

NORTHWEST NATURAL GAS COMPANY
 WN U-6 Third Revision of Sheet 11.1
 Cancels Second Revision of Sheet 11.1

GENERAL RULES AND REGULATIONS
 (continued)

Rule 11. Determination of Thermal Units.

The quality of Natural Gas procured and delivered by Company, or by Customers under **SCHEDULE T**, shall conform to standard purity requirements of the Commission; shall have an energy content of 1050 Btu per standard cubic foot ± 10 percent (945 to 1155); and shall permit satisfactory operation of appliances.

Customers will be billed based on energy units, normally in therms. Determination of thermal units shall take into account metered volume, metering pressure, metering temperature, compressibility ratio and energy content of the gas. Therms will be computed to a standard base pressure of 14.73 PSIA and a standard temperature of 60 degrees Fahrenheit. Equipment and methods used for billing factor calculations may vary.

Total Energy = Metered Volume x Billing Factor, where Billing Factor = Pressure Factor (PF) X Temperature Factor (TF) X Compressibility Ratio (CR) X BTU Factor (C)
 (C)

Metered volume is measured by the meter at the customer premises. The meter index is the output device that provides the index volume readings, typically in hundreds of cubic feet (ccf). An index multiplier of 1 is used for most residential and commercial customers. Larger volume customers may have index multipliers of 10, 100, or 1000.

$$\text{Metered Volume} = \text{Index Volume} \times \text{Index Multiplier}$$

The pressure factor times compressibility ratio (PF x CR) for residential and small commercial customer billings will be approximately 1.0091 when metering pressure is 6.5 inches water column, and approximately 1.1293 for 2.0 psig metering pressure. For metering pressures above 2.0 psig, the pressure factor will be calculated on a customer-specific basis. Some meters may incorporate a pressure compensating device for automatic calculation of the pressure factor at the meter site.

$$\text{Pressure Factor (PF)} = \frac{\text{Metering Pressure (PSIG)} + \text{Atmospheric Pressure (PSIA)}}{14.73 \text{ PSIA}}$$

Atmospheric Pressure (PSIA) is determined from plat map average elevation and an average determined from the daily barometric pressure during the billing period.

$$\begin{aligned} \text{Atmospheric Pressure (PSIA)} &= 14.73 \times \text{Barometric Factor} \times \text{Elevation Factor} && (T) \\ \text{Barometric Factor} &= \frac{\text{PDX Barometer Reading (inHg)} + 0.025}{29.99} \\ \text{Elevation Factor} &= 0.9871 \times \frac{(55457 - \text{Elevation})}{(54735 + \text{Elevation})} \end{aligned}$$

(continue to Sheet 11.2)

Issued August 11, 2017
 NWN Advice No. WUTC 17-05

Effective with service on
 and after September 13, 2017