Closed Landfill Program

2009 Report to the Legislature

Minnesota Pollution Control Agency

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Executive Summary

The 1994 Landfill Cleanup Act (LCA) created Minnesota's Closed Landfill Program (CLP or Program). The CLP is an alternative to Superfund for cleaning up and maintaining closed landfills and was the first such program in the nation. The CLP is unique because it is the only program that gives the Minnesota Pollution Control Agency (MPCA) the responsibility to "manage" up to 112 closed, state-permitted, mixed-municipal solid waste landfills to mitigate risks to the public and the environment. The CLP manages these sites by:

- monitoring environmental impacts associated with the landfills
- implementing remedial response actions that address contamination and methane gas migration
- maintaining the landfill properties, the landfill covers, and operating any remedial systems that might be present
- replacing aging landfill gas, groundwater treatment, leachate collection, and cover systems
- working with local governments to incorporate land-use controls at and near the landfills to protect human health and safety as well as the state's investment involving response actions taken and equipment purchased

The LCA (Minn. Stat. § 115B.412, subd. 10) requires the MPCA to provide a report to the Minnesota Legislature on the activities of the previous fiscal year (FY) and anticipated future work. This report fulfills the requirement and covers FY 2009 (July 1, 2008 to June 30, 2009) activities.

The report provides detailed information on how the CLP managed the closed landfills in the Program during FY 2009. The following pages give an overview of the Program, discuss Program activities that were accomplished in FY 2009, and provide a look ahead to FY 2010.

Program highlights in FY 2009 included:

- developing a new risk-scoring and priority system used to rank the landfills based on the risk they pose to the public and the environment
- creating site maps that depict groundwater contamination plumes and areas of concern for groundwater contamination and methane gas
- completing or starting remedial response actions at 11 sites
- preventing 26 million pounds of methane gas from entering the atmosphere
- capturing nearly nine million gallons of landfill leachate by removing it from, or preventing it from reaching, the groundwater

The CLP spent $24.2 million in contractual and administrative costs in FY 2009 to accomplish these and other activities. Future CLP work will require additional steps to manage the risks at these sites by upgrading landfill covers and gas systems, conducting investigations, monitoring groundwater and landfill gas impacts, and working with local governments to implement appropriate land-use controls to protect the public using land at and near the landfills. Major construction, costing more than ten million dollars each, is either ongoing or still needed at four large landfills (Washington County, WLSSD, Flying Cloud, and Freeway) to address significant environmental concerns. As these and other activities are completed, the CLP anticipates fewer corrective actions and greater focus on operation and maintenance and long-term land-use-planning activities.

Panoramic of waste cell at Woodlake Landfill, Hennepin County

Program Overview

Purpose

The 1994 LCA created Minnesota's CLP so the state could effectively protect human health, safety and the environment associated with 112 closed, state-permitted, mixed municipal solid waste landfills throughout Minnesota. The Program's goals to help achieve this outcome include managing the risks associated with human exposure to landfill contaminants and methane gas and mitigate the degradation of groundwater and surface water. In turn, managing these risks is best accomplished by implementing certain strategies, including (1) understanding the extent and magnitude of contaminant and methane gas impacts, as well as the overall risks, at each site; (2) operating and maintaining the landfills; (3) implementing construction-related response actions to reasonably address contaminant and methane gas migration issues; and (4) working with local governments to manage on-site and nearby land use. Table 1 summarizes the CLP's desired outcome, goals and strategies.

Table 1 Outcome, goals, and strategies of the CLP

Desired outcome	Goals	Strategies
Protect human health, safety, and the environment associated with closed landfills	Manage the risk Minimize human exposure to contaminants and methane gas Minimize degradation of groundwater and surface water	Understand extent and magnitude of contamination and methane gas migration Cleanup and/or control groundwater contamination Control or reduce methane gas migration Cooperatively manage land use Operate and maintain landfills

The LCA gives the MPCA the authority to initiate cleanup actions, complete landfill closures, and maintain these landfills in perpetuity. The LCA also authorizes the MPCA to work with local governments to ensure that safe and prudent land use occurs at and near the landfills.

How sites enter the CLP

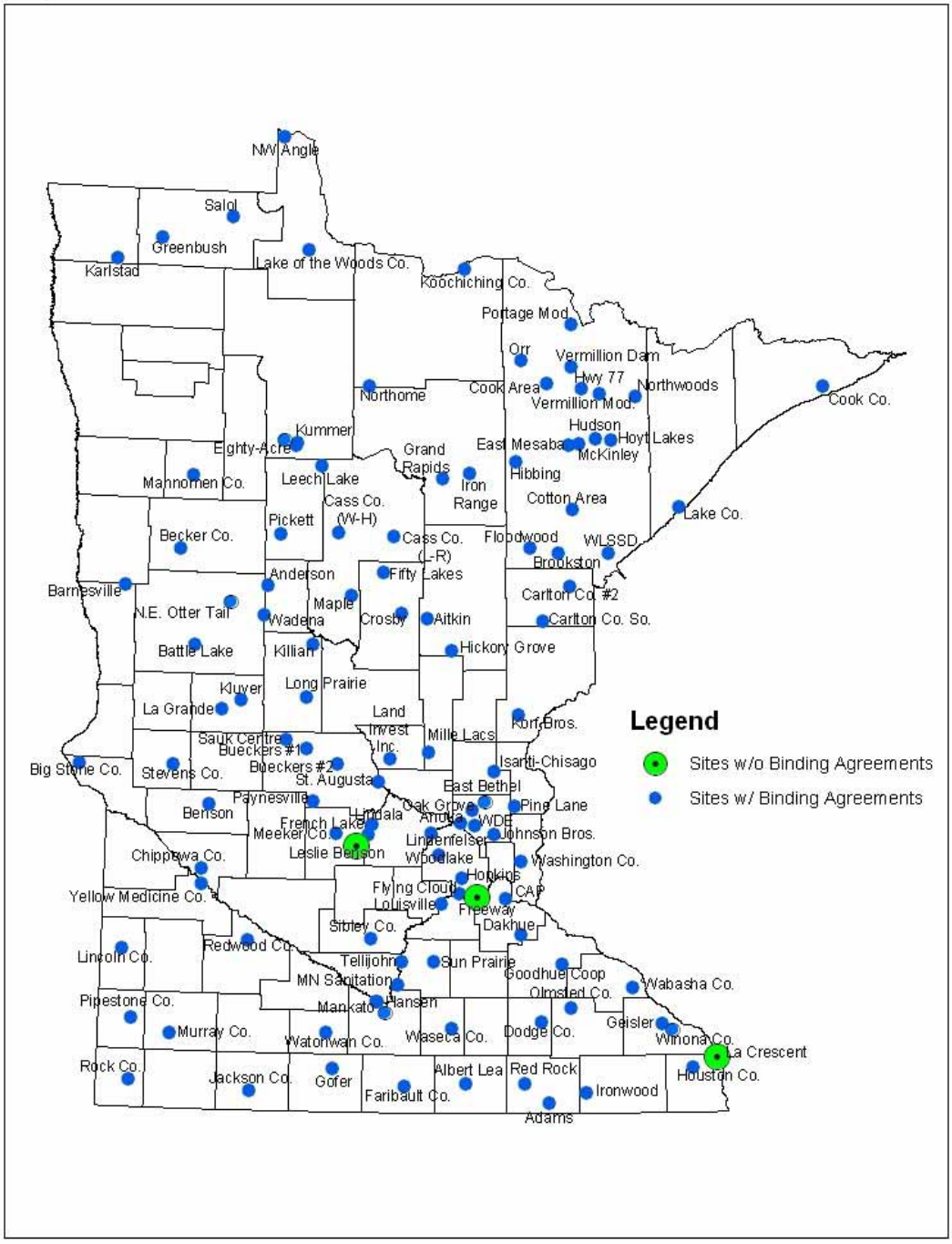
Before landfills are accepted into the CLP, certain requirements as stated in a Landfill Cleanup Agreement or Binding Agreement (BA) (typically executed between landfill owners/operators and the state) must be met. Once these requirements are fulfilled, a Notice of Compliance (NOC) is issued to the owner/operator. At this point, the site enters the Program and the state takes over responsibility for the landfill.

Through June 30, 2009, 109 landfill owners/operators had executed a Landfill Cleanup Agreement and received a NOC. Currently, three landfills are qualified for entry into the CLP but have not yet executed a BA. Significant progress has been made in developing a BA for the La Crescent Landfill and a NOC is expected to be issued in FY 2010. However, similar efforts have been challenging regarding the Freeway and Leslie Benson landfills since the LCA does not require a date by which these sites must enter the Program. The Freeway Landfill is of particular concern, given its high risk score and past failed efforts to formally enter the site into the CLP. The MPCA is considering appropriate alternative steps to address this situation. Figure 1 shows the location of all 112 qualified facilities including the three that currently do not have a Landfill Cleanup Agreement.

The LCA also requires the CLP to reimburse eligible parties for past cleanup costs after completing corrective actions. Reimbursements to landfill owners, operators and responsible parties total $37,107,759, while reimbursements to the U.S. Environmental Protection Agency (EPA) amount to $4,014,550. The Freeway Landfill is the only site that remains eligible for reimbursement to the EPA, at a cost of $17,000, when it enters the Program.

Groundwater monitoring wells at Woodlake Landfill, Hennepin County

Figure 1: Locations of CLP Qualified Facilities



Landfills in the CLP require long-term care or operation and maintenance. In general, operation and maintenance includes mowing and maintaining the landfill cover; monitoring groundwater, methane gas, and surface water; operating active gas-extraction systems and groundwater-treatment systems; and repairing equipment as well as roads and portions of the landfill cover. Remedial response actions, such as constructing new covers, installing gas-extraction and groundwater-treatment systems, or conducting landfill gas or groundwater investigations, are implemented when the need arises to better control landfill gas migration and address groundwater contamination that threaten human health and safety and the environment. In some unique circumstances, the best solution may be for the CLP to acquire title to certain parcels as a buffer to protect the public. In addition, working with local units of government to control land use (zoning changes, creating setbacks, conservation easements, etc.) is needed to mitigate the risk to public health and safety.

Site priority ranking

Minn. Stat. § 115B.40, subd. 2 requires the MPCA to establish and update a priority list for preventing or responding to releases of hazardous substances, pollutants and contaminants, or decomposition gases at closed landfills. The CLP staff's method for prioritizing the closed landfills has changed. In the past, each site was assigned a priority classification and score which reflected a site's priority or need for remedial measures, usually involving construction. An A classification signified the highest priority and a D signified the lowest. Within each classification, sites were given a numerical score. Landfills with high numbers were a higher priority than landfills with low numbers. This system, although effective for prioritizing the construction needs at landfills, did not sufficiently reflect the risk the landfills posed to the public and environment. As a result of the CLP staff's recent redesign efforts, a new scoring and prioritization system was developed that better reflects, and ranks, sites based on risk. Now, site work priorities reflect a more comprehensive list of remedies or response actions that are focused on reducing risk to the public and the environment. The work needed to reduce this risk may include response actions that might be small in scope (e.g., adding gas vents), include investigations of groundwater or landfill gas impacts or landfill covers, or working with local governments to incorporate land-use controls.

Under the new priority system, landfills are ranked by a risk score based on hazards present at each site (monitoring data and field observations), the conditions that exacerbate those hazards (example: subsurface conditions), and the likelihood the public will be exposed to those hazards (distance to wells and buildings, population density). Landfills with high risk scores receive a high ranking or priority.

The CLP scored and ranked the landfills and identified response actions for several of the high-risk sites. These response actions ranged from constructing new liners and covers to installing gas vents to implementing Closed Landfill Use Plans (see Local land use controls). The 30 highest-ranking landfills on the risk priority list can be found in Appendix A. Several of these response actions were already under way at some sites or were anticipated to be implemented in FY 2010. However, because design work at a few of the sites with lower risk scores had been completed and were already slated for construction before the new ranking system was used, work at these sites in FY 2010 took precedence over some of the higher-scoring landfills. Also, some remedial response actions have already been completed for some of these landfills. Risk scores for these sites should decrease over time while the effectiveness of the remedies is monitored.

Not all CLP construction activities are necessarily reflected in this priority list because not all construction is directly risk related. For example, construction may be necessary to replace an aging active gas system, leachate collection system, or cover – even at landfills that have a low risk score and ranking.

Funding

Funding for the CLP comes from three major sources:

- the Remediation Fund
- general obligation bonds
- settlements from landfill-related insurance coverage

In addition, closed landfills with financial assurance accounts were required to deposit remaining balances into the Remediation Fund to enter the Program. Also, the 3M Company has provided the CLP eight million dollar for PFC-related remedies at the Washington County Landfill per the consent agreement it has with the MPCA.

Transfers from the environmental fund

The environmental fund is used to support many programs at the MPCA including, in part, the CLP. Various sources of revenue are deposited into the environmental fund. A portion of this fund is then transferred into the remediation fund for use at CLP sites and for other remediation programs. Minnesota Laws (2009), Ch. 37, Art. 1, Sec. 3, Subd. 6 requires $40 million to be transferred from the environmental fund to the remediation fund for the FY 2010 – 2011 biennium.

Cable concrete channel at Wadena County Landfill

General obligation bonds

In 1994, the Minnesota Legislature authorized $90 million in general obligation bonds to be appropriated over ten years. This money was to be used for construction of remedial systems at publicly owned, closed landfills. However, in 2000, Minn. Stat. § 16A.642 cancelled all unused bonds more than four years old, regardless of program need or original legislative intent. This resulted in the cancellation of approximately $56 million of bonding authority. Since 2001, however, the legislature has authorized $51.15 million of general obligation bonds for construction. There are 93 closed landfills that are publicly owned and eligible for bonds. Through FY 2009, more than $80 million of general obligation bonds has been spent on construction activities at 51 sites.

Financial assurance

Minn. R. 7035.2665 requires owners of mixed municipal solid waste landfills remaining in operation after July 1, 1990, to set aside funds to pay for the cost of facility closure, post-closure care, and contingency action. Because several of the landfills that entered the CLP were still in operation as of July 1, 1990, their owners were required to meet these financial assurance rules. As part of the LCA, the owners of these landfills, upon entering the CLP, were required to transfer their financial assurance balances to the MPCA after having met closure requirements.

From inception of the CLP through FY 2009, the state has received a total of $15,406,837 in financial assurance payments from owners or operators of 25 closed landfills. An additional $1,781,489 that would have been collected from Waste Management of Minnesota, Inc. for the Anoka-Ramsey Landfill was waived because Waste Management of Minnesota, Inc. agreed to waive its reimbursement claim by an equal amount. Financial assurance collected and the amount of it spent to date at each landfill is summarized in Appendix B. Unless legislative changes allow additional sites to qualify for the CLP and transferring remaining financial assurance funds is required, no additional financial assurance dollars are anticipated in the future.

Insurance recovery

The LCA authorizes the MPCA and the Attorney General's office to seek to recover a fair share of the state's landfill cleanup costs from insurance carriers based upon insurance policies issued to responsible persons who are liable for cleanup costs under the state Superfund law. This would include insurance policyholders who owned or operated the landfills, hauled waste containing hazardous substances to the landfills, or arranged for the disposal of waste containing hazardous substances at the landfills. Under the LCA, the MPCA and Attorney General may negotiate coverage settlements directly with insurance carriers. If a carrier has had an opportunity to settle with the state and fails to do so, the state may sue the carrier directly to recover cleanup costs to the extent of the insurance coverage issued to responsible persons.

To date, the state has commenced six lawsuits against 56 insurance companies with assistance from the state's Special Attorneys that have been appointed by the Attorney General's office. The first four lawsuits have been fully resolved, including settlements with 41 insurance carrier defendants. In the fifth lawsuit, four of the five defendants have entered global settlements with the state and one carrier continues to litigate. Trial in this lawsuit began in October 2009. In January 2008, the MPCA and the Attorney General's office filed the sixth landfill insurance recovery lawsuit against ten insurance companies. Three carriers have settled in that case. Trial is scheduled in spring of 2010.

The state's settlement efforts in FY 2009 continued to focus on negotiating global settlements with insurance carriers that have been sued by the state. Global settlements resolve all of an insurance carrier's liability for all of the landfills covered by the 1994 Landfill Cleanup Act. The state reached global settlements with four insurance carriers in FY 2009. Three of these settlements, plus one payment of a settlement reached before FY 2009, resulted in a net deposit of $4,439,610 into the state treasury, which was split equally between the Remediation Fund and Closed Landfill Investment Fund. Payment from the fourth settlement will be received by the state in FY 2010. The state did not issue settlement offers to any additional insurance carriers in FY 2009. Through FY 2009, deposits into the state treasury from insurance carrier settlements total $87 million.

Under the LCA, insurance carriers may request that the state's claims for natural resource damages (NRD) at any of the landfills in the CLP be included in settlements with the state. NRD payments received in FY 2009 as a result of settlements amounted to $424,604. Total NRD payments received through June 30, 2009 equal $8,655,282. NRD recoveries are used by the Minnesota Department of Natural Resources (DNR) to rehabilitate, restore or acquire natural resources to remedy injuries or losses to natural resources resulting from a release of a hazardous substance through the DNR's Remediation Fund Grants Program. No projects were awarded grant funds by the DNR in FY 2009.

Waste cell construction at Washington County Landfill

Testing for liner leaks at Washington County Landfill

3M settlement agreement and consent order

The MPCA executed a Settlement Agreement and Consent Order with the 3M Company in May 2007 that authorizes 3M to take response actions to address releases of PFCs at three disposal sites. As part of this agreement, 3M has agreed to provide the MPCA eight million dollars for the MPCA's remedial actions at the Washington County Landfill. Through FY 2009, 3M has provided the MPCA five million dollars and, of this, $4.2 million has been spent. 3M provided the additional three million dollars in August 2009.

Moving waste at Washington County Landfill

Fiscal Year 2009 Expenditures

Program expenditures in FY 2009, including encumbrances not yet spent, totaled $24,244,707. A summary of these expenditures is found in Table 2. Expenditures for each landfill in FY 2009 are itemized in Appendix C.

Table 2 Landfill expenditures (including FY 2009 encumbrances)

Expenditure type	FY 2009	Cumulative
Closed Landfill Program Administration and Support	$2,468,051	$33,069,344
Remedial Response Actions*	$14,720,823	$148,218,642
Operation and Maintenance	$4,617,751	$49,076,103
CLP Legal Counsel (Attorney General)	$88,866	$2,254,643
Insurance Recovery Legal Counsel (Attorney General)	$134,236	$2,952,543
Insurance Recovery Legal Counsel (Special Attorneys)	$2,214,980	$36,041,336
EPA Reimbursement	$0	$4,014,550
Responsible Party Reimbursements	$0	$37,107,759
Total	**$24,244,707**	**$312,734,921**

Expenditure information is based on MAPS data for the time period of July 1, 2008, to June 30, 2009.

*These activities include both Bond and non-Bond expenditures through June 30, 2009.

Program Activities in Fiscal Year 2009

CLP activities in Fiscal Year 2009 included:

- designing and constructing landfill covers, gas systems, and other corrective actions
- investigating groundwater contamination, gas migration, and landfill cover thickness
- providing residences with bottled water and maintaining whole-house water-treatment filters
- inspecting landfills and mowing landfill covers
- operating landfill gas systems, groundwater-treatment systems, and gas-to-energy systems
- monitoring landfill gas, groundwater and surface water
- creating site maps showing methane gas and groundwater contaminant plumes and areas of concern
- continued redesign of the Closed Landfill Program

Remedial response actions

CLP response actions at closed landfills in FY 2009 included groundwater investigations, providing alternative water supplies or water-treatment systems, cover construction, waste consolidation, and installation of active and passive gas systems. Table 3 summarizes these activities and their costs.

The CLP uses several contracts and contractors to help complete some of these response actions. One contract involves designing response actions and providing construction oversight, and another contract is for drilling services.

Table 3: Remedial Response Actions in FY 2009

Landfill	Remedial Response Action	Expenditures and Encumbrances
Albert Lea	Completed construction of lined cell at landfill for relocating waste from adjacent city dump and landfill contaminated soils	$ 4,011,273
Bueckers #1	Installed gas probes and additional passive gas vents	$ 58,898
East Mesaba	Completed design for new cover, passive gas vents, relocating waste	$ 203,359
Faribault County	Installed additional passive gas vents	$ 69,227
Koochiching County	Ongoing pre-design investigation for possible new cover and passive gas system	$ 14,978
Maple	Completed cover investigation; began upgrade of cover, installation of additional passive gas vents, and improved site access controls	$ 102,356
Mille Lacs County	Completed liner installation, waste relocation onto a lined cell, new cover, leachate collection, passive gas vents; ongoing drinking water response	$ 1,944,153
Washington County	Completed design for relocating waste on site to address PFCs; ongoing drinking water response actions; ongoing groundwater investigation; began construction for relocating waste into lined cells	$ 4,965,489
WDE	Completed design of a soil vapor/cryogenic extraction system for the hazardous waste pit	$ 141,771
WLSSD	Completed cover design investigations, Phase I waste relocation, and preparation for wetland mitigation	$ 2,893,648
Woodlake	Completed construction of new cover, active gas-extraction system, and leachate-collection system	$ 315,671
Total		**$ 14,720,823**

The costs shown are for invoices paid and dollars encumbered in FY 2009, not necessarily total project costs.

Gas well at Woodlake Landfill, Hennepin County

Operation and maintenance

The MPCA is responsible for the long-term care of all Program landfills in perpetuity. Depending on the site, operation and maintenance (O&M) activities include mowing, sampling and analysis, inspections, general repair and maintenance, and general operation of active gas- and groundwater-treatment systems or gas-to-energy systems. O&M costs totaled more than $4.6 million in FY 2009. Costs for each site are provided in Appendix C.

Many of the O&M activities are performed by firms under contract with the state. One contract is for routine O&M activities, a second is for sampling and analytical services, a third is for mowing the landfills, and a fourth is for data management.

Local land use controls

Managing the risks associated with the closed landfills not only involves cleanup and long-term operation and maintenance, but also managing land use on and near the landfills so that the public living or working nearby can do so in a safe manner. Since it is unlikely that a reasonable cleanup effort will entirely eliminate all the risks associated with a landfill, proper management and regulation of land use at and near a closed landfill is an additional important factor in assuring long-term protection from the risks posed by the facility. Future use of property at and around closed landfills needs to be planned carefully and responsibly.

For each landfill, the MPCA is required to develop a Closed Landfill Use Plan (CLUP) in which the MPCA: 1) determines the appropriate land use for the property at the landfill where the MPCA is implementing environmental response actions; and 2) provides information about property at or near the landfill that may be affected by ground water and/or surface water contamination and methane gas migration. The purpose of each CLUP is to: 1) protect the health and safety of those living on, or occupying land near, the landfill; and 2) protect the integrity of the landfill and the MPCA's response action equipment.

Minn. Stat. § 115B.412, subd. 9 requires LGUs to make their local land use plans consistent with the MPCA's CLUP. The CLP will specifically identify land uses it designates for the property described in the BA, property with adjacent waste, adjacent buffer property, and adjacent property where response-action equipment is operated. The MPCA will recommend that LGUs adopt a new zoning district — "Closed Landfill Restricted" — for these properties. The MPCA may recommend zoning allowing for other uses certain properties depending on the land uses identified and circumstances of the property.

Minn. Stat. § 115B.412, subd. 4 (Affected Property Notice) requires the MPCA to provide LGUs with information that describes the types, locations, and potential movement of hazardous substances, pollutants and contaminants, or methane gas related to the landfill. LGUs are required to incorporate this information into their land use plans and 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. In addition, the MPCA will work with LGUs to identify appropriate land use controls on affected properties outside the landfill that best protects public health and safety.

The CLP has developed site reports and has made them available to the public since the Program's inception. However, in FY 2009, the CLP began creating site maps showing known areas of groundwater contamination and areas of potential methane gas and groundwater concern to assist LGUs in their land-use planning efforts. In FY 2010, the Program will provide these new maps to LGUs responsible for land-use planning.

The CLP intends to complete several CLUPs in FY 2010.

Panoramic of Lindala Landfill, Wright County

Alternative energy opportunities

The CLP, over the past few years, has become increasingly involved with opportunities for alternative energy because of two important resources it has: landfill gas and open space.

Landfill gas can be used as a boiler fuel or for the production of electricity. It is estimated that if all closed landfills with operational or proposed active gas-extraction systems were developed for electrical generation, these landfills would have the capacity to produce as much as 8-10 MW of base load (steady state) electricity — enough to provide sufficient electricity for the annual needs of more than 9,300 homes. Currently, four Stirling cycle engines that can generate up to 220 kW of electricity (enough to meet the electrical needs of 140 homes) operate at the WDE Landfill in Andover, Minnesota. Planergy/Ramsey Methane, LLC, having purchased the gas rights from the former landfill owner, generated 6,221,814 KWH of electricity in FY 2009 using the gas generated by the Anoka-Ramsey Landfill in Ramsey, Minnesota.

The MPCA is in the process of seeking proposals from interested solar panel installers as part of a pilot project to explore the feasibility of operating solar panels at the CLP landfills.

Program redesign

In FY 2007, the CLP initiated a redesign of the Program. It began as an effort to develop a product and process for implementing land-use-planning requirements (per state statute) for each landfill (see Local Land Use Controls). It became apparent, however, that land-use planning plays a much larger role — to effectively manage the risk to public health and the environment posed by the closed landfills — than previously understood. As a result, the CLP realized that a more holistic approach to managing the risk was needed and

that the Program needed to be redesigned. As part of the redesign effort, the CLP conducted focus groups with local governments as well as CLP staff. It also implemented continuous improvement tools to assist in the redesign.

Several items were identified as being critical to assure the quality of an effective Program, including the need for a single information system for storing and managing Program data; increased legal assistance to help with property issues; a new site-priority system based on risk; as well as modifying the work of CLP staff to fit the new design. In FY 2009, the building of a database was begun, new or modified staff responsibilities were developed, and a new site-priority/risk scoring system was put in place.

State ownership of landfills and adjacent property

The MPCA currently owns 27 landfills totaling 2,123 acres across Minnesota as part of the landfills' entry into the CLP or via tax forfeiture (see Appendix D for a complete list of property owned by the state). This was done in those cases where state ownership provided the best method of controlling access, managing the facility, and providing the best possible environmental protection and safety for the citizens living or working near the facility. In addition to the landfill property itself, the MPCA has acquired adjacent properties at 20 sites totaling 653 acres as a measure to protect human health and safety.

In FY 2009, the CLP acquired four acres of buffer property at the Pickett Landfill. The property was donated. The CLP is in the process of acquiring, at no cost, four additional landfills (Barnesville, Crosby American Properties, Flying Cloud, and WDE), with a number of others pending. Several property owners of private closed landfills have expressed an interest in transferring ownership to the CLP. In addition, the CLP is currently working on acquiring property adjacent to the Kluver and Barnesville landfills as buffer due to waste and/or landfill gas concerns.

Measuring Program Progress

MPCA staff use environmental and other indicators to generally measure the progress of the CLP. Currently, two environmental indicators are measured: (1) the volume of landfill leachate that is collected before it has a chance to impact groundwater, and (2) the amount of landfill gas emissions that are captured and destroyed. Both, if left unabated, have the potential to cause risk to public health and the environment. However, these Program measures are currently being evaluated and new measures are being considered that may better reflect the Program's overall management of risk at the closed landfills.

Leachate reduction

Landfill leachate is the liquid that has percolated through solid waste. This leachate contains extracted, dissolved or suspended materials from the solid waste. Some of the response actions completed at closed landfills have significantly reduced the amount of leachate reaching the groundwater. Completely eliminating leachate generation at unlined landfills is impossible given current technology, knowledge and economics. However, several activities can be done to reduce the amount of leachate each landfill generates, thereby minimizing the potential impact leachate can have on groundwater. Those activities include relocating poorly covered waste and waste originally placed in or near groundwater, reducing waste footprints, placing impermeable covers over waste, and collecting and treating leachate and contaminated groundwater. In certain situations, although expensive, constructing a bottom liner and relocating the waste on top of that liner can provide the greatest safeguard to protecting public health and the environment.

Improved or synthetic covers greatly reduce the infiltration of precipitation into the waste, thereby reducing the volume of leachate produced. Since the Program's inception, covers that meet or exceed current standards protect more than 2,000 acres of waste currently managed by the CLP.

The CLP also re-contours landfill surfaces, establishes vegetative growth on landfill covers, and engineers holding basins to further reduce the amount of surface water likely to come into contact with waste and form leachate. The CLP also operates eight leachate-collection systems and nine groundwater-collection systems at 16 sites. This prevented another 8.8 million gallons of leachate from reaching, or remaining in, the groundwater in FY 2009.

Landfill gas reduction

Landfill gas, primarily methane, is a concern with closed landfills because (1) it can migrate off site and become an explosive hazard, and (2) it is a greenhouse gas. Methane is generated as landfill waste decomposes and needs to be managed because it accumulates beneath the landfill cover. Currently, most landfills in the CLP have some type of passive gas-extraction system that helps alleviate methane buildup.

It is not currently possible to totally eliminate landfill gas escaping to the environment. However, installation of active gas-collection systems at larger sites can significantly reduce landfill gas emissions directly to the atmosphere. In FY 2009, 21 landfills had active gas-extraction systems or flares in operation. The active gas system at the Koochiching County Landfill did not operate in FY 2009 due to too low a gas volume. The Anoka-Ramsey Landfill, in addition to having a flare to burn gas from the active gas-extraction system, has a gas-to-energy plant, owned and operated by Planergy/Ramsey Methane, LLC, that converts the gas to usable electricity. The WDE Landfill is addressing gas issues by both a flare and gas-to-energy system that began operating last year (see Alternative Energy Opportunities). Unique is the solar-powered, single-vent flare at the Kummer Landfill that destroys methane from one vent.

Active landfill gas-extraction systems and flares, therefore, provide the following beneficial uses:

- reduction in methane migration and vegetative loss
- overall reduction in greenhouse gases
- reduction of volatile organic compounds that would otherwise migrate to groundwater
- gas-to-energy use

In FY 2009, 26 million pounds of methane were destroyed by the gas-extraction and gas-to-energy systems that are operated at CLP landfills (see Table 4). Since 2000, these systems have prevented about 237 million pounds of methane (2.26 metric tons of CO_2 equivalents) from entering the atmosphere. Stack test results from earlier studies show nearly 99 percent destruction of methane and other contaminants in the CLP's enclosed flares.

Gas Flare at Lindenfelser Landfill, Wright County

Table 4: Methane destroyed by gas-extraction and gas-to-energy systems in FY 2009

Landfill	Gas Flow (cfm)	% Methane in LF Gas	Operation Hours	Methane Destroyed (Pounds)
Albert Lea	159	43	7,437	**1,373,793**
Anoka - flare	271	44	196	**62,410**
Anoka - Planergy engines	271	44	8,564	**2,728,896**
Becker County	60	33	4,644	**243,802**
Dakhue	58	46	2,758	**195,894**
East Bethel	78	38	8,498	**674,854**
Flying Cloud	258	46	8,557	**2,705,139**
Grand Rapids	81	38	5,503	**448,087**
Hopkins	78	25	7,192	**372,870**
Koochiching County*	0	0	0	**0**
Kummer (solar flare)	3	45	7,884	**28,451**
Lindenfelser	76	42	7,770	**656,706**
Louisville	334	40	8,545	**3,074,385**
Oak Grove	91	50	8,722	**1,065,857**
Olmsted	137	46	7,453	**1,245,071**
Pine Lane	140	41	7,692	**1,184,052**
St. Augusta	70	39	8,498	**617,146**
Tellijohn	74	29	8,696	**503,140**
Washington County	89	41	8,670	**839,453**
Watonwan County	60	34	7,383	**398,702**
WDE	144	48	8,702	**1,589,806**
Winona County	84	51	6,131	**696,250**
Woodlake	504	46	8,536	**5,293,529**
TOTAL				**25,998,292**

*System shut down and is being evaluated.

Looking Ahead to FY 2010

Anticipated new projects

In FY 2010, the CLP will implement remedial response actions based on its new site priority ranking system and to repair or upgrade existing remedial and monitoring systems. However, this work will depend on available funding. Projects that began previous to using the new priority system will continue to be worked on in FY 2010 even if they currently rank lower than other sites. Table 5 lists the anticipated response actions at specific landfills, assuming funding is available. Additional activities for FY 2010 include ongoing water/whole-house filter services to residents near the Washington County, Becker County, and Mille Lacs County landfills.

Aeration Lagoon at Woodlake Landfill, Hennepin County

Table 5: Anticipated response actions for FY 2010

Landfill	Response Action
Anoka-Ramsey	CLUP to address future land use
Becker County	CLUP to address future land use
Carlton County No. 2	Surface water investigation; CLUP to address future land use
Dodge County	Install additional passive gas vents and gas cut-off trench
Flying Cloud	Feasibility study to upgrade active gas extraction system and improve cover; transfer landfill property title to state
Hudson	Install additional groundwater monitoring wells
Isanti-Chisago	Install additional passive gas vents
Kluver	Acquire adjacent buffer property; transfer landfill property title to state
Koochiching County	Feasibility study to address leachate management, active gas extraction, and cover issues
Lindala	CLUP to address future land use
Maple	Complete cover upgrade and improvements to site access controls
Mille Lacs County	CLUP to address future land use
Red Rock	Groundwater investigation
Sibley County	Improve surface drainage
Washington County	Continue waste relocation remedy, install additional monitoring wells
WDE	Begin cryogenic pilot study of hazardous waste pit; CLUP to address future land use; enhancements to gas-to-energy system
WLSSD	Begin Phase II construction to relocate/consolidate waste, upgrade cover and active gas extraction system, and create new wetlands
Woodlake	Install additional gas vents to reduce off-site methane gas migration

Additional Information

Additional information about the CLP, including landfill-specific information, can be found on the MPCA's Web site at: http://www.pca.state.mn.us/cleanup/landfill-closed.html.

Program Contacts

For more information about the CLP, contact:

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Appendix A: Site risk priority list (Top 30) – November 2009

Priority Ranking	Landfill	Risk Score	Initial Response Action Completed or Needed to Lower Risk Score	Status
1	Washington County	262220	Relocate waste on site on triple-lined cells	Ongoing
2	Hopkins	21300	Install additional passive gas vents; feasibility study to address gas migration potentially involving waste relocation	FY 2011
3	Kummer	18150	Monitor effectiveness of newly installed passive gas vents	Ongoing
4	Becker County	18022	CLUP to address future land use	Ongoing
5	WLSSD	16880	Relocate dump waste, consolidate waste footprint, upgrade cover, improve surface water drainage, create new wetlands, install active gas extraction system	Ongoing
6	Freeway	14190	Relocate waste on lined cell	No BA
7	Waste Disposal Engineering	12800	Cryogenic pilot study to remove organic vapors & solvents from hazardous waste pit / CLUP	Ongoing/ Completed
8	Korf Bros.	9040	Install additional gas probes / CLUP	FY 2011
9	Woodlake	7400	Install additional gas vents to reduce off-site migration	FY 2010
10	East Bethel	7310	Monitor effectiveness of newly upgraded cover and gas-collection system	Ongoing
11	Crosby American Properties	6860	Install additional passive gas vents near property boundary	FY 2011
12	Dodge County	6150	Install additional passive gas vents, gas cut-off trench	FY 2010
13	Mille Lacs County	6070	Monitor effectiveness of recently relocated waste on lined cell / CLUP	Ongoing/ Completed
14	Red Rock	6047	Groundwater investigation	Ongoing
15	Isanti - Chisago	6026	Install additional passive gas vents	FY 2010
16	Flying Cloud	5065	Feasibility study to upgrade active gas system, cover	Ongoing
17	Houston County	4673	Feasibility study of additional gas mitigation measures	FY 2011
18	Carlton County No. 2	4590	Surface water investigation / CLUP	Ongoing
19	Pine Lane	4445	CLUP to address future land use	FY 2011
20	East Mesaba	4410	Consolidate waste and construct new cover	FY 2011-12
21	Kluver	4203	Acquire adjacent buffer property, transfer landfill property title to state / CLUP	Ongoing/ FY 2011
22	Koochiching County	4111	Feasibility study to address leachate management & cover issues / Design & construct	Ongoing/ FY 2011-12
23	Albert Lea	3911	Monitor effectiveness of recently relocated waste from city dump & adjacent landfill waste onto lined cell	Ongoing
24	Lindala	3790	CLUP to address future land use	FY 2010
25	Oak Grove	3716	Surface water investigation (biomonitoring/peizometers)	FY 2011
26	Paynesville	3690	Upgrade cover system for adjacent disposal area	FY 2011-12
27	Anoka - Ramsey	3644	CLUP to address future land use	Ongoing
28	Ironwood	3630	CLUP to address future land use	FY 2011
29	Maple	2473	Monitor effectiveness of recently upgraded cover and improved site access controls	Ongoing
30	Winona County	2296	Monitor effectiveness of newly constructed lined cell, cover, leachate collection and active gas systems	Ongoing

This list does not necessarily include all construction activities for the Program, such as those needed for the replacement of aging remediation systems

Appendix B: Financial assurance

Site Name	Financial Assurance Received	Amount Spent in FY 09	Total Amount Spent	Financial Assurance Balance
Anoka-Ramsey*	$ 1,781,489	$ -	$ 1,781,489	$ -
Cass Co. (L-R)	$ 84,497	$ 2,299	$ 47,764	$ 36,733
Cass Co. (W-H)	$ 84,497	$ -	$ 84,497	$ -
Chippewa County	$ 362,516	$ 12,112	$ 165,673	$ 196,843
Cook County	$ 644,726	$ 40,724	$ 276,319	$ 368,407
Dakhue	$ 150,411	$ -	$ 150,411	$ -
Dodge County	$ 1,189,672	$ 9,505	$ 102,352	$ 1,087,320
East Mesaba	$ 696,244	$ 215,868	$ 451,862	$ 244,382
French Lake	$ 14,931	$ -	$ 14,931	$ -
Grand Rapids	$ 1,750,000	$ 90,181	$ 978,151	$ 771,849
Hibbing	$ 468,020	$ 9,738	$ 332,392	$ 135,628
Isanti-Chisago	$ 333,839	$ -	$ 333,839	$ -
Lindenfelser	$ 400,827	$ -	$ 400,827	$ -
Long Prairie	$ 72,973	$ -	$ 72,973	$ -
Louisville	$ 337,130	$ -	$ 337,130	$ -
Meeker County	$ 378,002	$ -	$ 378,002	$ -
Northeast Otter Tail	$ 590,996	$ 53,346	$ 436,287	$ 154,709
Paynesville	$ 111,641	$ -	$ 111,641	$ -
Pipestone County	$ 16,622	$ -	$ 16,622	$ -
Redwood County	$ 81,689	$ -	$ 81,689	$ -
Sun Prairie	$ 10,725	$ -	$ 10,725	$ -
Tellijohn	$ 351,406	$ -	$ 351,406	$ -
Winona	$ 1,586,726	$ -	$ 1,586,726	$ -
Woodlake	$ 1,350,000	$ -	$ 1,350,000	$ -
WLSSD	$ 4,338,747	$ 3,019,534	$ 3,456,120	$ 882,627
Total	**$ 15,406,837**	**$ 3,459,409**	**$ 13,309,828**	**$ 2,097,009**

* An additional $1,781,489 that would have been collected from Waste Management of Minnesota, Inc. (Anoka-Ramsey Landfill) was waived because Anoka-Ramsey Landfill agreed to waive its reimbursement claim from MPCA in an equal amount.

Appendix C: Fiscal year 2009 financial summary

Landfill Name	MPCA Salary & Expenses	Attorney General Support	Operation & Maintenance	Design/ Construction Non-Bond	Design/ Construction Bond	Landfill Totals
Adams (Relocated)	$ 21					$ 21
Aitkin Area	$ 2,608		$ 6,335			$ 8,943
Albert Lea	$ 83,537	$ 7,656	$ 80,262		$ 4,011,273	$ 4,182,728
Anderson-Sebeka	$ 575		$ 4,339			$ 4,914
Anoka-Ramsey	$ 16,430	$ 8,868	$ 454,397			$ 479,695
Barnesville	$ 6,857	$ 232	$ 14,214			$ 21,303
Battle Lake	$ 946		$ 7,522			$ 8,468
Becker County	$ 6,105		$ 137,399			$ 143,504
Benson	$ 1,129		$ 5,845			$ 6,974
Big Stone County	$ 1,159		$ 11,457			$ 12,616
Brookston Area	$ 1,188		$ 3,784			$ 4,972
Bueckers #1	$ 6,725		$ 8,560	$ 58,898		$ 74,183
Bueckers #2 (Relocated)						$ 0
Carlton County #2	$ 5,190		$ 36,645			$ 41,835
Carlton County South	$ 2,016		$ 3,272			$ 5,288
Cass County (L-R)	$ 1,381	$ 374	$ 2,299			$ 4,054
Cass County (W-H)	$ 2,056		$ 7,014			$ 9,070
Chippewa County	$ 1,390		$ 12,112			$ 13,502
Cook Area	$ 1,764		$ 4,488			$ 6,252
Cook County	$ 1,204	$ 253	$ 40,724			$ 42,181
Cotton Area	$ 969		$ 5,207			$ 6,176
Crosby	$ 1,828		$ 4,501			$ 6,329
Crosby American Properties	$ 3,623	$ 4,131	$ 20,294			$ 28,048
Dakhue	$ 8,848	$ 20	$ 61,362			$ 70,230
Dodge County	$ 1,432		$ 9,505			$ 10,937
East Bethel	$ 12,308	$ 20	$ 202,977			$ 215,305
East Mesaba	$ 9,317	$ 1,101	$ 12,509	$ 203,359		$ 226,286
Eighty Acre	$ 1,635		$ 8,052			$ 9,687
Faribault County	$ 5,080		$ 15,064	$ 69,227		$ 89,371
Fifty Lakes	$ 2,167		$ 3,849			$ 6,016
Floodwood	$ 688		$ 6,057			$ 6,745
Flying Cloud	$ 5,087	$ 20	$ 34,587			$ 39,694
Freeway	$ 5,292	$ 6,706				$ 11,998
French Lake	$ 1,358		$ 3,631			$ 4,989
Geislers (Relocated)	$ 21					$ 21
Gofer	$ 2,715		$ 11,754			$ 14,469
Goodhue Co-Op	$ 1,296		$ 6,689			$ 7,985
Grand Rapids	$ 1,808		$ 90,181			$ 91,989
Greenbush (Relocated)	$ 180	$ 51				$ 231
Hansen	$ 2,100		$ 3,802			$ 5,902
Hibbing	$ 1,944		$ 9,738			$ 11,682
Hickory Grove	$ 1,791					$ 1,791
Highway 77	$ 328		$ 4,973			$ 5,301
Hopkins	$ 3,031	$ 91	$ 77,945			$ 81,067
Houston County	$ 2,762		$ 63,062			$ 65,824
Hoyt Lakes	$ 721		$ 2,831			$ 3,552
Hudson	$ 4,543		$ 4,147			$ 8,690
Iron Range	$ 1,319		$ 3,535			$ 4,854
Ironwood	$ 7,111		$ 125,145			$ 132,256
Isanti-Chisago	$ 7,951	$ 152	$ 96,856			$ 104,959
Jackson County	$ 4,260		$ 14,220			$ 18,480
Johnson Bros.	$ 2,599		$ 6,422			$ 9,021
Karlstad	$ 593		$ 5,565			$ 6,158
Killian	$ 1,512		$ 9,127			$ 10,639
Kluver	$ 12,845	$ 2,464	$ 22,920			$ 38,229
Koochiching County	$ 3,552		$ 106,720	$ 14,978		$ 125,250
Korf Bros.	$ 2,270		$ 6,497			$ 8,767
Kummer	$ 4,836		$ 43,268			$ 48,104
La Crescent	$ 2,915	$ 3,495				$ 6,410
La Grand	$ 2,421	$ 3,283	$ 11,772			$ 17,476
Lake County	$ 856	$ 131	$ 13,058			$ 14,045
Lake of The Woods County	$ 920		$ 10,627			$ 11,547

Landfill Name	MPCA Salary & Expenses	Attorney General Support	Operation & Maintenance	Design/ Construction Non-Bond	Design/ Construction Bond	Landfill Totals
Land Investors (Relocated)	$ 43		$ 4,300			$ 4,343
Leech Lake	$ 1,303		$ 9,310			$ 10,613
Leslie Benson	$ 386	$ 1,535				$ 1,921
Lincoln County (Relocated)	$ 323	$ 2,899				$ 3,222
Lindala	$ 5,296		$ 23,474			$ 28,770
Lindenfelser	$ 1,168		$ 62,014			$ 63,182
Long Prairie	$ 11,631	$ 30	$ 22,119			$ 33,780
Louisville	$ 7,887	$ 1,263	$ 83,395			$ 92,545
Mahnomen County	$ 593		$ 3,420			$ 4,013
Mankato	$ 2,180		$ 6,237			$ 8,417
Maple	$ 18,333	$ 61	$ 7,452	$ 102,356		$ 128,202
McKinley	$ 697	$ 212	$ 1,704			$ 2,613
Meeker County	$ 1,368		$ 15,698			$ 17,066
Mille Lacs County	$ 48,513	$ 253	$ 59,748	$ 1,944,153		$ 2,052,667
Minnesota Sanitation	$ 886		$ 5,643			$ 6,529
Murray County	$ 1,432		$ 15,166			$ 16,598
Northeast Otter Tail	$ 3,188		$ 53,346			$ 56,534
Northome	$ 572		$ 3,311			$ 3,883
Northwest Angle	$ 711		$ 1,056			$ 1,767
Northwoods	$ 1,096		$ 11,094			$ 12,190
Oak Grove	$ 2,654		$ 120,068			$ 122,722
Olmsted County	$ 14,276	$ 20	$ 307,291			$ 321,587
Orr	$ 641					$ 641
Paynesville	$ 3,597		$ 14,749			$ 18,346
Pickett	$ 2,008	$ 2,262	$ 13,687			$ 17,957
Pine Lane	$ 2,552		$ 74,641			$ 77,193
Pipestone County	$ 1,140	$ 10	$ 11,387			$ 12,537
Portage Mod. (Relocated)	$ 384					$ 384
Red Rock	$ 2,505		$ 20,339			$ 22,844
Redwood County	$ 2,041		$ 13,521			$ 15,562
Rock County	$ 2,272		$ 30,019			$ 32,291
Salol / Roseau	$ 1,395		$ 16,799			$ 18,194
Sauk Centre	$ 1,608	$ 81	$ 10,201			$ 11,890
Sibley County	$ 5,508		$ 8,515			$ 14,023
St. Augusta	$ 11,920	$ 505	$ 76,806			$ 89,231
Stevens County	$ 1,246		$ 8,572			$ 9,818
Sun Prairie	$ 1,339		$ 10,351			$ 11,690
Tellijohn	$ 3,884		$ 83,565			$ 87,449
Vermillion Dam (Relocated)	$ 613		$ 1,211			$ 1,824
Vermillion Modified	$ 468		$ 3,116			$ 3,584
Wabasha County	$ 1,708		$ 15,472			$ 17,180
Wadena County	$ 2,261		$ 4,213			$ 6,474
Waseca County	$ 3,312		$ 38,325			$ 41,637
Washington County	$ 87,515	$ 8,504	$ 197,324	$ 4,965,489		$ 5,258,832
Watonwan County	$ 5,613		$ 63,708			$ 69,321
Waste Disposal Eng (WDE)	$ 20,618	$ 91	$ 538,751	$ 141,771		$ 701,231
Winona County	$ 17,709	$ 333	$ 167,355			$ 185,397
WLSSD	$ 57,438	$ 2,949	$ 125,886	$ 2,872,354	$ 21,294	$ 3,079,921
Woodlake	$ 12,714	$ 3,808	$ 218,234		$ 315,671	$ 550,427
Yellow Medicine County	$ 1,342		$ 12,560			$ 13,902
Administration & Support	$ 1,807,051	$ 25,002	$ 43,481			$ 1,875,534
TOTAL	**$ 2,468,051**	**$ 88,866**	**$ 4,617,751**	**$ 10,372,585**	**$ 4,348,238**	**$ 21,895,491**

Appendix D: CLP state ownership of landfills and adjacent property

Site Name	County	Landfill Acres	Buffer Acres	Twp	Range	Sect	Donated
Anderson/Sebeka	Wadena	27		137	35	29	Y
Anoka/Ramsey	Anoka	317		32	25	27	Y
Anoka/Ramsey Buffer	Anoka		23	32	25	23	N
Bueckers #1	Stearns	17	13	126	32	31	Y
Dakhue	Dakota	80		113	18	24	Y
East Bethel	Anoka	60		33	23	8&9	Y
East Bethel Buffer	Anoka		0.3	33	23	8	N
East Mesaba	St Louis	128		58	17	15	Y
French Lake	Wright	11		120	28	28	Y
French Lake Buffer	Wright		69	120	28	28	N
Isanti/Chisago	Isanti	40		35	23	1	Y
Kummer Buffer	Beltrami		10	147	33	32	N
La Grande	Douglas	77.2		128	38	18	Y
Land Investors, Inc.	Benton	9		36	30	11	Y
Leech Lake	Hubbard	60		145	32	13	Y
Leech Lake Buffer	Hubbard		16	145	32	13	N
Lindala	Wright	60		120	28	3	Y
Lindala Buffer	Wright		23	120	28	3	Y
Lindenfelser	Wright	60		120	24	26	Y
Lindenfelser Buffer	Wright		11	120	24	26	N
Long Prairie	Todd	28		129	32	18	Y
Long Prairie Buffer	Todd		100.7	129	32	18	N
Oak Grove	Anoka	160		33	24	28	Y
Oak Grove Buffer (3 Properties)	ANOKA		6	33	24	28	N
Olmsted	Olmsted	252		108	14	27	Y
Olmsted Buffer	Olmsted		47	108	14	27	y
Paynesville	Stearns	63		122	32	22	Y
Pickett	Hubbard	16		140	34	7	Y
Pickett Buffer	Hubbard		4	140	34	7	Y
Pine Lane	Chisago	44		33	21	16/17/20	Y
Pine Lane Buffer	Chisago		22	33	21	16/17/20	N
Pipestone	Pipestone	40		107	44	31	Y
Red Rock	Mower	80		108	17	32	Y
Red Rock Buffer	Mower		81	108	17	32	N
SALOL	Roseau	102		162	38	15	Y
Sauk Centre Buffer	Stearns		14	126	34	14	N
St. Augusta	Stearns	48		123	27	17/12	Y
St. Augusta Buffer	Stearns		43	123	27	7	Y
St. Augusta Buffer	Stearns		35	123	27	7	N
Sun Prairie	Le Sueur	80		111	24	24	Y
Wabasha County	Wabasha	29		109	24	24	Y
Washington Co. Buffer	Washington		20	29	21	10	N
WDE Buffer	Anoka		6	32	24	27	N
WLSSD	St. Louis	150		31	51	14	Y
Woodlake	Hennepin	85		118	23	8	Y
Woodlake Buffer	Hennepin		110	118	23	8	Y
Total		**2,122.5**	**653.1**				