

## Southern Star Central Gas Pipeline, Inc.

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# Southern Star Central Gas Pipeline, Inc.

## Gas Quality

### Sampling and Analytical Procedures

#### Overview

The natural gas industry relies on various entities (AGA, API, GPA etc.) for producing and maintaining standards relevant to measurement and gas quality. Often times the various groups collaborate on a specific standard and a standard is published by each group and identified by a different reference number but with the same title. Southern Star Central Gas Pipeline evaluates the various standards and complies with those that are most relevant to natural gas transmission.

For gas quality there are several standards that are utilized depending on the process or function being performed. Below is a list of standards relevant to sampling and analytical processes for determination of natural gas quality used by Southern Star Central Gas Pipeline, Inc. that are being posted per the NEASB WGQ Version 1.8 Section 4.3.90 requirements with a description of each standard.

#### Obtaining Gas Samples

- ***API 14.1, February 2006 Revision – “Collecting and Handling of Natural Gas Samples for Custody Transfer”***
  - The purpose of this standard is to provide a comprehensive guideline for properly collecting, conditioning and handling representative samples of natural gas that are at or above their hydrocarbon dew point.
  - The Standard considers spot, composite, continuous, and mobile sampling systems.
- ***Southern Star Central Gas Pipeline O&M Policy & Procedure – Gas Sampling***
  - Provides general guidelines on how and where to obtain samples and references API 14.1 as the approved sampling standard for outlining the methods.
  - Provides specific instruction on obtaining spot and composite gas analysis as well as sample identification and safe transportation to the laboratory.

#### Analytical Test Methods

- ***GPA Standard 2261, Year 2000 Revision – Analysis for Natural Gas and Similar Gaseous Mixtures by Gas Chromatography***
  - This method covers the determination of the chemical composition of natural gas and similar gaseous mixtures within specified ranges listed in the standard for gas concentration.

- ***GPA Standard 2286, Year 1995 Revision – Tentative Method of Extended Analysis for Natural Gas and Similar Gaseous Mixtures by Temperature Programmed Gas Chromatography***
  - This method covers the determination of the chemical composition of natural gas and similar gaseous mixtures within specified ranges listed in the standard. This method is intended for use with rich gas streams and in situations where heptanes plus compositional breakdown is desired.
- ***Southern Star Central Gas Pipeline Policies & Procedures – Gas Chromatographs - Operation and Maintenance***
  - Provides guidelines on frequency of calibration and minimum requirements for inspection as well as reference standards and carrier gases.
  - Provides specific procedures for operating and maintaining Daniel Gas Chromatographs and moderate troubleshooting tips.
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### **Physical Properties**

- ***GPA Standard 2145, January 2009 Revision, Rev. 1 – Physical Constants for Paraffin Hydrocarbons and Other Components of Natural Gas. Data are given in both English and SI Units***
  - The Table of Physical Properties for Hydrocarbons and Other Components of Interest to the Natural Gas Industry provides the gas processing industry with a convenient compilation of authoritative numerical values for the paraffin hydrocarbons and other compounds occurring in natural gas and natural gas liquids. Most properties are based on NIST (National Institute for Standards and Technology) databases. The numbers presented are checked, evaluated, and recalculated as necessary by NIST personnel.

### **Calculations**

- ***GPA Standard 2172, January 2009 Revision – Calculation of Gross Heating Value, Relative Density, and Compressibility of Natural Gas Mixtures from Compositional Analysis***
  - This Standard presents procedures for calculating, at base conditions from composition, the following properties of natural gas mixtures: gross heating value, relative density (real and ideal), and compressibility factor.
- ***AGA Report No. 8, July 1994 Revision – Compressibility Factors of Natural Gas and Other Related Hydrocarbon Gases***
  - This report presents detailed information for precise computations of compressibility factors and densities of natural gas and other hydrocarbon gases, calculation uncertainty estimations.