

**TABLE 2.1
RESULTS OF CULVERT 105 VIDEO INSPECTION**

**RCRA FACILITY INVESTIGATION REPORT – VOLUME IV
FMC CORPORATION – MIDDLEPORT, NEW YORK**

Pipe Conditions During April 2004 Inspection						
Pipe Section Number ¹	Length of Pipe Inspected (feet)	Pipe Material ²	Estimated Pipe Diameter	Pipe Condition ³	Entry Point and Comments	Sediment/Debris Presence
1	122.9	Tile	24"	Poor	Entry at catch basin CB-S6; south to debris in manhole MH-S7	Large debris only
2	7.4	Tile	24"	Poor	Entry at catch basin CB-S6; north to debris (joins Section 24)	Large debris only
3	234.6	PVC	24"	Good	Entry at grade-level pipe	Sediment present at entry point and catch basin
4	55.6	Tile	24"	Fair	Entry at manhole	Sediment present at catch basin
5	59.1	Tile	24"	Fair	Entry at manhole	Large debris only
6	34.7	Tile	24"	Fair	Entry at grade level pipe	Large debris only
7	79.1	Tile	24"	Fair	Entry at manhole	No sediment or debris present
8	170.3	PVC	24"	Good	Entry at manhole	No sediment or debris present
9	0	Concrete	Box Culvert	Fair	Inspection of box culvert beneath road	No sediment or debris visible
10	42.5	Concrete	24"	Fair	Entry at manhole	Large debris only
11	8.4	Steel	36"	Good	Entry at manhole	Large debris only
12	70.1	PVC	24"	Good	Entry at manhole	No sediment or debris present
13	31.3	Steel	24"	Fair	Entry at grade level pipe	Large debris only
14	5.5	Steel	24"	Fair	Entry at small manhole	Large debris only
15	100.9	Steel	24"	Good	Entry at small manhole	Large debris only
16	132.3	Concrete Tile	24"	Fair / Good	Entry at manhole MH-S2; north to Culvert 105 main pipe at manhole MH-S1	Sediments at 73.2 feet
17	2.0	Concrete Tile	24"	Good	Entry at manhole MH-S2; south to bulkhead end	No sediment or debris present
18	4.1	PVC	24"	Poor	Entry at manhole MH-S3; north to pipe material change to stone at 4.1 feet - stone prevents further progress	Large debris only
	0.7	Stone	24"	Poor		
19	119.0	CPP	24"	Good	Entry at manhole MH-S3; south to second catch basin	Large debris only
20	28.0	CPP	24"	Good	Entry at manhole MH-S4; north to catch basin (joins Section 19)	No sediment or debris present

**TABLE 2.1
RESULTS OF CULVERT 105 VIDEO INSPECTION**

**RCRA FACILITY INVESTIGATION REPORT – VOLUME IV
FMC CORPORATION – MIDDLEPORT, NEW YORK**

Pipe Conditions During April 2004 Inspection						
Pipe Section Number ¹	Length of Pipe Inspected (feet)	Pipe Material ²	Estimated Pipe Diameter	Pipe Condition ³	Entry Point and Comments	Sediment/Debris Presence
21	10.8	CPP	24"	Fair	Entry at manhole MH-S4; south to debris past catch basin CB-S5; pipe material change at 10.8 feet	Large debris only
	142.2	Tile	24"	Poor		
22	12.2	Tile	24"	Fair	Entry at manhole MH-S1; south to debris; pipe material change at 12.2 feet	Large debris only
	6.9	Stone	24"	Poor		
23	98.8	Tile	36"	Fair	Entry at manhole MH-S1; north to pipe material change at 98.8 feet	Sediment at 40.0 to 54.1 feet
	0.8	Stone	36"	Fair		
24	132.0	Tile	24" to 30"	Poor	Entry at catch basin CB-S6; north to pipe material change at 132.0 feet	Large debris only
	1.0					
25	11.4	Tile	10"	Fair	Entry at drop inlet basin on Freeman Avenue; lateral to debris at Culvert 105 main pipe	Large debris only
26	10.1	Tile (PVC at inlet)	8"	Fair	Entry at drop inlet basin on Park Avenue; lateral to Culvert 105 main pipe	Large debris only
27	5.6	Tile	8"	Fair	Entry at drop inlet basin on Park Avenue; lateral towards Culvert 105 to debris	Large debris only
28	2.0	Tile	8"	Fair	Entry at drop inlet basin on Park Avenue; south to debris	Large debris only

Notes:

- 1 Number assigned to each section of Culvert 105 buried pipe inspected, as referenced in the National Vacuum Service video inspection reports dated April 2004. Refer to Figures 2.2a and 2.2b of RFI Volume IV and *Culvert 105 Video Inspection Results* (July 2004).
- 2 Piping sections constructed of plastic materials (i.e., PVC, CPP) are likely to have been installed more recently (widely available since the 1960s) than pipe sections constructed of tile, steel, concrete, or stone (available since at least the early 1900s).
- 3 PVC = polyvinyl chloride plastic pipe
CPP = Corrugated polyethylene plastic pipe
- 4 Pipe condition reported by National Vacuum Service:
 - Good Pipe has little or no constructional defects, with minimal cracking/rootlets and little or no flow obstructions.
 - Fair Pipe has some damages, minor drainage obstructions, some cracks and rootlets penetration.
 - Poor Pipe is damaged with notable deformations, holes, breaks, deep root presence and other drainage obstructions.

**TABLE 3.2
OFF-SITE INVESTIGATION PARAMETER LIST**

**RCRA FACILITY INVESTIGATION REPORT – VOLUME IV
FMC CORPORATION – MIDDLEPORT, NEW YORK**

Parameter Group	Parameters / Constituents
Metals	Arsenic Lead Aluminum Cadmium Copper Iron Manganese Mercury Selenium Sodium Thallium Zinc
Chlorinated Pesticides	Aldrin BHC (Lindane) (alpha, beta, delta, gamma isomers) Chlordane (alpha, gamma isomers) DDD DDE DDT Dieldrin Endosulfan I Endosulfan II Endosulfan Sulfate Endrin Endrin Aldehyde Heptachlor Heptachlor Epoxide Isodrin Methoxychlor Toxaphene
Chlorinated Herbicides	2,4-Dichlorophenoxyacetic Acid (2,4-D), 2,4,5-Trichlorophenoxyacetic Acid (2,4,5-T)
Organophosphate Pesticides	Dursban (Chlorpyrifos) Diazinon Ethion Malathion Ethyl Parathion Methyl Parathion Phorate Ronnel
Phenolic Compounds	o-Cresol (2-methyl phenol) Dinitro-o-cresol (DNOC) Karathane (Dinocap)*, Dinitro-butylphenol (DNBP, Dinoseb)**
Furans and Methyl Carbamates	7-Hydroxybenzofuran Carbaryl Carbofuran Chlorpropham Propoxur

Notes:

* Analyzed by same method as chlorinated pesticides.

** Analyzed by same method as chlorinated herbicides.

This table was adapted from Table 4.2 of the *1990-1993 Off-Site Investigation Report* (CRA, 1993)

**TABLE 4.1
INVENTORY OF USABLE SOIL/SEDIMENT SAMPLES IN CULVERT 105 STUDY AREA**

**RCRA FACILITY INVESTIGATION REPORT – VOLUME IV
FMC CORPORATION – MIDDLEPORT, NEW YORK**

Parameter Group		FMC Primary Samples	FMC Duplicate Samples	Agency Primary Samples	Agency Duplicate Samples	Combined Samples
Arsenic	Total:	1,242	66	298	11	1,445
	Removed:	126	7	23	1	138
	Remaining:	1,116	59	276	10	1,308
Lead	Total:	77	5	11	0	81
	Removed:	9	0	3	0	12
	Remaining:	68	5	8	0	69
Chlorinated Pesticides	Total:	80	5	10	0	84
	Removed:	7	0	4	0	11
	Remaining:	73	5	6	0	73
Other Metals	Total:	8	0	4	0	12
	Removed:	4	0	3	0	7
	Remaining:	4	0	1	0	5
Chlorinated Herbicides and Organophosphate Pesticides	Total:	8	0	0	0	8
	Removed:	4	0	0	0	4
	Remaining:	4	0	0	0	4
Phenolic Compounds*	Total:	8	0	0	0	8
	Removed:	4	0	0	0	4
	Remaining:	4	0	0	0	4
Furans and Methyl Carbamates	Total:	8	1	0	0	8
	Removed:	4	0	0	0	4
	Remaining:	4	1	0	0	4

Notes:

1. Refer to Section 4.1 of this RFI Report Volume IV for description of "combined" samples.
2. * Some phenolic compounds analyzed by other methods:
Dinocap as chlorinated pesticide
Dinoseb as chlorinated herbicide
3. "Primary Samples" count includes split samples.
4. For arsenic data, refer to Tables C.1 through C.4 in Appendix C.
5. For lead data, refer to Table D.1 in Appendix D.
6. For chlorinated pesticides data, refer for Table D.1 in Appendix D.
7. For other metals data, refer to Table D.2 in Appendix D.
8. For chlorinated herbicides and organophosphate pesticides data, refer to Table D.2 in Appendix D.
9. For phenolic compounds data, refer to Table D.2 in Appendix D.
10. For furans and methyl carbamates data, refer to Table D.3 in Appendix D.

**TABLE 4.2
INVENTORY OF USABLE ARSENIC SOIL/SEDIMENT SAMPLES BY PROGRAM**

**RCRA FACILITY INVESTIGATION REPORT – VOLUME IV
FMC CORPORATION – MIDDLEPORT, NEW YORK**

Sampling Event	Number of Locations	Total Number of Combined Samples	Number of Samples Collected					
			FMC		Agency			
			Field Samples	Field Duplicates	Split Samples	Split Duplicates	Field Samples	Field Duplicates
1986 NYSDEC Investigation	4	4	0	0	0	0	4	0
1990-1993 Off-Site Investigation	4	8	8	0	0	0	0	0
2002 RFI Sampling Program	70	220	220	12	20	1	0	0
2004 RFI Tributary One & Culvert 105 – Phase I (Early 2004)	102	489	391	21	33	3	98	1
2004 RFI Tributary One & Culvert 105 – Phase II (Late 2004)	81	384	340	19	21	1	44	1
2005 RFI Tributary One & Culvert 105 – Phase III	59	293	236	11	21	4	57	0
2007 Early Action Sampling	12	47	47	3	0	0	0	0
Totals:	332	1,445	1,242	66	95	9	203	2

Notes:

1. This table only describes the sampling and analysis activities of each investigation that were conducted within the Culvert 105 Study Area; other sampling activities were conducted in other study areas concurrently, as described in RFI Report Volume I. In particular, additional samples were collected at properties that are traversed by Culvert 105 south of the Erie Canal as part of the Air Deposition Study Area (refer to Figures 3.3a and 3.3b of this Volume IV of the RFI report).
2. Number of samples reflects number of combined results for that event (refer to Section 4.1 of this Volume IV).
Analytical data for soil/sediment are summarized in Appendix C for arsenic and in Appendix D for other constituents.

**TABLE 6.1
CONCENTRATIONS OF METALS OBSERVED IN BACKGROUND SOIL SAMPLES**

**RCRA FACILITY INVESTIGATION REPORT - VOLUME IV
FMC CORPORATION - MIDDLEPORT, NEW YORK**

Location ID: Sample Depth: Date Collected:	Units	S 16 0 - 6" 11/90	S 17 0 - 6" 11/90	SS-9-85 0 - 6" 11/85	SS-10-85 0 - 6" 11/85	SB-JA-01 0 - 6" 2/89	SB-JA-01 6 - 12" 2/89	SB-JA-08 0 - 6" 2/89	SB-JA-08 6 - 12" 2/89	DOH-SS 19 0 - 3" 1/89	DOH-SS 20 0 - 3" 1/89	DOH-SS 21 0 - 3" 1/89	DOH-SS 22 0 - 3" 1/89	DOH-SS 23 0 - 3" 1/89
Arsenic														
Arsenic	mg/kg	5.8	19.7	34.3	22	31.6	41.2	56.1	55.9	24.0	25.0	4.4	5.5	5.7
Lead														
Lead	mg/kg	39.3	47.6	--	--	53.5	9.43	114	49.2	107	91.0	23.0	22.0	44.0
Other Metals														
Aluminum	mg/kg	13,700	8,360	--	--	--	--	--	--	20,900	21,500	21,700	25,400	23,400
Antimony	mg/kg	--	--	--	--	--	--	--	--	20 U	20 U	20 U	20 U	20 U
Barium	mg/kg	--	--	--	--	--	--	--	--	181	94.0	93.0	116	74.0
Beryllium	mg/kg	--	--	--	--	--	--	--	--	2.0	1.5	1.5	1.7	1.3
Cadmium	mg/kg	0.92 U	0.63 U	--	--	--	--	--	--	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Chromium	mg/kg	--	--	--	--	--	--	--	--	23.0	20.0	23.0	27.0	20.0
Cobalt	mg/kg	--	--	--	--	--	--	--	--	6.1	8.1	6.7	6.7	6.4
Copper	mg/kg	38.3	37.0	--	--	--	--	--	--	63.0	116	28.0	23.0	27.0
Iron	mg/kg	26,400	17,100	--	--	--	--	--	--	32,500	21,500	21,700	26,100	21,300
Manganese	mg/kg	1,370	785	--	--	--	--	--	--	3,140	1,090	633	469	341
Mercury	mg/kg	0.18 U	0.13 U	0.07	0.10 U	--	--	--	--	0.06	0.06	0.05	0.04	0.05
Molybdenum	mg/kg	--	--	--	--	--	--	--	--	8.0 U	8.0 U	8.0 U	8.0 U	8.0 U
Nickel	mg/kg	--	--	--	--	--	--	--	--	19.0	16.0	21.0	21.0	17.0
Selenium	mg/kg	0.92 U	0.63 U	--	--	--	--	--	--	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Silver	mg/kg	--	--	--	--	--	--	--	--	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U
Sodium	mg/kg	917 U	632 U	--	--	--	--	--	--	--	--	--	--	--
Strontium	mg/kg	--	--	--	--	--	--	--	--	24	32	26	20 U	20 U
Thallium	mg/kg	0.92 U	0.63 U	--	--	--	--	--	--	10 U	10 U	10 U	10 U	10 U
Tin	mg/kg	--	--	--	--	--	--	--	--	20 U	20 U	20 U	20 U	20 U
Titanium	mg/kg	--	--	--	--	--	--	--	--	321	332	383	525	313
Vanadium	mg/kg	--	--	--	--	--	--	--	--	37.0	34.0	36.0	44.0	34.0
Zinc	mg/kg	191	81.2	--	--	--	--	--	--	112	143	81.0	85.0	81.0

Notes:

1. milligrams per kilogram (mg/kg), equivalent to parts-per-million (ppm)
2. Results for arsenic and lead are "combined" results (refer to Section 4.1 of this RFI Report Volume IV for description)
3. Sampling locations are depicted on Figure 6.1a of this RFI Report Volume IV
4. U = not detected at concentration indicated
5. These 11 sampling locations (13 samples) were identified by the Agencies by letter dated January 24, 1996 as representing soil arsenic background in the Middleport study area
For arsenic, the background data in this table was replaced by the data resulting from the 2003 Gasport Background Study (see Table 7.2a of this RFI Report Volume IV)
6. -- = not analyzed

TABLE 6.2a
SUMMARY OF RESIDENTIAL SOIL SCREENING VALUES

RCRA FACILITY INVESTIGATION REPORT - VOLUME IV
FMC CORPORATION - MIDDLEPORT, NEW YORK

Constituent	Units	Residential Soil Cleanup Objective (SCO) ¹	Residential Soil Screening Level (SSL) ²	Values Used to Derive SSL ³		
				Ingestion Pathway Screening Level	Inhalation Pathway Screening Level	Soil Saturation Concentration (Csat)
Chlorinated Pesticides						
4,4'-DDD	ug/kg	2,600	2,670	2,670	NV	2,610,000
4,4'-DDE	ug/kg	1,800	1,880	1,880	NV	15,600,000
4,4'-DDT	ug/kg	1,700	1,880	1,880	1,700,000	1,910,000
Aldrin	ug/kg	19.0	37.7	37.7	7,730	12,800,000
alpha-BHC	ug/kg	97.0	102	102	1,690	71,500
beta-BHC	ug/kg	72.0	356	356	14,000	8,790
delta-BHC	ug/kg	100,000	102	102	NV	n.a.
gamma-BHC (Lindane)	ug/kg	280	493	493	NV	212,000
alpha-Chlordane	ug/kg	910	493	493	44,100	195,000
gamma-Chlordane	ug/kg	NV	493	493	44,100	195,000
Chlordane (total)	ug/kg	NV	493	493	44,100	195,000
Dieldrin	ug/kg	39.0	40.0	40.0	2,560	121,000
Endosulfan I	ug/kg	4,800	31,700	469,000	NV	31,700
Endosulfan II	ug/kg	4,800	31,700	469,000	NV	31,700
Endosulfan sulfate	ug/kg	4,800	31,700	469,000	NV	31,700
Endrin	ug/kg	2,200	23,500	23,500	NV	89,200
Endrin aldehyde	ug/kg	NV	23,500	23,500	NV	89,200
Endrin ketone	ug/kg	NV	23,500	23,500	NV	89,200
Heptachlor	ug/kg	420	142	142	258	7,360,000
Heptachlor Epoxide	ug/kg	NV	70.4	70.4	10,700	483,000
Isodrin	ug/kg	NV	38.0	38.0	7,700	n.a.
Methoxychlor	ug/kg	NV	128,000	391,000	NV	128,000
Toxaphene	ug/kg	NV	582	582	202,000	5,520,000
Metals						
Lead	mg/kg	400	400	400	NV	n.a.
Aluminum	mg/kg	NV	78,000	78,000	NV	n.a.
Cadmium	mg/kg	2.5	78.0	78.0	1,780	n.a.
Copper	mg/kg	270	2,890	2,890	48,200,000	n.a.
Iron	mg/kg	NV	23,000	23,000	NV	n.a.
Manganese	mg/kg	2,000	1,800	1,800	69,000	n.a.
Mercury	mg/kg	0.81	10.5	23.5	10.5	n.a.
Selenium	mg/kg	36	391	391	NV	n.a.
Sodium	mg/kg	NV	NV	NV	NV	n.a.
Thallium	mg/kg	NV	5.48	5.48	NV	n.a.
Zinc	mg/kg	2,200	23,500	23,500	48,200,000	n.a.
Phenolic Compounds						
2-Methylphenol (o-Cresol)	mg/kg	100	3,910	3,910	NV	71,400
4,6-Dinitro-2-methylphenol	mg/kg	NV	7.8	7.8	NV	n.a.
Dinocap (Karathane)	mg/kg	NV	NV	NV	NV	n.a.
Dinoseb (dinitro-butylphenol)	mg/kg	NV	78.2	78.2	NV	n.a.
Furans and Methyl Carbamates						
7-Hydroxybenzofuran	mg/kg	NV	NV	NV	NV	--
Baygon (propoxur)	mg/kg	NV	313	313	NV	--
Carbofuran	mg/kg	NV	391	391	NV	--
Carbaryl (Sevin)	mg/kg	NV	7,820	7,820	NV	--
Chloroprotham	mg/kg	NV	15,600	15,600	NV	--

TABLE 6.2a
SUMMARY OF RESIDENTIAL SOIL SCREENING VALUES

RCRA FACILITY INVESTIGATION REPORT - VOLUME IV
FMC CORPORATION - MIDDLEPORT, NEW YORK

Constituent	Units	Residential Soil Cleanup Objective (SCO) ¹	Residential Soil Screening Level (SSL) ²	Values Used to Derive SSL ³		
				Ingestion Pathway Screening Level	Inhalation Pathway Screening Level	Soil Saturation Concentration (Csat)
Chlorinated Herbicides						
2,4-D	mg/kg	NV	782	782	NV	--
2,4,5-T	mg/kg	NV	782	782	NV	--
Organophosphate Pesticides						
Chlorpyrifos (Dursban)	mg/kg	NV	235	235	NV	--
Ethion	mg/kg	NV	39.1	39.1	NV	--
Diazinon	mg/kg	NV	70.4	70.4	NV	--
Malathion	mg/kg	NV	1,560	1,560	NV	--
Methyl Parathion	mg/kg	NV	19.6	19.6	NV	--
Phorate (Thimet)	mg/kg	NV	15.6	15.6	NV	--
Ronnel	mg/kg	NV	3,910	3,910	NV	--
Ethyl Parathion	mg/kg	NV	469	469	NV	--

Notes:

1. Residential Remedial Program Soil Cleanup Objectives (SCOs) listed in Table 375-6.8(b) of 6 NYCRR Subpart 375-6.
2. Residential Soil Screening Levels (SSLs) listed in Table 7.2 of the 1999 Draft RFI Report.
3. The SSL is the lowest of three values: the ingestion pathway screening level, the inhalation pathway screening level, and the saturation concentration, if applicable. (n.a. = not applicable)
4. NV = no SCO available in 6 NYCRR Subpart 375-6 or no SSL available in the 1999 Draft RFI Report.

**TABLE 6.2b
SUMMARY OF INDUSTRIAL SOIL SCREENING VALUES**

**RCRA FACILITY INVESTIGATION REPORT - VOLUME IV
FMC CORPORATION - MIDDLEPORT, NEW YORK**

Constituent	Units	Industrial Soil Cleanup Objective (SCO) ¹	Industrial Soil Screening Level (SSL) ²	Values Used to Derive SSL ³		
				Ingestion Pathway Screening Level	Inhalation Pathway Screening Level	Soil Saturation Concentration (Csat)
Chlorinated Pesticides						
4,4'-DDD	ug/kg	180,000	238,000	238,000	NV	2,610,000
4,4'-DDE	ug/kg	120,000	168,000	168,000	NV	15,600,000
4,4'-DDT	ug/kg	94,000	168,000	168,000	28,500,000	1,910,000
Aldrin	ug/kg	1,400	3,370	3,370	130,000	12,800,000
alpha-BHC	ug/kg	6,800	9,080	9,080	28,400	71,500
beta-BHC	ug/kg	14,000	8,790	31,800	235,000	8,790
delta-BHC	ug/kg	1,000,000	9,080	9,080	NV	n.a.
gamma-BHC (Lindane)	ug/kg	23,000	44,000	44,000	NV	212,000
alpha-Chlordane	ug/kg	47,000	44,000	44,000	741,000	195,000
gamma-Chlordane	ug/kg	NV	44,000	44,000	741,000	195,000
Chlordane (total)	ug/kg	NV	44,000	44,000	741,000	195,000
Dieldrin	ug/kg	2,800	3,580	3,580	43,000	121,000
Endosulfan I	ug/kg	920,000	31,700	12,300,000	NV	31,700
Endosulfan II	ug/kg	920,000	31,700	12,300,000	NV	31,700
Endosulfan sulfate	ug/kg	920,000	31,700	12,300,000	NV	31,700
Endrin	ug/kg	410,000	89,200	613,000	NV	89,200
Endrin aldehyde	ug/kg	NV	89,200	613,000	NV	89,200
Endrin ketone	ug/kg	NV	89,200	613,000	NV	89,200
Heptachlor	ug/kg	29,000	4,330	12,700	4,330	7,360,000
Heptachlor Epoxide	ug/kg	NV	6,290	6,290	181,000	483,000
Isodrin	ug/kg	NV	3,400	3,400	130,000	n.a.
Methoxychlor	ug/kg	NV	128,000	10,200,000	NV	128,000
Toxaphene	ug/kg	NV	52,000	52,000	3,390,000	5,520,000
Metals						
Lead	mg/kg	3,900	NV	NV	NV	n.a.
Aluminum	mg/kg	NV	1,000,000	1,000,000	NV	n.a.
Cadmium	mg/kg	60	2,040	2,040	30,000	n.a.
Copper	mg/kg	10,000	75,600	75,600	67,500,000	n.a.
Iron	mg/kg	NV	610,000	610,000	NV	n.a.
Manganese	mg/kg	10,000	47,000	47,000	96,000	n.a.
Mercury	mg/kg	5.7	14.7	613	14.7	n.a.
Selenium	mg/kg	6,800	10,200	10,200	NV	n.a.
Sodium	mg/kg	NV	NV	NV	NV	n.a.
Thallium	mg/kg	NV	143	143	NV	n.a.
Zinc	mg/kg	10,000	613,000	613,000	67,500,000	n.a.
Phenolic Compounds						
2-Methylphenol (o-Cresol)	mg/kg	1,000	71,400	102,000	NV	71,400
4,6-Dinitro-2-methylphenol	mg/kg	NV	200	200	NV	n.a.
Dinocap (Karathane)	mg/kg	NV	NV	NV	NV	n.a.
Dinoseb (dinitro-butylphenol)	mg/kg	NV	2,040	2,040	NV	n.a.
Furans and Methyl Carbamates						
7-Hydroxybenzofuran	mg/kg	NV	NV	NV	NV	n.a.
Baygon (propoxur)	mg/kg	NV	8,180	8,180	NV	n.a.
Carbofuran	mg/kg	NV	10,200	10,200	NV	n.a.
Carbaryl (Sevin)	mg/kg	NV	204,000	204,000	NV	n.a.
Chlorpropham	mg/kg	NV	409,000	409,000	NV	n.a.

**TABLE 6.2b
SUMMARY OF INDUSTRIAL SOIL SCREENING VALUES**

**RCRA FACILITY INVESTIGATION REPORT - VOLUME IV
FMC CORPORATION - MIDDLEPORT, NEW YORK**

Constituent	Units	Industrial Soil Cleanup Objective (SCO) ¹	Industrial Soil Screening Level (SSL) ²	Values Used to Derive SSL ³		
				Ingestion Pathway Screening Level	Inhalation Pathway Screening Level	Soil Saturation Concentration (Csat)
Chlorinated Herbicides						
2,4-D	mg/kg	NV	20,400	20,400	NV	n.a.
2,4,5-T	mg/kg	NV	20,400	20,400	NV	n.a.
Organophosphate Pesticides						
Chlorpyrifos (Dursban)	mg/kg	NV	6,130	6,130	NV	n.a.
Ethion	mg/kg	NV	1,020	1,020	NV	n.a.
Diazinon	mg/kg	NV	1,840	1,840	NV	n.a.
Malathion	mg/kg	NV	40,900	40,900	NV	n.a.
Methyl Parathion	mg/kg	NV	511	511	NV	n.a.
Phorate (Thimet)	mg/kg	NV	409	409	NV	n.a.
Ronnel	mg/kg	NV	102,000	102,000	NV	n.a.
Ethyl Parathion	mg/kg	NV	12,300	12,300	NV	n.a.

Notes:

1. Industrial Remedial Program Soil Cleanup Objectives (SCOs) listed in Table 375-6.8(b) of 6 NYCRR Subpart 375-6.
2. Industrial Soil Screening Levels (SSLs) listed in Table 7.2 of the 1999 Draft RFI Report.
3. The SSL is the lowest of three values: the ingestion pathway screening level, the inhalation pathway screening level, and the saturation concentration, if applicable. (n.a. = not applicable)
4. NV = no SCO available in 6 NYCRR Subpart 375-6 or no SSL available in the 1999 Draft RFI Report.

TABLE 6.3
STATISTICAL SUMMARY OF NON-ARSENIC SOIL ANALYTICAL DATA
AND COMPARISON TO SOIL SCREENING LEVELS (SSLs)

RCRA FACILITY INVESTIGATION REPORT - VOLUME IV
FMC CORPORATION - MIDDLEPORT, NEW YORK

Constituent	Units	Residential Soil Screening Level (SSL)	All Samples			Samples Remaining		
			Frequency Detected	Maximum Concentration	# Samples Exceeding SSL	Frequency Detected	Maximum Concentration	# Samples Exceeding SSL
Chlorinated Pesticides								
4,4'-DDD	ug/kg	2,670	36/84	1,900	0	33/69	1,900	0
4,4'-DDE	ug/kg	1,880	56/84	730	0	43/69	730	0
4,4'-DDT	ug/kg	1,880	52/84	1,200	0	39/69	810	0
Aldrin	ug/kg	37.7	0/84	ND	0	0/69	ND	0
alpha-BHC	ug/kg	102	3/80	1,200	1	1/68	25	0
beta-BHC	ug/kg	356	6/83	51,000	1	3/69	51,000	1
delta-BHC	ug/kg	102	2/84	14	0	2/69	14	0
gamma-BHC (Lindane)	ug/kg	493	2/84	500	1	1/69	80	0
alpha-Chlordane	ug/kg	493	7/80	64	0	6/68	64	0
gamma-Chlordane	ug/kg	493	5/80	55	0	4/68	55	0
Chlordane (total)	ug/kg	493	4/4	750	2	1/1	750	1
Dieldrin	ug/kg	40.0	17/84	290	9	8/69	290	5
Endosulfan I	ug/kg	31,700	0/84	ND	0	0/69	ND	0
Endosulfan II	ug/kg	31,700	9/80	9.5	0	9/68	9.5	0
Endosulfan sulfate	ug/kg	31,700	0/80	ND	0	0/68	ND	0
Endrin	ug/kg	23,500	3/80	35	0	3/68	35	0
Endrin aldehyde	ug/kg	23,500	9/80	3	0	9/68	3	0
Endrin ketone	ug/kg	23,500	0/72	ND	0	0/64	ND	0
Heptachlor	ug/kg	142	0/80	ND	0	0/68	ND	0
Heptachlor Epoxide	ug/kg	70.4	2/80	58	0	2/68	58	0
Isodrin	ug/kg	38.0	1/80	0.81	0	1/68	0.81	0
Methoxychlor	ug/kg	128,000	0/80	ND	0	0/68	ND	0
Toxaphene	ug/kg	582	0/80	ND	0	0/68	ND	0
Metals								
Lead	mg/kg	400	80/81	541	2	68/69	541	2
Aluminum	mg/kg	78,000	8/8	13,600	0	4/4	13,600	0
Cadmium	mg/kg	78.0	6/8	2.7	0	4/4	2.7	0
Copper	mg/kg	2,890	8/8	232	0	4/4	232	0
Iron	mg/kg	23,000	8/8	29,700	2	4/4	29,700	2
Manganese	mg/kg	1,800	12/12	1,160	0	5/5	1,160	0
Mercury	mg/kg	10.5	6/8	0.58	0	2/4	0.41	0
Selenium	mg/kg	391	0/8	ND	0	0/4	ND	0
Sodium	mg/kg	NV	0/8	ND	0	0/4	ND	0
Thallium	mg/kg	5.48	0/8	ND	0	0/4	ND	0
Zinc	mg/kg	23,500	12/12	660	0	5/5	660	0
Phenolic Compounds								
2-Methylphenol (o-Cresol)	mg/kg	3,910	0/8	ND	0	0/4	ND	0
4,6-Dinitro-2-methylphenol	mg/kg	7.8	0/8	ND	0	0/4	ND	0
Dinocap (Karathane)	mg/kg	NV	0/8	ND	0	0/4	ND	0
Dinoseb (dinitro-butylphenol)	mg/kg	NV	0/8	ND	0	0/4	ND	0
Furans and Methyl Carbamates								
7-Hydroxybenzofuran	mg/kg	NV	0/9	ND	0	0/5	ND	0
Baygon (propoxur)	mg/kg	313	0/9	ND	0	0/5	ND	0
Carbofuran	mg/kg	391	0/9	ND	0	0/5	ND	0
Carbaryl (Sevin)	mg/kg	7,820	0/9	ND	0	0/5	ND	0
Chlorpropham	mg/kg	15,600	0/9	ND	0	0/5	ND	0
Chlorinated Herbicides								
2,4-D	mg/kg	782	0/8	ND	0	0/3	ND	0
2,4,5-T	mg/kg	782	0/8	ND	0	0/3	ND	0

**TABLE 6.3
 STATISTICAL SUMMARY OF NON-ARSENIC SOIL ANALYTICAL DATA
 AND COMPARISON TO SOIL SCREENING LEVELS (SSLs)**

**RCRA FACILITY INVESTIGATION REPORT - VOLUME IV
 FMC CORPORATION - MIDDLEPORT, NEW YORK**

Constituent	Units	Residential Soil Screening Level (SSL)	All Samples			Samples Remaining		
			Frequency Detected	Maximum Concentration	# Samples Exceeding SSL	Frequency Detected	Maximum Concentration	# Samples Exceeding SSL
Organophosphate Pesticides								
Chlorpyrifos (Dursban)	mg/kg	235	0/8	ND	0	0/4	ND	0
Ethion	mg/kg	39.1	0/8	ND	0	0/4	ND	0
Diazinon	mg/kg	70.4	0/8	ND	0	0/4	ND	0
Malathion	mg/kg	1,560	0/8	ND	0	0/4	ND	0
Methyl Parathion	mg/kg	19.6	0/8	ND	0	0/4	ND	0
Phorate (Thimet)	mg/kg	15.6	0/8	ND	0	0/4	ND	0
Ronnel	mg/kg	3,910	0/8	ND	0	0/4	ND	0
Ethyl Parathion	mg/kg	469	0/8	ND	0	0/4	ND	0

Notes:

1. Residential Soil Screening Levels (SSLs) provided in Table 6.2a.
2. Statistics based on data tables provided in Appendix D. "All Samples" includes all soil and sediment analytical data collected within Culvert 105 South Study Area. "Samples Remaining" does not include those samples that correspond to soil and sediment that was excavated or removed.
3. ND = not detected at laboratory reporting limit
4. N/A = not applicable - no SSL value available for comparison
5. NV = no value available

TABLE 6.4
STATISTICAL SUMMARY OF NON-ARSENIC SOIL ANALYTICAL DATA
AND COMPARISON TO SOIL CLEANUP OBJECTIVES (SCOs)

RCRA FACILITY INVESTIGATION REPORT - VOLUME IV
FMC CORPORATION - MIDDLEPORT, NEW YORK

Constituent	Units	Residential Soil Screening Objective (SCO)	All Samples			Samples Remaining		
			Frequency Detected	Maximum Concentration	# Samples Exceeding SCO	Frequency Detected	Maximum Concentration	# Samples Exceeding SCO
Chlorinated Pesticides								
4,4'-DDD	ug/kg	2,600	36/84	1,900	0	33/69	1,900	0
4,4'-DDE	ug/kg	1,800	56/84	730	0	43/69	730	0
4,4'-DDT	ug/kg	1,700	52/84	1,200	0	39/69	810	0
Aldrin	ug/kg	19	0/84	ND	0	0/69	ND	0
alpha-BHC	ug/kg	97	3/80	1,200	1	1/68	25	0
beta-BHC	ug/kg	72	6/83	51,000	1	3/69	51,000	1
delta-BHC	ug/kg	100,000	2/84	14	0	2/69	14	0
gamma-BHC (Lindane)	ug/kg	280	2/84	500	1	1/69	80	0
alpha-Chlordane	ug/kg	910	7/80	64	0	6/68	64	0
gamma-Chlordane	ug/kg	NV	5/80	55	0	4/68	55	0
Chlordane (total)	ug/kg	NV	4/4	750	0	1/1	750	0
Dieldrin	ug/kg	39	17/84	290	9	8/69	290	5
Endosulfan I	ug/kg	4,800	0/84	ND	0	0/69	ND	0
Endosulfan II	ug/kg	4,800	9/80	9.5	0	9/68	9.5	0
Endosulfan sulfate	ug/kg	4,800	0/80	ND	0	0/68	ND	0
Endrin	ug/kg	2,200	3/80	35	0	3/68	35	0
Endrin aldehyde	ug/kg	NV	9/80	3	0	9/68	3	0
Endrin ketone	ug/kg	NV	0/72	ND	0	0/64	ND	0
Heptachlor	ug/kg	420	0/80	ND	0	0/68	ND	0
Heptachlor Epoxide	ug/kg	NV	2/80	58	0	2/68	58	0
Isodrin	ug/kg	NV	1/80	1	0	1/68	0.81	0
Methoxychlor	ug/kg	NV	0/80	ND	0	0/68	ND	0
Toxaphene	ug/kg	NV	0/80	ND	0	0/68	ND	0
Metals								
Lead	mg/kg	400	80/81	541	2	68/69	541	2
Aluminum	mg/kg	NV	8/8	13,600	0	4/4	13,600	0
Cadmium	mg/kg	2.5	6/8	2.7	1	4/4	2.7	1
Copper	mg/kg	270	8/8	232	0	4/4	232	0
Iron	mg/kg	NV	8/8	29,700	0	4/4	29,700	0
Manganese	mg/kg	2,000	12/12	1,160	0	5/5	1,160	0
Mercury	mg/kg	0.81	6/8	0.58	0	2/4	0.41	0
Selenium	mg/kg	36	0/8	ND	0	0/4	ND	0
Sodium	mg/kg	NV	0/8	ND	0	0/4	ND	0
Thallium	mg/kg	NV	0/8	ND	0	0/4	ND	0
Zinc	mg/kg	2,200	12/12	660	0	5/5	660	0
Phenolic Compounds								
2-Methylphenol (o-Cresol)	mg/kg	100	0/8	ND	0	0/4	ND	0
4,6-Dinitro-2-methylphenol	mg/kg	NV	0/8	ND	0	0/4	ND	0
Dinocap (Karathane)	mg/kg	NV	0/8	ND	0	0/4	ND	0
Dinoseb (dinitro-butylpheno)	mg/kg	NV	0/8	ND	0	0/4	ND	0
Furans and Methyl Carbamates								
7-Hydroxybenzofuran	mg/kg	NV	0/9	ND	0	0/5	ND	0
Baygon (propoxur)	mg/kg	NV	0/9	ND	0	0/5	ND	0
Carbofuran	mg/kg	NV	0/9	ND	0	0/5	ND	0
Carbaryl (Sevin)	mg/kg	NV	0/9	ND	0	0/5	ND	0
Chlorpropham	mg/kg	NV	0/9	ND	0	0/5	ND	0
Chlorinated Herbicides								
2,4-D	mg/kg	NV	0/8	ND	0	0/3	ND	0
2,4,5-T	mg/kg	NV	0/8	ND	0	0/3	ND	0

**TABLE 6.4
 STATISTICAL SUMMARY OF NON-ARSENIC SOIL ANALYTICAL DATA
 AND COMPARISON TO SOIL CLEANUP OBJECTIVES (SCOs)**

**RCRA FACILITY INVESTIGATION REPORT - VOLUME IV
 FMC CORPORATION - MIDDLEPORT, NEW YORK**

Constituent	Units	Residential Soil Screening Objective (SCO)	All Samples			Samples Remaining		
			Frequency Detected	Maximum Concentration	# Samples Exceeding SCO	Frequency Detected	Maximum Concentration	# Samples Exceeding SCO
Organophosphate Pesticides								
Chlorpyrifos (Dursban)	mg/kg	NV	0/8	ND	0	0 / 3	ND	0
Ethion	mg/kg	NV	0/8	ND	0	0 / 4	ND	0
Diazinon	mg/kg	NV	0/8	ND	0	0 / 4	ND	0
Malathion	mg/kg	NV	0/8	ND	0	0 / 4	ND	0
Methyl Parathion	mg/kg	NV	0/8	ND	0	0 / 4	ND	0
Phorate (Thimet)	mg/kg	NV	0/8	ND	0	0 / 4	ND	0
Ronnel	mg/kg	NV	0/8	ND	0	0 / 4	ND	0
Ethyl Parathion	mg/kg	NV	0/8	ND	0	0 / 4	ND	0

Notes:

1. Residential Soil Cleanup Objectives (SCOs) provided in Table 6.2a.
2. Statistics based on data tables provided in Appendix d. "All Samples" includes all soil and sediment analytical data collected within Culvert 105 South Study Area. "Samples Remaining" does not include those samples that correspond to soil and sediment that was excavated or removed.
3. ND = not detected at laboratory reporting limit
4. N/A = not applicable - no SCO value available for comparison
5. NV = no value available

**TABLE 7.1
STATISTICAL SUMMARY OF ARSENIC SOIL/SEDIMENT ANALYTICAL DATA BY TRANSECT**

**RCRA FACILITY INVESTIGATION - VOLUME IV
FMC CORPORATION - MIDDLEPORT, NEW YORK**

Transect	Total Number of Samples	Arsenic Soil/Sediment Concentration (mg/kg)				
		Minimum (all depths)	Maximum (all depths)	Mean (all depths)	Mean (0-12")	Mean (>12")
Reach CS						
CS1	25	3.6	83.2	45.0	35.9	46.7
CS1 post-removal	12	3.6	79.1	33.5	n.a.	33.5
CS2	20	1.0	39.5	11.0	37.3	4.4
CS3	18	2.1	17.6	6.0	7.7	5.8
CS4	27	2.2	47.0	19.4	43.9	15.1
CS5	24	1.1	142	17.4	20.8	16.9
CS6	21	1.3	26.5	7.3	23.2	4.6
Remote borehole locations	7	2.3	114	57.6	73.1	19.0
Remote borehole locations (post-removal)	2	2.3	35.6	19.0	n.a.	19.0
Reach CS Total	142	1.0	142	20.8	39.2	16.8
Reach CS Total (post-removal)	124	1.0	142	14.9	n.a.	19.0
Reach C1						
C1	35	1.8	210	37.7	44.6	22.8
C1 post-removal	17	1.8	19.6	10.4	11.2	9.4
C2	36	2.3	199	41.7	48.9	20.0
C2 post-removal	20	2.3	98.7	30.2	46.1	7.2
C2.1	49	2.2	83.9	19.8	28.1	8.6
C2.1 post-removal	24	2.2	19.0	9.9	11.4	9.0
C3	46	2.3	82.9	18.6	24.4	3.8
C3 post-removal	21	2.3	16.2	7.6	12.5	3.9
C4	42	1.8	149	26.7	33.0	3.6
C4 post-removal	18	1.8	14.7	7.1	10.6	3.6
Remote borehole locations	126	2.4	217	21.9	22.6	20.8
Remote borehole locations (post-removal)	114	2.4	217	18.1	17.3	19.5
Reach C1 Total	334	1.8	217	25.6	30.5	15.1
Reach C1 Total (post-removal)	214	1.8	217	15.7	18.4	12.2
Reach C2						
C5	68	ND	94.5	19.8	26.9	8.2
C5.5	60	2.1	259	33.5	52.3	5.3
C6	57	2.1	231	54.2	71.8	4.8
C6.5	55	1.3	301	55.2	88.1	6.0
C7	102	1.4	636	99.7	144	7.2
Remote borehole locations	281	2.2	491	34.8	52.0	9.2
Reach C2 Total	623	ND	636	47.3	70.7	7.8
Reach C3						
C7.3	34	2	170	16.0	25.0	3.0
C7.5	39	2	291	21.5	32.9	3.1
C8	62	1.7	97.7	21.6	28.7	3.0
C8.2	51	1.9	60.3	16.6	24.9	3.8
C8.5	74	1	416	18.3	28.3	3.9
C9	47	2	219	42.0	52.1	8.7
C9.5	15	3.5	14.3	5.9	5.8	6.2
C10	22	ND	282	73.4	75.7	25.8
Remote borehole locations	2	23.6	78.2	50.9	50.9	n.a.
Reach C3 Total	346	ND	416	25.1	35.3	4.3

Notes:

1. Remote borehole locations are sample locations not associated with a transect.
2. ND = Not Detected.
3. n.a. = not applicable (no samples in this category).

TABLE 7.2a
SOIL ARSENIC DATA FROM 2001-2003 GASPORT BACKGROUND STUDY

RCRA FACILITY INVESTIGATION REPORT - VOLUME IV
FMC CORPORATION - MIDDLEPORT, NEW YORK

Property Group	Land Use Type	Property ID	Sample Location	Depth (inches)	Arsenic Concentration (mg/kg)				
					Primary	Duplicate	Agency Split	Other	Combined
Wooded-Agricultural	Crop Field	Ca	CA-1A	0-3	56.7				56.7
Wooded-Agricultural	Crop Field	Ca	CA-1B	0-3	4.9				4.9
Wooded-Agricultural	Crop Field	Ca	CA-2A	0-3	5.2				5.2
Wooded-Agricultural	Crop Field	Ca	CA-2B	0-3	4.1				4.1
Wooded-Agricultural	Crop Field	Ca	CA-3A	0-3	5	4.6			4.8
Wooded-Agricultural	Crop Field	Ca	CA-3B	0-3	3.5				3.5
Wooded-Agricultural	Crop Field	Ca	CA-4A	0-3	33.5		31.1		32.3
Wooded-Agricultural	Crop Field	Ca	CA-4B	0-3	7.1				7.1
Wooded-Agricultural	Crop Field	Cc	CC-1A	0-3	3.2				3.2
Wooded-Agricultural	Crop Field	Cc	CC-1B	0-3	3 J				3
Wooded-Agricultural	Crop Field	Cc	CC-2A	0-3	3.3		3.1		3.2
Wooded-Agricultural	Crop Field	Cc	CC-2B	0-3	2.9 J				2.9
Wooded-Agricultural	Crop Field	Cc	CC-3A	0-3	3.2				3.2
Wooded-Agricultural	Crop Field	Cc	CC-3B	0-3	2.3 J				2.3
Wooded-Agricultural	Crop Field	Cc	CC-4A	0-3	3.2				3.2
Wooded-Agricultural	Crop Field	Cc	CC-4B	0-3	4.4 J				4.4
Wooded-Agricultural	Crop Field	Cd	CD-1A	0-3	4.1		3.5		3.8
Wooded-Agricultural	Crop Field	Cd	CD-1B	0-3	5.1 J				5.1
Wooded-Agricultural	Crop Field	Cd	CD-2A	0-3	9.8				9.8
Wooded-Agricultural	Crop Field	Cd	CD-2B	0-3	11.9 J				11.9
Wooded-Agricultural	Crop Field	Cd	CD-3A	0-3	3.7				3.7
Wooded-Agricultural	Crop Field	Cd	CD-3B	0-3	4.4 J				4.4
Wooded-Agricultural	Crop Field	Cd	CD-4A	0-3	9.4				9.4
Wooded-Agricultural	Crop Field	Cd	CD-4B	0-3	8.4 J				8.4
Wooded-Agricultural	Crop Field	Ce	CE-1A	0-3	3.4				3.4
Wooded-Agricultural	Crop Field	Ce	CE-1B	0-3	4.7 J				4.7
Wooded-Agricultural	Crop Field	Ce	CE-2A	0-3	4.6				4.6
Wooded-Agricultural	Crop Field	Ce	CE-2B	0-3	3.4 J				3.4
Wooded-Agricultural	Crop Field	Ce	CE-3A	0-3	4.2				4.2
Wooded-Agricultural	Crop Field	Ce	CE-3B	0-3	4.1 J				4.1
Wooded-Agricultural	Crop Field	Ce	CE-4A	0-3	3.7		2.8		3.3
Wooded-Agricultural	Crop Field	Ce	CE-4B	0-3	4 J				4
Wooded-Agricultural	Crop Field	Ch	CH-1A	0-3	3.3				3.3
Wooded-Agricultural	Crop Field	Ch	CH-1B	0-3	5.3 J				5.3
Wooded-Agricultural	Crop Field	Ch	CH-2A	0-3	5.5				5.5
Wooded-Agricultural	Crop Field	Ch	CH-2B	0-3	36.9 J				36.9
Wooded-Agricultural	Crop Field	Ch	CH-3A	0-3	54.4		52.6		53.5
Wooded-Agricultural	Crop Field	Ch	CH-3B	0-3	5.3 J				5.3
Wooded-Agricultural	Crop Field	Ch	CH-4A	0-3	7.7				7.7
Wooded-Agricultural	Crop Field	Ch	CH-4B	0-3	3.3 J				3.3
Wooded-Agricultural	Wooded	Wd	WD-1A	0-3	6.9	6.9			6.9
Wooded-Agricultural	Wooded	Wd	WD-1B	0-3	3.3 J				3.3
Wooded-Agricultural	Wooded	Wd	WD-2A	0-3	7.9		7.3		7.6
Wooded-Agricultural	Wooded	Wd	WD-2B	0-3	6.7 J				6.7
Wooded-Agricultural	Wooded	Wd	WD-3A	0-3	8.8				8.8
Wooded-Agricultural	Wooded	Wd	WD-3B	0-3	8.1 J				8.1
Wooded-Agricultural	Wooded	Wd	WD-4A	0-3	5.1				5.1
Wooded-Agricultural	Wooded	Wd	WD-4B	0-3	7.2 J				7.2
Wooded-Agricultural	Wooded	We	WE-1A	0-3	4.2				4.2
Wooded-Agricultural	Wooded	We	WE-1B	0-3	4.7				4.7
Wooded-Agricultural	Wooded	We	WE-2A	0-3	5.2				5.2
Wooded-Agricultural	Wooded	We	WE-2B	0-3	3.2				3.2
Wooded-Agricultural	Wooded	We	WE-3A	0-3	4.7		3.8		4.3
Wooded-Agricultural	Wooded	We	WE-3B	0-3	4				4
Wooded-Agricultural	Wooded	We	WE-4A	0-3	3.7				3.7
Wooded-Agricultural	Wooded	We	WE-4B	0-3	3.4				3.4

TABLE 7.2a
SOIL ARSENIC DATA FROM 2001-2003 GASPORT BACKGROUND STUDY

RCRA FACILITY INVESTIGATION REPORT - VOLUME IV
FMC CORPORATION - MIDDLEPORT, NEW YORK

Property Group	Land Use Type	Property ID	Sample Location	Depth (inches)	Arsenic Concentration (mg/kg)				
					Primary	Duplicate	Agency Split	Other	Combined
Commercial-Industrial	Commercial	Bb	BB-1A	0-3	2.4 J	6.1 J	2.3	2.2	3.3
Commercial-Industrial	Commercial	Bb	BB-2A	0-3	4.6				4.6
Commercial-Industrial	Commercial	Bb	BB-3A	0-3	5.2				5.2
Commercial-Industrial	Commercial	Bf	BF-1A	0-3	7.5				7.5
Commercial-Industrial	Commercial	Bf	BF-2A	0-3	9.9		2.9		6.4
Commercial-Industrial	Commercial	Bf	BF-3A	0-3	13.2				13.2
Commercial-Industrial	Industrial	la	IA-1A	0-3	33.5	32.1			32.8
Commercial-Industrial	Industrial	la	IA-2A	0-3	26.1				26.1
Commercial-Industrial	Industrial	la	IA-3A	0-3	3.5		3.1		3.3
Commercial-Industrial	Industrial	lb	IB-1A	0-3	12.5				12.5
Commercial-Industrial	Industrial	lb	IB-2A	0-3	20.4		20.8		20.6
Commercial-Industrial	Industrial	lb	IB-3A	0-3	4.9				4.9
Residential-Public	Residential	Ra	RA-1A	0-3	6.3				6.3
Residential-Public	Residential	Ra	RA-2A	0-3	17.4		12.5		15
Residential-Public	Residential	Ra	RA-3A	0-3	4.5				4.5
Residential-Public	Residential	Rb	RB-1A	0-3	16.7		3.5		10.1
Residential-Public	Residential	Rb	RB-2A	0-3	11.6				11.6
Residential-Public	Residential	Rb	RB-3A	0-3	12.8				12.8
Residential-Public	Residential	Rc	RC-1A	0-3	8.7		7.2		8
Residential-Public	Residential	Rc	RC-2A	0-3	9.5				9.5
Residential-Public	Residential	Rc	RC-3A	0-3	9.9				9.9
Residential-Public	Residential	Re	RE-1A	0-3	5.7				5.7
Residential-Public	Residential	Re	RE-2A	0-3	7.7				7.7
Residential-Public	Residential	Re	RE-3A	0-3	18.6		20.3		19.5
Residential-Public	Residential	Rf	RF-1A	0-3	14.7		14.3		14.5
Residential-Public	Residential	Rf	RF-2A	0-3	21.2				21.2
Residential-Public	Residential	Rf	RF-3A	0-3	14.5				14.5
Residential-Public	Residential	Rg	RG-1A	0-3	7.3				7.3
Residential-Public	Residential	Rg	RG-2A	0-3	5.6				5.6
Residential-Public	Residential	Rg	RG-3A	0-3	8		7.3		7.7
Residential-Public	Residential	Rh	RH-1A	0-3	4.6	3.9	4.2		4.2
Residential-Public	Residential	Rh	RH-2A	0-3	20.3 J				20.3
Residential-Public	Residential	Rh	RH-3A	0-3	9.1				9.1
Residential-Public	School	Sa	SA-1A	0-3	4.2	4.3	3.3	3.5	3.8
Residential-Public	School	Sa	SA-2A	0-3	3.3				3.3
Orchard	Orchard	Oa	OA-1A	0-3	14.7				14.7
Orchard	Orchard	Oa	OA-2A	0-3	8.8		8		8.4
Orchard	Orchard	Oa	OA-3A	0-3	27.8				27.8
Orchard	Orchard	Oa	OA-4A	0-3	10.4				10.4
Orchard	Orchard	Ob	OB-1A	0-3	3.8	3.7			3.8
Orchard	Orchard	Ob	OB-2A	0-3	40.4		45.9		43.2
Orchard	Orchard	Ob	OB-3A	0-3	4.6				4.6
Orchard	Orchard	Ob	OB-4A	0-3	3.1				3.1
Orchard	Orchard	Od	OD-1A	0-3	130	129	105		121
Orchard	Orchard	Od	OD-2A	0-3	81.9				81.9
Orchard	Orchard	Od	OD-3A	0-3	24.5				24.5
Orchard	Orchard	Od	OD-4A	0-3	56.3				56.3

Notes:

1. All samples collected May 2002 during the Gasport Background Study.
2. Approximate locations of properties sampled shown on Figure 6.1b of this RFI Report Volume IV.
3. Results reported in *Development of Arsenic Background in Middleport Soil* (CRA 2003).
4. The combined result is the arithmetic average of all values reported for any primary field sample, field duplicate sample, Agency split sample, and additional other samples collected.
5. J = Associated value is estimated.

**TABLE 7.2b
SUMMARY OF SOIL ARSENIC CONCENTRATIONS BY PROPERTY TYPE/USAGE FROM 2001-2003 GASPORT BACKGROUND STUDY**

**RCRA FACILITY INVESTIGATION REPORT - VOLUME IV
FMC CORPORATION - MIDDLEPORT, NEW YORK**

Major Property Type/Usage	Number of Samples	Arsenic Concentrations (mg/kg)				
		Range	Mean	95% UCL	95th Percentile	98th Percentile
Orchard Land (3 Orchards)	12	3.1 to 121.3	33.3	63.5	99.6	112.6
Wooded or Overgrown Land and Agricultural Crop Field Land (2 Wooded, 5 Crop Fields) Including 4 potential statistical outliers	56	3.1 to 56.7	7.9	14.2	33.5	51.8
Excluding 4 potential statistical outliers	52	3.1 to 11.9	5.0	5.5	9.1	9.8
Commercial and Industrial Land (2 Business and 2 Industrial Properties)	12	2.2 to 32.8	11.7	18.4	29.1	31.3
Residential and Public Land (7 Residential Properties, 1 School)	23	3.3 to 21.1	10.1	12.0	20.2	20.7

Note: 95% UCL = 95% Upper Confidence Limit on the Mean

The 2001-2003 Gasport Background Study generated total arsenic data for 103 surface soil samples (0 - 3-inch depth interval) collected from four major property type/usage groups. An analysis for potential statistical outliers identified four points in the wooded/overgrown/agricultural crop field land group.

**TABLE 7.3
SUMMARY OF ESTIMATED MIDDLEPORT SOIL ARSENIC BACKGROUND CONCENTRATIONS**

**RCRA FACILITY INVESTIGATION REPORT - VOLUME IV
FMC CORPORATION - MIDDLEPORT, NEW YORK**

Property Type/Usage Weighting Factor Calculation Method ¹	Weighted Mean		95% UCL on Weighted Mean		95 th Percentile		98 th Percentile	
	Excluding Potential Outliers ⁽²⁾ N=99 (mg/kg)	Including Potential Outliers ⁽³⁾ N=103 (mg/kg)	Excluding Potential Outliers ⁽²⁾ N=99 (mg/kg)	Including Potential Outliers ⁽³⁾ N=103 (mg/kg)	Excluding Potential Outliers ⁽²⁾ N=99 (mg/kg)	Including Potential Outliers ⁽³⁾ N=103 (mg/kg)	Excluding Potential Outliers ⁽²⁾ N=99 (mg/kg)	Including Potential Outliers ⁽³⁾ N=103 (mg/kg)
2001 Gasport Work Plan ^{4,5}	8.1	9.7	8.7	12	19	22	NA	NA
Updated 2001 Gasport Work Plan ^{6,8}	13	14	19	19	39	40	76	75
Time-Weighted Alternative ^{7,8}	9.3	11	13	14	23	25	40	41

See Notes on Page 2.

**TABLE 7.3
SUMMARY OF ESTIMATED MIDDLEPORT SOIL ARSENIC BACKGROUND CONCENTRATIONS**

**RCRA FACILITY INVESTIGATION REPORT - VOLUME IV
FMC CORPORATION - MIDDLEPORT, NEW YORK**

Notes:

1. The Middleport background soil arsenic concentrations presented in this table are statistical values that were calculated using property type/usage group weighting factors (i.e., percentages) derived for the Middleport study area. The property type/usage groups are defined in the NYSDEC document entitled "Program to Determine Extent of FMC-Related Arsenic Contamination in Middleport - Part A - Work Plan for Development of Arsenic Background in Middleport Soil" (Agencies, September 2001) [2001 Gasport Work Plan]. The statistical values are calculated based on the soil arsenic data for different property types/usages presented in the report entitled "Development of Arsenic Background in Middleport Soil" (CRA, February 2003) [2003 Gasport Background Study Report]; the data is also provided in Table 7.2a of this RFI Report Volume IV.
2. Calculated concentrations in this column are based on the 2003 Gasport Background Study data, excluding 4 potential outliers (total sample size = 99).
3. Calculated concentrations in this column are based on the 2003 Gasport Background Study data, including 4 potential outliers (total sample size = 103).
4. The 2001 Gasport Work Plan arsenic values were calculated using property type/usage group weighting factors specified in the 2001 Gasport Work Plan that are time-weighted, with cumulative orchard areas within two time periods (1931-1958 and 1968-1978), based on aerial photos provided in the Draft RCRA Facility Investigation (RFI) Report (CRA, January 1999) [1999 Draft RFI Report]. The calculated arsenic values are presented in the 2003 Gasport Background Study Report. No value was presented for the 98th percentile.
5. The Agencies selected 20 mg/kg arsenic (based on the weighted 95th percentile of the 2003 Gasport Background Study soil data, using the 2001 Gasport Work Plan calculation method) as the delineation criterion for FMC-related arsenic in Middleport soils for the purposes of the RFI, with consideration given to other factors that could influence potential historical air deposition and stormwater flow.
6. The Updated 2001 Gasport Work Plan arsenic values were calculated using revised property type/usage group weighting factors. The revised property type/usage group weighting factors were calculated as specified in the 2001 Gasport Work Plan and are time-weighted, with cumulative orchard areas within two time periods (1931-1958 and 1968-1978), based on aerial photos provided in the 1999 Draft RFI Report and eight additional aerial photos. The revised property type/usage group weighting factors and the calculated arsenic values are presented in Appendix 6B of RFI Report Volume I – Background and Related Information (ARCADIS and AMEC Geomatrix, December 2008) [RFI Report Volume I].
7. The Time Weighted Alternative arsenic values were calculated using revised property type/usage group weighting factors. The revised property type/usage group weighting factors are time-weighted based on the individual dates of each aerial photo used. The aerial photos used include those provided in the 1999 Draft RFI Report and eight additional photos. The revised property type/usage group weighting factors and the calculated arsenic values are presented in Appendix 6B of RFI Report Volume I.
8. The Agencies have not accepted the statistical values from the Updated 2001 Work Plan or the Time-Weighted Alternative presented in the second and third rows, for reasons explained in their March 10, 2008 letter.

**TABLE 7.4
IDENTIFICATION OF POTENTIAL SOURCES AND FACTORS AFFECTING DISTRIBUTION ALONG CULVERT 105**

**RCRA FACILITY INVESTIGATION (RFI) REPORT - VOLUME IV
FMC CORPORATION - MIDDLEPORT, NEW YORK**

Property ¹	Observations/Conditions ²
Former Wooded Parcel	The 1911, 1920, 1931, 1945 Sanborn maps show the presence of a former vinegar works and Niagara Sprayer. The 1968 Sanborn map shows the presence of Food Machinery & Chemical Corp. Sampling log indicates presence of brick and/or coal at sample locations CS1-E1, E2, E3, E4, and CS1-W2. Sample location CS1-W3 had the presence of coal and slag; location CS1-W4 coal and petroleum/gas odor.
B1	Property B1 was historically used for saw mill/lumberyard operations in the 1800s through the 1920s (1889,1894, 1900, 1905, 1911, 1920 Sanborn). The property owner noted the presence of dwarf fruit trees and the use of fertilizers on the property. Sampling log notes the presence of brick material at sample location B1-12 and ash/coal at CS6-E3. Culvert 105 traverses eastern portion of property.
B3	Manhole for Culvert 105 in backyard, north of garage. Culvert 105 lies beneath garage and traverses the eastern property boundary.
B4	Sample log indicates the presence of coal at B4-2. Property log notes visual appearance that the property is largely fill material. Culvert 105 traverses property from southeast to northwest. The 2004 Culvert 105 video inspection indicated culvert constructed of stacked stone.
B5	The 1945 and 1968 Sanborn maps indicated the presence of a filling station and three underground storage tanks. Culvert 105 traverses southwest corner of property.
J1	Culvert 105 traverses eastern property boundary and CB-S5 located on the property. Sampling log notes presence of ash at sample location J1-4 and brick at CB-S5.
J2	Sampling log notes presence of coal at sample location J2-4. Culvert 105 traverses southwest corner of property.
J4	Property owner stated driveway soils used to build berm in backyard and use of granular fertilizer. Sample log notes presence of ash at sample location J4-6. Culvert 105 traverses southwest corner of property and was repaired by the Village of Middleport in 2004.
J13	Property owner stated use of Miracle Grow on garden and recalls Culvert 105 as open ditch in backyard. Sample location J13-4 collected from garden location. Imported soil, amendments, fertilizers and/or pesticides may have been used in the garden. Culvert 105 traverses northeast corner of property.
J14	Property owner stated soils from pool installation regraded throughout backyard (sample locations J14-3, J14-4, J14-5). Sample log indicates the presence of ash and coal at location CS5-W2. Culvert 105 traverses property from southeast to northwest. Portions were repaired by the Village in 2007 when soils were collapsing around the pipe (in the vicinity of J14-5).
J15	Culvert 105 traverses property in backyard. Sample log notes presence of brick at CS4-W4, coal at locations CS4-E1, E2, E3 and W2; coal and ash at CS4-W3 and W4.
J16	Culvert 105 traverses the southwest corner of the property and portions lie below the garage. Sample log notes indicates presence of coal at location J16-2.
M3	Property owner stated imported soil placed behind house in 1951 and in area of former pool. Culvert 105 runs below northeast corner of house. Sample log indicates the presence of coal and ash at locations CS3-E3 and CS3-W3.
M18	Sample location M18-2 collected in close proximity to wood deck. Culvert 105 traverses the northeast corner of the property.
M19	Sample logs indicate the presence of ash/coal at locations M19-4, CS2-W1, W3, and W4. Property owner stated the use of Grub-Ex in 2003. Culvert 105 traverses the eastern property boundary.
M20	Sample log notes the presence of coal/ash at locations M20-2 and CS2-E2. Culvert 105 traverses the western property boundary.
AA1	NYS Canal land property. Historically farm fields. Sample log indicates the presence of coal at C1-E2. Culvert 105 traversed property as an open ditch prior to 2007.
AB1	Culvert 105 traverses southwest corner of property.

**TABLE 7.4
IDENTIFICATION OF POTENTIAL SOURCES AND FACTORS AFFECTING DISTRIBUTION ALONG CULVERT 105**

**RCRA FACILITY INVESTIGATION (RFI) REPORT - VOLUME IV
FMC CORPORATION - MIDDLEPORT, NEW YORK**

Property¹	Observations/Conditions²
AB2	Sampling log indicates the presence of brick/ash at location CNB-SB3 and concrete/coal at CNB-SB4. Property owner stated buried Culvert 105 with 36" pipe on the east and north property boundaries. The 1911, 1920, 1931, 1945 and 1968 Sanborn maps show the presence of a machine shop.
AB3	Sampling log indicates the presence of ash at location CNC-SB1 and brick at CNC-SB2.
AB4	Sampling log indicates the presence of ash at location C2-E4 and brick/ash at C2.1-E2. Culvert 105 traversed eastern and southern property boundaries as an open ditch prior to 2007.
AB5	Culvert 105 traversed northern portion of property as open ditch prior to 2007.
AB6	Sampling log indicates the presence of glass fragments at locations CNF-SB2 and C2.1-W1, ash (fill) at C2.1-W4. Culvert 105 traversed northern property boundary as open ditch prior to 2007.
AB7	Sampling log indicates the presence of ash/cinders/brick (fill) at location CNE-SB4.
AC1	Culvert 105 traversed eastern property boundary as an open ditch prior to 2007.
AC2	Culvert 105 traversed western and southern property boundary as an open ditch prior to 2007.
AC3	Sample log indicates the presence of coal at locations C3-E2 and C3-E3. Culvert 105 traversed southern property boundary as an open ditch prior to 2007.
AC4	The 1920, 1931, 1945 Sanborn maps show the presence of the former Gould greenhouse and florist.
AD1	Historical orchard. Owner stated husband regraded large portions of the property during apartment construction.
AD2	Historical orchard.
AD3	Historical orchard.
AE1	Sampling log indicates the presence of coal at location C6-W2.
AE2	Historical orchard.
AF1	Culvert 105 buried by owner and area near installed pipe was re-graded.
AH1	Portion of property historical orchard.
AH2	Historical orchard.
AI1	Historical orchard and farm fields.
AJ1	Historical orchard. Site of Village of Middleport's wastewater treatment plant.
AJ2	Portions of property historical orchard. Sample log indicates the presence of coal at location C8-W3.
AK1	Portions of property historical orchard.

Notes:

1. Refer to Figure 3.1 for locations of properties.
2. Information obtained from property owner, field sampling logs, and historical Sanborn fire insurance maps and historical aerial photographs.
3. The presence of a potential non-FMC related source of contamination or arsenic source does not necessarily indicate the absence of FMC-related arsenic on the property.