Health Consultation

INCIDENTAL INGESTION EXPOSURES TO CHEMICALS
FROM A SMELTER

RED JACKET SALVAGE YARD SITE
a/k/a LACY'S SALVAGE YARD

RED JACKET, MINGO COUNTY, WEST VIRGINIA
EPA FACILITY ID: WVN000306116

APRIL 4, 2005

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:

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

Health Consultation

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A/K/A LACY'S SALVAGE YARD

RED JACKET, MINGO COUNTY, WEST VIRGINIA

Date: March 29, 2005

Prepared by

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Foreword

This document summarizes public health concerns related to lead, cadmium, and chromium found in ash piles at a salvage yard where a smelter operated in the past. The exposure pathway is from incidental ingestion of the surface soil and ash from the smelter that is contaminated with these chemicals. There is concern that contaminants from this site may also have reached a drinking water source. Nearby residents are the people who could be exposed to these chemicals.

A number of steps are necessary to complete this document.

Evaluating exposure: The West Virginia Department of Health and Human Resources ATSDR Cooperative Partners Program (WVDHHR) starts by reviewing available information about environmental conditions at the site. The first task is to find out how much contamination is present, where it is found on the site, and how people might be exposed to it. WVDHHR typically does not collect environmental samples. WVDHHR relies on information provided by the West Virginia Department of Environmental Protection (WVDEP), U.S. Environmental Protection Agency (EPA), other governmental agencies, businesses, and other sources of valid information.

Evaluating health effects: If there is evidence that people are being exposed, or could be exposed, to hazardous substances, WVDHHR scientists will take steps to determine whether that exposure could be harmful to human health. The report focuses on public health - the health impact on the community as a whole. The evaluation is based on existing scientific information.

Developing recommendations: In this report, WVDHHR outlines its conclusions regarding any potential health threat posed by a site and offers recommendations for reducing or eliminating human exposure to contaminants. The role of WVDHHR at these sites is primarily advisory. For that reason, these reports will typically recommend actions to be taken by other agencies, including the WVDEP and the EPA.

Soliciting community input: The evaluation process is interactive. WVDHHR starts by soliciting and evaluating information from various governmental agencies, the organizations responsible for cleaning up sites, and the community surrounding the site. Any conclusions about the site are shared with groups and organizations that provided the information.

If you have questions or comments about this report, we encourage you to:

write: Program Manager
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Bureau for Public Health
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Charleston, West Virginia 25301-1798

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Summary and Statement of Issues

The Red Jacket Salvage Yard (the site) is a former salvage yard located near Red Jacket, West Virginia. The salvage yard was formerly called Lacy's Salvage Yard. A small aluminum smelter operated at this site in the past. Two ash piles and the concrete pad of the former smelter are the remnants of this activity.

The West Virginia Department of Environmental Protection (WVDEP) requested assistance of the United States Environmental Protection Agency (EPA) to address the potential hazards at this site. The EPA asked the Agency for Toxic Substances and Disease Registry (ATSDR) for an opinion about whether chemicals found in surface soil/ash and surface water at this site posed a public health hazard. Personnel of the West Virginia Department of Health and Human Resources ATSDR Cooperative Partners Program (WVDHHR) reviewed the initial data and worked with the ATSDR Regional Representative to develop recommendations to mitigate exposure to hazardous chemicals at this site [1]. WVDHHR reviewed the data for the initial recommendations and conducted this health consultation under a cooperative agreement with ATSDR.

The main exposure pathway identified was incidental ingestion of surface soil and/or ash from the former smelter at this site by local residents. Lead, cadmium, and chromium were found in high enough amounts in surface soil and/or ash to be evaluated for possible adverse health effects in this population.

Some nearby residents use water collected from a nearby spring and/or the stream for drinking water. Surface water near to this spring was sampled. Cadmium, chromium, lead, and polychlorinated biphenyls (PCBs) were not found in the surface water samples at levels at this site where adverse health effects from exposures to them were likely.

Background

Site Description and History

The site is a four-acre former salvage yard (Figure 1). The salvage yard, previously known as Lacy's Salvage Yard, has been abandoned for several years. The site contains two small ash piles that cover about 10 feet by 4 feet in total area. The ash was created from a small aluminum smelter that operated at this site. The smelter was used to separate and collect aluminum from items such as old car parts. The concrete pad from the smelter remains at the site. One of the ash piles is on the concrete pad and the other is inside an old truck bed.

Part of this site and areas above it were used in the past as a dump operated by B&E Cartage. At one time, this firm provided trash-hauling services to over 75% of Mingo County.

Mitchell Branch Creek flows along the northeast side of the site. It parallels Mitchell Hollow Road until the intersection with West Virginia Route 6/1. Mitchell Branch Creek empties into Mate Creek. Mate Creek flows toward the community of Red Jacket. Forested mountains and strip mines surround the site (Figure 2). All the homes in this area are located along Mitchell Branch between 200 feet and 1.75 miles from this site (Figure 1). All the homes are downstream from the site. The Red Jacket Head Start Center and the Red Jacket Public Service District (PSD) water plant are 1.75 miles from this site, at the head of the hollow.

A local spring is the primary water source for 20-50 people, including children, living near to the site. The spring water comes from an inactive underground coal mine. The mine portal is 30-40 feet above the salvage yard. The piped outlet for the spring is located about 20 feet from the site property line. It is within the surface water drainage path from the site [2]. There is concern that contaminants from the ash pile could move into the local spring and the surface water drainage of the spring [3].

The site has no restrictions to entry by community members. The nearest residence is about 200 feet from the site. There is evidence of trespassing on the site. Children play in the waters of Mitchell Branch [3].

Several 55-gallon drums and one above ground storage tank were found at this site in the spring of 2004. The WVDEP collected and properly disposed of the drums, tank, and the fuel contained therein at a local disposal facility. Motor oil contaminated soil was observed at this site. No other hazardous chemicals, drums, or transformers were observed at the site [2,3]. A considerable amount of steel and other salvageable items remain on the site. These items pose a physical hazard to trespassers on this site.

The EPA requested funding to remove the ash piles under an emergency CERCLA removal action [4]. The EPA removed the lead-contaminated soil and smelter ash to approximately 12 inches below grade. The site was backfilled with clean fill. Soil erosion and site access was controlled during these activities. The WVDEP and the EPA removed a substantial portion of the physical hazards at this site by selling scrap metal and steel from the site [3].

The residents of Mitchell Branch will have public water available to them by early summer in 2005. Public water will be supplied by the Mingo County PSD of Naugatuck. A water line was recently installed along Mitchell Branch Road as part of this water line extension project, but cannot be used until additional infrastructure is completed. The water used for the public water system will be from an area not impacted by this site.

Demographics

The nearest residence is about 200 feet from this site. Five homes are within 0.25 miles from this site along Mitchell Branch. Fifteen homes are within 0.5 miles from this site. Approximately 13 people live within 0.25 miles and 40 people live within 0.5 miles of the site. An estimated 25-30 homes and 65-80 people live along the entire length of Mitchell Branch. The Red Jacket Head Start Center is at the head of Mitchell Hollow, about 1.75 miles from the site.

According to the US Census, the Red Jacket CDP (census designated place) community has about 728 people. This area is about 12 miles across. The median age of the people in this CDP is 34.5 years [5].

Discussion

A. Data Review and Selection of Chemicals of Concern

The first step in the assessment of human health risk is the selection of chemicals of concern. This process compares data from the site to environmental guideline comparison values (CVs). Comparison values are established based on an evaluation of toxicity literature for a given substance. They are used as screening tools. Exposure to a chemical below its corresponding CV indicates that adverse health effects are unlikely. Many safety factors are included in the derivation of these values, making them very conservative (i.e., protective of public health). Chemicals found above a CV *do not necessarily mean* that an adverse health effect will result. It simply indicates a *need for further evaluation* to determine if the chemicals *could be associated with* adverse health effects at this site.

Chemicals were selected as chemicals of concern if test results indicated they were in the environment in amounts above the selected CV or if there were no established CVs for those chemicals.

The WVDEP collected two grab samples from the ash piles, one surface soil sample from the area downgradient from the ash pile as well as one water sample from the creek that drains water from this site. The soil samples were tested for lead, cadmium, and chromium. Cadmium, chromium, and lead in the ash and lead in on-site surface soil were selected as chemicals of concern at this site.

In addition to lead, cadmium, and chromium, the surface water sample was tested for PCBs. No chemicals of concern were found in the surface water.

No off-site media were tested. The drinking water source near this site was not sampled. The chemical content of the water used for drinking in this community is unknown.

Table 1. Chemicals of Potential Concern

Medium	# samples	# detections	Amount of chemical in the sample	CV	Type of CV
Ash pile - Cadmium	2	1	44 mg/kg	10	ATSDR Chron EMEG child
Ash pile – Chromium	2	1	260 mg/kg	200	ATSDR RMEG child
Ash pile – Lead	2	2	1,500 – 2,300 mg/kg		none
Surface Soil – Lead	1	1	200 mg/kg		none

Source of data: WVDEP sample data sheets for samples taken on 7/28/04

mg/kg = milligrams per kilogram

ATSDR Chron EMEG child = ATSDR Environmental Media Evaluation Guide for a child exposed for over 365 days

ATSDR RMEG child = ATSDR Reference Media Guide for a child

There are no ATSDR health-based comparison values for lead in soil. However, commonly used guidance values for lead contamination in soil are those used by the EPA. The EPA guidance value for residential soils is 400 mg/kg and 1,200 mg/kg for industrial soil. Both of the ash samples exceed these amounts.

The conclusions in this report are affected by the availability and reliability of the information that was reviewed. WVDHHR assumes that all data used underwent adequate quality assurance and control measures during chain-of-custody, laboratory procedures, and data reporting.

B. Human Exposure Pathway Analysis

An exposure pathway consists of five parts:

1. a source of contamination,
2. movement of the contaminant(s) into and through the environment (in soil, air, groundwater or surface water) to bring it into contact with people,
3. a place where humans could be exposed to the contaminant(s),
4. a way for humans to be exposed to the contaminant(s) (such as by drinking the water or breathing the air), and
5. one or more people who may have contacted the contaminant(s).

Exposure pathways are considered *complete* when all five of these elements existed at some point in the past, exist in the present, or are likely to occur in the future. Exposure pathways are considered *potential* when one or more of the elements are missing or uncertain but could have existed in the past, could be occurring now, or could exist in the future. Pathways are considered *eliminated* when one or more of these five items do not exist or where conditions make exposures highly unlikely.

A completed pathway means that people have been exposed to chemicals. However, the existence of a completed pathway *does not necessarily mean that a public heath hazard existed* in the past, exists currently, or is likely to exist in the future. Chemicals found in the completed pathways are evaluated to determine whether adverse health effects could have occurred in the past, are occurring in the present, or could occur in the future.

Chemicals can get into the body in three ways.

- They can be ingested, by drinking water, taking in small amounts of contaminants through normal hand-to-mouth activities (incidental ingestion), or pica (the practice of eating soil and other non-food items). Pica behavior is not considered a pathway in this report because the practice is rare in children expected to be in contact with the soil and ash at this site.
- The second way that chemicals can get into the body is through the skin. This is called dermal exposure. Cadmium, chromium, and lead, are not absorbed through the skin easily. Therefore, this pathway will not be considered in this report.
- The third way that environmental chemicals can get into the body is by breathing air containing chemicals or particles that are small enough to get into the part of the lung where they can be absorbed. This is the inhalation pathway.

On-site ash and surface soil – Incidental Ingestion

The aluminum smelter and salvaged materials at this site are the likely source of cadmium, chromium, and lead found in the ash and surface soil at this site. Chromium and lead bind tightly to soil and move in the environment attached to small soil particles. People who contact soil containing these chemicals could transfer some of them to their mouths through normal hand-to-mouth activities. This is called incidental ingestion. Nearby residents, including children as young as 4-years old, are assumed to have the opportunity contact the ash and surface soil. Young children are assumed to access this site because homes are very close to the site. No recreational facilities are available to children in this area. This is a completed ingestion pathway for the past.

The removal action by the EPA makes continued exposure to the cadmium, chromium, and lead in the ash and soil at this site unlikely for the future. Therefore, this pathway is eliminated in the future.

On-site ash and surface soil – Inhalation Pathway

Chemicals can get into the body when air containing particles small enough to enter deep into the lungs is inhaled. There is a data gap for this pathway because the particle size of the ash was not determined. Therefore, this is a potential pathway for the past and present. The pathway is eliminated in the future because the ash and contaminated soil have been removed.

Off-site drinking water source – Ingestion Pathway

Many residents living in this area drink water from springs fed by former underground coal mines. The coal mine portal is close to the site. The chemical content of the water is unknown. Due to this data gap and the potential for chemicals from this site impacting the water, the drinking water pathway is a potential pathway. Even though the surface contamination has been removed, there may continue to be contamination of the drinking water currently used by this community.

On-site surface water – Incidental Ingestion Pathway

Chromium and lead could get into surface water when small particles of soil containing these chemicals are moved into streams with surface water runoff. Cadmium is more likely to move than chromium and lead from soil to water by a process called leaching. Surface water drainage on-site could move cadmium to other areas on this site. The surface water sample, however, showed levels of cadmium, chromium, and lead were not being moved off the site at levels that were likely to cause adverse health effects from ingesting this water. Adverse health effects are not likely from exposure to these chemicals in on-site surface water because of the low levels found. No data is available for the chemical content of the water during past operation of the smelter and no opinion can be given on the potential for past exposures. The removal action by the EPA removes the potential for exposures to these chemicals in the future. This pathway is eliminated.

C. Exposure Analysis

Calculation of Exposure Doses for Incidental Ingestion

Estimated exposure doses (expressed as milligrams per kilogram per day or mg/kg/day) were calculated by multiplying

- the amount of media (surface soil or ash) ingested in a day (0.0001 kilograms) by
- the amount of the chemical found in that media by
- the absorption factor by
- the exposure factor, representing the amount of time over which the exposures occurred, and
- dividing all the above by the body weight of the person exposed.

The exposure factor is the time period that exposure to a chemical is assumed to occur divided by the total time period during which the exposures occur. For instance, an exposure factor for a person exposed 180 days a year for 2 years is 0.5. The formula used is:

$$\frac{\text{180 days per year (actual exposure time)} \times \text{2 years (actual exposure time)}}{\text{365 days per year (total days in a year)} \times \text{2 years (total years of exposure)}}$$

The exposure factors were calculated assuming that, in the worst case, all age groups would be in contact with the ash and surface soil at this site 180 days a year. The age group from 4-6 would be in contact for 2 years. The age group 7-16 would be in contact for 10 years. Adults would be in contact for 25 years. This estimate is based on the likelihood that the salvage yard would be used as a playground for children during all non-school days a year due to the lack of recreational facilities in the community. It is also assumed that the ash would be contacted each day that the person was at the salvage yard. Adults were also assumed to contact the ash 180 days a year.

Thirty percent of lead in soil is assumed to be absorbed into the body when lead is ingested. A soil ingestion study has shown this absorption rate in adults. The absorption rate for children is based on feeding studies in immature pigs using assumptions based on the way that children and immature pigs absorb lead [6]. However, the absorption factor for lead in ash is unknown. For this report, the absorption factor was assumed to be 30%, the same as in soil.

Cadmium and chromium were assumed to be 100% absorbed.

The assumed body weights are; 4 to 6-year old child - 18 kilograms (kg) or about 40 pounds (lb), 7 to 16-year old child - 45 kg or about 99 lbs, and adult - 70 kg or about 154 lbs.

The assumptions used for the incidental ingestion pathways would require a persistent pattern of ingesting surface soil or ash, 180 days a year for many years. It is also likely that the ash and soil would not be contacted during each of the estimated 180 days a year. The estimated exposure doses, therefore, are greater than would likely occur to any person at this site.

Table 2. Estimated Exposure Doses

Chemical (medium)	Maximum amount found (mg/kg)	Estimated Exposure Doses mg/kg/day			Health Based Guideline	
		4-6-yr old child	7-16-yr old child	Adult	mg/kg/day	Type
Cadmium (ash)	44	0.0001	<0.0001	<0.0001	0.0002	ATSDR Chron Oral MRL
Chromium (ash)	260	0.001	<0.001	<0.001	0.003	EPA Chron Oral RfD
Lead (ash)	2,300	0.002	0.001	<0.001		none
Lead (surface soil)	200	<0.001	<0.001	<0.001		none

ATSDR Chron Oral MRL = ATSDR Chronic oral minimal risk level for exposures over 365 days

EPA Chron Oral RfD = EPA Chronic Oral Reference Dose for exposures over 365 days

Exposure to lead in soil and ash will also be evaluated by using models that estimate the blood lead levels in children and adults. The models for children and adults reflect differences in the absorption and exposures to lead in these two populations.

Calculation of the risk of elevated blood lead levels in children exposed to lead in on-site ash

The EPA model for predicting blood lead levels in children under 7-years old was used to assess potential health effects from exposures to lead at this site. A very conservative approach was used to assess the potential risk. This means that we estimated that a child would be in contact with the ash for 180 days a year. This is likely to be much higher than any child would be in contact with the ash pile. Therefore, the potential for risk has been overestimated.

The name of the model is the Integrated Exposure Uptake Biokinetic Model (IEUBK) [7]. The model estimates the risk that a typical child will have blood lead concentrations over the level of concern, 10 micrograms per deciliter (µg/dL). The model assumes that children will be exposed to lead from a variety of sources, outdoor soil, dust in the home, air, drinking water, and diet.

The model assumes that lead in the ash was 30% bioavailable to the child. The amount bioavailable is the amount taken into the body from the stomach and intestines. The rest of the lead is eliminated without being taken into the body. It is unknown if the bioavailability of lead in the ash is more or less than 30%. If the actual bioavailability were greater than 30%, the child blood lead level would be higher than that modeled in this report. Potential health effects would be more severe.

The average amount of lead in on-site ash, 1,900 mg/kg, was used to calculate blood lead levels in children. The amount of lead in residential soils near this site was assumed to be 200 mg/kg. This is the amount of lead found in the surface soil on-site directly in the surface water drainage from the ash piles.

The calculations used the EPA default assumptions about the amount of lead in outdoor air (0.1 micrograms per cubic meter [$\mu g/m^3$]), drinking water (4 micrograms per liter [µg/L]), and diet (from 5.53 to 7.00 micrograms per day [µg/day] depending on age). The model assumes that the amount of lead in the soil outside the home will be reflected in the amount of lead found in the dust inside the home.

Lead-based paint is often a significant exposure source of lead to young children. The potential hazard from exposure to lead-based paint inside the home is not within the scope of this health consultation.

The amount of time exposed to soils associated with this site and exposure to lead near and in the home were factored together using a time-weighted average.

The equation used is:

- (estimated blood lead level from exposure to 1,900 mg/kg lead in ash) *times* (180 days a year)
- *plus* (estimated blood lead level from exposure to 200 mg/kg lead in residential soil) *times* (15 days a year)
- *divided by* 365 days a year.

The model found that blood lead levels of children (ages 4 through 7) exposed to ash on-site for 180 days a year ranged from 6.6 micrograms per deciliter (µg/dL) to 8.6 µg/dL.

Calculation of the risk of elevated blood lead levels in adults exposed to lead in ash

Estimates of the blood lead level of adults exposed to on-site ash were determined using a method recommended by the EPA [8]. The average amount of lead in the ash, 1900 mg/kg, and 180 days a year exposure time were the variables in the equation. The EPA-recommended default values used were; biokinetic slope factor (0.4), intake rate of soil (0.05 grams per day), absolute gastrointestinal absorption factor (0.12), and averaging time (365 days per year).

The assumption was that the lead in the ash was as bioavailable as lead in soil, 30%. The actual bioavailability of lead in the ash is unknown. The estimate of blood lead levels for an adult exposed to lead in the ash on site for 180 days a year is 4.42 µg/dL.

Selection of chemicals to be reviewed for possible adverse health effects

Lead was selected for further review for possible health consequences because of the results of the exposure dose and the blood lead level analyses.

No further review for possible adverse health effects is needed for cadmium and chromium because cadmium and chromium are below their health-based comparison values when these assumptions are used.

D. Possible Health Consequences from exposure to lead in the on-site ash

Estimate using Blood Lead Level Models

The model found that blood lead levels of children (ages 4 through 7) exposed to ash on-site for 180 days a year ranged from 6.6 µg/dL to 8.6 µg/dL. The estimated of blood lead level for an adult exposed to lead in the ash on site for 180 days a year is 4.42 µg/dL. These estimates did not exceed the Centers for Disease Prevention and Control (CDC) blood level of concern, 10 µg/dL.

Exposures to lead are most dangerous to young children and unborn children. Adults can be exposed to more lead without experiencing adverse health effects. The CDC level of concern is set at 10 µg/dL because there are no effective ways to reduce children’s blood lead levels below this point once blood lead levels are over 10 µg/dL and the lack of accurate lab tests at levels below 10 µg/dL. Some researchers believe, however, that *any* elevation in blood lead levels will cause measurable adverse health effects. Some of these effects are subtle changes in brain function (Payton et al. 1998), changes in the cardiovascular system that can be detected in children’s electrocardiograms (Silver and Rodriguez-Torres 1968), growth retardation (Shukla et al. 1989), and changes in the blood (Chisolm et al 1985) [6].

Estimated Exposure Dose analysis

The estimated exposure dose from incidental ingestion of lead in the on-site ash is 0.002 mg/kg/day, for a child age 4 - 6 exposed to ash on-site for 180 days a year. Similarly, the estimated exposure dose for children age 7 – 16 and adults is estimated to be 0.001 mg/kg/day.

These estimates were compared to research in the ATSDR toxicological profile for lead that indicates the amount of lead exposure needed to cause adverse health effects. The research indicates potential adverse health effects as noted in the discussion regarding the blood lead levels noted above [6].

E. Health Outcome Data

Blood lead testing data is tabulated according to zip code by the WVDHHR. The zip code for this area is an area of approximately 16 square miles. The area includes the communities of Red Jacket, Varney, Taylorville, Surosa, portions of Matewan, and North Matewan. Potential lead exposures from this site are limited to one road in this large area. Therefore, it is not possible to differentiate available blood lead testing data specifically for residents living near this site.

Child Health Considerations

The many differences between children and adults demand special consideration. Children can be at greater risk than are adults from certain kinds of exposure to hazardous substances. Children play outdoors and often use hand-to-mouth behaviors that increase their exposure potential. Children are shorter than are adults. This means they breathe dust, soil, and vapors close to the ground. Children are smaller than adults which results in a greater dose of a substance per unit of body weight. If toxic exposure levels are high enough during critical growth stages, the developing body systems of children can sustain permanent damage. Finally, children are dependent on adults for access to housing, for access to medical care, and for risk identification. This health consultation considered potential health effects to children to assist adults who make decisions regarding their children's health.

The effects of incidental exposure to lead in ash from the former smelter in young children were assessed. The estimated blood lead levels were below the 10 µg/dL level of concern for children set by the CDC. However, some researchers have found subtle but measurable changes in children at blood lead levels below 10 µg/dL and within the range found in this health consultation. Possible potential adverse health effects may be subtle but measurable such as small changes in brain function (Payton et al. 1998), changes in the cardiovascular system detected in children's electrocardiograms (Silver and Rodriguez-Torres 1968), growth retardation (Shukla et al. 1989), and changes in the blood (Chisolm et al 1985) [6].

Conclusions

The five public health hazard categories used by ATSDR are; no public health hazard, no apparent public health hazard, indeterminate public health hazard, public health hazard, and urgent public health hazard.

The WVDHHR concludes that the Red Jacket Site poses *no apparent public health hazard* for the past and present from chronic exposure of the public to children and adults exposed to the on-site ash for 180 days a year. This is based on estimated blood lead levels in children and adults below the 10 µg/dL level of concern set by the CDC. They are subtle changes in brain function, changes in children's electrocardiograms, growth retardation, and changes in blood chemistry. The pathway is assumed to be eliminated in the future because of the anticipated EPA removal actions at this site.

Many local residents get their drinking water from a source that originates near this site. Public water will not be available to these residents until early summer of 2005. There is concern that chemicals from this site may be in this water. People could be exposed to chemicals from this site in the drinking water. No samples of this water have been taken. Because of this data gap for the potential pathway, the drinking water pathway is considered an *indeterminate public health hazard* to people drinking the spring water source originating near this site.

This former salvage yard contains many items that pose a physical hazard to young children playing at this site.

Recommendations

1. ATSDR and WVDHHR recommended that the EPA remove the ash pile at this site. This recommendation has been completed.
2. ATSDR and WVDHHR recommended that the EPA or WVDEP remove or reduce the physical hazards at this site, if possible. A substantial amount of the physical hazards at this site have been removed.

Public Health Action Plan

1. The WVDHHR will encourage the WVDEP or the EPA to sample and test the drinking water source used by many in this community.
2. The WVDHHR will encourage the WVDEP or the EPA to remove all remaining physical hazards from this site.
3. The WVDHHR will inform the community of the results and conclusions of this report within 6 months of the publication of this report.

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8. United States Environmental Protection Agency Recommendations of the technical workgroup for lead for an approach to assessing risks associated with adult exposures to lead in soil; Washington, D.C.: United States Environmental Protection Agency; 2003 Jan. Document # EPA-540-R-03-001.

Certification

The West Virginia Department of Health and Human Resources (WVDHHR) prepared this Health Consultation under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures in existence at the time the health consultation was initiated.

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Technical Project Officer
Division of Health Assessment and Consultation (DHAC), ATSDR

The Division of Health Assessment and Consultation of ATSDR has reviewed this Health Consultation and concurred with its findings.

Roberta Erlwein
Team Lead, SPAB, DHAC, ATSDR

Figures

Figure 1. Red Jacket Salvage Yard Site

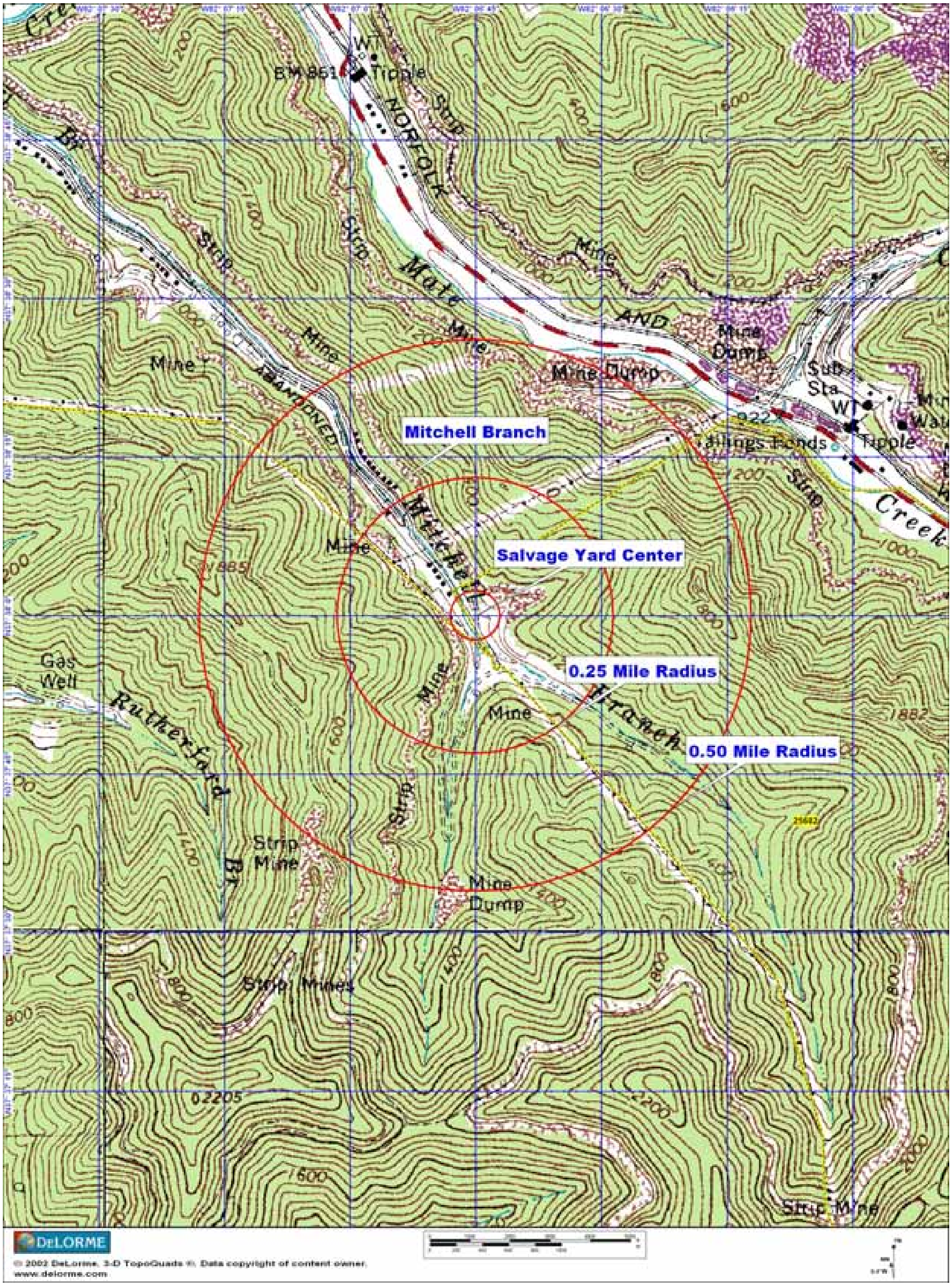

Figure 2. Location of the Site