2013 LANDFILL MANAGEMENT EXCELLENCE AWARD

RELEASE FORM

Release Statement: I certify that the information provided in this 2013 Excellence Award application is accurate and correct to the best of my knowledge. I understand that nominations become the property of SWANA. SWANA reserves the right to publish any or all of my application. My signature gives SWANA the right to reprint or make available for purchase any portion of this application.

Printed Name of Representative: Steve Tomczewski

Organization Name: Maryland Environmental Service

Signature:

Date: May 22, 2013
# Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive Summary</td>
<td>2</td>
</tr>
<tr>
<td>Section 1. General Information</td>
<td>2</td>
</tr>
<tr>
<td>Section 2. Siting, Design and Construction</td>
<td>3</td>
</tr>
<tr>
<td>Section 3. Environmental Controls and Monitoring</td>
<td>8</td>
</tr>
<tr>
<td>Section 4. Regulatory Compliance</td>
<td>12</td>
</tr>
<tr>
<td>Section 5. Planning, Operations, and Financial Management</td>
<td>15</td>
</tr>
<tr>
<td>Section 6. Equipment/Systems and Technologies</td>
<td>17</td>
</tr>
<tr>
<td>Section 7. Public Acceptance, Appearance and Aesthetics</td>
<td>19</td>
</tr>
<tr>
<td>Section 8. Innovation and Creativity</td>
<td>21</td>
</tr>
<tr>
<td>Site Plan</td>
<td>22</td>
</tr>
<tr>
<td>Caroline County Letter of Support</td>
<td>23</td>
</tr>
<tr>
<td>Revenue Bond</td>
<td>25</td>
</tr>
</tbody>
</table>

**2013 SWANA EXCELLENCE AWARD APPLICATION**

MIDSHORE LANDFILL I & II
EXECUTIVE SUMMARY

The Midshore II Landfill represents the second 20-year phase of an 80-year solution to the disposal needs of the Midshore Region. Maryland Environmental Service (MES) owns the facility, and is responsible for all permitting, design, construction, operational and post closure requirements for this site, plus the closed landfill in Talbot County, and future sites scheduled for Queen Anne’s and Kent Counties.

MES is an independent, self-supporting agency, which combines the public sector’s commitment to environmental protection with the private sector’s flexibility and responsiveness.

The Landfill Management Program features:

- Landfill design exceeding regulatory standards.
- Funding and designing an innovative capping system for the closed Midshore I Landfill.
- Funding for regional recycling programs thru a tip fee surcharge, resulting in $0 cost to the Counties.
- Continuing pro-active community relations programs which allowed for a smooth permitting process and start-up, while simultaneously operating two landfills with no community opposition.

SECTION 1
GENERAL INFORMATION

Located on the upper Eastern Shore of Maryland’s Chesapeake Bay, the Midshore Regional Solid Waste System consists of four planned facilities that will serve the municipal solid waste needs of Talbot, Caroline, Kent and Queen Anne’s Counties. This unique partnership is the only regional solid waste management agreement in Maryland. To date, two of the four landfills have been constructed. Both of the existing landfills are owned and operated by Maryland Environmental Service (MES), an independent state agency created to protect the state’s air, land and water resources.

MES operates each of the Midshore System’s landfills as a comprehensive, single-location facility to serve all of the waste disposal needs of the four-county service area. Midshore I, located in Talbot County, was the first landfill built, operating for a successful 20-year period beginning in 1991 and ending on December 31, 2010. The Midshore II Regional Solid Waste Facility, in Caroline County, actually started receiving soft trash (“fluff layer”) on October 11, 2010, and began full-scale commercial operation in January, 2011. The site will continue to operate for the next 18 years. The average daily solid waste volume received at MS II is 400 tons.
Since the Midshore I Landfill is in interim status, the bulk of this application revolves around Midshore II, however, both landfills are a continuum and where appropriate we have referenced Midshore I.

The Midshore I site has unused airspace remaining. As a result, MES has elected to cap the landfill with an exposed geomembrane capping system in the event that this remaining space is ever needed. The design and advantages to this cap are explained later in this application. The landfill cells have been covered with two feet of soil, vegetated, and graded for proper stormwater flow. All landfill gas extraction and subsequent flaring, monitoring of landfill gas and groundwater, and the monitoring of potable wells in the area will be maintained. Leachate will continue to be collected and transferred to the neighboring wastewater utility.

In addition, MES operates a solid waste transfer facility and Homeowner Drop-Off Center for the citizens of Talbot County at the Midshore I site. All waste from these two operations is transferred to Midshore II, and all source-separated recyclables are transported to processing facilities where they will be recycled.

SECTION 2
SITING, DESIGN AND CONSTRUCTION

Siting and Service Area

Midshore II is located near the town of Ridgely, in Caroline County, Maryland. Only solid waste generated within the geographic boundaries of the Midshore Counties is accepted at the landfill. This site services approximately 140,000 residents with an annual waste generation estimated to be 122,000 tons. The landfill is designed to provide 8.2 million cubic yards of airspace with approximately 6.6 million cubic yards available for waste placement. This site also has a contract life of 20 years, as did Midshore I.

Site Soils and Geology

The soils and hydrogeology of the site are suitable for waste management activities. Topography at the site is relatively flat, generally ranging from about 24 to 52 ft above mean sea level, typical of Maryland’s Eastern Shore and the surrounding area of Caroline County. The site is situated in the Atlantic Coastal Plain Physiographic Province, a wedge-shaped mass of unconsolidated sedimentary deposits overlying older hard crystalline rock of Pre-Cambrian or early Paleozoic age.

The site is immediately underlain by sandy and silty soils, which are then underlain by a continuous low-permeability clay layer. The soils are reasonably homogenous and uniform, which facilitates groundwater monitoring beneath the landfill and in the surrounding area. The uppermost soils at the Midshore II facility are part of the Columbia Formation. At the site, the Columbia Formation is relatively thin (less than approximately 80 feet thick). Although used as a potable water supply by several residences in the area, the Columbia Formation is not widely used for that purpose because local health department regulations stipulate that all new or replacement potable wells be installed in the protected and relatively accessible deeper, confined aquifer.

The location of the Midshore II facility in relation to its customer base, combined with the favorable soils and hydrogeology of the site, makes it an excellent location for a landfill. In addition, the location
is ideal for the related waste management programs at the site, including recycling, operation of a citizen drop-off area and leaf/yard trim processing.

Site Preparation and Design

The Midshore II facility site was designed and constructed to protect the environment and minimize the cost of development and maintenance. It was also designed to provide a comprehensive, integrated solution to the waste management needs of the four-county service area. In the following sections, the features of the landfill facility are described, with an emphasis on their merits in siting and environmental protection.

Protecting the Environment - Landfill Facility Features

Landfill Liner System

The landfill was designed and constructed to exceed the requirements of Subtitle D of the Resource Conservation and Recovery Act (RCRA) and the Code of Maryland Regulations (COMAR). The design includes a double synthetic membrane liner system with a leak detection layer.

In order to maximize the volume of airspace provided by the landfill, the liner system was designed with a two-percent slope towards the main header leachate collection pipes and with a one-percent slope in the header pipes to move the collected liquids out of the cell. Leachate flows by gravity, eliminating the need for a leachate collection sump within the cell. Such a sump would require raising the base grades of the landfill to provide the required 1.5-foot separation distance between groundwater and the base of the liner.

The relatively shallow design grades for the landfill were demonstrated to be sufficient to maintain less than 12 inches of liquid head on any part of the liner system throughout the active and post-closure life of the landfill. This was to ensure that one of the two liner systems met the requirements of Subtitle D in order to accommodate leachate recirculation in the future, if desired, and approved by the regulatory agencies.

Leachate Management System

The leachate collection, removal, transmission, and storage system was designed to be protective of the environment while minimizing operational effort and cost. The system includes:

- perforated pipes within the limits of the landfill to collect leachate and transport it to low points within each cell;
- pipe penetrations through the liner system and the cell perimeter berm of the landfill to allow leachate to flow via gravity to collection points outside each cell;
• leachate monitoring vaults where flow in both the primary leachate collection system and the secondary leachate leak detection system can be measured, sampled and recorded;
• double-walled leachate transmission header, which transports leachate from all five cells via gravity flow to a central lift station;
• 500,000 gallon above ground leachate storage tank with secondary containment; and
• truck load-out station where leachate from the storage tank is pumped into tanker trucks for transport to a permitted wastewater treatment facility.

The only pumping required at the facility is from the central lift station to the leachate storage tank, and then from the leachate storage tank to tanker trucks. The pumps installed at each of these locations operate in lead/lag mode or each independently, as required. In addition, each of the pumps is the same make and model, thereby minimizing the need for spare parts and the likelihood of significant downtime.

One significant advantage of the gravity flow leachate system is that, in the event of a power failure, there is a substantial amount of leachate storage capacity in the lift station and leachate transmission pipe to prevent an overflow of the system or backup of leachate into the cell. Lastly, leachate can be pumped using a generator or vacuum truck directly from the lift station in the event of an extended power outage.

Closure System

The design of the closure system for the facility is focused on long-term protection of the environment by containing waste while collecting leachate and landfill gas. The design also focuses on minimizing the need for future maintenance of the facility. The goals were met by designing a stable cover system that minimized the potential for erosion and excessive differential settlement. The environmental protection goal was met by ensuring that the leachate system will continue to operate throughout the post closure life of the facility and that connections to gas wells could accommodate the amount of expected settlement.

Other Waste Management Facility Features

Entrance Facility

The Midshore II entrance facility includes a scale house with both inbound and outbound scales and an administration/maintenance building. The entrance is designed to provide ¼ mile of truck queuing space prior to the scale, a truck inspection pull off area, efficiently process vehicles, accurately document
the source and quantity of waste for billing purposes, and quickly route trucks to the working face or the yard waste handling area.

The scale facility has state-of-the-art, hydraulic load cell scales that require minimal maintenance, as well as above ground scale platforms. The facility has both inbound and outbound scales that are controlled by separate weight monitors, so either side can be used if one scale is nonfunctional for any reason. A back-up diesel generator system is available to provide electrical power to the scale and scale computer system in the event of an interruption in electricity.

The facility uses state-of-the-art computer technology. The system has a direct link to the MES headquarters administrative office, which tracks the daily tonnage of: waste received, recyclables received, and recycled commodities sent out to the end processor. MES provides accounts payable and accounts receivable processing of all scale transactions at the Midshore I and II landfills. A separate, interactive computer system in the facility administration building allows the landfill management to monitor landfill functions such as leachate flows, pump operation, and status of all alarms.

Residents’ Drop-Off Center

A Residential Drop-Off Center (RDOC) is located adjacent to the landfill, and is operated by MES employees. Approximately 300 customers utilize the site on weekdays, and this number jumps to 400 customers a day on the weekends. All local residents are able to access the facility at no cost. Designed to enhance the customer experience and improve safety, the RDOC has a separate entrance and exit for local citizens off of Holly Road, isolating them from landfill truck traffic while excluding small vehicle traffic from the working face of the landfill.

The RDOC (shown to the right) has containers for glass, cardboard, mixed paper, metals, brush, yard waste, waste oil, anti-freeze, electronics, batteries, and residential municipal solid waste.
The containers that accept municipal solid waste for disposal are equipped with compactors to minimize the frequency of container removal. Employees transport the compacted waste via roll off truck to the landfill for disposal.

In addition, MES sponsors household hazardous waste collection events, scrap tire amnesty day collection events, and electronics recycling collection events on a regular basis, ensuring these materials are handled separately and not disposed of in the landfill.

By creating a safe, convenient and pleasant atmosphere for local citizens at the RDOC, MES builds community goodwill, while helping the Midshore Counties meet their recycling goals. The collected recyclable materials are handled by the Midshore Recycling Program collection system prior to consolidation with other materials collected from the outlying igloo-served recycling sites and ultimate shipment to processing centers.

Yard Waste Management and White Goods Recycling Area

Through careful separation of yard waste material from the incoming general waste stream, MES is able to conserve landfill capacity by diverting recyclable materials. The yard waste and white goods management area is located between the landfill and the RDOC. In 2012, MES received and processed 5,000 tons of yard waste and roughly 100 tons of scrap metal white goods. The yard waste is ground into mulch utilizing MES’s Mobile Yardwaste tub grinder and is used to stabilize temporary landfill roadways, stabilize slopes and prevent erosion during non-seeding seasons. MES also provides Mobile Yardwaste grinding service to all other Midshore Counties as directed by the Midshore Recycling Program manager.

Related Waste Management Activities

There are additional programs MES conducts to enhance the environmental performance of the landfill, conserve its disposal capacity, and benefit the community. These programs include on-site and off-site borrow soil management as well as off-site road improvements.

On-Site Borrow Area

MES operates an on-site borrow area at the Midshore II facility to provide borrow soil for landfill operations. The location of the borrow areas is immediately adjacent to, and on both sides of, the main entrance road. The borrow area provides daily cover, intermediate cover and final cover, as well as soils for planned future landfill cell construction. It is estimated the amount of soil needed through closure of the landfill is approximately 2 million cubic yards. The on-site borrow area encompasses about 42 acres of the site and is estimated to have a total useable capacity of up to 566,000 cubic yards. MES does not propose to excavate below the elevation of the water table. The on-site borrow area will provide the soil needed for construction and operation of the facility for at least the next five years.

Adjacent Off-Site Borrow Area

To meet soil needs through final closure, MES will also operate an off-site borrow area on the Ackerman farm property adjacent to Midshore II on Holly Road. This 60-acre borrow area covers an estimated
useable capacity of 1.7 million cubic yards above the water table elevation. Operation of the off-site borrow area will require obtaining a Surface Mining Permit from the State of Maryland. MES has begun this application process.

The off-site borrow area is designed to ensure the distance to transport soil on public roads is less than 200 feet, saving an estimated 4,000 metric tons of greenhouse gas emissions that otherwise would have been emitted had MES needed to transport soil from a nearby quarry. In addition, MES will save an estimate $10 million dollars in borrow costs over the 20 year life of the site. This will help to mitigate any future tip fee adjustments at the landfill.

Off-Site Road Improvements-Rubber Modified Asphalt

As part of the development of the Midshore II Landfill, MES designed and constructed nearly a mile of off-site road improvements on River Road - the main access road off of MD 480. MES replaced six failing culvert pipes, widened the roadway by two feet, and added a turn lane into the entrance of the landfill. MES received a grant from the Maryland Department of the Environment's Scrap Tire Program to construct the top 2” of pavement using Rubber Modified Asphalt (RMA), recycling 18,000 pounds of scrap tire material to make the RMA. The advantages of utilizing a RMA surface include: road noise reduction, increased anticipated life of the wear course on River Road and increased truck fuel efficiencies.

Master Plan for Facility Development and Post-Closure Use

The Midshore Regional Solid Waste Management Plan was developed in the mid to late 1980’s. The initial agreement included Talbot, Queen Anne’s and Caroline Counties. Under the provisions of the agreement, each county agreed to host a solid waste management facility for a period of 20 years; subsequently, Kent County agreed to join the Midshore partnership. Thus, the agreement serves as the framework for providing an 80-year solution for managing municipal solid waste within the region.

The Midshore II facility is designed to allow for bioreactor landfill technology. At the present time, MES has not sought a permit modification to implement this type of operation, but reserves the right to seek a permit amendment in the future if conditions warrant. As noted above, the landfill gas collection system is also designed to allow expansion as future cells of the landfill are constructed and filled. MES also intends to develop a landfill gas-to-energy facility when gas flows are sufficient to support such an endeavor. The future use of the Midshore I and II landfill area, is open space with the borrow areas becoming lakes.

SECTION 3  
ENVIRONMENTAL CONTROLS and MONITORING

Overview

The Maryland Department of the Environment issues Refuse Disposal Permits for sanitary landfills and other waste disposal facilities under the authority of the Environment Article, §9-204 of the Annotated
Code of Maryland, and regulations at COMAR 26.04.07. MES is committed to environmental stewardship, responsibility, and accountability, and in the spirit of this commitment MES designed and constructed the Midshore I and II landfills to exceed the requirements of Subtitle D of the Resource Conservation and Recovery Act (RCRA) and the Code of Maryland Regulations (COMAR).

Groundwater Protection

The unique hydrogeology and sensitivity of water sources in the Midshore area demand stringent groundwater protection. The Midshore II landfill liner system was designed and constructed to exceed both State and Federal requirements. The design includes a double synthetic membrane liner system with a leak detection layer. The components of the liner system, from top to bottom, are as follows:

- 12-inch protective drainage layer ($k \geq 1 \times 10^{-3}$ cm/s);
- Geocomposite drainage layer;
- 60-mil HDPE geomembrane;
- Geocomposite drainage layer (leak detection layer);
- 60-mil HDPE geomembrane; and
- 24-inch select clay liner ($k \leq 1 \times 10^{-7}$ cm/s).

Landfill Gas Management System

A comprehensive active landfill gas extraction and management system was designed for the facility as part of the permitting phase. At this time, the Midshore II facility is not subject to the requirements of the New Source Performance Standards of the Clean Air Act; however, the facility will be subject to these requirements as disposal tons increase beyond the threshold quantity.

The gas management system was designed with a combination of horizontal and vertical extraction wells to allow ease of landfill filling operations even during active gas extraction while also ensuring adequate gas extraction when the landfill reaches final grades. The system is also designed to allow expansion as future cells of the landfill are constructed and filled. MES intends to explore options for development of a landfill gas-to-energy facility when gas flows are sufficient to support such an endeavor.

Leachate Management System

The state-of-the-art leachate collection, transmission, and storage system conveys leachate through a double-walled leachate transmission header via gravity to a central lift station, and then to a 500,000 gallon above ground leachate storage tank with secondary containment. To date, the Midshore
II Facility has generated approximately 338,000 gallons of leachate. Although MES is currently considering several long-term on-site treatment options for the management of leachate, the leachate generated at the facility is currently transported to the Midshore I Landfill, where it is discharged to an adjacent POTW for treatment.

The only pumping required at the facility is from the lift station to the leachate storage tank and from the leachate storage tank to tanker trucks. All other leachate conveyance occurs via gravity, which minimizes the need for electrical power. Another significant advantage of the gravity flow leachate system is that, in the event a power failure disables the pumps, there is a substantial amount of leachate storage capacity in the lift station and leachate transmission pipe to prevent an overflow of the system. To date, the facility has no records of leachate spills, leaks, or discharges to the environment.

Stormwater Management

The design of the stormwater management for the Midshore II landfill is to address conveyance and stormwater quality and quantity management. The features of the site stormwater management plan include:

- Perimeter channel, cover terraces, downchutes, inlets and culverts to convey surface water runoff;
- Wet detention stormwater management pond and an entrance facility wet detention stormwater management pond to collect and detain surface-water runoff from the two-year frequency storm event, collect and retain the one-year water quality volume, and safely pass the runoff from the 100-year frequency storm event prior to discharging to an onsite natural stream channel.

Stormwater runoff from the Midshore II landfill cover is designed to be conveyed off site using a combination of designed benches or cover terraces, downchutes and a perimeter channel. The perimeter channel along the landfill access road and cover terraces are spaced such that the vertical drop of overland flow of water is not generally greater than 50 feet. These drainage features will slope longitudinally at three percent. Water will be conveyed from the cover terraces via downchutes to the landfill perimeter channel to Stormwater Detention Pond #1. This pond discharges to the Chicken Bridge Branch stream.

Stormwater runoff from the entrance road and entrance facility area is collected in a series of drop inlets and transferred to Stormwater Detention Pond #2, and then discharged to the Chicken Bridge Branch stream located to the southwest of the facility.

Waste Acceptance and Screening

The Midshore II landfill maintains a waste acceptance and screening program to prevent the disposal of prohibited waste. This program includes:

- Site access and control;
- Initial screening of the waste;
- Random load checks; and
- Training for facility personnel.
The landfill’s waste acceptance and screening program begins with knowledge of the commercial and industrial base of the service area. The four-county service area is largely agricultural and residential. The inbound volume is primarily household waste. Site access and control is designed to control public access and prevent unauthorized entry to the site. When a truck carrying waste enters the site it must first stop at the scale house. The attendant performs a visual inspection and records the type of waste and the hauler. Based on this initial screening, the Weighmaster can reject a suspicious load or pull it aside for a more thorough inspection. The facility performs a minimum of four daily random load inspections. The name of the hauler, truck number and results of the inspections are recorded on an inspection form. This form also contains a list of prohibited waste, which is also posted on sign at the scale entrance. Facility personnel are trained to recognize prohibited waste and key personnel have received 40 hours of HAZWOPER training.

Environmental Monitoring

The Midshore II landfill monitoring program is both comprehensive and protective of human health and the environment. MES has a staff of environmental professionals at the Millersville, MD headquarters, whom provide sampling and reporting service for the landfill.

Groundwater Monitoring

The Maryland Department of the Environment applies specific requirements for the evaluation of groundwater monitoring data at landfill facilities as specified in the Code of Maryland Regulations (COMAR). The existing groundwater monitoring well network at the facility consists of thirteen monitoring wells. There are eight groundwater monitoring wells screened in the upper, surficial aquifer. There are five groundwater monitoring wells screened in the lower, confined aquifer.

Landfill Gas Monitoring

Federal and State regulations specify the requirements for landfill gas monitoring at landfill facilities. Landfill gas levels must be below 100% of the Lower Explosive Limit (LEL) at the facility property boundary and below 25% of the LEL in any structure. The existing landfill gas monitoring network at the facility consists of eleven monitoring probes, approximately thirteen feet below ground surface. The probes are screened in the vadose zone, above the surficial groundwater table.
Voluntary Residential Potable Well Monitoring Program

As an added level of protection for families living near the landfill, MES invited homeowners within one-quarter mile of the Midshore II to participate in a voluntary Domestic Water Supply Sampling Program. MES analyzes the samples for the same analytical suite as that required under the Detection Monitoring Program for the on-site groundwater monitoring wells.

SECTION 4
REGULATORY COMPLIANCE

Local Solid Waste Management Plan

The Midshore II Landfill facility is the only regional landfill supporting the integrated solid waste management systems of Caroline, Kent, Queen Anne’s and Talbot Counties. The facility is responsible for funding and supporting the region’s recycling and disposal operations, and is active in promoting reuse (composting, scrap metal and used tire management and recycling program, etc.). Based on these activities, the facility is the fundamental provider of waste management services in the four-county region.

The tip fee charged at Midshore Landfill includes $5.00 that is allocated to fund the MES-managed Midshore Regional Recycling Program. This fund currently exceeds a half million dollars per year and represents well over 50% of four counties’ expenditure towards their recycling efforts. Additionally, Midshore I Landfill staff support the collection, storage, material segregation, and transportation efforts through a recycling materials consolidation point operated at the closed Midshore I landfill in Talbot County.

Home Owners Drop-Off and Transfer Facility

In addition to the recycling consolidation activities, MES operates a Home Owners Drop-Off Convenience and Recycling Center and a Transfer Station, under terms of an Inter Governmental Agreement with Talbot County. This activity significantly reduces truck traffic going to Midshore II by allowing waste to be consolidated and transferred via walking-floor trailers into the site several times per day. This provides quicker turn around and better service to Talbot County and the municipalities using the facility, and reduces the carbon footprint of the overall waste collection initiative.

Environmental Compliance

Although the Midshore II Facility has only been in operation for two years it is part of the overall Midshore solid waste management plan that has been administered by MES since 1991. The environmental compliance record for both Midshore I & II is included as part of this application. Since 1991, both landfills have operated in full compliance with their operations permit and have never been the subject of a consent order or an issue of significant non-compliance. During the course of routine inspections by MDE or internal audit staff, any issues noted have been immediately resolved by MES staff to insure proper compliance.
The Midshore II landfill has been constructed and is operated in accordance with the Maryland Refuse Disposal permit No. 2005-WMF-0608 issued by the Maryland Department of the Environment. In addition to the State Refuse Disposal permit, there are other various State and local permits and approvals that control the construction and operations of the landfill, including:

- Non-tidal Wetlands and Waterway Permit No. 200764583/07-NT-2179
- Maryland Department of Natural Resources Forest Conservation Plan Approval-File number E08-01 as amended
- State of Maryland Sediment and Erosion Control Permits for both construction activities and daily operations
- General Discharge for Stormwater Associated with Industrial Activities-Registration number 02SW2163
- Maryland State Water Appropriation Permit NO. C02010S002 (01)
- Maryland Department of the Environment Part 70 Operating Permit 24-011-00109

**Inspections and Compliance**

MES maintains a vigorous compliance policy that is administered by an agency-wide compliance officer. In addition, we employ a staff of inspectors to help administer the MES Environmental Compliance Program. MES views the Program as a critical component of our mission. The Program includes the following:

- Monitoring of processes and releases
- Spill prevention, control and countermeasures
- Reporting requirements (as specified by governmental permits or MES procedures) for violations, spills and unusual events
- Emergency response
- Facility maintenance (“good housekeeping”)  
- Handling, storage and spill remediation of chemicals and hazardous materials
- Employee training
- Documentation and records management
- Code of Conduct/Internal investigations/Accountability and enforcement

The facility is also subject to random site inspections by representatives of the Maryland Department of the Environment.

**Midshore I Closure Cap System**

The Midshore Agreement required MES to stop accepting waste at Midshore I on December 31, 2010. However, for a number of reasons (including diverting “soft trash” to Midshore II prior to the close of Midshore I), the landfill did not reach its airspace capacity.

MES is required to continue monitoring and maintaining the landfill once it is closed (post-closure care). Post-closure care activities consist of monitoring and maintaining the waste containment systems, and monitoring groundwater to ensure that waste is not escaping and polluting the surrounding environment. The required post-closure care period is 30 years from site closure.
MES evaluated a number of closure cap options, including a traditional RCRA cap, along with innovative caps such as an Exposed Geomembrane Cap Systems, (EGC). Once a traditional cap is installed it becomes cost prohibitive to reopen the landfill for future landfill operations, or to mine the landfill for recyclables should that option become financially viable in the future. For most landfills, this is an acceptable consequence, however, Midshore I has existing lined airspace capacity remaining, and permitted area for an additional cell(s). For this reason, having Midshore I readily available for future landfill operations, while at the same time meeting the 30 year post closure timeframe, has significant advantages for the four counties in the Midshore Region.

An Exposed Geomembrane Cap (EGC) does not employ any drainage, protective, vegetative, or soil layers, and is significantly cheaper and quicker to install. In addition, it is relatively easy to remove, and will make it simpler to reopen the closed landfill if the need arises. The downside to this type cover is a shorter lifespan than a buried cover because of UV degradation, potential damage from wind, and damage from animals walking on or pecking at the cover. Typically an EGC has, at best, a 30-year life before it has to be replaced. Many states do not consider an EGC a permanent cover, and therefore will not consider the time the landfill is capped with an EGC as counting towards the 30-year post closure period. However, in Maryland MDE will consider an EGC, but only once it has been shown to be equivalent to a traditional RCRA Cap. MES has had preliminary discussions with MDE and based on those discussions it is likely that MDE will approve an EGC system for Midshore I. Once MDE approves an EGC, and after it is installed, the 30-year post closure period clock begins.

MES evaluated the net present value cost of an EGC system (assuming a full replacement of the EGC after 20 years use) compared to a traditional cap. After review, the EGC was found to be a more cost effective alternative than the traditional cap, while at the same time, providing more flexible options to reopen Midshore I at a later date - for a final closure solution by a yet-to-be-discovered technology or landfill use.

Awards or Records of Exemplary Compliance

The Maryland Environmental Service has had several instances of exemplary compliance associated with its management of the Midshore Landfills.

Scrap Tire Program. The scrap tire demonstration program allowed Midshore II to pave the primary access (River Road) to the landfill with a surface layer of Rubber Modified Asphalt. This demonstration project revitalized interest in the use of RMA at the county and state roads offices, while providing a “control road” which will quiet the noise generated by the truck traffic and can be used to measure the effects of heavy truck traffic.

Landfill Gas Management System. MES in conjunction with a developer/partner has established a two phase project at the now closed Midshore I to centrally flare the landfill gas while marketing carbon credits under Phase I. Phase II which is currently under “due diligence” is anticipated to both directly market landfill gas, and to generate and sell electricity
back to the grid. As sufficient waste is placed in Midshore II, MES will continue to explore beneficial uses for the landfill gas generated with the intent to reduce the MES carbon footprint, and provide enhanced environmental benefits to Caroline County and the State of Maryland.

**Funding Initiative.** MES successfully applied for a Water Quality Loan Grant from the Maryland Department of the Environment under the Federal Clean Water Act to permanently close and cap the Caroline County’s Hobbs Road Landfill. The closure of this facility brings the unlined and long unused landfill up to established standards with a modern cap. MES has entered into a long-term loan agreement with the Water Quality Enhancement Fund in the amount of $3.5 million. The project is expected to reduce up to two million gallons of leachate per year, while at the same time assuring the elimination of other potential hazards associated with an earthen-capped landfill.

**Remediation Activities.** Maryland Environmental Service also took proactive actions to assure forest and wetland remediation efforts were met by purchasing an adjacent farm on which these activities could be undertaken (Ackerman Farm). In cooperation with the Adkins Arboretum at Tuckahoe State Park, extensive efforts were made to insure that that native plants and tree species were collected from the disturbed areas of the landfill site to assure their future preservation. Additionally, all trees planted under the re-forestation efforts have come from the Maryland Department of Natural Resources-operated nursery which emphasizes the preservation of native species.

**SECTION 5**
**PLANNING, OPERATIONS, AND FINANCIAL MANAGEMENT**

**Planning**

Midshore II, the second of four planned regional projects, was built as permitted and has a potential site life in excess of its 20-year contract life. The Midshore II landfill is designed to provide for a significant opportunity for expansion should that need arise. There is also room at the facility to create enhancements to its operation such as, a leaf and yard waste compost facility, a bioreactor or landfill gas-to-energy facilities. Each of these enhancements improves the value of the facility to the community and conserves the capacity of the landfill to the greatest degree practical. The decision to move forward with any of these enhancements can be accomplished as the needs of the four counties mature.

**Operations**

The Midshore II landfill operates six days a week. Monday through Friday, the landfill is open from 7 A.M. to 3:30 P.M. and on Saturday the landfill operates from 7 A.M. to 12:30 P.M. MES supports the administrative, technical, financial and regulatory needs of Midshore II utilizing our headquarter
staff to help control costs. Dedicated staff at the Midshore II Landfill include an Operations Manager; Operations Supervisor; Field Supervisor; Weighmasters; three Mechanics; seven Equipment Operator III (four with CDLs); and finally, four Equipment Operator II.

Training includes, but is not limited to; SWANA MOLO training and certification for our Operations Manager and Site Supervisors; Landfill Technical Associate Training and certification for our technical staff; Hazardous Waste Operations and Emergency Response Training (with annual refreshers); Confined Space Entry and Hazard Communication. Our training programs are highlighted by our participation in the annual SWANA Equipment Road-E-O. During the recent Regional Road-E-O, MES employees had a strong performance. MES employees placed 1st and 2nd in the Wheeled Loader Competition; 2nd place in Off-Road Truck Competition; and 3rd place in the Dozer Competition.

The landfill is operated using the area-fill method of waste placement. Using this method, each day the landfill staff place waste in a daily cell and cover that waste at the end of the day with an ADC approved tarp system to control odors, fire, vectors, litter and scavenging birds. Cover soil is used on a weekly basis to provide additional control and to serve as a fire break in the landfill cell in the event of a fire.

In general, the size of the daily working face is about 50 feet by 100 feet. At the beginning of each day, the tarp system is removed and then the work area is prepared. Waste is transported to the working surface in trucks and dumped at the working face. At that time, loads are spread over the working face using a John Deere 850 bulldozer and inspected for the presence of prohibited wastes, and the waste is also checked for the presence of large recyclable materials (e.g., metals, white goods, etc). A John Deere 450 excavator is used for removal of white goods and scrap metal. Tires are removed by hand. Acceptable wastes are compacted using a Caterpillar 836G and then covered with another load of waste. At the end of the workday, a tarp is placed over all sloped work surfaces and intermediate cover is placed over horizontal surfaces, unless another lift of waste will be placed over the day’s waste within a month.

Health and Safety

At MES, employee health and safety is the Agency’s number one operational priority. MES employs a full time Safety Director responsible for training, oversight and implementation of MES’s Safety Program. Individual facilities, such as Midshore II, also have designated site safety personnel responsible for enforcement of the safety at the individual sites. All MES employees receive regular safety training and participate in monthly “safety tailgates” where pertinent topics, such as “Lock Out/Tag Out”, are discussed. MES conducts regular safety inspections at each worksite and also holds monthly safety meetings for all site personnel. MES employees are required to take specialized training such as “Confined Space Entry” depending on their specific work duties. Employee loss-time accidents and injuries are lower than industry averages. A Health and Safety Plan has been developed for the site under the direction of the MES Health and Safety Officer with input from site staff.

Financial Management

The Waste Disposal Agreements between the four partner counties and MES stipulate the counties shall pay a proportionate share of the costs for MES to operate the landfills in the event the tipping fees fail to cover operating costs in any fiscal year. Notwithstanding this clause, the counties have never needed to contribute money to cover operating costs during the 20 plus years the agreement has been in place. Midshore Regional Landfill Project operations have been funded solely from tipping fees. This is a
direct result of good management practices and efficient operations. MES is proud that it has been able to design, construct and begin operating a new landfill without having the financial need to increase the facility tip fee.

**Operating Budget**

Each fiscal year, MES prepares an annual operating budget for the landfill. The budget includes ancillary projects such as the homeowner drop-off facility and post-closure care of the former Easton landfill which closed in 1991. For Fiscal Year 2013, the Midshore Project operating budget is $6,160,571 and anticipated revenues are $6,212,000. The current tipping fee is $58.00/ton of which $53.00/ton funds landfill operations, $5.00/ton funds recycling activities and $1.00/ton is placed in a reserve fund that will provide capping and post-closure care of the landfill for 30 years after cessation of disposal activities at the site.

The Finance Division of MES maintains monthly reports of quantities of all materials received, operational costs and other activities. An aerial survey and topographic map of active landfill areas are prepared every six months to calculate remaining landfill capacity and to calculate landfill compaction rates.

**Midshore Financing**

The financing of the Midshore II Regional Landfill Project consisted of two components. The construction cost of the first cell was financed from the sale of $18,275,000 tax exempt Revenue Bonds. The bonds achieved a bond rating from Standard & Poor’s Corporation of AA at an overall rate of 4.56%. The second component, closing of the Hobbs Road Landfill, MES was successful in securing a $3,500,000 low cost interest loan through the Maryland Water Quality Revolving Loan Fund Program.

**SECTION 6**

**EQUIPMENT/SYSTEMS and TECHNOLOGIES**

Midshore II was constructed using state-of-the-art equipment and technologies for containment of wastes, management of waste materials, and management of the landfill facility itself.

MES utilizes two methods to maximize available airspace disposal capacity, which extends the life of waste disposal cells. These methods include Alternative Daily Cover Material (ADCM) and use of the Caterpillar Computer Aided Earthmoving System. While receiving about 400 tons per day, the size of the working face is limited to minimize the amount of cover material needed to prevent odor or vector problems and comply with regulatory requirements. As ADCM, MES employs a special tarp to control odors, fire, vectors, litter and scavenging birds. Cover soil is used on a weekly basis to provide additional control and to serve as a fire break in the landfill cell in the event of a fire.

In 2009, the Caterpillar Computer Aided Earthmoving System (CAES) was installed on a bulldozer and compactor. With CAES the operator transitions from relying on survey stakes and flags to define the work area to having an electronic site plan actually available in the machine cab. The system provides continuous feedback that tells the operator when effective compaction has been achieved, thus reducing inefficient machine use. When used in conjunction with a track-type earthmover, operators receive real-
time grade/slope information to more efficiently utilize cover soil and minimize airspace consumption. With the information CAES provides, operators work more efficiently within the site plan to reduce operational costs.

Guided by the dash mounted computer screen, a dozer operator distributes the trash to achieve the designed elevations. The efficiency of the compaction operation is also increased by use of the CAES. The compactor operator, also guided by a dash mounted screen, achieves optimal compaction with the minimum number of passes. Actual calculated waste compaction increased 64%, from 1100 lb/yd3 to 1,800 lb/yd3. In addition to extending the landfill life, the CAES has the following benefits:

- Decreased customer waiting times
- Decreased fuel consumption
- Decreased wear on compactor
- Decreased cover soil needs

The Midshore Move

One option to transition from Midshore I to Midshore II would have been to close the Midshore I site and take a week to transfer the equipment to the Midshore II site before commencing full-scale operations. However, to best serve the needs of the of the four counties, MES concluded that for a period prior to the official contractual opening of Midshore II - January 3, 2011 - both landfills would have to be operated simultaneously.

Like most landfills, Midshore I is equipped with redundant equipment, so the temporary dual operation was possible without the requirement of purchasing additional heavy equipment. This dual operation was planned with the understanding that in the event of an equipment breakdown at Midshore I, the redundant machine would have to be returned from Midshore II or a similar machine would need to be rented. The Midshore Project heavy equipment inventory consists of:

- Two John Deere 850 dozers
- Two Caterpillar 836 Compactor
- One John Deere 450 excavator
- One Caterpillar 325 Excavator
- John Deere 410 Back-Hoe
- One John Deere 300 Articulated Off-Road Truck
- One Volvo 25D off road truck
- One John Deere 973 Track Loader
- Cat 120 Motor Grader
- One Peter-Built Roll-off Truck
- One Mack 4,000 gallon Water Truck
- One FINN 900 Hydro-Seeder
- Bob-Cat Tool Cat with assorted attachments
- One Holland Farm Tractor with assorted Attachments

With Midshore II scheduled to open Monday, October 11, 2010, 2 ½ months prior to the scheduled closing of Midshore I, several interim goals needed to be accomplished:

- Contract haulers needed to re-route residential “soft trash” to the new landfill to provide the first lift, or “fluff layer”
- MES Midshore employees needed to be fully briefed on the transition plans
- MES needed to schedule the relocation of the heavy equipment, some of which required several days to disassemble, transport and reassemble at Midshore II.
Since the initial operation of Midshore II was to be a very controlled placement of soft trash, only four pieces of heavy equipment were transferred during early October. Specifically:

- One John Deere 850 dozer to be used at the working face;
- John Deere 973 Track Loader to provide compaction;
- John Deere 450 excavator to excavate onsite borrow material; and
- John Deere 300 Articulated Off to transport borrow soil to the working face.

At this point, compactors were not required at the new landfill. The balance of the equipment remained to continue the full operation of Midshore I. Personnel required for the initial operation were:

- Field Supervisor
- Scale Operator
- Three Equipment Operators
- Three Laborers for removal of oversize items

SECTION 7
PUBLIC ACCEPTANCE, APPEARANCE AND AESTHETICS

MES believes in being a good neighbor. Building community acceptance of Midshore II began with the selection and purchase of the site by Caroline County. MES erected two large billboards on the site announcing “Future Home of Midshore II Landfill in 2010.”

MES utilized a pro-active community outreach concept in all aspects of the initial site evaluation, design, construction and operation of the landfill. MES first met with the Caroline County public in 2007 to discuss general information and the landfill permitting process. Since that time, MES has met with the community dozens of times. Executive staff has frequently met one-on-one with any citizen who voiced a concern.

MES believes having a landfill for a neighbor doesn't mean quality of life in the immediate neighborhood has to suffer. The Midshore II design took into consideration the landfill’s rural setting, and site operating personnel have made every attempt to maintain the quality of life in the area. MES established a forest conservation easement on the site, as well as on an adjoining property, planting thousands of tree saplings on the two sites.

The waste truck routing issue was of particular concern to the area residents. Numerous traffic focus group meetings were conducted with local residents, Caroline County Public Works personnel, Caroline County Managers, design engineers and the senior MES solid waste managers to deal with all issues related to refuse truck traffic entering and leaving the new landfill site. MES held meetings with major waste haulers to insure that all parties had a clear understanding of each side's issues. Every hauler using the landfill was required to sign a formal “Hauler's Agreement” which included very specific directions regarding acceptable and unacceptable traffic routes to and from the landfill. These agreements also provide penalties for any waste truck drivers who ignore the accepted routes.
After completion of the initial phases of the permitting process, a joint Forest Conservation/Wetlands/Solid Waste formal public hearing was conducted by the Maryland Department of the Environment and the Maryland Department of Natural Resources in a nearby elementary school in September of 2008. Despite the fact that this was a hearing for a new landfill which one would expect to be a contentious meeting, only six citizens attended the hearing and asked very few questions. This is clear proof that MES did an excellent job in communicating all aspects of the new landfill and answered any and all questions to the satisfaction of the vast majority of the nearby residents.

Community Service and Public Outreach

MES has partnered with the community by supporting the Ridgely Lions Club through participation in their annual Strawberry Festival. MES also sponsors an annual golf tournament with the proceeds benefitting the Lions Club’s scholarship program, and the local landfill manager is an active member. In addition, MES employees donate money and school supplies to the local Caroline County school district. Public acceptance is enhanced by routinely holding public meetings. Tours are conducted for public schools, colleges, and other local area groups.

When the landfill accepted its first load of soft trash, MES sponsored a light-hearted opening ceremony, inviting the local community and serving hamburgers and hotdogs while officially welcoming the first load of waste into the site led by a parade. This parade included a “First Trash Queen” riding in a Mustang convertible, local police/fire vehicles and an improvised drum and fife corp comprised of real trash can steel drums, kazoo’s and slide whistles played by MES landfill personnel. This event received front page media coverage in the community newspaper and was thoroughly
enjoyed by all participants. Certificates of attendance were issued to all “First Trash Day” attendees as well.

A portion of the solid waste disposal tip fee is set aside to finance 100% the MES-managed Midshore Regional Recycling Program (MRRP). The MRRP is a cooperative partnership proposed in 1991 and formed in 1993 by and between the Maryland Counties of Caroline, Kent, Queen Anne’s and Talbot. This program provides numerous recycling opportunities to approximately 140,000 residents in the Midshore County service area.

Through sharing of resources and cooperative marketing, the MRRP provides full financial and other types of support for:

- Recycling of newspaper, magazines and catalogs, office and other paper, plastic bottles and jugs, glass bottles and jars, metal household cans, scrap metal, lead acid batteries, appliances, cardboard, motor oil, antifreeze, yard waste, tires, clothing and textiles, boat shrink wrap, electronics and other materials when outlets can be developed;
- Operation of the Igloo program serving 41 of the 47 drop-off sites in the Midshore Region; in a recent year the Igloo program collected 2,436 tons of recyclables. Queen Anne’s County annually bales and markets over 700 tons of cardboard;
- Capital equipment for recycling programs: 8 yd front-end containers, front end trucks, igloos, igloo collection trucks, rolloff containers, storage areas, walking floor trailer, and other equipment;
- Transportation of recyclables to market for all four counties;
- Removal of Chlorofluorocarbon (CFC) refrigerants from appliances;
- Grinding of yard waste;
- Tire recycling and alternate disposal arrangements;
- Education and recycling and waste prevention awareness, information and promotion to students, residents and businesses;
- Marketing of recycled material collected in the region;
- Record keeping and reporting of recycling rates for the region;
- Coordination of the Midshore Region’s Household Hazardous Waste Collection Program initiated in 1998.

In preparation for the construction phase of the new landfill, Caroline County timbered approximately 70 acres of the designated site to recover commercial lumber. The timbering activity was limited to the areas that would later need to be cleared to construct the proposed waste disposal cells. Once timbered and prior to clearing and grubbing, MES senior managers, employees and volunteers dug up, and hauled out a variety of native plant species, including various tree-seedlings, ferns, summersweet and hearts-a-bursting. Led by Sylvan Kaufman, Conservation Curator of the nearby Adkins Arboretum, the MES volunteers returned the plants to the Arboretum, where some were sold and others passed on to other native plant societies or used for environmental restoration on the Arboretum property. MES maintains a close relationship with Adkins Arboretum, supporting their mission of displaying all of Maryland’s indigenous forest plants.
SECTION 8
INNOVATION AND CREATIVITY

Since the inception of a multi-county solution for solid waste management, the Midshore partnership has relied on innovation and creativity to finance, build, and operate solid waste management facilities on Maryland’s Eastern Shore. As members of an 80-year solution, Caroline, Kent, Queen Anne’s and Talbot Counties have formed the only regional solid waste management partnership in the state.

MES has invested significantly in innovation and community outreach, and has received significant benefits of those innovative approaches. Although these innovations are discussed elsewhere in this report, these efforts include: how the facility was financed; its support of local community organizations, (i.e. the Ridgley Lions club); its “out of the box” mentality when it comes to reaching out to involve the community (i.e. hosting an ice cream social after a public hearing for the Midshore II landfill or putting together a trash can band and parade when the first load of trash arrived at the new Midshore II landfill); its supports of the Adkins Arboretum; and its sponsorship of local advisory committee made up of our neighbors as well as other interested parties.

Another example of its innovation, MES purchased the Ackerman Farm to provide area for forest conservation as well as providing an area for wetland mitigation activities and a source of borrow soil materials. The purchase of this farm also dramatically reduced the future transportation needs for landfill borrow material given its close proximity to the landfill. MES estimated the savings on borrow costs were in excess of $10 million with a huge carbon offset due to the reduced transportation equal to 4,000 metric tons. A portion of the borrow area will eventually become a constructed wetlands once the borrow operations cease.

MES improved the paved section of River Road which services the landfill. MES, in cooperation with Caroline County, was able to secure a grant from the Maryland Department of the Environment’s Scrap Tire Fund to construct a two-inch thick rubber modified asphalt (RMA) surface along the landfill access route. The benefits of using RMA include: reduced traffic noise, less asphalt material, reduced cracking and rutting in the roadway surface, improving the nationwide market of scrap tires, and hopefully reducing the number of tires finding their way into illegal dumps.

Initial Midshore II Operational Creativity

Midshore II is designed with five cells; the filling sequence starts with the 14-acre Cell 4. To minimize leachate generation, the leachate collection system within Cell 4 was designed with two distinct water collection areas, each comprising seven acres. To minimize leachate generation in the new cell, 7 acres of the Cell 4A initial fill area were covered with a “rain bonnet.” The rain bonnet is an impermeable geosynthetic sheeting intended to shed rainwater and direct it to the storm water drainage system. The remaining unused portion of the cell, Cell 4B, was left uncovered as the leachate collection system within

Purchasing the neighboring farm for borrow material will result in savings in excess of $10 million dollars and create a carbon offset of 4,000 metric tons.
this portion of the cell was connected directly to the storm water drainage system and not the leachate collection system.

With local officials, employees and the press onsite, the initial 100’x100’ area of rain bonnet was pulled back and Midshore II accepted its first load on October 11, 2010. This process reduced the leachate generation area of the cell to only the limited area where trash was to be placed. An additional rain bonnet was removed as the working face progressed and the initial lift was installed. The rain bonnet was so effective in reducing leachate production that only 150,000 gallons of leachate was collected during the first four months of site operations.

As a result of its efforts, MES has been successful in constructing and operating two regional solid waste management facilities. MES plans to continue to apply innovative approaches in facility operations, possibly including bioreactor technology, gas-to-energy technology, and other appropriate technologies.
Mr. Steve Tomczewski
Executive Director for Environmental Operations
Maryland Environmental Service
259 Najoles Road
Millersville, Maryland 21108

Dear Mr. Tomczewski:

The County Commissioners of Caroline County are pleased to offer full support for the application submitted by the Maryland Environmental Service to the Solid Waste Association of North America (SWANA) as a nominee for the 2011 Landfill Management Excellence Award.

The Maryland Environmental Service (MES) has been, and continues to be, a valuable collaborator in the area of solid waste management with Caroline County, Maryland. The MES developed the Mid-Shore II Solid Waste Facility in Caroline County as part of a multi-County partnership for solid waste management. The MES has been the best possible partner in this endeavor for a rural jurisdiction such as Caroline County.

The Mid-Shore II Regional Solid Waste Facility centralizes the waste disposal needs for Caroline, Kent, Queen Anne's and Talbot Counties. These Eastern Shore counties have formed the only regional partnership in the State of Maryland. Under the agreement, each county will host a solid waste facility for a period of 20 years, providing an 80-year solution to waste disposal on the mid-shore. Constructed in 1991, the Mid-Shore I facility, which was located in Talbot County, was the first facility to operate under the agreement. Phase two of the regional solid waste agreement is in effect, wherein Caroline County is currently hosting the Mid-Shore II facility, which became fully operational and began accepting waste in January 2011.

During the implementation of Mid-Shore II, the MES developed a thoughtful and thorough strategy to create the solid waste facility, including public participation and input, keen awareness of community concerns, complete adherence to environmental regulations, excellent communication with government leaders and staff, and a responsive follow up to any and every detail. Their approach to the work was, and continues to be, both personal and professional, hands on and articulate, and with the highest quality of engineering service. The facility is "state of the art" in both design and implementation.
Mr. Steve Tomczewski  
Executive Director for Environmental Operations  
Maryland Environmental Service  
March 29, 2011  
Page Two

Caroline County has been well served by the MES for over 20 years. The cooperative spirit that has been fostered between the MES and Caroline County government is definitely a benefit for our citizens. This level of support, partnership and collaboration on local and regional solid waste issues is greatly appreciated and the County Commissioners look forward to the long-term continued management of Mid-Shore II Regional Landfill by MES, as well as continuing this valuable relationship in the future.

The County Commissioners feel that the MES is most deserving of this recognition. As a benefactor of the strides in solid waste management, and due to the innovative collaboration both regionally and locally that has been fostered with the assistance of the MES, the County Commissioners of Caroline County, respectfully offer enthusiastic support of the nomination of the Maryland Environmental Service for the 2011 Landfill Management Excellence Award through the Solid Waste Association of North America.

Sincerely,

[Signature]

COUNTY COMMISSIONERS OF CAROLINE COUNTY, MARYLAND
Jefferson L. Ghrist
President

VLAR

Cc:  Caroline County Department of Public Works
In the opinion of Bond Counsel, under existing laws, regulations, rulings and judicial decisions, and assuming the accuracy of certain representations and continuing compliance with certain covenants, the interest on the Series 2011 Bonds will be excludable from gross income for federal income tax purposes and is not a specific preference item for purposes of the federal alternative minimum tax. It is also the opinion of Bond Counsel that, under the terms of the Service’s enabling legislation, the Series 2011 Bonds, their transfer, the interest payable on them, and any income derived from them, including any profit realized on their sale or exchange, shall be exempt at all times from every kind and nature of taxation by the State of Maryland, or by any of its political subdivisions, municipal corporations or public units of any kind, except that no opinion is expressed as to estate or inheritance taxes or the Maryland franchise tax or any other taxes not levied or assessed directly on the Series 2011 Bonds, their transfer, or the income therefrom. See “THE BONDS – Tax Matters” herein.

$18,275,000
MARYLAND ENVIRONMENTAL SERVICE
REVENUE BONDS
(MID-SHORE II REGIONAL LANDFILL PROJECT), SERIES 2011

Dated: Date of delivery
Due: November 1, as shown below
Interest Payable: May 1 and November 1 until maturity
Denomination: $5,000 and integral multiples thereof
Form: Registered, book-entry only through the facilities of The Depository Trust Company
First Interest Payment Due: May 1, 2011
Optional and Mandatory Redemption: Series 2011 Bonds maturing on or after November 1, 2021 are subject to redemption prior to maturity without premium and the Series 2011 Bonds are also subject to optional and mandatory redemption as set forth in “THE BONDS – Redemption Provisions” herein.
Security: The Series 2011 Bonds are special obligations of the Service to be paid from the Trust Estate, including the Revenues (each as defined in the Indenture), pledged by the Service under the Indenture. See “THE BONDS – Security and Sources of Payment for the Bonds” herein.

Neither the State of Maryland, nor any political subdivision thereof nor the Service is obligated to pay the Series 2011 Bonds or the interest thereon except from the Trust Estate, and neither the general credit nor the taxing power of the State of Maryland or any political subdivision thereof or of the Service, is pledged to the payment of the principal of, redemption price or interest on the Series 2011 Bonds. The Service has no taxing power.

Purpose: The proceeds of the Series 2011 Bonds will be used (i) to finance a portion of the cost of the acquisition, design, construction, equipping and operation of a new landfill on an approximately 218-acre parcel of land located adjacent to the Holly Road Landfill near Ridgely, Caroline County, Maryland and other costs related to such Project, (ii) to pay in full the Service’s Revenue Bond Anticipation Note (Mid-Shore II Regional Landfill Project), Series 2009A outstanding in the aggregate principal amount of $12,000,000, and (iii) to pay for certain costs of issuance of the Series 2011 Bonds.

Trustee, Paying Agent and Registrar: The Bank of New York Mellon, Woodland Park, NJ

MATURITIES, PRINCIPAL AMOUNTS, INTEREST RATES, PRICES OR YIELDS AND CUSIPs

<table>
<thead>
<tr>
<th>Maturing</th>
<th>Principal Amount</th>
<th>Interest Rate</th>
<th>Yield</th>
<th>CUSIP</th>
<th>Maturing</th>
<th>Principal Amount</th>
<th>Interest Rate</th>
<th>Yield</th>
<th>CUSIP</th>
</tr>
</thead>
<tbody>
<tr>
<td>November 1</td>
<td>$600,000</td>
<td>3.600%</td>
<td>0.762%</td>
<td>574065DH3</td>
<td>2019</td>
<td>$895,000</td>
<td>6.000%</td>
<td>3.700%</td>
<td>574065DR1</td>
</tr>
<tr>
<td>2021</td>
<td>729,000</td>
<td>3.600%</td>
<td>1.020%</td>
<td>574065DIA9</td>
<td>2020</td>
<td>945,000</td>
<td>5.000%</td>
<td>3.940%</td>
<td>574065DS9</td>
</tr>
<tr>
<td>2022</td>
<td>846,000</td>
<td>3.600%</td>
<td>1.490%</td>
<td>574065DIA5</td>
<td>2021</td>
<td>850,000</td>
<td>5.000%</td>
<td>4.100%</td>
<td>574065DT7</td>
</tr>
<tr>
<td>2023</td>
<td>655,000</td>
<td>3.600%</td>
<td>1.960%</td>
<td>574065DL4</td>
<td>2022</td>
<td>895,000</td>
<td>5.000%</td>
<td>4.320%</td>
<td>574065DU4</td>
</tr>
<tr>
<td>2024</td>
<td>680,000</td>
<td>4.000%</td>
<td>2.360%</td>
<td>574065DM2</td>
<td>2023</td>
<td>980,000</td>
<td>5.000%</td>
<td>4.480%</td>
<td>574065DV2</td>
</tr>
<tr>
<td>2025</td>
<td>710,000</td>
<td>4.000%</td>
<td>2.690%</td>
<td>574065DN9</td>
<td>2024</td>
<td>1,090,000</td>
<td>5.000%</td>
<td>4.660%</td>
<td>574065DW0</td>
</tr>
<tr>
<td>2026</td>
<td>740,000</td>
<td>4.000%</td>
<td>3.140%</td>
<td>574065DP5</td>
<td>2025</td>
<td>1,085,000</td>
<td>5.000%</td>
<td>4.700%</td>
<td>574065DX8</td>
</tr>
<tr>
<td>2027</td>
<td>770,000</td>
<td>4.000%</td>
<td>3.440%</td>
<td>574065DQS8</td>
<td>2026</td>
<td>1,195,000</td>
<td>4.500%</td>
<td>4.830%</td>
<td>574065DY6</td>
</tr>
</tbody>
</table>

$5,156,000.00 5.000% Term Bond due November 1, 2039 Yield 5.080%; CUSIP: 574065DZ3

The cover page contains certain information for quick reference only. It is not intended to be a summary of this issue. Investors must read the entire Official Statement to obtain information essential to the making of an informed investment decision.

The Series 2011 Bonds are offered for delivery when, as and if issued, subject to the approving opinion of Kutak Rock LLP, Washington, D.C., Bond Counsel, and the opinion of the Office of the Attorney General of the State of Maryland. Certain legal matters will be passed upon for the Underwriters by McGuireWoods LLP, Baltimore, Maryland. It is expected that the Series 2011 Bonds in book-entry form will be available for delivery through the facilities of The Depository Trust Company in New York, New York, on or about February 16, 2011.

MORGAN KEEGAN

February 1, 2011

TD SECURITIES (USA) LLC