Lanchester Landfill

2016 Excellence Award Entry
Landfill Management Division Excellence Award Application
ARM Group Inc. / Chester County Solid Waste Authority

Lanchester Sanitary Landfill
Jurisdiction: 49 Municipalities in Northern Chester County, PA
Approx. Population: 500,000
Cost per Household of the project: $66.00 / Ton
Approximate Budget: $18,000,000

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Executive Summary:

Chester County Solid Waste Authority - The Chester County Solid Waste Authority oversees the operation of the Lanchester Sanitary Landfill, a disposal facility including other support services that provides multidimensional solid waste management services to 49 municipalities (approximately 500,000 persons) in Chester County Pennsylvania. Lanchester Landfill has been a leader in the Commonwealth of Pennsylvania for both management and operation/design innovation.

ARM Group Inc. - (ARM) is a full service engineering and environmental consulting firm, offering progressive, practical and professional solutions, adhering to the growth and innovation of the solid waste industry as sustainably and cost-effectively managing waste materials becomes increasingly difficult. ARM’s engineers and scientists have been successfully addressing waste disposal challenges involving solid and hazardous waste for over 25 years. Whether the challenge is locating the facility, permitting, design, expansion, monitoring, closure, remediation, or negotiating with regulatory agencies, our professionals have the experience to implement strategic solutions.
Site Overview / Siting, Design and Construction

Discussion of siting, site preparation and design, construction techniques, site soils, hydrology/geology and their suitability for a landfill.

Siting (Site selection)-
The Chester County Solid Waste Authority (Authority) operates the Lanchester Landfill (Lanchester) and has the responsibility to provide solid waste disposal for 49 communities in the Chester County, Pennsylvania. The Lanchester Landfill is sited on the western edge of its service area. It is located about 50 miles east of Harrisburg and 40 miles west of Philadelphia, and has served the south eastern region of Pennsylvania as a disposal option for five decades.

The predecessor facility to Lanchester began to receive solid waste before the Commonwealth of Pennsylvania adopted rules and regulations for solid waste management. When Pennsylvania adopted rules and regulations in 1972, the landfill owners obtained a permit and updated the design, construction and operations to comply with the new regulations.

Being sited in a largely rural area, the landfill included visible peaks as well as interconnected valleys. Unfortunately the location was visible to the surrounding community, and concerns about clearing woodlands, earth disturbance, and general opposition to landfill operation engendered concern and opposition.

In 1984 the landfill was purchased by the County of Chester for the long term management of its solid waste.

Three times in the last 25 years Lanchester Landfill approached its permitted capacity. Alternative disposal plans and options were considered and evaluated. After careful examination of the alternatives, the answer reverted to expansion of Lanchester as the most feasible option.

In addition the regulatory climate rendered financing other options difficult or impossible. Innovative solutions to mitigate visual impacts were undertaken to help address local concerns. Each time the landfill received a permit to expand, and today Lanchester may be considered the County’s only reasonable option for long-term waste management.

The harms/benefits (H/B) evaluation introduced subjective evaluation criteria into the overall permitting process, and is completed in addition to the other technical requirements of PADEP. Obtaining this approval is by itself considered an accomplishment.
Area E Expansion
ARM was selected by CCSWA to complete a feasibility study that examined expansion alternatives for the
Lanchester Landfill facility. Each expansion option was evaluated in terms of capacity, development cost per
ton of capacity, technical and operational factors, and regulatory and community acceptance considerations.

After CCSWA selected the preferred expansion option (termed “Area E”), ARM prepared a conceptual footprint
and proposed final grading plan. An approximately 4,600-foot long mechanically stabilized earth (MSE) berm
was integrated into the perimeter of the landfill footprint to optimize geometric efficiency, enable effective
expansion and piggybacking over the majority of the existing southern landfill face, and minimize lateral
expansion. In addition, in order to remain sensitive to community concerns and minimize potential ecological
impacts, the expansion concept was designed such that the current peak elevation of the landfill would not
increase; the disposal footprint would be maintained within the existing permit area; state-of-the-science landfill
gas (LFG) management, beneficial use, and odor control would be implemented; and leachate management methods (i.e.,
recirculation) that rapidly stabilize the waste mass and enhance beneficial use of LFG would be employed.

Following development of the conceptual design, ARM was
selected by CCSWA to prepare the Phase I Permit
Modification Application (PMA) for the Area E expansion.
This work entailed the delineation of an unlined landfill that
was partially relocated for the expansion; the completion of
hydrogeologic and ecological investigations and associated
reporting; the preparation of the environmental assessment;
and the completion of a social, economic, and environmental
harms/benefits analysis. ARM also provided technical
support, design collaboration and assistance, and peer
review services for the preparation of the Phase II PMA.

In addition, ARM developed a patented photovoltaic (PV) design concept to
enable a solar project to be developed in conjunction with the expansion
project. ARM proposed the concept to CCSWA and, with the authorization
of CCSWA, ARM prepared permit-level designs for a solar installation
project within the south-facing elements of the Area E MSE berm.
Utilization of the MSE berm face allows for the beneficial use of the majority
of 181,000 square feet of MSE berm facing. The project design would
result in the production of 1,046,954 kilowatt hours (kW-hrs) of electricity
per year that would be supplied to local businesses and manufacturers.
Design-
Lanchester employs a water management approach that seeks to minimize, and to the extent possible, eliminate the discharge of Leachate Treatment Plant effluent and groundwater to the permitted outfall located on a tributary to the Conestoga River. One method to accomplish this is to use leachate recirculation. In 2001, the Authority constructed and began to operate a leachate recirculation system. The benefits being realized at Lanchester as a result of incorporating leachate recirculation into the design of landfill units include: accelerated biostabilization of waste; enhanced rates of settlement and increased landfill gas production.

The Authority is required to collect groundwater from various sources around the site. Some water has low levels of VOCs, which are then treated by aeration in the Holding Pond. The local groundwater has a high iron and other minerals content, but with minimal aeration can be discharged to the permitted outfall.

Since 1996, liner systems at Lanchester have included a clay or geosynthetic clay liner (GCL) layer below one of the geomembranes. This system provides a composite liner component that exceeds PADEP regulatory requirements. Other evaluations and tests performed during landfill design include: slope stability evaluation; veneer stability evaluation; final cover veneer stability; MSE Berm analysis; interface shear test; representative final cover interface shear and transmissivity tests; supporting permeability test results for protective cover stone; waste settlement analysis; gas well cutoff calculations; waste heterogeneity and localized settlement analysis; seismic impact analysis; bearing capacity analysis of subbase; geosynthetic properties; leachate compatibility; geomembrane puncture resistance analysis; liner system anchor trench analysis; leachate detection layer flow analysis; leachate detection swale flow capacity; leachate collection pipe flow capacity; leachate collection pipe structural integrity; leachate collection gravel clogging analysis; geotextile filter clogging analysis; leachate collection pipe clogging analysis; erosion resistance of final cover; geocomposite drainage layer evaluation; and cover system hydraulic efficiency.

Stage 1A consisted of providing infrastructure (pond and communications improvements). Stage 1B consisted of major waste relocation efforts, decommissioning 3 ponds and extensive stormwater management upgrades, reinforced structural fill placement, leachate pump system improvements, and construction of a new wood, yard waste compost area. Stage 2 consisted of 19-acre landfill cell construction, 1,600 LF MSE berm construction, with a maximum height of approximately 70 feet, roadways, landfill gas improvements, leachate system improvements, etc.

Throughout its history, the Authority has commissioned Third Party Peer Reviews of various aspects of landfill design to assure the best quality possible in the final constructed product. The Authority’s most recent design of the new landfill unit and MSE Berm was reviewed in detail and approved by a landfill design engineer on behalf of the local host municipality as well as the engineers of the permitting agency, prior to permit issuance in 2011.
**Construction techniques**

Construction of piggy-backed landfill units at Lanchester requires modification to the existing landfill gas collection system. Care must be taken to be sure that existing gas collection components will not damage the liner system of the piggy backed landfill unit. This technique requires: removal of existing well heads; connection of these wells to piping; trenching from the well to a gas collection header located beyond the foot print of the new landfill unit; installation of new piping; and installation of a remote well head.

Geosynthetic and soil materials used for landfill and MSE Berm construction are evaluated under rigorous Construction Quality Assurance (CQA) standards. CQA standards are typically included in a project specific Construction Quality Assurance Plan prepared by the design engineer. Additionally, Quality Control (QC) requirements for contractors and manufactured materials are identified on detailed construction drawings and specifications. An independent third party CQA Consultant is employed to perform full time field CQA monitoring and documentation during the construction and provide professional certification to the PADEP.

Tasks performed by the CQA Consultant include but are not necessarily limited to: collection of conformance samples; collection and review of manufacturers’ quality control (MQC) documentation; monitoring installation and seaming operations; monitoring nondestructive material testing; collection of destructive seam samples; verification of laboratory test results; and tracking of on site geosynthetic inventory.

**Site soils**

On site soils are sampled and analyzed each time a landfill unit is developed at Lanchester. Samples are taken from both test pit excavations and soil borings placed at select locations. Existing soil test data are also reviewed and considered. In addition laboratory tests, soil thickness evaluations and visual classifications are performed in the field.

In general the depth to competent bedrock ranges from 2 feet to 11 feet. Particle size and consistency of soils varies with depth from ground surface. Near surface soil is typically fine-grained (such as silt loam). Soil becomes courser with depth from the surface (such as sandy loam) until a horizon of weathered bedrock (Chickies Quartzite) is encountered. Rock fragments are typical and are consistent with the nature of underlying bedrock. Grain size analysis, plasticity tests, compaction tests, laboratory classification tests are performed on samples to define soil characteristics. On site soils are generally found suitable for use as structural fill, provided oversized particles are removed or crushed. Sub-base, clay, and intermediate cover soils are generally obtained from off site sources. Alternate daily covers are maximally used in lieu of daily cover soil. Tarps consist of the primary daily cover. Spray on and nother ADCs are incorporated as supplemental forms.

The structural fill quantity needed for construction of the MSE Berms to date required approximately 435,000 cubic yards. On site and off site soils were utilized. Structural fill was compacted and field tested for the specified density and optimum moisture content requirements. Soil sources were tested to verify conformance with the requisite design criteria for: minimum friction angle; effective stress; cohesion; and total stress.

Vegetative soils on closed landfill areas being prepared for piggy backed landfill units are also recovered for on-site use. In the case of a piggy back landfill cell constructed in 2014, approximately 45,000 cubic yards of vegetative cover soil was recovered for re-use at another on site closure project. Stabilized biosolids have been used as a soil amendment to manufacture vegetative soils at Lanchester. The addition of biosolids to Lanchester’s vegetative soils result in a high nutrient and organics content. After fertilizing the vegetative soils support excellent grass growth over the years that Lanchester’s livestock and indigenous species enjoy.
Lanchester Landfill

Hydrology/geology - basic description/classification leachate monitoring system -

Lanchester is located in the Uplands Section of the Piedmont Physiographic Province, characterized as a gently rolling plateau with occasional bedrock highs underlain by resistant igneous and metamorphic rocks. The site is situated along and on top of the Welsh Mountain range which behaves as a surface and ground-water divide. Areas to the northwest drain to the Conestoga River watershed. Areas to the south west drain to the west Branch of the Brandywine Creek watershed. The lands around Lanchester are underlain by the Chickies Formation, of the Cambrian-period. The predominant geologic feature at the site is the Welsh Mountain Anticline.

Ground-water movement in the region is generally from topographic high areas (uplands), where ground-water recharge occurs, to topographic low areas (valleys) where ground-water discharge occurs. The general direction of regional groundwater flow reflects surface topography, but ground water movement within the bedrock aquifer is largely controlled by secondary porosity features such as joints and fractures. Ground-water may also be found within the primary porosity of the quartzite. Primary porosity is estimated to be as high as 15 percent in weathered granular portions of the formation. Because the porosity of this formation is controlled by secondary porosity features, the ground-water flow is considered anisotropic (i.e., the hydraulic conductivity varies with direction). Potentiometric surface contour maps are prepared and evaluated once a year. Aquifer characterization and hydrologic characterization of the aquifer was performed over an extended period of time when the permit applications were submitted for PADEP review.

Suitability for landfill -

An environmental assessment of this site has been performed to verify that the landfill does not extend into any exclusionary areas. This assessment evaluated and confirmed that the site does not encroach into area such as: floodplains; wetlands; coal- expansions; valley, ravine, or head of hollow; limestone or carbonate formations; occupied dwelling buffer zones; perennial streams; airports; water sources; schools, parks or playgrounds.

Potential impacts on the environment, public health and public safety have also been evaluated at Lanchester. Evaluations consider the potential for unacceptable impacts resulting from or to: geologic and foundational hazards; seismic activity; scenic and recreational rivers; special protection watershed; wetlands; parks; fish, game and plants; water uses; recreational areas; historic places; traffic increases; local zoning or land use restrictions. Suitability of the site for use as landfill has successfully been demonstrated through these evaluations and the incorporation of the appropriate and requisite environmental controls.

The landfill has been identified and included in the Chester County Solid Waste Management Plan as one of two primary options for most of County.
Discussion of merits of the site preparation and design for environmental protection, demonstrating that it is “state of the art” sanitary landfill:
The Authority has demonstrated that the need and benefits associated with the continued use and operation of Lanchester clearly outweighs perceived harms. In fact the Authority has worked to reduce perceived harms and increase benefits through more efficient use of available air space and the use of innovative waste management approaches. These approaches include: the use of GPS systems on landfill compactors since 2000; the use of liner systems that exceed regulatory requirements; piggy backing new landfill units above older units; limiting horizontal landfill expansion and new earth disturbance area through the use of MSE Berms, the use of leachate recirculation to minimize off site discharge of Treatment Plant effluent, increase waste compaction efficiency, and accelerate biostabilization of waste and landfill gas production; and the collection of landfill gas for use as an alternative energy resource by local industry, and the potential use of solar arrays on the face of subsequent phases of MSE Berms.

Substantial economic, social and environmental benefits associated with Lanchester have been demonstrated. These benefits include but are not necessarily limited to: employment benefits; support of local businesses; tax benefits; community services and support; and preservation of undisturbed land and natural resources.

After extensive study and evaluation of the site, no exclusionary areas or potential harms to the environment or public health and safety have been identified.

Overall Planning and End Use Planning

Overall Planning-
In Pennsylvania each County is required to prepare and implement a Municipal Solid Waste Plan. This plan is required to be updated every ten years, and currently the Chester County Health Department is preparing Municipal Solid Waste Plan Update. During the plan update process the Health Department advertises nationally for disposal options to meet the County’s requirements. The Lanchester Landfill had been the primary disposal site for the County’s solid waste in their 2007 plan. Lanchester Landfill disposed of approximately 67% of the municipal solid waste generated in Chester County. The previous draft plan update indicates that the Lanchester Landfill is not only the closest disposal option for most of Chester County, but also offered the lowest disposal prices (bid results) for municipal solid waste.

During 2005, The Authority and their engineer developed plans to replace the scales and small load residential tipping area. These plans included replacing the two scales with three to better serve the anticipated growth in residential disposal. Recently, a neighboring municipality discontinued their residential drop off transfer station and it is anticipated that other municipalities will follow this lead in the next few years. The redesign allowed Lanchester to go from one 80 cubic yard trailer to six 40 yard roll-off containers. The six containers will allow separation of items to be recycled such as metal, dry wall, computer monitors, mattresses and vinyl siding.
Equipment / Systems and Technologies

Turf Cap, Alternative Final Cover System — The Authority retained ARM to conduct a Preliminary Feasibility Study of an exposed geomembrane cap (EGC) for application to the intermediate cover grades of a section of the Lanchester Landfill, as an alternative to the traditional landfill capping system prescribed by PADEP regulations.

The features that prompted The Authority to investigate the feasibility of an EGC at Lanchester were the prospect of potentially reducing capping construction costs and maintenance costs for the final cover system. In evaluating the merits of an EGC application at Lanchester, ARM investigated general advantages, site-specific benefits and drawbacks, permitting efforts and costs required to implement an EGC, including likelihood of success, timeframe, bonding, and perceived issues relative to aesthetics.

Although merits of an EGC system existed, ARM concluded it was not a suitable system for final cover at Lanchester, and examined the Agru ClosureTurf™ (CT) product. Based on ARM’s research of CT, ARM concluded that this product offers several advantages over a traditional EGC and over a traditional final cover system. Since the CT system had not been installed at a Pennsylvania site prior to our research and does not meet the permitted final cover system design requirements, through technical discussions with PADEP and CCSWA, it was determined that pursuit of this product for use at Lanchester would require a Demonstration Facility Project Application for use on a trial basis at Lanchester.

The CT system and utilizes the Agru Super-Gripnet® (SGN) 50-mil LLDPE geomembrane, overlain by a 2-layer woven geotextile, fitted with HDPE grass blades, and in-filled with sand ballast. CT utilizes the space between the LLDPE studs of the SGN and the geotextile for the drainage component, while the sand fill ballasts the cap components. The CT system is capable of being installed on top of the intermediate cover soils, and eliminates the need for vegetative subsoil, topsoil, natural vegetation, and associated fertilizer, mulch, and maintenance.

Due to the lack of on-site soils available for cover, the use of CT provides the opportunity for cost savings and will eliminate the corresponding truck traffic that would have otherwise been required to haul in final cover soil from off-site sources. Post-closure maintenance of CT will also be less costly than a traditional cover system, due to the elimination of grass, soil cover, and erosion potential. ARM also conducted a detailed stormwater analysis to ensure that existing stormwater management features (e.g., channels, terraces, detention basins, etc.) will still function properly after installation of the CT in the proposed areas. CCSWA completed construction of the product on a 6.5-acre section of Lanchester Landfill in 2014 and is presently performing the 2-year evaluation required by the Demonstration Facility Permit.
Equipment/Systems and Technologies:

*Types of Equipment being utilized. Detail efficiency and effectiveness of equipment-
The Authority has been using the Computer Aided Earthmoving System (CAES) since 1999 on their landfill compactors. The purpose of the CAES is to integrate planning and operations with real time information regarding compaction effectiveness, landfill design and the amount of cut/fill required to meet the desired design.

Each compactor has a GPS receiver, computing hardware a daylight readable color display and a wireless communication system. The operator can choose from a menu of screens such as plan view, profile, compaction and many others. The time of day, coordinates and elevation are also displayed on the monitor. The color monitor allows the operator to see if the preset lift thickness and compaction are being achieved.

By radio the information from each machine is sent to a computer in the superintendent’s office. Activities from each machine can be monitored from this location. In the past the only feedback the Superintendent had on landfill density was a quarterly evaluation by traditional survey methods. With the implementation of the CAES system landfill density is often computed daily and posted in the operator’s lunch room for all to see. Since utilizing this system the density of waste placed in the Lanchester Landfill has increased about ten percent. The landfill density now significantly exceeds the density of an average landfill as discussed in SWANA’s MOLO course.

Environmental Controls and Monitoring

*Groundwater Monitoring-*
The Authority contracts with third-party environmental laboratory, certified in Pennsylvania, to collect samples and perform analysis. There are thirty-nine (39) groundwater wells that are monitored on a quarterly basis. Wells are sited based on PADEP requirements, the potentiometric surface of the area and the location of identified fracture traces at the site. Total well depths and screened intervals are determined based on groundwater flow directions and range of annual water table fluctuations as well as measured and estimated vertical gradients and consideration of the depths of other wells in the monitoring network. The monitoring system is designed to establish pre-operational and post operational water characteristics of the ground water. Wells are constructed in accordance with PADEP requirements.

In addition to monitoring on-site wells The Authority also monitors thirty-five (35) contiguous property owners’ private wells on a quarterly basis. The individual homeowners select the laboratory to conduct their sampling and analysis and they receive a copy of the results directly from the laboratory. This program adds a second tier of groundwater monitoring that encompasses points adjacent to the landfill facility.

*Leachate Monitoring-*
Leachate from the all landfill units is monitored quarterly, and there are a total of ten primary zone samples and eight witness zone samples collected. The leachate from each landfill cell is analyzed individually. Should there be a future impact to the water table this distinct sampling could help to pinpoint a potential source.
Collection-
Leachate is collected utilizing side slope risers that contain EPG Surepumps™ and controlled by EPG designed control panels. Wet wells containing EPG Surepumps™ transfer the leachate to the Leachate Treatment Plant through a duel wall containment piping system. Leachate is equalized in an 110,000 gallon tank and held for treatment or transferred to two 850,000 gallon tanks for short term storage.

Treatment methods employed-
Lanchester utilizes two methods for leachate management at a Treatment Plant that uses an Ultra Filtration/Reverse Osmosis manages about 10 gpm of the 20 gpm generation rate. The design flow of this system is 10 gpm, and the effluent from the plant usually meets drinking water standards. The second method of leachate management is recirculation. Lanchester currently recirculates leachate into the active area. The recirculation system utilizes a 10,000 gallon wet well, at it is controlled by EPG designed control panels. The leachate is applied to the landfill mass through a network of perforated piping, infiltration blankets can be applied directly to the working face using equipment outfitted with spray bars for controlled distribution. A portable weather station is located near the working face to assure that leachate is only applied when the weather conditions are in the range allowed by the permit.

Quantities Produced/collected-
The landfills at Lanchester usually produce five to six million gallons of leachate per year. Lanchester employs a “cap as you go” philosophy to minimize leachate production and maximize landfill gas collection. Of the six landfill units covering about 160 acres four, are in post-closure with about 25 acres, of daily or intermediate cover currently under development.

Materials used for environmental protection-
Landfill cell construction is a Subtitle D design conforming liner system with two geomembranes, leachate collection and detection zones. The liner system components from top to bottom are shown below:
The final cover system is installed on top of the waste after landfilling is completed. The final cap system cross section is illustrated below:

Stormwater must be continuously controlled and monitored throughout all phases of landfill construction and operation. All stormwater is carefully routed through a series of armored swales, energy dissipaters and settling ponds which provide seven days of retention to maximize removal of the fine silt and clay particles. Stormwater samples from seven sedimentation ponds are collected on a semi-annual basis and analyzed for pertinent stream quality and pollution parameters. Because the Lanchester stormwater system is at the head waters of the receiving stream basins, controlled release to the watersheds is vital to maintenance of downstream stability. Accordingly, Lanchester collects four samples from the Conestoga River, to which it is permitted to discharge treated leachate and groundwater.

In addition to groundwater, surface water and leachate monitoring the Authority operates a landfill gas management system installed in 1990. The gas extraction and collection system includes over two-hundred wellheads tied to either vertical extraction wells or horizontal collectors throughout the landfill. At a minimum, each wellhead is checked on a monthly basis for CH₄, CO₂, O₂ and balance gases as well as temperature, in order to maintain the proper pressure balance of the wellfield and to control gas migration and odors associated with landfill gas emissions. The Authority has two enclosed flares, and one utility candle flare permitted in the facility Title V Permit. The enclosed flare has 4,200 c.f.m. of capacity and the utility flare has 3,000 c.f.m. capacity.

While the extensive capture and flare destruction system has served the landfill’s air quality permit, Lanchester has sought to use the landfill gas as a resource. A joint venture with Granger Energy, Inc. was signed and Granger installed a processing facility to treat the gas prior to transport through a 13 mile pipeline to local industries that use the gas in lieu of oil or natural gas. Granger also produces 3MW of electrical power on-site. Lanchester’s gas is utilized by seven local businesses, powering almost 50 ovens, boilers and electrical generation equipment. This project was awarded the US EPA LMOP Program “Project of the Year” for 2005.
In addition to the gas extraction and collection system there are 30 perimeter gas monitoring wells that are monitored on a quarterly basis to insure that landfill gas is not migrating from the fill area. Additionally, surface emissions monitoring is conducted annually on the closed portions of the facility and quarterly on the active portions of the facility. The purpose of surface monitoring is to check for fugitive landfill gas emissions and to make sure the extraction system is adequately collecting all of the landfill gas that is being generated.

**Overall Impact of the Program on Human Health, Environmental Quality and Resource Conservation**

The purpose of environmental controls and monitoring programs is to be protective of human health and the environment.

The Authority has been proactive in addressing potential “harms” associated with the landfilling operations. Gas collection and control has been in place since 1990. The purpose of the original system was to control gas migration and the potential for off-site odors. The current system recovers the landfill gas for use in industrial boilers as an alternate to natural gas. This reduces the generation of greenhouse gases and also conserves natural resources by utilizing landfill gas in place of natural gas. Expansions to the gas extraction and collection system, whether it be the installation of vertical wells or horizontal collectors, are generally completed well ahead of regulatory mandated timelines in order to minimize the potential for odors and to capture and recover as much of the landfill gas as possible.

**Compatibility with the Environment**

The Lanchester Landfill is located in a topographical highpoint in the area known as the Welsh Mountains. The location offers flood protection as well as significant isolation distance from the regional water table. The facility is an approximately 600 acre parcel with half the site being woodlot buffer zone between the facility and its neighbors. The woodlot acreage is home to a variety of local wildlife such as whitetail deer, turkeys, foxes and raccoons. The closed vegetated areas provide habitat for rabbits and birds. These areas also attract a large number of red tail hawks, kestrels and other raptors looking for dinner. In 2015, the Wildlife Habitat Council (WHC) certified the Lanchester Landfill for its habitat and conservation efforts. Also in 2015, the Lanchester Landfill won the WHC’s Corporate Lands for Learning Rookie of the Year Award.

Lanchester’s recent piggy-back expansion efficiently uses the property and conserves open space that would be required to develop a landfill site at an alternate location or at other portions of the 600 acre property.

The landfill gas generated by the landfill is being utilized by industries to conserve natural gas resources.

Leachate generated by the facility is being recirculated in an effort to maximize the production of landfill gas and to reach a goal of “zero discharge” of leachate from the facility.
Regulatory Compliance

The system’s role in local community’s integrated solid waste management system-
A State mandated Citizens Advisory Committee (CAC) guides the development of every County Plan in Pennsylvania. The CAC has proposes the key components of Chester County’s integrated solid waste plan for the next ten years, and the Lanchester Landfill has been designated one of two Primary Disposal Facilities in the Plan Update. In addition the Plan Update identifies the Lanchester Landfill as a public drop off for waste, recyclables and compostables. The Authority is also designated in the Plan Update as the organization that will oversee all aspects of solid waste planning for Chester County in the future.

Details showing the site is in environmental compliance.

The Authority is fully in compliance with PADEP regulations and environmental permits that allow for the operation of the Lanchester Landfill. These permits include a PADEP municipal waste permit for the operation of the Lanchester Landfill, a Title V Operating Permit, a NPDES Permit that includes direct discharge of treated effluent from the on-site treatment plant to the surface waters of the Commonwealth as well as a permit to discharge stormwater from the facility.

The Lanchester Landfill is inspected by the regulatory agencies on a regular basis. At least once a month the inspector from the PADEP Bureau of Waste Management conducts a complete inspection of the facility operations. A Host Municipal Inspector from one of the local municipalities also conducts an inspection. On an annual basis an inspector from the PADEP Air Quality Program conducts an inspection of Title V related issues. PADEP engineers and other regulators may make site visits to inspect major construction projects such as new cell construction, gas extraction system additions and leachate treatment plant upgrades.
Planning, and Operations:

Description of operation program used to meet design and operational objectives-
A close working relationship has been established between the Operations Superintendent, Facility Engineer and design engineers. The Superintendent reviews all drawings during the design phase of every project. The Superintendent not only attends all project design meetings but also project meetings during construction. The Superintendent attends and provides input at Authority Work Shop Meetings where the Executive Director and Authority Board develop broad objectives for the Lanchester Landfill. The Lanchester Landfill accepts non-hazardous industrial wastes for disposal. Since 1993 the Authority has had a Waste Acceptance Plan in place that addresses what steps must be met in order for a special waste to be approved for disposal. Waste generators must complete the PADEP “Form U Request to Process or Dispose of Residual Waste”. Generators must conduct chemical analysis of their waste to prove that it is non-hazardous. Pertinent personnel are trained on what types of items need special approval prior to disposal.

In addition, equipment operators are trained to identify items that are not acceptable for disposal. This list includes explosives, radioactive materials, hazardous wastes and bulk liquid wastes. They are trained to look for warning labels on containers. If questionable waste is discovered at the landfill face a supervisor is called to investigate further.

The State of Pennsylvania requires that all landfills monitor incoming waste for elevated levels of radioactivity. The Authority maintains a Radiation Monitoring Action Plan that addresses how to respond to incidents of waste loads with elevated levels of radiation. The Authority installed fixed radiation detectors for monitoring of all waste entering the facility. Should the fixed detectors alarm, and it is determined the driver is not the cause of the alarm the truck is sent to a staging area to await further inspection. In the follow up investigation portable detectors are used to pinpoint the location of the alarm. Once the “hotspot” on the truck is pinpointed an attempt to identify the isotope is made with a portable gamma spectrometer. If it is determined the isotope is a short-lived medical isotope, the waste is allowed to be landfilled. In the 13 years since the implementation of the Plan all of the alarms have been short-lived medical isotopes.

Employee and Customer Safety
The Authority holds monthly staff safety meetings on general topics such as working safely in hot or cold weather conditions and topics specific to landfills such as landfill gas safety and how to handle special wastes. All employees are required to attend safety meetings, including weighmasters and clerical staff. Employees are also given an annual physical to monitor their general overall health and detect any health impacts from the job. Each new employee is asked to study and understand the operator’s manual for each piece they will operate. Each employee documents that they have read and understand the information. Manuals and operating procedures are discussed with supervisors and/or the superintendent before an employee is allowed to operate the equipment. The manuals are available to operators any time they need to review the information. When a new piece of equipment is purchased the vendor is required to provide training to the staff.

In late 2004 Authority Management decided to implement an early access defibrillation program at the facility. Even though the Lanchester Landfill employs a staff of less than twenty-five, throughout the course of a day upwards of 150 people come through the gate. Four Cardiac Science Powerheart AED G3 automated external defibrillators were purchased and installed at key locations at the facility. Ten employees successfully completed the training on proper use of the units. General training regarding the units and their locations was provided to all personnel. In addition, local emergency medical response organizations were informed of the availability of the AED’s.
Public Acceptance, Appearance and Aesthetics:

*Overall appearance of site; is the facility kept neat and clean-*

Not only does the Lanchester Landfill keep its site neat, but it recently received an award from the Pennsylvania Department of Transportation for being part of its Adopt-A-Highway Program for ten years. To be part of this state program the entity must patrol roads for litter at least four times a year. The Authority has a litter patrol on the roads at least once per week, and more frequently as weather conditions mandate added patrols.

The Authority strives to present a park like appearance to the public both inside and outside of the gate. For half of the year the landfill site is open to the public weekly to enjoy the playground and Scenic Overlook. During the remainder of the year the Lanchester Landfill often hosts school, college or other groups for tours. With goats and sheep grazing on about twenty five acres of capped landfill the property often takes on the appearance of a working farm.

The Authority has verbally committed to the Chester County Commissioners that their 600 acre property will be dedicated open space when landfilling activities are completed. While care must be extended to any use of the site while landfilling is still in operation, Lanchester has opened limited use to the public. The landfill is a geographical high point with a vista that extends to the horizon to the east and south. An extensive 20+ mile vista extends to the north. During May—October this “Scenic Overlook” is open to the public each Sunday. Picnic tables and small shelters are available while people enjoy the view. A new tot lot playground was installed in 2005 to augment the amenities. Once per year minimum, Lanchester conducts an open house for neighbors and County residents. The open house explains operations and development plans, recycling demonstration on composting and ends with a chicken barbeque. Attendance by 1,500-1,800 persons is typical. Special groups such as astronomy clubs and model airplane clubs have used the site for their unique activities, including the Lanchester Nature Trail. The trail is nearly 5 miles around the Landfill with benches, bird and bat houses, a pond and a picnic table. A scenic overlook is located nearby.

In response to both large and small customers The Authority hosts electronics recycling event. Composted leaf mulch is given to citizens annually for their private use. Each year The Authority holds an Open House to inform the public about the recent construction activities at the landfill, reuse and recycling.