



# Ore Knob Mine NPL Site Public Health Assessment

April 14, 2010

## Background

The Ore Knob Mine National Priorities List ("Superfund") site is located in Ashe County, North Carolina, 8 miles east of the town of Jefferson.

Multiple areas of mining and processing waste material are present on the site. These areas include the 1950s Mine and Mill Area located northwest of the intersection of Ore Knob Road and Little Peak Creek Road, just north of Highway 88 which comprises about 17 acres, and the 19<sup>th</sup> Century Operations Area and the Main Tailings Impoundment which are located across Little Peak Creek Road, at the end of Ore Knob Mine Road. The 19<sup>th</sup> Century Operations area extends about 10 acres near the top of Ore Knob and the Main Tailings Impoundment extends about 20 acres.

Copper mining occurred intermittently at the Ore Knob Mine from the 1850s through 1962. Waste from site operations is known to have contaminated on-site surface water and sediment with metals. Mining-related activities have also affected downstream surface waters, sediment, and floodplain soils as a result of surface soil and water runoff. Currently, the US Environmental Protection Agency (EPA) is on-site to stabilize the site to prevent further environmental damage to the surrounding areas.

## Purpose of the Health Consultation

The purpose of this Public Health Assessment is to determine if the site presents a potential health hazard to the nearby community.

## How was the Health Consultation conducted?

We evaluated drinking water and soil samples collected at nearby private residences; soil, surface water and mine waste materials collected throughout the mine site; and soil,

surface water and sediment data collected off-site.

The data evaluated was collected by the EPA and the N.C. Department of Environment and Natural Resources from 1987 through 2008.

## Conclusion

- Concentrations of manganese and cadmium in some private wells have the potential to cause harm to people drinking the water over many years.
- Concentrations of copper, aluminum, and iron in soil collected from the lawn of some private residences have the potential to cause harm to children who accidentally eat the soil over many years.
- Concentrations of copper, aluminum and zinc in soil within the mine property boundary could harm children who accidentally eat the soil while playing in the area. Some concentrations are high enough to harm children eating large amounts in a short time, such as 1 day.
- Infrequent accidental ingestion of sediment containing metals associated with Peak Creek and South Fork New River outside of the mine property is not expected to cause harm to people because of limited accessibility to the sediments.

## Chemicals associated with this site and potential health effects

Manganese is essential to our diet, but people who are exposed to high levels may experience nervous system effects including behavioral changes and slow or clumsy movement. Brain development may be affected in children exposed to extremely high levels, resulting in

behavior changes and a decrease in the ability to learn and remember.

**Cadmium:** Long-term exposure to low levels in air, food, or water may lead to kidney disease, lung damage and fragile bones. Eating food or drinking water with very high levels severely irritates the stomach, leading to vomiting and diarrhea. Cadmium is a known human carcinogen.

**Copper** is essential to our diet, but ingesting high levels can cause nausea, vomiting, and diarrhea. Very high doses of copper can cause damage to the liver and kidneys, and can even cause death. There are a very small percentage of infants and children who are unusually sensitive to copper.

**Aluminum:** Persons that store large amounts of aluminum in their bodies (may occur with kidney disease or people on dialysis) sometimes develop bone or brain diseases.

**Zinc** is essential to our diet, but eating or drinking large amounts in a short time can cause stomach cramps, nausea and vomiting. Eating or drinking large amounts for a longer time can cause anemia and negative changes in blood lipids.

**Iron** is essential to our diet, but eating large amounts of iron in a short period, or lower amounts over long periods, may result in abdominal pain, diarrhea and vomiting and ultimately damage the heart, pancreas, liver, kidneys and the immune system, reducing the body's ability to fight off infections.

### **NC Division of Public Health's recommendations**

- Keep people, especially children, off the mine property because of the physical hazards that exist and the concentrations of metals in the soil which children could accidentally eat during recreational activities. Control access to the mine and consider posting signs around the perimeter of the site to identify the hazards present at the mine.
- Conduct a comprehensive evaluation of private wells in the area that might be affected by contaminants from the mine.

Provide information to residents with harmful levels of metals in the water about ways to reduce their risks. If feasible, provide them with alternative water or provide them with water filtration systems.

- Provide information and education to parents about the potential risk to children who accidentally eat contaminated soil and about how to reduce their risk.
- Provide information to members of local hunting clubs that have access to the surrounding mine area about the potential hazards of the mine, especially hazards to children.
- Control contact with contaminated mine materials on and off the site.
- Limit residential development on or near areas of the site that contain mine waste.
- Residents who think they have been exposed to high levels of manganese, cadmium, copper, aluminum, iron or zinc should consult with their doctor.

#### **Contact:**

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#### **Additional Information**

N.C. Public Health: Health Assessment, Consultation and Education Program

[www.epi.state.nc.us/epi/oeo/hace/ncmap/CountyInfo.html#](http://www.epi.state.nc.us/epi/oeo/hace/ncmap/CountyInfo.html#Ashe)

[Ashe](#) (A full report is available under Ashe County).



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