

City of Midland Sanitary Landfill



2005 Annual Report

Facility Type: *Municipal Solid Waste*
License Number: *9029*

Facility ID Number: *470453*
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The City of Midland Landfill functions as the final disposal site for all of Midland County's household, commercial, and non-hazardous industrial waste. The Landfill must efficiently handle the daily inflow of refuse, while maintaining customer satisfaction and safety and meeting or exceeding state and federal environmental regulations concerning landfill operations. Landfill operations are separated into the following areas: Landfill refuse handling, Composting, Recycling, Capital Improvements, Maintenance of Existing Facilities, Environmental Monitoring and Regulations Compliance, and Public Education.

LANDFILL REFUSE HANDLING OPERATIONS

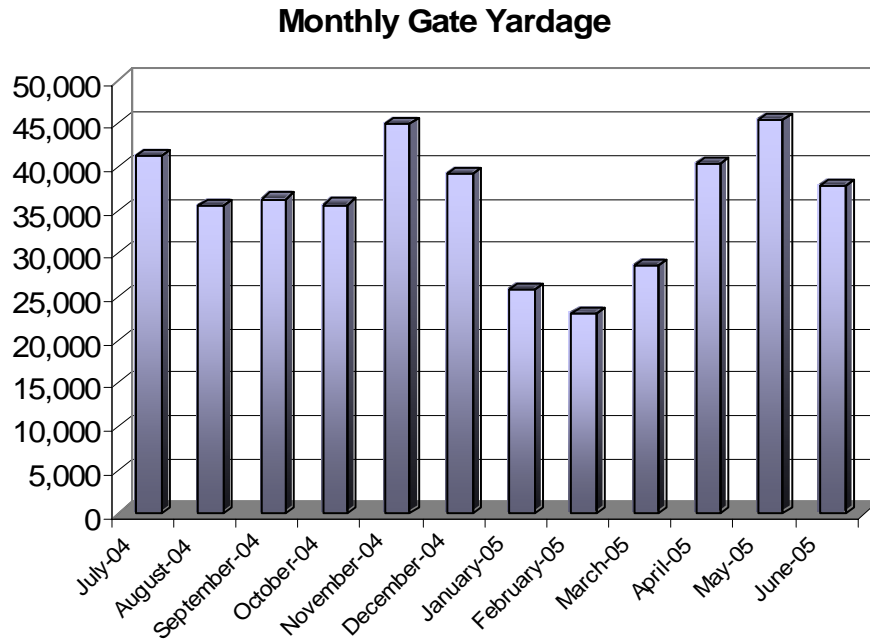
In 1996 the Landfill completed a master plan outlining future expansion and development of six new engineered cells. The first of these cells opened was Cell 14 in 1998. With an approximate size of 12 acres, Cell 14 was designed to accept 2,475,000 loose cubic yards of waste and has nearly reached full capacity. Cell 15 opened in December 2003, and in summer 2004 Cell 14 was covered with interim cover soils. Cell 15 is 11 acres in size and has a design capacity of 4,880,000 loose cubic yards, nearly double the volume of Cell 14. Cell 15 will accept waste for six (6) more years at current fill rates.

The entire area of Cells 14 through 19 will have a capacity of 33,750,000 loose cubic yards of waste, with a final closed landfill height of 150 feet above ground level. At current fill rates the site will meet the needs of Midland County for approximately 50 years.

Yardage received per month at the landfill varies with the seasons and the economic climate. Community cleaning activity increases in the spring and fall, while construction activity is strong through the summer. Rainy and winter months typically result in less outdoor activity and, ultimately, less refuse received at the Landfill.

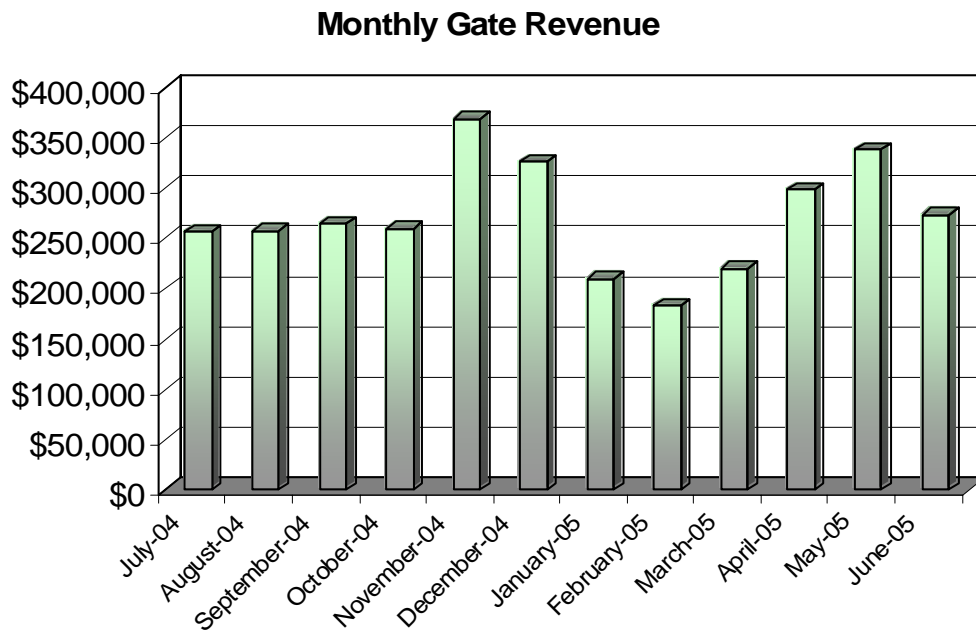
The total refuse received through the gate in fiscal year 2004/05 amounted to 642,016 loose cubic yards. This volume was brought to the landfill by more than 35,000 vehicles over the course of the year. The comparable reported yardage was 700,970 in 2003/04, hauled by 36,000 vehicles. On an average day over 500 tons of refuse is received at the landfill. Chart-1 shows a monthly distribution of refuse yardage received at the Landfill and indicates a general slowing in the months November through February, with the exception of abnormal demolition variations from Dow Chemical Company.

Chart-1



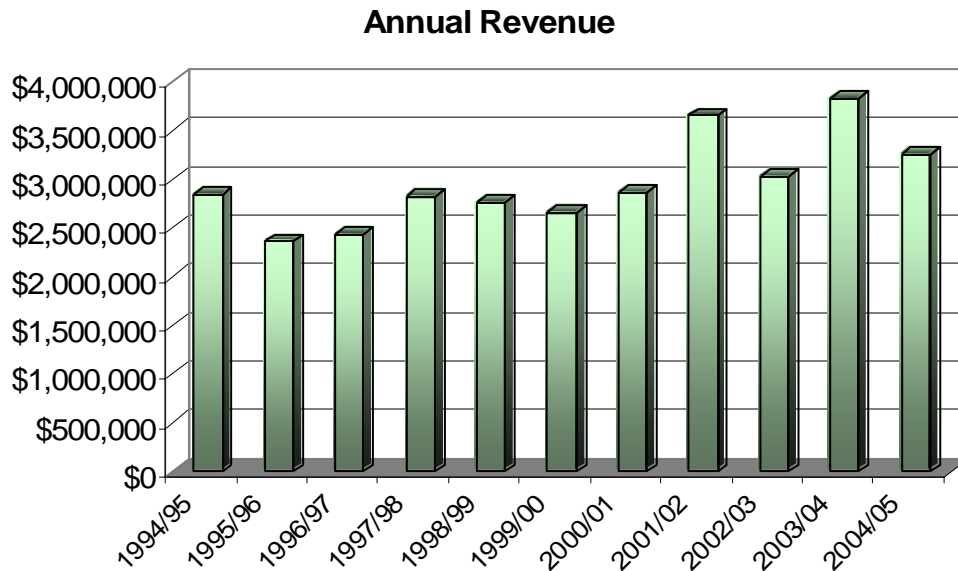
Total Revenue generated in 2004/05 was \$3,254,000 compared to \$3,831,000 in 2003/04. The decrease of nearly \$600,000 is attributed to a decrease of \$860,000 in contaminated soils received. The revenue loss was offset by an abnormal increase of nearly \$300,000 from Dow Chemical Company demolition projects in November, December, April and May. Total monthly revenue generated from the yardage received in 2004/05 is reflected in Chart-2.

Chart-2



Yearly revenue generated from refuse received at the Landfill is shown in Chart-3, comparing the years 1995/06 through 2004/05. Revenue growth is difficult to forecast because a major portion of the annual landfill revenue is demolition material of existing structures and refuse generated from new construction. Each of these items is directly affected by the economy in Midland County. Contaminated soil volumes are also unpredictable and have a significant impact on revenue. Contaminated soil volume is the cause for abnormal revenue increases in 2001/02 and 2003/04 fiscal years.

Chart-3

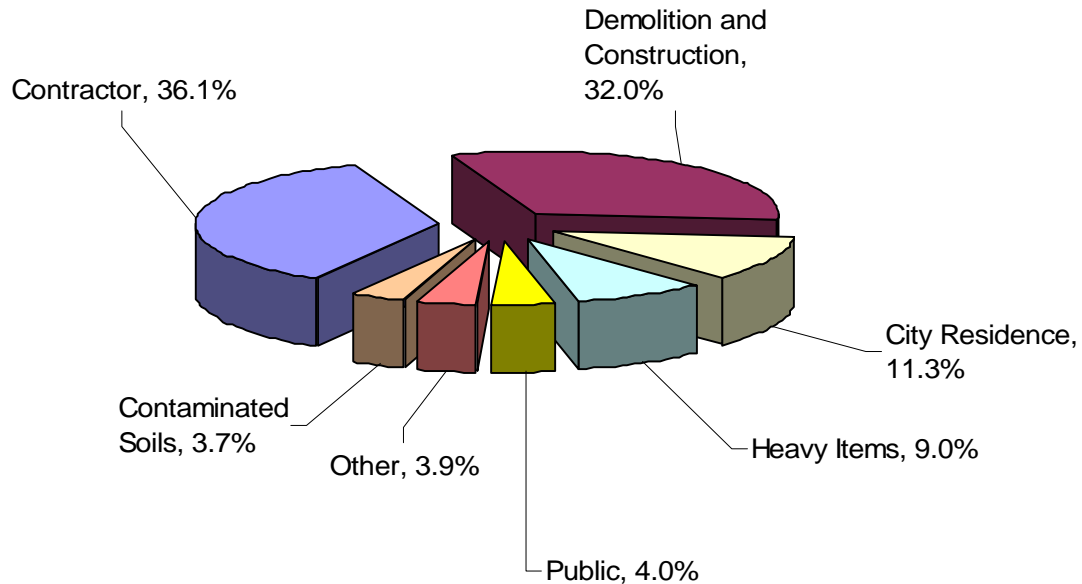


There are many types of refuse received at the Landfill every day. General municipal solid waste (City Residence and Contractor) made up a total of 47.4% (11.3% and 36.1%, respectively) of all yardage received in 2004/05. Demolition and construction waste made up 31.9% of the waste stream, up from 20.5% in 2003/04. Heavy item collection brought to the landfill by the City of Midland Department of Public Services accounted for 9.0% of waste received. As previously stated, the largest change in refuse volume and revenue was contaminated soils, which decreased from 87,117 cubic yards in 2003/04 to a more typical volume of 15,384 cubic yards in 2004/05. These soils accounted for 3.7% of the annual yardage received, compared with 19.1% last year. The balance of refuse received included public (4.0%) and all others (Appliances, Clean Fill, Medical Waste, Street Dirt, Tires, Wastewater, Water) together making up approximately 3.9% of the total yardage for the year.

Chart-4 shows a breakout of each major type of refuse and its associated percentage contribution to total yards received.

Chart-4

Refuse Received by Type



Much of the refuse received at the landfill is in the form of loose cubic yardage. It is estimated that the incoming refuse can be reduced to one-third of its original volume using a specialized compactor. The compactor is also designed to minimize airborne debris, which is a concern to property owners adjacent to the landfill property.

Landfill staff is required each day to observe the refuse loads being brought to the landfill and care must be given to keep sharp items from puncturing the geosynthetic liner of the cell, which could allow waste liquids to leach from the containment area. Continued special handling of contaminated soils, medical waste, and asbestos is also the responsibility of landfill staff.

Gates are open Monday through Friday 8 a.m. to 4 p.m. and from 8:30 a.m. to 12:00 p.m. on Saturdays during the months of March through November.

COMPOST OPERATIONS

Each year the landfill receives over 13,000 yards of yard waste, 40,000 yards of leaves, and 20,000 yards of brush. From this inflow the landfill is able to produce over 20,000 cubic yards of quality compost.

Over the past several years the compost operation at the landfill has been facilitated by the use of a grinder. The grinder takes the yard waste, leaves, and brush and grinds them into small particles, which helps to speed up the decomposition of the material. The extra-long conveyor belt attached to the grinder allows the compost to be piled in taller mounds, saving compost pad space. The compost piles are turned and mixed when the temperature of the material falls below

or rises above the desired temperature range of 110° – 140° Fahrenheit. The grinding, maintaining proper moisture, and periodic turning and mixing of the compost material allows the compost to be fully processed and ready for screening in a matter of three or four months.

Screening is accomplished using the Erin Star screener. Finished, fine compost passes through the screen while larger impurities and brush which has not fully decomposed are separated for further composting. In the past all compost generated at the landfill had been used on site as vegetative and topsoil cover for cell capping projects. Compost has also been used to add nutrients to landfill-owned grounds whose topsoil was removed for use in construction projects such as closure of cells 1-13 and the Waste Water Treatment Plant retention basin. This summer finished compost was sent to an independent laboratory for testing with plans to sell the material beginning in the 2005/06 fiscal year.

RECYCLING OPERATIONS

The City of Midland Landfill continues to promote the recycling of as many materials as possible on site. Appliances are received daily from residents and many of them contain Freon, which has to be removed before the items can be recycled. In 2004/05 over 1,000 appliances were received, had the Freon removed, and the scrap metal recycled. Scrap metal from other sources is also separated at the landfill's scrap metal collection pad and recycled. In addition to scrap metal the landfill receives and recycles car batteries, clean concrete and asphalt, grass, leaves and brush.

Tires continue to be accepted at the landfill for disposal. In 2004/05 the landfill received 2,805 tires, compared with 3,145 tires in 2003/04. During collection events this year nearly 2,500 tires were collected to be shredded for use as fuel in Michigan industry.

The City of Midland Landfill again served as the site of the Midland County Household Hazardous Waste Materials Collections. This program allows Midland County and City residents to dispose of household hazardous materials, such as paint, pesticides, herbicides, and motor fueling and lubrication products. The collection of these hazardous materials is held in the landfill's maintenance building, whereby residents can conveniently drive in, unload into segregated bins, and drive out. During the five collections this year over 300 barrels of waste were collected and safely disposed.

CAPITAL IMPROVEMENTS

Equipment Purchases - Two major pieces of equipment were purchased this year; a replacement D6R Caterpillar bulldozer and 2) a Roll-Off Container Truck. The new D6R, shown in the photo below, is equipped with a landfill protection package which includes guards and design modifications to handle working in refuse and demolition waste, rather than just soils. The unit also has



a low ground pressure design which allows operation in muddy conditions without sinking, or on only one foot of protective sand over a cell liner system without causing damage to the liner. The bulldozer roughly 20% heavier than its predecessor, and offers an increase in power and efficiency.

The roll-off container truck, shown in the photo below, is a dual function unit capable of handling two styles of dumpsters. Most trucks can work with either a hook lift system or a cable and pulley system. The new container truck can do both, as both styles of cans are on site at the



Landfill. Additionally, the truck can be used as an earth moving dump truck or a road watering truck when properly equipped with a specialized container. These specialized units will be purchased in the 2005/06 fiscal year to complement the truck's capabilities. The truck will be used daily to maintain the new

residential drop off area, whose construction began in spring 2005 and will be completed in fall 2005.

Residential Drop-off Area - The new residential waste disposal area is an elevated asphalt pad where residential customers can conveniently drop off refuse without entering the landfill cell. This will improve efficiency for these customers and reduce small vehicle traffic in the heavy equipment operating area. Construction is underway and will be completed in fall 2005.

Interim Cover - Another project undertaken by City staff this year was interim cover soil placement on Cell 14. Originally, plans were to place final liner cover over the slopes, but through engineering changes with our consultants and with MDEQ approval the strategy has been changed. Now, final capping will occur as one project when Cells 14-19 are all near completion. This change reduces costs short-term and allows waste settling to occur, which allows placement of more waste decades from now.

Compost Pad - The expansion of the asphalt compost pad by roughly one acre was also undertaken this past year. The existing pad has struggled to meet staff needs for space, especially with ever increasing volumes of yard waste material each year. The larger pad will also accommodate more, shorter height compost windrows in the future. This will allow the planned 2005/06 fiscal year purchase of a compost windrow turner to work effectively on the site. The new turner will increase composting efficiency significantly, taking a process that takes up to four months and reducing that by 30% or more. The material will also be turned weekly instead of monthly, improving final product quality and reducing odor concerns.

Computer Software - This year new software was selected for installation in fall 2005. The software will be more user-friendly, and make financial and regulatory reporting more effective. The new program will also incorporate the billing and accounting work currently done through two systems and require less time from staff. Once installed, staff will accept bids for an

automated scale to further improve efficiency and reduce the need to estimate truck volume for billing.

Gas Extraction - A major capital project under consideration is the installation of an active landfill gas extraction system for conversion to energy. This is routinely done at larger landfills to generate a revenue source from decomposition by-products. The City of Midland site is nearing the refuse volume in place necessary to make a landfill gas to energy project financially viable. A consultant has done preliminary investigation and will have final recommendations by early 2006.

Bioreactor - Also under consideration is the feasibility of a bioreactor landfill system. A bioreactor system is a newer technology for rapid refuse decomposition. Its benefits are rapid gas generation for extraction, and rapid waste settling for placement of new refuse in the same space material had previously been placed. This extends site life, reduces waste liquid being pumped to the Waste Water Treatment Plant, and controls odors through active collection. Consultants have begun investigation of this major operational change and have met with City staff and MDEQ to discuss its potential.

MAINTENANCE OF EXISTING FACILITIES

The landfill is visited each year by thousands of vehicles delivering refuse. Roadways must continually be maintained for a smooth transition from pavement to gravel and dirt roads. Landfill staff and temporary employees pick up blowing papers on a daily basis, repair landfill grounds areas and mend fences. Dust is kept to a minimum with the help of a water tanker truck which, during very dry seasons, is used to water landfill roads several times per day. Staff has also begun use of dust control mixtures with a chemical base called lignin. Lignin mixtures have a long lasting dust reduction effect, similar to brine on a gravel road. Mowing grass of the landfill grounds and trimming of trees helps to make the landfill as aesthetically pleasing as possible. Staff has also planted a flower bed at the entrance to the site to improve the site's appearance.

ENVIRONMENTAL MONITORING AND REGULATIONS COMPLIANCE

Engineering consultants provide testing and analysis services of groundwater and landfill gas. The tests insure proper containment of waste liquid and gases from the site to nearby residences. This quarterly testing has resulted in no levels exceeded for 2004/05.

Landfill staff continues to work with the MDEQ to insure compliance with personal and environmental health laws. Contractors installed deeper groundwater monitoring wells around the older cells at the request of the MDEQ. Landfill consultants have also increased testing frequency at certain wells, again at the request of MDEQ.

Final capping and closure of Cells 1-13 was completed and received final closure certification from the MDEQ in 2004/05. Staff installed a leachate collection system onto Cells 1-6 which, having been built in the 1970s and 1980s, had no waste liquid removal system installed. The

leachate is pumped to the waste water treatment plant from wells placed directly into the buried refuse. Removing leachate from these cells will aid in the decomposition of remaining waste and reduce the potential for leachate migration downward through clay to groundwater sources.

PUBLIC EDUCATION

One of the goals set for landfill staff this past year was to continue support in the area of public education. Through the efforts of staff the landfill has taken two steps forward in working with the public schools in our area. Educational brochures have been printed for adults as well as children. In coordination with their spring session about earth science school children toured the landfill and then received compost kits to take with them. Staff completed the recycling loop with a hands-on project of growing a flower in our recycled compost dirt, and created a teacher's packet with suggested projects. The landfill gave out approximately 500 compost kits, which included a ruler, a cup of compost dirt, a seed packet, a colorful brochure, crayons and activity pages.



GOALS SUMMARY FOR 2005/06

- Install waste oil burner in maintenance building to reduce propane heating costs;
- Improve composting efficiency and finished product quality with a new windrow turner and using compost test results to update operating procedures;
- Install radio telemetry control system for leachate pumps to improve regulatory compliance and automate certain recordkeeping;
- Initiate Cell 16 construction plans.