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Health Consultation

Public Health Implications of Surface Soil Lead Contamination at the Willow Woods Manufactured Home Community and a Single Family Residence

MATTEO & SONS
(A/K/A MATTEO IRON AND METAL SITE)

WEST DEPTFORD, GLOUCESTER COUNTY, NEW JERSEY

EPA FACILITY ID: NJD011770013

AUGUST 21, 2006

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Atlanta, Georgia 30333

Health Consultation: A Note of Explanation

An ATSDR health consultation is a verbal or written response from ATSDR to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation 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.

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Prepared By:

New Jersey Department of Health and Senior Services
Public Health Services Branch
Consumer and Environmental Health Services
Hazardous Site Health Evaluation Program

Under Cooperative Agreement with the
U.S. Department of Health and Human Services
Agency for Toxic Substances and Disease Registry

Summary

The New Jersey Department of Health and Senior Services, in cooperation with the Agency for Toxic Substances and Disease Registry, evaluated potential health risks posed by surface soil lead contamination detected at the Willow Woods Manufactured Home Community and a single family residence located adjacent to the Matteo Iron and Metal site, West Deptford, Gloucester County, New Jersey. The Matteo Iron and Metal site had operated as a junkyard, an unregistered landfill and a metals recycling facility since 1961. The southern edge of the landfill area is adjacent to the Willow Woods Manufactured Home Community.

Results from the February 2006 United States Environmental Protection Agency sampling event at these two residential properties indicated that the mean and maximum concentration of lead detected in the surface soil in and around the Willow Woods Manufactured Home Community and the single family residence were higher than the New Jersey Department of Environmental Protection soil clean-up criteria for lead.

Based on review of the February 2006 soil lead data and observations made during the site visit, there are completed exposure pathways in the past to area residents (including children) via incidental soil and dust ingestion and dust inhalation. Results from the United States Environmental Protection Agency Integrated Exposure Uptake Biokinetic Model for Lead in Children indicated that if young children (aged 6 - 84 months) were to be exposed to levels of the mean concentrations of lead in soil at the contaminated area, blood lead levels of concern could result in some children. The New Jersey Department of Health and Senior Services and the Agency for Toxic Substances and Disease Registry conclude that the soil lead concentrations detected in sampling from February 2006 poses a ***Public Health Hazard***, especially for past exposures. Present and future pathways of exposure via inhalation and incidental ingestion have been partially interrupted by the installation of temporary high-visibility fencing directly behind the residences facing the open area. The United States Environmental Protection Agency and/or the potential responsible party have initiated the installation of a permanent eight-foot chain-link fence and have begun excavation of contaminated soil around the Matteo Iron and Metal site.

It is recommended that blood lead screenings be made available to all children residing at the Willow Woods Mobile Home community. The environmental agencies should continue to remediate lead contaminated soils and restrict public access to the lead contaminated areas in and around the Willow Woods Mobile Home Community and the single family residence. Residents of Willow Woods Manufactured Home Community and the single family residence should take steps to reduce child lead exposures inside the homes by cleaning floors, window frames, window sills and other surfaces frequently. The New Jersey Department of Health and Senior Services and the Agency for Toxic Substances and Disease Registry will evaluate additional sampling results from this site as appropriate, including an evaluation of childhood blood lead data from this community. Additionally, public availability sessions will be held to discuss results from this health consultation.

Statement of Issues

In February 2006, the United States Environmental Protection Agency (USEPA) requested assistance from the Agency for Toxic Substances and Disease Registry (ATSDR) to evaluate potential health risks posed by surface soil lead contamination detected at two residential properties located adjacent to the Matteo Iron and Metal site, West Deptford, Gloucester County, New Jersey (see Figure 1, below). In response to this request and through a cooperative agreement with the ATSDR, the New Jersey Department of Health and Senior Services (NJDHSS) prepared the following health consultation to assess the public health implications associated with surface soil lead contamination detected during a February 2006 USEPA sampling event at these two residential properties.

Background

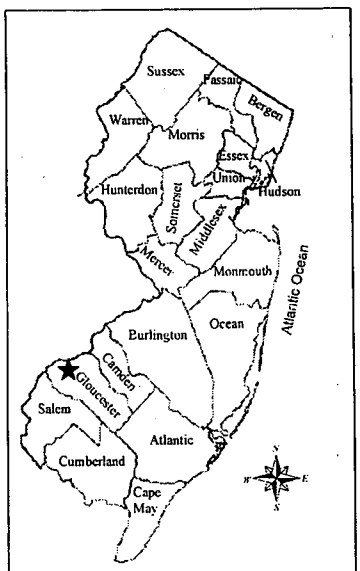

Figure 1: Location of the Matteo Iron and Metal site

The residential properties are the Willow Woods Manufactured Home Community (hereinafter referred to as Willow Woods MHC), 1762 Crown Point Road and a single family residence located at 1686 Crown Point Road. They are located northeast and southwest, respectively, of the Matteo Iron and Metal (hereinafter referred to as Matteo), Inc. (see Figure 2). The single family residence is leased to private individuals by the owner of Matteo, Inc. Currently, Matteo, Inc. operates a scrap metal recycling facility on a portion of the Matteo site closest to Crown Point Road. The Matteo site had operated as a junkyard, an unregistered landfill and a metals recycling facility since 1961 (The Louis Berger Group, Inc. 2004). The unregistered landfill accepted crushed automotive battery casings and industrial and domestic waste. The southern edge of the landfill area is adjacent to the Willow Woods MHC (USEPA 2005). Trails are present throughout the Matteo site from off-site areas. Most of these trails lead directly to or near the Willow Woods MHC. USEPA site visit observations noted the remnants of a campfire situated at the end of a trail leading directly from the Willow Woods MHC, indicating that the Matteo site is accessed and used for recreational purposes.

Demographics

Based on 2000 United States Census data, the ATSDR estimates that there are approximately 10,030 individuals residing within a one mile radius of the Matteo site (see Figure 3).

Site Investigations

Prior to 2004, the NJDEP, the USEPA and Matteo, Inc. conducted limited investigations for waste characterization at the Matteo site. Lead was found to be the primary contaminant of

concern in the surface soils, surface waters, sediments, and groundwater. Polychlorinated biphenyl (PCB) compounds were also identified in some of the surface soils and sediments.

In 2004, the NJDEP conducted a Remedial Investigation (RI) of the Matteo site to delineate the lead and PCB contamination identified during previous investigations (The Louis Berger Group, Inc. 2004). Results from surface soils samples indicated the presence of PCBs and heavy metals including lead, antimony, arsenic and barium. In addition, low levels of chlorinated solvents (primarily vinyl chloride) and arsenic were detected in the groundwater.

In April 2005, the USEPA conducted environmental sampling for placement on the National Priorities List. The sampling included collection of 82 surface soil samples (0 – 6 inches depth) from the Matteo site, the Willow Woods MHC and the single family residence located adjacent to the scrap yard to the northeast. Field screening results from the Willow Woods MHC and the single family residence indicated a mean and maximum soil lead concentration of 144 and 906 milligrams of lead per kilogram of soil (mg/kg), respectively. Based on field screening results, nine samples were selected for laboratory confirmation analysis. Results from laboratory analyses indicated a mean and maximum surface soil lead concentration of 358 and 1,520 mg/kg, respectively.

In February 2006, the USEPA conducted an extensive soil (0 - 3 inches depth and 6 - 12 inches depth at some locations) sampling in the open area present around the Matteo site and the Willow Woods MHC, and at the single family residence. This sampling was conducted to delineate the extent of lead contamination detected in surface soil in the earlier sampling event.

Prior ATSDR/NJDHSS Involvement

There has been no prior ATSDR and NJDHSS involvement at the site.

Site Visit

The site visit was conducted on February 21, 2006. Present were Tariq Ahmed, Somia Aluwalia, and Julie Petix from NJDHSS; Leah Escobar from ATSDR; and representatives from the NJDEP, the USEPA, and the Gloucester County Department of Health. The Willow Woods MHC has been present since the 1950s and there are approximately 100 homes in this community. The Willow Woods MHC is bordered by Crown Point road to the south; the Matteo site to the northeast; and Woodbury Creek to the west (see Figure 2 and Photographs 1 and 2).

The property boundary between the Matteo site and Willow Woods MHC was unclear. At the time of the site visit, no continuous fence existed between the Matteo site and the Willow Woods MHC. Residents were using the open area around the property boundary as their backyard (see Photographs 3 and 4). Toddler play equipment and toys (e.g., tire swing, swing set, toy car, sliding board, tricycle) were observed in this area. It was noted that this open area might have been used as a common play area for children for several surrounding homes in the Willow Woods MHC. A significant portion of the ground surface within the contaminated area was bare soil. Crushed battery casings were observed mixed in the surface soil (see Photographs 5 and 6). It was evident that a portion of this open area was being used as a turnaround and

parking by area residents, potentially generating contaminated dust (see Photograph 7). The highest lead concentration from the previous sampling event was near this area. Trails were observed leading from this open area into the wooded area of the Matteo site. The USEPA representative indicated that an eight foot chain-link fence is proposed to be constructed along the entire Matteo site boundary. The single family residence was visited next, located adjacent to Matteo, Inc. (see Figure 2 and Photograph 8). Currently it is rented out to an individual; however, prior occupancy history is unknown. The location of previously sampled areas was noted.

Based on observations made during the site visit and review of available soil data, a letter of technical assistance was issued by NJDHSS on March 10, 2006 recommending immediate notification of residents of Willow Woods MHC and the single family residence of the surface soil lead contamination (see Appendix).

Community Concerns

On March 13, 2006, the USEPA held an information session to disseminate fact sheets to five specific families/households, based on proximity to the area with elevated soil lead levels. Of these five families, four were present at the information session and also received copies of the ATSDR ToxFAQs for lead. The information session was attended by representatives of the ATSDR, NJDHSS and the NJDEP. None of the residents present at this information session specified any health concerns. It was expressed by some residents that the bare ground area was essential in its use for parking and turning around. Additionally, public utility companies routinely utilize this area.

On March 16, 2006, the USEPA held a public availability session, attended by representatives of the ATSDR, NJDHSS and the NJDEP. Prior to this meeting, temporary high-visibility fencing had been installed behind the residential homes near the property boundary with the Matteo site (see Photograph 9). It was estimated that not more than eight Willow Woods MHC residents and two non-local residents attended the availability sessions. There were some health related concerns posed to the NJDHSS by two Willow Woods MHC residents. A woman was concerned about her nine year old daughter who played on the tire swing in the contaminated areas from the age of five onwards. A couple planning a family in the near future was particularly interested in remediation efforts.

Environmental Contamination

An evaluation of site-related environmental contamination consists of a two tiered approach: 1) a screening analysis; and 2) a more in-depth analysis to determine public health implications of site-specific exposures. First, maximum concentrations of detected substances are compared to media-specific environmental guideline comparison values (CVs). If concentrations exceed the environmental guideline CVs, these substances, referred to as Contaminants of Concern (COC), are selected for further evaluation. Contaminant levels above environmental guideline CVs do not indicate that adverse health effects are likely, but that a health guideline comparison is necessary to evaluate site-specific exposures. Once exposure

doses are estimated, they are compared with health guideline CVs to determine the likelihood of adverse health effects.

For this report the NJDEP Residential Direct Contact Soil Cleanup Criteria (RDCSCC) were used as CVs. They are primarily based on human health impacts but also consider natural background concentrations, analytical detection limits and ecological effects.

Environmental Guideline Comparison

In February 2006, the USEPA conducted an extensive soil (at 0 - 3 inches and 6 -12 inches depth) sampling of the backyard area around the Matteo site and the Willow Woods MHC, and the single family residence. This sampling was conducted to delineate the extent of lead contamination in the Willow Woods MHC detected in the earlier April 2005 sampling event. Results of surface soil (0-3 inches) sampling are as follows:

Location	No. Samples Collected	Mean Lead Concentration (mg/kg)	Maximum Lead Concentration (mg/kg)	NJDEP RDCSCC (mg/kg)
Willow Woods MHC	42	812	4,900	400
Private Residence	11	896	1,600	

The mean and maximum lead concentrations were compared to the NJDEP RDCSCC for lead, which is the same value as the USEPA Soil Screening Guidance Level. The mean and maximum concentration of lead detected in the surface soil at the Willow Woods MHC were approximately two and 12 times higher than the NJDEP RDCSCC of 400 mg/kg, respectively. The mean and maximum surface soil lead concentrations detected at the single family residence were about two and four times higher than the NJDEP RDCSCC, respectively.

Discussion

The method for assessing whether a health hazard exists to a community is to determine whether there is a completed exposure pathway from a contaminant source to a receptor population and whether exposures to contamination are high enough to be of health concern. Site-specific exposure doses can be calculated and compared with health guideline CVs.

Assessment Methodology

An exposure pathway is a series of steps starting with the release of a contaminant in environmental media and ending at the interface with the human body. A completed exposure pathway consists of five elements:

1. source of contamination;
2. environmental media and transport mechanisms;
3. point of exposure;
4. route of exposure; and

5. receptor population.

Generally, the ATSDR considers three exposure pathway categories: 1) completed exposure pathways, that is, all five elements of a pathway are present; 2) potential exposure pathways, that is, one or more of the elements may not be present, but information is insufficient to eliminate or exclude the element; and 3) eliminated exposure pathways, that is, one or more of the elements is absent. Exposure pathways are used to evaluate specific ways in which people were, are, or will be exposed to environmental contamination in the past, present, and future.

During the February 22, 2006 site visit, it was noted that no continuous fence existed between the Matteo site and the Willow Woods MHC. Toddler play equipment and toys were observed on this area, and a significant portion of the ground surface within the contaminated area was bare soil. The road leading to this area was being used for vehicular traffic potentially resulting in the generation of contaminated dust. Individuals walking through this area may have tracked lead-contaminated soil on shoes or clothing into their automobiles and homes, potentially exposing sensitive persons such as children and pregnant women.

Occupancy information is available for 14 homes located in the immediate area near the boundary around the Matteo site and the Willow Woods MHC. This information indicates there are two residences with small children; one with one child aged five and the other residence has two children aged three and five, respectively. One other residence has two children aged 12 and 16, respectively.

Based on a review of USEPA soil sampling data and observations during the site visit, the following completed exposure pathways were identified and are discussed in the following section.

Completed Pathways

Incidental Ingestion of Contaminated Soil and Dust (past): There is a completed exposure pathway in the past from ingestion of lead in surface soil to area residents including children. Children playing in the area near the boundary around the Matteo site and the Willow Woods MHC came in contact with contaminated soil. The contaminated soil could have been potentially tracked indoors (with shoes, clothes and hair) and presented an additional source of dust exposures to children inside the residences. Furthermore, dusts generated by vehicular traffic accessing the contaminated area could have infiltrated into the homes and be potentially ingested by children through hand to mouth behavior.

Inhalation of Contaminated Dust (past): There is a completed exposure pathway in the past from inhalation of dust in ambient and indoor air to area residents (including children). A significant portion of the ground surface within the contaminated area is bare soil resulting in wind-generated dust that potentially infiltrated into residences. Dust was also generated via vehicular traffic that accessed this area, thereby presenting a route of exposure to children playing outside.

Present and future pathways of exposure via inhalation and incidental ingestion have been partially interrupted by the installation of temporary high-visibility fencing directly behind the residences facing the open area. This minimizes children from directly accessing the main source of contaminated soil near the residences. Additionally the fencing prevents dust generation by vehicular traffic although exposures from wind-generated dust are still possible. The USEPA and/or the potential responsible party has initiated the installment of a permanent eight-foot chain-link fence around the Matteo site following the completion of a survey to determine the property line between the Willow Woods MHC and the Matteo site.

Public Health Implications of Completed Pathways

Health Guideline Comparison

Non-Cancer Health Effects

To assess the public health implications of site-specific exposures, estimated exposure doses, derived from site-specific exposure conditions, are compared to dose-based comparison values. To this end, ATSDR has developed Minimal Risk Levels (MRLs) for contaminants that are commonly found at hazardous waste sites. MRLs are based largely on toxicological studies in animals and on reports of human occupational (workplace) exposures. ATSDR has not derived MRLs for lead exposure for inorganic lead and lead compounds. This is because clear dose-response relationships cannot be established using environmental concentrations of lead (ATSDR 1999).

The USEPA developed the Integrated Exposure Uptake Biokinetic (IEUBK) Model for Lead in Children (USEPA 2002). The IEUBK model can be used to predict the risk of elevated blood lead levels in children (under the age of 84 months) that are exposed to environmental lead from many sources. Blood lead levels are indicators of recent exposure, and are also the most widely used index of internal lead body burdens associated with potential health effects. The model also calculates the probability (or P_{10}) that children's blood lead levels will exceed a level of concern. The Centers for Disease Control and Prevention (CDC) level of concern for children up to 84 months of age is 10 micrograms of lead per deciliter of blood or 10 µg/dL (CDC 1991, ATSDR 1999). In using the model, the USEPA recommends that the lead concentration in site soil does not result in a five percent probability of exceeding a blood lead concentration of 10 µg/dL (USEPA 1994).

The potential for lead exposures associated with exposure to contaminated soil and dust at the Willow Woods MHC and the single family residence was evaluated using the IEUBK model.

Air monitoring data is unavailable for this site. However, an upper bound lead concentration in dust due to disturbances created by recreational activities may be calculated using mean lead concentration in the soil (812 mg/kg). It is also assumed that all dust created by recreational activities and/or vehicular traffic disturbances that a child might breathe in would contain lead at the mean concentration measured in the surface soils. To estimate upper bound ambient lead concentration associated with dust particles, a dust loading factor of 2×10^{-7} kg of soil per cubic meter of air (kg/m^3) was used (ATSDR 2003). This dust loading factor is two to

three orders of magnitude greater than the default value for wind erosion of residential soils (to 7.6×10^{-10} kg/m^3) and is considered conservative. The mean ambient air lead concentration that a person might breathe in, in microgram per cubic meter (μg/m^3), is given by:

$$C_{lead,\ air} = C_{lead,\ surface\ soil} \times MLF \times CF$$

where $C_{lead,\ surface\ soil}$ = average concentration of lead in surface soil in mg/kg,
MLF = soil mass loading factor in kg/m^3 and
CF = conversion factor (1000 μg/mg).

Using the mean concentration of lead detected in the surface soil (812 mg/kg), the ambient lead concentration in dust may be estimated as 0.16 μg/m^3.

The model inserts default values whenever site-specific information is not used. This model uses standard age-weighted exposure parameters for consumption of food, drinking water, soil, and dust, and inhalation of air, matched with site-specific concentrations of lead in these media, to estimate exposure for the child. The daily dietary lead intake values for each age apply to a typical U.S. child in a typical setting in the United States after 1990. The water lead concentration is set to a typical 1990 urban value of four micrograms of lead per one liter of water (μg/L). The default value for total intake of soil and dust depends on age, and ranges from 85 to 135 mg/day (USEPA 1994).

Using the site-specific air concentration and default model assumptions for other variables, the predicted geometric mean blood lead levels and the probability of blood lead levels exceeding 10 μg/dL (P_{10}) for children residing at the Willow Woods MHC are shown in the following table:

Age (months)	**Based on maximum soil concentration – 4,900 mg/kg**		**Based on mean soil concentration – 812 mg/kg**	
	Blood Lead Level[1] (μg/dL)	**P_{10} (%)[2]**	**Blood Lead Level (μg/dL)**	**P_{10} (%)**
6 -12	28	98	9.0	41
12 - 24	32	99	10	52
24 - 36	30	99	9.7	47
36 - 48	30	99	9.3	44
48 - 60	26	98	7.8	29
60 - 72	23	96	6.6	19
72 - 84	21	94	5.9	13

[1]Geometric Mean lead levels in blood; [2]probability of blood lead level > 10 μg/dL

Based on maximum soil lead concentrations, the model predicted that the blood lead levels for children aged 6 - 84 months were considerably elevated above 10 μg/dL. In addition, the probabilities of blood lead levels exceeding 10 μg/dL for children ages 6 - 84 months was near 100 percent. Therefore, for children exposed to maximum concentration of lead contaminated soil at the property located between the Willow Woods MHC and the Matteo site,

the predicted blood lead levels would exceed the CDC level of concern. Based on mean soil lead concentrations, the model predicted that the blood lead levels for children aged 6 - 84 months would be at or below the level of concern (10 µg/dL). However, the percent of young children aged 6 - 84 months who are predicted to exceed a blood lead concentration of 10 µg/dL ranged from 13 to 52 percent. Thus, if young children were to be exposed to levels of the mean concentrations of lead in soil at the contaminated area, blood lead levels of concern could result in some children.

Although according to the USEPA, children do not currently reside at the single family residence, the IEUBK model was used to predict potential child blood lead levels in the event of future residency. Based on mean and maximum soil lead concentrations (896 and 1,600 mg/kg, respectively) at the single family residence, it can be concluded that if young children were to be exposed to levels of the average and maximum concentrations of lead in soil at the property, blood lead levels of concern could result in some children.

No health guidelines or threshold levels have been established for the health effects resulting from exposure to lead in various environmental media. There is strong evidence linking health effects in children to blood lead levels (ATSDR 2005; CDC 1991). Levels of 10 µg/dL and perhaps even lower, in children's blood have been associated with small decreases in IQ and slightly impaired hearing and growth (ATSDR 2005; CDC 1991). Concentrations of 20 µg/dL and greater are associated with changes in nerve conduction velocity. Vitamin D metabolism, which is important in bone development, can suffer at concentrations of 30 µg/dL (CDC 1991). In children, lead begins to affect hemoglobin synthesis at 40 µg/dL.

Fetuses are at even greater risk from lead exposure than children (ATSDR 2005; CDC 1991). Because lead crosses the placenta, a woman exposed during pregnancy can transmit lead to her fetus. Lead in the bones of women who were exposed before pregnancy may be mobilized because of the physiological stresses of pregnancy resulting in exposure to the fetus. Studies of lead exposure to children and the developing fetus have demonstrated an association between lead and several health effects (ATSDR 1999, 2005; CDC 1991). These health effects include physical and mental impairments, hearing difficulties, impaired neurological development, and reduced birth weight and gestational age.

Adults are believed to be less susceptible to adverse effects of chronic, low level exposures to lead. Some health effects attributed to lead exposure are interference with Vitamin D production, neurobehavioral toxicity, renal dysfunction, increases in blood pressure (particularly in middle-aged and older people) and, at higher exposures, dysfunction of cardiovascular, hepatic, gastrointestinal, and endocrine systems (ATSDR 1999).

Cancer Health Effects

The site-specific lifetime excess cancer risk (LECR) indicates the cancer potential of contaminants. The LECR is calculated by multiplying the cancer exposure dose by the cancer slope factor (CSF), derived from animal and/or human cancer studies. Although lead has not been classified as a carcinogen by the US Department of Health and Human Services, the carcinogenicity of inorganic lead and lead compounds have been evaluated by the USEPA

(USEPA 1986, 1989). The USEPA has determined that data from human studies are inadequate for evaluating the carcinogenicity of lead, but there is sufficient data from animal studies which demonstrate that lead induces renal tumors in experimental animals. In addition, there are some animal studies which have shown evidence of tumor induction at other sites (i.e., cerebral gliomas; testicular, adrenal, prostate, pituitary, and thyroid tumors). However, a CSF has not been derived for inorganic lead or lead compounds, so no estimation of LECR can be made for lead exposure.

Child Health Considerations

The NJDHSS and ATSDR recognize that the unique vulnerabilities of infants and children demand special emphasis in communities faced with contamination in their environment. Children are at greater risk than adults from certain types of exposures to hazardous substances. Their lower body weight and higher intake rate results in a greater dose of hazardous substance per unit of body weight. The developing body systems of children can sustain permanent damage if toxic exposures occur during critical growth stages. Most important, children depend completely on adults for risk identification and management decisions, housing decisions, and access to medical care.

Lead and Health Effects in Children Six Years and Younger

In residential settings, children ages six years and younger are considered to be at greater risk for health effects from lead exposure than are older children and adults. The reasons for children's increased vulnerability include the following:

- children's developing nervous system;
- hand-to-mouth behavior exhibited by children which increases the opportunity for soil ingestion
- the efficiency of lead absorption from the gastrointestinal tract is greater for children than adults; and
- iron and calcium deficiencies, which are prevalent in children, may enhance the absorption and increase the toxic effects of lead (ATSDR 1999; Sedman 1989).

The occupancy survey for the Willow Woods MHC indicates that there are three children under the age of five residing near the boundary with the Matteo site. At the blood lead levels modeled from soil and dust lead concentrations, children aged 6 - 84 months living at the Willow Woods MHC may be at increased risk of lead exposure and consequent health effects.

Conclusions

The mean and maximum concentration of lead detected in the surface soil at the Willow Woods MHC and the single family residence exceeded the NJDEP RDCSCC. Based on review of USEPA soil lead data collected in February 2006 and observations made during the site visit, there are completed exposure pathways in the past to area residents (including children) via

incidental soil and dust ingestion and dust inhalation. The review found that children's exposures to lead detected in surface soil have the potential to cause adverse health effects. These effects are likely to be seen in children who play in the open area (making regular contact with the contaminated soil through incidental ingestion). The NJDHSS and ATSDR conclude that the soil lead concentrations detected in sampling from February 2006 poses a ***Public Health Hazard***, especially for past exposures. Present and future pathways of exposure via inhalation and incidental ingestion have been partially interrupted by the installation of temporary high-visibility fencing directly behind the residences facing the open area. The USEPA and/or the potential responsible party have initiated the installation of a permanent eight-foot chain-link fence and have begun excavation of contaminated soil around the Matteo, Inc. site (USEPA 2006).

Adults are believed to be less susceptible to adverse effects of lead. Exposures to lead are most dangerous to young children and fetuses. Most children with lead poisoning have no obvious symptoms, and therefore, the condition often remains undiagnosed and untreated (CDC 1991). The neurotoxicity of lead is a particular concern. Some health effects, such as impaired academic performance and motor skills, may persist as a result of lead exposure, even when blood lead concentrations return to normal levels (ATSDR 2005).

Recommendations

1. Blood lead screenings for all children residing at the Willow Woods MHC should be made available by the Gloucester County Department of Health.

2. The environmental agencies should continue remediation of the lead contaminated soils at the Willow Woods MHC and should continue to restrict public access to the lead contaminated areas at the Willow Woods MHC and the single family residence.

3. Residents of Willow Woods MHC and the single family residence should clean floors, window frames, window sills, and other surfaces frequently using a mop, sponge, or paper towel dampened with warm water and a general all-purpose cleaner. These should be thoroughly rinsed after cleaning dirty or dusty areas. Children's hands should be washed often, especially before they eat and before nap time and bed time.

Public Health Action Plan (PHAP)

The purpose of a PHAP is to ensure that this health assessment not only identifies public health hazards, but also provides a plan of action designed to mitigate and prevent adverse human health effects resulting from exposure to hazardous substances in the environment. Included is a commitment on the part of ATSDR and NJDHSS to follow up on this plan to ensure that it is implemented. The public health actions to be implemented by the NJDHSS and the ATSDR are as follows:

Public Health Actions Undertaken by NJDHSS and ATSDR

1. A Letter of Technical Assistance was prepared and issued by the NJDHSS recommending immediate notification of residents of Willow Woods MHC and the single family residence of the surface soil lead contamination (see Appendix).

2. The NJDHSS and ATSDR reviewed available environmental data and other relevant information to identify and evaluate human exposure pathways and public health issues.

3. In cooperation with the ATSDR and the NJDEP, a site visit was conducted of the Willow Woods MHC and the single family residence.

4. On March 13, 2006, the NJDHSS attended a USEPA information session which involved meeting a group of residents located directly adjacent to the contaminated area to discuss health concerns.

5. On March 16, 2006, the NJDHSS and the ATSDR participated in USEPA public availability sessions to provide public education materials about the hazards of lead exposure to area residents.

Public Health Actions Planned by NJDHSS and ATSDR

1. The NJDHSS and ATSDR will evaluate additional sampling results from this site as appropriate, including an evaluation of childhood blood lead data from this community.

2. The NJDHSS and the ATSDR will conduct public availability sessions to discuss results from this health consultation.

3. This HC will be made available to residents of Willow Woods MHC and the single family residence. Materials will be provided to the residents of Willow Woods MHC and the single family residence giving guidance on protecting children from lead exposures around the home.

4. The NJDHSS will prepare a citizens' guide to this health consultation summarizing its findings and incorporating additional information on lead and children.

5. The NJDHSS will incorporate additional USEPA sampling results from Willow Woods MHC as part of the public health assessment prepared for the adjacent Matteo, Inc. Superfund site.

6. The NJDHSS and the ATSDR will update this public health action plan as warranted by additional data and/or conditions.

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[USEPA] United States Environmental Protection Agency. 2002. Overview for the IEUBK model for lead in children. Washington, DC: August 2002. OSWER #9285.7-31. Available at URL: http://www.epa.gov/superfund/programs/lead/products/factsht5.pdf

[USEPA] United States Environmental Protection Agency. 2003. Superfund lead-contaminated residential sites handbook. Washington, DC: U.S. Environmental Protection Agency. August 2003. Available at: http://www.epa.gov/superfund/programs/lead/products/handbook.pdf

[USEPA] United States Environmental Protection Agency. 2005. Action Memorandum from Nick Magriples to George Pavlou, concerning request for a CERCLA Removal Action at the Matteo Iron and Metal Site, West Deptford, Gloucester County, New Jersey. September 30, 2005.

[USEPA] United States Environmental Protection Agency. 2006. Pollution Report for the Matteo Iron and Metal Site, Gloucester County, New Jersey. May 24, 2006.

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Senior Regional Representative

Leah T. Escobar, R.S.
Associate Regional Representative

ATSDR Technical Project Officer:

Gregory V. Ulirsch, MS, PhD
Technical Project Officer
Superfund Site Assessment Branch
Division of Health Assessment and Consultation

Any questions concerning this document should be directed to:

New Jersey Department of Health and Senior Services
Consumer and Environmental Health Services
Hazardous Site Health Evaluation Program
3635 Quakerbridge Road
P.O. Box 369
Trenton, New Jersey 08625-0369

CERTIFICATION

The health consultation for the Matteo Iron and Metal site, Gloucester County, New Jersey was prepared by the New Jersey Department of Health and Senior Services under a cooperative agreement with the Agency for Toxic Substances and Disease Registry. It is in accordance with approved methodology and procedures existing at the time the health consultation was initiated. Editorial review was conducted by the cooperative agreement partner.

Gregory V. Ulirsch, MS, PhD
Technical Project Officer, CAT, SPAB, DHAC
Agency for Toxic Substances and Disease Registry

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

Alan Yarbrough
Team Leader, CAT, SPAB, DHAC
Agency for Toxic Substances and Disease Registry

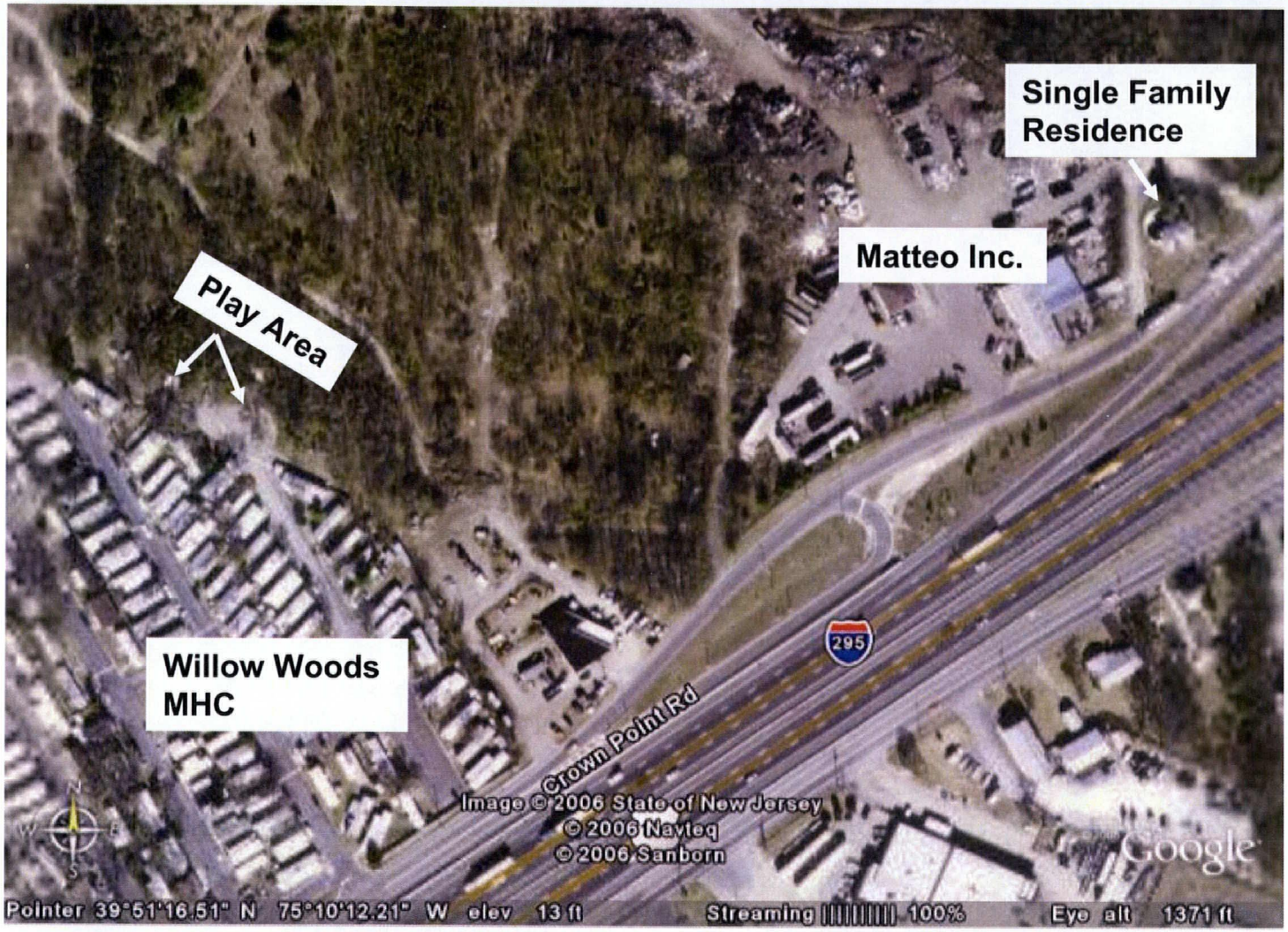
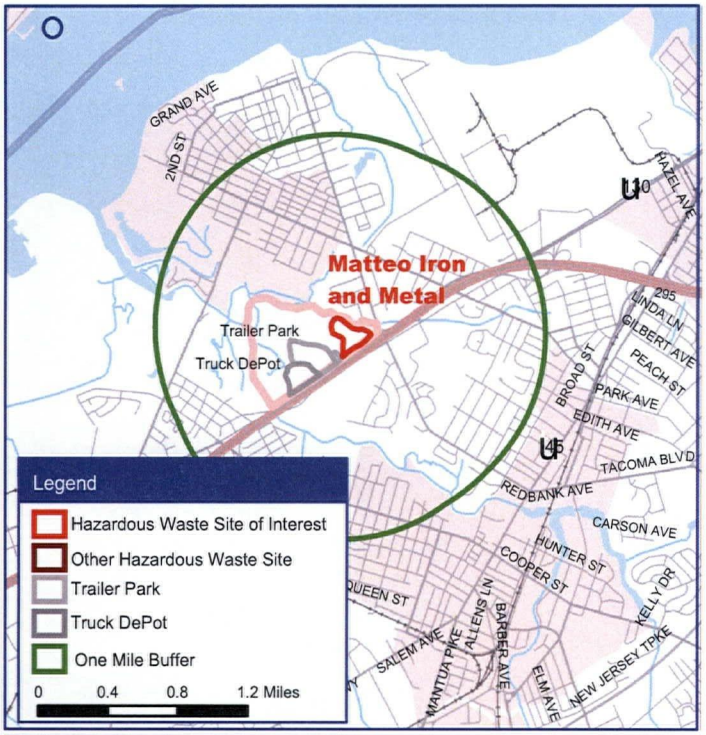


Figure 2: Site map showing the location of Willow Woods MHC and the single family residence

Matteo Iron And Metal
West Deptford Township, NJ
EPA Facility ID: NJD011770013

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

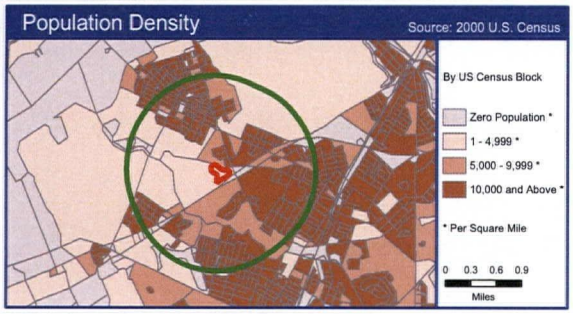


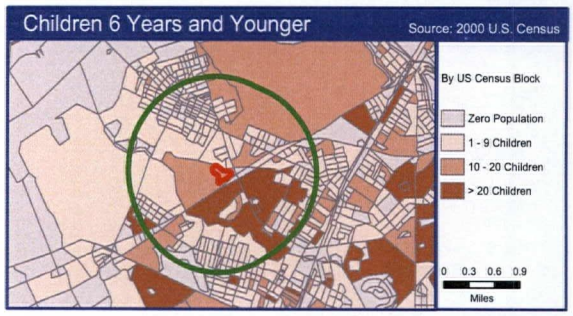
Base Map Source: Geographic Data Technology, May 2005.
Site Boundary Data Source: ATSDR Public Health GIS Program, May 2005.
Coordinate System (All Panels): NAD 1983 StatePlane New Jersey FIPS 2900 Feet

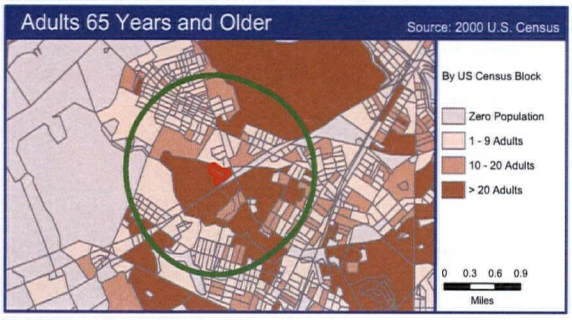
Demographic Statistics
Within One Mile of Site*

Total Population	10,028
White Alone	9,502
Black Alone	306
Am. Indian & Alaska Native Alone	21
Asian Alone	86
Native Hawaiian & Other Pacific Islander Alone	0
Some Other Race Alone	42
Two or More Races	71
Hispanic or Latino**	127
Children Aged 6 and Younger	880
Adults Aged 65 and Older	1,217
Females Aged 15 to 44	2,214
Total Housing Units	3,797

Demographics Statistics Source: 2000 U.S. Census
* Calculated using an area-proportion spatial analysis technique
** People who identify their origin as Hispanic or Latino may be of any race.







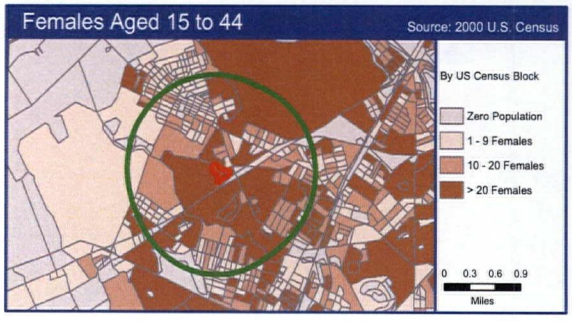


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Figure 3: Demographic Information of Matteo Iron and Metal site based on 2000 U.S. Census

Photograph 1: Matteo Iron and Metal, West Deptford, Gloucester County, NJ

Photograph 2: Willow Woods MHC located adjacent to Matteo Iron and Metal

Photographs 3 and 4: Open area present behind some Willow Woods MHC residences

Photograph 5: Surficial crushed battery casings in the open area present in the Willow Woods MHC

Photograph 6: Part of battery casing found in the open area behind homes in the Willow Woods MHC

Photograph 7: Road leading to the open area behind Willow Woods MHC residences

Photograph 8: Crushed battery in Matteo's loading dock area adjacent to single family residence

Photograph 9: Temporary fencing restricting access to the open area present behind the homes in the Willow Woods MHC

Appendix

State of New Jersey
DEPARTMENT OF HEALTH AND SENIOR SERVICES
CONSUMER AND ENVIRONMENTAL HEALTH SERVICES
PO BOX 369
TRENTON, N.J. 08625-0369
www.nj.gov/health

JON S. CORZINE
Governor

FRED M. JACOBS, M.D., J.D.
Commissioner

March 10, 2006

Mr. Nicholas Magriples
On-Scene Coordinator, Removal Action Branch
U.S. Environmental Protection Agency, Region 2
2890 Woodbridge Avenue
Edison, New Jersey 08837-3679

Dear Mr. Magriples:

This Letter of Technical Assistance is in response to a United States Environmental Protection Agency (USEPA) Region 2 request that the New Jersey Department of Health and Senior Services (NJDHSS), through a cooperative agreement with the federal Agency for Toxic Substances and Disease Registry (ATSDR), evaluate potential health risks posed by lead soil contamination detected at two residential properties located adjacent to the Matteo Iron and Metal site, West Deptford, Gloucester County, New Jersey. These properties are the Willow Woods Manufactured Home Community (MHC), 1762 Crown Point Road and a single family residence (leased to private individuals by the owners of Matteo Iron and Metal) located at 1686 Crown Point Road. Lead results of surface soil samples (0 - 3 inches depth) collected from these properties during the week of February 6, 2006 are as follows:

Location	**No. Samples Collected**	**Average Lead Concentration (mg/kg)***	**Maximum Lead Concentration (mg/kg)**	**USEPA Residential Soil Guidance Value (mg/kg)**
Willow Woods MHC	42	812	4,900	400**
Private Residence	11	896	1,600	

*mg/kg = milligrams of lead per kilogram of soil
**Also the New Jersey Department of Environmental Protection Residential Direct Soil Cleanup Criteria for lead.

The average and maximum lead surface soil concentrations detected at the Willow Woods MHC were approximately two and 12 times higher than the USEPA Residential Soil Guidance Value (RSGV) of 400 milligrams of lead per kilogram of soil, respectively; the average and maximum surface soil lead concentrations detected at the private residence were about two and four times higher than the USEPA RSGV.

A more detailed and comprehensive evaluation will be provided to the USEPA in a health consultation being prepared for the site. Please contact me at 609-584-5367 or Julie.Petix@doh.state.nj.us if you have any questions. Public inquiries regarding this matter may be referred to Ms. Leah Escobar, Associate Regional Representative, ATSDR Region II at 732-906-6932 or Escobar.Leah@epamail.epa.gov. Thank you.

Yours truly,

Julie R. Petix, MPH, CPM, HO
Project Manager,
Health Assessment and Consultation Unit
Hazardous Site Health Evaluation Program

c: Gregory Ulirsch, Technical Project Officer, ATSDR
Arthur Block, Senior Regional Representative, ATSDR Region II
Jerald Fagliano, MPH, PhD, Program Manager, NJDHSS
Thomas Budroe, Team Leader/ERRD, USEPA
Larry Quinn, Case Manager, NJDEP
Donald Benedik, Health Officer, Gloucester County Department of Health
William Atkinson, Chief Sanitary Inspector, Gloucester County Department of Health