



Proposed Plan

TOMAH MUNICIPAL SANITARY LANDFILL

Tomah, Wisconsin

August 1997

This Fact Sheet Will Provide You:

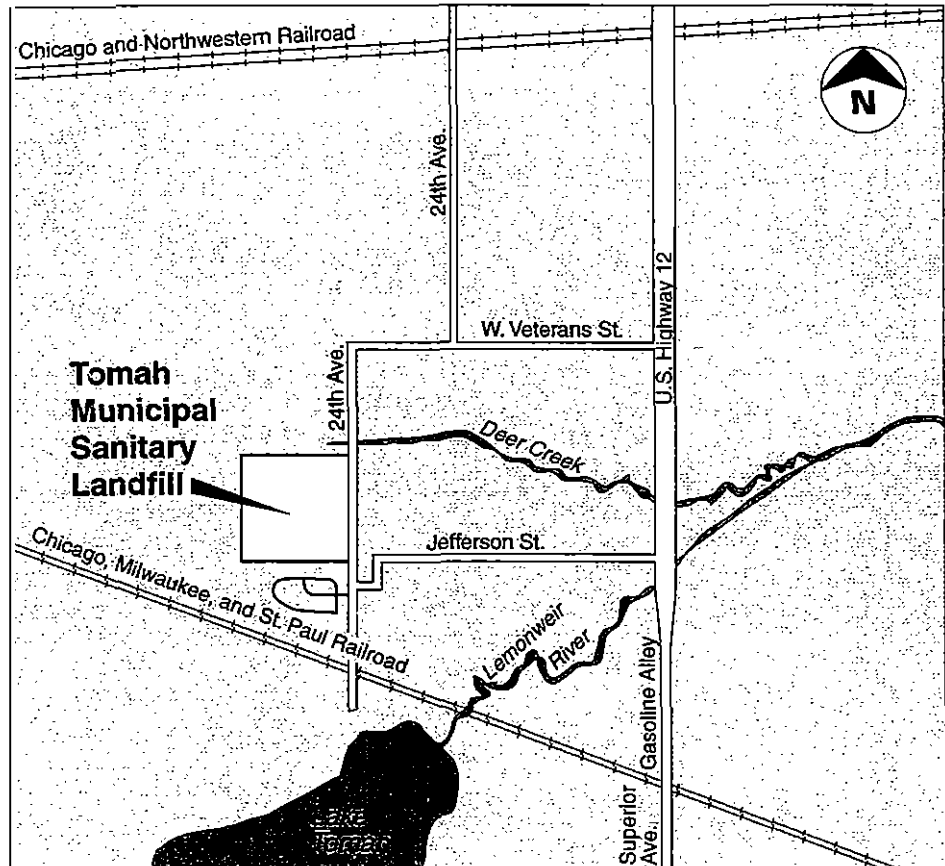
- Background information about the Tomah Municipal Sanitary Landfill site;
- U.S. EPA's proposed plan for cleaning up the Tomah Municipal Sanitary Landfill
- How you can learn more about the site.

You Are Invited to a Public Meeting

U.S. EPA will hold a public information meeting to explain U.S. EPA's recommended cleanup plan for the Tomah Municipal Sanitary Landfill and to answer your questions and to accept comments. **The meeting will be held on August 18, 1997, at 6:00 p.m. at the Tomah City Hall Council Chambers, 819 Superior Avenue.** This meeting will be held in conjunction with the meeting for the Tomah Armory Landfill Superfund site. Please plan on attending the meeting to discuss both sites with project staff.

Public Comment Period

U.S. EPA is holding a 30-day public comment period to accept comments on its proposed cleanup plan for the Tomah Landfill site. The public comment period begins August 7, 1997 and will close on September 5, 1997. All comments should be sent to Bri Bill, U.S. EPA, at the address listed on page 4. For more information on the proposed cleanup plan see page 4.



Introduction

This Proposed Plan presents U.S. EPA's recommended remedy for the Tomah Municipal Sanitary Landfill Superfund site. The Proposed Plan summarizes the alternatives for cleaning up the Tomah Municipal Sanitary Landfill Superfund site in Tomah, Wisconsin. These alternatives have been developed by the U.S. Environmental Protection Agency (U.S. EPA) in consultation with the Wisconsin Department of Natural Resources (WDNR). The alternatives described in this Proposed Plan are described in greater detail in the recently completed **Feasibility Study (FS)**. The FS and other relevant documents are available for review at the Tomah

Public Library (see back page). Public comments on the alternatives and the information that supports the alternatives are an important contribution to the cleanup remedy selection process. Based on new information or public comments, U.S. EPA and WDNR may modify the recommended alternative or select another alternative presented in this plan and/or the FS report. You are encouraged to review and comment on all technologies and alternatives considered for the Tomah Municipal Sanitary Landfill Superfund site cleanup. A pre-addressed comment form is included with this Proposed Plan.

Site Description and History

The Tomah Municipal Sanitary Landfill site is located just outside the City of Tomah. The 40-acre site is bordered on the north by a wetland and forested land, on the east by 24th Street, on the south by residential development, and on the west by farmland and a wetland. Deer Creek flows across the northwest corner of the site.

There are two other Superfund sites in the Tomah area—the Tomah Armory Landfill and the Tomah Fairgrounds Landfill. A proposed plan for the Tomah Armory Landfill Superfund site was recently mailed to interested parties. Background information on the three Tomah area sites is available for review at the Tomah Public Library. This fact sheet focuses on the **Tomah Municipal Sanitary Landfill** site only.

The City of Tomah operated the Tomah Municipal Sanitary Landfill from 1959 to 1979, disposing of municipal and industrial wastes on 18 acres located on the southern portion of the site. From 1960 to 1977, a local industry disposed of thousands of gallons of solvents and sludges containing heavy metals at the site. In 1975, WDNR ordered the City of Tomah to close the site because of potential degradation of local ground-water quality. The City closed the site in 1979, covered it with soil and topsoil, and planted grass and trees on the site. In 1984, WDNR tested ground water at the property and found contamination at levels of health concern. Based on these findings, WDNR nominated the site for inclusion on U.S. EPA's National Priorities List in April 1985. The National Priorities List is a roster of hazardous waste sites that threaten human health or the environment and are eligible for the federal Superfund program.

In 1993, the City provided municipal water to homes in the Sunnyvale subdivision to eliminate the potential hazard posed by the landfill for private drinking water wells in the subdivision. In January 1994, U.S. EPA and three **Potentially Responsible Parties (PRPs)** signed a legal document called an administrative

order on consent. Under the order, the PRPs were responsible for conducting a **Remedial Investigation (RI)** and FS at the Tomah Landfill site.

Later in 1994, U.S. EPA decided to use a presumptive remedy approach. After years of addressing contaminated landfills, U.S. EPA has found that the most practical way to deal with the large variety and volume of waste found at municipal landfills is containment. A containment remedy may include one or more of the following components: a landfill cap; a ground-water collection and treatment system; a landfill gas collection and treatment system; a **leachate** collection and treatment system; and land use restrictions. Containment involves placing a cap over the landfill that does not allow water into the landfill. When water (usually rain or melted snow) enters a landfill, it percolates through the waste and picks up contaminants. This contaminated water may migrate out of the landfill and into ground water and surface water near the landfill. A leachate collection system has not been proposed, as there has been no leachate detected on the site. Institutional controls and ground-water collection and treatment will be addressed at a later date (see below).

Use of the presumptive remedy approach allows a focused evaluation of alternatives to contain contaminated waste in the landfill. Thus, selection of a remedy to contain the landfilled material need not wait until all long-term ground-water contamination issues are resolved. This Proposed Plan only addresses controlling the spread of contaminants from the landfill. The Proposed Plan for ground-water cleanup has not been developed because the ground-water contamination has not been fully investigated. Further investigation is necessary to determine a future remedy for the ground water, which will be addressed in a separate Proposed Plan.

Results of Remedial Investigation

The RI was conducted in 1994 and 1995. The investigation included:

- installing 22 ground-water monitoring wells in and around the landfill;
- installing 13 gas probes in and

around the waste in the landfill;

- collecting water samples and sediment samples from 3 locations in Deer Creek and one location in the wetland immediately north of the landfill;
- installing gas probes near the residences south of the landfill.

Ground Water

The RI indicates that the Tomah Municipal Sanitary Landfill affects ground-water quality northeast (downhill) of the landfill. **Volatile organic compounds (VOCs)** were detected in the ground-water samples collected from the monitoring wells. Vinyl chloride and benzene were the two VOCs detected most often and at the highest concentrations. **Six** other VOCs were also detected.

Ground-water sample results also indicate that several metals are present in the ground water at levels above federal standards, especially northeast of the site. These include aluminum, iron, manganese, lead, chromium cadmium, and thallium.

Surface Water and Sediment

Surface water and sediment samples from Deer Creek and the wetland north of the landfill indicate that VOCs and metals have not significantly contaminated Deer Creek or the wetland.

Landfill Gas

Data collected from gas probes indicate that landfill gas is being generated by the landfill and is migrating south of the landfill. During the RI, a gas extraction system was installed along the southern boundary of the landfill to eliminate the potential hazard posed by the landfill gas to homes south of the landfill. The explosive nature of methane gas requires that it be extracted from the landfill as effectively as possible. The installed gas extraction system's effectiveness is limited, due to the lack of a cap on top of the landfill. The gas extraction system may also remove some contaminants from the landfill before they reach the ground water.

Risk Assessment

Based on data collected during the RI, human health and ecological risks

associated with contaminants detected in the ground water, surface water and sediment within and near the site were assessed. This assessment, called a baseline screening, was conducted to compare contamination levels at the site with U.S. EPA standards. It considered ways in which people and wildlife could be exposed to site-related contaminants and whether such exposure could increase the incidence of cancer and noncarcinogenic (health effects that are not cancer) diseases above the levels that normally occur in the study area.

The screening assumed that people could be exposed to site-related contaminants by ingestion (eating), inhalation (breathing) and dermal absorption (touching). U.S. EPA also assumed that the degree of exposure to ground water, surface water and sediment is strongly related to land use patterns. The assessment therefore evaluated risks under current and expected future land use conditions.

The **Risk Assessment** focused on users who would face the greatest exposure to landfill contaminants. Recreational users and residents are the two groups most likely to be exposed.

U.S. EPA uses conservative estimates when evaluating potential risks. This approach may overstate the true risks, but it provides a high level of protection for public health and the environment.

Summary of Site Risks

Potential cancer risks for the public are expressed numerically, i.e., 1×10^{-2} or 1×10^{-6} . Carcinogenic (cancer-causing) risk expressed as 1×10^{-2} means that of 100 people exposed to contamination over a 70-year lifetime, one individual could potentially develop cancer as a result of the exposure. A carcinogenic risk of 1×10^{-6} means that of 1,000,000 people exposed over a 70-year lifetime one individual could potentially develop cancer as a result of the exposure. U.S. EPA has established a carcinogenic risk range in an attempt to set standards for remediation and protectiveness. In general, as carcino-

genic risks increase above one case in a million people exposed over a 70-year lifetime, the carcinogenic risk becomes less acceptable. The carcinogenic risk to individuals should generally not meet or exceed one additional case in 10,000 exposures (1×10^{-4}). A 1×10^{-6} excess lifetime cancer risk is considered to be the level at which cancer is not distinguishable from naturally occurring cancers (i.e. a "normal" cancer risk).

The measure of non-carcinogenic risk is termed a "hazard index" and is also expressed numerically. When the hazard index exceeds 1, there is a potential for adverse health effects.

Potential Human Health Risks

In general, the majority of the predicted potential health impacts are associated with ground-water contaminants at the Tomah Municipal Sanitary Landfill site. Ground-water contaminants were evaluated for residential ingestion (eating), inhalation (breathing), and dermal exposure (skin contact). The potential lifetime excess cancer risk posed by potential exposure to ground-water contaminants present at the Tomah Municipal Sanitary Landfill was calculated for both adults and children. The total excess lifetime cancer risk for adult residents was 3×10^{-2} (3 additional cancer cases in 100 lifetime exposures), while that for child residents was 1×10^{-2} (1 additional cancer case in 100 lifetime exposures), these are both higher than U.S. EPA's acceptable risk level. The adult and child non-cancer hazard risk indices are 139 and 325, respectively. These are also well above U.S. EPA's acceptable risk index of 1, indicating a potential for adverse non-cancerous health effects. The ingestion of ground-water contaminants posed the greatest risk to the residents' health.

Skin exposure to contaminants in the surface water and sediment results in excess lifetime cancer risks below 1×10^{-6} and hazard indices below 1 for recreational users and trespassers.

The total overall risk for adult residents using the ground water and the wetlands for fishing or other recreational activities is 3×10^{-2} , and

1×10^{-2} for child residents. The risk is primarily due to the presence of vinyl chloride in the ground water.

Exposure Pathways Evaluation

The risk assessment evaluated the risk posed to adult and child residents from contaminated groundwater. The results indicate that vinyl chloride is present in the ground water at levels which exceed the acceptable risk range for adult and child residents. Vinyl chloride also posed the greatest non-carcinogenic hazard to residents.

It should be noted that two exposure pathways were not evaluated quantitatively in this baseline human health risk assessment. Exposure to soil was not evaluated; nor was exposure to landfill gases. There were not adequate data to calculate risks in either case. But a precise risk assessment here is not really necessary since the remedy U.S. EPA is proposing will address both soil and gas. Capping the landfill will minimize contact with contaminated soil, while the gas extraction component of the remedy will eliminate any threat posed by landfill gas.

Ecological Risk Assessment

Actual damage to the aquatic and terrestrial ecosystem of Deer Creek and the adjacent wetlands was not observed. However, the assessment does not preclude the possibility that future impacts could occur due to contaminated ground water reaching the surface water system.

Summary of Alternatives

Eight alternatives were considered for presumptive remedies at the Tomah Municipal Landfill:

1. No Action.
Estimated Cost \$0
2. Continued operation and maintenance of existing landfill gas extraction system, and continued ground-water monitoring.
Estimated Cost: \$1,385,000
3. Installation of a low permeability **geomembrane cap** over the landfill to minimize infiltration of water, and an active gas extraction system.

- Estimated Cost: \$2,755,000
4. Installation of a low permeability geomembrane and a **geo-synthetic clay liner** over the landfill to minimize infiltration of water, and an active gas extraction system.
Estimated Cost: \$3,224,000
 5. Installation of a low permeability geomembrane and a clay cap over the landfill to minimize infiltration of water, and an active gas extraction system.
Estimated Cost: \$3,939,000
 6. Excavation to remove and reconsolidate saturated waste, installation of a low permeability geomembrane cap over the landfill to minimize infiltration of water, and an active gas extraction system.
Estimated Cost \$6,135,000
 7. Excavation to remove and reconsolidate saturated waste, installation of a low permeability geomembrane and geosynthetic clay liner cap over the landfill to minimize infiltration of water, and an active gas extraction system.
Estimated Cost: \$6,544,000
 8. Excavation to remove and reconsolidate saturated waste, installation of a low permeability geomembrane and clay cap over the landfill to minimize infiltration

tion of water, and an active gas extraction system.

Estimated Cost: \$7,166,000

Evaluation of Alternatives

U.S.EPA used the nine criteria described below to evaluate the cleanup alternatives. The evaluation criteria are summarized below:

Overall Protection of Human Health and the Environment addresses whether a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) addresses whether a remedy will meet all other Federal and State environmental statutes and/or provide grounds for issuing a waiver.

Long-Term Effectiveness and Permanence refers to the amount of risk to maintain reliable protection of human health and the environment over time once cleanup goals have been met.

Reduction of Toxicity, Mobility, or Volume through Treatment is the anticipated performance of treatment technologies that may be employed in a remedy.

Short-Term Effectiveness refers to the speed with which the remedy achieves protection, as well as the remedy's potential to create adverse impacts on human health and the environment during the construction and implementation period.

Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement the chosen solution.

Cost addresses the estimated capital and operation and maintenance (O&M) costs, evaluated as the present worth cost. Present worth is the present value of the capital and future O&M costs of an alternative based on the time value of money.

Support Agency Acceptance indicates whether, based on its review of the FS and the Proposed Plan, the support agency (in this case, the WDNR) concurs with, opposes, or has no comment on the recommended alternative.

Community Acceptance will be assessed in the Record of Decision (the document that outlines the selected cleanup plan) following a review of the public comments received on the FS report and the Proposed Plan.

Evaluation Criteria	Alternatives							
	1	2	3	4	5	6	7	8
1. Overall Protection of Human Health and Environment	O	*	●	●	●	●	●	●
2. Compliance with ARARs	O	O	O	●	●	O	●	●
3. Long-term Effectiveness and Permanence	O	*	*	●	●	*	●	●
4. Reduction of Toxicity, Mobility, or Volume through Treatment	O	●	●	●	●	●	●	●
5. Short-term Effectiveness	O	*	●	●	●	●	●	●
6. Implementability	●	●	●	●	●	●	●	●
7. Cost (\$ millions)	\$0	\$1.4	\$2.8	\$3.2	\$3.9	\$6.1	\$6.5	\$7.2
8. Support Agency Acceptance	The State of Wisconsin fully supports and accepts Alternative #4							
9. Community Acceptance	Community Acceptance of the recommended alternative will be evaluated at the public comment period							
● Fully meets criteria ○ Partially meets criteria O Does not meet								

Comparison of Alternatives

When the 8 alternatives were evaluated against the nine criteria described above, Alternatives 4 and 5 were the best alternatives (see Comparison of Alternatives matrix). Alternative 4 provides the benefits of Alternative 3 with the added backup of a geosynthetic clay liner (GCL). Also, Alternative 4 meets ARARs because it provides a backup barrier to the geomembrane, which Alternative 3 does not. Wisconsin regulations require two feet of clay or a GCL below a geomembrane. Alternatives 4 and 5 offer essentially the same level of protection, but Alternative 4 is approximately \$700,000 less expensive to construct than Alternative 5.

Recommended Alternative

The recommended alternative is **Alternative 4, installation of a low permeability geomembrane and a GCL over the landfill to reduce infiltration of water, and an active gas extraction system.** The GCL would be placed below the geomembrane, which would be covered by 3 feet of soil. Vegetation that has a root system less than 3 feet deep would be planted on top of the cap. The GCL provides a stronger barrier to water than clay. The active gas control system would use a vacuum blower (already a component of the existing gas extraction system) to extract gas from extraction wells in the landfill. The gas would be vented into the air. If the quality of gas collected exceeds State air quality standards, it will be treated as it exits the landfill.

What's Next

U.S. EPA and WDNR will consider public comments received during the public comment period before choosing a final remedy for the Tomah Municipal Sanitary Landfill. The final remedy will be described in the **Record of Decision.** A summary of all comments and U.S. EPA's responses to those comments will be contained in the Responsiveness Summary section of the Record of Decision, which will be available for review at the Tomah Public Library.

For Additional Information

Anyone interested in learning more about the investigation, the cleanup plan for the Tomah Municipal Sanitary Landfill, or the Superfund process is encouraged to review the information repository maintained for the site. It contains copies of the remedial investigation reports, feasibility study and other materials related to the site. The information repository is located at the following location:

Tomah Public Library

716 Superior Avenue
Tomah, WI

The Administrative Record is located at the library and U.S. EPA Region 5 office. For further information on the Tomah Municipal Sanitary Landfill, please contact:

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Glossary

Potentially Responsible Party (PRP): PRPs are comprised of the companies who are considered the owners and operators of the chemical industries and waste disposal sites surrounding Fields Brook. PRPs may also include the companies who, by contract, agreement, or other means, either accepted, or arranged for transport, disposal or treatment of, hazardous substances within the Fields Brook site.

Record of Decision (ROD): A legal document signed by U.S. EPA that describes the final cleanup remedy for a Superfund site, why the remedial action was chosen, how much it will cost, and public comments and the U.S. EPA response.

Remedial Investigation (RI)/Feasibility Study (FS): A two part study of the site. The first part is the Remedial Investigation, which studies the nature and extent of the problem. The second part is the Feasibility Study, which evaluates different methods of dealing with the problem and selects a method that will effectively protect public health and the environment.

Risk Assessment: The part of the remedial investigation report that discusses the potential for human and ecological exposure to site contaminants.

Leachate: A liquid (usually precipitation) that has percolated through wastes and contains components of that waste. Contaminated leachate can seep to the ground surface or into ground water.

Geomembrane Cap: A landfill cap in which the typical clay component is replaced with a geosynthetic (plastic) liner. The plastic liner reduces the amount of water percolating through the cap.

Geosynthetic Clay Liner: A liner composed of a layer of bentonite clay sandwiched between two layers of geomembrane.



U.S. Environmental Protection Agency
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