

# Early Landfill Gas Collection: Why You Should Consider it in Your Next Gas Collection and Control System Design

Stephanie Liptak, E.I.T., Laila Al-Khalaf, E.I.T., and Anthony Detweiler

Gas migration, odors, and elevated surface emissions are often among landfill gas (LFG) collection issues at landfills. These issues can lead to unsafe work conditions, complaints from citizens, potential hazardous atmosphere in below grade work areas, and, in the worst-case, Notice of Violations (NOVs) and/or fees from regulatory agencies. Common practices to decrease odors and gas migration are to install a gas collection and control system (GCCS) with extraction wells, both horizontal and vertical. While these solutions are viable, they do not always capture all the gas available. Additionally, vertical extraction wells can be costly, as they require a full construction



Figure 2 - Early collector installation at the Lena Road Landfill.

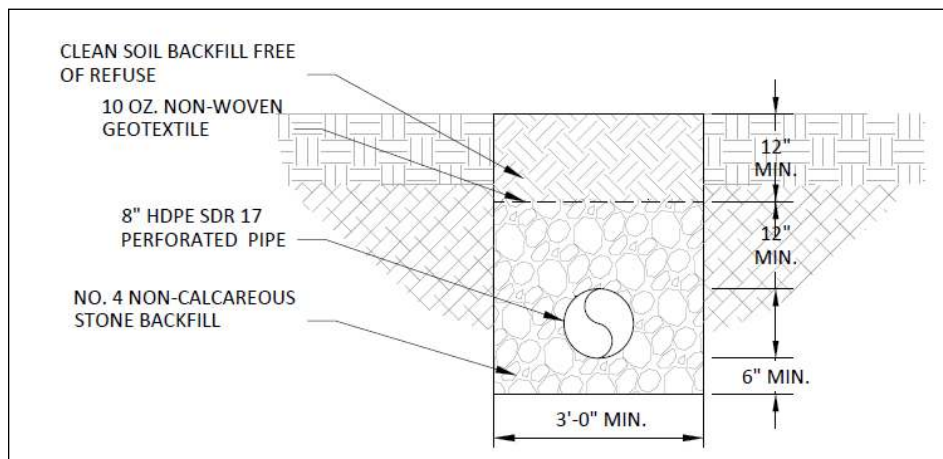


Figure 1 - Section view of early collector design.

crew for installation. Vertical wells also require at least 40 to 50 feet of waste to remain approximately 15 feet off the bottom liner system, which may take upwards of five years depending on a site's fill sequencing plan. Horizontal collectors can be installed earlier than vertical wells; however, these wells have the potential to settle over time as waste is placed on top of them. Installation of both vertical and horizontal wells can affect day-to-day site operations. A new solution is to install collectors "early", prior to regulation timeline requirements and before waste is in place.

## Early Collection System Design

Early collection in a new landfill cell prior to waste being placed is a newer concept in the LFG industry. Early collectors consist of perforated High-Density Polyethylene (HDPE), non-woven geotextile wrap, No. 4 non-calcareous stone

backfill, and a vacuum source, as seen in Figure 1. They are installed after a cell is excavated/constructed and prior to it being filled with waste. These collectors are sloped in a saw tooth formation comprising of low-points (LPs) and high-points (HPs). To promote drainage of liquids that may enter the collector, the LPs can be strategically placed above the leachate collectors, or a rock pit can be installed beneath the LPs.

## An Early Collection Success Story

SCS designed and installed early collectors at the Lena Road Landfill (Landfill) located in Manatee County, FL. The Solid Waste Division at Manatee County (County) strives for innovative ideas and preventative measures to their landfill. Early collection of new waste would benefit the County's LFG powered Sludge Dryer Facility onsite. Construction of the early collectors took place immediately following the completion of their new Cell 4A in February 2022. Waste was placed in the cell a few weeks following the installation. Figure 2 shows the installation of the early collectors during construction.

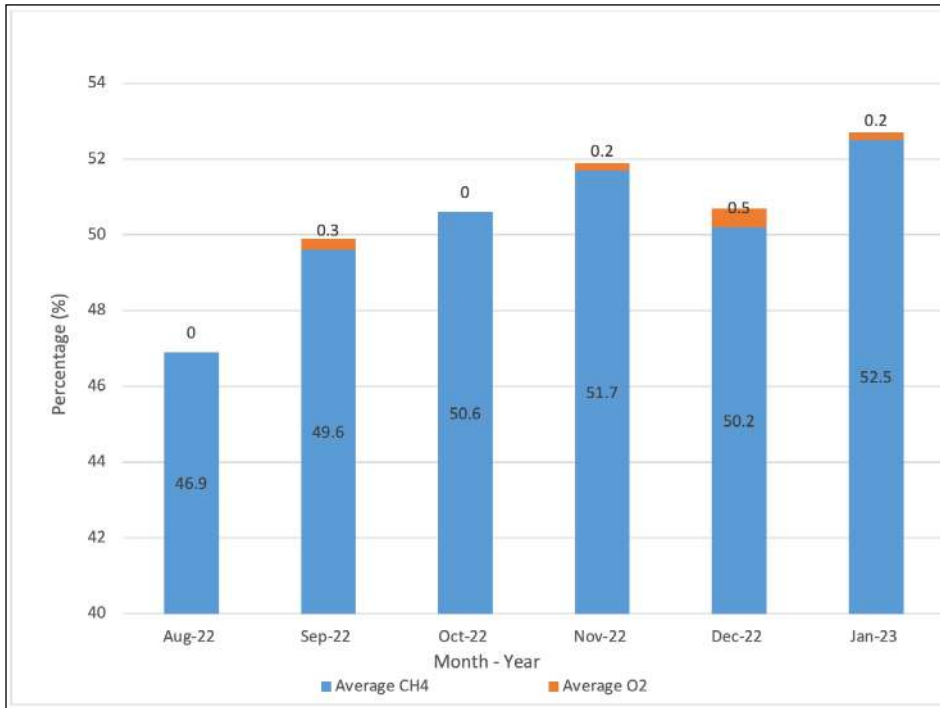


Figure 3 - Average gas quality of Cell 4A Early Collection System.

Gas collection from the early collector commenced in May 2022 and has shown excellent gas quality, which can be seen in the data presented in Figure 3. The County benefitted so much from the early collectors installed in Cell 4A, that early collectors were implemented into new Cells 4C, 5A, and 5B.

#### Applicability and Outlook

Early collectors are becoming increasingly popular in GCCS designs. They are a low-cost preventative measure for gas migration that can be altered to fit most landfill cell designs. When considering the applicability of an early collection system in your next GCCS design, consider the benefits of installing these systems:

- Early access to waste degradation which can lead to overall improvement of gas quality
- Low maintenance and cost-effective alternative to early in-waste horizontal collectors
- Minimal disturbance of day-to-day landfill operations
- Preventative measure for gas migration and surface emissions

In recent years, the U.S. regulatory agencies have focused on methane emissions from landfills and there are no signs of it slowing down. It is possible that earlier gas collection could even become a requirement in the future. Incorporating early collection systems in GCCS and cell designs now will help ease the transitional period if the rules are incorporated into new regulations.

*Stephanie Liptak, E.I.T. is a Senior Project Professional with SCS Engineers. She can be reached at (813) 804-6738 or e-mail [sliptak@scsengineers.com](mailto:sliptak@scsengineers.com).*

*Laila Al-Khalaf, E.I.T. is a Staff Professional with SCS Engineers. She can be reached at (813) 270-0518 or e-mail [lal-khalaf@scsengineers.com](mailto:lal-khalaf@scsengineers.com).*

*Anthony Detweiler is the Operations Supervisor at the Lena Road Landfill. He can be reached at (941) 748-5543 or e-mail [anthony.detweiler@mymanatee.org](mailto:anthony.detweiler@mymanatee.org).*