

NJ Landfill Offers a New Approach to Funding Long-Term Care

Economically sustainable model of custodial care at closed landfills

By Gary DeFranco and Daryl O'Dell

Around the United States, many landfills are reaching the end of the 30-year land-fill post-closure period required by the federal Resource Conservation and Recovery Act (RCRA) Subtitle D regulations governing landfills that came into effect in 1990. One such landfill is Kinsley's Deptford Renewable Energy Center (previously known as Kinsley's Landfill, Inc.) in Deptford Township. Required to maintain the landfill in the post-post-closure period (aka custodial care), Kinsley's developed and implemented an economically sustainable custodial care model giving them the financial strength needed to care for the facility for years to come. The project received the 2022 Sustainability Award from NJ SWANA, a voluntary group of professionals dedicated to the advancement of integrated solid waste management that is both environmentally sound and economical. It may very well serve as a model for the many other solid waste landfills that need to build revenue to long-term care after closure.

Kinsley needed funds to extend its post-closure care for 10 more years

Kinsley's Deptford Renewable Energy Center is a closed 137-acre landfill located on 194 acres in Deptford Township in Gloucester County. The landfill accepted municipal solid waste from Gloucester County and neighboring communities from the 1960s through 1987. The facility then closed in compliance with a New Jersey Department of Environmental Protection (NJDEP) approved Closure and Post Closure (CPC) Care Plan. In 2015, Kinsley's negotiated with the NJDEP to extend post-closure care for another 10 years beyond the original 30-year post-closure maintenance period, until 2027.

Kinsley's recognized that it had to develop a way to pay for required ongoing maintenance and monitoring activities to deal with the continued production of landfill gas and leachate. The site had reserved funds for the 30-year post-closure period but needed additional funds in order to pay for the required extended care.

Sustainable activities generate income for maintenance

In conjunction with local and state officials, Kinsley's developed a pragmatic approach with sustainable activities capable of generating sufficient revenue to maintain and monitor the landfill for the 10-year period. The program's two key revenue generating components are a *soil reuse and regrading program* to restore pre-settlement landfill slopes and development of a



The regrading program restores slopes to conditions optimal for promoting stormwater runoff while directing the runoff to existing on-site stormwater controls.



Materials delivered by truck are graded to eliminate low areas where stormwater collects and infiltrates.



Powering 14,000 homes with clean solar energy eliminates the carbon dioxide that would have been created if it had been generated by burning fossil fuels.

solar electric generating system. Operators estimate that the revenue obtained from soils regrading and solar development will cover the extended 10-year post-closure period.

"The partnership between Deptford Township, the New Jersey Department of Environmental Protection, and Kinsley's has proven to be effective and productive," commented Paul Medany, Mayor of Deptford Township, New Jersey.

Reuse and regrading

Kinsley's compacted low permeability clay cover performed as expected and had good leakage performance when placed, but the freeze/thaw cycling and the settlement that has accumulated over the 30 years since closure allowed leakage to increase over time. A permeability study conducted nearly 20 years ago showed that the permeability of the cover had increased in the decade since it was first placed; fissures, cracks, and ponding due to settlement was suspected to be driving the increase in leachate generation. In the early 2000s, Kinsley's received approval to regrade the landfill to address settlement as a component of post-closure care.

Facility operators reasoned that they could decrease their operations and maintenance costs for leachate management if they regraded to improve stormwater runoff. At the same time, the revenue they would receive from accepting the regrading material could help them build up the reserve needed for their eventual post-post-closure (custodial care) responsibilities.

The regrading program is designed to restore the plateau and slopes to pre-settlement conditions optimal for promoting storm water runoff while directing the runoff to existing onsite controls. The approach also reduces the potential for leachate generation. The landfill accepts a variety of clean and regulated soils and fill materials from construction projects, dredging projects, filter material from water treatment plants, or other materials meeting the facility's NJDEP-approved site-specific Material Acceptance Protocol (MAP), which was created based on Tetra Tech's site-specific material assessment parameter review. Having pre-approved acceptance criteria in the MAP means that Kinsley's can accept materials in a timely manner and does not need to make time-consuming individual approval requests to NJDEP.

The materials are used to restore grade and eliminate low areas where stormwater collects and infiltrates. The facility regrading also helps advance additional beneficial end uses for the landfill, including the development of Kinsley's Deptford Renewable Energy Center.

Continued



Gary DeFranco, Vice President of Operations, Transtech Industries, Inc.

Solar array development

Kinsley's implemented a phased solar array program following its ranking as # 1 among over 700 New Jersey landfills in PSG&E's Solar 4 All® study on closed landfills. Phase I, completed in 2017, is an 11.2 megawatts DC (MW DC) rigid solar array project. Phase II, completed in 2020, expanded the solar field's footprint to a total of approximately 37 acres, producing a combined 16.2 MWDC of solar power. The clean solar energy generated by this facility avoids about 80,000 tons of CO₂ per year, calculated using EPA's Greenhouse Gases Equivalencies Calculator and other industry calculation resources. The existing solar array powers about 14,000 homes.

Kinsley's is continuing progressive filling in preparation for a possible Phase III solar expansion (estimated at 10 MC DC), which would occupy the rest of the undeveloped landfill plateau on approximately 20 acres of available land. Partnering with a knowledgeable engineering firm and encouraging and cultivating open and collaborative dialog with both Township officials and state regulators has led to the successful solar projects, which are environmentally friendly energy production facilities that further help fund long term care of the facility while helping to reduce post closure care O&M costs.

"Renewable energy is an important initiative in New Jersey," said Mayor Medany. "Our Deptford community is proud to be part of it."

Proactive approach enables long-term care

"The key to the project's success has been getting rid of the mindset that the landfill is only a liability and implementing the new mindset that the facility is a long-term renewable resource," said Dan Edwards, President



Daryl O'Dell, PE, P Eng., Client Manager, Tetra Tech

of Transtech Industries, Inc, Kinsley's parent company. According to Edwards, the project demonstrated to Kinsley's how complex tasks can be accomplished when working with a dedicated team that is laser focused on pursuing innovative solutions for new and challenging problems. "Along the way it brought with it a new and useful purpose for the facility and the organization."

As a result, Kinsley's Deptford Renewable Energy Center's sustainability program is an



An aerial view of the landfill.

economically sustainable model of custodial care that can be replicated at other closed landfills, which will be absolutely critical in the coming years. Kinsley's efforts have resulted in continued financial strength, which enables them to care for the facility into the future.

Editor's Note:

Gary DeFranco is Vice President of Operations for Transtech Industries, Inc. He is an environmental professional with experience in waste management, innovative self-financing site remediation projects, independent power production, industrial wastewater treatment, and industrial site clean-ups. He has served as Supervisor of Solid Waste Programs for the Middlesex County Department of Solid Waste Management, Manager of Technical Services for United Environmental Services, Inc., Operations Manager for Edgeboro Disposal, Inc., and General Manager of Kinsley's Landfill, Inc. He can be reached at gdefranco@transtechindustries.com.

Daryl O'Dell, PE, P Eng., is a Client Manager at Tetra Tech with 25 years of experience in solid waste consulting and construction materials testing. He has experience in landfill design and permitting, landfill gas design, and renewables, including compressed natural gas and solar. Daryl has extensive experience working with New Jersey Department of Environmental Protection and clients during post-closure and custodial care, working with both to find sustainable solutions to long-term care and funding mechanisms for solid waste facilities and, where applicable, removing landfill facilities from the requirements of long-term, post-closure care. He can be reached at daryl.odell@tetrattech.com. ♣

- All sand plants utilize 100 percent recycled water.
- Barging accounts for 49 percent of Tilcon-provided product transportation, realizing a savings of 75 percent GHG emissions compared to truck.



Whitestone Associates, Inc.
Thomas Uzzo
President & CEO

Whitestone recently completed a sixth phase in support of our client SFG Passaic Urban Renewal, LLC's remediation and redevelopment of a blighted Brownfield site in Passaic. What makes this project unique are the myriad technologies and methodologies employed in assessing, classifying and remediating the site while jointly conducting various materials management actions and geotechnical engineering methods in support of redeveloping the property with a 295,606-square feet warehouse.

This project truly was the poster child for Brownfield site remediation and redevelopment, and Whitestone's corrective actions included both innovative and conventional technologies ranging from in situ soil and groundwater remediation to underground storage tank removal and management of both hazardous and nonhazardous soils. Building materials were assessed prior to demolition to evaluate on-

site beneficial reuse and off-site management alternatives. Sustainable remediation practices included efforts to maximize in situ treatment technologies and on-site re-use of acceptable demolition residuals while minimizing the volume of wastes transported off site.



Whitman
Jaclyn DiDonato
Green Team Leader

Led by our firm's Environmental Sustainability Associate, Jaclyn DiDonato, Whitman's Green Team is an internal team of volunteers created to establish sustainable programs within our company, participate in volunteer-based activities throughout the state, and provide sustainable information and tips to the staff as well as our firm's social media followers.

The Team's initiatives have included: implementing Terracycle's Zero-Waste Box program in our office to collect "hard to recycle" items that will ultimately be upcycled into different products; participating in a Grow-a-Row harvesting event at Pittstown Farm at which 37,000 pounds of corn was harvested to feed thousands in need; joining the Raritan Headwater Association's 33rd Annual Stream Cleanup; planting sunflowers; replacing disposable products in the office with reusable and zero-waste products to help reduce our collective environmental impact; and providing environmen-

tally educational pieces for inclusion in each issue of our company's monthly internal newsletters.



William Paterson University
Richard Helldobler
President

Our commitment to environmental leadership and sustainability through conservation, efficiency, and education extends more than two decades, and continues to grow in impact. Our 3.3 MW solar panel installation supplies 12 percent of energy needs. While the campus has grown by 47 percent since 2001, the University has lowered consumption of electricity by 30 percent, natural gas by 50 percent, and carbon emissions by 1350 tons per year. Strategies include food waste composting, energy-efficient lighting and HVAC systems, recycling initiatives, installation of electric charging stations, and usage of electric shuttle buses. Honors include a U.S. Green Building Council LEED Gold Award, three Green Building Design Awards, EPA recognition for carbon reduction, and the 2020 Approaching Zero Sustainability Award. A signatory of the national Climate Leadership Network-Carbon Commitment, we are a member of the Second Nature higher education climate initiative. A Sustainability Committee, endorsed by President Richard Helldobler and comprised of faculty, staff, administrators, and students, guides campus efforts. ♣

STEVE ADUBATO'S

LESSONS IN LEADERSHIP

with co-host Mary Gamba



Saturday 5:00pm

Sunday 10:00am

news12+



Stand-Deliver.com

Promotional Partner:





