



Memorandum

Date September 15, 1986

From Acting Director
Office of Health Assessment

Subject Ellisville-Bliss, SI-86-197
Alton, Missouri

To Mr. Edward J. Skowronski
Public Health Advisor
EPA Region VII

EXECUTIVE SUMMARY

The Ellisville-Bliss site is composed of five contiguous properties near Ellisville, Missouri. Hazardous waste problems include surface soil contaminated with 2,3,7,8-Tetrachlorodibenzo-p-dioxin(TCDD) at concentrations up to 120 ppb, soils contaminated with organic solvents, and buried drums of hazardous waste.

The major public health concerns with this site are potential groundwater contamination and direct contact with contaminated soil.

We concur with the recommended remedial alternatives in the Feasibility Study(FS) and Focused Feasibility Study(FFS):

1. For soil and wastes containing more than 1 ppb TCDD, temporary containerized on-site storage in a secured building.
2. For non-TCDD wastes, off-site disposal.
3. For buried drums of non-TCDD wastes, overpacking and off-site disposal.
4. For non-hazardous wastes, disposal at a permitted sanitary landfill.

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SUPERFUND RECORDS

Access to the site should be restricted.

Measures should be taken to adequately characterize all wastes prior to consolidation or staging.

Post-cleanup data should be sent to ATSDR for an assessment of any public health threat due to remaining contaminants.

BACKGROUND

The Environmental Protection Agency (EPA), Region VII Office, has asked the Agency for Toxic Substances and Disease Registry (ATSDR) to review the Ellisville-Bliss Remedial Investigation/Feasibility Study(RI/FS), and Focused Feasibility Study for temporary on-site storage of TCDD waste.

Specific questions asked by EPA are:

1. What are the public health concerns currently associated with this site?
2. Part of the final remedy will include consolidation of non-TCDD wastes on-site prior to off-site disposal. Does this present any increased public health risk?
3. What is an appropriate level of cleanup that meets or exceeds appropriate Federal public health or environmental requirements?

The Bliss site is an 11.5 acre tract owned by Jerry Russell Bliss, plus four contiguous properties near Ellisville, Missouri. Hazardous materials have been identified in 17 waste disposal locations on the site. The following quantities of hazardous wastes have been estimated:

1. 20,000 cubic yards of soil contaminated with 2,3,7,8-TCDD.
2. 1,000 to 2,000 buried drums of waste.
3. 10,000 cubic yards of buried, uncontainerized non-TCDD hazardous wastes.

The major public health concerns with this site are potential groundwater contamination and direct contact with contaminated soil.

DOCUMENTS REVIEWED

1. "Final Draft Report. On-site Storage Focused Feasibility Study. Bliss and Contiguous Properties, Ellisville, Missouri." February 14, 1986.
2. "Remedial Investigation: Ellisville Hazardous Waste Disposal Site, Ellisville, Missouri." Volume I: Summary Report. September 21, 1983.
2. "Remedial Investigation: Ellisville Hazardous Waste Disposal Site, Ellisville, Missouri." Volume II: Appendices. September 21, 1983.
3. "Summary of Remedial Alternative Selection. Bliss and Contiguous Properties, Ellisville Site, St.Louis County, Missouri." Undated.
4. "Description of Current Situation: Ellisville Hazardous Waste Disposal Site, Ellisville, Missouri." August 30, 1982.
5. "Remedial Feasibility Study: Ellisville Hazardous Waste Disposal Site, Ellisville, Missouri." September 28, 1983.

LIST OF PRINCIPAL CONTAMINANTS

2,3,7,8-Tetrachlorodibenzodioxin (TCDD) was found at 120 ppb 1 foot below the surface in one area, at 9 ppb in the surface of the dirt parking lot of the horse arena, and at concentrations above 1 ppb at five other locations.

Among the priority pollutants and listed hazardous substances that were found in the soil were toluene at 2700 ppm, xylenes at 3200 ppm, and trichloroethylene at 190 ppm. The contaminants reached 20 feet at several locations but the top 5 feet of soil are the most contaminated.

ENVIRONMENTAL PATHWAYS

The site is underlain by fractured Burlington-Keokuk limestone. This type of geologic formation is very susceptible to contamination because of cracks and solution channels in the bedrock. The flow of groundwater in this area is primarily along these solution-enlarged seams. Because these channels are unpredictable, the general groundwater flow direction can only be estimated to be in the down-dip (northeast) direction of the formation.

Sampling of four domestic drinking water wells found no contaminants that could be attributed to the wastes at the Ellisville site. Since these wells were all west of the site, they might not be down-gradient from the waste source.

Contaminants were detected in on-site groundwater samples. This indicates that some migration of contaminants has occurred but it has remained on-site.

Because of the possibility of rapid transport of contaminants through the fractured limestone of the area, groundwater contamination remains a definite health risk, although its occurrence has not been documented.

Several of the waste disposal locations are in or adjacent to the beds of the three small creeks flowing through the site. Sampling of surface

water indicates some on-site contamination, but none was found off-site in Caulks Creek water or sediments. Again, surface water contamination remains a risk, although it has not yet been documented.

The tributary Creek "A" is a "gaining" stream as it passes through the waste disposal areas on the northern part of the site but is a "losing" stream as it leaves the site to the northwest. Therefore, contaminated surface water has a direct path to groundwater after it leaves the site.

During the months of June-August, when warm weather maximizes volatilization, the prevailing winds are from the Bliss site toward the residential area to the north. This is risk for public health during activities that generate large amounts of dust, whether they occur before or during remedial action.

EXPOSURE PATHWAYS

There are approximately 70 private wells in the Caulks Creek watershed and a number of them are used for drinking water. The number of wells that are down-gradient from the site is unknown.

The nearest off-site residential area is several hundred feet north of the horse arena. Access to the site is apparently not restricted. With the increasing residential development of the area, there is a growing risk of exposure to trespassers, especially children. Direct contact with the TCDD-contaminated soil in the horse arena parking lot presents a serious health risk.

There is potential exposure to users of the bike path in Quail Woods Park. The path was fenced off from Dubman property in April 1986 to limit the access of children to the contaminated areas. The possibility of exposure to contaminated dust still exists.

DISCUSSION

If no action is taken, the buried drums will gradually corrode and release their contents, which may be rapidly transported to the water table through cracks in the limestone. Erosion of the soil cover would expose leaking drums and/or contaminated soil. This would result in additional routes of exposure: direct contact with the wastes or contaminated soil, airborne migration of volatiles or contaminated dust, and erosion of wastes and contaminated soil to the surface water.

ATSDR concurs with the evaluation of the Missouri Department of Natural Resources(MDNR) draft Record of Decision that the major public health threats at this site are direct contact with contaminants or contaminated soil and contamination of groundwater used for drinking. Exposure to airborne contaminants is a concern during remedial action. Worker health and safety should also be protected during the cleanup process.

We concur with the recommended remedial alternatives in the FS and FFS:

1. For TCDD wastes, temporary containerized on-site storage in a secured building.
2. For non-TCDD wastes, off-site disposal.
3. For buried drums of non-TCDD wastes, overpacking and off-site disposal.
4. For non-hazardous wastes, disposal at a permitted sanitary landfill.

In general, TCDD concentrations in residential soil should be less than 1 ppb, but this level may be lower if excessive soil contact, bioaccumulation in edible species (fish or rooting animals), or drinking water contamination may occur. The level may be greater if exposure is less than that usually associated with residential exposure or if the contaminated soil is located below the surface soil so that direct contact

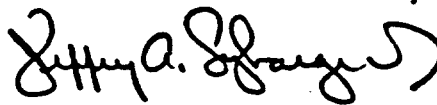
may not occur. In their remediation plan, EPA should evaluate the potential for these exposures and the possibility of excavation or other activities increasing exposure to subsurface contaminated soils. They should also consider the geological characteristics of the area when evaluating the potential for contamination of drinking water supplies.

For non-TCDD wastes, we are unable at this time to specify the cleanup levels required to protect public health. We agree with the MDNR proposal to develop a Centers for Disease Control (CDC)/ATSDR approved sampling plan during the Remedial Design. Post-cleanup data collected according to this sampling plan should be sent to ATSDR for an assessment of any public health threat due to remaining contaminants.

RECOMMENDATIONS

1. Accessible TCDD contaminated soils pose a potential health risk to local residents and such exposures should be prevented.
2. Remedial alternatives for the temporary storage of TCDD contaminated wastes is acceptable from a health perspective if the storage facility is secure from human contact and from weathering.
3. Cleanup measures should eliminate the potential for direct contact with TCDD-contaminated soils and TCDD contamination of drinking water supplies. The geological and demographic characteristics of the area should be considered in the plan.
4. Work practices should protect clean-up workers and prevent the spread of contaminants to uncontaminated areas.

5. All wastes should be characterized before being consolidated or staged on-site. This is necessary to protect both workers and residents of the area. Since there is little data available on the contents of the buried drums, we recommend that steps be taken to insure that each drum is properly categorized as "TCDD waste," "non-TCDD waste," or "non-hazardous waste."



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