

## Gas Quality Industry Standards Utilized

### Chromatograph Standards:

API 14.1

*(Collection and Handling of Natural Gas Samples for Custody Transfer)*

ASTM D 1945

*(Standard Test Method for Analysis of Natural Gas by Gas Chromatography)*

GPA 2172

*(Calculation of Gross Heating Value, Relative Density and Compressibility Factor for Natural Gas Mixtures from Compositional Analysis)*

ISO 6976

*(Calculation of calorific values, relative density and Wobbe index from composition)*

GPA 2145

*(Table of Physical Constants of Paraffin Hydrocarbons and Other Components of Natural Gas)*

### Bottle Sampling:

API 14.1

*(Collection and Handling of Natural Gas Samples for Custody Transfer)*

GPA 2172

*(Calculation of Gross Heating Value, Relative Density and Compressibility Factor for Natural Gas Mixtures from Compositional Analysis)*

GPA 2198

*(Selection, Preparation, Validation, Care and Storage of Natural Gas and Natural Gas Liquids Reference Standard Blends)*

GPA 2145

*(Table of Physical Constants of Paraffin Hydrocarbons and Other Components of Natural Gas)*

GPA 2261

*(Analysis for Natural Gas and Similar Gaseous Mixtures by Gas Chromatography)*

GPA 2177

*(Analysis of Natural Gas Liquid Mixtures Containing Nitrogen and Carbon Dioxide by Gas Chromatography)*

GPA 2199

*(Determination of Specific Sulfur Compounds by Capillary Gas Chromatography and Sulfur Chemiluminescence Detection)*

GPA 2186

*(Tentative Method for the Extended Analysis of Hydrocarbon Liquid Mixtures Containing Nitrogen and Carbon Dioxide by Temperature Programmed Gas Chromatography)*

GPA 2103

*(Tentative Method for Analysis of Natural Gas Condensate Mixtures Containing Nitrogen and Carbon Dioxide by Gas Chromatography)*

GPA 2286

*(Tentative Method for the Extended Analysis for Natural Gas and Similar Gaseous Mixtures by Temperature Programmed Gas Chromatography)*

### Online Analyzers:

ASTM D4084

*(Standard Test Method for Analysis of Hydrogen Sulfide in Gaseous Fuels – Lead Acetate Reaction Rate Method)*

ASTM D5454

*(Standard Test Method for Water Vapor Content in Gaseous Fuels Using Electronic Moisture Analyzer)*

### **Field Tests:**

**ASTM D 4984**

*(Standard Test Method for Carbon Dioxide in Natural Gas Using Length of Stain Detector Tubes)*

**ASTM D 4810**

*(Standard Test Method for Hydrogen Sulfide in Natural Gas Using Length-of-Stain Detector Tubes)*

**ASTM D 4888**

*(Standard Test Method for Water Vapor in Natural Gas Using Length-of-Stain Detector Tubes)*

### **Cricondentherm Hydrocarbon Dew Point:**

The Hydrocarbon Dew Point Calculations are performed using Oil Phase DBR software program (November 2004 Release) and the Peng-Robinson equation of state. The Hexane Plus values (Hexane, Heptane, and Octane) are the same assumed values used for the volume and Dekatherm calculations. The ratio is 47.466% Hexane, 35.340% Heptane, and 17.194% Octane. The Hexane Plus values assumption is that Nonane and Decane do not exist in the flowing gas stream.