



U.S. Environmental Protection Agency
Proposed Plan
for
Midway Landfill, Kent, Washington

May 2000

Introduction

The U.S. Environmental Protection Agency (EPA) is proposing a limited action remedy to complete the cleanup at Midway Landfill. The City of Seattle's cleanup work has successfully reduced the environmental problems at the landfill. EPA is asking for your opinion on this proposal.

This proposed limited action would not require further construction at the landfill. However, this proposal would require the City of Seattle to continue to operate and maintain the gas collection system, the cap that was constructed over the landfill, and the storm water collection system. The City also needs to continue to monitor the effectiveness of these systems and cap, and to regularly sample the groundwater until groundwater cleanup standards have been met. Additional groundwater monitoring wells may need to be installed. Legal controls are needed to make sure the control systems are not damaged. Regular notices are needed to ensure that the public is regularly warned that the groundwater near the landfill is not to be used for drinking water. Also, cleanup levels for the groundwater down-gradient from the landfill need to be established. All these elements are part of EPA's limited action proposal described in greater detail later in this proposed plan.

While EPA is the lead agency for this proposal, the Washington Department of Ecology (Ecology) has been the lead agency overseeing the cleanup. EPA has consulted with Ecology on this proposed plan. EPA expects Ecology to continue to oversee the cleanup.

EPA, in consultation with Ecology, will select the final remedy for this site after reviewing and considering all information submitted during the 30-day public

Public comments are due June 16, 2000.

comment period. EPA may modify the preferred alternative or select another response action presented in this proposed plan based on new information or public comments. You are encouraged to review and comment on both alternatives presented in this proposed plan.

Community Participation

How You Can Participate: The public is encouraged to participate in the decision-making process by commenting on this proposed plan. EPA will accept written comments on this proposed plan during the public comment period from **May 18, 2000 to June 16, 2000**. All public comments will be considered by EPA prior to reaching a final decision. Written comments should be addressed to:

Judi Schwarz
Environmental Cleanup Office, ECL-117
U.S. Environmental Protection Agency
1200 Sixth Avenue
Seattle, Washington 98101
e-mail: Schwarz.Judi@epa.gov

EPA will host a public meeting if sufficient interest is expressed. To request a public meeting, send a written request to the address above or call Judi Schwarz at 206 553-2684 before May 31, 2000.

In addition to this plan, related project documents are available for review in the Midway Landfill Administrative Record at the EPA Superfund Records Center, 1200 Sixth Avenue, Seattle and in the Kent Regional Library, 212 2nd Avenue N, Kent (253 859-3330). Please call EPA's Records Center at 206 553-4494 to obtain the most current information on their office hours. The Administrative Record is a collection of all the documents which EPA relies on for making site decisions. These related project documents can give you a more comprehensive understanding of the site and the cleanup activities that have been conducted. The documents available include the 1990 Consent Decree between Ecology and the City of Seattle, site investigation summaries, and recent monitoring data.

EPA will respond to public comments in a document called a Responsiveness Summary. A final Record of Decision will then be prepared by EPA. The Responsiveness Summary will be part of the Record of Decision and will be available for review at the locations listed above.

At this site, issuance of a Record of Decision will be a very important step, because if the Record of Decision selects the preferred remedy, EPA will then officially determine that construction has been completed at this Superfund National Priorities List site. This determination is a very significant cleanup milestone.

Ecology has separate responsibilities for decision-making at the Midway Landfill site under the State's Model Toxic Control Act (MTCA). Under MTCA, Ecology may decide to issue their own decision document (called a Cleanup Action Plan) after public notice and opportunity to comment, or Ecology can adopt or use an EPA Record of Decision. At this site, Ecology has decided to prepare a Cleanup Action Plan.

Site History

The Midway Landfill is located between I-5 and Highway 99, and between S. 252nd Street and S. 246th Street in Kent, Washington. The site is approximately 60 acres in size with refuse buried on about 40 acres and at depths over 100 feet. (See Figure 1.)

From 1945 to 1966, the site of the current Midway Landfill was operated as a gravel pit. In 1966, the City of Seattle leased the site and began using it as a landfill. From 1966 to 1983, approximately three million cubic yards of solid waste were deposited there. The Midway Landfill was created primarily to accept demolition materials, wood waste and other slowly decomposing materials. However, industrial wastes were also placed in the landfill, particularly prior to a 1980 state-mandated screening process administered by the Seattle-King County Department of Public Health. The site is currently owned by the City of Seattle.

When the City closed the landfill in the fall of 1983, it began extensive testing of water and gas in the landfill and its vicinity. Samples of groundwater from monitoring wells in and around the landfill, and gas samples from gas probes, indicated the presence of organic and inorganic contaminants outside the landfill boundary. In 1985, Ecology also began investigating the site and found methane gas in nearby residences. Beginning in September 1985, the City of Seattle constructed gas migration control wells within the landfill property and gas extraction wells beyond the landfill property to control the subsurface migration of gas.

In May 1986, EPA placed the site on the Superfund National Priorities List (NPL) for cleanup based on potential groundwater contamination. In August 1986, the City, under Ecology oversight, initiated a remedial investigation.

Because of the high degree of public interest in the landfill, the City of Seattle and the Washington State Department of Ecology developed a formal community involvement program in 1985 when residents near the landfill became concerned about landfill gas migration. Public meetings were held at critical points to keep residents informed about activities at the landfill. Also, for about two years, the City ran an information office in the Midway area to give citizens a convenient place to find out about cleanup activities, health information, and legal claims. As landfill gas migration was brought under control and residents' fears subsided, office hours were reduced and eventually the office closed. During the same period, a newsletter was sent to about 7000 area residents. The City and Ecology also worked with leaders from local active community groups to set up MAG (Midway Action Group) meetings, which were held monthly at first, and then less frequently. Through these meetings, community members could express their views and learn about the investigation and cleanup process.

The City created the Good Neighbor Program in 1986 to help the community when concern over landfill gas was at its peak. The program addressed fears about perceived drops in property values. The City guaranteed residents that their homes would sell for fair market value, as if the landfill was not there. The City continued the program until the real estate market was normal.

copy figure 1 map here

Ecology and City of Seattle staff continue to be available to respond to concerns and questions from the public.

In May 1990, prior to completion of the remedial investigation and feasibility studies, the City and Ecology entered into a Consent Decree pursuant to MTCA. This legal agreement set forth Ecology's determination that certain remedial actions at Midway Landfill would provide immediate protection to public health and the environment. This remedial action had four elements:

- Construction of a landfill cover ("cap"), which included complete regrading of the site and installation of a multi-layer engineered cover. The cap was designed to greatly reduce the amount of rain that would seep into the landfill.
- Completion of a landfill gas extraction system, including gas manifolds and flares, to reduce subsurface gas migration from the landfill.
- Completion of a surface water management system, including controls to prevent surface water from infiltrating the site, construction of a storm water detention pond, and rerouting of storm water from surrounding areas to prevent it from entering the landfill.
- Preparation of a comprehensive operation and maintenance manual.

The Consent Decree also required the City to place a legal notice in the property records stating that this site was used as a landfill and was on EPA's National Priorities List.

The City of Seattle completed construction of the landfill cover, landfill gas extraction system, and surface water management system in November 1992. A comprehensive operation and maintenance manual for both short-term and long-term operation and maintenance for the systems constructed under the Consent Decree was prepared by the City of Seattle, and was approved by Ecology in April 1992. The City and Ecology are still in negotiations on the long-term monitoring plan.

Site Characteristics

Because of the remedial work performed by the City of Seattle at Midway Landfill since 1985, the environmental conditions at the site have greatly improved.

- Potentially explosive methane gas does not leave the landfill property, and has not since 1990. The gas is collected within the landfill and then burned on the site. The gas collection system has also helped dry out the landfill contents and further reduce the contaminated groundwater leaving the landfill.

- Clean storm water is collected from the entire surface of the landfill and the surrounding area and is stored in a lined storm water detention pond north of the landfill. This clean water is discharged to McSorley Creek, west of the landfill, and enters Puget Sound at Saltwater State Park.
- The groundwater beneath and down gradient of the site is much cleaner than it was in 1985. However, the groundwater does not meet federal drinking water standards and MTCA cleanup standards in all down gradient wells. See below for more information on the groundwater.
- The site is fenced and regularly inspected to ensure the landfill cover stays in good condition, and the gas collection and flare system and the storm water system are functioning properly.
- Groundwater quality is monitored twice a year and methane gas concentrations in soil are monitored at least quarterly to ensure that landfill gas is not moving off the landfill and that groundwater quality is improving.

Groundwater

The underground geology and groundwater flow patterns under and around the Midway Landfill site are complex. Here is a general summary of the geology and groundwater and detected contamination in and near the landfill.

- There are multiple layers of sand, or sand and gravel, under or around the landfill that allow subsurface movement of groundwater to and from the landfill. These layers, or aquifers are called, in order from the surface to the deepest layers studied: the Upper Gravel Aquifer, the Sand Aquifer, and the Northern and Southern Gravel Aquifer.
- Water in the Upper Gravel Aquifer and the Sand Aquifer moves from outside the landfill inward towards the south end of the Midway Landfill. This water, along with the leachate developed within the landfill itself, then joins the deeper Southern Gravel Aquifer. Water from the landfill does not appear to enter the Northern Gravel Aquifer.
- There is now significantly less water within the landfill itself because of the remedial actions described above. Many of the shallower monitoring wells in or near the landfill that used to contain contaminated groundwater are now dry. The water levels around the landfill in both the Upper Gravel Aquifer and the Sand Aquifer have also generally dropped. These results means that much less water is entering the landfill and the containment systems constructed by the City of Seattle have been successful. Historically, these higher volumes of water dissolved contaminants in the landfill waste and carried these contaminants beyond the landfill.

- The only down-gradient monitoring wells where contamination has been detected over the past two or three years are in the Southern Gravel Aquifer. These two wells are located approximately 600 feet and 1200 feet east of the south-east corner of the landfill. Three chemicals have been detected at levels of concern. These chemicals are 1,2 - dichloroethane, vinyl chloride, and manganese. These chemicals were detected at slightly above the federal drinking water standard or a risk-based number.
- Another Southern Gravel Aquifer monitoring well that is closer to the landfill has met all federal drinking water standards for the past two years. During the groundwater monitoring before the containment systems were constructed, this same well contained contaminants at levels greater than 10 times the federal drinking water standard. Again, these results indicate that the containment remedy appears to be successful.
- To the best of Ecology's and the City's knowledge, no one is drinking the groundwater from any aquifer within a mile of the landfill, and there are no current plans to use the groundwater near the landfill for drinking water. The closest wells currently in use for drinking water are the Lake Fenwick wells approximately 1 mile southeast of the Midway Landfill.
- There is some groundwater contamination in the Sand Aquifer to the north, northwest and west of the landfill that most likely did not come from Midway Landfill. Some of the groundwater samples in this area are above both federal and state drinking water standards and the MTCA cleanup standards. This contamination may be flowing towards and under the Midway Landfill. No one is using this groundwater and thus no one is currently exposed to this contamination.

Summary of Site Risks

Human Health Risks

Before the cleanup work began at the Midway Landfill site in 1985, there were many ways in which humans could be exposed to unacceptable levels of contaminants. These exposures posed acute hazards to residents due to the high levels of methane gas reaching residential basements, and long-term potential risks from solvents in the groundwater if anyone had been drinking the groundwater. The risks from these possible exposures were greater than EPA's and the State of Washington's acceptable risk levels. For example, if a person had been drinking groundwater from the most contaminated well down gradient from the site for 30 years, the excess cancer risk from this exposure alone would have been approximately 1 in 1,000. In other words, for every 1,000 people that could have been exposed, one extra cancer death could have occurred as a result of drinking water exposure. Other possible exposures could have occurred through air emissions or through direct contact with the landfill contents.

There are no current unacceptable risks to human health from the landfill because the gas migration has been stopped and no one is currently drinking the groundwater. However, as described above, there is still some groundwater contamination above federal drinking water standards in two monitoring wells east of the landfill and I-5, and there may still be groundwater contamination on the west side of the landfill. Because drinking this groundwater could result in an imminent and substantial endangerment to human health, some actions are needed at Midway Landfill to ensure that the site will be protective over the long-term.

Ecological Risks

No ecological risks to plants or animals are expected now or in the future because there will be no exposure to the contaminants at or from the site. The site is covered and capped with clean material, and the groundwater from the site does not impact any surface water bodies or seeps.

Remedial Action Objectives

The risks at or from the Midway Landfill site have been eliminated or reduced by containment. Midway Landfill is an example of a site where containment has been successful and has reduced the risks posed by site.

The remedial action objectives, or cleanup goals, are:

- To ensure containment is effective and working
- To ensure containment will be maintained
- To ensure no residential exposure to groundwater until groundwater cleanup standards have been met

Cleanup Standards

For groundwater that is a potential future source of drinking water, the more stringent of federal drinking water standards (also known as Maximum Contaminant Levels or MCLs) and State of Washington cleanup standards under the Model Toxics Control Act (MTCA) are the appropriate cleanup levels. If there is no federal drinking water standard, then a risk-based value may be used to set cleanup levels. For the groundwater contaminants at this site, the proposed cleanup levels and their basis are shown in Table 1.

Table 1. Proposed Groundwater Cleanup Standards

Contaminant	Proposed Cleanup Level	Basis of the Cleanup Level	Comments
1,2 Dichloroethane	0.005 mg/L	Federal Drinking Water Standard (MCL)	a solvent
vinyl chloride	0.0002 mg/L	MTCA Method B, adjusted for analytical limitations	a solvent that can also be formed during the natural breakdown of other solvents
manganese	2.2 mg/L	MTCA Method B	a natural mineral that dissolves into the groundwater because of the chemistry of the water leaving the landfill

If other contaminants are found in any down-gradient monitoring well, cleanup levels will be established for these additional contaminants using the federal drinking water standards and MTCA.

The point of compliance for the groundwater will be at the edge of the landfill waste, which may be within or beyond the City’s property boundary. (Some landfill waste lies under the southbound lanes of I-5.) All groundwater down gradient of this point of compliance will need to meet these cleanup levels before the Midway Landfill is removed from the Superfund National Priorities List.

Summary of Remedial Alternatives

Two remedial alternatives are being considered for the Midway Landfill site.

No Action alternative:

The No Action alternative means that EPA would not require any additional action at the Midway Landfill site. The City of Seattle would still have to fulfill its responsibilities under its 1990 Consent Decree with Ecology, as well as any other requirements established under state or local regulations for closed landfills. Monitoring could be required under this alternative. EPA would not set cleanup levels nor points of compliance under this alternative.

Limited Action Alternative:

This alternative does not require any significant additional remedial construction because the actions taken by the City of Seattle since 1985 have eliminated or greatly reduced the contaminants leaving the landfill. Instead, this alternative focuses on maintaining and monitoring the constructed containment remedy to ensure it is and will continue to be effective and protective. This alternative would also set groundwater cleanup levels and points of compliance.

The main elements of the limited action alternative are:

1. Monitor to
 - a) ensure the remedial systems are working as designed
 - b) ensure progress is being made towards meeting the groundwater cleanup standards
 - c) ensure adequate containment is maintained when and if major changes are approved by Ecology in the operation of the site, such as turning off or scaling down the gas collection system
 - d) demonstrate that the cleanup levels have been achieved

The monitoring will be done by the City of Seattle, while the monitoring requirements will be established by Ecology, who has been the lead regulatory agency at this site. Ecology will also determine when the cleanup levels established in EPA's Record Of Decision have been met. Ecology may require the City of Seattle to install new monitoring wells whenever Ecology determines they are needed to meet any of these goals. For example, Ecology believes that a deeper well is needed on the west side of the landfill to replace a Sand Aquifer well that went dry in 1994. This well is needed to assess the quality of groundwater leaving the landfill in this area.

2. Continue to operate and maintain all remedial elements required in the 1990 Ecology/City of Seattle consent decree. Ecology will continue to oversee the City's operation and maintenance activities. Operational changes can be approved by Ecology when such changes will still ensure that the site and remedy will still be protective.
3. Institutional controls. Institutional controls are legal or administrative actions that help ensure the long-term protectiveness of the remedy. At this site, the limited action alternative includes three types of institutional controls. The first type of institutional control would be a legal notice the City would place in King County's records, alerting any future purchaser of the property, in perpetuity, that this property had been used as a landfill and was on EPA's National Priorities List, and that future use of the property is restricted. The second type of institutional control is a requirement that the City ensures continued operation and maintenance of the containment and monitoring systems if ownership of the property should change. Both of these institutional controls are required as part of the 1990 Consent Decree between Ecology and the City of Seattle, though the

legal notice has not yet been placed in the County's records. The limited action alternative would establish a deadline for placing this legal notice in the County's records. The third type of institutional control is an annual written notice about the groundwater quality down-gradient from the landfill. The City of Seattle would be required to notify the Seattle-King County Department of Public Health, nearby water districts, Ecology, and local licensed well drillers. As an additional protection, state regulations forbid any drinking water wells within 1,000 feet of a municipal landfill. Again, Ecology would oversee the City of Seattle's institutional controls.

EPA would also review the remedy no less often than every five years to ensure that the remedial action remains protective of human health and the environment.

Evaluation of Alternatives

EPA's preferred alternative was selected on the basis of the nine criteria listed in Table 2. These criteria were established in EPA's National Oil and Hazardous Substances Pollution Contingency Plan. The nine criteria are divided into three categories: threshold, balancing, and modifying criteria. To be eligible for selection, an alternative must meet the two threshold criteria. The five balancing criteria weigh trade-offs among the alternatives. The last two modifying criteria are considered after the public comment period during the final selection of the remedy.

Overall Protection of Human Health and the Environment

Both alternatives are protective, because the City of Seattle would continue to operate and maintain the cap, and the gas and storm water systems under both alternatives.

Compliance with Applicable or Relevant and Appropriate Requirements

Federal and state drinking water standards and MTCA groundwater cleanup standards are the primary applicable or relevant and appropriate requirements under the Limited Action Alternative. The cleanup standards listed above would need to be met before the remedial action at the Midway Landfill could be considered complete. No cleanup standards would be set by EPA under the No Action Alternative, though Ecology could decide to set cleanup standards separately under MTCA at a later time.

Long-term Effectiveness and Permanence

The Limited Action Alternative has greater long-term effectiveness and permanence than the No Action Alternative because it would require annual notice to water districts and well permit regulators, which would provide slightly greater assurance that no one would drink the groundwater leaving the landfill. It would also clarify the need to adjust monitoring requirements as site conditions change.

Table 2. Alternative Evaluation Criteria

Threshold Criteria:

1. **Overall protection of human health and the environment**— How well does the alternative protect human health and the environment, both during and after construction?
2. **Compliance with federal and state regulations (ARARs)**— Does the alternative meet all federal and state applicable or relevant and appropriate requirements (ARARs)?

Balancing Criteria:

3. **Long-term effectiveness and permanence**— How well does the alternative protect human health and the environment after completion of cleanup? What, if any, risks will remain at the site?
4. **Reduction of toxicity, mobility, or volume through treatment**— Does the alternative effectively treat the contamination to significantly reduce the toxicity, mobility, or volume of the hazardous substance?
5. **Short-term effectiveness**— Are there potential adverse effects to either human health or the environment during construction or implementation of the alternative? How quickly does the alternative reach the cleanup goals?
6. **Implementability**— Is the alternative both technically and administratively feasible? Has the technology been used successfully on other similar sites?
7. **Cost**— What are the estimated costs of the alternative?

Modifying Criteria:

8. **State acceptance**— What are the state's comments or concerns about the alternatives under consideration and about EPA's preferred alternative? Does the state support or oppose the preferred alternative?
9. **Community acceptance**— What are the community's comments or concerns about the preferred alternative? Does the community generally support or oppose the preferred alternative?

Reduction of Toxicity, Mobility and Volume of Contaminants through Treatment

Neither alternative includes any additional treatment. Extracted landfill gas is flared as part of the existing landfill gas collection system.

Short-term Effectiveness

Both alternatives have the same short-term effectiveness. Neither alternative includes construction nor will either alternative affect the time needed for all groundwater leaving the site to meet federal and state drinking water standards.

Implementability

Both alternatives are equally implementable.

Cost

The costs for the two alternatives are expected to be very similar. The monitoring costs for the Limited Action Alternative may be slightly higher than the monitoring costs for the No Action Alternative.

State Acceptance

Ecology has been consulted on EPA's preferred alternative. State acceptance will be evaluated after the public comment period on this proposed plan.

Community Acceptance

Community acceptance will be evaluated after the public comment period on this proposed plan has closed.

Summary of the Preferred Alternative

While EPA believes no new remedial construction is needed, it is important that the City of Seattle continue to operate and maintain the gas collection system, the cap that was constructed over the landfill, and the storm water collection system. The City also needs to continue to monitor the effectiveness of these systems and cap, and to regularly sample the groundwater until groundwater cleanup standards have been met. The City needs to establish permanent, legally binding, controls on the landfill property to ensure that the cap and systems are not damaged as long as the cap and gas and storm water systems are required. Also, groundwater cleanup levels for the groundwater down gradient of the landfill need to be established.

EPA's preferred alternative is the Limited Action Alternative. The main elements of this alternative are continued operation and maintenance of the landfill gas and storm water systems and cap, continued monitoring of the effectiveness of these systems, and institutional controls.

All of this work would be done by the City of Seattle under Ecology's oversight. This alternative is preferred by EPA because it will provide the best long-term protectiveness at the Midway Landfill site by setting groundwater cleanup standards and ensuring long-term operation, maintenance, and monitoring of the containment systems at the Midway Landfill site. It would also clarify the need for, and types of, institutional controls that are necessary to ensure long-term protectiveness of the remedy.

The City of Seattle is interested in having the Midway Landfill site removed from EPA's National Priorities List as soon as possible. Under the preferred alternative, Ecology would decide when the cleanup standards have been met. The gas and storm water systems and landfill cap would also need to be still working effectively and the institutional controls would need to be in place. Ecology would then recommend to EPA that the Midway Landfill site be removed from EPA's National Priority List.

One of the City of Seattle's concerns is that contaminated groundwater is coming into the landfill from up-gradient sources, and that this in-coming contaminated groundwater will never allow the groundwater leaving the landfill to meet the groundwater cleanup standards. Because of the major improvements in down-gradient water quality in the last ten years, EPA believes it is possible that the groundwater leaving the landfill will eventually meet the groundwater cleanup standards. However, if in the future the City wants to demonstrate that it is technically impracticable for them to meet the cleanup standards at every down gradient well because of the up-gradient sources, EPA and Ecology will work together with the City to determine what information is needed to support such a demonstration. For example, Ecology believes it may be necessary to identify the contaminant concentrations actually entering the landfill from sources located on the north and northwest side of the landfill. Additional monitoring wells may also be needed to determine the impact of any in-coming contaminated groundwater on the groundwater beneath the landfill.

Additional Information

If you have any questions about this proposed plan, please contact either:

Judi Schwarz
EPA Project Manager
(206) 553-2684 or
(800) 424-4372, extension 2684

e-mail: schwarz.judi@epa.gov

Andrea Lindsay
Community Involvement Coordinator
(206) 553-1896 or
(800) 424-4372, extension 1896

e-mail: lindsay.andrea@epa.gov

EPA Web Site: www.epa.gov/r10earth
Click on "index" at the bottom
Click on "m" for Midway Landfill