Kent County
Department of Public Works

SWANA 2012 Integrated Solid Waste Management System Excellence Award Application
Executive Summary -

The Kent County (MI) Department of Public Works is an enterprise fund department established by the Board of Commissioners to provide solid waste management services and waste and sewer system construction, inspection, and maintenance under contract with some local units of government. The department is divided into four divisions: Utility Services, Finance and Accounting, Waste-to-Energy, and Solid Waste. In addition to general administration and budgetary oversight, the department also helps local municipalities to secure funding for water and sewer projects.

Seeing the opportunity for environmental benefit and cost savings to the County, the Department of Public Works has implemented an integrated solid waste system that include voluntary landfill gas-to-energy generation, converting trash to electricity at a state-of-the-art Waste-to-Energy (WTE) facility, extensive public education programs, household hazardous waste disposal and ever-expanding recycling services, including a single-stream processing facility, integral to a integrated solid waste management plan designed to reduce the amount of waste generated and properly process that which enters the South Kent Landfill.
Overview of System & System Performance

Population & Service Area

Kent County occupies 864 square miles with a population of over 601,000 (2010 U.S. Census), in western Michigan. Kent County is the fourth largest population center in Michigan. The majority of the metropolitan area is comprised of the cities of Grand Rapids, East Grand Rapids, Kentwood, Wyoming, Walker and Grandville. Grand Rapids is the second largest city in the state of Michigan. The remainder of land is suburban or rural. Several smaller communities, e.g., City of Rockford, Plainfield Charter Township and Grand Rapids Township, are developing as business service hubs for the greater Grand Rapids metropolitan area. Local government units include: twenty-one townships, five villages and nine cities.

Kent County remains committed to a fully integrated solid waste management system. This system includes: reuse, waste reduction, recycling, composting, incineration with energy recovery and landfiling. The county has adequate landfill capacity for the next 20 years. This capacity is available at the County owned and operated South Kent Landfill and landfills in adjacent counties.

Elements of the System

The Board of Public Works (BPW) is the designated agency for the Kent County Solid Waste Management Plan. As such the Department of Public Works (DPW), reporting to the Board, develops and institutes the Solid Waste Management Plan approved by the State of Michigan. This plan was amended as recently as 2009 and is currently in the midst of an amendment in 2012. This plan assures the County’s residents of proper disposal of the waste generated in the county.

The current system for refuse disposal in Kent County is based on a plan which incorporates an integrated solid waste system. The components of this system include energy recovery, material recovery and processing, transfer and landfilling, as well as expanded education in resource recovery.

South Kent Landfill

The South Kent Landfill is a Type II solid waste facility located on over 300 acres in Byron Township, MI, at the southern edge of Kent County. The landfill serves as a crucial piece of the puzzle in the County’s Solid Waste Management infrastructure for waste that cannot be diverted. As Kent County’s only active municipal solid waste landfill, South Kent serves a diverse and environmentally progressive community.

South Kent Landfill is licensed to receive both municipal solid waste (MSW) and ash from the Waste-To-Energy facility. The two are disposed of in segregated landfills on the site. In 2011, South Kent Landfill received approximately 186,600 tons of MSW and 41,200 tons of ash.
The scalehouse is situated at the entrance to the site and has two inbound scales and one outbound scale. This orientation helps alleviate traffic congestion and maintains an orderly entrance and exit process for the County’s customers.

The upland site at 300 100th Street in Byron Township proved an ideal location for a landfill for many reasons including geology, soil types, hydrology, topography, and proximity to a major freeway within the county.

Soils at the 100th Street location are composed of sand, silt and an abundance of low-permeability clay. The high clay content in the soils makes it an ideal location for a landfill. Water infiltration within clay soil is much slower due to the structure of clay particles. At the site, laterally continuous clay isolates the underlying regional aquifer and isolates it from rapid infiltration of precipitation and snow melt water on the site.

In preparation for cell construction, soils are excavated and used to provide daily, intermediate and final cover from the property. Testing is performed prior to cell construction to examine soils and demonstrate that there is a minimum of 10 feet of clay below newly constructed cells. The top two feet of clay are excavated and re-compacted to eliminate cracks in the clay, increase bulk density (mass per unit volume of soil) and reduce infiltration and percolation within the soil. The depth of the water table below the cells is also measured to ensure adequate separation between groundwater and the cell bottom.

A leachate collection system is in place to prevent leachate from impacting the local groundwater and surface water. Leachate is collected through a series of drains just above the landfill liner. The leachate collected from the solid waste cells is discharged via forcemain for treatment at the local wastewater treatment plant. The leachate collected from the ash monofill is pumped to an onsite tank and stored for regular trucking to the local wastewater treatment plant.

Beneath the leachate collection drains within each landfill cell is a synthetic liner made of either 40 mil PVC or 60 mil HDPE plastic.

At the current disposal rate, estimated closure will take place in 2029 with the ash monofill closing around year 2017. In preparation for these closures, Kent County has purchased approximately 300 acres of adjacent land and is preparing expansion plans to ensure on-going service for our citizens. These parcels are located in Dorr Township, in neighboring Allegan County, under a long-term cooperative Solid Waste Plan agreement.

In 2009, Granger Electric and the DPW, in a contracted partnership, completed construction of a state-of-the-art landfill Gas- to-Energy facility. It is equipped with two Caterpillar 3520C Engine Generators and was built with room to add one additional engine. This facility utilizes a system of gas extraction wells to capture the landfill gas and converts it to electricity which is sold back to the grid. This facility has generated over 39,000 MW of electricity since its completion.

The landfill is also involved in the cap-and-trade carbon credit system because of the installation of the gas-to-energy system that prevents methane from entering the atmosphere. The amount of non-methane organic compounds (NMOC) the landfill produces falls below the standard for mandatory implementation of a landfill gas management system, so the carbon credits are sold and profits are returned to fund other landfill programs. To date, over 120,000 tons of carbon equivalents will not enter the atmosphere because of this program.
South Kent Landfill received the 2010 Landfill Methane Outreach Program Community Partner Award from the United States Environmental Protection Agency. This award recognized the landfill for its innovative partnership, expedient implementation and overall management of a gas-to-energy system.

The Environmental Management System at the South Kent Landfill was registered with the ISO 14001:2004 program in 2007 and was renewed in March 2010. An Environmental Management System meeting the requirements of ISO 14001:2004 enables landfill staff and managers to identify and control the environmental impact of our activities, products or services; improve our environmental performance continually; and implement a systematic approach to setting environmental objectives and targets, to achieving these and to demonstrate that they have been achieved. Implementing the ISO 14001:2004 system at South Kent Landfill has proven to be an excellent means to monitor environmental performance while always looking for opportunities for improvement.

North Kent Transfer Station

The North Kent Transfer Station (NKTS) was built in 1991 after the North Kent Landfill was closed due to reaching final capacity. The County was well aware that some type of waste disposal service was needed for the northern half of Kent County.

Located in the northern part of Kent County, in Plainfield Township, the NKTS provides a convenient location for commercial waste haulers and residents to dispose of trash without having to drive to a distant landfill. The proximity of this facility (between a major metropolitan area and a landfill) helps keep refuse costs lower for residents in rural areas by keeping haulers’ transportation costs lower.

The NKTS was designed to transfer municipal solid waste to the County-owned South Kent Landfill located in the southern end of the County, as well as to surrounding private landfills. The MSW is unloaded on a concrete floor, compacted, loaded into a transfer trailer and transported to the landfill. The transfer station was so well received that the County decided to expand it in 2001. The designed expansion doubled the size of the building and equipment. Presently the NKTS handles over 62,000 tons of waste per year.

The Department of Public Works has a long-term solid waste swap agreement with a major national waste company. This agreement saves significant transportation costs for both agreement partners.

A recycling drop-off center is open during normal business hours for household recyclables at the NKTS. Recycling containers are provided for single stream recyclables which are brought to the County-owned Recycling and Education Center for processing. The transfer station also is one of three drop-off locations for the DPW’s electronics recycling program. Individuals can drop off specific electronic devices along with televisions during normal business hours. Other drop-off sites are located at the South Kent Landfill and the Recycling & Education Center. The DPW’s program collects over 300 tons of electronics per year.
Recycling and Education Center

While the South Kent Landfill operates with environmental controls in place, its effectiveness in protecting the environment begins before waste even reaches the landfill. In the late 1980s, Kent County’s Board of Public Works committed to a pioneering vision. They researched and determined that Kent County had the opportunity to manage solid waste in ways no other county in Michigan ever had. With that vision in mind, Kent County took responsibility and ownership of a struggling Materials Recovery Facility (MRF) that processed residential and small business recyclables from all over west Michigan. Since then, the facility has been upgraded, and more than 214,835 tons of recyclables have been recycled instead of sent to a landfill. Having found success as the only significant MRF in west Michigan, the Board of Public Works authorized construction of a new single-stream recycling facility to keep Kent County progressive in the recycling industry.

The new 56,000 square foot Kent County Recycling & Education Center opened in the summer of 2010 and replaced an aging and outdated dual stream system for sorting residential recyclables. The new single stream system is capable of sorting considerably more material in a shorter period of time than the old system. The single stream system can sort 18 tons of recyclables per hour and allows recyclers to mix all their recyclables together and place them in one cart. The state-of-the-art technology includes a sorting process that utilizes a combination of conveyors, rotating screens, blowers, magnets, optical sorters and air separators to assist in the separation of recyclables. Since beginning operations in July of 2010, the facility has processed approximately 33% more recyclables over the same time period as last year or 23,000 tons per year (an increase from 13,500 tons). The County invested $11.4 million, of which none is taxpayer’s dollars, in this facility and expects to operate the facility at a breakeven point by 2014. This facility will also considerably extend the life of the county owned landfill.

The DPW, in partnership with the City of Grand Rapids, loaned the city $1.5 million for the purchase of 45,000 residential single-stream recycling carts in 2010. Each household in Grand Rapids received a cart through the City’s free curbside recycling program in an effort to make recycling more convenient for the residents, which is one of the goals of the DPW in the Solid Waste Plan.

The facility also offers a 5,000 square foot education area that houses two public meeting and classroom areas and a 125 foot long viewing platform overlooking the processing facility. The new center was built following Green building standards and recently received LEED Certification from the United States Green Building Council.
Waste-to-Energy Facility

Around the same time that Kent County took over responsibility for recycling, the second waste-to-energy (WTE) facility in Michigan was constructed. This County-owned, state-of-the-art facility proved to be an innovative way to marry the objectives of recycling, waste reduction and energy development, providing many more years of useful life to the South Kent Landfill. Without the WTE, the South Kent Landfill would have reached capacity in 2006.

Located in the city of Grand Rapids, the Waste-To-Energy (WTE) Facility celebrated 21 years of service in February 2011. While this is a notable achievement, there is every reason to expect many more years of clean, reliable service for the citizens of Kent County. The County-owned WTE Facility is the primary solid waste disposal facility for the cities of Grand Rapids, East Grand Rapids, Grandville, Kentwood, Walker and Wyoming. Kent County has entered into contracts with the cities as part of an integrated approach to solid waste management including waste reduction, recycling, a household hazardous waste program and landfilling. The WTE was built after many years of planning and discussion with the full participation of the six cities, business and environmental groups and the general public. Construction of the WTE Facility was completed ahead of schedule and under budget. Covanta Kent, Inc. operates the Facility under a long term contract.

The WTE Facility is located at 950 Market Ave. SW on a 9-acre site zoned for heavy industry in the City of Grand Rapids. It takes about 40 employees of Covanta Energy and 9 from Kent County per day to run the Facility 365 days a year, 24 hours per day. Approximately 555 tons of municipal solid waste (MSW) is processed daily, totaling 185,905 tons in 2011. Approximately 4,250 tons of ferrous metal is recycled from the ash every year. MSW is burned on furnace grates specially designed to burn the most waste efficiently. High pressure steam is generated in waterwall boilers and routed through a turbine/generator to produce electricity. The electricity is first used on site with the balance sold to Consumers Energy Company to cover a portion of operation costs. The electricity sold is enough to supply all of the households in the cities of Grandville and Walker.

An average of 555 tons of solid waste are incinerated at the Kent County WTE facility each day, generating up to 18 megawatts of electricity per hour. Through incineration, the volume is reduced by 90% and the weight reduced by 77%. The residual ash is hauled to the ash monofill at South Kent Landfill.

In March 2006, the Kent County WTE Facility became Michigan’s 121st, and the first municipal, Clean Corporate Citizen (CCC). To qualify for a Clean Corporate Citizen designation, candidates must adopt a facility-specific environmental management system and active pollution prevention initiatives, and have a consistent record of compliance with applicable environmental requirements.

Projected Dates for Waste-to-Energy:

- May 2012: 2.1 Million MWH of electricity sold
- May 2012: 4.1 Million tons of solid waste processed
- May 2012: 113,000 tons of ferrous metal recovered & recycled

“Joining the CCC program is a monumental accomplishment for a waste-to-energy facility... Kent County and Covanta Energy are true environmental leaders in providing a sustainable future for the citizens of West Michigan.”

Jennifer Granholm, former Governor of Michigan
Resource Recovery & Public Education Programs

Household Hazardous Waste Program

In a step to protect the landfill and the environment, the DPW began collecting Household Hazardous Waste (HHW) from residents with a one day event in 1985. Twenty-five years later, there are now four permanent centers that collect over 156,000 pounds of chemicals a year with over 2,600 participants a year. The first year, the average cost per pound was $1.75. Today the average cost for disposal is $0.52 (cents) per pound. In 1988 the DPW started one day collections per month, expanded this program to three sites one day every month at each site, and then expanded the program in 1991 to hold collections in the northern and southern portions of the county. Outreach to these areas increased participation and allowed the program to reach a more rural segment of the county population. The first permanent storage container was purchased in July 2000 for the central location near downtown Grand Rapids. An additional permanent storage container was added in Sept of 2001. The final 2 permanent storage sites were added in the southern end of Kent County in June 2004 and September 2005. Since the final permanent site was added in 2005 the HHW program has steadily increased in participation throughout the county, disposal costs for the county have been reduced, and more material is collected on a per capita basis.

The DPW’s four year-round permanent sites schedule appointments during the week and hold 8-12 Saturday collections each year beginning in April or May and ending in October. Appointments for weekdays can be made by residents either by phone or via our website. The Saturday collections are open to all residents without an appointment, as there is more than one staff person as well as the Hazardous Waste contractor on site. Saturday collections average 150-250 households and account for 40% of the households participating in the program. The number of participants to the program is tracked by means of an abbreviated survey asking households for their city and zip code. This helps track which areas of the county are being served the most and areas that need to be targeted for participation. A schedule with the dates are published every year in the DPW’s Waste and Recycling Guide and published on our website. Announcements are made on local radio stations and in local newspapers prior to Saturday events.

Materials are picked up at the centers by a licensed hazardous waste contractor every 4-6 weeks, collecting an average of 25-30 drums or approximately 5,000 pounds. The materials collected by the hazardous waste contractor may be diverted for recycling, most in the form of solvent fuel blending to a cement kiln. Used oil and oil filters, about 675-800 gallons per year, are diverted and recycled through a separate oil recycling contractor. Beginning in 2010, the DPW subcontracted for the fluorescent bulbs collected through the program for separate recycling. Last year, 7,420 bulbs were collected and diverted, 65% of which were four foot tubes. A separate CFL bulb collection program with collection buckets at local neighborhood associations and small businesses will bring the collected CFL’s from residents to the HHW program for disposal.
In the fall of 2011, the Kent County HHW program began collecting used vegetable oil for residents for recycling. Organicorp, Inc., a local company, has placed specially designed containers at the HHW centers. The non-hydrogenated vegetable oil will be processed into bio-fuel and sold on the open market.

The current program serves all of Kent County. Eight-two percent of the population in the county resides within the metropolitan area and can access one of the collection sites within a 1-8 mile radius. The most rural population of the county, 18%, have access to a collection center with a 10-15 mile radius.

Since its inception, the HHW program has served over 26,000 residents and has collected over 1.4 million pounds of material for proper disposal.

**Electronics Collection Program**

In the beginning years, electronics collections averaged between 150 - 250 tons per year and have steadily increased volumes collected. The current program collects and sends for processing 300-350 tons per year. Over 4 million pounds have been collected since 2001.

**Battery Collection and Disposal Program**

In 1990, Kent County began its battery collection program to reduce mercury source pollution at the Waste-to-Energy facility. Residents can bring in their dry cell batteries for proper disposal at one of 36 drop-off locations. Drop-site buckets are located at local libraries, city and township offices throughout the county. Five gallon buckets or 14-gallon drums have been distributed to the various locations for collection. WTE personnel collect the batteries when notified that the container is full. Batteries are then sorted by type at the Recycling & Education Center. Lithium, ni-cad, mercury oxide (button cells), sealed lead acid batteries and rechargeable batteries are sent to a battery reclaimer for recycling.

Approximately 60,000 tons of batteries are diverted from the WTE each year with about 5,900 pounds of the button/ dry cell batteries sent for recycling.
Pharmaceutical Collection

In 2010, the Kent County Department of Public Works, in collaboration with local waste water treatment plants, law enforcement agencies and local pharmacies, developed a pharmaceutical collection program for residents. The West Michigan Take Back Meds program currently has 44 pharmacies and 17 law enforcement agencies across three counties, serving a population of 978,977 residents. These sites provide safe and convenient disposal of unwanted and expired medications from residents. The DPW, as owner of the Waste to Energy facility (WTE), has a unique role in providing a safe, low cost disposal method for these unwanted medications.

Law enforcement agencies, with concerns for drug abuse and other criminal activities, agreed to accept controlled medications from residents. Specialized collection boxes were designed and manufactured locally for these collections. Similar to mailboxes, these drop site boxes have one way doors for residents to deposit their medications. A separate locking door on the container is used to empty the collection boxes at the law enforcement agencies by evidence technicians. Medicines collected are brought in for disposal to the WTE by the law enforcement agency with other contraband in their evidence lockers. Nine of the boxes are placed in metropolitan police agencies and four boxes at more rural law enforcement agencies.

Collection at the pharmacies is done by preindustrial treatment personnel from one of three local wastewater treatment plants. Two (or more) 3 1/2 gallon buckets are placed at the pharmacies for collection of the medications from residents. The pharmacist checks the medication from the resident to make sure it is not a controlled substance, and then places the medication in the collection pail. All patient information must be removed from the containers. Residents are required to black out personal information but leave the name of the medication visible. If it is a controlled substance the pharmacist gives the resident a brochure listing the law enforcement locations for drop-off of controlled substances.

Wastewater treatment personnel are called when the buckets are full. Personnel from the wastewater plants bring in locking totes, weigh and empty the buckets into the locking totes. The totes are then taken back to a secure locked area at the treatment plants for storage. Medications are brought to the WTE, by appointment, when storage reaches capacity.

The West Michigan Take backs Meds Program took its lead from the City of Wyoming’s (MI) successful “Wy Meds” program which started in the fall of 2009. To have the same program expanded throughout the County took a joint effort, with law enforcement agencies willing to be responsible for the drop boxes at their sites, local waste water treatment plants being willing to provide collection service at the pharmacies, and the ability to utilize the County’s Waste-to-Energy Facility for safe and secure disposal.

To provide residents with the most up-to-date information and drop off locations, the DPW also paid for and maintains a website dedicated to the program: www.wmtakebackmeds.org.
The current program has collected over 12,300 lbs of medications since the beginning of the “WyMeds” program in 2009. In 2012, the West Michigan Take Back Meds program has averaged 221 pounds of medications collected per month from the local pharmacies.

The WTE was prepared to accept medicines because the protocols were already in place from working with law enforcement agencies to destroy illegal drugs. The current program of law enforcement drop boxes and pharmacies serves an estimated 87% of the county population. Law enforcement drop boxes in the most rural areas of the county serve an additional 13% of the county population.

The West Michigan Take Back Meds program has grown in just two years from a single city program serving 70,000 residents, to serving the entire Kent County population, to a regional program serving nearly 1,000,000 residents in West Michigan.

**Yard Waste**

Since March 28, 1995, yard clippings have been banned from disposal in Michigan municipal solid waste landfills and the burning of yard clippings has been banned in municipalities of 7,500 or more in population, unless specifically authorized by local ordinance. Each municipality addresses yard waste collection independently. Each of the six major metropolitan cities in Kent County offer both collection and residential drop-off of leaves, Christmas trees and some additional yard wastes during the year.

Outlying townships and smaller cities generally rely on either home composting or private composting facilities to process organic wastes. At least ten private companies in the region accept grass clippings, leaves and/or branches for composting or chipping. One company has expanded services to include food wastes collected from restaurants, hotels and other commercial organic waste producers.

**On-Site Special Waste Recovery Programs**

On-site resource recovery programs collect tires, propane tanks, scrap metal, and appliances at the South Kent Landfill and the North Kent Transfer Station. Tires are banned from disposal in landfills in Michigan. Instead of turning customers away who have tires, the South Kent Landfill became one of only two registered commercial scrap tire collection sites in West Michigan. Since becoming a registered collection site in 2007, over 194 tons of tires have been collected to be recycled into synthetic sports fields, rubberized asphalt, tire turf and tire derived fuel. Propane tanks have the potential to cause significant damage if disposed of in the trash so they are accepted at South Kent for proper removal of residual gas and recovery of the metal. Refrigerant gas is removed from appliances by a licensed contractor on-site to prevent atmospheric damage from gas releases. Since 2006 more than 1,300 appliance units have been recycled for scrap metal recovery, many of which contained refrigerant gas that was properly removed.
Long term availability

Kent County is expected to continue to experience population growth and development. The County’s population as a whole is expected to increase at a growth rate of 9.8% from 2010 to 2020. Concomitantly, the county will experience continued waste generation. Systems are in place to manage current and future waste generation through 2020. Thereafter, the County will need to evaluate long-term disposal options to handle approximately 2,600 tons of solid waste generated every day (949,000 tons/year). The Waste-To-Energy Facility incinerates an average of 555 tons/day, while the South Kent Landfill presently accepts approximately 468 tons/day for disposal. The remaining 1,300 tons of solid waste are transported to out-of-county disposal areas as defined in the approved Solid Waste Management Plan. This leaves a balance of approximately 330 tons of material per day for diversion. This diversion rate includes residential recycling (49 tons/day) and 279 tons per day for commercial/industrial recycling and composting. South Kent Landfill has sufficient capacity for the next 23 years at a disposal rate of 155,000 tons per year or 500 tons per day.

Kent County has selected a plan for solid waste management that includes energy recovery, landfilling, material recovery and expanded resource recovery. Landfilling is the predominant method for waste disposal in Kent County. Waste-to-Energy remains a vital part of the County’s plan and will continue to be in the future. The Waste-To-Energy Facility continues to process approximately 190,000 tons of waste per year. This is also a very accurate and obtainable number and reflects optimum operating conditions at the facility. As the total projected solid waste quantities for Kent County continue to increase, the percentage of waste incinerated will continue to decrease. This leaves the remaining four classes of technology (reuse, waste reduction, composting and recycling) to compete for the remaining volume of trash.

Environmental Protection & Regulatory Compliance

The South Kent Landfill is a critical component of an extensive, integrated solid waste management system administered by the Kent County Department of Public Works. As the only licensed type II landfill in Kent County, South Kent is relied upon by hundreds of thousands of people and its continued operation is essential.

South Kent Landfill has consistently met and exceeded all regulatory compliance requirements:

The landfill operating permit, issued by the Michigan Department of Natural Resources and Environment, requires gas probes surrounding the landfill to be tested quarterly to ensure that methane is not escaping the landfill site through the soil. Additional voluntary methane monitoring is done through mounted detectors with alarms inside buildings on-site. These detectors monitor for gas intrusion into the building.

In addition to monitoring methane, the operating permit requires groundwater monitoring on and around the landfill property. Groundwater samples from 16 monitoring wells are collected and analyzed by a contract laboratory on a quarterly basis. In addition to the required primary and secondary parameters, groundwater is also tested for potassium, an indicator that leachate leaked from an ash cell. Five leachate indicator criteria are tested in total. As a voluntary public service, drinking water from neighboring homes is sampled and tested once per year. South Kent Landfill continues to show no threat to the groundwater.
The South Kent Landfill generates approximately two million gallons of leachate per month that is either hauled or discharged directly to the City of Wyoming Clean Water Plant under an Industrial User Permit. Strict permit limits for primary pollutants, including BOD (biological oxygen demand), TSS (total suspended solids), total phosphorus, oil & grease, arsenic, PCBs, cyanide and several heavy metals are monitored by the Plant. Leachate is tested for the same parameters before leaving South Kent Landfill and by the City of Wyoming. Leachate is also statistically analyzed for potassium, beyond the state requirements, to ensure the concentration is not increasing faster than it should. Kent County holds a renewable operating permit (ROP) for air quality at the landfill. Under the ROP, the Landfill Air Emissions Estimation Model is used to estimate fugitive carbon dioxide, non-methane organic compounds, volatile organic compounds, NOX, SOX, particulate matter (PM10 and PM2.5) and various organic hazardous air pollutants from the flare, turbine generators, landfilled waste and the haul roads.

A Storm Water Pollution Prevention Plan (SWPPP) for South Kent Landfill has been developed as required under Part 1.B of Michigan’s National Pollutant Discharge Elimination System (NPDES) general permit for stormwater discharges. The SWPPP describes the facility and its operations, identifies potential stormwater discharges at the facility, recommends appropriate best management practices (BMPs) or pollution control measures to reduce the discharge of pollutants in stormwater runoff, and provides for periodic review of the SWPPP. Preventive maintenance involves the regular inspection, testing and cleaning of landfill equipment, ditches and the maintenance facility. Comprehensive inspections of the site BMPs are conducted at least two times per year by the Stormwater Operator. Daily inspections are conducted by the site supervisor to ensure the integrity of the system. Effectiveness of the SWPPP is comprehensively reviewed annually.

While not a regulatory requirement, Kent County felt that the listed goals and objectives outlined in the 1989 Kent County Solid Waste Management Plan required reassessment. In 2009, Kent County voluntarily underwent a year-long planning process to update the County Solid Waste Plan. Kent County’s integrated solid waste management system effectively addresses all aspects of the solid waste generated in the region and corresponds with the State of Michigan goal of utilizing 50% of the solid waste in Kent County.

The WTE Facility operates under one of the toughest environmental Permits in the State. MSW coming to the Facility is screened by County employees before being placed in the waste storage pit. The Facility also has the ability to remove oversized or non-processable waste from the waste storage pit without running it through the combustion units. Air pollution control technology utilized includes computerized combustion controls, acid gas scrubbers, carbon injection for control of mercury emissions, a SNCR system for control of nitrogen oxides and bag houses for control of heavy metals and particulates. The Facility employs a Continuous Emissions Monitoring system to insure proper operation within permit standards. In addition, an independent lab conducts separate stack emission tests every year in accordance with State standards with State Inspectors present. The ash produced at the plant is non-hazardous and takes up only about 10 percent of the space in a landfill of regular waste. The high furnace (1,800 – 2,000 degree F) temperature destroys the organic compounds that can cause ground water contamination in older, compromised landfill sites.
Financial & Business Management

The Department of Public Works operates as an enterprise fund under the rules and regulations of the State of Michigan and the Governmental Accounting Standards Board (GASB). As such, the full accrual method of accounting is employed. This requires being subject to GASB Statement Number 18, Accounting for Municipal Solid Waste Landfill Closure and Postclosure Care Costs. This GASB Statement requires the DPW to recognize the cost of closing and care for a landfill after closure under State regulations over the life of filling the landfill. The DPW’s financial goals are to operate the Solid Waste Operations each year in an efficient and environmentally safe way at calculated rates that cover current costs of the operations and the fair portion of future costs such as those indicated in GASB 18.

The Department does not receive any outside financial assistance such as tax revenues or transfers from the other County Funds. Currently the Solid Waste Operations has two Funds: a Waste-to-Energy Fund and a Solid Waste Fund. Each Fund is designed to be self-sufficient and sets its own rates but does have interacting components with the other Fund.

The Kent County Solid Waste Management Plan is the guiding document that assists the Department of Public Works Directors in planning and implementing programs and services that serve all of Kent County’s 601,000 residents as well as the surrounding region. Long-range goals and objectives outlined in this document help determine expenses that will be incurred from public service programs like the Household Hazardous Waste Program, residential recycling services and other public and environmental safety initiatives. Because the Department of Public Works operates in the public interest, any revenues at South Kent Landfill, the Waste-to-Energy facility, the Recycling and Education Center, and the North Kent Transfer Station are directed toward continuing existing services and expanding to provide new services. These services include household hazardous waste, electronics recycling, solid waste planning, and the management of closed landfills under Kent County’s supervision.

Looking ahead to the future, programs that may be implemented on Kent County’s solid waste system include:

- **Expansion of the ash monofill and landfill.** Scheduled for closure in 2017, the ash monofill is a unique aspect of the South Kent Landfill that has enabled the DPW to track characteristics of leachate coming from ash. Keeping the ash separate from the municipal solid waste has proven to be an important decision for leachate conveyance and expansion of the ash area is scheduled to begin in the next 3–5 years. To enable expansion of the ash monofill and future expansion of the landfill, a partnership with an adjacent county was formed. In this agreement, South Kent Landfill will be expanded across the Kent/Allegan County border. In preparation for this, more than 300 acres have been purchased.

- **Expanded household hazardous waste services.** Since 1985, household hazardous wastes (HHW) have been collected in various ways from residents of Kent County. As awareness of the environment grows, so will participation in programs like the HHW collections. As such, expansion of the program will be necessary and is being planned. A permanent center with open hours will be added to make dropping off hazardous wastes more convenient. An additional appointment-based center will also be added to the South Kent Landfill to enable residents to dispose of all their wastes at the same facility.

- **Expanded recyclables and additional recycling centers.** With its location at the extreme southern end of the county, the availability of recycling services in the area is limited. Adding a recycling drop-off center at South Kent Landfill would encourage participation in recycling activities and also bring attention to the other programs available for resource conservation at the facility. The opening of the new single-stream recycling
facility in 2010, 15 miles north of the landfill, has enabled additional quantities and types of recyclables to be processed.

- **Ensuring environmental services are available to everyone in the region.** South Kent Landfill and the Kent County Department of Public Works offer many services to residents that most private landfills do not provide. Proper disposal of household hazardous waste is a critical service to provide to further protect the landfill and the environment around it. The DPW believes that other landfills should offer these services as well. As written in the 2009 Amended Solid Waste Management Plan, any new solid waste facility in Kent County is required to make household hazardous waste disposal, electronics recycling, and residential recycling services available to its customers.

- **Utilize excess property for green energy.**
  Fortunate to have room to expand and a potential energy source, plans to incorporate 24 acres of greenhouses across the street from the landfill are possible in the future. Waste heat generated from the gas-to-energy operations would be harnessed to heat greenhouses on excess property surrounding the landfill.

- **Increase usage of recycled materials for landfill projects.** South Kent Landfill will continue to utilize recycled products in construction and improvement projects. An upcoming project will use recycled asphalt shingles to pave access roads around the landfill.

No other county or municipality in the state of Michigan has comparable comprehensive and integrated solid waste programs and facilities. Kent County has the only municipal single-stream residential recycling facility in the state. Likewise, Kent County is one of only three such solid waste processing facilities.

### Employee Relations & Training

*The mission of Kent County government is to be an effective and efficient steward in delivering quality services for our diverse community.* Our priority is to provide mandated services, which may be enhanced and supplemented by additional services to improve the quality of life for all our citizens within the constraints of sound fiscal policy.

At Kent County, providing quality service to both our internal and external customers is our number one priority. The Employee Recognition for Quality Service program is designed to identify and recognize those employees who have provided outstanding quality customer service to Kent County’s internal and/or external customers/clients. In order to be recognized, the employee must have provided outstanding service through his or her work and must have demonstrated a positive and supportive disposition.

Nominations may be submitted by anyone, including members of the public, co-workers, supervisors, administrators, elected officials, etc. During each quarter, a designated selection committee will review all of the nominations and select the Quality Service Employee of the Quarter. All Kent County employees are eligible to be nominated, excluding elected officials and appointed individuals.

The Department of Public Works relies heavily on the quality of the employees and managers that operate the facilities. The DPW offers competitive wages with a comprehensive benefit program. Benefits include health,
dental, vision and prescription coverage with an employee contribution to the costs. The employees also contribute to a defined contribution pension plan and enjoy a good vacation plan based on seniority. Professional development opportunities are available through tuition reimbursement and attendance at various seminars. This helps explain why the DPW enjoys the benefits of many long-term employees.

The DPW is very safety conscious and includes continuous education in CPR, forklift certification, first aid training, lockout/tagout, confined space, fire extinguisher training among others. All employees go through extensive health and safety training classes based on OSHA requirements and job performance safety standards. A combination of hands-on, classroom, video and written training sessions assure that employees are fully trained for their respective position. Many employees are also cross-trained to ensure that a knowledgeable person is available at each position in case of an emergency. Employees are also encouraged to advance their education through memberships in regional and national organizations like SWANA, NAHMMA, West Michigan Air and Waste Management Association, the National Recycling Coalition, and the Michigan Recycling Coalition. The Department actively promotes diversity in the workplace through participation in Kent County sponsored activities, like the popular “Brown Bag Luncheon” series, sponsored by the Kent County Cultural Insight Council. Recently, the DPW began producing its own monthly informational newsletter to expand communication among the divisions and employees.

Continuing education is important for staff to remain informed about new technologies and trends in the waste industry. Conferences and committees that staff participate in include Michigan Recycling Coalition; Resource Recycling Conference; Local Emergency Planning Committee; Lower Grand River Organization of Watersheds Stormwater Committee; Solid Waste Association of North America; North American Hazardous Materials Management Association; and Resource Recovery Educators of Michigan.

Environmental Industry Associations recognizes and honors waste industry drivers nationally for safety, quality and service. Jeff Velthouse, a roll-off truck driver at South Kent Landfill and the Materials Recovery Facility, was a semi-finalist for the 2007 Driver of the Year award. Jeff has been employed with the DPW for twelve years and has a perfect driving record.

Sandy Cihak, a 20 year employee of the DPW, was given a 2009 Essential Service Award from the Economic Club of Grand Rapids. Not only does Sandy perform all functions of her job as a scale house attendant, but she “has the respect of the drivers”.

FIRE EXTINGUISHER TRAINING
Change Management

An effective method in which the Department measures the effectiveness and costs associated with programs is completion once a year of the County’s Performance Goals and Objectives with resulting Measurements Program. Each year goals and objectives are developed to measure the results of the activities of the Department. Measurements can be a wide range such as tons, persons served, costs, etc. The results of comparing year to year can show the participation and effectiveness of resources allocated to such activities. The following table shows a sample of the activities and their measurements.

<table>
<thead>
<tr>
<th>Facility</th>
<th>2008 Actual</th>
<th>2009 Actual</th>
<th>2010 Actual</th>
<th>2011 Actual</th>
<th>2012 Projected</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recycling Facility</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tons Marketed</td>
<td>12,814</td>
<td>12,475</td>
<td>12,909</td>
<td>22,732</td>
<td>25,000</td>
</tr>
<tr>
<td>Net cost/ton</td>
<td>$75.90</td>
<td>$73.48</td>
<td>$90.22</td>
<td>$105.34</td>
<td>$105.00</td>
</tr>
<tr>
<td><strong>South Kent Landfill</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tons solid waste landfilled</td>
<td>190,545</td>
<td>182,602</td>
<td>251,107</td>
<td>227,437</td>
<td>230,000</td>
</tr>
<tr>
<td>Tons ash landfilled</td>
<td>42,118</td>
<td>42,460</td>
<td>42,029</td>
<td>41,236</td>
<td>42,000</td>
</tr>
<tr>
<td>Cost/ton for processing</td>
<td>$19.25</td>
<td>$18.94</td>
<td>$14.81</td>
<td>$22.71</td>
<td>$22.00</td>
</tr>
<tr>
<td><strong>North Kent Transfer Station</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tons solid waste processed</td>
<td>57,800</td>
<td>57,383</td>
<td>59,150</td>
<td>60,228</td>
<td>60,000</td>
</tr>
<tr>
<td>Cost/ton for processing</td>
<td>$23.84</td>
<td>$24.00</td>
<td>$22.18</td>
<td>$25.84</td>
<td>$25.00</td>
</tr>
<tr>
<td><strong>Waste-to-Energy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tons solid waste processed</td>
<td>187,135</td>
<td>186,290</td>
<td>188,000</td>
<td>185,995</td>
<td>187,000</td>
</tr>
<tr>
<td>Tons ferrous metal recovered</td>
<td>4,253</td>
<td>2,942</td>
<td>3,900</td>
<td>3,686</td>
<td>4,000</td>
</tr>
<tr>
<td>Tires recovered</td>
<td>2,336</td>
<td>1,196</td>
<td>1,100</td>
<td>933</td>
<td>200*</td>
</tr>
<tr>
<td>Electricity sold (Mwh)</td>
<td>102,168</td>
<td>100,195</td>
<td>104,000</td>
<td>101,773</td>
<td>98,769</td>
</tr>
</tbody>
</table>

* Fewer tires are expected in 2012 due to a change in tipping floor procedures and a reduction in the number of tires coming to the WTE
Community Relations:

The Resource Recovery Program (RRP) forms an integral part of Kent County’s Solid Waste Management Plan. The goal of the RRP is to be the public face of all DPW programs and provide outreach and education to the general public. Activities performed by Resource Recovery staff include presentations at schools or group meetings; tours of the Recycling & Education Center and the South Kent Landfill; staffing the Household Hazardous Waste Program and working with the West Michigan Take Back Meds program.

Tours & Presentations

The Resource Recovery staff provides tours at the Recycling and Education Center and the South Kent Landfill. Recycling tours are approximately one hour in length and include a classroom discussion about recycling as well as a facility overview on the observation deck overlooking the functioning equipment. The South Kent Landfill is the only solid waste landfill operating in Kent County. Tours are up to one hour in length and provide an in-bus talking tour of the entire landfill area, including a trip up to the top to see the big machines in action (weather permitting) and all groups weigh in at the scale house. A short discussion on the new methane gas recovery system is included. Groups that generally participate in these free tours include: schools, senior citizen groups and other local organizations. Resource recovery staff also provides the following free presentations to schools at different grade levels.

- “KC the Recycling Raccoon,” Grades: K-4, 45 minutes;
- “Packing a Waste Free Lunch”, Grades: 3+, 45 minutes;
- “Watch Your Waste!” Grades: 2-8, 45 minutes;
- “Paper or Plastic? The Great Debate” Grades: 9-12, 45 minutes.

Community groups and schools can sign up for a free tour or presentation by calling or filling out a form on the departmental website. Staff conducted over 150 tours at the Recycling & Education Center and more than 30 at the South Kent Landfill, plus an additional 20 presentations at various groups and schools. The educational programs reached 7,500 people in 2011.

The Resource Recovery Program maintains two educational videos of our new single stream recycling system. One video was made by an intern from a local university and is posted on our website. The other video was made with a local TV personality, Maranda – whose programming focus is on kids and families in West Michigan. Maranda’s video excites kids to learn more about the process of recycling.

Eco-Kits

Eco-Kits are generally loaned out for 1-2 week periods to teachers or other community groups interested in a hands-on reuse activity. The kits provide a hands-on project for teachers to use with their students in addressing solid waste issues. These kits emphasize the concepts of reuse and reducing waste through creative means.

- Grades 1+: Crayon Recycling Kit,
- Grades 2+: Paper-making Kit,
- Grades 3+: Steel Can Lantern Kit.
Special Events

The Resource Recovery Program also provides and staffs an information booth at annual local events such as the West Michigan Home and Garden Show, John Ball Park Zoo’s Party for the Planet, and summer Maranda’s Park Parties for children. The addition of the Recycling and Education Center also provides more opportunities to sponsor events including an expo for teachers that was held in collaboration with other local organizations to provide information to teachers on various community organizations and what programs they had available for school groups. Each spring a special 2-day event for Boy Scouts and Girl Scouts is held at the Recycling & Education Center in collaboration with other community organizations.

School Recycling Challenge

Each year, the Kent County Board of Public Works invites all Kindergarten through Grade 5 schools in the Kent Intermediate School District to participate in the Earth Day Recycle Challenge to promote awareness for Earth Day (celebrated April 22nd each year) and to encourage recycling at an early age. Schools are challenged to collect a specific item for recycling, and awards are given out to the top performing schools based on a per student average of the collected item. The 2012 focus material is paperboard. With more than 12,000 students participating, the goal is to collect at least 5 pieces of paperboard per student. Past focus materials have included plastic grocery bags, CD’s & DVD’s, plastic milk jugs, and telephone books. The top-achieving schools win a park bench made of recycled plastic; each student is rewarded for their participation with a small token of appreciation and each school receives a certificate of appreciation.

Event Recycling Bins

Special-use recycling containers are available for rent to organizations and residents in the Kent County area. The bins have been used for major events in the area, like the Grand Rapids Fifth Third River Bank Run and Festival of the Arts, as well as small events like graduation parties and family reunions. These bins help local event organizers and residents provide recycling options to their guests. Each recycling bin comes with a metal frame & plastic lid labeled “Plastic Bottles/Aluminum Cans”. A $10 per container refundable deposit is due when picking up the containers. The deposit will be returned when the containers are returned in the same condition as they were loaned.

Website & Facebook Page

The DPW invested in the development of a website, www.recycleKent.org, independent of the County website, which is more colorful and eye-catching than was allowed through the traditional Kent County website. This gives more options to provide interactive content to the community and will allow us to expand information and contact options. Facebook pages for the DPW, RecycleKent, and West Michigan Take Back Meds were developed and is an additional resource for instant information on upcoming events.
Advertising & Outreach material

A variety of printed materials are distributed to residents of Kent County at special events and through media outlets. A printed “Household Waste & Recycling Guide” is distributed annually to nearly 150,000 people through one of Michigan’s largest newspapers and a small local newspaper, and more than 10,000 are delivered to municipalities to distribute around the county. The Guide assists people in finding proper outlets for their wastes and reminds them that the DPW facilities are nearby to manage many of their disposable goods. Print advertising in local newspapers is also utilized to promote household hazardous waste collections.

Quarterly electronic newsletters are e-mailed to subscribers interested in DPW updates and general waste reduction resources.

WOOD-1300, the oldest radio station in West Michigan and one of the oldest in the world, hosts several Saturday morning shows that reach the target audience for DPW program outreach efforts. The shows are titled Auto Talk (ads focus on properly disposing of motor oil, antifreeze and other auto fluids), Home Improvement Show (ads focus on properly disposing of excess home improvement chemical products) and Flowerland Garden Show (ads focus on properly disposing of yard and garden chemicals).

In March 2011, Citadel Broadcasting began a month-long radio campaign to encourage residents to recycle properly. The Random Recycling Rewards campaign ran through Earth Day. Residents with curbside recycling could register their address on the company’s website, and, each day, a radio personality drew an address and visited the home on their curbside recycling pick-up day. If the resident was recycling the correct types of items properly, they received a gift bag of prizes and were registered for the grand prize. Prize sponsors include the City of Grand Rapids; Bata Plastics, Inc.; Cascade Engineering; Padnos; Amway; Buffalo Wild Wings; Celebration Cinemas; Fifth Third Bank; Cole’s Garlic Bread; the West Michigan White Caps; the Grand Rapids Griffins; and Kent County Department of Public Works.
South Kent Landfill

1. Entrance
2. Scalehouse
3. Customer Convenience Center
4. Operations and Maintenance
5. Methane To Electricity Facility
6. Commercial Container Storage
7. Active Type II Landfill
8. Active Ash Monofill
9. Closed Ash Monofill
10. Landfill Excavation (Future)
Kent County Department of Public Works

SWANA 2012 Integrated Solid Waste Management System Excellence Award Application

Waste-to-Energy Facility

1. Tipping Floor
2. Refuse Holding Pit
3. Grapple Feed Chute
4. Feed Chute
5. MARTIN Stoker Grate
6. Combustion Air Fan
7. MARTIN Ash Discharger
8. Combustion Chamber
9. Radiant Zone (furnace)
10. Convection Zone
11. Superheater
12. Economizer
13. Dry Gas Scrubber
14. Baghouse
15. Fly Ash Handling System
16. Induced Draft Air Fan
17. Stack
Public Education Materials
Special Events

The Kent County Waste-To-Energy (WTE) facility celebrated 20 years of service in February 2010. Since its opening, over 9,251,500 tons of waste have been processed, with over 100,000 tons of ferrous metal recycled. Waste ash sent to the landfill from the WTE is reduced 96% by volume and 77% by weight. This has saved over 4760 acre feet of landfill space, essentially using another landfill from opening in Kent County, and produced about 2 billion kWh of electricity enough to power the cities of Walker & Comstock. Energy produced from burning municipal solid waste is renewable and achieves the reduction of greenhouse gas emissions. For 20 years, the WTE has achieved 100% compliance with one of the toughest environmental permits in the State of Michigan. With the end of the debt on the facility, waste disposal fees in 2011 will be reduced by 33%.

Please join us as we celebrate this milestone!

Wednesday, November 10, 2010
950 Market SW
Grand Rapids, MI 49503

10:00 am Opening Remarks
10:20 am Mortgage Burning Ceremony

Tours & light refreshments will follow.

You are cordially invited to the Dedication of the new
Kent County Recycling & Education Center

Friday, August 20, 2010
977 Wealthy Street SE
Grand Rapids, MI 49504

11:00 am Dedication Ceremony
1:30 pm - 5:00 pm Open House

Tour & Light Lunch

The Town of a reply is requested by August 1, 2010
www.recycleKent.org/RSVP or 616-338-3644