ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

Public Health Assessment for

CONSILIDATED IRON AND METAL
NEWBURGH, ORANGE COUNTY, NEW YORK
EPA FACILITY ID: NY0002455756
MAY 25, 2004

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
Agency for Toxic Substances and Disease Registry

THE ATSDR PUBLIC HEALTH ASSESSMENT: A NOTE OF EXPLANATION

This Public Health Assessment was prepared by ATSDR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund) section 104 (i)(6) (42 U.S.C. 9604 (i)(6)), and in accordance with our implementing regulations (42 C.F.R. Part 90). In preparing this document, ATSDR has collected relevant health data, environmental data, and community health concerns from the Environmental Protection Agency (EPA), state and local health and environmental agencies, the community, and potentially responsible parties, where appropriate.

In addition, this document has previously been provided to EPA and the affected states in an initial release, as required by CERCLA section 104 (i)(6)(H) for their information and review. The revised document was released for a 30-day public comment period. Subsequent to the public comment period, ATSDR addressed all public comments and revised or appended the document as appropriate. The public health assessment has now been reissued. This concludes the public health assessment process for this site, unless additional information is obtained by ATSDR which, in the agency's opinion, indicates a need to revise or append the conclusions previously issued.

Agency for Toxic Substances & Disease Registry ..... Julie L. Gerberding, M.D., M.P.H., Administrator
Howard Frumkin, M.D., Dr.P.H., Director

Division of Health Assessment and Consultation…. ..... William Cibulas, Jr., Ph.D., Director
Sharon Williams-Fleetwood, Ph.D., Deputy Director

Health Promotion and Community Involvement Branch ..... Lisa Calhoun Hayes, P.E., DEE, Acting Chief

Exposure Investigations and Consultation Branch ..... Susan M. Moore, Ph.D., Chief

Federal Facilities Assessment Branch ..... Sandra G. Isaacs, B.S., Chief

Superfund and Program Assessment Branch ..... Richard E. Gillig, M.C.P., Chief

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PUBLIC HEALTH ASSESSMENT

CONSOLIDATED IRON AND METAL

NEWBURGH, ORANGE COUNTY, NEW YORK

EPA FACILITY ID: NY0002455756

Prepared by:

New York State Department of Health
Center for Environmental Health
Under a Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry

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SUMMARY

The Consolidated Iron and Metal Company is an inactive car and scrap metal junk yard, smelting facility, and dealer located at the foot of Washington Street in the City of Newburgh, Orange County, New York. The facility was in operation from the 1950's until 1999. The site is a vacant parcel except for a garage adjacent to the northern boundary and the remains of former structures (e.g., basements and slabs). The site is bordered by a boat marina to the north, Conrail railroad tracks and South Water Street to the west, a wastewater treatment plant to the south, and the Hudson River to the east. The United States Environmental Protection Agency (US EPA) proposed the site to the National Priorities List (NPL) on December 1, 2000, and added the site to the list on June 14, 2001.

When operating, the facility produced wastes, via smelting activities, that were contaminated with aluminum, lead, and other heavy metals. The wastes were stored uncovered on-site. During numerous site visits between 1997 and 1999, the New York State Department of Environmental Conservation (NYS DEC) observed storm water discharging into the adjacent Hudson River. After the NYS DEC referred the site the US EPA, the US EPA removed an ash/slag pile, a processed soil pile, scrap metal piles, and all but one of the structures from the site. During the summers of 2002 and 2003, the City of Newburgh, Orange County and the US EPA removed approximately 50,000 tires from the site.

The US EPA completed several investigations which included soil and groundwater sampling, at the site between 1998 and 1999. Elevated concentrations of metals, polycyclic aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs) were detected in on-site soil. There is one completed exposure pathway for this site, which is the past exposure of trespassers (based on the occurrence of vandalism at the site) to site-related contaminants through contact with contaminated surface soils. Three potential exposure pathways are identified for this site.

First, recreational users of the Hudson River may be exposed to contaminated near-shore, surface sediments. Second, people may be exposed to contaminants from the site if they eat local, small-ranging fish from the Hudson River and these fish have been affected by the site due to contamination in near-shore sediments. To minimize exposures associated with this potential contamination, the New York State Department of Health (NYS DOH) encourages the public to follow existing advisories (based on PCB and cadmium contamination unrelated to the site) that recommend limiting the amount of sportfish eaten from this segment of the river. Third, exposure to airborne particulates from waste piles formerly on the site and past smelting processes is a potential past exposure pathway.

Exposure to groundwater contaminants is not expected because the facility and neighboring residences and businesses are serviced by public water. In addition, volatile organic compounds are not present in the groundwater at concentrations that would present indoor air problems via volatilization.

The NYS DOH and the United States Agency for Toxic Substance and Disease Registry

(ATSDR) conclude that trespassers may have been exposed in the past to contaminants at levels above health comparison values when in direct contact with on-site surface soil. However, the US EPA has taken steps to mitigate this exposure pathway by improving site security to restrict access to the site. Surface soil at the Consolidated Iron and Metal site contains lead above levels that the US EPA considers a lead hazard in residential soil. The elevated levels of lead detected in surface soil across the site could have resulted in increased exposure of trespassers to this contaminant. Children are known to be more sensitive than adults to lead-related health effects. Lead exposure is associated with premature birth and low birth weights, and may also affect mental and physical development in children. Thus, there is increased concern for exposure of children to lead, especially in locations having bare soil. The surface soil at the site also contains metals (antimony, arsenic) and organic chemicals (PCBs and PAHs) at levels that exceed typical background soil concentrations, and the concentrations in some of the samples exceeded health comparison values based on nonresidential exposure. The estimated risk to trespassers from exposure in the past to the individual chemicals is very low considering average soil levels. The estimated risk for noncancer effects from exposure in the past to individual chemicals is minimal considering average soil levels.

The NYS DOH and the ATSDR conclude that the site represents an indeterminate public health hazard due to the lack of data available to evaluate three potential exposure pathways: consumption of contaminated fish from the Hudson River, contact with contaminated near-shore surface sediments during recreational use of the Hudson River, and contact and incidental ingestion of off-site surface soils contaminated by the deposition of airborne particulates from former on-site waste piles or smelting processes.

After receiving complaints from a nearby open-air barge restaurant about dust, the US EPA erected a wind-break structure around a processed soil pile in September 1999 to prevent the migration of dust particles from the site. The US EPA subsequently removed the processed soil pile from the site between September 14 to October 4, 1999. A citizen has also expressed concerns regarding the tires stored on-site and trespassing due to the site's accessibility. The US EPA, the NYS DEC, the City of Newburgh and Orange County have taken steps to increase site security and to remove the tires. Additional community concerns about this specific site have not been documented with local, state or federal environmental agencies.

Based on this assessment, the NYS DOH and the ATSDR recommend that the US EPA should collect the following: near-shore surface sediment samples from the Hudson River to evaluate contaminant levels associated with past unauthorized discharge practices and runoff; shoreline surface soil samples to evaluate potential exposures for recreational users; and surface soil samples off-site in areas likely to have received atmospheric deposition during the smelting process.

As part of the public health actions planned for the site, the US EPA, the ATSDR and/or the NYS DOH intend to distribute this public health assessment to the community near the site and to evaluate additional environmental data to determine the overall public health hazard posed by the site. The NYS DOH will coordinate with the appropriate agencies to implement the

recommendations contained in this public health assessment.

A draft of this Public Health Assessment was released for public review and comment on October 28, 2003. A response to the comments that the NYS DOH and ATSDR received is in Appendix E.

PURPOSE AND HEALTH ISSUES

The purpose of this public health assessment (PHA) is to summarize environmental data; evaluate the possibility of past, current and future human exposures to site-related contaminants; evaluate public health implications; answer community questions; and make recommendations for site-specific health activities where appropriate. This PHA also fulfills the congressional mandate for a public health assessment for each site being proposed to the National Priorities List (NPL).

BACKGROUND AND STATEMENT OF ISSUE

Under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR), the New York State Department of Health (NYS DOH) will evaluate the public health significance of the Consolidated Iron and Metal site. More specifically, the ATSDR and the NYS DOH will determine whether health effects are possible from exposure to site-related contaminants and will recommend actions, listed at the end of this document, to reduce or prevent possible health effects.

The ATSDR is a federal agency within the United States Department of Health and Human Services. The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, has authorized the ATSDR to conduct public health assessments at hazardous waste sites proposed for the NPL. The United States Environmental Protection Agency (US EPA) proposed the Consolidated Iron and Metal site (CERCLIS ID No. NY0002455756) to the NPL on December 1, 2000, and added the site to the list on June 14, 2001.

A. Site Description and History

The Consolidated Iron and Metal site, formerly owned by the Consolidated Iron and Metal Company, was a car and scrap metal junk yard and dealer located at the foot of Washington Street in the City of Newburgh, Orange County, New York. The site occupies approximately seven acres of land bordering the Hudson River in a mixed industrial, commercial and residential area. The location of the site is presented in Figure 1. A boat marina to the north, Conrail railroad tracks and South Water Street to the west, a wastewater treatment plant to the south, and the Hudson River to the east bound the site. The site is a vacant parcel except for a garage adjacent to the northern boundary and the remains of former structures (e.g., basements and slabs). The site drainage direction is northeast, directly into the Hudson River. Groundwater is at a depth of approximately eight feet below grade. A locked gate and a fence bound the site on three sides.

From World War I until the early 1940s, Eureka Shipyard operated at the facility. Scrap metal

recycling and storage operations have occurred at the site for approximately the past 40 years. According to the former owner, a smelter operated from 1975 through 1995. The smelter was used primarily to melt aluminum transmissions to produce a reusable aluminum product. Other metallic materials were also smelted, resulting in a lead-contaminated ash/slag by-product that was stockpiled at the site. Additional site operations included sorting ferrous and non-ferrous metal scrap for recycling.

From 1997 to 1999, the New York State Department of Environmental Conservation (NYS DEC) inspected the facility several times (Dorneman, 2000). On February 10, 1997, the NYS DEC observed oil and other waste liquids on the facility soils. The NYS DEC advised the Consolidated Iron and Metal Company that potential violations exist at the site and that it must obtain a State Pollution Discharge Elimination System (SPDES) General Permit.

Inspection reports completed by the NYS DEC indicate that one or more underground storage tanks (USTs) may be at the site. In May 1997, the NYS DEC informed the facility owner that he was required to perform an investigation to determine the location and condition (i.e., tightness testing) of each UST on site. In addition, the NYS DEC instructed the facility owner to register, in accordance with New York State Petroleum Bulk Storage Regulations, all tanks that were to remain in service. The Consolidated Iron and Metal Company did not perform the investigation and did not register any USTs with the NYS DEC.

The Consolidated Iron and Metal facility has routinely used the southern portion of the site as a tire storage area, resulting in the accumulation of approximately 50,000 tires. In May 1997, the NYS DEC notified the facility owner that he was in violation of New York State Environmental Conservation Law (ECL) Article 360 regulations. At this time the NYS DEC also informed the facility owner that he was required to submit a proposed schedule for the removal and legal disposal of the tires and additional solid waste stored on-site. Consolidated Iron did not submit a schedule and did not remove these materials.

On May 21, 1997, the NYS DEC inspected the facility and concluded that the site has potentially significant levels of contamination as a result of past industrial practices. The NYS DEC requested that the Consolidated Iron and Metal Company conduct a site assessment evaluating the level and extent of contamination.

On June 6, 1997, the NYS DEC conducted a Hazardous Waste Compliance Inspection at the facility. The NYS DEC cited numerous violations including, but not limited to, failure to notify the US EPA of its Resource Conservation and Recovery Act (RCRA) status, resulting in a request for a Hazardous Waste Determination of the aluminum slag pile.

On July 9, 1998, after performing these numerous site inspections without successfully affecting a clean up by the owner/operator, the NYS DEC referred the site to the US EPA. The NYS DEC made this referral due to the potential threat to human health and the environment from wind dispersal of the lead-contaminated ash/slag to nearby residents and the potential threat of migration of hazardous substances to the adjacent Hudson River.

On July 15, 1998, the NYS DEC observed storm water being discharged into the Hudson River from the northeast corner of the property without appropriate testing or permits. The NYS DEC instructed facility personnel to terminate the discharge and advised the personnel of two possible corrections: containerize the water or construct a berm of clean impermeable material. A subsequent site inspection was conducted on July 23, 1998. The NYS DEC noted that the personnel had constructed a berm out of untested and fairly porous waste material from the site. The berm was located at the water's edge and exhibited evidence of erosion. In addition, the NYS DEC observed stained soil near the metal shearing machine and throughout the facility. The NYS DEC notified the facility on August 20, 1998, that an individual SPDES permit was required.

On August 11, 1998, the US EPA conducted an Expedited Removal Assessment of the ash/slag pile that was generated by the aluminum smelting process (Ferriola, 1999b; US EPA, 1999a). The assessment included sampling of the ash/slag pile, separating the pile into ferrous, nonferrous, and fine piles, and removing the fine pile (approximately 6,600 tons) from the site to a RCRA-approved treatment, storage, and disposal facility (TSDF) for stabilization and landfilling. The US EPA completed the removal of the ash/slag pile on August 13, 1999.

In March 1999, the NYS DEC noted that storm water discharge entering the Hudson River had a visible oily sheen, as did the river. The NYS DEC also observed oil sheens on puddles throughout the facility. The New York State Attorney General subsequently prosecuted Consolidated Iron for various violations including illegal discharge to surface water without a SPDES permit in the spring of 2000.

From late July 1998 to September 1998, a processed soil pile was generated during recycling operations at the site (Ferriola, 1999a; US EPA, 1999a). On July 7, 1999, the US EPA sampled the pile and subsequently removed the processed soil pile (approximately 11,000 tons) from the site. The US EPA transferred the processed soil pile to a RCRA-approved TSDF for stabilization and landfilling from September 14 to October 4, 1999. Also at this time, the US EPA conducted a hazard characterization of the contents of numerous drums that were found scattered throughout the perimeter of the site. The US EPA subsequently removed the drums from the site.

In July 1999, the US EPA examined 27 drums scattered throughout the perimeter of the site (Ferriola, 1999a; US EPA, 1999a). They found many of the drums partially-filled, unlabeled, and deteriorated with their contents leaking onto the ground surface. An on-site hazard characterization of drum contents indicated that the liquids in fifteen of the drums exhibited the characteristics of ignitability and/or corrosivity, and/or contained polychlorinated biphenyls (PCBs). The US EPA containerized the deteriorated drums to prevent further leakage and subsequently removed all of the drums from the site in September 1999.

In September 1999 and November 1999, the US EPA conducted a Preliminary Assessment/Integrated Assessment at the site to determine the horizontal and vertical extent of contamination (Dorneman *et al.*, 2000).

In August and September of 2002, the US EPA installed a new three-sided fence, with privacy screening fabric along the north face, and a locked entrance gate at the site. The City of Newburgh and Orange County removed approximately 15,000 tires from the site. A lack of funding prevented the removal of all tires. In addition, Orange County transferred thirteen loads of scrap metal from the site to an off-site recycling facility.

In summer 2003, the US EPA removed all remaining tires and scrap metal piles across the site. Furthermore, it demolished and removed the following structures: the smelter in the southwest corner of the facility, a compactor and metal shear on the eastern boundary, and an office building and scale adjacent to the northern boundary. Some basements and slabs from these structures remain.

B. Site Visits and Physical Hazards

In early August 2002, representatives from the NYS DOH, the NYS DEC, and the US EPA visited the site. Graffiti on the buildings indicated that trespassing had occurred, as did openings in the surrounding fence and foot paths into the site. A vagrant, who claimed to be living at the site, had established a temporary residence on a metal barge adjacent to the river. The structure of the former office building appeared unstable. The local fire department had spread out the tire pile during a recent fire at the site. The ground was littered with various debris, such as pieces of metal and glass. By September 2002, the US EPA replaced the three-sided fence surrounding the site, installed screening material on the north face of the new fence, and barred and bolted the door of the former office building. In addition, the City of Newburgh and Orange County removed approximately 15,000 tire from the site. In summer 2003, the US EPA removed surficial metal debris, all remaining tires, and the office building from the site.

C. Demographics

The NYS DOH estimated, from the 2000 Census (U.S. Bureau of the Census, 2001) that 21,472 people live within one mile of the Consolidated Iron and Metal site in Orange County. The age distribution of the area is somewhat younger than that of the rest of Orange County as well as New York State, excluding New York City. There were 5,489 females of reproductive age (ages 15-44) within one mile of the site. The area within one mile of the site has a higher proportion of blacks and Hispanics compared to the rest of the County and State. Based on the 2000 Census (U.S. Bureau of the Census, 2002), a higher percentage of the population is living below the poverty level while the median household income is lower than the rest of the County and State. These comparisons are provided in the following table. In addition, there are seven schools and one nursing home within a mile of the site.

The NYS DEC and the US EPA recently developed guidelines for identifying potential environmental justice communities. A potential environmental justice community is defined as a minority or low-income community that may bear a disproportionate environmental burden resulting from industrial, municipal, and commercial operations. A low-income community means a census block group, or a contiguous area with multiple census block groups, having a

low-income population equal to or greater than 23.59% (as defined by the 2000 US Census) of the total population. A minority community means a census block group, or a contiguous area with multiple census block groups, having a minority population equal to or greater than 51.1% in an urban area and 33.8% (as defined by the 2000 US Census) in a rural area of the total population. If a community is found to be *either* low-income or minority, then it is defined as a potential environmental justice community. Because the population within one mile of the Consolidated Iron site meets both the criteria for low-income and minority communities, it is considered a potential environmental justice community.

Table 1
Demographics within a one-mile radius of the Consolidated Iron and Metal site

	New York State, excluding NYC	Orange County	Area within 1 mile
Age Distribution[a]			
< 6	8 %	9 %	13 %
6 - 19	20 %	23 %	27 %
20 - 64	58 %	58 %	53 %
> 64	14 %	10 %	7 %
Race Distribution[a]			
White	85 %	84 %	37 %
Black	8 %	8 %	36 %
Native American	< 1 %	< 1 %	< 1 %
Asian	2 %	2 %	< 1 %
Pacific Islander	< 1 %	0 %	< 1 %
Other	2 %	4 %	21 %
Multi-Racial	2 %	2 %	6 %
Percent Minority[b]	18 %	22 %	79 %
Ethnic Distribution[a]			
Percent Hispanic	6 %	12 %	41 %
1999 Median Income[c]	$ 47,517	$52,058	$ 28,982
% Below Poverty Level[c]	10 %	11 %	30 %

[a]U.S. Bureau of the Census, 2001.
[b]Minority includes Hispanics, African-Americans, Asian-Americans, Pacific Islanders and Native Americans.
[c]U.S. Bureau of the Census, 2002.

ENVIRONMENTAL CONTAMINATION

This section includes a discussion of the environmental contaminants of concern. The NYSDOH selects contaminants of concern after considering the following criteria:

1. concentrations of contaminants in environmental media (e.g., air, soil, groundwater, etc.),
2. quality of the samples, the laboratory analyses, and the sampling design,
3. comparison of the contaminant concentrations with background concentrations, if available,
4. comparison of the contaminant concentrations with health-based comparison values, and
5. community health concerns.

The inclusion of a chemical compound in the list of contaminants of concern does not necessarily indicate that the contaminant will cause adverse health effects. Instead, this list indicates contaminants that will be evaluated further in this public health assessment to determine whether exposure to them is occurring and whether that exposure may be of significance to public health. Also, the NYS DOH may include compounds that are not site-related on the list of contaminants of concern. This may happen when a contaminant is naturally present at high concentrations, or when there is no information about the natural, or background, concentration. Tables B.1, B.2 and B.3 (Appendix B) list the contaminants of concern; Table B.4 (Appendix B) lists typical background concentrations and public health assessment comparison values for the contaminants of concern.

A. On-Site Contamination

Soil

The US EPA collected 25 surface soil samples (0 to 6 inches) and 25 subsurface soil samples (13 at 2 to 4 feet and 12 at 4 to 6 feet) from the site on September 22-23, 1999 (Dorneman *et al.*, 2000). Analytical results were compared to background soil samples that were collected off-site. Compounds that were detected in surface soil samples at concentrations greater than in background samples include benzene, xylenes (total), polycyclic aromatic hydrocarbons (PAHs), pesticides, polychlorinated biphenyls (PCBs), aluminum, antimony, arsenic, chromium, iron, zinc, and lead. Similar results were obtained in subsurface soil samples, except that the concentrations of PAHs in on-site soils were significantly lower than those detected in the background samples. Background samples were collected from a vacant lot about one-half mile north of the site at Front Street and Fourth Street because the lot reportedly has been undisturbed for approximately 100 years. Summaries of the contaminants of concern in on-site surface and subsurface soil are given in Tables B.1 and B.2 (Appendix B), respectively.

Groundwater

On September 23, 1999, the US EPA collected five groundwater samples, four on-site and one off-site (background), at depths between 4 to 14 feet below surface. Volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), inorganic compounds, pesticides and PCBs were detected. A summary of compounds with concentrations exceeding both New York State Drinking Water Standards for Public Drinking Water Supplies and background levels is given in Table B.3 (Appendix B).

B. Off-Site Contamination

Surface Water and Sediment

During various site inspections conducted between 1997 and 1999, the NYS DEC noted storm water being discharged into the Hudson River from the northeast corner of the site without appropriate testing or permits (Dorneman, 2000). The NYS DEC also observed oil sheens on both storm water discharge and the surface of the Hudson River. No surface water samples were collected from the Hudson River during the environmental investigations conducted at this site.

Although the US EPA collected sediment samples from 20 to 100 feet off-shore and 4 to 20 feet deep (Dorneman *et al.*, 2000), recreational users of the Hudson River are unlikely to be exposed to these sediments. No near-shore (within 20 feet) surface (0 to 2 inches) sediment samples were collected during the environmental investigations conducted at the site.

EXPOSURE PATHWAYS

The NYS DOH assesses a site by evaluating exposure pathways. An exposure pathway is the way chemicals may enter a person's body. An exposure pathway includes the following five elements:

1. a chemical release source,
2. chemical movement,
3. a place where people can come into contact with the chemical,
4. a route of human exposure, and
5. a population that could be exposed.

Exposure pathways are categorized as eliminated, potential or completed. An exposure pathway can be eliminated if at least one of the five pathway elements is missing and is extremely unlikely to be present. In a potential pathway, some pathway element(s) are missing and are uncertain indicating that exposure to a contaminant could have occurred in the past, could be occurring, or could occur in the future. In a completed pathway, all the elements are present indicating that exposure to a contaminant has occurred in the past, is occurring, or will occur in the future.

A. Completed Exposure Pathways

Trespassers

Prior to the US EPA's installation of a new fence, the Consolidated Iron and Metal site was bounded on three sides by a wooden fence, the north face of which had been pushed over, thereby allowing access to the property. The side adjacent to the Hudson River is not secured. Trespassers have in the past entered and vandalized the site (Ferriola, 1999b). During a site visit in early August 2002, the NYS DOH observed evidence of trespassing, including graffiti and the temporary residence of a vagrant living at the site. Routes of exposure associated with trespassing include direct contact with the soil and incidental soil ingestion, either through inhalation of dust particles or by eating, drinking or smoking with contaminated soil on the hands (i.e., via hand-to-mouth activities). Current exposure to site-related contaminants via trespassing is not likely given the improvements in site security the US EPA made in August and September of 2002.

B. Potential Exposure Pathways

Nearby Residents and Businesses

Nearby residents and businesses (specifically, the patrons and employees) may have been exposed in the past to site-related contaminants via inhalation and/or ingestion of airborne particulates, as well as through direct contact with airborne particulates after deposition. There were three potential on-site sources of contaminated particulates:

1. According to the former owner, Consolidated Iron and Metal operated a smelter at the site from 1975 through 1995 (Ferriola, 1999b). The smelter was used to melt metallic materials, primarily aluminum transmissions to produce a reusable aluminum product. During the smelting process, the facility may have released metal-containing particulates into the air via fugitive and stack emissions.

2. A lead-contaminated ash/slag was produced during smelting operations. This by-product was stored at the site in an uncovered pile until the US EPA removed the pile in August 1999. Off-site migration of ash/slag particulates may have occurred due to wind dispersion.

3. The processed soil pile was present on the site, uncovered, from late July 1998 until October 1999. Off-site migration of processed soil particulates may have occurred due to wind dispersion. On September 8, 1999, a US EPA representative noted a wind-break structure (i.e., an elevated tightly-meshed fence) was in place around the processed soil pile to prevent the potential off-site migration of particulates (US EPA, 1999b). The structure was erected due to complaints from an open-air barge restaurant, docked immediately north of the site, about dust from the site.

There are no known air data available to evaluate the public health implications of airborne releases from any of these potential on-site sources. In addition, there are no current or expected future airborne exposures because the facility is now inactive and both the ash/slag pile and the processed soil pile have been removed from the site. Particulates may have deposited on nearby properties, but there are no off-site surface soil data to evaluate potential exposures and subsequent public health implications at this time. An evaluation of off-site surface soil conditions in expected depositional areas is needed to determine whether this potential exposure pathway is complete.

Recreational Users of the Hudson River

As described in the Background and Statement of Issue section, past releases of site contaminants to the Hudson River have been witnessed, but the impacts of these discharges, if any, on water quality are unknown because no surface water samples were collected. Similarly, potential past exposures of Hudson River recreational users to contaminated surface water cannot be evaluated due to insufficient data. Present exposures to site-related contaminants in surface water are expected to be minimal due to the termination of operations at the facility, the removal of unconfined hazardous waste piles from the site, the installation of a berm to prevent surface water runoff into the river, the dilution of previous storm water discharges by the river, and the relative affinity of the contaminants of concern for solids (i.e., soil and sediment) rather than liquids (i.e., surface water).

The impacts, if any, of unauthorized discharges and runoff containing particulates (e.g., from the ash/slag pile and contaminated surface soil) on sediment quality is also unknown. Recreational users of the Hudson River may be exposed to contaminated sediments if they wade in the river near the site. Routes of exposure include direct contact with the sediment and incidental sediment ingestion. However, whether the sediments to which recreational users would more likely be exposed (i.e., surface sediments (0 to 2 inches) within 20 feet of the shoreline) are contaminated is not known. An evaluation of the extent of contamination, if any, in near-shore surface sediments is needed to determine whether this potential exposure pathway is complete.

People Who Eat Fish from the Hudson River

The Hudson River is used for commercial and recreational fishing and has received non-permitted storm water discharges from the site. Some of the contaminants found in on-site soils and off-site river sediments, including PCBs and lead, can be absorbed by and concentrated in fish. Therefore, there is a potential for people who eat fish caught from the Hudson River near the Consolidated Iron and Metal site to be exposed to contamination from the site. However, the extent to which this route of exposure may, or may not, be occurring cannot be evaluated at this time. The NYS DOH will evaluate near-shore, shallow sediment data to examine this route of exposure and determine if more sampling is needed.

The NYS DOH has issued general advisories that recommend limiting the amount of sportfish

eaten from much of the Hudson River, including the segment of the Hudson River that is adjacent to the site. The contaminants that led to the advisories are PCBs and cadmium. To limit their exposure to these contaminants, the public is encouraged to follow the advisories, which are updated annually. The current advisories are available on the NYS DOH website (http://www.health.state.ny.us/nysdoh/environ/fish.htm) or can be requested by emailing BTSA@health.state.ny.us or by calling 1-800-458-1158 (ext. 27815).

C. Eliminated Exposure Pathway

Although the results of limited groundwater sampling indicate that on-site groundwater has been impacted (Table B.3, Appendix B), past, present, and future exposures to contaminated groundwater are unlikely. Homes and businesses at and near this site are supplied with public water. There are no known public or private water supply wells (potable or non-potable) within a one-mile radius of the site. Volatile organic compounds are not present in the groundwater at concentrations that would present indoor air problems via volatilization. These on-site and off-site groundwater exposure pathways have, therefore, been eliminated from further consideration in this document.

The potential impact of contaminated groundwater on the quality of surface water and sediments in the Hudson River has not yet been evaluated due to a lack of information. The US EPA will be characterizing groundwater flow conditions and investigating surface water, near-shore sediment and groundwater quality further in an investigation of the site planned for 2004.

PUBLIC HEALTH IMPLICATIONS

A. Toxicological and Epidemiologic Evaluation

An analysis of the toxicological and epidemiological implications of past trespassing activities at the Consolidated Iron and Metal site is presented below. To evaluate the potential health risks from contaminants of concern associated with the site, the NYS DOH assessed the risks for cancer and noncancer health effects. The risks of health effects depend primarily on contaminant concentration, exposure route, exposure frequency and duration. Additional information on the NYS DOH assessment for this site is presented in Appendix C, including the definitions of the descriptors (e.g., “low” or “high”) used throughout this evaluation to qualitatively describe cancer and noncancer risks.

Evaluation Methodology for Polycyclic Aromatic Hydrocarbons

PAHs are a group of over 100 different chemicals that are formed during the incomplete combustion (burning) of organic material. They usually occur as complex mixtures. Seven PAHs (benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene) are classified as probable human carcinogens by the US EPA (US EPA, 1991). Collectively, these PAHs are sometimes called total carcinogenic PAHs. Although each carcinogenic PAH is considered a potential cancer-causing chemical, they do not all have the

same ability to cause cancer (i.e., some cause cancer at lower doses than others). Benzo(a)pyrene, one of the most toxic and well-studied of the carcinogenic PAHs, is the only chemical of this group for which a quantitative estimate of cancer potency is available from long-term animal studies. The relative potencies of the other six carcinogenic PAHs compared to benzo(a)pyrene are estimated from shorter-term tests. Thus, the concentrations of all the carcinogenic PAHs are scaled to benzo(a)pyrene and expressed as "benzo(a)pyrene equivalents." Because benzo(a)pyrene equivalents account for the relative cancer-causing ability for the seven PAHs, they are used in this public health assessment for evaluating the public health implications of potential exposures to these chemicals.

On-Site Surface Soil

Surface soil at the Consolidated Iron and Metal site contains lead above levels that the US EPA considers a lead hazard in soil (US EPA, 2001). Aluminum was detected at levels as high as 129,000 mg/kg, which is more than twice the upper end of the range of typical background levels in soils (7000 mg/kg to 50,000 mg/kg; Schacklette and Boerngen, 1984). The surface soil also contains other metals (antimony, arsenic) and organic chemicals (PCBs and PAHs) at levels that exceed both typical soil background concentrations and comparison values based on nonresidential exposure (Table B.4). The cancer comparison values assume a 70 kilogram adult ingests 50 milligrams of soil per day, 2 days per week, 3 months per year for 30 years of a 70 year lifetime. Noncancer comparison values assume a 36 kilogram child ingests 50 milligrams of soil per day, 5 days per week, 6 months per year. In addition to lead, the chemicals with levels in surface soil that exceed both typical background levels and the nonresidential comparison values are selected for further evaluation. Trespassers at the site could have been exposed to these chemicals in surface soil through incidental ingestion and dermal contact.

Metals–Lead

Lead was detected in all 25 on-site surface soil samples at concentrations ranging from 1,350 to 36,200 milligrams per kilogram (mg/kg). These levels are above typical soil background concentrations and above levels that the US EPA considers lead hazards in bare residential soil (400 mg/kg in play areas or averaging over 1200 mg/kg for the rest of the yard (US EPA, 2001)). Chronic exposure to lead is predominantly associated with effects on the nervous system and blood (e.g., anemia and increased blood pressure). The developing fetus and young children are particulary sensitive to lead-induced effects. For example, lead exposure is associated with premature birth and low birth weights, and may affect mental and physical development in children (ATSDR, 1999b). The levels of lead detected in surface soil across the site could have increased exposure of trespassers (particularly children) to this contaminant, especially where the contamination is located in places with bare soil.

Metals–Aluminum

Aluminum was detected at concentrations more than twice that of typical soil background concentrations. Aluminum is naturally occuring, is widespread in soil, and makes up about eight percent of the earth's crust. At high levels of exposure, aluminum can cause adverse effects on the central nervous system of humans and laboratory animals. Aluminum has also been shown to cause birth defects in laboratory animals, but only at levels high enough to cause adverse effects on the parent animals (ATSDR, 1999a). Although aluminum in the surface soil is elevated at the site, the estimated exposures for people who have accessed the site in the past are much lower (by about 1500 times) than the levels of exposure that cause aluminum-related health effects, and the risk for these effects is minimal.

Metals–Antimony and Arsenic

All of the 25 surface soil samples contained antimony at levels greater than typical background levels while four of 25 samples contained arsenic at levels greater than typical background (Table B.4). One sample, located just south of the former scrap metal pile on the eastern half of the site, contained the highest detected levels of both antimony and arsenic (1,090 mg/kg and 115 mg/kg, respectively). This sample also was the only antimony result and one of two arsenic results in which nonresidential soil comparison values were exceeded for these contaminants. Antimony in this sample exceeded its noncancer comparison value, while the level of arsenic exceeded its cancer comparison value.

Studies of people exposed to high levels of arsenic in drinking water in foreign populations provide evidence of an association between arsenic ingestion and cancer (ATSDR, 2000a). Toxicological data are inadequate to evaluate the carcinogenic potential of antimony (ATSDR, 1992). The primary health effects associated with oral exposure to high levels of antimony are gastrointestinal irritation, diarrhea, and effects on the liver and red blood cells (ATSDR, 1992). Based on the available information, long-term exposure to the average level of arsenic detected in surface soil at the site (22 mg/kg) is estimated to pose a very low increased cancer risk. People exposed to the average levels of antimony and arsenic (82 mg/kg and 22 mg/kg) would have a minimal risk for noncancer health effects. If we assume that the antimony and arsenic detected in the single sample containing the highest levels (1,090 mg/kg and 115 mg/kg, respectively) is representative of trespassers' past exposure, then the estimated cancer risk for arsenic would be low, and the estimated noncancer health risk would be low for antimony and minimal for arsenic.

Organic Chemicals–PAHs and PCBs

In all surface soil samples, carcinogenic PAHs were detected above the upper end of the range for urban background (1 to 3 mg/kg) reported by Menzie *et al.* (1992). Twenty of 25 samples contained carcinogenic PAHs (as benzo(a)pyrene (B(a)P) equivalents) above the nonresidential soil comparison values for carcinogenic effects. Aroclors 1248 and 1254 (commercial mixtures of PCBs) were detected in 22 of 25 and 25 of 25 surface soil samples, respectively, and all of the detections were above the range of average soil concentrations for total PCBs (less than 0.01 to

0.04 mg/kg) reported in a national soil monitoring program (ATSDR, 2000b). Only two samples containing Aroclor 1248, and only one sample containing Aroclor 1254 had levels that exceed nonresidential soil comparison values for carcinogenic effects. The highest levels of carcinogenic PAHs (27 mg/kg, expressed as (B(a)P) equivalents), Aroclor 1248 (31 mg/kg) and Aroclor 1254 (27 mg/kg) were detected in a single sample located in the former processed soil pile area at the northeast corner of the site.

Long-term human exposure to materials containing mixtures of PAHs such as coal tars, mineral oils, soots, and fossil fuel combustion emissions have been associated with cancer of the skin, bladder, lung and scrotum (ATSDR, 2000c; NTP, 1998). Although there are no studies to date that unequivocally establish that PAHs cause cancer in humans, there is sufficient information to conclude that exposure to mixtures containing PAHs increases the risk of cancer in humans. Studies of workers exposed to PCBs in air (and perhaps through the skin) raise concerns about the human carcinogenicity of PCBs, but the results of these studies are not consistent. The data from these studies are inadequate to prove that exposure to PCBs causes cancer in humans. Both PCBs and individual PAHs (such as B(a)P) cause cancer in laboratory animals exposed to high levels over their lifetimes (ATSDR, 2000b,c). Chemicals that cause cancer in laboratory animals may also increase the risk of cancer in humans who are exposed to lower levels over long periods of time. Long term exposure to the average or highest levels of B(a)P equivalents (10.1 mg/kg and 27 mg/kg, respectively) in surface soil at the site is estimated to pose a low increased cancer risk. Long term exposure to the average levels of Aroclor 1248 (8.7 mg/kg) and Aroclor 1254 (8.7 mg/kg) in surface soil is estimated to pose a very low increased cancer risk. If we assume that the Aroclors detected in the single sample containing the highest levels is representative of trespassers' past exposure, then the estimated cancer risks would be low. The risk for noncancer effects would be minimal for both the average and highest levels of B(a)P equivalents and Aroclors detected in surface soil.

On-Site Subsurface Soil

Subsurface soil (depth 2 to 6 feet) at the Consolidated Iron and Metal site contains levels of several metals that exceed typical soil background levels. Arsenic, detected up to 85 mg/kg, exceeds its nonresidential soil comparison value for carcinogenic effects. The levels of the other metals did not exceed comparison values. The highest levels of Aroclor 1248 (31 mg/kg) and Aroclor 1254 (240 mg/kg) exceed their cancer and/or noncancer soil comparison values for nonresidential exposure. The potential for exposure to the elevated levels of metals and Aroclors is low because the contamination is at least two feet below the surface. If these materials are brought to the surface and made available for human contact, the potential for exposure and the risks for adverse health effects (particularly due to the Aroclors) could increase.

B. Health Outcome Data

While trespassers may have been exposed to contaminants in surface soil, there is inadequate information about levels of exposure and the number and identity of trespassers. The NYS DOH will consider evaluating health outcome data for this group if additional information becomes available.

Because of insufficient exposure data, the NYS DOH has not evaluated health outcome data specifically for the Consolidated Iron and Metal site. The NYS DOH maintains several health outcome databases, that could be used to generate site-specific data, if warranted. These databases include the cancer registry, the congenital malformations registry, vital records (birth and death certificates), and hospital discharge information.

In addition, since 1981, the NYS DOH has maintained a registry of individuals found to have elevated levels of heavy metals. Any physician, clinical laboratory or health facility in attendance of a person with a blood or urine test with a value of arsenic, cadmium, lead or mercury at or above certain levels has been required to report such occurrence to the NYS DOH within ten days of the receipt of the test results. In 1992, legislation was enacted which requires universal screening for lead in children under the age of six. In addition, the legislation requires all blood lead results, regardless of concentration, to be reported.

As part of the NYS DOH Cancer Surveillance Improvement Initiative (New York State Department of Health, 2000), age-adjusted incidence rates for specific sites of cancer are being tabulated and mapped at the zip code level for the entire state. Areas of the state that have an unusual disease pattern, such as higher than expected rates of cancer, will be selected for further study. Factors that might explain the increase in disease occurrence will be examined. This may include a review of potential environmental exposures in the area. Scientists will also review the scientific literature to investigate what substances in the environment might contribute to the development of disease. If it is determined that exposure to environmental contaminants could potentially be related to the higher than expected cancer rates in an area, additional environmental and epidemiological studies will be conducted.

As of August 2002, the NYS DOH has evaluated four sites of cancer at the zip code level-breast, lung, colorectal and prostate. Of the cancers investigated, colorectal cancer was found at levels significantly higher than expected in a portion of Orange County, including the area surrounding this site. Because of this, the area is eligible for a more in depth investigation using the protocol outlined above.

Known risk factors for colorectal cancer include age, a family history of the disease, history of intestinal polyps or inflammatory bowel disease and a diet high in animal fat, while diets high in vegetables, fruit and fiber may protect against colon cancer.

C. ATSDR Child Health Considerations

The ATSDR Child Health Initiative emphasizes the ongoing examination of relevant child health issues in all of the agency's activities, including its mandated public health assessment activities. The NYS DOH and the ATSDR consider children when we evaluate exposure pathways and potential health effects from environmental contaminants. We recognize that children are of special concern because of their greater potential for exposure from play and other behavior patterns. Children sometimes differ from adults in their susceptibility to the effects of hazardous chemicals, but whether there is a difference depends on the chemical. Children may be more or less susceptible than adults to health effects from a chemical and the relationship may change with developmental age.

Lead is the primary contaminant of concern at the site. As stated previously, the developing fetus and young children are particularly sensitive to lead-induced effects (ATSDR, 1999b), and lead exposure is associated with premature birth and low birth weights. Lead may also affect mental and physical development in children. The levels of lead detected in soil at the Consolidated Iron and Metal site (as high as 36,200 mg/kg) could have increased exposure of people trespassing onto the site (including children) to this contaminant and posed a concern for lead-related health effects, especially where the site is poorly vegetated and the contamination is in bare soil. Human exposures are not currently expected because the US EPA has taken steps to improve site security and restrict access to the site.

COMMUNITY HEALTH CONCERNS

After receiving complaints from a nearby open-air barge restaurant about dust, the US EPA erected a wind-break structure around the processed soil pile in September 1999 to prevent the migration of dust particles from the site (US EPA, 1999b). The US EPA subsequently removed the processed soil pile from the site between September 14 to October 4, 1999.

A citizen has also expressed concerns to the NYS DOH, the NYS DEC, and the US EPA regarding the tires stored on-site and trespassing due to the site's accessibility. The US EPA took steps to prohibit access to the site in August and September of 2002. During the same time period, the City of Newburgh and Orange County removed approximately 15,000 of the 50,000 tires from the site. A lack of funding prevented the removal of all tires. The US EPA removed all remaining tires in the summer of 2003.

The NYS DOH and the ATSDR sought input from the community on this draft of the Public Health Assessment. Concerns received from the community were addressed in the final Public Health Assessment. A draft of this Public Health Assessment was released for public review and comment on October 28, 2003. A response to the comments that the NYS DOH and ATSDR received is in Appendix E.

CONCLUSIONS

1. The NYS DOH and the ATSDR conclude that trespassers may have been exposed in the past to contaminants at levels above health comparison values when in direct contact with on-site

surface soil. However, the US EPA has taken steps to mitigate this exposure pathway by improving site security to restrict access to the site. Surface soil at the Consolidated Iron and Metal site contains lead above levels that the US EPA considers a lead hazard in residential soil. The elevated levels of lead detected in surface soil across the site could have resulted in increased exposure of people who trespassed onto the site to this contaminant. Children are known to be more sensitive than adults to lead-related health effects. Lead exposure is associated with premature birth and low birth weights, and may also affect mental and physical development in children. Thus, there is increased concern for exposure of children to lead at the site in the past, especially in locations having bare soil.

The surface soil also contains metals (antimony, arsenic) and organic chemicals (PCBs and PAHs) at levels that exceed typical background soil concentrations and the concentration in some of the samples exceeded health comparison values based on nonresidential exposure. The estimated cancer risk from past exposure to the individual chemicals is very low considering average soil levels. The estimated risk for noncancer effects from past exposure to individual chemicals is minimal considering average soil levels.

2. The NYS DOH and the ATSDR conclude that the site represents an indeterminate public health hazard due to the lack of data available to evaluate three potential exposure pathways: consumption of site-related contaminated fish from the Hudson River, contact with contaminated sediments during recreational use of the Hudson River, and contact and incidental ingestion of off-site surface soils contaminated by the deposition of airborne particles from former on-site waste piles or smelting processes. Near-shore, surface sediment and off-site surface soil samples are needed to evaluate these potential pathways.

RECOMMENDATIONS

1. The US EPA should maintain site security to restrict access to trespassers until remedial activities are completed.

2. The US EPA should collect near-shore (within 20 feet), surface (0 to 2 inches) sediment samples from the Hudson River to evaluate contaminant levels associated with past unauthorized discharge practices and runoff. These data should also be used to evaluate whether additional investigation is needed to determine if local, small-ranging fish may be affected by site-related contamination.

3. The US EPA should collect shoreline surface soil samples (0 to 2 inches) from areas likely to be frequented by recreational users. These data would be used to evaluate the potential for recreational users, including children, to be exposed to contaminants by incidental ingestion or dermal contact while using the area.

4. The US EPA should collect off-site surface soil samples in areas likely to have received atmospheric deposition during the smelting process.

PUBLIC HEALTH ACTION PLAN

The Public Health Action Plan (PHAP) for the Consolidated Iron and Metal site contains a description of actions to be taken by the US EPA, the ATSDR and/or the NYS DOH following completion of this public health assessment. For those actions already completed at this site, please refer to the Background and Statement of Issue section of this document. The purpose of the PHAP is to ensure that this health assessment identifies public health hazards and provides a plan of action designed to mitigate and prevent adverse human health effects resulting from the past, present and/or future exposures to hazardous substances at or near the site. Included is a commitment on the part of the ATSDR and/or the NYS DOH to follow up on this plan to ensure that it is implemented. The public health actions planned by the US EPA, the ATSDR and/or the NYS DOH are as follows:

1. The NYS DOH will coordinate with the appropriate agencies to implement the recommendations contained in this public health assessment.

2. The NYS DOH and the ATSDR will make this public health assessment available to the community near the Consolidated Iron and Metal site.

3. The US EPA will be investigating further the extent of contamination at the site planned for 2004. The NYS DOH and the ATSDR will evaluate environmental data obtained from this investigation, such as groundwater, sediment, and soil data as they become available to determine the overall public health hazard posed by the site.

4. The NYS DOH will work with the US EPA to ensure data are collected during the Remedial Investigation/Feasibility Study process to evaluate the potential exposure pathways associated with the site.

5. The ATSDR will reevaluate and expand the PHAP, as needed, outlining the actions completed and those in progress, as well as recommendations for additional actions, if warranted by new environmental, toxicological, and/or health outcome data. Follow-up reports will be placed in repositories that contain copies of this public health assessment and will be provided to all persons who request it.

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PREPARERS OF REPORT

New York State Department of Health Authors

Krista M. Anders

Assistant Sanitary Engineer
Bureau of Environmental Exposure Investigation

Sharlin Liu
Research Scientist
Bureau of Toxic Substance Assessment

Thomas Johnson
Research Scientist
Bureau of Toxic Substance Assessment

Donald W.R. Miles
ATSDR Grant Coordinator
Bureau of Environmental Exposure Investigation

Steven P. Forand
Research Scientist
Bureau of Environmental and Occupational Epidemiology

Agency for Toxic Substances and Disease Registry

ATSDR Regional Representative
Arthur Block
Senior Regional Representative
Region 2
Office of Regional Operations

ATSDR Technical Project Officer
Greg Ulirsch
Environmental Health Engineer
Superfund Site Assessment Branch
Division of Health Assessment and Consultation

CERTIFICATION

This Public Health Assessment was prepared by the New York State Department of Health under a

cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the public health assessment was initiated.

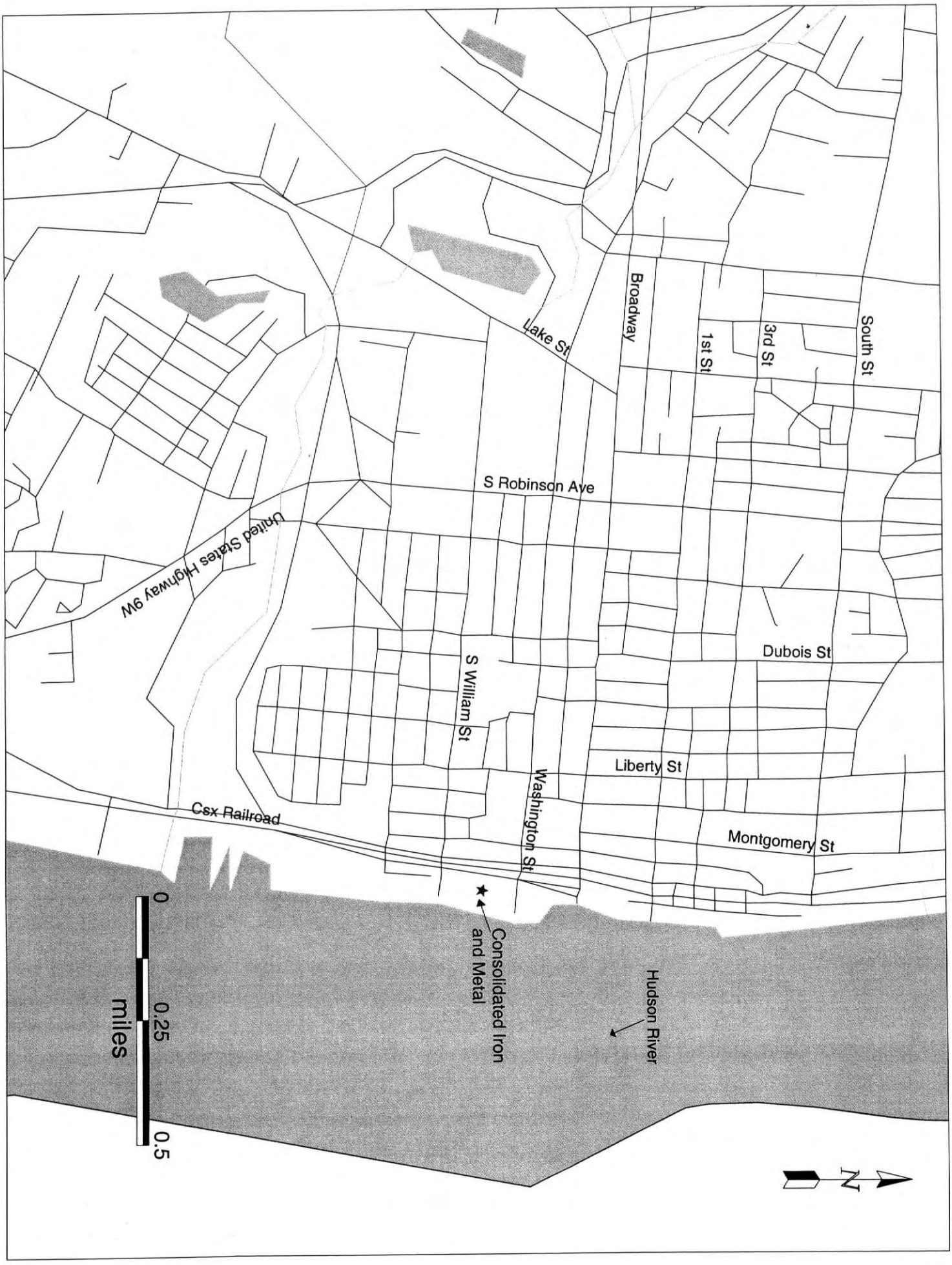
Technical Project Officer, SSAB, DHAC

The Division of Health Assessment and Consultation (DHAC), ATSDR, has reviewed this public health assessment, and concurs with its findings.

Team Leader, CAT, SSAB, DHAC, ATSDR

APPENDIX A

FIGURE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United States Highway 9W
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Dubois St
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Figure 1

APPENDIX B

TABLES

TABLE B.1 Contaminants of Concern in On-site Surface Soils (0-6 inches)

Contaminant	Non-Background Concentration Range Detected	Non-Background FOD[b]	Background[a] Concentration Range Detected	Background[a] FOD
SVOCs (mg/kg)				
Benzo[a]anthracene	0.66 - 20	25 / 25	0.66 : 1.1	2 / 2
Benzo[a]pyrene	0.96 - 18	25 / 25	0.81 : 1.3	2 / 2
Benzo[b]fluoranthene	0.93 - 15	25 / 25	0.89 : 1.3	2 / 2
Benzo[k]fluoranthene	1.1 - 16	25 / 25	0.55 : 0.94	2 / 2
Chrysene	0.8 - 19	25 / 25	0.84 : 1.3	2 / 2
Dibenz[a,h]anthracene	0.38 - 4.7	25 / 25	0.14 : 0.16	2 / 2
Indeno[1,2,3-cd]pyrene	0.92 - 10	25 / 25	0.69 : 1	2 / 2
Pesticides / PCBs (mg/kg)				
Aroclor-1248	1.2 - 31	22 / 25	N.D.[c]	0 / 2
Aroclor-1254	0.96 - 27	25 / 25	N.D.	0 / 2
Inorganics (mg/kg)				
Antimony	10 - 1,090	25 / 25	N.D.	0 / 2
Arsenic	7.9 -115	25 / 25	31 : 61	2 / 2
Lead	1,350 - 36,200	25 / 25	386 : 545	2 / 2

SOURCE: Dorneman *et al.*, 2000.
[a]Background samples (0 to 6 inches) were collected from a vacant lot located approximately one-half mile north of the site at Front Street and Fourth Street. The lot reportedly has been undisturbed for approximately 100 years.
[b]FOD = Frequency of Detection = # of detections per # of samples
[c]N.D. = not detected

TABLE B.2 Contaminants of Concern in On-Site Subsurface Soil (2-4 feet and 4-6 feet)

Contaminant	Non-Background Concentration Range Detected	Non-Background FOD[b]	Background[a] Concentration Range Detected	Background[a] FOD
SVOCs (mg/kg)				
Benzo[a]anthracene	0.024 - 20	13 / 25	69 : 370	2 / 2
Benzo[a]pyrene	0.028 - 19	12 / 25	65 : 310	2 / 2
Benzo[b]fluoranthene	0.024 - 19	11 / 25	56 : 240	2 / 2
Benzo[k]fluoranthene	0.025 - 10	7 / 25	56 : 330	2 / 2
Chrysene	0.028 - 20	13 / 25	65 : 340	2 / 2
Dibenz[a,h]anthracene	0.15 - 3.6	5 / 25	23 : 100	2 / 2
Indeno[1,2,3-cd]pyrene	0.064 - 13	7 / 25	30 : 140	2 / 2
Pesticides / PCBs (mg/kg)				
Aroclor-1248	0.2 - 31	16 / 25	N.D.[c]	0 / 2
Aroclor-1254	0.1 - 420	20 / 25	N.D.	0 / 2
Inorganics (mg/kg)				0.1 -
Antimony	2 - 129	19 / 25	2	1/ 2
Arsenic	6 - 85	25 / 25	13 : 23	2 / 2
Lead	53 - 4,520	25 / 25	923 : 1,680	2 / 2

SOURCE: Dorneman *et al.*, 2000.
[a]Background samples (0 to 6 inches) were collected from a vacant lot located approximately one-half mile north of the site at Front Street and Fourth Street. The lot reportedly has been undisturbed for approximately 100 years.
[b]FOD = Frequency of Detection = # of detections per # of samples
[c]N.D. = not detected

Table B.3 Contaminants of Concern in Groundwater

[All concentrations in micrograms per liter (µg/L)]

Contaminant of Concern (COC)	Non-Background Concentration Range Detected	Non-Background FOD[b]	Background[a] Concentration Range Detected	Background[a] FOD	New York State Drinking Water Standard
VOCs					
Xylenes (total)	**7**	**1 / 4**	**2**	**1 / 1**	**5**
SVOCs					
Benzo(a)pyrene	**0.6 : 3**	**2 / 4**	**N.D.[c]**	**0 / 1**	**0.2**
Bis(2-ethylhexyl)phthalate	**0.6 – 15**	**4 / 4**	**5**	**1 / 1**	**6**
Pesticides / PCBs					
Aroclor-1248	**5.7**	**1 / 4**	**N.D.**	**0 / 1**	**0.5**
Aroclor-1254	**2.6**	**1 / 4**	**N.D.**	**0 / 1**	**0.5**
Inorganics (filtered samples)					
Iron	**4,980 – 25,400**	**4 / 4**	**6,650**	**1 / 1**	**30**

SOURCE: Dorneman *et al.*, 2000.

[a]The background sample was collected from an area believed to be upgradient from identified areas of concern at the site.

[b]FOD = Frequency of Detection = # of detections per # of samples

[c]N.D. = not detected.

Table B.4

Sampling Results, Typical Background Levels and Public Health Assessment Comparison Values

for Trespassers to Contaminants of Concern in Surface Soil at the Consolidated Iron and Metal Site

[All values in parts per million (ppm)]

Chemicals	Range of Detection	Frequency of Detection	Typical Background Level*	Comparison Values**			
				Non-cancer	Basis***	Cancer	Basis***
antimony	10 - 1,090	25 / 25	< 1 - 2	806	EPA RfD	none	none
Aroclor 1248	1.2 - 31	22 / 25	< 0.01 - 0.04[a]	40	--[b]	23	US EPA
Aroclor 1254	0.96 - 27	25 / 25	< 0.01 - 0.04[a]	40	EPA RfD	23	US EPA
arsenic	7.9 - 115	25 / 25	2 - 20	605	EPA RfD	30	EPA CPF
benzo(a)pyrene equivalents	1.6 - 27	25 / 25	--[c]	16,000[d]	--	5	NYS CPF
lead	1,350 - 36,200	25 / 25	10 - 300	--[e]			

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** Noncancer comparison values assume a 36 kg child ingests 50 milligrams of soil per day, 5 days per week, 6 months per year. Cancer comparison values assume a 70 kg adult ingests 50 milligrams of soil per day, 2 days per week, 3 months per year for 30 years of a 70 year lifetime.

*** EPA CPF: United States Environmental Protection Agency Cancer Potency Factor

EPA RfD: United States Environmental Protection Agency Reference Dose
NYS CPF: New York State Department of Health Cancer Potency Factor
United States Environmental Protection Agency. 1996. PCBs: Cancer Dose-Response Assessment and Application to Environmental Mixtures. National Center for Environmental Assessment. Office of Research and Development. Washington, DC
US EPA:

[a]Total PCBs; (ATSDR, 2000).

[b]Based on Aroclor 1254 RfD.

[c]No information available for individual PAHs. Refer to reported background level for total carcinogenic PAHs of 1-3 ppm (Menzie, et al., 1992).

[d]Because the chronic comparison value for this contaminant in soil may not protect against skin irritation, a recommended default skin irritation threshold level of 16,000 milligrams per kilogram should be used, provided that the actual threshold level of the contaminant for skin irritation is not known.

[e]In the absence of a comparison value, lead levels in soil were compared to US EPA standard for defining lead hazards in soil (US EPA 2001).

APPENDIX C

NYS DOH PROCEDURE FOR EVALUATING POTENTIAL HEALTH RISKS FOR CONTAMINANTS OF CONCERN

NYS DOH PROCEDURE FOR EVALUATING POTENTIAL HEALTH RISKS FOR CONTAMINANTS OF CONCERN

To evaluate the potential health risks from contaminants of concern associated with the Consolidated Iron and Metal site, the New York State Department of Health assessed the risks for cancer and noncancer health effects.

Increased cancer risks were estimated by using site-specific information on exposure levels for the contaminant of concern and interpreting them using cancer potency estimates derived for that contaminant by the US EPA or, in some cases, by the NYS DOH. The following qualitative ranking of cancer risk estimates, developed by the NYS DOH, was then used to rank the risk from very low to very high. For example, if the qualitative descriptor was "low", then the excess lifetime cancer risk from that exposure is in the range of greater than one per million to less than one per ten thousand. Other qualitative descriptors are listed below:

Excess Lifetime Cancer Risk

Risk Ratio	Qualitative Descriptor
equal to or less than one per million	very low
greater than one per million to less than one per ten thousand	low
one per ten thousand to less than one per thousand	moderate
one per thousand to less than one per ten	high
equal to or greater than one per ten	very high

An estimated increased excess lifetime cancer risk is not a specific estimate of expected cancers. Rather, it is a plausible upper bound estimate of the probability that a person may develop cancer sometime in his or her lifetime following exposure to that contaminant.

There is insufficient knowledge of cancer mechanisms to decide if there exists a level of exposure to a cancer-causing agent below which there is no risk of getting cancer, namely, a threshold level. Therefore, every exposure, no matter how low, to a cancer-causing compound is assumed to be associated with some increased risk. As the dose of a carcinogen decreases, the chance of developing cancer decreases, but each exposure is accompanied by some increased risk.

There is general consensus among the scientific and regulatory communities on what level of estimated excess cancer risk is acceptable. An increased lifetime cancer risk of one in one million or less is generally not considered a significant public health concern.

For noncarcinogenic health risks, the contaminant intake was estimated using exposure assumptions

for the site conditions. This dose was then compared to a risk reference dose (estimated daily intake of a chemical that is likely to be without an appreciable risk of health effects) developed by the US EPA, ATSDR and/or NYS DOH. The resulting ratio was then compared to the following qualitative scale of health risk:

Qualitative Descriptions for
Noncarcinogenic Health Risks

Ratio of Estimated Contaminant Intake to Risk Reference Dose	Qualitative Descriptor
equal to or less than the risk reference dose	minimal
greater than one to five times the risk reference dose	low
greater than five to ten times the risk reference dose	moderate
greater than ten times the risk reference dose	high

Noncarcinogenic effects unlike carcinogenic effects are believed to have a threshold, that is, a dose below which adverse effects will not occur. As a result, the current practice is to identify, usually from animal toxicology experiments, a no-observed-effect-level (NOEL). This is the experimental exposure level in animals at which no adverse toxic effect is observed. The NOEL is then divided by an uncertainty factor to yield the risk reference dose. The uncertainty factor is a number that reflects the degree of uncertainty that exists when experimental animal data are extrapolated to the general human population. The magnitude of the uncertainty factor takes into consideration various factors such as sensitive subpopulations (e.g., children or the elderly), extrapolation from animals to humans, and the incompleteness of available data. Thus, the risk reference dose is not expected to cause health effects because it is selected to be much lower than dosages that do not cause adverse health effects in laboratory animals.

The measure used to describe the potential for noncancer health effects to occur in an individual is expressed as a ratio of estimated contaminant intake to the risk reference dose. A ratio equal to or less than one is generally not considered a significant public health concern. If exposure to the contaminant exceeds the risk reference dose, there may be concern for potential noncancer health effects because the margin of protection is less than that afforded by the reference dose. As a rule, the greater the ratio of the estimated contaminant intake to the risk reference dose, the greater the level of concern. This level of concern depends upon an evaluation of a number of factors such as the actual potential for exposure, background exposure, and the strength of the toxicologic data.

APPENDIX D

PUBLIC HEALTH HAZARD CATEGORIES

INTERIM PUBLIC HEALTH HAZARD CATEGORIES

CATEGORY / DEFINITION	DATA SUFFICIENCY	CRITERIA
A. Urgent Public Health Hazard This category is used for sites where short-term exposures (< 1 yr) to hazardous substances or conditions could result in adverse health effects that require rapid intervention.	This determination represents a professional judgement based on critical data which ATSDR has judged sufficient to support a decision. This does not necessarily imply that the available data are complete; in some cases additional data may be required to confirm or further support the decision made.	Evaluation of available relevant information* indicates that site-specific conditions or likely exposures have had, are having, or are likely to have in the future, an adverse impact on human health that requires immediate action or intervention. Such site-specific conditions or exposures may include the presence of serious physical or safety hazards.
B. Public Health Hazard This category is used for sites that pose a public health hazard due to the existence of long-term exposures (> 1 yr) to hazardous substance or conditions that could result in adverse health effects.	This determination represents a professional judgement based on critical data which ATSDR has judged sufficient to support a decision. This does not necessarily imply that the available data are complete; in some cases additional data may be required to confirm or further support the decision made.	Evaluation of available relevant information* suggests that, under site-specific conditions of exposure, long-term exposures to site-specific contaminants (including radionuclides) have had, are having, or are likely to have in the future, an adverse impact on human health that requires one or more public health interventions. Such site-specific exposures may include the presence of serious physical or safety hazards.
C. Indeterminate Public Health Hazard This category is used for sites in which "*critical*" data are *insufficient* with regard to extent of exposure and/or toxicologic properties at estimated exposure levels.	This determination represents a professional judgement that critical data are missing and ATSDR has judged the data are insufficient to support a decision. This does not necessarily imply all data are incomplete; but that some additional data are required to support a decision.	The health assessor must determine, using professional judgement, the "criticality" of such data and the likelihood that the data can be obtained and will be obtained in a timely manner. Where some data are available, even limited data, the health assessor is encouraged to the extent possible to select other hazard categories and to support their decision with clear narrative that explains the limits of the data and the rationale for the decision.
D. No Apparent Public Health Hazard This category is used for sites where human exposure to contaminated media may be occurring, may have occurred in the past, and/or may occur in the future, but the exposure is not expected to cause any adverse health effects.	This determination represents a professional judgement based on critical data which ATSDR considers sufficient to support a decision. This does not necessarily imply that the available data are complete; in some cases additional data may be required to confirm or further support the decision made.	Evaluation of available relevant information* indicates that, under site-specific conditions of exposure, exposures to site-specific contaminants in the past, present, or future are not likely to result in any adverse impact on human health.
E: No Public Health Hazard This category is used for sites that, because of the absence of exposure, do NOT pose a public health hazard.	Sufficient evidence indicates that no human exposures to contaminated media have occurred, none are now occurring, and none are likely to occur in the future**.**	

*Such as environmental and demographic data; health outcome data; exposure data; community health concerns information; toxicologic, medical, and epidemiologic data; monitoring and management plans.

APPENDIX E

Summary of Public Comments and Responses

Summary Of Public Comments and Responses
Consolidated Iron and Metal Public Health Assessment

This summary was prepared to address comments and questions on the public comment draft of the Consolidated Iron and Metal Public Health Assessment. The public was invited to review the draft during the public comment period which ran from February 9, 2004, through March 12, 2004. We received one written set of comments from a resident. Similar comments may be consolidated or grouped together and some statements reworded to clarify the comment. If you have any questions about this summary, you may contact Krista Anders of the New York State Department of Health (NYS DOH) at 1-800-458-1158 ext.27860.

Comment 1: A resident stated that the September 2000 Preliminary Assessment/Integrated Assessment Report (Weston, 2000) showed elevated levels for DDT, DDE, mercury, and zinc. Why were these contaminants not listed as contaminants of concern in either groundwater or soil?

Response 1: The lists of contaminants of concern (Tables B.1, B.2, and B.3) indicate contaminants that are evaluated further in the public health assessment. Compounds are considered contaminants of concern in soil samples if they were detected in soil samples at concentrations greater than typical background concentrations and health comparison values for exposures corresponding to trespassing. The concentrations of DDT, DDE, mercury and zinc detected in soil samples did not meet these criteria; therefore, they are not listed as contaminants of concern in Tables B.1 and B.2. Of these, only zinc exceeded background levels and none exceeded health comparison values.

Compounds are considered contaminants of concern in groundwater if they were detected in groundwater samples at concentrations greater than New York State drinking water standards. The concentrations of DDT, DDE, mercury and zinc detected in groundwater samples did not meet these criteria. Therefore, they are not listed as contaminants of concern in Table B.3.

Comment 2: A resident commented that in Table 5.4 of the Groundwater CLP Inorganic Analytical Results of 9/23/99, some of the results indicated that they may have been at or above the instrument detection limits. Does this mean that the actual contamination is greater than indicated and, if so, would that change the possible health/environmental effects the contaminants may have?

Response 2: No. The results referenced in the question are at the low range of the laboratory's ability to detect and, for these chemicals at this site, are below levels that require further evaluation for public health implications.

As further explanation, a "B" next to the number on the laboratory reports indicates the compound was detected in the groundwater sample at a concentration greater than the instrument detection limit and less than the contract required detection limit. The instrument detection limit is the lowest amount of a substance that can be detected by the analytical instrument. The contract required detection limit is the substance-specific level that a contract laboratory program (CLP) laboratory must be able to routinely and reliably detect in specific sample matrices (e.g., groundwater). The contract required detection limit is not the lowest detectable level achievable, but rather the level that a CLP laboratory must reliably quantify. The contract required detection limit may or may not be equal to the ability of the instrument to detect a given substance in a given sample. In general, a "B" indicates the compound was detected at a very low level and in this case none were detected at levels that required further evaluation.

Comment 3: A resident requested that near-shore sediment samples be collected and that more consideration be placed on the boat launch area as a possible exposure pathway.

Response 3: The United States Environmental Protection Agency will be collecting near-shore (i.e., within 20 feet, when feasible) sediment samples within the shoreline area adjacent to the site, with at least one sample located by the boat ramp to the northeast of the site boundary in a sedimentation area. Depending upon the results of this sampling, additional sampling may be required to delineate the nature and extent of contamination.

Comment 4: A resident requested a more in-depth study of colorectal cancer be done for the area surrounding Consolidated Iron and Metal.

Response 4: As discussed in the Health Outcome Data section of this public health assessment, results from the Cancer Surveillance Improvement Initiative's Cancer Mapping Project do indicate that ZIP code 12550, which contains the Consolidated Iron Site, is in an area considered to be significantly elevated for colorectal cancer among both males and females. However, the elevated areas are fairly large, encompassing parts of several counties. In addition, the colorectal cancer rates for ZIP code 12550 were lower than those in several surrounding ZIP codes.

There is no information indicating that the residents of this area are being exposed to contaminants from this site. While on-site workers and trespassers may have been exposed to contaminants in surface soil, there is inadequate information about levels of exposure and the number and identity of workers and trespassers. Because there is no evidence of exposure among residents**,** no cancer studies are being planned at this time.

References:

Weston, Roy F., 200. Preliminary Assessment/Integrated Assessment, Consolidated Iron and Metal, Newburgh, New York. Cerclis #:NY0002455756.