Guild Associates, Inc.

Molecular Gate™

Case Study : Carbon Dioxide Removal from Landfill Gas

A landfill in Millington, TN uses a Molecular Gate™ PSA system to upgrade landfill gas to pipeline quality Renewable Natural Gas (RNG)

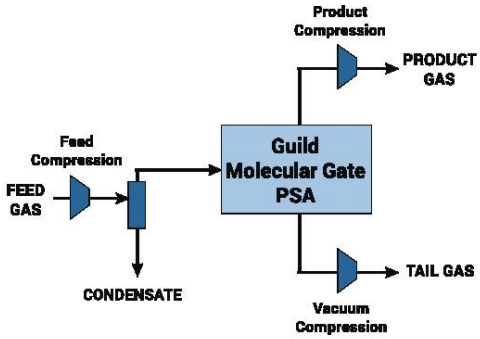
Clean Energy Renewables owns and operates a Molecular Gate Pressure Swing Adsorbtion (PSA) system at the North Shelby County landfill in Millington, TN. Guild supplied the feed compression, PSA, vacuum compression and product compression for the project. The PSA removes carbon dioxide (CO2), hydrogen sulfide (H2S), volatile organic chemicals (VOCs), siloxanes, and water to meet the pipeline specification. Oxygen and nitrogen rejection are not required at this site as their concentration from the landfill is managed by tuning the well field.

The landfill feed gas is compressed to 100 psig and cooled to remove the bulk of the water as condensate.

This low-moisture gas is re-heated with the waste heat of the compressor to 150°F and fed into the PSA, the contaminants are removed. This product gas from the PSA is fed to compressors where it is boosted to the pipeline pressure of 275 psig.

The plant operates with 98% up time and a methane recovery of 95%.

The current system capacity is 2,800 SCFM, with a future capacity of 4,800 through two planned expansions. This plant has been operational since July 2014, and is using the original adsorbent charge.



Mass Balance Table			
	FEED	PRODUCT	TAIL
Feed Flow (SCFM)	2800	1452	1200
Pressure (psig)	3	275	2
Temperature (°F)	100	120	180
COMPOSITION (mole %)			
Methane (CH4)	54.81	94.06	14.06
Nitrogen (N2)	1.99	3.84	0.00
Carbon Dioxide (CO2)	37.18	1.10	85.37
Oxygen (O2)	0.52	1.00	0.00
Water (H2O)	5.42	0.00	0.36
Hydrogen Sulfide (H2S) ppm	200	4	400

About Guild Associates

Guild Associates is the sole licensee of BASF's Molecular Gate™ Adsorbent. PSA systems using Molecular Gate™ adsorbent were first commercialized in 2004.

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3-17