

Public Health Assessment for

INTERIM

ONALASKA MUNICIPAL LANDFILL

ONALASKA, LA CROSSE COUNTY, WISCONSIN

CERCLIS NO. WID980821656

JULY 15, 1992

U.S. DEPARTMENT OF HEALTH & HUMAN SERVICES
Public Health Service
Agency for Toxic Substances and Disease Registry



PUBLIC HEALTH ASSESSMENTS: STATEMENT OF PURPOSE

The federal "Superfund" law requires the U.S. Agency for Toxic Substances and Disease Registry (ATSDR) to prepare a public health assessment for all toxic waste sites that the U.S. Environmental Protection Agency (EPA) proposes for placement on the Superfund list (called the National Priorities List).^{*} The Wisconsin Division of Health works with the ATSDR to prepare assessments. The purposes of assessments are:

1. to evaluate whether contaminants at the site pose a current or future threat to public health;
2. to recommend any steps needed to protect the public from exposure to toxic substances; and
3. to recommend long-term health studies, when appropriate.

For each assessment health professionals look at the types of contamination present, including each substance's toxicity; ability to move through soil, air or water; persistence in the environment; and ability to accumulate in the food chain. They look at such ways that people could come in contact with the contaminants as ingestion, skin contact, or breathing. Investigators make conclusions about the types of illness that could result from exposure to the chemicals present. Finally, they recommend actions to protect public health now and in the future.

A "preliminary public health assessment" is conducted when a site is proposed for the National Priorities List. The preliminary assessment relies on whatever data are available at the time. It also identifies data needs that the remedial investigation can address. Later, after the remedial investigation of the site is completed a full "public health assessment" is conducted using the more complete data. The EPA, the Wisconsin Department of Natural Resources, and health agencies provide much of the sampling data used for the assessment.

^{*} Officially, this section of the "Superfund" law is 42 U.S.C. 9604 (i).

INTERIM PUBLIC HEALTH ASSESSMENT
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ONALASKA, LA CROSSE COUNTY, WISCONSIN
CERCLIS NO. WID980821656

Prepared by:
Wisconsin Department of Health
Under Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry

THE ATSDR HEALTH ASSESSMENT: A NOTE OF EXPLANATION

Section 104 (i)(6)(F) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, states "...the term "health assessment" shall include preliminary assessments of potential risks to human health posed by individual sites and facilities, based on such factors as the nature and extent of contamination, the existence of potential pathways of human exposure (including ground or surface water contamination, air emissions, and food chain contamination), the size and potential susceptibility of the community within the likely pathways of exposure, the comparison of expected human exposure levels to the short-term and long-term health effects associated with identified hazardous substances and any available recommended exposure or tolerance limits for such hazardous substances, and the comparison of existing morbidity and mortality data on diseases that may be associated with the observed levels of exposure. The Administrator of ATSDR shall use appropriate data, risk assessment, risk evaluations, and studies available from the Administrator of EPA."

In accordance with the CERCLA section cited, ATSDR prepared this Interim Health Assessment using available data and information. ATSDR will re-evaluate this site and prepare an updated health assessment as warranted by the availability of additional data and information and as resources permit.

SUMMARY

The Onalaska Municipal Landfill is located in La Crosse County, Wisconsin, approximately 10 miles north of the City of La Crosse. Industrial wastes dumped at the site from 1969-1980 consisted of naphtha-based solvents used in a metal cleaning process and wastes from paint spray, gun cleaning, and machine shop cleaning fluids. Small quantities of other wastes included paint and ink components, cutting oils, lubricating oils, and asphalt.¹

This site was placed on the Environmental Protection Agency's National Priorities List in September 1984.

A layer of naphtha-solvents floating on the water table is a source of the groundwater contaminant plume that appears to be discharging toward the Black River wetlands. Also, remaining drums on the site could contribute to groundwater contamination. Surface water and sediment samples taken from the wetlands show no site-related contamination.²

The site currently poses no apparent public health hazard because exposures that may have occurred are not considered to have been at levels that could cause adverse health effects. If remediation of the site does not take place, exposure to contaminants via the groundwater supply could occur and pose a public health hazard to persons living near the site. Continued sampling of the following is recommended: residential wells in the area for groundwater contamination; surface water and soil; and soil gas for methane. People should not trespass on the site.

The Wisconsin Division of Health and the Agency for Toxic Substances and Disease Registry (ATSDR) reviewed the data on this site to determine the need for more action on health-related concerns. People who drank water from the contaminated residential well nearby may have been exposed to chemicals from the site. There is no evidence, however, that people were exposed to chemicals from the site at a level that would result in measurable health effects. Neither is there a way to measure exposures that may have occurred. Therefore, no more health studies are needed now. The Division of Health and ATSDR will look again at the need for more health activities if high levels of contamination are released when the site is cleaned up or if new information shows that public exposure is greater than expected.

BACKGROUND

A. SITE DESCRIPTION AND HISTORY

Located near the confluence of the Mississippi and Black Rivers, the Onalaska Municipal Landfill is within 400 feet of the Black River (map appended). The Mississippi River, which forms Lake Onalaska, is about 1.5 miles southwest of the site.³ Consisting of about 11 acres, the site was mined as a sand and gravel quarry from the early to mid-1960's. At that time the Town of Onalaska began to use the quarry as a municipal landfill. Between 1969 and 1980 the site accepted both municipal and chemical wastes. The Onalaska Landfill used about seven acres for open pit disposal.

Several industrial firms are known to have used the landfill for waste disposal. The industrial solvents consisted primarily of naphtha, toluene, and paint residues.⁴ Because the site did not meet Wisconsin solid waste codes, the Wisconsin Department of Natural Resources requested an infield conditions report in 1978. Warzyn Engineering investigated the site and recommended phased abandonment. At that time the average distance between the groundwater table and the base of the refuse pile at the site was one foot. Studies showed that the seasonal fluctuation in water levels sometimes allowed the groundwater to be in direct contact with a portion of the waste for extended periods. Closure began in 1980 and a final cap was placed over the landfill in July 1982.⁵ The site was placed on the Environmental Protection Agency's National Priorities List in September 1984.

Except for highs and lows associated with operations at the site, the topography in the site area is very flat. Soils in the area are light-colored fine and loamy fine sands that exhibit excessive drainage and are easily eroded by wind.⁶

Groundwater flow at the site discharges toward the Black River and Lake Onalaska for most of the year. The rest of the year (one to two months) the groundwater flow field is altered because of high river stages during the spring runoff. At this time groundwater flows to the south-southeast;⁷ the Black River and Lake Onalaska then recharge the sand and gravel aquifer beneath the site.⁸ Seasonal fluctuation in the water table is responsible for raising and distributing the floating contaminant layer throughout a four-foot vertical section of the soil profile.⁹

The current cap on the landfill consists of silty sand, silt, and lean silty clay; these materials vary in relative proportion at the site.¹⁰ The thickness of the cap ranges from eight inches to four feet (average 1.5 feet). The Remedial Investigation conducted in 1989 indicated that the cap has deteriorated because of frost damage, erosion and animal activity, and will continue

to deteriorate from freeze and thaw cycles.

B. SITE VISIT

Representatives from the Wisconsin Division of Health conducted a site visit on August 30, 1988. They observed no-trespassing signs posted around the site, a locked gate at the site opening, and a partial fence. There was a bicycle path along the Black River and evidence of fishing and boating.

A representative of the WDOH revisited the site and attended a meeting with the local community on January 31, 1992. There have been no changes at the site since the last site visit.

C. DEMOGRAPHICS, LAND USE, AND NATURAL RESOURCE USE

The Onalaska Municipal Landfill is located in a generally rural area; however, several homes are located within 500 feet of the site and a subdivision of about 50 homes is located 1.25 miles southeast of the site. The population within 1.25 miles of the site is estimated to be 200 persons. The site is bordered to the south by cropland, intermittent woods, and grassland pastures. East and north of the site are open grasslands; to the west is a wooded area and Black River wetlands.¹¹

D. HEALTH OUTCOME DATA

Based on the evaluations performed as part of this health assessment, there are indications that at least one household may have been exposed to low levels of site-related contaminants. In addition, community concerns related to the site have been reported. The follow-up health actions that have been proposed by the Health Activities Recommendation Panel (HARP) do not include an evaluation of health outcome data because there is no evidence that exposure occurred at levels that would cause health effects of public health concern. However, future health assessments that are prepared for the site will include an evaluation of health outcome data, if warranted.

COMMUNITY HEALTH CONCERNS

At a public meeting related to the site January 31, 1990, a resident of the area asked whether air quality around the site is expected to be of concern in the future.

The local community did not express any new health concerns to the WDOH during a January 31, 1992 meeting.

ENVIRONMENTAL CONTAMINATION AND OTHER HAZARDS

A. ON-SITE CONTAMINATION

Eleven volatile organic compounds (VOCs) were detected in 11 of 29 monitoring wells in two sampling rounds in 1989. Results show that the six prevalent VOCs in the groundwater beneath and around the site are ethylbenzene (range 10-210 ug/l), 1,1-dichloroethane (36-1,280 ug/l), 1,1,1-trichloroethane (7-450 ug/l), 1,2-dichloroethene (5-260 ug/l), toluene (10-20,000 ug/l); and xylenes (42-1,800 ug/l).¹² Barium has been also detected in the groundwater at concentrations above background levels; concentrations above the background or detection limit of 344 ug/l ranged from 347-2010 ug/l in 1989.¹³

Some metals are present at the site in subsurface soil at concentrations higher than those typical for metals in these soils. Lead and zinc are the chemicals that most frequently occurred at concentrations twice the maximum probable concentration. For values at least twice above background levels, lead concentrations ranged from 37.9-274 mg/kg; zinc concentrations ranged from 39.5-918 mg/kg.¹⁴

Petroleum- and coal-derived naphthas constitute a major source of contamination at the site. These substances are less dense than water and float on the water table. Some of the organic compounds detected in the groundwater from past analyses may be derived from the naphtha waste. The degradation products would generally consist of aliphatic and aromatic carboxylic acids, toluene, and other complex mixtures of aromatic and aliphatic hydrocarbons. The naphtha solvents will also contain constituents derived from the process for which they were used, including metal particles and paint and ink residues.¹⁵

B. OFF-SITE CONTAMINATION

Sampling of private wells in 1982 indicated that groundwater contamination related to the site had occurred. Water in a shallow residential well south of the site exceeded drinking water standards for barium and contained measurable quantities of five organic compounds.¹⁶ Among the contaminants found were barium (1,600 $\mu\text{g/L}$), trichloroethylene (1.7 $\mu\text{g/L}$), dichloroethylene (4 $\mu\text{g/L}$). Benzene and vinyl chloride were detected at less than quantifiable levels.¹⁷ The Town of Onalaska replaced this well with a deep bedrock well.

Results of seven residential groundwater samples collected from both immediately north and approximately 3/4 mile south of the site in 1989 did not reveal evidence of contamination attributable to the site; compounds detected in these samples were consistent with background levels or laboratory-introduced

contamination.¹⁸

Based on groundwater analysis, a few VOCs appear to have migrated to the Black River and adjacent wetlands. However, analysis of surface water and sediment indicates that organic contamination associated with the site has not affected the sediments or surface waters adjacent to the site at this time. This is not unexpected, since large dilutions of the relatively low groundwater VOC concentrations would be expected once they discharge to the river. An area of higher concentration of VOCs has not yet reached the river. Volatilization of the VOCs would occur if groundwater is discharged to the adjacent wetlands.¹⁹

A contaminant plume has moved about 500 feet from the edge of the landfill in a southwesterly direction. The highest concentration of contaminants is located along the southwest edge of the landfill where industrial solvents are believed to have been disposed of.

Toxic Chemical Release Inventory (TRI). The 1987, 1988, and 1989 TRI was searched for chemical releases from the Onalaska Municipal Landfill and other facilities in the same zip code area. The site is not listed in the TRI. One facility within the 54650 zip code area did report releases of toluene and acidic compounds to the air.

C. QUALITY ASSURANCE AND QUALITY CONTROL

In preparing this Health Assessment, the Division of Health relies on the information provided in the referenced documents and assumes that adequate quality assurance and quality control measures were followed concerning chain-of-custody, laboratory procedures, and data reporting. The validity of the analysis and conclusions drawn for this health assessment is determined by the availability and reliability of the referenced information. Some of the sampling values cited are considered estimated. Since results of Remedial Investigation sampling for inorganic chemicals (metals) in offsite soil and sediment were unusable, exposure to metals via fish cannot be evaluated.

D. PHYSICAL AND OTHER HAZARDS

Decomposing municipal refuse produces methane. Methane gas is likely to be generated at the site, which may pose a risk of explosion if it migrates laterally through the soil and accumulates in soil pockets opened by drilling or in a nearby enclosed building.

PATHWAYS ANALYSIS

A. ENVIRONMENTAL PATHWAYS

Analyses suggest that the landfill itself is not currently a significant source for future groundwater contamination by VOCs. Most of the organic chemicals disposed there may have migrated to the groundwater or been volatilized, biodegraded, or burned. However, it is possible that localized hot spots of contamination or intact, containerized waste could still exist in the landfill. Also, organic compounds have been retained beneath and around the landfill in the zone of seasonal groundwater fluctuation; this zone could therefore present a source of future loading to the groundwater.

Natural decomposition of wastes other than VOCs are likely to continue and will act as a continuing source of inorganic contamination. Natural landfill processes will continue to leach inorganic contaminants from the soil and waste into the groundwater.²⁰

There does not appear to be a clear source area where soil contamination correlates to where drums were disposed. Evidence of chemical disposal is random, probably reflecting the manner in which the chemicals were reportedly disposed. There is contamination migrating offsite near the interface of the saturated and unsaturated zones, most of which is likely confined to the interval of seasonal groundwater fluctuation.²¹

There is no current evidence of release of VOCs through the cap via soil or air, so release of contaminants through dust suspension or volatilization is probably insignificant. An investigation of the site in 1989 did not find VOCs in sufficient concentrations in subsurface soils to result in a substantial airborne release.²² Erosion or site development in the future could result in releases of contaminants from buried chemicals and subsurface soil; however, these circumstances are unlikely.²³ Methane gas migration may be a vehicle for movement of VOCs in soil.

B. HUMAN EXPOSURE PATHWAYS

According to the EPA Remedial Investigation Report, there is no indication that people are being exposed to contaminants associated with the Onalaska site through groundwater use. Residential well sampling performed in 1989 did not indicate any site-related contamination in downgradient residential wells.

In the case of one non-household well, low-level exposure is currently possible: A hand-pump well on a property about 400 feet southwest of the site is contaminated with chemicals including 1,1-dichloroethane (490 $\mu\text{g/L}$). When used at infrequent

intervals by hikers or hunters, water from this pump probably poses a negligible health hazard; nonetheless, users should be alerted to the condition of the water or the well should be rendered unusable.

If groundwater flow changed and began to move in the direction of residences southeast of the site, the travel time for compounds from the site to these wells is estimated to be between 80 and 100 years. At that time, residents could be exposed to VOCs via ingestion, inhalation of vapors, and dermal absorption.²⁴

Although residential development may occur in the future, prohibitions in Wisconsin regulations make development of the site unlikely. It is therefore improbable that wells would be installed on site.²⁵ Nonetheless, variances to such regulations are routinely granted generally.

Wisconsin regulations limit the installation of wells within 1,200 feet of a solid waste landfill; therefore, construction of new homes and wells probably would occur outside this zone of restriction. However, prediction of contaminant travel is uncertain and a limited amount of home construction could occur in the vicinity of the site. Therefore, if wells are constructed in the shallow aquifer, human exposure to contaminants in the water could occur.²⁶

Although there is access to the site, there is no indication that people are being exposed to contaminants associated with the site through direct contact with the soil. Breaks in the cap could result in exposures to site chemicals; however, environmental fate mechanisms such as losses to the atmosphere would reduce contaminant levels.²⁷

If the cap is not maintained, exposure to VOCs by direct contact to trespassers on the site, and to VOCs in surface water runoff could occur to recreational users of the Black River watershed via dermal absorption, ingestion or inhalation. However, the low slope, vegetation, and sandy soil at the site limit runoff and reduce the likelihood of exposure.²⁸

Although there are no detectable releases of contaminated groundwater into the Black River, the plume is moving toward the river. This pathway therefore also poses a low-likelihood risk to recreational users of the Black River in the future.²⁹

PUBLIC HEALTH IMPLICATIONS

In the absence of remediation at this site, significant public health implications would be related to groundwater use exposures that would be possible in about 80 years.³⁰ At that time, exposure to VOCs could occur via ingestion of water, dermal

absorption and inhalation. Other routes of exposure are possible but probably insignificant. As noted above, a hand-pump well near the site is contaminated and would pose a threat to health if frequently used for drinking water. Current amounts of VOCs released from the landfill to the air are unlikely to affect the health of nearby residents.

CONCLUSIONS

The Division of Health concludes that this site poses no apparent public health hazard because exposures that may have occurred are not considered to have been at levels that could cause adverse health effects. However, the existence of buried drums and contaminated groundwater and subsurface soils could pose a public health hazard in the future as a result of exposures via groundwater, surface water and soil if remedies for the site were not carried out. Accumulation and lateral migration of methane gas in soil could pose a physical hazard due to the explosive potential of methane in enclosed spaces. Volatile compounds in soil could be released during the remediation process.

A handpump well near the site is contaminated; however, infrequent exposures via ingestion of the water by passersby on the property are unlikely sources of significant past or current exposure.

RECOMMENDATIONS

Regardless of remedial actions taken, the following is recommended:

- . Residential wells should continue to be sampled due to the potential for certain site contaminants, i.e., chlorinated organic solvents, to sink down into the deeper aquifer.
- . Surface water and sediments of the wetland and Black River should be sampled to ascertain whether significant contamination of the aquatic food chain is occurring.
- . Soil gas should be sampled to determine whether methane is migrating toward nearby buildings. If less permeable material is placed over the site, venting should occur.
- . People should not trespass on the landfill property.
- . If volatile organic compounds in groundwater and soils are exposed to air during remedial work at the site, air sampling should be done.

Need for Follow-up Health Activities

The Division of Health and ATSDR reviewed the data on this site to determine the need for more action on health-related concerns. Such action could include conducting more studies on cases of disease in the area or providing information about exposure to toxic chemicals. People who drank water from the contaminated residential well nearby may have been exposed to chemicals from the site. There is no evidence, however, that people were exposed to chemicals from the site at a level that would result in measurable health effects. Neither is there a way to measure exposures that may have occurred. Therefore, no more health studies are needed now. The Division of Health and ATSDR will look again at the need for more health activities if high levels of contamination are released when the site is cleaned up or if new information shows that public exposure is greater than expected.

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CERTIFICATION

This Interim Public Health Assessment was prepared by the Wisconsin Division of Health under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the Interim Public Health Assessment was initiated.


Technical Project Officer, SPS, RPB, DHAC

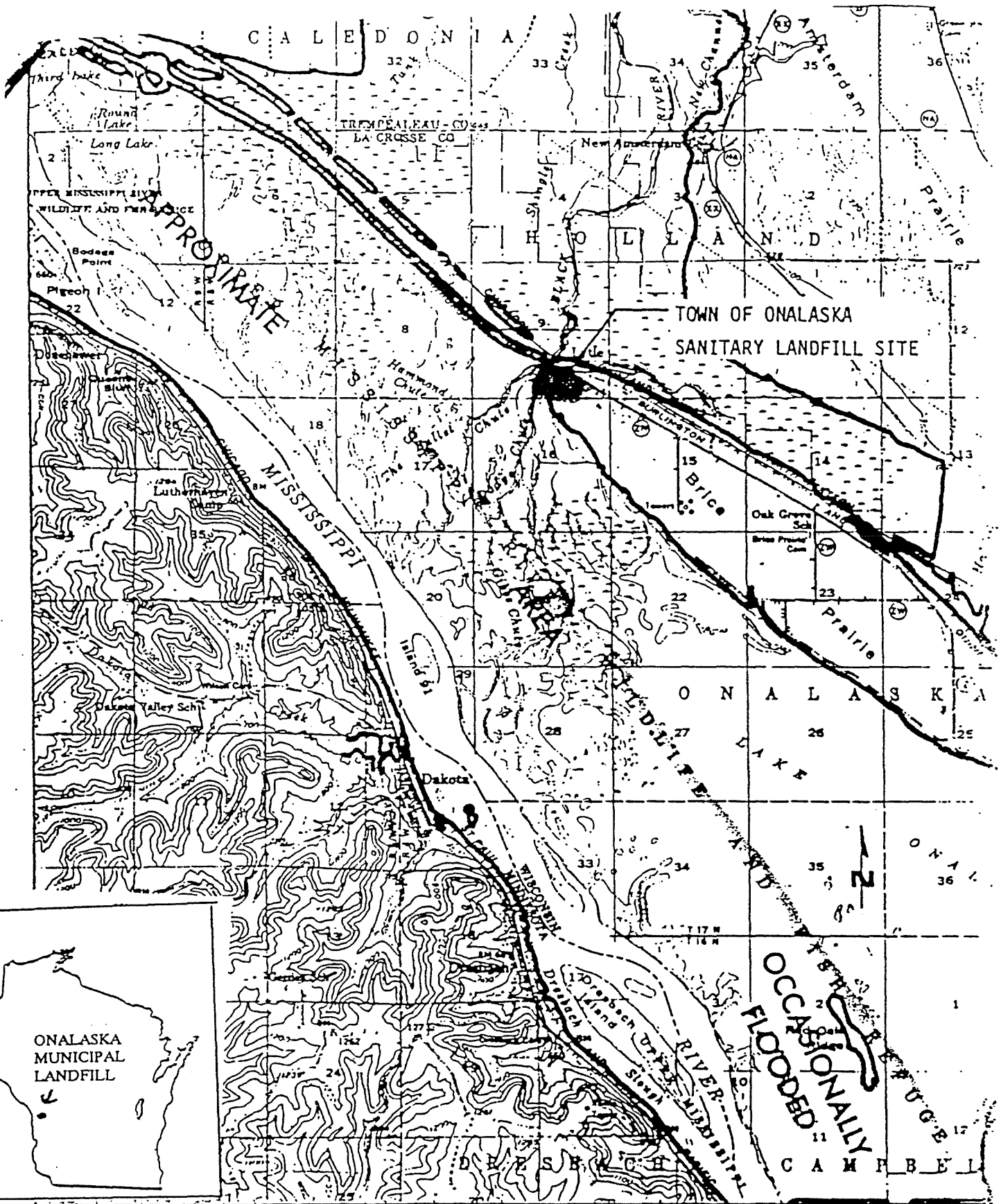
The Division of Health Assessment and Consultation, ATSDR, has reviewed this Interim Public Health Assessment and concurs with its findings.


Director, DHAC, ATSDR

REFERENCES

1. Agency Review Draft, Remedial Investigation Report, Executive Summary, Site Description and History, p. 2.
2. Memorandum Re: Proposed Plan for the Onalaska Municipal Landfill, Kevin Adler, Remedial Project Manager, USEPA Region V. December 27, 1989.
3. Remedial Investigation Report, Onalaska Municipal Landfill, WA 01-5LL5.0, December 22, 1989. Vol. 1, p. 3-7.
4. Remedial Investigation Report, p. 1-3.
5. Remedial Investigation Report, p. 1-3.
6. Remedial Investigation Report, p. 3-4.
7. Remedial Investigation Report, p. 3-5.
8. Remedial Investigation Report, p. 3-7.
9. Remedial Investigation Report, p. 3-7.
10. Remedial Investigation Report, p. 3-3.
11. Remedial Investigation Report, p. 4-10.
12. Remedial Investigation Report, p. 3-16 and tables 3-5 and 3-5.
13. Remedial Investigation Report, p. 1-5 and Table 3-7.
14. Remedial Investigation Report, p. 3-11, Figure 3-16.
15. Remedial Investigation Report, p. 1-5.
16. Remedial Investigation Report, p. 1-4.
17. Correspondence from David Degenhardt, State Laboratory of Hygiene (Madison, Wisconsin) to Jim Boettcher, Wisconsin Department of Natural Resources, La Crosse Area Office regarding contamination in the Cecil Miller well, September 23, 1982.
18. Remedial Investigation Report, p. 3-22.
19. Remedial Investigation Report, p. 3-24.
20. Remedial Investigation Report, p. 3-13.
21. Remedial Investigation Report, p. 3-11.

22. Remedial Investigation Report, p. 4-12.
23. Remedial Investigation Report, Table 4-10, p. 1.
24. Remedial Investigation Report, p. 4-14.
25. Remedial Investigation Report, p. 4-15.
26. Remedial Investigation Report, p. 4-15.
27. Remedial Investigation Report, p. 4-15.
28. Remedial Investigation Report, Table 4-10, p. 2.
29. Remedial Investigation Report, Table 4-10, p. 2.
30. Remedial Investigation Report, p. 4-14.



MAP OF FLOOD-PRONE AREAS

TOWN OF ONALASKA SANITARY LANDFILL

ONALASKA, LACROSSE COUNTY, WISCONSIN
 (Adapted From: "Map of Flood-Prone Areas" U.S. Geological Survey, La Crescent, Minn-Wis. Topographic Quad, 1969.)

OCCASIONALLY FLOODED