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FIVE-YEAR REVIEW REPORT

LORD SHOPE LANDFILL

SUPERFUND SITE

GIRARD TOWNSHIP, PENNSYLVANIA

Prepared by:

U.S. Environmental Protection Agency

Region III

Philadelphia, Pennsylvania

U.S. Environmental Protection Agency
Region 3
Hazardous Site Cleanup Division
Five-Year Review (Type I)
Lord Shope Landfill, Girard Township, Pennsylvania

I. Introduction

A. Purpose

EPA Region III conducted this review pursuant to § 121© of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended ("CERCLA"), 42 U.S.C. § 9621(c); § 300.400(f)(4)(ii) of the National Oil and Hazardous Substances Pollution Contingency Plan, 40 C.F.R. Part 300 (as amended); and OSWER Directives 9355.7-02 (May 23, 1991), 9355.7-02A (July 26, 1994) and 9355.7-03A (December 21, 1995). It is a statutory review. The purpose of a five-year review is to ensure that a remedial action remains protective of public health and the environment and is functioning as designed. This document will become a part of the Site file. This is Type I review since remedial action construction has been completed and the site is the Operations and Maintenance ("O&M") phase.

B. Site History and Characteristics

The 25.2 acre Lord Shope Landfill Superfund Site ("Site") is located west of Pieper Road approximately 4500 feet south of the intersection of U.S. Route 20 and Pieper Road in Girard Township, Erie County, Pennsylvania. The site consists of an inactive, hazardous waste landfill covering approximately 4 acres, and adjacent areas of contaminated soil, surface water, and groundwater. To the north of the site and to the west of the site are two unnamed tributaries of Elk Creek (Reference Figure 1). The property is currently owned by the Lord Corporation ("Lord") of Erie, Pennsylvania.

The area surrounding the site is primarily rural agricultural there are scattered residential areas bordering the roads. The nearest population center, Girard Borough, is located two miles to the northeast of the site. Girard Borough had a 1996 population of 4800 people.

From the mid-1950s until 1979, industrial wastes; including spent adhesives, degreasing solvents, cutting oils, acids and caustics; along with miscellaneous paper, wood and rubber wastes, were disposed of at the Site. The property was then owned by Mr. Melvin Shope. The wastes were generated at Lord Corporation's Erie and Saegertown, PA manufacturing plants.

In 1982, after Lord had conducted some preliminary site studies, Lord, Mr. Shope, and the Pennsylvania Department of Environmental Protection ("PADEP"), then named the

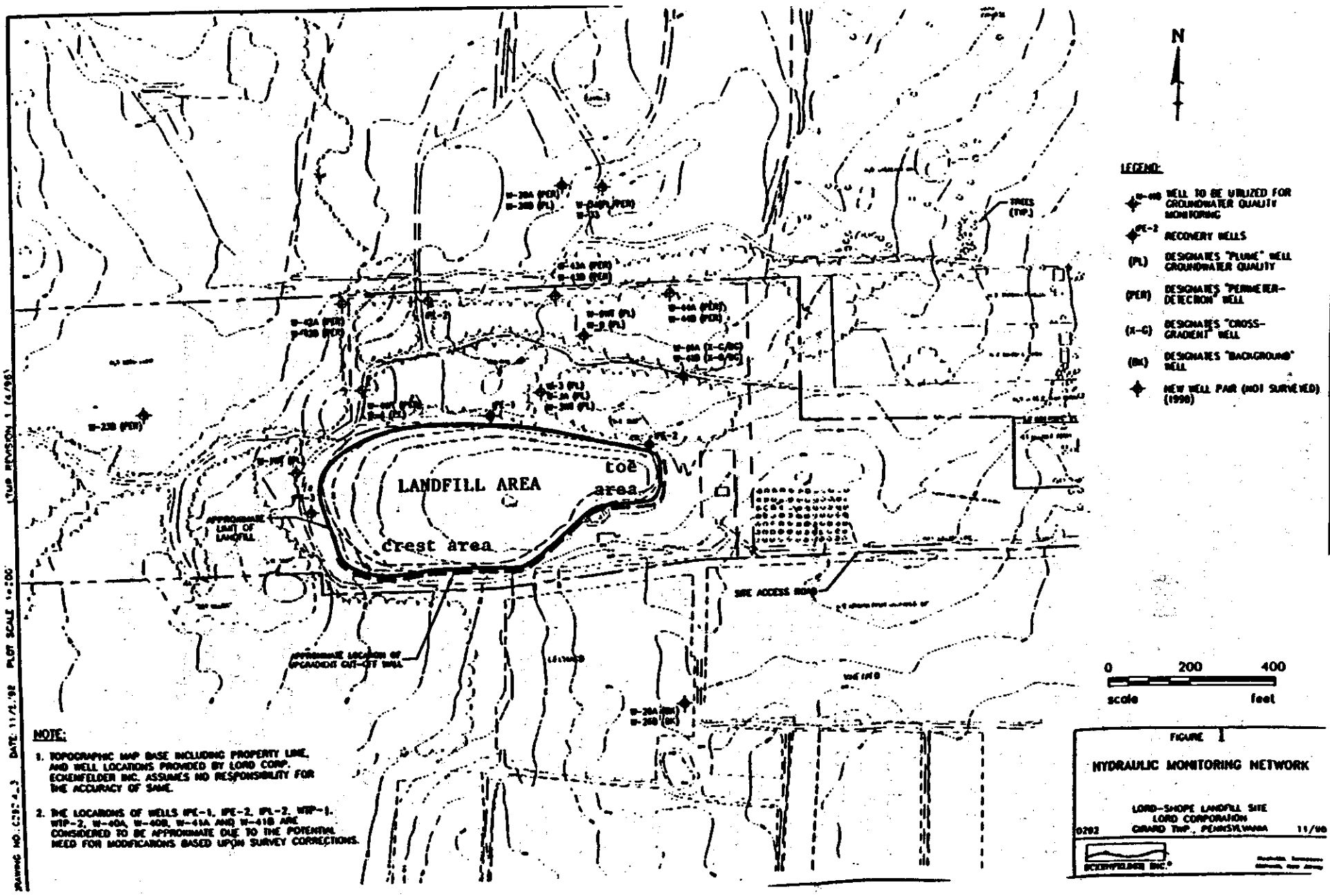

FIGURE 1

HYDRAULIC MONITORING NETWORK

LORD-SHOPE LANDFILL SITE
LORD CORPORATION
0202 GIRARD TWP., PENNSYLVANIA 11/98

ECKENFELDER INC.

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Pennsylvania Department of Environmental Resources ("PADER"), entered into a Consent Order and Agreement that required the continued monitoring and the implementation of a remedial alternative at the Site. This remedial alternative was implemented in 1982 and 1983 and consisted of the removal of approximately 81 exposed drums of waste, emplacement of a composite cap over the landfill, the construction of a low permeability groundwater cutoff wall upgradient (south) of the landfill, and the regrading and revegetation of the Site. The construction of the cap included a clay layer, a synthetic membrane, and a vegetative soil cover. The objective of that remedial alternative action was to reduce the amount of contamination entering the groundwater by reducing leachate production in the landfill and diverting groundwater flow around the Site. The site was proposed for inclusion in the National Priorities List ("NPL") on December 30, 1982, and was finalized on the NPL on September 8, 1983.

In order to supplement the existing site information and to meet the requirements of CERCLA, the PADER and the EPA requested, in 1985, Lord to conduct a focused Remedial Investigation and Feasibility Study ("RI/FS"). In 1987, Lord agreed to conduct the RI/FS under the terms of a Consent Order signed by PADER and Lord. The RI was conducted and submitted by Lord's environmental consultant, Aware Incorporated. Following the evaluation of the report, PADER and EPA decided further investigations at the Site were necessary, and requested Lord to conduct a "Phase II" RI and FS. The subsequent RI/FS Report was submitted as a comprehensive report covering all of the work done up to that point.

The report showed that as a result of the uncontrolled disposal of liquid wastes and the leaching of contaminants, site soils, landfill materials, and groundwater became contaminated with volatile organic compounds ("VOCs") and various heavy metals. The contaminant plume extends off the site property boundary onto an adjacent golf course. Site related contaminants consist of the following: acetone, arsenic, barium, benzene, 1,2-trans-dichloroethene, lead, methyl ethyl ketone, methyl isobutyl ketone, tetrachloroethene, trichloroethene, and vinyl chloride. Long-term risks are posed by the potential consumption of contaminated groundwater.

Residences adjacent to the site, rely on groundwater for their drinking water supplies. Historic and ongoing monitoring of these wells indicate they have not been impacted by Site related contaminants.

On June 29, 1990 the EPA Regional Administrator signed a Record of Decision ("ROD") containing the following remedy components

1. Groundwater extraction and treatment to halt contaminant migration in groundwater, with the long-term effect of returning the groundwater to its most beneficial use. The most beneficial use of groundwater at the site is drinking water. The treated groundwater is discharged to a tributary of Elk Creek adjacent to the site, subject to National Pollution Discharge Elimination System ("NPDES") permit regulations;

2. In-situ vapor stripping ("ISVS") that uses vacuum wells to remove volatile organic

compounds from the landfill materials and surrounding soils; and

3. The additional protection provided by institutional controls to restrict the use of contaminated groundwater and the installation of security fencing around the property to prevent direct human contact with contaminants at the Site.

On June 25, 1991, Lord entered into a Consent Decree with the United States for the design and implementation of the remedy selected in the ROD. On July 20, 1994, EPA approved the site's Remedial Design. The Remedial Action construction at the Site began on October 31, 1994, and all physical construction of the remedy in accordance with the approved remedial plans and design specifications was completed on June 5, 1996. The site's Preliminary Close Out Report ("PCOR") was signed on September 30, 1996 becoming the 400th NPL site to achieve construction completion status. The site is presently in the Operations and Maintenance ("O&M") Phase of activities.

II. Remedial Objectives; Areas of Compliance/Non-compliance

This five year review started on October 21, 1999 and consisted of a site visit and inspection of the: treatment building, treatment process equipment, and operational and maintenance logs. Attendees of at the site visit include the EPA and PADEP RPMs, and representatives from Lord Corporation. A meeting with representatives of Lord Corporation was held during the site visit to discuss issues related to the remedy.

A. Cleanup Goals:

The cleanup goals for the groundwater were developed using existing or proposed Maximum Contaminant Levels ("MCLs"). Where no MCL was available or where the other factors set forth in Section 300.430(e)(2)(I) of the National Contingency Plan ("NCP") so require, health-based risk levels were used in setting the cleanup goals for the groundwater at the Site. As a result of this analysis, the cleanup goals were set to levels representing 10^{-4} excess cancer risks or hazard indices not exceeding 1.0 for each contamination determined to be present in groundwater in concentrations above the appropriate MCL or health-based risk level. The cleanup goal identified in the ROD is the Commonwealth of Pennsylvania requirement pertaining to groundwater containing hazardous substances. It requires that all groundwater must be remediated to "background" quality. To the extent that the concentration of any contaminant exceeds the background concentration, the cleanup level will be modified to or set at the background concentration unless attainment of background concentration is determined to be in feasible or is otherwise waived under Section 121(d)(4) of CERCLA, 42 U.S.C. Section 9621(d)(4).

Ground water treatment is classified as a long term response action ("LTRA"). During the LTRA, performance data is being collected and evaluated in accordance with the remedy's long term groundwater monitoring plan. If this performance data indicates that background

levels are technically impracticable to achieve, the background standard will be waived through a ROD modification. In accordance with the approved Long-term Groundwater Monitoring Plan, Lord performs groundwater monitoring of on-site, off-site perimeter and residential wells adjacent to the site. Lord also performs sampling and analysis of the NPDES outfall on a Quarterly Basis. Historic analytic results indicate the NPDES outfall limits are in compliance and site related groundwater contamination has not impacted residential wells.

B. ARARS

A review of applicable or relevant and appropriate requirements (ARARs) was conducted to determine if any ARARs had changed since the time of the ROD's issuance, and if they had whether the remedial actions would still be protective of human health and the environment.

The ARAR review indicated the ARAR for groundwater treatment levels may be a potential concern. At the time of ROD issuance, the Commonwealth of Pennsylvania required treatment to background concentrations. After the issuance of the ROD the Commonwealth of Pennsylvania enacted, Act II, which requires Commonwealth of Pennsylvania groundwater cleanup standards to be consistent (not more stringent) than Federal requirements (MCLs). The current Commonwealth of Pennsylvania groundwater cleanup standard under Act II would be MCLs; however, the Commonwealth has never asserted MCLs for the Site and the cleanup to background ARAR remains as the cleanup standard. The cleanup to background standard is protective of human health and the environment.

C. Site Fence

The ROD required a site security fence be installed around the site property to prevent human contact with contaminated seeps and soils and to protect the treatment system and equipment. During the site visit, a visual inspection of the fence determined the fence is surrounding the property and is in good condition with no breeched access points. There are no signs of vandalism and no reports of vandalism or trespassing.

D. Institutional Controls

The ROD required the implementation of institutional controls to restrict the permitting and construction of groundwater wells in the area of the contaminated groundwater plume. Lord instituted these controls in 1991 as specified in the Consent Decree.

E. Observations

1. Reports/ Submittals:

In preparation for the site visit, the Site's monthly progress reports, groundwater monitoring results and effluent discharge data from October 1994 through September 1999 were

reviewed. The site data indicate, the groundwater plume is contained, and the concentration of VOCs and metals are being removed from the groundwater. The treated effluent is being discharged below the required NPDES limits. The data also indicates the thermal oxidizer unit has operated satisfactorily, (except during its initial startup period), with an overall destruction removal efficiency of 99%-99.9% of total VOC vapor influent. The groundwater treatment system has operated normally from startup in 1996 to the present with a total VOC removal efficiency ranging from 94%-99%. The data indicates a general trend of decreasing concentrations of site related contaminants. The groundwater cleanup will continue to operate for an estimated 50 years until background concentrations are achieved, and operation of the ISVS will continue until nondetect levels or no significant removal levels of indicator compounds have been demonstrated for three consecutive months and the subsequent spike values reveal nondetect or no significant removal levels. The 1990 ROD estimated the ISVS would operate for two years, but current estimates are between seven and nine years of operation.

In addition to implementing the remedial action in 1996, Lord expanded the groundwater monitoring program to evaluate the contributions of Natural Attenuation ("NA") on contaminated groundwater at the site. The U.S. EPA's National Risk Management Research Laboratory ("NRMRL") in Ada, Oklahoma reviewed Lord's work plan and subsequent studies. The studies have concluded the near absence of parent chlorinated ethenes and the presence of degradation (daughter) products. The decreasing concentrations and the supporting geochemical data provide evidence that biodegradation has contributed to NA of the plume in areas off the Lord property. In September 1999, NRMRL concluded the data shows NA processes are occurring and may be important. NRMRL recommended further studies be conducted to examine the role of NA in conjunction with the site remedial action objectives. Lord is currently in the process of supplementing the existing NA data with additional studies while continuing to operate the remedial action.

In 1998 Lord provided EPA and PADEP with six years of groundwater data for review. The data indicated no exceedences of cleanup levels or MCLs in samples obtained from wells off the Lord property. As a result, the EPA and PADEP concurred to discontinue monitoring all but four of the wells located on the adjacent golf course property.

2. Site Visit / Inspection

During the site inspection the groundwater treatment system ("GWTS") housed in the on-site treatment building, the ISVS system including the thermal oxidizer unit, the process control equipment and the extraction wells on Site were all visited and visually inspected. Recent logs for individual components of the treatment equipment were reviewed.

The treatment process including the groundwater recovery wells and vacuum extraction wells, are all in good working order condition. The treatment building is located within the site fence and is locked. The treatment building houses the GWTS comprised of the following equipment: intake equalization tank, permanganate mixing tank, two pressure filters, air stripper

equipment: intake equalization tank, permanganate mixing tank, two pressure filters, air stripper unit, effluent backwash holding tank, filtrate tank, sludge holding tank, filter press, pumps and process control units.

The landfill area and two adjacent areas known as the "toe area" and the "crest area" are remediated by ISVS. The ISVS treatment system equipment is located outside and adjacent to the groundwater treatment building. The vapor extraction / treatment system includes a thermal oxidizer, blower(s), demister, condensate removal tank, condensate water pump and controls. Blowers are used to pull a vacuum on the header pipe that is connected to three vapor extraction wells located in the landfill area, six vapor extraction wells located in the crest area of the landfill and a horizontal extraction pipe located in the toe area of the landfill. Low vapor recovery has historically been experienced in the crest area, and these six vapor extraction wells were not in operation during the visit.

The GWTS and ISVS equipment are well maintained on a preventative maintenance schedule and is in good operational working order. No prolonged downtime of the systems have been recorded since 1996. In early 1996 the thermal oxidizer unit's stack was replaced due to materials defect. Lord is currently planning to replace the thermal oxidizer's outer steel casing in the Spring of 2000. This replacement is necessary because the outer shell unit has corroded. The unit's operation and safety has not been impacted. There are two extraction wells pumping at a rate of approximately 13 gallons per minute. Monitoring and extraction wells are clearly numbered, are visible, and are in good condition. All wells are secured.

Records are maintained at the site and include the following: a site log book for everyone to sign who enters the building, operational and maintenance log sheets for individual pieces of treatment equipment, and electronic data recorded from the data sensors embedded in the various pieces of process equipment and process lines. Data from the sensors include time and date, groundwater pump rates, effluent flowrate, temperature, thermal oxidizer temperature, and line pressure. System log books dating back two years are kept on site, while earlier records are archived off-site. Electronic data from the site's computerized control unit is archived in electronic format offsite. Site status activities are presented monthly by Lord in a remedial action monthly progress report submitted to EPA and PADEP.

The landfill's cap and vegetative cover, surface water control structures, and access roadways are well maintained.

G. Community Involvement

During the week of October 25, 1999, the EPA Community Involvement Coordinator ("CIC") contacted the following community representatives to discuss these issues:

1. Girard Township Official: Mrs. Betty Bell, Girard Township Treasurer, (and former Girard Township Secretary during the time period of the remedy's construction and completion)

2. Mrs. Sawin, Girard Township Resident, and Community Spokesperson. Mrs. Sawin spoke on behalf of the community during the 'Site 400 Superfund Construction Completion' event in October 1996.

No complaints or issues related to the implementation and/or operation of the remedy were conveyed to the CIC.

III. Recommendations.

No further response actions have been determined to be necessary based on this five-year review. Long term monitoring and O&M of the remedy will continue as required. EPA and PADEP will continue to review and supply comments on data, reports and submittals.

IV. Statement on Protectiveness

The remedy for the Lord Shope Landfill Superfund Site is protective of human health and the environment. The ROD's site-wide remedial objective to cleanup groundwater to background concentrations has not yet been achieved.

The remedial actions required by PADER prior to EPA's 1990 ROD continue to be effective. The groundwater data indicates that the groundwater cut off wall is effective at preventing groundwater flow through the landfill source area. The landfill cap is effective at containing contaminants through preventing infiltration of precipitation and direct contact with contaminated materials and soils. The cap's vegetated cover is intact and is well maintained.

The groundwater pump and treatment and ISVS systems are functioning as designed. Levels of contaminants are decreasing as needed to achieve cleanup goals within the time frame anticipated as indicated in the ROD. Institutional controls are in place to prevent groundwater use from the contaminated plume. The site security fence is in good order and warning signs are in place and clearly visible. There is no evidence of vandalism or history of trespassing. The PRP has implemented an aggressive preventive maintenance program in assure continued operation of the remedy to acheive remediation goals in a timely manner.

V. Next Five-Year Review.

The next five-year review will be conducted no later than October 31, 2004.

Abraham Ferdas, Director
Hazardous Site Cleanup Division

11/1/99
Date