



Minnesota Pollution Control Agency

LAND USE PLAN



WASTE DISPOSAL ENGINEERING LANDFILL

MPCA produced this report with the assistance of Sanders Wacker Bergly, Inc.

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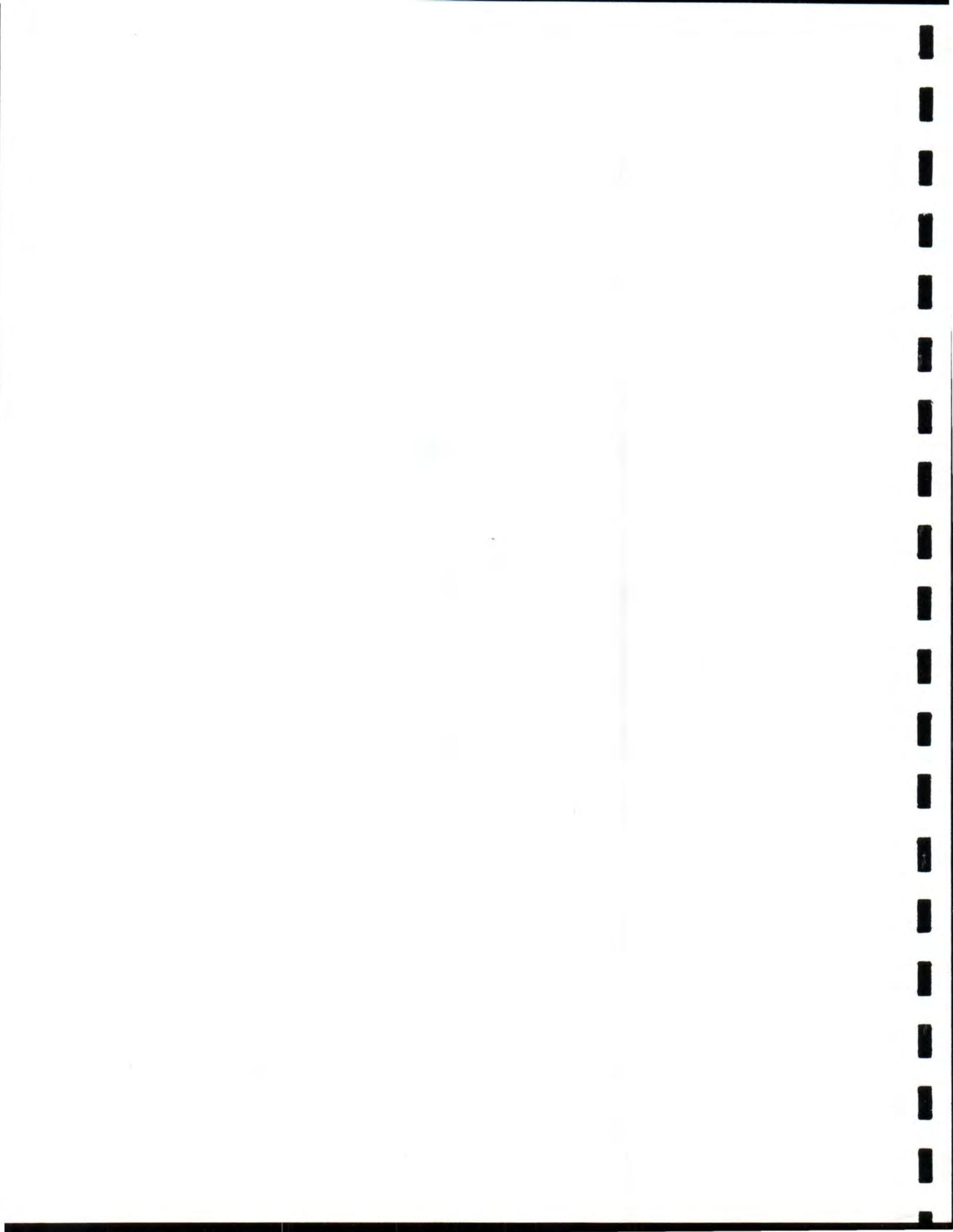


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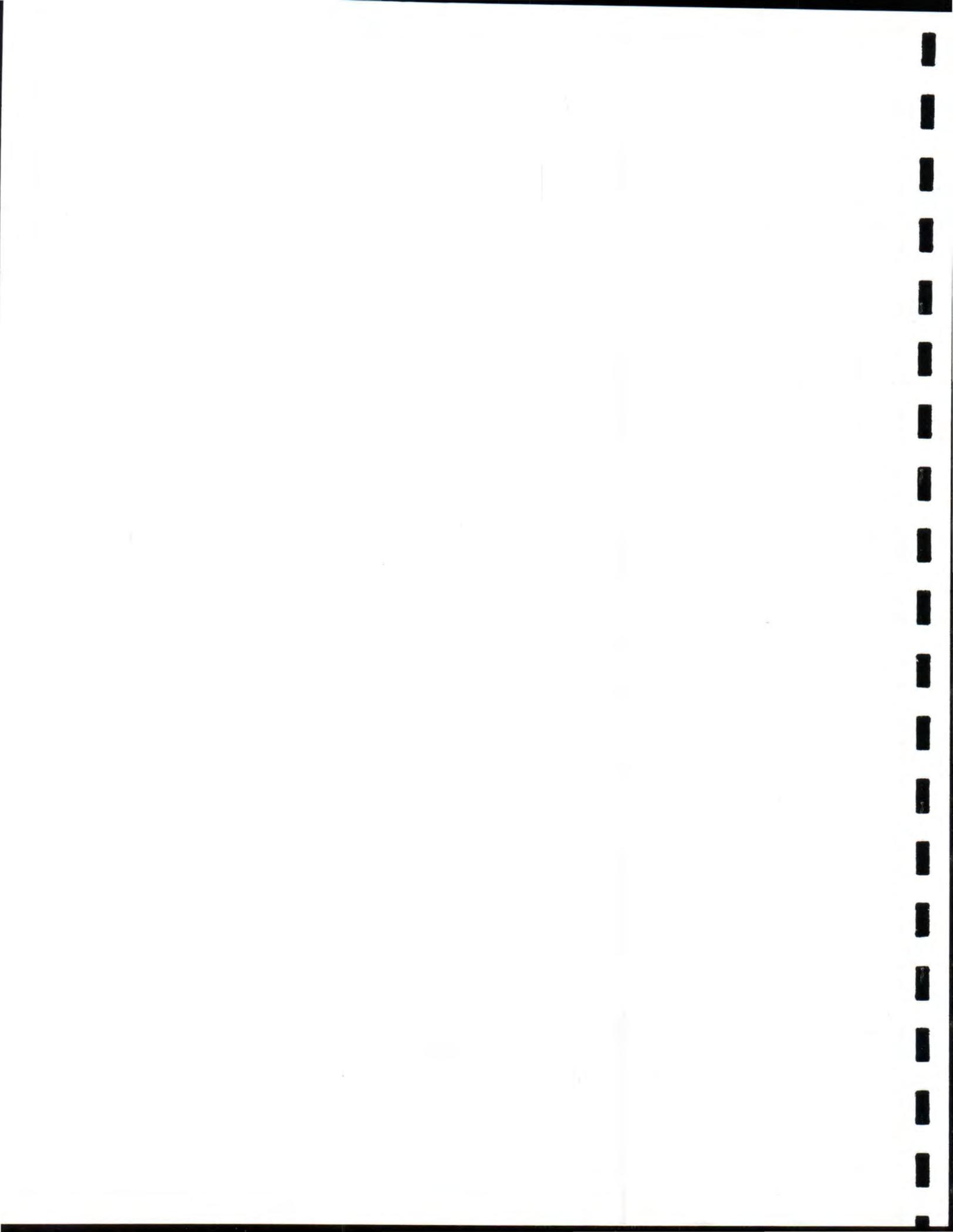
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Land Use Plan Waste Disposal Engineering Landfill

Introduction

In 1994, the Minnesota Legislature adopted the Landfill Cleanup Act (LCA) (currently codified at Minn. Stat. 115B.39 - 115B.445) which created the Closed Landfill Program (CLP). Under the CLP, the Legislature authorized the Minnesota Pollution Control Agency (MPCA) to take over the owner/operator's environmental response action obligations at over 100 closed mixed municipal solid waste landfills throughout the State and initiate cleanup actions, complete closures, and prepare annual evaluations.

As part of these responsibilities, the LCA (Minn. Stat. § 115B.412, subd. 9) requires that the MPCA develop a Land Use Plan for each of the landfills in the CLP. The LCA terms the landfills as "qualified facilities". The statute states:

The Commissioner shall develop a land use plan for each qualified facility. All local land use plans must be consistent with a land use plan developed under this subdivision. Plans developed under this subdivision must include provisions to prevent any use that disturbs the integrity of the final cover, liners, any other components of any containment system, or the function of any monitoring systems unless the commissioner finds that the disturbance:

- is necessary to the proposed use of the property, and will not increase the potential hazard to human health or the environment; or
- is necessary to reduce a threat to human health or the environment.

(Appendix A: Land Use Plan Fact Sheet and is available on the MPCA's web page at: www.pca.state.mn.us/cleanup/closedlandfills.html#lup)

Possible Problems Associated with Closed Landfills

Landfill gas migration and ground water contamination are serious concerns associated with many landfills in the CLP; not only at the landfill itself, but also on adjacent property. In several cases, these situations could pose a threat to the health and safety of persons living close to these landfills or to persons associated with some activity either at or in the vicinity of these landfills. Specific examples of these potential threats include explosive concentrations of landfill gas in buildings and other structures at and near the landfill, the risk of inducing contaminated groundwater into other aquifers by constructing groundwater wells in multiple aquifers, and the consumption of contaminated drinking water as the result of constructing potable wells in contaminated aquifers.

Because the MPCA is responsible for the long-term care of these landfills, the MPCA has implemented monitoring programs and corrective actions at most of the sites. The MPCA is not only responsible for addressing the landfill gas and groundwater issues at the facility, but is also responsible for the operation and maintenance (O&M) of the landfill cover, any remediation and monitoring systems present, and site security. In addition, worst case situations sometimes mean that more elaborate remediation systems, such as active gas extraction systems and groundwater treatment systems, need to be constructed and operated at these landfills in order

to help mitigate these problems. Consequently, any future use and development of the landfill property needs to be planned carefully and responsibly and must be compatible with the MPCA's responsibilities for the qualified facility.

Purpose of Land Use Plans

The purpose for preparing a Land Use Plan (LUP), for each landfill, is to protect human health and public safety; and to protect the integrity of the landfill's remediation and monitoring systems. The LUP also helps local government balance needs and desires for land use with consideration for health and safety requirements.

To meet the requirements of the statute, local units of government must make their land-use plans for the qualified facility land (landfill boundary) consistent with the MPCA's land-use plan. In some cases, adoption of a consistent local plan may require a change to local zoning and other land-use measures.

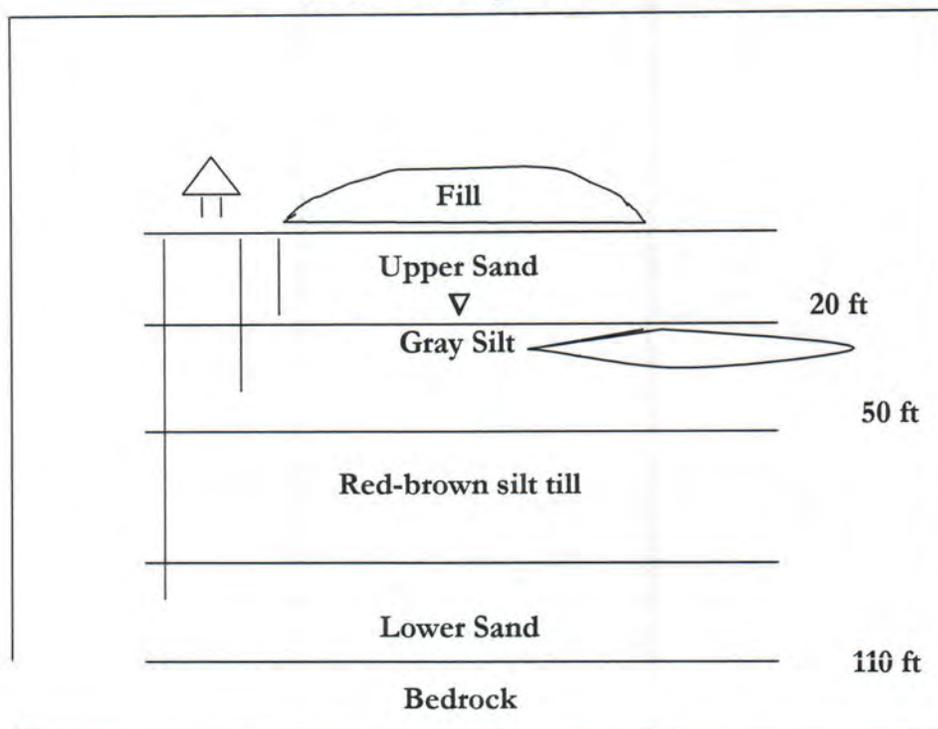
Site Location and Description

The Waste Disposal Engineering Landfill (Landfill) is located in the City of Andover, Anoka County, Minnesota. The Landfill property boundary (Figure 1 *Boundary Survey-URS 2006**) is bounded on the east by Hanson Boulevard, to the north by Coon Creek, to the west by Crosstown Boulevard, private property, and city park land, and to the south by land owned by the City of Andover's Economic Development Authority. The property comprising the landfill boundary is currently owned by the State of Minnesota, through tax forfeiture and portions by the MPCA.

The Landfill is located in a glacial geomorphic feature referred to as the Anoka Sand Plain. The geology at the site reflects its location. There are two aquifers at the site referred to as the Upper and Lower Sand. The Upper Sand is unconfined and water in this aquifer is found at a depth of 15 to 20 feet below the ground surface at the site. The Upper Sand is approximately 50 feet thick and contains discontinuous gray silt. Monitoring wells with an "A" suffix are vertically placed in the Upper Sand to intersect the water table. Monitoring wells with a "B" suffix are vertically placed at the base of the Upper Sand. The Upper Sand discharges to Coon Creek which is north of the site. The Upper Sand is separated from the Lower Sand by the Grantsburg Till which is characterized at the site by red-brown silts. The Grantsburg Till acts as an impermeable barrier between the two sand aquifers and is up to 40 feet thick below the site. Contamination has not been found in the Lower Sand. Residential wells and monitoring wells with a "D" suffix are screened in the Lower Sand. The thickness of the Lower Sand has not been defined beneath the site but depth to the Lower Sand in the residential and monitoring wells varies from 90 to 110 feet below the ground surface. The bedrock beneath the site is characterized by the St. Lawrence Formation (shales) and has been found south of the site at a depth of 120 feet below the ground surface.

*Footnote: Figure 1 is based on a current survey (March 2006). Figures 2-10 are pdf maps done in the fall of 2004 and therefore, not accurate for the landfill boundary.

General Geology of Site



(The vertical lines represent wells in D, B, and A horizons, from left to right.)

Site History and Remediation System

The site was operated as a private dump for at least ten years prior to the MPCA issuing an operating permit in 1971. The Landfill stopped accepting waste in 1983. The permitted facility is 114 acres, with a fill area of approximately 73 acres. It contains approximately 2,410,000 cubic yards of compacted mixed municipal solid waste and soil cover material. A permitted hazardous waste disposal pit also accepted liquid industrial and hazardous waste from November 1972 to January 1974, at which time the MPCA ordered the pit closed. The Landfill was placed on EPA's National List of Priorities (Superfund) in September 1983. Information included in the EPA 106 Superfund Administrative Order (106 Order) for the Landfill, dated July 26, 1991, indicated a truck load of barrels reportedly broke through the asphalt liner of the hazardous waste pit in November 1972. The repairs were not completed until July 1973. The 106 Order also describes an undetermined quantity of hazardous waste, much of it in bulk loads, disposed throughout the Landfill.

In response to the 106 Order, the Waste Disposal Engineering (WDE) Potential Responsible Parties (PRP) Group installed a ground water pumpout system in 1992 and 1993, and constructed a final cover system in 1993. The ground water pumpout system included eight perimeter pumpout wells to capture the contaminant plume and a single pumpout well located inside a slurry wall constructed around the hazardous waste disposal pit. This was done to create an inward hydraulic gradient thereby minimizing migration of contaminants from the pit area. Two perimeter pumpout wells were manifolded together due to low flow rates. The final cover system included regrading the waste prior to constructing a cover and installing twelve passive gas vents and two gas barrier membranes.

During this phase of construction, the ground water from each pumpout well was manifold into a common header before being pumped to a sanitary sewer located in Crosstown Boulevard. Monitoring data indicated that the flash point limit, for the Metropolitan Council Environmental Services Industrial Discharge Permit, was exceeded on three occasions (1993), requiring further treatment of the ground water prior to discharge to the sanitary sewer. Therefore, a tray stripper unit was installed to volatilize contaminants from the waste stream. One flash point exceedance of the tray stripper effluent occurred in November 1995 after the tray stripper unit was installed. However, there have not been any exceedances of flash point since 1995.

In October 1995 Anoka County, the WDE PRP Group and the MPCA signed a Landfill Cleanup Agreement and the MPCA issued the Notice of Compliance. The site was deleted from the National Priorities List by EPA in March 1996. This resulted from the State's 1995 agreement with the EPA, implementation of the CLP, and the signed Landfill Cleanup Agreement which requires the State to assume the long-term care of the Landfill.

The cost of operating the pumpout system, with little indication of near-future decrease in costs, caused MPCA to consider alternatives to more efficiently remove volatile organic compounds from the Landfill. The potential for off-site gas migrating towards nearby private property also influenced MPCA's considerations. The MPCA concluded that it would install an active gas extraction system to remove methane and other volatile organic compounds from the waste and combust them in an enclosed flare. The MPCA has been operating the active gas extraction system, a system which includes 54 gas extraction wells, since 1998.

In 2004, the MPCA installed a new extraction well (EW-8) because the 2003 groundwater monitoring well data indicated that the contaminant plume extends beyond the capture zone of the pumpout system in one location. In addition, because of safety issues surrounding the cleaning of the tray stripper, the MPCA redesigned the effluent treatment system and eliminated the need for the tray stripper. The new design pumps extracted groundwater and condensate into a lined treatment basin for pretreatment prior to discharge to the sanitary sewer. The MPCA constructed this new system in the fall of 2004.

A WDE Landfill Fact Sheet is provided as Appendix B and is available on MPCA's web page at: www.pca.state.mn.us/cleanup/closedlandfills.html#factsheets. It highlights historical points, contamination issues and provides MPCA staff contact information.

The MPCA has determined that a gas to energy system is feasible at the Landfill and has received bids to construct the project.

Environmental Impacts from the Landfill

Due to the types of the materials that were disposed of at the Landfill and left on site at the time of its closure, there are numerous public health concerns associated with the Landfill. The toxic materials have migrated into the soil, surface water and ground water. Also, the site continues to generate methane gas, which is explosive when concentrated to certain levels. Remediation procedures such as capping the site, pumping out contaminated groundwater, and extracting and burning the landfill gas have partially mitigated these dangers but public use of land and water, in and near the landfill site, still is not completely safe. In order to protect public health and welfare from these dangers certain land and water uses must be controlled, now and well into perpetuity.

Groundwater Contamination

The influent and effluent data showed a marked decrease in contaminants removed seasonally from the groundwater and the landfill gas. The contaminants that exceed drinking water standards in the groundwater, at the compliance boundary (200 feet from the waste footprint), include arsenic, benzene, vinyl chloride, and 1,1,2,2 tetrachloroethene. Figure 2 represents the Total Volatile Organic Compound (VOC) Contamination at the Base of the Upper Sand and Figure 3 represents Flow at the Base of the Upper Sand. The monitoring wells completed in the lower sand aquifer have not shown VOC contamination from the Landfill. The monitoring wells north of Coon Creek exceeded the Health Risk Limit for 1,1,2,2 tetrachloroethene in 2003. Surface water sampling during 2003 of Coon Creek indicated no exceedance of Aquatic Life Standards.

It is important to note that groundwater contamination has been detected off-site north of the Landfill. Although this Land Use Plan does not address land-use off of the landfill boundary, the MPCA's Annual Report for the Landfill provides detailed information about this off-site concern.

Gas Migration

The active gas extraction system operated 97 percent of the time during 2003. The active gas extraction system is designed to remove landfill gas including methane and volatile organic compounds from the waste and combust them in an enclosed flare. There are 54 gas extraction wells in the Landfill. MPCA installed one of the gas extraction wells in the hazardous waste pit to further reduce ground water contamination. The gas extraction system is controlling gas migration. There were no significant detections of explosive gas beyond the landfill boundaries in 2003. The MPCA tested the flare stack in November 2003. The results indicated that the flare's combustion exceeds 99.9% destruction of combustible organics measured in the inlet gas of the flare.

Land Use Issues

The key document which guides the use of the Landfill is the October 1995 *Landfill Cleanup Agreement: Document # 1203355* (Figure 4) between Anoka County, the WDE PRP Group and the MPCA. It placed the following controls on the Landfill:

- No transfer of any rights in the tax-forfeited property without an easement to the MPCA;
- No sale of any tax-forfeited property improved with state general obligation bond funds without compliance with state law and orders;
- No structures on the tax-forfeited property without prior written approval of the MPCA;
- Any approved structures shall be built to protect occupants from landfill gas infiltration;
- No placement of materials, personal property, equipment, or any other items on the tax-forfeited property without the MPCA's written consent;
- No public access or development of the property except in the Hanson Boulevard right-of-way lying outside the landfill fence and except as defined in other existing easements;
- No trees or shrubs can be planted which may potentially disturb or impede the landfill cover;
- No groundwater extraction from the tax-forfeited property. This does not apply to the repair or replacement of existing wells provided that there is no material increase in the

amount of water extracted. This also does not apply to water extraction that is part of the remedial action;

- Any dewatering for public utility or public road purposes requires the MPCA's prior written approval;
- No drinking water well without written approval of the MPCA and the Minnesota Department of Health;
- Various exceptions and conditions relating to work on Hanson Boulevard and public utilities in the vicinity.

Figure 5 *Refuse limits, with 200' and 500' zones*, identifies the two refuse limit boundaries around the Landfill.

Another key document guiding the use of the Landfill and surrounding property is the *Andover City Ordinance 19* (Figure 6). This ordinance contains the following restrictions:

- No enclosed structures can be built on the Landfill or within 200 feet of WDE refuse limit as depicted by Line F (should be Line E) in Exhibit A (attached to the ordinance), except north of Coon Creek;
- Enclosed structures between 200 feet of refuse (as shown by Line E in Exhibit A) and 500 feet of refuse limit (as shown by Line F in Exhibit A) require installation of soil gas monitoring probe between the structure and the refuse;
- Structures between 200 feet of refuse (as shown by Line E in Exhibit A) and 500 feet of refuse limit (as shown by Line F in Exhibit A) must have explosive gas monitor installed at lowest level;
- MPCA is granted access for monitoring purposes to all monitors and probes that are covered by the ordinance;
- No extraction of groundwater from the Upper Sand Aquifer within 500 feet of limit of refuse. No extraction of groundwater from the Lower Sand Aquifer within area indicated in Exhibit A to the ordinance.

Land use of the Landfill, as well as surrounding properties is also governed by the current city municipal code, easements and land use restriction agreements. Future zoning and land use will be guided by the City of Andover Comprehensive Plan. In addition, there are Federal Emergency Management Agency (FEMA) floodplains and National Wetlands Inventory (NWI) indicated wetlands on the WDE Landfill and surrounding properties (Figure 7 *Wetlands and Floodplains*).

Controls, Easements, Other Restrictions

In addition to the Landfill Cleanup Agreement and the Andover City Ordinance 19, there are multiple documents and regulations which place controls on the Landfill property and adjacent properties. These restrictions come from easements, restrictive covenants, deed conditions, agreements, local, state and federal wetland regulations, Federal Emergency Management Agency (FEMA) restrictions and City of Andover/Coon Creek Watershed District regulations. Following is a list of these documents, a recording number, if applicable and a brief description of the controls:

- Utilities:
 - United Power Association Easement (Document #1626332)
 - Sewer Easement (Document #820166)
 - Rural Cooperative Power Association Easement (Document #297946)

- Rural Cooperative Power Association Easement (Document #297578)
- Wetland Conservation Act and Clean Water Act (Section 404)
 - Windschitl Access Easement (Document # 1215236): 200' from refuse boundary; no construction of any kind other than city road to connect with 142nd Lane NW; no underground utility construction without MPCA approval; no installation of wells for groundwater extraction from the Upper Sand Aquifer; no extraction from Lower Sand Aquifer; and, gas monitoring equipment required for any enclosed structure.
 - Modifications to the Access Agreements: City of Andover Property and NSP Easement.
 - Quit Claim Deed (Document #1450970): parcels south of the Landfill.
 - Nature's Run Declaration of Restrictive Covenants (Document #1623821): 500' from refuse boundary; no groundwater extraction from Upper Sand Aquifer without prior MPCA approval; and, no groundwater extraction from Lower Sand Aquifer without prior MPCA approval (except existing wells).

The above referenced documents or regulations address multiple land use issues as highlighted below:

- Development/Grading/Construction Restrictions
- Upper Sand Aquifer Groundwater Restrictions
- Lower Sand Aquifer Groundwater Restrictions
- Building Restrictions
- Planting Restrictions
- Utilities
- Fences
- Roadways
- Soil/Minerals
- Wetland and Floodplain Restrictions
- Zoning Restrictions

Sanders Wacker Bergly developed Figure 8, *All Development Restriction*, to aid those interested in identifying these multiple restrictions.

Hazard Disclosure Document

The MPCA had a Hazard Disclosure Document (2004) developed for the Landfill. The purpose of the document is to inform the MPCA's contractors and consultants about a broad range of hazards that they could encounter when working at the facility. A copy of the Hazard Disclosure Document is included in this LUP to better inform interested persons and units of government of the types of potential hazards that exist at the Landfill. The document highlights physical, biological, and chemical hazards. A copy of the *Potential Hazards at Closed Landfill Sites* is included as Appendix C.

Existing and Future Land Use

The MPCA will continue its long-term care responsibility for the Landfill including monitoring of groundwater and landfill gas, operating the active gas extraction system, and other maintenance responsibilities for as long as necessary. Due to public safety concerns, the MPCA will continue to prohibit public access onto the site without its authorization. At this time, the MPCA believes the appropriate land use for the site for the foreseeable future is open space with no public use or development. The City of Andover's *Comprehensive Plan: Guided Land Use* (Figure 9), identifies the Landfill as Open Space. In Figure 10, *Zoning Districts*, the zones are identified

and the majority of the Landfill is zoned R-1 – Single Family, with additional areas zoned R-4 – Single Family-Urban and GB – General Business.

Discussions / Conclusions

Andover City Ordinance 19 - Recommendation

The MPCA's consultant, Sanders Wacker and Bergly, Inc., reviewed documents pertaining to the WDE Landfill including Andover City Ordinance 19. Based upon that review, the MPCA is recommending that the Ordinance 19 be amended as follows:

- In Section 7.1. the 200-foot limit is mistakenly referred to as Line F, instead of Line E
- Exhibit A (a site map) should be attached to the Ordinance (it is referenced).
- In Section 7.4. the language regarding the 500-foot limit should include a reference to Line F.

The City of Andover adopted Ordinance 19 by resolution in January 1996. It has not been incorporated into the City Zoning Code, Subdivision Code, or other information sources that the City hands out to prospective property developers. Without inclusion of Ordinance 19 in codes, plans, and handouts, there is a danger that prospective developers may not become aware of the Ordinance until after significant decisions have been made. It also appears to pose a challenge for City planning staff to keep track of the requirements of Ordinance 19 since staff does not need to refer to it on a regular basis. Therefore, the MPCA recommends that the City of Andover incorporate Ordinance 19 into an informational source that would be used by developers and City staff (i.e. City Zoning Code).

Qualified Facility

State statute requires that all local land-use plans be consistent with the MPCA's Land Use Plan for the qualified facility. The MPCA's environmental response action obligations for the qualified facility conflict with the current zoning, for this property (Figure 10 *Zoning Districts*). The MPCA believes the R-1 – Single Family – Rural, R-4 – Single Family – Urban and GB – General Business zonings, are not compatible with the MPCA's present and future responsibilities for the qualified facility due to public health and safety concerns and the need to preserve the integrity of the Landfill's remediation systems. It is misleading to potential developers, property owners, or any other interested parties, for the Landfill to be zoned for residential use.

As a result, the MPCA recommends that the City of Andover amend its land use plan and adopt a new zoning district and ordinance specific to the qualified facility. The recommended zoning district is called Closed Landfill Restricted (CLR). A draft ordinance is included as Appendix D.

Property Outside the Qualified Facility

Unlike the qualified facility, the State statute requiring the development of an LUP at closed landfills does not apply to property outside of the qualified facility. However, Minn. Stat. § 115B.412, subd. 4(a) requires the MPCA to provide affected local units of government with site information including a description of the types, locations, and potential movement of hazardous substances, pollutants and contaminants, or decomposition gases related to the landfill. Furthermore, Minn. Stat. § 115B.412, subd. 4(b) requires local units of government to notify persons applying for a permit to develop affected property of the existence of this information and, on request, to provide them a copy of the information. Lastly, the MPCA understands that

Minn. Stat. § 115B.412, subd. 4(b) requires local units of government incorporate this information in its future land-use planning efforts.

The MPCA refers the City of Andover and any prospective persons interested in developing property near the Landfill to the MPCA's latest Annual Report for the WDE Landfill, which is on the MPCA's web site at: www.pca.state.mn.us/cleanup/clp-sitereports.html. The Annual Report summarizes the information listed above and serves to fulfill the MPCA's obligation in this regard.

