Background Range*	Comparison Values					
		Nonresidential Setting**				Industrial Setting***	
		Cancer	Basis****	Noncancer	Basis****	Cancer	Noncancer
Volatile Organics							
trichloroethene	ND	1,800	EPA CPF	4,300	NYS DOH RfG	470	22,000
styrene	ND	650	EPA HEAST	120,000	EPA RfD	170	590,000
Semi-Volatile Organics							
indeno(1,2,3-cd)pyrene	+	14[aa]	b	17,000	a	3.0[aa]	89,000[a]
benzo(a)anthracene	+	14[aa]	b	17,000	a	3.0[aa]	89,000[a]
chrysene	+	1,400[aa]	b	17,000	a	300[aa]	89,000[a]
benzo(b)fluoranthene	+	14[aa]	b	17,000	a	3.0[aa]	89,000[a]
benzo(k)fluoranthene	+	140[aa]	b	17,000	a	30[aa]	89,000[a]
benzo(a)pyrene	+	1.4	NYS DOH CPF	17,000	a	0.3	89,000[a]
dibenz(a,h)anthracene	+	1.4[aa]	b	17,000	a	0.3[aa]	89,000[a]
Pesticides/PCBs							
aroclor-1242	<0.01-0.04[c]	2.5	EPA CPF	12	ATSDR MRL	0.7	59
aroclor-1248	<0.01-0.04[c]	2.5	EPA CPF	12	ATSDR MRL	0.7	59
aroclor-1254	<0.01-0.04[c]	2.5	EPA CPF	12	ATSDR MRL	0.7	59
aroclor-1260	<0.01-0.04[c]	2.5	EPA CPF	12	ATSDR MRL	0.7	59
Inorganics							
aluminum	7,000-100,000	--	--	--	--	--	--
arsenic	10-20	11	EPA CPF	175	EPA RfD	2.9	885
chromium	10-40	--	--	2,915	EPA RfD	--	14,750
copper	<1-25	--	--	22,130	EPA HEAST	--	383,500
iron	10,000-40,000	--	--	--	--	--	--
lead	300	--	--	--	--	--	--
zinc	50-100	--	--	170,000	EPA RfD	--	890,000

ND - not determined

*References: Adriano (1986); Clarke et al. (1985); Connor et al. (1957); Davis and Bennett (1983); Dragun (1988); Frank et al. (1976); McGovern (1988); Schacklette and Boerngen (1984).
**Comparison values for cancer risk are determined for a 70 kg adult trespassing on-site and who ingests 50 mg soil per day, 2 days per week for 3 months per year; comparison values for noncancer risk are determined for a 21 kg child trespassing on-site and who ingests 100 mg soil per day, 5 days per week for 6 months per year.
***Comparison values for cancer risk are determined for a 70 kg adult who ingests in the work place 50 mg soil per day, 5 days per week, 8 months per year and assuming that exposure occurs for 40 working years out of a 70 year lifetime; comparison values for noncancer risk are determined for a 70 kg adult who ingests in the workplace 50 mg soil per day, 5 days per week for 8 months per year.
****EPA CPF = US EPA Cancer Potency Factor
EPA RfD = US EPA Reference Dose
EPA HEAST = US EPA Health Effects Assessment Summary Table
ATSDR MRL = ATSDR Minimal Risk Level
NYS DOH CPF = NYS DOH Cancer Potency Factor
[†]Based on reported background levels for total polycyclic aromatic hydrocarbons of 1 to 13 mg in soil (ATSDR, 1993i; Edwards, 1983).
[a]Used oral EPA RfD for pyrene
[b]Used NYS DOH oral Cancer Potency Factor for benzo(a)pyrene
[c]Total Aroclors
[aa]Public health assessment comparison value adjusted according to US EPA's interim relative potency factors for polycyclic aromatic hydrocarbons.

Table 8.

Water Quality Standards/Guidelines and/or Public Health Assessment Comparison Values
that are Exceeded by Contaminants Found in Sources of Drinking Water at or Near the Liberty Industrial Finishing Site
[All values in micrograms per liter (mcg/L)]

	Water Quality Standards/Guidelines				Comparison Values*			
	New York State		U.S. EPA					
Contaminant	Ground-water	Surface Water	Drinking Water	Drinking Water	Cancer	Basis**	Noncancer	Basis**
Volatile Organics								
benzene	0.7	0.7	5	5	1.2	EPA CPF	4.9	ATSDR, 1987
chlorobenzene	5	20	5	100	--	--	100	EPA LTHA
1,1-dichloroethane	5	5(g)	5	--	--	--	700	EPA HEAST
1,1-dichloroethene	5	0.07(g)	5	7	0.058	EPA CPF	7	EPA LTHA
1,2-dichloroethene (total)	5	5(g)	5	70	--	--	70	EPA LTHA
1,2-dichloropropane	5	0.5(g)	5	5	0.51	EPA HEAST	630	ATSDR, 1989
methylene chloride	5	5(g)	5	5	4.8	EPA CPF	420	EPA RfD
tetrachloroethene	5	0.7(g)	5	5	0.67	EPA CPF	70	EPA RfD
1,1,1-trichloroethane	5	5(g)	5	200	--	--	200	EPA LTHA
1,1,2-trichloroethane	5	0.6	5	5	0.61	EPA CPF	3	EPA LTHA
trichloroethene	5	3	5	5	3.3	EPA CPF	52	EPA RfD
vinyl chloride	2	0.3(g)	2	2	0.018	EPA HEAST	0.14	ATSDR MRL
Semi-Volatile Organics								
bis(2-ethylhexyl)phthalate	50	4(g)	6	6	2.5	EPA CPF	140	EPA RfD
4-nitroaniline	5	--	5	--	--	--	--	--
pentachlorophenol	1	1	1	1	0.29	EPA CPF	210	EPA RfD
Pesticides								
chlordane	0.1	0.02(g)	2	2	0.02	NYS DOH CPF	0.42	EPA RfD
dieldrin	ND[a]	0.0009	5	--	0.0009	NYS DOH CPF	0.35	EPA RfD
heptachlor epoxide	ND	0.009	0.2	0.2	0.004	EPA CPF	0.09	EPA RfD
Inorganics								
aluminum	--	--	--	50-200[a]	--	--	--	--
arsenic	25	50	50	50++	0.02	EPA CPF	1.1	EPA RfD
cadmium	10	10	5	5	--	--	5	EPA LTHA
chromium	50	50	100	100	--	--	100	EPA LTHA
iron	300	300	300	300[a]	--	--	--	--
manganese	300	300	300	50[a]	--	--	200	EPA RfD
nickel	--	--	--	--	--	--	100	EPA LTHA
sodium	20,000	--	+	--	--	--	--	--
thallium	4(g)	4(g)	2	2	--	--	0.4	EPA LTHA
cyanide	100	100	--	200(p)	--	--	200	EPA LTHA

Footnotes for Table 8.

a = ND = not detected
g = Guidance value
s = Secondary maximum contaminant level (MCL) based on aesthetic considerations
p = proposed

*Comparison value determined for a 70 kg adult who drinks 2 liters of water per day.

**EPA RfD = EPA Reference Dose
EPA LTHA = EPA Lifetime Health Advisory
EPA HEAST = EPA Health Assessment Summary Tables
ATSDR MRL = ATSDR Oral Minimal Risk Level
ATSDR, 1987 = ATSDR Toxicological Profile for Benzene, Draft, December 1987
ATSDR, 1989 = ATSDR Toxicological Profile for 1,2-Dichloropropane, ATSDR/TP-89/12

+No designated limit; water containing more than 20,000 mcg/L should not be used for drinking by people on severely restricted sodium diets; water containing more than 270,000 mcg/L should not be used for drinking by people on moderately restricted sodium diets.

++Under review

Table 9.
Liberty Industrial Finishing Site
Chlordane and PCBs Detected in Fish Collected from Massapequa Reservoir in 1991
[All values in milligrams per kilogram (mg/kg)]

Contaminant	Range of Detection	Average Level	Comparison Values			
			Cancer**	Basis***	Noncancer**	Basis***
*chlordane	0.420-0.579	0.526	0.001	NYS CPF	0.13	EPA RfD
*PCBs	0.428-0.649	0.585	0.0003	EPA CPF	0.04	ATSDR MRL

*Contaminant selected for further evaluation.

**Comparison values are determined for a 70 kilogram adult who eats 32 grams of fish (with skin-on) per day.

***EPA CPF = EPA Cancer Potency Factor
EPA RfD = EPA Reference Dose
ATSDR MRL = ATSDR Minimal Risk Level
NYS CPF = NYS Cancer Potency Factor

APPENDIX C

Quality Assurance and Quality Control

Quality Assurance and Quality Control

In preparing this PHA, NYS DOH relied on the information provided in the referenced documents and assumed that adequate quality control (QC) measures were followed with regard to chain of custody, laboratory procedures, and data reporting. Specific quality assurance (QA) / QC information presented in the RI include the following:

- The subsurface soil samples collected at the site background location (SB-1) and in Ellsworth-Allen Park were free of organic contamination, except for acetone found in sample SB-1-12-15 at an estimated concentration of 1.1 mg/kg. This detection may be attributed to the acetone used in the field decontamination procedures because elevated concentrations of acetone also were detected in the associated field blanks.

- The low concentrations for some of the VOCs (methylene chloride, acetone, chloroform, and 2-butanone) reported in the disposal basin and sludge-drying bed soil results also were present in the field rinse or laboratory blanks and can be attributed to contamination from field procedures or laboratory analysis.

- Testing results for SVOCs for a third soil boring sample collected from SB-20 in Disposal Basin 1 were rejected because of laboratory error.

- The copper test results for four of the seven sludge-drying bed soil samples were rejected during data validation.

- Subsurface soil sample TP-13-2.5-3.5 and its field duplicate sample from testpit TP-38 at the Building M pad were scheduled to be tested for SVOCs but the analysis could not be run because of matrix interferences. The manganese test results for test pit samples from the Building M area were rejected during data validation.

- Elevated concentrations of VOCs were detected in leaching chamber sediment samples SB-34 and TP-41. These results are inconsistent with the field duplicate sample results, which do not indicate the presence of VOCs. The differences may be caused by incomplete sample homogenization in the field and not laboratory errors, considering the elevated concentrations and the consistency with other leaching chamber sediment data. The arsenic test results for all leaching chamber soil samples except TP-12-11-12 and TP-12-11-12 DUP were rejected during data validation.

- VOCs were not detected in the test pit TP-52 sample from beneath underground storage tanks UT-5 and UT-6 from a depth of 8.5 - 9 feet (TP-26-8.5-9), although the analytical detection limits were abnormally high because of matrix interferences in the laboratory.

- The test results for the inorganic compounds cadmium, chromium, and mercury, detected in ambient air samples (baseline air samples), are considered suspect because of the levels of inorganic contamination detected in the field blanks. Because of laboratory error, the ambient air samples collected were not tested for hexavalent chromium.

- Because of laboratory error, the surface water samples collected from Massapequa Creek were not tested for hexavalent chromium.

- The low-level concentrations of many of the VOCs (methylene chloride, chloroform, acetone, and 2-hexanone) reported in groundwater samples from on-site and off-site

monitoring wells may not indicate actual environmental contamination. These compounds also were present in the trip, rinse, and/or bailer blank water and can be attributed to contamination from field procedure or laboratory analysis.

- Low-level concentrations of SVOCs (phenol, di-n-butylphthalate, bis(2-ethyhexyl)phthalate) reported in groundwater samples from on-site and off-site monitoring wells may not indicate actual environmental contamination. These compounds also were detected in field rinse blank water and can be attributed to contamination from field procedure or laboratory analysis.

APPENDIX D

Procedure for Evaluating Potential
Health Risks for Contaminants of Concern

PROCEDURE FOR EVALUATING POTENTIAL HEALTH RISKS FOR CONTAMINANTS OF CONCERN

To evaluate the potential health risks from contaminants of concern associated with the Liberty site, NYS DOH assessed the risks for cancer and noncancer health effects.

Increased cancer risks were estimated by using site-specific information about exposure levels for the contaminant of concern and interpreting them using cancer potency estimates derived for that contaminant by US EPA or, in some cases, by NYS DOH. The following qualitative ranking of cancer risk estimates, developed by NYS DOH, then was used to rank the risk from very low to very high. For example, if the qualitative descriptor was "low," then the excess lifetime cancer risk from that exposure ranges from greater than one per million to less than one per ten thousand. Other qualitative descriptors are listed below:

Excess Lifetime Cancer Risk

Risk Ratio	Qualitative Descriptor
equal to or less than 1 per million	very low
greater than 1 per million to less than 1 per 10 thousand	low
1 per 10 thousand to less than 1 per thousand	moderate
1 per thousand to less than 1 per 10	high
equal to or greater than 1 per 10	very high

An estimated increased excess lifetime cancer risk is not a specific estimate of expected cancers. Rather, it is a plausible upper bound estimate of the probability that a person may develop cancer sometime in his or her lifetime after exposure to that contaminant.

Knowledge about cancer mechanisms is insufficient to determine whether a level of exposure to a cancer-causing agent exists below which no risk exists of developing cancer, namely, a threshold level. Therefore, every exposure, no matter how low, to a cancer-causing compound is assumed to be associated with some increased risk. As the dose of a carcinogen decreases, the chance of developing cancer decreases, but each exposure is accompanied by some increased risk.

No general consensus exists within the scientific or regulatory communities about what level of estimated excess cancer risk is acceptable. Some scientists have recommended the use of the relatively conservative excess lifetime cancer risk level of one in one million because of the uncertainties in scientific knowledge about the mechanism of cancer. Others believe that risks that are lower or higher may be acceptable, depending on scientific, economic, and social factors. An increased lifetime cancer risk of one in one million or less generally is considered an insignificant increase in cancer risk.

For noncarcinogenic health risks, the contaminant intake was estimated using exposure assumptions for the site conditions. This dose was then compared with reference dose (estimated daily intake of a chemical that is likely to be without an appreciable risk for adverse health effects) developed by US EPA, ATSDR, and/or NYS DOH. The resulting ratio was then compared with the following qualitative scale of health risk:

Qualitative Descriptions for
Noncarcinogenic Health Risks

Ratio of Estimated Contaminant Intake to Reference Dose	Qualitative Descriptor
equal to or less than the reference dose	minimal
greater than 1 to 5 times the reference dose	low
greater than 5 to 10 times the reference dose	moderate
greater than 10 times the reference dose	high

Noncarcinogenic effects are believed to have a threshold, i.e., a dose below which adverse effects will not occur. As a result, the current practice is to identify, usually from animal toxicology experiments, a no-observed adverse effect level (NOAEL). This is the experimental exposure level in animals at which no adverse toxic effect is observed. The NOAEL is then divided by an uncertainty factor to yield the reference dose. The uncertainty factor reflects the degree of uncertainty that exists when experimental animal data are extrapolated to the general human population. The magnitude of the uncertainty factor takes into consideration various factors such as sensitive subpopulations (e.g., children or the elderly), extrapolation from animals to humans, and the incompleteness of data. Thus, the reference dose is not expected to cause adverse health effects because it is selected to be much lower than dosages that do not cause adverse health effects in laboratory animals.

The measure used to describe the potential for noncancer health effects in a person is expressed as a ratio of estimated contaminant intake to the reference dose. If exposure to the contaminant exceeds the reference dose, concern may exist for potential noncancer health effects because the margin of protection is less than that afforded by the reference dose. As a rule, the greater the ratio of the estimated contaminant intake to the reference dose, the greater the level of concern. A ratio equal to or less than one is generally considered an insignificant (minimal) increase in risk.

APPENDIX E

Public Health Hazard Categories

INTERIM PUBLIC HEALTH HAZARD CATEGORIES

CATEGORY / DEFINITION	DATA SUFFICIENCY	CRITERIA
A. Urgent Public Health Hazard This category is used for sites where short-term exposures (< 1 yr) to hazardous substances or conditions could result in adverse health effects that require rapid intervention.	This determination represents a professional judgement based on critical data which ATSDR has judged sufficient to support a decision. This does not necessarily imply that the available data are complete; in some cases additional data may be required to confirm or further support the decision made.	Evaluation of available relevant information* indicates that site-specific conditions or likely exposures have had, are having, or are likely to have in the future, an adverse impact on human health that requires immediate action or intervention. Such site-specific conditions or exposures may include the presence of serious physical or safety hazards.
B. Public Health Hazard This category is used for sites that pose a public health hazard due to the existence of long-term exposures (> 1 yr) to hazardous substance or conditions that could result in adverse health effects.	This determination represents a professional judgement based on critical data which ATSDR has judged sufficient to support a decision. This does not necessarily imply that the available data are complete; in some cases additional data may be required to confirm or further support the decision made.	Evaluation of available relevant information* suggests that, under site-specific conditions of exposure, long-term exposures to site-specific contaminants (including radionuclides) have had, are having, or are likely to have in the future, an adverse impact on human health that requires one or more public health interventions. Such site-specific exposures may include the presence of serious physical or safety hazards.
C. Indeterminate Public Health Hazard This category is used for sites in which "*critical*" data are *insufficient* with regard to extent of exposure and/or toxicologic properties at estimated exposure levels.	This determination represents a professional judgement that critical data are missing and ATSDR has judged the data are insufficient to support a decision. This does not necessarily imply all data are incomplete; but that some additional data are required to support a decision.	The health assessor must determine, using professional judgement, the "criticality" of such data and the likelihood that the data can be obtained and will be obtained in a timely manner. Where some data are available, even limited data, the health assessor is encouraged to the extent possible to select other hazard categories and to support their decision with clear narrative that explains the limits of the data and the rationale for the decision.
D. No Apparent Public Health Hazard This category is used for sites where human exposure to contaminated media may be occurring, may have occurred in the past, and/or may occur in the future, but the exposure is not expected to cause any adverse health effects.	This determination represents a professional judgement based on critical data which ATSDR considers sufficient to support a decision. This does not necessarily imply that the available data are complete; in some cases additional data may be required to confirm or further support the decision made.	Evaluation of available relevant information* indicates that, under site-specific conditions of exposure, exposures to site-specific contaminants in the past, present, or future are not likely to result in any adverse impact on human health.
E: No Public Health Hazard This category is used for sites that, because of the absence of exposure, do NOT pose a public health hazard.	Sufficient evidence indicates that no human exposures to contaminated media have occurred, none are now occurring, and none are likely to occur in the future	

**Such as environmental and demographic data; health outcome data; exposure data; community health concerns information; toxicologic, medical, and epidemiologic data; monitoring and management plans.*

APPENDIX F

Response to Public Comments

RESPONSE TO PUBLIC COMMENTS

Comment #1: Although the PHA provides information about historical site use, no information about current site use is provided. A brief description of current site conditions and uses should be included in the PHA. Additional background information about site use after 1978, when Liberty Finishing II ceased operation at the site, also should be included.

Response #1: A total of 10 buildings at the site were or are used for a variety of operations including trucking, warehousing, auto parts salvaging, product distribution, and pallet recycling. This information has been added to the PHA.

Comment #2: The Summary suggests that a public health hazard existed in the past, but the magnitude of the hazard cannot be identified. If sufficient information does not exist to quantify the past potential public health hazard, the sentence should be revised to read: "It is not possible to determine whether the site posed a potential public health hazard in the past."

Response #2: The summary has been revised. In accordance with ATSDR's guidance on selecting public health hazard categories, specific criteria were followed in assigning the "indeterminate public health hazard category" pursuant to previous conditions at the site. This category is used for sites with incomplete information and is based on the following criteria:

The limited data do not indicate that humans are being or have been exposed to levels of contamination that would be expected to cause adverse health effects. However, data or information are not available for all environmental media to which humans may have been exposed, and community-specific health outcome data are insufficient or absent to indicate the site has adversely impacted human health.

Comment #3: Later sections of the PHA indicate that the PCBs and chlordane detected in the fish from Massapequa Reservoir probably are not related to the Liberty Industrial Finishing site. Therefore, the Summary should be revised to include the following: "the source of these constituents in fish has not been determined and is probably not attributable to the Liberty Industrial Finishing site."

Response #3: The Summary has been revised.

Comment #4: A paragraph describing the portions of the site at which industrial operations occurred should be added to the "Site Description and History" section because it would enable the reader to better put into perspective subsequent sections of the PHA discussing locations at the site where constituents were detected in environmental media.

Response #4: Most of the process buildings used by Liberty Industrial Finishing are no longer standing, but the former building locations are identified by the remains of concrete floor slabs. Historical information is not available to identify areas of the site where specific industrial operations occurred. The results of the RI were used to develop a detailed site history and waste disposal perspective, which is presented in the 1994 final RI report prepared by Roy F. Weston, Inc., for US EPA. The reader should refer to this document for additional history of site use.

Comment #5: None of the figures identifies the location of the Massapequa Reservoir. The PHA should be revised to include a more detailed map identifying the location of the Massapequa Creek, Massepequa Reservoir, and specific region of the creek and reservoir to which the fish consumption advisory pertains to.

Response #5: Figure 2 has been revised and now includes an expanded view of Massapequa Creek and its associated waterbodies, including the Upper Massepequa Reservoir and Massapequa Lake. The text has been revised to indicate that the NYS DOH fish consumption advisory pertains only to the Upper Massepequa Reservoir, which lies between Clark Boulevard and Sunrise Highway (Route 27). This is the body of water from which fish were collected in 1991 for NYS DEC's pesticide/PCB contamination study.

Comment #6: The PHA states that constituent concentrations were compared with PHA comparison values to determine whether detected concentrations warrant further evaluation. A review of the methodology used to develop certain of these comparison values indicates they were derived using conservative exposure assumptions that correspond to frequent, long-term exposure. Comparison values for soil (assuming an industrial setting), for example, assume exposure occurs 5 days per week, 8 months per year, over 40 years. The assumed exposure duration (40 years) is greater than the upper-bound estimate of exposure duration for workers recommended by US EPA for use in the Superfund program. Assuming that a receptor is equally likely to contact soil at any location at the site on any given day, the constituent concentration to which the receptor would be exposed is best represented by the average concentration at the site, rather than the concentration at any given sampling location. The comparison values are valid only when compared with average concentrations of constituents at the site. Therefore, the PHA should be revised to compare sitewide average concentrations to the existing comparison values derived using assumptions for sitewide chronic exposures. Alternatively, individual detected concentrations could be compared with comparison values calculated assuming an exposure frequency and duration appropriate for the small portion of the site represented by each sampling location.

Response #6: We use the soil comparison values for screening and selecting contaminants for further evaluation. For these purposes, if the highest detected level of the contaminant in soil exceeds the cancer or noncancer comparison value, the contaminant is selected for further evaluation. In estimating the cancer and noncancer health risks, we agree with the comment that in some cases, depending on site-specific characteristics, long-term exposure to a soil contaminant at a specific location may be unlikely and that a sitewide average for the contaminant may be more representative of people's potential long-term exposure. For some sites, on the basis of availability and adequacy of sampling data and other site-specific considerations, we have estimated cancer and noncancer health risks using both the maximum detected sampling results and the average sampling results. For the Liberty site, we chose not to estimate the past health risks associated with exposure to on-site surface soil because of concerns about the representativeness of the sampling and inadequate exposure information.

Comment #7: The section under the heading, "Ambient Air and Soil Gas," indicates that tetrachloroethene was elevated in the basin area of the site. Because the PHA does not identify comparison concentrations for this compound in this medium, the sentence should be edited to state that concentrations of tetrachloroethene were "highest" in samples from these areas.

Response #7: The text has been revised.

Comment #8: The PHA should state that the surface soil data are from areas of the site most likely to have been affected by historical industrial operations and therefore should not be assumed to represent conditions at the site as a whole.

Response #8: The following statement has been added to the discussion of surface soil contamination in the on-site contamination section: "The sampling locations are identified on Figure 6 as SS-1 through SS-7. According to the US EPA, these locations were thought to pose the greatest likelihood of surficial contamination on the basis of site history, visual observations during the site reconnaissance and the remedial investigation data. Therefore, these surface soil sampling data should not be considered to represent conditions at the site as a whole."

Comment #9: If any of the test pit or soil boring samples were taken from depths of 0 - 3 inches, these samples should be categorized as surface soil samples, rather than as subsurface soil samples.

Response #9: No change is required because no test pit soil samples or soil boring samples were collected specifically from depths of 0 - 3 inches. The shallowest depth from which soil samples were collected from the soil borings and test pits is 0 - 6 inches and includes the following samples: TP-41, TP-46, TP-48, and SB-23.

Comment #10: Concentrations of constituents detected in subsurface soil were compared with soil comparison values calculated using exposure assumptions that are inconsistent with typical subsurface soil exposure scenarios. The PHA should be revised to include separate comparison values for surface and subsurface soil, each calculated using potential exposure assumptions that are appropriate for the depth of interest.

Response #10: Comparison values for soil contaminants are used to evaluate the level of risk for potential adverse health effects by these contaminants if the subsurface soil is made available for long-term exposure. This is not the case at the Liberty site, where long-term exposure to subsurface soil contaminants is unlikely and which therefore precluded the need for a toxicologic evaluation of these contaminants. Additional language has been added to the final PHA to clarify this issue.

Comment #11: Constituents detected at or below background concentrations probably are not present as a result of historical or current industrial activities. For this reason, the PHA should be revised to omit comparisons of background constituency concentrations to comparison values.

Response #11: By comparing levels of background constituents with comparison values and showing that these levels did not exceed these values, we have reinforced the notion that these background samples selected were representative of typical background conditions.

Comment #12: The PHA compares concentrations of constituents detected in on-site monitoring wells to comparison values calculated using assumptions for residential drinking water exposure. Given that the current site use is industrial, the PHA should be revised to compare concentrations detected in on-site monitoring wells with comparison values calculated using exposure assumptions appropriate for potential industrial groundwater use.

Response #12: The drinking water exposure pathway is based on the potential for site-related contaminants to migrate into groundwater, which is used as a sole source of drinking water in Nassau County. Therefore, we believe it is not unreasonable to use the PHA comparison values in Table 8 for contaminants that may be found in drinking water.

Comment #13: The PHA should be revised to include additional groundwater fate and transport information in the section under the heading, "Off-site Contamination-Surface Water and Sediments." This information could include estimated groundwater flow direction and speed, as well as potential locations of groundwater discharge.

Response #13: Although site hydrogeology information is presented in the Pathways Analyses section of the PHA, additional information about the groundwater and surface water relation has been added as requested.

Comment #14: The PHA should identify the depth from which groundwater samples with concentrations exceeding guidelines or standards were taken. Additionally, the PHA should identify the specific guideline, standard, or comparison value that was exceeded.

Response #14: Except for monitoring wells MW-6B and MW-7B, all on-site monitoring wells are screened in the Upper Glacial Aquifer at 25 - 29 feet below grade. Wells MW-6B and MW-7B are each about 60 feet below grade. Exception for one downgradient monitoring well (MW-11C), all off-site monitoring wells are screened in the Upper Glacial Aquifer 12 - 75 feet below grade. Monitoring well MW-11C is screened in the Magothy Aquifer at 120 feet below grade. This information has been added to the PHA. Individual well data are included in the final RI report for comparison to the PHA comparison values presented in Table 8 of the PHA.

Comment #15: The section under the heading, "Off-site Contamination-Groundwater (Private Supply Wells)," should include the depth at which the irrigation well at the Farmingdale High School is screened.

Response #15: The irrigation well at the Farmingdale High School is screened in the Upper Glacial Aquifer 55 - 70 feet below grade. This information has been added to the PHA.

Comment #16: The discussion of public supply wells N-7515 and N-7516 under the heading, "Off-site Contamination-Groundwater (Public Supply Wells)," should be revised to state that, because these wells are sidegradient to the site, constituents detected in groundwater from these wells probably are not site-related.

Response #16: The text has been revised.

Comment #17: The last sentence in the section under the heading, "Off-site Contamination - Biota (Edible Fish)," should be revised to include, "however, the source probably is not attributable to the LIF site."

Response #17: The text has been revised as suggested.

Comment #18: Because the PHA is intended to focus on the potential public health significance of the Liberty Industrial Finishing site, it is not appropriate to include a discussion of potential health impacts from constituents and/or facilities unrelated to the Liberty site. For this reason,

the discussion of air emissions from the Grumman Aerospace Corporation should be omitted from the PHA.

Response #18: At the time this PHA was released for public comment, ATSDR PHA policy required a review of data from the US EPA's Toxic Chemical Release Inventory (TRI). Since then, this requirement has been dropped. Therefore, we removed the TRI section from this document.

Comment #19: According to Figure 7 and Table 6, at least 34 groundwater samples from approximately 14 offsite monitoring wells screened at various depths were collected and analyzed during investigations at the Liberty site. However, it is impossible to determine how many samples were collected from the Magothy Aquifer and whether constituents were detected in these samples.

Response #19: Before public release of the draft PHA, two rounds of groundwater sampling were conducted from the monitoring well (MW-11C) screened in the Magothy Aquifer. In the first round of sampling (March 1992), the only site-related contaminants detected above comparison values were 1,2-dichloroethene at 69 mcg/L and trichloroethene at 760 mcg/L. In the second round of sampling (July 1992), these compounds again were the only site-related contaminants detected above comparison values at estimated concentrations of 120 mcg/l and 1300 mcg/L, respectively.

Comment #20: The PHA states that downgradient public supply wells could be affected by site-related contamination; however, the report does not identify the public supply wells to which this statement refers. The section under the heading, "Potential Exposure Pathways-Groundwater Exposure Pathway," should be revised to include the following information: "The South Farmingdale Water District public supply wells approximately 7,500 feet southwest of the site (well N-6148) and approximately 8,000 feet south/southeast of the site (wells N-5147 and N-6149), and the Massepequa Water District wells approximately two miles south/southeast of the site (wells N-4602, N-5703, N-8214, and N-9173) are not located in the pathway of the well-defined Upper Glacial unit plume. The Upper Glacial unit plume is currently monitored and will continue to be monitored. Additional monitoring wells will be installed to assess current conditions and monitor groundwater quality in the Magothy Aquifer in the area of the existing Upper Glacial plume. The data to be collected from the monitoring wells installed in the Magothy Aquifer will likely demonstrate that the public supply wells identified above are not being affected by groundwater from the Magothy Aquifer in the area of the Liberty site."

Response #20: The text has been revised.

Comment #21: The section under the heading, "Potential Exposure Pathways-Soil Exposure Pathway," should state that the affinity of PCBs for soil also results in a low bioavailability.

Response #21: People can take in PCBs if they are exposed to low levels in soil. People can be exposed to PCBs in contaminated soil by incidentally eating some soil or by absorbing PCBs through the skin. The amount of soil-bound PCBs absorbed through the skin and into the body is relatively low, particularly compared with absorption after ingestion. This information has been added to the Toxicologic Evaluation section of the PHA.

Comment #22: In section A.2. (Toxicologic Evaluation-Past Exposure of Persons Ingesting Fish from the Massapequa Reservoir and Its Tributaries) of the Public Health Implications, the

sentence, “Chlordane and PCBs have been detected in fish from these waters,” should be revised to include the following: “however, it is unlikely the source of chlordane and PCBs in fish is attributed to the Liberty site.”

Response #22: The text has been revised.

Comment #23: The title of Table 8 in Appendix B should be revised to include “Groundwater” in place of “Sources of Drinking Water.”

Response #23: The table heading has been revised.

Comment #24: The discussion of estimated increased excess lifetime cancer risk (Appendix C : Procedure for Evaluating Potential Health Risks for Contaminants of Concern) should be edited to include the following: “given a specific set of assumptions about potential exposure and toxicity of the constituent.”

Response #24: This statement is now included in the revised PHA (Appendix C : Procedure for Evaluating Potential Health Risks for Contaminants of Concern).

Comment #25: The third paragraph in the Summary indicates that persons exposed to levels of VOCs in their drinking water that upon long-term exposure could result in a low increased risk of developing cancer. How do you know the risk of cancer is low if for 6 years the “presence and extent of contamination in the well cannot be determined?”

Response #25: In actuality, the presence and extent of contamination in the well was not known for about 24 years. Therefore, the NYS DOH’s determination of low increased cancer risk from exposure to VOCs (i.e., benzene, trichloroethene and 1,2-dichloroethane) in drinking water is based on an exposure period of up to 24 years (from 1954, when the well was placed in service, until 1978, when use of the well was discontinued). For this evaluation, these VOCs were assumed to be present during the entire 24-year period. These VOCs also were assumed to be present at the highest concentration at which each was detected during the 1976 -1978 monitoring. This information has been added to the Toxicologic Evaluation section of the PHA.

Comment #26: How can you do a health assessment without comment about the dangers associated with the plume of groundwater contaminants (in the Magothy Aquifer) and their impact upon all of us? How can you do a health assessment without investigating the extent of vertical (groundwater) contamination?

Response #26: The toxicologic properties of the contaminants detected in the Magothy Aquifer monitoring well samples are discussed in the Public Health Implications section of the PHA. The US EPA has conducted field work for a supplemental groundwater investigation. This investigation will further characterize the groundwater quality in the deeper Magothy Aquifer. These additional groundwater quality data will be evaluated by NYS DOH and if necessary, the PHA will be appropriately revised and/or updated.

Comment #27: How can you say the site currently poses no apparent public health hazard, then you say that your [surface soil] data are limited? This site has never been anything but industrial/commercial, and you have stated it posed an indeterminate public health hazard in the past; now you tell us it does not represent a public health concern provided it remains industrial/commercial?

Response #27: In selecting the appropriate health hazard category(s), the assessor must consider the total body of information available for the site when the PHA is being prepared. Therefore, the site category is determined primarily by existing conditions at the site. Existing conditions at the Liberty site relate to a number of site-specific variables, including what is known about the extent of environmental contamination and the opportunity for community exposure to the identified contamination that can vary according to land use. In accordance with ATSDR's guidance, the "no apparent public health hazard" category is used for sites where human exposure to contaminated media is occurring or has occurred, but the exposure is below a level of health hazard. The estimation of exposure involves assumptions about how long, and how frequently the community has been exposed to site contaminants given the industrial/commercial land use scenario. If data become available suggesting that human exposure to hazardous substances at levels of public health concern is occurring or has occurred, NYS DOH will reevaluate the need for any follow-up.

Comment #28: Don't you think you should wait assessing health risks [to off-site soil gas] until you have all the information to evaluate?

Response #28: See response to Comment #27.

Comment #29: Why does the state renew the stock of fish every year (in Massepequa Reservoir) if the fish are becoming contaminated with PCBs? Where is a report evaluating the contamination found in the reservoir? Does some agency constantly test these fish? Why not suggest to the state to stop restocking the reservoir? Why expose those who fish to this danger?

Response #29: Since 1928, the NYS DEC has stocked trout in the Massapequa Creek and Massapequa Reservoir. NYS DEC aims to provide the citizens of New York an opportunity for sportfishing at this sole remaining trout stream in Nassau County. Because the government does not regulate a person's decision to eat sportfish, the NYS DOH issues consumption advisories to help people plan what fish to eat. In this instance, the advisory should be used as a guide to minimize exposure to contaminants that bioaccumulate in certain species of fish. In April and May 1985, the NYS DEC conducted a Long Island chlordane study to assess the uptake of chlordane in trout. During this controlled cage study, trout specimens were collected from Massapequa Reservoir at specific intervals, and the fish tissue was analyzed for chlordane. The results of this unpublished study do not indicate the uptake of chlordane in trout for the duration of the study. By summer's end each year, the trout population in Massapequa Creek and Massapequa Reservoir is significantly depleted by angling and warm water die-off. Therefore, annual restocking of Massapequa Creek and Massapequa Reservoir is needed to reestablish a sizeable population of trout in these waterbodies. Additional information about contaminant levels in fish is available from the NYS DEC's Division of Fish, Wildlife, and Marine Resources, Bureau of Habitat, at 625 Broadway, Albany, New York 12233; (518) 457-6178. Additional information about fishing inland waters and the stocking of fish in Nassau County is available from the NYS DEC at Loop Road, Building 40- SUNY, Stony Brook, New York 11790; (516) 444-0280.

Comment #30: I believe there are more than three contaminated transformer pad areas, and the PCB contamination is not limited to the transformer areas.

Response #30: During the RI, the US EPA identified numerous potential on-site source areas that included four transformer areas, some of which included active transformer units. Results

of the soil and wipe sample taken at these areas indicated three of these areas required remediation, which was undertaken in 1995. A review of historical records does not indicate the existence of additional transformer pad areas. Extensive sampling data have been compiled during the RI and do not indicate any significant PCB contamination or PCB source areas elsewhere on the site.

Comment #31: In the updated evaluation of the incidence of Hodgkin disease cases in the South Farmingdale/Massapequa area of Nassau and Suffolk counties, you state there is no clustering, but you neglect to say these 13 cases in females all occurred in ZIP codes 11735 and 11758, which border each other. Where these 13 cases actually are is not being released by the NYS DOH, but it should be as I believe this is public information.

Response #31: The updated report, released in May 1994, indicates that among females, 13 of the 30 Hodgkin disease cases were diagnosed in the last 2 years of the investigation period. The report also indicates an unusually high number of cases diagnosed in females during the same period in ZIP codes 11735 and the northern portion of ZIP code 11758. The NYSDOH considers information involving the locations of the 13 cases of Hodgkin Disease as confidential, in accordance with Public Health Law, Article 28, Section 2805-g. The Commissioner of Health has authority to adopt such regulations as necessary to give effect to the provisions of this section and to preserve the confidentiality of medical, social, personal, or financial records of patients.

Comment #32: The PHA stated that the VOC contamination was present in groundwater samples collected from SFWD Well No. N-4042 from 1976 through 1978, however no supporting data were provided in the appendices of the report. Why did the NYS DOH choose to discuss groundwater contamination in a Liberty site-related document in which it is clearly stated that the contamination in SFWD well No. N-4042 was clearly stated to not be related to the site? In regards to this well, the following points were omitted from the report:

- None of the VOCs were detected above levels of concern for that time period. The standards were 50 mcg/L for each individual VOC and not to exceed a total of 100 mcg/L for all VOCs at sampling. Therefore, when detected, the drinking water was considered safe to drink according to US EPA and NYS DOH standards at the time;

- According to SFWD records, the well was used only as a lag well through 1978 when the well was taken out of service because of a screen collapse. Therefore, the amount of water actually supplied to the public from the well was minimal.

Response #32: The monitoring well data for SFWD Well No. N-4042 were received from the NC DOH. These data are not presented in the Liberty site PHA but can be obtained by contacting the NC DOH Bureau of Public Water Supply Protection at (516) 571-3323. An essential element of the PHA is to identify potential and completed exposure pathways that might or might not be associated with past, present, and future use of the site. Information reviewed during the preparation of this PHA indicated that persons probably were exposed to VOCs in drinking water obtained from Well No. N–4042 for an undetermined period, representative of a past completed exposure pathway. The additional points made in the comment have been incorporated in the text.

APPENDIX G

ATSDR Plain Language Glossary
of Environmental Health Terms

ATSDR Glossary of Terms

The Agency for Toxic Substances and Disease Registry (ATSDR) is a federal public health agency with headquarters in Atlanta, Georgia, and 10 regional offices in the United States. ATSDR's mission is to serve the public by using the best science, taking responsive public health actions, and providing trusted health information to prevent harmful exposures and diseases related to toxic substances. ATSDR is not a regulatory agency, unlike the U.S. Environmental Protection Agency (EPA), which is the federal agency that develops and enforces environmental laws to protect the environment and human health. This glossary defines words used by ATSDR in communications with the public. It is not a complete dictionary of environmental health terms. If you have questions or comments, call ATSDR's toll-free telephone number, 1-888-42-ATSDR or
(1-888-422-8737).

General Terms

Absorption
The process of taking in. For a person or an animal, absorption is the process of a substance getting into the body through the eyes, skin, stomach, intestines, or lungs.

Acute
Occurring over a short time [compare with chronic].

Acute exposure
Contact with a substance that occurs once or for only a short time (up to 14 days) [compare with intermediate duration exposure and chronic exposure].

Additive effect
A biologic response to exposure to multiple substances that equals the sum of responses of all the individual substances added together [compare with antagonistic effect and synergistic effect].

Adverse health effect
A change in body function or cell structure that might lead to disease or health problems

Aerobic
Requiring oxygen [compare with anaerobic].

Ambient
Surrounding (for example, ambient air).

Anaerobic
Requiring the absence of oxygen [compare with aerobic].

Analyte
A substance measured in the laboratory. A chemical for which a sample (such as water, air, or blood) is tested in a laboratory. For example, if the analyte is mercury, the laboratory test will determine the amount of mercury in the sample.

Analytic epidemiologic study
A study that evaluates the association between exposure to hazardous substances and disease by testing scientific hypotheses.

Antagonistic effect
A biologic response to exposure to multiple substances that is less than would be expected if the known effects of the individual substances were added together [compare with additive effect and synergistic effect].

Background level
An average or expected amount of a substance or radioactive material in a specific environment, or typical amounts of substances that occur naturally in an environment.

Biodegradation

Decomposition or breakdown of a substance through the action of microorganisms (such as bacteria or fungi) or other natural physical processes (such as sunlight).

Biologic indicators of exposure study
A study that uses (a) biomedical testing or (b) the measurement of a substance [an analyte], its metabolite, or another marker of exposure in human body fluids or tissues to confirm human exposure to a hazardous substance [also see exposure investigation].

Biologic monitoring
Measuring hazardous substances in biologic materials (such as blood, hair, urine, or breath) to determine whether exposure has occurred. A blood test for lead is an example of biologic monitoring.

Biologic uptake
The transfer of substances from the environment to plants, animals, and humans.

Biomedical testing
Testing of persons to find out whether a change in a body function might have occurred because of exposure to a hazardous substance.

Biota
Plants and animals in an environment. Some of these plants and animals might be sources of food, clothing, or medicines for people.

Body burden
The total amount of a substance in the body. Some substances build up in the body because they are stored in fat or bone or because they leave the body very slowly.

CAP [see Community Assistance Panel.]

Cancer
Any one of a group of diseases that occur when cells in the body become abnormal and grow or multiply out of control.

Cancer risk
A theoretical risk for getting cancer if exposed to a substance every day for 70 years (a lifetime exposure). The true risk might be lower.

Carcinogen
A substance that causes cancer.

Case study
A medical or epidemiologic evaluation of one person or a small group of people to gather information about specific health conditions and past exposures.

Case-control study
A study that compares exposures of people who have a disease or condition (cases) with people who do not have the disease or condition (controls). Exposures that are more common among the cases may be considered as possible risk factors for the disease.

CAS registry number
A unique number assigned to a substance or mixture by the American Chemical Society Abstracts Service.

Central nervous system
The part of the nervous system that consists of the brain and the spinal cord.

CERCLA [see Comprehensive Environmental Response, Compensation, and Liability Act of 1980]

Chronic
Occurring over a long time [compare with acute].

Chronic exposure

Contact with a substance that occurs over a long time (more than 1 year) [compare with acute exposure and intermediate duration exposure]

Cluster investigation
A review of an unusual number, real or perceived, of health events (for example, reports of cancer) grouped together in time and location. Cluster investigations are designed to confirm case reports; determine whether they represent an unusual disease occurrence; and, if possible, explore possible causes and contributing environmental factors.

Community Assistance Panel (CAP)
A group of people from a community and from health and environmental agencies who work with ATSDR to resolve issues and problems related to hazardous substances in the community. CAP members work with ATSDR to gather and review community health concerns, provide information on how people might have been or might now be exposed to hazardous substances, and inform ATSDR on ways to involve the community in its activities.

Comparison value (CV)
Calculated concentration of a substance in air, water, food, or soil that is unlikely to cause harmful (adverse) health effects in exposed people. The CV is used as a screening level during the public health assessment process. Substances found in amounts greater than their CVs might be selected for further evaluation in the public health assessment process.

Completed exposure pathway [see exposure pathway].

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA)
CERCLA, also known as Superfund, is the federal law that concerns the removal or cleanup of hazardous substances in the environment and at hazardous waste sites. ATSDR, which was created by CERCLA, is responsible for assessing health issues and supporting public health activities related to hazardous waste sites or other environmental releases of hazardous substances. This law was later amended by the Superfund Amendments and Reauthorization Act (SARA).

Concentration
The amount of a substance present in a certain amount of soil, water, air, food, blood, hair, urine, breath, or any other media.

Contaminant
A substance that is either present in an environment where it does not belong or is present at levels that might cause harmful (adverse) health effects.

Delayed health effect
A disease or an injury that happens as a result of exposures that might have occurred in the past.

Dermal
Referring to the skin. For example, dermal absorption means passing through the skin.

Dermal contact
Contact with (touching) the skin [see route of exposure].

Descriptive epidemiology
The study of the amount and distribution of a disease in a specified population by person, place, and time.

Detection limit
The lowest concentration of a chemical that can reliably be distinguished from a zero concentration.

Disease prevention
Measures used to prevent a disease or reduce its severity.

Disease registry
A system of ongoing registration of all cases of a particular disease or health condition in a defined population.

DOD
United States Department of Defense.

DOE

United States Department of Energy.

Dose (for chemicals that are not radioactive)
The amount of a substance to which a person is exposed over some time period. Dose is a measurement of exposure. Dose is often expressed as milligram (amount) per kilogram (a measure of body weight) per day (a measure of time) when people eat or drink contaminated water, food, or soil. In general, the greater the dose, the greater the likelihood of an effect. An "exposure dose" is how much of a substance is encountered in the environment. An "absorbed dose" is the amount of a substance that actually got into the body through the eyes, skin, stomach, intestines, or lungs.

Dose (for radioactive chemicals)
The radiation dose is the amount of energy from radiation that is actually absorbed by the body. This is not the same as measurements of the amount of radiation in the environment.

Dose-response relationship
The relationship between the amount of exposure [dose] to a substance and the resulting changes in body function or health (response).

Environmental media
Soil, water, air, biota (plants and animals), or any other parts of the environment that can contain contaminants.
Environmental media and transport mechanism
Environmental media include water, air, soil, and biota (plants and animals). Transport mechanisms move contaminants from the source to points where human exposure can occur. The environmental media and transport mechanism is the second part of an exposure pathway.

EPA United States Environmental Protection Agency.

Epidemiologic surveillance
[see Public health surveillance].

Epidemiology
The study of the distribution and determinants of disease or health status in a population; the study of the occurrence and causes of health effects in humans.

Exposure
Contact with a substance by swallowing, breathing, or touching the skin or eyes. Exposure may be short-term [acute exposure], of intermediate duration, or long-term [chronic exposure].

Exposure assessment
The process of finding out how people come into contact with a hazardous substance, how often and for how long they are in contact with the substance, and how much of the substance they are in contact with.

Exposure-dose reconstruction
A method of estimating the amount of people's past exposure to hazardous substances. Computer and approximation methods are used when past information is limited, not available, or missing.

Exposure investigation
The collection and analysis of site-specific information and biologic tests (when appropriate) to determine whether people have been exposed to hazardous substances.

Exposure pathway
The route a substance takes from its source (where it began) to its end point (where it ends), and how people can come into contact with (or get exposed to) it. An exposure pathway has five parts: a source of contamination (such as an abandoned business); an environmental media and transport mechanism (such as movement through groundwater); a point of exposure (such as a private well); a route of exposure (eating, drinking, breathing, or touching), and a receptor population (people potentially or actually exposed). When all five parts are present, the exposure pathway is termed a completed exposure pathway.

Exposure registry
A system of ongoing followup of people who have had documented environmental exposures.

Feasibility study

A study by EPA to determine the best way to clean up environmental contamination. A number of factors are considered, including health risk, costs, and what methods will work well.

Geographic information system (GIS)
A mapping system that uses computers to collect, store, manipulate, analyze, and display data. For example, GIS can show the concentration of a contaminant within a community in relation to points of reference such as streets and homes.

Grand rounds
Training sessions for physicians and other health care providers about health topics.

Groundwater
Water beneath the earth's surface in the spaces between soil particles and between rock surfaces [compare with surface water].

Half-life ($t_{1/2}$)
The time it takes for half the original amount of a substance to disappear. In the environment, the half-life is the time it takes for half the original amount of a substance to disappear when it is changed to another chemical by bacteria, fungi, sunlight, or other chemical processes. In the human body, the half-life is the time it takes for half the original amount of the substance to disappear, either by being changed to another substance or by leaving the body. In the case of radioactive material, the half life is the amount of time necessary for one half the initial number of radioactive atoms to change or transform into another atom (that is normally not radioactive). After two half lives, 25% of the original number of radioactive atoms remain.

Hazard
A source of potential harm from past, current, or future exposures.

Hazardous Substance Release and Health Effects Database (HazDat)
The scientific and administrative database system developed by ATSDR to manage data collection, retrieval, and analysis of site-specific information on hazardous substances, community health concerns, and public health activities.

Hazardous waste
Potentially harmful substances that have been released or discarded into the environment.

Health consultation
A review of available information or collection of new data to respond to a specific health question or request for information about a potential environmental hazard. Health consultations are focused on a specific exposure issue. Health consultations are therefore more limited than a public health assessment, which reviews the exposure potential of each pathway and chemical [compare with public health assessment].

Health education
Programs designed with a community to help it know about health risks and how to reduce these risks.

Health investigation
The collection and evaluation of information about the health of community residents. This information is used to describe or count the occurrence of a disease, symptom, or clinical measure and to evaluate the possible association between the occurrence and exposure to hazardous substances.

Health promotion
The process of enabling people to increase control over, and to improve, their health.

Health statistics review
The analysis of existing health information (i.e., from death certificates, birth defects registries, and cancer registries) to determine if there is excess disease in a specific population, geographic area, and time period. A health statistics review is a descriptive epidemiologic study.

Indeterminate public health hazard
The category used in ATSDR's public health assessment documents when a professional judgment about the level of health hazard cannot be made because information critical to such a decision is lacking.

Incidence
The number of new cases of disease in a defined population over a specific time period [contrast with prevalence].

Ingestion
The act of swallowing something through eating, drinking, or mouthing objects. A hazardous substance can enter the body this way [see route of exposure].

Inhalation
The act of breathing. A hazardous substance can enter the body this way [see route of exposure].

Intermediate duration exposure
Contact with a substance that occurs for more than 14 days and less than a year [compare with acute exposure and chronic exposure].

In vitro
In an artificial environment outside a living organism or body. For example, some toxicity testing is done on cell cultures or slices of tissue grown in the laboratory, rather than on a living animal [compare with in vivo].

In vivo
Within a living organism or body. For example, some toxicity testing is done on whole animals, such as rats or mice [compare with in vitro].

Lowest-observed-adverse-effect level (LOAEL)
The lowest tested dose of a substance that has been reported to cause harmful (adverse) health effects in people or animals.

Medical monitoring
A set of medical tests and physical exams specifically designed to evaluate whether an individual's exposure could negatively affect that person's health.

Metabolism
The conversion or breakdown of a substance from one form to another by a living organism.

Metabolite
Any product of metabolism.

mg/kg
Milligram per kilogram.

mg/cm2
Milligram per square centimeter (of a surface).

mg/m3
Milligram per cubic meter; a measure of the concentration of a chemical in a known volume (a cubic meter) of air, soil, or water.

Migration
Moving from one location to another.

Minimal risk level (MRL)
An ATSDR estimate of daily human exposure to a hazardous substance at or below which that substance is unlikely to pose a measurable risk of harmful (adverse), noncancerous effects. MRLs are calculated for a route of exposure (inhalation or oral) over a specified time period (acute, intermediate, or chronic). MRLs should not be used as predictors of harmful (adverse) health effects [see reference dose].

Morbidity
State of being ill or diseased. Morbidity is the occurrence of a disease or condition that alters health and quality of life.

Mortality
Death. Usually the cause (a specific disease, a condition, or an injury) is stated.

Mutagen

A substance that causes mutations (genetic damage).

Mutation
A change (damage) to the DNA, genes, or chromosomes of living organisms.

National Priorities List for Uncontrolled Hazardous Waste Sites (National Priorities List or NPL)
EPA's list of the most serious uncontrolled or abandoned hazardous waste sites in the United States. The NPL is updated on a regular basis.

National Toxicology Program (NTP)
Part of the Department of Health and Human Services. NTP develops and carries out tests to predict whether a chemical will cause harm to humans.

No apparent public health hazard
A category used in ATSDR's public health assessments for sites where human exposure to contaminated media might be occurring, might have occurred in the past, or might occur in the future, but where the exposure is not expected to cause any harmful health effects.

No-observed-adverse-effect level (NOAEL)
The highest tested dose of a substance that has been reported to have no harmful (adverse) health effects on people or animals.

No public health hazard
A category used in ATSDR's public health assessment documents for sites where people have never and will never come into contact with harmful amounts of site-related substances.

NPL [see National Priorities List for Uncontrolled Hazardous Waste Sites]

Physiologically based pharmacokinetic model (PBPK model)
A computer model that describes what happens to a chemical in the body. This model describes how the chemical gets into the body, where it goes in the body, how it is changed by the body, and how it leaves the body.

Pica
A craving to eat nonfood items, such as dirt, paint chips, and clay. Some children exhibit pica-related behavior.

Plume
A volume of a substance that moves from its source to places farther away from the source. Plumes can be described by the volume of air or water they occupy and the direction they move. For example, a plume can be a column of smoke from a chimney or a substance moving with groundwater.

Point of exposure
The place where someone can come into contact with a substance present in the environment [see exposure pathway].

Population
A group or number of people living within a specified area or sharing similar characteristics (such as occupation or age).

Potentially responsible party (PRP)
A company, government, or person legally responsible for cleaning up the pollution at a hazardous waste site under Superfund. There may be more than one PRP for a particular site.

ppb
Parts per billion.

ppm
Parts per million.

Prevalence
The number of existing disease cases in a defined population during a specific time period [contrast with incidence].

Prevalence survey
The measure of the current level of disease(s) or symptoms and exposures through a questionnaire that collects self-reported information from a defined population.

Prevention
Actions that reduce exposure or other risks, keep people from getting sick, or keep disease from getting worse.

Public availability session
An informal, drop-by meeting at which community members can meet one-on-one with ATSDR staff members to discuss health and site-related concerns.

Public comment period
An opportunity for the public to comment on agency findings or proposed activities contained in draft reports or documents. The public comment period is a limited time period during which comments will be accepted.

Public health action
A list of steps to protect public health.

Public health advisory
A statement made by ATSDR to EPA or a state regulatory agency that a release of hazardous substances poses an immediate threat to human health. The advisory includes recommended measures to reduce exposure and reduce the threat to human health.

Public health assessment (PHA)
An ATSDR document that examines hazardous substances, health outcomes, and community concerns at a hazardous waste site to determine whether people could be harmed from coming into contact with those substances. The PHA also lists actions that need to be taken to protect public health [compare with health consultation].

Public health hazard
A category used in ATSDR's public health assessments for sites that pose a public health hazard because of long-term exposures (greater than 1 year) to sufficiently high levels of hazardous substances or radionuclides that could result in harmful health effects.

Public health hazard categories
Public health hazard categories are statements about whether people could be harmed by conditions present at the site in the past, present, or future. One or more hazard categories might be appropriate for each site. The five public health hazard categories are no public health hazard, no apparent public health hazard, indeterminate public health hazard, public health hazard, and urgent public health hazard.

Public health statement
The first chapter of an ATSDR toxicological profile. The public health statement is a summary written in words that are easy to understand. The public health statement explains how people might be exposed to a specific substance and describes the known health effects of that substance.

Public health surveillance
The ongoing, systematic collection, analysis, and interpretation of health data. This activity also involves timely dissemination of the data and use for public health programs.

Public meeting
A public forum with community members for communication about a site.

Radioisotope
An unstable or radioactive isotope (form) of an element that can change into another element by giving off radiation.

Radionuclide
Any radioactive isotope (form) of any element.

RCRA [see Resource Conservation and Recovery Act (1976, 1984)]

Receptor population
People who could come into contact with hazardous substances [see exposure pathway].
Reference dose (RfD)

An EPA estimate, with uncertainty or safety factors built in, of the daily lifetime dose of a substance that is unlikely to cause harm in humans.

Registry
A systematic collection of information on persons exposed to a specific substance or having specific diseases [see exposure registry and disease registry].

Remedial investigation
The CERCLA process of determining the type and extent of hazardous material contamination at a site.

Resource Conservation and Recovery Act (1976, 1984) (RCRA)
This Act regulates management and disposal of hazardous wastes currently generated, treated, stored, disposed of, or distributed.

RFA
RCRA Facility Assessment. An assessment required by RCRA to identify potential and actual releases of hazardous chemicals.

RfD [see reference dose]

Risk
The probability that something will cause injury or harm.

Risk reduction
Actions that can decrease the likelihood that individuals, groups, or communities will experience disease or other health conditions.

Risk communication
The exchange of information to increase understanding of health risks.

Route of exposure
The way people come into contact with a hazardous substance. Three routes of exposure are breathing [inhalation], eating or drinking [ingestion], or contact with the skin [dermal contact].

Safety factor [see uncertainty factor]

SARA [see Superfund Amendments and Reauthorization Act]

Sample
A portion or piece of a whole. A selected subset of a population or subset of whatever is being studied. For example, in a study of people the sample is a number of people chosen from a larger population [see population]. An environmental sample (for example, a small amount of soil or water) might be collected to measure contamination in the environment at a specific location.

Sample size
The number of units chosen from a population or an environment.

Solvent
A liquid capable of dissolving or dispersing another substance (for example, acetone or mineral spirits).

Source of contamination
The place where a hazardous substance comes from, such as a landfill, waste pond, incinerator, storage tank, or drum. A source of contamination is the first part of an exposure pathway.

Special populations
People who might be more sensitive or susceptible to exposure to hazardous substances because of factors such as age, occupation, sex, or behaviors (for example, cigarette smoking). Children, pregnant women, and older people are often considered special populations.

Stakeholder
A person, group, or community who has an interest in activities at a hazardous waste site.

Statistics
A branch of mathematics that deals with collecting, reviewing, summarizing, and interpreting data or information. Statistics are used to determine whether differences between study groups are meaningful.

Substance
A chemical.

Substance-specific applied research
A program of research designed to fill important data needs for specific hazardous substances identified in ATSDR's toxicological profiles. Filling these data needs would allow more accurate assessment of human risks from specific substances contaminating the environment. This research might include human studies or laboratory experiments to determine health effects resulting from exposure to a given hazardous substance.

Superfund [see Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and Superfund Amendments and Reauthorization Act (SARA)

Superfund Amendments and Reauthorization Act (SARA)
In 1986, SARA amended the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and expanded the health-related responsibilities of ATSDR. CERCLA and SARA direct ATSDR to look into the health effects from substance exposures at hazardous waste sites and to perform activities including health education, health studies, surveillance, health consultations, and toxicological profiles.

Surface water Water on the surface of the earth, such as in lakes, rivers, streams, ponds, and springs [compare with groundwater].

Surveillance [see public health surveillance]

Survey
A systematic collection of information or data. A survey can be conducted to collect information from a group of people or from the environment. Surveys of a group of people can be conducted by telephone, by mail, or in person. Some surveys are done by interviewing a group of people [see prevalence survey].

Synergistic effect
A biologic response to multiple substances where one substance worsens the effect of another substance. The combined effect of the substances acting together is greater than the sum of the effects of the substances acting by themselves [see additive effect and antagonistic effect].

Teratogen
A substance that causes defects in development between conception and birth. A teratogen is a substance that causes a structural or functional birth defect.

Toxic agent
Chemical or physical (for example, radiation, heat, cold, microwaves) agents that, under certain circumstances of exposure, can cause harmful effects to living organisms.

Toxicological profile
An ATSDR document that examines, summarizes, and interprets information about a hazardous substance to determine harmful levels of exposure and associated health effects. A toxicological profile also identifies significant gaps in knowledge on the substance and describes areas where further research is needed.

Toxicology
The study of the harmful effects of substances on humans or animals.

Tumor
An abnormal mass of tissue that results from excessive cell division that is uncontrolled and progressive. Tumors perform no useful body function. Tumors can be either benign (not cancer) or malignant (cancer).

Uncertainty factor
Mathematical adjustments for reasons of safety when knowledge is incomplete. For example, factors used in the calculation of doses that are not harmful (adverse) to people. These factors are applied to the lowest-observed-adverse-

effect-level (LOAEL) or the no-observed-adverse-effect-level (NOAEL) to derive a minimal risk level (MRL). Uncertainty factors are used to account for variations in people's sensitivity, for differences between animals and humans, and for differences between a LOAEL and a NOAEL. Scientists use uncertainty factors when they have some, but not all, the information from animal or human studies to decide whether an exposure will cause harm to people [also sometimes called a safety factor].

Urgent public health hazard

A category used in ATSDR's public health assessments for sites where short-term exposures (less than 1 year) to hazardous substances or conditions could result in harmful health effects that require rapid intervention.

Volatile organic compounds (VOCs)

Organic compounds that evaporate readily into the air. VOCs include substances such as benzene, toluene, methylene chloride, and methyl chloroform.

Other glossaries and dictionaries:

Environmental Protection Agency (http://www.epa.gov/OCEPAterms/)

National Center for Environmental Health (CDC) (http://www.cdc.gov/nceh/dls/report/glossary.htm)

National Library of Medicine (NIH) (http://www.nlm.nih.gov/medlineplus/mplusdictionary.html)

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