

PSM Explanatory Notes

Preface

The *Petroleum Supply Monthly* (PSM) and *Petroleum Supply Annual* (PSA) are reports produced by the Monthly Petroleum Supply Reporting System (MPSRS) operated by the U.S. Energy Information Administration (EIA). The PSM and PSA track supply and disposition of crude oil, hydrocarbon gas liquids, petroleum products, and biofuels. The reports are produced by the Office of Petroleum and Biofuel Statistics of the U.S. Energy Information Administration (EIA).

Data presented in the PSM and PSA describe supply and disposition of crude oil, hydrocarbon gas liquids, petroleum products, and biofuels in the United States, and major U.S. geographic regions with selected data available at the state level. Data describe production, imports, exports, inter-Petroleum Administration for Defense District (PADD) movements, and inventories in the United States (50 States and the District of Columbia). The reporting universe includes operators engaged in primary supply activities including refining, motor gasoline blending, natural gas processing and fractionation, inter-PADD transportation, importers, and major inventory holders. When aggregated, data reported by operators in these sectors are used to derive consumption of petroleum products in the United States.

Monthly and year-to-date data are normally released in the PSM on the last business day of each month. Monthly data are available approximately 60 days after the end of each reference month. Revised monthly data and annual totals and averages are released in the PSA usually at the end of August each year.

Appendix B. Explanatory Notes

1. Overview

A. The Energy Information Administration's Quality Guidelines

Data contained in the *Petroleum Supply Monthly* (PSM) and *Petroleum Supply Annual* (PSA) are subject to information quality guidelines issued by the Office of Management and Budget (OMB), the Department of Energy (DOE), and Energy Information Administration (EIA). With available resources, EIA continually works to improve its systems in order to provide high quality information needed by public and private policymakers and decision makers. EIA has performance standards to ensure the quality (i.e., objectivity, utility, and integrity) of information it disseminates to the public. Quality is ensured and maximized at levels appropriate to the nature and timeliness of the disseminated information.

B. Concepts of Product Supply and Demand

Petroleum supply estimates contained in the PSM and PSA are used for calculation of petroleum demand measured as product supplied. Product supplied is often called “implied” demand because it is a measure of demand that is implied by disappearance of petroleum product barrels from facilities and activities in the “primary” supply chain. Facilities and activities in the primary supply chain include refineries, bulk storage and blending terminals, natural gas processing plants and fractionators, renewable fuels and oxygenate production plants, imports, exports, , and transportation by pipelines, tankers, barges, and railroads. Total product supplied at the U.S. level is equal to the sum of field production (including production of crude oil and natural gas liquids from natural gas processing plants), refinery and blender net production, renewable fuels and oxygenate plant net production, imports, and adjustments, minus the sum of stock change, refinery and blender net inputs, and exports. Net receipts are added to supply when product supplied is calculated for Petroleum Administration for Defense Districts (PADD). Crude oil product supplied is zero after September 1997 because crude oil is processed in refineries to produce fuels and other products rather than being used directly as fuel. Data include crude oil used directly as fuel between January 1981 and September 1997.

The secondary supply chain falls between primary supply and end-users. Product barrels typically flow in bulk quantities from primary supply into secondary supply before delivery to consumers. Fuels and other products held by consumers are considered to be in tertiary supply. Secondary supply facilities and activities include storage at bulk plants and retail outlets. Bulk plants are wholesale storage facilities that have less than 50,000 barrels of storage capacity and, as defined by EIA, receive product only by rail or truck, but not by barge, tanker, or pipeline. Tertiary inventories are held by end users and include fuel in vehicle tanks, heating oil in residential tanks, fuel oil held by utilities, fuel and nonfuel products held by end users, and certain proprietary storage of raw materials such as propane held at chemical plants for use as ethylene feedstock.

There is a delay between the time when barrels are reported as demand measured as product supplied and when the same barrels are actually

consumed. The delay is due to the time required for barrels to move from primary supply through secondary and tertiary supply chains and ultimately to end users where the barrels are actually consumed as fuel, feedstock, or for other purposes. Users of demand measured as product supplied should expect product supplied to either anticipate or lag timing of actual petroleum consumption.

C. Components of Supply and Disposition

The detailed statistics tables in the PSM provide complete supply and disposition information for the current month and year to date. The tables are organized to locate National and Petroleum Administration for Defense (PAD) District supply and disposition data at the front followed by tables that contain detailed information on supply and disposition. These include tables on crude oil and petroleum product production, import/export data, stocks information, and lastly, data on crude oil and petroleum product movements. To assist in the interpretation of these tables, the following discussion of supply, disposition, and ending stocks as shown in Tables 1– 25 is provided. The categories and products are defined in the EIA Glossary.

(1.) Supply

a. Field Production - Total Field Production is the sum of crude oil production and natural gas plant liquids and liquefied refinery gases production.

Crude oil production is an estimate based on data received from State conservation agencies, the Mineral Management Service of the U.S. Department of the Interior and Form EIA-914 “Monthly Crude Oil, Lease Condensate, and Natural Gas Production Report. Refer to “Domestic Crude Oil Production” in Section 2C (1) for further details.

Field production of natural gas plant liquids is reported on Form EIA-816 and published on a net basis (i.e., production minus inputs).

b. Renewable Fuels and Oxygenate Plant Net Production - Renewable Fuels and Oxygenate Plant Net Production are reported on Forms EIA-819 and EIA-22M. Production includes fuel ethanol, Ethyl Tertiary Butyl Ether (ETBE), Methyl Tertiary Butyl Ether (MTBE), other fuel oxygenates, and biodiesel. This supply category also includes natural gasoline, finished motor gasoline, and motor gasoline blending components added to fuel ethanol as denaturants and blended at fuel ethanol plants. Negative production indicates the amount of a product produced during the month was less than the amount of that same product reported as input during the same month. Beginning with PSA data for 2019, EIA excluded oxygenates supply and disposition from U.S. and regional balance tables.

c. Refinery and Blender Net Production – Refinery and Blender Net Production is reported on Forms EIA-810 and EIA- 815. Refinery and Blender Net Production equals refinery

and blenders production minus refinery and blender inputs. Negative production of finished petroleum products will occur when the amount of a product produced during the month is less than the amount of that same product that is reprocessed (input) or reclassified to become another product during the same month.

d. Imports - Imports include receipts of goods into the 50 States and the District of Columbia from U.S. possessions and territories from foreign countries.

e. Net Receipts – Net Receipts data are included in tables containing PAD District-level data to account for inter-PAD District movements of crude oil and petroleum products. Net receipts for a PAD District are calculated by subtracting shipments out of the PAD District from receipts into the PAD District. Net Movements of Crude Oil and Petroleum Products by Pipeline, Tanker, and Barge, and Rail between PAD Districts are shown in Table 62.

f. Adjustments – This column includes adjustment quantities for crude oil, fuel ethanol, motor gasoline blending components, biodiesel (included in “Renewable Fuels Except Fuel Ethanol”) and distillate fuel oil. EIA calculated adjustment quantities to balance supply and disposition for selected products or to reclassify one product to another product. EIA calculates product supplied as the balancing item for most products and a measure of implied demand for petroleum products. EIA uses adjustments as balance items in cases where it does not make sense to interpret the balancing item as demand. Reclassifications reported in the adjustments column may be implied by the supply and disposition balance or reported on surveys. Recall that supply at the U.S. level is equal to the sum of field production, renewable fuels and oxygenate plant net production, refinery and blender net production, imports, and adjustments. Disposition at the U.S. level is equal to the sum of stock change, refinery and blender net inputs, exports, and products supplied. At the PAD District level, supply components include net receipts equal to gross receipts from other PAD Districts minus gross shipments to other PAD Districts. In every case, supply must equal disposition. Applicable components of supply and disposition vary depending on the product or product group. Unless otherwise noted in Section 2C, adjustment calculations that balance supply and disposition equal disposition minus supply for the U.S. and for each PAD District.

(2.) Disposition

a. Stock Change – Stock Change is calculated as the difference between the current month Ending Stocks column and the Ending Stocks column in the prior month’s publication. A negative number indicates a decrease in stocks and a positive number indicates an increase in stocks.

b. Refinery and Blender Net Inputs – Refinery and Blender Net Inputs are inputs of crude oil and intermediate materials (unfinished oils, motor and aviation gasoline blending components, hydrocarbon gas liquids, hydrogen, renewable fuels, and other hydrocarbons) processed at refineries or

blended at terminals to produce finished petroleum products.

Crude oil input represents total crude oil (domestic and foreign) input to atmospheric crude oil distillation units and other refinery processing units (e.g. vacuum distillation units).

Refinery and blender input of natural gas liquids equal gross input of natural gas liquids received from natural gas plants for blending and processing.

Inputs of unfinished oils, motor gasoline blending components, and aviation gasoline blending components are published on a net basis (i.e., refinery and blender input minus refinery and blender production). Negative inputs of unfinished oils and motor and aviation gasoline blending components will occur when the amount of a product produced during the month is greater than the amount of that same product that is input or reclassified to become another product during the same month.

c. Exports - Exports include shipments from the 50 States and the District of Columbia to Puerto Rico, the Virgin Islands, other U.S. possessions and territories and to foreign countries.

d. Products Supplied - Products supplied is equal to field production, plus renewable fuels and oxygenate plant net production, plus refinery and blender net production, plus imports, (plus net receipts on a PAD District basis), plus adjustments, minus stock change, minus refinery and blender net inputs, minus exports.

Product supplied values indicate quantities of petroleum products supplied for domestic consumption. Occasionally, the result for a product is negative because total disposition of the product exceeds total supply. Negative product supplied may occur for a number of reasons: (1) product reclassification has not been reported; (2) data were misreported or reported late; (3) in the case of calculations on a PAD District basis, the figure for net receipts was inaccurate because the coverage of inter-PAD movements was incomplete; and (4) products such as gasoline blending components and unfinished oils have entered the primary supply channels with their production not having been reported, e.g., streams returned to refineries from petrochemical plants.

Beginning with data for January 2010, EIA assumed product supplied for crude oil equal to zero. Prior to January 1983, crude oil burned on leases and by pipelines as fuel was reported as either distillate or residual fuel oil and was included in product supplied for these products. From January 1983 through December 2009, crude oil product supplied was equal to crude oil used directly as reported on Form EIA-813 “Monthly Crude Oil Report.” Reporting of crude oil used directly was discontinued on Form EIA-813 after December 2009.

(3.) Ending Stocks

Ending stocks are primary stocks of crude oil and petroleum products held in storage as of midnight on the last day of each month. Primary stocks include crude oil, hydrocarbon gas liquids, biofuels, and petroleum products held in storage at

refineries, natural gas processing plants, pipelines, tank farms, biofuel production plants, and bulk terminals.

Crude oil that is in-transit by water from Alaska and crude oil stored in the Strategic Petroleum Reserve is included. Primary Stocks exclude stocks of foreign origin that are held in bonded warehouse storage. Primary stocks of petroleum products also exclude secondary stocks held by dealers and jobbers and tertiary stocks held by consumers. Product stocks held as reserves by federal and state agencies are excluded from primary stock quantities reported by EIA, but quantities held in selected government reserves are provided in Appendix D.

Primary stocks of crude oil included barrels held on crude oil producing sites (lease stocks) until June 2016. Primary stocks of crude oil excluded lease stocks beginning with release of PSM data for July 2016 on September 30, 2016. Historical crude oil stocks in on eia.gov were revised beginning with data for January 2005 to exclude lease stocks. Data may be accessed from the following locations on the EIA web site.

http://www.eia.gov/dnav/pet/pet_sum_snd_d_nus_mdbl_m_cur.htm

http://www.eia.gov/dnav/pet/pet_sum_crdsnd_k_m.htm

http://www.eia.gov/dnav/pet/pet_stoc_typ_c_nus_EPC0_mdbl_m.htm

2. Components - Forms Discussions

The data presented in the *PSM* include data collected by the EIA on nine monthly petroleum supply surveys, export data obtained from the U. S. Bureau of the Census, and crude production data collected on Form EIA-914 as well as production data from State conservation agencies and the Minerals Management Service of the U. S. Department of Interior.

A. Petroleum Supply Reporting System

The nine monthly petroleum supply surveys are part of the Petroleum Supply Reporting System (PSRS). The PSRS tracks the supply and disposition of crude oil, petroleum products, and hydrocarbon gas liquids in the United States. The PSRS is organized into two data collection subsystems: the Weekly Petroleum Supply Reporting System (WPSRS) and the Monthly Petroleum Supply Reporting System (MPSRS). The WPSRS processes the data from the six weekly surveys. The MPSRS includes nine monthly surveys and one annual survey. The survey forms that comprise the PSRS are:

1. EIA-800, “Weekly Refinery and Fractionator Report,”
2. EIA-802, “Weekly Product Pipeline Report,”
3. EIA-803, “Weekly Crude Oil Stocks Report,”
4. EIA-804, “Weekly Imports Report,”
5. EIA-805, “Weekly Bulk Terminal Report,”
6. EIA-809, “Weekly Oxygenate Report,”
7. EIA-22M, “Monthly Biodiesel Production Survey,”
8. EIA-810, “Monthly Refinery Report,”
9. EIA-812, “Monthly Product Pipeline Report,”
10. EIA-813, “Monthly Crude Oil Report,”
11. EIA-814, “Monthly Imports Report,”
12. EIA-815, “Monthly Bulk Terminal Report.”

13. EIA-816, “Monthly Natural Gas Liquids Report”
14. EIA-817, “Monthly Tanker and Barge Movement Report”
15. EIA-819, “Monthly Oxygenate Report”
16. EIA-820, “Annual Refinery Report.”

Both weekly and monthly surveys are administered at six key points along the petroleum production and supply chain including refineries, fractionators, natural gas processing plants, bulk product storage and blending terminals, crude oil and product pipelines, crude oil stock holders, importers, and renewable fuel (biodiesel and fuel ethanol) and oxygenate producing plants. Monthly surveys also include inter-PAD District movements by pipelines, tankers, and barges. Weekly surveys do not capture petroleum movements. Respondents reporting on weekly surveys are sampled from among the respondents reporting on monthly surveys.

Annual U.S. refinery capacity data are collected on the Form EIA-820, “Annual Refinery Report.” The EIA-820 data are published in the annual “Refinery Capacity Report.”

B. Monthly Supply Survey Description and Methodology

(1.) Description of Surveys Forms

Copies of the survey forms and instructions can be found at: <https://www.eia.gov/survey/>

The Form EIA-22M “Monthly Biodiesel Production Survey” collects data on biodiesel plant location, operating status, annual production capacity, monthly biodiesel and co-product production, stocks, input of feedstocks, alcohol, and catalysts, and biodiesel sales.

The Form EIA-810, “Monthly Refinery Report,” collects data on refinery input and capacity, sulfur content and API gravity of crude oil, and data on supply (beginning stocks, receipts, and production) and disposition (inputs, shipments, fuel use and losses, and ending stocks) of crude oil and refined products. Working and shell storage capacity for selected products is collected on an annual basis.

The Form EIA-812, “Monthly Product Pipeline Report,” collects data on end-of-month stocks and movements of petroleum products transported by pipeline. Intermediate movements for pipeline systems operating in more than two PAD Districts are included.

The Form EIA-813, “Monthly Crude Oil Report,” collects data on end-of-month stock levels of crude oil held in pipelines, and at tank farms operated by the reporting company, and Alaskan crude oil in transit by water. Data are reported by PADD including stocks held in the 50 states and the District of Columbia. In addition to stocks, EIA uses Form EIA-813 to collect inter-PADD movements of crude oil by pipeline. EIA collects movements for shipping and receiving PADDs with no intermediate PADD movements. EIA uses Form EIA-813 to collect annual storage capacity in data for the month of March.

The Form EIA-814, “Monthly Imports Report,” collects data on imports of crude oil and petroleum products (1) into the 50

States and the District of Columbia, (2) into Puerto Rico, the Virgin Islands, and other U.S. possessions (Guam, Midway Islands, Wake Island, American Samoa, and Northern Mariana Islands), and (3) from Puerto Rico, the Virgin Islands, and other U.S. possessions into the 50 States and the District of Columbia. Imports into Foreign Trade Zones located in the 50 States and the District of Columbia are considered imports into the 50 States and the District of Columbia. The type of commodity, port of entry, country of origin, quantity (thousand barrels), sulfur percent by weight, API gravity, and name and location of the processing or storage facility are reported. Sulfur percent by weight is requested for crude oil, crude oil burned as fuel, and residual fuel oil only. API gravity is requested for crude oil only. The name and location of the processing or storage facility is requested for crude oil and unfinished oils only.

The Form EIA-815, "Monthly Bulk Terminal Report," collects data on the operations of all bulk terminals located in the 50 States, District of Columbia, Puerto Rico, the Virgin Islands, Guam, and other U. S. possessions. Beginning and end-of-month stocks, receipts, inputs, production, shipments, and fuel use and losses during the month are collected from operators of terminals. Working and shell storage capacity is collected on an annual basis.

The Form EIA-816, "Monthly Natural Gas Liquids Report," collects data on the operations of natural gas processing plants and fractionators. Beginning and end-of-month stocks, receipts, inputs, production, shipments, and plant fuel use and losses during the month are collected from operators of natural gas processing plants. End-of-month stocks are collected from fractionators.

The Form EIA-817, "Monthly Tanker and Barge Movement Report," collects data on the movements of crude oil and petroleum products between PAD Districts. Data are reported by shipping and receiving PAD District and sub-PAD District. Shipments to and from the Panama Canal are also included if the shipment was delivered to the Canal.

The Form EIA-819, "Monthly Oxygenate Report" collects facility-level data on oxygenate inputs, production, gasoline blending at ethanol plants, and end-of-month stocks. Data on end-of-month stocks are reported on a custody basis regardless of ownership.

(2.) Frame

EIA maintains complete lists of respondents to its monthly surveys. Each survey has a list of companies and facilities required to submit petroleum activity data. This list is known as the survey frame. Frame maintenance procedures are used to monitor the status of petroleum companies and facilities currently contained in each survey frame as well as to identify new members to be added to the frame. As a result, all known petroleum supply organizations falling within the definition of "Who Must Submit" participate in the survey.

The activities for frames maintenance are conducted on an

ongoing basis. Monthly frames maintenance procedures focus on examining industry periodicals that report changes in status (births, deaths, sales, mergers, and acquisitions) of petroleum facilities producing, transporting, importing, and/or storing crude oil and petroleum products. Augmenting these sources are articles in newspapers, notices from respondents, and information received from survey systems operated by other offices. Survey managers review these sources regularly to monitor changes in company operations and to develop lists of potential respondents. These activities assure coverage of the reporting universe and maintain accurate facility information on addresses and ownership.

Respondents to Form EIA-22M "Monthly Biodiesel Production Survey" include operators of plants that produce biodiesel meeting ASTM D 6751-07B specifications and used for commercial purposes.

Respondents to Form EIA-810, "Monthly Refinery Report" include operators of all operating and idle petroleum refineries located in the 50 States, the District of Columbia, Puerto Rico, the Virgin Islands, Guam and other U.S. possessions.

Respondents to Form EIA-812, "Monthly Product Pipeline Report" include all product pipeline companies that carry petroleum products (including interstate, intrastate, and intra-company pipelines) in the 50 States and the District of Columbia.

Respondents to Form EIA-813, "Monthly Crude Oil Report" include all companies which carry or store 1,000 barrels or more of crude oil. Included in this survey are gathering and trunk pipeline companies (including interstate, intrastate, and intra-company pipelines), crude oil tank farm operators, and companies transporting Alaskan crude oil by water (to U.S. ports) in the 50 States and the District of Columbia.

Respondents to Form EIA-814, "Monthly Imports Report" include each importer of record (or Ultimate consignee in some situations regarding Canadian imports) that import crude oil or petroleum products (1) into the 50 States and the District of Columbia, (2) into Puerto Rico, the Virgin Islands and other U.S. possessions (Guam, Midway Islands, Wake Island, American Samoa, and Northern Mariana Islands), (3) into Foreign Trade Zones located in the 50 States and the District of Columbia and (4) from Puerto Rico, the Virgin Islands and other U.S. possessions into the 50 States and the District of Columbia. A report is required only if there has been an import during the month unless the importer has been selected as part of a sample to report every month regardless of activity.

Respondents to Form EIA-815, "Monthly Bulk Terminal Report" include operators of all bulk terminals located in the 50 States, District of Columbia, Puerto Rico, the Virgin Islands, Guam, and other U. S. possessions must report. A bulk terminal is primarily used for storage, marketing, and often blending of petroleum products and has a total bulk storage capacity of 50,000 barrels or more, and/or receives petroleum products by tanker, barge, or pipeline. Bulk terminal facilities associated with a product pipeline are included.

Respondents to Form EIA-816, “Monthly Natural Gas Liquids Report” include operators of all facilities that extract liquid hydrocarbons from a natural gas stream (natural gas processing plant) and/or separate a liquid hydrocarbon stream into its component products (fractionator).

Respondents to Form EIA-817, “Monthly Tanker and Barge Movement Report” include all companies that have custody of crude oil or petroleum products transported by tanker or barge between Petroleum Administration for Defense Districts and all companies that have custody of crude oil or petroleum products originating from a PAD District and transported to the Panama Canal with the intent that the crude oil or petroleum products be further transported to another PAD District.

For purposes of this report, custody is defined as physical possession of crude oil or petroleum products on a company-owned tanker or barge. Also, companies that lease vessels or contract for the movement of crude oil or petroleum products on a tanker or barge between PAD Districts are considered to have custody.

Respondents to Form EIA-819, “Monthly Oxygenate Report” include all operators of facilities that produce (manufacture or distill) oxygenates (including MTBE plants, petrochemical plants, and refineries that produce oxygenates as part of their operations located in the 50 States and the District of Columbia.)

(3.) Collection

Survey data for the MPSRS are collected by Internet using secure file transfer, and electronic transmission. All respondents must submit their data by the 20th calendar day following the end of the report month. Receipt of the reports is monitored using an automated respondent mailing list. Telephone follow-up calls are made to nonrespondents prior to the publication deadline. Respondents who are chronically late (i.e., 3 consecutive months) are notified by EIA by certified letter.

(4.) Processing and Micro Editing

Upon receipt, all reported data are transformed into a standard format and sent through a log-in and prescreening process to validate respondent control information and resolve any discrepancies. The data are then processed using generalized edit and imputation procedures. Automated editing procedures check current data for consistency with past data and for internal consistency (e.g., totals equal to the sums of the parts). After the edit failures are resolved and imputation performed for nonrespondents, preliminary tables are produced and used to identify anomalies. These tables show U.S. and PAD District estimates for the current month and the prior 4 years. Anomalies result in further review of respondent data which in turn may result in additional flagged data and imputation.

(5.) Estimation and Imputation

The nine monthly supply surveys are census surveys. As such, the estimates using these data are the sum of the edited, reported

data. Where possible, EIA uses imputed values to account for activity when a company fails to file. Depending on the survey, imputed values may be estimates based on weekly reports, estimates equal to prior-month reported quantities, or estimates based on non-survey data (e.g. imports quantities may be imputed using data provided to EIA by U.S. Customs and Border Protection). Imputation normally accounts for very small quantities in published totals because response rates to monthly surveys tend to be very high, typically exceeding 97 percent calculated as total reports received divided by total reports expected.

Adjustments are made to aggregate data from time to time. For example, unusual industry conditions, including fuel transitions, business practice shifts, or hurricane dislocations, may generate reporting anomalies and require adjustments. Measurement error and frame deficiencies may occasionally result in inconsistencies when individual respondent data are aggregated to publication levels and require adjustment. Monthly supply data are reviewed throughout the year and some estimates may be replaced with newly available or resubmitted respondent data in the *Petroleum Supply Annual (PSA)*.

(6.) Macro Editing

Monthly data are compared to weekly data on a regular basis. Discrepancies between weekly and monthly data are documented and respondents are called when discrepancies are either large (usually over 300 thousand barrels) or consistent (e.g., weekly data are always lower than monthly data). In addition, a comparison of the data collected on the PSRS with other similar data series from sources outside of the EIA is performed on an ongoing basis. Results of selected data comparisons are published once a year in the feature article, “Comparison of Independent Statistics on Petroleum Supply.” Additional comparisons are made between survey data and model results. Data reported in the Petroleum Supply Monthly and Petroleum Supply Annual are routinely imputed to correct for cases where comparison with other data suggests errors in survey data.

(7.) Dissemination

The PSM data are normally released within 60 days of the close of the reference month. The PSM is available on the web at:

<http://www.eia.gov/petroleum/supply/monthly/>

Much of the PSM data are available in HTML format on eia.gov. Features include: downloadable spreadsheets containing complete data history, data tables which “pivot” to present different perspectives, and selection boxes to easily change the product, area, process, period, and unit of measure. Petroleum data can be accessed at:

<http://www.eia.gov/petroleum/data.cfm>

C. Derived Data

Due to the time constraints in publishing monthly petroleum supply statistics and the desire to reduce industry response burden, some of

the statistics published in the PSM are obtained from sources other than the monthly supply surveys. These other sources include models to data and data from supplemental sources such as the Bureau of the Census.

(1.) Domestic Crude Oil Production

The interim estimate of U.S., PAD District, and state oil production for the current reference month, published in Tables 1 through 26 of the PSM, are based on:

- (a.) crude oil production data from state government agencies and the Department of the Interior, Bureau of Safety and Environmental Enforcement;
- (b.) crude oil production data reported on Form EIA-914, “Monthly Crude Oil, Lease Condensate, and Natural Gas Production Report.” For some states, EIA uses current reported data from the state (chiefly Alaska). For the states of Arkansas, California, Colorado, Kansas, Louisiana, Montana, New Mexico, North Dakota, Ohio, Oklahoma, Pennsylvania, Texas, Utah, West Virginia, Wyoming, and the Federal Gulf of Mexico, EIA calculates an estimate by modeling the relationship between final state-level data from DrillingInfo, a third-party vendor of well-level data collected by state agencies, and data reported on the EIA-914 survey using weighted least squares (WLS) linear regression. Additional explanation of the WLS estimation methodology is available. Estimates have to be made for crude oil production because complete and correct data from states may take from several months to over two years.
- (c.) first purchase data reported on Form EIA-182 “Domestic Crude Oil First Purchase Report.” For the remaining states and areas (Alabama, Arizona, Federal Pacific Offshore, Florida, Idaho, Illinois, Indiana, Kentucky, Maryland, Michigan, Mississippi, Missouri, Nebraska, Nevada, New York, Oregon, South Dakota, Tennessee, and Virginia) EIA calculates an estimate by using the average lagged ratio (ALR) of the state reported data to EIA-182 data, applied to the current EIA-182 data. Additional explanation of the ALR estimation methodology is available.

State-level production estimates are published in Table 26, “Production of Crude Oil by PAD District and State.” Table 26 contains estimates for crude oil production for state and federal offshore areas reported by state agencies and the Bureau of Safety and Environmental Enforcement or estimated by EIA using the ALR or WLS methods discussed above. Every month, the monthly crude oil production estimates are updated in Table 26 of the Petroleum Supply Monthly ([http:// www.eia.gov/petroleum/supply/monthly/](http://www.eia.gov/petroleum/supply/monthly/)) using reports from state agencies and the Bureau of Safety and Environmental Enforcement. The estimates are reported in the Petroleum Supply Monthly roughly 60 days after the production month.

(2.) Exports

The U.S. Bureau of the Census compiles the official U.S. export statistics. Exporters are required to file a “Shipper’s Export Declaration Document” with the U.S. Census Bureau. Each month the EIA receives aggregated export statistics from the U.S. Bureau of the Census (EM-522 and EM-594). Census export statistics used in the PSM reflect both government and non-governmental exports of domestic and foreign merchandise from the United States (the 50 States and the District of Columbia) to foreign countries and U.S. possessions, without regard to whether or not the exportation involves a commercial transaction. The following types of transactions are excluded from the statistics:

- Merchandise shipped in transit through the United States from one foreign country to another, when documented as such with U.S. Customs.
- Bunker fuels and other supplies and equipment for use on departing vessels, planes, or other carriers engaged in foreign trade.

The country of destination is defined as the country of ultimate destination or the country where the goods are to be consumed, further processed, or manufactured, as known to the shipper at the time of exportation. If the shipper does not know the country of ultimate destination, the shipment is credited to the last country to which the shipper knows that the merchandise will be shipped in the same form as it was when exported.

(3.) Movements of crude oil and select products by railroad

The volume of crude oil, ethanol, biodiesel, propane, propylene, normal butane, isobutane, petroleum coke, and asphalt moving by railroad is calculated using several data sources including Carload Waybill Sample (CWS) data from the U.S. Surface Transportation Board (STB), data from the National Energy Board of Canada (NEB), data in EIA’s Oil and Gas Supply Module (OGSM) within the National Energy Modeling system (NEMS) for data prior to 2015, the EIA-914 survey starting in January 2015, and an estimation procedure developed by EIA for months in which data these data are not available.

Additional data from the NEB, OGSM, and the EIA-914 are used for estimating factors for converting carloads to barrels of crude oil. Carloads of ethanol, biodiesel, propane, propylene, normal butane, isobutane, petroleum coke, and asphalt are converted to barrels using data from the CWS.

The most current monthly STB waybill sample may not be received with sufficient lead time to be processed and included in the PSM publication. Further, STB aggregates and provides waybills based on the accounting period, while EIA is interested in the waybill date, which can differ by several months from the accounting period. In addition, waybills from non-Class I railroads might only be included in the sample for the last month of a calendar quarter. As a result, EIA may estimate anywhere from one to three months of rail movements, relying on historical averages or near-month model estimates for those months to be published in the PSM for which incomplete or no

STB data are available.

Estimates of rail movements are subject to revision on a monthly basis as new, more complete, and more accurate data become available. Monthly revisions will typically affect data available on the EIA web site for the current year and up to two prior years. To the extent that revisions are needed to data more than 2 years in the past, these revisions will be made once a year at the time when Petroleum data html tables are updated with final data for a year from the Petroleum Supply Annual. Petroleum Supply Monthly and Petroleum Supply Annual tables released as PDF files will not be revised.

(4.) Stocks of Crude Oil held on Producing Sites (Lease Stocks)

The adjustment for lease stocks was discontinued beginning with PSM data for July 2016 released on September 30, 2016 because EIA discontinued reporting crude oil stocks held on producing sites (lease stocks). The lease stock adjustment remains in all historical EIA lease stocks data.

This adjustment corrects for incomplete survey coverage of companies that store crude oil on leases. Up until 1983, monthly state government data on lease stocks were substituted for EIA data wherever possible in order to rectify the understatement of lease crude oil stocks. State data were available from three states - Texas, New Mexico, and Montana. To calculate the “lease adjustment,” a comparison between EIA reported data and the state government data was made and the difference added to the EIA data for the respective states.

In 1983, the EIA modified the Form EIA-813 to eliminate state data on crude oil stocks and began collecting crude oil stock data by Petroleum Administration for Defense (PAD) District. With this change, the “lease adjustment” could no longer be calculated on a state basis and was changed to a PAD District level. To adjust for this incomplete coverage, 10,300 thousand barrels of crude oil are added to PAD District 3 stocks and 330 thousand barrels are added to PAD District 4 stocks.

(5.) Trans-Alaska Pipeline System (TAPS) Natural Gas Plant Liquids (NGPL) Adjustment

The TAPS-NGPL adjustment corrects for overstatement of crude oil receipts and input at refineries due to NGPL injection into Alaskan crude oil transported in TAPS. Natural gas processing plants in Alaska produce substantial volumes of NGPL that are added to crude oil transported through TAPS. Refiners have been unable to separate the volume of NGPL from Alaskan crude oil when reporting crude oil receipts and inputs to EIA. The TAPS-NGPL adjustment subtracts Alaskan NGPL production reported by selected gas processing plant operators from crude oil receipts and inputs reported by refiners. Adjusted NGPL production is added to refinery receipts and inputs of NGPL. The adjusted NGPL barrels are allocated to PAD Districts based on the regional distribution of receipts of Alaskan crude oil. Data most affected by the TAPS-NGPL adjustment are receipts and inputs of crude oil in PAD District 5 and receipts, inputs, and product supplied of butane

and natural gasoline also in PAD District 5.

NGPL injections into crude oil transported in the TAPS started in 1987. The TAPS-NGPL adjustment was first applied to revised data reported in the Petroleum Supply Annual (PSA) for 1988.

(6.) Finished Motor Gasoline Adjustment

Adjustment quantities for finished motor gasoline are the sum of motor gasoline blending components, fuel ethanol, and methyl tertiary butyl ether (MTBE) adjustments reclassified to finished motor gasoline. Finished motor gasoline adjustment quantities are assumed to reflect gasoline blending activity that was not reported on surveys.

Note on MTBE Adjustment: The MTBE portion of the gasoline adjustment described in this section was only applied to Petroleum Supply Monthly (PSM) data for 2009. The MTBE portion of the gasoline adjustment was discontinued after further examination of the issue made clear the MTBE adjustment was not helpful in forming an accurate statistical representation of U.S. and regional gasoline supplies. The MTBE adjustment was not applied to gasoline supply and disposition data in years prior to 2009, nor was it applied to revised data for 2009 published in the Petroleum Supply Annual or in years after 2009. This note only applies to MTBE adjustments. MTBE blending that was reported on EIA surveys is reflected in U.S. and regional gasoline supply and disposition data. Other adjustments to gasoline supply and disposition data to account for motor gasoline blending components and fuel ethanol remain as described in this section.

- Adjustment quantities for finished reformulated motor gasoline include adjustments for reformulated blendstock for oxygenate blending (RBOB) plus a percentage of gasoline treated as blendstock (GTAB), “other” motor gasoline blending components, fuel ethanol, and MTBE. The quantity of GTAB and “other” motor gasoline blending components adjustments reclassified to finished reformulated motor gasoline is based on the ratio of finished reformulated motor gasoline net production divided by total finished motor gasoline net production reported on surveys by refiners and blenders in each PAD District. Motor gasoline blending components adjustments reclassified to finished reformulated motor gasoline are further classified as blended with alcohol (i.e. fuel ethanol), blended with ether (i.e. MTBE), or non-oxygenated during 2009.

Starting with data for January 2010, motor gasoline blending component adjustment quantities were classified only as blended with fuel ethanol and “other”. During 2009, RBOB adjustment quantities were classified based on the product description that included reference to the oxygenate to be blended. Beginning with data for January 2010, all RBOB is reported in one product category without reference

to specific oxygenates, and all RBOB adjustment quantities are assumed blended with fuel ethanol. During 2009, adjustment quantities for GTAB and “other” motor gasoline blending components reclassified to finished reformulated gasoline were further classified as blended with ether, blended with alcohol, or non-oxygenated based on the ratio of production of these products in reported survey data. After determining adjustment quantities of motor gasoline blending components reclassified to each type of finished reformulated motor gasoline, portions of the fuel ethanol and MTBE adjustments were reclassified to reformulated motor gasoline. The fuel ethanol quantity reclassified to finished reformulated motor gasoline was determined using the ratio of fuel ethanol blended into finished motor gasoline calculated from fuel ethanol blending data reported on survey forms by PAD District. For example, if the calculated volumetric fuel ethanol blend ratio was 10%, then a quantity of the fuel ethanol adjustment sufficient to make a 10% blend with the available motor gasoline blending components is reclassified to finished reformulated motor gasoline, but the quantity of fuel ethanol cannot exceed the total quantity of the fuel ethanol adjustment. During 2009, a similar process was followed for allocating the MTBE adjustment to reformulated motor gasoline except the blend ratio was assumed to be 12% in all PAD Districts. Starting with data for January 2010, the entire MTBE adjustment quantity is assumed to be blended with finished conventional motor gasoline.

- ◦ Adjustment quantities for finished conventional motor gasoline include adjustments for conventional blendstock for oxygenate blending (CBOB) plus the portion of GTAB, “other” motor gasoline blending components, fuel ethanol and MTBE adjustments that were not reclassified to finished reformulated motor gasoline. The total adjustment to finished conventional motor gasoline is further classified as finished conventional gasoline blended with fuel ethanol and “other” finished conventional motor gasoline. The quantity of the finished conventional motor gasoline adjustment reclassified as finished conventional motor gasoline blended with fuel ethanol is determined using the quantity of the fuel ethanol adjustment allocated to finished conventional motor gasoline and the fuel ethanol blend ratio calculated from fuel ethanol blending reported on surveys by PAD District. For example, if the fuel ethanol blend ratio calculated from survey data was 10% in a PAD District, then the total adjustment quantity of finished conventional motor gasoline in that PAD District would be 10 times the fuel ethanol adjustment quantity allocated to finished conventional gasoline (i.e. the adjustment to finished conventional motor gasoline blended with fuel ethanol includes 10% fuel ethanol and 90% gasoline from the motor gasoline blending components adjustment). The MTBE adjustment allocated to finished conventional

motor gasoline is simply added to the adjustment for “other” finished conventional motor gasoline.

- Fuel ethanol adjustment quantities frequently exceed the volume of fuel ethanol needed to achieve a blend ratio implied by blending activity reported by refiners and blenders on surveys when considering only the gasoline barrels available from the motor gasoline blending components adjustment. In this case, “other” finished conventional motor gasoline is reclassified by the adjustment to finished conventional motor gasoline blended with alcohol in order to maintain an ethanol blend ratio equal to the fuel ethanol blend ratio reported by refiners and blenders in each PAD District.

(7.) Motor Gasoline Blending Components Adjustment

Adjustment quantities for motor gasoline blending components at the U.S. level equal the sum of stock change, refinery and blender net input, and exports minus the sum of imports and renewable fuels and oxygenate plant net production (i.e. motor gasoline blending components use as denaturant for fuel ethanol production). Adjustment quantities by PAD District equal the sum of stock change, refinery and blender net input, and exports minus the sum of imports, renewable fuels and oxygenate plant net production, and net receipts. Motor gasoline blending components adjustments are calculated for reformulated blendstock for oxygenate blending (RBOB), conventional blendstock for oxygenate blending (CBOB), gasoline treated as blendstock (GTAB), and “other” motor gasoline blending components. Product supplied for motor gasoline blending components is assumed to always equal zero because there is no end-user demand for motor gasoline blending components as anything other than finished motor gasoline. Motor gasoline blending components adjustment quantities are assumed to reflect finished motor gasoline blending implied by the supply and disposition balance but not reported on surveys. Adjustment quantities for motor gasoline blending components are reclassified to finished motor gasoline and added to the finished motor gasoline adjustment.

(8.) Renewable Fuels including Fuel Ethanol Adjustment

Adjustment quantities for renewable fuels (including fuel ethanol) at the U.S. level equal the sum of stock change, refinery and blender net input, and exports minus the sum of renewable fuels and oxygenate plant net production and imports. Calculation of adjustment quantities by PAD District depends on the product. Individual products include fuel ethanol, biomass based diesel fuel (including biodiesel), “other” renewable diesel fuel, and “other” renewable fuels (e.g. bio-jet fuel). Product supplied for renewable fuels (including fuel ethanol) is assumed equal to zero. Adjustments for fuel ethanol and “other” renewable fuels are discussed separately below.

- ◦ Fuel ethanol adjustment quantities at the U.S. level equal the sum of stock change, refinery and blender net input, and exports minus the sum of

renewable fuels and oxygenate plant net production and imports. Adjustment quantities by PAD District equal the sum of stock change, refinery and blender net input, and exports minus the sum of imports, renewable fuels and oxygenate plant net production, and net receipts. Fuel ethanol adjustment quantities are assumed to reflect blending of fuel ethanol into finished motor gasoline that is implied by the available supply of fuel ethanol but not reported on surveys. Fuel ethanol adjustment volumes are reclassified to finished reformulated motor gasoline and finished conventional motor gasoline through finished motor gasoline adjustments.

- The product category called “renewable fuels except fuel ethanol” includes biomass-based diesel fuel (including biodiesel), “other” renewable diesel fuel, and “other” renewable fuels (e.g. bio-jet fuel). For PSM data prior to January 2012, renewable fuels except fuel ethanol adjustment quantities at the U.S. and PAD District levels were calculated as the sum of stock change, refinery and blender net input, and exports minus imports. Data for production of Renewable Fuels except Fuel Ethanol was unavailable and was excluded from Renewable Fuels and Oxygenate Plant Net Production. Therefore the calculation of adjustments to Renewable Fuels except Fuel Ethanol caused production to be included in the adjustment. Similarly, the calculation caused net inter-PAD District movements (i.e. net receipts) by rail and truck to also be included in adjustments to renewable fuels except fuel ethanol.

- Beginning with PSM data for January 2012, production of biodiesel reported on Form EIA-22M was included under the heading of “renewable fuels and oxygenate plant net production” in petroleum supply and disposition balances for “renewable fuels except fuel ethanol”. As a result, the adjustment for “renewable fuels except fuel ethanol” no longer includes production of biodiesel. This change will also be made to revised monthly data for January-December 2011 when the 2011 Petroleum Supply Annual is released.

- Biodiesel adjustment quantities at the U.S. level equal the sum of stock change, refinery and blender net input, and exports minus the sum of renewable fuels and oxygenate plant net production and imports. Adjustment quantities by PAD District equal the sum of stock change, refinery and blender net input, and exports minus the sum of imports, renewable fuels and oxygenate plant net production, and net receipts. Biodiesel adjustment quantities are assumed to reflect blending of biodiesel into distillate fuel oil that is implied by the available supply of biodiesel but not reported as input on surveys. Biodiesel adjustment volumes are reclassified to distillate fuel oil (15

ppm sulfur and under) through distillate fuel oil adjustments.

(9.) Distillate Fuel Oil Adjustment

Adjustment quantities for distillate fuel oil show reclassification by pipeline operators of distillate fuel oil with sulfur content of 15 ppm and under to distillate fuel oil with sulfur content greater than 15 ppm to 500 ppm (inclusive). Reclassification may occur when distillate product with sulfur content of 15 ppm and under becomes mixed with products having higher sulfur content during pipeline transportation, storage, or handling. Adjustment quantities are reported by pipeline operators on Form EIA-812 “Monthly Product Pipeline Report.” This adjustment was discontinued after publication of data for December 2010.

Beginning with PSM data for January 2012, distillate fuel oil adjustments equal the opposite of biodiesel adjustments described above in section 7. Biodiesel adjustments are added to distillate fuel oil (15 ppm sulfur and under) and total distillate fuel oil. Distillate fuel oil adjustment quantities are assumed to reflect biodiesel blending activity implied by biodiesel supply and disposition but not reported on surveys. Distillate fuel oil adjustments for biodiesel will also be added to revised data for January-December 2011 when the 2011 Petroleum Supply Annual is released

(10.) Crude Oil Adjustment

Adjustment quantities for crude oil are derived to balance crude oil supply and disposition. Crude oil product supplied was equal to crude oil used directly as reported on Form EIA-813 “Monthly Crude Oil Report” in data through December 2009. Reporting crude oil used directly was discontinued on Form EIA-813 after collection of data for December 2009. Crude oil product supplied is assumed equal to zero beginning with data for January 2010. Undercounting crude oil imports in survey data is one example of a typical cause of crude oil adjustments. This results in a positive crude oil adjustment because crude oil disposition (i.e. the sum of stock change, refiner inputs, and exports) will exceed available supply (i.e. the sum of field production and imports) due to import undercounting. Crude oil losses are included in crude oil adjustment quantities. The crude oil adjustment was formerly called unaccounted-for crude oil. The name change was effective with data for January 2005

(11.) Other Hydrocarbon Adjustment

Adjustment quantities for “other” hydrocarbons equal the sum of stock change, refinery and blender net inputs and exports minus imports. “Other” hydrocarbons product supplied is assumed equal to zero. Adjustment quantities account for “other” hydrocarbons produced outside of refineries. There are no movements data collected on surveys for “other” hydrocarbons. Therefore, adjustment quantities include any net receipts of “other” hydrocarbons resulting from inter-PAD

District movements.

(12.) Hydrogen Adjustment

Adjustment quantities for hydrogen equal refinery and blender net input of hydrogen. Hydrogen product supplied is assumed equal to zero. Adjustment quantities account for hydrogen supplied to U.S. refineries from non-refinery sources. There are no movements data collected on surveys for hydrogen. Therefore, adjustment quantities at the PAD District level include any net receipts of hydrogen resulting from inter-PAD District movements.

(13.) Oxygenates (excluding fuel ethanol) Adjustment

Adjustment quantities for oxygenates (excluding fuel ethanol) equal the sum of stock change, refinery and blender net inputs, and exports minus the sum of renewable fuels and oxygenate plant net production and imports. Product supplied for oxygenates (excluding fuel ethanol) is assumed equal to zero. Methyl tertiary butyl ether (MTBE) is the single largest component of oxygenates (excluding fuel ethanol). Beginning with PSA data for 2019, EIA excluded oxygenates supply and disposition from U.S. and regional balance tables.

3. Quality

A. General Discussion

(1.) Response Rates

The response rate is generally 98 to 100 percent. Average response rates for the monthly and weekly surveys are published in the annual PSM article “Accuracy of Petroleum Supply Data.” Chronic nonrespondents and late filing respondents are contacted in writing and reminded of their requirement to report. Companies that file late or fail to file are subject to criminal fines, civil penalties, and other sanctions as provided by Section 13(i) of the Federal Energy Administration (FEA) Act.

(2.) Non-sampling Errors

There are two types of errors usually associated with data produced from a survey; sampling errors and nonsampling errors. Because the estimates for the monthly surveys are based on a complete census of the frame, there is no sampling error in the data presented. The data, however, are subject to non-sampling errors. Non-sampling errors may arise from a number of sources including: (1) the inability to obtain data from all companies in the frame (non-response) and the method used to account for non-response, (2) response errors, (3) differences in the interpretation of questions or definitions, (4) mistakes in recording or coding of the data obtained from respondents, and (5) other errors of collection, response, coverage, processing, and estimation.

(3.) Resubmissions

Throughout the year, EIA accepts data revisions of monthly data. If a revision to a monthly submission is made after the *PSM* has been published, it is referred to as a resubmission. The final monthly values for the previous year are published in the *PSA*. These values reflect all *PSM* resubmissions and other data corrections. The values contained in the *PSA* are EIA’s most accurate measure of petroleum supply activity.

(4.) Revision Policy

EIA will publish revised monthly crude oil production estimates going back to the previously published Petroleum Supply Annual every month in petroleum data tables (<http://www.eia.gov/petroleum/supply/monthly/>). Once a year with the release of the Petroleum Supply Annual, EIA will revise up to 10 years of historical production estimates in petroleum data tables.

B. Data Assessment

The principal objective of the PSRS is to provide an accurate picture of petroleum industry activities and of the availability of petroleum products nationwide from primary distribution channels. The PSM preliminary monthly data serve as leading indicators of the final monthly data published in the PSA. The PSM monthly data are not expected to have the same level of accuracy as the final monthly data published in the PSA. However, the preliminary monthly data are expected to exhibit like trends and product flow characteristic of the final monthly data.

To assess the accuracy of monthly statistics, initial monthly estimates published in the PSM are compared with the final monthly aggregates published in the PSA. Although final monthly data are still subject to error, they have been thoroughly reviewed and edited, they reflect all revisions made during the year, and they are considered to be the most accurate data available. The mean absolute percent error provides a measure of the average revisions relative to the aggregates being measured for a variable. The mean absolute percent error for 2007 monthly data was less than 1 percent for 50 of the 66 major petroleum variables analyzed.

4. Provisions Regarding Disclosure of Information

All PSRS survey forms, with the exception of the Form EIA-814, “Monthly Imports Report,” have the same general disclosure information statement. The information reported on Form EIA-814 will be considered “public information” and may be publicly released in company or individually identifiable form, and will not be protected from disclosure in identifiable form. In addition, biofuel production capacity data reported on Form EIA-819 and Form EIA-22M will be released in company identifiable form. Refinery distillation capacity collected on Form EIA-810 also may be released in company identifiable form. EIA releases annual refinery input and production capacities in company identifiable form each year in the Annual Refinery Capacity Report.

Except as described above, information reported on Forms EIA-810

through 813, 815 through 817, 819, 820, and 22M will be protected and not disclosed to the public to the extent that it satisfies the criteria for exemption under the Freedom of Information Act (FOIA), 5 U.S.C. §552, the Department of Energy (DOE) regulations, 10 C.F.R. §1004.11, implementing the FOIA, and the Trade Secrets Act, 18 U.S.C. §1905. The Federal Energy Administration Act requires the EIA to provide company-specific data to other Federal agencies when requested for official use. The information reported on this form may also be made available, upon request, to another DOE component; to any Committee of Congress, the Government Accountability Office, or other Federal agencies authorized by law to receive such information. A court of competent jurisdiction may obtain this information in response to an order. The information may be used for any nonstatistical purposes such as administrative, regulatory, law enforcement, or adjudicatory purposes.

Disclosure limitation procedures are not applied to the statistical data

aggregated and published from these survey's information. Thus, there may be some statistics that are based on data from fewer than three respondents, or that are dominated by data from one or two large respondents. In these cases, it may be possible for a knowledgeable person to estimate the information reported by a specific respondent.

In addition to the use of the information by EIA for statistical purposes, the information may be made available, upon request, to other Federal agencies authorized by law to receive such information for any nonstatistical purposes such as administrative, regulatory, law enforcement, or adjudicatory purposes.

Company specific data are also provided to other DOE offices for the purpose of examining specific petroleum operations in the context of emergency response planning and actual emergencies.