

# Health Consultation

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KETTLE RIVER CREOSOLE

GLEN CARBON, MADISON COUNTY, ILLINOIS

EPA FACILITY ID: ILD984791665

AUGUST 27, 2008

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

KETTLE RIVER CREOSOLE

GLEN CARBON, MADISON COUNTY, ILLINOIS

EPA FACILITY ID: ILD984791665

Prepared By:

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

## **Purpose**

The Illinois Department of Public Health (IDPH) has evaluated the Kettle River Creosole site in Glen Carbon at the request of the Illinois Environmental Protection Agency (Illinois EPA). IDPH evaluated the available site information, soil samples in particular, to determine if it posed a public health hazard. Illinois EPA conducted sampling in October 2005 and completed an expanded site inspection (ESI) in 2006 (Illinois EPA, 2006).

## **Background and Statement of Issues**

### **Site Location and Description**

The Kettle River Creosole site is in Glen Carbon, Madison County, Illinois, in a mixed residential-commercial area located southwest of the State Route 159 and Center Grove Road intersection. The former facility was established in 1925 in an agricultural setting and consisted of about 80 acres. The main operations consisted of pressure treating railroad ties and other timber products using creosote and related chemicals. Approximately 50 to 75 people were employed at the peak operations around 1930.

The facility buildings, chemical use and storage structures, were clustered at the east end of the property, close to the local rail line. In the past, there were six above ground creosote tanks, two unlined surface impoundments, a 124 foot by 8 foot treatment cylinder, six to seven miles of railroad tracks, and various buildings. At times, the facility stored up to 1.25 million railroad ties and other products. The ties would be pressure-treated with creosote, dripped dry, and air-dried for approximately one year on rail road cars in the rail yard located in the western portion of the site.

The site closed in 1960 and building demolition and rail line removal was completed by the mid 1960s. Later, a road (Kettle River Drive) was built in the middle of the 80 acres, running east and west.

It is reported that the site formerly drained to the south as part of the watershed for a water body known as Lakewood Lake. Engineered drainage along Kettle River and other nearby roads now collects storm water and no longer runs off to the neighboring properties. Several apartment complexes and subdivisions have built up around the lake and divided the surface water into different sections. The northernmost finger of the lake was selected for sampling by Illinois EPA for the ESI.

Currently, the site is relatively flat and during rainstorms, there is some pooling surface water. There are no private wells being used for drinking water in the area. The nearest drinking water well identified is more than 3 miles from the site.

Commercial facilities were established north and south of Kettle River Drive in the 1970s and 1980s. In addition to the IDPH regional office, many other business establishments exist.

Illinois EPA recently identified a report completed by the owners of a Kettle River Drive business, the former emissions testing center located at the western end of the road. The business developed a Phase I Environmental Assessment in 1997 by Carlson Environmental, Inc. from Chicago. This property was selected as an uncontaminated location and identified as the location of "background" soil samples.

Road construction projects in this area, the most recent in 2006, have also contributed to changed grades and altered traffic patterns. Much of the area has been disturbed and regraded in recent years. It is likely that commercial development will continue around the reengineered routes. There are no residential properties known to exist on the former site property. Future land use may include Brownfield program redevelopment.

According to the U.S. Environmental Protection Agency (USEPA), the site was first discovered in August 1990. A Preliminary Assessment conducted in 1991 and Site Assessment in 1992 assigned the site as a "lower priority" (CERCLIS, 1995).

In September 2005, USEPA tasked the Illinois EPA to begin an environmental site evaluation of the site. A total of one site groundwater sample and one background groundwater sample; four sediment samples with one field duplicate sample and one background sediment sample; and 15 soil samples with two field duplicate samples and one background soil sample were collected. Some of the 15 soil sample locations were analyzed near the surface and others were analyzed at multiple depths. The samples were collected in October 2005.

All of the 2005 samples were analyzed for pesticides, polychlorinated biphenyls (PCBs), volatile organic chemicals (VOCs), and semivolatile organic chemicals (SVOCs), including polycyclic aromatic hydrocarbons (PAHs).

IDPH reviewed the available information and laboratory results from the 2005 sampling for this report and assumed that the samples were collected and handled properly and that appropriate analytical methods were used (Illinois EPA, 2005 & 2006).

No air samples were collected; however samples were screened with a field instrument that measures total volatile hydrocarbons. Sample X120 from former creosote tank area had a total hydrocarbon reading of 65 parts per million (ppm) and sample X125 from one of the former impoundments had a reading of 20 ppm.

## **2005 Soil Sampling**

Soil sampling sites were selected to determine contamination at:

- background concentrations on the west end of Kettle River Drive (one sampling location analyzed at two depths),
- in the western air-drying area on the south side of Kettle River Drive representing the former rail yard (three sampling locations were analyzed at one depth each),

- the eastern main operations area, which includes the former location of the creosote storage tanks and facility buildings [10 total sampling locations (6 sampling locations were analyzed at two depths and 4 sampling locations were analyzed at one depth)], and
- the unlined impoundments (or pits) also located in the eastern main operations area (two sampling locations, one analyzed at two depths and one analyzed at three depths).

### **2005 Sediment Sampling**

Five sediment samples were collected from two suspected former drainage ways. The ditch to the west, near a former rail line, and Lakewood Lake to the south, now part of a residential subdivision were the two areas suspected to formerly receive run off from the site. It is not likely that the site drains to these areas any longer.

### **2005 Groundwater Sampling**

The Illinois EPA staff attempted several times to collect groundwater samples from the site in October 2005. Only one sample was collected at a depth of 8 to 12 feet below grade near the former impoundments on the eastern portion of the site.

### **Site Visit**

IDPH staff most recently visited the site in July 2008. The eastern portion of the main operations area has no evidence of former creosote facility structures or rail lines. It is flat and partially covered with parking areas for businesses. An open unfenced field makes up the remainder of the former main operations area. The open field contains vegetative cover.

## **Discussion**

### **Chemicals of Interest**

IDPH compared the available information and laboratory results of the Illinois EPA October 2005 environmental sampling event with the appropriate comparison values used to select chemicals for further evaluation for carcinogenic and noncarcinogenic health effects. The sediment samples and surface and subsurface soil samples were compared to the soil comparison values and the groundwater sample to the drinking water comparison values. Chemicals found at levels greater than comparison values and those for which no comparison value exists were selected for further evaluation. Attachment 1 provides a description of the comparison values used.

The laboratory results for pesticides and PCBs in surface and subsurface soils did not detect any contaminants greater than current comparison values (ATSDR, 2007). No comparison values were exceeded in either the sediment samples or the groundwater sample.

The laboratory results for VOCs in surface and subsurface soils detected only 8 of 49 chemicals tested. None of the eight chemicals detected exceeded any current comparison values (ATSDR, 2007). There was no consistency across the samples, that is, each sample had different volatile chemicals detected. Some of the volatile chemicals are used in laboratories and there may have been some cross contamination.

PAHs are the class of chemicals that are associated with the creosote wood treatment process that occurred at this site. PAHs were detected in soil samples at varying depths.

The chemicals of interest from the 2005 sampling event are the mixture of PAHs found in on-site soils in the eastern portion of the site, likely the residual chemicals from the use of creosote at this site (Table 1). Some of the most concentrated PAHs and highest prevalence of PAH detection is sample X125, where the old unlined impoundments existed.

The current chemicals of interest at this site are limited to 12 PAHs found in surface and subsurface soils and include: acenaphthylene, benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, carbazole, chrysene, dibenzo(a,h)anthracene, dibenzofuran, indeno(1,2,3-cd)pyrene, and phenanthrene.

## **Exposure Evaluation**

A chemical can cause an adverse effect only if people contact it at a sufficient level for a sufficient amount of time. That requires a source of exposure, an environmental transport medium, a point of exposure, a route of exposure, and a receptor population. An exposure pathway is complete if all of the components are present, and people were exposed in the past, are currently being exposed, or will be exposed in the future. If parts of a pathway are absent or if data are insufficient to decide whether the pathway is complete or whether exposure could occur at some time (past, present, future), then a potential exposure pathway exists. If part of an exposure pathway is not present and will never exist, the pathway is incomplete and can be eliminated from further consideration.

The most likely exposure scenario is for former workers at the site during the production years of 1925 through 1960 being exposed to site-related chemicals. It has been estimated that 50 to 75 workers were employed around 1930. The workers likely were exposed to the chemical mixtures in creosote and production wastes as well as to contamination in soils and impoundments. It is impossible to recreate past exposure, but it is likely that the concentrations the workers handled were higher than the residual soil contamination recently found on the site. It is not known what the health status of the workers at this site were when the site closed in 1960.

The main former operations areas have been developed into commercial facilities and there has been no residential development of the site. Grading and covering areas with roads, buildings, and parking lots has altered the original site and it is suspected most of the contamination now is below grade. The undeveloped portion of the main operations area has vegetative cover. It is not fenced, but trespassers would not be expected to be exposed while walking across the field.

No known completed pathway currently exists. The site was originally in an undeveloped area, so homes had not been established nearby while the facility operated.

Residential areas began to be developed around the lake about 0.4 miles south of the site in the 1970s and later. The community has increased in population and many businesses have been established. Currently, the nearest homes are about 0.1 miles south of Kettle River Drive, and are west of the former main operations area. Homes that have been built near the site over the past few decades are apartments or duplexes with small yards and little gardening or disturbance of the ground.

### **Community Health Concerns**

Currently and historically there have been no complaints or inquiries regarding this site received by staff at IDPH or ATSDR. According to Illinois EPA regional staff in Collinsville, Illinois, most of the contamination is below grade. Discussions are on-going with commercial property owners (IEPA, 2006).

### **Child Health Considerations**

No children were known to be exposed in the past, currently, or expected to be exposed in the future.

### **Conclusions**

IDPH concludes that the site does not currently pose a public health hazard. The site operated for approximately 25 years in an undeveloped area therefore the only likely human exposures were to the former workers. Workers who were at the site during the years of operation may have been exposed to PAHs at levels that could cause adverse health effects, but it is not possible to recreate past exposure.

Currently, PAHs can be found in the eastern portion of the property and are more concentrated in subsurface soils than on the surface. No chemicals of interest were detected in the groundwater and public water is used in the area. There are no known receptor populations and no complaints are known to exist regarding this site.

### **Recommendations and Public Health Action Plan**

If future commercial development of contaminated property occurs, consideration and planning for worker protection should take place.

If any future data is generated as a result of additional sampling, IDPH will review the results and provide a health-based interpretation.

### **Preparer of Report**



Catherine Dondanville, M.S.  
Environmental Toxicologist  
Illinois Department of Public Health

## References

Agency for Toxic Substances and Disease Registry (ATSDR) (1995) Toxicological Profiles for Polycyclic Aromatic Hydrocarbons (PAHs) August 1995. Atlanta, Georgia.

Agency for Toxic Substances and Disease Registry (ATSDR) (2002) Toxicological Profiles for Wood Creosote, Coal Tar Creosote, Coal Tar, Coal Tar Pitch, and Coal Tar Pitch Volatiles. September 2002. Atlanta, Georgia.

Agency for Toxic Substances and Disease Registry (ATSDR) (2007) Comparison Values Issued February 2007.

Illinois EPA (2005) Correspondence from Lance Range, December 2005, which included soil sample results from October 2005 sampling event at Kettle River Creosote Works site.

Illinois EPA (2006) CERCLA Expanded Site Inspection for Kettle River Creosole, Glen Carbon, Illinois. Bureau of Land. February 15, 2006.

Illinois EPA (2006) Correspondence from Lance Range, May 2006, which included groundwater and sediment sample results from October 2005 sampling event at Kettle River Creosole site.

Nisbet, I.C.T. and P.K. LaGoy (1992) Toxic Equivalency Factors (TEFs) for Polycyclic Aromatic Hydrocarbons (PAHs). Regulatory Toxicology and Pharmacology 16, 290-300.

U.S. EPA (1993) Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons. EPA/600/R-93/089. July 1993.

U.S. EPA (1995) Superfund Program CERCLIS 1995.

**Table 1. Kettle River Creosole chemicals detected in surface and subsurface soil samples collected October**

	detected in ppm	Toxicity Equivalency Factor calculation ppm	Number of detections (n=2)	Comparison Values ppm (ATSDR, 2007)	Source
				Adult	
<b>Acenaphthene</b>	0.54J-2.4	2.4 x 0.001 = 0.0024	3	40,000	RMEG
<b>Acenaphthylene</b>	0.32J-5.3	5.3 x 0.001 = 0.0053	5		
<b>Anthracene</b>	0.26J-17.0	17 x 0.01 = 0.17	6	200,000	RMEG
<b>Benzo(a)anthracene</b>	0.96-32	32 x 0.1 = 3.2	6		
<b>Benzo(a)pyrene</b>	<b>0.03J-22</b>	<b>22 x 1.0 = 22</b>	<b>6</b>	<b>0.1</b>	<b>CREG</b>
<b>Benzo(b)fluoranthene</b>	0.47J-47	47 x 0.1 = 4.7	6		
<b>Benzo(g,h,i)perylene</b>	0.081J-16J	16 x 0.01 = 0.16	6		
<b>Benzo(k)fluoranthene</b>	0.15J-13	13 x 0.1 = 1.3	6		
Bis-(2-Ethylhexyl)Phthalate	0.07J		1		CREG
1,1'-Biphenyl	0.18J-0.38J		2	40,000	RMEG
Carbazole	0.09J-5.6		6		
<b>Chrysene</b>	0.77-39	39 x 0.01 = 0.39	6		
<b>Dibenzo(a,h)anthracene</b>	0.39J-4.6	4.6 x 5.0 = 23.0	5		
<b>Dibenzofuran</b>	0.7J-3.6		5		
<b>Fluroanthene</b>	4.3-58	58 x 0.001 = 0.058	6	30,000	RMEG
<b>Fluorene</b>	0.087J-4.9	4.9 x 0.001 = 0.0049	4	30,000	RMEG
<b>Indeno(1,2,3-cd)pyrene</b>	0.096J-20	20 x 0.1 = 0.2	6		
2-Methylnaphthalene	0.073J-1.2J		3	3,000	RMEG
Naphthalene	0.048-1.9J		4	10,000	RMEG
<b>Phenanthrene</b>	0.62-19	19 x 0.001 = 0.019	6		
<b>Pyrene</b>	3.1-58	58 x 0.001 = 0.058	6	20,000	RMEG
<b>Total TEFs</b>		<b>55.27</b>		<b>0.1</b>	<b>CREG</b>

J=estimated

TEF = toxic equivalency factors for selected PAHs (see papers referenced)

RMEG = Reference Dose Media Evaluation Guide

CREG = Cancer Risk Evaluation Guide for 1 x 10<sup>-6</sup> cancer risk

### **Comparison Values Used In Screening Contaminants for Further Evaluation**

Environmental Media Evaluation Guides (EMEGs) are developed for chemicals based on their toxicity, frequency of occurrence at National Priorities List (NPL) sites, and potential for human exposure. They are not action levels but are comparison values. They are developed without consideration for carcinogenic effects, chemical interactions, multiple route exposure, or exposure through other environmental media. They are very conservative concentration values designed to protect sensitive members of the population.

Reference Dose Media Evaluation Guides (RMEGs) are another type of comparison value. They are developed without consideration for carcinogenic effects, chemical interactions, multiple route exposure, or exposure through other environmental media. They are very conservative concentration values designed to protect sensitive members of the population.

Cancer Risk Evaluation Guides (CREGs) are estimated contaminant concentrations based on a probability of one excess cancer in a million persons exposed to a chemical over a lifetime.

Maximum Contaminant Levels (MCLs) have been established by USEPA for public water supplies to reduce the chances of occurrence of adverse health effects from use of contaminated drinking water. These standards are well below levels for which health effects have been observed and take into account the financial feasibility of achieving specific contaminant levels. These are enforceable limits that public water supplies must meet.

Lifetime Health Advisories for drinking water (LTHAs) have been established by USEPA for drinking water. They represent the concentrations of chemicals in drinking water that are not expected to cause any adverse, non-carcinogenic effects over a lifetime of exposure. These are conservative values that incorporate a margin of safety.

## Certification

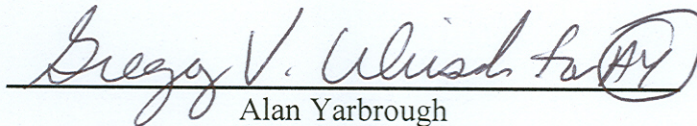
This Kettle River Creosole health consultation was prepared by the Illinois Department of Public Health under a cooperative agreement with the federal Agency for Toxic Substances and Disease Registry (ATSDR). It was completed in accordance with approved methodologies and procedures existing at the time the health consultation was initiated. Editorial review was completed by the Cooperative Agreement partner.



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Charisse J. Walcott  
Technical Project Officer, CAT, CAPEB, DHAC

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



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Alan Yarbrough  
Team Lead, CAT, CAPEB, DHAC, ATSDR