

**Staff Summary
Method 2B Application**

**Applied Natural Gas Fuels, Inc.
Fresh Kills Landfill Gas (Staten Island, New York) to Liquefied Natural Gas
and Liquefied-to-Compressed Natural Gas Delivered in California
(Pathway Codes: CNG046 and LNG032)**

Deemed Complete Date: September 10, 2015
Posted for Comments Date: November 20, 2015
Certified Date: December 1, 2015

Pathway Summary

Applied Natural Gas Fuels, Inc. (ANGF) has applied for two landfill-gas-to-biomethane fuel pathways. The landfill gas (LFG) for both pathways is extracted from the Fresh Kills Landfill in Staten Island, New York. The landfill and the LFG Recovery Facility both are owned and operated by the City of New York Department of Sanitation (DSNY). Rights to all biomethane from the Fresh Kills Landfill are received by EM Gas Marketing, LLC (EMGM) and gas delivery is tracked to ANGF liquefaction facility in Topock, Arizona by EMGM. One pathway covers the liquefaction of the resulting biomethane at ANGF liquefaction facility and the dispensing of the fuel as liquefied natural gas (LNG); the other pathway covers the liquefaction of the resulting biomethane at ANGF liquefaction facility and the subsequent vaporization and compression of the liquefied natural gas into compressed natural gas (L-CNG). All fueling stations covered by these pathways are located in California.

LFG from the Fresh Kills Landfill is cleaned up using grid electricity and buy back¹ natural gas from the pipeline system. Natural gas is used in the compressor, thermal oxidizer, and flare pilot. The thermal oxidizer and flare are used to destroy LFG when the processing plant is not fully operational.

The pathway utilizes the CA-GREET1.8b default values for LFG recovery and L-CNG conversion. To determine combustion emissions from the consumed natural gas, the flare and the thermal oxidizer, the CA-GREET1.8b default values for natural gas combustion in a turbine were used. These emissions factors are more representative of operations at the Fresh Kills Landfill plant than are the emission factors for a compressor powered by a natural gas engine. ANGF had previously applied for a pathway for North American landfill gas that used conservative inputs values². The Fresh Kills landfill gas pathway uses specific input values which results in improved CI.

¹ Buy back gas: natural gas supplied to the pipeline grid is used in the Thermal Oxidizer

² Pathway LNG012_1: <http://www.arb.ca.gov/fuels/lcfs/2a2b/apps/angf-nalfg-011414.pdf>

The biomethane from the Fresh Kills LFG processing plant is injected into the interstate pipeline system for conveyance to ANGF plant in Topock, Arizona. The pipeline transport distance is 2,800 miles. As such, ANGF will be obligated to retain records that unequivocally demonstrate that the credits earned under the pathways described in this Summary correspond directly with the volumes of biomethane produced at the Fresh Kills Landfill in Staten Island, New York.

Carbon Intensity of LNG and L-CNG Produced

As shown in table below, the applicant has calculated the CIs of its LNG and L-CNG pathways to be 31.84 and 32.24 gCO₂e/MJ, respectively.

Proposed Lookup Table Entries

Fuel	Pathway Identifier	Pathway Description	Carbon Intensity Values (gCO ₂ e/MJ)		
			Direct Emissions	Land Use or Other Indirect Effects	Total
LNG from LFG	LNG032	2B Application*: New York landfill gas to pipeline-quality biomethane; delivered via pipeline; liquefied to LNG in Arizona; transported by trucks to California	31.84	0	31.84
L-CNG from LFG	CNG046	2B Application*: New York landfill gas to pipeline-quality biomethane, delivered via pipeline, liquefied in Arizona; transported by trucks to California; re-gasified and compressed to L-CNG in California	32.24	0	32.24

* Specific Conditions Apply.

Operating Conditions

1. Actual pathway energy consumption values shall remain at or below the levels specified in ANGF application. These pathways were calculated using LFG production data (gas sales) covering May 2012 through August 2014 and LNG liquefaction and CNG compression data covering calendar years January 2013 and December 2014³. The recovery and processing efficiency levels at the Fresh Kills Landfill in Staten Island, New York shall

³ Two different time periods of data were originated from the two different companies, where confidential business information from one could not be revealed to the other.

remain at or above the levels specified in the ANGF application. In addition, the liquefaction efficiency at the Topock LNG plant shall remain at or above the levels specified in the application.

2. Because the biomethane supplied under this pathway is commingled with fossil natural gas both when it enters the interstate pipeline system and when it enters ANGF Topock liquefaction facility, ANGF and EMGM must maintain an accounting system that will enable it to demonstrate unequivocally at any time that every unit of biomethane-based transportation fuel sold and reported under the LCFS can be associated with an equal unit of biomethane produced at the Fresh Kills Landfill.
3. ANGF and EMGM must unequivocally demonstrate that the biomethane that Fresh Kills landfill supplies to the natural gas pipeline has been stripped of its renewable attributes (e.g. Fresh Kills landfill, owned by DSNY, is supplying fossil methane in its contracts with the pipeline company).
4. ANGF and EMGM shall provide signed statements from any party to whom it conveys the biomethane from Fresh Kills Landfill attesting under penalty of perjury under California law that all environmental attributes pursuant to this pathway, including the right to generate credits under the LCFS, are exclusively reserved to ANGF and EMGM, and the party will not claim or has not claimed credit for volumes reported in California's LCFS program under any other governmental program except the federal RFS.

Staff Analysis and Recommendations

Staff has reviewed Fresh Kills application for the production of L-CNG and LNG from LFG originating in Staten Island, New York. Staff has replicated, using the CA-GREET1.8b spreadsheet, the CI values calculated by ANGF and EMGM. ANGF and EMGM have provided documentation in support of the key components of its pathways: energy consumption at the New York LFG processing plant (EMGM) and the ANGF liquefaction plant (ANGF). It has also provided the volumes of LNG and CNG produced. Staff is satisfied that the energy consumption levels reported in ANGF and EMGM application accurately represent actual usage for the time period for which records were submitted, and that ANGF/EMGM is capable of maintaining CIs that are at or below those shown in the table above. Therefore, staff recommends that ANGF Method 2B application for LFG-to-LNG and LFG-to-L-CNG pathways be certified, subject to the operating conditions set forth in this staff summary.