

Spectro PowerCap™

Case Study

Hickory Ridge Landfill



Project Overview

Republic Services' Hickory Ridge landfill located near Atlanta Georgia, is home of the world's most advanced Exposed Geomembrane Solar Cap (EGSC) - Carlisle's Spectro PowerCap. Approved by Georgia's Environmental Protection Division (GEPD) as a long-term interim closure, the system will provide trouble-free maintenance and superior environmental protection as a landfill closure system, while generating clean renewable energy for a minimum of 20 years. This exciting project is the first large scale installation of its type, and is an environmental success story for Georgia and Republic Services.



Project Details

Location: Conroy, GA (near Atlanta)

Completed: June 2010

Total Landfill Closure Area: 45+ acres

Geomembrane: 60-mil Scrim-Reinforced Dark Ivy Thermoplastic Polyolefin (TPO)
+2.7 million square feet

Solar Photovoltaics: 6,984 UNI-SOLAR® PVL-144 Laminates

Electrical Generation Capacity: 1,005.7 kWp DC

Annual Electricity Output (est): 1,300,740 kWh AC per year

Inverters: 4x Satcon PowerGate 250kWp DC

“Not only does Carlisle’s Spectro PowerCap provide exceptional environmental protection as a result of the exposed geomembrane cover design, but the financial justification is a “no-brainer”.

Tony Walker
Republic Services ”

This Project...

- Is the largest exposed geomembrane solar cap (EGSC) in the world.
- Is the first EGSC and the first approved use of Thermoplastic Polyolefin (TPO) Geomembrane as a landfill closure system in the state of Georgia.
- Is the largest solar photovoltaic array installation in Georgia.
- Utilizes more than 148 miles of electrical wiring, which is more miles of wiring than found in Boeing’s new 787 Dreamliner (133 miles).

The Spectro PowerCap System

Carlisle’s patent-pending Spectro PowerCap is an alternative landfill closure system designed to meet the requirements of the EPA and state regulatory agencies as a long-term interim or final closure cover. The dual-purpose landfill closure system combines two known, world-class components: the industry’s leading thermoplastic polyolefin technology found in Carlisle’s GeoTPO™ geomembrane and the field-proven solar output performance of UNI-SOLAR®’ triple-junction amorphous silicon photovoltaic laminates. These two components are integrated in a factory-controlled environment using Carlisle’s proprietary bonding technology and finished with a unique, patent-pending low-profile electrical interconnect system to ensure years of trouble-free performance and minimal maintenance.

Depending on the size of the photovoltaic array, the system can be installed within an already prescribed budget for a comparable traditional landfill closure, however, unlike the traditional closure, the Spectro PowerCap provides income and tax benefits that provide lower overall costs. As an example, the system provides income from the sale of electricity, while tax incentives (credits and accelerated depreciation) and other local rebates provide the further justification for the system.

Carlisle’s Landfill Solution’s group provides a complete product offering for the closure system, certified installers, design and build services, and comprehensive warranty packages for a complete engineered solution.

Environmental Benefits

The foundation of the Spectro PowerCap is the TPO exposed geomembrane cover (EGC), which by design provides many environmental benefits versus a traditional landfill closure system. The primary benefit is lower operational and maintenance costs through the elimination of mowing, seeding, watering and soil erosion due to stormwater events. In addition, the cover provides clean runoff water with minimal silt and sedimentation issues.

Estimated Annual Environmental Equivalency Benefits Multiply these numbers by 25 for total lifetime benefits*

- Powering 224 homes[^]
- The greenhouse gas emissions of 191 cars
- 1,102 tons of CO₂

*According to the EPA’s Green Power Equivalency Calculator
[^]EIA SEDS database



The Power of Your Landfill Cap

Key Partners in the Project’s Success

HDR, Inc. -
Permit Engineer

Carlisle Energy Services -
Spectro PowerCap designer
and technology supplier

American Environmental Group, Ltd. -
Liner Installer

Cooper Barnette Page, Inc. -
Earthwork Contractor

Geosyntec Consultants -
Construction Manager

Oasis Consulting Services, Inc. -
CQA Engineer



About Carlisle Energy Services, Inc.

As a wholly owned subsidiary of Carlisle Construction Materials Incorporated, Carlisle Energy Services, Inc. (CES) specializes in turnkey project development and design for large-scale commercial photovoltaic solar rooftops and solar landfill closure systems. Combining Carlisle’s unmatched roofing industry performance and expertise with cutting edge energy management solutions, CES provides a unique service to the roofing, energy and landfill industries.