

Molecular Gate™ Adsorption Technology

Upgrading Wastewater Digester Gas for the San Antonio Water System (SAWS)



The Molecular Gate™ PSA unit

The largest USA wastewater treatment plant (WWTP) digester gas purifier is operating for the City of San Antonio. Guild Associates, Inc provided the system to upgrade 1,300 standard cubic feet per minute (SCFM) of raw digester gas from 60 percent methane to pipeline quality gas in a single step.

Guild equipment was provided to Ameresco, who owns as well as designed, engineered, permitted, constructed, operates, manages and maintains the gas conditioning and distribution facility and the pipelines necessary to transfer and sell the gas to commercial natural gas pipelines. "This is the culmination of a tremendous amount of hard work and ingenuity, along with a great partnership with SAWS, in order to implement this groundbreaking 'renewable resource' project," said Michel T. Bakas, Ameresco's Vice President of Renewable Energy. "This is an exciting project for the partners."

To date, Guild has provided more than 30 PSA systems to upgrade a wide variety of feed streams, including digester gases, landfill gas, contaminated natural gas and coal bed gases. The gas cleanup for SAWS is built upon this experience base along with improvements that remove H₂S and siloxanes in a single step when the water vapor and CO₂ impurities are removed from the digester gases.

"Guild's design and packaging of the compression and clean-up system and the removal of all impurities in a single step allows for a cost effective and well integrated solution for producing this green energy," said Mike Mitariten, VP of Gas Separations for Guild. "We look forward to many more such projects."

Digester gas systems producing biogas to pipeline, CNG and LNG are becoming increasingly common based on the wide range of benefits offered when compared to electricity generation - one of which is a better return on investment. Another draw is the relative simplicity when compared to operating gas engines.



A Guild packaged biogas feed compressor

In SAWS' process, biogas is compressed in a packaged oil flooded screw compressor to 100 pounds per square inch (psig) before being introduced to the Guild PSA adsorption system. Water vapor, carbon dioxide, H₂S, VOCs and siloxanes are removed to yield a product gas that meets pipeline specifications. The product gas is delivered at 90 psig and then further compressed to 750 psig for injection into a high pressure sales gas pipeline.

The system removes the water to the pipeline specifications of less than 7 pounds per million standard cubic feet (MMSCF), removes the H₂S to a typical requirement of 4 parts per million (ppm), removes the siloxanes to parts per billion (ppb) levels, and removes the carbon dioxide to less than 2 percent, as required by the pipeline specification.

About Ameresco

Ameresco, Inc. is the largest independent comprehensive energy solutions provider in North America. Ameresco uses innovative strategies, systems, and technologies for renewable and sustainable energy generation and infrastructure renewal, thereby reducing operating expenses, increasing energy reliability and enhancing the environment. Please visit ameresco.com.

About Guild Associates

Guild Associates is the exclusive USA licensee of the Molecular Gate technology originally developed by Engelhard Corporation (now part of the BASF Group). Guild provides adsorption and catalyst systems to a variety of markets as well as shop fabricated engineered systems including Molecular Gate systems.

Contact

To learn more about Molecular Gate technology contact Michael Mitariten by phone, at 908-752-6420 or by email at mike@moleculargate.com. You can also visit us on the Internet at www.moleculargate.com.

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