



## **Recuperative Thermal Oxidizer with Two (2) Heat Exchangers Provides Significant Energy Savings at an LFG Facility While Destroying VOCs**

### The Issue

An alternative Electric Power Generation facility had been leasing a Direct-Fired Thermal Oxidizer from Pollution Systems for approximately two (2) years at their LFG gas-to-energy site in the Northeast. An energy study was done on the site, and significant energy savings were identified with very good payback. The facility had multiple waste streams generated from the reclamation of landfill gas tanks, bioreactors, and media beds to oxidize and wanted to combine them into one and have a single, permanent oxidizer system handle the combined waste streams. Among the recommendations for increasing energy savings was the incorporation of a heat exchanger to preheat the combined incoming waste stream. The addition of a secondary heat recovery system would provide even greater energy savings by preheating the inlet air stream for the plant's siloxane purge process. Other critical performance goals for the customer were:

- VOC destruction rate efficiency (DRE) of 99% or 10 ppm as Methane @ 3% O<sub>2</sub>
- Long term, continuous system operation with low maintenance and operating costs
- Automated operations with minimal interface requirements and
- Cost effective, reliable design

National Grid, the energy provider for the Tri-state area, was offering significant financial incentives for opportunities to reduce gas and electric consumption to avoid capital expenditures necessary to add capacity. Timing was a major consideration.

### The Solution

After carefully reviewing the process application, Pollution Systems recommended the installation of a Recuperative Thermal Oxidizer with a 70% thermally efficient primary heat exchanger to preheat the incoming waste stream, and another 70% thermally efficient secondary heat exchanger to reduce the preheat load for the siloxane purge process. Recuperative Thermal Oxidizers are proven technology for waste gas streams requiring heat recovery. They are also a good choice for waste gas streams like this which contain particulates.

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### The Deciding Factor

Pollution Systems' engineering team designed and built a Recuperative Thermal Oxidizer Model # TO-5 RHE with a primary and secondary heat exchanger sized to process the 4800 SCFM of VOC and siloxane-laden stream at a >99% VOC destruction rate efficiency. The system was fully automated for ease of startup and minimal operator interaction. The TO-5 RHE system's two (2) shell and tube heat exchangers also incorporated access doors which allowed easy access for necessary periodic cleaning of the tubes. The Recuperative Thermal Oxidizer Model # TO-5 RHE, with few significant moving parts other than system fans, provided very high on-stream time and, due to few maintenance concerns, met the facility's desire for long-term, continuous operation with low maintenance.

### The Final Result

Pollution Systems delivered the Recuperative Thermal Oxidizer Model # TO-5 RHE with Primary and Secondary Heat Exchangers quickly as desired and within budget. Once installed, Pollution Systems successfully commissioned the unit on the process and trained the customer regarding its maintenance and operation. The Recuperative Thermal Oxidizer successfully abated @>+99% DRE of the VOC from the multiple waste streams sent to the oxidizer for treatment. Overall, the customer was very happy with the cost, ease of operation, and reliability of the system.

