LIBERTY UTILITIES (PEACH STATE NATURAL GAS) CORP.

SERVICE REGULATION NO. 10

LOCAL GAS QUALITY STANDARDS

10.0 All conforming local gas delivered to the Company in accordance with Rate Schedule 870 shall meet the more stringent specific gas quality standard of (a) the Interstate Natural Gas Pipeline serving the portion of the Company's distribution system wherein the local gas is delivered to the Company, or (b) the Gas Quality standards as follows:

10.1 Application and Purpose

These standards apply to all local gas injected into the Liberty Utilities gas distribution system. These specifications ensure that RNG to be injected into the system is within expected operating parameters and interchangeable with natural gas, without regard to local gas sources.

10.2 Specifications

Local gas composition must meet the specifications outlined in Table 1. The values shown in Table 1 represent maximum levels, unless a range of values is indicated. Minimum and maximum pressures will be set for each local gas production facility on a case-by-case basis.

In summary, in order to be injected into the Liberty Utilities gas distribution system, RNG must:

- Not contain any contaminants, particles, or other impurities at a concentration that are known as a threat to the integrity of the system, human health, or the environment.
- Have an energy content no lower than 970 btu/scf and no higher than 1110 btu/scf.
- Have a Wobbe Index during normal operation no lower than 1270 and no higher than 1400 btu/scf.
- Not contain more than 2% by volume of carbon dioxide.
- Not contain more than 0.4% by volume of oxygen.
- Not contain more than 4% by volume of total inerts.
- Not contain more than 7lbs / million scf of water content.
- Not contain more than 0.3% by volume of hydrogen.
- Not contain more than .25 grains / 100scf (4.125 ppm) of hydrogen sulfide.
- Not contain more than 1 grain / 100scf (16.5 ppm) of total sulfur.
- Not contain more than 10ppm of ammonia.
- Not contain more than 0.5ppm of total siloxanes (depending on molecular weight).
- Not contain more than 1-2ppm of halocarbons and organochlorinated compounds (depending on molecular weight).

- Be technically free of volatile organic compound, bacteria, particles, and dust.
- Not form liquid hydrocarbons at temperatures of 15°F or higher at the delivery pressure.
- Be delivered at a maximum temperature of 86°F.

Table 1: Renewable Natural Gas – Pipeline Gas Quality Specifications

		Value	Unit	Monitoring Frequency*	Recommended Test
Heating Value	HV	970 - 1110	BTU/scf	Continuous	D1945 / D7164
Wobbe Index	WN	1270 – 1400	BTU/scf	Continuous	D1945 / D7164
Carbon Dioxide	CO_2	2	% vol	Continuous	D1945
Oxygen	O_2	0.1 - 0.4	% vol	Continuous	D1945
Total Inerts		4	% vol	Continuous	D1945
Water Content	H_2O	7	Lbs/Mscf	Continuous	D1142 / D5454 / D3588
Hydrogen	H_2	0.1 – 0.3	% vol	Periodic	D1945
Hydrogen Sulfide	H_2S	4.125	ppm	Continuous	D4084 / D6228 / D4468 / D5504 / D7166
Total Sulfur	S	16.5	ppm	Periodic	D4084 / D6228 / D4468 / D5504 / D7166
Ammonia	NH_3	10	ppm	Periodic	D1945
Siloxanes	Si	0.5	ppm	Periodic	E.g., Gas Chromatography (ELCD, AED, MS)
Halocarbons and organochlorinated compounds		1 - 2	ppm	Periodic	E.g., Gas Chromatography / Electrolytic Conductivity Detector
Volatile organic compound	VOCs	Technically free of		Periodic	E.g., Gas Chromatography / Mass Spectrometry (GC/MS)
Bacteria		Technically free of		Periodic	E.g., Most Probable Number Determination of Total Live Bacteria (MPN), others
Particles, dust, etc.		Technically free of		Continuous	E.g., Environmental recommendations 0.1µm filters
Hydrocarbon Dew Point		15 / -9	°F / C°	Continuous	D5504 / D1142
Delivery Temperature (plastic pipe)		86 / 30	°F / C°	Continuous	

** In this document, continuous monitoring means real-time or near-real time. Periodic monitoring could be seasonal, semi-annually, or annually. Final monitoring frequency will be defined for each RNG facility*