

Health Consultation

Public Health Evaluation of Soil Data
Athletic Playing Field Behind Hamden Middle School

HAMDEN MIDDLE SCHOOL
(a/k/a NEWHALL STREET FIELD)

HAMDEN, NEW HAVEN COUNTY, CONNECTICUT

EPA FACILITY ID: CTD982544355

SEPTEMBER 21, 2001

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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HEALTH CONSULTATION

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Prepared by:

Connecticut Department of Public Health
Under a Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry

The conclusions and recommendations in this health consultation are based on the data and information made available to the Connecticut Department of Public Health and the Agency for Toxic Substances and Disease Registry. The Connecticut Department of Public Health and the Agency for Toxic Substances and Disease Registry will review additional information when received. The review of additional data could change the conclusions and recommendations listed in this document.

BACKGROUND AND STATEMENT OF ISSUE

The Connecticut Department of Public Health (CT DPH) was asked by the Quinnipiack Valley Health District, the Town of Hamden and the CT Department of Environmental Protection (CT DEP) to evaluate the public health significance of soil data collected at the athletic field behind the Hamden Middle School. The Hamden Middle School is located at 560 Newhall Street in Hamden, Connecticut. The athletic field (the Field) is approximately four acres in size and is located on the west side of the middle school. It consists of paved tennis courts, soccer fields, baseball fields and a small paved track area. The Field was historically known as the Newhall Street Field and is bordered by private residences, an industrial park and by the buildings of the middle school. The Middle School itself has been the subject of an extensive environmental investigation which is covered in a separate public health assessment. Figure A is a site plan showing the school, the Field and selected sampling locations.

During the 1940s and 1950s the Field was allegedly used by local residents for disposal of domestic waste and by the Winchester Repeating Arms Division for the disposal of old batteries (NUS 1991). Hamden Middle School was built in 1955. According to some reports, the Field continued to be used for waste disposal for a period of time after the school was built.

Since the late 1970s, a number of soil sampling investigations have occurred at the Field. These investigations have documented the presence of numerous contaminants both at the surface and at depth. Visual observations made during sampling investigations noted the presence of "a black ash-like material with traces of brick/wood pulp or cinders" in sample locations at a minimum depth of 12 inches below grade (CDM 1994).

In August 1991, EPA's Removal Program completed a Preliminary Assessment/Site Investigation report for the Field in which they concluded that the amount and type of contamination present at the Field did not warrant a Federal response (Weston 1991).

ATSDR and CT DPH previously have been asked to make public health evaluations of data collected at the Hamden Middle School athletic field. In November 1991, at the request of EPA, ATSDR prepared a health consultation for the Field (ATSDR 1991). ATSDR concluded that based on limited data, lead contaminated soils at the Field posed a health threat to children playing in areas of exposed soils. They recommended that more sampling be done to better characterize lead contaminated soils and that the need for covering the Field be considered. At the time ATSDR prepared the health consultation, the Middle School was considering construction of a new athletic field at the same location. ATSDR further recommended that

precautions be taken during any excavation work to minimize soil dust and prevent exposures to children and construction workers.

In May 1992, at the request of the Quinnipiack Valley Health District, the CT DPH was asked to comment on potential health impacts associated with use of the Field (CT DPH 1992). CT DPH reviewed the most recent data available for the Field at that time and concluded that given the Field's grass-covered condition, it was safe to use. CT DPH's conclusion was based on EPA's lead exposure model which showed that at the maximum lead concentration detected in surface soil (1600 mg/kg), the Field would not contribute significantly to children's blood lead levels. CT DPH recommended that the grass cover on the field be maintained and that the potential for health impacts be reevaluated before any excavation activities were undertaken.

In 1993, HRP Associates Inc., under contract to the Town of Hamden, sampled the athletic field for the purpose of more fully characterizing the lead contamination and recommending an action plan to the Town. Sometime between 1994 and 1996, the Town capped the Field with clean fill and reconstructed the existing athletic facilities.

In late 2000, residents began to question whether the athletic Field was safe because of the extensive environmental investigations that were going on at the middle school. In February 2001, in response to residents' concerns about the safety of the field, CT DEP collected 26 surface soil samples (top 6 inches) in a grid pattern across the Field (samples shown in red in Figure A). They also collected core samples to a depth of four feet to visually confirm that a clean soil cap was present. DEP sample results confirm that surface soil at the Field is clean. Visual evidence confirms that the clean soil cap is present. Cap thickness ranges from a minimum of two feet to a maximum of four feet.

In April 2001, as part of an investigation EPA was conducting of contaminated landfill materials in the residential area adjacent to the Hamden Middle School, EPA discovered elevated levels of lead in surface soil (0-6 inches) in some of the residential yards along the southern side of the Field (Morse Street side). Further EPA sampling revealed that the elevated lead extends approximately 25 feet beyond the residential property lines toward the Field (samples shown in green in Figure A). Because that area is accessible to people walking between the Field and the Newhall Street School Parking lot, the Town of Hamden, at the direction of CT DEP and CT DPH, quickly installed snow fencing to restrict access to the area with elevated lead. In early May 2001, CT DEP collected 35 surface (0-3 inches) soil samples to better define the extent of elevated contaminants in the area (samples shown in blue in Figure A). Samples were analyzed for metals and semi-volatile organic compounds (SVOCs). CT DEP sample results indicated that the high lead levels found by EPA are limited to a narrow area along the residential property line. CT DEP sampling results also indicated some elevated levels of polycyclic aromatic hydrocarbons (PAHs) next to the Newhall Street School parking lot. As precaution against potential exposure, the Town immediately covered the entire area sampled by EPA and DEP (samples shown in green and blue) with wood chips. During the summer 2001, the Town will place an asphalt walkway through the area and will maintain the woodchips around the walkway area.

Demographics

The Hamden Middle School athletic field is used by middle school students, the Hamden Soccer Association, and nearby residents. There are approximately 1000 students (aged 11-14) in the middle school. Middle School students may use the Field an average of 1 to 4 hours per week during the nine month school year.

The Hamden Soccer Association uses the Field for soccer practices and games. There are approximately 600 children (aged 4 to 10 years) who have used the Field in past years for soccer practice and games. Currently, there are approximately 450 children (aged 6 to 10 years) who play soccer on the Field. In addition, there are approximately 15 junior referees (aged 12-15 years) and 55 adult coaches who use the Field as part of the youth soccer program. Usage of the Field for soccer games and practices is approximately 2 to 4 hours per week during the spring and fall soccer seasons. In addition to the children who play soccer at the Field, there are families with young children who regularly visit the Field to watch soccer practices and games.

There are approximately 639 children under the age of 18 who live within a one-block distance of the Field who could access to the Field for playing (1990 US Census).

Environmental Data and Exposure Pathways

To evaluate potential exposures at the Hamden Middle School Athletic Field, CT DEP considered the available environmental data for the site and how people might come into contact with contaminants. To evaluate past exposures, CT DEP considered soil data collected prior to the town of Hamden placing clean soil over contaminated areas. If there is no potential for exposure to contaminants, then it can be concluded that there is no possibility of adverse health effects from the contaminants. If there is potential exposure, contaminant concentrations are then compared with health-protective comparison values. Comparison values are screening levels, below which, there is little likelihood of adverse health effects from exposure. When contaminant concentrations exceed comparison values, exposures are evaluated further. For this site, comparison values were taken from two sources. One source is the Connecticut residential criteria for direct exposure to soil (CT RSRs). These values assume that contact with soil occurs every day over the long term (30 years). ATSDR-developed comparison values were also used for some contaminants. ATSDR comparison values also assume frequent contact with soil over the long term.

Since 1979, over 100 surface and subsurface soil samples have been collected at the Hamden Middle School Athletic Field. Prior to the Town installing the soil cap on the Field in the mid-1990s, both surface and subsurface soils were sampled on several occasions. Those sampling data show that metals including lead, arsenic, antimony, manganese and chromium are present at elevated levels in surface and subsurface soils.

Table 1 summarizes the soil sampling results from the Filed *prior to installation of the clean soil cap* in the mid-1990s. Maximum concentrations in surface and subsurface soils are included. Health protective comparison values are also shown. Contaminants detected below comparison values are not included in Table 1.

Table 1. Summary of soil data from Hamden Middle School Athletic Field, Hamden, CT
Data were collected **prior** to the town installing the clean soil cap over the Field.

Contaminant	Max. Conc. ANY DEPTH (mg/kg)	Sample Depth (inches)	Max. conc. in Surface Soil [@]	Comparison Value (mg/kg)	Comparison Value Source
Antimony	66	12	5.1	20	child RMEG
Arsenic	18.5	12	4.1	0.5 10	CREG CT RSR
Chromium (unspeciated)	300	4	300	3900 Cr III 100 Cr VI	CT RSR CT RSR
Lead	56,000*	12	4855	500	CT RSR
Manganese	5920	6	5920	3000	child RMEG

* This sample was significantly higher than any of the other 68 soil samples for lead. The next highest lead level measured at the Field was 4855 mg/kg.

[@] Only samples taken within the top 6 inches were considered surface soil samples.

CT RSR = Connecticut residential criteria for direct exposure to soil; 365 days/year exposure for 30 years.

child RMEG = Reference Dose Media Evaluation Guide for children (noncancer effects).

chronic EMEG = Chronic (exposure \geq 365 days) Environmental Media Evaluation Guide (noncancer effects).

CREG = Cancer Risk Evaluation Guide for 1×10^{-6} cancer risk based on lifetime exposure.

Soil samples collected by CT DEP in February 2001 show that the Field in its current condition has a clean soil cap that ranges from 2 feet to 4 feet in thickness. Soil samples were analyzed for metals and SVOCs and all results were well below CT DEP residential cleanup standards for direct exposure to soil (CT RSRs). CT RSRs are developed to be protective for direct exposure to soil, assuming exposure occurs 365 days per year for 30 years.

As mentioned above, elevated lead was found in surface soils along the southern side of the Field, near the fence separating Middle School property from residences along Morse Street. This area is not part of the athletic field per se, but is used as a walkway to and from the Field.

Table 2 provides a summary of surface soil results from the walkway area. Maximum concentrations are included. Health protective comparison values are also shown. Contaminants detected below comparison values are not included in Table 2.

Table 2. Summary of surface soil data from walkway area to Hamden Middle School Athletic Field, Hamden, CT
Data were collected prior to the town installing fencing and placing woodchips over the area.

Contaminant	Maximum Concentration (mg/kg)	Comparison Value	Comparison Value Source	Number of samples exceeding Comparison Value
Lead	15,000	500	CT RSR	10 of 51
Arsenic	44	0.5 10	CREG CT RSR	37 of 39 2 of 39
Benzo(a)pyrene	4.7	0.1 1	CREG CT RSR	16 of 39 8 of 39
Benzo(a)anthracene	3.4	1	CT RSR	7 of 39
Benzo(b)fluoranthene	9	1	CT RSR	9 of 39
Indeno(1,2,3-cd)pyrene	3.1	1	CT RSR	3 of 39

CT RSR = Connecticut residential criteria for direct exposure to soil; 365 days/year exposure for 30 years.
CREG = Cancer Risk Evaluation Guide for 1×10^{-6} cancer risk based on lifetime exposure.

In order to be exposed to soil contaminants at the Hamden Middle School athletic field, one must come into direct contact with the soil by touching it (dermal contact), breathing in soil particles (inhalation) or eating soil adhered to fingers or food items (ingestion). Under current conditions, there are no pathways by which someone could be exposed to soil contaminants at the Field because the Field is grassed and has a two to four foot thick clean soil cap. Also, access to contaminated soil in the walkway area is restricted by fencing and a covering of wood chips.

Under past site conditions, prior to the mid-1990s when the town installed the soil cap, it is possible that exposure to soil contaminants at the Field could have occurred to children or adults by dermal contact, inhalation or ingestion. It is also possible that dermal, inhalation or ingestion exposure to lead and PAHs in soil in the walkway area could have occurred in the past, before the Town of Hamden fenced and covered the area with woodchips in the spring of 2001.

DISCUSSION

Evaluation of public health implications to adults and children

When determining the public health implications of exposure to hazardous contaminants, CT DPH considers how people might come into contact with contaminants and compares contaminant concentrations with health protective comparison values. When contaminant levels are below comparison values, we can say with relative certainty that health impacts from exposure to those levels are unlikely. When contaminant levels exceed comparison values, it does not mean that health impacts are likely. Rather, it means that exposures should be evaluated further.

Current Site Conditions - Field and Walkway Area

As stated above, there is no exposure to soil contaminants under current site conditions because the Field is grassed and is covered with a clean soil cap which provides a barrier between people and the soil contamination. Soil contaminants in the walkway area are currently covered with a layer of woodchips and access to the area of highest concentration is restricted by a fence. Without exposure to the contaminants, there is no potential for adverse health effects.

Past Site Conditions at the Athletic Field (prior to installation of cap in mid-1990s)

In the past, prior to the Town installing the soil cap, people using the Field could have come into contact with soil contaminants. As Table 1 shows, five contaminants were detected above comparison values. However, surface soils (top 6 inches) are generally much lower in concentration than deeper soils. Only four surface soil contaminants; arsenic, chromium, lead and manganese exceed comparison values. In the past, people would have been much more likely to come into contact with surface soils on a regular and continuing basis than they would have with deeper soils. Digging would have had to occur in order for deeper soils to be contacted. It is reasonable to assume that in the past, people would not have been exposed on a regular and continuing basis to soils at depth.

Arsenic

Arsenic is an element that is found naturally in soil at low levels. The arsenic that occurs naturally in soil is inorganic arsenic. Inorganic arsenic has been recognized as a human poison since ancient times. Eating very large doses of inorganic arsenic can produce death. At lower levels of exposure, over the long term, arsenic can produce a characteristic pattern of skin changes including darkening of the skin and lung and throat irritations. Arsenic is recognized as a known human carcinogen. Breathing inorganic arsenic increases the risk of lung cancer. Ingesting inorganic arsenic increases the risk of skin cancer and tumors of the bladder, kidney, liver and lung (ATSDR Toxicological Profile, 2000). These health impacts from arsenic exposure are provided for general information and not to imply that these effects would be expected from exposures at the site.

Prior to installation of the clean soil cap, only one surface soil sample at the Field was analyzed for arsenic. Arsenic was found at a concentration of 4.1 mg/kg. With only one surface soil sample, it is difficult to reach a conclusion about potential health effects. However, eleven depth samples showed arsenic ranging from 0.69 mg/kg to 18.5 mg/kg. The average concentration at depth is roughly the same as the level found at the surface. It seems reasonable to assume that the average arsenic concentration at the surface is similar to the average at depth. The arsenic concentration found at the surface does not exceed the CT RSR but it does exceed the ATSDR CREG value. The ATSDR value is based on assumed exposure 7 days per week, 365 days per year for 30 years. The frequency and duration of exposure to soils at the Field would have been significantly less than the ATSDR assumption. The ATSDR screening value also assumes that arsenic in soil is 100% bioavailable (that is, 100% of the arsenic in soil is absorbed by the body). It is widely agreed that arsenic bioavailability in soil is less than 100%. ATSDR uses a bioavailability of 60% when evaluating site-specific arsenic exposures (personal communication, David Mellard, April 24, 2001). Finally, background levels of arsenic in soil range from about 1 to 40 mg/kg, with an

average of about 5 mg/kg (ATSDR 2000). Given all of the above considerations, it is very unlikely that long-term exposure in the past to arsenic in surface soil at the Field would have resulted in adverse health impacts.

With regard to possible acute effects, 4.1 mg/kg arsenic is well below a level that would be expected to result in adverse health effects from a single exposure, based on the ATSDR acute Minimal Risk Level of 0.005 mg/kg/day.

Chromium

Chromium occurs in the environment in several different forms. The most common forms are chromium(0), chromium(III), and chromium(VI). Breathing high levels of chromium(VI) can cause irritation to the nose. Ingesting large amounts of chromium(VI) can cause stomach ulcers, convulsions, kidney and liver damage, and even death. Skin contact with certain chromium(VI) compounds can cause skin ulcers. Some people are extremely sensitive to chromium(VI) or chromium(III). Allergic reactions consisting of severe redness and swelling of the skin have been noted. Several studies have shown that inhaling chromium(VI) compounds can increase the risk of lung cancer (ATSDR Toxicological Profile, 2000). These health effects from exposure to chromium are provided for general information and not to imply that these effects would be expected from exposures at the site.

Chromium was found in surface soil of the Field (prior to installation of the clean soil cap) at a maximum concentration of 300 mg/kg. The average concentration in surface soil is much lower (35 mg/kg). The maximum concentration exceeds the CT RSR for Chromium VI but not the less toxic form, Chromium III. The average concentration does not exceed either comparison value. Sample results for chromium were not speciated but it is highly unlikely that all of the chromium at the Field is the more toxic form, Chromium VI. Additionally, CT RSRs are developed to be extremely health protective, with an assumed exposure to soil 365 days per year for 30 years. As stated previously, the frequency and duration of exposure to soils at the soccer field would be significantly less than what was assumed in developing the CT RSRs. Thus, CT DPH believes that past exposure to chromium in surface soil at the Field would not result in adverse health impacts.

Lead

Lead can affect almost every organ and system in the body. The most sensitive is the central nervous system, particularly in young children. High levels of lead exposure also damage kidneys and the reproductive system. The effects are the same whether it is breathed or swallowed. At high levels, lead may decrease reaction time, cause weakness in fingers, wrists, or ankles, and possibly affect the memory. Lead may cause anemia, a disorder of the blood. It can also damage the male reproductive system. The connection between these effects and exposure to low levels of lead is uncertain. Lead has not been shown to cause cancer (ATSDR Toxicological Profile, 1999). These health effects from exposure to lead are provided for general information and not to imply that these effects would be expected from exposures at the site.

Lead was found in surface soils of the Field (prior to installation of the clean soil cap) at a maximum concentration of 4855 mg/kg, a level higher than the CT RSR of 500 mg/kg. However, the average lead level in surface soil of the Field was only 378 mg/kg, which is well below the CT RSR of 500 mg/kg. CT DPH believes that 378 mg/kg provides a good estimate of the true average in the field because it is based on results of 61 soil samples for lead, which is a large number of samples given the size of the Field. The average concentration of lead in the Field (378 mg/kg) better represents what a person may have been exposed to over the long term than the maximum concentration. Given all of these considerations, CT DPH believes that past exposures to lead in surface soils at the Field are very unlikely to have resulted in adverse health impacts.

Manganese

Manganese is a naturally occurring metal that is found in many types of rocks. Manganese is an essential trace element and is necessary in small amounts for good health. Some individuals exposed to very high levels of manganese for long periods of time in their workplace developed mental and emotional disturbances, slow and clumsy body movements and respiratory problems. There is currently no evidence to suggest that manganese exposure causes cancer in humans (ATSDR Toxicological Profile, 2000). These health effects from exposure to manganese are provided for general information and not to imply that these effects would be expected from exposures at the site.

As Table 1 shows, manganese was found in surface soils at the Field (prior the installation of the clean soil cap) at a maximum concentration above the CT RSRs. However, all other surface soil samples showed no detectable levels of manganese. As stated previously, CT RSRs are developed to be extremely health protective, with an assumed exposure to soil 365 days per year for 30 years. Because the frequency and duration of exposure to soils at the Field would have been significantly less than what is assumed in developing the CT RSRs, CT DPH believes that past exposure to manganese in surface soil at the Field would not result in adverse health impacts.

Past Site Conditions in the Walkway Area (prior to the placement of fencing and woodchips in the spring 2001)

It is possible that prior to the spring of 2001, before the Town placed fencing and woodchips in the area, people may have been exposed to lead, arsenic and PAHs in surface soil while walking from the Newhall Street School parking lot to the Field or sitting in the western most part of the walkway area to watch activities on the Field.

Table 2 above summarizes surface soil data collected from the walkway area prior to the area being covered with woodchips. It is important to note that the highest lead concentrations were not found in the center, most accessible portion of the walkway area but rather, very close to the fence separating residential properties from school property. Lead concentrations decrease drastically as one moves away from the fence and into the center portion of the walkway area where people are more likely to walk or sit. For example, the samples collected by CT DEP (shown in blue in Figure A) were taken from areas where people are more likely to walk or sit than the area next to the fence. The maximum lead concentration detected in the CT DEP

samples is 1485 mg/kg and the average is 169 mg/kg; well below the CT RSR of 500 mg/kg for lead. Considering the low average concentration and the low frequency and intensity of potential past contact with soil, CT DPH believes that health impacts from exposure to lead under past site conditions (prior to the spring 2001) are unlikely to have occurred.

With regard to arsenic and PAH concentrations, the areas with exceedances of health-based comparison values are limited. In addition, as previously discussed, comparison values are developed to be protective for very frequent and intense soil contact, which is not likely to have occurred here. Thus, CT DPH concludes that potential past exposures to arsenic and PAHs in surface soils of the walkway are not likely to have resulted in adverse health impacts.

COMMUNITY HEALTH CONCERNS

Community health concerns were collected at a number of public meetings held between December 2000 and February 2001 as well as at a public availability session on March 26, 2001 organized by the Hamden Soccer Association. Specific community health concerns are identified and addressed here.

1. The community is concerned that inadequate documentation exists regarding the specifications of the soil cap on the Field. They question whether the soil cap is effective in eliminating exposure to contaminants and whether the Field is safe for children to use.

In response to this community concern, CT DEP took 26 surface soil samples in a grid pattern across the Field in February 2001. In addition, CT DEP looked at core samples to a depth of 4 feet to observe whether a clean soil cap was present. Results from CT DEP's sampling showed that there are no contaminants present at levels above CT DEP's health protective cleanup standards (RSRs) for residential yards. Additionally, CT DEP's observations of core samples confirmed that a soil cap is present on the Field and it ranges from two to four feet in thickness. CT DPH believes that the soil cap on the Field effectively prevents contact with contaminants present in soil below the cap and that the Field is safe for all to use.

2. Several parents stated that young children (aged 1-3 years) often accompany families to the Field to watch soccer games and practices. The children often dig in the soil on the sidelines of the Field. Parents question whether the Field is safe for younger children.

CT DEP's observations of core samples indicate that the minimum thickness of clean soil on the Field is two feet. Therefore, in order to come into contact with contaminated soil, a young child would have to dig more than two feet into the soil. It is highly unlikely, that a young child would dig more than two feet into the soil.

3. At least one parent asked whether the Field is safe for a child with a preexisting medical condition (such as a child receiving medical treatment for cancer or a child with asthma).

Yes, the Field is safe for anyone who wishes to use it. The clean soil cap on the Field will prevent any child, even one with a preexisting medical condition, from coming into contact with soil contamination beneath the cap.

4. A number of parents noted that the Field is often very wet, especially in the spring. They are concerned that groundwater beneath the Field may be moving contamination from deeper soils up to the surface.

It is very unlikely that puddles on the Field are the result of groundwater rising to the surface. Rather, they are more likely to be from rain and melting snow. However, even if there was movement of contaminated groundwater to the ground surface, there would be only extremely small concentrations of contaminants in the groundwater (relative to concentrations in soil) because the contaminants present in soil at the Field (metals) do not dissolve well in water.

5. Many local residents believe that there are higher numbers of people with cancer in the Hamden Middle School area. They are concerned that contamination at the Field is causing cancer.

In response to community concerns about cancer, the Quinnipiack Valley Health District conducted a house-to-house survey in the early spring 2001 in the residential area surrounding the Middle School. Questionnaires were used to collect information about cancer and other health concerns. Based on a preliminary evaluation of the information, there does not appear to be an unusually high number of people with cancer in the Hamden Middle School area. CT DPH is assisting the Quinnipiack Valley Health District in a more detailed evaluation of the data.

6. Parents expressed a concern about contamination that may have been in soils at depth that were dug up during utility work performed several years ago at the Middle School. The utility excavation work was apparently done on the west side of the school building, closest to the Field. Parents stated that soil from the excavation was left at the ground surface for a period of time and could have been moved about by people walking through it or by the wind blowing it around.

CT DPH has no information to suggest that excavated soils containing hazardous contaminants were left on the ground after utility work was performed at the Middle School. If this did occur, it is possible that the contaminated soil was spread about. However, surface soil sampling has been conducted on the Field and in the area where the utility work was performed. Such sampling would have likely detected high levels of contaminants in the area if they were present.

CONCLUSIONS

Since the late 1970s, a number of soil sampling investigations have occurred at the Field. These investigations have documented the presence of numerous metals, including lead both at the surface and at depth. In the mid-1990s, the Town capped the Field with clean fill. Sampling performed by CT DEP in early 2001 confirmed that a clean soil cap is present across the field.

Recent sampling by EPA and CT DEP in a walkway area connecting the Newhall Street School parking lot with the Field showed some limited areas with elevated lead and PAHs in surface soil. This area has been covered with a layer of wood chips to restrict contact with the soil.

Under current conditions, the site presents no public health threat because there is no exposure to hazardous contaminants at the site. Under past site conditions, it is unlikely that exposures to contaminants at the Field or in the walkway area to the Field would have been great enough to result in adverse health impacts. Under future conditions, the site should pose no public health threat as long as the clean soil covering contaminated soils is not disturbed.

ATSDR has a categorization scheme whereby the level of public health hazard at a site is assigned to one of five conclusion categories. ATSDR conclusion categories are included as Attachment A to this report. CT DPH has concluded that soils at the site currently present "No Public Health Hazard." Under past conditions, the site presents "No Apparent Public Health Hazard."

RECOMMENDATIONS

1. CT DPH recommends that contaminated soils at the Field beneath the clean soil cap should not be disturbed unless appropriate measures are taken to protect people who could come into contact with the contamination.
2. CT DPH recommends that the Town of Hamden continue to maintain the cover of wood chips that it placed on the walkway area. This will ensure that contact with contaminated soil is prevented.

PUBLIC HEALTH ACTION PLAN

Actions Planned

1. CT DPH will continue to work with the Quinnipiack Valley Health District, CT DEP and EPA in responding to public health concerns and questions.
2. CT DPH will review additional data that may be collected in the future from the Field.

Actions Taken

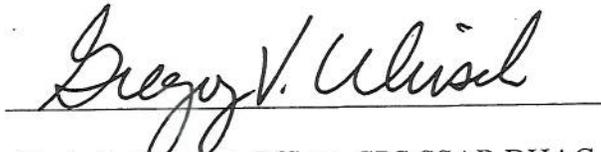
1. CT DPH has assisted CT DEP in developing sampling plans for the Field and walkway area.
2. CT DPH has addressed health-related questions and concerns regarding the Hamden Middle School Athletic Field at six public meetings and two meetings for Middle School teachers and students.
3. CTDPH assisted the Quinnipiack Valley Health District in producing a Question and Answer Fact Sheet addressing questions and concerns regarding the safety of the athletic field.

REFERENCES

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- ATSDR 1999. ATSDR Toxicological Profile for Lead, 1999.
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- ATSDR 2000. ATSDR Toxicological Profile for Arsenic, 2000.
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- CDM 1994. ARCS I Final Site Inspection Prioritization Report, Newhall Street Field. Prepared by CDM Federal Programs Corporation for US EPA, December 5, 1994.
- CT DPH 1992. Letter from Jennifer Kertanis, CT DPH to Marianne Cherniak, Quinnipiack Valley Health District, May 7, 1992.
- HRP 1993. Evaluation of Newhall Street Screening Study and Recommendations for Subsequent Sample Collection/Analysis, HRP Associates, Inc., May 1993.
- NUS 1991. Final Screening Site Inspection, NUS Corporation, July 23, 1991
- Weston 1991. Removal Program Preliminary Assessment/Site Investigation for Newhall Street Field. Prepared by Roy F. Weston, Inc. for the US EPA, August 1991.
- 1990 US Census Population Data, STF 1B.

CERTIFICATION

The Health Consultation for **Evaluation of Soil Data at the Athletic Playing Field Behind the Hamden Middle School, Hamden, Connecticut** was prepared by the Connecticut Department of Public 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 health consultation was initiated.


Technical Project Officer, SPS,SSAB,DHAC

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


Chief, SSAB,DHAC,ATSDR

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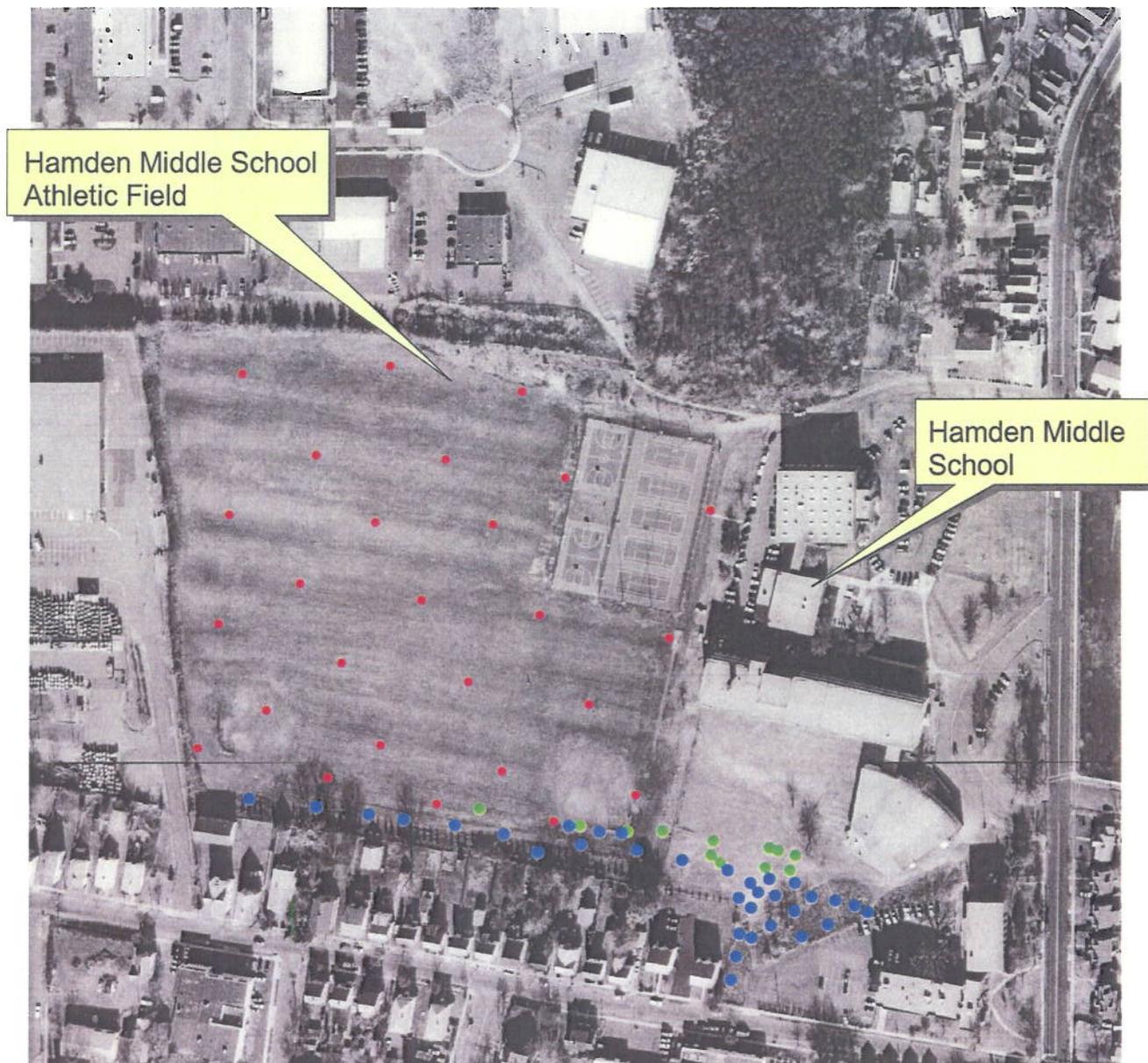
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ATTACHMENT A: ATSDR Public Health Hazard Categories

Category	Definition	Criteria
A. Urgent public health hazard	This category is used for sites that pose an urgent public health hazard as the result of short-term exposures to hazardous substances.	evidence exists that exposures have occurred, are occurring, or are likely to occur in the future AND estimated exposures are to a substance(s) at concentrations in the environment that, upon short-term exposures, can cause adverse health effects to any segment of the receptor population AND/OR community-specific health outcome data indicate that the site has had an adverse impact on human health that requires rapid intervention AND/OR physical hazards at the site pose an imminent risk of physical injury
B. Public health hazard	This category is used for sites that pose a public health hazard as the result of long-term exposures to hazardous substances.	evidence exists that exposures have occurred, are occurring, or are likely to occur in the future AND estimated exposures are to a substance(s) at concentrations in the environment that, upon long-term exposures, can cause adverse health effects to any segment of the receptor population AND/OR community-specific health outcome data indicate that the site has had an adverse impact on human health that requires intervention
C. Indeterminate public health hazard	This category is used for sites with incomplete information.	limited available data do not indicate that humans are being or have been exposed to levels of contamination that would be expected to cause adverse health effects; data or information are not available for all environmental media to which humans may be exposed AND there are insufficient or no community-specific health outcome data to indicate that the site has had an adverse impact on human health
D. No apparent public health hazard	This category is used for sites where human exposure to contaminated media is occurring or has occurred in the past, but the exposure is below a level of health hazard.	exposures do not exceed an ATSDR chronic MRL or other comparable value AND data are available for all environmental media to which humans are being exposed AND there are no community-specific health outcome data to indicate that the site has had an adverse impact on human health
E. No public health hazard	This category is used for sites that do not pose a public health hazard.	no evidence of current or past human exposure to contaminated media AND future exposures to contaminated media are not likely to occur AND there are no community-specific health outcome data to indicate that the site has had an adverse impact on human health

Figure A
Hamden Middle School Athletic Field
Selected Sample Locations



0.05 0 0.05 0.1 0.15 Miles



- Approximate Location of DEP Grid Samples [(n=26) Feb. 2001]
- EPA Samples [(n=12) 4/26/2001]
- DEP Samples [(n=33) 5/10/2001]