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SITE IDs 290 - 296: LIPE-ROLLWAY CORPORATION

SITE SUMMARY REPORT
DRAFT

Onondaga Lake Project
Task 5: 104(e) Review

Site No. 734030-002
Work Assignment Number D003060-27

Prepared by

TAMS Consultants, Inc.
655 Third Ave.
New York, New York 10017

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DRAFT

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1.0 SITE DESCRIPTION

The information referenced in this report was mainly obtained from the 104(e) responses of Lipe-Rollway Corporation (Lipe-Rollway, Company ID 2040). Three mailings were received from Lipe-Rollway dated October 7, 1996, October 15, 1996 and September 11, 2000. Information obtained from other sources is noted, as necessary. The documents pertaining to Lipe-Rollway operations that were available for review primarily discuss a single facility although their operations were at seven locations in the Syracuse, New York area. The environmental condition of this single site will be addressed in detail in this Site Summary Report, and only limited information will be provided for the other sites.

It should be noted that page numbers were not provided on the first two Lipe-Rollway mailings. Therefore, page numbers were added to facilitate referencing, starting with page 000001 at the cover page of the first mailing, and these numbers are included in this report's citations. Attachment numbers were indicated in the first two Lipe-Rollway mailings, and these will be indicated along with the issued page numbers where possible.

1.1 Location

The Lipe-Rollway Corporation and its predecessors have occupied seven locations in the Syracuse area during its history. Their only present facility is located at 7600 Morgan Road, Liverpool, NY (Site ID 290). Previous locations include: 200 & 208 South Geddes Street, Syracuse, NY (Site ID 291); 541 Seymour Street, Syracuse, NY (Site ID 292); 213 Maltbie Street, Syracuse, NY (Site ID 293); 806 Emerson Avenue, Syracuse, NY (Site ID 294); 601 West Fayette Street, Syracuse, NY (Site ID 295); and 6581 Townline Road, Mattydale, NY (Site ID 296). Figure 1 shows the location of these facilities in relation to Onondaga Lake. Each of these facilities were located adjacent to tributaries of Onondaga Lake. The site

location for the facility which is currently operated by Lipe-Rollway (at 7600 Morgan Road) is shown on the USGS topographic map in Figure 2.

The current facility at Morgan Road, which was constructed in 1963, includes a plant building covering 220,000 square feet, a parking lot, lawn areas, and a storage shed on approximately 40 acres of land. An additional 40 acres of undeveloped land surrounding the site is owned by Lipe-Rollway (Environmental Strategies Corporation, or ESC, 1996a). A floor plan of the Morgan Road facility was provided, and is included herein as Figure 3 (Mailing No. 1, Attachment 4, p. 000009) and a site layout map for the full property limit is provided as Figure 4 (ESC, 2000). The site is bound to the west by Morgan Road and a railroad right-of-way to the east. Sawmill Creek enters the property along the northeastern boundary of the site and flows through the eastern portion of the property (see Figure 4). According to ESC (2000), a gasoline station, a residence, and several vacant lots border the site to the north, and a paper manufacturer borders the site to the south.

Site location maps for the other six Lipe-Rollway sites were provided in Mailing No. 1 (Attachment 4, pp. 000007-000008). These former facilities are shown in Figure 1 herein. The South Geddes Street site is bound to the north by West Fayette Street and to the east by Geddes Street. The nearest cross street to the south is Marcellus Street and to the west is Magnolia Street. The Seymour Street site is located along the north side of Seymour Street between Geddes Street and Oswego Street. To the north are properties located along Gifford Street. The Maltbie Street site is located on the east side of Maltbie Street between Spenser Street and Plum Street. The eastern property boundary is adjacent to Onondaga Creek. The Emerson Avenue site is located along the eastern side of Emerson Street north of Lewis Street and west of Erie Boulevard West. The West Fayette Street site is located on the south side of the street between Niagara and Tioga Streets. To the south are properties located along Marcellus Street. The Townline Road site is located on the eastern side of the road near the intersection of Factory Avenue and immediately northwest of the Route 298 traffic

circle. General Motors' Former Inland Fisher Guide facility (Site ID 224), a subsite of the Onondaga Lake Superfund site, is on the western side of Townline Road.

1.2 Geology

The surficial geology of the Syracuse area was strongly influenced by the most recent glacial advance (Wisconsin age, 12,000 to 14,500 years ago). The area occupies a region that was covered by Lake Iroquois, a large glacial lake situated in front of the ice margin. The broad flat-lying plains situated north from Syracuse to Lake Ontario were formed beneath Lake Iroquois and are characterized by lacustrine fine sand and silt deposits. Additional glacial features common to the region are moraines, drumlins, U-shaped valleys, and meltwater channels.

Onondaga Lake and all its major tributaries lie within glacial meltwater channels. These features originally were conduits carrying meltwater at large volumes and high velocities away from the glacier. Sediment types characteristically found in meltwater channels are sands and gravels. These relict features form important water bearing and transmitting units which form an irregularly branching, net-like pattern.

The bedrock geology of the greater Syracuse area includes Lower to Middle Paleozoic age sedimentary rocks predominated by carbonate (dolostone and limestone) and shale, and containing some sandstone, siltstone, and evaporites. Bedrock directly beneath the area (as well as underneath Onondaga Lake) is Silurian Vernon Shale (Rickard and Fischer, 1970) which has low permeability, but does possess secondary porosity due to fractures.

Soil boring logs for the Morgan Road site were included Lipe-Rollway's first mailing (Attachment 9, pp. 000071 to 000124), the ESC Environmental Site Assessment (ESC, 1996a), and the ESC Summary of Investigations (ESC, 2000). A total of 68 direct push soil

borings were completed with boring depths that ranged from 6 to 43 ft below ground surface (ft bgs). Eight of these borings were completed as monitoring wells. A review of these boring logs indicate that refusal was encountered at depths ranging from 7 to 40 ft bgs. Soils at the Morgan Road site were reported to consist of unconsolidated glacial deposits, or specifically, sandy silt to silty sand underlain by silty clay. Soil borings within the roof drain outfall area indicate a thin veneer (less than one foot) of organic-rich sediments, underlain by silt and clayey soils. In several areas, disturbed native soils or fill were encountered with depths up to 12 ft bgs. Several borings at the Morgan Road facility reported shale saprolite at shallow depths (7 to 15 ft bgs). Many logs reported weathered shale at the refusal depth. ESC reported that the depth to bedrock appears to increase towards the northeast. It was concluded that groundwater is in the competent shale with lenses of perched water present in silty clay and weathered shale (ESC, 2000, Appendix B). The water-bearing zones were noted to be discontinuous and perched within the fill and near the contact between the fill and the underlying glacial till. Soil boring logs for the other Lipe-Rollway sites were not included in the documents that were available for review.

1.3 Hydrogeology

According to the Brewerton USGS quadrangle map, the ground surface elevation at the Morgan Road facility is between approximately 425 and 440 ft NGVD. Lipe-Rollway included copies of three monitoring well installation reports (MW-1, MW-2 and MW-6) in their submission (Attachment 9, pp. 000125-000127). Copies of monitoring well installation forms for MW-3, MW-4, and MW-5 were not included in the submission, however, the locations are shown on the ESC site maps. Groundwater measurements were not included on the well installation forms. A groundwater contour map was included in the ESC Summary of Investigations report (ESC, 2000, Figure 3), and is provided herein as Figure 5. Based on information collected by ESC, groundwater flow is to the north. Sawmill Creek

is the nearest surface water body and is located approximately 1,800 ft east of the building, just inside the eastern property boundary (see Figure 4).

According to the Syracuse West USGS quadrangle map, the ground surface elevation at the former South Geddes Street facility is approximately 400 ft NGVD. Information concerning the direction of groundwater flow at this site was not available for review. The site is approximately 1,000 ft north of the point where Harbor Brook enters a culvert. It is difficult to determine the direction of groundwater flow in this relatively flat, highly urbanized area. However, based on the proximity of Harbor Brook, groundwater most likely flows towards the brook.

According to the Syracuse West USGS quadrangle map, the ground surface elevation at the former Seymour Street facility is approximately 400 ft NGVD. Information concerning the direction of groundwater flow at this site was not available for review. However, based on the proximity of Harbor Brook, groundwater most likely flows west towards the brook.

According to the Syracuse West USGS quadrangle map, the ground surface elevation at the former Maltbie Street facility is approximately 380 to 390 ft NGVD. Information concerning the direction of groundwater flow at this site was not available for review. However, Onondaga Creek flows past the northern and eastern property boundary of the site, and therefore, groundwater most likely flows towards this creek.

According to the Syracuse West USGS quadrangle map, the ground surface elevation at the former Emerson Avenue facility is approximately 410 to 420 ft NGVD. Information concerning the direction of groundwater flow at this site was not available for review. However, based on ground surface contours and the proximity of Harbor Brook, groundwater most likely flows northeast towards Harbor Brook which is located approximately 100 to 200 ft north of the site. The former Erie Canal was also located just north of this area.

According to the Syracuse West USGS quadrangle map, the ground surface elevation at the former West Fayette Street facility is approximately 400 ft NGVD. Information concerning the direction of groundwater flow at this site was not available for review. However, based on ground surface contours and the proximity of Onondaga Creek (approximately 1,500 ft east of the site), groundwater most likely flows east towards Onondaga Creek. The former Erie Canal was located immediately north of the site and may affect the groundwater flow direction.

According to the Syracuse East USGS quadrangle map, the ground surface elevation at the former Townline Road facility is 375 ft NGVD. Information concerning the direction of groundwater flow at this site was not available for review. However, based on ground surface contours and the proximity of Ley Creek, groundwater most likely flows north towards Ley Creek which is located approximately 800 ft from the site.

1.4 Surface Water Hydrology

The Morgan Road facility is located approximately 2.1 miles northeast of the northern shore of Onondaga Lake. Sawmill Creek is approximately 1,800 ft east of the main building (Figure 4). As shown on this figure, Sawmill Creek flows through the Lipe-Rollway property in the northeast corner of the site and exits at the southeast corner of the site. Stormwater from the Morgan Road facility is conveyed through an underground pipe to a discharge point approximately 500 ft east of the main building. A channel originates at the outfall and extends approximately 20 ft east towards a wetland area. The wetland and surface water discharge area is shown on Figure 4, and is labeled "roof drain outfall area." A ditch located east of the building and south of the hazardous material storage shed may also direct stormwater into this wetland area. A wetlands delineation map and a map showing the exact location of the wetland area's discharge point to Sawmill Creek were not provided in the documents that were available for review. ESC noted that there is a drainage ditch present

along the norther property boundary which was used to determine representative surface soil background concentrations as described in Section 4.2.1. Lipe-Rollway currently implements a Spill Prevention, Control, and Countermeasures (SPCC) Plan, a Resource Conservation and Recovery Act (RCRA) Contingency Plan, a Stormwater Pollution Prevention Plan (SWPPP), and a NYSDEC State Pollutant Discharge Elimination System (SPDES) general permit for stormwater discharges associated with industrial activity, which would all provide an outline of surface water flow at this facility. However, these documents were not available for review.

The former South Geddes Street facility is approximately 7,000 ft southeast of the southern shore of the lake. The site is approximately 1,000 ft north of the point where Harbor Brook enters a culvert.

The former Seymour Street facility is approximately 1.5 miles southeast of the southern shore of the lake. Harbor Brook is located approximately 1,200 ft west of the site.

The former Maltbie Street facility is approximately 1 mile southeast of the southern shore of the lake. The site is directly adjacent to Onondaga Creek approximately 6,000 ft upstream of the lake.

The former Emerson Avenue facility is approximately 1,400 ft south of Onondaga Lake. Harbor Brook is located approximately 100 to 200 ft north of the site and the former Erie Canal was also located just north of this area.

The former West Fayette Street facility is approximately 1.4 miles southeast of the southern shore of the lake. Onondaga Creek is located approximately 1,500 ft east of the site.

The former Townline Road facility is approximately 4.2 miles east of the eastern shore of the lake. The site is approximately 800 ft south of Ley Creek.

2.0 SITE HISTORY

2.1 Owners/Operators

The Lipe-Rollway Corporation, a subsidiary of Emerson Electric Company of St. Louis, Missouri, has been in existence since 1881 (Mailing No. 1, p. 000003). The company was established in 1881 when it operated under the name Charles E. Lipe, Mechanical Engineer and was located at 200 & 208 South Geddes Street. In 1920, the company changed names to the W.C. Lipe Company and again changed names in 1942 to Lipe-Rollway Corporation. In 1949, the company vacated the South Geddes Street location and moved to 806 Emerson Avenue in 1950. Several subsidiaries operated at the facility, including Brown-Lipe Gear Company and Lipe-Walrath Company, which were sold to other companies.

The company operated at 541 Seymour Street under the names Railway Roller and Bearing Company from 1908 to 1927 and Rollway Bearing Company from 1927 to 1962. The Rollway Bearing Company also operated at 213 Maltbie Street from 1945 to 1962. In 1962, the bearing production operations moved to the 7600 Morgan Road facility. From 1963 to 1985, the company's automobile clutch division operated at the Emerson Avenue facility. In 1985, the clutch division was sold to Echlin Corporation and operated under the name Lipe Auto Clutch.

The Rollway Bearing Company also had a manufacturing operation at 601 West Fayette Street from 1960 to 1962. These operations were moved to the Morgan Road facility in 1962.

The Lipe-Rollway Corporation automated equipment division leased a portion of a building at 6581 Townline Road in Mattydale. The start date of operations at this location was not indicated in the documents that were available for review, but it was noted that the company

left this location in November 1994 and moved these operations to the Morgan Road facility (Mailing No. 1, pp. 000003-000004). Based on a 1992 USEPA Notice of Intent for Stormwater Discharge (see Section 2.3), the Morgan Road facility operator was described as the "Rollway Bearing Division of Lipe-Rollway Corporation" (Mailing No. 1, Attachment 13, p. 000625).

2.2 Site Operations

Lipe-Rollway stated in their first mailing that records of processes for their facilities other than the Morgan Road facility were unavailable (Attachment 6, p. 000011). There was a limited amount of site operation information that was available for review regarding the six former Lipe-Rollway sites (Mailing No. 1, pp. 000003-000004). In general, Lipe-Rollway and its predecessor companies have been producers of bearings, gears, clutches, and machine tools (SIC Code 3562). The wastes that have been generated by Lipe-Rollway operations are discussed in Section 2.3.

Morgan Road Facility

The processes that are currently performed at the Morgan Road facility are as follows: steel machining which consists of turning, boring, facing, drilling and tapping steel parts; cast iron and bronze machining which involves the turning, facing, boring, drilling, and reaming of cast iron and bronze parts; heat treatment to harden steel parts including a salt bath unit and an oil-quenching unit (Mailing No.1, Attachment 13, p. 000633); internal, external, and surface grinding of "hazardous steel parts" (the results of testing that was conducted, if any, indicating the hazardous nature of these steel parts were not available for review); a mass finishing operation known as tumbling; a non-destructive chemical testing process known as Nital Etch; parts washing with an alkaline liquid spray and dip-type washers for cleaning steel parts; and a surface coating operation in a paint booth which was installed in 1994

(Mailing No. 1, Attachment No. 6, p. 000011). Dates of inception for the other processes were not indicated in the documents which were available for review.

There were also some discontinued operations and process changes described in the Lipe-Rollway submittals. Lipe-Rollway stated that prior to 1995, the grinding process generated waste coolant and that, subsequent to a process change, this waste is currently recycled. Details regarding this and other historic changes to the grinding process were not indicated in the documents that were available for review. In addition, a recycling process was incorporated into the aforementioned Nital Etch chemical testing system in 1991 which eliminated the generation of flammable liquid waste. Then, in 1996, the Nital Etch operation was again altered to eliminate the flammable ingredient from the process altogether. As shown on Figures 3 and 4, there is a naphtha aboveground storage tank (AST) that was removed in 1997 east of the main building, however, it was not indicated what site operation(s) utilized petroleum naphtha. Naphtha might be the flammable ingredient whose use was discontinued in the Nital Etch process. Prior to 1991, the facility's parts washers used trichloroethene (TCE) products, instead of alkaline liquids, for the cleaning of steel parts.

Lipe-Rollway indicated that three site operations had been discontinued at this facility at the time their third mailing was submitted (September 11, 2000, p. 000006), however, dates when the processes were terminated were not indicated in the documents that were available for review. The three discontinued operations were: a process known as Bright Dip which served as a bronze paint cleaning system; a caustic-controlled rust process known as Black Oxide; and a caustic/acid chemical process known as Alumi-Etch which was used to etch aluminum parts (Mailing No. 1, Attachment 6, p. 000011). The locations of areas labeled "Brite Dip" and "Etching" are indicated on Figure 3, which are assumed to be the sites of the Bright Dip and Alumi-Etch (and Nital Etch) operations, however, the location of the Black Oxide operation was not indicated on the site maps that were included in the submittals.

South Geddes Street Facility

At the South Geddes Street facility, the company operated under the names Charles E. Lipe, Mechanical Engineer (1881 to 1920), W.C. Lipe Company (1920 to 1942), and Lipe-Rollway Corporation (1942 to 1949). This facility manufactured "bicycle gears, various machine tools, broom sewing machines, automobile parts, cigars, and other products" (Mailing No. 1, p. 000003). Several subsidiary companies operated at this location including Brown-Lipe Gear Company and Lipe-Walwrath Company, which were sold to other companies. Information regarding the companies who purchased these entities was not available for review.

Seymour Street Facility

The company operated at Seymour Street under the names Railway Roller and Bearing Company (1908 to 1927) and Rollway Bearing Company (1927 to 1962) (Mailing No. 1, p. 000003). This facility manufactured bearings for street cars, railroad cars, and other applications. In 1962, this facility was relocated to the Morgan Road facility.

Maltbie Street Facility

The Rollway Bearing Company operated at the Maltbie Street facility from 1945 until 1962, when this operation was relocated to the Morgan Road facility. It was not noted what operations were specifically conducted at this location, however, it is possible that this site manufactured bearings for street cars and railroad cars, and the same other operations as Rollway Bearing Company performed at the Seymour Street facility.

Emerson Avenue Facility

In 1950, Lipe-Rollway moved operations to a facility at Emerson Avenue from South Geddes Street. Although not specifically stated in their mailings, it is assumed that similar types of manufacturing operations were conducted at both the Emerson Avenue and South Geddes Street facilities. Between 1950 and 1962, Lipe-Rollway manufactured ball bearings at this location, however, at the time of their third submittal (September 11, 2000), Lipe-Rollway was unable to "identify any information or documents" pertaining to their specific ball bearing site operations (Mailing No. 3, p. 000003). In 1962, the bearing production operations were moved to the Morgan Road facility. From 1963 to 1985, the company's automobile clutch division operated out of the Emerson Avenue facility. During this period, Lipe-Rollway manufactured "new truck and heavy equipment clutches and tore down returned clutches, shipping the parts to facilities outside New York for re-building. The manufacture of new clutches involved the cutting and forming of cast iron and carbon steel, including bar stock, and flat or sheet stock. Pre-formed heat-absorbent facings would also be affixed to the metal clutch pad faces. New clutches were run through a vibratory finishing process to smooth rough edges" (Mailing No. 3, pp. 000004-000005). Tear-down of returned clutches was a disassembly process. In 1985, the clutch division was sold to Echlin Corporation and operated under the name Lipe Auto Clutch.

West Fayette Street Facility

The Rollway Bearing Company performed site operations at their West Fayette Street facility between 1960 and 1962. It was not noted what operations were specifically conducted at this location, however, it is possible that this site manufactured bearings for street cars and railroad cars, and the same other operations as Rollway Bearing Company performed at the Seymour Street facility. The West Fayette Street operation was moved to the new Morgan Road facility in 1962.

Townline Road Facility

The Lipe-Rollway automated equipment division leased a portion of a building at 6581 Townline Road in Mattydale, New York. The start date of the lease and the operations that were performed at this location were not indicated in the documents which were available for review. In their third mailing, Lipe-Rollway stated that the Townline Road facility produced "vibratory feeder/orienters" and "the processes conducted at this facility consisted primarily of machining, including milling, welding, lathing, and assembly" (Mailing No. 3, p. 000004). The facility also used a "wet spray paint booth." In November 1994, the company moved these operations to the Morgan Road facility. It was also noted in the third submittal that Lipe-Rollway "is not in possession of any documents pertaining to this facility and believes that documents pertaining to this facility no longer exist."

2.3 Generation and Disposal of Wastes

The quantities and types of wastes generated at the Morgan Road, Emerson Avenue, and Townline Road facilities were indicated in the documents that were provided, and are presented in Table 1 herein. Known disposal locations are indicated in the text following Table 1. For those wastes which were discussed in the documents that were submitted, but for which no estimated generator quantities were provided (i.e., not shown in Table 1), text descriptions will be provided, if available.

Morgan Road Facility

The types and quantities of wastes generated at the Morgan Road facility were indicated in the first mailing (Attachment 6, p. 000011) and are presented in Table 1. As noted in Section 2.2, flammable liquid waste was generated during the Nital Etch process prior to 1991, TCE waste was generated during parts washing operations prior to 1991, and waste coolant was

Table 1: Summary of Generated Wastes

Site Operation	Waste Generated	Quantity of Wastes Generated
Morgan Road Facility		
Machining, steel parts	Loose steel chips	20 cu yd/week
	Scrap steel parts	48,000 lb/yr
Machining, cast iron	Scrap cast iron	12,600 lb/yr
Machining, bronze	Bronze chips and scrap parts	128,000 lb/yr
Hardening, steel parts	Oil-based sludge	10,600 lb/yr
Grinding, steel parts	Grinding swarf	125 ton/yr
	Waste coolant (prior to 1995)	10,000 gal (period of time was not indicated)
Tumbling	Sludge	17,000 lb/yr
Nital Etch	Mildly acidic waste	600 gal/yr
	Flammable liquid waste (prior to 1991)	4,200 gal (period of time was not indicated)
Bright Dip Process	Alkaline liquid waste (prior to September 11, 2000) [1]	200 gal/yr
Black Oxide Process	Alkaline liquid waste (prior to September 11, 2000) [1]	500 gal/yr
Alumi-Etch Process	"Fairly" neutral liquid waste (prior to September 11, 2000) [1]	400 gal/yr
Parts Washing	Alkaline liquid waste	3,000 gal/yr
	Waste TCE (prior to 1991)	3,100 gal/yr
Paint Booth Operations	Waste paint and paint thinner	200 gal/yr
Emerson Avenue Facility [2]		
Office, Cafeteria, and Restroom Operations, and Wooden Pallets	General waste	20 cu yd/week
Vibratory Finishing Process	Alkaline wash waste and waste iron and steel shavings/chips	Unknown
Clutch Disassembly	Wastewater (alkaline detergent and oil and grease)	Unknown

Table 1: Summary of Generated Wastes (Continued)

Site Operation	Waste Generated	Quantity of Wastes Generated
Townline Road Facility [2]		
Paint Booth Operations	Paint residue and paint thinner	200-250 gal/yr
Alkaline Dip, Etching	Alkaline dip and etch solution	30 gal/yr
Metal Shavings/Machining Waste	Metal shavings, machining waste with trace amounts of cutting oils and/or water-based coolant	10-20 cu yd/yr [3]
Unspecified Facility Operations	Used oil	500-800 gal/yr
Office, Cafeteria, and Restroom Operations, and Wooden Pallets	General waste	20 cu yd/week

Sources: Lipe-Rollway, Mailings No. 1 and 3, 1996a and 2000.

Notes: 1 = September 11, 2000 was the date of the third mailing (Mailing No. 3, p. 000006).
2 = It is likely that the waste generation documents that were available for review regarding these two facilities is incomplete.
3 = Although not stated, it assumed that the rate of machining waste generation was annual (Mailing No. 3, p. 000004).
Disposal locations are noted in the accompanying text.

generated during the grinding process prior to 1995. Waste generated by the Bright Dip, Black Oxide, and Alumi-Etch processes were discontinued at the time of Lipe-Rollway's third mailing (September 11, 2000), and the specific dates of process termination were not indicated.

Details of the Morgan Road facility's on-site materials storage facilities, including the details about containment and spill management, were not indicated in the documents which were available for review. However, the Morgan Road facility site maps that were provided in Lipe-Rollway's first mailing (p. 000009) and ESC's Summary of Investigations (ESC, 2000) indicate that there were numerous aboveground and underground storage tanks at the facility. These site maps are included as Figures 3 and 4 herein, respectively. Figure 4 indicates that all of the exterior underground storage tanks (USTs) and aboveground storage tanks (ASTs) shown in Figure 3 were removed or closed in place by 1998. Additional UST and AST information was obtained from the ESC Environmental Site Assessment (ESC, 1996a). The tanks that were removed include: two fuel oil USTs (10,000 and 20,000-gallon capacities) that were removed in 1994; one 1,000-gallon naphtha AST that was removed in 1997; one 1,000-gallon waste oil AST that was removed in 1997; one 6,000-gallon cutting oil AST that was removed in 1998; and one 500-gallon gasoline UST that was removed in 1991 (ESC, 1996a, pp. 10-11). Figure 3 indicates that a 1,000-gallon waste oil UST, located adjacent to the scrap chips container, was replaced in 1991. Figure 4 indicates that this replacement UST was for used cutting oil and was later removed in 1998. ESC indicated that a 1,000-gallon waste oil tank UST was still in operation as of the date of their Environmental Site Assessment (April 11, 1996) (ESC, 1996a, p. 10). This is assumed to be the same used cutting oil UST that was removed in 1998. Figure 4 indicates that the 20,000-gallon quench oil UST, located at the southeast corner of the facility, was closed in place in 1998. Figure 3 indicates that a second quench oil UST (6,000-gallon capacity) is located inside the southeast corner of the building. It is assumed that this tank is still in service. The 1996 ESC Environmental Site Assessment refers to this quench oil tank as a "flow-through

process tank" and not a UST from a regulatory standpoint (ESC, 1996a, p. 11). It was not indicated in the documents reviewed what types of alternative storage systems were used, if any, after the storage tanks were either closed in place or removed (with the exception of the waste oil UST that was replaced in 1991 and whose replacement was removed in 1998).

The following external storage facilities (other than the ASTs and USTs) are shown on the Morgan Road facility site maps (Figures 3 and 4 herein): hazardous waste and waste oil shed; scrap metal container; grinding swarf container; baghouse; and former scrap chips pad. According to the Environmental Site Assessment (ESC, 1996a), scrap chips were formerly stored outside on a concrete pad located near the southeast corner of the main building. The scrap chips storage area was relocated to a covered concrete pad west of the old pad as shown on Figure 4. It is assumed that the newer storage area is shown on Figure 4 in the area labeled "scrap chips container." A date for this change in storage location was not indicated. Other changes to the storage and disposal facilities at this site were also not indicated in the documents reviewed.

The following indoor storage locations are also noted on Figure 3: product storage area; raw material storage area; drum storage area; parts storage area; and the current scrap chips container as noted above.

Figures 3 and 4 show waste storage locations for a number of site operations, however, some storage areas for wastes listed in Table 1 are not readily apparent. The following are those operations for which the corresponding storage areas are labeled on the site maps: grinding scrap metal wastes are stored in the scrap metal container and scrap chips containers (which were located on the "former scrap chips pad" prior to the submittal of the first mailing on October 7, 1996); oily sludges and oily water generated during heat treatment and tumbling were stored in ASTs and/or USTs; and grinding swarf is stored in a container east of the building. It is not apparent, based on Figures 3 and 4, where the following wastes would

have been stored: waste coolant generated during the grinding operations prior to 1995; Nital Etch acidic and flammable liquid wastes prior to 1991; alkaline liquid wastes generated during the Bright Dip, Black Oxide, and parts washing operations; the Alumi-Etch operation's fairly neutral liquid waste; and paint and paint thinner waste. It is possible that these wastes were stored in either the hazardous waste and waste oil storage shed and/or the drum storage area shown on the site maps. It was generally noted that poly tanks and drums of waste liquids are stored in the hazardous waste and waste oil storage shed (ESC, 1996a).

Disposal locations were indicated for some of the Lipe-Rollway wastes that were generated. Scrap steel chips and parts are disposed locally at Roth Steel (Company ID 2008, Site ID 203) in Syracuse, New York (Mailing No. 1, Attachment 7, p. 000065). The final disposal locations of bronze and cast iron wastes were not indicated. The heat treating and tumble processes generate oily sludge and oily water, and Lipe-Rollway listed several facilities which receive oily water and oily coolant. However, the processes which generated these wastes were not specified. Quantex Environmental, Inc. of Kitchener, Ontario disposes approximately 15,000 gallons of Lipe-Rollway's oil, coolant, and mop water annually, however, in 1987, this facility disposed 58,129 gallons of Lipe-Rollway's oil, coolant, and mop water (Mailing No. 1, Attachment 9, p. 000068). Oily water was shipped to Quantex Environmental, Inc. in 1994 (17,850 - units illegible) and Frontier Chemical Waste of Niagara Falls, New York in 1991 (3,025 gallons) (Mailing No. 1, Attachment 12, pp. 000183, 000233). A manifest was provided for an oily water shipment (6,200 gallons) by the transporter, Luzon Environmental Services (Mailing No. 1, Attachment 12, p. 000171). The following companies provided either "handling, transportation, or disposal" services for oily wastes, however, their specific functions were not indicated: O.G. Rauscher, Inc. in Waterloo, New York (9,400 gallons oily coolant in 1991); Harold Marcus, Ltd. in Ontario, Canada (9,400 gallons oily coolant in 1994); and Scandex Chemical Services which was located at the same Ontario address as the current Quantex Environmental, Inc. (11,889 gallons oily coolant in 1984 and 1985) (Mailing No. 1, Attachment 7, p. 000063).

Approximately 125 tons of grinding swarf were transported annually by Rubbish Removal, Inc. of Syracuse, New York for disposal at Seneca Meadows Landfill in Waterloo, New York (Mailing No. 1, Attachment 9, p. 000068). It was noted that toxicity characteristic leaching procedure (TCLP) testing was conducted on the generated grinding swarf, and the material was found to be non-hazardous (Mailing No. 1, Attachment 6, pp. 000012-000026).

A review of the waste manifests provided by Lipe-Rollway indicated that Solvents & Petroleum Service in Syracuse, New York (Company ID 2016, Site ID 249) was the primary destination of the flammable liquid waste, petroleum naphtha, oil, and waste trichloroethene (TCE) dating back to 1981 (Mailing No. 1, Attachment 7, p. 000064; Attachment 9, p. 000069; and Attachment 12, pp. 000365, 000419-000421). Smaller shipments of flammable waste materials (not listed here) were also indicated in Lipe-Rollway's first mailing, however, it was not noted whether the companies listed were handlers, transporters, or disposal facilities (Mailing No. 1, Attachment 7, pp. 000063-000065; Attachment 9, pp. 000068-000070). Neutralized acid waste that was used to "clean metal parts and check for grind damage" was also shipped to Frontier Chemical Waste Process, Inc. in Niagara Falls, New York at a rate of 3,200 gallons per year (Mailing No. 1, Attachment 12, p. 000234). Prior to 1991, Lipe-Rollway stated that their parts washing operations generated waste TCE. As listed on hazardous waste manifests included in their mailings, waste liquids containing TCE were disposed at several facilities within the Onondaga Lake basin, including Environmental Products & Services (EP&S) and Solvents & Petroleum Services in Syracuse, New York, and Safety Kleen Corp. in Mattydale, New York (Company ID 2013, Site ID 235). The annual TCE-waste volumes disposed by Solvents & Petroleum from 1981 to 1990 ranged from 220 gallons in 1990 to 2,255 gallons in 1984. The painting operations, which began in 1994, generate waste paint and paint thinner. Waste manifests that were provided indicate that "off-spec paint," paint thinner, waste solvent, and acetone, were disposed at Laidlaw Environmental Services of Lawrence, Massachusetts in 1996 (Mailing No. 1,

Attachment 12, pp. 000405-000411). There was no indication as to what constituted "off-spec paint" in the submission.

Disposal locations (other than possibly the sanitary sewer) for the following wastes were not indicated in the documents that were available for review: waste coolant that was generated during grinding operations prior to 1995 (when coolant recycling was initiated); Nital Etch acidic and flammable liquid wastes prior to 1991; alkaline liquid wastes generated during the Bright Dip, Black Oxide, and parts washing operations; and the Alumi-Etch operation's fairly neutral liquid waste.

Some electrical transformers at the Morgan Road facility contained polychlorinated biphenyl (PCB) fluids and switches (Mailing No. 1, Attachment 9, pp. 000069-000070). According to the documents reviewed, the Morgan Road facility used PCB transformers that were located on the roof of the main building, and on a concrete pad southeast of the main building. Other specific transformer locations, if any, were not indicated. The roof transformers were removed in 1987 (ESC, 1996a, p. 14), and the transformer located on the concrete pad was removed in 1997 (ESC, 2000, p. 21). In 1987, Lipe-Rollway disposed of 42,680 pounds of PCB-filled transformers at the General Electric Company facility in Tonawanda, New York (Mailing No. 1, Attachment 12, pp. 000428-000430). PCBs were also disposed at other facilities including: 300 pounds of large PCB capacitors were disposed at S.C.A. Chemical Services, Inc., Model City, New York in 1983 (Mailing No. 1, Attachment 12, pp. 000536, 000547); 770 pounds of PCB capacitors were disposed at S.C.A. Chemical Services, Inc., Model City, New York in 1989 (Mailing No. 1, Attachment 12, pp. 000519-000521); five PCB switches (21 pounds) to PCB Incorporated of Missouri, Kansas City, Kansas in 1986 (Mailing No. 1, Attachment 12, pp. 000454-000459); and 1,200 pounds of waste PCB solids, consisting of less than 5 pounds of PCBs, to CECOS International, Niagara Falls, New York in 1983 (Mailing No. 1, Attachment 12, p. 000534).

The furnace pits were cleaned in 1985 by Environmental Oil, Inc., of Syracuse, New York. During the cleaning, 300 pounds of asbestos were removed and disposed at Seneca Meadows Landfill by Environmental Oil, Inc. (Mailing No. 1, Attachment 7, p. 000063; and Attachment 12, pp. 000240, 000486-000491). On page 000063 (Mailing No. 1, Attachment 7), Lipe-Rollway listed EP&S as a contractor engaged by the company in "handling, transportation or disposal of hazardous materials." It should be noted that EP&S was listed as the transporter of 300 pounds of asbestos waste which was disposed in 1985 in the Seneca Meadows Landfill (Mailing No. 1, Attachment 9, p. 000068). However, Environmental Oil, Inc. was described by Lipe-Rollway as the transporter of this waste (Mailing No. 1, Attachment 12, p. 000489). Lipe-Rollway also disposed one ton of encapsulated asbestos in 1995 at G. Page in Weedsport, New York (Mailing No. 1, Attachment 7, p. 000063).

The following hazardous wastes were noted in the manifests included in the Lipe-Rollway submission, however, the processes that generated these wastes were not indicated in the documents that were available for review: 730 gallons of hazardous chromium waste liquid were disposed in 1991 at Frontier Chemical Waste in Niagara Falls, New York (Mailing No. 1, Attachment 12, p. 000359); 30 pounds of waste sodium cyanide were also disposed at Frontier Chemical Waste in 1989 (Mailing No. 1, Attachment 12, p. 000374); 55 gallons of waste sodium hydroxide solution and 300 pounds of waste flammable liquid were disposed at Frontier Chemical Waste in 1989 (Mailing No. 1, Attachment 12, p. 000377); and 55 gallons of a hazardous waste solid designated D007 (which indicates chromium as the toxic contaminant) were disposed at Waste Conversion, Inc., in Hatfield, PA in 1987 (Mailing No. 1, Attachment 12, pp. 000433-000434).

Twelve tons of non-hazardous, oil-contaminated absorbents were disposed at the Monroe-Livingston Landfill in Scottsville, New York in 1984 (Mailing No. 1, Attachment 13, pp. 000511-000514). According to Lipe-Rollway's waste shipment summaries (Mailing No. 1, Attachment 7, pp. 000063-000065; Attachment 9, pp. 000068-000070), the following oil

waste shipments were also made from the Morgan Road facility: approximately 9,000 gallons of mixed fuel oil were handled, transported, and/or disposed by Op-Tech Environmental Services in Massena, New York in 1994 (Lipe-Rollway did not specify which of these are relevant for this shipment); unknown quantities of oil were handled, transported, and/or disposed by Cibro Petroleum, Inc. in Albany, New York for an unspecified period of time; 55 gallons of solid chromium were handled, transported, and/or disposed by Industrial Oil Tank Service, Inc. in Verona, New York in 1987; and unknown quantities of "oil, coolant, etc." were handled, transported, and/or disposed by Quanta Resources in Syracuse, New York for an unspecified period of time.

Emerson Avenue Facility

The wastes generated at the Emerson Avenue facility between 1950 and 1962, when the site was used for the manufacture of ball bearings, were not identified in the documents that were available for review (Mailing No. 3, p. 000004). However, general descriptions of the wastes generated from the manufacture and tear down of clutches (between 1963 and 1985) were indicated in Lipe-Rollway's third mailing. It was noted that the vibratory finishing process generated an alkaline wash waste stream, as well as waste iron and steel shavings and chips. According to Lipe-Rollway, "the quantities of wastes generated by these processes is unknown" (Mailing No. 3, p. 000005). This waste stream was discharged to a railroad drainage culvert adjoining the Emerson Avenue property. Although not indicated by Lipe-Rollway, it is believed, based on topography, that this wastewater flowed into Harbor Brook. Returned clutch tear down involved running a bath of hot water and alkaline detergent to remove oil and grease, however, the quantity of wastewater produced by this process was unknown at the time of this submittal. The alkaline detergent/hot water wash waste stream was discharged to a drywell on the Emerson Avenue property. Trash from this facility was hauled off-site by Rubbish Removal, Inc., and the final disposal location was not indicated (Mailing No. 3, p. 000008). Details regarding waste storage and disposal locations and a site

map were not included in the documents that were available for review. The current status and ownership of this facility was also not indicated.

Townline Road Facility

The types and quantities of wastes generated at the Townline Road facility were indicated in the third mailing (pp. 000003-000004) and are presented in Table 1 herein. Details of the on-site materials storage facilities were not available for review. As noted earlier, a site map for this facility was also not available for review. It was noted that the mixed paint residue and paint thinner wastes that were generated during cleaning of paint booth spray heads were disposed off-site by Solvents & Petroleum Services. However, Lipe-Rollway was "unable to identify the final disposal facility for this waste stream" at the time of its third submittal (September 11, 2000) (Mailing No. 3, p. 000007). The metal shavings and machining waste that were found to contain "trace amounts of cutting oils and/or water-based coolant" were collected in a dumpster on-site, and hauled off-site by Roth Steel, Inc. to a location where Lipe-Rollway believed it would be recycled. The alkaline dip and etch solution waste was discharged to the Syracuse sanitary sewer system pursuant to a permit issued by the City of Syracuse (the permit number was not included in the documents reviewed). At the time of their third submittal, Lipe-Rollway indicated that they could not identify the hauler and final disposal facility that were used to dispose waste oil.

Lipe-Rollway was "unable to locate any documents pertaining to waste disposal from the Townline Road facility" (Mailing No. 3, p. 000007).

Facility Permits

The USEPA ID number for the Morgan Road facility, a generator of hazardous waste, is NYD002228419.

Lipe-Rollway was issued an Onondaga County Industrial Wastewater Discharge Permit, Permit Number 64, for the Morgan Road facility that was valid between January 1, 1994 and January 1, 1997 (Mailing No. 1, Attachment 13, pp. 000598-000624). The permit allows Lipe-Rollway to discharge sanitary wastewater and wastewater emanating from metal etching, quenching, and wash operations for treatment at the Wetzel Road Wastewater Treatment Facility. This treatment plant, located approximately 1.3 miles northwest of the facility (see Figure 2), discharges to the Seneca River. Sewer #1 was designated as the total facility effluent monitoring location. Effluent limitations were listed on pages 000603 and 000604 of Mailing No. 1 (Attachment 13).

Lipe-Rollway filed for a USEPA/NYSDEC Notice of Intent (NOI) for Stormwater Discharges Associated with Industrial Activity under the SPDES (State Pollutant Discharge Elimination System) General Permit on March 8, 1995 and the NPDES (National Pollutant Discharge Elimination System) General Permit on September 28, 1992 (Mailing No. 1, Attachment 12, pp. 000285-000287). Based on these forms, it was indicated that there was no associated quantitative data for the discharge, and the receiving water body was "unnamed." The site investigations performed by ESC indicate that stormwater from roof drains is directed to the wetland area east of the main building shown on Figure 4 which likely flows into Sawmill Creek.

NYSDEC Division of Air Certificates to Operate an Air Contamination Source were provided for six emission points for the Morgan Road facility (Permit Number 7-312400-0416) (Mailing No. 1, Attachment 13, pp. 000628-000634). The permits were issued on

April 1, 1988 and expired on April 1, 1993. A letter from NYSDEC dated April 1991 was provided which informed Lipe-Rollway that the company did not have to take any action to renew any expiring or expired air permits and that this letter would serve as an interim Certificate to Operate for the Morgan Road facility (Mailing No. 1, Attachment 13, pp. 000627-000634). The contaminants which are regulated at the six emission points are liquid mist NEC, nitric acid mist, oil mist, and particulates. Permissible and measured air emission rates of these contaminants are discussed in Section 3.4. The Morgan Road facility was issued a permit extension on April 21, 1996 for their air permit (Mailing No. 2, Attachment 13, pp. 000707-000708).

In 1995, the Morgan Road facility was issued an Out-of-State Hazardous Waste Generator Number by the Missouri Department of Natural Resources, Missouri Generator ID Number 029231. This permit and supporting documentation were provided in Mailing No. 1 (Attachment 12, pp. 000299-000335). The permit allows the Morgan Road facility to transport hazardous waste to Missouri for disposal. The permit is for registration and identification purposes. The materials that Lipe-Rollway indicated would be transported were: D035 (methyl ethyl ketone); F003 (flammable liquids, N.O.S.); and F005 (flammable liquids, oil) (Mailing No. 1, Attachment 12, p. 000329). No additional information was included with the permit as to the actual type(s) of hazardous waste transported to Missouri, volume of waste, or the date(s) of transport.

It was noted that the Townline Road facility was issued a permit to discharge alkaline dip etch waste to the Syracuse sanitary sewer system (Mailing No. 3, p. 000007). However, a copy of the permit and the permit number were not included in the documents that were available for review.

Information on permits for the other Lipe-Rollway facilities was not included in the documents available for review.

3.0 POTENTIAL PATHWAYS FOR RELEASE OF HAZARDOUS SUBSTANCES TO THE LAKE SYSTEM

3.1 Soil

Soil on the seven Lipe-Rollway sites can be contaminated directly from on-site waste disposal and spills that occur during chemical and waste storage and handling. There was no soil information available for review for five of the Lipe-Rollway facilities. The remaining two sites are discussed below.

Morgan Road Facility

Soils at the site may have been contaminated from one or more of the underground storage tanks (USTs), aboveground storage tanks (ASTs), and heat treat trenches shown on Figures 3, 4, and 6. According to these site maps, the storage tanks contained cutting oil, fuel oil, gasoline, naphtha, quench oil, and waste oil. All exterior USTs and ASTs were closed in place or removed by 1998, as noted in Section 2.3. The conditions of the tanks at the time of their closure, removal, or replacement were not indicated in the documents that were available for review. Tank inspection documents were also not available for review, which would help identify possible sources of leaks to the soil. Soil contamination and free product were encountered under the floor slab of the heat treat department located in the southeastern portion of the main building. Reportedly, the release was caused by the failure of seals between sections of the quench oil return line (ESC,1999, p. 16).

Lipe-Rollway provided a waste manifest, accounts payable voucher, and a soil sampling report that indicated a ruptured tank was replaced by a 1,000-gallon steel UST on August 13, 1991. The specific tank that was replaced was not indicated in the documents reviewed, however, the only tank that is shown on Figures 3 or 4 as being replaced in 1991 was the

waste oil UST. Although it was not explicitly stated, it is likely that the "Waste Oil UST (Replaced 1991)" label on Figure 3 is the same tank that is labeled on Figure 4 as the "Used Cutting Oil UST (Removed 1998)." However, if this is not true, then the waste oil UST that was installed in 1991 would be the only existing operational UST at the facility. The tank replacement, and the contaminant spill which prompted its removal and replacement, are discussed in detail in Section 4.1.

There is an area labeled "Truck Well" on Figure 3 which serves as a loading dock for the facility as discussed in the ESC Environmental Site Assessment (ESC, 1996a). The loading dock was described as a paved truck pit that sloped towards the building. ESC stated that any spilled material would drain to a sump located at the base of the pit and that the sump has no outlet. The quality and quantity of accumulated sump materials, if any, were not described in the available documents. It was generally not noted whether Morgan Road facility storage areas were paved, and the Spill Prevention, Control, and Countermeasures (SPCC) Plan referred to in ESC's Summary of Investigations (ESC, 2000) was not included in the documents that were reviewed.

Figures 3 and 4 show that scrap chips were formerly stored on a pad south of the main building. Scrap chips are currently stored in a roll-off container located inside the main building along the south-central wall. It is assumed that the chips are generated during machining operations and are composed of steel, cast iron, and bronze. Two other waste storage areas which are exterior of the main building (to the east) are the baghouse and the grinding swarf container, as shown on Figure 4. Parts washing operations included the use of TCE for oil removal, and the waste TCE was stored in drums prior to transport. Waste manifests indicate that waste wash liquids containing TCE were stored in 55-gallon drums prior to transport and disposal. According to the ESC Environmental Site Assessment (ESC, 1996a), poly tanks and drums of waste liquids are stored in the hazardous waste and waste

oil storage shed located east of the main building. Incidental spills on the shop floor and drum handling on-site were possibly sources of TCE to the soils at the plant.

Figure 6 shows the extent of free product contamination resulting from the leak in the quench oil gravity return line under the floor slab in the heat treat department (ESC,1999, Figure 4). The revised Remedial Action Work Plan states "The return line was reportedly excavated and repaired or replaced; however, no remediation was conducted" (ESC, 1999, p.16). The nature and extent of the contamination is discussed in Section 4.2.1.

An inactive water well is shown on the Lipe-Rollway site map included in the 1996 ESC Environmental Site Assessment (Figure 3 herein), but is not shown in the 2000 ESC Summary of Investigations (Figure 4 herein). The water well could have possibly provided a pathway for migration of contaminants to subsurface soils in addition to groundwater. The existing condition of the water well, if still present, was not indicated in the documents reviewed.

Emerson Avenue Facility

It was indicated in the third Lipe-Rollway submittal that the Emerson Avenue facility generated an alkaline detergent and hot water wash waste stream that was discharged to a drywell on their property (Mailing No. 3, p. 000007). It was not indicated in the documents that were available for review, whether the drywell could have provided a pathway for migration of contaminants to soils and groundwater. The existing condition of the drywell was not indicated in the documents reviewed.

3.2 Surface Water

Contaminated stormwater runoff from the seven Lipe-Rollway facilities is a potential source of pollutants to off-site surface waters. Each of the sites is adjacent to tributaries of Onondaga Lake (see Figure 1). Outdoor materials storage and handling facilities may serve as sources of off-site contamination if stormwater comes into contact with stored or spilled contaminants. The Morgan Road facility was the only site for which data were provided regarding the facility's impact on surrounding surface water bodies. Site maps, detailed site operation information, and waste generation, storage, and disposal data were only available for the Morgan Road facility. In the third mailing, Lipe-Rollway identified a potential source for surface water contamination at the Emerson Avenue facility (discussed below). Preventive measures to limit runoff contamination at the seven Lipe-Rollway sites, if any, were not identified in the documents that were available for review. Lipe-Rollway indicated that they did not discharge treated or pre-treated material to Onondaga Lake or its tributaries, or to a municipal sewerage system (Mailing No. 1, p. 000004). However, Lipe-Rollway did discharge wastewater to the municipal sewer as noted in Section 2.3. Surface water data were only provided for the Morgan Road facility.

Morgan Road Facility

Stormwater runoff from the "roof of the main building is conveyed through an underground pipe that discharges at the edge of the wetland area approximately 500 feet east of the manufacturing building. A channel originates at the outfall and extends approximately 20 feet east towards the wetland" (ESC, 2000, p. 7). Maps showing the extent of the wetland area, such as a wetland delineation map, were not available for review. However, Figure 4 does show an area labeled "roof drain outfall area" and Figure 7 herein shows samples collected in this area. It was noted in the ESC Summary of Investigations (ESC, 2000) that stormwater originating west of the main building collects in drainage swales along the access

roads and flows to a drainage ditch along Morgan Road and surface water from the parking lot north of the plant building also drains northwest towards Morgan Road. There is a drainage ditch located along the northern property boundary which was used to determine representative surface soil background concentrations as described in Section 4.2.1 (see Figure 4). ESC stated that this ditch does not receive stormwater runoff from portions of the site currently used for industrial activities, and the surface water drainage in its vicinity is southwest towards the outfall (ESC, 2000, p. 9). There is a drainage ditch shown on Figure 4, located east of the building and south of the hazardous material storage shed, which directs stormwater into the wetland area. Stormwater on the eastern, undeveloped portion of the site infiltrates into the ground or flows to the wetland area or Sawmill Creek. According to ESC (2000, p. 23), the general ground surface topography west of Sawmill Creek slopes to the west toward the wetland area and the Morgan Road facility. ESC also indicated that the general regional topography in the vicinity of the facility is "north-northwest towards the Seneca River" (ESC, 2000, p. 4). It was also noted that elevations in the wetland area are highest along the northern perimeter, where surface water is likely to drain to the southwest towards the outfall (ESC, 2000, p. 8).

The Morgan Road facility's main building is located approximately 1,800 ft west of Sawmill Creek, and approximately 2.1 miles northeast of the northern shore of Onondaga Lake. Sawmill Creek enters the Morgan Road site along the northern property line near a railroad spur and then flows south along the eastern property line. The ESC Summary of Investigations (2000) indicated that four drainage ditches enter the site at the northern and eastern property boundaries, and these are shown on Figure 4. These ditches convey stormwater runoff into Sawmill Creek from the area of the railroad line and nearby commercial properties.

As noted in Section 2.3, Lipe-Rollway filed for USEPA Notices of Intent (NOI) for Stormwater Discharges Associated with Industrial Activity under the SPDES (State Pollutant

Discharge Elimination System) General Permit on March 8, 1995 and the NPDES (National Pollutant Discharge Elimination System) General Permit on September 28, 1992 (Mailing No. 1, Attachment 12, pp. 000285-000287). It was noted in the NOIs that there was no associated quantitative data for the discharges, and the receiving water bodies were "unnamed." It was also noted in the Summary of Investigations (ESC, 2000, p. 21) that Lipe-Rollway conducts semi-annual sampling of the stormwater discharge to the wetland area in accordance with the facility's SPDES General Permit. The analyzed parameters include "oil and grease, lead, chromium, nickel, and zinc." The collected stormwater data and a copy of the SPDES permit were not available for review. The closest water bodies are Sawmill Creek or possibly the on-site wetland (if the wetland regularly has standing water). Approximations of the quantities of stormwater discharged were not provided in the documents that were reviewed.

The outdoor materials and waste storage areas, and loading/unloading areas which could be potential sources of surface water runoff contamination are as follows: naphtha, waste oil, and cutting oil ASTs; hazardous waste and waste oil shed; scrap metal container; grinding swarf container; baghouse; scrap chips container; and former scrap chips pad. The aforementioned naphtha, waste oil, and cutting oil ASTs were potential spill locations and potential sources of contamination prior to their closure and/or removal. The parking area would also be a potential source of runoff contamination if it has been used for the parking of hazardous material transport vehicles, and there were historical spills from these vehicles.

Exposed areas of contaminated soil can also be sources of contamination to surface water, and were noted in Section 3.1. Soil was analyzed in the vicinity of a ruptured tank in 1991, however, the soil was not found to contain elevated pollutant concentrations as indicated in Section 4.2.1. Additional soil sampling was conducted in 1995 and 1998. These data are summarized in Section 4.2.1.

South Geddes Street Facility

The former South Geddes Street facility is approximately 7,000 ft southeast of the southern shore of the lake. The site is approximately 1,000 ft north of the point where Harbor Brook enters a culvert, and 3,700 ft west of Onondaga Creek.

Seymour Street Facility

The former Seymour Street facility is approximately 1.5 miles southeast of the southern shore of the lake. Harbor Brook is located approximately 1,200 ft west of the site.

Maltbie Street Facility

The former Maltbie Street facility is approximately 1 mile southeast of the southern shore of the lake. The site is adjacent to Onondaga Creek approximately 6,000 ft upstream of the lake.

Emerson Avenue Facility

The former Emerson Avenue facility is approximately 1,400 ft south of Onondaga Lake. Harbor Brook is located approximately 100 to 200 ft north of the site and the former Erie Canal was also located just north of this site. The vibratory finishing operation that was conducted at this site generated an alkaline wash waste stream that was "discharged to a pipe and then to a railroad drainage culvert adjoining the Emerson Avenue property" (Mailing No. 3, p. 000008). The receiving water associated with this culvert was not indicated in the documents that were available for review, however, it is likely to have been Harbor Brook. It was indicated in the third Lipe-Rollway submittal that the Emerson Avenue facility generated an alkaline detergent and hot water wash waste stream that was discharged to a

drywell on their property (p. 000007). It is possible that the drywell could have possibly provided a pathway for migration of contaminants to soils and groundwater, and then to nearby surface waters. The existing condition of the drywell (and the entire site) were not indicated in the documents reviewed.

West Fayette Street Facility

The former West Fayette Street facility is approximately 1.4 miles southeast of the southern shore of the lake. Onondaga Creek is located approximately 1,500 ft east of the site. The culverted section of Harbor Brook is approximately 2,500 ft west of the site.

Townline Road Facility

The former Townline Road facility is approximately 4.2 miles east of the eastern shore of the lake. The site is approximately 800 ft south of Ley Creek.

3.3 Groundwater

Groundwater beneath the seven Lipe-Rollway facilities can be contaminated directly from leaching of contaminants from the facility's storage and disposal activities, and by the direct application of contaminants to the soil.

Morgan Road Facility

Potential sources of groundwater contamination at the Morgan Road facility are the same as the potential sources of soil contamination (i.e., USTs, ASTs, scrap chips storage pads, baghouse, grinding swarf container, heat treat trenches, and water well). Groundwater may

also be affected by discharges to the wetland area. A summary of available groundwater data is provided in Section 4.2.1.

Emerson Avenue Facility

In addition to the potential sources identified above, another potential source of groundwater contamination for the Emerson Avenue facility includes the drywell used for disposal of the alkaline detergent/hot water wash waste stream generated during the vibratory finishing process (Mailing No. 3, p. 000007).

3.4 Air

Air emissions represent a local source of contaminants to the atmosphere with potential deposition to the ground surface and subsequent overland transport to surface waters via surface runoff. Aside from the Morgan Road facility, there was no air quality information available for review for the other six Lipe-Rollway facilities.

Morgan Road Facility

As noted in Section 2.3, NYSDEC air permits were provided for six Morgan Road facility emission points (Permit Number 7-312400-0416) (Mailing No. 1, Attachment 13, pp. 000627-000634). The permits were issued on April 1, 1988 and expired on April 1, 1993, and a letter from NYSDEC dated April 1991 was provided which informed Lipe-Rollway that action would not be required to renew their expiring or expired air permits for the Morgan Road facility. Furthermore, it was indicated that this letter would serve as an interim Certificate to Operate for the Morgan Road facility (Mailing No. 2, Attachment 13, p. 000709). The Morgan Road facility was issued a permit extension on April 21, 1996 for their air permit (Mailing No. 2, Attachment 13, p. 000707). There is a baghouse east of the

main building indicated on the site maps provided by Lipe-Rollway. Baghouses are typically associated with dust control systems which would indicate an exhaust system in that area of the facility.

The contaminants which are regulated at the six emission points are liquid mist NEC, nitric acid mist, oil mist, and particulates. The permitted and actual emissions are presented in Table 2 herein, which shows that there were no annual exceedances of the permitted levels (Mailing No. 1, Attachment 9, p. 000067). It should be noted that the air permit forms that were available for review, and which have been summarized in Table 2, did not indicate a discharge of paint and paint thinners. However, the summary in Mailing No. 1, Attachment 9 (p. 000067) indicates that 2,000 pounds per year of paint and paint thinners were released to the air.

3.5 County Sewer System

The only Lipe-Rollway facilities for which information was available for review regarding sanitary sewer discharges were the Morgan Road and Townline Road facilities. With the exception of the Morgan Road facility's on-site stormwater runoff outfall system, Lipe-Rollway did not indicate whether there were any other storm sewer conveyances constructed on-site for any of their seven facilities. Descriptions of the wastewater discharges are presented below.

Table 2: Permissible and Actual Air Emissions Data, Morgan Road Facility

Emission Point (Process/Unit Description)	Regulated Contaminant	Permissible Rate of Emission (lb/yr)	Actual Rate of Emission (lb/yr)
Emission Point 15 (Non-destructive testing process) [1]			
	Nitric Acid Mist	153.6	153.6
	Liquid Mist NEC	307.2	307.2
	Liquid Mist NEC	19.2	1.92
Emission Point 18 (Black Oxide process) [1]			
	Liquid Mist NEC	652.8	652.8
	Liquid Mist NEC	249.6	249.6
	Liquid Mist NEC	153.6	153.6
Emission Point 19 (Bronze surface conditioning process) [1]			
	Liquid Mist NEC	96.0	96.0
	Liquid Mist NEC	2,227	2,227
Emission Point 27 (Exhaust ventilator for the heat treat quenching process)			
	Oil Mist	756	756
Emission Point 28 (Exhaust unit for salt bath unit heat treating process)			
	Particulates [2]	1,848	1,848
Emission Point 30 (Shot blasting cleaning process)			
	Particulates [3]	47,044	1,152

Sources: Lipe-Rollway, Mailing No. 1, Attachment 9, p. 000067, and Attachment 13, pp. 000627-000634.

Notes: 1 = There are multiple permissible emission rates for liquid mist NEC from these emission points.
2 = This particulates emission was described as chloride salts in Mailing No. 1 (Attachment 9, p. 000067).
3 = This particulates emission was described as shot blast dust in Mailing No. 1 (Attachment 9, p. 000067).

Morgan Road Facility

The Morgan Road facility has historically discharged wastewater into the Onondaga County Department of Drainage and Sanitation (OCDDS) system for treatment at the Wetzel Road Wastewater Treatment Facility. According to a December 23, 1993 letter from OCDDS, the average daily flow rate in 1992 was 31,280 gallons per day (Mailing No. 1, Attachment 13, p. 000598). Numerous Notices of Violation (NOVs) were included in the submission which indicate that there have been exceedances of effluent limitations for oil and grease, pH, total chromium, and total toxic organics. The existing sanitary sewer, which extends from north of the facility to the east and beyond Sawmill Creek, is shown on Figure 4 herein. There is also a sanitary sewer line shown in the north-south direction to the east of Morgan Road.

The majority of exceedances were for oil and grease, and pH, for which the acceptable regulatory levels are less than 150 mg/L for oil and grease, and 5.5 to 9.5 for pH. Oil and grease concentrations were measured as high as 258 mg/L on February 27, 1991 (Mailing No. 2, Attachment 9, p. 000656), a high pH of 12.2 was measured on May 9, 1995 (Mailing No. 2, Attachment 9, p. 000682), and a low pH of 4.9 was measured on March 12, 1995 (Mailing No. 2, Attachment 9, p. 000675). Many other violations were noted in 1994 and 1995.

The Morgan Road facility was issued a Notice of Hearing from Onondaga County in December 1995 for repeated pH violations of their sewer permit between October 1994 and November 1995. It was indicated that the company contributed accidental discharges, or spills, into the County sewer system on January 31, 1995, February 3, 1995 and February 10, 1995 (Mailing No. 2, Attachment 9, pp. 000691-000693).

Two NOVs for the Morgan Road facility were included in the submission for exceedances of the total toxic organics (TTOs) limit of 2.13 mg/L. These violations include: an April 6,

1995 discharge with a TTO concentration of 21.1 mg/L; and two discharges on January 24-25, 1996 with TTO concentrations of 540 mg/L and 11 mg/L (Mailing No. 2, Attachment 9, pp. 000694, 000699). Since laboratory reports were not provided, the specific compounds (e.g., benzene) responsible for the TTO exceedances are unknown.

One NOV dated May 30, 1996 was included in the submission for an exceedance of the permitted total chromium monthly maximum average limit of 1.71 mg/L for discharges during the month of July 1995. The measured level was 1.75 mg/L and samples collected after July 1995 and prior to the date of the letter (May 1996) were in compliance for total chromium (Mailing No. 2, Attachment 9, p. 000704).

Townline Road Facility

At the Townline Road facility, the alkaline dip etch waste stream was "discharged to the Syracuse sanitary sewer system pursuant to a permit issued by the City of Syracuse" (Mailing No. 3, p. 000007). The permit and permit number were not included in the documents that were reviewed.

4.0 LIKELIHOOD OF RELEASE OF HAZARDOUS SUBSTANCES TO THE LAKE SYSTEM

4.1 Documented Releases

Documented Spills

In their submittal, Lipe-Rollway indicated that their facilities have "had the following accidental releases to the environment," however, there were no releases listed subsequent to that comment on that page or the next few pages (Mailing No. 1, Attachment 9, p. 000067). There were, however, releases from the Morgan Road facility discussed elsewhere in the mailings and in the ESC reports, and those will be summarized below.

Morgan Road Facility

In the Environmental Site Assessment (ESC, 1996a, p. 11), ESC stated that two USTs were removed in 1991: a 500-gallon gasoline tank (located near the southwest corner of the building); and a 1,000-gallon waste oil tank (located next to the scrap chips container). The report stated that a release was detected from the waste oil tank and that 20 cubic yards of contaminated soil were removed. The report also indicated that tank removal or verification sampling reports were not available. After removal of the waste oil UST, the tank was replaced with another 1,000-gallon UST for the storage of used cutting oil (Mailing No. 1, Attachment 12, pp. 000249-000256). According to the Summary of Investigations (ESC, 2000), this used cutting oil UST was removed in 1998 (Figure 4). Analytical laboratory data were provided for soil that was tested on August 31, 1991, however, the location of the sample was not indicated. It is assumed that the sample was collected from the area of soil that was potentially affected by the waste oil UST rupture because the laboratory report was dated only 2½ weeks after the replacement tank purchase order and the date of the transport

manifest. Also, Lipe-Rollway submitted the report and these two documents on consecutive pages (Mailing No. 1, Attachment 12, pp. 000249-000252). The soil sample was tested for PCBs, petroleum hydrocarbons, TCLP metals, and TCLP volatile organic compounds (VOCs) (Mailing No. 1, Attachment 12, pp. 000252, 000254). PCBs and the TCLP parameters were not detected in this soil sample. Under the total petroleum hydrocarbon analyses, kerosene and #2 fuel oil were both reported as less than 4,000 mg/kg (ppm) and lube oil was determined to be "present." A footnote on the laboratory report (p. 000254) indicates that the detected pattern represents a heavier fuel oil (possibly #4) at an estimated amount of 4,000 mg/kg.

The 500-gallon gasoline UST was also removed in 1991. As noted above, the 1996 ESC Environmental Site Assessment stated that no tank removal reports or verification sampling were available. In the fall of 1995, a Phase II investigation was conducted at the Morgan Road facility, and included the collection of soil samples from the former gasoline UST area at the southeast corner of the main building. The field work was summarized in the Environmental Site Assessment (ESC, 1996a). Additional sampling of the gasoline UST area was conducted by ESC on October 2, 1998 (ESC, 2000), and the findings of both investigations are summarized in Section 4.2.1.

In the revised Remedial Action Work Plan (ESC, 1999, p. 15), ESC indicated that two investigations have been conducted in the heat treat area. A Phase II investigation was performed in the heat treat area in October 1995 that involved drilling and sampling eight soil borings inside and outside the main building. A second investigation was performed in May and June 1999 to determine the extent of free product on the groundwater table at monitoring well MW-4. The findings of each investigation are discussed in Section 4.2.1.

ESC indicated that "a PCB transformer was formerly located southeast of the main building approximately 800 feet from the roof drain outfall area" (ESC, 2000, p. 21). This

transformer was removed from the property in October 1997. ESC also indicated that Morgan Road facility personnel reported there were never any releases from this PCB transformer during its operation. The roof PCB transformers were removed in 1987, and no reports regarding releases from these transformers were noted in the documents reviewed (ESC, 1996a, p. 14).

During October 1998, ESC observed "that uncontrolled dumping has occurred in Sawmill Creek and along the railroad right-of-way. The dumping did not appear to have been conducted by Lipe-Rollway personnel, as evidenced by the presence of household appliances and other residential debris that are not associated with Lipe-Rollway's manufacturing operations" (ESC, 2000, p. 9).

The Morgan Road facility was issued a Notice of Hearing from Onondaga County for repeated violations of their OCDDS industrial wastewater discharge permit (Permit No. 64) between October 1994 and November 1995, because the company contributed accidental discharges or spills into the County sewer system. Additional information regarding these violations is presented in Section 3.5.

Emerson Avenue Facility

Lipe-Rollway indicated that two waste streams from the former Emerson Avenue facility were discharged on-site (Mailing No. 3, pp. 000007-000008). The first waste stream was alkaline detergent and hot water wash that was discharged to a drywell on-site. The second waste stream consisted of alkaline wash that was discharged to a pipe and then to a railroad drainage culvert adjacent to the Emerson Avenue property. The exact location of the drywell, discharge pipe, and culvert were not indicated and, as noted earlier, no site map was available for review. An estimate of the quantities of the waste and a detailed description

of the types of contaminants that were released to the environment during these events were not indicated in the documents that were reviewed.

Ongoing/Recent Releases

The only ongoing releases from the Lipe-Rollway facilities that were described in the documents reviewed were for permitted air emissions and discharges to the municipal sewer. These releases are summarized in Sections 3.4 and 3.5, and in Table 2 herein.

4.2 Threat of Release to the Lake System

4.2.1 Extent of Site Contamination

The three Lipe-Rollway mailings did not include any information on the extent of site contamination for any of their seven facilities. There were, however, three reports prepared by ESC (1996a, 1999, and 2000) that were provided by NYSDEC which document environmental investigations at the Morgan Road facility. The results of these investigations are discussed below.

Morgan Road Facility

A series of investigations were performed by ESC to evaluate the potential for releases at the Lipe-Rollway Morgan Road facility to "affect the environmental quality of the Onondaga Lake drainage system" (ESC, 2000, p. 1). The 2000 report was prepared on behalf of Emerson Electric Company (Emerson) as part of "Emerson's application to the voluntary cleanup program in the spring of 1996." Lipe-Rollway is a subsidiary of Emerson. The potential areas of concern which were investigated by ESC in their Summary of Investigations were: the hazardous waste and waste oil storage shed; the ditch located south

of the hazardous waste and waste oil storage shed; the former gasoline UST pit near the southeast corner of the main building (not shown on the site maps that were available for review); the roof drain outfall and the wetland area; and sediments of Sawmill Creek (ESC, 2000, pp. 1-2). It should be noted that ESC data tables were based on analytical laboratory reports which ESC originally included with their report as a "separate enclosure" (ESC, 2000, p. ii). This separate enclosure (Appendix C) was not available for review. Thus, the following data tabulations are based on ESC's tabulations in their report rather than the laboratory forms.

The Summary of Investigations Report (ESC, 2000) did not discuss the existence of soil contamination and free product under the floor slab of the heat treat department. This information was presented in the revised Remedial Action Work Plan (ESC, 1999) and is also discussed below.

Soil: Morgan Road Facility

A total of 56 geoprobe soil borings were installed at the Morgan Road facility during October and November 1995. ESC attempted to install six monitoring wells during this time, however, two were abandoned prior to well installation (MW-1 and MW-3) because water was not encountered above a depth of 30 ft bgs.

Soil borings were installed in the following areas as shown on Figure 3: the naphtha AST; the waste oil AST; inside and outside the hazardous waste and waste oil storage shed; the scrap chips container pad; the cutting oil AST and the underground lines leading to the main building; the two quench oil USTs; the former scrap chips pad; the gasoline UST; the two fuel oil USTs; inside and outside the degreasers located in the etching room; the inside drum storage room; the underground lines in the heat treatment room; and the waste oil UST (ESC, 1996a, pp. 16-20).

Soil samples were analyzed for total petroleum hydrocarbons (TPHs), and select samples were also analyzed for polycyclic aromatic hydrocarbons (PAHs) and VOCs based on the TPH results and the field screening. Although a significant number of samples reported high concentrations of TPHs, these results are not discussed here in detail as there is no NYSDEC recommended cleanup criterion for TPH. According to ESC (1996a, p. 3), a "comparison of soil sample analytical results with the boring logs indicates that soil which exhibits staining or odors generally contains TPH concentrations above 1,000 mg/kg." Based on data reported in Table 3 of ESC, 1996a, the following areas contained soil with TPH concentrations greater than 1,000 mg/kg: naphtha AST (up to 1,200 mg/kg at location B-1); grinding swarf pad (up to 1,500 mg/kg at B-6); hazardous waste and waste oil storage shed (up to 6,000 mg/kg at B-12); cutting oil AST (up to 3,900 mg/kg at B-10); heat treat trenches (up to 42,000 mg/kg at B-34); waste oil UST (up to 3,700 mg/kg at B-41); former scraps chip pad (up to 14,000 mg/kg at B-21); and the scrap chips container (up to 9,000 mg/kg at B-43). The complete results are presented in the Environmental Site Assessment (ESC, 1996a) in Tables 1 through 4.

The revised Remedial Action Work Plan (ESC, 1999, p. 15) indicates that eight soil borings were drilled inside the heat treat department and east of the main building to depths of 8 to 16 feet bgs (Figure 6). Soil samples were collected near the surface, at the depth of the quench oil return line (8 to 12 feet bgs), and deeper if staining or oil was encountered. Each soil sample was analyzed for TPH by USEPA Method 418.1. Nine samples contained TPH concentrations above the site-specific screening level of 100 mg/kg. ESC stated that "TPH concentrations above 100 mg/kg were detected at depths ranging from the surface (B-34) to a depth of 16 feet bgs (B-39). The highest TPH concentration (42,000 mg/kg) was detected in B-34 at a depth of 4 to 6 feet. No VOCs or PAHs were detected in the heat treat area at concentrations above the evaluation criteria" (ESC, 1999, p. 15).

Soil boring B-6, located near the grinding swarf pad, contained benzo(a)pyrene at a concentration of 140 μg/kg in a surficial soil sample, slightly above the NYSDEC recommended soil cleanup objective (RSCO) of 61 μg/kg. VOCs were not analyzed in this sample. Two soil borings, located near the former gasoline UST, reported concentrations of BTEX compounds above their respective RSCOs. Sample B-23 was collected at a depth of 8-10 ft bgs and reported the following exceedances: benzene (7.9 mg/kg, RSCO of 0.06 mg/kg); toluene (100 mg/kg, RSCO of 1.5 mg/kg); ethylbenzene (41 mg/kg, RSCO of 5.5 mg/kg); and xylenes (194 mg/kg, RSCO of 1.2 mg/kg). PAHs were not analyzed in this sample. Soil boring B-45 contained xylenes at a concentration of 1.6 mg/kg, slightly above the RSCO of 1.2 mg/kg.

Soil boring B-34, located on the east side of the main building in the heat treat trench area, contained benz(a)anthracene at a concentration of 330 μg/kg (RSCO of 224 μg/kg) in a sample collected at a depth of 4-6 ft bgs. Soil boring B-52, located near the hazardous waste and waste oil storage shed, contained cis-1,2-dichloroethene at concentrations of 450 μg/kg and 780 μg/kg (duplicate) (RSCO of 300 μg/kg) in a sample collected at a depth of 5-7 ft bgs.

ESC concluded that approximately 6,500 cubic yards of soil would have to be excavated (based on areas with TPH concentrations greater than 1,000 mg/kg), including 3,600 cubic yards (cu yd) that would need to be treated or properly disposed (ESC, 1996a, pp. 4 and 31). Table 6 of ESC, 1996a indicates that the majority of the soil requiring excavation (4,450 cu yd) would be from the "heat treat room and outside building" area, with lesser amounts from the former scrap chips pad (740 cu yd), grinding swarf pad (330 cu yd), cutting oil AST (300 cu yd), scrap chips container (300 cu yd), gasoline UST (220 cu yd), and the hazardous waste and waste oil storage shed (150 cu yd). It was also indicated that most of the soil with concentrations of TPH greater than 1,000 mg/kg and petroleum present in nearby perched groundwater is inaccessible due to the presence of the building. The extent of the ESC-

recommended soil remediation, if performed, was not indicated in the documents reviewed. Groundwater remediation was not suggested by ESC.

On October 2, 1998, ESC collected a continuous soil sample at 6 to 8 ft bgs at the location of the former gasoline UST pit southeast of the main building (location B-58). The soil boring log indicates that there was a "moderate to strong petroleum odor" between 7 and 17 ft bgs, with a high photoionization detector (PID) reading of 300 ppm at 7 ft bgs (ESC, 2000, Appendix B). It was not indicated whether non-aqueous phase liquid (NAPL) was detected. Soil data that were collected from this location are presented in Table 3 herein (ESC, 2000, Table 12). Only analytical data from the 6 to 8 ft range were provided for this location, and these data for location B-58 have been compared to NYSDEC RSCOs and average site background concentrations, where possible (ESC, 2000, Table 4). ESC also collected eight surface soil samples from "a drainage ditch along the northern property line" (see Figure 4) to represent site background soil concentrations for metals, but not for organic compounds (ESC, 2000, p. 7). As noted in Section 1.4, the ditch used for background soil levels "does not receive stormwater runoff from portions of the site presently used for industrial activities." However, it was not indicated if there were any potential off-site sources of contamination to this ditch. Both the RSCOs and the average background concentrations were exceeded in the samples collected from the former gasoline UST pit for 14 metals and 6 volatile organic compounds (VOCs). Of these six VOCs, BTEX compounds (benzene, toluene, ethylbenzene, and xylenes) exceeded the RSCOs by at least an order-of-magnitude. Other VOCs for which RSCOs are not available (e.g., trimethylbenzenes) were also detected at elevated concentrations. Three semivolatile organic compounds (SVOCs) were detected, but at concentrations less than the RSCOs. PCBs and pesticides were not detected.

Table 3: Soil Concentrations, Morgan Road Facility Former Gasoline UST Pit

Analytes	NYSDEC RSCO (mg/kg)	Range [Avg] of Background Concs. (mg/kg) [1]	B58-4 [6-8' bgs] (mg/kg)	Analytes	NYSDEC RSCO (µg/kg)	B58-4 [6-8' bgs] (µg/kg)
Metals				**VOCs**		
Aluminum	SB	5420-11200 [7739]	**13000**	Benzene	60	**940**
Antimony	SB	ND-0.57 [0.14]	**0.29**	n-Butylbenzene	NA	16000
Arsenic	7.5 or SB	2.5-4.3 [3.3]	**9.1**	sec-Butylbenzene	NA	3200
Barium	300 or SB	40.7-73.7 [50.6]	37.6	Chloroform	300	**770**
Beryllium	0.16 or SB	0.22-0.56 [0.43]	**0.57**	Ethylbenzene	5500	**49000**
Cadmium	1 or SB	0.19-0.87 [0.46]	ND	Isopropylbenzene	NA	6900
Calcium	SB	4400-14500 [9510]	**15200**	p-Isopropyltoluene	NA	6700
Chromium	10 or SB	11.9-27.3 [19.9]	**20.7**	Methylene Chloride	100	**3600**
Cobalt	30 or SB	4.2-7.4 [5.6]	**61.5**	n-Propylbenzene	NA	26000
Copper	25 or SB	21.4-47.6 [34.4]	**229**	Toluene	1500	**95000**
Iron	2000 or SB	8040-18900 [12030]	**23000**	1,2,4-Trimethylbenzene	NA	150000
Lead	SB	124-318 [231]	16.1	1,3,5-Trimethylbenzene	NA	170000
Magnesium	SB	2530-7290 [5059]	**17800**	Xylenes (Total)	1200	**288000**
Manganese	SB	345-833 [494]	**628**	**SVOCs**		
Mercury	0.1	ND-0.16 [0.08]	0.03	2-Methylnaphthalene	36400	9600
Nickel	13 or SB	12.9-22.4 [16.7]	**44.3**	Naphthalene	13000	8100
Potassium	SB	882-2030 [1329]	**1420**	Phenanthrene	50000	190
Selenium	2 or SB	ND-2.1 [0.8]	ND			
Silver	SB	ND-4.1 [2.0]	ND			
Sodium	SB	ND-106 [54]	**106**			
Thallium	SB	ND-1.2 [0.3]	ND			
Vanadium	150 or SB	15.2-29.1 [19.6]	14.6			
Zinc	20 or SB	58.1-132 [95.2]	54.6			

Sources: ESC, 2000, Tables 4 and 12; NYSDEC Technical and Administrative Guidance Memorandum #4046, Determination of Soil Cleanup Objectives and Cleanup Levels. January 24, 1994, Updated July 10, 1998.

Notes: 1 = Background soil concentrations were provided for metals, not organics.
SB = Site background; ND = Not detected; NA = Not available.
Boldfaced values exceed both the NYSDEC RSCO and the average background level.

ESC compared measured organic concentrations to the NYSDEC Spill Technology and Remediation Series (STARS) TCLP alternative guidance values (NYSDEC, 1993), and compared metals data to three times the mean background concentrations. ESC concluded that "the metals concentrations detected in the soil of the former tank pit were similar to those detected in the background soil samples" and metals were, therefore, "not a concern in this area" (ESC, 2000, p. 23). ESC also concluded that the organic compounds that were detected at elevated concentrations were all "petroleum-related," and should be remediated "as proposed in the draft Remedial Action Work Plan for the property" dated October 1996 (ESC, 1996b). The results of this remedial action, if performed, were not available for review.

On October 27, 1998, three surficial soil samples and one duplicate sample were collected by ESC from the Morgan Road facility drainage ditch, which is located south of the hazardous waste and waste oil storage shed, at the location of two former drum storage areas (samples SS-1 and SS-2), and at one location downgradient (SS-3). These locations are shown on Figure 4 herein. In the 2000 ESC report, this area is referred to as the "former drum locations." The ESC soil metals data for these samples are presented in Table 4a herein, and were compared to NYSDEC RSCOs and the same average background concentrations considered for the former gasoline UST pit area. Soil concentrations from the drainage ditch adjacent to the hazardous waste and waste oil storage shed exceeded both the NYSDEC RSCO and the average site background concentration for 15 metals. Of these exceedances, those samples that exceeded the RSCOs and average background concentrations by more than a factor of five were antimony, barium, and nickel.

Table 4a: Soil Metals Concentrations, Morgan Road Facility Drainage Ditch

Metals	NYSDEC RSCO (mg/kg)	Range [Avg] of Background Concs. (mg/kg)	SS-1 (mg/kg)	SS-11 [1] (mg/kg)	SS-2 (mg/kg)	SS-3 (mg/kg)
Aluminum	SB	5420-11200 [7739]	**10000**	**10500**	**8980**	**8900**
Antimony	SB	ND-0.57 [0.14]	**0.67**	**0.53**	**0.49**	**0.89**
Arsenic	7.5 or SB	2.5-4.3 [3.3]	2.2	1.9	2.6	2
Barium	300 or SB	40.7-73.7 [50.6]	155	108	77.7	**789**
Beryllium	0.16 or SB	0.22-0.56 [0.43]	**0.58**	**0.51**	**0.45**	**0.46**
Cadmium	1 or SB	0.19-0.87 [0.46]	ND	ND	ND	0.18
Calcium	SB	4400-14500 [9510]	3460	3290	**38600**	**9750**
Chromium	10 or SB	11.9-27.3 [19.9]	14.3	14	**42.1**	**28.8**
Cobalt	30 or SB	4.2-7.4 [5.6]	9.6	6.8	23.5	9.2
Copper	25 or SB	21.4-47.6 [34.4]	25.2	27.8	**89.8**	**91.7**
Iron	2000 or SB	8040-18900 [12030]	**16400**	**15100**	**16300**	**15800**
Lead	SB	124-318 [231]	14.6	14.1	37	43
Magnesium	SB	2530-7290 [5059]	3240	3330	**24700**	**5210**
Manganese	SB	345-833 [494]	**837**	104	**702**	335
Mercury	0.1	ND-0.16 [0.08]	0.06	0.08	**0.11**	**0.16**
Nickel	13 or SB	12.9-22.4 [16.7]	14.1	14.1	**112**	**32.9**
Potassium	SB	882-2030 [1329]	1180	1250	**2060**	**1700**
Selenium	2 or SB	ND-2.1 [0.8]	ND	ND	ND	ND
Silver	SB	ND-4.1 [2.0]	ND	ND	ND	ND
Sodium	SB	ND-106 [54]	ND	ND	ND	ND
Thallium	SB	ND-1.2 [0.3]	**1.3**	**1.1**	ND	**0.6**
Vanadium	150 or SB	15.2-29.1 [19.6]	20	18.6	11.6	16.5
Zinc	20 or SB	58.1-132 [95.2]	48.4	47.3	**101**	**137**

Sources: ESC, 2000, Tables 4 and 7. NYSDEC Technical and Administrative Guidance Memorandum #4046, Determination of Soil Cleanup Objectives and Cleanup Levels. January 24, 1994, Updated July 10, 1998.

Notes: 1 = SS-11 was a duplicate sample of SS-1.
SB = Site background; ND = Not detected.
Boldfaced values exceed both the NYSDEC RSCO and the average background level.

Organic contaminants that were detected during the drainage ditch soil sampling in 1998 are presented in Table 4b herein. For the pesticides and semivolatile organic compounds that were detected, there were no exceedances of NYSDEC RSCOs. PCBs and other organic contaminants, which were not included in Table 7 of the ESC report, are assumed to have been not detected. ESC compared measured metals concentrations to three times the mean concentration of each metal detected in the eight background soil samples (ESC, 2000, p. 17). VOCs and SVOCs in the drainage ditch were compared to NYSDEC RSCOs. ESC concluded that, of the metals of concern for which elevated concentrations were detected, the levels either do not "pose a significant threat to human health or the environment" or were localized to a small area (ESC, 2000, p. 19). Furthermore, ESC noted that "no VOCs, SVOCs, pesticides, or PCBs" were measured above their "evaluation criteria." Most of these data were not available for review and the available data are shown in Tables 4a and 4b herein.

No soil information was available for review for the other six sites.

Groundwater: Morgan Road Facility

According to ESC (2000), a total of eight borings were completed as groundwater monitoring wells (MW-1 through MW-8), however, two of the wells (MW-1 and MW-3) were abandoned. The locations of these wells are shown on Figures 4 and 5. Monitoring wells MW-2, MW-4, MW-5, and MW-6 were sampled as part of the Phase II investigation in 1995 and data were summarized in the Environmental Site Assessment (ESC, 1996a). Four in-situ groundwater samples were also collected at locations downgradient of the hazardous waste and waste oil storage shed in April 1998 in order to assist with the placement of additional monitoring wells (samples GP-01 through GP-04, see Figure 4). In August 1998, two monitoring wells, MW-7 and MW-8, were installed based on the results of the in-situ

Table 4b: Soil Organic Compound Concentrations, Morgan Road Facility Drainage Ditch

Analytes	NYSDEC RSCO (µg/kg)	SS-1 (µg/kg)	SS-11 [1] (µg/kg)	SS-2 (µg/kg)	SS-3 (µg/kg)
SVOCs					
Benzyl alcohol	NA	ND	110	ND	ND
bis(2-Ethylhexyl)phthalate	50000	180	130	ND	ND
Di-n-butylphthalate	8100	ND	89	106	ND
Pesticides					
4,4-DDE	2100	ND	ND	11	ND
4,4-DDT	2100	ND	ND	76	ND

Sources: ESC, 2000, Tables 4. NYSDEC Technical and Administrative Guidance Memorandum #4046, Determination of Soil Cleanup Objectives and Cleanup Levels. January 24, 1994, Updated July 10, 1998.

Notes: 1 = SS-11 was a duplicate sample of SS-1.
SB = Site background; ND = Not detected; NA = Not available.
Boldfaced values exceed both the NYSDEC RSCO and the average background level.

samples (ESC, 2000). The results of these groundwater samples are presented in Tables 5, 6, and 7.

At the Morgan Road facility, groundwater sampling results (see Table 5 herein) from MW-2, located adjacent to the scrap chips pad, reported no detections of VOCs and total petroleum hydrocarbons (TPH) at a concentration of 2.1 mg/L. Monitoring well MW-4, located near the southeast corner of the main building, contained TPH at a concentration of 2.4 mg/L. Several VOCs were reported at concentrations below the NYSDEC Class GA groundwater standards. Trichloroethene was reported at a concentration of 5.9 μg/L, slightly above the standard of 5 μg/L. Monitoring well MW-5 (and duplicate sample MW-10) located inside the hazardous waste and waste oil storage shed, contained TPH at concentrations of 2.9 mg/L and 2.0 mg/L, respectively. Concentrations of 2-butanone, 1,1-dichloroethene, 1,2-dichloroethene (total), trichloroethene, and vinyl chloride were reported at concentrations significantly above the standards. Monitoring well MW-6, located adjacent to the former fuel oil USTs near the northwest corner of the main building, contained select VOCs at concentrations below the standards.

The results of the in-situ groundwater sampling (see Table 6 herein) indicated that vinyl chloride was detected at a concentration of 13.1μg/L in GP-01, located downgradient of the hazardous waste and waste oil storage shed. Except for acetone, VOCs were not detected in the other in-situ groundwater samples at concentrations above the Class GA standards. Data from downgradient monitoring wells MW-7 and MW-8 (and duplicate sample MW-18) indicate that the VOC contamination is restricted to the area near the hazardous waste and waste oil storage shed (see Table 7 herein). Data from these monitoring wells (MW-5, MW-7, and MW-8) indicate that this contamination is not migrating beyond the immediate vicinity of the shed (ESC, 2000, p. 24). ESC recommended that no further investigation or groundwater remediation be performed.

Table 5: Groundwater Concentrations, Morgan Road Facility, 1995 Investigation

Analytes	NYSDEC Class GA Standards	MW-2	MW-4	MW-5	MW-6	MW-10 [1]
Miscellaneous						
TPH (mg/L)	NA	2.1	2.4	2.9	ND	2.0
PAHs (μg/L)	NA	ND	ND	ND	ND	ND
VOCs (μg/L)						
Acetone	50	ND	14 J	ND	ND	ND
2-Butanone	50	ND	16 J	**310 J**	13	**300**
1,1-Dichloroethene	5	ND	ND	ND	ND	**230**
cis-1,2-Dichloroethene	5	ND	2.6 J	**1500**	2.0	**1200**
trans-1,2-Dichloroethene	5	ND	3.0 J	**480**	2.3	**290**
Trichloroethene	5	ND	**5.9**	**72 J**	1.4	**48**
Vinyl Chloride	2	ND	ND	**540**	ND	**240**

Sources: ESC, 1996a, Table 5. NYS Division of Water Technical and Operational Guidance Series (T.O.G.S., 1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, October 22, 1993. Revision: June 1998.

Notes: 1 = MW-10 is a duplicate of MW-5.
NA = Not available.
Boldfaced values exceed the NYSDEC Class GA standard or guidance value.

Table 6: In-Situ Groundwater VOC Concentrations, Morgan Road Facility, 1998 Investigation

Analytes	NYSDEC Class GA Standards	GP-01	GP-02	GP-02A	GP-03	GP-04	GP-70 [1]	GP-04A
VOCs (μg/L)								
Acetone	50	ND	**50.2**	ND	13.8	**70.8**	**70**	ND
Methylene Chloride	5	ND	ND	2	ND	ND	ND	2
Trichloroethene	5	3.5	ND	ND	ND	ND	ND	ND
Vinyl Chloride	2	**13.1**	ND	ND	ND	ND	ND	ND
Xylenes	5	ND	ND	ND	ND	ND	ND	2

Sources: ESC, 2000, Table 3. NYS Division of Water Technical and Operational Guidance Series (T.O.G.S., 1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, October 22, 1993. Revision: June 1998.

Notes: 1 = GP-70 is a duplicate of GP-4.
Boldfaced values exceed the NYSDEC Class GA standard or guidance value.

Table 7: Groundwater Concentrations, Morgan Road Facility, 1998 Investigation

Analytes	NYSDEC Class GA Standards	MW-7	MW-8	MW-18 [1]
VOCs (μg/L)				
Methylene Chloride	5	ND	ND	ND
Xylenes, Total	5	ND	ND	2
Total Metals [Dissolved Metals] (μg/L)				
Aluminum	NA	1140 [ND]	ND [ND]	ND [ND]
Arsenic	25	ND [ND]	5.4 [4.4]	7.9 [3.6]
Barium	1000	64.2 [NA]	11.7 [NA]	12.2 [NA]
Beryllium	3	NA [ND]	NA [ND]	NA [1.1]
Calcium	NA	186000 [ND]	456000 [443000]	430000 [411000]
Copper	200	ND [ND]	ND [ND]	ND [ND]
Iron	NA	1970 [ND]	2150 [1600]	2030 [1360]
Lead	25	2.2 [ND]	ND [2.6]	ND [ND]
Magnesium	35000	**69700 [40900]**	**97500 [92300]**	**92400 [81800]**
Manganese	NA	875 [ND]	227 [157]	222 [145]
Potassium	NA	6850 [7500]	62500 [61200]	58500 [54400]
Silver	50	3.8 [4.1]	ND [ND]	4.3 [ND]
Sodium	20000	5260 [6020]	**51300 [52100]**	**48800 [45000]**
Zinc	2000	ND [ND]	ND [ND]	ND [ND]

Sources: ESC, 2000, Table 13. NYS Division of Water Technical and Operational Guidance Series (T.O.G.S., 1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, October 22, 1993. Revision: June 1998.

Notes: 1 = MW-18 is a duplicate of MW-8.

NA = Not available. For NYSDEC guidelines, there are no NYS H(WS) Ambient Water Quality Standards or Guidance Values for these parameters as listed in T.O.G.S. 1.1.1, June 1998.

Boldfaced values exceed the NYSDEC Class GA standard or guidance value.

The Summary of Investigations Report (ESC, 2000) did not discuss the existence of the free product encountered within the weathered shale under a portion of the heat treat department and in a limited area outside the building in the vicinity of existing monitoring well MW-4 (Figure 6). This information was presented in the revised Remedial Action Work Plan (ESC, 1999). It was noted that a free product sheen was observed on the water surface southeast of the main building (ESC,1999, p. 25). Emerson proposed to remove the measurable free product with a product-only recovery system and to allow remaining product sheen to attenuate naturally (ESC,1999, p. 25). The areas of measurable product and sheen are shown on Figure 6.

Groundwater data were not available for review for the other six sites.

Surface Water: Morgan Road Facility

ESC collected one surface water sample on October 27, 1998 from the channel east of the Morgan Road facility's outfall to the wetlands area. The sample was collected during dry weather conditions from a channel that "originates at the outfall and extends approximately 20 feet east toward the wetland area" (ESC, 2000, p. 7). The surface water sample location, SW-1, was located 10 ft east of the roof drain outfall as shown on Figure 7 herein, and the data that were presented in the ESC report (ESC, 2000, Table 8) are shown in Table 8 herein. Detections of one of the SVOCs (bis(2-ethylhexyl)phthalate) and one metal (copper) were slightly greater than the NYSDEC Class C surface water standards for protection of aquatic life from chronic effects. None of the other metals exceeded the standards or guidance values. Data for chromium were not provided and it is not known if this analyte was detected in the surface water sample collected. VOCs, other SVOCs, pesticides, and PCBs were not detected in this water sample (ESC, 2000, p. 19). ESC noted that the evaluation criteria they used for comparison were the "groundwater effluent limitations" listed in the June 1998 NYSDEC T.O.G.S. 1.1.1

Table 8: Surface Water Sampling Results, Morgan Road Facility Outfall Area

Analytes	NYSDEC Surface Water Standards and Guidance Values [1]		SW-1	
SVOCs (μg/L)				
bis(2-Ethylhexyl)phthalate	0.6		**1**	
Metals (μg/L)	**Total Metals**	**Dissolved Metals**	**Total Metals**	**Dissolved Metals**
Aluminum	100 (ionic Al)	NA	ND	142
Arsenic	NA	150	ND	-
Barium	NA	NA	53.5	49.4
Cadmium	NA	2.1 [2]	-	0.29
Calcium	NA	NA	55200	54100
Copper	NA	9.0 [2]	ND	**13.4**
Iron	300	NA	181	274
Lead	NA	3.8	2.6	0.95
Magnesium	NA	NA	17500	17200
Manganese	NA	NA	11.6	19.2
Potassium	NA	NA	13400	13100
Silver	0.1 (ionic Ag)	NA	ND	-
Sodium	NA	NA	22900	22100
Zinc	NA	82.6 [2]	59.9	54.4

Sources: ESC, 2000, Table 8.
NYS Division of Water Technical and Operational Guidance Series (T.O.G.S., 1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, October 22, 1993. Revision: June 1998.

Notes: 1 = Standards and guidance values are shown for Class C waters which were developed for protection of aquatic life from chronic effects, A(C), in freshwaters.
2 = Listed values are based on a water hardness of 100 ppm.
NA = Not applicable, that is, there are no NYSDEC A(C) Ambient Water Quality Standards or Guidance Values for these parameters as listed in T.O.G.S. 1.1.1, June 1998.
ND = Not detected.
Boldfaced values exceed the NYSDEC Class C standard or guidance value.

document, however, the reason why groundwater evaluation criteria were used to analyze surface water samples was not indicated (ESC, 2000, Table 8).

Sediment: Morgan Road Facility

In addition to the surface water sample that was collected from the roof drain outfall area, ESC also collected a sediment sample (SS-4) from that same location on October 27, 1998, from the channel that originates at the outfall, and extends to the east into the wetland area. Twenty-five additional sediment samples were collected by ESC between January 6, 1999 and March 5, 1999, from thirteen "locations within the wetland to further evaluate the horizontal and vertical extent of PCBs and metals detected in sediment sample SS-4" (ESC, 2000, p. 8). Although not indicated by ESC, it is assumed that sample SS-84 is a duplicate of SS-34 and sample SS-87 is a duplicate of SS-37. Sediment sample locations are shown on Figure 7 herein, and the data are presented in Table 9 herein (ESC, 2000, Figure 4 and Table 6). Surficial samples were collected at each of the locations (0 to 0.5 ft bgs), and samples from 1.5 to 2.0 ft bgs were collected at nine of the locations (SS-31 through SS-39).

Eight "background samples" were collected from the northern perimeter of the wetland and were analyzed for metals, and the range and average of these concentrations are noted in Table 9 herein. These background samples are also shown on Figure 7 herein. It was indicated that "the background sample locations are unlikely to be affected by discharges from the roof drain" because this area is at a slightly higher elevation than at the roof drain area, and the surface drainage was observed to be southwest toward the outfall (ESC, 2000, pp. 8-9). Neither ground surface elevations nor a topographic map were provided.

Sediment metals concentrations were compared to both NYSDEC Severe Effect Levels (SELs) screening criteria (NYSDEC, 1999) and average site background concentrations, and values that exceeded both are noted in Table 9 herein as boldfaced text. Exceedances were detected in surficial sediment for antimony (4 locations), total chromium (14 locations),

Table 9: Sediment Concentrations, Morgan Road Facility Roof Drain Outfall Area

Metals	Range [Avg] of Background Concs. (mg/kg)	NYSDEC		SS-4 (mg/kg) [0-0.5']	SS-20 (mg/kg) [0-0.5']	SS-21 (mg/kg) [0-0.5']	SS-22 (mg/kg) [0-0.5']	SS-23 (mg/kg) [0-0.5']	SS-24 (mg/kg) [0-0.5']
		LEL (mg/kg)	SEL (mg/kg)						
Aluminum	8720-13700 [11203]			3360	4500	1820	4790	5260	4280
Antimony	ND-6.2 [2.6]	2	25	2	11.1	5.7	**113**	**27.3**	**30.1**
Arsenic	2.7-8.4 [4.9]	6	33	3	7.2	4.1	12.4	10.5	7.5
Barium	90.8-503 [241.0]			27.8	75.4	29.6	340	153	127
Beryllium	ND-0.64 [0.47]			0.24	0.31	0.37	0.52	ND	ND
Cadmium	ND-0.44 [0.15]	0.6	9	ND	1.6	1.3	3.1	3.5	3.6
Calcium	10600-33000 [18050]			39500	6750	54100	6200	7130	6930
Chromium(tot)	13.8-629 [236.1]	26	110	**260**	**1070**	**643**	**11300**	**2580**	**2940**
Chromium(hex)	NA			NA	NA	NA	NA	NA	NA
Cobalt	6.1-19.6 [11.8]			10.1	9.6	5.9	14.5	14.3	9.4
Copper	22.4-87.5 [48.7]	16	110	**459**	**189**	**188**	**629**	**309**	**287**
Iron	14800-28000 [21563]	20000	40000	20300	15900	10400	14400	17400	14900
Lead	17.2-84.1 [40.7]	31	110	**227**	**205**	107	**587**	**387**	**327**
Magnesium	4570-15900 [8274]			15900	3950	3490	2070	2200	1910
Manganese	844-18700 [5866]	460	1100	350	514	98.9	544	1210	528
Mercury	ND-0.32 [0.13]	0.15	1.3	0.07	0.1	0.05	0.41	0.3	0.34
Nickel	15-23 [19.5]	16	50	27	33.8	37	32.9	45.9	48.8
Potassium	1590-2580 [1945]			504	806	333	874	834	760
Selenium	0.79-11.1 [4.52]			ND	0.9	0.74	1.9	1.9	2.5
Silver	ND-7.9 [3.2]	1	2.2	ND	ND	ND	ND	ND	ND
Sodium	ND-199 [86.7]			99.4	ND	ND	ND	ND	ND
Thallium	ND-ND [ND]			0.31	ND	ND	2.7	ND	ND
Vanadium	18.9-32.1 [24.2]			24.5	69.1	169	44.6	82.9	110
Zinc	41.8-471 [178.9]	120	270	**573**	**593**	**289**	**747**	**836**	**727**

Sources: ESC, 2000, Tables 6 and 9; NYSDEC, Technical Guidance for Screening Contaminated Sediments, January 1999.
Notes: LEL = Lowest Effect Level; SEL = Severe Effect Level; ND = Not detected; NA = Not analyzed.
Boldfaced values exceed the NYSDEC SEL and the average background level.

Table 9: Sediment Concentrations, Morgan Road Facility Roof Drain Outfall Area (Continued)

Metals	Range [Avg] of Background Concs. (mg/kg)	NYSDEC		SS-25 (mg/kg) [0-0.5']	SS31-1 (mg/kg) [0-0.5']	SS31-2 (mg/kg) [1.5-2']	SS32-1 (mg/kg) [0-0.5']	SS32-2 (mg/kg) [1.5-2']	SS33-1 (mg/kg) [0-0.5']
		LEL (mg/kg)	SEL (mg/kg)						
Aluminum	8720-13700 [11203]			7890	8710	10400	10700	9710	7440
Antimony	ND-6.2 [2.6]	2	25	**29.9**	7.4	ND	8.2	ND	13.7
Arsenic	2.7-8.4 [4.9]	6	33	8.4	6.4	2.8	5.8	2.6	7.7
Barium	90.8-503 [241.0]			198	187	93.6	230	81.8	208
Beryllium	ND-0.64 [0.47]			0.51	0.63	0.47	0.64	0.45	ND
Cadmium	ND-0.44 [0.15]	0.6	9	3.2	0.7	ND	1	ND	1.4
Calcium	10600-33000 [18050]			5140	27400	1970	7030	1830	8840
Chromium(tot)	13.8-629 [236.1]	26	110	**3100**	**846**	19.2	**856**	24.7	**1410**
Chromium(hex)	NA			NA	ND	NA	ND	NA	ND
Cobalt	6.1-19.6 [11.8]			13.7	22.7	12.2	18.1	13.5	24.8
Copper	22.4-87.5 [48.7]	16	110	**302**	**137**	45.2	81.9	48.8	**117**
Iron	14800-28000 [21563]	20000	40000	17900	21300	20800	22700	21800	24200
Lead	17.2-84.1 [40.7]	31	110	**330**	108	6.2	76.2	5.4	**113**
Magnesium	4570-15900 [8274]			2490	15200	4700	3840	4260	2880
Manganese	844-18700 [5866]	460	1100	430	2750	847	2860	692	2730
Mercury	ND-0.32 [0.13]	0.15	1.3	0.25	0.23	ND	0.22	ND	0.54
Nickel	15-23 [19.5]	16	50	47.1	30.4	24.3	23.9	23.9	22.8
Potassium	1590-2580 [1945]			1410	1560	1510	1700	1620	1050
Selenium	0.79-11.1 [4.52]			1.4	ND	ND	ND	ND	4.5
Silver	ND-7.9 [3.2]	1	2.2	ND	**6.4**	**5.6**	**6.3**	**5.2**	**7.2**
Sodium	ND-199 [86.7]			ND	61.6	38	44.1	24	52.1
Thallium	ND-ND [ND]			ND	ND	ND	ND	ND	ND
Vanadium	18.9-32.1 [24.2]			85.9	28.8	18.9	30.2	19.2	30.2
Zinc	41.8-471 [178.9]	120	270	**688**	**500**	32.4	**462**	33.4	**590**

Sources: ESC, 2000, Tables 6 and 9; NYSDEC, Technical Guidance for Screening Contaminated Sediments, January 1999.
Notes: LEL = Lowest Effect Level; SEL = Severe Effect Level; ND = Not detected; NA = Not analyzed.
Boldfaced values exceed the NYSDEC SEL and the average background level.

Table 9: Sediment Concentrations, Morgan Road Facility Roof Drain Outfall Area (Continued)

Metals	Range [Avg] of Background Concs. (mg/kg)	NYSDEC		SS33-2 (mg/kg) [1.5-2']	SS34-1 (mg/kg) [0-0.5']	SS84-1[1] (mg/kg) [0-0.5']	SS34-2 (mg/kg) [1.5-2']	SS35-1 (mg/kg) [0-0.5']	SS35-2 (mg/kg) [1.5-2']
		LEL (mg/kg)	SEL (mg/kg)						
Aluminum	8720-13700 [11203]			12300	3050	6550	9020	4380	9700
Antimony	ND-6.2 [2.6]	2	25	ND	10.8	16.2	ND	7.5	ND
Arsenic	2.7-8.4 [4.9]	0.6	33	2.4	8.8	13.4	1.2	12.3	4.6
Barium	90.8-503 [241.0]			126	88	182	92.6	280	102
Beryllium	ND-0.64 [0.47]			0.53	ND	ND	0.4	ND	0.44
Cadmium	ND-0.44 [0.15]	6	9	ND	4.1	3.2	ND	3.3	ND
Calcium	10600-33000 [18050]			2740	7420	10800	2550	14100	2430
Chromium(tot)	13.8-629 [236.1]	26	110	28.6	**1040**	**1700**	18.7	**763**	22.2
Chromium(hex)	NA			NA	ND	ND	NA	ND	NA
Cobalt	6.1-19.6 [11.8]			10.4	13.1	18.2	7.4	26.1	17.3
Copper	22.4-87.5 [48.7]	16	110	28	**232**	**285**	16	**133**	64.1
Iron	14800-28000 [21563]	20000	40000	21600	12200	26700	15700	24800	21900
Lead	17.2-84.1 [40.7]	31	110	7.1	**184**	**301**	5.1	88.9	5.6
Magnesium	4570-15900 [8274]			4580	1500	2960	3630	3880	4650
Manganese	844-18700 [5866]	460	1100	421	1280	2220	431	**6180**	1650
Mercury	ND-0.32 [0.13]	0.15	1.3	ND	0.75	0.68	ND	0.32	0.07
Nickel	15-23 [19.5]	16	50	19.9	23.1	38.3	16.5	26.3	29.1
Potassium	1590-2580 [1945]			1460	675	667	1090	1160	1690
Selenium	0.79-11.1 [4.52]			ND	ND	ND	ND	ND	ND
Silver	ND-7.9 [3.2]	1	2.2	**5.9**	**4.9**	**7.7**	**4.4**	**8.8**	**5.7**
Sodium	ND-199 [86.7]			37.1	ND	72.7	46.3	108	24.4
Thallium	ND-ND [ND]			1	ND	ND	0.68	ND	0.53
Vanadium	18.9-32.1 [24.2]			25.1	43.4	81.4	17	37	20
Zinc	41.8-471 [178.9]	120	270	38	**654**	**1140**	33	**947**	30.6

Sources: ESC, 2000, Tables 6 and 9; NYSDEC, Technical Guidance for Screening Contaminated Sediments, January 1999.
Notes: LEL = Lowest Effect Level; SEL = Severe Effect Level; ND = Not detected; NA = Not analyzed.
1 = SS84 is assumed to be the duplicate of SS34.
Boldfaced values exceed the NYSDEC SEL and the average background level.

Table 9: Sediment Concentrations, Morgan Road Facility Roof Drain Outfall Area (Continued)

Metals	Range [Avg] of Background Concs. (mg/kg)	NYSDEC		SS36-1 (mg/kg) [0-0.5']	SS36-2 (mg/kg) [1.5-2']	SS37-1 (mg/kg) [0-0.5']	SS87-1[2] (mg/kg) [0-0.5']	SS37-2 (mg/kg) [1.5-2']	SS38-1 (mg/kg) [0-0.5']
		LEL (mg/kg)	SEL (mg/kg)						
Aluminum	8720-13700 [11203]			11300	10200	6690	8070	7390	NA
Antimony	ND-6.2 [2.6]	2	25	9.4	ND	3.4	2.9	ND	NA
Arsenic	2.7-8.4 [4.9]	0.6	33	3.2	5.3	2.8	3.9	4.1	NA
Barium	90.8-503 [241.0]			144	98.7	122	152	88.3	NA
Beryllium	ND-0.64 [0.47]			0.41	0.45	ND	0.39	0.39	NA
Cadmium	ND-0.44 [0.15]	6	9	1.1	ND	0.69	0.75	ND	NA
Calcium	10600-33000 [18050]			7340	2450	7190	8120	2080	NA
Chromium(tot)	13.8-629 [236.1]	26	110	**896**	30.1	**292**	**307**	11.1	NA
Chromium(hex)	NA			ND	NA	ND	NA	NA	ND
Cobalt	6.1-19.6 [11.8]			9.5	15.6	8	8.3	5.2	NA
Copper	22.4-87.5 [48.7]	16	110	89.6	37.9	72.7	74.2	23.3	NA
Iron	14800-28000 [21563]	20000	40000	14500	22800	12800	16200	15900	NA
Lead	17.2-84.1 [40.7]	31	110	69.4	5.8	53.2	62.2	6.2	NA
Magnesium	4570-15900 [8274]			3650	4600	2560	2980	2050	NA
Manganese	844-18700 [5866]	460	1100	751	1090	1610	2090	198	NA
Mercury	ND-0.32 [0.13]	0.15	1.3	0.39	ND	0.27	0.25	0.06	NA
Nickel	15-23 [19.5]	16	50	18.4	25.8	16.2	15.6	12.3	NA
Potassium	1590-2580 [1945]			1740	1330	1060	1190	550	NA
Selenium	0.79-11.1 [4.52]			ND	ND	3	2.6	ND	NA
Silver	ND-7.9 [3.2]	1	2.2	**4.5**	**5.9**	**5**	**5.7**	**4.5**	NA
Sodium	ND-199 [86.7]			85.4	20.9	ND	ND	ND	NA
Thallium	ND-ND [ND]			ND	0.45	ND	ND	ND	NA
Vanadium	18.9-32.1 [24.2]			23.2	23.6	20.1	24.1	23	NA
Zinc	41.8-471 [178.9]	120	270	**385**	34.2	**338**	**434**	24.3	NA

Sources: ESC, 2000, Tables 6 and 9; NYSDEC, Technical Guidance for Screening Contaminated Sediments, January 1999.
Notes: LEL = Lowest Effect Level; SEL = Severe Effect Level; ND = Not detected; NA = Not analyzed.
2 = SS87 is assumed to be the duplicate of SS37.
Boldfaced values exceed the NYSDEC SEL and the average background level.

Table 9: Sediment Concentrations, Morgan Road Facility Roof Drain Outfall Area (Continued)

Metals	Range [Avg] of Background Concs. (mg/kg)	NYSDEC		SS38-2 (mg/kg) [1.5-2']	SS39-2 (mg/kg) [1.5-2']	SS40-1 (mg/kg) [0-0.5']	SS41-1 (mg/kg) [0-0.5']
		LEL (mg/kg)	SEL (mg/kg)				
Aluminum	8720-13700 [11203]			12500	5780	NA	NA
Antimony	ND-6.2 [2.6]	2	25	ND	ND	NA	NA
Arsenic	2.7-8.4 [4.9]	0.6	33	3.7	0.89	NA	NA
Barium	90.8-503 [241.0]			109	59.6	NA	NA
Beryllium	ND-0.64 [0.47]			0.46	0.28	NA	NA
Cadmium	ND-0.44 [0.15]	6	9	ND	ND	NA	NA
Calcium	10600-33000 [18050]			1610	1600	NA	NA
Chromium(tot)	13.8-629 [236.1]	26	110	53.6	10.6	NA	NA
Chromium(hex)	NA			NA	NA	ND	ND
Cobalt	6.1-19.6 [11.8]			9.5	4.8	NA	NA
Copper	22.4-87.5 [48.7]	16	110	28.1	11.8	NA	NA
Iron	14800-28000 [21563]	20000	40000	19100	10000	NA	NA
Lead	17.2-84.1 [40.7]	31	110	9.8	3.7	NA	NA
Magnesium	4570-15900 [8274]			3660	1960	NA	NA
Manganese	844-18700 [5866]	460	1100	241	111	NA	NA
Mercury	ND-0.32 [0.13]	0.15	1.3	ND	ND	NA	NA
Nickel	15-23 [19.5]	16	50	20	9.7	NA	NA
Potassium	1590-2580 [1945]			1540	634	NA	NA
Selenium	0.79-11.1 [4.52]			ND	ND	NA	NA
Silver	ND-7.9 [3.2]	1	2.2	**5.4**	2.6	NA	NA
Sodium	ND-199 [86.7]			ND	ND	NA	NA
Thallium	ND-ND [ND]			1.1	0.56	NA	NA
Vanadium	18.9-32.1 [24.2]			20.4	10.5	NA	NA
Zinc	41.8-471 [178.9]	120	270	37.9	22.1	NA	NA

Sources: ESC, 2000, Tables 6 and 9; NYSDEC, Technical Guidance for Screening Contaminated Sediments, January 1999.
Notes: LEL = Lowest Effect Level; SEL = Severe Effect Level; ND = Not detected; NA = Not analyzed.
Boldfaced values exceed the NYSDEC SEL and the average background level.

copper (11 locations), lead (8 locations), manganese (1 location), silver (8 locations), and zinc (14 locations). The only exceedance for a deep sample (1.5 to 2.0 ft bgs) was for silver at eight locations. The highest metals concentrations were detected at surface sample locations SS-22 and SS35-1 (approximately 20 and 90 feet northeast of the roof drain outfall, respectively) (see Figure 7 herein).

The highest concentration of chromium (11,300 mg/kg), detected at location SS-22, is over two orders-of-magnitude greater than the NYSDEC SEL for sediment (110 mg/kg) and over three orders-of-magnitude greater than the NYSDEC RSCO (10 mg/kg). The highest concentration of copper (629 mg/kg), also detected at location SS-22, is nearly six times the NYSDEC SEL (110 mg/kg) and 25 times greater than the NYSDEC RSCO (25 mg/kg). The highest concentration of lead (587 mg/kg) was also detected at this location. The highest concentrations of manganese (6,180 mg/kg), silver (8.8 mg/kg), and zinc (947 mg/kg) were detected at surface location SS-35. It should be noted, however, that higher concentrations of manganese (up to 18,700 mg/kg) were detected in the samples identified as "background" by ESC. Also, concentrations of chromium, manganese, silver, and zinc in the "background" samples exceeded the NYSDEC SELs. Therefore, results from these samples are not appropriate for use as background data. Thus, the sediment metals data conclusions noted in the 2000 ESC report, which were based on comparing the data to three times the mean background sample concentrations, are also not appropriate.

PCB concentrations in sediment in the roof drain outfall area, which were presented by ESC in Table 10 of their 2000 report, were detected as high as 1,400 μg/kg (ppb) (location SS-22) among the surficial samples, and 508 μg/kg at 1.5 to 2.0 ft bgs (location SS39-2). These two samples were collected in the same general area, approximately 20 ft northeast of the roof drain outfall (see Figure 7). Based on sample-specific total organic carbon (TOC) values, the NYSDEC screening criteria for PCBs for these two samples are 28 μg/kg and 0.2 μg/kg, respectively (ESC, 2000, Table 10). ESC indicated that the subsurface PCB concentrations were most likely a result of cross-contamination during sampling and that the source of the PCBs in this area is unknown (ESC, 2000, pp. 20-21).

One SVOC, bis(2-ethylhexyl)phthalate, was detected at location SS-4 at a concentration of 550 μg/kg (ESC, 2000, Table 9), which is below the NYSDEC sediment criterion for benthic aquatic life chronic toxicity, which is 23,000 μg/kg based on 11.4% TOC at SS-4 (ESC, 2000, Table 10). SVOCs were not analyzed at the other 13 locations.

ESC noted that there are no current releases of potential contaminants to the wetland area based on surface water sampling events from the roof drain outfall (ESC, 2000, p. 22). Lipe-Rollway conducts semi-annual sampling of the stormwater discharge to the wetland area in accordance with a NYSDEC General SPDES Permit for stormwater discharges associated with industrial activity (ESC, 2000, p. 21). The parameters that are analyzed include chromium, lead, nickel, oil and grease, and zinc. These data were not available for review. As noted earlier, a SPCC Plan, RCRA Contingency Plan, and SWPPP were prepared for the Morgan Road facility, but were also not available for review.

ESC generally concluded that, based on their investigation of the roof drain outfall area's sediment, remediation of the sediment was not warranted. Their conclusion is based on the sediment concentrations included in Tables 6 and 9 of their 2000 report (Table 9 herein), as well as the isolated location of the densely vegetated wetland area, relatively small size of the affected area, and the findings of a number of reports which were not available for review (including the SPCC Plan, RCRA Contingency Plan, and SWPPP). However, since the "background" data used for comparison do not appear to be appropriate, and certain metals are orders-of-magnitude above the NYSDEC standards, ESC's conclusions do not appear justified.

As part of their Sawmill Creek investigation, ESC collected two sediment samples from Sawmill Creek (SS-5 and SS-6), one sediment sample from each of the four drainage ditches which convey stormwater runoff into Sawmill Creek from off-site railroad and commercial/industrial areas to the north and east (SS-27 through SS-30), and one sample from where Sawmill Creek first flows onto the Lipe-Rollway Morgan Road facility property (SS-26). Samples were collected from locations SS-27 through SS-30 to evaluate the source

of contaminants to Sawmill Creek stations SS-5 and SS-6, which are downstream of the four ditches (ESC, 2000, p. 9). The sample locations are shown on Figure 4 herein (ESC, 2000, Figure 2). Sediment concentrations for metals and SVOCs are provided in Tables 10a and 10b herein. Detected sediment concentrations at SS-5 and SS-6 were compared to maximum background concentrations (SS-26 through SS-30) and NYSDEC sediment screening criteria.

As indicated in Table 10a, no metals were detected at concentrations which exceed both NYSDEC SELs and maximum background levels. Concentrations of manganese and zinc at both stations SS-5 and SS-6 exceeded the SEL, while concentrations of arsenic, copper, iron, lead, and nickel only exceeded the NYSDEC Lowest Effect Level (LEL). Concentrations of arsenic (location SS-27), iron (SS-27), manganese (SS-27 and SS-29), and zinc (SS-27) also exceeded the SEL at the background stations (based on data presented in ESC, 2000, Table 5). As indicated in Table 10b herein, the only SVOC that exceeded the NYSDEC screening criteria is benz(a)anthracene at station SS-6. Concentrations of benzo(g,h,i)perylene at both Sawmill Creek stations slightly exceeded the maximum background concentrations. According to ESC (ESC, 2000, p. 22), VOCs, PCBs, and pesticides were not detected at concentrations above the evaluation criteria, however, these data were not included in the 2000 ESC report.

According to ESC (ESC, 2000, p. 23), "surface runoff from the [Lipe-Rollway] facility could not reasonably reach Sawmill Creek ... therefore, the slightly elevated levels of metals and one SVOC in Sawmill Creek sediment reflect offsite sources of contamination and not a source on the Lipe-Rollway property."

Table 10a: Sawmill Creek Sediment Metals Concentrations, Morgan Road Facility

Metals	Maximum of Background Concs. (mg/kg)	NYSDEC		SS-5 (mg/kg)	SS-6 (mg/kg)
		LEL (mg/kg)	SEL (mg/kg)		
Aluminum	12600	NA	NA	12100	9050
Antimony	4.1	2	25	0.91	1.1
Arsenic	1960	6	33	21.2	21.9
Barium	448	NA	NA	212	240
Beryllium	0.74	NA	NA	0.72	0.63
Cadmium	0.35	0.6	9	0.04	ND
Calcium	45300	NA	NA	86400	97700
Chromium(tot)	24.1	26	110	22.5	19.3
Cobalt	15.5	NA	NA	11.8	11.2
Copper	63	16	110	46.8	44.4
Iron	110000	20000	40000	24400	22800
Lead	57.9	31	110	40.4	34.5
Magnesium	13000	NA	NA	19000	17200
Manganese	4260	460	1100	2380	3100
Mercury	0.11	0.15	1.3	0.1	0.11
Nickel	24.1	16	50	25.6	21.9
Potassium	2160	NA	NA	2620	1900
Sodium	1030	NA	NA	309	324
Vanadium	37.2	NA	NA	25.3	25.4
Zinc	559	120	270	321	320

Sources: ESC, 2000, Table 11. NYSDEC, Technical Guidance for Screening Contaminated Sediments, January 1999.
Notes: LEL = Lowest Effect Level; SEL = Severe Effect Level.
ND = Not detected; NA = Not available.

Table 10b: Sawmill Creek Sediment SVOC Concentrations, Morgan Road Facility

SVOCs	Maximum of Background Concs. (µg/kg)	NYSDEC Benthic Chronic Sediment Criteria (µg/kg)	SS-5 (µg/kg)	SS-6 (µg/kg)
Benz(a)anthracene	2000	480 [1]	ND	820
Benzo(a)pyrene	2100	NA	720	1200
Benzo(b)fluoranthene	2500	NA	1400	2300
Benzo(k)fluoranthene	1500	NA	750	970
Benzo(g,h,i)perylene	920	NA	1100	1300
Chrysene	2600	NA	970	1600
Fluoranthene	5400	40800 [1]	1200	2200
Indeno(1,2,3-cd)pyrene	1200	NA	820	1400
Pyrene	4800	38440 [1]	1200	2000

Sources: ESC, 2000, Table 11. NYSDEC, Technical Guidance for Screening Contaminated Sediments, January 1999.
Notes: ND = Not detected.
1 = These NYSDEC Benthic Chronic Sediment Criteria are based on an average sediment organic carbon of 4% (ESC, 2000, Table 5).

NYSDEC also collected sediment samples in Sawmill Creek in 1996 and 1997. Two surface sediment samples (top four inches) were collected in the vicinity of the Lipe-Rollway Morgan Road facility in 1997. According to NYSDEC's field notes, sample SM-5 was collected just upstream of the Sawmill Creek Dump Site (Site ID 311) which is south of and downstream of the Morgan Road facility. Sample SM-6 was collected upstream of SM-5, adjacent to the Crouse-Hinds 7456 Morgan Road facility (Company ID 2015, Site ID 247). Since the Crouse-Hinds facility is north of the Lipe-Rollway facility, it is assumed that sample SM-6 is upstream of the Lipe-Rollway Morgan Road site. NYSDEC collected samples SM-1 through SM-4 in 1996 in Sawmill Creek, downstream of location SM-5. Therefore, the 1996 NYSDEC data were not reviewed for this report.

Most of the metals were detected at both locations (SM-5 and SM-6). Arsenic was detected at levels above the NYSDEC LEL of 6 mg/kg (and below the SEL of 33 mg/kg) at both stations, but decreased from 10.9 mg/kg at station SM-6 to 6.7 mg/kg at station SM-5. Cadmium was detected at levels below the LEL of 0.6 mg/kg at SM-6 (0.33 mg/kg), and above the LEL but below the SEL (9.0 mg/kg) at SM-5 (2.8 mg/kg). Chromium was detected at a level just below the LEL of 26 mg/kg at SM-6 (25.7 mg/kg), and above the SEL of 110 mg/kg at station SM-5 (147 mg/kg). Copper was detected at levels above the LEL of 16 mg/kg and below the SEL of 110 mg/kg at both SM-6 (43 mg/kg) and SM-5 (59.4 mg/kg). Lead was detected above the LEL of 31 mg/kg at SM-6 (40.9 mg/kg), and increased to a level significantly above the SEL of 110 mg/kg at SM-5 (444 mg/kg). Manganese was detected at a level above the LEL of 460 mg/kg at SM-6 (887 mg/kg) and increased to a level above the SEL of 1,100 mg/kg at SM-5 (1,660 mg/kg). Nickel was detected at a level above the LEL of 16 mg/kg at SM-6 (23.2 mg/kg) and increased to a level above the SEL of 50 mg/kg at SM-5 (88.5 mg/kg). Zinc was detected at a level above the LEL of 120 mg/kg at SM-6 (250 mg/kg) and increased to a level significantly above the SEL of 270 mg/kg at SM-5 (1,880 mg/kg). The metals detected at levels above the NYSDEC SELs at the downstream Sawmill Creek station (SM-5), including chromium, lead, manganese, and zinc, were also detected at elevated levels in wetland sediment on the Lipe-Rollway site (see Table 9). The remaining detected metals do not have NYSDEC screening criteria (aluminum, barium,

beryllium, calcium, cobalt, magnesium, potassium, sodium, and vanadium), and exhibited higher concentrations downstream (SM-5) than upstream (SM-6), with the exception of calcium. Wetland area sediment on the Lipe-Rollway site also exhibited elevated concentrations of antimony and silver, however, these analytes were not detected at the two nearby Sawmill Creek sediment sample locations.

One PCB Aroclor (1260) was detected during the 1997 NYSDEC Sawmill Creek sediment sampling event. Aroclor-1260 was detected at concentrations of 32 μg/kg at SM-6 and 45 μg/kg at SM-5. These concentrations do not exceed the NYSDEC benthic aquatic life chronic toxicity sediment criterion for PCBs (1,300 μg/kg based on an average TOC in these two samples of 6.8%). VOCs and SVOCs were not detected in either SM-5 or SM-6, except for the following polycyclic aromatic hydrocarbons (PAHs): acenaphthylene, anthracene, benz(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, benzo(g,h,i)perylene, carbazole, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene, which were all detected in both samples. Each of these SVOCs exhibited higher concentrations at the downstream sample location. Of the parameters which have NYSDEC sediment standards, there were no exceedances of the benthic aquatic life chronic toxicity sediment criteria (based on an average TOC of 6.8%).

Sewer Discharges: Morgan Road Facility

Numerous violations of the OCDDS industrial wastewater discharge permit (Permit No. 64) were provided for the Morgan Road facility. Permit violations which are discussed in Section 3.5 were noted for oil and grease, pH, total chromium, and total toxic organics. The Morgan Road facility was also issued a Notice of Hearing from Onondaga County on December 29, 1995 for repeated pH violations (Mailing No. 2, Attachment 9, pp. 000691-000693).

Sewer Discharges: Townline Road Facility

At the Townline Road facility, the alkaline dip etch waste stream was discharged to the sanitary sewer system pursuant to a permit issued by the City of Syracuse. The permit and permit number, analytical data, and Notices of Violation, if any, were not provided in the documents reviewed.

No sewer discharge information was available for review for the other five sites.

4.2.2 Migration Potential of Contaminants

As indicated in Section 3, there are several potential pathways for the release of contaminants into the lake system. These pathways include erosion and runoff of contaminated soil, discharge of contaminated wastewater and spills/leaks through outfalls into surface waters or the sewer system, migration of contaminants into groundwater and subsequent transport via groundwater flow, and transport into the atmosphere with subsequent deposition to surface waters. The only Lipe-Rollway facility for which sufficient environmental data were available to assess contaminant migration potential was the Morgan Road facility. In addition, general statements are made in this subsection for the Emerson Avenue facility. The remaining five sites could not be evaluated, however, based on historic manufacturing processes at these facilities, and proximity of tributaries of Onondaga Lake, it is possible that these facilities were sources of contamination to the lake system.

Migration Potential: Morgan Road Facility

Specific sources of potential off-site contaminant migration from the Morgan Road facility include contaminants from the former gasoline UST area, the hazardous waste and waste oil storage shed area, and the heat treat trench area, in both soil and groundwater, and runoff from the former drum storage location and wetlands area.

If the contaminated soil from the former gasoline UST pit is removed as recommended by ESC in their Summary of Investigations report (ESC, 2000, p. 27), it would eliminate the soil contamination and remove an on-going source for the groundwater contamination. However, it was not indicated if the remediation has taken place yet.

According to ESC (ESC, 2000, p. 27), contaminated groundwater (VOCs and metals) is limited to the area around the hazardous waste and waste oil storage shed (well MW-5, Table 5) and is not migrating toward the wetland or off-site. This conclusion was based on data from wells north and east of the shed (wells MW-7 and MW-8) as shown in Table 7 herein. Although ESC did not recommend remediation of the contaminated groundwater in this area, they did propose a groundwater monitoring program be implemented as part of the revised Remedial Action Work Plan. These supplemental groundwater monitoring data, if available, would have confirmed that contamination is not migrating, however, this information was not included in the documents which were available for review. It was also not indicated in the documents reviewed if the source of groundwater contamination (e.g., soil beneath the shed) has been remediated.

The revised Remedial Action Work Plan (ESC, 1999, Figures 4 and 7) indicates that a large area of the site beneath the heat treat department area contains free product. The limit of free product is shown herein on Figure 6. In order to prevent further migration of free product, Emerson proposed the installation of a free product recovery system consisting of six extraction wells to recover the free product using the gravity skimming method (ESC,1999, p. 33). The proposed extraction wells were to be located in areas that exhibit the highest rate of recovery. ESC stated that "The pilot study will be designed to collect information necessary to implement the technology, including equipment applications, product recovery rates, and pump run cycles" (ESC, 1999, p. 35). It was not indicated in the documents available for review if the free product recovery system has been installed. The report submitted in 2000 did not discuss this free product contamination nor the free product recovery system.

Contaminants in the facility's drainage ditch soil (including the former drum storage location) could have potentially contributed to contamination of wetland soils sediments since the ditch discharges stormwater into the wetland, or roof drain outfall area. Metals concentrations in the ditch were found to be high. Surface water sampling at the outfall did not show elevated contaminant levels, however, there were high PCB and metals concentrations found within wetland sediment. It was generally noted by ESC that "the wetland area and Sawmill Creek drain southeast toward Onondaga Lake" (ESC, 2000, p. 4), providing a path for contaminant migration into Onondaga Lake. PCBs and metals tend to adsorb to sediment particles so that the migration potential for PCBs and metals from the wetland area appears to be low.

Sediment sampling from Sawmill Creek on the Lipe-Rollway site did not result in the detection of excessive contaminant levels, with the exception of manganese and zinc which exceeded NYSDEC SELs (Tables 10a and 10b). Sawmill Creek also receives runoff from at least four drainage ditches from the north and east (see Figure 4) which would combine with runoff from the Morgan Road facility wetland area in the creek.

Migration Potential: Emerson Avenue

The migration potential of contaminants from the Emerson Avenue facility is difficult to assess due to the lack of information on disposal practices or quantities of wastewater generated. The wastewater discharged to the drywell would have a high potential for affecting groundwater quality at the site. The wastewater discharged to the drainage ditch adjacent to the railroad tracks would have a moderate to high potential to reach the lake system given the relatively short distance from the site to Onondaga Lake via Harbor Brook. This wastewater most likely contained cutting oils, metal filings, and abrasives from the finishing process. This facility was in operation for 35 years (1950 to 1985).

5.0 POTENTIAL FOR ADVERSE IMPACTS TO LAKE SYSTEM DUE TO A RELEASE OR THREAT OF A RELEASE

5.1 Hazardous Substance Characteristics

The only three Lipe-Rollway facilities for which information is available regarding hazardous substances that have been generated, stored, and/or disposed, are the Morgan Road, Emerson Avenue, and Townline Road facilities. Table 1 herein contains a list of the wastes that were generated at these facilities. Of these three sites' generated wastes, those that were potentially hazardous include: Morgan Road facility waste TCE prior to 1991, waste coolant prior to 1995, oil-based sludge, acidic Nital Etch waste, and alkaline liquid waste from the Black Oxide (prior to September 2000), Bright Dip (prior to September 2000), and parts washing operations; Emerson Avenue facility waste paint and paint thinner and alkaline wastewater; and Townline Road waste paint and paint thinner, and alkaline dip and etch solution. Of these three sites, the only site for which environmental data are available is the Morgan Road facility.

Data to determine contaminants of concern at the four remaining facilities not discussed in this section (the Lipe-Rollway facilities on South Geddes Street, Seymour Street, Maltbie Street, and West Fayette Street) were not available for review.

Morgan Road Facility

Lipe-Rollway indicated that there is a hazardous waste and waste oil storage shed, as well as a drum storage area, adjacent to the Morgan Road facility main building (see Figure 3). The types and quantities of materials stored in this area were not indicated in the documents that were available for review, and it is possible that this area has been a source of contamination to groundwater. Aboveground and underground storage tanks have been used at the facility to store fuel, naphtha, and oils, and as of March 28, 2000 (date of the ESC Summary of Investigations), only one exterior UST still remained: a 20,000-gallon quench

oil tank located in the southeast corner of the facility that was closed in place in 1998. Other than documented spills (see Section 4.1), there were no incidents of on-site hazardous waste disposal at the Morgan Road facility described in the documents reviewed.

Free product and soil containing elevated levels of TPH exist within the weathered shale under a portion of the heat treat department and in a limited area outside the building as shown on Figure 6 and discussed in Sections 3 and 4.

According to ESC (2000), the only sources of PCB waste at the Morgan Road facility were PCB transformers which have been removed. These transformers were removed from operation and taken off-site in the 1980s (Mailing No. 1, Attachment 12) and October 1997 (ESC, 2000, p. 21). ESC indicated that "future releases of PCBs from current site operations are unlikely" because other PCB sources are not known (ESC, 2000, p. 21). Sampling of sediment in the roof drain outfall area between October 27, 1988 and March 5, 1999 indicated that there were PCBs detected in 14 of 24 collected samples, and as high as 1,400 mg/kg. PCBs may therefore be considered a threat for off-site contamination (i.e., runoff from the wetland area, groundwater contamination). It should be noted that the ESC report's Table 10 shows 24 samples with 14 detections (not including a duplicate), and it was noted in their text that there were 23 samples with 13 detections (ESC, 2000, p. 20).

Benzene, toluene, ethylbenzene, and xylene (BTEX) exhibited elevated concentrations in soil in the former gasoline UST pit area (Table 3). It was noted that the contaminated soil in this area should be remediated (ESC, 2000, p. 23), however, the status of this remediation was not noted in the documents reviewed.

A waste oil UST located near the scrap chips container that was replaced in 1991, was found to be leaking. Approximately 20 cubic yards of soil were removed prior to replacing the UST as noted in Section 4.1. The replacement UST was removed in 1998. It was not noted whether other USTs and/or ASTs that have been removed from the site exhibited leaks, thereby releasing contaminants into the soil and/or groundwater.

Soil from the Morgan Road facility drainage ditch located east of the main building and just south of the hazardous waste and waste soil storage shed (see Figure 4) was found to contain levels of barium, chromium, copper, magnesium, nickel, and zinc that exceeded NYSDEC recommended soil cleanup objectives by at least a factor of two (Table 4a).

Total chromium was detected in six surface sediment samples from the runoff outfall/wetlands area at concentrations greater than ten times the NYSDEC Severe Effect Level, with the maximum detection of chromium (11,300 mg/kg) greater than 100 times the NYSDEC SEL (Table 9). Detections of other metals (e.g., copper, lead, manganese, silver, and zinc) in the surface sediments in this area also exceeded the NYSDEC SELs. The samples used as "background" by ESC, also collected in this outfall area (Figure 7), also contained levels of chromium and other metals that exceeded the NYSDEC SELs. In the wetland sediment samples, the only NYSDEC SEL exceedances for the deep samples (1.5-2.0 ft bgs) were for silver at eight locations and manganese at one location, suggesting most of the contamination is limited to the surficial, high organic-content sediments. These metals, particularly chromium, should be considered potential contaminants of concern in the respective areas in which they were detected.

Groundwater contamination is present beneath the hazardous waste and waste oil storage shed to the east of the main building. Contaminants that greatly exceeded NYSDEC Class GA standards include 2-butanone, 1,1-dichloroethene (DCE), cis and trans 1,2-dichloroethene, trichloroethene (TCE), and vinyl chloride (Table 5).

Other potentially hazardous waste releases from the Morgan Road facility include liquid mist NEC, nitric acid mist, and oil mist, which are permitted air emissions (Table 2).

A discussion of hazardous substance characteristics for the primary contaminants of concern, chromium (as a representative metal) and VOCs, is provided below.

Emerson Avenue Facility

It was indicated in the Lipe-Rollway documents that were reviewed that two facility waste streams were regularly discharged to the environment, which could have impacted the Onondaga Lake system. The Emerson Avenue facility discharged vibratory finishing process waste (an alkaline wash waste stream with waste iron and steel shavings and chips) directly into a railroad drainage culvert. It is possible that this flow reached Harbor Brook which is adjacent to this facility. The processing (tear down) of returned clutches generated an alkaline detergent and hot water wash waste stream which was discharged into an on-site drywell. These two waste disposal operations would likely have an adverse impact to surface water, soil, and/or groundwater. Details were not available for review regarding the composition of these waste streams, therefore, the potential contaminants of concern for this facility could not be determined. There were no other generated hazardous wastes, on-site waste disposal activities, or land disposal of waste operations described for this facility in the documents reviewed.

Townline Road Facility

According to the documents reviewed, the only incidence of potentially hazardous waste disposal at the Townline Road facility was the discharge of alkaline dip and etch solution waste into the Syracuse sanitary sewer system. Details were not available for review regarding this alkaline waste, therefore, the potential contaminants of concern for this facility could not be determined.

Mobility

The fate and mobility of chromium in soil is dependent on the pH, redox potential, and sorption characteristics of the soil. Reduction of hexavalent chromium (Cr(VI)) to trivalent chromium (Cr(III)) is facilitated by low pH (USDHHS, 1991). Chromium in soil is predominantly in the trivalent form and as an insoluble oxide, and is, therefore, not very mobile in soil (USDHHS, 1991). Also, chromium in soil can be transported to the atmosphere as an aerosol or dust or can be transported via surface runoff to receiving waters in soluble or bulk precipitate form. Chromium in soluble and unadsorbed complexes in soil can leach into groundwater, depending upon soil pH (USDHHS, 1991).

VOCs rapidly volatilize into the atmosphere and, thus, volatilization is considered the most important fate and transport process of VOCs in surface water and in surficial soil. Photooxidation of VOCs in the atmosphere produces hydrochloric acid, carbon monoxide, carbon dioxide, and carboxylic acid. In surface waters, dissolved VOCs will rapidly volatilize into the atmosphere where photooxidation will occur. In soil, BTEX compounds are considered very mobile under most subsurface conditions and will readily leach into groundwater. Movement in groundwater is generally not severely retarded. Solubilities for BTEX compounds are relatively high, giving these compounds a high mobility in groundwater. Chlorinated solvents are slightly less soluble than BTEX compounds but are still considered to be relatively soluble in water and thus highly mobile.

Toxicity

Hexavalent chromium is classified as a human carcinogen (USEPA, 1996). Epidemiological studies of chromate facilities in the United States have found an association between chromium exposure and lung cancer. Workers are likely exposed to both Cr(III) and Cr(VI), however, only Cr(VI) has been found to be carcinogenic in animals (USEPA, 1996). Chromium(VI) is also very toxic to aquatic organisms (USEPA, 1979). Exposure to high levels of Cr(III), although an essential element, via inhalation, ingestion, or dermal contact

may cause serious health effects (USDHHS, 1991). Analytical testing performed by ESC (2000) for the Morgan Road facility indicates that chromium contamination in the sediment in the wetland area at the site is in the trivalent form (although not all sediment samples were analyzed for both total chromium and hexavalent chromium).

Epidemiological studies have linked benzene with leukemias, and it is classified as a suspected human carcinogen. Chronic exposure to benzene primarily effects the blood-forming tissues, resulting in increased blood counts, followed by aplastic anemia. Dichloroethane is classified as a suspected human carcinogen. In animal studies, dichloroethane and dichloroethene have caused liver, kidney, and lung damage, as well as nervous system disturbances (USDHHS, 1991). Ethylbenzene has been shown to be teratogenic in laboratory animals. Toluene is not classified as a carcinogen in humans or animals. No carcinogenic effects have been documented for xylenes, but possible teratogenic effects have been observed. Chronic exposure to xylenes can result in effects on the liver, kidneys, and central nervous system. Vinyl chloride is a human liver and a brain carcinogen. Tumors have been reported in other organs such as the lung, kidneys, and lymphatic and nervous systems.

Persistence

In surface waters, no data have been found that would indicate that photolysis, biodegradation, and volatilization of chromium are important fate processes (USEPA, 1979). Sorption and bioaccumulation are considered important aquatic fate processes. As discussed above, chemical speciation plays an important role in the fate of chromium in surface water; conditions favorable to Cr(VI) will maintain chromium in soluble form while conditions favorable to Cr(III) will result in precipitation and partitioning to solids and to sediments (USEPA, 1979). Chromium is not considered as persistent in surface water compared to soil and sediment.

The relative short half-life of VOCs in the atmosphere (high vapor pressure) indicates that they are not persistent atmospheric compounds. As stated above, VOCs in surface waters or surficial soils will predominantly volatilize into the atmosphere and are thus not persistent in those media. In subsurface soils where volatilization cannot occur, TCE, DCE, and VOCs, in general, may be relatively persistent since they are slowly degraded (USDHHS, 1991). Once in groundwater, VOCs will not readily volatilize and are relatively persistent.

Bioaccumulation

Bioaccumulation of chromium in aquatic organisms and passage through the food chain has been demonstrated (USEPA, 1979). However, chromium concentrations decrease with an increase in trophic level. Chromium is not expected to biomagnify in the aquatic food chain (USDHHS, 1991). Partitioning studies indicated that bioconcentration factors of benthic invertebrates to water are approximately 2,000 to 3,000 whereas the bioconcentration factor of benthics to sediments is less than one (USEPA, 1979). In general, chromium is accumulated in aquatic and marine biota to levels much higher than surface water, however, concentrations in biota are usually lower than sediment concentrations. Also, chromium does not biomagnify along the terrestrial food chain from soil to plant to animal (USDHHS, 1991).

The potential for bioaccumulation of benzene, xylenes, and other VOCs, has been found to be low. Toluene has not been found to bioaccumulate (USEPA, 1979). Potential for weak to moderate bioaccumulation of TCE exists, however, no evidence of biomagnification has been found (USEPA, 1979).

5.2 Quantity of Substances

Table 1 in Section 2.3 of this report summarizes the quantities of waste generated at the Morgan Road, Emerson Avenue, and Townline Road facilities. Table 2 in Section 3.4 summarizes the air emissions rates from the Morgan Road facility. Although there were environmental investigations conducted at the Morgan Road facility, there is not enough information to determine actual quantities of contaminants released to the site's soil, sediment, or groundwater. Information on environmental investigations at the Emerson Avenue and Townline Road facilities, if performed, was not included in the documents reviewed.

There was no information available for review regarding the quantity of substances that have accumulated in or were discharged from the remaining four facilities on South Geddes Street, Seymour Street, Maltbie Street, and West Fayette Street, which are no longer operated by Lipe-Rollway.

5.3 Levels of Contaminants

Contaminant levels for the Lipe-Rollway Morgan Road facility were provided for site soils, sediment, groundwater, and surface water. An ESC Summary of Investigations (ESC, 2000) and Environmental Site Assessment (ESC, 1996a) were the sources of these data which are presented herein in Tables 3 through 10b. The investigations concentrated on five suspected areas of contamination: a former gasoline UST pit (Table 3); a former drum storage location and drainage ditch (Tables 4a and 4b); groundwater downgradient of the hazardous waste and waste oil storage shed (Tables 5, 6, and 7); a roof drain outfall and wetlands area (Tables 8 and 9); and Sawmill Creek which flows through the site (Tables 10a and 10b). This subsection summarizes elevated contaminant levels at these locations. It should be noted that the ESC Summary of Investigation Report (ESC, 2000) did not include a discussion of the free product that was described in the revised Remedial Action Work Plan (ESC, 1999) as shown on Figure 6. It was not indicated in the documents reviewed if analytical testing of

this free product was performed. Analytical data from the other six Lipe-Rollway sites were not available for review.

Soil in the vicinity of the former gasoline UST pit, southeast of the main building, was found to contain elevated VOC and metals concentrations. An extensive geoprobe boring program conducted in 1995 indicated that many areas of the site contained TPH in soil greater than 1,000 mg/kg (ESC, 1996a). The most notable exceedances of NYSDEC RSCOs (based on 1998 soil data) were for BTEX compounds (940 μg/kg benzene, 95,000 μg/kg toluene, 49,000 μg/kg ethylbenzene, and 288,000 μg/kg total xylenes) and methylene chloride (3,600 μg/kg) (Table 3). Soil samples collected from an on-site drainage ditch east of the main building which conveys stormwater toward the wetland area, exhibited elevated concentrations of select metals that exceeded NYSDEC RSCOs or average background concentrations (0.89 mg/kg antimony, 789 mg/kg barium, 0.58 mg/kg beryllium, 42.1 mg/kg chromium, 91.7 mg/kg copper, 24,700 mg/kg magnesium, 837 mg/kg manganese, 112 mg/kg nickel, and 137 mg/kg zinc) (Table 4a). Organic contaminant concentrations in the drainage ditch soil did not exceed NYSDEC RSCOs (Table 4b).

Groundwater was sampled at four wells in 1995 (Table 5), as well as at four in-situ monitoring points (Table 6) and two wells (Table 7) in 1998. The highest concentrations of VOCs were detected in 1995 at well MW-5 beneath the hazardous waste and waste oil storage shed at concentrations significantly exceeding NYSDEC Class GA standards. Exceedances were found for the following parameters: 2-butanone (310 μg/L); 1,1-dichloroethene (230 μg/L in MW-10, a duplicate of the MW-5 sample); cis 1,2-dichloroethene (1,500 μg/L); trans 1,2-dichloroethene (480 μg/L); trichloroethene (72 μg/L); and vinyl chloride (540 μg/L) (Table 5). Acetone (70.8 μg/L) and vinyl chloride (13.1 μg/L) also exceeded the Class GA standards in at least one of the in-situ monitoring points (Table 6). Exceedances were also noted for magnesium (97,500 μg/L) and sodium (52,100 μg/L) at the two downgradient wells (Table 7).

Surface water sampling was conducted in the outfall area where runoff is discharged to a wetlands area east of the facility. There were no significant exceedances of NYSDEC surface water standards and guidance values (Table 8). However, chromium was not reported in ESC's tabulation of the surface water data (ESC, 2000, Table 8).

Wetland sediment samples were collected from the roof drain outfall area east of the Morgan Road facility main building. Metals concentrations were detected which exceeded NYSDEC SELs by as much as two orders-of-magnitude. The highest concentrations for the metals which exceeded SELs were as follows: 113 mg/kg antimony, 11,300 mg/kg total chromium, 629 mg/kg copper, 587 mg/kg lead, 6,180 mg/kg manganese, 8.8 mg/kg silver, and 1,140 mg/kg zinc (Table 9). With the exception of silver, the metals contamination in the wetland area sediment appears to be generally limited to surficial sediment. PCBs were detected in 14 of 24 sediment samples at concentrations ranging from 30 μg/kg to 1,400 μg/kg, and were mostly confined to the area closest to the roof drain outfall.

Sediment samples were collected from two locations in Sawmill Creek within the property boundary, one location in Sawmill Creek just upstream of the site, and four locations in drainage ditches from off-site areas (Figure 4). Manganese (up to 3,100 mg/kg) and zinc (up to 321 mg/kg) were detected at concentrations that exceeded the NYSDEC SELs at the two Sawmill Creek locations within the property boundary (Table 10a). Concentrations of these two metals also exceeded the SELs for at least one of the five "background" locations. The concentration of benz(a)anthracene (820 μg/kg) at one of the Sawmill Creek locations on-site exceeded the NYSDEC benthic chronic standard (480 μg/kg), but was less than the maximum "background" concentration of 2,000 μg/kg (Table 10b). As noted earlier, ESC stated that "no VOCs, PCBs, or pesticides were detected at concentrations above the evaluation criteria," however, the actual data were not available for review (ESC, 2000, p. 22).

NYSDEC sampling of surficial sediment in Sawmill Creek at a location downstream of the site resulted in the following metals exceeding the NYSDEC SELs: chromium (147 mg/kg); lead (444 mg/kg); manganese (1,660 mg/kg); nickel (88.5 mg/kg); and zinc (1,880 mg/kg).

5.4 Impacts on Special Status Areas

Morgan Road Facility

The Morgan Road facility is situated in an area where direct adverse impact to regulated wetlands or protected streams is likely to occur. The Lipe-Rollway property extends from Morgan Road east to the Conrail railroad tracks. Sawmill Creek, which is a Class C waterbody in this area (6 NYCRR Part 895.4), traverses the eastern portion of the property.

According to the Brewerton National Wetlands Inventory (NWI) map (USDOI, 1978), a federal wetland exists approximately 2,000 ft northeast of the Morgan Road facility and is designated as POWZx (Palustrine, Open Water, Intermittently Exposed/Permanent, Excavated). Based on the NYSDEC Brewerton wetlands map, it is believed that a New York State freshwater wetland designated BRE24 is located within the property boundary. This State wetland is situated along the western edge of Sawmill Creek and extends a distance of approximately 1,000 ft to the west onto the Lipe-Rollway property. It is difficult to determine if this wetland overlaps with the "roof drain outfall area" shown on Figures 4 and 6 as the location of Sawmill Creek on the New York State wetland map does not correspond with either the USGS topographic map (Figure 2) or that shown on Figure 4. Although a detailed topographic map or wetland delineation map was not provided for this site, it is noted that ESC (2000) refers to the outfall area as a wetland and it is possible that this area overlaps a portion of the State wetland. Sediment samples from this area indicate that site contaminants have impacted this wetland. Other designated Federal wetland areas are present south of the site along Sawmill Creek as it approaches Onondaga Lake, the nearest of which is approximately 8,500 ft downstream of the site near the New York State Thruway,

and is designated PF01E. A State wetland, designated SYW1, is located near where Sawmill Creek discharges into Onondaga Lake.

As of August 1996, there were no New York State "Natural Heritage Sensitive Elements" within one mile of the Morgan Road facility.

South Geddes Street Facility

According to the Syracuse West NWI map (USDOI, 1978), Harbor Brook, upstream of the site, is a federal wetland designated R2OWH (Riverine, Lower Perennial, Open Water, Permanent) which at its nearest point is approximately 1,200 ft south of the site where the brook enters a culvert. Onondaga Creek is also a federal wetland designated R2OWH and is approximately 4,000 ft east of the site. The nearest State wetland, designated SYW19, is along the southern shore of Onondaga Lake at the mouth of Harbor Brook, approximately 7,000 ft northwest of the site. Harbor Brook is a Class C waterbody downstream of the culvert.

As of August 1996, there were no New York State "Natural Heritage Sensitive Elements" within one mile of the South Geddes Street site.

Seymour Street Facility

According to the Syracuse West NWI map (USDOI, 1978), Harbor Brook is a federal wetland designated R2OWH (Riverine, Lower Perennial, Open Water, Permanent) which at its nearest point is approximately 1,200 ft west of the site where the brook enters a culvert. Onondaga Creek is also a federal wetland designated R2OWH and is approximately 3,500 ft east of the site. The nearest State wetland, designated SYW19, is along the southern shore of Onondaga Lake at the mouth of Harbor Brook, approximately 8,500 ft northwest of the site. Harbor Brook is a Class C waterbody downstream of the culvert.

As of August 1996, there were no New York State "Natural Heritage Sensitive Elements" within one mile of the Seymour Street site.

Maltbie Street Facility

According to the Syracuse West NWI map (USDOI, 1978), Onondaga Creek is a federal wetland designated R2OWH (Riverine, Lower Perennial, Open Water, Permanent) which is immediately north and east of the site. The nearest State wetlands are along the southern shore of Onondaga Lake, designated SYW12 and SYW19, which are both located approximately 6,000 ft northwest of the site. Onondaga Creek is a Class C waterbody near this site.

As of August 1996, there were no New York State "Natural Heritage Sensitive Elements" within one mile of the Maltbie Street site.

Emerson Avenue Facility

According to the Syracuse West NWI map (USDOI, 1978), a federal wetland designated POWKZh (Palustrine, Open Water, Artificial, Intermittently Exposed/Permanent, Diked/Impounded) exists approximately 1,800 ft northwest of the site. Also, Harbor Brook, which has the classification R2OWH (Riverine, Lower Perennial, Open Water, Permanent), is located north of the railroad tracks which parallel the northern property boundary of the site. The nearest State wetland, designated SYW19, is approximately 1,400 ft north and downgradient of the site along the southern shore of the lake at the mouth of Harbor Brook. Harbor Brook is a Class C waterbody near this site.

As of August 1996, there were no New York State "Natural Heritage Sensitive Elements" within one mile of the Emerson Avenue site.

West Fayette Street Facility

According to the Syracuse West NWI map (USDOI, 1978), Onondaga Creek is a federal wetland designated R2OWH (Riverine, Lower Perennial, Open Water, Permanent) which is approximately 1,500 ft east of the site. The nearest State wetlands are located along the southern shore of Onondaga Lake, designated SYW12 and SYW19, which are approximately 8,500 ft northwest and 7,500 ft northwest of the site, respectively. Onondaga Creek is a Class C waterbody near this site.

As of August 1996, there were no New York State "Natural Heritage Sensitive Elements" within one mile of the West Fayette Street site.

Townline Road Facility

Ley Creek, which is located approximately 800 ft north of the site, is a federal wetland designated R2OWH (Riverine, Lower Perennial, Open Water, Permanent), according to the Syracuse East NWI map (USDOI, 1978). There are several federal wetlands on the Syracuse West NWI map (USDOI, 1978) designated PFO1E (Palustrine, Forested) near Ley Creek, approximately 3,000 ft west of the site. A New York State wetland area, designated SYE6, is located less than 1,000 ft north of the site along Ley Creek. Ley Creek is a Class B waterbody adjacent to this site. Class B waterbodies are considered "protected streams" in New York State.

As of August 1996, there were no New York State "Natural Heritage Sensitive Elements" within one mile of the Townline Road site.

6.0 SUMMARY OF CONCERNS

Based on the information provided in the three Lipe-Rollway submissions and the ESC site investigation reports, the following concerns are identified:

- The Morgan Road facility is currently being investigated under the NYSDEC voluntary cleanup program. The results to date, as reported by ESC (ESC, 2000, pp. 25-27), indicate that although there are several areas of contamination at the site, contamination is not thought to be migrating off-site or entering Sawmill Creek, which flows through the eastern portion of the property. In the Summary of Investigations Report (ESC, 2000), ESC recommended that remediation should be limited to soil excavation at the former gasoline UST area. The revised Remedial Action Work Plan (ESC,1999) specified the installation of a free product recovery system to recover measurable free product in the vicinity of the heat treat department for recycling or disposal at an off-site facility. The status of these remedial activities was not indicated by Lipe-Rollway in the documents reviewed.

- Groundwater beneath the hazardous waste and waste oil shed exhibited levels of VOCs (e.g., 1,2-dichloroethene) up to 300 times greater than the NYSDEC Class GA standards. The specific source of this groundwater contamination (e.g., contaminated soil beneath the structure) was not specified by Lipe-Rollway in the documents reviewed. It is believed that this source has not been remediated. Although remediation of groundwater was not recommended by ESC (ESC, 2000, p. 27), they did propose implementing a groundwater monitoring program as part of the revised Remedial Action Work Plan. The results of this groundwater monitoring plan were not available in the documents reviewed.

- Sediment contaminant levels were determined to be elevated for PCBs and certain metals in the Morgan Road facility's runoff outfall and wetland area. The only sources of PCB waste that were indicated in the available documentation were transformers that were removed in the 1980s and in 1997. It seems possible that there were additional instances of PCB waste disposal on-site. In addition, metals were detected at concentrations in surface sediment samples in the wetlands area significantly above NYSDEC Severe Effect Levels for sediments and NYSDEC recommended soil cleanup objectives. For example, chromium was detected at a maximum concentration of 11,300 mg/kg which is two orders-of-magnitude greater than the NYSDEC sediment screening criterion. Also, the "background" data used by ESC to evaluate the wetlands sediment data do not appear to be appropriate since the "background" locations are potentially downstream of the outfall, and the "background" data exceed the NYSDEC standards. ESC's recommendation of not conducting active remediation of sediments in this area (ESC, 2000, p. 22) should be reevaluated.

- Lipe-Rollway is reported to have discharged two waste streams at the Emerson Avenue facility. The first waste stream consisted of alkaline detergent and hot water wash that was generated during the cleaning and tear down of used clutches. This wastewater was discharged to a drywell on-site. The second source was an alkaline wash waste stream generated during the vibratory finishing process. This wastewater was discharged to a drainage ditch adjacent to the property which discharged to a railroad drainage culvert. This waste stream likely contained high pH, as well as iron and steel shavings and abrasives from the finishing process which would have also been discharged to the drainage ditch. It is possible that this ditch ultimately discharged to Harbor Brook which is less than 200 ft from the site. Further investigations should be conducted to assess the possible environmental impacts the Emerson Avenue facility has had on the surrounding area, and specifically, the Onondaga Lake system. The current condition of the site was not indicated and site contamination data, if available, were not provided in the documents reviewed.

- Detailed environmental and operational information was not provided for six of the seven Lipe-Rollway facilities. It is possible that the other Lipe-Rollway facilities employed similar waste generation and disposal practices as noted for the Morgan Road and Emerson Avenue facilities (i.e., on-site disposal to drywells, wastewater discharge to a drainage ditch), however, this was not indicated in the documents reviewed. Additional information regarding the environmental condition of these sites is recommended to determine if these facilities have impacted the Onondaga Lake system.

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Environmental Strategies Corporation. 1996b. Draft Remediation Work Plan for the Lipe-Rollway Site, Liverpool, New York. October 25, 1996.

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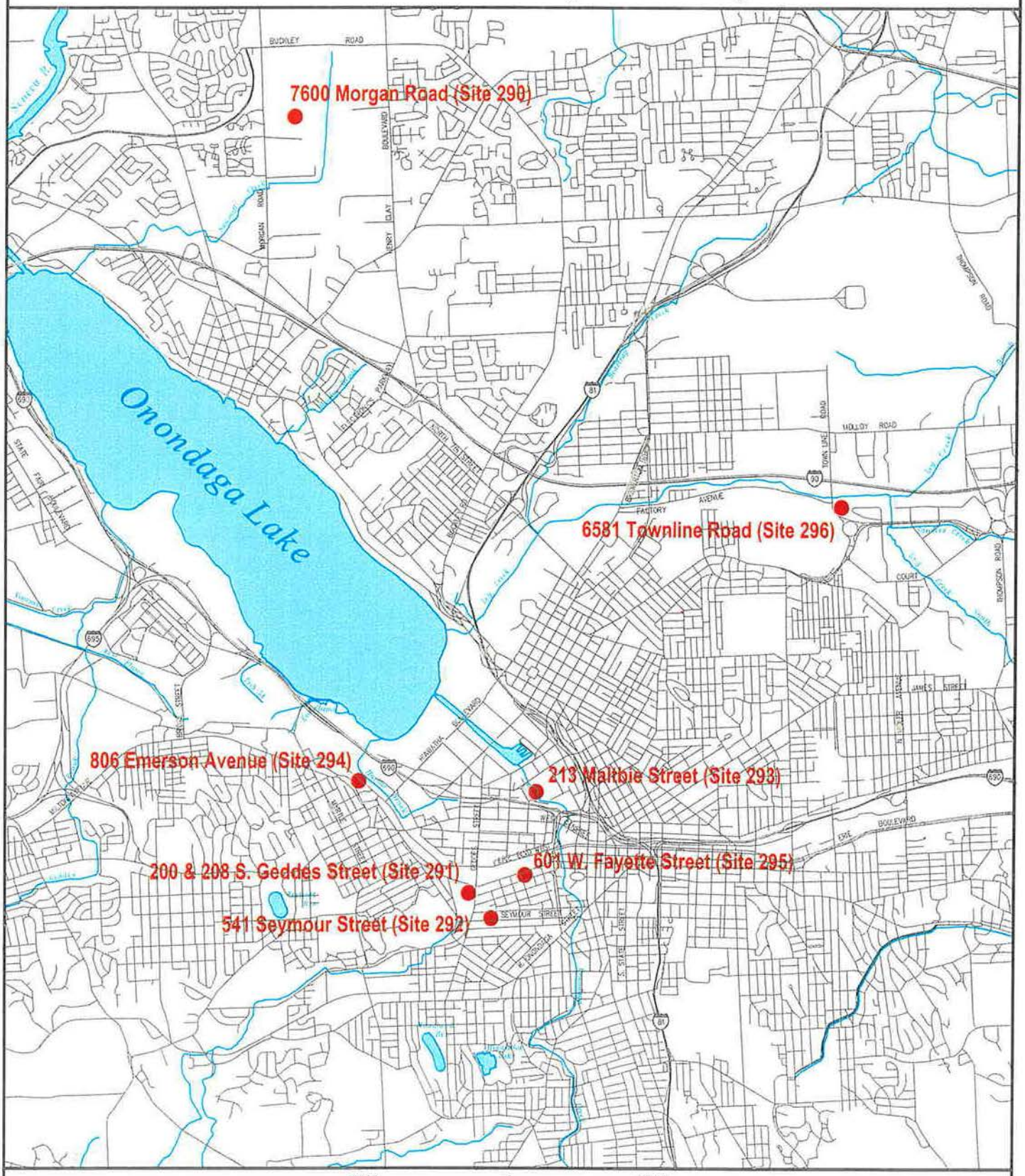
Site Locations: Lipe-Rollway



Site Location

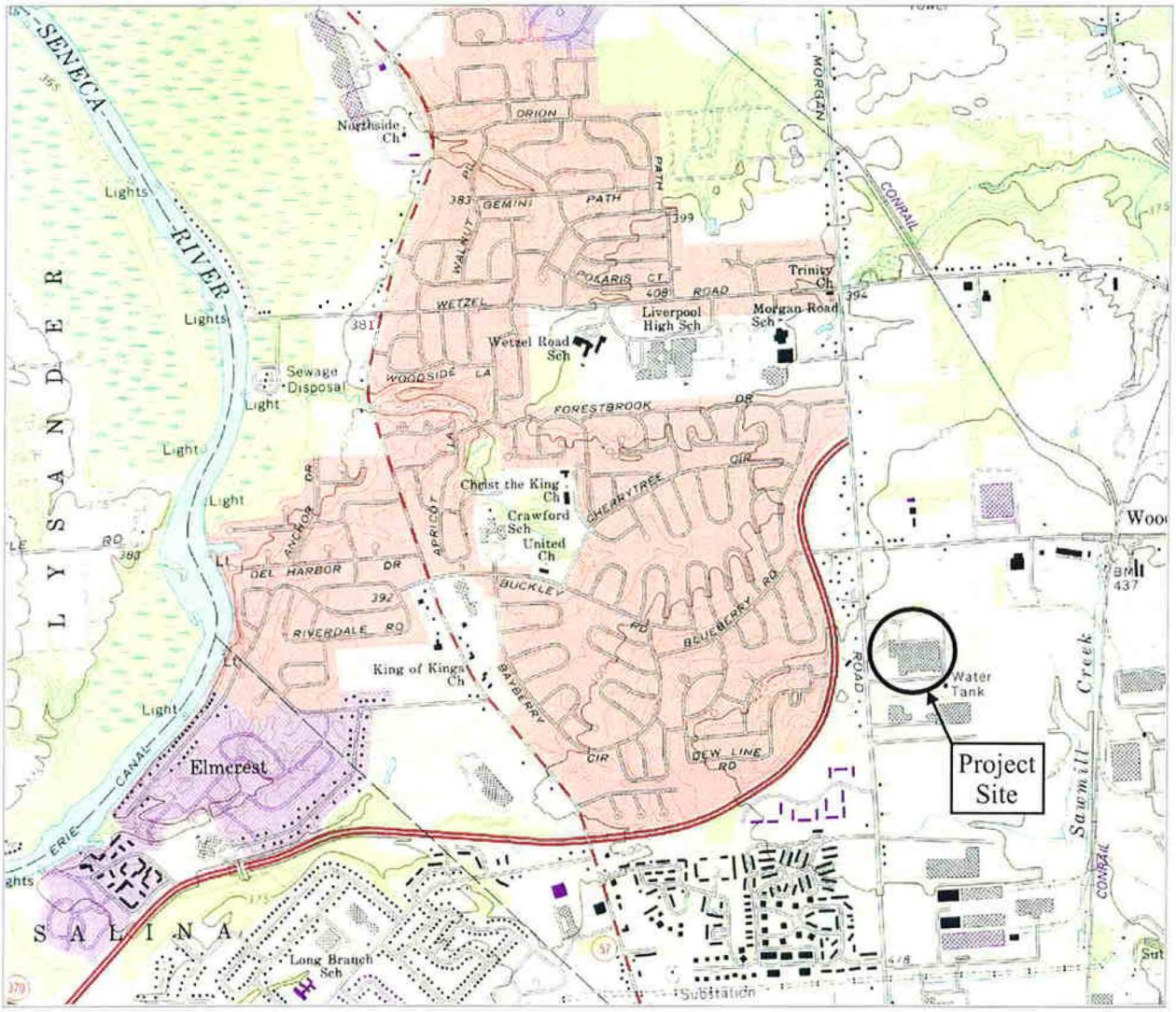
6000 0 6000
Scale in Feet

2000 0 2000
Scale in Meters

N

TAMS

Figure 1



SCALE 1:24 000

1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETRE

CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
DEPTH CURVES AND SOUNDINGS IN FEET—DATUM IS 363 FEET IN ONONDAGA LAKE

QUADRANGLE LOCATION

N

United States Geological Survey
Brewerton Quadrangle
Onondaga County, New York

TAMS

Figure 2
Lipe-Rollway Morgan Road Facility

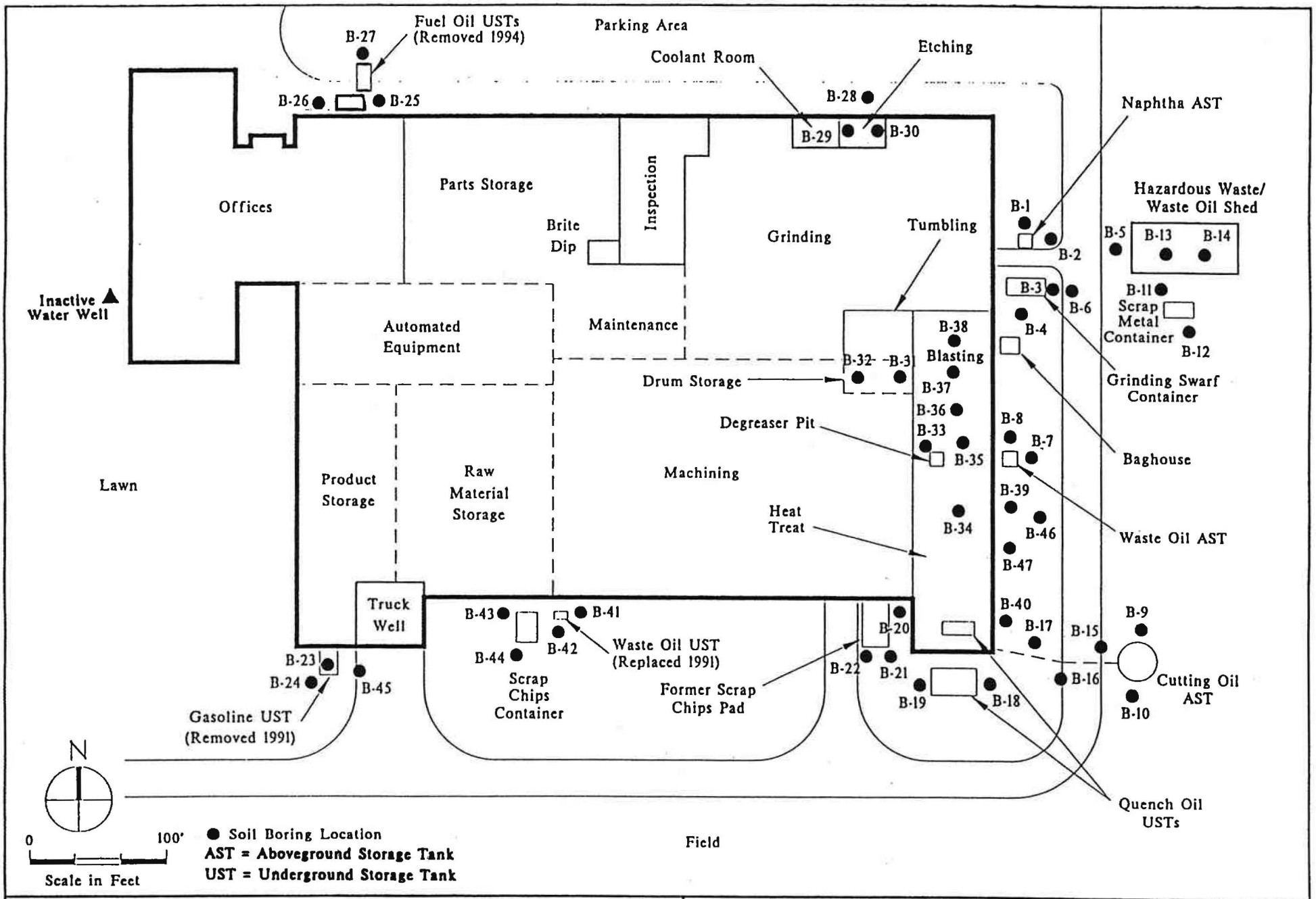


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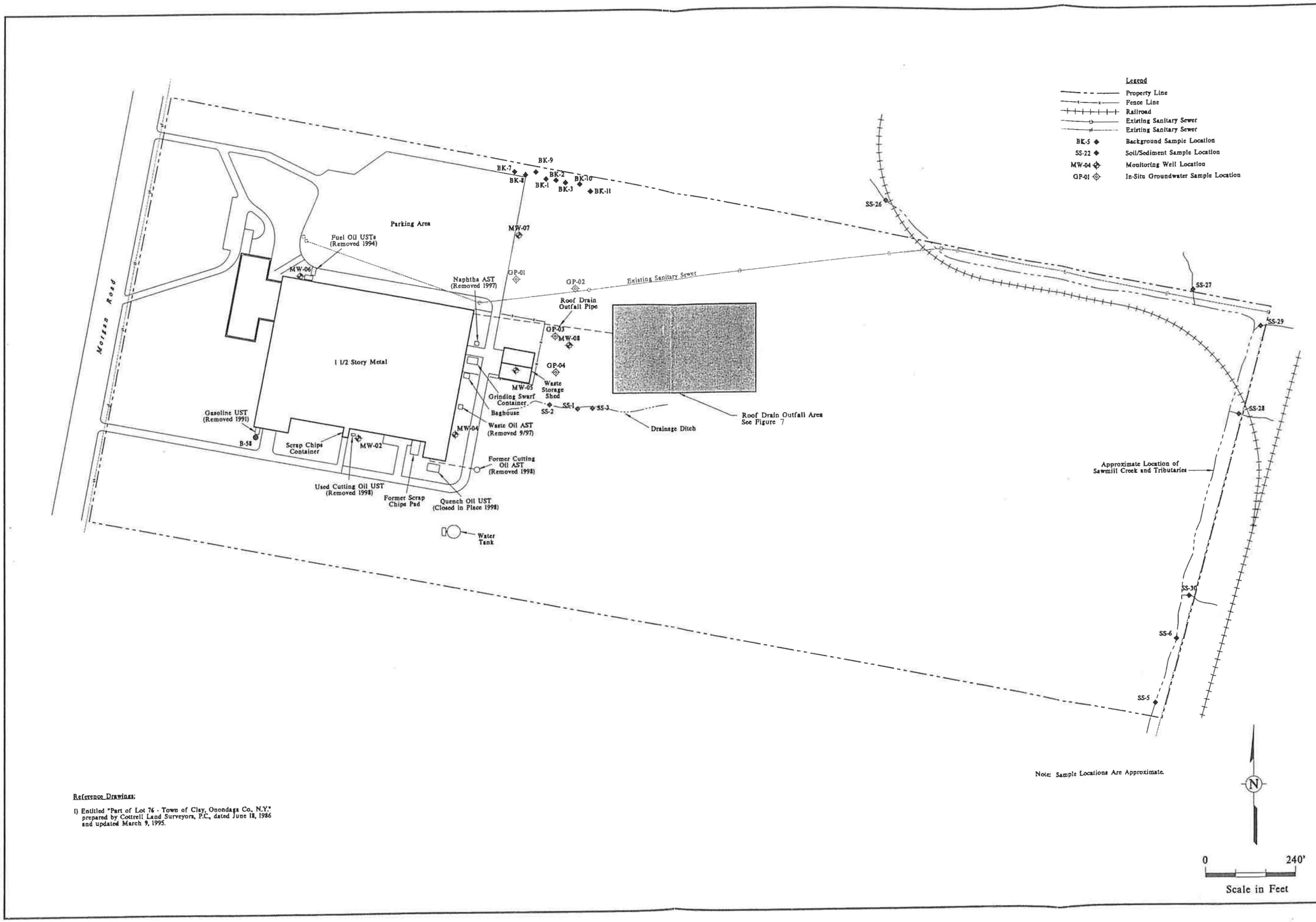
Figure 3
Soil Boring Locations - October 1995
Lipe-Rollway Corporation
Liverpool, New York

LIV002.DWG

Source: ESC, 1996a.



Reference Drawings:

1) Entitled "Part of Lot 76 - Town of Clay, Onondaga Co., N.Y." prepared by Cottrell Land Surveyors, P.C., dated June 18, 1986 and updated March 9, 1995.

Figure 4
Site Layout
Lipe Rollway Facility
Liverpool, New York

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LPC002.DWG

Source: ESC, 2000.

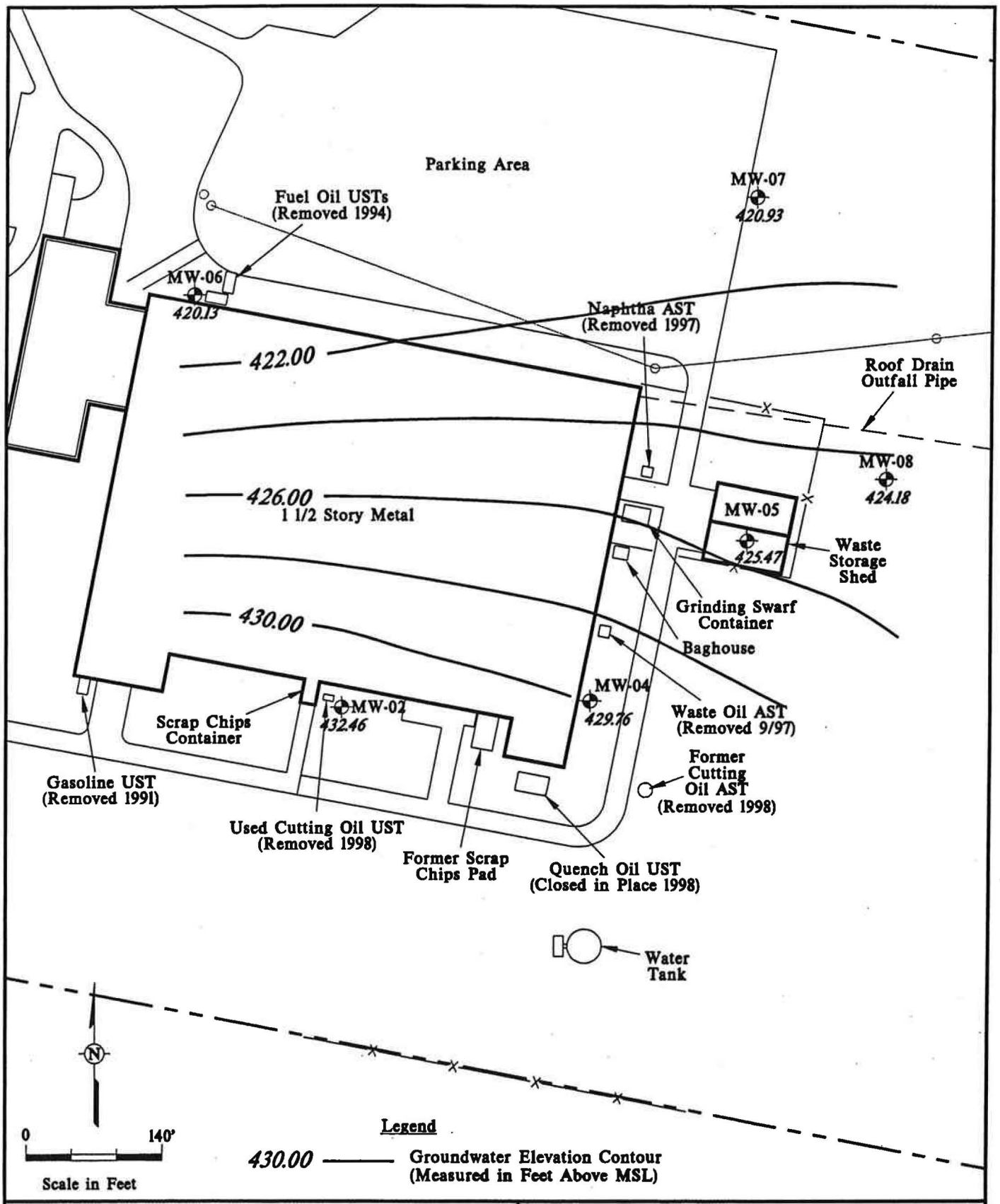

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Figure 5
Groundwater Contour Elevations - November 11, 1998
Lipe Rollway Facility
Liverpool, New York

LPC005.DWG

Source: ESC, 2000.

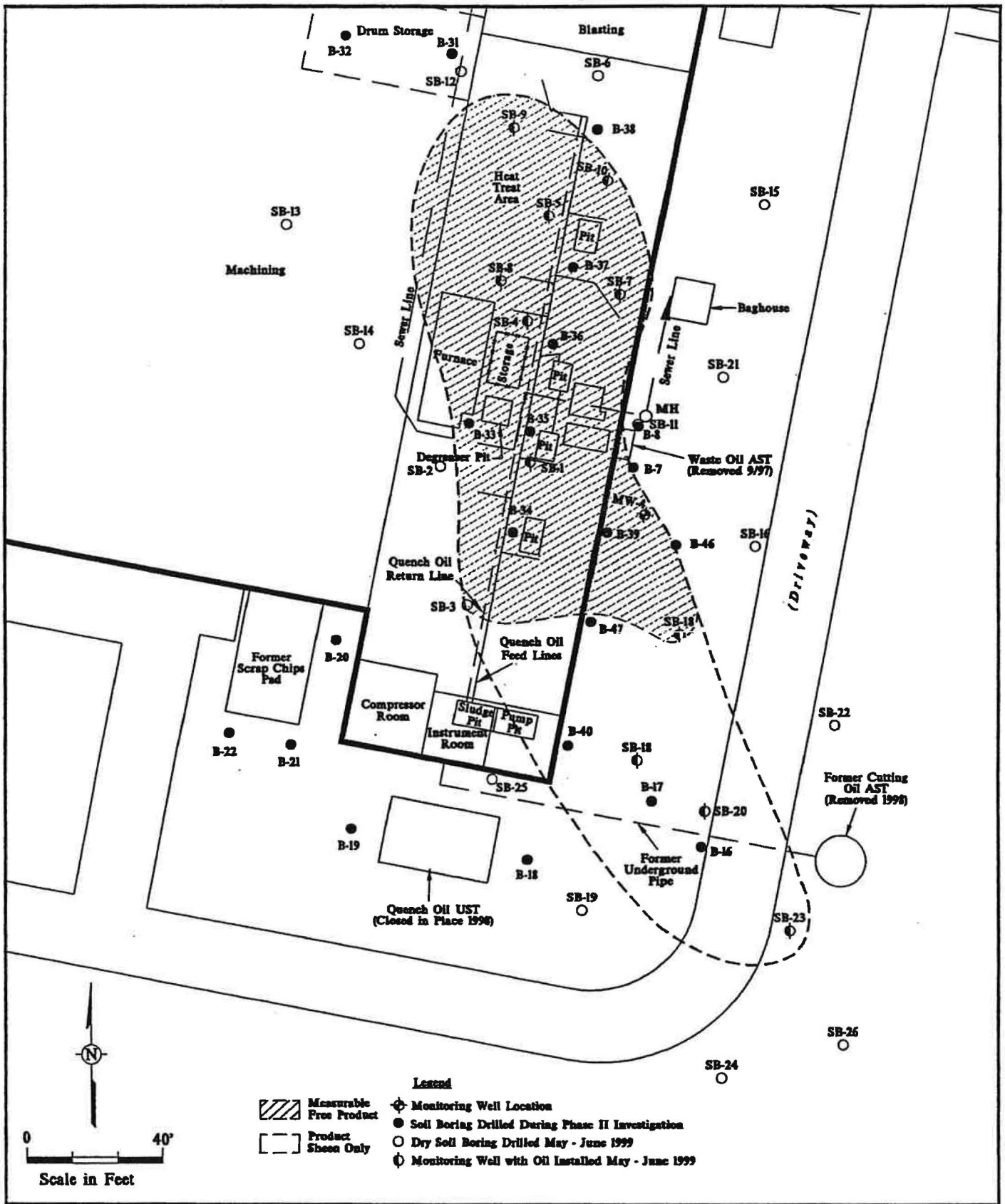

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Figure 6
Limit of Free Product
Lipe Rollway Facility
Liverpool, New York

LPC012.DWG

Source: ESC, 1999.

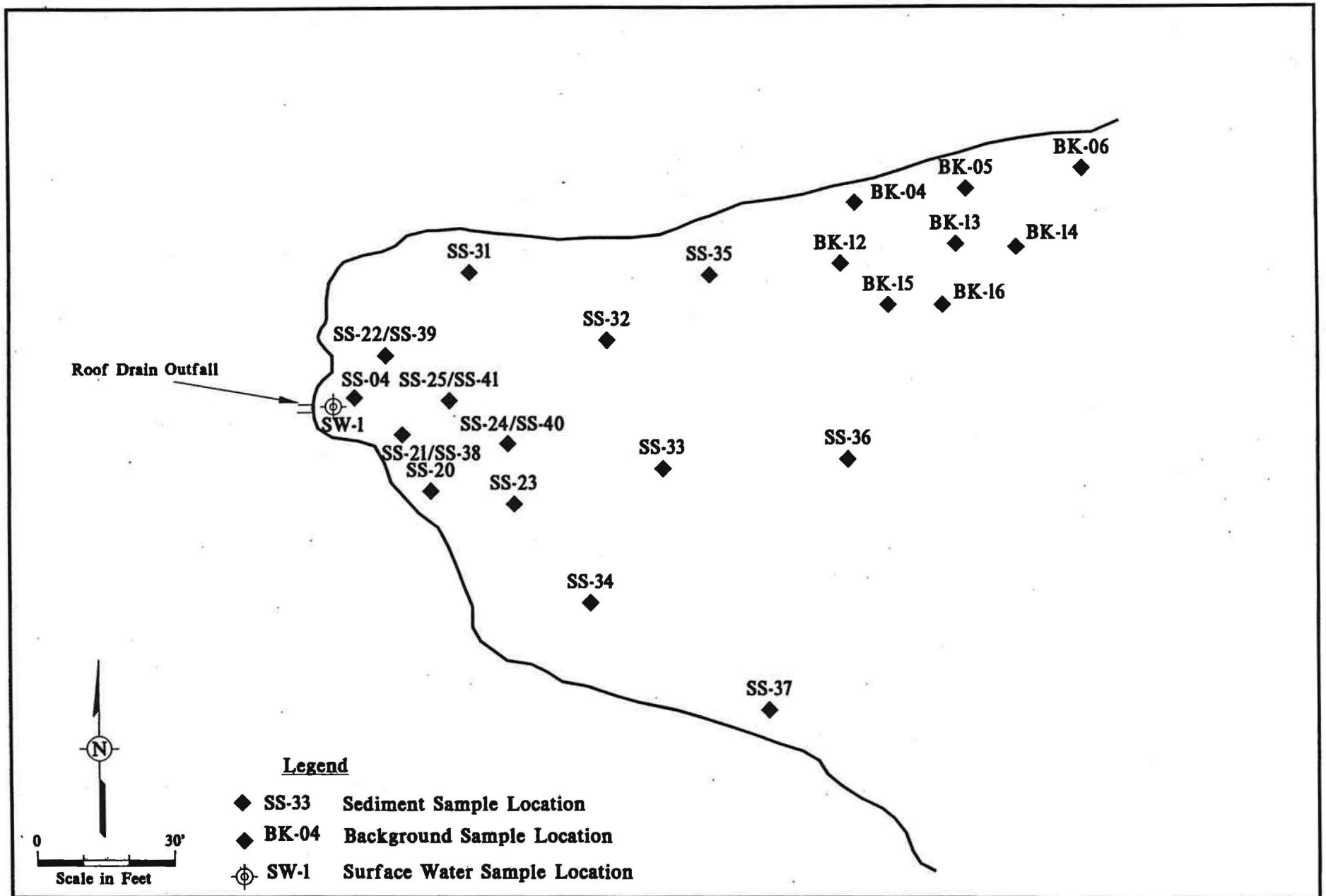

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Figure 7
Roof Drain Outfall Area
Lipe Rollway Corporation
Liverpool, New York

LPC002.DWG

Source: ESC, 2000.