

EXPLANATION OF SIGNIFICANT DIFFERENCE

ONALASKA MUNICIPAL LANDFILL SUPERFUND SITE
ONALASKA, WISCONSIN

I. Introduction

The Onalaska site is located in the Township of Onalaska, about 10 miles north of La Crosse, Wisconsin. The 11-acre site includes the 7-acre former Township landfill and is situated 400 feet east of the Black River, near the confluence of the Mississippi and Black Rivers. The Black River is located within the Upper Mississippi River Wildlife and Fish Refuge, a wetlands area which supports numerous migrating species of birds and is also used for hiking, fishing, hunting, and other recreational purposes by area residents and visitors.

The area surrounding the site is generally rural, although several residences are located within 500 feet to the north and to the south of the landfill. A subdivision of about 50 homes is located about 1.25 miles southeast of the site. Agricultural lands are located south of the landfill, and intermittent woods and grasslands border the site to the east.

II. Requirement to Address Significant Change

The lead agency (in this case, U.S. EPA) may determine that a significant change to the selected remedy described in the ROD may be warranted after the ROD is signed. Section 117(c) of CERCLA, requires that:

After adoption of a final remedial action plan (ROD) -

- (1) if any remedial action is taken,
- (2) if any enforcement action under section 106 is taken, or
- (3) if any settlement or consent decree under section 106 or section 122 is entered into,

and if such action, settlement, or decree differs in any significant respects from the final plan, the U.S. EPA shall publish an explanation of the significant differences (ESD) and the reasons such changes were made. (42 U.S.C. §9617(c)).

In this case, the U.S. EPA, after appropriate consultation with the WDNR, has determined that an ESD is appropriate to explain and document modifications made to the operation of the groundwater treatment plant required by the ROD. Specifically this ESD allows the temporary shutdown of the groundwater extraction and treatment system to evaluate the need for continuous

operation of the system and to determine whether natural attenuation processes exist at the site which might address the remaining groundwater contamination. The modifications resulted from information gathered during the Long Term Remedial Action phase of this action. This ESD document and all of the technical information and data relating to it shall become part of the administrative record for the Site, which is available for viewing, during normal business hours, at the site information repository located at the Holmen and Onalaska public libraries.

III. Background

A. Site History

The Onalaska site was mined as a sand and gravel quarry in the early 1960's. Quarry operations ceased in the mid-1960's and the Town began to use the site as a municipal landfill, although for a time both municipal and chemical wastes were disposed of in the landfill. In 1978, the Wisconsin Department of Natural Resources (WDNR) determined that the landfill operation did not meet state solid waste codes and ordered the Town to close the landfill by September 1980. After disposal operations ceased, the Town capped the landfill in June 1982.

In September 1982, the WDNR sampled four landfill monitor wells and several nearby residential wells for compliance with drinking-water standards. The investigation documented that the sand and gravel aquifer beneath the landfill serves as the primary source of drinking water for area residents and that groundwater contamination had occurred within and around the site. One residential well, located southwest of the landfill, was found to exceed the Federal drinking-water standard for barium (1.0 mg/L). The well sample also contained five organic compounds at concentrations above background levels. A landfill monitor-well sample was found to be contaminated with toluene at a concentration of 14.7 mg/L, which was well above the State groundwater-quality Enforcement Standard (0.343 mg/L) and the federal drinking-water (2.0 mg/L) standard in place at that time. The Town replaced the contaminated residential well with a deep, uncontaminated well in January 1983.

Pursuant to CERCLA, U.S. EPA inspected the Onalaska site in 1983. Subsequent to the submittal of the Site Inspection report in May 1983, the U.S. EPA placed the site on the National Priorities List (NPL) in September 1984.

Remedial Investigation

U.S. EPA, in consultation with the WDNR, conducted a Remedial Investigation and Feasibility Study (RI/FS) at Onalaska from April 1988 through December 1989. The major findings of the RI included:

- The landfill is the source of groundwater contamination. A groundwater contaminant plume consisting of organic and inorganic compounds had migrated at least 800 feet from the southwestern edge of the landfill. The leading edge of the contaminant plume

appeared to be discharging into nearby wetlands and the adjacent Black River.

- The upper groundwater aquifer consists primarily of sand and is approximately 135 feet thick. Local residences utilize this aquifer as a primary source of drinking water.
- The predominant organic compounds of concern included toluene, xylene, 1,1-dichloroethane (1,1-DCA), and trichloroethene (TCE), based upon concentrations and potential impacts to human health and the environment.
- Site soils located above the water table and adjacent to the southwestern edge of the landfill were contaminated with naphtha solvents derived from the landfill. The contaminated soil zone occurred from 11 feet to 15 feet below ground surface and up to 150 feet from the landfill. Soil samples indicated that contaminant levels of up to 550 mg/kg were present and were a continual source of groundwater contamination.
- The original landfill cap had deteriorated and did not meet the landfill closure regulations in effect at the time the landfill closed. The cap was originally to be composed of 2 feet of compacted clay, but the RI showed that the cap is composed of sandy soils in certain portions and that it is only 1-foot thick in other portions.
- Magnetometer anomalies, as well as site records, suggested that up to 1000 55-gallon drums were likely to have been disposed of in the landfill. Although several crushed and empty drums were found in the landfill during excavation of test pits, the RI could not ascertain whether the drums are concentrated in any one area, although it may be likely that many of the drums would be in the same condition as the drums that were found in the test pits.
- The average depth to the water table and the depth of waste disposal is 15 feet. As a result, it is likely that refuse is periodically in direct contact with groundwater. Soil below the water table does not appear to be greatly affected by landfill contaminants, in that the hazardous substances found in the groundwater are soluble. Soluble contaminants would tend to remain dissolved in the groundwater rather than sorbing onto sand particles.
- Potential long-term exposure to low levels of VOCs through the use of private wells in contaminated groundwater and plausible adverse discharges of contaminants to the wetlands and Black River downgradient of the landfill were identified as the principal threats to human health and the environment.

B. Record of Decision

Based on the findings of the RI, U.S. EPA completed a feasibility study (FS) that evaluated remedial alternatives to address migration of the groundwater contaminant plume. U.S. EPA

completed the FS in December 1989. U.S. EPA then issued a Record of Decision (ROD) in August 1990 that called for the following actions to mitigate the areas of concern:

- Installation of a landfill cap in accordance with federal and state requirements;
- Installation of a groundwater extraction and treatment system to capture and treat contaminants in the groundwater immediately downgradient of the landfill;
- Installation of an air injection system within the area of soils contamination to enhance the bioremediation of organic contaminants; and
- Implementation of a groundwater, surface water, and sediment monitoring program to ensure the adequacy of the cleanup.

The selected remedy establishes a containment and treatment system to eliminate the principal threat posed to human health and the environment by isolating the source of groundwater contaminants in the landfill and eliminating those in the adjacent soils, preventing the further migration of VOCs in groundwater, and by treating extracted groundwater to acceptable discharge limits.

The selected remedy established cleanup standards for groundwater based on Safe Drinking Water Act Maximum Contaminant Levels (MCLs) and Wisconsin Administrative Rule Chapter NR 140 Enforcement Standards (ES) and Preventive Action Limits (PAL) for groundwater protection. The selected remedy established an estimated cleanup goal of 80 to 95 percent biodegradation of the organic compounds in the soils adjacent to the landfill.

U.S. EPA entered into a Superfund State Contract with WDNR in 1991 which provided that the state would fund 50% of the remedial action. U.S. EPA then began to implement the Remedial Design (RD) and Remedial Action (RA).

The landfill cap construction subcontract was awarded on March 25, 1993, and construction commenced on May 1, 1993. A multi-layer clay cap was installed over the landfill. The cap was completed in November 1993.

The groundwater and soils construction subcontract was awarded on June 11, 1993, and construction began on July 12, 1993. Five groundwater extraction wells were installed downgradient of the landfill and are designed to pump a total of 800 to 1000 gallons per minute. A treatment plant was constructed nearby, where the extracted groundwater is subjected to aeration and pH adjustment (iron precipitation), clarification (iron removal), air stripping (VOC removal), and pH readjustment prior to discharge to the Black River. Temporary activated carbon units were placed in the treatment train prior to discharge as a back-up measure while the treatment plant components underwent a 3-month "shakedown" period. The groundwater extraction and treatment system was completed in June 1994.

Approximately 29 shallow air-injection wells were installed to bioremediate the organic compounds in the contaminated soils adjacent to the landfill. Installation of the biotreatment system was completed in June 1994. U.S. EPA, in consultation with WDNR, certified that soil remediation activity is complete since it has been demonstrated that the bioremediation system no longer contributes to the cleanup of the contaminated soils.

A pre-final inspection was conducted by the project managers for U.S. EPA and WDNR on June 1, 1994. At that time, it was determined that the landfill cap, groundwater, and bioremediation systems were constructed as designed and that they were operational. U.S. EPA signed the Onalaska preliminary close-out report (PCOR) on July 29, 1994.

On July 14, 1998 U.S. EPA completed the first Five-Year Review for the site. The review concluded that with the continued implementation of the remedial action, pursuant to the ROD and as designed, the selected remedy remains protective of human health and the environment.

On September 29, 2000, U.S. EPA completed an ESD revising the Site cleanup standards to reflect the current State of Wisconsin groundwater cleanup standards.

IV. Significant Difference

The purpose of this document is to explain modifications to the selected remedy, as presented in the ROD. Specifically this ESD allows for the temporary shutdown of the groundwater extraction and treatment system to study the effectiveness of continued operation and to study whether natural attenuation processes exist at the site which might address the remaining groundwater contamination. This modification will not alter the scope of the remedy selected in the August 1990 ROD.

Prior to the temporary shut down study the groundwater monitoring program will be revised, and additional monitoring wells will be installed if necessary, to monitor the plume behavior under non-pumping conditions and to ensure that any potential migration of contamination will be detected. The monitoring program will also be revised to include the natural attenuation parameters which will be used to assess the fate of the remaining contaminants. At the conclusion of the study the treatment system will be reactivated. The slow movement of groundwater in the area will effect the length of time needed to detect changes in contaminant plume and complete the studies. The temporary shut down may last at least two years. It is possible that the results of the study may indicate that the permanent shut down of the treatment system is appropriate, however, before such a permanent change could be implemented a ROD Amendment and consideration of public comments would be required. If it is determined before the studies are complete that the contaminant concentrations are increasing, or the plume is migrating, the agencies will restart the groundwater extraction and treatment system to prevent further migration of the contaminants.

Information obtained during Long-Term Remedial Action (LTRA) phase of the work at the Site demonstrated the need for this modification. In particular, the decision to temporarily shut down the system was based upon the results of the long-term groundwater monitoring program in place at the Site. Groundwater monitoring samples are collected from the monitoring wells, extraction wells, and two residential wells. Figure 1 shows the monitoring point locations.

Baseline sampling was conducted in November 1993 before startup of the groundwater extraction and treatment system. The system began operation in the spring of 1994. Quarterly sampling began in March 1995 and was reduced to semi-annual monitoring in March 1997. The results of the monitoring program are summarized in the Annual Groundwater Quality and Capture Report for each year, which are available at the site information repositories. Between April 1999 and September 2000, no organic contaminants of concern were detected in any of the monitoring wells above the current State of Wisconsin Enforcement Standards. The results show that the contaminant concentrations, except for the few exceptions noted below, have dropped below health-based cleanup standards.

In 1999 a full priority pollutant scan was performed on the site groundwater samples to determine whether any new contaminants were present in the site groundwater. Previous rounds of monitoring were limited to the chemicals of concern identified in the ROD. The list of chemicals tested for in a full priority pollutant scan is more inclusive than the limited list of chemicals of concern from the ROD. The priority pollutant scan and a subsequent round of sampling in 2001 detected trimethylbenzene at 600 ppb in well MW-4S exceeding the state enforcement standard of 480 ppb. Trimethylbenzene was also detected at MW-5S above the PAL but below the State ES. There is no federal MCL established for trimethylbenzene. In April 2000, toluene was detected at MW-5S at 209 ppb, just exceeding the PAL of 200 ppb. Napthalene was detected above the PAL, but below the ES at three wells (MW-4S, MW-5S and MW-14S) in 2000. Methylene Chloride was detected above the ES in 2000, but its presence has not been confirmed by subsequent sampling. This may have been a laboratory contaminant. Because these contaminants were not part of the monitor program we do not have long-term data on their concentrations and are not able to determine any trends in their concentrations. They will be included in the monitoring program and the results will be used to evaluate the need to change the ROD to include these as contaminants of concern, and also will be considered in determining whether the groundwater treatment plant can be permanently shut down or should be restarted .

The only inorganic contaminants of concern identified in the ROD consistently remaining above PALs are arsenic, barium, cadmium, iron, and manganese. The only inorganic contaminants of concern detected above their respective ESs were iron and manganese. However, iron and manganese are not considered by the State of Wisconsin to be substances of public health concern, but rather have ESs based upon aesthetic (taste or odor) criteria. Neither of these metals has a federal MCL established. The PAL for iron is 150 ppb and the ES is 300 ppb. The highest concentration of iron detected in 2000 was 22,300 in well MW-2M. The PAL for manganese is 25 ppb and the ES is 50 ppb. The highest concentration of manganese detected in

2000 was 3,140 ppb at MW-1S. The long-term monitoring has determined that these metals exist at significant levels in samples from upgradient, background wells and that groundwater is likely contributing significantly to the levels seen downgradient.

Ground water from the Site discharges into the Black River and adjacent wetlands. There are currently no drinking water wells within the flow path of the contaminant plume. The RI identified only one well drawing contaminated water from the affected sand and gravel aquifer. This was a garden well occasionally used by the home-owners to water the garden, and intermittently by hikers as a drinking water source. No wells identified as a primary drinking water sources were found to be contaminated by site chemicals. The Town of Onalaska replaced the contaminated residential well with a deep, uncontaminated well in January 1983. The well was installed in an unaffected sandstone aquifer which lies beneath the contaminated sand and gravel aquifer. The well at another nearby home was determined to be installed in an unaffected aquifer. Both wells are monitored on a regular basis and have remained uncontaminated.

Therefore, based on the results from the long-term groundwater study, showing significantly reduced levels of contaminants and limited exposure pathways, it is feasible to conclude that continued operation of the groundwater extraction/treatment system may be no more effective than other, more cost-effective methods in addressing the remaining contamination. By temporarily shutting down the system the agencies will be able to gather data necessary to evaluate the effectiveness of continuous operation of the extractions/treatment system, and determine whether natural attenuation processes exist at the site capable of addressing the remaining contamination. It is not possible to gather that information while the system is operating. The data would also be used to evaluate whether alternate pumping paradigms (e.g. pulse pumping) would be appropriate given current site conditions.

V. Affirmation of Statutory Determinations

U.S. EPA believes that the remedy as modified in this ESD remains protective of human health and the environment, complies with federal and State requirements that are applicable or relevant and appropriate to this remedial action, and is cost-effective. In addition, the revised remedy utilizes permanent solutions to the maximum extent practicable for this Site.

VI. State Comment


The State of Wisconsin was consulted regarding these changes and has reviewed this ESD. The State agrees that the modifications to the selected remedy are necessary and appropriate.

VII. Public Participation Activities

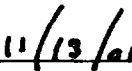
This ESD and other documents related to this project are available for public review at the public

libraries in Holmen and the City of Onalaska, during normal business hours.

A public comment period on this ESD was held from September 10, 2001 through October 10, 2001. During the comment period EPA received one comment concerning the proposed plan. It was in full support of the temporary shut down. The commentor also supported the WDNR's eventual take-over as lead agency once the shut down occurs. Copies of all documents pertaining to this ESD, including a copy of the one public comment can be found at the Holmen and City of Onalaska public libraries and at the U.S. EPA Region 5 offices located at 77 W. Jackson Boulevard, Chicago, IL.



William E. Munro, Director
Superfund Division



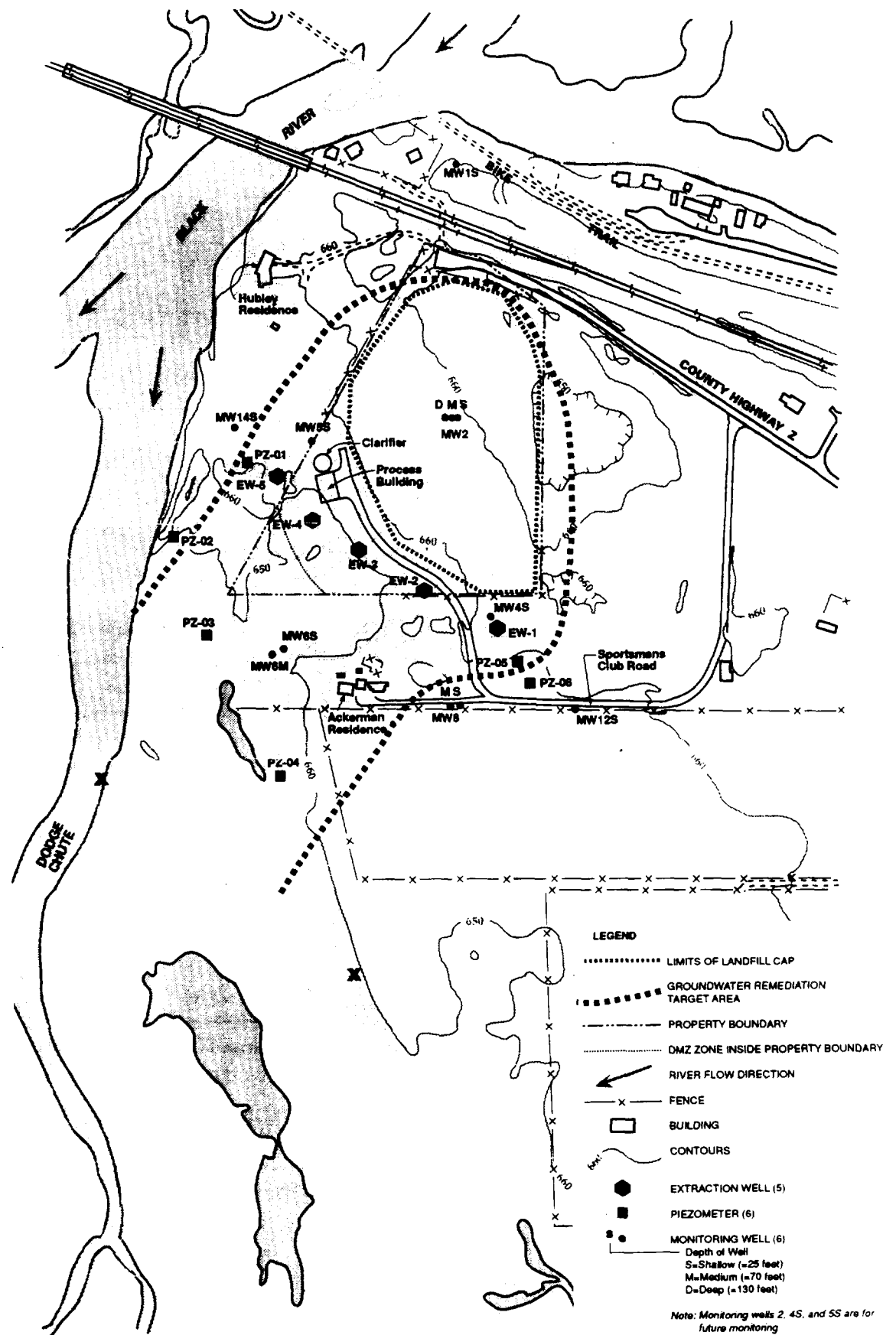
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**Table 1
Groundwater Cleanup Standards
Onalaska Municipal Landfill**

Compound	Standard (parts per billion)
Benzene	0.5
Toluene	200
Xylene	1000
Trichloroethene	0.5
1,1-Dichloroethane	85
Lead	1.5
Arsenic	5.0 ¹
Barium	400 ¹
Ethylbenzene	140
1,1,1-Trichloroethane	40
1,1-Dichloroethene	0.7
Manganese	25 ¹
Iron	150 ¹

Notes: 1 = Naturally occurring levels of these compounds found at the Onalaska site may be higher than these standards.

Section NR 140.28, WAC provides for establishing a (Wisconsin) alternative concentration limit (WCL) if (1) background concentrations exceed preventative action limits (PALs) and/or enforcement standards (Ess) or (2) if it is determined that it is not technically or economically feasible to achieve PALs (see section XII(b)(1)(B)(ii) of the 1990 ROD)



LEGEND

- LIMITS OF LANDFILL CAP
- GROUNDWATER REMEDIATION TARGET AREA
- PROPERTY BOUNDARY
- DMZ ZONE INSIDE PROPERTY BOUNDARY
- ← RIVER FLOW DIRECTION
- x FENCE
- BUILDING
- CONTOURS
- EXTRACTION WELL (5)
- PIEZOMETER (6)
- MONITORING WELL (6)
Depth of Well
S=Shallow (=25 feet)
M=Medium (=70 feet)
D=Deep (=130 feet)
- Note: Monitoring wells 2, 4S, and 5S are for future monitoring
- x ESTIMATED LOCATION OF SURFACE WATER AND SEDIMENT SAMPLE

FIGURE
MONITORING WELL, EXTRACTION WELL,
AND PIEZOMETER NETWORK
 ONALASKA
 QAPP

U.S. ENVIRONMENTAL PROTECTION AGENCY
REMEDIAL ACTION

ADMINISTRATIVE RECORD
FOR
ONALASKA MUNICIPAL LANDFILL SITE
ONALASKA, LACROSSE COUNTY, WISCONSIN

UPDATE #4
OCTOBER 22, 2001

<u>NO.</u>	<u>DATE</u>	<u>AUTHOR</u>	<u>RECIPIENT</u>	<u>TITLE/DESCRIPTION</u>	<u>PAGES</u>
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3	09/29/00	Muno, W., U.S. EPA	Public	Explanation of Signifi- cant Difference at the Onalaska Municipal Land- fill Site	9
4	10/27/00	Fisher, J., CH2M Hill	Prendiville, T., U.S. EPA	E-Mail Transmission re: Evaluation of WDNR Inquiry Regarding a Shut- Down Test at Onalaska Municipal Landfill Site	2
5	10/31/00	Fisher, J., CH2M Hill	Prendiville, T., U.S. EPA	E-Mail Transmission re: Evaluation of WDNR Inquiry Regarding a Shut- Down Test at Onalaska Municipal Landfill Site	2
6	01/00/01	CH2M Hill	U.S. EPA	Annual Groundwater Quality and Capture Report for 2000 for the Onalaska Municipal Landfill Site	136
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9 10/08/01

Heidel, S., Bill, B.,
Onalaska U.S. EPA
Resident

E-Mail Transmission re: 1
Public Comment on the
Proposed Shutdown of
the Onalaska Municipal
Landfill Site

[The following text is extremely faint and largely illegible. It appears to be a series of lines of text, possibly a list or a set of notes, but the specific content cannot be discerned.]