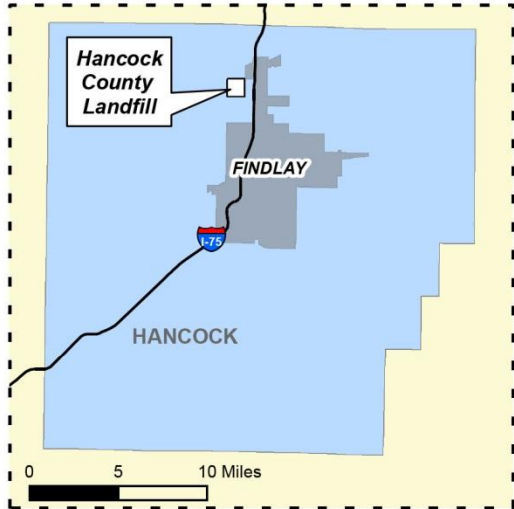


Hancock County Landfill Gas to Electric Project

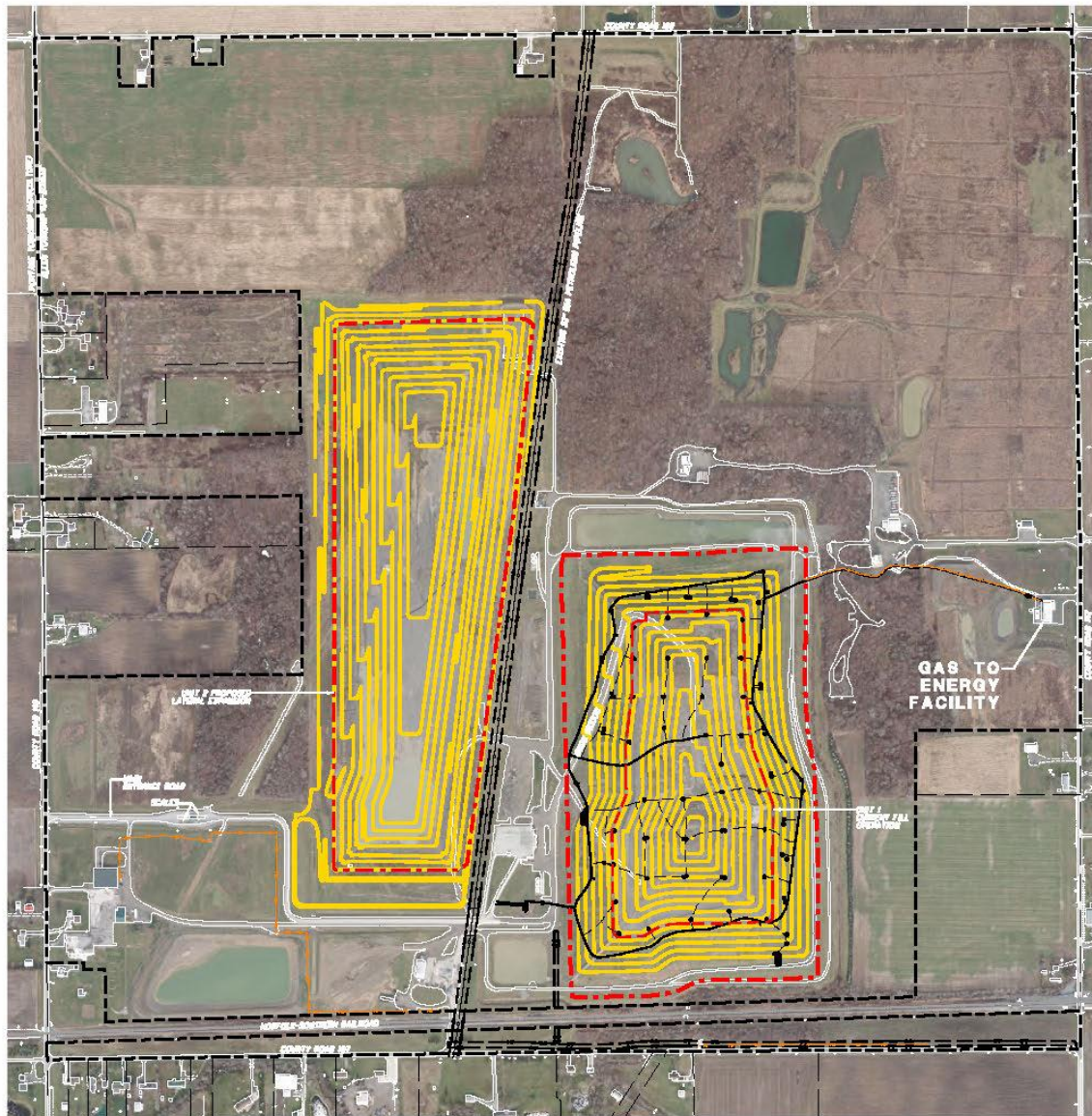
Steve Wilson, PE, PS
Sanitary Engineer
Hancock County, Ohio





**LANDFILL METHANE OUTREACH PROGRAM
HANCOCK COUNTY 2015**





**LANDFILL METHANE OUTREACH PROGRAM
HANCOCK COUNTY 2015**



Landfill History

- Hancock County is a single county Solid Waste Management District
- Landfill opened in 1969 as a “trench & cover” facility
- Municipal and industrial solid waste and C&DD
- AMDWR is 750 TPD, average daily is 450 TPD



Landfill History

- Subtitle D regulations required closure of original facility – vertical expansion
- Permitted capacity – 5.5 million CY (0.7 million in vertical expansion)
- Four years remaining life in vertical – will begin construction on lateral expansion in 2016



Landfill gatehouse



Residential drop off facility

Landfill History

- Hancock County SWMD has a very active voluntary recycling program
 - there is no curb-side pick-up
 - “Litter Landing” is the main recycling facility with 21 remote drop sites
 - 2,200 tons of material were recycled in 2014



Preschool tour



Litter Landing

Landfill Gas Project History

The Landfill has had a passive gas system since operations began and will not be required, by regulations, to have an active system for many years. The gas collection system that has been installed is a voluntary action and thus eligible for Carbon Credits.

2007	Granger made a site visit to gauge County's interest in a Gas to Energy project
2008	County requested RFP's from landfill gas developers (10 proposals were received)
2009	Granger Electric and County executed an agreement for landfill gas purchase and property lease rights.
June, 2010	Granger designed, permitted and constructed active landfill gas collection and flaring systems <ul style="list-style-type: none">•System has continuously collected and destroyed approximately 1,000 to 1,200 standard cubic feet per minute (scfm) of landfill gas, with a measured gas quality of 50% methane or better.•Carbon credits generated from the voluntary collection and control of landfill gas are currently sold under contract to Origin Climate formerly know as Terra Pass.



Landfill Gas Project History

2008 -2014	Granger engaged all major utilities in the state of Ohio and all potential direct-use gas customers within a two mile radius of the site in an effort to find the project best suited to maximize the use of the landfill gas.
2014	Granger signed a long term Power Purchase Agreement with Buckeye Power and the Hancock Wood Electric Cooperative.
November, 2013	Granger broke ground on the electrical generating facility. Power pricing in the Midwest is very competitive which required Granger to utilize four (4) of its own rebuilt CAT 3516 engine-generators resulting in significantly lower project capital costs.
August, 2014 - Current	Granger began generating electricity – normal operations stabilized within 60 days <ul style="list-style-type: none">•Project is exporting approximately 2.4 MW• 0.8 MW is available as soon as more gas becomes available



What Made This Project Work

- Hancock County proactively sought gas development to stay ahead of air quality regulations.
- Innovative lease agreement obligated Granger to install, own, and operate landfill gas collection system and flare, and to develop a commercially viable landfill gas to energy project at no cost to the County.
- County benefitted by having no investment, no operating costs, improved local air quality and receives revenue based on gas consumption and quality.

What Made This Project Work

- Strong support from Hancock Wood Electric was vital to obtaining a power purchase agreement that gave Granger confidence to proceed with investment in generating facility.
- Teamwork - “This project has been a joy to work on. Hancock County has been the most professional and helpful public organization I’ve ever dealt with, and their landfill is managed as good as any I’ve worked at. The folks at Buckeye Power and the Hancock Wood Electric Cooperative are technically astute, business savvy and downright pleasant.” Todd Davlin – Granger Electric

What Made This Project Work

- Hancock County residents have been updated on the project progress in the local newspaper.
- The electric generating station will host tours for community groups.
- As a new member of the community, Granger has become a part of the landfill operations team as well as a member of the Hancock Wood Electric Cooperative
- Granger will join Hancock Wood to support to support community and education outreach activities.

Public Private Partnerships

Good working relationships with like-minded people

– *Do things right!*

Hancock County operating a very well run landfill
+ Granger operating a state of the science power plant
= The two-facilities complementing each other



Public/Private Partnerships

Challenging economics require flexibility

The original wellfield and flare project relied heavily on Carbon Credits. When the voluntary carbon market dried up Origin Climate, Granger and Hancock County kept an open dialogue about options. There is still revenue from carbon credits, albeit less than originally anticipated.



Public/Private Partnerships

Challenging economics require flexibility

The original plant design included a more elaborate building with a conference room and community education center. When the electric and Carbon Credit markets declined during the economic downturn, Granger and the county agreed to a less expensive alternative. Open dialogue and a commitment to using the landfill gas productively ultimately lead to a simpler plant, but a viable project.



Public/Private Partnerships

Challenging economics require flexibility

Electric market pricing in Ohio forced reconsideration of installing new CAT 3520 engines. Ultimately, project economics required using rebuilt CAT 3516 engine generators.



Public/Private Partnerships

Challenging economics require flexibility

Being flexible and communicating with our partners has allowed this project to be successful despite challenging market conditions and a sluggish economy.

