

# Increasing Landfill Gas Capture



Sharing real-time data.

## THE CUMBERLAND COUNTY LANDFILL PROJECT

### PROJECT OVERVIEW

Landfill gas collection at the 239-acre Cumberland County Solid Waste Complex in New Jersey for destruction and beneficial use.

**Project developer:** LoCI Controls, Inc.

**Baseline:** Collection and combustion of landfill gas as required by regulation on part of the landfill, along with collection and combustion of landfill gas where regulation does not yet require it in a new part of the landfill.

**Activities:** Implementation of LoCI Control's real-time data and control system to increase landfill gas collection efficiency 15-20 percent above baseline levels and capture of landfill gas not yet required by regulation to be captured, resulting in destruction and beneficial use of gas that could have otherwise been vented to the atmosphere.

**ACR729:** 142,141 metric tons CO<sub>2</sub>e of verified carbon emission reductions from 2021-2024; Core Carbon Principles (CCP) labeled carbon credits.

### SELLING CARBON CREDITS TO INCREASE GAS COLLECTION

"People don't realize what it takes to run a landfill," noted Tony Riviera, Managing Director of Landfill Operations for Cumberland County, New Jersey. "For example, they don't know we have automated systems and don't understand the complexity of the systems."

First opened in 1987, Cumberland County's landfill handles about 300,000 short tons of municipal solid waste per year. From the beginning, the operators liked to be on the cutting edge. From a heat exchanger that increases efficiency to a micro energy grid onsite, they work hard to show what's possible.

When LoCI Controls approached the landfill with an innovative idea, the team at Cumberland County decided to take a closer look. At first it sounded too good to be true; LoCI would install its cutting-edge, real-time data

and automated control system, which would increase gas collection efficiency at no cost to the landfill. To make it possible, the landfill would become a carbon project, and the sale of credits would cover the costs.

### CAPTURING METHANE AT THE SOURCE

According to the U.S. Environmental Protection Agency (EPA), landfills are the third-largest source of methane emissions in the country, representing 17 percent of total human-caused methane emissions. Food waste, in particular, is a big contributor.

When waste is dumped into a landfill, it decomposes under anaerobic conditions to produce landfill gas, which is primarily composed of methane and carbon dioxide. Landfills also emit small amounts of air pollutants called non-methane organic compounds such as benzene, toluene, and vinyl chloride, the emissions of which can be reduced by gas collection and control



*A controller that automatically measures gas characteristics.*

systems.” Methane is 28 times more potent than carbon dioxide as a greenhouse gas and is short-lived in the atmosphere, the combination of which is why it’s responsible for up to one-third of climate change impacts to date.

While most municipal solid waste landfills are required by law to use gas collection and control systems to capture the gas, the systems can be inefficient and there is no requirement to improve collection practices. For example, as atmospheric pressure increases or decreases with changes in the weather, the wells in a landfill need to be adjusted. While the atmospheric pressure is constantly changing, it is common for landfill operators to adjust wells only once a month. In addition, federal regulations allow operators up to five years to install gas collection wells on new areas of a landfill, yet the EPA estimates that more than half of all emissions happen in the first 3.5 years.

To generate carbon credits, the LoCI Controls system goes beyond regulatory mandates to address these opportunities and capture more landfill gas.

## USING TECHNOLOGY TO INCREASE EFFICIENCY

LoCI Controls is a leading provider of real-time monitoring and control systems, which helps operators increase gas capture and cut methane emissions from landfills.

**“Innovation is at the core of everything we do at LoCI,”**

said Peter Quigley, Chairman and CEO of LoCI Controls. “Our mission is to deliver a unique, technology-driven real-time data and control platform to optimize landfill gas collection and minimize harmful greenhouse gas emissions.”

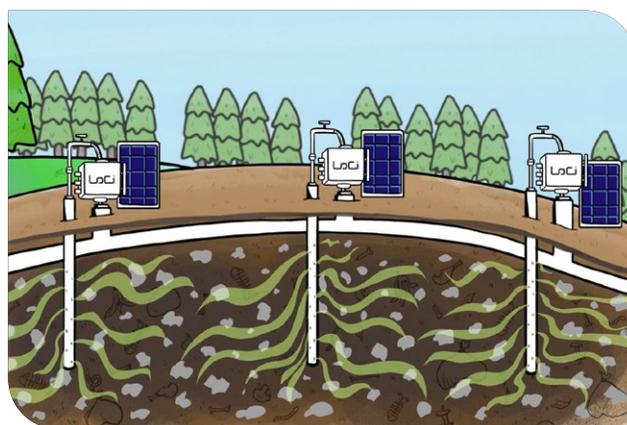


*Peter Quigley, CEO of LoCI Controls*

The LoCI system consists of a real-time data and action plan platform that is built out with data points from devices installed in the gas collection system. LoCI’s system relies on a network of solar-powered, communication-enabled, automated devices that are positioned to monitor regional and well-specific performance. The devices continuously measure gas characteristics to inform landfill teams and use proprietary automated responsive well tuning to adjust control valves in near real-time.

This real-time wellfield action allows wells to self-correct as conditions change, improving gas capture stability, reducing variability, and minimizing the need for manual field intervention. In parallel, the platform produces a daily report that analyzes changes across the wellfield and translates performance trends into clear, prioritized, and actionable tasks for operators. Rather than sifting through raw data or reacting to problems after they occur, landfill teams receive daily guidance on which wells require attention, what adjustments are needed, and how those changes support overall system performance.

In the Cumberland County project, there are nearly 100 controllers providing data and tuning wells continuously. This gives the operators consistent capture, reduced methane losses, and the confidence to stay ahead of whatever the landfill throws at them.



*A network of solar-powered, communication-enabled, automated devices to improve gas capture.*

“Fluctuation happens all the time,” said Christie Bagley, Project Manager for LoCI Controls.

**“To maintain compliance with the regulations, most operators tune their wells conservatively with a lower vacuum level.”**



Christie Bagley, Project Manager for LoCI Controls

In other words, to make sure the landfill gas captured has less than 5 percent oxygen, operators lower the applied vacuum. As a result, landfill gas that could otherwise be captured is emitted to the atmosphere. Using LoCI’s platform, the landfill operator has access to the real-time data needed to adjust the wells and increase gas

collection. In the case of Cumberland County, the result is a 15-20 percent increase in gas capture. In addition, the operators at Cumberland County expanded their gas collection system early into new parts of the landfill, before regulations required them to do so.

The collected gas is then used in an on-site landfill-gas-to-energy plant operated by NextEra, which burns the gas to generate electricity. Power from the plant is used to operate the landfill, with excess power exported onto the electrical grid. The landfill also uses flares to combust methane. Either way, the landfill gas is converted into a less potent greenhouse gas, carbon dioxide, destroying non-methane organic compounds in the process.

## EXCEEDING BUSINESS AS USUAL

ACR first published its [Landfill Gas Destruction and Beneficial Use Projects](#) methodology in 2017, with an update in 2021. Using carbon finance to incentivize actions that reduce greenhouse gas emissions, the methodology includes an additionality framework that is based on a performance standard or a three-pronged test. In the case of the Cumberland County project, the automated collection system goes beyond regulatory requirements and “business as usual” for the sector.

**“Automated gas collection and control systems are an excellent way to avoid the release of methane from the approximately 1,000 large municipal solid waste landfills in the U.S.”**



Example of LoCI Control’s WellWatcher®, a real-time data and action plan platform.

said Mary Jane Coombs, ACR Director of Industrial Programs. “The sale of carbon credits can play an important role in covering the costs of these efficient control systems.”

## SEIZING BIG OPPORTUNITIES

“Never in a million years did I think I’d be working on a landfill,” said Cumberland County’s Riviera. But he was drawn to the idea of clean communities and recycling and supported the County’s approach of leaning into opportunities. When it comes to reducing landfill gas emissions, there are big opportunities.



Tony Riviera, Managing Director of Landfill Operations for Cumberland County, New Jersey

It is possible to cut U.S. landfill emissions nearly in half, according to a recent report by Energy Vision, a nonprofit focused on opportunities to prevent methane emissions from organic waste. By using real-time technology, early action ahead of regulatory requirements, and state-of-the-art gas capture systems, U.S. landfill emissions could be reduced by almost 50 million metric tons CO<sub>2</sub>e annually.

In partnership with LoCI Controls, Cumberland County is seizing these opportunities, using carbon markets to finance the improvements.

**“This is an example of what a landfill can be,”**

Riviera noted.

For more information about the Cumberland County Landfill Project, visit [LoCI Controls](#) or [ACR](#).