

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

**RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)
Page 1
Current Human Exposures Under Control**

Interim Final 2/5/99

Facility Name: IBM Poughkeepsie
Facility Address: 2455 South Road, Poughkeepsie, New York 12601
Facility EPA ID#: NYD080480734

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.

Attachment A contains site background.

Attachment B contains soils data summary tables for soil samples collected at the site.

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).

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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)?

_____ 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.

	<u>Yes</u>	<u>No</u>	<u>?</u>	<u>Rationale / Key Contaminants</u>
Groundwater	X			(1) see below
Air (indoors) ²		X		(2) see below
Surface Soil (e.g., <2 ft)	X			(3) see below
Surface Water		X		(4) see below
Sediment		X		(5) see below
Subsurface Soil (e.g., > 2 ft)	X			(6) see below
Air (outdoors)		X		(7) see below

Rationale and Reference(s):

1. Groundwater:

RATIONALE: Groundwater monitoring data collected under the site’s Part 373 Permit indicate exceedence of New York State Groundwater Quality Standard (Part 703).

KEY CONTAMINANTS: Tetrachloroethene; Trichloroethene; 1,1,1-Trichloroethane; 1,2-Dichloroethene; Vinyl Chloride; 1,1-Dichloroethane; 1,1-Dichloroethene, Freon 113, Methylene Chloride. A summary table for each of these key contaminants with historical concentration ranges is provided below. The grouping of wells for these statistical evaluations is based on corrective actions underway at the facility (Groups 1, 2 and 3 and Site Gravel). (See Figure 1)

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).

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<i>Ranges in Concentration in Groundwater (ug/l)</i>				
<i>Site Area Parameter</i>	<i>Group 1</i>	<i>Group 2</i>	<i>Group 3</i>	<i>Site Gravel</i>
Tetrachloroethene	ND - 2.8	ND - 7.2	ND - 1.1	ND - 74.7
Trichloroethene	ND - 160	ND - 11000	ND - 92.3	ND - 18000
1,1,1-Trichloroethane	ND - 19	ND - 18000	ND - 490	ND - 6.6
1,2-Dichloroethene	ND - 880	ND - 2700	ND - 410	ND - 12000
Vinyl Chloride	ND - 390	ND - 26	ND - 160	ND - 200
1,1-Dichloroethene	ND - 12	ND - 670	ND - 13	ND - 4.9
Freon 113	ND - 40	ND - 120000	ND - 35	ND - 150
Methylene Chloride	ND - 12	ND - 40000	ND	ND

REFERENCES: Groundwater monitoring data are presented in numerous reports and transmittals including:
 NYSDEC Permit 3-1346-00035/00123
 Groundwater RCRA Facility Investigation (December 12, 1997)
 Former Antenna Drum Storage Area RCRA Facility Investigation (December 17, 1997)
 Corrective Measures Study Report (March 31, 1999)
 Corrective Measures Implementation Groundwater Treatment System 100% Design Package (February 22, 2000)
 Annual Groundwater Monitoring Reports (annually by April 30 each year)

2. Air (indoors)²

RATIONALE: Based upon soil concentrations existing beneath site buildings the Johnson & Ettinger vapor intrusion model was run by a qualified risk assessor.

The review of the soils data led to the evaluation of two (2) parameters in B003 (chloroform and trichloroethene); one parameter (acetone) in B004; one parameter (tetrachloroethene) in B075 and one parameter (trans-1,2-dichloroethene) in B416. Although Buildings 001, 002, 004, 008 and 450 also have concentrations of trichloroethene in subsurface soil or groundwater underlying these buildings, Building 003 was selected for evaluation for this compound over those buildings because of the comparatively high concentration of TCE underlying that building.

An inhalation exposure/risk model* was run using the calculated indoor air concentrations in each building (B003, B004, B075 and B416). The risk model was run by a qualified risk assessor. The risk model assumed a body weight of 70Kg, breathing rate of 20 m³/day, exposure time of 8 hrs/day, exposure frequency of 250 days/year and an exposure duration of 25 years.

Based on the modeling results, none of the calculated risk levels risks for any of these buildings is above the EPA acceptable risk range for worker exposure scenarios, including manufacturing, maintenance and office workers. Based on the conservative assumptions of the model, the highest risk level calculated for any of these buildings was for Building 003. Although the predicted concentration represents a risk level for human receptors in excess of 1×10^{-5} , it is still, nonetheless, within the EPA acceptable risk range and at least two

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orders of magnitude below the acceptable OSHA limit for worker exposure. To confirm the predicted concentration in B003, indoor air sampling was performed. The results of four samples verify the model predictions and the resultant risk level on the order of 1×10^{-5} .

** The inhalation exposure/risk model follows the USEPA Risk Assessment Guidance for Superfund (RAGS) format.*

KEY CONTAMINANTS: Chloroform, trichlorethene, acetone, tetrachloroethene trans-1,2-dichloroethene

REFERENCES: Data evaluation-Risk Assessment recently completed for the IBM Poughkeepsie site.

3. Surface Soil (e.g. <2 ft)

RATIONALE: Comparison of all available surficial soils (<2 ft. below ground surface) data to Recommended Soil Cleanup Objective Values presented in TAGM 4046 *Determination of Soil Cleanup Objectives and Cleanup Levels* shows nineteen (19) parameters for this depth interval exceed values presented in this TAGM. Most of these compounds were detected in the area known as the Former Equipment Crusher Release Pathway.

In response to the findings of a RCRA Facility Investigation of this area, an Interim Corrective Measure (ICM) was proposed, approved and completed during 2000. The ICM included installation of an asphalt cap as an engineering control to prohibit inadvertent contact with the shallow contaminated soils.

In addition to the aforementioned engineering control, IBM has also implemented an institutional control restricting digging within site areas without prior notice to and approval from the site environmental manager.

Known releases at this site, with few exceptions, were primarily from subsurface structures (eg. piping, tanks) typically at a burial depth of greater than 2 feet.

KEY CONTAMINANTS: Benzo(a)anthracene; Benzo(a)pyrene; Benzo(b)fluoranthene; Benzo(k)fluoranthene; Chrysene; Dibenz(a,h)anthracene; Indeno(1,2,3-c,d)pyrene; PCB-1242; PCB-1248; PCB-1254; Arsenic (total); Barium (total); Beryllium (total); Cadmium (total); Chromium (total); Cobalt (total); Copper (total); Lead (total); Nickel (total); Selenium (total); Zinc (total); Dieldrin (total); Tetrachloroethene and; Trichloroethene. Attachment B contains a summary table of the maximum concentrations detected for each parameter analyzed for this soil interval (less than or equal to 2 feet below ground surface).

REFERENCES: Surficial soils data are presented in numerous reports and transmittals including:
Annual Groundwater Monitoring Reports (submitted annually, due April 30 each year)
RCRA Facility Assessment - Sampling Visit (Soils) Nine Solid Waste Management Units (Feb. 18, 1998)
Former Antenna Drum Storage Area RCRA Facility Investigation (December 17, 1997)
RCRA Facility Investigation (Soils) Former Equipment Crusher Release Pathway (June 30, 1999)
Contained-in Requests (August 18, 1999)
Historical Soil Sampling Data Report

4. Surface Water

RATIONALE: An extensive surface water sampling program has been on going at the site since the late 1970's. Historical monitoring has also been conducted at surface water discharge locations that are either currently or have been regulated under SPDES.

In addition, significant modifications have been made to mitigate infiltration of groundwater into underground storm water piping systems which, in turn, discharge to surface water under a SPDES permit. These modifications have included segregation of dry weather flows with collection and subsequent treatment

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of this infiltrated groundwater.

Since these engineering solutions have been in place, sampling data indicates compliance with SPDES outfall limits.

Most recent surface water sampling conducted at H-107 (June 2002) shows no detections above New York State surface water quality standards. Samples are collected from H-107 on a quarterly frequency.

KEY CONTAMINANTS: Trichloroethene; 1,2-Dichloroethylene

REFERENCES: Surface water monitoring data is presented in numerous reports and transmittals including:
Groundwater RCRA Facility Investigation (December 12, 1997)
Annual Groundwater Monitoring Reports (annually by April 30 each year)
SPDES DMRs (submitted monthly)
SPDES Permit and SPDES Permit Modification Applications (NY0005541)

5. Sediment

RATIONALE: Contamination of sediment is not reasonably suspected. Discharge data meets SPDES limits. Sediment is coarse textured and the constituents of concern do not sorb to this media.

An investigation of sedimentation in the Hudson River and in the vicinities of the H-107 outlet and Outfall 003 (discharge from onsite industrial waste treatment facility) concluded there were no depositional areas with fine-grained sediments that could be linked to the outfalls as a source.

The configuration of the outfalls in the river is such that discharged material will mix with the main river flow in relatively deep water and be transported and mixed with the ambient river solids.

REFERENCES:

Analysis of Sedimentation Characteristics in Areas Identified by NYSDEC - May 1997

6. Subsurface Soil (e.g. > 2 feet)

RATIONALE: A comparison of all available subsurface soils data (> 2 feet below ground surface) was made to the Recommended Soil Cleanup Objective Values presented in TAGM 4046, *Determination of Soil Cleanup Objectives and Cleanup Levels*. These comparisons show samples collected at below 2 feet exceed these standards for thirteen (13) parameters. Maximum concentrations for parameters that exceed the TAGM 4046 Soil Cleanup Objective value generally fall within the area of the Former Equipment Crusher Release Pathway, beneath B003, or the location of the Former Sludge Drying Bed. Attachment B contains a summary table of the maximum concentrations detected for each parameter analyzed for this soil interval (below 2 feet) for each of these three areas (Former Equipment Crusher Release Pathway, beneath B003 and the location of the Former Sludge Drying Bed).

Engineering controls have been installed in an area of significant surficial soil contamination. The Interim Corrective Measure at the former B075 Equipment Crusher Release Pathway precludes exposure for the trespasser as well as the maintenance worker to the contaminated surficial soils. In addition, also as previously discussed, IBM Poughkeepsie has implemented an institutional control (Soil Management Protocol) restricting digging within site areas without prior notice to and approval from the site environmental manager. It should be noted that the Former Sludge Drying Bed area is subject to these institutional controls (Soil Management Protocol). Other soils are inaccessible because these soils fall within the footprint of a building (i.e. soils beneath B003). Controls for these soils will be re-evaluated should the

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building be demolished.

KEY CONTAMINANTS: 1,3 Dichlorobenzene; Benzo(a)anthracene; Benzo(a)pyrene; Benzo(b)fluoranthene; Benzo(k)fluoranthene; Chrysene; Dibenzo(a,h)anthracene; Acetone; Chloroform; Methylene Chloride; trans-1,2-Dichloroethylene; Trichloroethylene; Xylene (total). Attachment B contains a summary table of the maximum concentrations detected for each parameter analyzed for this soil interval (greater than 2 feet below ground surface).

REFERENCES: Subsurface soils data is presented in numerous reports and transmittals including:
Annual Groundwater Monitoring Reports (submitted annually, due April 30 each year)
RCRA Facility Assessment - Sampling Visit (Soils) Nine Solid Waste Management Units (Feb. 18, 1998)
Former Antenna Drum Storage Area RCRA Facility Investigation (December 17, 1997)
RCRA Facility Investigation (Soils) Former Equipment Crusher Release Pathway (June 30, 1999)
Contained-in Requests (August 18, 1999)
Historical Soil Sampling Data Report

7. Air (outdoors)

RATIONALE: Prevailing winds and an uncontained volume of air would result in contaminant concentrations in ambient outdoor air significantly less than that calculated for indoor air. It is therefore not reasonable to expect that this media is contaminated above risk-based levels.

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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)

<u>Contaminated Media</u>	<u>Residents</u>	<u>Workers</u>	<u>Day-Care</u>	<u>Construction</u>	<u>Trespassers</u>	<u>Recreation</u>	<u>Food</u>
Groundwater	No	No	NA	No	No	No	No
Air (indoors)	NA	Yes <i>(B003 only)</i>	NA	No	No	No	NA
Soil (surface, <2ft)	NA	Yes	NA	No	No	No	No
Surface Water	-----“Not contaminated” As per # 2, See instruction #1 below-----						
Sediment	-----“Not contaminated” As per # 2, See instruction #1 below-----						
Soil (subsurface, >2ft)	NA	No	NA	No	No	No	NA
Air (outdoors)	-----“Not contaminated” As per # 2, See instruction #1 below-----						

Instructions for Summary Exposure Pathway Evaluation Table:

- Strike-out specific Media including Human Receptors’ spaces (for Media which are not “contaminated”) as identified in #2 above.
- 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.

_____ 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 conditions(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).

___X_ 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: Based on the developed site model, workers were determined to have a potentially complete pathway to surface soil and volatile emissions (to indoor air) from subsurface soil.

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Based on the modeling results of indoor air, none of the risks from Buildings 003, 004, 075 or 416 are an acceptable or significant exposures for worker scenarios. Based on the conservative assumptions of the model, exposure to indoor air in Building 003 (B003) may result in a risk level for human receptors of 1.2×10^{-5} . As noted previously, this risk level falls within the EPA's acceptable risk range and is at least two orders of magnitude below the OSHA limit for worker exposure. It is therefore also considered to be insignificant.

As discussed previously, engineering controls have been installed in an area of significant surficial soil contamination. The Interim Corrective Measure at the former B075 Equipment Crusher Release Pathway precludes exposure for the trespasser as well as the maintenance worker to the contaminated surficial soils. In addition, also as previously discussed, IBM Poughkeepsie has implemented an institutional control restricting digging within site areas without prior notice to and approval from the site environmental manager.

REFERENCES:

Groundwater RCRA Facility Investigation (December 12, 1997)
Former Antenna Drum Storage Area RCRA Facility Investigation (December 17, 1997)
RCRA Facility Investigation (Soils) Former Equipment Crusher Release Pathway (June 30, 1999)
Corrective Measures Study Report (March 31, 1999)
Corrective Measures Implementation Groundwater Treatment System 100% Design Package (February 22, 2000)
Annual Groundwater Monitoring Reports (annually by April 30 each year)
Interim Corrective Measure, Former Equipment Crusher Release Pathway
Site Institutional Controls
Risk Assessment recently completed for the site.

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4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be “**significant**”² (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)?

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):

RATIONALE: Based on the developed site model, maintenance workers were determined to have a potentially complete and significant pathway to surface soil and volatile emissions (to indoor air) from subsurface soil and groundwater. However, there would be no significant exposure since work in areas of contaminated surficial soils would be in accordance with an approved health and safety plan.

Based on the modeling results of indoor air, none of the risks from Buildings 003, 004, 075 or 416 are unacceptable or significant exposures for worker scenarios. Based on the conservative assumptions of the model, exposure to indoor air in Building 003 (B003) may result in a risk level for human receptors of 1.2×10^{-5} . Based on this risk level, indoor air sampling was performed inside B003. The results of this sampling confirmed the model calculations with a risk level of 1.0×10^{-5} . Both these risk levels fall within the EPA acceptable levels of risk of 1.0×10^{-4} to 1.0×10^{-6} . In addition, the concentrations detected in indoor air were 1/1000 of the OSHA allowable limit. Based on the sampling results and calculated risk levels, IBM will post the results of the indoor air sampling within the area sampled for the period from October 14 through October 25, 2002.

As discussed previously, engineering controls have been installed in an area of surficial soil contamination. The Interim Corrective Measure at the former B075 Equipment Crusher Release Pathway precludes exposure for the trespasser as well as the maintenance worker to the contaminated surficial soils. In addition, also as previously discussed, IBM Poughkeepsie has implemented an institutional control restricting digging within site areas without prior notice to and approval from the site environmental manager which would preclude a completed pathway of exposure.

² 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.

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REFERENCES:

Groundwater RCRA Facility Investigation (December 12, 1997)

Former Antenna Drum Storage Area RCRA Facility Investigation (December 17, 1997)

RCRA Facility Investigation (Soils) Former Equipment Crusher Release Pathway (June 30, 1999)

Corrective Measures Study Report (March 31, 1999)

Corrective Measures Implementation Groundwater Treatment System 100% Design Package (February 22, 2000)

Annual Groundwater Monitoring Reports (annually by April 30 each year)

Interim Corrective Measure, Former Equipment Crusher Release Pathway

Site Institutional Controls

Risk Assessment recently completed for the site.

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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.

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6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA 725), 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 IBM Poughkeepsie facility, EPA ID# NYD08048734, located at Poughkeepsie, 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 (signature) _____ Date 9/30/2002
(print) Victor Valaitis
(title) Environmental Engineer

Supervisor (signature) _____ Date 9/30/2002
(print) Roger Murphy
(title) Chief, Eastern Corrective Action Section
(EPA Region or State) NYSDEC

Supervisor (signature) _____ Date 9/30/2002
(print) Edwin Dassatti
(title) Chief, Bureau of Solid Waste & Corrective Action
(EPA Region or State) NYSDEC

Locations where References may be found:

New York State Department of Environmental Conservation, 625 Broadway, Albany, NY 12233

Contact telephone and e-mail numbers:

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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.



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Attachment A

Site Description:

The IBM Poughkeepsie facility is located approximately 6 miles south of the City of Poughkeepsie. The site lies between Route 9 and the Hudson River in a mixed residential industrial area. Figure 2 is the site location map. The plant site, which has been operated by IBM since the 1940's, consists of approximately 423 acres, of which two-thirds is occupied by the manufacturing complex. Figure 3, Solid Waste Management Units Location Map, depicts the layout of the site. The facility conducts manufacturing, assembly and testing of computer systems. Electronics research and development activities are also conducted at the facility.

Due to accidental releases, breaks in underground pipes and past practices, there have been releases to both soils and groundwater. The most serious releases are volatile organic releases to the groundwater in the manufacturing area of the plant. This has resulted in the Site Gravel groundwater plume which is currently under remediation. Most releases to soils were immediately cleaned up by the facility and where questions remained, confirmatory soil sampling and analysis was conducted under RCRA authority. As a result of site investigations, a release to soils requiring corrective measures was found in an area of the site known as the Former Equipment Crusher lower release pathway. This area (containing petroleum products and semi-volatile organics which are not very mobile) was covered by asphalt, special soil management protocols were implemented and groundwater monitoring was implemented.

Potential Threats and Contaminants:

Contaminants.

Groundwater chemistry data have been collected from monitoring wells at this site since 1979. Solvents used at the Poughkeepsie facility have been detected in dissolved form in the groundwater in the unconsolidated aquifer beneath the site. These solvents contain volatile organic compounds (VOCs). The most wide spread concentration of these contaminants is in the Site Gravel plume which appears to have originated largely from activities in the manufacturing area of the plant site. Specific plumes associated with the lower plant are related to specific activities in these areas.

Subsurface soil sampling has been conducted in many areas of the site historically and most recently as part of the RFI at the Former Drum Storage Area and the RFA-Sampling Visit activities for soils at nine Solid Waste Management Units (SWMUs). This sampling activity performed two functions: (1) at SWMUs where corrective action had taken place, the soil samples confirmed that

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the cleanup was to acceptable levels; and

(2) for suspected releases, confirm the absence or presence of hazardous constituents at levels of concern.

Soil sampling at the Former Equipment Crusher indicated the need for further action at two areas: (1) adjacent to and under a portion of Building B075; and (2) the lower release pathway (Figure 4). The main concern was the presence of semi-volatile organics above ingestion action levels. Since the area under the building is not accessible at this time, corrective measures will be delayed until this area becomes accessible. Corrective measures were implemented for the area outside of the building and the lower release pathway.

Potential Threats From Contaminated Groundwater.

At this facility groundwater is not used as a source of drinking water. Also, there are no known public or private drinking water supply wells impacted by this groundwater. All adjacent housing is on municipal water supply. However, 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 a combination of fencing and security and not expected to come in contact with contaminated groundwater. Workers sampling and managing contaminated groundwater corrective measures will do so following an appropriate health and safety plan.

Potential Threats From Contaminated Soil.

Since the site is secure, trespassers would not be expected to come in contact with contaminated soils. Any maintenance work to be implemented on site would be in accordance with an appropriate health and safety plan. No construction work is planned in areas containing contaminated soils. If this changes and construction work is conducted, all work in areas of contaminated soils would be in accordance with an approved health and safety plan.

Potential Threats From Air Contamination.

Indoor air sampling (within Building 003) has demonstrated that volatile organics, although present, are below levels of concern.

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Attachment B
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IBM Poughkeepsie, New York, Main Plant
Soils Data Summary Tables

<i>Question 2. Item 3. Surface Soil (e.g. <2 ft) Summary of Maximum and Minimum Detected Soil Concentrations</i>			
<i>Parameter</i>	<i>Minimum concentration</i>	<i>Maximum concentration</i>	<i>Measurement Units</i>
Benzo(a)pyrene	ND	8,300	ug/kg
Benzo(b)fluoranthene	ND	9,900	ug/kg
Benzo(k)fluoranthene	ND	3,500	ug/kg
Chrysene	ND	7,400	ug/kg
Dibenz(a,h)anthracene	ND	300	ug/kg
Indeno(1,2,3-c,d)pyrene	ND	3,200	ug/kg
PCB-1242	ND	1,300	ug/kg
PCB-1248	ND	1,900	ug/kg
PCB-1254	ND	1,800	ug/kg
Arsenic (total)	ND	18.8	mg/kg
Barium (total)	ND	4,250	mg/kg
Beryllium (total)	ND	1.3	mg/kg
Cadmium (total)	ND	17.1	mg/kg
Chromium (total)	ND	90.3	mg/kg
Cobalt (total)	14.0	54.1	mg/kg
Copper (total)	9.4	163	mg/kg

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Lead (total)	ND	454	mg/kg
Nickel (total)	3.9	37.9	mg/kg
Selenium (total)	ND	2.2	mg/kg
Zinc (total)	24.3	8,090	mg/kg
Dieldrin (total)	ND	160	ug/kg
Tetrachloroethene	ND	44,000	ug/kg
Trichloroethene	ND	3,400	ug/kg

Question 2.

Item 6. Subsurface Soil (e.g. >2 ft)

Summary of Maximum and Minimum Detected Soil Concentrations

Site Area: B075 Former Equipment Crusher Release Pathway

<i>Parameter</i>	<i>Minimum concentration</i>	<i>Maximum concentration</i>	<i>Measurement Units</i>
1,3-Dichlorobenzene	ND	ND	ug/kg
Benzo(a)anthracene	ND	2,500	ug/kg
Benzo(a)pyrene	ND	2,200	ug/kg
Benzo(b)fluoranthene	ND	2,700	ug/kg
Benzo(k)fluoranthene	ND	810	ug/kg
Chrysene	ND	2,300	ug/kg
Dibenz(a,h)anthracene	ND	260	ug/kg
Indeno(1,2,3-c,d)pyrene	ND	1,100	ug/kg
Acetone	ND	ND	ug/kg
Chloroform	ND	ND	ug/kg
Methylene Chloride	ND	ND	ug/kg
1,2-Dichloroethylene	ND	ND	ug/kg
Trichloroethene	ND	26	ug/kg
Xylene (total)	ND	340	ug/kg

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Question 2.

Item 6. Subsurface Soil (e.g. >2 ft)

Summary of Maximum and Minimum Detected Soil Concentrations

Site Area: Beneath Building 003

<i>Parameter</i>	<i>Minimum concentration</i>	<i>Maximum concentration</i>	<i>Measurement Units</i>
1,3-Dichlorobenzene	ND	17,000	ug/kg
Benzo(a)anthracene	Not Analyzed		ug/kg
Benzo(a)pyrene	Not Analyzed		ug/kg
Benzo(b)fluoranthene	Not Analyzed		ug/kg
Benzo(k)fluoranthene	Not Analyzed		ug/kg
Chrysene	Not Analyzed		ug/kg
Dibenz(a,h)anthracene	Not Analyzed		ug/kg
Indeno(1,2,3-c,d)pyrene	Not Analyzed		ug/kg
Acetone	Not Analyzed		ug/kg
Chloroform	ND	350	ug/kg
Methylene Chloride	ND	6.4	ug/kg
1,2-Dichloroethylene	ND	230,000	ug/kg
Trichloroethene	ND	8,900,000	ug/kg
Xylene (total)	Not Analyzed		ug/kg

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*Question 2.
Item 6. Subsurface Soil (e.g. >2 ft)
Summary of Maximum and Minimum Detected Soil Concentrations
Site Area: Former Sludge Drying Bed*

<i>Parameter</i>	<i>Minimum concentration</i>	<i>Maximum concentration</i>	<i>Measurement Units</i>
1,3-Dichlorobenzene	Not Analyzed		ug/kg
Benzo(a)anthracene	Not Analyzed		ug/kg
Benzo(a)pyrene	Not Analyzed		ug/kg
Benzo(b)fluoranthene	Not Analyzed		ug/kg
Benzo(k)fluoranthene	Not Analyzed		ug/kg
Chrysene	Not Analyzed		ug/kg
Dibenz(a,h)anthracene	Not Analyzed		ug/kg
Indeno(1,2,3-c,d)pyrene	Not Analyzed		ug/kg
Acetone	Not Analyzed		ug/kg
Chloroform	Not Analyzed		ug/kg
Methylene Chloride	Not Analyzed		ug/kg
1,2-Dichloroethylene	ND	15	ug/kg
Trichloroethene	ND	230	ug/kg
Xylene (total)	ND	2,050	ug/kg