

**EPA Superfund
Record of Decision:**

**SAUK COUNTY LANDFILL
EPA ID: WID980610141
OU 01
EXCELSIOR, WI
09/28/1995**

RECORD OF DECISION

REMEDIAL ACTION FOR THE GROUNDWATER OPERABLE UNIT

Site Name and Location

Sauk County Landfill

The Sauk County landfill is located in the Town of Excelsior, Sauk County, Wisconsin (approximately 6 miles east of the City of Reedsburg and approximately 9 miles west and north of the City of Baraboo), SE 1/4 of Section 15, Township 12 North, Range 5 East.

Statement of Basis and Purpose

This decision document represents the selected groundwater remedial action for the Sauk County Landfill in the Town of Excelsior, Sauk County, Wisconsin, developed in accordance with CERCLA, as amended by SARA, and to the extent practicable, the National Contingency Plan. The attached Summary of Remedial Alternatives identifies the information contained in the administrative record for this site upon which the selection of the remedial action is based.

Description of the Selected Groundwater Remedy

The selected groundwater remedy is Alternative A, the No-Action Alternative. Under this alternative, monitoring of groundwater quality over time will take place. The WDNR considers this a no further action ROD. Twelve (12) on-site groundwater monitoring wells and six (6) off-site private water supply wells will be sampled for volatile organic compounds (VOCs) on a semi-annual basis to determine changes in groundwater quality with time. If the VOC concentrations in the groundwater increase in violation of NR 140, Wis. Adm. Code, then additional source control measures will be taken, including the installation of a composite landfill cover. Details on the potential source control actions are listed in the source control Record of Decision for this site. This groundwater operable unit is the second of two operable units. The record of decision for the first operable unit, source control, was issued in March, 1994.

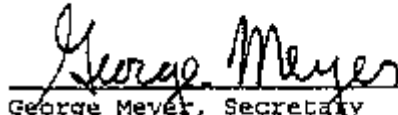
The principle threat of groundwater contaminants are met through the previously installed source control measures, and the natural attenuation, degradation and dilution of contaminants in groundwater.

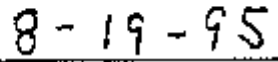
Statutory Determinations

This groundwater remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate requirements ("ARARs") for this action, and is cost effective. Because this remedy will result in hazardous substances remaining on-site, a review will be conducted to ensure that the remedy continues to provide adequate protection of human health and the environment within 5 years after the commencement of this remedial action.

The remedy utilizes permanent solutions to the extent practicable. This remedy does not satisfy the statutory preference for treatment as a principle element of the remedy. Natural attenuation, degradation and dilution of groundwater contaminants will take only slightly longer than an active treatment system and will cost less.

A review of the remedy and groundwater quality will be conducted every five years. This review shall concentrate on whether the standards in NR 140, Wis. Adm. Code are being met.


George Meyer, Secretary
Wisconsin Department of Natural
Resources


Date

SUMMARY OF REMEDIAL ALTERNATIVES SELECTION

GROUNDWATER REMEDY

SAUK COUNTY LANDFILL

The following summarizes the information contained in the administrative record for the Sauk County Landfill site. The selected groundwater remedy is based upon the information contained in the site's administrative record.

I. SITE NAME, LOCATION AND DESCRIPTION

The Sauk County Landfill was listed on the National Priorities List (NPL) by the U.S. Environmental Protection Agency (EPA) in October of 1989. This site does not include the active Sauk County landfill which is located a few hundred feet north of the closed Sauk County Landfill.

The Sauk County Landfill is located in the northeastern part of the county between Reedsburg and Baraboo, south of Hwy 33. The landfill is 14 acres in size and is part of a 320 acre parcel containing both the closed and active landfills in the Southeast 1/4 of Section 15, Township 12 North, Range 5 East, Town of Excelsior, Sauk County, Wisconsin. The location is depicted on Map 1. The landfill and property boundary are fenced. Vehicle access is limited by a gate across the road entering the landfill property.

The Sauk County landfill accepted municipal and industrial waste from Sauk County between the years 1973 and 1983. The site was designed as a natural attenuation landfill. This means it has no liner or leachate collection system. It has a waste volume of about 750,000 cubic yards.

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

Sauk County operated this landfill between 1973 and 1983. During operations, the site accepted municipal, commercial and industrial wastes, including over 200,000 tons of foundry sand. The foundry sand was used primarily in berms on the edge of the refuse. The site was closed in 1981 with a cover system consisting of 2' of clay on the landfill surface, 1' of clay on the sidewalls and 6" of topsoil over the entire site. The topsoil was vegetated. The site has been maintained by Sauk County since closure.

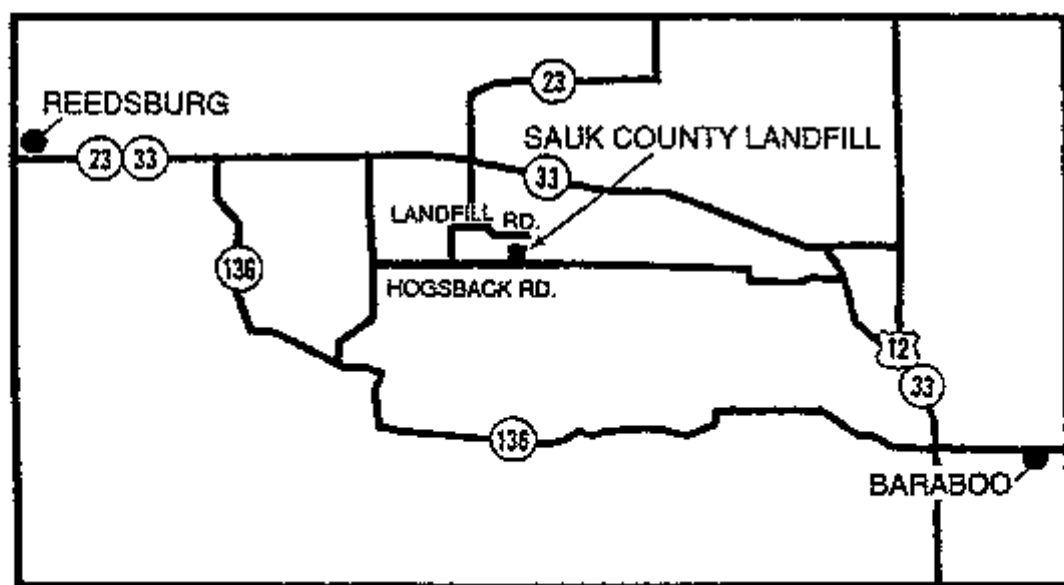
After reviewing groundwater quality data from this landfill, the WDNR recommended to EPA that the site be included on the National Priorities List (NPL). The site was listed on the NPL in 1989. In September, 1991, Sauk County entered into a contract with WDNR to perform a remedial investigation and feasibility study ("RI/FS") pursuant to s. 144.442, Wisconsin Statutes and the Comprehensive Response, Compensation and Liability Act ("CERCLA"). Under terms of the contract, Sauk County also agreed to complete a Source Control Operable Unit. WDNR issued a source control record of decision (ROD) for this site in March, 1994.

Map 1

SAUK COUNTY LANDFILL



SITE LOCATION MAP



Not to Scale

The RI was completed and submitted to WDNR on April 28, 1994. The FS for groundwater remediation was submitted to WDNR on January 4, 1995.

III. HIGHLIGHTS OF THE COMMUNITY PARTICIPATION

An information repository has been established at the Reedsburg Public Library, 345 Vine Street, Reedsburg, Wisconsin. The administrative record is made available to the public at the Baraboo Public Library, 230 Fourth Street, Baraboo, Wisconsin.

In September, 1992 WDNR issued a Superfund Fact Sheet which provided a summary of the site history, explained the Superfund process and delineated the approved RI work plan. On September 29, 1992 the WDNR and the Wisconsin Department of Health and Social Services (WDHSS) held a public informational meeting at 7:00 p.m. in the Rock Springs Community Center. The meeting was held to discuss the landfill and to explain the RI field work which was about to start. Approximately 30 residents attended the meeting.

Residents living near the landfill created the Evergreen Property Owners Association. On November 11, 1992 the Property Owners Association organized a meeting attended by WDNR, WDHSS and Simon Hydro-Search (consultant to Sauk County) to answer questions from residents living near the landfill. Approximately 100 persons attended this meeting.

In March, 1993 WDNR issued a Superfund Fact Sheet containing a summary of the RI data up to that point in time. This fact sheet contained information on:

- * groundwater quality in on-site monitoring wells
- * groundwater quality at houses surrounding the landfill
- * preliminary results from a vegetation survey designed to detect methane stress, and
- * a timeline for installing new monitoring wells at the site.

In May, 1993 the Evergreen Property owners Association was awarded a Technical Assistance Grant from EPA. The purpose of the grant is to allow persons affected by Superfund sites to retain their own technical staff to explain the Superfund process and the data generated during the RI.

In September, 1993 the WDNR issued another Superfund Fact Sheet. This fact sheet also contained a summary of the RI data.

The Proposed Plan for the source control operable unit was made available for public comment on September 8, 1993. Notices announcing the availability of the proposed plan were published in the Reedsburg Time Press and the Wisconsin State Journal on September 2, 1993. A public meeting to explain the Proposed Plan, and to receive public comments was held on September 21, 1993. Approximately 40 persons attended the meeting. The public comment period was held between September 8, and November 9, 1992. Comments received from the public and WDNR's response to those comments are included in the source control record of decision.

WDNR issued a proposed plan for groundwater remediation in March, 1995. The RI/FS and proposed plan were available for public comment in the administrative record. The public comment period ran between March 3 and April 10, 1995. WDNR was available to hold a public meeting, but didn't receive any requests to hold such meeting. WDNR didn't receive any comments during the public comment period.

At the time the WDNR announced the proposed plan, the WDNR failed to place an add in the newspaper. CERCLA requires that an add be placed in the newspaper of record when a proposed plan has been issued. To comply with CERCLA, the WDNR placed an add in the Baraboo News Republic on June 29, 1995. The add announced the availability of the groundwater proposed plan and opened another public comment period running between June 29 and August 1, 1995. The WDNR didn't receive any public comments during this second public comment period.

The public participation requirements of s. 144.442(6)(f), Wisconsin Statutes, and the community relations requirements in the National Contingency Plan at 40 CFR s. 300.430(f)(3) have been met in this groundwater remedy selection process.

IV. SCOPE OF THE GROUNDWATER REMEDY

The groundwater contaminants from this landfill is volatile organic compound (VOC) contamination. Sauk County has been measuring VOCs at various monitoring wells since the mid 1980's. Since that time, VOC concentrations have dropped dramatically. Plots showing the VOC concentrations over time are included. in the source control ROD. Should VOC concentrations continue decreasing at the rate shown in the past several years, all contaminants should be below their respective preventive action limits within the next couple of years. Preventive action limits (PALs) are the clean up standards for contaminants in groundwater. PALs are listed in NR 140, Wis. Adm. Code.

Since groundwater quality is improving, active groundwater remedial actions are not considered necessary for this site. The No Action alternative includes a groundwater monitoring plan that was approved as part of the source control remedy. Under the plan, twelve (12) on-site monitoring wells and six (6) off-site private water supply wells will be monitored for VOCs. Sampling of the wells will take place in April and October of each year. After five (5) years of sampling results are available, the data will be analyzed to determine whether or not there is compliance with NR 140, Wis. Adm. Code, and compliance with terms set forth in the source control ROD.

V. SUMMARY OF SITE CHARACTERISTICS

A. Topography

The Sauk County landfill is located along the eastern margin of the unglaciated area. Topography in the site vicinity is gently sloping to somewhat hilly. The landfill is located in an east-west trending valley bounded to the north and south by sandstone bedrock ridges. Elevations on the ridges are approximately 1200 feet above mean sea level. The valley is gently

sloping to the west with elevations near the fill ranging from 1010 to 960 msl.

B. Geology/Hydrogeology

The geology near the landfill consists of approximately 50 feet of unconsolidated material, primarily sand with some silt and gravel layers present. The color of the sand is predominantly brownish yellow. Below the unconsolidated material three different bedrock units were identified.

The top of the bedrock is a poorly lithified weathered sandstone. This is the Mazomanie Formation. It is medium grained and brown to yellow in color. it ranges in thickness from approximately 40' east of the landfill to only 5' at the western edge of the County property.

The next bedrock unit is the Lone Rock Formation. This unit consists of siltstone, shale and very fine grained sandstone. It ranges in thickness from 30' to over 50'. This unit acts as a semi-confining unit between the sandstone units above and below.

Below the Lone Rock Formation is the Wonewoc Formation. It is a medium grained sandstone that is brown, reddish brown to yellow in color. The entire thickness of the Wonewoc was not penetrated by monitoring wells, but it is at least 65' thick near the landfill. The Wonewoc Formation acts as a water supply aquifer for homes located to the west of the landfill.

Within the unconsolidated deposits, shallow groundwater at or near the water table flows west, southwest towards the Baraboo River. This upper flow system has an average horizontal gradient of 0.015 ft/ft west of the landfill. Near the base of the unconsolidated deposits and within the weathered sandstone (Mazomanie Fm) groundwater also flows west, southwest with a horizontal gradient ranging from 0.010 to 0.013 ft/ft. These groundwater flow directions are a result of the natural slope of the upper bedrock surface.

Directly beneath the siltstone and shale semi-confining layer (Lone Rock Fm), groundwater flows southeast with a gradient of 0.006 to 0.007 ft/ft. Deeper within the Wonewoc Formation groundwater flows to the east. This is consistent with the regional flow towards the Wisconsin River. The horizontal gradient in the deeper Wonewoc is approximately 0.0012 ft/ft.

All vertical gradients were downward and ranged from 0.02 to 0.76 ft/ft. The highest vertical gradient was noted to the east of the landfill where the semi-confining layer is thickest. Thickness of the confining layer as well as the lithology and competence of the Lone Rock Formation are likely to affect vertical gradients.

C. Groundwater Contamination

Based upon data collected as part of the RI, a total of 18 volatile organic compounds (VOCs) were detected in groundwater monitoring wells. The most common VOCs detected are 1,1-DCA which was found in 13 wells and 1,1,1-TCA which was found in 8 wells. Of the 18 VOCs detected, only two exceeded

enforcement standards found in NR 140, Wis. Adm. Code, during sampling events in 1993. Tetrachloroethylene (PCE) and vinyl chloride were detected in concentrations attaining or exceeding enforcement standards. Five additional VOCs [1,2-dichloropropane, 1,2-dichloroethane, 1,1-dichloroethane, benzene, cis 1,2-dichloroethene] exceeded NR 140, Wis. Adm. Code preventive action limits. Table 1, 2, 3 and 4 from the qualitative risk assessment list the concentrations of the groundwater contaminants and compares them to groundwater quality standards.

A total of 18 private wells surrounding the landfill have been tested for VOCs. A home located approximately 3000 feet west-southwest of the landfill has detected VOCs. 1,1-dichloroethane (1,1-DCA) has been detected on two occasions and 1,1,1-trichloroethane (1,1,1-TCA) has been detected three times. These samples were taken in 1992, 1993 and 1994. In all three sampling events, the concentrations of these two compounds were far below their respective drinking water standards. A second home had detections of 1,1-DCA and 1,1,1-TCA the first time it was sampled. These detections were also far below the drinking water standards. Subsequent sampling of the well has failed to detect any VOCs. None of the other 16 wells tested have had VOCs detected.

The groundwater monitoring plan approved under the source control remedy, and included as part of the No Action alternative for groundwater remediation will effectively monitor changes in groundwater quality with time.

D. Landfill Gas

Three of the gas probes and one well located within the waste had landfill gas samples collected and analyzed for VOCs. Nineteen VOCs were detected with the highest concentration of total VOCs occurring in the gas probe on the east side of the landfill. The VOCs with the highest concentration (at any sampling point) are methyl ethyl ketone, toluene, vinyl chloride, total xylenes and 1,1-DCA.

In addition, the gas probes, two wells screened within the waste, and a background location were measured for methane, oxygen and carbon dioxide. The background sample was not a soil gas sample, but was an ambient air sample near the access gate to the landfill. It can only be used for comparative purposes. All methane measurements except the background location and the gas probe on the southern edge of the landfill indicated explosive concentrations of methane.

The source control ROD required a landfill gas extraction and treatment system. This system was installed during the winter of 1994-1995. Fifteen gas wells collect gas generated within the waste and route it to a flare for combustion.

VI. SUMMARY OF SITE RISKS

A qualitative risk assessment was completed for the Sauk County landfill Superfund site. The purpose of the assessment was to identify human health hazards posed by environmental contamination from the site. The qualitative

risk assessment evaluates current as well as future potential exposures to site related contamination. Sample results from the remedial investigation were used to evaluate all environmental pathways with potential human exposure routes.

The reasons that a qualitative, rather than a quantitative, risk assessment was completed include:

- * state standards for air and water quality are protective of human health and the environment
- * the remedy must comply with state standards
- * EPA guidance documents state that exceedances of state standards, whether or not the site represents an unacceptable risk, are a cause for action at Superfund municipal landfill sites.

The groundwater, surface soil/sediment, and air pathways were evaluated as possible exposure routes for contaminants. The groundwater data came from on-site monitoring wells and off-site private water supply wells. No surface water bodies are present on the site. The sediment samples were collected from areas where runoff water, when present, would settle out and deposit sediment. Soil gas samples and one ambient air sample were collected and used in the evaluation of the air pathway.

A copy of the qualitative assessment is found in the administrative record. Presented below is a brief summary of the assessment and it's conclusions.

Groundwater Pathway

The following compounds were identified as contaminants of concern:

benzene	barium	benzoic acid
chrysene	iron	diethylphthalate
tetrachloroethylene	manganese	2,4-dimethyl phenol
vinyl chloride		
1,1-dichloroethylene		

The compounds listed in the first column represent probable carcinogens. The qualitative health assessment concludes that persons who drink groundwater every day, over a lifetime, with the highest concentration of these contaminants detected in **on-site** monitoring wells are at an increased risk of getting cancer. This does not represent a present use scenario since the wells containing these concentrations are on Sauk County property and this water is not being used for water supply purposes. This represents a possible, though not probable, future use scenario. The future use scenario is not probable since Chapter NR 812, Wis. Adm. Code pertaining to private water supplies requires a minimum setback distance of 1200 feet from landfills.

The compounds listed in the second and third columns are not carcinogens, but were evaluated for non-carcinogenic health effects. The qualitative risk assessment concludes that there are no adverse health effects associated with

exposure to these compounds at the highest concentrations detected in on-site groundwater monitoring wells.

Two additional compounds were detected in monitoring of private wells around the landfill. 1,1,1-trichloroethane and 1,1-dichloroethane were detected in two private wells. The concentrations detected are far below the drinking water standards for these compounds. The qualitative risk assessment concludes that there are no adverse health effects expected from exposure to these compounds in the private wells.

Surface Soil and Sediment Pathway

Because there are no surface water bodies at the site, the surface soil and sediment data were evaluated together. The following compounds were identified as contaminants of concern for surface soils:

arsenic	beryllium	polyaromatic hydrocarbons (PAHs)
lead	manganese	

Arsenic and beryllium are probable carcinogens. The concentrations of these metals in surface soils are at concentrations that could cause an increased risk of cancer if they were ingested at a rate of 100 mg/day for a lifetime. This exposure is only appropriate for assessing exposures in urban areas or in residential yards. Because the location of the surface soil contamination is in a rural area that has restricted access, no increased cancer risk would be expected from incidental exposures to the highest concentrations of arsenic and beryllium.

PAHs were detected in samples of surface soils on-site. PAHs are created from the incomplete combustion of fossil fuels. They are often associated with vehicle emissions and/or oil and grease spills. Individual PAHs are rarely identified in the absence of others. The health effects of the individual PAHs may not be exactly alike. However, the coincident detection of a number of these compounds makes it difficult to isolate health effects for individual PAHs. For this reason the toxicity of these PAHs is evaluated as a group. There are over one hundred different PAH compounds. Long term exposure to some PAH compounds has been shown to cause cancer in humans exposed through inhalation and dermal absorption. These PAHs were detected in soils at concentrations that could cause an increased cancer risk if they were ingested at a rate of 100 mg/day for a lifetime. This exposure scenario is only appropriate for assessing surface soil exposures in urban areas or residential yards. Because the location of the surface soil contamination is in a rural area with restricted access, no increased cancer risk would be expected from incidental exposures to the highest concentrations of PAHs at the site.

Arsenic, beryllium, lead and manganese were also evaluated for noncarcinogenic health effects. Exposure to the highest concentrations of these compounds detected in the surface soil samples is not expected to cause adverse health effects.

Air Pathway

Gas samples collected as part of the investigation were primarily soil gas and not ambient air. Samples of soil gas are not indicative of ambient air quality. It is expected that concentrations in ambient air would be considerably less than those detected in soil gas. Because the data collected were for soil gas and not for ambient air, the qualitative risk assessment does not include estimates of potential exposure concentrations. The following compounds were identified as contaminants of concern for the air pathway:

benzene	freon
1,1-dichloroethylene	acetone
methylene chloride	methyl ethyl ketone
tetrachloroethylene	toluene
vinyl chloride	xylene
	1,2-dichloroethylene

Those compounds listed in the first column are probable carcinogens and were detected in soil gas at concentrations above that considered to pose a health concern in ambient air. However, it is assumed that concentrations in the ambient air would be considerably less than the concentrations detected in soil gas.

Compounds listed in the second column were evaluated for non-carcinogenic health effects. The highest concentration of these compounds detected in soil gas were below levels that would be expected to cause adverse health effects.

In addition to carcinogenic and non-carcinogenic health effects, landfill gas also represents another hazard. Methane generated by decomposing refuse, when mixed with oxygen in the right concentration, is an explosion hazard. Soil gas probes around the landfill detected methane at high enough concentrations to represent an explosion and fire hazard.

To control the methane and other landfill gases listed above, the source control remedy has an active gas collection and treatment system. The gas is collected through a series of wells and piping. The gas is then routed to a flare where it is destroyed by controlled combustion. The gas extraction system was installed in late 1994.

VII. Description of the Remedial Alternatives

A. Groundwater Remedial Action Objectives

Remedial action objectives were developed for this site to provide short and long term protection of human health and the environment, and to meet applicable or relevant and appropriate requirements (ARARs). The site specific groundwater remedial objectives for this landfill are to:

- * Prevent migration of impacted groundwater in violation of NR 140, Wis. Adm. Code
- * Restore groundwater quality to standards in NR 140, Wis. Adm. Code

B. Development of Alternatives

The remedial alternatives were assembled from applicable remedial technology options. The alternatives surviving the initial screening were evaluated and compared with respect to the nine criteria set forth in the National Contingency Plan ("NCP"). In addition to the remedial action alternatives, the NCP requires that a no-action alternative also be considered for the site. The no action alternative serves primarily as a point of comparison for the other alternatives.

C. Groundwater Alternatives

Alternative A - No Action

Alternative B - Pump and Treat Contaminated Groundwater

A complete description of the various alternatives is provided in the Focused Feasibility Study for groundwater. A brief narrative description of each alternative is provided below:

Alternative A: No Action

The No Action alternative is developed to act as a baseline to compare all other alternatives against. This alternative consists of continued monitoring of groundwater at both on-site monitoring wells and off-site private water supply wells. All of the groundwater monitoring wells, and the private water supply wells are considered points of compliance with respect to NR 140. The groundwater quality data collected from the wells will be evaluated after the monitoring plan has been in effect for 5 years. The evaluation will review compliance with NR 140.

Alternative B: Pump and Treat Contaminated Groundwater

Under the pump and treat alternative, five (5) groundwater extraction wells would be installed at various locations downgradient (west) of the landfill. The wells would have a cumulative pumping rate of 50 gallons per minute. The extracted water would be treated and then discharged to an intermittent stream. All of the groundwater monitoring wells, and the private water supply wells are considered points of compliance with respect to NR 140. The groundwater quality data collected from the wells will be evaluated after the monitoring plan has been in effect for 5 years. The evaluation will review compliance with NR 140.

VIII. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

A. Introduction

U.S. EPA has established in the NCP nine criteria that consider health impacts, technical and cost considerations to determine the most appropriate remedial alternative. The criteria are designed to select a remedy that will be protective of human health and the environment, attain ARARs, utilize permanent solutions and treatment technologies to the maximum extent practicable, and be cost effective. The relative performance of each of the

remedial alternatives listed above has been evaluated using the nine criteria set forth in the NCP at 40 CFR 300.430(e)(9)(iii) as the basis of comparison. These nine criteria are summarized as follows:

THRESHOLD CRITERIA - The selected remedy must meet the threshold criteria.

1. Overall Protection of Human Health and the Environment
A remedy must provide adequate protection and describe how risks are eliminated, reduced or controlled through treatment, engineering controls or institutional controls.
2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)
A remedy must meet all applicable or relevant and appropriate requirements of federal/state laws. If not, a waiver may apply.

PRIMARY BALANCING CRITERIA are used to compare the effectiveness of the remedies.

3. Long-term Effectiveness and Permanence
Once clean up goals have been met, this refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time.
4. Reduction of Toxicity, Mobility or Volume Through Treatment
The purpose of this criteria is to anticipate the performance of the treatment technologies that may be employed.
5. Short-term Effectiveness
This refers to the potential adverse impacts on human health and the environment during the construction and implementation period.
6. Implementability
This criteria requires consideration of the technical and administrative feasibility of a remedy, including whether needed services and materials are available.
7. Cost
Capital, operation and maintenance, and 30 year present worth costs are addressed.

MODIFYING CRITERIA deal with support agency and community response to the alternatives.

8. State Acceptance
After review of the Focused Feasibility Study and the Proposed Plan, support agency's concurrence or objections are taken into consideration.
9. Community Acceptance
This criteria summarizes the public's response to the alternative remedies after the public comment period. The comments from the public are addressed in the Responsiveness Summary attached to this ROD.

- B. Evaluation of the Remedial Alternatives for Groundwater

1. Threshold Criteria

The threshold criteria are CERCLA statutory requirements that must be satisfied by any alternative in order for it to be eligible for selection as a CERCLA-quality remedy. These two criteria are discussed below:

a. Overall Protection of Human Health and the Environment

Alternative A - Groundwater concentrations of VOCs have shown a decreasing trend over the past several years. If the trend continues, all VOCs should achieve compliance with standards in NR 140, Wis. Adm. Code and Ch. 160 Stats., within the next couple of years. Drinking water standards for VOCs are only exceeded at wells within 150 feet of the landfill. This water is not currently used for drinking water purposes, nor is it likely to be used for drinking water purposes in the future.

Monitoring of the on-site wells and select off-site private water supply wells will ensure protection of human health and the environment. This alternative complies with this threshold criterion.

Alternative B - This alternative would capture contaminated water located near the landfill, keeping it from spreading any further downgradient. The captured water would be treated to remove contaminants, and then discharged. This alternative complies with this threshold criterion.

b. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Alternative A - Chapter 160, Stats., and NR 140, Wis. Adm. Code contains groundwater quality standards, and sets forth actions that may be required to be taken when groundwater standards are exceeded. One such action, a source control action, has already been implemented at this landfill. Groundwater quality is showing an improving trend. Required actions within NR 140 also include implementation of groundwater monitoring. This alternative complies with applicable or relevant and appropriate requirements because it appears that the source control action that has already been implemented will bring the site into compliance with NR 140 groundwater quality standards within a reasonable period of time.

Alternative B - A remedial action to renovate or restore groundwater quality is a potentially required action listed in NR 140 when a groundwater quality standard is exceeded. Pumping and treating the groundwater is considered an action to renovate or restore groundwater quality.

The federal Safe Drinking Water Act (40 CFR, Part 142) is the federal ARAR which lists federal drinking water standards. Groundwater quality standards listed in ch. 160, Stats., and NR 140, Wis. Adm. Code are at least as stringent as those standards listed in the Safe Drinking Water Act. This alternative complies with applicable or relevant and appropriate requirements.

2. Primary Balancing Criteria

Alternatives which satisfy the two threshold criteria are then evaluated according to the five primary balancing criteria.

a. Long-term Effectiveness and Permanence

Alternative A - This alternative offers long term protection of human health and the environment because groundwater monitoring will continue indefinitely. A decision on changing the monitoring would be made once groundwater data clearly indicate compliance with NR 140 standards.

Alternative B - This alternative offers long term effectiveness since capturing and treating the contamination will remove contaminants from the groundwater.

b. Reduction in Toxicity, Mobility or Volume Through Treatment

Alternative A - The selected remedy doesn't include active treatment of the groundwater contamination. However, groundwater monitoring data indicate that VOC concentrations are decreasing. The cause of this decrease is attenuation, dispersion, degradation and dilution. These processes, acting together with the source control action already taken at the site, will likely cause groundwater VOC concentrations to decrease within a reasonable period of time to a point at which VOC concentrations will comply with standards found in NR 140.

Alternative B - Pumping and treating the groundwater would actively reduce the mobility and volume of contamination through treatment. Compliance with NR 140 standards may be achieved more quickly than under Alternative A.

c. Short-term Effectiveness

Alternative A - There would be no short term adverse effects by implementing this alternative, namely because it is already in place. A groundwater monitoring plan was approved as part of the source control remedy.

Alternative B - This alternative would have only minor short term adverse impacts. Installation of a pump and treat system would require construction of a well and treatment facility. Any mechanical construction has physical risks associated with it. However, these risks can be minimized by using standard engineering and construction practices, and by using a contractor familiar with this construction.

d. Implementability

Alternative A - This alternative has already been implemented. A groundwater monitoring plan was approved as part of the source control remedy and has been implemented since the fall of 1994.

Alternative B - This alternative is easily implemented. Groundwater extraction and treatment systems have been used for many years. There are

many consulting firms and contractors available with the skill to properly design and build this remedy.

e. Costs

Alternative A

Capital Costs - \$0.00

Annual Costs - \$25,000

Net Present Worth - \$344,000

Alternative B

Capital Costs - \$261,000

Annual Costs - \$87,000

Net Present Worth - \$1,458,000

3. Modifying Criteria

a. State Acceptance

The WDNR is the lead agency on this case and authors this ROD.

b. Community Acceptance

No comments were received from the public during the public comment period.

c. Summary

Both of the alternatives meet the threshold, balancing and modifying criteria. The difference between the two is one of complexity and cost. Groundwater VOC concentrations have been decreasing for the past several years. The original landfill cap appears to have substantially reduced the amount of contamination leaving the landfill. The cap was improved as part of the source control remedy. This should further decrease the contamination leaving the landfill.

Given that groundwater quality is improving at an acceptable rate, there isn't any need for a groundwater pump and treat remedial system. With the decreasing trend in VOC concentrations groundwater standards should be achieved sometime in the next couple of years. The pump and treat remedy may only decrease this by a year or less. The marginal benefits of time gained by implementing a pump and treat system aren't warranted when compared to the cost of implementing such a system.

CONCLUSIONS OF LAW

Alternative A will protect human health and the environment by monitoring changes in groundwater quality with time, will comply with all legally applicable, or relevant and appropriate requirements for this final groundwater remedy, and will be cost effective.

A. Protection of Human Health and the Environment

The selected remedy provides protection of human health and the environment by monitoring changes in groundwater quality over time.

B. Attainment of ARARs

The selected remedy complies with NR 140, Wis. Adm. Code by monitoring changes in water quality after a source control remedy has been implemented. Monitoring groundwater is one of the potentially required actions listed in Table 5 of NR 140, Wis. Adm. Code. Contaminant concentrations in groundwater have been decreasing at an acceptable rate for the past several years. Natural attenuation, degradation and dilution are likely causing this improvement in water quality. Should this trend continue, all contaminants should be below their respective preventive actions limits within the next 2-3 years.

C. Cost Effectiveness

The selected remedy provides for overall cost effectiveness. Groundwater quality is improving as a result of the effectiveness of the landfill cap in reducing infiltration into the waste, and the natural processes of degradation, attenuation and dilution in retarding contaminant movement within the groundwater. Since groundwater quality is improving at a reasonable rate, an active and more expensive groundwater remedy of pump and treat isn't necessary. Monitoring of the groundwater quality is the most cost effective remedy.

D. Utilization of Permanent Solutions and Alternative Treatment Technologies

Groundwater monitoring is neither a permanent solution nor an alternative treatment technology. The source control remedy included capping the landfill and it is a permanent solution.

E. Preference for Treatment as a Principal Element

Due to the improving groundwater quality, active groundwater treatment measures aren't necessary.

THE SELECTED REMEDY

Based on an evaluation of the alternatives, the Wisconsin Department of Natural Resources believes that Alternative A, the selected remedy, will be protective of human health and the environment, comply with ARARs, be cost effective, and will use permanent solutions to the maximum extent practicable.

The selected groundwater remedy for the site includes the following:

- * continued monitoring of the groundwater at 12 on-site groundwater monitoring wells and 6 off-site private wells

This monitoring was required as part of the source control record of decision and has already been implemented. A groundwater monitoring plan approved by WDNR was started in the fall of 1994. The approved plan requires the monitoring of VOCs and water levels, and also requires that an analysis of the data take place every five years to determine whether the groundwater is in compliance with NR 140, Wis. Adm. code. This report will be submitted to WDNR for review. The water quality data from each of the wells in the monitoring program will be used to determine compliance with NR 140.

The WDNR has determined that the selected remedy, Alternative A, will achieve the groundwater remedial action objectives for this site.

RESPONSIVENESS SUMMARY

The Department of Natural Resources originally issued the proposed plan for groundwater between March 3, 1995 and April 10, 1995. At that time a fact sheet announcing the proposed plan was sent to all persons living near the site, politicians, news media and all other who have shown an interest in this site. The Department didn't receive any comments from the public during this time frame.

At the time of announcing the proposed plan, the Department failed to place an add in the newspaper indicating the availability of a proposed plan. This newspaper add is a CERCLA requirement. To comply with CERCLA, the Department placed an add in the Baraboo News Republic announcing the proposed plan for groundwater. The add was placed on June 29, 1995 and the public comment period ran between June 29 and August 1, 1995. The Department didn't receive any public comments.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF

Mr., George E. Meyer
Secretary
Wisconsin Department of Natural Resources
101 South Webster Street
Madison, Wisconsin 53707

RE: Sauk County Landfill Superfund Site

Dear Mr. Meyer:

The United States Environmental Protection Agency (U.S. EPA) hereby concurs with the no action remedy in the groundwater Record of Decision (ROD) completed by the Wisconsin Department of Natural Resources (WDNR) for the Sauk County Landfill Superfund Site. This concurrence is in accordance with 40 CFR Section 300.515(e)(2)(i) and (ii). The no action remedy does include continued monitoring of the groundwater at on-site groundwater monitoring wells and off-site private wells.

U.S. EPA understands that this ROD identifies the final remedy and/or decision for the site. The 1994 source control ROD included regrading of the landfill cap and installation of a gas collection system to control the source of groundwater contamination. Since groundwater data collected by Sauk County since the 1980's, demonstrates a significant decrease in volatile organic compounds (VOCs) overtime, U.S. EPA concurs with WDNR's determination that an active groundwater treatment is not necessary at the site. U.S. EPA understands that the long term monitoring of the groundwater will be evaluated after five years to determine the remedy's compliance with the laws and the terms set forth in the 1994 source control ROD.

U.S. EPA congratulates the State of Wisconsin for completing the successful remediation of Sauk County Landfill by using a common sense approach and an expedited timeframe.

Sincerely,

Mitchell D. Jordan

10- Valdas V. Adamkus
Regional Administrator