DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)

Current Human Exposures Under Control

Facility Name: **Ciba/Hercules Main Plant Site***
Facility Address: **Lower Warren Street, Glens Falls, NY**
Facility EPA ID #: **NYD002069748**

* The Main Plant Site designation and its abbreviations include: (1) the Main Plant (MP) Site; (2) off-site Pretreatment Plant (PTP); (3) off-site Air Impacted Properties (AIPs); (4) upper section of the Hudson River (HR) extending from the western boundary of the MP Site and 3,500 feet downstream to the Baker Falls Dam; (5) off-site former HR channel of the Ponded Backwater Area (PBA); and (6) off-site Cement Company Pond (CCPs).

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1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

   __X__ If yes - check here and continue with #2 below.

   _____ If no - re-evaluate existing data, or

   _____ if data are not available skip to #6 and enter "IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e.,

RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	Yes	No	?	Rationale / Key Contaminants
Groundwater	X	___	___	MP: Monitoring results for chromium, cyanide & volatile organic compounds (VOCs). PTP: Monitoring results for cyanide.
Air (indoors) [2]	___	X	___	MP: No occupied buildings.
Surface Soil (e.g., <2 ft)	X	___	___	MP: Soil sampling results for metals (barium, cadmium, chromium, lead, mercury), arsenic, cyanide, semi volatile organic compounds (SVOCs) &VOCs.
Surface Soil (e.g., <2 ft)		X		PTP: Final CMI removed metal contamination
Surface Soil (e.g., <2 ft)		X		AIP: Final CMI removed metal contamination.
Surface Water	___	X	___	HR surface water sampling for metals.
Sediment	___	X	___	HR: Final CMI removed metals in adjacent HR.
Sediment	X		___	CCP: Final CMI covered in-situ contaminated sediments containing metals & polyaromatic hydrocarbons (PAHs).
Sediment	X			PBA: Final CMI under way to remove sediments contaminated with metals.
Subsurf. Soil (e.g., >2 ft)	X	___	____	MP: Soil sampling results for inorganic metals, SVOCs & VOCs.
Subsurf. Soil (e.g; >2 ft)		X	____	PTP: Final CMI removed metal contamination
Air (outdoors)	___	X	___	Air monitoring during remediation.

_____ If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate "levels," and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

__X__ If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

_____ If unknown (for any media) - skip to #6 and enter "IN" status code.

Rationale.

Facility Location, Topography and Areas of Contamination.

MP Site is located in the Town of Queensbury, just east of the City of Glens Falls, Warren County, New York. As shown on Figure 1 the Site is bounded on the south by the Hudson River, on the north by the Glens Falls Feeder Canal, on the west by the Glens Falls Cement Company and on the east by property owned by Warren County. Following remediation of the approximately 15 acre eastern portion of the Site in 1991and its sale to Warren County, the total acreage of the MP Site was reduced from approximately 60 acres to 45 acres.

The topography of the Site generally slopes toward the Hudson River. Excavation and fill deposits associated with past construction and plant activities modified the original topography to depths reaching thirty feet adjacent to the River. Demolition of plant buildings resulted in a predominantly unvegetated site occupied largely by concrete building foundations and intervening asphalt, gravel, and building debris. Weir Brook flows north to south under the surface at about the center of the MP Site from the Feeder Canal to the HR.

The 45 acre MP Site has three major areas of contamination where final corrective measures are currently being implemented. Active railroad tracks divide two of the areas: (1) the 20 acre solid waste management unit (SWMU) north of the tracks which consisted mostly of concrete foundations and adjacent soils contaminated with relatively low concentrations of cyanide, inorganic metals, and isolated pockets of VOCs; and (2) the 20 acre SWMU south of

the tracks containing fewer concrete foundations and built-up with deeper contaminated fill deposits. Higher average concentrations of cyanide and inorganic metals exist at depth throughout this SWMU. Also, this SWMU contains elevated concentrations of SVOCs and VOCs detected in the vicinity of the former organic pigment production building and to a lesser degree at the former open burning area. The third area containing the most significant contamination is the 5 acre parcel located at the northwestern portion of the site and adjacent to the 20 SWMU north of the railroad tracks. This parcel contains three SWMUs; a surface impoundment and two adjacent waste piles known as the North and South Waste Piles. The impoundment and piles contain the highest concentrations of inorganic metals while the South Waste Pile also contains elevated levels of VOCs.

Areas east, west and north of the MP Site contain a mix of industrial, commercial and residential development. Off-site commercial and residential properties are situated in a corridor of prevailing northeast winds and extending about 3/4 of a mile downwind from the Site. Some off-site properties had been impacted by past air releases of heavy metals from the MP Site. At the Glens Falls Cement Company property located on the western boundary of the Site the sediment in two of its ponds are contaminated with inorganic metals that eroded from the MP Site. The Glens Falls Feeder Canal and Lower Warren Street bound the Site to the north. However, the Canal was not adversely impacted by releases from the Site. To the east the MP Site is bounded by property sold to Warren County following implementation of a removal action for surficial soil contaminated by chromite ore.

Across the street from the MP Site and to the north is the approximately four acre PTP which is considered part of the Site for the purpose of RCRA corrective action. The topography of the PTP is generally flat and includes: paved and unpaved surfaces with remnant foundations; open fields with grass and other vegetation; and marshy areas that grade away from the plant. Several operating structures exist here, including a treatment building and an above-ground wastewater storage tank. A small stream flows near the northern boundary of the PTP and into a marshy area to the east where it then drains to the Feeder Canal through an open section in the northern wall of the Feeder Canal. The Feeder Canal is situated adjacent to the PTP and comprises much of its southern boundary. South of the Feeder Canal, the land surface slopes to the south-southeast towards another marsh area and stream situated in a topographically low area. Paved roads (River Street and Quaker Road) comprise the remainder of the southern and western boundaries of the PTP as shown on Figure 2. The PTP had received industrial wastewater from the impoundment when the MP was operating for treatment prior to discharging to the Glens Falls POTW. Subsequently contaminated storm water from the impoundment is treated prior to discharging to the POTW. Spills contaminated the surficial soils around the PTP with inorganic metals and cyanide.

Facility Ownership and Manufacturing History.

Industrial activity at the MP Site began in the 1800's with American Wall Paper, which when incorporated, the name changed to Imperial Wallpaper. It manufactured and sold wallpaper from purchased paper stock and pigments. Then in 1907, the company began to develop inorganic pigments and formed a separate business unit, Imperial Color Works, Inc., to expand the manufacture and sale of a wide range of colored pigments. By the early 1920's, the manufacture of organic pigments had begun. During World War II, the plant expanded operations to produce zinc chromate (an anti-corrosive coating), chromium oxide (camouflage green) and magnesium powders (for flares and tracer bullets). Also, chromite ore was stored and processed on-site to extract the metals needed for manufacturing operations. Ore tailings were then disposed on-site as fill material. Hercules Incorporated (Hercules) purchased Imperial (including the site) in 1960. Ciba-Geigy Corporation purchased Hercules' pigment business (including the site) in 1979. During February 1989, Ciba-Geigy stopped production at the MP Site then implemented a major interim corrective measure (ICM) that demolished all buildings except for a newly constructed warehouse. Highly contaminated debris was disposed off-site in a secure hazardous waste landfill and uncontaminated organic materials were disposed off-site in a solid waste landfill. Following this ICM a final remedy was implemented at the 15 acre parcel of property located at the eastern end of the 60 acre site to remove soil contaminated with residual chromite ore and to decontaminate the inside of the existing concrete warehouse. In 1991 this remediated parcel of property, including the warehouse, was then sold to Warren County for use by their department of public works. On September 9, 1996 ownership of the MP Site was transferred from Ciba-Geigy Corporation to Ciba Specialty Chemicals Corporation. Hercules and Ciba had entered into a cooperative agreement whereby Hercules is managing the corrective measures while Ciba retains ownership of the site. Because of this arrangement and Hercules' need for direct interaction with the New York State Department of Environmental Conservation (NYSDEC) on matters relating to corrective action they became a co-permittee.

Facility Regulatory History.

The surface impoundment (North Lagoon) located at the northwest end of the MP site was used for emergency containment of a wastewater sludge which is a listed hazardous waste. The usage of the impoundment after July 26, 1982 made the unit a "RCRA Regulated Unit" subject to closure as a hazardous waste landfill and to post-closure permitting unless decontaminated at closure. In 1984 Ciba-Geigy submitted a Federal RCRA permit application to operate the surface impoundment and a hazardous waste container storage area. Prior to permit issuance, New York State was granted authority to issue state hazardous waste operating permits and requested the submission of a Part 373 permit application. After submitting the application, Ciba-Geigy decided to close the impoundment and pursue an operating permit only for the container storage area. On September 24, 1987 a Part 373 Operating Permit was issued to Ciba-Geigy for such storage and RCRA corrective action investigations and studies. The storage unit operated until 1989 when the waste was removed and the concrete slab cleaned. NYSDEC accepted the Certification of Closure on March 31, 1992. On September 28, 1989, NYSDEC approved a RCRA Closure Plan for the North Lagoon that tied closure to site-wide corrective measures, since it was not technically feasible to close the lagoon without remediating the adjacent North and South Waste Piles. That Closure Plan was addressed as part of the corrective action program in the State Part 373 Post-Closure Permit issued on September 27, 1991. On January 6, 1997, the Post-Closure Permit for the MP Site was renewed and a Statement of Basis (SB) was issued that selected the final corrective measures for the PTP and the MP Site, including the use of a corrective action management unit (CAMU) for the consolidated closure of the waste piles and surface impoundment. That Permit required the facility to submit final corrective measures design documents and to continue investigations and studies for off-site locations impacted by the facility's past releases. Investigations and studies carried out pursuant to the renewed Permit showed that past releases of heavy metals from the MP Site impacted the Hudson River, the PBA, the CCPs and off-site residences downwind from the facility. On January 8, 1999, NYSDEC issued a final SB and modified the Permit to require the final corrective measures at all off-site locations except the PBA where additional studies would be necessary. Additional investigations and studies conducted in the PBA indicated a need to implement corrective measures to protect the fish and wildlife in the area from surficial heavy metal contamination found in some of the surrounding soils and in sediments of three small ponds located in this area. On December 6, 2000 the Post-Closure Permit was modified and a SB issued that addressed the final corrective measures for the PBA. Currently under review is the renewal application for the Post-Closure Permit.

Groundwater Hydrogeology and Surface Water Hydrology.

Groundwater level contours at the MP Site indicate groundwater flows generally from north to south towards the Hudson River in the overburden and in each of three progressively deeper, highly fractured bedrock water-bearing zones known as Horizons A, B, and C. Groundwater in the overburden water-bearing zone flows southward and discharges to the River through lacustrine sands containing some clay lenses. Groundwater in the Horizon A bedrock water-bearing zone flows southward and generally discharges to the Hudson River. At times groundwater in this zone may flow beneath the river and discharge through seeps into the limestone quarry further south. Groundwater in the deeper bedrock water-bearing zones, Horizon B and Horizon C, flows southward and southwest respectively with the potential to discharge in the limestone quarry located on the far side of the River. Bedrock is shallow at the northern portion of the site especially in the vicinity of the CAMU located to the northwest. Chromium, cyanide, and VOCs are the principal contaminants in both the overburden and bedrock groundwater at the MP Site. The CAMU acts as a major source for both the overburden and bedrock groundwater contamination.

Groundwater beneath the PTP flows laterally through shallow relatively permeable fill and lacustrine sands. A massive clay layer underlies most of the site and this together with the underlying bedrock unit forms a lower boundary to the shallow flow zone. The bedrock is only exposed to the shallow flow zone beneath a very limited portion of the site and does not exhibit the fracture zones that would consider it significant contaminant pathway. Groundwater flows generally west to east across the site but exhibits local variability caused by variations in the topography of the clay surface. At times a groundwater divide develops in the central portion of the site resulting in a diversion of groundwater flow to the west and southwest in the western portion of the site. In the eastern half of the site groundwater flows toward and discharges to the stream and marshy area lying to the north and east and acting as a groundwater divide. In the southern part of the site groundwater flows to the south toward the feeder canal and then southeast and under the canal where the southward sloping surface of the clay unit dips beneath the bottom of the canal. The principal contaminant detected in the groundwater at the PTP is cyanide.

Two significant surface water bodies flow in the vicinity of the MP Site. The Glens Falls Feeder Canal located to the north of the Site with a west to east flow was determined after sampling not to have been adversely impacted by facility releases. The larger surface water body, the upper Hudson River, forms the 1,200 foot southern boundary of the MP Site. River flow in the vicinity of the MP Site is easterly and varies with the season, being highest during the spring snow melt and lowest during the dry summer days. Flow can be controlled to some extent by releases from the Great Scandaga Lake at the Conklingville Dam located to the north and west of the MP Site. The River bottom in the vicinity of the MP Site and out from the shoreline is rocky and without much sediment due to the scouring of the River bottom during high flows. Sediment can be found adjacent to the shore and in the narrow areas existing between the shore and the small islands located in the River where the water deepens. Adjacent to the Site and further downstream both the sediments in the River and the shoreline were contaminated with high levels of inorganic metals from past industrial wastewater releases and eroding waste materials from the MP Site.

Approximately 1,900 feet downstream from the MP Site is a parcel of marsh land property owned by a local utility company known as the Ponded Backwater area (PBA). The PBA shown in Figure 3 is an approximately 13-acre, relatively flat, heavily vegetated area adjacent to the Hudson River, bounded by the banks of a former River channel. When a former dam was in place further downstream in the Hudson River, a River channel had formed where three interconnected ponds now exist. This former River channel became a depositional area for MP releases. Both the pond sediments and surficial soils adjacent to the ponds were found to contain inorganic metal contamination, but at significantly lower concentrations than detected in the River sediments and shoreline. Including the ponds, the total acreage considered to be associated with the former river channel depositional area and subject to corrective action is 5.4 acres. To the north and south, the PBA borders on vacant land containing large trees and dense vegetation. This adjacent vacant land extends from the Delaware & Hudson Railroad Corporation (DHRC) property to the north (which contains the railroad tracks) to the shore of the Hudson River to the south. Both the vacant land and the PBA are inhabited by various species of wildlife. Under normal River conditions, the PBA remains dry except for three interconnected ponds that remain wet throughout the summer. The PBA is subject to flooding in the spring, during conditions of high flow in the River.

On the Glens Falls Cement Company property located west of and adjacent to the MP Site are located a march land containing two ponds that are situated about 10 to 15 feet lower then the top surface embankment on the MP Site. These ponds cover an area of approximately 3/4 of a acre with a shallow depth that varies with the season. Sediments in the ponds have been impacted by inorganic metals that eroded from the waste piles located at the western portion of the MP Site. Run-off from former coal piles placed on the cement company property contaminated pond sediments with polyaromatic hydrocarbons (PAHs). The upper pond adjacent to the MP Site is fed by an intermittent stream flowing from underneath the Glens Falls Feeder Canal. The second lower pond receive water from the upper pond and eventually discharges to the Hudson River through Weir Brook.. Both ponds provided very limited habitat with no fish or other aquatic vertebrates being previously observed in the ponds.

Contamination and Corrective Action.

Eastern Portion Of Main Plant (MP) Site.

After demolition of all but one structure on the MP Site, a final corrective measures was completed for a fifteen (15) acre parcel located at the eastern portion of the MP Site. Approximately 13,000 cubic yards of soil mixed with residual chromite ore having chromium and lead concentrations in excess of 100 and 250 mg/kg respectively was excavated and temporarily stored under cover on a building slab foundation elsewhere on the Site. Following the excavation the area was covered with asphalt. Subsequently the soil pile was spread over part of the MP Site during implementation of the Site's final corrective measures. A warehouse used for the storage of products manufactured at the facility was not demolished, but decontaminated by steam cleaning the concrete walls and floor. Groundwater contamination was not detected at this location. During 1991 Ciba-Geigy sold the remediated parcel, including the warehouse to Warren County for use by their Public Works Department.

Off-Site Air Impacted Properties (AIPs).

Surficial soil samples were collected in an "upwind area" located approximately 2 ½ miles from the site. This study concluded that inorganic metals and cyanide were contributed to the off-site soil in a corridor extending about 3/4 of a mile downwind from the former MP Site air emissions. The range of contamination found in surficial soils at the AIPs was as follows:

Contaminant	Max. Conc.*	Min. Conc.*
Barium, Total	173.0	41.0
Cadmium, Total	130.0	0.1
Chromium, Total	425.0	48.0
Copper, Total	43.0	5.2
Lead, Total	467.0	24.0
Strontium, Total	112.0	7.9
Mercury, Total	22.0	0.7
Cyanide, Total	2.0	Non Detect

*Units are mg/kg (parts per million)

Soil sampling results at the AIPs were evaluated to determine whether the levels of contamination were a public health threat. This evaluation took into consideration several factors including: the average level of metal contamination on a parcel; the depth of the contamination in a soil column; whether a property was industrial or residential; and whether there was a potential for a vegetable garden. Both direct and indirect ingestion pathways for both adults and children were considered during human health assessment. Although other metals were present, cadmium was considered the constituent of concern and it was used as the target contaminant. Two cleanup levels for total cadmium were employed during remediation: 10 mg/kg (ppm) where there was the potential for a vegetable garden; and 28 mg/kg (ppm) for direct ingestion. During the investigation the levels of total cadmium in the soils at three down wind residential properties were at levels that required remediation. Final corrective measures removed the top one foot of soil at two properties and at least the top six inches of soil at the third property and replaced it with suitable clean fill material.

Off-Site Glens Falls Cement Company Ponds (CCPs).

Contaminated material from the western side of the waste piles had washed down into the Cement Company Ponds. During August and September of 1994, after receipt of protection of waters permits from the US Army Corps of Engineers and the NYSDEC, an ICM relocated the intermittent stream feeding the upper pond and removed approximately 1,900 cubic yards waste material back on to the North Waste Pile. Silt fences were installed around the North Waste Pile to prevent erosion of this material and excavated areas were back filled with clean clay. Similar material from the MP Site contaminated the adjacent off-site CCPs sediment. The heavy metals and their range of concentrations detected in the sediment are as follows:

Contaminant	Max. Conc.*	Min. Conc.*
Cadmium, Total	250.0	0.95
Chromium, Total	6,770.0	20.7
Lead, Total	11,000.0	17.8
Mercury, Total	9.6	Non Detect

*Units are mg/kg (parts per million)

A final corrective measures was implemented at the ponds during the summer of 2000. This final in-situ remedy consisted of placing geotextiles followed by clean gravel fill on top of the sediments in both ponds to prevent re-suspension of the contaminated sediments. At the same time the flow between the ponds had been improved by removing most of the natural barrier material existing between the ponds. New sediment deposits from run-off and the intermittent stream are expected to overfill the gravel and restore the ponds with uncontaminated sediment.

Off-Site Hudson River Sediment And Waste Deposits.

Limited impacts to the benthic community were found to correspond to an approximate 1,900 foot stretch of Hudson River where visible waste deposits and/or discolored sediments were observed. Approximately 3,500 feet downstream from the MP Site chemical analysis of the fine grain sediments lying behind the Baker's Falls Dam (the downstream limit of the sediment investigation) did not indicate significant levels of metal contaminants that would require further action. Investigations determined that colored waste in the River generally occurred as discrete deposits along and/or adjacent to the north bank of the River in the vicinity of the MP Site. Two types of waste occurred in the study area: (1) A red, relatively hard waste occurring in layers up to a few feet thick. It formed ledges or was present as a crust over coarse sediment or bedrock. In some areas this material extended 150 feet out from the shoreline. Large fragments of the red waste had broken off from the layers and ledges and were deposited downstream with coarse grained sediment as boulder to gravel sized particles; and (2) A layered, often multicolored, waste with the consistency of very soft clay extended in places up to 15-20 feet from shoreline. Some

limited areas extended up to 40-50 feet from shoreline. In places, this waste material extended under the on-shore riverbank and north bank of the island adjacent to the site.

The waste deposits in the banks and in the River were contaminated with several heavy metals with the highest concentrations occurring in the waste deposits found imbedded in the banks. Some of these deposits exhibited a hazardous waste characteristic. A summary of the of the key inorganic heavy metal constituents detected in the bottom sediments and/or waste deposits is as follows:

Contaminant	Max. Conc.*	Min. Conc.*	
Cadmium, Total	250.0	Non Detect	
Chromium, Total	14,100.0		3.2
Lead, Total	12,300.0	Non Detect	
Mercury, Total	31.0	Non Detect	

*Units are mg/kg (parts per million)

A final corrective measures began in the summer of 2000 after receipt of the protection of waters permits from the US Army Corp of Engineers and the NYSDEC for the removal of the discolored sediment and/or waste deposits in the River and along the banks of the River. Removal of the shoreline deposits was followed by end point sampling. Approximately 12,000 cubic yards of waste deposits, debris and overburden was removed and placed in the CAMU at the MP Site. Following the removal action a protective rip-rap cover was installed where waste deposits been removed in and underneath the banks of the Hudson River.

Off-Site Ponded Backwater Area (PBA).

After it was determined that the former Hudson River channel area of the PBA may have served as a depositional area for releases from the MP Site subsequent RFIs focused investigations on bottom sediments of the three small ponds and soils adjacent to the ponds. Although bottom sediments did not exhibit a hazardous waste characteristic based on TCLP tests, the elevated levels of total inorganic metals summarized in the table below indicated a potential threat to the terrestrial and aquatic biota in the PBA.

Contaminant	Max. Concen. (mg/kg) (ppm)	Avg. Concen. (mg/kg) (ppm)
Cadmium, Total	260.0	110.0
Chromium, Total	1,300.0	715.0
Hexavalent Chromium	Non-Detect	Non-Detect
Lead, Total	1,100.0	644.0
Mercury, Total	3.8	2.5
Zinc, Total	280.0	182.0

Based on the aforementioned sampling data investigations were conducted by the DEC Division of Fish and Wildlife focusing attention on total cadmium as an indicator contaminant in leaf litter and vegetation. Maximum concentrations of 20.7and 2.96 mg/kg (ppm) of total cadmium were detected in leaf litter and vegetation respectively. The average concentration of total cadmium in all samples was 5.2 mg/kg (ppm). Subsequently fish and earthworms living in the PBA were analyzed for the presence of total cadmium, total lead and total mercury and organics. Although no organic constituents were detected at levels which would cause concern, the elevated levels of total metals detected was of concern. Based on the results of the prior investigations total cadmium was selected as an indicator constituent in subsequent investigations of the surrounding soils in the PBA since it readily bio-accumulates in biota and its toxic effects are evident at relatively low concentrations. The sampling results by depth are depicted in the next table:

Depth of Cadmium Contamination	Avg. Concen. (mg/kg) (ppm)	Max. Concen. (mg/kg) (ppm)

0.0 to 0.5 feet	55.0	280.0
1.0 to 2.0 feet	12.0	63.0
2.0 to 3.0 feet	3.7	16.0
3.0 to 4.0 feet	2.9	8.9

After analysis of all the data collected, it was concluded that the greatest potential environmental risks posed by the metal contamination in the bottom sediment and surrounding soils of the PBA's former Hudson River channel area would be to the aquatic and terrestrial biota which inhabit the area. In addition, there is the potential to impact higher-order animals and/or fish which consume this biota as a food source. The levels of mercury found in the fish are at levels which may cause reproductive problems in fish-eating birds.

After receipt of the protection of waters permits from the US Army Corp of Engineers and the NYSDEC implementation of final corrective measures began in the summer of 2001 and is expected to be completed by this fall. The final remedy will affect approximately 5.4 acres of the PBA and will include: (1) Removal of approximately 1,000 cubic yards of heavy metal-contaminated bottom sediments in the three small ponds; (2) Changing the topography by lowering surface grades and rerouting a culvert from which a steam flows into the western end of the PBA. These changes will allow for the interconnection of all three ponds and the formation of a continuous easterly flowing stream. The increased flow through the ponds and backwater area is expected to improve both the wetland habitats in and bordering the continuous water body to be formed by this corrective measure; (3) Removal of approximately 14,000 cubic yards of cadmium contaminated soil and surface vegetation at three sections of the PBA's former River channel. The average residual total cadmium concentration after excavating all three sections is expected to be less than 5 mg/kg (ppm) and will also significantly reduce the average residual levels of the other heavy metals; and (4) Backfilling with clean fill and restoration of the vegetation with many original plant species removed during the implementation of the final remedy.

Pretreatment Plant (PTP).

Soil Contamination.

Analytical data collected during remedial investigations indicated that the highest concentrations of hazardous constituents in the soil are within the easternmost portion of the PTP. Here the soils exhibited a hazardous waste characteristic for cadmium and chromium. The concentrations decrease greatly towards the west, except for a small area in the central portion of the plant. Soil contamination in the western portion of the PTP is above natural background levels but within the concentration range acceptable for unrestricted use. The maximum contaminant concentrations in the eastern part of the PTP were typically from zero to two feet below the surface, with contaminants down to four feet at isolated locations. The concentrations of metals detected in the eastern portion of the PTP were as follows:

Constituent	Max Conc.*	Avg. Conc.*
Cadmium, Total	622.0	36.0
Chromium, Total	885.0	139.0
Cyanide, Total	375.0	26.0
Lead, Total	4,570.0	587.0
Mercury, Total	52.0	3.0

*Units are mg/kg (parts per million)

A final corrective measures was implemented in 1997 that involved the excavation of contaminated surficial soil from the eastern portion of the PTP. The removal action achieved the following residual soil target cleanup levels which did not require placing institutional controls on the remaining soils:

Contaminant	Target Cleanup Level*
Cadmium, Total	10.0
Chromium, Total	50.0
Cyanide, Total	1,600.0

Lead, Total	500.0
Mercury, Total	3.4

*Units are mg/kg (parts per million)

Groundwater Contamination.

Early investigations detected cyanide concentrations in the overburden groundwater ranging from slightly over the groundwater standard of 100 ug/l (ppb) at the perimeter and immediately down-gradient of the PTP area to a range of several hundred to over 5,000 ug/l within the central portion of the area. Concentrations then and now vary considerably both spatially and temporally, but indicate a general downward trend. The results from the temporary well points along the south side of the canal support the hydrogeologic model of the site. Here groundwater above the clay was absent from the area around the pipe bridge over the canal and to the west. Concentrations of cyanide were detected in the temporary well points installed further to the east indicating that the groundwater was passing beneath the canal in this area. Here cyanide concentrations varied from well below the groundwater standard to slightly above. Along the western perimeter of the Pretreatment Plant area cyanide concentrations were detected up to and slightly exceeding the groundwater protection concentrations. The migration to this area is likely due to the complex groundwater flow patterns caused by the interaction between the undulating surface of the clay unit, the relatively thin saturated thickness above the clay and fluctuations in the groundwater elevations. Cyanide bearing groundwater that migrates off the Pretreatment Plant site to the west or southwest, via the overburden, would most likely flow toward the Main Plant Site.

Main Plant (MP) Site.

North Lagoon Area: Soil And Waste Contamination.

This area is approximately five acres and includes three SWMUs: the Inactive Surface Impoundment; the North Waste Pile; the South Waste Pile; and approximately one hundred and fifty feet of property extending eastward from the eastern edge of the Impoundment and the South Waste Pile. The volume of hazardous waste sludge remaining in the Impoundment and containing metal contaminants has been estimated at 8,000 cubic yards. The Impoundment was situated between the two waste piles. The North Waste Pile was about 20 to 30 feet above original ground surface, covered an area of approximately 1.1 acres and contained an estimated 31,800 cubic yards of waste material. This pile was created from soil, fill, and ore tailings excavated during construction of the Impoundment and may include wastewater treatment plant sludge which is a listed hazardous waste. The South Waste Pile is about 25 feet above original ground surface and covers an area of approximately 1.0 acre. Underlying this Pile was a surface impoundment originally constructed in for storage of wastewater treatment plant hazardous waste sludge. When closed the sludge was left in place and the impoundment filled over with excavated soil, miscellaneous fill, ore tailings, demolition debris, and general industrial waste to form the South Waste Pile with an estimated volume of 31,300 cubic yards. Analytical data collected during remedial investigations indicate that the soil/waste material in the North Lagoon Area, including the adjacent property east of the piles, contains the highest levels of contamination found on-site. This significance is illustrated by the following elevated concentrations of inorganic contaminants detected in and around the North and South Waste Piles.

Contaminant	Max. Concen.*	Avg. Concen.*
Arsenic, Total	330.0	50.9
Barium, Total	51,000.0	11,199.1
Cadmium, Total	27,000.0	1,434.8
Chromium, Total	114,000.0	20,676.6
Cyanide, Total	5,670.0	2110.3
Lead, Total	199,000.0	35,022.3
Mercury, Total	470.0	43.1

*Units are mg/kg (parts per million)

The South Waste Pile also exhibited the most frequently detected highest concentrations, expressed in parts per million, of organic hazardous constituents. Maximum total VOCs ranged from 2.4 to 1,073 mg/kg, with the maximum total SVOCs ranging from 3.3 to 374.94 mg/kg.

Construction began in 1999 on the final corrective measures for the North Lagoon Area. The final remedy includes the consolidation and grading of all waste material from the three SWMUs into a corrective action management unit (CAMU) which will be capped with an impermeable cover. Contaminated sediment and waste material removed from the adjacent HR has been placed in the CAMU. Installation of the final cover is expected to

be completed in the fall of 2001.

SWMUs North And South Of The Rail Road Tracks: Soil And Waste Contamination.

Analytical data collected during remedial investigations indicate that soil/waste material in the South Area SWMU contains high concentrations of hazardous constituents. Inorganic hazardous constituents, including high concentrations of chromium, cadmium and lead were found throughout the SWMU and as deep as thirty feet. This inorganic contamination did not appear to exhibit any strong lateral or vertical trends, but appears to be widespread and scattered throughout the area. Overall maximum and average concentrations, expressed in parts per million for the inorganic contaminants, are as follows:

Contaminant	Max. Concen.*	Avg. Concen.*
Arsenic, Total	111.0	6.3
Barium, Total	12,200.0	237.0
Cadmium, Total	2,300.0	36.8
Chromium, Total	14,800.0	1,460.9
Cyanide, Total	72.0	10.9
Lead, Total	65,000.0	1,160.1
Mercury, Total	157.0	2.9

*Units are mg/kg (parts per million)

Also, investigations at the South Area SWMU detected organic contamination. Over the entire SWMU area, maximum concentrations of VOCs ranged from 0.01 mg/kg to 1,073 mg/kg, with SVOC maximum concentrations ranging from 0.34 mg/kg to 281.2 mg/kg. However, an analysis by location demonstrated that the VOCs and SVOCs with elevated concentrations are focused in the vicinity of the Building 56 slab foundation where organic pigments were made and, at lesser concentrations, in the vicinity of the former open incineration area where waste material containing spent solvents were burned.

The North Area SWMU contains numerous concrete foundations surrounded with surficial soil contamination extending about 4 feet down into the subsurface. This SWMU area received very little, if any, contaminated waste fill material. Located on one building slab foundation was approximately 13,000 cubic yards of soil contaminated with inorganic hazardous constituents (i.e., total chromium, lead and cadmium) which did not exhibit a hazardous waste characteristic. This material was excavated as part of the final remedy for the eastern part of the MP Site which was subsequently sold to Warren County. Soil sampling data collected during the remedial investigations indicate that this area contains elevated concentrations of total chromium, cadmium, and lead, but were detected less frequently and at much lower levels then at the South Area SWMU. However, the North Area SWMU did produce higher concentrations of cyanide than the South Area SWMU at several isolated locations. Overall maximum and average concentrations, expressed in parts per million for the inorganic contaminants are as follows:

Constituent	Max. Concen.*	Avg. Concen.*
Arsenic, Total	10.6	5.3
Barium, Total	8,100.0	453.3
Cadmium, Total	280.0	31.3
Chromium, Total	1,740.0	21.5
Cyanide, Total	450.0	4.8
Lead, Total	5,000.0	52.5
Mercury, Total	7.4	3.1

*Units are mg/kg (parts per million)

Organic contamination was also scattered throughout the North Area SWMU and showed no definitive trends in either the lateral or vertical directions. Several isolated hot spots were detected, but over the entire area, maximum VOCs ranged from 0.07 to 2.43 mg/kg with SVOCs ranging from 0.17 to 214.97 mg/kg.

Final corrective measures began in 1999 and consisted of bringing remaining concrete building foundations down to grade; installing large diameter culverts for handling the water flowing in Weir Brook; and grading the 40 acres containing the North Area and South Area SWMUs. Contaminated material excavated from the PTP, the Eastern Portion of the original MP Site and the PBA was placed and graded out on the 40 acres. A final cover consisting of 18 inches select fill topped with a 6 inch vegetated top soil layer is being placed over the entire 40 acres to prevent any incidental direct contact with the contaminated soil.

Main Plant Site: Contaminated Groundwater.

Limited leachate studies on the highly contaminated soil/waste material located within the North Lagoon Area (i.e.,CAMU) demonstrates that it has the propensity to leach out inorganic contaminants during precipitation events. Groundwater investigations support the conclusion that this area serves as the most significant source of groundwater contamination at the MP Site. Total dissolved chromium, total cyanide and total VOCs, indicator contaminants for the area have been detected at elevated concentrations in the groundwater immediately and further downgradient (i.e., south) of the CAMU. Groundwater contamination by the CAMU source appears to be focused in the overburden and the adjacent underlying bedrock water-bearing zones known as Horizons A and B. Furthermore, it is probable that some of the groundwater contamination detected in wells located further downgradient, in the area south of the railroad property, has its main origins at the CAMU. Using the maximum concentration data generated during the remedial investigation, the following concentrations in parts per billion by water-bearing zone and indicator contaminants (that are representative of general contaminant distribution) demonstrate the magnitude of the groundwater contamination detected in the vicinity and downgradient of the CAMU:

Contaminant	Overburden	Horizon A	Horizon B
Chromium, Total	20,000.0 ug/l	500.0 ug/l	100.0 ug/l
Cyanide, Total	50,000.0 ug/l	5,000.0 ug/l	100.0 ug/l
VOCs, Total	10.0 ug/l	1,000.0 ug/l	10,000.0 ug/l

Groundwater monitoring data suggests that the South Waste Pile in the CAMU contributed VOC contamination directly to the bedrock water-bearing zones due to a combination of circumstances: (1) the VOC contamination in that Pile seemed more concentrated near its bottom with the potential existing for dense non-aqueous phase liquids (DNAPLs) to have penetrated into the bedrock and serve as sources for groundwater contamination; (2) that approximately three-quarters of the bottom rested on or very near Horizon A, the first bedrock water-bearing zone, which also was demonstrated to communicate hydraulicly with the underlying bedrock zone, Horizon B; and (3) the possible diversion of most overburden groundwater to the periphery of the open Surface Impoundment and South Waste Pile by the open Impoundment's lined northern section which was constructed down to bedrock. The very deep bedrock water-bearing zone, Horizon C, was found to be contaminated with indicator contaminants detected in the CAMU. Tests have demonstrated limited natural vertical movement between this horizon and the one above. However, it appears that contamination from the upper water-bearing zones was allowed to migrate down into Horizon C, along some of the deep bedrock production wells that were present at the site. Decommissioning and sealing of these wells appears to have effectively eliminated this migration pathway into the deeper bedrock zone.

Groundwater monitoring carried-out as part of the RFI for this SWMU provided the following generalized maximum concentration data for the indicator contaminants:

Contaminant	Overburden	Horizon A	Horizon B
Chromium, Total	20,000.0 ug/l	3,000.0 ug/l	1,000.0 ug/l
Cyanide, Total	20,000.0 ug/l	5,000.0 ug/l	1,000.0 ug/l
VOCs, Total	20,000.0 ug/l	200.0 ug/l	10,000.0 ug/l

Limited and random testing on the soil/waste material located in the South Area SWMU demonstrated the potential to leach inorganic contaminants to the groundwater. However, analysis of groundwater monitoring data and corresponding soil/waste contamination profiles suggested that the incineration area and properties in the vicinity of former buildings associated with organic pigment production can be considered the primary contributing sources to overburden organic groundwater contamination in the area south of the railroad property. This becomes evident by examining VOC groundwater concentration contours for those locations. Also, underground industrial sewers in this SWMU area, which conveyed wastewater containing chromium and cyanide, were assessed and found to leak. Although the lines that would continue in use were repaired as part of the sewer remediation project past leakage of contaminated wastewater contributed to the chromium and cyanide contamination of the South Area SWMU.

Additional chromium and cyanide groundwater contamination at the southwestern part of the Area originated at the CAMU located to the north. Cyanide contamination detected in the overburden water-bearing zone in the northern part of this SWMU extends into the North Area SWMU where elevated soil/waste cyanide concentrations were detected at concentrations of 213 mg/kg and 136 mg/kg. In addition to cyanide only very low concentrations of metals and VOCs were detected in the groundwater at the North Area SWMU.

In the early 1990's an ICM was implemented behind the organic pigment Building 56 slab foundation to limit VOC migration and discharge to the Hudson River via the overburden groundwater at that location. The ICM consisted of a number of extraction wells located at the edge of site and adjacent to the foundation along with a stripping column that pretreated the groundwater prior to its discharge to the Glens Falls POTW. Although this ICM was successful in controlling releases to the River it had to be dismantled for the implementation of the final MP Site corrective measures. The final site wide remedy constructed for contaminated groundwater consists of an overburden collection trench and a series of bedrock extraction wells both of which extend along most of the southern perimeter of the MP Site adjacent to the Hudson River. Extracted contaminated groundwater is expected to be pretreated at the PTP before it's discharged to the Glens Falls POTW. This final remedy should become operational before the end 2001.

References.

(1) MP RFI Report (Soil) approved 3/15/93 & RFI Report (Groundwater) approved 9/30/93. (2) PTP RFI Report approved 1/31/95. (3) AIP RFI Report approved 3/27/97 & Construction Documentation Report approved 6/4/99. (4) Sediment/Surface Water RFI Report (Phase 1) approved 8/4/95; RFI Report (Phase 2) approved 9/30/97; and RFI Report (Phase 3) approved 2/9/99.

Footnotes:

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

[2] Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

	Potential **Human Receptors** (Under Current Conditions)						
"Contaminated" Media	Residents	Workers	Day-Care	Construction	Trespassers*	Recreation*	Food[3]
Groundwater	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
~~Air (indoors)~~							
Soil (surface <2 ft)	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
~~Surface Water~~							
Sediment	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
Soil (subsurface >2 ft)	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
~~Air (outdoors)~~							

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated") as identified in #2 above.

2. enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("___"). While these combinations may not be

probable in most situations they may be possible in some settings and should be added as necessary.

__X__ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

_____ If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

_____ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code.

Rationale.

Potential Threats From Contaminated Groundwater.

Contaminated groundwater, limited to the MP Site and the PTP, would pose a threat if ingested; however there are no known water supply wells impacted by this groundwater. The State considers all its groundwater to be a potential source of potable water and should be remediated to its Groundwater Quality Protection Standards. Trespassers are kept off site by fencing and security and they would not be expected to come in contact with contaminated groundwater if they should gain access to the sites. Workers sampling and managing contaminated groundwater will do so following an appropriate health and safety plan.

Potential Threats From Contaminated Soil And Sediment.

Contaminated soil remains at the MP Site but under a clean soil cover. The CAMU has been covered with a clean cushing soil and the placement of the impermeable cover is expected to begin in September 2001. Trespassers are kept off site by fencing and security and not expected to come in contact with contaminated soils. Any construction to be implemented at the Site would be in accordance with an appropriate health and safety plan.

Off-site at the former depositional area of the PBA the final removal action remedy for contaminated soil and sediment is proceeding on schedule. The topography of the PBA and the daily presence of remediation workers keeps trespassers from entering the site. The workers themselves are operating under an appropriate health and safety plan. After the final remedy at the former Hudson River channel area of the PBA has been completed, including the replanting of native vegetation, this wetland area is expected to return to its heavily vegetated state in a short period of time. The levels of cadmium that will remain in the soils of the former River channel will be protective of public health and the environment. Since the PBA is a isolated, heavily vegetated, inaccessible area which is not frequented by the public, except for the occasional trespasser or fisherman who would remain on the site for only a short period of time, these conditions would limit public exposure to soils in other areas of the PBA that may contain low concentrations of metals.

Although residual contamination remains in the sediment of the cement company ponds, the placement of the in-situ covers will allow for the recovery of the biota and aquatic life in the ponds, and will preclude any accidental direct human contact with the contaminated sediment.

References.

Refer to the references listed under item 2 above.

4 Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **"significant"**[4] (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?

__X__ If no (exposures can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures

(from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

____ If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

_____ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

Rationale and Reference(s): :

[4] If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience.

5 Can the "significant" **exposures** (identified in #4) be shown to be within **acceptable** limits?

_____ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

_____ If no (there are current exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.

_____ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code

Rationale and Reference(s).

6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

__X__ YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the Ciba/Hercules Main Plant facility, EPA ID # NYD002069748, located at Glens Falls, New York under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

____ NO - "Current Human Exposures" are NOT "Under Control."

____ IN - More information is needed to make a determination.

Completed by: _____ Date: August 27, 2001

_____Victor Valaitis
Environmental Engineer II
New York State Department of Environmental Conservation (NYSDEC)

And

_____ Date: August 27, 2001

Steve Kaminski
Chief, Eastern Engineering Section
NYSDEC

Supervisor: Original signed by: Date: August 28, 2001

Paul J. Merges
Director, Bureau of Radiation and Hazardous Site Management
NYSDEC

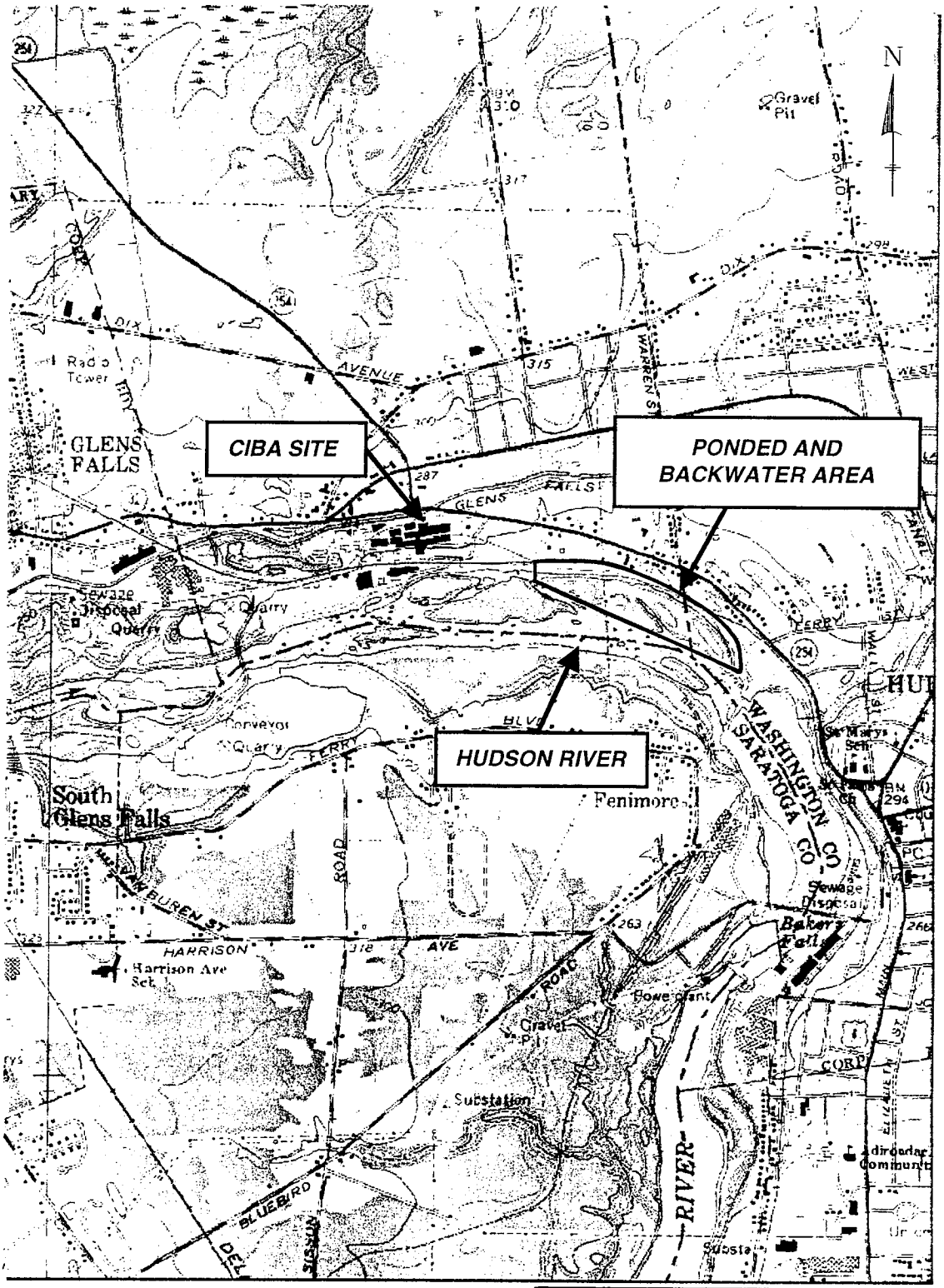
Locations where References may be found:

NYSDEC
Division of Solid and hazardous Materials
625 Broadway
Albany, New York, 12233-7252

Contact telephone and e-mail numbers

Victor Valaitis (518) 402-8594 E-Mail: vavalait@gw.dec.state.ny.us

FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.



SOURCE: GLENS FALLS, NY (1966)
HUDSON FALLS, NY (1966)
NY 7.5' QUADRANGLES

2000 0 2000
scale feet

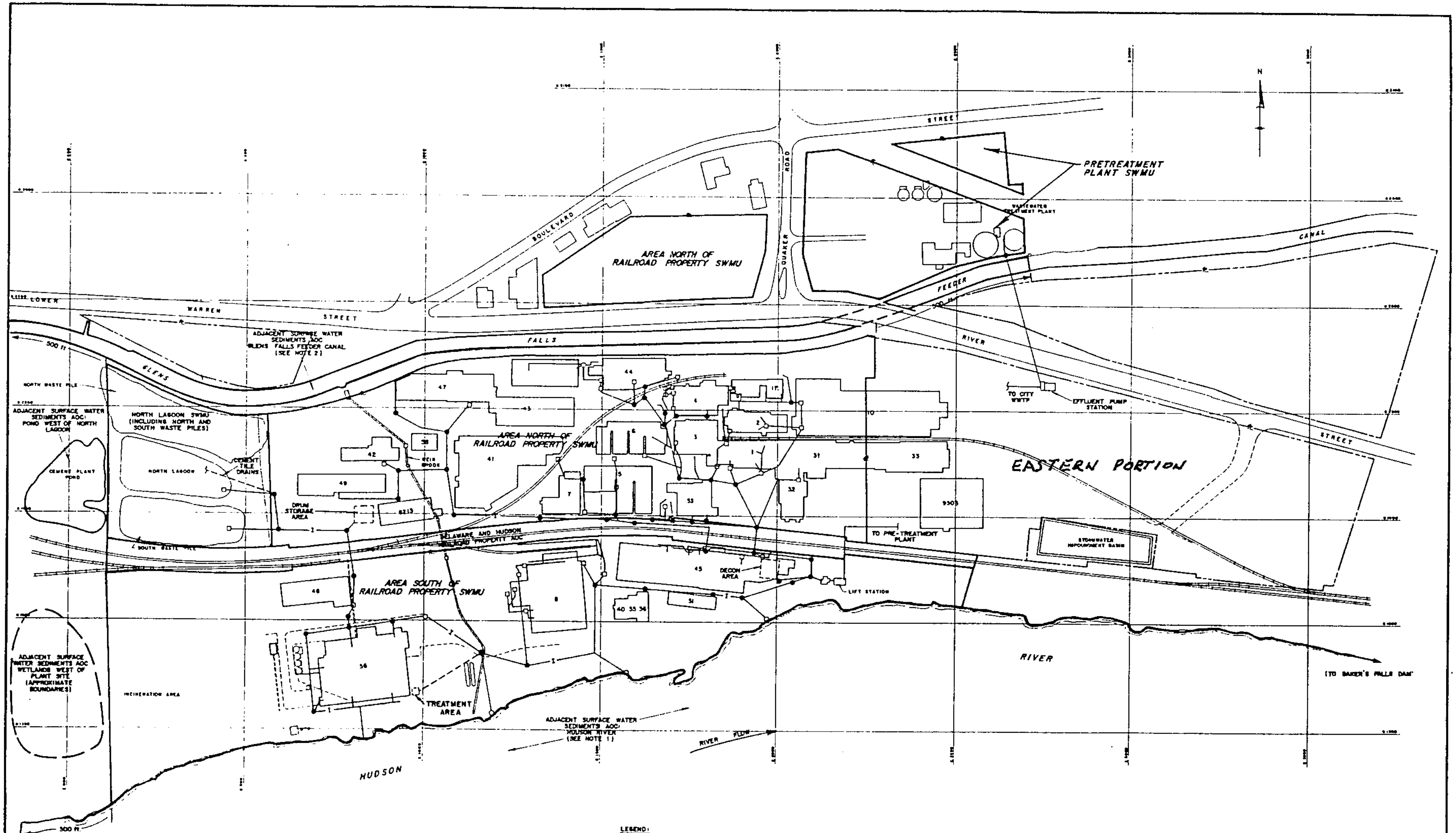
FIGURE 1

GENERAL LOCATION MAP
PONDED AND BACKWATER AREA

HERCULES INCORPORATED
CIBA SITE
GLENS FALLS, NEW YORK

BROWN AND CALDWELL
Mahwah, New Jersey

P:\^J\18205\topo-fig.ppt



N
STREET
PRETREATMENT PLANT SWMU
WASTEWATER TREATMENT PLANT
BOULEVARD
QUAKER ROAD
AREA NORTH OF RAILROAD PROPERTY SWMU
CANAL
FEEDER
LOWER
WARREN STREET
RIVER
FALLS
GLENS
ADJACENT SURFACE WATER SEDIMENTS AOC GLENS FALLS FEEDER CANAL (SEE NOTE 2)
300 ft
NORTH WASTE PILE
ADJACENT SURFACE WATER SEDIMENTS AOC: POND WEST OF NORTH LAGOON
NORTH LAGOON SWMU (INCLUDING NORTH AND SOUTH WASTE PILES)
CEMENT PLANT POND
NORTH LAGOON
CEMENT TILE DRAINS
DRUM STORAGE AREA
SOUTH WASTE PILE
TO CITY WWTP
EFFLUENT PUMP STATION
EASTERN PORTION
STREET
TO PRE-TREATMENT PLANT
STORMWATER IMPOUNDMENT BASIN
DELAWARE AND HUDSON RAILROAD PROPERTY AOC
AREA SOUTH OF RAILROAD PROPERTY SWMU
DECON AREA
LIFT STATION
RIVER
(TO BAKER'S FALLS DAM)
ADJACENT SURFACE WATER SEDIMENTS AOC WETLANDS WEST OF PLANT SITE (APPROXIMATE BOUNDARIES)
INCINERATION AREA
TREATMENT AREA
ADJACENT SURFACE WATER SEDIMENTS AOC: HUDSON RIVER (SEE NOTE 1)
RIVER FLOW
HUDSON
300 ft.

LEGEND:

- SWMU / AOC BOUNDARY
- —I— INDUSTRIAL SEWER LINE SWMU
- CATCH BASIN
- MANHOLE
- SEEP SUMP

NOTES:

1. HUDSON RIVER SURFACE WATER SEDIMENTS AOC EXTENDS 300 FEET UPSTREAM FROM THE WESTERN CIBA-GEIGY PLANT SITE BOUNDARY AND DOWNSTREAM TO THE BAKER'S FALLS DAM
2. GLENS FALLS FEEDER CANAL SURFACE WATER SEDIMENTS AOC EXTENDS 300 FEET UPSTREAM FROM THE WESTERN CIBA-GEIGY PLANT SITE BOUNDARY AND 300 DOWNSTREAM FROM THE EASTERN CIBA-GEIGY PLANT SITE BOUNDARY
3. THE LOCATION OF THE INDUSTRIAL SEWER LINES ARE FROM CIBA-GEIGY / HERCULES GLENS FALLS PLANT MAP, INDUSTRIAL SEWER LINES, DWG No. 051-6721-6100 S-502-17. ECKENFELDER ENGINEERING P.C. ASSUMES NO RESPONSIBILITY FOR ACCURACY OF THE SAME
4. BASE MAP AND PRELIMINARY ASSESSMENT FEATURES TRANSPOSED FROM MALCOLM PIRNIE (1987) SOIL BORINGS AND WASTE DEPOSITION LOCATIONS MAP
5. PROPERTY LINES TRANSPOSED FROM TAX MAP OF THE TOWN OF QUEENSBURY NEW YORK MAP & SECTION 115 THESE PROPERTY LINES DO NOT REPRESENT A FIELD SURVEY

120 0 120 240 feet

NO.	REVISIONS	REV'D BY	DATE	APPROD BY

ECKENFELDER ENGINEERING P.C.
Nashville, Tennessee
Mahwah, New Jersey

HERCULES INCORPORATED
CIBA-GEIGY PLANT SITE
GLENS FALLS, NEW YORK

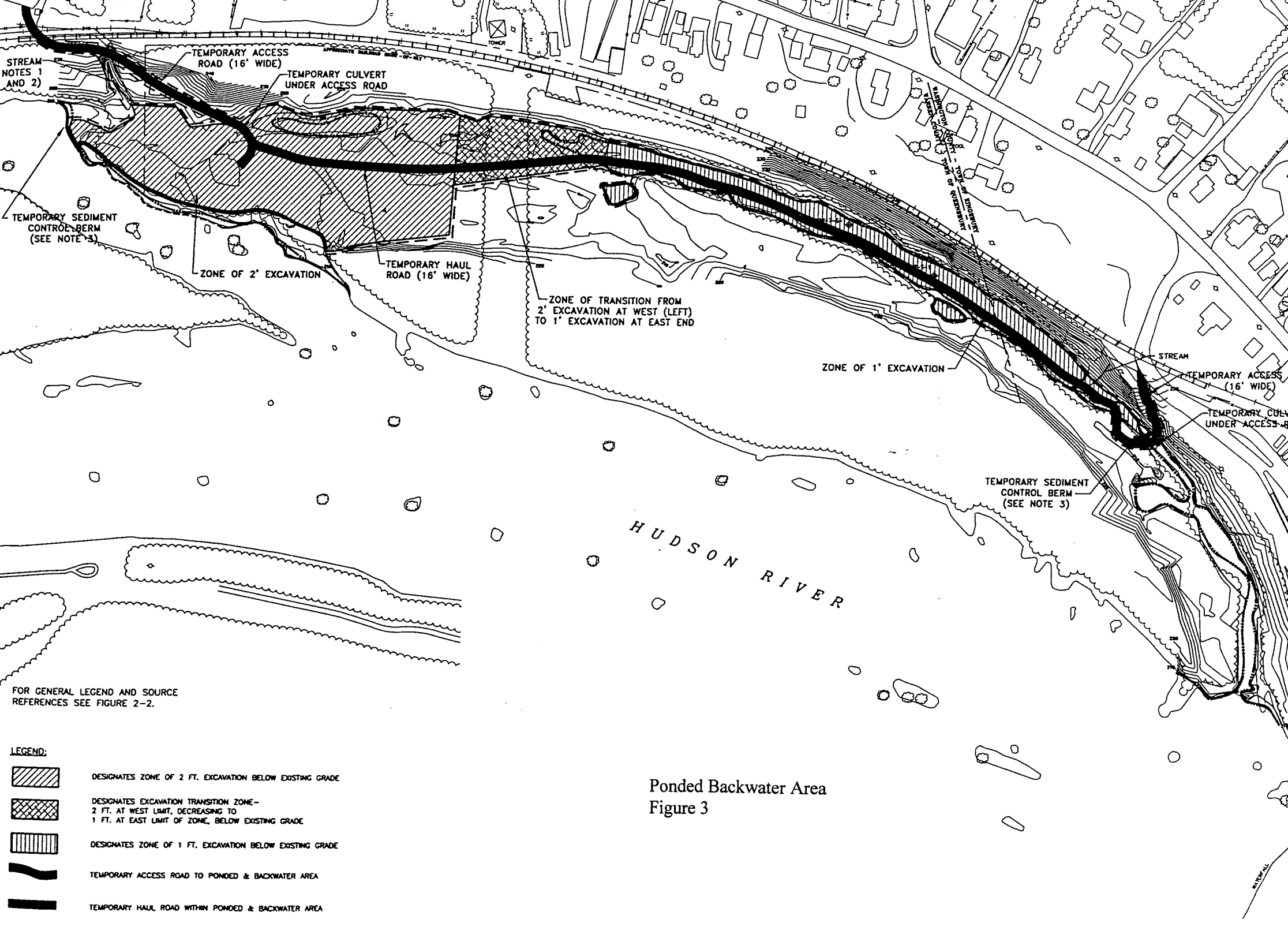
SITE MAP

SCALE: AS SHOWN

DRAWN BY	DATE	CHECKED BY	APPROVED BY
AMB		RLG	WGE

FIGURE 2

DRAWING NUMBER 6764



Ponded Backwater Area
Figure 3