

RECORD OF DECISION
FINAL REMEDIAL ACTION
Junker Landfill
Town of Hudson
St. Croix County, Wisconsin

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8/20/96

EPA Region 5 Records Ctr.



280667

Site Name and Location

The Junker Landfill (also known as the Pilquist Brothers Sanitary Landfill, Landfill Land Co. Landfill, Sanitary Landfill Site, Inc. Landfill, Junker Sanitary Landfill Inc. Landfill, Klondike Resource Conservation and Recovery System/Program Landfill) is located in the Town of Hudson, St. Croix County, Wisconsin, approximately six miles east of the City of Hudson. The site address is Route 5, Alexander Road and the section location is the SE1/4 of the SE1/4 of Section 13, T29N, R19W. The site occupies 15 acres of a 46 acre tract of land. The site is situated in rural surroundings that are dominated largely by residential and agricultural land uses.

Statement of Basis and Purpose

This decision document represents the selected final remedial action for Junker Landfill in the Town of Hudson, St. Croix County, Wisconsin. This action was developed consistent with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and the National Contingency Plan (NCP). The attached Administrative Record Index identifies the information contained in the administrative record for this site upon which the selection of the remedial action is based.

The remedial investigation and feasibility study for the site were performed voluntarily by a group of waste generators who organized themselves as the Junker Landfill Trust. This site is not listed on the National Priorities List (NPL) and is, therefore, not subject to United States Environmental Protection Agency (US EPA) concurrence on the selected final action.

Assessment of the Site

Actual or threatened releases of hazardous substances from the site, if not addressed by implementing the remedial action selected in this Record of Decision (ROD), may present an imminent and substantial danger to public health, welfare, or the environment.

Description of the Remedy

The selected remedy addresses groundwater contamination, landfill gas movement away from the landfill, and water supply replacement for impacted and potentially impacted private drinking water wells. The selected remedy includes:

- continued maintenance of the existing landfill cover system and perimeter control including repair to existing subsidence areas
- continued operation and maintenance of the existing landfill gas and leachate extraction systems
- creation of deed restrictions on the landfill property
- extension of the existing landfill cover system over an area of uncovered wastes or excavation and relocation of this waste on-site in a previously capped area
- reconstruction of the south perimeter ditch and extension of the existing landfill cover system to the south over an area of presumed surface water infiltration
- installation and maintenance of individual point-of-entry granulated activated carbon water supply treatment units to all households and businesses in the area impacted by the Junker Landfill

- upgrading of the existing gas extraction system
- long-term monitoring of groundwater, leachate, condensate, unsaturated soils, and landfill gas
- supplemental studies of groundwater quality, landfill seeps and internal landfill leachate quantities and flow properties
- implementation of any additional remedial actions that are found to be necessary by the additional studies of groundwater quality, landfill seeps, and internal leachate quantities and flow properties

Statutory Determinations

This final remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost effective. This remedy satisfies the CERCLA preference for remedies that employ treatment that reduce the toxicity, mobility or volume as a principal element because it reduces toxicity, mobility or volume through the operation of an active gas extraction system.

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 every five years after the commencement of the source control elements of the remedial action. Earlier review of the data and additional contingencies are also included in the remedy.

George E. Meyer
George Meyer, Secretary
Wisconsin Department of Natural Resources

8/20/96
Date

RECORD OF DECISION SUMMARY
Junker Landfill
Town of Hudson
St. Croix County, Wisconsin

I. SITE DESCRIPTION, HISTORY, AND ENFORCEMENT ACTIVITIES

The 15-acre Junker Landfill (also known as the Pilquist Brothers Sanitary Landfill, Landfill Land Co. Landfill, Sanitary Landfill Site, Inc. Landfill, Junker Sanitary Landfill Inc. Landfill, Klondike Resource Conservation and Recovery System/Program Landfill) is located in the Town of Hudson, St. Croix County, approximately six miles east of the City of Hudson. The site address is Route 5, Alexander Road and the section location is the SE1/4 of the SE1/4 of Section 13, T29N, R19W. The site is situated in rural surroundings that are dominated largely by residential and agriculture land uses. The landfill is bordered on the west and south by Alexander Road, on the east by a residential farmstead and on the north by undeveloped, wooded property owned and operated by the Girl Scouts of America as a retreat camp. The camp is maintained by a caretaker who lives there permanently. The Union Pacific Railroad Company (previously the Chicago and North Western Railroad) runs parallel to Alexander Road along the southwest side.

The landfill began operation under the ownership of Walfred Pilquist, who previously operated a gravel pit on the 46-acre property. The original site, approved in October 1972 was a 2 acre private solid waste disposal site, licensed only to take wood, glass, paper, and plastic from the Andersen Window Factory. The first license was issued in November 1972.

In 1973, Landfill Land Company became the operator of the landfill and in April 1973 became the landfill owner. On July 28, 1975, Garry Thompson, owner of the Landfill Land Company, received approval to expand operation of the site to a 15-acre sanitary landfill. The site was designed as a natural attenuation landfill. This means that it has no liner or base leachate collection system. The site was to be operated in two phases with a proposed site life of 11 years and a design capacity of 1 million cubic yards. The disposed volume is estimated to be between 1 and 1.2 million cubic yards. Wastes disposed of at the site included municipal, commercial, and industrial materials.

In 1977, James Junker of Junker Sanitary, Inc. began leasing the landfill. Junker, under the name of Junker Sanitary Landfill Inc., operated the site from 1977 until January 5, 1987, at which time he terminated his lease agreement with Garry Thompson. When Junker terminated his lease, the Wisconsin Department of Natural Resources (WDNR) denied Thompson's request to the WDNR to relinquish the license back to Thompson. Although, it was no longer a licensed landfill, Thompson proceeded to operate the landfill during the months of June and July 1987 under the name Klondike Resource Conservation and Recovery System/Program Landfill.

In 1987 the WDNR was awarded an injunction against him and Garry Thompson filed a bankruptcy petition with the federal bankruptcy court of St. Paul, MN in July 1988.

In 1985, the WDNR published a report showing that the Junker Landfill was causing contamination to the underlying groundwater. Based on private well

sampling results, the WDNR identified an area of potential groundwater contamination.

Because the site was abandoned by the owners and operators of the landfill, the WDNR installed a clay cap on the landfill in the late 1980's. The WDNR then initiated post-closure care of the landfill, which consisted of maintaining the landfill cover, fencing and surface water controls, monitoring groundwater (using nearby private wells and 8 on-site monitoring wells) and surface water, and monitoring the movement of landfill gasses through subsurface soils. In the early 90's, due to off-site detections of landfill gas, the WDNR installed an emergency active gas extraction system with leachate collection capabilities.

In September 1991, the WDNR established a Special Well Construction Area in the Town of Hudson for the areas in the vicinity of both the Junker Landfill and a downgradient industrial spill site. This designation allows the WDNR to control the installation of new residential wells within the areas of groundwater contamination.

Periodic sampling of residential wells in the area has been performed by the WDNR and the United States Environmental Protection Agency (USEPA). Sampling to date has shown that several homes in the area have shallow wells contaminated with unsafe levels of volatile organic compounds (VOCs), mainly the solvents trichloroethene (TCE) and tetrachloroethene (PCE). Results of a comprehensive sampling event performed in October 1994 showed that 44 of the private wells in the area near the Junker Landfill had detectable levels of TCE or PCE.

Following implementation of the emergency source control measures (capping, gas migration) in the early 1990's, the WDNR proceeded to score the landfill site for listing on the Superfund National Priorities List (NPL). However, in late 1994, a group of 22 entities that generated waste, which was ultimately disposed of in the Junker Landfill, stepped forward and volunteered to investigate the contamination that was believed to have originated at the landfill. These Potentially Responsible Parties (PRPs) formed the Junker Landfill Trust. The Junker Landfill Trust hired a consultant and completed a Remedial Investigation (RI) in July 1995 and a Feasibility Study (FS) in February 1996. The WDNR issued a Proposed Plan for the site in June 1996.

The proposed plan recommended the selection of the following components of the remedial action:

- continued maintenance of the existing landfill cover system and perimeter control (fencing), including repairs to existing subsidence areas in the cover
- continued operation and maintenance of the existing landfill gas and leachate extraction systems
- creation of deed restrictions on the landfill property
- extension of the existing landfill cover system over an area of uncovered wastes
- reconstruction of the south perimeter ditch and extension of the existing landfill cover system to the south over an area of presumed surface water infiltration
- installation and maintenance of individual point-of-entry granulated activated carbon water supply treatment units to all households and businesses in the area impacted by the Junker Landfill

- installation and maintenance of a perimeter gas migration control system
- implementation of a long-term monitoring program of groundwater, leachate, condensate, unsaturated soils and landfill gas
- implementation of supplemental studies of groundwater quality, landfill seeps and internal landfill leachate quantities and flow properties
- implementation of any additional remedial actions that are found to be necessary by the additional studies of groundwater quality, landfill seeps and internal leachate quantities and flow properties

Information submitted during the public comment period caused the WDNR to change the recommendations outlined in the proposed plan regarding the best, most cost effective approach to controlling landfill gas migration, leachate generation, and the area of uncapped waste. Factors considered by the WDNR in making its decision are listed in Section VIII, Summary of Comparative Analysis of Alternatives.

In April 1996, due to breakdowns in negotiations with the Junker Landfill Trust, the WDNR signed an agreement with the previous landfill operator - James Junker, his operator and transporter companies - Junker Recycling, Junker Sanitary Landfill, Inc., and Junker Sanitation Services, Inc., and the subsequent purchasers of these companies - United Waste Systems, Inc. and United Waste Transfer, Inc. These entities, also PRPs for the site, formed the Landfill Remediation Trust (LRT).
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On July 17, 1996, following a 30-day public comment period, the Consent Decree for performance of the Remedial Design and Remedial Action was entered by Judge Shabaz of the United States District Court for the Western District of Wisconsin.

In the interim, civil suits have been filed by both Trusts against over 500 businesses, industries and municipalities that sent waste to the Junker Landfill. The lawsuits have been combined and are scheduled to be tried in the District Court in March 1997.

II. COMMUNITY PARTICIPATION

An information repository has been established at the Town of Hudson Public Library, 911 Fourth Street, Hudson, Wisconsin. The administrative record is made available to the public at the WDNR's Western District office, 1300 W. Clairemont Avenue, Eau Claire, Wisconsin.

A Community Relations Plan for the site was finalized in the work plan for the RI dated December 1994, revised January 1995. During performance of the RI/FS, the Junker Landfill Trust performed, with WDNR oversight and support, all community relations. This consisted of a pre-investigation public meeting and periodic fact sheets mailed to all residents in the Town of Hudson area and other interested parties throughout the local and government community.

On August 16, 1994, the WDNR held a public information meeting at the St. Croix County Government Center and issued a fact sheet explaining the history of the landfill, activities completed and planned for the site, and a description of the Superfund process. The purpose of the informational meeting was to discuss the WDNR's interest in scoring the Junker Landfill for possible listing on the NPL and to describe the work that still needed to be

performed at the site. This meeting was attended by WDNR and US EPA staff and approximately 100 members of the interested public.

On November 7, 1994, the WDNR issued a mailing to realtors, builders, lenders, and contractors that work in the Town of Hudson area. This mailing consisted of a copy of the August 1994 Fact Sheet, health information prepared by the Wisconsin Division of Health, and a map of the current limits of the Special Well Construction Area. The mailing was precipitated by a recent increase in property transfers in the area and a general lack of information being provided to potential home/land buyers.

On December 14, 1994, the Junker Landfill Trust issued a fact sheet describing who they were and what they would be doing in the future. On January 3, 1995, the Junker Landfill Trust issued a follow-up fact sheet explaining the upcoming investigation and inviting the public to a meeting to be held later that month. On January 10, 1995, the Junker Landfill Trust hosted a public information meeting to present the scope of work for the RI. The meeting was attended by WDNR staff and approximately 50 people. A fact sheet was provided by the Trust at this meeting.

Additional fact sheets were issued throughout 1995 and into early 1996, by the Junker Landfill Trust. The September 1995 fact sheet described the findings of the investigation. The March 1996 fact sheet described the results of the FS and the recommended components of the remedy.

In May 1996 the WDNR mailed out over 400 copies of the Junker Landfill Proposed Plan to residents in the Town of Hudson as well as interested parties in Wisconsin and Minnesota. The mailing included information regarding a public comment period on the proposed cleanup remedy, as well as an upcoming public informational meeting.

Press releases, regarding the proposed plan and informational meeting were sent to the River Falls Journal, the Hudson Star Observer, the Stillwater Gazette, and the St. Paul Pioneer Press. The public meeting to explain the Proposed Plan and to receive public comments was held on May 21, 1996, at the Hudson Public High School Cafeteria. Approximately 30 people attended this meeting. The public comment period was from May 15, 1996, to June 15, 1996. All comments which were received by the WDNR prior to the end of the public comment period, including those expressed verbally at the public meeting, were considered in making the final decision and are addressed in the attached Responsiveness Summary, which is part of this ROD.

To date there has been no formal organization of residents living near the site. On June 13, 1996, a group of residents met with WDNR staff to discuss water treatment devices and the merits of continued provision of bottled water. These residents were part of a group of 19 residents that had provided the WDNR with a petition requesting that bottled water, along with filters, continue to be made available.

Based upon comments received during the public comment period, WDNR has revised some components of the selected alternative. WDNR has modified the means in which to deal with the area of uncapped waste on the northwest side of the landfill, the ponded leachate, and the landfill migration away from the landfill to the south.

A modification of Option GWS-4 Extend Cover is viewed as the best means of implementing a final source control for the uncapped waste on the northwest side of the landfill. The modification is specific to allowing

reconsolidation of waste on the landfill and then capping, as opposed to the previous recommendation of capping in place. A comment submitted during the public comment period pointed out that capping in place may create additional drainage problems for surface water that don't currently exist and that use of this material to fill subsidence areas will result in a cost savings. This modification is equally protective and also meets all Applicable or Relevant and Appropriate Requirements (ARARs).

Option LG-4 Upgrading the Active Gas Extraction System was selected over LG-5 Installation of a Soil Vapor Barrier System. Based on comments submitted during the comment period for the Proposed Plan, it is the opinion of more than one independent consultant (with the concurrence of the WDNR) that upgrading the system can be done effectively and efficiently, and at a lower cost than estimated by the authors of the FS. As indicated in the proposed plan, LG-4 and LG-5 are equally protective and both meet all ARARs. Therefore, the Department could select either of the alternatives, after considering the balancing and modifying criteria. (These criteria are described in section VIII.)

Prior to implementing Alternative GWS-5 - Extend Cover South to Alexander Road, additional investigations relative to the leachate will be performed. Based on comments submitted during the comment period for the Proposed Plan, it is the opinion of more than one independent consultant (with the concurrence of the WDNR) that additional leachate monitoring wells should be installed and a controlled aquifer test on the leachate should be performed. The data collected will be used to evaluate leachate ponding within the landfill. This evaluation will be performed prior to designing the Alternative GWS-5, the perimeter ditch liner. This information will also be used in the event that leachate extraction, Alternative GWS-6, is implemented at a later date.

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 remedy selection process. All the documents referenced above are available in the Administrative Record maintained at the WDNR Western District Headquarters, 1300 W. Clairemont Avenue, Eau Claire, Wisconsin.

III. SCOPE AND ROLE OF THE RESPONSE ACTION

Contaminated groundwater, the waste within the landfill, and migration of landfill gas away from the landfill pose a threat to human health and the environment because of the current and future risks identified. Contaminated groundwater at the site poses an actual current threat to human health and the environment because of the risks from possible ingestion of the impacted groundwater. Contaminated soil at the site poses a possible future threat because of the risks of possible ingestion of the soils should the land use at the site change. Migrating landfill gas poses a possible current threat because of the risk explosion due to explosive levels of methane gas present in the subsurface soils beyond the landfill site boundary and adjacent to residential areas.

The selected components of the remedial action address the principal threats posed by site conditions by eliminating the potential for direct contact with contaminants of concern in the waste, groundwater, and landfill gas and reducing the levels of contamination in the groundwater.

IV. SUMMARY OF SITE CHARACTERISTICS

A. **Topography** - The site is located in an area that is characterized by rolling hills and a hummocky terrain. The landfill is located in a old sand and gravel pit (glacial till) and ground elevations near the landfill range from 900 to 1060 feet above mean sea level.

B. **Surface Water Hydrology** - The site is located in the St. Croix River basin, which has a drainage basin of approximately 7,000 square miles and receives an average rainfall of 32 inches per year of precipitation. Drainage in the area is generally toward the southwest to the St. Croix River, which ultimately flows into the Mississippi River near Prescott, Wisconsin, 20 miles southwest of the site. The Willow River is located northwest of the landfill and flows into the St. Croix River six miles west of the site.

The surface water features on-site include three detention ponds which collect runoff from the surface of the landfill through a series of ditches and culverts. Off-site there are many small closed basins and associated marshy areas, such as immediately south of the landfill and in the vicinity of County Trunk Highway A. With the exception of Shank Lake, a 10-acre lake 3/4 of a mile north of the site, there are no major surface water bodies in the area.

C. **Geology/Hydrogeology** - The geology near the landfill consists of approximately 30 to 80 feet of unconsolidated glacial till material, primarily coarse-grained sand with some gravel, and some silt layers. Below the unconsolidated material three different bedrock units were identified.

Near the landfill, the unconsolidated till is overlying remnant St. Peter Sandstone. The thickness of the St. Peter ranges from 5 feet north of the site to 40 feet south of the site. West of the site, the St. Peter is absent.

The next bedrock unit is the Prairie du Chien group. This unit consists of fractured dolomite with possible solution channels and sinkholes. It is approximately 220 feet thick in the vicinity of the site.

Below the Prairie du Chien bedrock is the Cambrian-aged Jordan Sandstone, a white/gray, medium- to coarse-grained quartz sandstone. The entire thickness of the Jordan was not penetrated by monitoring wells, but is reported to be about 100 feet thick near the site.

West of the site, approximately 3 miles, is an area of faults. The faults have been reported to have offsets of more than 200 feet in this area. West of the site, there was no evidence of the Prairie du Chien unit in well borings. The geology consists only of sand and gravel to a depth of more than 200 feet.

In the vicinity of the landfill, the water table is approximately 130 feet below ground surface, under unconfined conditions in the upper portions of the Prairie du Chien. Some private well logs in the area indicate groundwater flow in the unconsolidated glacial material above the Prairie du Chien, suggesting a highly eroded bedrock surface. Further west, in the area of CTH A, where the Prairie du Chien formation is absent, groundwater again flows in the unconsolidated glacial material.

Regional groundwater flow direction is west towards the St. Croix River. Local variation in flow direction in the northwest is due to the influence of the Willow River. In the vicinity of the site, the horizontal gradient averages 0.003 ft/ft to the west-northwest and the hydraulic conductivity was found to be, on average, 21 feet/day.

During the RI, piezometers near the site indicate a downward vertical gradient of 0.03 foot per foot, however, a review of historical water elevation data shows an upward vertical gradient has been present in the past. A downgradient well nest was observed to have an upward gradient of 0.0003 foot per foot.

D. Groundwater Contamination - Based upon data collected as part of the RI, a total of eighteen volatile organic compounds (VOCs) were detected in groundwater monitoring wells and nearby private drinking water wells. The most common VOCs detected are: TCE (in 21 of the 35 wells sampled), PCE (in 5 wells), freon-11 (in 15 wells) and freon-12 (in 16 wells). Of the 18 VOCs detected, only one, trichloroethylene (TCE), exceeded enforcement standards (ESs) found in chapter NR 140, Wisconsin Administrative Code, during the sampling events in 1994 and 1995. One other VOC, tetrachloroethylene (PCE), exceeded the ch. NR 140, Wis. Adm. Code PAL.

A total of 70 private wells surrounding the landfill were tested for VOCs in October 1994. Some of these wells, as well as new private wells, were also sampled during the RI in 1995.

The wells in which TCE exceeded the ES of 5 ug/l since 1994 are as follows:

Monitoring wells:	MW-3, MW-5, MW-7, WW-13
Residential wells:	942 Alexander Road
	881 E. Hwy 12
	888 E. Hwy 12
	890 E. Hwy 12
	898 E. Hwy 12
	756 Holden Lane
	783 Holden Lane
	792 Holden Lane
	932 LaBarge Road
	953 LaBarge Road
	959 LaBarge Road
	763 McCutcheon Road
	795 McCutcheon Road
	981 Tanney Lane
	982 Tanney Lane

The RI report summarizes the PAL exceedances as well as all other recent and historic detections of VOCs.

Monitoring wells MW-3, MW-5, MW-9, WW-11, WW-13, and WW-15a, and leachate were also sampled and monitored for semi-volatile organic compounds (SVOCs) and PCB/pesticides. Neither SVOCs or PCB/pesticides were found to be contaminants of concern in the vicinity of the landfill.

Metals were analyzed for at six monitoring wells (MW-3, MW-5, MW-9, WW-11, WW-13, and WW-15A) and three private wells (786 McCutcheon, 963 LaBarge Road, and 980 CTH A). Of the 19 metals analyzed, only six were frequently detected. These were iron, manganese, barium, copper, lead, and zinc. Only lead, iron, and manganese exceeded their respective ES. Lead was found to exceed the ES in MW-5 next to the landfill, in the round one sample, but was not detected in round two. Metals were not found to be a significant concern in the groundwater.

E. **Landfill Gas** - Currently an active gas extraction system is operating at the landfill. This system consists of 17 gas extraction wells with leachate pumping capabilities, piping, a blower, and a ground flare.

The landfill gas at the blower has routinely been sampled for VOCs. The VOCs with the highest concentrations are:

Benzene	Vinyl Chloride
Ethyl Benzene	Chloroethane
Toluene	Methylene Chloride
Xylene	cis-1,2-Dichloroethene
1,3,5-Trimethylbenzene	Trichloroethene (TCE)
1,2,4-Trimethylbenzene	Tetrachloroethene (PCE)
Freon 11	Freon 12

Condensate from the gas extraction system has also been sampled for VOCs. The VOCs with the highest concentrations are:

Benzene	Chloroform
Ethyl Benzene	1,1-Dichloroethane
Toluene	1,2-Dichloroethane
Xylene	cis-1,2-Dichloroethane
1,3,5-Trimethylbenzene	Trichloroethene (TCE)
1,2,4-Trimethylbenzene	Tetrachloroethene (PCE)
Isopropylbenzene	Methylene Chloride
1,2-Dichloropropane	Napthalene
p-Isopropyltoulene	Styrene

On-site gas monitoring probes have historically detected methane, despite the operation of the gas extraction system. A geoprobe soil gas survey which was completed during the RI revealed an area of landfill gas migration. Landfill gas at combustible concentrations for methane was detected off-site to the south approximately 1,000 feet.

F. **Leachate within the Landfill** - Leachate samples were collected during the RI from five wells (GEWS 7-10 and LHW-1) and analyzed for VOCs, SVOCs, PCB/pesticides and metals. Analyses showed low level detections of compounds from each of the group of analytes. Groundwater ESs were exceeded for tetrahydrofuran, total xylene, arsenic, iron, and manganese in all five samples.

Leachate levels measured in leachate head wells and gas extraction wells indicate a leachate buildup in the southeast corner of the landfill.

V. SUMMARY OF SITE RISKS

A. Human Health Risks

A screening level risk assessment was completed for the site by the PRP group as part of the FS. The purpose of the assessment was to identify human health hazards posed by environmental contamination from the site. The risk assessment evaluates current as well as future potential exposures to site related contamination. Sample results from the RI were used to evaluate all environmental pathways with potential human exposure routes.

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

- * the remedy selected for the landfill must comply with state standards

- * state standards for air and water quality are protective of human health and the environment
- * EPA guidance documents state that exceedances of state standards, as opposed to the site representing an unacceptable risk, are a cause for action at Superfund municipal landfill sites.

For source related risks, review of existing controls as well as the presumptive remedy approach reduced the level of effort required for the risk assessment. The groundwater, surface soil/sediment, and air pathways were evaluated as possible exposure routes for contaminants. The groundwater data came from on- and off-site monitoring wells and off-site private water supply wells. On-site sediment was not evaluated due to the previously installed cover system which limits any contact runoff would have with waste. Landfill gas was evaluated based on samples from the gas extraction system blower.

For off-site groundwater, the screening level assessment identified potential TCE and PCE exposures through water ingestion, dermal contact, and inhalation. Specific risk calculations were not conducted as part of the FS. Since some of the impacted water supplies exceed the 5 ppb maximum contaminant level for TCE and PCE, it was known that unacceptable health risks exist for some private well users. Also, given the widespread nature of the contamination, it is possible that other users may be exposed to unacceptable levels. Presented below is a brief summary and conclusions of the assessment:

1. Groundwater Pathway

The contaminants identified in groundwater above state standards since 1994 include: tetrachloroethylene (PCE) and trichloroethylene (TCE), both of which are currently found in drinking water supplies. TCE and PCE are possible human carcinogens. Persons who drink groundwater every day, over a lifetime, with the highest concentration of these contaminants detected in on-site monitoring wells and off-site private drinking water wells are at an increased risk of getting cancer. Consequently for the water supply component of this remedy, these two compounds are the contaminants of concern.

The exposure or potential exposure to the contaminants listed above can come about through the following potential pathways or routes of exposure: dermal contact with or inhalation or ingestion of contaminated water supplies. This site is located in a rural area of St. Croix County. Surrounding land use is primarily single family residential and agricultural. The nearest population center is the City of Hudson, which lies approximately six miles west of the site. It is estimated that 70 existing homes could potentially be impacted by drinking water contamination. The potential exists for further development which would increase this number well above 70.

Under the existing conditions, the release of TCE and other contaminants from the waste disposal site to the groundwater poses unacceptable environmental risks and potential human health risks. These releases and risks will be addressed if all components of this remedial action are implemented. The Water Supply Replacement component should completely remove all TCE and PCE exposures through drinking water and, therefore, should meet State and Federal requirements for providing safe drinking water included in the Federal Safe Drinking Water Act (40 CFR 141 and 143) and State administrative code chs. NR 809 and 812.

2. Surface Soil and Sediment Pathway

Because most of the landfill has been capped in compliance with chapter NR 504, Wis. Adm. Code and, with the exception of the on-site detention ponds, there are no surface water bodies at the site, the qualitative risk assessment concludes that there are no adverse health effects expected from exposure to surface soil and sediments.

A small area of waste on the northern side of the landfill has never been capped. This area was not qualified with respect to risk due to the requirements of NR 506, Wis. Adm. Code, which is an ARAR for the site. This area will be addressed by the presumptive remedy of capping, either in-place or reconsolidated into a previously capped waste cell within the landfill.

Additionally, a deed restriction for the site, which prohibits disturbing the integrity of the final cover system will provide another level of protection.

3. Air Pathway

Landfill gas samples were collected at the blower, as part of the operation and maintenance of the active gas extraction system at the landfill. Samples of blower gas are not indicative of ambient air quality. It is expected that concentrations in ambient air would be considerably less than those detected at the blower due to thermal destruction at the flare. Because the data collected were 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:

TCE	Freon-11	Benzene
PCE	Freon-12	Toluene
cis 1,2-Dichloroethene	Methylene Chloride	Ethylbenzene
Vinyl Chloride	Chloroethane	Xylene
	1,3,5-Trimethylbenzene	
	1,2,4-Trimethylbenzene	

Some of these compounds are probable carcinogens and were detected in the blower gas at concentrations above levels 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 the blower gas. In addition, the landfill gas is combusted following extraction from the landfill.

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 concentrations, is an explosion hazard. Soil gas probes around the landfill detected methane at high enough concentrations to represent an explosion and fire hazard.

The previously installed active gas extraction and treatment system acts to control the methane and other landfill gases listed above. The gas is collected from the landfill mass 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 1992 and has continually operated since that time.

The results of the investigation indicate that the existing gas extraction system is not effective in preventing all off-site migration

of landfill gas. Therefore, the qualitative risk assessment concludes that there is the potential for adverse health effects from exposure to the landfill gas off-site. To control the landfill gas, an upgrade to the existing system will be designed to prevent all landfill gas migration off-site, in compliance with State ARARs.

B. Ecological Risk Assessment

Due to the lack of surface water or soil exposure routes for contaminated materials and the fact that groundwater contamination is low from an ecological standpoint, this site does not pose significant ecological threats.

An area of small seeps, possibly leachate, next to the northern most sedimentation pond has been noted. This liquid, which has not been investigated, may pose an ecological threat to local plants and animals which use the pond.

C. Rationale for Further Action

Actual or threatened releases of hazardous substances from this site, if not addressed by the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

VI. ENVIRONMENTAL STANDARDS NOT MET AT THE SITE

The Junker Landfill does not currently meet the following applicable State environmental standards:

NR 140, Wis. Adm. Code

Administrative Code which establishes standards for groundwater quality and actions taken to restore groundwater quality. Tables 5 and 6 within NR 140 list potential actions to be taken when PALs and ESs are exceeded. One potential action listed in both tables includes a remedial action to prevent or minimize the further release of the substance to groundwater. Both PAL and ESs are exceeded in the area impacted by the landfill.

NR 445, Wis. Adm. Code

Administrative Code which regulates the discharge of hazardous air contaminants. Some landfill gas continues to migrate beyond the property boundary at unknown levels.

NR 502.04(1)(a)(3) and NR 504.04(4)(d), Wis. Adm. Code

Administrative codes that prohibit landfills to be located, operated, or maintained where the facility will cause a detrimental effect on groundwater quality or will cause or exacerbate an attainment or exceedance of any preventive action limit or enforcement standard at a point of standards application as defined in ch. NR 140. Groundwater standards have been exceeded at the site.

NR 502.04(1)(a)(5) and NR 504.04(4)(e), Wis. Adm. Code

Administrative codes that prohibit landfills to be located, operated, or maintained where the facility will cause the migration and concentration of explosive gases...in the soils or air at or beyond the facility property boundary in excess of 25 percent of the lower explosive limit for such gasses at any time.

NR 506.07(4), Wis. Adm. Code

Administrative code that requires effective means to be utilized to prevent the migration of explosive gasses generated by the waste fill. At no time shall the concentration of explosive gases in the soils

outside the limits of filling or air within 200 feet of or beyond the property boundary exceed the lower explosive limit (LEL) for such gasses. Landfill gas is migrating beyond the property boundary above the LEL.

NR 506.08(3), Wis. Adm. Code

Administrative Code that requires that landfills must be capped and sloped to allow surface water runoff. The area of waste on the northern edge of the landfill is not capped.

NR 506.08(6), Wis. Adm. Code

Administrative code that requires all facilities which accepted greater than 500,000 cubic yards of waste to collect and combust hazardous air contaminants.

NR 508.04, Wis. Adm. Code

Administrative code that requires a response when a groundwater standard is attained or exceeded at any groundwater monitoring well.

NR 812, Wis. Adm. Code and WDNR issued health advisories

Administrative Code which regulates private drinking water and health advisories associated with areas of known contamination. In addition to posing unacceptable risks to human health, the TCE impacted water supply contamination does not meet the applicable standards of NR 812 and WDNR issued health advisories.

Once the groundwater source control and landfill gas components of the remedial action have been implemented, the Junker Landfill will be in compliance with chs. NR 445 and 506. Implementation of these will also help to achieve compliance with chs. NR 140, 502, 504, and 508, Wis. Adm. Code. Implementation of the water supply replacement component will achieve compliance with ch. NR 812, Wis. Adm. Code.

VII. DESCRIPTION OF THE REMEDIAL ALTERNATIVES

A. Remedial Action Objectives

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

- Eliminate risk associated with direct contact of waste
- Eliminate human exposure to contaminated water supplies through inhalation, ingestion or dermal exposure, and to comply with applicable drinking water standards
- Prevent all migration of landfill gas in violation of chs. NR 502, 504, and 506, Wis. Adm. Code
- Control the release of on-site landfill gas to the atmosphere in compliance with NR 445
- Minimize the generation of leachate at the site and reduce leachate levels
- Reduce the concentration of contaminants that exceed ch. NR 140, Wis. Adm. Code groundwater quality standards at monitoring wells and private drinking water wells outside the waste management area.
- Prevent migration of impacted groundwater in violation of chapter NR 140, Wisconsin Administrative Code

- Restore groundwater quality to standards in ch. NR 140, Wis. Adm. Code within a reasonable period of time

B. Development of Alternatives

The purpose of the groundwater portion of the remedy is to return groundwater at the site to its beneficial use, as an actual or potential groundwater source, within a reasonable period of time. Contaminated groundwater will be returned to its beneficial use when the concentrations of groundwater meet the groundwater cleanup standards found in NR 140, Wis. Adm. Code. The groundwater cleanup standards are the PALs. The groundwater cleanup standards are applicable requirements for the groundwater cleanup.

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 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. A complete description of the various alternatives is provided in the Final Feasibility Study. A brief narrative description of each alternative and the estimated costs are provided below.

C. Groundwater Source Control Alternatives

Since waste will remain on-site, the WDNR will review the data at five year increments to determine if the remedy is still protective, or whether additional remedial measures need to be taken under all of the alternatives that were evaluated except Alternative GWS-1.

Alternative GWS-1 (also in FS as GWA-1, WS-1, LG-1) - No Action

The No Action alternative is developed to act as a baseline to compare against all other alternatives. This alternative consists of no further action at the landfill. The existing remedial actions would no longer be maintained. The landfill cap would not be maintained, nor would perimeter control. The landfill gas extraction system would be shut down. The in-home methane monitors would be removed. No landfill gas monitoring would be performed. Aquifer restoration would be left to naturally attenuate over time. Monitoring of progress in reaching NR 140 groundwater standards, monitoring of private drinking water wells, and the provision of bottled water would all cease.

There is no capital or annual operation and maintenance (O&M) costs associated with this alternative.

Alternative GWS-2 (also GWA-2, WS-2, LG-2) - Continued Level of Effort

The present landfill systems would continue to be operated and maintained. Access to the site would be restricted through perimeter control. This alternative will use source control of contaminants by the existing remedial actions (landfill cap and gas/leachate extraction system) to minimize additional impacts from the landfill and natural attenuation to address off-site impacts. The groundwater quality data collected from the wells will be evaluated over time, for compliance with NR 140.

There is no capital cost for this alternative and the annual operation and maintenance (O&M) cost is estimated at \$231,100. The total present worth cost for this alternative is \$3,455,370. These costs include the tasks performed under GWA-2, WS-2 and LG-2.

Alternative GWS-3 - Institutional Controls

The institutional control is the creation of deed restrictions on the landfill property to ensure no disturbance to the final cover and various collection systems.

The estimated cost of implementing this action is \$31,800. There are no annual operation & maintenance (O&M) costs. The total present worth cost for this alternative is \$31,800.

Alternative GWS-4 - Extend Cover

This alternative addresses the area of uncapped waste by extending the landfill cap to this area or reconsolidating the waste beneath an area with an existing cover system.

The estimated engineering and construction cost of implementing either of these designs is \$70,920. There are no annual operation and maintenance (O&M) costs. The total present worth cost for this alternative is \$70,920.

Alternative GWS-5 - Extend Cover South to Alexander Road

This alternative addresses leachate generation by improving surface water drainage along the south side of the landfill and adding a barrier layer to prevent seepage into the ditch.

The estimated engineering and construction cost of implementing this action is \$168,480. There are no additional annual operation and maintenance (O&M) costs. The total present worth cost for this alternative is \$168,480.

Alternative GWS-6 - Use or Modify Leachate Collection System

This alternative involves using the existing leachate collection system or modifying the system to remove as much of the ponded leachate as possible.

The estimated engineering and construction costs of implementing this action range from \$42,000 to \$344,800. Annual operation and maintenance (O&M) cost is estimated between \$56,000 to \$210,100. The total present worth cost for this alternative is \$831,800 to \$2,451,000.

Alternative GWS-7 - Pump and Treat Contaminated Groundwater

This alternative involves containment of contaminated groundwater by extraction from the area immediately downgradient of the landfill, and the area to the south of the landfill. This water would be treated and reinfiltreated.

The estimated engineering and construction costs of implementing this action is \$696,600. Annual operation and maintenance (O&M) cost is estimated at \$88,800. The total present worth cost for this alternative is \$1,945,100.

D. Groundwater Aquifer Restoration Alternatives

Alternative GWA-2 - Continued Level of Effort

The present landfill systems would continue to be operated and maintained. Monitoring of groundwater at on- and off-site monitoring wells, as well as private wells for changes in the degree and extent of contamination over time will also continue. All of the groundwater monitoring wells, and the private water supply wells are considered

points of compliance with respect to NR 140. This alternative will use source control of contaminants by the existing remedial actions (landfill cap and gas/leachate extraction system) to minimize additional impacts from the landfill and natural attenuation to address off-site impacts. The groundwater quality data collected from the wells will be evaluated over time, for compliance with NR 140.

There is no capital cost for this alternative and the annual operation and maintenance (O&M) cost is estimated at \$231,100. The total present worth cost for this alternative is \$3,455,370. These costs include the tasks performed under GWS-2, GWA-2 and LG-2.

Alternative GWA-3 - Pump and Treat the Shallow Aquifer within the Area Affected by the Junker Landfill

This alternative would extract and treat ALL of the contaminated water to WDNR groundwater standards. This alternative involves a series of pumpout wells, treatment and infiltration basin.

The estimated engineering and construction costs of implementing this action is \$2,137,200. Annual operation and maintenance (O&M) cost is estimated at \$333,600. The total present worth cost for this alternative is \$6,838,900.

E. Water Supply Alternatives

Alternative GWS-2 (also in FS as GWA-2, WS-2, LG-2) - Continued Level of Effort

Bottled water would continue to be provided to all residents of the area where the potential exists for groundwater to be impacted by the landfill. Monitoring of groundwater at on- and off-site monitoring wells, as well as private wells for changes in the degree and extent of contamination over time will also continue.

There is no capital cost for this alternative and the annual operation and maintenance (O&M) cost is estimated at \$231,100. The total present worth cost for this alternative is \$3,455,370. These costs include the tasks performed under GWS-2, GWA-2 and LG-2.

Alternative WS-3 - Institutional Controls

Institutional controls would provide a means for requiring, prior to occupancy of the residence or business, either the installation of wells with deep casings or installation of a treatment device, whenever new private drinking water wells are proposed in the area where groundwater could be potentially impacted by the landfill.

There is no capital or annual operation and maintenance (O&M) costs associated with this alternative.

Alternative WS-4 - Supply Individual Water Treatment Units

This alternative involves installing and maintaining point-of-entry, granulated activated carbon treatment units on all existing and new homes and businesses within the area where groundwater could be potentially impacted by the landfill.

The estimated engineering and construction costs of implementing this action is \$305,600. Annual operation and maintenance (O&M) cost is estimated at \$52,700. The total present worth cost for this alternative is \$1,159,500.

Alternative WS-5 - Replace Shallow Wells with Deep Wells

This alternative includes replacing impacted wells with deeper wells and monitoring other wells to ensure that they remain clean.

The estimated engineering and construction costs of implementing this action is \$478,300. Annual operation and maintenance (O&M) cost is estimated at \$57,000. The total present worth cost for this alternative is \$1,426,600.

Alternative WS-6 - Residential Cluster Wells

This alternative includes replacing a group of wells with a single deep well and monitoring other wells to ensure that they remain clean.

The estimated engineering and construction costs of implementing this action is \$2,318,400. Annual operation and maintenance (O&M) cost is estimated at \$16,800. The total present worth cost for this alternative is \$2,555,200.

Alternative WS-7 - Public Water Supply

This alternative involves constructing, operating, and maintaining a community well to serve the area where groundwater could be potentially impacted by the landfill.

The estimated engineering and construction costs of implementing this action is \$8,002,900. Annual operation and maintenance (O&M) cost is estimated at \$347,600. The total present worth cost for this alternative is \$12,902,500.

F. Landfill Gas Alternatives

Alternative LG-2 - Continued Level of Effort

The present landfill systems would continue to be operated and maintained. The in-home methane meters would continue to be maintained and landfill gas monitoring would continue. This alternative will use source control of contaminants by the existing remedial actions (landfill cap and gas/leachate extraction system) to minimize additional impacts from the landfill.

There is no capital cost for this alternative and the annual operation and maintenance (O&M) cost is estimated at \$231,100. The total present worth cost for this alternative is \$3,455,370. These costs include the tasks performed under GWS-2, GWA-2 and WS-2.

Alternative LG-3 - Additional Gas Extraction Wells

This alternative includes installation of additional gas extraction wells for the purpose of removing additional volumes of landfill contaminants in the form of a gas in order to prevent eventual migration to groundwater. These wells will be installed within the landfill in an area identified a source of VOCs. This alternative is in reality a source control action in which the source is reduced through withdrawal of contaminants in a vapor phase prior to leaving the landfill in a liquid phase as leachate.

The estimated engineering and construction costs of implementing this action is \$90,800. Additional annual operation and maintenance (O&M) costs are estimated at \$3,000. The total present worth cost for this alternative is \$133,400.

Alternative LG-4 - Upgrading Existing Gas Extraction System

This alternative includes installing additional gas extraction wells and piping to the existing system in order to prevent all gas migration away from the landfill. The design of the upgrade includes an evaluation of the number and placement additional gas extraction wells which will create overlapping radii of influences to the extent that no landfill gas will migrate away from the landfill.

The estimated engineering and construction costs of implementing this action is \$287,100. Additional annual operation and maintenance (O&M) costs are estimated at \$13,200. The total present worth cost for this alternative is \$473,100.

Alternative LG-5 - Soil Vapor Barrier System

This is a gas extraction system installed beyond the waste limits to form a barrier to gas movement. The system involves gas extraction wells, piping, and a blower.

The estimated engineering and construction costs of implementing this action is \$343,300. Additional annual operation and maintenance (O&M) costs are estimated at \$28,800. The total present worth cost for this alternative is \$749,200.

VIII. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

A. Introduction

U.S. EPA has established in the NCP nine criteria that balance health, 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 to 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 how fast a remedy achieves protection. Also, it weighs 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 Final Feasibility Study and the Proposed Plan, support agency's concurrence or objections are taken into consideration. The State is the lead agency. As this site is not on the NPL; there is no support agency.

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** The nine criteria evaluation is as follows:

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**
Alternatives GWS-1, GWA-1, WS-1, LG-1 (no action) are not protective of human health and fail to meet this threshold criterion because groundwater is contaminated above drinking water levels, an area of uncapped waste exists and landfill gas is migrating at explosive levels. These alternatives will not be evaluated further.

Alternatives GWS-2, GWA-2, WS-2, LG-2 (continued level of effort) are not protective of human health and the environment by themselves. Continued operation and maintenance of the landfill systems is not fully protective without upgrades to address landfill gas migration and the area of uncapped waste. Provision of bottled water and maintenance of the in-home methane meters are protective until other components of the remedy are in place and effectively operating, but do not constitute a permanent water supply remedy or a landfill gas migration remedy. A monitoring program for on- and off-site monitoring wells and private drinking water wells is a necessary component of the selected remedy, but is not protective by itself because groundwater is contaminated above drinking water levels, an area of uncapped waste exists and landfill gas is migrating off-site at explosive levels.

Alternative GWS-3 (institutional controls) is protective by ensuring that the final cover and collection systems are not disturbed, and as such may be a necessary component of the remedy; however, it is not protective by itself because groundwater is contaminated above drinking water levels, an area of uncapped waste exists and landfill gas is migrating off-site at explosive levels.

Alternative GWS-4 (extend cover) options is protective by capping either in-place or reconsolidating below the existing cover system, and as such may be a necessary component of the remedy; however, it's not protective by itself because groundwater is contaminated above drinking water levels and landfill gas is migrating off-site at explosive levels.

Alternative GWS-5 (extend cover to Alexander Road) is protective by limiting leachate generation which may ultimately affect groundwater contamination as well as increased landfill gas migration, and as such may be a necessary component of the remedy; however, it is not protective by itself because groundwater is contaminated above drinking water levels, an area of uncapped waste exists and landfill gas is migrating off-site at explosive levels.

Alternative GWS-6 (use or modify leachate collection system) is protective by withdrawing ponded leachate which, if left in the landfill, may ultimately affect groundwater contamination as well as increased landfill gas migration, and as such may be a necessary component of the remedy; however, it is not protective by itself because groundwater is contaminated above drinking water levels, an area of uncapped waste exists and landfill gas is migrating off-site at explosive levels.

Alternative GWS-7 (pump and treat contaminated groundwater near the site) is protective by containing the groundwater near the site thus preventing continued migration of contaminated groundwater, and as such may be a necessary component of the remedy; however, it is not protective by itself because off-site groundwater is contaminated above drinking water levels, an area of uncapped waste exists and landfill gas is migrating off-site at explosive levels.

Alternative GWA-3 (pump and treat all contaminated groundwater) is protective by removing and treating all contaminated groundwater, and as such may be a necessary component of the remedy; however, it is not protective by itself because an area of uncapped waste exists and landfill gas is migrating off-site at explosive levels.

Alternative WS-3 (institutional controls) is protective by either continuing the existing requirements of the SWCA by requiring a deep well or issuing a variance for a shallow well and making sure that newly installed drinking water wells are sampled for VOCs and the well owner is either advised not to drink the water if it is impacted or that treatment is required. As described, this may be a necessary component of the remedy; however, it is not protective by itself because groundwater is contaminated above drinking water levels, an area of uncapped waste exists and landfill gas is migrating off-site at explosive levels.

Alternative WS-4 (supply individual water treatment units) is protective because all private water supplies would be treated to safe drinking water levels, and as such may be a necessary component of the remedy; however, it is not protective by itself because an area of uncapped waste exists and landfill gas is migrating off-site at explosive levels.

Alternatives WS-5 (replace shallow wells with deep wells), WS-6 (residential well clusters) and WS-7 (public water supply) are all protective because water supplies would come from a clean portion of the aquifer, and as such may be a necessary component of the remedy; however, none are protective by themselves because an area of uncapped waste exists and landfill gas is migrating off-site at explosive levels.

Alternative LG-3 (additional gas extraction wells) is protective by maximizing the removal of VOCs from the landfill, thereby, limiting the amount of contamination that may leach into the aquifer, and as such may be a necessary component of the remedy; however, it is not protective by itself because groundwater is contaminated above drinking water levels, an area of uncapped waste exists and landfill gas is migrating off-site at explosive levels.

Alternatives LG-4 (upgrade existing gas extraction system) and LG-5 (soil vapor barrier system) are both protective by eliminating off-site migration of landfill gas and as such may be a necessary component of the remedy; however, neither is protective by itself because groundwater is contaminated above drinking water levels, an area of uncapped waste exists and landfill gas is migrating off-site at explosive levels.

If, following implementation of the upgrade of the gas extraction system, landfill gas is detected in the subsurface soils, beyond the property boundary, additional action will need to be taken in order to be protective. At a minimum, this additional action will be implementation of LG-5 Installation of a Soil Vapor Barrier System and GWS-6 Leachate Extraction.

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

Alternatives GWS-1, GWA-1, WS-1, LG-1 (no action) do not comply with ARARs for this site and are not an acceptable solution. Federal and state requirements would not be met under this plan of action. Consequently, these alternatives are not evaluated further.

Alternatives GWS-2, GWA-2, WS-2, LG-2 (continued level of effort) do not comply with NR 140, Wis. Adm. Code, or other ARARs for this site by themselves, however, when included as a component of the remedy they meet requirements for: the presumptive remedy actions already in place (capping...), monitoring, temporarily providing clean water, and temporarily protecting against landfill gas migration. Consequently, these ARARs would be complied with.

Alternatives GWS-4, GWS-5, GWS-6, GWS-7, and GWA-3 comply with source control ARARs when used as a component of the remedy.

Alternative WS-3, WS-4, WS-5, WS-6, and WS-7 comply with water replacement ARARs when used as a component of the remedy.

Alternatives LG-3, LG-4, and LG-5 comply with landfill gas control ARARs when used as a component of the remedy.

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**

Source control alternatives GWS-2, GWS-3, GWS-4, GWS-5, GWS-6, and GWS-7 all provide for long-term/permanent reduction of the source as the point of generation for both groundwater contamination and landfill gas migration. Each of these alternatives will need to be used in conjunction with a water supply alternative, and a landfill gas control alternative for permanence and full effectiveness.

Aquifer restoration alternative GWA-3 provides an effective, permanent solution. Alternative GWA-2 provides assurances through monitoring that groundwater standards are met. GWA-2 may be incorporated into GWA-3 following implementation.

Water supply replacement alternatives WS-2, WS-4, WS-5, WS-6, and WS-7 all provide acceptable long-term solutions. Bottled water is by far the weakest long-term solution because of its practical implementation problems, that it does not completely eliminate TCE/PCE exposure, and it is not considered a permanent water supply replacement by the WDNR's Water Supply Program. Private well replacement by either individual wells or clusters carry a long-term risk of contamination migrating deeper and eventually impacting all or some of the replacement wells. Treatment of water supplies should pose no long term concerns when operated and maintained properly over time needed to restore groundwater to NR 140 standards. Institutional controls are effective and can be permanent, but must be used in conjunction with another water supply alternative.

Landfill gas alternatives LG-4 and LG-5 both provide acceptable long-term solutions. LG-3 provides a long-term permanent solution for maximizing the removal of VOCs at the source, but may have to be used in conjunction with another landfill gas control alternative to prevent ALL landfill gas from migrating away from the landfill. LG-2 provides short-term assurance that landfill gas is not an explosion hazard in a specific home, but should only be used until a more permanent action is implemented.

b. **Reduction in Toxicity, Mobility, or Volume Through Treatment**

Alternatives GWS-4 and GWS-5 will reduce the movement of leachate to groundwater and surface water. Alternative GWS-6 will treat leachate at a POTW. Alternatives GWS-7 and GWA-3 will pump and treat contaminated water which will reduce the mobility and volume of contamination through treatment. GWS-2, LG-3, LG-4 and LG-5 will reduce the toxicity, mobility and volume of contaminants by both maximizing the source removal of VOCs as well as treating the landfill gas in a flare system. WS-4 provides some treatment of

the groundwater at the point of use. None of the remaining alternatives provide for treatment of the contamination.

c. Short-term Effectiveness

Alternatives GWS-2, GWA-2, WS-2, and LG-2 currently provide short-term limitations to exposure of groundwater and landfill gas.

Alternatives GWS-3 and GWS-4 would be effective to quickly reduce any possible exposure to the waste.

Alternatives GWS-4, GWS-5 and GWS-6 would be effective to quickly limit the leachate available to impact groundwater.

Alternatives GWS-7 and GWA-3 in conjunction with additional source control measures would reduce the time to restore the groundwater to standards/protective levels.

Alternative WS-4 has a good short term effectiveness because treatment units could be installed in a relatively short time frame.

Alternatives WS-5, WS-6, WS-7 have a longer construction time when compared with WS-4. In addition, construction impacts can be more extensive. WS-7 will also have administrative issues related to a development of a sanitary district which will need to be resolved and more complicated design issues.

Alternatives LG-3, LG-4, LG-5 can all be implemented within a relatively short time frame.

d. Implementability

All options are technically implementable using readily available engineering practices. Legal issues may develop that may slow the implementation of some of the alternatives.

e. Costs

The costs for the alternatives are presented with each alternative. The present worth costs specified under Section VII are presented using 5 percent as the discount rate. These costs are used for comparison purposes only and should be viewed as estimates which are intended to range from -30 to +50 percent of the actual cost.

The estimated costs eliminated alternative WS-7 as being an unacceptable high cost compared to the benefits received and the availability of another alternative, WS-4, which was equally able to provide clean water. Alternatives GWS-6, GWS-7, and GWA-3 were also eliminated due to the high costs and the availability of other alternatives used together to achieve the same benefits. The decisions regarding elimination due to cost are based on the information available to date. Future decisions regarding implementation of additional remedial actions will be reevaluated relative to costs and effectiveness.

3. MODIFYING CRITERIA

a. State Acceptance - The WDNR is the lead agency on this case and issues this ROD.

b. **Community Acceptance**

The substantive comments received by WDNR are listed in the attached Responsiveness Summary. In general the public is concerned about the effectiveness of the filters and prefers that bottled water continue to be provided after the filters are installed. Citizens are also concerned about the long-term monitoring and the ability to detect changes in contaminants or the introduction of additional compounds.

IX. THE SELECTED REMEDY

Based upon consideration of the requirements of CERCLA, as amended by SARA, and the NCP, the detailed analysis of the alternatives and public comments, the Wisconsin Department of Natural Resources, after consultation with EPA, believes that a combination of alternatives will be the most appropriate remedy for this site. Furthermore, based on an evaluation of the alternatives, the Wisconsin Department of Natural Resources believes that a combination of the alternatives 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 WDNR has determined that the selected remedy will achieve the remedial action objectives for this site. The selected components of the remedy for the site include:

1. Continuation of operation and maintenance of the existing remedial actions. The existing landfill cap and site access control will continue to be maintained by performance of on-going inspections, monitoring, and repair work. The in-home methane meters will continue to be operated and maintained until the landfill gas migration control component has been implemented and fully operational in preventing all landfill gas from migrating away from the landfill. Bottled water will continue to be provided until the water supply replacement component has been implemented. The existing active gas extraction system will continue to be maintained by performance of on-going inspections, monitoring and repair work. This includes maintenance of all aspects of the gas system that currently serve to remove leachate from the landfill. Routine monitoring of the on- and off-site groundwater monitoring wells and private wells is also included.
2. Implementation of on-site institutional controls, including land use/deed restrictions. These will be designed to prevent unauthorized excavation, groundwater use or installation of water supply wells on the landfill site. These will also restrict interference with the on-site components of the remedy.
3. Capping the waste on the north side of the landfill that is beyond the current limits of the landfill cover system. This may be achieved by either installing a landfill cover system in-place or reconsolidating waste to an area where a landfill cover system currently exists. Regardless of where the cover system is installed, it will consist of a six (6) inch thick grading layer, two (2) feet of compacted clay, a thirty (30) inch thick drainage and rooting zone layer, and a six (6) inch thick layer of topsoil, extending the clay cap that was placed on the landfill in the late 1980's. The top slope steepness will be determined during the design, based on site conditions and rule requirements in effect at the time. Currently, top slope requirements are 5 percent. The cover will be seeded, as necessary, to establish new vegetation.

Capping materials needed for these activities may come from on-site if an adequate quantity meeting specifications exists or from an approved borrow source. If no borrow source is readily available, an investigation which meets the standards of s. NR 512.15, Wis. Adm. Code will be performed.

4. Repair areas where settlement has occurred in the existing cap. Repair work will require that the existing cover system be removed where settlement has occurred and the area filled with clean material or reconsolidation of waste from the uncapped area on the north side of the landfill. The cover system will then be replaced.
5. Installation of additional leachate monitoring wells, performance of a controlled aquifer test on the leachate, and evaluation of leachate ponding within the landfill. This evaluation will be performed prior to designing the perimeter ditch liner as described in paragraph 6.
6. Reconstruction of the surface water drainage ditch on the southern perimeter of the landfill, and installation of a clay or geomembrane liner, if needed. Design investigations will examine the limits of the clay in this area and evaluate the extent to which additional material will be needed. It may be determined during the design investigation that the ditch is adequately lined with existing clay material and that only regrading of the drainage ditch on the southern perimeter will be needed to maximize runoff into one of the on-site detention ponds.
7. Additional evaluation of leachate seeps that have been identified along the east side of the landfill, adjacent to the detention pond. This evaluation will consist of a chemical analysis of the liquid along with an assessment of the risk associated with the seeps. If unacceptable risk exists or if the seep is deemed a result of ponded leachate within the landfill, the assessment will include a determination as to what additional remedial action should be taken.
8. Implementation of a long-term environmental monitoring program to evaluate the effects of the remedial actions and eventual compliance with ch. NR 140 Wis. Adm. Code groundwater standards. At a minimum, this will involve routine VOC monitoring of groundwater, collected from monitoring wells and private wells, and gas monitoring probes located beyond the waste boundaries. This monitoring program shall include an evaluation of contaminant concentrations in the groundwater collected from WW-13 and 888, 890, 881, and 898 E. Highway 12. VOC monitoring of these wells shall begin immediately. Unless the results of the evaluation show a significant improvement in groundwater quality beyond the property boundary, showing a trend toward meeting ch. NR 140, Wis. Adm. Code PALs within a reasonable amount of time, additional source control and/or groundwater actions shall be implemented to achieve ch. NR 140 Wis. Adm. Code PALs within a reasonable period of time. At a minimum, additional source control shall include a plan for removing ponded leachate, if present in depths of more than 2 feet from the landfill.

At a minimum, the effectiveness of the source control components shall be shown by a reduction of Trichloroethylene (TCE) in groundwater below the NR 140 Enforcement Standards (ESs) in the monitoring and private wells listed above within one-year following completion of construction. If, within the one-year timeframe, VOCs in the groundwater are reduced

but have not met the ESSs, the Department will review the consultants estimate of the time it will take based on the first year of data and determine if it supports the estimated cleanup time from the FS and if it does, additional time to monitor will be allowed. If the level of contaminants in the groundwater remain at current/background levels then additional source control and/or groundwater actions must be implemented.

A long-term detailed environmental monitoring program will be developed during the remedial design. The monitoring program will address the following objectives:

- a. Cap inspections to identify for repair any erosion, differential settlement, or leachate seepage.
- b. Methane and VOC monitoring of off-site gas monitoring probes to verify the effectiveness of the source control components of the remedy.
- c. Monitoring of all existing and new groundwater monitoring wells to determine the effects of the source control components of the remedy.
- d. Quarterly or more frequent VOC monitoring of the following private wells for the purpose of documentation of effects of source control:
 - i. 888 E. Highway 12
 - ii. 890 E. Highway 12
 - iii. 881 E. Highway 12
 - iv. 898 E. Highway 12
- e. VOC monitoring of deep private wells to confirm that the deeper aquifer remains unimpacted.
- f. VOC monitoring of private wells for the purpose of documenting the limits of the SWCA
- g. Monitoring of private and monitoring wells for the purpose of documenting that contaminant types and levels remain consistent with historical data and that the water supply replacement component remains protective.
- h. Monitoring of the levels of leachate ponded within the landfill.
- i. Monitoring of the leachate quality ponded within the landfill to be used to compare with off-site groundwater quality.
- j. Monitoring of the condensate and landfill gas removed from the landfill for the purpose of documenting removal of contaminants from the waste mass.
- k. Additional monitoring required as part of the water replacement component of the remedy.

The existing monitoring well network will be evaluated during the design to determine if any wells need to be abandoned and/or replaced. This evaluation will examine the need for additional wells based on the water

quality results from new development east of CTH A and the additional private well sampling west of CTH A.

9. Installing and maintaining point-of-entry granulated activated carbon water treatment units in all new and existing residences and businesses within the area impacted by the Junker Landfill if the owners permit installation. This area currently includes all homes, approximately 70, within the Special Well Construction Area (SWCA) east of CTH A as well as the business at 720 Norflex Drive. Additional monitoring will be conducted west of CTH A and in the vicinity of 720 Norflex Drive to verify the limits of the impacted area. The results of this monitoring may show that water treatment units will be required outside of the currently designated SWCA or within the SWCA west of CTH A. In addition, areas identified as being impacted by the Junker Landfill during routine monitoring will be included in this action. Treatment devices must be approved by Department of Industry, Labor and Human Relations (DILHR) and installation of the treatment device must be approved by the WDNR Private Water Supply Section. The WDNR Private Water Supply Section will determine the necessary maintenance and routine monitoring requirements.
10. Implementation of institutional controls to prevent residents from using groundwater as a source of drinking water without installation of a deeper well or an approved treatment device as described above in number 9. This may be a local zoning ordinance tied to an occupancy permit for the structure or continued oversight of the SWCA by the WDNR.
11. Installation of additional gas extraction wells within the waste mass to maximize VOC removal from the waste. These wells will be located in an area of waste with concentrated VOCs. Installation and operation of these wells may be adequate for effectively controlling landfill gas migration away from the landfill, rendering further upgrade to the system unnecessary. If this is the case, it must clearly be demonstrated through VOC and methane monitoring of off-site gas monitoring probes that landfill gas is not migrating away from the landfill. If this action cannot control landfill gas migration, as indicated by off-site detections of methane gas or VOCs, additional action will be required as provided in paragraph 8.
12. Installation of additional gas extraction wells for the purpose of eliminating all landfill gas migration away from the landfill. This upgrade may be accomplished by the extraction wells installed under paragraph 11 above. Once the gas extraction system (upgraded, if necessary) is operational, it must clearly be demonstrated through VOC and methane monitoring of off-site gas monitoring probes that landfill gas is not migrating away from the landfill. If this action does not control landfill gas migration, additional action will be required. Additional action may be installation of a soil vapor barrier system as described in the FS for the site.
13. Monitoring of leachate levels and leachate quality within the landfill. This information will be used to compare with the groundwater quality data collected under paragraph 8 above, to determine if the ponded leachate is directly affecting groundwater quality near the landfill. If either of the following situations occur, additional remedial action will be required:

- a. If sampling of monitoring/private wells indicate new detections of parameters that are detected in the leachate (currently or under a new monitoring program) or
- b. If sampling of the leachate indicates an order of magnitude or more increase in the parameters which are currently detected in both the leachate and the monitoring/private wells.
- c. The results of the groundwater evaluation described in paragraph 8 above, do not show a significant improvement in groundwater quality beyond the property boundary, showing a trend toward meeting ch. NR 140, Wis. Adm. Code PALs within a reasonable amount of time.

At a minimum, the additional remedial action will include a plan for removing ponded leachate, if present in depths of more than 2 feet, from the landfill as described in FS as Alternative GWS-6.

X. CONCLUSIONS OF LAW

The selected remedy will protect human health from the exposure pathways identified in the Summary of Site Risk Section of this ROD, complies with all legally applicable and relevant and appropriate requirements for this action, and is cost effective. This action is designed to be final; it represents the best balance of tradeoffs among alternatives with respect to pertinent criteria, given the scope of the remedial action.

XI. STATUTORY DETERMINATION

The selected remedy will satisfy the requirements of Section 121 of CERCLA to:

- a. protect human health and the environment,
- b. comply with ARARs,
- c. be cost effective,
- d. utilize permanent solutions and alternate treatment technologies to the maximum extent practicable, and
- e. satisfy the preference for treatment as a principal element of the remedy or document in the ROD why the preference for treatment was not satisfied.

The implementation of the following components of the final remedy satisfies the requirements of CERCLA as detailed below:

A. Protection of Human Health and the Environment

The selected components of the remedy provide protection of human health and the environment by:

- reducing the generation of leachate by maintaining the existing landfill cap (GWS-2) which will reduce the time needed to attain compliance with NR 140 groundwater standards;
- providing an interim level of protection by maintaining in-home methane meters until such time as all gas migration from the landfill has been eliminated (GWS-2/LG-2);
- eliminating the explosive risk associated with landfill gas migration away from the site (LG-4 or LG-5);
- providing an interim level of protection by continued provision of bottled water until such time as drinking water has been adequately treated (GWS-2/WS-2);

- eliminating the potential exposure to contaminated drinking water through the use of whole-house treatment of the groundwater on all new and existing homes within the area potentially impacted by the landfill (WS-4);
- reduce the risk associated with a resident drinking untreated groundwater unknowingly (from a newly installed private drinking water well without a whole-house water treatment device installed by implementing an institutional control which requires a treatment device on all new homes and businesses prior to occupancy (WS-3);
- providing an interim means of monitoring leachate levels within the landfill until the leachate levels within the landfill decrease as a result of an action that cuts off the likely source of infiltration into the landfill (GWS-2)
- reducing the generation of leachate by eliminating an area of infiltration beyond the limits of the existing cap (GWS-5) which will reduce the time needed to attain compliance with NR 140 groundwater standards;
- eliminating the potential risk associated with direct contact with the area of uncapped waste by either capping in place (GWS-4) or reconsolidating the waste and capping (modified GWS-4);
- reducing the potential leachate generation through the area of uncapped waste by either capping in place (GWS-4) or reconsolidating the waste and capping (modified GWS-4) which will reduce the time needed to attain compliance with NR 140 groundwater standards;
- eliminating the potential risk associated with direct contact with any area of waste already capped by implementing a deed restriction that prohibits any activity that interferes with the integrity of the cap which serves as a barrier to contact (GWS-3);
- maximizing source removal of VOCs and eventual attainment of NR 140 groundwater standards, by installing additional gas extraction wells in an area of concentrated VOCs within the waste mass (LG-3) which will reduce the time needed to attain compliance with NR 140 groundwater standards and the time required for groundwater to be treated at the point of use (private wells);
- providing a monitoring program in which compliance with NR 140 groundwater standards can be determined (GWS-2/GWA-2)
- providing a monitoring program in which levels and types of contaminants in private wells can be monitored to confirm that whole-house treatment continues to be maintained and protective (GWS-2/WS-2);
- providing a monitoring program in which compliance with NR 504.04(4)(e), Wis. Adm. Code for landfill gas migration beyond the property line (GWS-2/LG-2) can be documented;

B. Attainment of ARARs

The selected remedy will be designed to meet all applicable, or relevant and appropriate requirements under federal and state environmental laws. Since the Junker Landfill is a PRP-lead, state oversight cleanup, no CERCLA on site permit exemption is available. All permits and approvals required to implement the remedy must be obtained and strictly complied with. The primary ARARs that will be achieved by the selected alternative are:

1. Action specific ARARs

Wisconsin Statutes, Chapters 144 and 162 [to be renumbered chs. 280 through 299, effective January 1, 1997]

Wis. Adm. Code ch. NR 103 - Wetlands. Utilization of any proposed borrow source shall be evaluated in accordance with this applicable administrative code.

Wis. Adm. Code NR 141 - Monitoring Well Requirements - These are applicable standards for new or replacement monitoring wells. Abandonment requirements apply to any existing or new well.

Wis. Adm. Code NR 149 - Lab Certification Program. Water samples shall be analyzed at a laboratory that meets ch. NR 149, Wis. Adm. Code, which is applicable.

Wis. Adm. Code ch. NR 445 - Discharge of Hazardous Air Contaminants. These requirements are applicable to the design of the landfill gas collection system at the site.

Wis. Adm. Codes, ss. NR 502.04(1)(a)(5), NR 504.04(4)(e), NR 504.08, NR 506.07(4) and NR 507.22 - Landfill Gas Control. Standards for landfill gas control and monitoring practices. These requirements are applicable to the landfill gas collection system at the site.

Wis. Adm. Codes chs. NR 504, NR 506, NR 514, and NR 516 - Landfill Closure Requirements. The minimum slope requirements in ch. NR 506 are applicable. The minimum slope requirements in ch. NR 504 for the cover system are relevant and appropriate.

Wis. Adm. Codes ss. NR 502.04(1)(a)(3), NR 504.04(4)(d), NR 508.04 and NR 140 - Groundwater Monitoring Requirements. Substantive requirements for monitoring plans must meet these applicable requirements.

Wis. Adm. Code s. NR 506.08(5) - Deed Notation. Relevant and appropriate Administrative Code which requires landfills to have notation recorded on the deed for the landfill property. The notation in the deed shall in perpetuity notify any potential purchaser of the property that the land has been used as a landfill and its use is restricted to prevent disturbing the integrity of the final cover, liner or any other components of the containment system or the function of the monitoring systems.

Wis. Adm. Code s. NR 512.15 - Borrow Reports. Applicable requirements for soil borrow reports.

Wis. Adm. Code NR 600 series - Hazardous Waste Requirements. This code was enacted to regulate the transportation, storage, and disposal of hazardous waste. This code is only applicable, or relevant and appropriate for this site if waste is to be moved off-site.

Wis. Adm. Codes NR 700-736 - Investigation and Remediation of Environmental Contamination - This code specifies applicable standards and procedures pertaining to the identification, investigation, and remediation of sites. Notification of private well results under s. NR 716.13(9), Wis. Adm. Code are specifically noted. Identification of the site by posting of a sign under ch. 714 is also noted.

Wis. Adm. Code ch. NR 812 - Private Drinking Water and Health Advisories. This code is applicable to areas of known contamination.

Resource Conservation and Recover Act (RCRA), Subtitle C - Hazardous Waste Requirements. Subtitle C are the federal regulations enacted for hazardous waste. Hazardous waste may have been placed in the landfill, however, the disposal took place prior to promulgation of Subtitle C and there is no specific information to describe that waste. This regulation is neither applicable, nor relevant and appropriate for this site at this time.

RCRA, Subtitle D - Solid Waste Requirements. Subtitle D are the federal regulations enacted for solid waste disposal. The regulations are applicable to facilities which accepted waste after October 9, 1991. The Junker landfill closed in 1987. The Subtitle D regulations are neither applicable, nor relevant and appropriate for this site because the Subtitle D cover system would be no more effective for reducing infiltration and surface soil exposure than the existing cover system. The Department reserves the right to re-examine the relevance and appropriateness of the cover system requirements in the future.

Wis. Adm. Code 108 and 211; 40 CFR 403 - Pretreatment standards. These regulations prohibit discharges to POTWs which pass through or interfere with the operation or performance of the POTW. The requirements of these regulations are applicable to the discharge of leachate and/or condensate at a POTW.

2. Chemical Specific ARARs

Clean Air Act [42 U.S.C. 7401 et seq.]; Wisconsin Statutes, sections 144.30 to 144.426 [to be renumbered 285.01 to 285.87, effective January 1, 1997]

40 CFR 50; Wisconsin Administrative Code, chs. NR 404, NR 415 to NR 449 - Emission Standards. Standards for emission of pollutants into ambient air and procedures for measuring specific air pollutants. Cap construction could cause air emissions of VOCs, particulates, fugitive dust, or other contaminants which could adversely affect human health and the environment. The design of the component of the remedy for landfill gas migration, must reduce air emissions to acceptable levels or provide treatment to satisfy these applicable standards.

Wis. Adm. Code ch. NR 809 - Maximum Contaminant Levels (MCLs). MCLs establish drinking water standards for potential and actual drinking water sources. The selected remedy is intended to achieve compliance with MCLs and non-zero Maximum Contaminant Level Goals.

Wis. Adm. Code NR 140 - Groundwater Quality Standards. This administrative code establishes groundwater quality standards including Preventive Action Limits (PALs), Enforcement Standards (ESs) and (Wisconsin) Alternative Concentration Limits (WACLs). The remedy is designed to reduce the amount of contamination entering groundwater and

achieve compliance with applicable standards found in NR 140, at and beyond the waste boundary, within a reasonable period of time. To the extent that the Department subsequently determines that it is not technically or economically feasible to achieve PALs, s. NR 140.28 provides substantive standards for granting exemptions from the requirement to achieve PALs. Such exemption levels may not be higher than the ESs.

Federal 40 CFR 141 and 143 - National Primary and Secondary Drinking Water Standards - Applicable, nationwide drinking water standards.

C. **Cost Effectiveness**

The selected remedy provides for overall cost effectiveness. The costs associated with source control are fully justified in order to minimize the time required for groundwater to reach NR 140 groundwater standards.

The additional cost to use or modify the leachate collection system is not warranted at this time. In the event that leachate levels do not decrease as a result of the source control measures or compounds which currently exist in the leachate are detected in the groundwater, the additional costs of implementing GWS-6 (Use or Modify Leachate Collection System) will be warranted.

The additional cost of either groundwater pump and treat alternative, GWS-7 or GWA-3, is not warranted at this point. The evaluation showing that the existing landfill cap and gas extraction system are having a beneficial effect on groundwater quality provides for flexibility in choosing from the remedial alternatives. The implementation of the additional source control actions are expected to result in further reductions of the contaminants of concern in the groundwater. If contaminant levels do not decrease to NR 140 groundwater standards within one year following implementation of LG-4 or LG-5, the need for implementing additional Aquifer Restoration or Groundwater Source Control alternatives will be evaluated by the WDNR.

It is expected that implementation of LG-5 is adequate to eliminate landfill gas migration away from the landfill and that the added cost of LG-4 is not warranted. If LG-5 is not successful in controlling landfill gas, the additional cost of implementing LG-4 and GWS-6 (leachate removal) will be warranted.

With respect to replacement of water supplies, the components, WS-3 and WS-4, were selected instead of WS-7 due to the significant increase in cost to provide a public water supply. The Department typically allows treatment of water supplies only when no other practical alternative exists. In this case the significant difference in cost was prohibitive and made alternative WS-7 impractical at this time.

D. **Utilize Permanent Solutions and Alternative Treatment Technologies**

The selected components of the remedial action represent the best balance of alternatives with respect to the nine evaluation criteria. The cap, deed restrictions and the posting of warning signs reduce the direct contact exposure. Maintenance of the existing cap and capping (either in place or reconsolidated) of the uncapped waste reduces the amount of leachate generated within the site. The modifications to the south drainage ditch also reduces the amount of leachate generated within the site. Maintenance of the active gas extraction system as well as additional wells in the area of concentrated VOCs and upgrades

to minimize landfill gas migration provides for removal and treatment of the dominant threat to groundwater (i.e., VOCs) and will effectively control other landfill gasses. Potential future threats will be addressed, if necessary, through the contingency aspect of the remedy.

E. Preference for Treatment as a Principal Element

By treating the waste mass with active gas extraction, the remedy satisfies the statutory preference for remedies that employ treatment of the principal contaminant threat to permanently and significantly reduce toxicity, mobility, or volume through treatment.

RESPONSIVENESS SUMMARY

This Responsiveness Summary has been prepared to meet the requirements of Sections 113 (k) (2) (B) (iv) and 117(b) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), which requires the United States Environmental Protection Agency (EPA) or the state, on state lead sites, to respond "... to each of the significant comments, criticisms, and new data submitted in written or oral presentations" on a proposed plan or draft Record of Decision for the remedial action. The Responsiveness Summary addresses concerns by the public and potentially responsible parties (PRPs) in written and oral comments received by the state regarding the proposed source control remedy at the Junker Landfill site.

A. OVERVIEW

I. BACKGROUND/PROPOSED PLAN

The Junker Landfill is located in the Town of Hudson, St. Croix County, Wisconsin, approximately six miles east of the City of Hudson. The site address is Route 5, Alexander Road and the section location is the SE1/4 of the SE1/4 of Section 13, T29N, R19W. The site occupies 15 acres of a 46 acre tract of land. The site is situated in rural surroundings that are dominated largely by residential and agricultural land uses.

Partial remedial actions have capped the landfill and installed a gas extraction system with leachate removal. Additional source control and groundwater remedial measures are planned for the landfill. This site is believed to be responsible for the water supply contamination problems addressed in this action.

The Proposed Plan (PP) for the site was made available for public comment in early May 1996. The Proposed Plan calls for making available, monitoring, and maintaining point-of-entry granulated activated carbon treatment units on private wells. This will provide a long-term safe water supply to the approximately 70 existing private wells. Additional actions to be taken involve operating and maintaining the existing source control systems, implementing institutional controls for the landfill property, addressing continued methane gas migration issues, controlling leachate generation and removal, and continuing a long-term environmental monitoring program and a contingency plan to address future releases of VOCs from the site.

II. PUBLIC COMMENT PERIOD

A public comment period was held from May 15, 1996, to June 15, 1996, to allow interested parties to comment on the Proposed Plan in accordance with Section 117 of CERCLA. In addition, a public meeting was held on May 21, 1996, at the Hudson High School Cafeteria. The Wisconsin WDNR of Natural Resources (WDNR) presented the Proposed Plan, answered questions and accepted verbal comments from the public. No written comments were submitted at that time. During the public comment period, WDNR received written comments from four separate entities concerning the Proposed Plan. On June 12, 1996, the WDNR received a petition signed by 19 residents. In addition, WDNR staff met on June 13, 1996, with a group of home/well owners with the most contaminated wells. At this meeting, the WDNR received verbal comments which were documented in the notes from the meeting.

Comments from the residents focused primarily on the water supply replacement action and the desire by some residents to have bottled water continue to be available at no cost to them. All comments which were received by the WDNR prior to the end of the public comment period, including those expressed verbally at the public meeting, were considered in making the final decision and are addressed in this Responsiveness Summary.

B. COMMUNITY INVOLVEMENT

Public interest regarding the site has been mixed. The community generally seems in favor of the filters; however, a group of well owners, which have the highest levels of contaminants, are concerned about the effectiveness of the filters and prefer that in addition to the filters, bottled water continues to be made available. Significant comments were prepared by residents in the area and consultants for the Junker Landfill Trust, the Landfill Remediation Trust, and Nor Lake, Inc.

C. SUMMARY OF SIGNIFICANT PUBLIC COMMENTS

Comments received during the public comment period are summarized below. Some of the comments are paraphrased to effectively summarize them in this document.

Comment 1

Residents/well owners within the area impacted by the Junker Landfill commented that all contaminants have not been identified and, therefore, the Point-of-Entry Granulated Activated Carbon (POE GAC) filter may not be removing all contamination from their drinking water.

Response

The WDNR, with the assistance of USEPA and the Junker Landfill Trust (old PRP Group), has investigated the groundwater contamination, believes it has fully characterized the contaminants that are affecting the groundwater in the vicinity of the Junker Landfill and have identified the contaminants of concern. The WDNR acknowledges these concerns and will address them in the long-term monitoring for the site. On a routine basis, selected site wells will be tested for contaminants other than those currently known to be impacting the groundwater.

Comment 2

Residents/well owners within the area impacted by the Junker Landfill commented that the POE GAC filters may become saturated and the homeowner may not realize it and begin drinking contaminated water. The scenario under which this may be possible is, if an outside tap was left on for an extended period of time without knowledge of the homeowner and the filter reached capacity, the homeowner may unknowingly be drinking contaminated water.

Response

The WDNR believes that because the POE GAC filters are conservatively oversized and include a flow meter. The responsible party will be required to implement a maintenance/monitoring program to ensure that this type of situation does not occur. This may be done with participation by the homeowner and/or routine meter reading by representatives of the responsible party. Or, the homeowner may be provided information on how to read their meter and documentation regarding the capacity of the filter. The homeowner may need to assist by checking their meter after any major change in their routine or notifying the responsible party of such a change

in water usage. Changeouts of filter media will be scheduled ahead of time and a contingency plan will be in place to address additional concerns.

Comment 3

Residents/well owners within the area impacted by the Junker Landfill have additionally expressed a wish to have bottled water continued to be made available after the filters are installed. This comment was voiced at the public meeting as well as by a petition signed by 19 residents. WDNR staff also met with a group these residents to provide additional information regarding the filters.

Wenck Associates, consultant for the Junker Landfill Trust, commented that bottled water should continue to be made available after the filters are installed due to the low cost associated with this action and the fact that the CERCLA process requires the WDNR to consider "community acceptance."

Response

The WDNR believes that the use of POE GAC filters are fully protective of human health and are, therefore, an appropriate long-term water replacement remedy. Adding an additional requirement to also provide bottled water is redundant, provides no additional health protection, and is beyond the authority of the WDNR.

Within the remedy selection process, "community acceptance" is an important "modifying" criterion. Community acceptance plays a role when two or more remedies meet all of the criteria for selection, but the community has a preference toward one of the alternatives over the other. This is not the situation here. First of all, the WDNR does not consider bottled water to be fully protective of life and health and, therefore, cannot be a stand-alone remedy. Secondly, the residents are not petitioning for bottled water instead of filters, they are requesting both actions, which the WDNR does not have the authority to require. This ROD does not preclude the PRPs from performing additional actions such as providing bottled water on a long-term basis.

The WDNR would like to point out that the petition filed by residents with impacted wells has been forwarded to the Trust for the responsible parties (Landfill Remediation Trust) for their consideration. The WDNR encourages a voluntary action by the responsible parties to offer continued bottled water service, free of charge, to some or all of the residents potentially impacted by the Junker plume, in addition to the POE GAC filters.

Comment 4

Bob Waxon, a Town of Hudson supervisor, commented that he believes a municipal water system is needed with a well far enough away from the contaminated area. He commented that the methane problem should be taken care of, but that the landfill should be left to take care of itself. He felt that the PRPs will spend a lot of money now on filters and then have to install a water system in 5-10 years anyhow.

Senator Alice Clausing also made the comment that the money should go toward a water supply and less so on monitoring.

Response

The WDNR believes that the significant cost associated with installation, operation, maintenance, and administration of a municipal water distribution system is not warranted at this site. The cost of the filter alternative is estimated at \$1.2 million, versus \$13 million for a

municipal alternative. In the event that the extent or degree of contamination changes over time and that this change renders the filters ineffective, the PRPs will indeed have to provide another means for assuring clean drinking water to the private well users. However, at this point, the WDNR believes this is unlikely to occur with aggressive source control actions taking place.

Based on the results of the RI, the site does pose an existing and potential future risk to human health and the environment and state groundwater standards are exceeded, as described in the Decision Summary. Therefore, a cleanup action is warranted. A goal of the remedial action is to prevent future additional groundwater impacts.

Comment 5

Dames & Moore, consultant for the Landfill Remediation Trust, commented that Alternative GWS-4 Extend Cover to the Areas of Uncapped Waste should not be performed, but instead, the uncapped waste should be excavated and reconsolidated in an existing waste cell where the cover system will be replaced, citing that the estimated costs are the same (possible savings), the waste can be used to bring grades up in areas of settlement, and relocating the waste will avoid additional drainage problems capping in place will create.

Response

The WDNR generally agrees with this comment and has accounted for it in the decision summary.

Comment 6

Dames & Moore, consultant for the Landfill Remediation Trust, commented that Alternative GWS-5 Extend Cover South to Alexander Road may not be needed or may need to be modified. Dames & Moore suggests that this need be investigated by performing a controlled aquifer test on the leachate on newly installed gas extraction wells and smaller diameter observation wells. Dames & Moore commented that if leachate is found to be in pockets and not as a mass at the bottom of the landfill, there is no need for the lining aspect of GWS-5, because the ditch is not a source of significant infiltration. If, following the pilot test, leachate is found to be in a more significant mass, indicative of a recharge situation, Dames & Moore suggests investigating the limits of the existing clay along the south edge of the landfill to determine the limits where clay needs to be replaced. Dames & Moore acknowledges that modifications to the ditch to improve drainage is needed regardless, however, the extent of the clay cap/impermeable liner (clay or geosynthetic) aspect of GWS-5 may not be as indicated in the Feasibility Study.

Response

The WDNR generally agrees with this comment and has accounted for it in the decision summary.

Comment 7

Dames & Moore, consultant for the Landfill Remediation Trust, agrees with WS-4 Supply Individual Water Treatment Units. However, Dames & Moore commented that the WDNR should consider a reasonable time frame for the regulatory process for approval of a new design and subsequent implementation, if existing design-owner approval cannot be secured.

Response

The WDNR does not feel that Wisconsin Department of Industry, Labor and Human Relations (DILHR) approval will require much beyond routine communication with DILHR staff. Design documents are readily available and approval requires only submittal of an application and a \$200 filing fee. Design-owner approval for existing approved systems is not required.

Comment 8

Dames & Moore, consultant for the Landfill Remediation Trust, commented that Alternative LG-4 Upgrade Active Gas Extraction System can be designed to effectively stop all gas migration from the landfill, therefore, eliminating the need for Alternatives LG-3 Additional Gas Extraction Wells and LG-5 Soil Vapor Barrier System.

Natural Resource Technology, Inc. (NET), consultant for Nor Lake, Inc., commented that the gas control alternatives be implemented in a phased approach. NET believes that Alternative LG-4: Upgrading Existing Gas Extraction System will meet the remedial action objectives.

Response

The WDNR generally agrees with the above comment, since both LG-4 and LG-5 are equally protective of human health and the environment, and has accounted for it in the decision summary. Alternative LG-3 Additional Gas Extraction Wells is required as an upgrade to source removal of VOCs. If implementation of LG-3 is also adequate to control landfill gas migration, an additional upgrade to the gas extraction system will not be necessary. If implementation of LG-4 indicates an inability to adequately control landfill gas (VOCs and methane) migration, LG-5, and potentially GWS-6, will be required to be implemented.

Comment 9

Wenck Associates, Inc. consultant for the Junker Landfill Trust, commented that Alternative LG-5 should be implemented and that their experience has shown that the likelihood of Alternative LG-4 eliminating all landfill gas migration is poor. They also believe Alternative LG-5 is the only way to prevent all gas movement off-site and will facilitate faster groundwater contamination cleanup at the source.

Response

In light of comments to the contrary, by other professionals, the WDNR is willing to allow the party that is committed to implementing the remedial action to evaluate which of the gas control alternatives to implement, recognizing that they are equally protective of human health and the environment and that failure to adequately control landfill gas migration will require implementation of the other alternative.

Comment 10

Wenck Associates, Inc. consultant for the Junker Landfill Trust, commented that it should be more clearly stated that the specifics of Alternative WS-4 Supply Individual Water Treatment Units are that treatment units should be offered to all residents within the area potentially impacted by the Junker Landfill. This should be done in lieu of routine monitoring of all private wells. Cost-effectiveness and added protectiveness are cited as the reasons for this approach.

Response

The WDNR agrees with this comment and has accounted for it in the decision summary.

Comment 11

Bruce A. Miller commented that since we have no knowledge of what is in the landfill and, therefore, no knowledge of what breakdown contaminants could be generated, the remedial action should be to open up the landfill, neutralize the waste, and put a liner under it.

Response

The WDNR feels that the risk associated to nearby residents and the average passerby is significantly increased by opening up the landfill, disturbing the waste and constructing a containment system. In addition, the cost associated with this type of action would be extremely prohibitive.

Comment 12

Natural Resource Technology, Inc., consultant for Nor Lake, Inc., commented that the procedure for leachate collection from leachate head wells and gas extraction wells performed during the RI did not conform to accepted practices, and the data are, therefore, in question.

Response

The WDNR generally agrees that the leachate wells should have been purged, prior to sample collection, however, the WDNR does not believe that this impacts the remedy selection as documented in the decision summary.

Comment 13

Natural Resource Technology, Inc. (NET), consultant for Nor Lake, Inc., disagrees with the conclusion of the RI, that leachate is not impacting groundwater quality. NET concludes that there are large portions of the landfill where leachate does not accumulate and is allowed, under natural conditions, to directly infiltrate to the groundwater.

Response

The WDNR generally agrees with this conclusion, however, the WDNR does not believe that this impacts the remedy selection as documented in the decision summary because leachate cannot be collected where it does not accumulate.

Comment 14

Natural Resource Technology, Inc. (NET), consultant for Nor Lake, Inc., commented that the conclusion of the RI, that leachate is not impacting groundwater is overstated. NET's review of the data suggest that the groundwater is being impacted by both landfill gas and leachate in very comparable degrees.

Response

The WDNR generally agrees with this conclusion, however, the WDNR does not believe that this impacts the remedy selection as documented in the decision summary.

Comment 15

Natural Resource Technology, Inc., consultant for Nor Lake, Inc., commented that the leachate seeps need to be characterized in order to assess the significance of such seeps. NET believes that additional leachate management may be necessary, which would result in a higher remedial cost than are currently projected.

Response

The WDNR generally agrees with this conclusion and has accounted for it in the decision summary.

Comment 16

Natural Resource Technology, Inc., consultant for Nor Lake, Inc., commented that the monitoring program for the site should include representative monitoring and private wells west of CTH A to document natural attenuation of VOCs.

Wenck Associates, consultant for the Junker Landfill Trust, also provided limited comments on the scope of the monitoring program, recommending frequencies and locations.

Residents with private wells near the landfill expressed concern regarding the monitoring that would be performed in order to ensure knowledge of contaminants and levels leaving the landfill.

Response

The WDNR acknowledges these concerns, and has accounted for them in the decision summary. The existing monitoring program under Operation and Maintenance (O&M) will continue until implementation of the remedial actions are complete, with modifications. WDNR approval of the long-term environmental monitoring program will be required at the remedial design stage.

Comment 17

Natural Resource Technology, Inc., consultant for Nor Lake, Inc., expressed specific concern regarding natural attenuation monitoring for Freon 11 west of CTH A.

Response

The WDNR acknowledges this concern, and agrees that Freon 11, or trichlorofluoromethane, has been detected in both on- and off-site monitoring wells and private drinking water wells, however, the NR 140 PAL and ES for Freon 11 are 698 and 3490 ug/l, respectively. Levels detected in the wells have consistently been below the PAL, therefore, action under NR 140, relative to Freon 11, is not required and monitoring for Freon 11 is unnecessary.

Comment 18

Natural Resource Technology, Inc., consultant for Nor Lake, Inc., questioned whether landfill gas was migrating from other areas of the landfill.

Response

The WDNR acknowledges this concern and has documented it in the approval of the Feasibility Study. The WDNR has determined that monitoring during development of the remedial design should be done. Gas migration in directions other than the south can be determined by monitoring of water table observation wells which have screens that extend above the water table.

Comment 19

Natural Resource Technology, Inc., consultant for Nor Lake, Inc., commented that the costs outlined in the FS for LG-3 and LG-5 do not seem reasonable.

Response

The WDNR generally agrees with this conclusion, however, the WDNR does not believe that this impacts the remedy selection as documented in the decision summary.

Comment 20

Ayres Associates, Inc., consultant for Nor Lake, Inc., commented that the WDNR Recommended Plan does not address the full extent of the Junker Landfill groundwater contamination plume. Ayres Associates believes the Junker Landfill plume extends substantially west of CTH A based on: groundwater travel times, lack of data west of CTH A in the Spurline Circle area, potential for preferential flow paths.

Response

The WDNR believes that the results of the RI, for regulatory purposes, have shown the area impacted by the Junker Landfill. The rationale provided by Ayres Associates does not address the contaminants of concern for the Junker Landfill which are TCE and PCE or the contaminant transport mechanisms beyond basic travel times. In addition, reliable data does in fact exist for the Spurline Circle area, contrary to the statements made by Ayres Associates. And finally, due to the fractured nature of bedrock, the varying professional interpretations of seismic refraction results, the varying professional interpretations of well drillers, a preferential groundwater and contaminant flow pathway has not been and may never be reliably defined.

In addition, Enforcement Standard exceedances have not been detected beyond Bakken Road (due to the Junker Landfill).

Comment 21

Ayres Associates, Inc., consultant for Nor Lake, Inc., commented that the WDNR Recommended Plan fails to require further source control at the Junker Landfill. Ayres states that leachate removal and treatment must be completed at the Junker Landfill site to achieve source control.

Response

The WDNR agrees with this comment and has accounted for it in the decision summary as a contingency tied to source control performance standards.

Comment 22

Ayres Associates, Inc., consultant for Nor Lake, Inc., commented that further investigation near the landfill (within 1200 feet) is necessary before determining if on-site groundwater extraction and treatment are warranted.

Response

The WDNR believes that the results of the RI show that existing source control measures along with the upgrades proposed and natural attenuation will act to reach the remedial action goal for groundwater within a reasonable period of time. Additional monitoring will be performed during implementation of the remedial action, and a long-term monitoring program will put in place to verify that the remedial action is resulting in significant improvement in groundwater quality beyond the waste boundary to the south, showing a trend towards meeting ch. NR 140, Wis. Adm. Code PALs within a reasonable amount of time.

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