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HUDSON RIVER PCB (POLYCHLORINATED BIPHENYL) NPL SITE

STATE OF NEW YORK

CERCLIS No. NYD980763841

Agency for Toxic Substances and Disease Registry
U.S. Public Health Service

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SUMMARY

Hudson River PCB (polychlorinated biphenyl) is a National Priorities List (NPL) site located in the State of New York. Because of the past disposal of PCBs in the Hudson River, surface water, sediment, and fish from the Upper and Lower Hudson River are contaminated with elevated concentrations of PCBs. Based on information reviewed, the Agency for Toxic Substances and Disease Registry (ATSDR) has concluded that this site is of potential public health concern because of the risk to human health resulting from possible exposure to hazardous substances at concentrations that may result in adverse health effects. As noted in the Human Exposure Pathways Section below, human exposure to PCB-contaminated fish or other consumable aquatic organisms from the Hudson River may occur and/or may be occurring via oral exposure (ingestion). Possible inhalation of volatilized PCBs, airborne PCB-contaminated dusts, as well as dermal contact with PCB-contaminated sediment are also of potential concern to human health.

BACKGROUND

A. SITE DESCRIPTION

The Hudson River PCBs site is a National Priorities List (NPL) site. For over 30 years ending in 1977, the General Electric (GE) capacitor manufacturing plants near Fort Edward and Hudson Falls, New York discharged polychlorinated biphenyls (PCBs) to the Hudson River. Much of the PCBs were trapped in sediments behind a 100-year-old dam at Fort Edward. After the removal of the dam in 1973, large spring floods scoured an estimated 1.1 million cubic yards of sediment from the former dam pool. An estimated 887,000 to 1.1 million pounds of PCBs have been dispersed into the entire Hudson River System south of Fort Edward. In 1984, the estimated remaining PCBs in the river system, that were not dredged or washed to the sea, was between 498,000 to 656,000 pounds. In addition, five PCB remnant deposit areas are located along a 1.5 mile stretch of the Hudson River between the Town of Fort Edward and the Village of Hudson Falls. These deposits are the remains of sediment and debris which accumulated behind the former dam at Fort Edward.

Sediment surveys revealed that most of the PCB contamination was located in about 40 "hot spots" in the Hudson River between Fort Edward and Albany, New York, and in five exposed remnant deposit areas located in the former dam pool. The Hudson River PCB contamination problem potentially affects all waters, lands, ecosystems, communities, and facilities located in or immediately adjacent to the 200-mile stretch of river from Fort Edward to the Battery. Because of the concern over bioaccumulation of PCBs in fish and other aquatic organisms, and subsequent consumption by humans, in 1976, the State of New York banned fishing in the Upper Hudson River between Albany and Fort Edward and restricted commercial and recreational fishing in the lower reaches of the Hudson River. Currently,

recreational fishing is allowed in the Lower Hudson River; however, commercial fishing is banned. Yearly health advisories are issued by the State of New York delineating the potential health threats posed by consumption of fish from the Hudson River.

Land uses in the Hudson River Basin include agriculture, service, and manufacturing. Furthermore, the Hudson River is an important source of hydroelectric power, public water supplies, transportation, and recreation (includes swimming). The cities of Waterford and Poughkeepsie, the village of Rhinebeck, the Highland Water District, and the Port Ewen Water District, all located in the State of New York, obtain their water supplies directly from the Hudson River. In addition, a water intake near Chalsea, which is north of Beacon, New York, may be used to supplement New York City water supplies during periods of drought. The Town of Stillwater obtains their water from the Upper Hudson River above the Troy Dam, and is the only municipal water supply intake below Fort Edward and above the Troy Dam.

In 1977 and 1978, about 180,000 cubic yards of contaminated sediments were dredged from the east channel of the river at Fort Edward and placed in a clay lined containment cell in the town of Moreau. Several removal actions for the remnant deposits were completed between 1974 and 1978. The sediments and soils from Remnant Area 3a were excavated and contained. In addition, the unstable banks of Areas 3 and 5 were graded and stabilized with stone riprap; and these areas, along with Area 2, were revegetated.

A Feasibility Study (FS) for the site was issued in April 1984. An Environmental Protection Agency (EPA) Record of Decision (ROD) for the site was signed on September 25, 1984. The selected remedial actions are:

1. In-place containment of the remnant deposits by constructing a soil covering followed by vegetation. In addition, banks currently reinforced will be stabilized and fences will be erected where appropriate to prevent public access.
2. Evaluation of downstream domestic water quality at Waterford, New York and assessment of various treatment upgrading options if appropriate.

The remedial actions proposed in the ROD for the remnant areas are currently in the design phase. In addition, certain contaminated sediments in the Hudson River are being considered for removal and storage to a secure landfill. This proposal and any subsequent actions are being regulated under the Resource, Conservation, and Recovery Act (RCRA) and the Toxic Substances Control Act (TSCA).

B. SITE VISIT

A site visit at the PCB remnant site in Fort Edward and a general survey of the Upper Hudson River were conducted on September 12, 1988. The Site Visit Report is shown in Appendix I.

ENVIRONMENTAL CONTAMINATION AND PHYSICAL HAZARDS

A. SITE CONTAMINATION

Because the Hudson River and associated contaminated media are considered to be the "site", there is no delineation of on-site and off-site contamination in this Health Assessment. In addition, because there was no formal Remedial Investigation at this site (although a Feasibility Study was issued), the data used to develop Table I came from various sources gathered by ATSDR (e.g., State of New York reports).

The data reported for the site contamination in Table I include the sediment samples from the unremediated remnant bank areas (Fort Edward), Hudson River sediment and surface water samples, treated drinking water from City of Waterford, New York, air samples from the remnant areas, ambient air along the river, ambient air near the dredge disposal site, and fish tissue samples.

Fish samples from various species from the Hudson River have been monitored on a yearly basis since the spring of 1977 by the New York State Department of Environmental Conservation. In addition, fish tissues (i.e., striped bass) from the Marine District of New York (i.e., New York Harbor, Long Island Sound, and the Atlantic Ocean) were also monitored in 1984, 1985, and 1987.

The PCB concentration in treated water for the City of Waterford has rarely gone above 0.1 ug/l (FS, 1986). Currently, the treated and raw water is sampled and analyzed every two weeks (Personal Communication, Harold Berger, General Manager-City of Waterford Water Works, October 19, 1988).

C. PHYSICAL HAZARDS

No known physical hazards are associated with the Hudson River PCB site.

TABLE I: HUDSON RIVER PCB SITE-RELATED CONTAMINATION

<u>ENVIRONMENTAL MEDIA</u>	<u>CONCENTRATION OR RANGE^{a,b}</u>
SURFACE WATER	
Upper Hudson River raw water (1986)	0.197 ppb (average)
Municipal Drinking Water-Waterford, New York	
Raw water	
(1975-1983)	0.23 ppb (average)
(1982-1988)	< 0.1 ppb
Treated water	
(1975-1983)	0.04 ppb (average)
(1982-1988)	< 0.1 ppb
SEDIMENT	
Remnant Areas	5-250 ppm (average)
Upper Hudson River (1976-1981)	ND-3,707 ppm
Lower Hudson River (1976-1981)	
Albany, New York	1.6-140 ppm
Upper New York Harbor	0.7-5.8 ppm
AIR	
Farm fields near Hudson River	5 ng/m ³ (average)
Thompson dam (1981) ^c	0.11-0.52 ng/m ³ (average)
Remnant areas (1981) ^d	9 ug/m ³ (average) 10 ug/m ³ (maximum)
Dredged sediment dumping sites (1979) ^{d,e}	0.3-130 ug/m ³ (range of average values) 300 ug/m ³ (maximum)
FISH	
Marine District ^{f,g}	
Striped Bass	
All fish (1985)	2.69 ppm (geometric average)

TABLE I (CONTINUED)

(1987)	2.17 ppm (geometric average)
Current legal size fish (> 33 inches)	
(1985)	3.84 ppm (geometric average)
(1987)	3.30 ppm (geometric average)
Lower Hudson River	
Striped Bass ^g	
All fish	
(1978)	18.1 ppm (geometric average)
(1987)	3.63 ppm (geometric average)
Current legal size fish (> 33 inches) ^h	
(1987)	9.97 ppm (geometric average)
Pumpkinseeds ^{h,i}	
(1979)	5.89 ppm (average)
(1983)	5.48 ppm (average)
Upper Hudson River	
Brown Bullhead ^g	
(1977)	106.5 ppm (average)
(1983)	16.8 ppm (average)
Largemouth Bass ^g	
(1977)	70.72 ppm (average)
(1983)	6.76 ppm (average)
Pumpkinseeds ⁱ	
(1979)	19.91 ppm (average)
(1983)	9.09 ppm (average)

NOTES

- <- Less than stated value.
- ppb- Parts per billion.
- ppm- Parts per million.
- ug/m³- Micrograms per cubic meter.
- ND- Not detected.
- a- All concentrations in total polychlorinated biphenyls (PCBs).
- b- All average values are arithmetic means unless otherwise stated.
- c- Ambient air monitoring along the Hudson River during the summer months.
- d- Samples obtained at a height of 3-4 feet above ground level.
- e- Maximum value obtained from the Caputo Dump.
- f- Includes New York Harbor, Long Island Sound, and Atlantic Oceans fish samples.
- g- Analysis on whole fillet samples on a wet basis.
- h- Fish mostly caught near Albany, New York.
- i- Analysis on yearling whole fish samples on a wet basis.

DEMOGRAPHICS OF POPULATION NEAR SITE

The total population of the Hudson River Basin was 2.5 million persons. Albany, the largest city in the basin, has a population of about 100,000 persons. The town of Fort Edward, New York has a population of 6,479 persons.

EVALUATION

A. SITE CHARACTERIZATION (DATA NEEDS AND EVALUATION)

1. Environmental Media

The conclusions and recommendations made in this Health Assessment are based on the information and monitoring data provided. The following information and monitoring data, as detailed in this section, are needed to characterize the site and to evaluate the public health concerns completely. The recommendations based on these data needs are presented in the Conclusions and Recommendations Section. Additional information and monitoring data, as it becomes available, may necessitate a reevaluation by ATSDR of the public health concerns associated with the Hudson River NPL site.

Some banks along the Hudson River may have been used for depositing of the maintenance dredging from the river. Information about the location and potential environmental and human exposure pathways associated with these areas are not included in the information reviewed by ATSDR; hence, until such information about these areas is provided, ATSDR cannot comment on the potential public health implications associated with the contamination in this environmental media. Some of this information may be available, however, it currently is under litigation and was not presently available for review by ATSDR.

Several disposal sites (e.g., dumps) for dredging materials or sediments from Remnant Area 3a were identified and monitoring data for ambient air was provided for them. However, information on the other potential environmental and human exposure pathways associated with these sites was not addressed in the documents reviewed by ATSDR. Hence, until these areas are completely characterized or until information becomes available, ATSDR cannot comment on all of the potential public health implications associated with the contamination at these sites.

Although the primary public health concern is the concentration of PCBs in Hudson River fish tissue that can result from bioaccumulation, consumable and milk producing animals may be exposed to PCBs if they ingest surface water from the Hudson River or are possibly fed contaminated plant materials. In addition, PCBs may bioaccumulate in wildlife because of exposure to PCB contaminated surface water and bank (remnant or other areas) sediments. However, these potential environmental and human

exposure pathways have not been addressed in the documents reviewed by ATSDR. Until these pathways are identified and characterized (i.e., through appropriate monitoring), or until such information is made available, ATSDR cannot comment on the potential public health implications associated with the contamination in these media.

2. Land Use and Demographics

Adequate information is available on the land use and demographics of the Hudson River NPL site to perform this Health Assessment.

3. Quality Assurance and Quality Control

Because of the nature of the source of the data obtained for the development of this Health Assessment, it cannot be determined if all the data reviewed have passed QA/QC standards. Conclusions contained in this Health Assessment are based on the information received by ATSDR. The accuracy of these conclusions is determined by the availability and reliability of the data.

B. ENVIRONMENTAL PATHWAYS

As a result of past disposal practices and the subsequent release of PCB-contaminated river sediment, after the Fort Edward Dam was removed, various environmental media are contaminated with PCBs. Based on the present monitoring data available, the current potential sources of PCB contamination are sediments located in the Hudson River (especially above the Troy Dam-Upper Hudson River) and the remnant areas located in Fort Edward. These sources of PCBs are responsible for the continued contamination of various environmental media including the surface water, fish, and possibly air. The potential exists for wildlife and/or livestock to be contaminated with PCBs; however, these potential environmental pathways cannot be addressed without additional information and characterization.

SURFACE WATER AND SEDIMENT

The PCB-contaminated sediments in the Hudson River continue to contaminate the water column through the desorption of PCBs from the sediment into the surface water. Bed loads during high flow conditions may transport significant amounts of PCB contaminated sediment. Based on the Hudson River sediment monitoring data, PCB contaminated sediments have been transported to the lower reaches of the Hudson River. As shown in Table I, sediment concentrations are significantly reduced in the Lower Hudson Harbor relative to the concentrations found in the Upper Hudson. The Troy Dam, located near Albany, is responsible for attenuating much of the contaminated sediment.

The above factors are the cause for the highly variable PCB concentrations found in samples throughout the Hudson River. In addition, based on the Hudson River raw water quality data from the City of Waterford (see Table I), PCB concentrations have reduced appreciably since the period 1975-1983.

Although some of the remnant areas were stabilized, the potential exists for continued PCB contamination of the sediment and surface water from this source, especially during storm events where appreciable scouring of the remnant areas may occur due to erosion. The ROD remedial activities should help mitigate the potential for scouring of the remnant areas and subsequent additional contamination of sediment and surface water in the Hudson River.

AIR

Ambient air monitoring data (i.e., gaseous samples) indicates elevated concentrations of PCB in the breathing zone at the remnant areas and the former dumping sites for the dredged Hudson River sediment. The levels found in the ambient air at Thompson Island and at the farm fields along the Hudson River were not at concentrations of public health concern. The generation of fugitive dusts from the remnant areas is possible.

The ROD remedial actions, which proposed the placement of a soil cap and additional vegetation on the remnant areas, should mitigate the volatilization of PCBs and the generation of PCB-contaminated dusts from these areas. Information on the former dumping sites for dredge sediments and the manner in which air monitoring was conducted at these sites were not reviewed by ATSDR; hence, this environmental pathway cannot be characterized further.

CONSUMABLE BIOTA

The contaminated surface water and sediment from the Hudson River are the sources of fish contamination. PCBs have a high fish bioconcentration factor (BCF= 100,000); furthermore, they tend to concentrate in fatty tissue of the fish. As shown in Table I, concentrations of PCBs in fish tissues have declined over the past ten years; however, based on the most recent fish tissue (fillets) monitoring data from the Lower Hudson River and the Marine District of New York, striped bass, brown bullheads, and largemouth bass have PCB concentrations in excess of the Food and Drug Administration's (FDA) guideline of 2.0 ppm. In addition, the potential exists that other consumable aquatic organisms from the Hudson River may bioaccumulate PCBs in their tissues; however, no monitoring data was available to evaluate this potential.

GROUND WATER

Several municipalities, industries, and private individuals operate ground water supply wells located adjacent to the Hudson River. From the information reviewed by ATSDR, it could not be determined if surface

water from the Hudson River recharges adjacent ground water aquifers. If such recharge occurs, then the potential exists for the contamination of ground waters from contaminants in the Hudson River. The probability of appreciable accumulation of PCB in ground water is minimal because the current levels of PCB in the Hudson River surface water are not of concern, and if surface water levels were to increase (because of flooding or other events) the natural binding action of the alluvium deposits along the river should reduce these concentrations before they enter the ground water. However, this pathway cannot be adequately defined unless monitoring of these wells is performed.

C. HUMAN EXPOSURE PATHWAYS

The contamination of the environmental media previously identified in the Environmental Pathways Section, contributes to the following potential human exposure pathways:

1. Direct contact with PCB-contaminated sediment remnants and inhalation of volatilized PCBs or PCB-contaminated dusts generated from the remnant areas. However, these areas are mostly inaccessible (except remnant area 1 or 5 (see Site Visit Report-Appendix I), and in the future the proposed remedial actions should mitigate these potential human exposure pathways.
2. Ingestion of PCB-contaminated fish or other consumable aquatic organisms from the Lower Hudson River (i.e., below the Troy Dam) and Marine District of New York. Fishing in the Lower Hudson River is not banned for recreational purposes. Hence, individuals that frequently fish or capture, and subsequently consume contaminated fish or other aquatic organisms may be exposed to appreciable concentrations of PCBs.
3. Ingestion of potentially contaminated wildlife, livestock, and milk products through bioaccumulation of PCBs. This human exposure pathway cannot be evaluated without further identification and characterization of the environmental pathway associated with potential exposure.
4. Direct contact, incidental ingestion, or inhalation of PCBs while swimming or wading in the Hudson River.
5. Inhalation of PCB-contaminated air at the former Hudson River dredged sediment disposal sites. Other potential human exposure pathways may exist at these former dumping sites; however, ATSDR cannot evaluate them without additional information.

Additional human exposure pathways may exist if the Hudson River contaminated sediments are dredged. Inhalation of PCB contaminated dusts by remedial workers or residents near the dredging area could occur. In addition, PCB concentrations may increase in the water column during dredging activities; hence, municipalities that obtain water from the Hudson, and are downstream of the dredging activities, may experience a

temporary increase in PCB concentrations in their raw water supplies. Depending on the efficiency of PCB removal by the municipality's treatment process, additional human exposure may occur through oral (ingestion), dermal, and inhalation exposure to PCB-contaminated municipal potable water supplies.

PUBLIC HEALTH IMPLICATIONS

The public health implications, resulting from potential human exposure to contaminants at the Hudson PCB NPL site, are discussed below according to potential human exposure pathways and the contaminants of concern for each of those pathways.

1. Ingestion of PCB-Contaminated Fish

Ingestion of PCB-contaminated fish, particularly from the Lower Hudson River and Marine District of New York, is the primary human exposure pathway of concern to human health. Maximum PCB levels, detected in the edible portion of various fish species, were substantially higher than the Food and Drug Administration (FDA) tolerance level of 2 ppm. Since significant PCB levels were detected in fish, where recreational fishing is allowed, individuals who may consume PCB-contaminated fish may be exposed and are the primary receptor population of concern in regard to potential adverse health effects. In addition, individuals who consume other potentially contaminated aquatic organisms from the Hudson River may also be exposed to PCBs at levels that may adversely impact their health.

PCBs tend to accumulate in adipose tissue, blood, and breast milk. Infants are particularly susceptible to PCB exposure and can be exposed to PCBs in the breast milk of lactating mothers. There have been some studies which indicate a decrease in birth weight, head circumference, and an increase in the incidence of premature births in women who had previously ingested PCB-contaminated fish (Fain *et al.*, 1984). There are also some studies which indicate a positive correlation between the consumption of PCB-contaminated fish by mothers, serum cord PCB levels, and an increased incidence of decreased visual recognition memory in the newborn (Jacobson *et al.*, 1985). However, these studies are not conclusive in that there are no specific dose estimates cited.

In addition, PCBs have been designated as Group B2—Probable Human Carcinogens (USEPA, 1987). This designation is based on some studies which indicate a positive correlation between PCB concentration and liver cancer (hepatocellular carcinomas) and hepatic neoplastic nodules in laboratory animals (Kimbrough *et al.*, 1975); Norbeck and Weltman (1985). Long-term ingestion of PCB-contaminated fish may pose a significant carcinogenic risk to human health.

2. Incidental Ingestion of and Dermal Contact with PCB-Contaminated Surface Water

Incidental ingestion of and dermal contact with PCB-contaminated surface water is of possible concern to the health of those who may utilize the upper Hudson River for recreational purposes (e.g., swimming and wading). Long-term oral exposure to maximum PCBs, at the levels detected, may result in significant carcinogenic risks to human health (see narrative above). Exposure to PCB-contaminated surface water at the Hudson River PCB site is more likely incidental than long-term.

3. Inhalation of Volatilized PCBs and Dermal Contact With Dredged PCB-Contaminated Sediment Disposal Sites

PCBs were detected in ambient air at a maximum level of 300 ug/m^3 in the dredged sediment dump sites. This is at a level of concern to human health via inhalation. The primary susceptible receptors of concern are workers (if the Occupational Safety and Health Administration (OSHA) regulatory and National Institute for Occupational Safety and Health (NIOSH) precautionary measures are not followed) and possibly nearby residents. The liver and skin are target organs and adverse health effects may result from the inhalation of PCB levels as low as 90 ug/m^3 (chloracne and liver effects). Low-birth weight has also been observed from long-term inhalation exposure of mothers to PCBs, and there are studies which indicate a positive correlation between inhalation of PCB levels and an increased incidence of malignant melanomas.

Dermal absorption is also an exposure pathway of possible concern, particularly for those who may be involved in sediment sampling and excavation activities without protection. An increased incidence of mesenchymal tumors have been associated with this route of PCB exposure; however, these studies are not conclusive.

The complete public health implications associated with the disposal of dredged PCB-contaminated sediments cannot be adequately evaluated without further identification and characterization of the associated environmental and human exposure pathways.

Another exposure pathway of potential concern to human health is the possible ingestion, dermal absorption, and inhalation of PCBs possibly in municipal water supplies. This concern is applicable if raw water supplies are contaminated with PCBs from dredging activities and if the municipal water treatment process is not capable of reducing PCB concentrations below levels of public health concern. The primary exposure route of concern would be via ingestion. A significant carcinogenic risk may result from long-term exposure.

4. Inhalation of Volatilized PCBs and PCB-Contaminated Remnant Dusts and Dermal Contact with Sediment Remnants (Remnant Areas 1 and 5)

The potential for inhalation of volatilized PCBs and PCB-contaminated sediment remnant dusts and dermal contact with sediment remnants, may be

of possible concern to human health. The maximum levels detected (9-10 $\mu\text{g}/\text{m}^3$) were two orders of magnitude higher than a typical urban background level (0.02 $\mu\text{g}/\text{m}^3$), as well as above the NIOSH guidelines (1 $\mu\text{g}/\text{m}^3$) for a ten hour work day/forty hour work week. In addition, PCBs are readily absorbed through the skin. This absorption may be a possible concern to human health.

5. Ingestion of PCB-Contaminated Consumable Biota

Ingestion of consumable biota (e.g., wildlife, livestock, milk products, or other aquatic organisms from the Hudson River) may be of concern to human health, if these biota contain PCBs. However, as a result of the lack of a consumption survey and sampling data, we cannot be conclusive on human exposure and any potential subsequent adverse health effects.

CONCLUSIONS AND RECOMMENDATIONS

Based on the data needs in the Site Evaluation Section and the public health concerns associated with the Hudson River PCB site, the following conclusions and recommendations are warranted.

Based on information reviewed, ATSDR has concluded that this site is of potential public health concern because of the risk to human health resulting from possible exposure to hazardous substances at concentrations that may result in adverse health effects. As noted in the Human Exposure Pathways Section above, human exposure, primarily to PCB-contaminated fish, may occur and/or may be occurring via oral exposure. Possible inhalation of volatilized PCBs, airborne PCB-contaminated dusts, and dermal contact with PCB-contaminated sediment is also of potential concern to human health.

The public health implications associated with the possible presence of PCBs in riverbanks, which were used to dispose of maintenance dredgings from the Hudson River, cannot adequately be further evaluated without identification and characterization of the potential environmental and human exposure pathways associated with these areas.

The public health implications associated with the the consumption of PCBs in potentially contaminated wildlife, livestock, milk products, and other aquatic organisms from the Hudson River cannot adequately be evaluated, without further identification and characterization of the potential environmental and human exposure pathways.

The complete public health implications associated with the disposal of PCB-contaminated dredgings at various sites and dumps cannot adequately be evaluated without further identification and characterization of the potential environmental and human exposure pathways.

ATSDR recommends the following:

- (1) Workers should follow all OSHA and NIOSH guidelines while engaged in remedial action clean-up activities.
- (2) If the Hudson River PCB-contaminated sediments are dredged, ambient air monitoring should be performed at potential human exposure points. In addition, municipalities which are located downstream of the dredging activities and use the Hudson River as the source of their potable waters, should perform daily monitoring of their raw and treated potable water supplies in order to evaluate the potential for human exposure to PCB-contaminated municipal waters.
- (3) A consumption survey of wildlife and livestock, which may possibly consume PCB-contaminated media (e.g., surface water), is recommended to define human exposure and any possible subsequent adverse health effects.
- (4) In accordance with the Comprehensive Environmental Response, Compensation, Liability Act of 1980 (CERCLA), as amended, the Hudson River PCB site, New York, has been evaluated for appropriate follow-up with respect to health effects studies. Since human exposure to site contaminants may be occurring, this site is being considered for follow-up health effects studies. After consultation with Regional EPA staff and State and local health and environmental officials, the Epidemiology and Medicine Branch, Office of Health Assessment, ATSDR will determine if follow-up public health actions or studies are appropriate for this site.

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APPENDICES

- a. Appendix I, Trip Report: Site Visit to Hudson River PCB NPL Site.