Health Consultation

BAYOU SORREL
POST-HURRICANE GROUNDWATER SAMPLING EVALUATION

IBERVILLE PARISH, LOUISIANA

EPA FACILITY ID: LAD980745541

AUGUST 21, 2006

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:

Louisiana Department of Health and Hospitals
Office of Public Health
Section of Environmental Epidemiology and Toxicology
Under Cooperative Agreement with the
U.S. Department of Health and Human Services
Agency for Toxic Substances and Disease Registry

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List of Acronyms

ATSDR	Agency for Toxic Substances and Disease Registry
CLAW	Clean Land Air Water, Inc.
CV	Comparison Value
EPA	Environmental Protection Agency
EPAC	Environmental Purification Advancement Corporation
kg	Kilograms
LDHH	Louisiana Department of Health and Hospitals
mg/kg/day	Milligrams per kilogram per day
mg/L	Milligrams per liter
MRL	Minimum Risk Level
NPL	National Priorities List
O&M	Operation and Maintenance
OPH	Office of Public Health
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SEET	Section of Environmental Epidemiology and Toxicology
U	Non-detected samples
ug/L	Micrograms per liter

Summary and Statement of Issues

On August 29 and September 24, 2005, hurricanes Katrina and Rita made landfall along the Gulf Coast. From September 29, 2005 through October 14, 2005, a team of U.S. Environmental Protection Agency (EPA) contractors collected samples at the National Priority List (NPL) sites in Louisiana to assess any potential impacts that the hurricanes may have had on remedies completed at those sites. On October 13, 2005, EPA collected groundwater samples from 3 monitoring wells at the Bayou Sorrel site, located in Iberville Parish, Louisiana. Although the Bayou Sorrel site was deleted from the NPL in September 1997, the site is currently in operation and maintenance status, with routine annual groundwater monitoring to ensure protectiveness of the EPA remedial actions. As part of prudent public health practices, the Louisiana Department of Health and Hospitals/Office of Public Health/Section of Environmental Epidemiology and Toxicology (LDHH/OPH/SEET) have performed a review of the post-hurricane groundwater data through a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). SEET staff reviewed the contaminant concentrations found in groundwater from the Bayou Sorrel monitoring wells to determine whether ingestion of the groundwater would pose a threat to human health and to establish what further public health actions, if any, may be needed.

Background

Site Description

The Bayou Sorrel site is located in Iberville Parish, Louisiana, in Sections 40 through 43, Township 10 South, Range 10 East, approximately 20 miles southwest of Baton Rouge, and about six miles northwest of the town of Bayou Sorrel. The site is a “T” shaped, relatively flat parcel of land encompassing 265 acres. The western border of the site is bound by a man-made drainage feature called the Borrow River. This river was formed during the construction of the Atchafalaya Basin Protection Levee, which is approximately 100 yards to the west. The north and east sides of the site are bordered by the Upper Grand River and Pats Bayou. Undeveloped swamp land is adjacent to the site on the south. Access to the site from the north is along an unpaved levee road, 17 miles south of its intersection with Interstate 10 in Ramah, Louisiana. Access to the site from the south is along the same unpaved levee road six miles north of the town of Bayou Sorrel. A 50-acre lake and a one-acre pond are situated along the north border of the site. Outside of the north and south area caps, dense brush and trees cover the site. The site and its surroundings can best be described as marshy bayou-type environments that are prone to periodic flooding and poor drainage [1].

The site is underlain by the Plaquemine Aquifer, at a depth of approximately 100- to 125- feet below ground surface. This confined aquifer is about 600- feet thick in the vicinity of the site and consists mainly of sand and gravel with a few, thin interbeds of silt and clay. Groundwater present within the clays and silts of the upper confining unit that overlay the Plaquemine Aquifer is characterized as the shallow saturated zone. Because of low yield and poor regional water quality, the shallow zone in the vicinity of the site is not considered to be a potential source of groundwater [1].

Site History

The Bayou Sorrel Superfund site is a de-listed National Priorities List (NPL) site. From early 1977 to 1978, the Environmental Purification Advancement Corporation (EPAC) operated the site as a hazardous-waste landfill, covering approximately 50 acres of the total site acreage. The waste disposal areas consisted of four landfills, including a spent lime cell and a crushed-drum cell, four covered liquid-waste ponds, and one land farm. Disposed wastes included process wastes from pesticide and herbicide manufacturing, sulfide containing wastes from hydrocarbon processing and exploration activity, and spent wash solutions from boiler-cleaning and equipment-cleaning contractors. A sister firm, Clean Land Air Water, Inc. (CLAW), operated an injection well approximately six miles south of the site, in the town of Bayou Sorrel. Both injection-well waste records and EPAC records were included in the summary of wastes possibly present at the Bayou Sorrel site, as it was reported by employees that wastes were diverted from the CLAW injection well to the EPAC site during processing difficulties [2].

A site inspection conducted by state and federal regulatory officials in the summer of 1978 revealed the presence of large open, un-permitted ponds containing unknown materials. The 18th Judicial District Court ordered the closure of the site, and in the spring of 1979 closure activities were completed. The site was finalized on the NPL on September 8, 1983 [2].

November 27, 1985, the Environmental Protection Agency (EPA) published the remedial investigation/feasibility study (RI/FS) for the Bayou Sorrel site defining the nature and extent of contamination and presenting data to develop and analyze remedial alternatives. Following public comment, EPA signed the record of decision (ROD) on November 14, 1986. Requirements of the ROD included covering the former disposal areas with a topsoil/geomembrane/clay cap and the installation of a venting system, the construction of a slurry wall/multi-layered clay cap containment system around the waste ponds and an extensive post-construction groundwater monitoring program to monitor the remedy's ability to contain the wastes and mitigate the potential for future migration of site constituents into the groundwater. Construction for the remedial action began in July 1988 and was successfully completed in September 1990 [1]. Over 1 million cubic feet of waste were contained in the slurry wall/multi-layered clay cap system. All contaminants were contained and the potential for exposure eliminated. The site was deleted from the NPL in September 1997 [3].

The Bayou Sorrel site is currently in operation and maintenance (O&M) status, receiving routine annual groundwater monitoring/sampling to ensure the protectiveness of the EPA remedial actions. Annual inspections of the caps are conducted to ensure integrity [4].

Demographics

Bayou Sorrel is located in Iberville Parish, Louisiana. Census 2000 results record a parish population of 33,320. The largest ethnic group in the parish at that time was African-American (49.7%), followed by Caucasian (49.3%), American Indian and Alaska Native (0.2%), Asian (0.3 %), with 0.5% of the population reporting as Other. 65.7% of the population age 25 or older in 2000 had earned at least a high school diploma. The median household income in 1999 was $29,039, with 23.1% of persons living below poverty level [5]. The largest employers in the parish were the manufacturing industry; the retail trade industry; health care and social assistance; accommodations and food services; administrative, support, waste management, and remediation services; and professional, scientific and technical services [6].

No one lives on the Bayou Sorrel site or directly adjacent to it. It is surrounded by remote back swamp environments and is access restricted by security fencing along the perimeter of the site.

Discussion

Environmental Data

On October 13, 2005, EPA collected groundwater samples from 3 monitoring wells at the Bayou Sorrel site. Groundwater samples were collected at monitoring wells MW-1S, MW-14S, and MW-25S [see figure 1]. All samples were analyzed for volatiles and total metals. A site inspection was also conducted and found no evidence of damage at the site associated with the hurricanes. There was no standing water or evidence of flooding or ground surface erosion. No damage to the perimeter security fencing was observed [1].

Arsenic was the only contaminant detected above health based comparison values, and was found in all three samples collected. Health based comparison values are media-specific concentrations of chemicals used by health assessors to select environmental contaminants for further evaluation. They are not used to predict health effects or to set clean-up levels. Contaminants with media concentrations above a health based comparison value do not necessarily represent a health threat, but are selected for further evaluation. Contaminants with media concentrations below a health based comparison value are unlikely to be associated with illness and are not evaluated further.

Exposure Pathways

To determine whether a child or adult would be exposed to arsenic detected in groundwater from the Bayou Sorrel site, SEET evaluated the environmental and human components that lead to exposure. An exposure pathway contains the following five elements: a source of contamination, transport through some kind of environmental medium, a point of exposure, a route of exposure, and a receptor population. ATSDR categorizes an exposure pathway as a completed or potential exposure pathway if the exposure pathway cannot be eliminated. Completed pathways require that the five elements exist and indicate that exposure to a contaminant has occurred in the past, is presently occurring, or will occur in the future. Potential pathways, however, indicate that exposure to a contaminant could have occurred in the past, could be occurring now, or could occur in the future. An exposure pathway can be eliminated if at least one of the five elements is missing and will never be present.

The Bayou Sorrel site is located in a swamp and shallow groundwater is not used as a water supply due to its naturally poor quality. The site perimeter is access restricted by security fencing and there are no residents living in the vicinity of the site. Trespassing and/or recreational usage is not expected, eliminating the potential for oral and/or dermal exposures to elevated arsenic levels detected in groundwater from the Bayou Sorrel site. As such, all exposure pathways have been eliminated.

Contaminants detected in groundwater monitoring wells at the Bayou Sorrel site, Iberville Parish, LA. October 2005 post-hurricane sampling event.

Detected Contaminants	MW-1S	MW-14S	MW-25S
Metals (mg/L)[1]:			
Arsenic	0.22	0.10	0.022
Cadmium	0.0050 U[2]	0.0050 U	0.0050 U
Chromium	0.040	0.017	0.025
Lead	0.015 U	0.015 U	0.015 U
Volatiles (ug/L)[3]:			
Ethylbenzene	5.00 U	5.00 U	5.00 U

[1] mg/L- milligrams per liter; [2] ug/L- micrograms per liter; [3] U- non detected samples

Adult and child exposure doses estimated for arsenic identified in groundwater from all three monitoring wells exceeded the ATSDR Minimal Risk Level (MRL) of 0.0003 milligrams per kilogram per day (mg/kg/day). However, there are no completed or potential exposure pathways at the Bayou Sorrel site, as the shallow groundwater is not used as a water supply due to its naturally poor quality. Therefore, arsenic identified in the groundwater monitoring wells is unlikely to cause adverse health effects.

Child Health Considerations

It is unlikely that children would be exposed to the groundwater from the Bayou Sorrel site. The site is located in a swamp and shallow groundwater is not used as a water supply due to its naturally poor quality. There are no residents living in the vicinity of the site. SEET found no public health hazard to children under these conditions.

Conclusions

Evaluation of the groundwater sampled by EPA during its post-hurricane investigation suggests that there is no public health hazard from exposures to groundwater from the Bayou Sorrel site.

Recommendations

There are no recommendations to be made at this time regarding Bayou Sorrel groundwater. LDHH/OPH/SEET will examine future Bayou Sorrel data as needed or requested.

Public Health Action Plan

The information produced within this health consultation will be disseminated to the public repositories, community members and stakeholders within Iberville Parish, Louisiana by SEET.

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Certification

This health consultation for Bayou Sorrel was prepared by Louisiana Department of Health and Hospitals under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It was completed in accordance with approved methodology and procedure existing at the time the health consultation was initiated. Editorial review was completed by the Cooperative Agreement Partners.

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

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References

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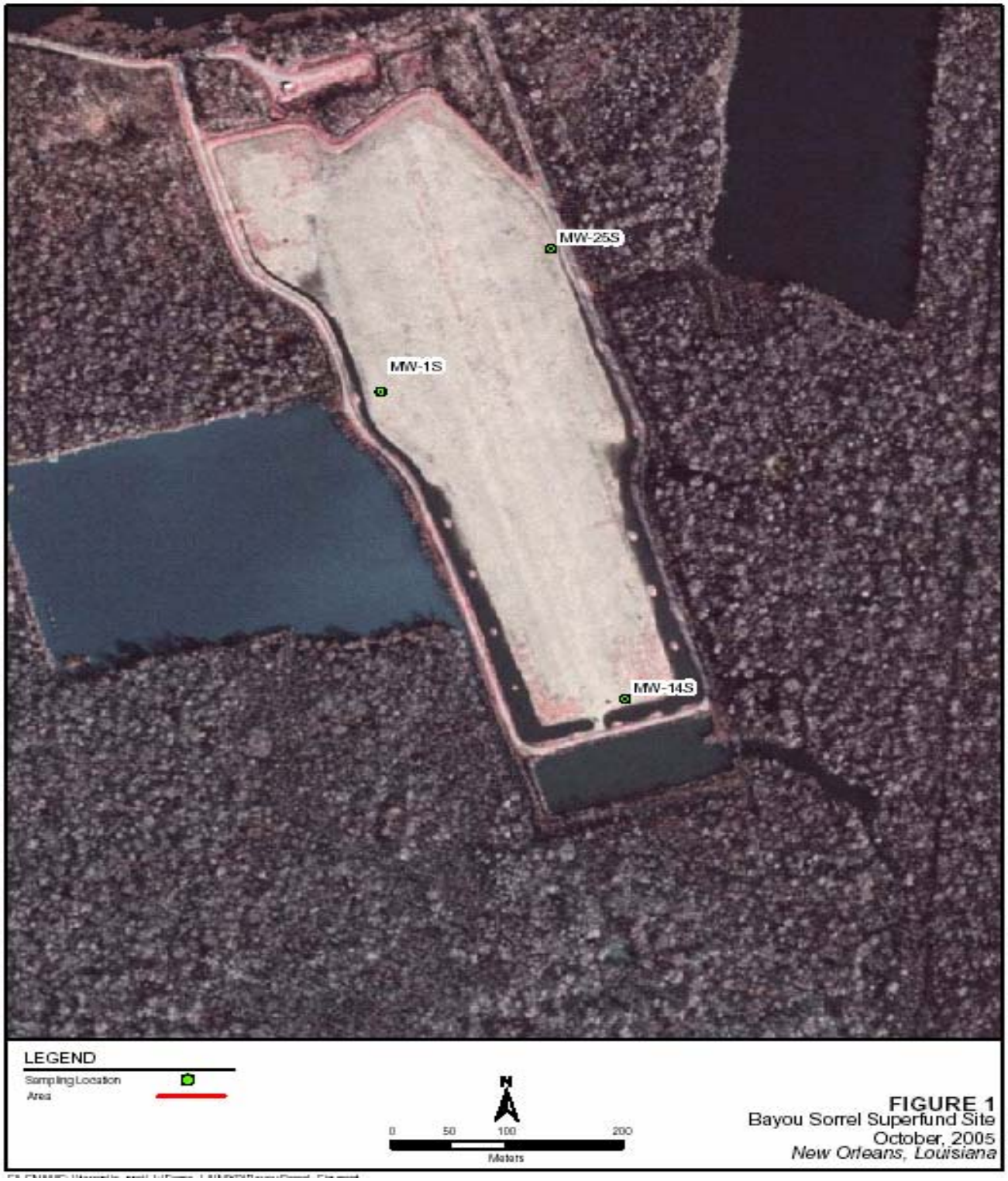
4. Environmental Protection Agency Region 6. Fact Sheet for the Bayou Sorrel Site, Iberville Parish, Louisiana. Accessed 22 Jun 2006 at URL: http://www.epa.gov/superfund/sites/npl/la.htm

5. U.S. Census Bureau, Iberville Parish, Louisiana Population Finder- American Fact Finder. Generated by Darcie Olexia. Accessed 28 Jun 2006 at URL: http://factfinder.census.gov/

6. U.S. Census Bureau, Iberville Parish, Louisiana American Fact Finder. Generated by Darcie Olexia. Accessed 28 Jun 2006 at URL: http://factfinder.census.gov/

Figures

Figure 1: October 2005 groundwater sampling locations, Bayou Sorrel site. Iberville Parish, LA.



Source: CH2MHILL Technical Memorandum, Hurricane Katrina Response Bayou Sorrel Superfund Site, Louisiana Site Inspection and Sampling Results. December 2005.