Appendix A

Explanatory Notes

The Energy Information Administration (EIA) publishes monthly data for the supply and disposition of natural gas in the United States in the *Natural Gas Monthly* (*NGM*). The information in this Appendix is provided to assist users in understanding the monthly data. Table A1 lists the methodologies for deriving the data to be published for the most recent months shown in Tables 1 and 2. The following explanatory notes describe sources for all *NGM* tables.

Note 1. Production

Monthly Data

Estimates of gross withdrawals and marketed production for the lower-48 States are derived from submissions by well operators on the monthly Form EIA-914, "Monthly Natural Gas Production Report." Production volumes are collected specifically for

Table A1. Methodology for Most Recent Monthly Natural Gas Supply and Disposition Data of Tables 1 and 2

Components	Reporting Methodology
Supply and Disposition	
Marketed Production	Estimated from sample data reported on Form EIA-914
Extraction Loss	Derived from data reported on Form EIA-816
Dry Production	Marketed Production minus Extraction Loss
Withdrawals from Storage	Reported on Form EIA-191M
Supplemental Gaseous Fuels	Derived from supply estimates and coal gasification information
Imports	Derived from the Office of Fossil Energy; estimated from National Energy Board of Canada information and liquefied natural gas information
Additions to Storage	Reported on Form EIA-191M
Exports	Derived from the Office of Fossil Energy; estimated from industry trends and liquefied natural gas information
Current-Month Consumption	Reported on Form EIA-857, Form EIA-923, and other sources below
Consumption by Sector	
Lease and Plant Fuel	Derived from Marketed Production
Pipeline and Distribution Use	Derived from Deliveries to Consumers
Residential	Estimated from sample data reported on Form EIA-857
Commercial	Estimated from sample data reported on Form EIA-857
Industrial	Estimated from sample data reported on Form EIA-857
Electric Power	Estimated from sample data reported on Form EIA-906, Form EIA-920, and, beginning in January 2008, Form EIA-923
Vehicle Fuel	EIA computations

Texas, Louisiana, Oklahoma, Wyoming, New Mexico, the Federal Offshore Gulf of Mexico, and the sum of all other States (except Alaska). (See http://www.eia.doe.gov/oil_gas/natural_gas/data_publications/eia914/eia914meth.pdf for an explanation of the procedure for estimating State gross withdrawals from reported volumes.) Gross withdrawals for the State of Alaska are obtained from summary reports posted by the State of Alaska, Oil and Gas Conservation Commission. Marketed production is estimated from gross withdrawals using historical relationships between the two, while taking into consideration recent disturbances to those relationships.

All monthly data are considered preliminary until after publication of the *Natural Gas Annual* (*NGA*) for the year in which the report month falls. Final monthly data are the sums of monthly data reported on the Form EIA-895A, "Annual Quantity and Value of Natural Gas Report."

Annual Data

Natural gas production data are collected from 32 gas-producing States on the voluntary Form EIA-895A. The form requests data on gross withdrawals, gas vented and flared, repressuring, nonhydrocarbon gases removed, fuel used on leases, marketed production (wet), and extraction loss. The U.S. Minerals Management Service (MMS) also supplies data on the quantity and value of natural gas production from the Federal waters of the Gulf of Mexico.

Note 2. Extraction Loss

Monthly Data

Monthly extraction loss is estimated from monthly natural gas liquids (NGL) production reported by gas processing plants on Form EIA-816, "Monthly Natural Gas Liquids Report." These liquid volumes are converted to natural gas equivalents using factors consistent with industry standards published by the Gas Processors Association, and instructions to respondents to EIA's annual survey of gas processing plants, Form EIA-64A, "Annual Report of the Origin of Natural Gas Liquids Production." Separate values are used for ethane, propane, isobutane, and normal butane. A value for "natural gasoline," reflecting pentanes and higher, is used. A separate value for isopentane is also used when reporting facilities have the capability to separate out and market isopentane on its own. The value for natural gasoline also includes isopentane - this value is used when estimating the volumetric equivalent of "pentanes plus" produced. These factors all are for "real" rather than "ideal" gas volumes stated at a pressure of 14.73 pounds per square inch absolute (psia) at 60 degrees Fahrenheit on a dry basis.

Annual Data

The final extraction loss estimates, published in the *NGA*, incorporate information received from gas processing plants on Form EIA-64A, "Annual Report of the Origin of Natural Gas Liquids Production." Monthly extraction loss estimates are recalibrated to equate to this total.

Note 3. Supplemental Gaseous Fuels

Monthly Data

All monthly data are considered preliminary until after the publication of the *NGA* for the year in which the report month falls. Monthly estimates are based on the annual ratio of supplemental gaseous fuels to the sum of dry gas production, net imports, and net withdrawals from storage. This ratio is applied to the monthly sum of these three elements to compute a monthly supplemental gaseous fuels figure.

Monthly data are revised after publication of the *NGA*. Final monthly data are estimated based on the revised annual ratio of supplemental gaseous fuels to the sum of dry gas production, net imports, and net withdrawals from storage. This revised ratio is applied to the revised monthly sum of these three supply elements to compute final monthly data.

Annual Data

Annual data on supplemental gaseous fuel supply are reported on Form EIA-176, "Annual Report of Natural and Supplemental Gas Supply and Disposition."

Note 4. Imports and Exports

Monthly Data - Imports

Preliminary monthly import data are based on data from the Office of Fossil Energy, U.S. Department of Energy, "Natural Gas Imports and Exports," the National Energy Board of Canada, and EIA estimates. Preliminary data are revised after the publication of the *NGA*.

Monthly Data - Exports

Preliminary monthly export data are based on current and historical data from the Office of Fossil Energy, U.S. Department of Energy, "Natural Gas Imports and Exports," informal industry contacts, and information

gathered from natural gas industry trade publications. Preliminary data are revised after publication of the *NGA*.

Annual Data and Final Monthly Data

Annual and final monthly data are supplied by the Office of Fossil Energy, U.S. Department of Energy, "Natural Gas Imports and Exports," which requires monthly data to be reported each quarter for the calendar year.

Note 5. Natural Gas Storage

Note that final monthly and annual storage levels, additions, and withdrawal data shown in Table 1 include both underground and liquefied natural gas (LNG) storage.

Monthly Data

Preliminary and final monthly data on underground storage levels, additions, and withdrawals are from the Form EIA-191M, "Monthly Underground Gas Storage Report." All operators of underground storage fields complete the survey.

Estimates of monthly LNG additions and withdrawals are calculated by applying the proportion of each month's net injections to underground storage during the injection season to annual LNG additions and the proportion of each month's net withdrawals from underground storage during the withdrawal season to annual LNG withdrawals.

There are three principal types of underground storage facilities in operation in the United States today: salt caverns (caverns hollowed out in salt "bed" or "dome" formations), depleted fields (depleted reservoirs in oil and/or gas fields), and aquifer reservoirs (water-only reservoirs conditioned to hold natural gas). A storage facility's daily deliverability or withdrawal capability is the amount of gas that can be withdrawn from it in a 24-hour period. Salt cavern storage facilities generally have high deliverability because all of the working gas in a given facility can be withdrawn in a relatively short period of time. (A typical salt cavern cycle is 10 days to deplete working gas, and 20 days to refill working gas.) By contrast, depleted field and aquifer reservoirs are designed and operated to withdraw all working gas over the course of an entire heating season (about 150 days). Further, while both traditional and salt cavern facilities can be switched from withdrawal to injection operations during the heating season, this is usually more quickly and easily done in salt cavern facilities, reflecting their greater operational flexibility.

Annual Data

Starting in 2003, final annual data on additions and withdrawals from underground storage facilities are the sum of the monthly data from the EIA-191.

Annual data on LNG additions and withdrawals are from the EIA-176.

Note 6. Consumption

Monthly Data

All monthly data are considered preliminary until after publication of the *NGA*.

Annual Data

All annual data are from the *NGA*. Total consumption is the sum of the components of consumption listed below. Monthly data are revised after publication of the *NGA*.

Residential, Commercial, and Industrial Sector Consumption

Preliminary estimates of monthly deliveries of natural gas to residential, commercial, and industrial consumers in 50 States are based on data reported on Form EIA-857, "Monthly Report of Natural Gas Purchases and Deliveries." See Appendix C, "Statistical Considerations," for a detailed explanation of sample selection and estimation procedures. Monthly data for a given year are revised after the publication of the *NGA* to correct for any sampling errors. Final monthly data are estimated by allocating annual consumption data from the Form EIA-176 to each month in proportion to monthly volumes reported in Form EIA-857.

Vehicle Fuel Use

Monthly U.S. total estimates of natural gas (compressed or liquefied) used as vehicle fuel are derived from an annual estimate of vehicle fuel use provided by the Coal, Nuclear, and Renewable Fuels Division of EIA. Monthly State-level vehicle fuel data are not available.

Electric Power Sector Consumption

Monthly estimates of deliveries of natural gas to electric power producers are derived from data submitted by the sample of electric power producers reporting monthly on Form EIA-906, "Power Plant Report"; Form EIA-920, "Combined Heat and Power Plant Report"; and predecessor forms. Beginning with 2008 monthly data, the Form EIA-923, "Power Plant Operations Report," replaced Form EIA-906, "Power Plant Report,"

and Form EIA-920, "Combined Heat and Power Plant Report." The estimates reported in the *NGM* represent gas delivered to electricity-only plants (utility and nonutility power producers) and combined heat and power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public. For a discussion of these estimates, see the *Electric Power Monthly*.

Pipeline and Distribution Use

Preliminary monthly estimates are based on the pipeline fuel consumption as an annual percentage of total consumption from the previous year's Form EIA-176. This percentage is applied to each month's sum of total deliveries plus lease and plant fuel to compute the monthly estimate.

Monthly data are revised after the publication of the *NGA*. Final monthly data are based on the revised annual ratio of pipeline fuel consumption to total consumption from the Form EIA-176. This ratio is applied to each month's revised sum of total deliveries plus lease and plant fuel to compute final monthly pipeline fuel consumption estimates.

Lease and Plant Fuel Consumption

Preliminary monthly data are estimated based on lease and plant fuel consumption as an annual percentage of marketed production. This percentage is applied to each month's marketed production figure to compute estimated lease and plant fuel consumption.

Monthly data are revised after publication of the *NGA*. Final monthly plant fuel data are based on a revised annual ratio of plant fuel consumption to marketed production from Form EIA-176. This ratio is applied to each month's revised marketed production figure to compute final monthly plant fuel consumption estimates. Final monthly lease data are collected on the Form EIA-895 and estimates from the Form EIA-176. See the *NGA* for a complete discussion of this process.

Note 7. Balancing Item

The balancing item category represents the difference between the sum of the components of natural gas supply and the sum of the components of natural gas disposition. These differences may be due to data reporting problems or to issues in survey coverage. Preliminary monthly data in the balancing item category are calculated by subtracting dry gas production, withdrawals from storage, supplemental gaseous fuels, and imports from total disposition. The balancing item may reflect problems in any of the surveys comprising natural gas supply or disposition. Reporting problems include differences due to the net result of conversions of flow data metered at varying temperatures and pressure bases and converted to a standard temperature and pressure base; the effect of variations in company accounting and billing practices; differences between billing cycles and calendar periods; and imbalances resulting from the merger of data reporting systems, which vary in scope, format, definitions, and type of respondents. Survey coverage problems include incomplete survey frames or problems in sampling design.

Annual data are from the *NGA*. For an explanation of the methodology used in calculating the annual balancing item, see the *NGA*.

Note 8. Average Price of Deliveries to Consumers

For most States, price data are representative of prices for gas sold and delivered to residential, commercial, and industrial consumers by local distribution companies. Published prices are considered to be total prices paid by end-users per thousand cubic feet of natural gas in the respective sectors, inclusive of all tax, delivery, commodity, demand and other charges. In the States of Georgia, Maryland, New York, Ohio, and Pennsylvania, the residential and commercial sector prices reported in the *NGM* include data on prices of gas sold to customers in those sectors by energy marketers. These latter data are collected on Form EIA-910, "Monthly Natural Gas Marketer Survey." Beginning in January 2005, the EIA-910 is collected in the States of Florida, Illinois, Massachusetts, Michigan, New Jersey, Virginia, West Virginia, and the District of Columbia as well. Residential and commercial sector prices reported in the *NGM* include data on prices of gas sold to customers in those States by energy marketers as data quality becomes acceptable. Except for these States, none of the prices reflect average prices of natural gas transported to consumers for the account of third parties. Table 22 indicates the percentage of total deliveries included in commercial and industrial price estimates.

Prices of natural gas delivered to the electric power sector through 2007 are derived from data reported on FERC Form-423, "Monthly Report of Cost and Quality of Fuels for Electric Power Plants"; Form EIA-423, "Monthly Cost and Quality of Fuels for Electric Plants Report"; and their predecessor forms. Beginning with 2008 data, the Form EIA-923, "Power Plant Operations Report," replaced those sources. In 2007, annual filers reported their cost and quality of fuels data on the new Form EIA-923. Prices from these surveys are also published in the *Electric Power Monthly*.

Note 9. Average Wellhead Price

Monthly Data

Preliminary values for the monthly U.S. natural gas wellhead price are estimated from the New York Mercantile Exchange (NYMEX) futures final settlement price for near-month delivery at the Henry Hub, and reported cash market prices at five major trading hubs: Henry Hub, LA; Carthage, TX; Katy, TX; Waha, TX; and Blanco, NM. The NYMEX price is publicly available and is reported in numerous trade publications, including NGI's Daily Gas Price Index (published by Intelligence Press, Inc.). The cash market prices are published in another trade publication, Natural Gas Week (Energy Intelligence Group, Inc.), and they reflect the spot delivered-to-pipeline, volume-weighted average prices for natural gas bought and sold at the specified trading hubs.

Prices include processing, gathering, and transportation fees to the hubs. The estimated wellhead prices are derived with a statistical procedure based on analysis of monthly time series data for the period 1995 through 2000. The preliminary estimates are replaced when annual survey data become available, usually about 10 months after the end of the report year.

Final monthly data are provided through the Form EIA-895A, which requests State agencies to report monthly values of marketed production and its cost. Preliminary monthly gas price data are replaced by these final monthly data.

Annual Data

The annual Form EIA-895A requests State agencies to report the quantity and value of marketed production. When complete data are unavailable, the form instructs the State agency to report the available aggregate value and the quantity of marketed production associated with this value. Some States reported volumes of production and associated values for other than marketed production. In addition, information for several States that were unable to provide data was estimated based on price information submitted by neighboring producing States.

Note 10. Heating Degree-Days

Degree-days are relative measurements of outdoor air temperature. Heating degree-days are deviations of the mean daily temperature below 65 degrees Fahrenheit. A weather station recording a mean daily temperature of 40 degrees Fahrenheit would report 25 heating degree-days. There are several degree-day databases maintained by the National Oceanic and Atmospheric Administration. The information published in the *NGM*, is developed by the National Weather Service Climate Analysis Center, Camp Springs, Maryland.

The data are available weekly with monthly summaries and are based on mean daily temperatures recorded at about 200 major weather stations around the country. The temperature information recorded at these weather stations is used to calculate Statewide degree-day averages weighted by gas home customers. The State figures are then aggregated into Census Divisions and into the national average. Table 23 of this report presents the Heating Degree data, and is included in the December through March *NGM* publications.