MALCOLM PIRNIE

REMEDIAL WORK PLAN

Former Ingersoll-Rand
Foundry Site
Village of Painted Post
Steuben County, New York

Prepared For:

PAINTED POST DEVELOPMENT, LLC.

Submitted by:
Malcolm Pirnie, Inc.
40 Centre Drive
Orchard Park, NY 14127

AUGUST 2005

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Introduction

SECTION 1

1.1 Purpose and Scope

Painted Post Development, LLC plans to redevelop the former Ingersoll-Rand Foundry Site in Painted Post, New York for use as a warehousing and distribution center. Malcolm Pirnie has prepared this Remedial Action Work Plan to support a New York State Department of Environmental Conservation (NYSDEC)-sponsored Brownfields Cleanup Program (BCP) remediation of the Site appropriate for its intended use. This Work Plan summarizes the conclusions of site investigations performed on the site and describes the remedy selection process for the site.

Section 2.0 summarizes the results of investigations performed on the site and presents the remedial action objectives established for the site based on the human health risk assessment performed from the investigation data collected. Section 3.0 describes the range of potentially applicable remedies available and presents the evaluation of each alternative against NYSDEC criteria. Section 4.0 presents the conceptual design and proposed implementation schedule of the selected remedial alternative

1.2 Background

The Site is a former foundry plant facility situated on approximately 49-acres of land at the northwest end of West Water Street in the northwestern portion of the Village of Painted Post, Steuben County, New York. The Site is approximately 500 feet east of the south-flowing Cohocton River. The Site is surrounded by an open field to the west, a parking lot to the south and residential housing to the east and north. Two rail spurs once serviced the Site. The facility began operations in 1848 as a machine shop and foundry owned by the Weston Engine Company. In 1898, the Imperial Engine Company, a subsidiary of the Rand Drill Company, purchased the facility. In 1905 Rand merged with the Ingersoll-Sergeant Drill Company to become Ingersoll-Rand (IR). The facility remained under IR's ownership until December 31, 1986 when Dresser Industries merged with IR to become the Dresser-Rand Company (Capsule, 1988).

During its active use, the foundry contained 287,000 square feet of industrial buildings, most of which were located along the northeastern side of the Site. The foundry produced gray iron castings used in assembling air compressors. In 1972, the foundry began producing gray iron in continuous pour from electric-melt furnaces. At that time operations included pattern construction, sand mold lines, casting, shakeout, casting cleaning, and pattern and casting storage (Capsule, 1988). IR ceased production operations at the Painted Post foundry site on January 1, 1986.

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Summary of Site Conditions

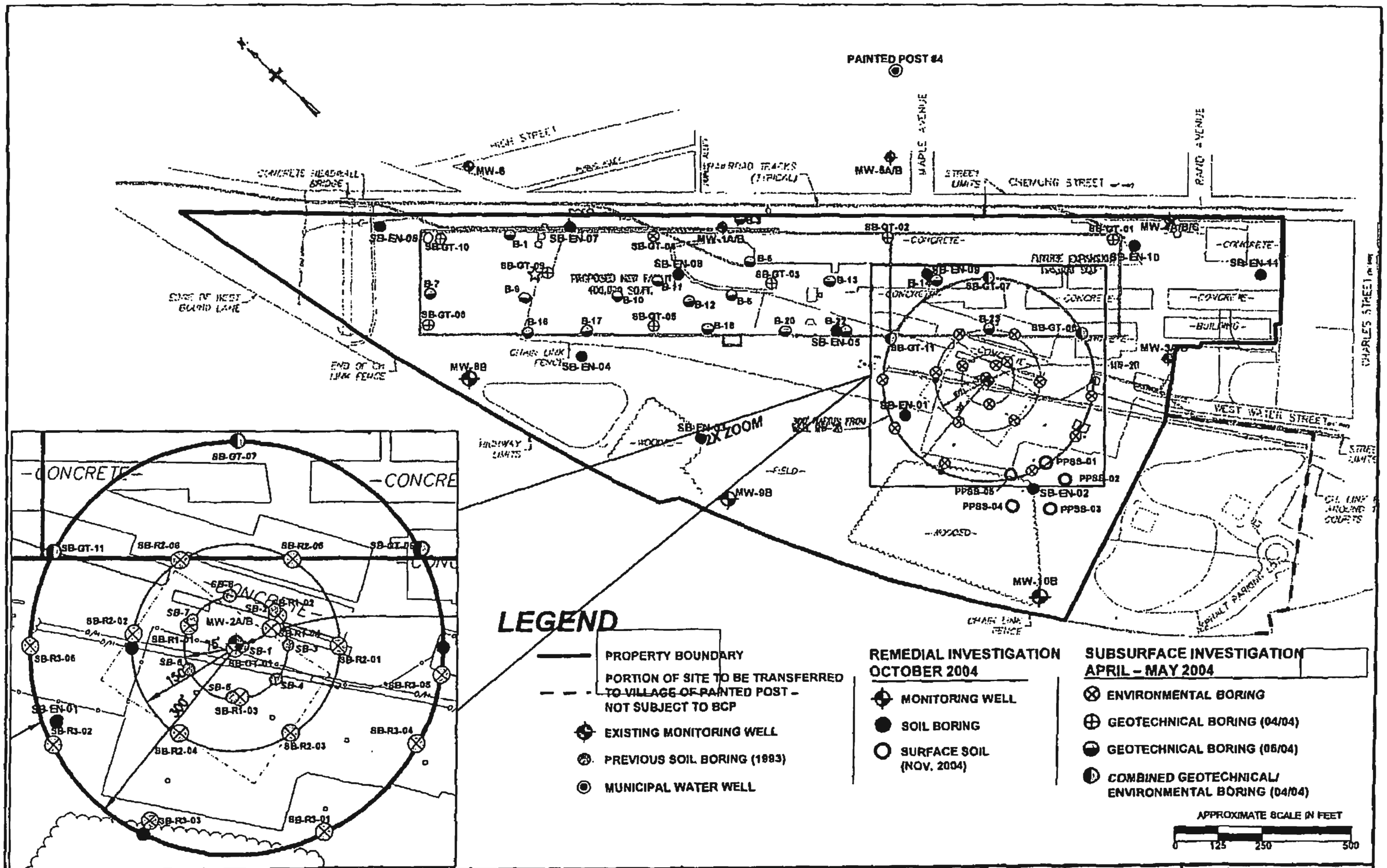
SECTION 2

2.1 Summary of Previous Investigations

The following is a general summary of previous environmental investigations and remedial actions performed at the Site. Information for this summary was obtained from copies of reports, or portions of reports, made available by the New York State Department of Environmental Conservation (NYSDEC) Region 8 office under a Freedom of Information Law (FOIL) request # 04289. This summary is intended to provide a general idea of the previous and current Site conditions and should not be considered a complete presentation of past environmental activities at the Site. Figure 2-1 illustrates boring and monitoring well locations.

December 1985 – As part of the Site closure, IR contracted Capsule Environmental Engineers, Inc. (CEE) to identify areas on Site that may contain PCBs. CEE conducted a site assessment and preliminary sampling for PCBs. Based on the results of these activities, CEE prepared a cleanup specification for removal of underground storage tanks, equipment cleaning, removal of spent raw materials, removal of wastes generated during the cleanup operations, and initial studies to determine if further remedial work was necessary.

June 25, 1986 to August 12, 1988 – Allwash of Syracuse was awarded the initial PCB cleanup contract and completed the work in two "divisions". Division I activities included further evaluation of contaminated areas and the characterization of waste materials for subsequent disposal. Division II activities included the cleaning and removal of numerous underground storage tanks containing products including, Linocure A.W., Linoil 742, kerosene, gasoline, and diesel fuel. Also completed during Division II was the cleaning and removal of



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FORMER INGERSOLL RAND FACILITY
PAINTED POST, NEW YORK

Boring and Monitoring Well Locations

MALCOLM PIRNIE, INC.
October 2004

FIGURE 2-1

contaminated machinery and equipment and the excavation of contaminated soil. Soil contaminants included PCBs, oil and grease, and lead.

January 1992 – Law Environmental, of Albany, New York prepared (for CEE on behalf of IR) an Interim Stratigraphy Report for a Phase I Groundwater Quality Assessment. Two soil borings were drilled and sampled to the depth of 82 feet to determine subsurface conditions and finalize monitoring well construction details for the subsequent groundwater quality assessment.

September 1992 – Wenck Associates, Inc. of Maple Plain Minnesota (for CEE on behalf of IR) completed a Groundwater Quality Assessment. The purpose of the GQA was to satisfy requirements of Section VII of an Order on Consent between IR and the NYSDEC that was signed on October 2, 1987. Section VII addresses the question of whether or not past practices on site have led to impacts to groundwater. As part of this GWA, 13 groundwater monitoring wells were installed at seven locations. Some of the wells were installed in groups of two or more with each grouped well monitoring one of three unique water-production depths. Some wells monitored the 80-foot depth and were designated as "A" wells, others monitored the water table and were designated "B" wells. At well location 4, a third well was installed to monitor above an aquitard of limited extent at the 35-foot depth. The geology of the overburden was characterized, as were the chemical characterizations of the soil and groundwater flow and quality. The effects of pumping nearby municipal supply wells were also mapped to show a local effect at the Site. Samples of fill material at well number MW-2 contained elevated PAHs (up to 11 PPM total PAHs) and the presence of toluene. At MW-4A, soils and groundwater samples contained constituents of a petroleum product and benzene was present in the groundwater from well MW-4B at a concentration above the NYSDEC groundwater standard. Recommendations of the GQA report included confirmation sampling and further evaluation of the elevated PAHs at the MW-2B location.

February 9, 1993 – At the request of the NYSDEC, CEE completed a Subsurface Investigation on behalf of IR, in response to a citizen allegation regarding the disposition of drums at the Site. A soil trenching and sampling program was performed. Four trenches were excavated. Two drums were encountered, sampled and removed. One of the two drums contained ash-like material and was suspected to have been used for trash burning. Excavated material primarily consisted of black and tan sands with treated wood and miscellaneous debris. Treated wood included small bits to full size railroad ties. The report concluded that no material found in the trenches would indicate that IR improperly disposed of hazardous materials in drums through burial on site and recommended no further subsurface investigation.

1993 Quarterly Groundwater Monitoring - Quarterly groundwater quality monitoring was performed beginning in the second quarter of 1993. References to this monitoring data (see 2/25/94 FS report described below) indicate that sample results since beginning the quarterly monitoring through the subsequent two years resulted in no exceedances of NYS groundwater standards or Federal MCLs.

August 2, 1993 – Per the recommendations made in the September 1992 Groundwater Quality Assessment Report, CEE, on behalf of IR, prepared a report titled "Report of the Subsurface Evaluation of MW-2B–Additional Groundwater Quality Assessment Investigation." CEE drilled eight soil borings at and around well MW-2B to further delineate the area of elevated PAHs. One boring was placed adjacent to well MW-2B, four borings were placed around the center boring at a distance of 40 feet and two were placed at a distance of 75 feet. Where conditions allowed, samples were collected at the three-foot depth and directly below the fill, which ranged in thickness between six and 13 feet. All samples were analyzed for semivolatile organic compounds. All samples from the three-foot depth contained PAHs with a maximum of 25 PPM. Samples of the native soils beneath the fill contained no significant PAHs. Stated conclusions of the report were that significant levels of PAHs are not vertically migrating and impacting the natural soils at the Site and that previous groundwater sampling data for wells MW-2A and MW-2B indicate that PAHs have not impacted the groundwater at this well location. Additional evaluation of the PAHs was not deemed warranted.

February 25, 1994 – CEE, on behalf of IR, prepared a Focused Feasibility Study (FFS) for the Site in February 1994. As part of the FFS, a Risk assessment was performed that focused on the presence of TCA in one of the nearby municipal supply wells (Well #4). The risk assessment concluded that the groundwater beneath the Site is in compliance with state and federal MCLs and that groundwater beneath the Site is unlikely to pose any health concerns to the community. The FS recommended the following:

- Limited groundwater monitoring at the Site
- Fencing of the Site to limit access, and
- A deed restriction to notify future property owners of the presence of contaminants in the vicinity of MW-2B.

August 25, 1994 – In accordance with a Record of Decision (ROD) signed in March 1994, CEE, on behalf of IR, submitted a Sampling and Analysis Plan for long-term monitoring of Site groundwater quality. The SAP outlined plans for the sampling of six on-site and two near off-site monitoring wells for VOCs five times over a period of three calendar years (1994, 1995 and 1996).

September 9, 1997 – CEE, on behalf of IR, prepared a 1997 Annual Ground Water Monitoring Report. Presumably the long-term groundwater monitoring was performed uninterrupted since beginning in 1994. The report presents results of VOC analysis of the eight wells specified in the 1994 SAP. The report documents very low concentrations (less than 1 ug/l) of several VOCs with only 1,1,1 – TCA present above 1 ug/l, ranging up to 6 ug/l.

May 2004 – Malcolm Pirnie performed a supplemental environmental investigation on behalf of the Painted Post Development, LLC in April 2004 in support of a due diligence effort for property acquisition. Soil borings were installed to delineate and characterize the extent of polycyclic aromatic hydrocarbons (PAHs) within the deed restricted radius of monitoring well MW-2B. Samples of the soil and overburden material were also collected as part of a pre-construction geotechnical study. Results of the investigation confirmed that fill material does contain elevated concentrations of PAHs that exceed the NYSDEC TAGM soil clean-up objectives. The fill material also contained elevated nickel, magnesium, and zinc at concentrations that exceeded typical background soils concentrations. The soil sample analytical results from this investigation were summarized in the RI Work Plan.

September 2004 – Malcolm Pirnie conducted RI sampling in September and October 2004. This sampling included drilling and sampling of 14 soil borings. From these borings, seven surface soil, 17 subsurface soil/fill and three groundwater samples were collected. All samples from the RI sampling event were analyzed for Volatile Organic Compounds (VOCs), Semivolatile Organic Compounds (SVOCs), Polychlorinated biphenyls (PCBs), pesticides, TAL metals, cyanide, and pH. Tables 2-1A, 2-2, and 2-3 provide a summary of the analytical results of the RI.

November 2004- On November 12, 2004 as part of a pre-construction supplemental characterization study, five surface soil samples (0-2" depth) were collected to further delineate the lateral extent of elevated PCB concentrations detected at a single point sampled during the RI. The five samples were collected in a circular pattern approximately 100 feet from soil boring SB-EN-02 and analyzed for PCBs. Table 2-1B provides a summary of analytical results of the surface soil samples collected for PCBs.

2.2 Site Investigation Results Summary

Overall, the results of the 2004 investigations confirmed:

- On-site subsurface fill contains individual PAHs (benzo(a) pyrene and chrysene) above TAGM cleanup objectives, although total PAHs and total SVOCs were both below TAGM guidelines for total SVOCs.
- On-site surface soils in the northernmost treed area of the Site does not contain PAHs or metals above TAGM values; however, surface fill in other areas of the Site does contain individual PAHs above TAGM values. Elevated PCB concentrations were found in surface soils at one location on-site.
- Ground water at the Site has not been impacted by the contaminants present in Site fill.
- Native soils at the Site have not been significantly impacted by the contaminants present in Site fill.
- No "source area" of contamination exists.
- Very low concentrations of PCBs exist sporadically in the fill.

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TABLE 2-1A
SUMMARY OF ANALYTICAL RESULTS - WESTERN PERIMETER SURFACE SOIL
REMEDIAL INVESTIGATION REPORT
FORMER INGERSOLL-RAND FOUNDRY SITE
PAINTED POST, NEW YORK

Sample Location Sampling Depth (bgs) Collection Date	NYSDEC TAGM 4046[1]	Urban Background Concentrations[2][3]	MW-8B 0-2" 10/4/2004	MW-9B 0-2" 9/30/2004	MW-10B 0-2" 9/29/2004	SB-EN-01 0-2" 9/30/2004	SB-EN-02 0-2" 9/30/2004	SB-EN-03 0-2" 10/1/2004	SB-EN-04 0-2" 10/1/2004
General Chemistry/Physical Characteristics									
Percent Solids	NA	NA	78.7	96.6	82.3	90.7	75.2	83	79.4
pH	NA	NA	6.08	6.5	6.39	6.87	6.81	7.11	6.03
TAL Inorganic Analytes (mg/kg)									
Aluminum	SB	33000	10,600	1,740	10,300	4,210	9,250	4,740	11,700
Antimony	SB	N/A				1.4 J	3.5 J	1.4 J	
Arsenic	7.5 or SB	3 - 12	6.5 J		6.2	3.4	6.6	3.3	6.8
Barium	300 or SB	15 - 600	128	9.9 J	138	49.2	114	56.2	141
Beryllium	0.16 or SB	0 - 1.75	0.41 J		0.33 J		0.1 J	0.04 J	0.38 J
Cadmium	1 or SB	0.1 - 1	0.27 J	0.5 J	0.55 J	0.49 J	2.8	0.59 J	0.56 J
Calcium	SB	130 - 35,000	1,490	232 J	2,820	2,500	3,910	1,650	1,400
Chromium	10 or SB	1.5 - 40	14.1 J	3	13.5	19.1	22.3	19.3	15.6
Cobalt	30 or SB	2.5 - 60	8.3 J	7 J	7.8 J	6.9 J	7.9 J	5 J	8.7 J
Copper	25 or SB	1 - 50	14.9 J	3.2 J	16.3	25.8	67.2	29.6	14.8
Iron	2000 or SB	2,000 - 550,000	19,600	2,620	18,600	14,000	19,200	13,300	20,900
Lead	400 [4]	200-500	22.4 J	136 J	25.9 J	117 J	365 J	57.9 J	25.1 J
Magnesium	SB	100 - 5,000	2,910	286 BJ	2,820 J	1,090 J	1,660 J	1,550 J	2,980 J
Manganese	SB	50 - 5,000	558	38.8	608	388	618	312	626
Mercury	0.1	0.001 - 0.2	0.04 B	0.01 J	0.04 J	0.04 J	0.33	0.05 J	0.05 J
Nickel	13 or SB	0.5 - 25	19.7	5 J	18.6	16.1	24.8	21.9	21.1
Potassium	SB	8,500 - 43,000	1,150 J	158 J	1,150 J	527 J	935 J	588 J	1,050 J
Sodium	SB	6,000 - 8,000	50.7 J	33.5 J	88.9 J	79.7 J	118 J	93.6 J	89.6 J
Vanadium	150 or SB	1 - 300	15.9	3.3 J	16	8.8 J	16.4	8.5 J	16.8
Zinc	20 or SB	9 - 50	70.1	9.5 J	78.5 J	48.6 J	216 J	54.6 J	72.4 J
Pest/PCBs (µg/kg)									
All Pesticides	NA	NA							
Total Pesticides	10	NA							
Aroclor-1260	NA	NA				370	2400	130	
Total PCBs	1000	NA				370	2400	130	

Notes: See Page 3

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TABLE 2-1A
SUMMARY OF ANALYTICAL RESULTS - WESTERN PERIMETER SURFACE SOIL
REMEDIAL INVESTIGATION REPORT
FORMER INGERSOLL-RAND FOUNDRY SITE
PAINTED POST, NEW YORK

Sample Location Sampling Depth (bgs) Collection Date	NYSDEC TAGM 4046(1)	Urban Background Concentrations(2)(3)	MW-8B 0-2" 10/4/2004	MW-9B 0-2" 9/30/2004	MW-10B 0-2" 9/29/2004	SB-EN-01 0-2" 9/30/2004	SB-EN-02 0-2" 9/30/2004	SB-EN-03 0-2" 10/1/2004	SB-EN-04 0-2" 10/1/2004
Semi-Volatile Organic Compounds - SVOCs (µg/kg)									
2-Methylnapthalene	36,400	NA				95 J	150 J	59 J	
Acenaphthylene	41,000	NA				130 J			
Antracene	50,000	NA				92 J			
Benzo(a)anthracene	224	169 -59,000	120 J			830	2,700	440	270 J
Benzo(a)pyrene	61	165 - 220	190 J	48 J		1,200	3,500	670	380 J
Benzo(b)fluoranthene	1100	15,000 - 62,000	230 J	60 J		830	6,100	780	480
Benzo(g,h,i)perylene	50,000	900 - 47,000	220 J	66 J		1,000	5,500	680	380 J
Benzo(k)fluoranthene	1100	300 - 26,000	170 J	52 J		610	3,600	550	330 J
Bis(2-ethylhexyl)phthalate	50,000	NA		140 J	42 J	100 J	150 J	51 J	66 J
Chrysene	400	251 - 640	180 J	48 J		1,300	4,900	640	380 J
Dibenz(a,h,)anthracene	14	NA	57 J			290 J	1,600	210 J	110 J
Di-*n*-butylphthalate	8100	NA		37 J		130 J		71 J	
Fluoranthene	50,000	200 - 166,000	140 J	49 J		690	2,800	480	320 J
Indeno(1,2,3-cd)pyrene	3200	8,000 - 61,000	180 J	51 J		730	4,300	590	320 J
Naphthalene	13,000	NA				100 J	250 J	74 J	
Phenanthrene	50,000	NA				460	980 J	210 J	84 J
Pyrene	50,000	145 - 147,000	150 J	40 J		940	2,500	520	280 J
Total BaP Equivalent(3)	NA	NA	304	60	0	1,748	6,495	1,073	604
Total SVOCs	500,000***	NA	1,637	591	42	9,527	39,030	6,025	3,400
Volatile Organic Compounds - VOCs (µg/kg)									
Acetone	200	NA		4 J					
Cyclohexane	NA	NA	2 J					1 J	
Methyl Acetate	NA	NA	3 J						
Methylene chloride	100	NA							
Total VOCs	10,000	NA	5	4				1	

Notes: See Page 3

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TABLE 2-1A
SUMMARY OF ANALYTICAL RESULTS - WESTERN PERIMETER SURFACE SOIL
REMEDIAL INVESTIGATION REPORT
FORMER INGERSOLL-RAND FOUNDRY SITE
PAINTED POST, NEW YORK

Notes:

Only those analytes detected at a minimum of one location are shown.
Blank space indicates analyte was not detected.
Shaded concentrations exceed TAGM values for Pest/PCBs, SVOCs, and VOCs.
Shaded TAL Inorganic Analytes exceed upper range of Eastern USA Background Concentrations and TAGM values.
Bold/Italic SVOC results exceed upper limit of Urban Soils Background Range for PAHs.
(1) New York State Dept. of Environmental Conservation TAGM 4046, *Recommended Soil Cleanup Objectives*, Dec. 2000.
(2) TAL Inorganic Analytes from Eastern USA Background as shown in New York State Dept. of Environmental Conservation TAGM 4046, Dec. 2000.
(3) SVOCs background from Background Soil Concentrations of Poly Aromatic Hydrocarbons (PAHs), Urban Soils (U.S. and other), *Toxicological Profile for PAHs, US Dept. of Health and Human Services, August 1995.*
(4) USEPA Region 3 Soil Screening Level.
(5) Total BaP equivalent - Benzo (a) pyrene equivalent is calculated by multiplying the following individual PAH concentrations by their multiplier (#) and summing the results. Benzo (a) pyrene (1.00); Dibenzo (a,h) anthracene (1.00); Benzo (a) anthracene (0.10); Benzo (b) fluoranthene (0.10); Ideno (1,2,3-cd) pyrene (0.10); Benzo (k) fluoranthene (0.01); Chrysene (0.01).
*** - The Soil Cleanup Objective refers to the sum of these compounds.
D- Indicates result from subsequent run at 5x dilution.
J - Indicates and estimated value.

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TABLE 2-1B
SUMMARY OF ANALYTICAL RESULTS - SB-EN-02 SURFACE SOIL SAMPLES
FORMER INGERSOLL-RAND FOUNDRY SITE
PAINTED POST, NEW YORK

Sample Location Sampling Depth (ft. bgs) Collection Date	Proposed Site Specific Action Level (SSAL)	PPSS-01 11/16/2004	PPSS-02 11/16/2004	PPSS-03 11/16/2004	PPSS-04 1 /16/2004	PPSS-DUP (PPSS-04) 11/16/2004	PPSS-05 11/16/2004
General Chemistry/Physical Characteristics							
Percent Solids (%)	NA	85.7	73.1	80.6	43	44.9	87.6
pH (s.u.)	NA	7.09	7.24	7.46	7.18	7.11	6.94
PCBs (ug/kg)							
Aroclor-1260	NA	98		72	7700	4500	730
Total PCBs (Surface - 1.0')	1,000	98		72	7700	4500	730

Notes:

Samples collected at the surface, at evenly spaced intervals on a 100 ft. radius around soil boring SB-EN-02.
Only those analytes detected at a minimum of one location are shown.
Blank space indicates analyte was not detected.
Shaded concentrations exceed Site Specific Action Levels (SSALS).

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TABLE 2-2
SUMMARY OF ANALYTICAL RESULTS - SUBSURFACE SOIL - OCTOBER 2004 SAMPLING
REMEDIAL INVESTIGATION REPORT
FORMER INGERSOLL-RAND FOUNDRY SITE

PAINTED POST, NEW YORK

Sample Location Sampling Depth (ft. bgs) Collection Date	NYSDEC TAGM 4046[1]	Urban Background Concentrations[2][3]	MW-8B 8-9' 10/4/2004	MW-9B 10-11.5' 9/30/2004	MW-10B 6-8' 9/29/2004	SB-EN-01 4-6' 9/30/2004	SB-EN-02 0.5-2' 9/30/2004	SB-EN-03 8-10' 10/1/2004	SB-EN-03 8-11' 10/1/2004	SB-EN-04 6-8' 10/1/2004	SB-EN-05 2-4' 10/1/2004	SB-EN-05 2-5' 10/1/2004
General Chemistry/Physical Characteristics												
Percent Solids	NA	NA	87.5	89.7	80.5	69.3	85.4	82	75.9	90.8	93.1	93.1
pH	NA	NA	7.96	7.15	7.72	6.95	7.48	-	7.8	7.31	-	7.87
TAL Inorganic Analytes (mg/kg)												
Aluminum	SB	33,000	3,810	6,620	11,100	25,100	5,030	-	8,080	2,800	-	3,630
Antimony	SB	N/A	7.4 J			1.7 J	0.87 J	-	6.4 J		-	
Arsenic	7.5 or SB	3 - 12	3.5 J	5.9	5.1	11.9	3.1	-	4.3	2 J	-	3.5
Barium	300 or SB	15 - 600	164	68.3	154	146	55	-	137	16.3 J	-	16.8 J
Beryllium	0.16 or SB	0 - 1.75		0.17 J	0.32 J		0.03 J	-	0.12 J		-	
Cadmium	1 or SB	0.1 - 1	1.1 J	0.43 J	0.46 J	2.0	0.83 J	-	1.9	0.2 J	-	0.39 J
Calcium	SB	130 - 35,000	6,150	1,100 J	2,150	3,290	1,590	-	3,160	1,110	-	4,040
Chromium	10 or SB	1.5 - 40	524 J	10.8	13.7	44.7	12.3	-	554	7.3	-	13.6
Cobalt	30 or SB	2.5 - 60	7.2 J	6.2 J	7.8 J	5 J	4.9 J	-	10.6 J	1.1 J	-	2.8 J
Copper	25 or SB	1 - 50	327 J	14.4	11.5	76.4	32.2	-	135	8.1	-	25.7
Iron	2000 or SB	2,000 - 550,000	38,700	17,600	18,300	38,500	13,000	-	48,200	8,670	-	16,800
Lead	400 [4]	200-500	157 J	11.6 J	9.2 J	298 J	114 J	-	89 J	5.2 J	-	8.5 J
Magnesium	SB	100 - 5,000	1,060 J	2,100 J	2,910 J	1,070 J	985 J	-	2,650 J	410 BJ	-	907 J
Manganese	SB	50 - 5,000	463	421	623	455	348	-	899	80.6	-	255
Mercury	0.1	0.001 - 0.2	0.11	0.02 J	0.03 J	0.27	0.05 J	-	0.04 J		-	0.02 J
Nickel	13 or SB	0.5 - 25	164	15.4	18.8	48.7	13.7	-	112	10.3	-	16.8
Potassium	SB	8,500 - 43,000	437 J	672 J	715 J	1,180 J	481 J	-	613 B	240 J	-	368 J
Selenium	2 or SB	0.1 - 3.9	1.3 J					-	1.1 J		-	
Silver	SB	N/A	3.7					-	0.51 J		-	
Sodium	SB	6,000 - 8,000	126 J	95.6 J	89.6 J	350 J	93.5 J	-	150 J	101 J	-	105 J
Total Cyanide	NA	NA	1.67					-			-	
Vanadium	150 or SB	1 - 300	10.6 J	11.6	16.3	42.3	9 J	-	13.8	6.2 J	-	15.5
Zinc	20 or SB	9 - 50	191 J	53.1 J	66.7 J	130 J	71.9 J	-	116 J	11.7 J	-	16.7 J
Pest/PCBs (µg/kg)												
All Pesticides	NA	NA						-			-	
Total Pesticides	10	NA						-			-	
Aroclor-1254	NA	NA						-			-	
Aroclor-1260	NA	NA					330 J	-			-	
Total PCBs	1000	NA					330	-			-	

Notes: See Page 5

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TABLE 2-2
SUMMARY OF ANALYTICAL RESULTS - SUBSURFACE SOIL - OCTOBER 2004 SAMPLING
REMEDIAL INVESTIGATION REPORT
FORMER INGERSOLL-RAND FOUNDRY SITE

PAINTED POST, NEW YORK

Sample Location Sampling Depth (ft. bgs) Collection Date	NYSDEC TAGM 4046[1]	Urban Background Concentrations[2][3]	MW-8B 8-9 10/4/2004	MW-9B 10-11.5' 9/30/2004	MW-10B 6-8' 9/29/2004	SB-EN-01 4-6 9/30/2004	SB-EN-02 0.5-2 9/30/2004	SB-EN-03 8-10 10/1/2004	SB-EN-03 8-11 10/1/2004	SB-EN-04 6-8 10/1/2004	SB-EN-05 2-4 10/1/2004	SB-EN-05 2-5 10/1/2004
Semi-Volatile Organic Compounds - SVOCs (µg/kg)												
1,1'-Biphenyl	NA	NA				98 J	64 J	-			-	
2-Methylnapthalene	36,400	NA				76 J	170 J	-	110 J		-	47 J
Acenaphthene	50,000	NA				52 J		-			-	56 J
Acenaphthylene	41,000	NA						-	46 J		-	150 J
Anthracene	50,000	NA	130 J			140 J	67 J	-	66 J	250 J	-	110 J
Benzo(a)anthracene	224	169 -59,000	3,300			3,500	1,400	-	750	8,000	-	1,200
Benzo(a)pyrene	61	165 - 220	4,600			3,700	1,700	-	1,100	11,000	-	2,000
Benzo(b)fluoranthene	1100	15,000 - 62,000	5,700			6,900 D	2,200	-	1,400	13,000	-	2,800
Benzo(g,h,i)perylene	50,000	900 - 47,000	5,300			4,200 D	1,800	-	1,200	9,900	-	2,100
Benzo(k)fluoranthene	1100	300 - 26,000	4,000			3,400	1,000	-	1,100	9,000	-	1,600
Bis(2-ethylhexyl)phthalate	50,000	NA		330 J	180 J	130 J	360 J	-	1,000		-	560
Carbazole	NA	NA	170 J			86 J		-		440 J	-	
Chrysene	400	251 - 640	4,900			5,900 D	2,300	-	1,100	11,000	-	1,900
Dibenz(a,h,)anthracene	14	NA	1,500			1,500	580	-	360 J	3,300	-	670
Dibenzofiran	6200	NA				100 J	55 J	-			-	
Di-n-butylphthalate	8100	NA		76 J		86 J	45 J	-	46 J		-	110 J
Fluoranthene	50,000	200 - 166,000	4,000			4,100 D	960	-	800	9,100	-	1,100
Fluorene	50,000	NA						-			-	
Indeno(1,2,3-cd)pyrene	3200	8,000 - 61,000	4,300			3,600	1,300	-	1,000	8,800	-	1,800
Naphthalene	13,000	NA	120 J			240 J	200 J	-	110 J		-	72 J
Phenanthrene	50,000	NA	1,000 J			1,200	670	-	400 J	2,100	-	290 J
Pyrene	50,000	145 - 147,000	3,400			2,800	1,000	-	690	8,400	-	1,000
Total BaP Equivalent[5]	NA	NA	7,519	0	0	6,693	2,803	-	1,797	17,480	-	3,285
Total SVOCs	500,000***	NA	42,420	406	180	41,808	15,871	-	11,278	94,290	-	17,565
Volatile Organic Compounds - VOCs (µg/kg)												
1,1,1-Trichloroethane	800	NA							-			-
Acetone	200	NA							-			-
Benzene	60	NA				3 J			-			-
Cyclohexane	NA	NA	4 J				2 J	1 J	-	3 J	4 J	-
Isopropylbenzene	5,000	NA							-			-
M+P-xylene	1,200	NA							-			-
O-xylene		NA							-			-
Methyl Acetate	NA	NA	2 J									
Methycyclohexane	NA	NA							-			-
Methylene chloride	100	NA							-			-
Toluene	1,500	NA						2 J	-		1 J	-
Trichloroethene	700	NA							-			-
Total VOCs	10,000	NA	6			3	2	3	-	3	5	-

Notes: *See Page 5*

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MALCOLM PIRNIE

TABLE 2-2
SUMMARY OF ANALYTICAL RESULTS - SUBSURFACE SOIL - OCTOBER 2004 SAMPLING
REMEDIAL INVESTIGATION REPORT
FORMER INGERSOLL-RAND FOUNDRY SITE

PAINTED POST, NEW YORK

Sample Location Sampling Depth (ft. bgs) Collection Date	NYSDEC TAGM 4046(1)	Urban Background Concentrations(2)(3)	SB-EN-06 12-13.5' 10/4/2004	SB-EN-07 0.5-1.5' 10/5/2004	SB-EN-08 6-8' 10/5/2004	SB-EN-08 6-10' 10/5/2004	SB-EN-09 2-3' 10/5/2004	DUP-1 (SB-EN-09) 2-3') 10/5/2004	SB-EN-10 12-14 10/6/2004	VOA-DUP (SB-EN-10 12-14') 10/6/2004	SB-EN-10 12-16 10/6/2004	SB-EN-11 2-4' 10/6/2004
General Chemistry/Physical Characteristics												
Percent Solids	NA	NA	87.6	74.7	79.3	80	81.5	85.6	91.8	92.7	91.1	88.8
pH	NA	NA	7.74	6.93	-	6.96	7.11	7.19	-	-	9.23	6.02
TAL Inorganic Analytes (mg/kg)												
Aluminum	SB	33,000	10,800	8,620	-	10,400	7,600	6,910	-	-	7,630	7,790
Antimony	SB	N/A			-		1.4 J	1.2 J	-	-		
Arsenic	7.5 or SB	3 - 12	8.5 J	4.3 J	-	12 J	14.2 J	14.5 J	-	-	5.4 J	5.3 J
Barium	300 or SB	15 - 600	133	49.1 J	-	89	105	114	-	-	46	44.5 J
Beryllium	0.16 or SB	0 - 1.75	0.33 J	0.06 J	-	0.39 J	0.07 J	0.16 J	-	-		
Cadmium	1 or SB	0.1 - 1	0.29 J	0.68 J	-	0.38 J	0.78 J	0.89 J	-	-	0.25 J	0.25 J
Calcium	SB	130 - 35,000	1,570	1,260 J	-	4,250	8,310	15,400	-	-	42,800	3,460
Chromium	10 or SB	1.5 - 40	16.5 J	10.7 J	-	14.4 J	15.4 J	15.9 J	-	-	10.9 J	17.5 J
Cobalt	30 or SB	2.5 - 60	10.9 J	4.4 J	-	8.4 J	5.1 J	5.2 J	-	-	6.7 J	3.4 J
Copper	25 or SB	1 - 50	21.1 J	111 J	-	40.4 J	41.6 J	39.4 J	-	-	30.7 J	17.1 J
Iron	2000 or SB	2,000 - 550,000	24,900	14,000	-	25,100	34,700	31,000	-	-	17,500	24,200
Lead	*400 (4)*	*200-500*	10.3	52.3 J	-	17.4	66.1 J	80.6 J	-	-	6.3	19 J
Magnesium	SB	100 - 5,000	3,400	1,480	-	3,140	1,980	1,810	-	-	14,600	866 J
Manganese	SB	50 - 5,000	532	293	-	1,170	396	451	-	-	601	630
Mercury	0.1	0.001 - 0.2	0.02 J	0.05 J	-	0.05 B	0.1 J	0.29	-	-		0.1 J
Nickel	13 or SB	0.5 - 25	25.2	14	-	22.4	14.5	14.9	-	-	16.4	13.1
Potassium	SB	8,500 - 43,000	977 J	676 J	-	1,190 J	997 J	1,050 J	-	-	815 J	660 J
Selenium	2 or SB	0.1 - 3.9			-				-	-		
Silver	SB	N/A			-				-	-		
Sodium	SB	6,000 - 8,000	72.3 J	49.7 J	-	93.5 J	105 J	135 J	-	-	109 J	128 J
Total Cyanide	NA	NA			-				-	-		
Vanadium	150 or SB	1 - 300	17.2	13.6	-	20.8	18.9	18	-	-	16.9	16.5
Zinc	20 or SB	9 - 50	74	75.1	-	101	165	172	-	-	86.1	44.2
Pest/PCBs (µg/kg)												
All Pesticides	NA	NA			-				-	-		
Total Pesticides	10	NA			-				-	-		
Aroclor-1254	NA	NA		150	-				-	-		
Aroclor-1260	NA	NA		47 J	-		480	360	-	-		
Total PCBs	1,000	NA		197	-		480	360	-	-		

Notes: See Page 5

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Checked by: SC Date: 4/19/2004

MALCOLM PIRNIE

TABLE 2-2
SUMMARY OF ANALYTICAL RESULTS - SUBSURFACE SOIL - OCTOBER 2004 SAMPLING
REMEDIAL INVESTIGATION REPORT
FORMER INGERSOLL-RAND FOUNDRY SITE

PAINTED POST, NEW YORK

Sample Location Sampling Depth (ft. bgs) Collection Date	NYSDEC TAGM 4046[1]	Urban Background Concentrations[2][3]	SB-EN-06 12-13.5' 10/4/2004	SB-EN-07 0.3-1.5' 10/5/2004	SB-EN-08 6-8' 10/5/2004	SB-EN-08 6-10' 10/5/2004	SB-EN-09 2-3' 10/5/2004	DUP-1 (SB-EN-09 2-3') 10/5/2004	SB-EN-10 12-14 10/6/2004	VOA-DUP (SB-EN-10 12-14') 10/6/2004	SB-EN-10 12-16 10/6/2004	SB-EN-11 2-4' 10/6/2004
Semi-Volatile Organic Compounds - SVOCs (µg/kg)												
1,1'-Biphenyl	NA	NA	Note 6		-	Note 6	56 J	86 J	-	-		
2-Methylnapthalene	36,400	NA	Note 6		-	Note 6	330 J	480	-	-		
Acenaphthene	50,000	NA	Note 6		-	Note 6	66 J	97 J	-	-		
Acenaphthylene	41,000	NA	Note 6		-	78 J	44 J		-	-		
Anthracene	50,000	NA	Note 6		-	Note 6	68 J	67 J	-	-		
Benzo(a)anthracene	224	169 -59,000	Note 6	160 J	-	290 J	500	530	-	-		8,100 J
Benzo(a)pyrene	61	165 - 220	Note 6	310 J	-	380 J	680	740	-	-		11,000 J
Benzo(b)fluoranthene	1100	15,000 - 62,000	Note 6	310 J	-	440	870	970	-	-		15,000
Benzo(g,h,i)perylene	50,000	900 - 47,000	Note 6	360 J	-	300 J	720	740	-	-		13,000
Benzo(k)fluoranthene	1100	300 - 26,000	Note 6	230 J	-	290 J	510	580	-	-		12,000
Bis(2-ethylhexyl)phthalate	50,000	NA	760 J		-	Note 6	540		-	-	1,300 J	
Carbazole	NA	NA	Note 6		-	Note 6	48 J	53 J	-	-		
Chrysene	400	251 - 640	Note 6	220 J	-	330 J	690	750	-	-		11,000 J
Dibenz(a,h,)anthracene	14	NA	Note 6	97 J	-	120 J	220 J	220 J	-	-		4,700 J
Dibenzofiran	6200	NA	Note 6		-	Note 6	110 J	150 J	-	-		
Di-n-butylphthalate	8100	NA	39 J	160 J	-	45 J	83 J	52 J	-	-		
Fluoranthene	50,000	200 - 166,000	Note 6	170 J	-	220 J	770	770	-	-		10,000 J
Fluorene	50,000	NA	Note 6		-	Note 6		51 J	-	-		
Indeno(1,2,3-cd)pyrene	3200	8,000 - 61,000	Note 6	310 J	-	330 J	650	660	-	-		12,000
Naphthalene	13,000	NA	Note 6		-	Note 6	200 J	280 J	-	-		
Phenanthrene	50,000	NA	Note 6	52 J	-	Note 6	490	580	-	-		5,100 J
Pyrene	50,000	145 - 147,000	Note 6	170 J	-	190 J	510	480	-	-		8,700 J
Total BaP Equivalent[5]	NA	NA	0	490	-	612	1,114	1,189	-	-	0	19,440
Total SVOCs	500,000***	NA	799	2,549	-	3,013	8,155	8,336	-	-	1,300	110,600
Volatile Organic Compounds - VOCs (µg/kg)												
1,1,1-Trichloroethane	800	NA				-		-			-	
Acetone	200	NA	4 J			-	6 J	-		21 J	-	
Benzene	60	NA				-		-			-	
Cyclohexane	NA	NA				-	3 J	-			-	4 J
Isopropylbenzene	5,000	NA				-		-	11 J	15 J	-	
M+P-xylene	1,200	NA				-	2 J	-			-	
O-xylene		NA				-		-			-	
Methyl Acetate	NA	NA										
Methycyclohexane	NA	NA				-	2 J	-			-	
Methylene chloride	100	NA				-		-			-	
Toluene	1,500	NA				-	3 J	-			-	
Trichloroethene	700	NA				-		-			-	
Total VOCs	10,000	NA	4			-	16	-		36	-	4

Notes: See Page 5

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MALCOLM PIRNIE

TABLE 2-2
SUMMARY OF ANALYTICAL RESULTS - SUBSURFACE SOIL OCTOBER 2004 SAMPLING
REMEDIAL INVESTIGATION REPORT
FORMER INGERSOLL-RAND FOUNDRY SITE
PAINTED POST, NEW YORK

Notes:

Shaded Sample locations represent samples taken of the fill materials. Unshaded sample locations represent samples of native soils.
Only those analytes detected at a minimum of one location are shown.
Blank space indicates analyte was not detected.
Shaded concentrations exceed TAGM values for Pest/PCBs, SVOCs, and VOCs.
Shaded TAL Inorganic Analytes exceed upper range of Eastern USA Background Concentrations and TAGM values.
Bold/Italic SVOC results exceed upper limit of Urban Soils Background Range for PAHs.
(1) New York State Dept. of Environmental Conservation TAGM 4046, Recommended Soil Cleanup Objectives, Dec. 2000.
(2) TAL Inorganic Analytes from Eastern USA Background as shown in New York State Dept. of Environmental Conservation TAGM 4046, Dec. 2000.
(3) SVOCs background from Background Soil Concentrations of Poly Aromatic Hydrocarbons (PAHs), Urban Soils (U.S. and Other), Toxicological Profile for PAHs, US Dept. of Health and Human Services, August 1995.
(4) USEPA Region 3 Soil Screening Level.
(5) Total BaP equivalent - Benzo (a) pyrene equivalent is calculated by multiplying the following individual PAH concentrations by their multiplier (#) and summing the results. Benzo (a) pyrene (1.00); Dibenzo (a,h) anthracene (1.00); Benzo (a) anthracene (0.10); Benzo (b) fluoranthene (0.10); Ideno (1,2,3-cd) pyrene (0.10); Benzo (k) fluoranthene (0.01); Chrysene (0.01).

(6) Rejected base-neutral fraction non-detects due to low surrogate recovery for 1,2-dichlorobenzene-d4 (<10%), positive base-neutrals qualified "J", negative bias suggested.
*** - The Soil Cleanup Objective refers to the sum of these compounds.
D - indicates a result detected in a secondary dilution factor.
J - Indicates and estimated value.

MALCOLM PIRNIE

TABLE 2-3
SUMMARY OF ANALYTICAL RESULTS - SUBSURFACE SOIL - APRIL 2004 SAMPLING
SUBSURFACE INVESTIGATION
FORMER INGERSOLL RAND FOUNDRY SITE
PAINTED POST, NEW YORK

Sample Location Sampling Depth (feet bgs) Collection Date	NYSDEC TAGM 4046[1]	Urban Background Concentrations[2][3]	SB-CT-01 0 to 5 4/8/2004	SB-CT-01 5 to 10 4/8/2004	SB-R1-01 4 to 7 4/8/2004	SB-R1-02 8 to 16 4/8/2004	SB-R1-03 3 to 6 4/8/2004	SB-R1-04 2 to 4 4/8/2004	SB-R2-01 0 to 5 4/12/2004	SB-R2-02 2 to 8 4/12/2004
pH										
pH	NA	NA	7.42	7.58	7.61	8.08	7.84	7.57	7.51	6.74
TAL Inorganic Analytes (mg/kg)										
Aluminum	SB	33,000	-	-	-	-	-	-	-	-
Antimony	SB	N/A	-	-	-	-	-	-	-	-
Arsenic	7.5 or SB	3 - 12	-	-	-	-	-	-	-	-
Barium	300 or SB	15 - 600	-	-	-	-	-	-	-	-
Beryllium	0.16 or SB	0 - 1.75	-	-	-	-	-	-	-	-
Cadmium	1 or SB	0.1 - 1	-	-	-	-	-	-	-	-
Calcium	SB	130 - 35,000	-	-	-	-	-	-	-	-
Chromium	10 or SB	1.5 - 40	-	-	-	-	-	-	-	-
Cobalt	30 or SB	2.5 - 60	-	-	-	-	-	-	-	-
Copper	25 or SB	1 - 50	-	-	-	-	-	-	-	-
Iron	2000 or sb	2,000 - 550,000	-	-	-	-	-	-	-	-
Lead	400 [4]	200-500	-	-	-	-	-	-	-	-
Magnesium	SB	100 - 5,000	-	-	-	-	-	-	-	-
Manganese	SB	50 - 5,000	-	-	-	-	-	-	-	-
Mercury	0.1	0.001 - 0.2	-	-	-	-	-	-	-	-
Nickel	13 or SB	0.5 - 25	-	-	-	-	-	-	-	-
Potassium	SB	8,500 - 43,000	-	-	-	-	-	-	-	-
Selenium	2 or SB	0.1 - 3.9	-	-	-	-	-	-	-	-
Silver	SB	N/A	-	-	-	-	-	-	-	-
Sodium	SB	6,000 - 8,000	-	-	-	-	-	-	-	-
Thallium	SB	N/A	-	-	-	-	-	-	-	-
Vanadium	150 or SB	1 - 300	-	-	-	-	-	-	-	-
Zinc	20 or SB	9 - 50	-	-	-	-	-	-	-	-
Polycyclic Aromatic Hydrocarbons (ug/kg)										
Acenaphthene	50,000	NA			1,300 J					
Acenaphthylene	41,000	NA								980 J
Anthracene	50,000	NA								2,300 J
Benzo(a)anthracene	224	169 - 59,000	1,700 J	1,800 J	11,000		4,000 J	5,900	1,100 J	5,100
Benzo(a)pyrene	61	165 - 220	3,200	3,200	22,000		5,200 J	8,500	2,000 J	3,500
Benzo(b)fluoranthene	1,100	15,000 - 62,000	6,800	7,000	31,000		9,700	16,000	3,800	3,600
Benzo(g,h,i)perylene	50,000	900 - 47,000	4,600 J	4,500	16,000			10,000	2,500	
Benzo(k)fluoranthene	1,100	300 - 26,000	2,000 J	1,500 J	9,700		3,200 J	3,900 J	1,100 J	
Chrysene	400	251 - 640	3,100	3,000	15,000		5,800	8,700	1,600 J	6,100
Dibenzo(a,h)anthracene	14	NA	1,400 J		3,500 J			3,400 J		
Fluoranthene	50,000	200 - 166,000	1,800 J	2,000 J	14,000		4,700 J	7,600	1,100 J	7,600
Fluorene	50,000	NA								730 J
Indeno(1,2,3-cd)pyrene	3,200	8,000 - 61,000	3,800	4,300	1,700		3,800 J	8,300	2,100 J	
Naphthalene	13,000	NA								
Phenanthrene	50,000	NA			2,500 J		1,200 J	5,000 J		11,000
Pyrene	50,000	145 - 147,000	1,900 J	1,500 J	16,000		4,400 J	8,000	1,400 J	10,000
Total BaP equivalent[5]	NA	NA	6,969	5,530	23,430		1,455	15,917	3,074	957
Total PAHs	500,000***	NA	30,300	28,800	143,700		42,000	85,300	16,700	50,910

Notes: (see page 5)

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Checked by: JR Date: 08/24/04

MALCOLM PIRNIE

TABLE 2-3
SUMMARY OF ANALYTICAL RESULTS - SUBSURFACE SOIL - APRIL 2004 SAMPLING
SUBSURFACE INVESTIGATION
FORMER INGERSOLL RAND FOUNDRY SITE
PAINTED POST, NEW YORK

Sample Location Sampling Depth *(feet bgs)* Collection Date	NYSDEC TAGM 4046[1]	Urban Background Concentrations[2,3]	SB-R2-03 1 to 4.5 4/12/2004	SB-R2-04 1 to 4 4/12/2004	SB-R2-05/06 2 to 10 4/12/2004	SB-R3-01 0 to 4 4/14/2004	SB-R3-01 4 to 9 4/14/2004	SB-R3-02 0 to 4 4/14/2004	SB-R3-02 4 to 7 4/14/2004	SB-R3-03 0 to 6 4/14/2004
pH										
pH	NA	NA	7.18	7.39	8.53	6.38	7.7	7.1	6.68	7.04
TAL Inorganic Analytes (mg/kg)										
Aluminum	SB	33,000	-	-	-	-	-	-	-	-
Antimony	SB	N/A	-	-	-	-	-	-	-	-
Arsenic	7.5 or SB	3 - 12	-	-	-	-	-	-	-	-
Barium	300 or SB	15 - 600	-	-	-	-	-	-	-	-
Beryllium	0.16 or SB	0 - 1.75	-	-	-	-	-	-	-	-
Cadmium	1 or SB	0.1 - 1	-	-	-	-	-	-	-	-
Calcium	SB	130 - 35,000	-	-	-	-	-	-	-	-
Chromium	10 or SB	1.5 - 40	-	-	-	-	-	-	-	-
Cobalt	30 or SB	2.5 - 60	-	-	-	-	-	-	-	-
Copper	25 or SB	1 - 50	-	-	-	-	-	-	-	-
Iron	2000 or sb	2,000 - 550,000	-	-	-	-	-	-	-	-
Lead	400 [4]	200-500	-	-	-	-	-	-	-	-
Magnesium	SB	100 - 5,000	-	-	-	-	-	-	-	-
Manganese	SB	50 - 5,000	-	-	-	-	-	-	-	-
Mercury	0.1	0.001 - 0.2	-	-	-	-	-	-	-	-
Nickel	13 or SB	0.5 - 25	-	-	-	-	-	-	-	-
Potassium	SB	8,500 - 43,000	-	-	-	-	-	-	-	-
Selenium	2 or SB	0.1 - 3.9	-	-	-	-	-	-	-	-
Silver	SB	N/A	-	-	-	-	-	-	-	-
Sodium	SB	6,000 - 8,000	-	-	-	-	-	-	-	-
Thallium	SB	N/A	-	-	-	-	-	-	-	-
Vanadium	150 or SB	1 - 300	-	-	-	-	-	-	-	-
Zinc	20 or SB	9 - 50	-	-	-	-	-	-	-	-
Polycyclic Aromatic Hydrocarbons (ug/kg)										
Acenaphthene	50,000	NA								
Acenaphthylene	41,000	NA								
Anthracene	50,000	NA								
Benzo(a)anthracene	224	169 - 59,000	2,300 J	5,900 D		1,900	350	1,700 J	6,200	640 J
Benzo(a)pyrene	61	165 - 220	3,700	7,900 D		3,500	580	2,500 J	11,000	970 J
Benzo(b)fluoranthene	1,100	15,000 - 62,000	6,200	15,000 D	91 J	5,600	1,200	4,200	16,000	1,500 J
Benzo(g,h,i)perylene	50,000	900 - 47,000	3,500	6,900 D		2,900	770	3,000	9,000	
Benzo(k)fluoranthene	1,100	300 - 26,000	2,000 J	3,100 JD		2,100	260 J		5,000	
Chrysene	400	251 - 640	3,600	8,300 D	64 J	3,000	580	3,100	9,000	1,100 J
Dibenzo(a,h)anthracene	14	NA	1,100 J			880 J	230 J	960 J	2,000	
Fluoranthene	50,000	200 - 166,000	2,700 J	6,700 D		1,800	300	1,100 J	5,500	
Fluorene	50,000	NA								
Indeno(1,2,3-cd)pyrene	3,200	8,000 - 61,000	2,900	6,800		3,000	660	2,200 J	9,200	
Naphthalene	13,000	NA								
Phenanthrene	50,000	NA	950 J	1,600 JD		300 J	86 J		740 J	
Pyrene	50,000	145 - 147,000	2,600 J	5,600 D		1,700	280	1,500 J	5,300	
Total BaP equivalent[5]	NA	NA	5,588	9,193		4,706	1,177	4,673	13,890	
Total PAHs	500,000***	NA	31,550	67,800		26,680	5,296	20,260	78,940	

Notes: *(see page 5)*

Created by: SC Date: 05/04/04
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TABLE 2-3
SUMMARY OF ANALYTICAL RESULTS - SUBSURFACE SOIL - APRIL 2004 SAMPLING
SUBSURFACE INVESTIGATION
FORMER INGERSOLL RAND FOUNDRY SITE
PAINTED POST, NEW YORK

Sample Location Sampling Depth (feet bgs) Collection Date	NYSDEC TAGM 4046[1]	Urban Background Concentrations[2][3]	SB-R3-03 6 to 12 4/14/2004	SB-R3-04 2 to 5 4/14/2004	SB-R3-04 5 to 7 4/14/2004	SB-X2 (SB-R3-04) 5 to 7 4/14/2004	SB-R3-05 2 to 10 4/14/2004	SB-R3-06 0 to 4 4/14/2004	SB-R3-06 4 to 8 4/14/2004	SB-GT-01/02 2 to 10 4/9/2004
pH										
pH	NA	NA	7.46	7.5	7.05	7.40	9.1	7.56	7.34	8.02
TAL Inorganic Analytes (mg/kg)										
Aluminum	SB	33,000	-	-	-	-	-	-	-	7,650
Antimony	SB	N/A	-	-	-	-	-	-	-	2.4 J
Arsenic	7.5 or SB	3 - 12	-	-	-	-	-	-	-	3.84 J
Barium	300 or SB	15 - 600	-	-	-	-	-	-	-	43.4
Beryllium	0.16 or SB	0 - 1.75	-	-	-	-	-	-	-	0.258 J
Cadmium	1 or SB	0.1 - 1	-	-	-	-	-	-	-	0.27 J
Calcium	SB	130 - 35,000	-	-	-	-	-	-	-	19,000
Chromium	10 or SB	1.5 - 40	-	-	-	-	-	-	-	9.74
Cobalt	30 or SB	2.5 - 60	-	-	-	-	-	-	-	3.83
Copper	25 or SB	1 - 50	-	-	-	-	-	-	-	24.3
Iron	2000 or sb	2,000 - 550,000	-	-	-	-	-	-	-	15,000
Lead	400 [4]	200-500	-	-	-	-	-	-	-	13.5
Magnesium	SB	100 - 5,000	-	-	-	-	-	-	-	6,580
Manganese	SB	50 - 5,000	-	-	-	-	-	-	-	925 J
Mercury	0.1	0.001 - 0.2	-	-	-	-	-	-	-	0.038 J
Nickel	13 or SB	0.5 - 25	-	-	-	-	-	-	-	26.9 J
Potassium	SB	8,500 - 43,000	-	-	-	-	-	-	-	627
Selenium	2 or SB	0.1 - 3.9	-	-	-	-	-	-	-	0.28 J
Silver	SB	N/A	-	-	-	-	-	-	-	0.78 J
Sodium	SB	6,000 - 8,000	-	-	-	-	-	-	-	97.6 J
Thallium	SB	N/A	-	-	-	-	-	-	-	
Vanadium	150 or SB	1 - 300	-	-	-	-	-	-	-	15.1
Zinc	20 or SB	9 - 50	-	-	-	-	-	-	-	67.7
Polycyclic Aromatic Hydrocarbons (ug/kg)										
Acenaphthene	50,000	NA						750 J	2,800	
Acenaphthylene	41,000	NA						540 J		
Anthracene	50,000	NA						710 J	580 J	
Benzo(a)anthracene	224	169 - 59,000	560 J	850 J	730 J	970 J		1,800	3,600	630 J
Benzo(a)pyrene	61	165 - 220	720 J	1,400	1,100 J	1,400 J		2,800	8,800	1,000 J
Benzo(b)fluoranthene	1,100	15,000 - 62,000	1,300 J	2,600	2,200	2,900		4,300	12,000	1,900
Benzo(g,h,i)perylene	50,000	900 - 47,000		1,600	1,200 J			3,200	9,800	1,500
Benzo(k)fluoranthene	1,100	300 - 26,000		950 J	800 J	930 J		1,100 J	3,400	
Chrysene	400	251 - 640	790 J	1,300	1,200 J			2,200	4,300	1,000 J
Dibenzo(a,h)anthracene	14	NA						850 J	2,300 J	430 J
Fluoranthene	50,000	200 - 166,000	530 J	670 J	670 J	800 J		2,800	3,800	640 J
Fluorene	50,000	NA						910 J	560 J	
Indeno(1,2,3-cd)pyrene	3,200	8,000 - 61,000	620 J	1,600	1,200 J	1,500 J		3,200	10,000	1,200 J
Naphthalene	13,000	NA						1,900	580 J	
Phenanthrene	50,000	NA						5,000	3,200	
Pyrene	50,000	145 - 147,000	710 J	650 J				4,100	4,000	620 J
Total BaP equivalent[5]	NA	NA		2,024	1,537			4,895	14,503	2,242
Total PAHs	500,000***	NA		11,620	9,100			36,160	69,720	8,920

Notes: (see page 3)

Created by: SC Date: 05/04/04
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TABLE 2-3
SUMMARY OF ANALYTICAL RESULTS - SUBSURFACE SOIL - APRIL 2004 SAMPLING
SUBSURFACE INVESTIGATION
FORMER INGERSOLL RAND FOUNDRY SITE
PAINTED POST, NEW YORK

Sample Location Sampling Depth (feet bgs) *Collection Date*	NYSDEC TAGM 4046[1]	Urban Background Concentrations[2]	SB-GT-03/04 2 to 10 4/9/2004	SB-X1 (SB-GT-03/04) 2 to 10 4/9/2004	SB-GT-05 2 to 8 4/9/2004	SB-GT-06/07 5 to 10 4/12/2004	SB-GT-07 1 to 5 4/12/2004	SB-GT-08 2 to 16 4/13/2004	SB-GT-09/10 2 to 10 4/14/2004	SB-GT-11 2 to 10 4/14/2004
pH										
pH	NA	NA	7.86	8.00	7.03	8.72	7.39	7.5	8.09	7.72
TAL Inorganic Analytes (mg/kg)										
Aluminum	SB	33,000	5,620	6,960	4,500	10,600	11,400	6,030	5,730	5,730
Antimony	SB	N/A	3.7 J	2.5 J	3.3 J	4.2 J	2.8 J	8.36 J	3 J	2.7 J
Arsenic	7.5 or SB	3 - 12	3.67 J	3.0 J	2.17	4.06	1.84	3.39	2.97	1.58
Barium	300 or SB	15 - 600	30.5	36.1	17.8 J	42.4	22.3	29.2	27.8	26.9
Beryllium	0.16 or SB	0 - 1.75	0.2 J	0.24 J	0.12 J	0.252 J	0.18 J	0.1 J	0.19 J	0.206 J
Cadmium	1 or SB	0.1 - 1	0.21 J	0.18 J	0.22 J	0.15 J	0.13 J	0.26 J	0.16 J	0.07 J
Calcium	SB	130 - 35,000	20,900	32,000	1020	47,700 J	1,620 J	3,010 J	69,400 J	1,460 J
Chromium	10 or SB	1.5 - 40	8.63	8.0	9.38	9.24	8.06	43.4 J	7.19	5.79
Cobalt	30 or SB	2.5 - 60	4.49	3.5	1.73	4.75	1.96 J	2.77 B	3.94 J	3.33 J
Copper	25 or SB	1 - 50	20.7	22.5	27.3	30.1 J	10.4 J	73 J	17.5 J	9 J
Iron	2000 or sb	2,000 - 550,000	12,000	14,400	28,800	14,200	8,900	18,100	10,600	10,300
Lead	400[4]	200-500	8.48	20.7	11.7	8.64 J	14.2 J	52.3 J	5.87 J	9.44 J
Magnesium	SB	100 - 5,000	5,580	8,220	587	12,100 J	721 J	674 J	28,000 J	1,180 J
Manganese	SB	50 - 5,000	432 J	406 J	260 J	531	95.6	322	465	184
Mercury	0.1	0.001 - 0.2	0.03		0.032 J			0.071	0.038 J	0.03 J
Nickel	13 or SB	0.5 - 25	13.2 J	14.5	22 J	15	6.4	46.7	10.2	10.1
Potassium	SB	8,500 - 43,000	620	726	421 J	683	544	306 J	668	705
Selenium	2 or SB	0.1 - 3.9	0.33 J	0.66 J	0.17 J	0.46 J	0.21 J	0.24 J	0.47 J	0.21 J
Silver	SB	N/A		0.69 J	0.6 J	0.88 J	0.82 J	1.07		
Sodium	SB	6,000 - 8,000	184 J	390 J	66 J	72.1 J	88.2 J	72.4 J	85.4 J	104 J
Thallium	SB	N/A								
Vanadium	150 or SB	1 - 300	9.43	12.0	9.91	10.2	12.8	7.98	7.95	10.7
Zinc	20 or SB	9 - 50	53.8	64.7	14.5	60.9 J	14.4 J	75.9 J	62.5 J	19.8 J
Polycyclic Aromatic Hydrocarbons (ug/kg)										
Acenaphthene	50,000	NA								
Acenaphthylene	41,000	NA								
Anthracene	50,000	NA	86 J	52 J						
Benzo(a)anthracene	224	169 - 59,000	100 J	180 J	4,700 JD	58 J	2,300 D	4,600		1,000 J
Benzo(a)pyrene	61	165 - 220	83 J	150 J	8,600 D		3,400 D	8,000		1,700
Benzo(b)fluoranthene	1,100	15,000 - 62,000	160 J	260	15,000 D	66 J	10,000 D	15,000		3,000
Benzo(g,h,i)perylene	50,000	900 - 47,000			11,000 D		7,000 D	8,200		2,000
Benzo(k)fluoranthene	1,100	300 - 26,000			4,800 JD		2,800 D	3,600		820 J
Chrysene	400	251 - 640	120 J	190 J	7,400 D	76 J	4,900 D	7,000		1,700
Dibenzo(a,h)anthracene	14	NA			2,800 JD		1,600 D	2,200		
Fluoranthene	50,000	200 - 166,000	226 J	360	4,500 JD		2,700 D	5,500		1,300
Fluorene	50,000	NA				93 J				
Indeno(1,2,3-cd)pyrene	3,200	8,000 - 61,000		110 J	8,700 D		6,400 D	8,000		1,800
Naphthalene	13,000	NA								
Phenanthrene	50,000	NA	190 J	170 J		190 J	520 JD	950 J		320 J
Pyrene	50,000	145 - 147,000	170 J	280	4,900 JD	140 J	1,900 D	5,200		1,300
Total BaP equivalent[5]	NA	NA			16,224		9,959	12,680		2,497
Total PAHs	500,000***	NA			72,400		43,520	68,250		14,940

Notes: (see page 5)

Created by: SC Date: 05/04/04
Checked by: JR Date: 08/24/04

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TABLE 2-3
SUMMARY OF ANALYTICAL RESULTS - SUBSURFACE SOIL - APRIL 2004 SAMPLING
SUBSURFACE INVESTIGATION
FORMER INGERSOLL RAND FOUNDRY SITE
PAINTED POST, NEW YORK

Notes:

Shaded Sample locations represent samples taken of the fill materials. Unshaded sample locations represent samples of native soils.
Only those analytes detected at a minimum of one location are shown.
Blank space indicates analyte was not detected.
Shaded concentrations exceed TAGM values for Pest/PCBs, SVOCs, and VOCs.
Shaded TAL Inorganic Analytes exceed upper range of Eastern USA Background Concentrations and TAGM values.
Bold/Italic SVOC results exceed upper limit of Urban Soils Background Range for PAHs.
(1) New York State Dept. of Environmental Conservation TAGM 4046, Recommended Soil Cleanup Objectives, Dec. 2000.
(2) TAL Inorganic Analytes from Eastern USA Background as shown in New York State Dept. of Environmental Conservation TAGM 4046, Dec. 2000.

(3) SVOCs background from Background Soil Concentrations of Poly Aromatic Hydrocarbons (PAHs), Urban Soils (U.S. and other), Toxicological Profile for PAHs, US Dept. of Health and Human Services, August 1995.

(4) USEPA Region 3 Soil Screening Level.

(5) Total BaP equivalent - Benzo (a) pyrene equivalent is calculated by multiplying the following individual PAH concentrations by their multiplier (#) and summing the results. Benzo (a) pyrene (1.00); Dibenzo (a,h) anthracene (1.00); Benzo (a) anthracene (0.10); Benzo (b) fluoranthene (0.10); Ideno (1,2,3-cd) pyrene (0.10); Benzo (k) fluoranthene (0.01); Chrysene (0.01).
*** - The Soil Cleanup Objective refers to the sum of all SVOCs.
J - Indicates and estimated value.
B - Aanlyte detected in method or trip blank.
D - indicates a result detected in a secondary dilution factor.
NA indicates Not Applicable
\- indicates Not Analyzed

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- Elevated concentrations (above TAGM cleanup objectives) of arsenic, cadmium, calcium, chromium, copper and mercury are located sporadically throughout the fill.

2.3 Risk Assessment Results

A human health risk assessment and a fish and wildlife impact analysis were performed for the Site to evaluate the impacts to receptor populations exposed, or potentially exposed to site COPECs. Based on existing conditions (without remediation), there is a potential for short-term exposure to contaminated surface soils via dermal contact or ingestion. Exposure to COPECs identified in foundry sands and subsurface soils is possible, if engaged in intrusive activities.

A risk assessment based on the proposed Site remediation identified construction workers as the only population that could be exposed to Site COPECs. Potential exposure to soils and groundwater could be expected during construction activities but would be mitigated with implementation of a site-specific health and safety plan (HASP).

Based on the fish and wildlife impact analysis described in the Remedial Investigation (RI), selected COPECs found in Site soils may potentially cause adverse effects to the Eastern cottontail rabbit which was used as the baseline ecological receptor. However, with the exception of arsenic the magnitude of risk based on the concentrations of the selected COPECs found in soils is not great. There was no risk associated with the Site groundwater due to attenuation and dilution as water recharges to the Cohoctan River.

2.4 Remedial Action Objectives

A qualitative human health and ecological risk assessment was performed to evaluate potential for exposure to Site contaminants. The primary remedial action objective for the Site is to evaluate and select a remedy for the Site that supports the planned redevelopment and reduces the potential risks posed by Site soils and fill.

Figure 2-2 illustrates the footprint for the structure and associated infrastructure proposed for the Site. Within the construction footprint, the risk assessment confirmed that surface and

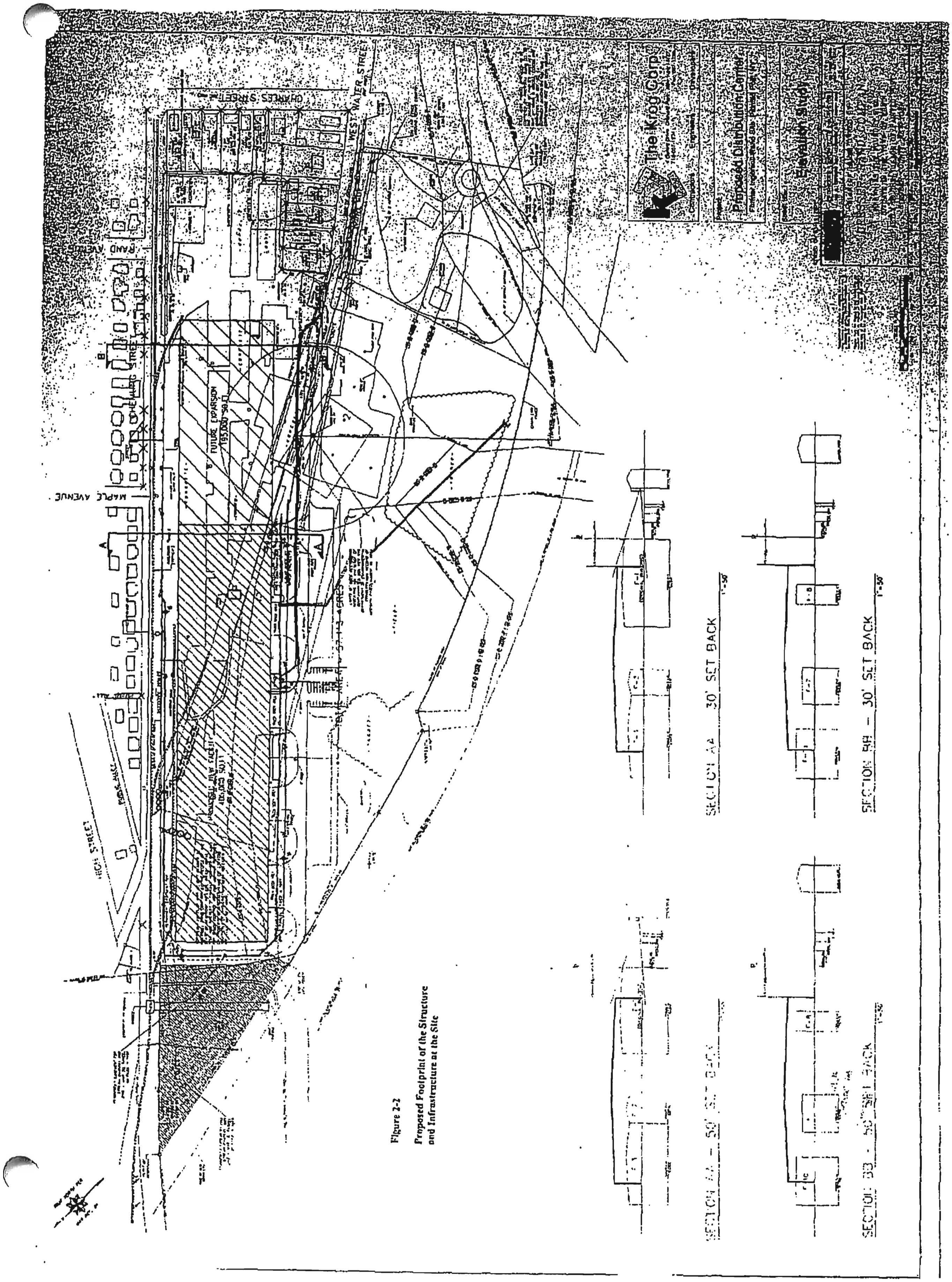

Figure 2-2

Proposed Footprint of the Structure and Infrastructure at the Site subsurface fill material, which will be handled in grading the Site and excavating for footings or Site infrastructure, poses a potential risk for on-site workers. As a result, soil management protocols are necessary to limit the potential for exposure of on-site workers to contaminated fill materials. The proposed protocols are presented in Appendix A and include procedures for determining what materials will be returned to the Site for use once excavated and what must be sent for off-site disposal.

Outside the construction areas, surface soil sampling has confirmed that limited contamination is present in the northernmost treed area of the Site. Therefore, no remedial action is proposed in this area.

Results of soil and groundwater sampling has confirmed that contaminants present in the fill have not migrated into native soils or groundwater, therefore no remedial action is proposed for these media.

The risk assessment confirmed that direct contact with contaminated surface soils poses a risk to the public and/or on-site workers. Therefore, on-surface fill materials are identified as requiring remediation.

Based on proposed construction activities 25,600 cubic yards of fill material are affected. The following section describes the evaluation of potential remedial alternatives for this volume of fill.

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Identification of Remedial Alternatives

SECTION 3

3.1 General Response Actions

In accordance with the October 2003 legislation outlining Brownfields Cleanup Program requirements, until soil cleanup numbers are developed, site owners are required to evaluate both remedies that allow unrestricted site use as well as remedies that rely upon institutional controls or engineering controls (IC/ECs). Remedies available to provide unrestricted use of the site include excavation and off-site disposal of all fill materials on-site, off-site disposal of fill materials excavated during construction only, and in-situ or ex-situ treatment of the contaminated fill. Treatment technologies potentially applicable for the contaminants associated with site include: solidification/stabilization, bioremediation, phytoremediation, chemical oxidation, electrokinetic separation and soil flushing. Restricted use remediation of the site can be accomplished by providing soil cover over all areas of the site where direct contact will not be precluded by the presence of either proposed buildings or pavement. The following section describes each of these alternatives.

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Description of Remedial Alternatives

SECTION 4

4.1 Unrestricted Use Remedies

Excavation and Off-site Disposal

This alternative involves excavation of fill materials and off-site transport and placement in an appropriately permitted secure landfill. Two options exist under this alternative: excavation and off-site disposal of all fill materials, or disposal of only those fill materials encountered during construction for Site infrastructure. The cost for off-site disposal of <u>all</u> Site fill and then backfilling and regrading before Site construction activities begin would make the cost for Site development prohibitive, and thus will not be considered further.

Treatment Technologies

Solidification/Stabilization (S/S) involves physically binding or enclosing the site contaminants within a stabilized mass (solidification), or inducing chemical reactions between the stabilizing agent and the contaminants to reduce their mobility (stabilization). S/S can be applied in-situ or ex-situ. The target contaminant group for in-situ S/S is generally inorganics and thus would not address the PAHs. The In-Situ Vitrification (ISV) process can destroy or remove organics and immobilize most inorganics in contaminated soils, sludge, or other earthen materials. The process has been tested on a broad range of VOCs and SVOCs, other organics including dioxins and PCBs, and on most priority pollutant metals and radionuclides. However, future usage of the site may "weather" the materials and affect their ability to maintain immobilization of contaminants and most processes result in a significant increase in volume (up to double the original volume). In addition, the solidified material would hinder future site uses. As a result S/S is considered not applicable for remediation of this site and will not be further considered.

Bioremediation/Bio-augmentation describes the activity of naturally occurring or inoculated microbes stimulated by circulating water-based solutions through the contaminated soils to enhance in situ biological degradation of organic contaminants or immobilization of inorganic contaminants. Nutrients, oxygen, or other amendments may be used to enhance bioremediation and contaminant desorption from subsurface materials. The contaminant groups treated most often are PAHs, non-halogenated SVOCs (not including PAHs), and BTEX. Remediation of metals with microbial techniques is in the experimental stage, with limited data/guidance. Bioleaching uses microorganisms to solubilize metal contaminants either by direct action of the bacteria, as a result of interactions with metabolic products, or both. Bioleaching can be used in-situ or ex-situ to aid the removal of metals from soil. Because of bioremediation's limited applicability for treating recalcitrant PAHs and metals, and the potential for the on-site metals concentrations to be toxic to the microorganisms, this treatment technology is considered not applicable for remediation of this site and will not be considered further.

Phytoremediation is a process that uses plants to remove, transfer, stabilize, or destroy contaminants in soil, sediment, and groundwater. The mechanisms of phytoremediation include enhanced rhizosphere biodegradation, which takes place in soil or groundwater immediately surrounding plant roots; phytoextraction (also known as phytoaccumulation), the uptake of contaminants by plant roots and the translocation/accumulation of contaminants into plant shoots and leaves; phytodegradation, the metabolism of contaminants within plant tissues; and phytostabilization, the production of chemical compounds by plants to immobilize contaminants at the interface of roots and soil. Phytoremediation applies to all biological, chemical, and physical processes that are influenced by plants (including the rhizosphere) and that aid in cleanup of the contaminated substances. Plants can be used in site remediation, both through the mineralization of toxic organic compounds and through the accumulation and concentration of heavy metals and other inorganic compounds from soil into aboveground shoots. Phytoremediation may be applicable for the remediation of metals, pesticides, solvents, explosives, crude oil, PAHs, and landfill leachates. Some plant species have the ability to store metals in their roots. As the roots become saturated with metal contaminants, they can be harvested. Hyper-accumulator plants may be able to remove and store significant amount of metallic contaminants. Currently, trees are under investigation to determine their ability to remove organic contaminants from ground water, translocate and transpiration, and possibly metabolize them either to CO2 or plant tissue. The depth of the treatment zone varies based on the plants used in phytoremediation, but in most cases, it is limited to shallow soils. High concentrations of some contaminants can be toxic to plants. In addition, the process occurs seasonally. Since different planting materials would be required for each group of site contaminants, this process likely requires many seasons to remediate to non-risk concentrations, may not consistently remove materials from across the site and with depth, and products may be mobilized into groundwater or bioaccumulated in animals. This treatment technology is considered not applicable for remediation of the site and will not be considered further.

Chemical Oxidation chemically converts hazardous contaminants to non-hazardous or less toxic compounds that are more stable, less mobile, and/or inert. The oxidizing agents most commonly used are ozone, hydrogen peroxide, hypochlorites, chlorine, and chlorine dioxide. This technology can be applied in-situ or ex-situ. In-situ chemical oxidation (ISCO) using permanganate for soil and groundwater treatment and has been demonstrated at a number of sites on the following organics: chlorinated solvents (such as trichloroethylene [TCE]), naphthalene, and pyrene. Fenton's Reagent can be used to treat a wide range of organic contaminants in soil and groundwater, including chlorinated solvents, petroleum hydrocarbons, semi-volatile organic compounds (SVOCs), and pesticides. ISCO has also been used to remediate polyaromatic hydrocarbons (PAHs), petroleum products, and ordnance compounds. Chemical treatment may be used to solubilize contaminants from the most contaminated fraction of the soil. Many processes manipulate the acid/base chemistry of the slurry to leach contaminants from the soil. Oxidizing and reducing agents (e.g., hydrogen peroxide, sodium borohydride) provide yet another option to aid in solubilization of metals since chemical oxidation/ reduction can convert metals to more soluble forms. Finally, surfactants may be used in extraction of the metals from soil. Because different chemicals would be required to treat each contaminant group, and application is limited by the ability of the oxidants to reach the contaminants, this treatment technology is considered not applicable for remediation of this site and will not be considered further.

Electrokinetic Separation relies upon the application of a low-intensity direct current through the soil between ceramic electrodes that are divided into a cathode array and an anode array. This mobilizes charged species, causing ions and water to move toward the electrodes. Metal ions, ammonium ions, and positively charged organic compounds move toward the cathode. Anions such as chloride, cyanide, fluoride, nitrate, and negatively charged organic compounds move toward the anode. The current creates an acid front at the anode and a base front at the cathode. This generation of acidic condition in-situ may help to mobilize sorbed metal contaminants for transport to the collection system at the cathode. Concentrated (migrated) contaminants are then removed for treatment or can be treated in treatment walls as they migrate. The polarity of the electrodes is reversed periodically, which reverses the direction of the contaminants back and forth through treatment zones. Electrokinetics has been used for decades in the oil recovery industry and to remove water from soils, but in-situ application of electrokinetics to remediate contaminated soil is new. Recently, attention has focused on developing in-situ electrokinetic techniques for the treatment of low permeability soils, which are resistant to remediation with traditional technologies because of their low hydraulic conductivity. Because of its limited effectiveness for non-polar organic contaminants, such as PAHs, because they will not migrate with the current, this treatment technology is considered not applicable for remediation of this site and will not be considered further.

In-Situ Soil Flushing is used to mobilize metals by leaching contaminants from soils so that they can be extracted without excavating the contaminated materials. An aqueous extracting solution is injected into or sprayed onto the contaminated area to mobilize the contaminants, usually by solubilization. After being contacted with the contaminated material, the extractant solution is collected using pump-and-treat methods for disposal or treatment and reuse. Common extracting agents include acids/bases, chelating agents, oxidizing/reducing agents and surfactants cosolvents. This process can be applied in-situ or ex-situ (soil washing). The target contaminant groups for soil washing are SVOCs, fuels, and heavy metals. The technology can be used on selected VOCs and pesticides. The technology offers the ability for recovery of metals and can clean a wide range of organic and inorganic contaminants from coarse-grained soils. However, complex mixture of contaminants in the soil (such as a mixture of metals, nonvolatile organics, and SVOCs) and heterogeneous contaminant compositions throughout the soil mixture make it difficult to formulate a single suitable washing solution that will consistently and reliably remove all of the different types of contaminants. There is additionally limited data regarding flushing for PAHs. For these reasons, this treatment technology is considered not applicable for remediation of this site and will not be considered further.

4.2 Restricted Use Remedies

In order to eliminate potential exposure risks associated with direct contact with site fill material, the entire Site can be covered as part of site redevelopment. The cover system would be placed directly on top of the regraded on-site fill material and will include clean soil for outdoor, vegetated areas, asphalt for roads and parking lots, or concrete for sidewalks, buildings and heavy use areas. Responsibility for monitoring and maintenance of the site cover system is delineated in the Brownfield Cleanup Agreement. An Operation, Monitoring, and Maintenance (OM&M) Work Plan for implementation following remediation of the site is included in Appendix C.

The proposed cover system has been designed to be protective of human health and the environment. The primary exposure pathway for contaminants at the site (metals and PAHs in soil) is via direct contact. The proposed plan of covering the on-site fill material will eliminate the potential for direct contact with soil and is therefore protective of human health and the environment. Groundwater data indicate that the contaminants present at the site are not impacting groundwater quality.

Exposure to the soil fill piles during construction will be precluded for on-site workers and trespassers through covering. Exposure to fill at the surface would be precluded for future on-site workers through covering. The potential for exposure through invasive on-site construction activities would be managed by implementation of the protocols of the Soil/Fill Management Plan.

Following redevelopment, the site will not present a significant risk to wildlife because the site will be completely covered with clean fill, asphalt or concrete. Additionally, although some wildlife may occasionally use the site, the presence of human activities will inhibit significant use of the site by wildlife.

Preparation of Site Surface

The site will require grading prior to cover placement activities. The surface will be graded to a regular topographic surface as planned for redevelopment with grading completed such that precipitation events will not cause the formation of standing water. All trees, shrubs, stumps, roots, brush, masonry, rubbish, scrap, debris, pavement, curbs, fences and miscellaneous structures in the construction areas will either be buried, or removed and disposed of off-site at a permitted disposal facility. Prior to placement of the cover soil, all protruding material will be removed from the ground surface. Burning shall not be allowed on the site.

The placement of the cover material may occur as portions of the site are developed or after construction of the proposed structures. Under either scenario, the site will be hydroseeded to limit dust generation from the soil/fill that has not yet been covered.

Soil

In areas that will not receive significant equipment or vehicular use, the minimum cover system will be composed of documented clean off-site soil tested in accordance with Section A.4 of the Soil/Fill Management Plan and found to contain constituent concentrations less than those specified in NYSDEC TAGM 4046. The completed soil cover will be of a thickness required to maintain sufficient vegetative cover to prevent exposure to the on-site fill material. The minimum soil thickness must be 12 inches.

Berms or mounds may be composed of excavated soil/fill. In areas in which trees and shrubs will be planted, the berms or mounds will be of sufficient thickness to allow the excavation of only clean fill to a depth sufficient to plant the tree or shrub root ball. Unless additional soil is required for the plantings, the soil cover thickness will be 12 inches. The soil used to cover the berms or mounds will contain sufficient organic material to allow the growth of trees and/or shrubs and will be of sufficient strength to support trees and/or shrubs at their maximum height. Fill containing lumps, pockets, or concentrations of silt or clay, rubble, debris, wood or other organic matter will not be acceptable. Fill containing unacceptable material shall be removed and disposed appropriately.

Topsoil used for the final cover shall meet the following general specifications:

1. Fertile, friable, natural loam surface soil, capable of sustaining plant growth, and free of clods of hard earth, plants or roots, sticks or other extraneous material harmful to plant growth. The topsoil shall be well-graded with the following approximate analysis:

   a.

Sieve Size	Percent Passing by Weight
3-inch	100
No. 4	>75
No. 200	>30
0.002 mm	<20

   b. pH 5.5 to pH 7.6.

   c. Minimum organic content of 2.5 percent as determined by ignition loss.

   d. Soluble salt content not greater than 500 ppm.

2. Before delivery, soil samples will conform to the criteria specified in Sections 2.3 and 2.4 in the Soil/Fill Management Plan.

Grass seed used for final cover shall meet the following general specifications:

1. The grass seed mixture will be fresh, clean, new-crop seed complying with the tolerance for purity and germination established by the Official Seed Analysts of North America.

2. The entire ground surface disturbed by construction operations shall be seeded with 100 lbs/acre of seed conforming to the following:

   a.

Name of Grass	Application Rate (lbs/acre)	Purity (%)	Germination (%)
Perennial Ryegrass	10	95	85

Kentucky Bluegrass	20	85	75
Strong Creeping Red Fescue	20	95	80
Chewings Fescue	20	95	80
Hard Fescue	20	95	80
White Clover	10	98	75

b. Germination and purity percentages should equal or exceed the minimum seed standards listed. If it necessary to use seed with a germination percentage less than the minimum recommended above, the seeding rate will be increased accordingly to compensate for the lower germinations.

c. Weed seed content will be less than 0.25 percent and free of noxious weeds.

d. All seed shall be rejected if the label lists any of the following grasses:

1) Sheep Fescue

2) Meadow Fescue

3) Canada Blue

4) Alta Fescue

5) Kentucky 31 Fescue

6) Bent Grass

3. In addition to the seed mixtures listed above, one bushel per acre of oats or rye seed shall be sowed over the entire area, including drainage ditches, to provide a quick shade cover and to prevent erosion during turf establishment.

Asphalt

The cover system in areas that will become roads, sidewalks, and parking lots will consist of a minimum of two inches of asphalt that will be placed over the soil/fill material at the site. The asphalt will be placed on a minimum four-inch gravel subbase to provide stability for construction and to limit subsidence. Prior to placement of the subbase, all protruding material will be removed from the ground surface and the area regraded to a regular surface.

Concrete

The cover system in areas that will become slab-on-grade structures will consist of a minimum of two inches of concrete that will be placed above the soil/fill material. The concrete will be placed on a minimum four-inch gravel subbase to provide stability for construction and to limit subsidence. Concrete may also be used instead of asphalt for roads, sidewalks, and parking lots. Prior to placement of the subbase, all protruding material will be removed from the ground surface and the area regraded to a sufficient regular surface.

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Remedial Evaluation Criteria

SECTION 5

The criteria used to evaluate the selected remedial technologies include the following:

- Short-term effectiveness and impacts
- Long-term effectiveness and permanence
- Implementability
- Reduction of toxicity, mobility and volume
- Conformance to standards, criteria and guidance
- Overall Protectiveness
- Cost

The issues considered for each critiera are discussed blow.

Short term Effectiveness and Impacts - The effectiveness of alternatives in protecting human health and the environment during construction and implementation of the remedial action is evaluated by this criterion. Short-term effectiveness is assessed by protection of the community, protection of workers, environmental impacts, and time until protection is achieved.

Long term Effectiveness and Permanence - This criterion evaluates the long-term protection of human health and the environment at the completion of the remedial action. Effectiveness is assessed with respect to the magnitude of residual risks; adequacy of controls, if any, in managing residuals or untreated wastes that remain at the Site; reliability of controls against possible failure, and potential to provide continued protection.

Reduction of Toxicity, Mobility, and Volume - This evaluation criterion prioritizes those remedial actions that permanently and significantly reduce toxicity, mobility, or volume of the hazardous substances. This criterion is satisfied when the treatment is used to reduce the principal threats at a site through destruction of toxic contaminants, irreversible reduction in contaminant mobility, or reduction of total volume of contaminated media.

Implementability - This assessment criterion evaluates the technical and administrative feasibility of implementing alternatives and the availability of services and materials.

Compliance with Standards, Criteria, and Guidelines - This threshold addresses whether or not a remedy will meet regulatory environmental limits.

Overall Protection of Human Health and the Environment - This is a threshold assessment, which addresses whether or not a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled. This evaluation allows for consideration of whether an alternative poses any unacceptable short term or cross-media impacts.

Cost - The estimated capital and operation and maintenance (O&M) costs.

These criteria serve to provide a basis of comparison and allow for ranking of the alternatives by preference and acceptability.

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Detailed Evaluation of Restricted Use Remedial Alternatives

SECTION 6

Potential remedial technologies that could reasonably be developed for the Site are identified and evaluated in this section. No unrestricted Site use alternatives are considered feasible for redevelopment of the Site. Only remedies that accomplish restricted Site use are evaluated in this detailed evaluation of remedial alternatives.

Alternative 1 – Restricted Site Use - Excavation and Off-Site Disposal – Cover System

Alternative 2 – Restricted Site Use – Excavation Using Soil/Fill Management - Cover System

6.1 Alternative 1 - Excavation and Off-Site Disposal – Cover System

This alternative involves the removal of all excavated fill and contaminated soils and off-site transport and placement in an appropriately permitted secure landfill, backfill placement and installation of a cover system of either asphalt, concrete or a minimum of one-foot of clean fill. A discussion of the evaluation criteria for this alternative follows.

Excavation of the waste and subsequent backfilling and re-grading would effectively eliminate the source of the contamination. Short-term risks of exposure to construction personnel could be adequately managed through the appropriate use of personal protective equipment (PPE), and health and safety protocols. Disposal of the removed material at an approved off-site facility would effectively eliminate the human health risks posed by the Site and would thus provide a permanent remedy for the site. This alternative does pose a slight potential risk of exposure to the public during transport to the disposal facility if a truck were to spill its contents.

The time to implement this alternative (i.e., excavate and remove the site's contaminated fill/soil) would be reasonable and is not anticipated to appreciably extend the timeline for site development. Excavation of the Site's waste material could be accomplished using standard construction equipment and techniques. Some time will be required to sample and characterize the soil/fill and obtain appropriate approvals for disposal. This alternative would reduce the mobility of the contaminants, but not the toxicity or volume. Under this alternative SSALs would be achieved and no long-term monitoring or special maintenance of the site will be required.

Table 6-1 presents the capital cost of this alternative. While this alternative is implementable and effective in achieving the remedial action objectives, the transportation and disposal cost of the excavated materials would be approximately $4.3 million dollars.

6.2 Alternative 2 – Excavation Using Soil/Fill Management - Cover System

This alternative involves excavation of soil/fill using a soil/fill management plan followed by the installation of a cover system of either asphalt, concrete or a minimum of one foot of documented clean fill covering the entire Site. No long-term monitoring is required. A discussion of the evaluation criteria for this alternative follows.

Implementation of any of the cover types would require appropriate grading of the fill material. Any short-term risk of exposure to construction personnel could be adequately managed through the use of personal protective equipment (PPE) and appropriate health and safety protocols. Short-term risk of exposure to trespassers during construction activities would be addressed through covering stockpiled soil/fill, temporary seeding of graded soil/fill areas and site security. Once the construction is complete and the Site is fully covered, the risk to on-site workers and the public will be eliminated and sustained through adequate protections and maintenance of the cover systems. Exposure risks to future construction workers would be

Table 6-1
Alternative 1 - Restricted Site Use Scenario
Off-Site Disposal of Excavated Fill

ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT	ESTIMATED UNIT PRICE	ESTIMATED BID AMOUNT
1	Excavation and Off-Site Disposal of Fill Material (1)	38,400	Tons	$70	$2,688,000
2	Off-Site Backfill Material For Foundations	1,600	CY	$12	$19,200
3	6" clean soil cover material (2)	25,300	CY	$15	$379,500
4	Misc. Environmental costs (3)	1	LS	$50,000	$50,000
Sub-Total					$3,136,700
20% Contingency					$627,300
Total Project Cost					**$3,764,000**

1) Assumes fill contains non-hazardous concentrations of PAHs and metals, above the Site-Specific Action Limits (SSALs)

2) A 6" topsoil layer will also be required to be placed above the clean soil barrier layer. It is assumed that this cost along with landscaping and restoration, is a necessary development cost for any site.

3) Misc costs include PID screeninig, health and safety plan development, site safety officer, decontamination units, site access control, NYSDEC coordination, and construction certification report preparation.

adequately managed through the Soil/Fill Management protocols and appropriate health and safety protocols. The time to implement this alternative does not materially affect the construction schedule and standard readily available construction equipment and techniques would be utilized. This alternative would reduce the mobility of the contaminants, but not their toxicity or volume. The SSAL's would be achieved through implementation of the Soil/Fill Management Plan, since no excavated fill or soils with concentrations in excess of the SSAL's would be returned to the Site. The resulting Site condition would not pose a potential risk to human health provided the cover systems are appropriately maintained. Table 6-2 presents the capital cost of this alternative. The cost to implement this alternative is approximately $1.4 million in capital cost.

Table 6-2
Alternative 2 - Restricted Site Use Scenario
On-Site Reutilization of Excavated Fill with Cover System

ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT	ESTIMATED UNIT PRICE	ESTIMATED BID AMOUNT
1	Excavation and Off-Site Disposal of Fill Material (1)	1,920	Tons	$70	$134,400
2	*Analytical Soil Sampling*	256	Samples	$500	$128,000
3	6" clean soil cover material (3)	25,300	CY	$15	$379,500
4	*Misc. Environmental costs* (4)	1	LS	$70,000	$70,000
Sub-Total					$711,900
20% Contingency					$142,400
Total Project Cost					**$854,300**

1) Assumes 5% of excavated soils contain non hazardous concentrations of PAHs and metals, above the Site-Specific Action Limits (SSALs)

2) 25, 600 CY of excavated material sampled every 100 cubic yards for TCL VOCs, SVOCs, pesticides and PCBs, metals, and pH

3) A 6" topsoil layer will also be required to be placed above the clean soil barrier layer. It is assumed that this cost along with landscaping and restoration, is a necessary development cost for any site.

4) Misc costs include polyethylene sheeting for stockpiles/stockpile management, PID screening, health and safety plan development, site safety officer, decontamination units, site access control, NYSDEC coordination, and construction certification report preparation.

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Comparative Analysis of Remedial Alternatives

SECTION 7

This comparison of the alternatives evaluates the relative performance of each alternative with respect to each of the evaluation criteria: short-term effectiveness and impacts; long-term effectiveness and permanence; reduction of toxicity, mobility, and volume; implementability; compliance with standards, criteria, and guidelines; overall protection of human health and the environment, and cost. The advantages and disadvantages of the alternatives are identified so that trade-offs between the alternatives can be appropriately evaluated. Tables 6-1 and 6-2 provide the capital costs for each alternative.

Short-term Effectiveness and Impacts – Equivalent levels of potential exposure for workers exist under both alternatives. Short-term exposure risk would be minimal for the public for the excavation and disposal alternative.

Long-term Effectiveness and Permanence – The cover systems alternative would not remove the contaminant source, but with routine maintenance would be effective in long-term containment of the waste. The excavation and removal alternative would remove the contamination from the Site and thus be considered a permanent remedy.

Reduction of Toxicity, Mobility, and Volume – Both the alternatives would reduce the mobility of the contaminants. Neither alternative would reduce the toxicity, or volume of the contaminated fill.

Implementability – Both the alternatives are readily implementable with standard construction equipment and techniques.

Compliance with Standards, Criteria, and Guidelines – Both alternatives would be expected to achieve compliance with SSAL's.

Overall Protection of Human Health and the Environment – Both alternatives provide equivalent protection of human health or ecological receptors.

Cost – Capital cost for implementing the excavation and disposal remedial action for the Site were estimated as $4.3 million, as compared to $1.4 million for the cover system alternative.

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Recommended Approach

SECTION 8

8.1 Proposed Approach

Both of the restricted use alternatives provide comparable long-term effectiveness and overall protection to human health and the environment, but excavation and disposal at a properly permitted landfill increases the cost for Site development by almost $3 million.

As a result, based on an evaluation of the criteria for each alternative and review of the capital cost impact, the Excavation Using Soil/Fill Management Cover System Alternative would provide the best overall remedy for the Site. This alternative is able to provide effective long-term contaminant containment and be protective of both on-site and off-site potential receptors at a lower overall cost.

8.2 Soil/Fill Management Plan (SFMP)

During construction activities at the site, excavation of soil/fill material will be necessary for the construction of utility corridors. Excavation may also be necessary during the construction of footings for structures and for other activities including the planting of trees. Although a number of environmental investigations have been conducted at the Site to characterize the nature and extent of contamination, the nature of investigations does not allow for a 100 percent complete or accurate characterization. Therefore, it is possible that some quantity of unsuspected contamination may be encountered during redevelopment activities.

Soil management protocols are necessary to limit the potential for exposure of on-site workers to contaminated fill material. The soil handling protocols will also be necessary for assisting with the determination of whether soil/fill removed during excavation activities may be reused on-site or must be disposed off-site. The Soil/Fill Management Protocols are included in Appendix A.

8.3 Health and Safety

Invasive work performed at the Site will be performed in accordance with all applicable local, state, and federal regulations to protect worker health and safety. The Soil/Fill Management Protocols (Appendix A) describes recommended Health and Safety procedures for intrusive work activities of the Site.

All contractors performing redevelopment or maintenance activities involving intrusive work at the Site will be required to prepare a site-specific, activity-specific Health and Safety Plan. In order to facilitate the creation of an appropriate Health and Safety Plan by the contractor(s) performing work, the ranges of concentrations of contaminants detected in soil and groundwater samples collected during previous site investigations conducted by Malcolm Pirnie are shown in Tables 2-1, 2-2, and 2-3 respectively.

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References

SECTION 9

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State of New York Department of Environmental Conservation. *Order on Consent.* December 31, 1986

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Soil/Fill Management Protocols

APPENDIX A

The objective of this Soil/Fill Management Plan (SFMP) is to set guidelines for management of soil material during any activities, which would breach the cover system. The SFMP is a portion of the overall remedy, which addresses disturbance/use of any residually contaminated soil fill left on the Site, after other elements of the remedy have been implemented. This SFMP addresses environmental concerns related to soil/fill management. This SFMP is not intended to serve as a design document for construction activities related to redevelopment activities. It is the developer's responsibility to prepare a design that incorporates the requirements for cover and soil management as set forth in this SFMP.

A.1 Excavation and Handling of On-Site Soil/Fill

No excavation, grading or disturbance of the final vegetated soil cover or existing subgrade soil/fill shall be initiated prior to a minimum of three working days notification to the NYSDEC Region 8, Division of Environmental Remediation. A Professional Engineer with remedial investigation experience, representing the subject property owner or developer will oversee soil/fill excavations or disturbances. The excavation activities will be conducted in accordance with the protocols detailed herein.

All on-site soil/fill will be presumed to contain metals and PAHs and will be handled in accordance with the provisions of this SFMP. Although a number of environmental investigations have been conducted at the Site to characterize the nature and extent of contamination, the nature of investigations does not allow for a 100 percent complete or accurate characterization. It is possible that some quantity of unsuspected contamination may be encountered during redevelopment activities. Therefore, as a safeguard for unknown or unsuspected contamination presence, during excavation, all soil/fill will be visually inspected for staining and will be field screened for the presence of volatile organic compounds (VOCs). A photoionization detector (PID) will be used to check for VOCs. Visual observation will be sufficient to identify stained soils. Stained soil is soil that is discolored, tinted, dyed, unnaturally mottled, or contains a sheen. Attachment II contains a Standard Operating Procedure for Soil Screening. Excavated soil/fill that is visibly stained or produces elevated PID readings (i.e., sustained 10 PPM or greater) will be considered potentially contaminated and stockpiled separately on-site for further assessment. The potentially contaminated soil/fill will be stockpiled (in maximum 100 cubic yard piles) on polyethylene sheeting and then sampled to determine its ultimate disposition; viz., reuse or off-site disposal. The stockpiled potentially contaminated soil/fill will also be completely covered using polyethylene sheeting to reduce particle runoff and entrain dust. Sampling and analysis will be completed in accordance with the protocols delineated in Section A.2. Soil/fill containing one or more constituents in excess of the site-specific action levels (SSALs) shown in Table A-1 will be transported off-site to a permitted waste management facility. Soil/fill awaiting analytical results or awaiting transportation will be stored continuously on-site under polyethylene sheeting.

Any soil/fill with a pH higher than 12.5 is considered hazardous and therefore must be properly disposed off-site. Additionally, any soil/fill with a pH greater than 9.0 but less than 12.5 may be reused on-site but only to fill in areas below grade. This soil/fill may not be used as backfill in utility trenches or to create berms or other above grade mounds. This soil/fill must also be covered with clean material in accordance with Section 3.2 of the Remedial Work Plan.

If buried drums or underground storage tanks are encountered during soil excavation activities, excavation will cease and the NYSDEC will be immediately notified. All drums and/or underground storage tanks encountered will be evaluated and the Owner will submit a removal plan for NYSDEC approval. Appropriately trained personnel will excavate all of the drums and/or underground storage tanks while following all applicable federal, state, and local regulations. Removed drums and underground storage tanks will be properly characterized and disposed off-site. The soil/fill surrounding the buried drums or underground storage tanks will be considered as potentially contaminated and will be stockpiled and characterized.

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TABLE A-1
SITE SPECIFIC ACTION LEVELS
SOIL/FILL HANDING PLAN
FORMER INGERSOLL-RAND FOUNDRY SITE
PAINTED POST, NEW YORK

Sample Location Sampling Depth (ft. bgs) Collection D	NYSDEC TAGM 4046(1)	Eastern USA Background Concentrations(2)	Maximum Concentration Detected(3)	Average Concentration Detected	Frequency of Detections	Proposed Site Specific Action Level (SSAL)
TAL Inorganic Analytes (mg/kg)						
Arsenic	7.5 or SB	3 - 12	14.50	5.25	30 / 31	50(4)
Cadmium	1 or SB	0.1 - 1	2.80	0.59	31 / 31	20(4)
Chromium	10 or SB	1.5 - 40	554	48.3	31 / 31	500(4)
Copper	25 or SB	1 - 50	327	43.2	31 / 31	200
Mercury	0.1	0.001 - 0.2	0.33	0.06	26 / 31	1.0(4)
Nickel	13 or SB	0.5 - 25	164	26.2	31 / 31	100
Total Cyanide	NA	NA	1.67	0.08	1 / 22	50(4)
Zinc	20 or SB	9 - 50	216	76.1	31 / 31	500
Pest/PCBs (µg/kg)						
Total Pesticides	10	NA	0.0	0	0 / 22	10,000(4)
Total PCBs (Surface - 1.0')	1,000	NA	2,400	413	3 / 7	1,000(4)
Total PCBs (Subsurface > 1.0')	10,000	NA	480	91	4 / 15	10,000(4)
Semi-Volatile Organic Compounds - SVOCs (µg/kg)						
Total SVOCs	500,000	NA	143,700	25,969	51 / 54	500,000(4)
Volatile Organic Compounds - VOCs (µg/kg)						
Total VOCs	10,000	NA	19.5	4.1	15 / 22	10,000(4)

Notes:

(1) New York State Dept. of Environmental Conservation TAGM 4046, Recommended Soil Cleanup Objectives, Dec. 2000.

(2) TAL Inorganic Analytes from Eastern USA Background as shown in New York State Dept. of Environmental Conservation TAGM 4046, Dec. 2000.

(3) *Maximum concentration detected during the subsurface investigation* (MPI, April 2004) and the remedial investigation (MPI, October

(4) Site Specific Action Levels for Hanna Furnace former Railroad Yard Area (Subparcel 1), Soil Fill Handling Plan, as prepared by Malcolm Pirnie, February 2002. Action levels were negotiated and approved by NYSDEC.

NA - Not Avaialable.

ND - Not Detected

Created by: BW Date: 10/25/2004
Checked by: KRM Date: 10/26/2004

All excavations or disturbances must be backfilled as soon as the work allows. Backfilled excavations must be covered with suitable cover material defined in Section 4.2 of the Remedial Action Work Plan) within ten working days of backfilling or as otherwise approved by the NYSDEC.

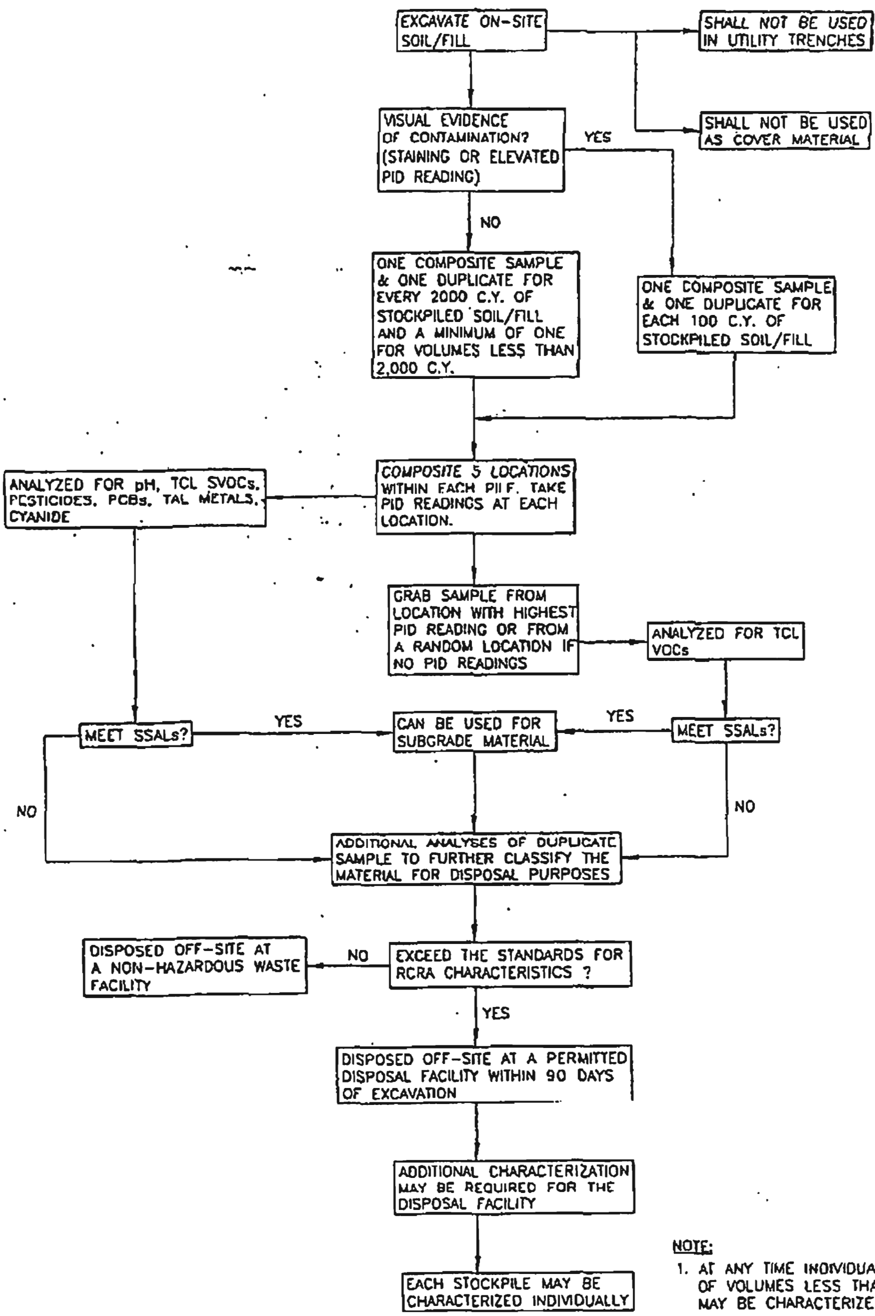
If no evidence of additional contamination is encountered through the screening during excavation activities, the excavated soil fill will be stockpiled as appropriate on site. No special provisions for separate handling are required other than the characterization defined in Section A.2.

Excavated or disturbed backfill may be used as subgrade, excavation backfill or berm construction following characterization performed in accordance with Section A.2 if it meets the SSAL's presented in Table A-1.

A.2 Soil/Fill Sampling and Analysis Protocol

A soil/fill characterization flow chart is provided as Figure A-1. As stated in Section A.1, all excavated soil/fill that exhibits evidence of additional contamination through screening (staining or elevated PID measurements) will be stockpiled separately and sampled and classified for reuse or disposal. One composite soil sample will be collected for each 100 cubic yards of soil. The composite sample will be collected in the manner described in the Standard Operating Procedures (SOPs) included in Attachment II from five locations within each stockpile. PID measurements will be recorded for each of the five composite sample locations, and one grab sample and one duplicate sample will be collected from the location with the highest PID measurement of the five composite locations. The composite sample will be analyzed by a NYSDOH ELAP-certified laboratory for Target Compound List (TCL) semivolatile organic compounds (SVOCs), pesticides, and polychlorinated biphenyls (PCBs), and the metals arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver plus cyanide using current NYSDEC Analytical Services Protocols (ASP). Additionally, pH will be analyzed using SW-846 Method 9045. The grab sample will be analyzed for TCL volatile organic compounds (VOCs).

FIGURE A-1
SOIL/FILL CHARACTERIZATION FLOW CHART



NOTE:
1. AT ANY TIME INDIVIDUAL STOCKPILES OF VOLUMES LESS THAN THOSE STATED MAY BE CHARACTERIZED INDIVIDUALLY.

Excavated soil/fill that exhibits no evidence of additional contamination (staining or elevated PID measurements) will also require characterization prior to use as subgrade or backfill at the site. Characterization samples will be collected and analyzed at a frequency of not less than one sample for 2000 cubic yards of soil/fill, and a minimum of one sample will be collected for volumes less than 2000 cubic yards. The characterization samples will be collected in accordance with the protocols described above; the sampling efforts shall consist of discrete samples for VOCs and composite samples collected from five locations for the remaining analytes.

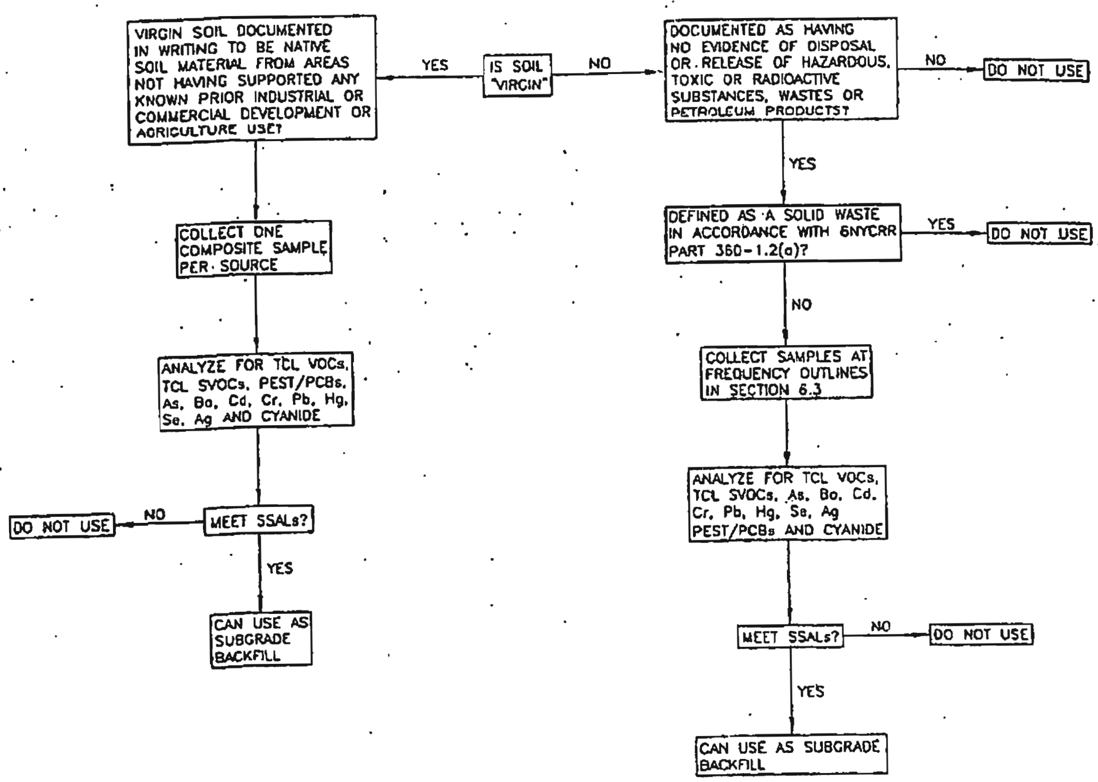
Any soil/fill that has been characterized and found to meet the SSALs may be reused as subgrade, excavation subgrade backfill, or for berm construction. If the analysis of the soil/fill samples reveals unacceptably high levels of any analytes (i.e., greater than one or more SSAL), additional analyses will be necessary to further classify the material for hazardous characteristics for disposal purposes. At a minimum, the duplicate sample will be analyzed using the Toxicity Characteristic Leaching Procedure (TCLP) for the particular analytes that were detected at concentrations exceeding the SSALs. The duplicate sample may also be analyzed for RCRA Characteristics including reactivity, corrosivity, and ignitability. If the analytical results indicate that concentrations exceed the standards for either TCLP or RCRA Characteristic analysis, the material will be considered a hazardous waste and must be properly disposed off-site at a permitted disposal facility within 90 days of excavation. Additional characterization sampling for off-site disposal may be required by the disposal facility. To potentially reduce off-site disposal requirements/costs, the owner or site developer may also choose to characterize each stockpile individually.

A.3 Subgrade Material

Subgrade material used to backfill excavations or placed to increase site grades or elevation shall meet the following criteria (see Figure A-2):

- Excavated on-site soil/fill shall either exhibit no evidence of contamination (staining and/or elevated PID measurements) or, if evidence of contamination is present,

FIGURE A-2
SUBGRADE MATERIAL FLOW CHART



NOTE:
1. AT ANY TIME INDIVIDUAL STOCKPILES OF VOLUMES LESS THAN THOSE STATED MAY BE CHARACTERIZED INDIVIDUALLY.

analytical results of the soil/fill indicate that the contaminants are present at concentrations below the SSALs.

- Off-site borrow soils will be documented as having originated from locations having no evidence of disposal or release of hazardous, toxic or radioactive substances, wastes or petroleum products.

- Off-site soils intended for use as site backfill cannot otherwise be defined as a solid waste in accordance with 6NYCRR Part 360-1.2(a).

- If the contractor designates a source as "virgin" soil, it shall be further documented in writing to be native soil material from areas not having supported any known prior industrial or commercial development or agricultural use.

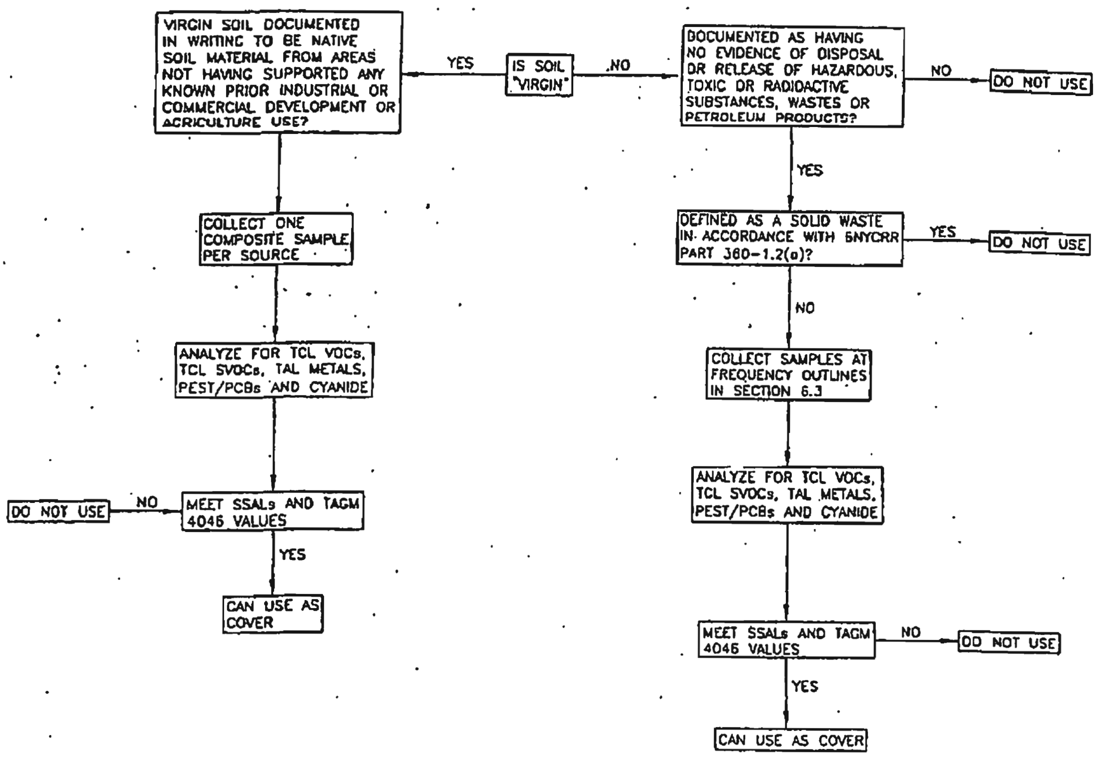
- Virgin soils should be subject to collection of one representative composite sample per source. The sample should be analyzed for TCL VOCs, SVOCs, pesticides, PCBs, and the metals arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver plus cyanide. The soil will be acceptable for use as backfill provided that all parameters meet the SSALs.

- Non-virgin source area soils will be tested via collection of one composite sample per 500 cubic yards of material from each source area. If more than 1,000 cubic yards of soil are borrowed from a given off-site non-virgin soil source area and both samples of the first 1,000 cubic yards meet the SSALs, the sample collection frequency will be reduced to one composite for every 2,500 cubic yards of additional soils from the same source, up to 5,000 cubic yards. For borrow sources greater than 5,000 cubic yards, sampling frequency may be reduced to one sample per 5,000 cubic yards, provided all earlier samples met the SSALs.

A.4 Final Cover

Surface coverage over the entire redeveloped parcel or subparcels will be required by the developer or owner as a pre-condition of occupancy. The purpose of the surface cover is to eliminate the potential for human contact with fill material. Surface coverage will consist of

FIGURE A-3
FINAL COVER MATERIAL FLOW CHART



NOTE:
1. AT ANY TIME INDIVIDUAL STOCKPILES OF VOLUMES LESS THAN THOSE STATED MAY BE CHARACTERIZED INDIVIDUALLY.

documented clean soil with vegetative cover, asphalt or concrete paving, or buildings with concrete floors.

The cover soil material shall meet the following criteria (see Figure A-3):

- Excavated on-site soil/fill shall not be used as cover material.
- Off-site borrow soils will be documented as having originated from locations having no evidence of disposal or release of hazardous, toxic or radioactive substances, wastes or petroleum products.
- Off-site soils intended for use as site cover cannot otherwise be defined as a solid waste in accordance with 6NYCRR Part 360-1.2(a).
- If the contractor designates a source as "virgin" soil, it shall be further documented in writing to be native soil material from areas not having supported any known prior industrial or commercial development or agricultural use.
- Virgin soils should be subject to collection of one representative composite sample per source. The sample should be analyzed for TCL VOCs, SVOCs, pesticides, PCBs, and TAL metals plus cyanide. The soil will be acceptable for use as cover material provided that all parameters meet the NYSDEC recommended soil cleanup objectives included in TAGM 4046.
- Non-virgin source area soils will be tested via collection of one composite sample per 500 cubic yards of material from each source area. If more than 1,000 cubic yards of soil are borrowed from a given off-site non-virgin soil source area and both samples of the first 1,000 cubic yards meet the TAGM 4046 criteria, the sample collection frequency will be reduced to one composite for every 2,500 cubic yards of additional soils from the same source, up to 5,000 cubic yards. For borrow sources greater than 5,000 cubic yards, sampling frequency may be reduced to one sample per 5,000 cubic yards, provided all earlier samples met the TAGM 4046 criteria.
- To reduce the potential for disturbance of the soil cover material, berms or mounds composed of clean soil will be constructed in areas in which trees and shrubs will be planted.

A.5 Erosion Controls

A.5.1 General Guidelines

When site development or remedial actions require the disturbance of more than five acres of land, federal and state laws[1] require that the project obtain coverage under the NYSDEC SPDES General Permit for Storm Water Discharges from Construction Activities that are classified as "Associated with Industrial Activity", Permit #GP-93-06 (Construction Storm Water General Permit). Requirements for coverage under the Construction Storm Water General Permit include the submittal of a Notice of Intent form and the development of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP must fulfill all permit requirements and must be prepared in accordance with "Chapter Four: the Storm Water Management and Erosion Control Plan" in Reducing Impacts of Storm Water Runoff from New Development, NYSDEC, 1992. This Storm Water Management and Erosion Control Plan, in accordance with permit requirements, will provide the following information:

- A background discussion of the scope of the construction project.
- A statement of the storm water management objectives.
- An evaluation of post-development runoff conditions.
- A description of proposed storm water control measures.

[1] The Federal Water Pollution Control Act (as amended, 33 U.S.C. 1251 et. Seq.) and the New York State Environmental Conservation Law: Article 17, Titles 7 and 8 and Article 70.

- A description of the type and frequency of maintenance activities required to support the control measure.

The SWPPP will address issues such as erosion prevention, sedimentation control, hydraulic loading, pollutant loading, ecological protection, physical site characteristics that impact design, and site management planning. The SWPP will also include a contingency plan to be implemented in the event of heavy rain events. All descriptions of proposed features and structures at the site will include a description of structure placement, supporting engineering data and calculations, construction scheduling, and references to established detailed design criteria. The SWPPP will conform to all requirements as established by applicable regulatory agencies.

Proven soil conservation practices will be incorporated in the construction and development plans to mitigate soil erosion damage, off-site sediment migration, and water pollution from erosion. These practices combine vegetative and structural measures. Many of these measures will be permanent in nature and become part of the completed construction project (design features such as drainage channels and grading). Other measures will be temporary and serve only during the construction stage. The contractor will remove temporary measures at the completion of construction. The selection of erosion and sediment control measures will be based on several general principles, including:

- The minimization of erosion through project design (maximum slopes, phased construction, etc.).
- The incorporation of temporary and permanent erosion control measures.
- The removal of sediment from sediment-laden storm water before it leaves the site.

The generic erosion and surface water control plan included in Attachment III details typical methods of erosion control that must be followed during site redevelopment activities. As described in Attachment III, a specific erosion and surface water control plan must be created prior to implementation of redevelopment activities. The use of appropriate temporary erosion control measures such as silt fencing and/or hay bales will be required around all soil/fill stockpiles and unvegetated soil surfaces during redevelopment activities. These methods are described below, and Attachment IV includes details for various erosion control measures that might be used during site redevelopment activities. Stockpiles shall be graded and compacted as necessary for positive surface water runoff and dust control. Stockpiles of soil/fill will be placed a minimum of fifty feet from the boundaries.

A.5.2 Temporary and Permanent Erosion Control Measures

A.5.2.1 Temporary Measures

Temporary erosion and sedimentation control measures and facilities will be employed during active construction stages. Prior to any construction activity, temporary erosion and sediment control measures shall be installed and maintained until they are no longer needed, or until such time that permanent erosion control measures are installed and effective. Additional sediment control measures may also be necessary. Structural measures, as described below, will be designed and installed to provide the required sediment and erosion control. The following temporary measures will be incorporated into construction activities:

- Silt fencing.
- Straw bales.
- Temporary vegetation/mulching.

A.5.2.1.1 Silt Fencing

Regrading and capping activities may result in sheet flow to various areas of the site; therefore, silt fencing will be used as he primary sediment control measure. Prior to extensive clearing, grading, excavation, and placement of cover soils, silt fences will be installed along all construction perimeter areas to prevent sedimentation in low areas and drainage areas. The location and orientation of silt fencing to be used during redevelopment operations will be field determined. There may be breaks and overlaps in the silt fencing to allow construction vehicles access to the construction areas.

Intermediate silt fencing will be used upslope of perimeter areas where phased construction activities are occurring. This measure will effectively lower sheet flow velocities and reduce sediment loads to perimeter fencing. In addition, silt fencing around soil stockpiles will be employed.

As sediment collects along the silt fences, they will be cleaned to maintain desired roval performance and prevent structural failure of the fence. Removed sediment will be disposed on-site as general fill in a designated area. The perimeter silt fences will remain in place until construction activities in the area are completed and vegetative cover or other erosion control measures are adequately established. Silt fences will be provided and installed in accordance with the details presented in Attachment IV.

A.5.2.1.2 Straw Bales

Straw bales will be used to intercept sediment-laden runoff from storm water channels as needed during various phases of construction. Additional straw bale dikes may be necessary in some areas during some phases of construction.

Use of straw bales will be limited to swales and/or diversion ditches where the anticipated flow velocity will not be greater than 5 feet per second (fps). Where flows may eventually exceed 5 fps along a swale or diversion ditch, an intermediate straw bale barrier will be installed upgradient of the final bale barrier. The intermediate bale barrier will effectively reduce flow velocities and sediment load to the final barrier.

As with the silt fencing, sediment will be removed to maintain performance and prevent overtopping or failure of the straw bale barrier. Removed sediment will be disposed of on-site as general fill in a designated area. Sediment laden straw bales that have lost their structural integrity and/or effectiveness will be disposed of off-site as a solid waste. Straw bale barriers will remain in place until construction activities contributing sediment to the barrier are complete and vegetative cover or other erosion control measures are adequately established. Straw bales will be provided and installed in accordance with the details presented in Attachment IV.

Design features incorporated into the construction plans to control erosion will include limiting steep slopes, routing runoff to surface water collection channels, limiting flow velocities in the collection channels to the extent practical, and lining collection channels, where appropriate. In areas where flow will be concentrated (i.e; collection channels) the channel slopes and configuration will be designed to maintain channel stability.

A.5.2.2.2 Construction Features

Any final slopes greater than 25 percent will be reinforced or have a demarcation layer under the clean cover to indicate if erosion has extended into the subgrade. Following the placement of final cover soils over regraded areas, a revegetation program will be implemented to establish permanent vegetation. Vegetation serves to reduce erosion, enhance evapotranspiration, and improve runoff water quality. The areas to be grassed will be seeded in stages as construction in is completed with 70 lbs./acre of seed conforming to the mix included in 3.2.1 of the Remedial Work Plan. In addition to the above seed mixture, mulch, mulch blankets, or synthetic fabric will be placed to prevent erosion during turf establishment. Mulch will be placed on all slopes less than 15% and a mulch blanket on all slopes greater than 15%. Synthetic erosion control fabric will be placed in drainage ditches and swales. As an aid to turf establishment, seeded areas will be fertilized with a starter fertilizer.

A.6 Dust Controls

The surface of unvegetated or disturbed soil/fill areas will be wetted at all times with water or other dust suppressive agents to control dust during construction. There shall be no visible dust generated during redevelopment activities. Any subgrade material left exposed during extended interim periods (greater than 90 days) prior to placement of final cover shall be covered with a temporary cover system (i.e., tarps, spray type cover system, etc.) or planted with vegetation to control fugitive dust to the extent practicable. Particulate monitoring will be performed along the downwind occupied perimeter of parcels during subgrade excavation, grading, and handling activities in accordance with the Community Air Monitoring Plan further detailed in Section 4.2.

A.5.2.1.3 Temporary Vegetation and Mulching

As a result of phased construction and split construction schedule, portions of the site may be left in intermediate/incomplete conditions. Intermediate areas may include rough graded areas awaiting finer grading or areas awaiting topsoil placement. Intermediate areas where activities will not resume for a period in excess of two weeks shall be seeded with a quick germinating variety of grass or covered with a layer of straw mulch.

The temporary cover will act to stabilize the soil and reduce erosion. As construction progresses, areas containing temporary vegetation or straw mulch can be covered without removal of the temporary vegetation or mulch.

A.5.2.2 Permanent Control Measures

Permanent erosion control measures and facilities will be incorporated during cover construction and during site redevelopment for long-term erosion protection. Permanent measures and facilities will be installed as early as possible during construction phases. Parking and building systems associated with redevelopment shall not include dry wells or other subsurface injections/disposal piping or facilities.

A.5.2.2.1 Design Features

The remedial construction activities will involve the installation of cover system including asphalt, concrete, or clean fill over the entire site. Permanent erosion control measures incorporate a combination of design features to limit overall erosion and sediment problems to practical design limits, and the placement of permanent facilities during site restoration for long-term erosion protection. The soil cover system will be designed based on the following criteria:

- Maximum slope of 33% (3H: 1V) to limit erosion.
- Minimize the potential contact with, and migration of, waste fill.
- Provide a medium for the growth of vegetation to control erosion.

Dust suppression techniques will be employed at the site in accordance with NYSDEC TAGM 4031 (Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites). This TAGM describes guidance for dust monitoring, and includes a list of effective dust suppression techniques. Dust monitoring is more fully described in Section A.12.2 (Community Air Monitoring Program). As per TAGM 4031, dust suppression techniques that may be used at the site include applying water on roadways, wetting equipment, spraying water on buckets during excavation and dumping, hauling materials in properly covered or watertight containers, covering excavated areas and material after excavation activity ceases, establishing vegetative cover immediately after placement of cover soil, and reducing the excavation size and/or number of excavations.

A.7 Construction Water Management

Pumping of water (i.e., groundwater and/or storm water that has accumulated in an excavation) from excavations, if necessary, will be done in such a manner as to prevent the migration of particulates, soil/fill, or unsolidified concrete materials, and to prevent damage to the existing subgrade. Water pumped from excavations will be managed properly in accordance with all applicable regulations so as to prevent endangerment of public health, property, or any portion of the construction.

The groundwater in excavations will be field screened for VOCs and observed for any noticeable sheens. Water in the excavations will not be discharged to the ground surface if:

- Staining or PID measurements above background are observed in the excavation, or
- A sheen is present on the water surface.

If any of these conditions exist, the water pumped from the excavations will be containerized and analyzed in accordance with the Surface Water and Groundwater quality Standards set forth in 6 NYCRR Part 703.5 and the local sewer authority discharge permit. If the water meets the surface water and groundwater quality standards, it may be discharged to the ground surface. If the water does not meet the surface water and groundwater quality standards, it may be discharged to the local sewer authority under a discharge permit. If the water quality is such that the local sewer authority discharge permit requirements will be exceeded, or the local sewer authority will not approve the discharge to a sewer, it will be transported off-site for proper disposal or treated on-site via a treatment system that has been approved by NYSDEC.

Runoff from surface discharges shall be controlled. No discharges shall enter a surface water body without proper permits.

A.8 Fencing And Access Control

Access to soil/fill on the site must be controlled until final cover is placed to prevent direct contact with subgrade materials. To better control site access, obvious access points will be gated. All gates and existing fencing will be posted with "No Trespassing" signs. The majority of the site will be covered with clean fill or vegetated via hydroseeding to limit dust generation.

A.9 Property Use Limitations

The use of the property will be restricted through verbiage in the Brownfield Cleanup Agreement, to which this Remedial Action Work Plan will be attached.

A.10 Notification and Reporting Requirements

The following minimum notification and reporting requirements shall be followed by the property owner prior to and following site development, as appropriate:

- The NYSDEC and NYSDOH will be notified that subgrade activities are being initiated a minimum of five working days in advance of construction.
- A construction certification report stamped by a New York State licensed Professional Engineer, will be prepared and submitted to the NYSDEC and NYSDOH within 90 days after development of each parcel or subparcel. At a minimum, the report will include:

- An area map showing the parcel or subparcel that was developed and the property's tax map number.
- A topographic map of the developed property showing actual building locations and dimensions, roads, parking areas, utility locations, berms, fences, property lines, sidewalks, green areas, contours and other pertinent improvements and features. The topographic map will be stamped by a New York State licensed surveyor.
- Plans showing areas and depth of fill removal.
- Description of erosion control measures.
- A text narrative describing the excavation activities performed, health and safety monitoring performed (both site specified and Community Air Monitoring), quantities and locations of soil/fill excavated, disposal locations for the soil/fill, soil sampling locations and results, a description of any problems encountered, location and acceptability test results for backfill sources, and other pertinent information necessary to document that the site activities were carried out properly.
- Plans showing before and after survey elevations on a 100-foot grid system to document the thickness of the clean soil cover system.
- A certification that all work was performed in conformance with the SFMP.

A.11 Quality Assurance and Quality Control (QA/QC)

A.11.1 Analytical Methods

All site soil/fill characterization samples collected during site redevelopment activities will be analyzed using EPA-approved analytical methods using the most recent edition of the EPA's "Test Methods for Evaluating Solid Waste" (SW-846). Methods for Chemical Analysis of Water and Wastes "(EPA 600/4-79-020), Standard Methods for Examination of Waste and Wastewater" (prepared and published jointly by the American Public Health Association, American Waterworks Association and Water Pollution Control Federation).

A.11.2 Laboratory

The laboratory proposed to perform the analyses will be certified through the New York State Department of Health Environmental Laboratory Approval Program (ELAP) to perform Contract Laboratory Program (CLP) analysis and Solid Waste and Hazardous Waste Analytical testing on all media to be sampled during this investigation. The laboratory will maintain this certification for the duration of the project.

A.11.3 Data Submittal

The laboratory will perform the analysis of samples in accordance with the most recent (year 2000) NYSDEC Analytical Services Protocol (ASP). Analytical data will be submitted in complete ASP Category B data packs including documentation of laboratory QA/QC procedures that will provide legally defensible data in a court of law. If requested, the Category B data packs will be submitted to the NYSDEC.

Procedures for chain of custody, laboratory instrumentation calibration, laboratory analyses, reporting of data, internal quality control, and corrective actions shall be followed as per SW-846 and as per the laboratory's Quality Assurance Plan. Where appropriate, trip blanks, field blanks, field duplicates, and matrix spike, matrix spike duplicate shall be performed at a rate of 10% and will be used to assess the quality of the data. The laboratory's in-house QA/QC limits will be utilized whenever they are more stringent than those suggested by the EPA methods.

A.11.4 Data Usability Summary Reports

After receipt of analytical results, the data package will be sent to a qualified, third party, data validation specialist for evaluation. A Data Usability Summary Report (DUSR) will be prepared. The DUSR will provide a determination of whether or not the data meets the project specific criteria for data quality and data use.

A.12 Health and Safety Procedures for Intrusive or Maintenance Activities

A.12.1 Construction Personnel Protection

Contractors engaged in subsurface (invasive) construction or maintenance activities (e.g., foundation and utility workers) will be required to implement appropriate health and safety procedures. These procedures will involve, at a minimum, donning adequate personal protective equipment, performing appropriate air monitoring, and implementing other engineering controls as necessary to mitigate potential ingestion, inhalation and contact with residual constituents in the soils. A site-specific, activity-specific health and safety plan must be prepared by the contractor prior to on-site construction activities. Recommended health and safety procedures include the following:

- While conducting invasive work at the site, the Contractor shall provide working conditions on each operation that shall be as safe and healthful as the nature of that operation permits. The Contractor shall comply with all New York State Department of Labor regulations and published recommendations and regulations promulgated under the Federal Occupational Safety and Health Act of 1970 and the Construction Safety Act of 1969, as amended, and with laws, rules, and regulations of other authorities having jurisdiction. Compliance with governmental requirements is mandated by law and considered only a minimum level of safety performance. The Contractor shall insure that all work is performed in accordance with recognized safe work practices.

- The Contractor shall be responsible for the safety of the Contractor's employees, the public and all other persons at or about the site of the work. The Contractor shall be solely responsible for the adequacy and safety of all construction methods, materials, equipment and the safe prosecution of the work.

- The Contractor shall have a written health and safety plan (HASP) prepared, signed and sealed by a safety professional; a safety professional and/or a trained safety representative(s) active on the job whenever the work is in progress; an effective and documented safety training program; and a safety work method check list system.

- The Contractor shall stop work whenever a work procedure or a condition at a work site is deemed unsafe by the safety professional or his trained safety representative(s).

- The Contractor shall employ a properly qualified safety professional whose duties shall be to initiate, review and implement measures for the protection of health and prevention of accidents. The Contractor shall also employ safety representative(s) whose duties, working under the direct supervision of the safety professional, shall include the implementation the safety program for the work at the site.

- Recognition as a safety professional shall be based on a minimum of certification by the Board of Certified Safety Professionals as a Certified Safety Professional and 5 years of professional safety management experience in the types of construction and conditions expected to be encountered on the site.

- The safety representative(s) who will work under the direction of the safety professional will have appropriate qualifications. The required qualifications shall include a minimum of: five years of relevant construction experience, two years of which were exclusively in construction safety management; successful completion of a 30-hour OSHA Construction Safety and Health training course; 40-hour training as per 29 CFR 1926.65, Hazardous Waste Operations and Emergency Response; and, if confined space entry is required, training as per 29 CFR 1910.146, Permit-Required Confined Spaces.

- The safety professional shall visit and audit all work areas as often as necessary but at least once each week and shall be available for consultation whenever necessary.

- The safety representative(s) must be at the job site full-time (a minimum of 8 hours per working day) whenever intrusive work is in progress. When multiple shift work is in progress more than one safety representative may be required.

- The safety professional and his safety representative(s) shall be responsible for ensuring Contractor compliance with governing laws, rules and regulations as well as of good safety practice.

- The safety staff shall maintain and keep available safety records, up-to-date copies of all pertinent safety rules and regulations, Material Safety Data Sheets, and the Contractors' site specific health and safety plans (HASPs) and the site emergency response plan with emergency and telephone contacts for supportive actions.

- The responsible safety professional shall sign and seal the Contractor's written site-specific HASP and the Plan shall be available to workers on site. The Contractor shall provide copies of the HASP to the Contractors' insurer, if required.

- The HASP will identify and define the following: the hazards anticipated for each major invasive task; the engineering, administrative and/or personal protective equipment control measures that will be implemented; the surveillance methods, and schedules of both walk through surveys and in-depth safety audits to be performed on site; medical monitoring and screening methods; the Contractors' pre-start-up and continuous safety-training program; emergency response equipment, notification, training and procedures; and include copies of safety inspection check-off sheets, specific to the work methods and crews performing work at the various job locations, to be used on a regular basis in evaluating the site and work methods.

- The safety professional and/or his trained safety representative(s) shall as a minimum:

    - Schedule and conduct safety meetings and safety training programs as required by law, the health and safety plan, and good safety practice. A specific schedule of dates of these meetings and an outline of materials to be covered shall be provided with the health and safety plan. All employees shall be instructed on the recognition of hazards, observance of precautions, of the contents of the health and safety plan and the use of protective and emergency equipment.

    - Determine that operators of specific equipment are qualified by training and/or experience before they are allowed to operate such equipment.

    - Develop and implement emergency response procedures. Post the name, address and hours of the nearest medical doctor, name and address of nearby clinics and hospitals, and the telephone numbers of the appropriate ambulance service, fire, and the police department.

    - Post all appropriate notices regarding safety and health regulations at locations that afford maximum exposure to all personnel at the job site.

    - Post appropriate instructions and warning signs in regard to all hazardous areas or conditions that cannot be eliminated. Identification of these areas shall be based on experience, on site surveillance, and severity of hazard. Such signs shall not be used in place of appropriate workplace controls.

- Ascertain by personal inspection that all safety rules and regulations are enforced. Make inspections at least once a shift to ensure that all machines, tools and equipment are in a safe operating condition; and that all work areas are free of hazards. Take necessary and timely corrective actions to eliminate all unsafe acts and/or conditions, and submit to the Engineer each day a copy of his findings on the inspection check list report forms established in the health and safety plan.

- Provide safety training and orientation to authorized visitors to ensure their safety while occupying the job site.

- Perform all related tasks necessary to achieve the highest degree of safety that the nature of the work permits.

- The Contractor shall have proper safety and rescue equipment, adequately maintained and readily available, for foreseeable contingencies. This equipment may include such applicable items as: proper fire extinguishers, first aid supplies, safety ropes and harnesses, stretchers, water safety devices, oxygen breathing apparatus, resuscitators, gas detectors, oxygen deficiency indicators, combustible gas detectors, etc. This equipment should be kept in protected areas and checked at scheduled intervals. A log shall be maintained indicating who checked the equipment, when it was checked, and that it was acceptable. This equipment log shall be updated monthly and be submitted with the monthly report. Equipment that requires calibration shall have copies of dated calibration certificates on site. Substitute safety and rescue equipment must be provided while primary equipment is being serviced or calibrated.

- All personnel employed by the Contractor or his subcontractors or any visitors whenever entering the job site, shall be required to wear appropriate personal protection equipment required for that area. The Contractor may remove from the site any person who fails to comply with this or any other safety requirement.

- Because water with elevated pH may act as a skin irritant, care must be taken to inhibit dermal contact when handling any groundwater at the site. Actions to inhibit contact with groundwater may include the use of latex or other waterproof gloves by on-site workers.

A.12.2 Community Air Monitoring Program

Ambient air monitoring will be conducted by the Professional Engineer monitoring the work on a real-time basis during all subsurface construction activities using a minimum of a photoionization detector and a dust meter. Battery charge level for each instrument will be checked at the beginning and end of each day. The instruments will be calibrated at a frequency recommended by the manufacturer. All air monitoring readings will be recorded in a logbook and will be available for review by the NYSDEC and New York State Department of Health (NYSDOH).

Baseline conditions will be measured at proposed intrusive activity locations prior to commencement of operations. Air quality within the work zone will be monitored in accordance with the site-specific health and safety plan created by the site developer or contractor. In addition to monitoring the work area for worker health and safety, volatile organic compounds will be monitored at the downwind perimeter of the work area every hour. If downwind perimeter organic vapor levels exceed five parts per million (ppm) above the upwind work area perimeter concentrations, the Vapor Emission Response Plan will be implemented.

As described in Section A.6, appropriate dust suppression techniques will be employed at all times during site redevelopment activities. Using a dust meter, particulates will be continuously monitored immediately downwind in the work area and integrated over a period not to exceed 15 minutes. If the downwind particulate level is more than 150 ug/m^3, then upwind (background) levels must be measured immediately. If the downwind levels are more than 100 ug/m^3 above background, additional dust suppression measures must be taken.

A.12.1.1 Vapor Emission Response Plan

If the downwind area perimeter air concentrations of organic vapors exceed the upwind work area perimeter concentration by 5 ppm but less than 25 ppm, the following actions will be taken:

- Every 30 minutes monitor the perimeter work area location.
- Every 30 minutes monitor the organic vapor concentration 200 feet downwind of the work area perimeter or half the distance to the nearest receptor, whichever is less. If this reading exceeds the perimeter work area upwind organic vapor concentration by 5 ppm, all work must halt and monitoring increased to every 15 minutes. If, at any time, this reading exceeds the perimeter work area upwind concentration by 10 ppm, the Major Vapor Emissions Response Plan will be initiated.
- If organic vapor levels 200 feet downwind of the perimeter work area or half the distance to the nearest downwind receptor, whichever is less, exceeds by 5 ppm the work area perimeter upwind concentration persistently, then air quality monitoring must be performed within 20 feet of the nearest downwind receptor (20-foot zone). If the readings in the 20-foot zone exceed the perimeter work area upwind concentration by 5 ppm for more than 30 minutes, then the Major Vapor Emissions Response Plan will be implemented.
- Work activities can resume only after the downwind 200-foot reading and the 20-foot zone reading are less than 5 ppm above the perimeter work area upwind concentration. In addition, the downwind perimeter work area concentration must be less than 25 ppm above the perimeter work area upwind concentration.

A.12.2.2 Major Vapor Emission Response Plan

If the downwind work area perimeter organic vapor concentration exceeds the upwind work area perimeter concentration by more than 25 ppm, then the Major Vapor Emission Response Plan will be activated. Upon activation, the following activities will be undertaken:

1. All work will halt.
2. All Emergency Response Contacts as listed in the Health and Safety Plan will be contacted.

3. The NYSDEC, NYSDOH, and the Steuben County Health Department will be notified and advised of the situation.

4. The local police and fire department authorities will immediately be contacted by the Safety Officer and advised of the situation.

5. Frequent air monitoring will be conducted at 30-minute intervals within the 20-Foot Zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the Safety Officer and work may resume

MALCOLM PIRNIE

Operation, Monitoring and Maintenance Work Plan

APPENDIX

B

MALCOLM PIRNIE

OPERATION, MONITORING AND MAINTENANCE WORK PLAN FOR THE FORMER INGERSOLL-RAND FOUNDRY SITE

VILLAGE OF PAINTED POST
STEUBEN COUNTY, NEW YORK

AUGUST 2005

MALCOLM PIRNIE, INC.

40 Centre Drive
Orchard Park, NY 14127

3198-004/rawp/omwp

MALCOLM PIRNIE

1.0 INTRODUCTION

This Operation, Monitoring and Maintenance (OM&M) Work Plan has been prepared for the former Ingersoll-Rand Foundry Site in Painted Post, New York (the Site). The Site is the subject of a Voluntary Cleanup Agreement in accordance with New York State Department of Environmental Conservation (NYSDEC) Brownfields Cleanup Program guidance. The Agreement requires that the Site owner maintain the institutional and physical components that shall comprise the completed voluntary cleanup. This OM&M Work Plan describes the conditions and procedures for maintaining the physical components of the completed Site voluntary cleanup, and as an appendix to the Remedial Work Plan (RWP), it shall be an enforceable part of the Agreement.

The owner (Owner) of the Site (or any portion thereof) should evaluate the criteria presented in this plan and should recommend changes to the NYSDEC, as appropriate, depending on actual post-closure site conditions. As a minimum, this plan should be reviewed annually during the post-closure period and updated when necessary.

Prior to initiation of the OM&M Work Plan, the Owner shall prepare and submit appropriate organizational documents to the NYSDEC for review and approval. The organizational documents shall include:

- An organizational chart outlining the responsible party's personnel (with qualifications) who will be responsible for implementing the post-closure operation, maintenance and monitoring program.
- A health and safety plan.
- Example inspection report forms.
- A schedule for the annual inspections and reporting.

MALCOLM PIRNIE

2.0 BACKGROUND

The Site is a former foundry plant facility situated on approximately 57-acres of land at the northwest end of West Water Street in the northwestern portion of the Village of Painted Post, Steuben County, New York. The Site is approximately 1,200 feet east of the south-flowing Cohocton River. The Site is surrounded by an open field to the west, a parking lot to the south and residential housing to the east and north. Two rail spurs once serviced the Site. The facility began operations in 1848 as a machine shop and foundry owned by the Weston Engine Company. In 1898, the Imperial Engine Company, a subsidiary of the Rand Drill Company, purchased the facility. In 1905 Rand merged with the Ingersoll-Sergeant Drill Company to become Ingersoll-Rand (IR). The facility remained under IR's ownership until December 31, 1986 when Dresser Industries merged with IR to become the Dresser-Rand Company (Capsule, 1988).

During its active use, the foundry contained 287,000 square feet of industrial buildings, most of which were located along the northeastern side of the Site. The foundry produced gray iron castings used in assembling air compressors. In 1972, the foundry began producing gray iron in continuous pour from electric-melt furnaces. At that time operations included pattern construction, sand mold lines, casting, shakeout, casting cleaning, and pattern and casting storage (Capsule, 1988). IR ceased production operations at the Painted Post foundry site on January 1, 1986.

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3.0 REMEDIAL WORK PLAN

The Remedial Work Plan (RWP) for the site was prepared in October 2004 to be implemented during the voluntary cleanup of the Former Ingersoll-Rand Site.

According to the RWP, in order to eliminate potential exposure risks associated with direct contact with site fill material, the entire site will be covered as part of site redevelopment. The cover system will be placed directly on top of the re-graded on-site fill material and will include clean soil for outdoor, vegetated areas, asphalt for roads and parking lots, or concrete for sidewalks, buildings and heavy use areas. Surface coverage over the entire redeveloped parcel or subparcel will be required by the site owner or developer as a pre-condition of occupancy.

The proposed cover system has been designed to be protective of human health and the environment. The primary exposure pathway for contaminants at the site (metals and polycyclic aromatic hydrocarbons) in soil is via direct contact. The proposed plan of covering the on-site fill material will eliminate the potential for direct contact with soil and is therefore protective of human health.

The Qualitative Risk Assessment performed as part of the Supplemental Investigation (Malcolm Pirnie, 2004) evaluated the risk posed by chemicals of potential concern ("COPCs") to human health and wildlife. The Risk Assessment also evaluated the adequacy of the cover system planned for placement during site redevelopment and determined that the above-described cover system would protect human health and wildlife from these COPCs.

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4.0 SUMMARY OF THE REMEDIAL CLOSURE DESIGN

4.1 PREPARATION OF SITE SURFACE

The Site will require grading prior to cover placement activities, in accordance with the Remedial Work Plan (RWP) and appended Soil/Fill Management Plan (SFMP). Any fill material will be graded to a regular topographic surface as planned for redevelopment. All trees, shrubs, roots, brush, masonry, rubbish, scrap, debris, pavement, curbs, fences and miscellaneous structures will either be removed and disposed of off-site at a permitted disposal facility. Prior to placement of the cover system, all protruding material will be removed from the ground surface. Burning shall not be allowed on the Site.

4.2 COVER SYSTEM

4.2.1 *Soil*

In areas that will not receive significant equipment or vehicular use, the cover system will be composed of soil fill from a NYSDEC-approved borrow source and tested in accordance with the Soil/Fill Management Plan and found to contain constituent concentrations less than those specified in NYSDEC TAGM 4046. The soil cover will be placed in accordance with the RWP.

It will be the responsibility of the Owner to annually verify that the soil cover has remained in good condition (e.g., grass or other vegetation is maintained) and sufficiently covers the soil/fill material at the Site (i.e., eroded areas are repaired and the soil cover is maintained). Certification as to this verification is included on the site inspection form on Attachment A.

4.2.2 Asphalt

The cover system in areas that will become roads, sidewalks, and parking lots will consist of a minimum of two inches of asphalt that will be placed over the soil/fill material at the site. The

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asphalt will be placed on a minimum four-inch gravel subbase to provide stability for construction and to limit subsidence, in accordance with the RWP. Prior to placement of the subbase, all protruding material will be removed from the ground surface and the area re-graded to a regular surface.

It will be the responsibility of the Owner to annually verify that the asphalt has remained in good condition and sufficiently covers the soil/fill material.

4.2.3 Concrete

The cover system in areas that will become structures will consist of a minimum of two inches of concrete that will be placed above the soil/fill material. The concrete will be placed on a minimum four-inch gravel subbase to provide stability for construction and to limit subsidence. Concrete may also be used instead of asphalt for roads, sidewalks, and parking lots. Prior to placement of the subbase, all protruding material will be removed from the ground surface and the area re-graded to a sufficient regular surface.

It will be the responsibility of the Owner to annually verify that the concrete has remained in good condition and sufficiently covers the soil/fill material at the Site as per Attachment A.

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4.3 EROSION CONTROL MEASURES

In accordance with the SFMP, design and permanent construction features shall be incorporated into the site construction plans to control erosion. It will be the responsibility of the Owner to annually certify that storm water channel slopes, vegetation and any synthetic erosion control fabrics placed in such channels remain in good condition.

4.4 FENCING AND ACCESS CONTROL

In accordance with the RWP and the SFMP, fencing shall be constructed and signs posted around all areas with exposed soil/fill or areas where excavation will occur. If the entire Site is completely hydroseeded or completely graded and covered at the same time, fencing the entire Site will not be necessary, but gates shall be installed across obvious access points to limit the potential for illegal dumping. It will be the responsibility of the Owner to annually certify that fences, gates and signs are in place and that access is restricted, to the best of the Owner's ability.

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5.0 INSPECTION PROCEDURES

The physical components of the cover system shall be inspected annually by a representative of Owner (or its delegated agent) qualified to carry out such inspections. The inspector should be, at minimum, a certified industrial hygienist or a person with a four-year college degree in environmental sciences. The inspection will be coordinated with facility personnel at least one week prior to ensure that most, if not all, of the paved areas will be accessible for inspection. Indoors, in office spaces with floor coverings, the inspection should at minimum make note of areas with settled or uneven surfaces, seepage or flooding. Arrangements to repair those areas that the inspector requires to be maintained, if any, will be initiated as may be required by the inspector.

The annual inspection shall include, but not be limited to, those matters set forth on the Environmental Inspection Form, attached hereto as Exhibit A. These inspection reports, which shall include a map that shows areas of damage or required maintenance, shall be kept on file by the Owner. If the inspections reveal that maintenance is necessary, then the Owner shall notify the NYSDEC, and arrange to complete the repairs. The NYSDEC shall be informed by Owner when repairs are complete.

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6.0 FINAL COVER SYSTEM CONDITION

The final cover system shall be observed by traversing the cover on foot and making appropriate observations, notes and photographic records as necessary, for inclusion with the report. It is anticipated that some maintenance activities will be necessary during the closure period. The following characteristics shall be looked for during the observation of the cover system, fencing and signs, and erosion control features:

- Sloughing.
- Cracks.
- Settlement (depression and puddles).
- Erosion features.
- Distressed vegetation/turf.
- Damaged fencing, gates and signs.

The following paragraphs describe actions that should be taken to address the conditions described above. Maintenance and repairs that are typically necessary during the closure period are also described.

6.1 SLOUGHING

Sloughing of the soil cover may occur. Areas where sloughing has occurred shall be repaired. Cover soil shall be placed in accordance with the requirements of the Remedial Work Plan (RWP), and of the Soil/Fill Management Plan (SFMP).

6.2 CRACKS

The locations of any cracks in the soil, asphalt or concrete cover should be noted on the inspection log and site map, including width, length and depth of the crack. The appropriate maintenance

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procedure will be determined by the inspector. Small willow cracks in the soil cover can be repaired by minor re-grading of the cracked area and re-seeding the area. Larger cracks that appear to extend into the fill material shall be filled with soil similar to that used for construction of the cover soil layer prior to re-seeding, in accordance with the RWP. Repairs to the asphalt and/or concrete will be completed when and in the fashion deemed necessary by the inspector.

6.3 SETTLEMENT

Settlement features such as depressions or areas of ponding water shall be re-graded by placing additional soil cover so that surface water drains in the appropriate direction.

6.4 EROSION FEATURES

Erosion features shall be repaired by backfilling to the original grade with soil and re-seeding. Torn or displaced synthetic erosion control fabric in storm water channels shall be repaired or replaced as directed by the inspector.

6.5 DISTRESSED VEGETATION/TURF

Areas of distressed turf shall be re-seeded and a starter fertilizer applied. Large-root growth may also compromise the integrity of the soil cover and shall be discouraged with regular mowing. Reasonable efforts shall be taken to avoid damage to the turf from traffic and other unintended uses.

6.6 FENCING AND ACCESS CONTROL

To the best of owner's ability, physical discontinuities in fence material shall be repaired; fence posts and foundations that show evidence of structural weakness shall be repaired or replaced as necessary; gates and locks shall be maintained to deter unauthorized entry; and warning signs shall be kept secured in place and trees shall be trimmed to ensure the signs are visible.

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7.0 INSPECTION REPORTING

Annual inspection reports shall be forwarded by the Owner to the NYSDEC. If the inspection finds that corrective action is required, a followup inspection will be made after the repairs have been completed. If the inspector determines that corrective action is required, the Corrective Action Form will be included with the inspection report, confirming that the repairs were completed, and in accordance with the Remedial Work Plan.

Any analytical data that may be gathered during the course of the inspection or corrective action shall also be included with the inspection report and submitted to the NYSDEC within 21 days of the inspection. The inspection reports will be submitted by the Site Owner with an attached Annual Certification form, signed and notarized by the Site Owner, certifying that the specified engineering and institutional controls are in place and functioning.

ATTACHMENT A

ENVIRONMENTAL INSPECTION FORM

Painted Post, NY – Former Ingersoll-Rand Foundry Site

Property Name: ______________________ Inspection Date: ____________________

Property Address: ____

City: __________________________ State: __________ Zip Code: _________

Property ID: (Tax Assessment Map)

Section:_______ Block:_______ Lot(s):_________

Total Acreage: _______________

Weather (during inspection): Temperature: _____ Conditions:

SIGNATURE:

The findings of this inspection were discussed with appropriate personnel, corrective actions were identified and implementation was mutually agreed upon:

Inspector: ______________________________ Date: _______________

Next Scheduled Inspection Date: _______________

SECURITY AND ACCESS

	Yes	No
1. Access controlled by perimeter fencing?	____	____
Are there sections of the fence material damaged or missing?	____	____
Are the fence or gate post foundations structurally sound?	____	____
2. "No Trespass" signs posted in appropriate languages?	____	____
Are the signs securely attached to the fencing or posts?	____	____
Are there sufficient signs; are the signs adequately spaced around the perimeter of the property?	____	____
3. Is there evidence of trespassing?	____	____
Is there evidence of illegal dumping?	____	____

COVER & VEGETATION

	Yes	No
4. Final cover in acceptable condition?	____	____
Is there evidence of sloughing, erosion, ponding or settlement?	____	____
Is there evidence of unintended traffic; rutting?	____	____
Is there evidence of distressed vegetation/turf?	____	____

	Yes	No
5. Final cover sufficiently covers soil/fill material?		
Are there cracks visible in the soil or pavement?	____	____
Is there evidence of erosion in the stormwater channels or swales?	____	____
Is there damage to the synthetic erosion control fabric in the channels or swales?	____	____

ACTIVITY ON SITE

6. Any activity on site that mechanically disturbed soil cover? ____ ____

ADDITIONAL FACILITY INFORMATION

Development on or near the site? (Specify size and type: e.g., residential, 40 acres, well and septic)

COMMENTS

Item #

ATTACHMENTS

1. Site Sketch
2. Photographs
3. Laboratory Report (s)

3198-004

Annual Certification of Institutional/Engineering Controls

Painted Post, NY – Former Ingersoll-Rand Foundry Site

Property Name:
Property Address:

County: Erie
City/Town: Buffalo
Property ID: (Tax Assessment Map)
Section:_______ Block:_______ Lot(s):_________

I (name), residing at (address), as owner of the property(ies) listed above which are located wholly or partially within the boundaries of the Voluntary Cleanup Site named above; do certify that the engineering and/or institutional controls, as specified in the Declaration of Covenants and Restrictions for the Voluntary Cleanup Site are in-place and functioning as designed within the property(ies) listed above.

Signature:______________________

(This area for notary public)

3198-004

CORRECTIVE ACTION FORM

Painted Post, NY – Former Ingersoll-Rand Foundry Site

Property Name: ______________________

Property Address:

City: ______________________ State: __________ Zip Code: __________

Property ID: (Tax Assessment Map)

Section:_______ Block:________ Lot(s):__________

Total Acreage: ________________

Weather (during inspection): Temperature: _____ Conditions:

An inspection of the subject property on (date) identified the need for corrective action.

CORRECTIVE ACTION TAKEN

Description: (attach site sketch and photographs)

Date Completed:

SIGNATURE:

The corrective action described above was completed in accordance with all relevant requirements of the Remedial Action Work Plan.

Inspector: ______________________________Date: ________________

ATTACHMENTS

1. Site Sketch
2. Photographs
3. Laboratory Report (s)

3198-004