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STATISTICAL SUMMARY [ADVANCE RELEASE]

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Statistical Summary

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This annual report summarizes data on nonfuel mineral production[1] for the United States including the Commonwealth of Puerto Rico.

Although nonfuel mineral production quantity may be measured at any stage of extraction and processing, the stage of measurement used most commonly in this report is "mine output." This term refers to minerals or ores in the form in which they are first extracted from the ground and customarily may include the output from auxiliary processing at or near the mines. Mine output as measured as material sold or used by producers in a given year is what is primarily shown in the tables, because values can be assigned. Where sold or used data are not available, mine output is used as the production measurement and value is estimated based on the average price of the mineral commodity for that year.

For copper, gold, lead, palladium, platinum, silver, and zinc, the production quantities listed are recorded on a mine basis (as the recoverable content of ore sold or treated). The values assigned to the quantities, however, are based on the average selling price of refined metal, not the value of the mined material.

The total value of all nonfuel mineral production in the United States in 2016 decreased slightly to $70.9 billion compared with $73.0 billion for 2015; metals decreased by 3.7% to $23.5 billion, and industrial minerals decreased slightly to $47.4 billion (table 1).

In 2016, 12 mineral commodities had production values greater than $1 billion. They were, in descending order of value, crushed stone, portland cement, gold, construction sand and gravel, copper, iron ore, industrial sand and gravel, lime, salt, marketable phosphate rock, soda ash, and zinc. The production of these mineral commodities accounted for 89.3% of the U.S. total production value (table 1).

In 2016, the top 10 States, in descending order of value of nonfuel mineral production, were Nevada, Arizona, Texas, California, Florida, Alaska, Minnesota, Michigan, Missouri, and Wyoming. The mineral production of these States accounted for 54.7% of the U.S. total production value (table 3).

[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending upon the mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 2016 U.S. Geological Survey (USGS) mineral production data published in this chapter are as of March 2019. For some mineral commodities, such as construction sand and gravel, crushed stone, and portland cement, estimates are updated periodically. To obtain the most current information, please check the most recent publications posted on the commodity pages of the USGS National Minerals Information Center (NMIC) at https://www.usgs.gov/centers/nmic/commodity-statistics-and-information. Contact information for USGS mineral commodity specialists is also found on those pages. Alternatively, specialists' names and telephone numbers may be obtained by calling the Main Switchboard for the USGS National Center at 1–703–648–4000 or by calling USGS Science Information Services at 1–888–ASK–USGS (1–888–275–8747). Minerals Yearbook chapters for countries and U.S. States are also available on the NMIC website at https://www.usgs.gov/centers/nmic.

TABLE 1

NONFUEL MINERAL PRODUCTION IN THE UNITED STATES[1, 2, 3]

(Thousand metric tons and thousand dollars unless otherwise specified)

Commodity		2014		2015		2016	
		Quantity	Value	Quantity	Value	Quantity	Value
Metals:							
Beryllium[4]	metric tons	270	W	205	W	155	W
Cobalt[e, 5]	do.	120	W	760	W	690	W
Copper[6]		1,360	9,510,000	1,380	7,810,000	1,430	7,090,000
Gold[6]	kilograms	210,000	8,570,000	214,000	8,000,000	222,000	8,950,000
Iron ore[7]		56,100	4,730,000	46,100	3,750,000	41,800	3,050,000
Lead[6]	metric tons	367,000	860,000	360,000	724,000	336,000	699,000
Molybdenum mineral concentrates[8]	do.	68,200	1,610,000	47,400	700,000	36,200	481,000
Nickel[9]	do.	4,300	W	27,200	W	24,100	W
Palladium[6]	kilograms	12,400	324,000	12,500	280,000	13,100	259,000
Platinum[6]	do.	3,660	163,000	3,670	125,000	3,890	124,000
Rare earths[e, 10]	metric tons	5,400	W	5,900	W	--	--
Rhenium[e, 11]	kilograms	8,510	NA	7,900	NA	8,440	NA
Silver[6]	do.	1,180,000	727,000 [r]	1,090,000	551,000	1,150,000	633,000
Titanium mineral concentrates, ilmenite	metric tons	200,000 [12]	W	300,000 [12]	W	100,000 [12]	W
Zinc[6]	do.	803,000	1,900,000	797,000	1,680,000	778,000	1,740,000
Zirconium mineral concentrates	do.	(13)	W	80,000 [12]	W	(13)	W
Combined values of cadmium (byproduct of zinc production), magnesium metal, titanium mineral concentrates (rutile), and values indicated by symbol W		XX	496,000	XX	802,000	XX	486,000
Total		XX	28,900,000	XX	24,400,000	XX	23,500,000
Industrial minerals, excluding fuels:[14]							
Barite		663	74,500 [r, e]	439 [r]	51,800 [r, e]	240	23,400 [e]
Cement:[7]							
Masonry		2,220 [15]	323,000 [e]	2,311 [15]	350,000 [e]	2,514 [15]	396,000 [e]
Portland		80,315 [15]	7,980,000 [e]	82,094 [15]	8,640,000 [e]	82,181 [15]	9,040,000 [e]
Clay:							
Ball clay[e]		1,030	45,200	1,030	47,500	975	44,000
Bentonite		4,830 [r]	326,000 [r]	4,050 [r]	299,000 [r]	3,600	270,000
Common clay and shale		10,200 [r]	127,000 [r]	11,300 [r]	167,000 [r]	11,700	173,000
Fire clay		394 [r]	4,180 [r]	393 [r]	5,000 [r]	528	7,090
Fuller's earth, montmorillonite		2,040 [r]	176,000 [r]	1,960 [r]	169,000 [r]	1,860	166,000
Kaolin[e]		6,020 [r]	867,000 [r]	5,810 [r]	877,000 [r]	5,320	833,000
Diatomite		901	269,000	832	242,000	686	195,000
Feldspar[e, 7]	metric tons	530,000 [16]	34,800	520,000 [16]	37,300	470,000 [16]	33,100
Garnet, industrial[7, 17]	do.	42,100 [r]	9,350 [r]	55,200 [r]	12,700 [r]	56,400	12,800
Gemstones, natural[e, 7]		NA	9,490	NA	8,540	NA	11,700
Gypsum, crude[7]		16,200 [r]	129,000 [r]	16,600 [r]	129,000 [r]	17,000	136,000
Helium:							
Crude	million cubic meters	27.2	93,100	25.0	85,900	22.9	82,600
Grade-A	do.	102	904,000	90.7	654,000	89.3	614,000
Kyanite[18]	metric tons	88,600 [r]	29,000 [r, e]	109,000 [r]	38,000 [r, e]	79,700	28,000 [e]
Lime[19]		19,500	2,390,000	18,300	2,290,000	17,700	2,210,000
Mica, crude	do.	48,200	5,640	32,600	4,640	30,900	3,310
Peat	do.	479,000	12,000	460,000 [r]	13,000 [r]	443,000	14,200
Perlite, crude	do.	462,000	25,500	444,000 [r]	26,900 [r]	437,000	28,400
Phosphate rock, marketable[7]		25,300	1,990,000	27,400	1,980,000	27,100	2,090,000
Potash[16]		2,000	680,000	1,500	550,000	1,400	410,000
Pumice and pumicite	metric tons	269,000	10,400	310,000	10,100	374,000	14,300
Salt		46,000	2,180,000	42,800	2,360,000	40,200	2,190,000

See footnotes at end of table.

TABLE 1—Continued
NONFUEL MINERAL PRODUCTION IN THE UNITED STATES[1, 2, 3]

(Thousand metric tons and thousand dollars unless otherwise specified)

Commodity		2014		2015		2016	
		Quantity	Value	Quantity	Value	Quantity	Value
Industrial minerals, excluding fuels:[14]—Continued							
Sand and gravel:							
Construction		830,000 r	6,670,000	881,000 r	7,290,000 r	888,000	7,460,000
Industrial		110,000	8,240,000	102,000 r	4,840,000 r	77,700	2,630,000
Silica stone, special[7]	metric tons	146 e	36 e	205	49	300 e	72 e
Silica, tripoli[7]	do.	93,100	19,500	70,500	19,400	56,600	17,300
Soda ash[7]		11,700	1,730,000	11,600	1,800,000	11,800	1,770,000
Stone:							
Crushed		1,250,000	12,700,000 r	1,340,000 r	14,200,000 r	1,360,000	15,100,000
Dimension		2,470	470,000	2,630	461,000	2,790	445,000
Talc, crude[7]	metric tons	608,000	16,700	615,000 r	18,100 r	536,000	16,300
Vermiculite, concentrates[e]		100 [20]	W	106 [20]	W	100 [20]	W
Zeolites[7]	metric tons	62,800	W	75,100	W	73,400	W
Combined values of andalusite, bauxite, boron minerals, bromine, clay (attapulgite), emery (2014), iodine (crude), iron oxide pigments (crude), lithium carbonate, magnesite, magnesium compounds, pyrophyllite (crude), staurolite, wollastonite, and values indicated by symbol W		XX	907,000 r	XX	935,000 r	XX	948,000
Total		XX	49,500,000 r	XX	48,600,000 r	XX	47,400,000
Grand total		XX	78,400,000 r	XX	73,000,000 r	XX	70,900,000

[e]Estimated. [r]Revised. do. Ditto. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined values." XX Not applicable. -- Zero.

[1]Table includes data from the commodity chapters published in the U.S. Geological Survey 2016 Minerals Yearbook as they were completed and released through March 2019.

[2]Production as measured by mine output, mine shipments, sales, or marketable production (including consumption by producers). Mine output measured as sold or used by producers is primarily shown in the tables, because values can be assigned. Where sold or used data are not available, actual mine output is used as the production measurement and value is estimated average price of the mineral commodity for that year. Data are reported in gross weight unless otherwise specified.

[3]Data are rounded to no more than three significant digits, unless otherwise specified; may not add to totals shown.

[4]Beryllium content of mine shipments of beryllium-containing ores. Calculated based on 4% metal content. Data are rounded to the nearest 5 metric tons.

[5]Cobalt content of concentrates.

[6]Recoverable content of ores and concentrates. The values assigned to the quantities, however, are based on the average selling price of refined metal, not the value of the mined material.

[7]Production, mine output.

[8]Recoverable content of molybdenum mineral concentrates. Value is based on the metal oxide content.

[9]Recoverable content of nickel sulfide concentrates.

[10]Rare-earth-oxide (REO) basis.

[11]Based on 80% recovery of estimated rhenium contained in molybdenum mineral concentrates.

[12]Data rounded to no more than one significant digit to avoid disclosing company proprietary data.

[13]Withheld to avoid disclosing company proprietary data.

[14]Sold or used, unless otherwise specified.

[15]Data are not rounded. Refer to the Minerals Yearbook cement chapter.

[16]Data are rounded to no more than two significant digits.

[17]Crude garnet production. Refer to the Minerals Yearbook garnet chapter for refined garnet production.

[18]Production based on publicly available data; refer to the Minerals Yearbook kyanite chapter. Value data are rounded to no more than two significant digits.

[19]Includes Puerto Rico.

[20]Rounded to the nearest 100,000 metric tons.

TABLE 2

NONFUEL MINERALS PRODUCED IN THE UNITED STATES, BY COMMODITY AND STATES IN 2016[1]

(Principal States based on quantity unless otherwise noted)

Commodity[2]	Principal States[3]	Other States[3]
Andalusite	NC	
Barite	GA and NV	
Beryllium	UT	
Boron minerals	CA	
Bromine	AR	
Cement:		
Masonry	AL, CA, FL, IN, TX	AR, AZ, CO, GA, KS, KY, MD, ME, MI, MO, MT, NM, NY, OH, OK, PA, SC, SD, TN, VA, WV.
Portland	AL, CA, FL, MO, TX	All other States, except AK, CT, DE, HI, ID, LA, MA, MN, MS, NC, ND, NH, NJ, RI, VT, WI.
Clay:		
Ball clay	IN, KY, MS, TN, TX	
Bentonite	AL, AZ, MS, UT, WY	CA, MT, NV, OR, TX.
Common clay and (or) shale	AL, NC, NY, OK, TX	All other States, except AK, DE, FL, HI, ID, MN, NH, NJ, NV, RI, VT, WI.
Fire clay	CO, MO, OH, TX	
Fuller's earth:		
Attapulgite	FL, GA, NV	
Montmorillonite	CA, GA, MO, MS, VA	IL, KS, TN, TX.
Kaolin	AL, AR, GA, NV, SC	CA, FL, TX.
Cobalt	MI	
Copper[4]	AZ, MT, NM, NV, UT	MI, MO.
Diatomite	CA, NV, OR, WA	
Feldspar	CA, ID, NC, OK, VA	SD.
Garnet, industrial	ID, MT, NY	
Gemstones, natural[5]	AZ, CA, CO, ID, OR	All other States.
Gold[4]	AK, CA, CO, NV, UT	AZ, MI, MT, NM, SD, WA.
Gypsum, crude	IA, KS, NV, OK, TX	AR, AZ, CA, CO, IN, LA, MI, NM, SD, UT, WY.
Helium:		
Crude	KS and TX	
Grade-A	AZ, CO, KS, OK, WY	UT.
Iodine, crude	OK	
Iron ore	MI and MN	
Iron oxide pigments, crude	AL, GA, UT	
Kyanite	VA	
Lead[4]	AK, ID, MO, WA	
Lime	AL, KY, MO, OH, TX	All other States, except AK, CT, DE, HI, IL, KS, MD, ME, MS, NC, NH, NJ, NM, NY, RI, SC, VT.
Lithium carbonate	NV	
Magnesite	NV	
Magnesium compounds	CA, DE, MI, UT	
Magnesium metal	UT	
Mica, crude	GA, NC, SD	
Molybdenum mineral concentrates	AZ, CO, MT, NV, UT	
Nickel[4]	MI	
Olivine	WA	
Palladium[4]	MT	
Peat	FL, IL, ME, MI, MN	IA, IN, NJ, NY, OH, PA, WA.
Perlite, crude	AZ, ID, NM, NV, OR	
Phosphate rock	FL, ID, NC, UT	
Platinum[4]	MT	
Potash	NM and UT	
Pumice and pumicite	CA, ID, KS, NM, OR	
Pyrophyllite, crude	NC	
Salt	KS, LA, NY, OH, TX	AL, AZ, CA, MI, NM, NV, OK, TN, UT, VA, WV.
Sand and gravel:		
Construction	AZ, CA, MI, MN, TX	All other States.
Industrial	IL, MO, NC, TX, WI	All other States, except AK, CT, DE, HI, ID, KS, MA, MD, ME, MT, NH, NM, UT, VT, WY.
Silica stone, special[6]	AR	
Silica, tripoli	AR, IL, MO	

See footnotes at end of table.

TABLE 2—Continued

NONFUEL MINERALS PRODUCED IN THE UNITED STATES, BY COMMODITY AND STATES IN 2016[1]

(Principal States based on quantity unless otherwise noted)

Commodity[2]	Principal States[3]	Other States[3]
Silver[4]	AK, AZ, ID, NV, UT	CA, CO, MO, MT, NM, SD.
Soda ash	CA and WY	
Staurolite	FL	
Stone:		
Crushed	FL, MO, OH, PA, TX	All other States.
Dimension	GA, IN, MA, TX, WI	All other States, except AK, DE, FL, HI, IA, KY, LA, MS, ND, NE, NJ, OR, RI, SC, WV, WY.
Talc, crude	MT, TX, VT	
Titanium mineral concentrates:		
Ilmenite	FL and GA	
Rutile	GA	
Vermiculite, crude	SC and VA	
Wollastonite	NY	
Zeolites	CA, ID, NM, OR, TX	MT.
Zinc[4]	AK, ID, MO, TN, WA	
Zirconium mineral concentrates	FL and GA	

[1]Table includes data from the commodity chapters published in the U.S. Geological Survey 2016 Minerals Yearbook as they were completed and released through March 2019.

[2]In addition to the commodities listed, bauxite was produced in Alabama, Arkansas, and Georgia; cadmium was recovered as a byproduct from zinc mineral concentrates in Tennessee; small quantities of fluorspar were intermittently produced in Kentucky; and rhenium was recovered as a byproduct from molybdenum mineral concentrates in Arizona, Montana, and Utah.

[3]Listed in alphabetical order by abbreviation.

[4]Recoverable content of ores and concentrates.

[5]Principal States according to value.

[6]Grindstones, pulpstones, and sharpening stones; does not include mill liners and grinding pebbles.

TABLE 3

VALUE OF NONFUEL MINERAL PRODUCTION IN THE UNITED STATES AND PRINCIPAL NONFUEL MINERALS PRODUCED IN 2016[1]

State	Value[2] (thousands)	Rank[3]	Percent of U.S. total[4]	Principal commodities[5]
Alabama	$1,310,000	19	1.84	Cement (masonry and portland), lime, sand and gravel (construction), stone (crushed).
Alaska	3,300,000	6	4.65	Gold, lead, sand and gravel (construction), silver, zinc.
Arizona	5,870,000	2	8.27	Cement (portland), copper, molybdenum mineral concentrates, sand and gravel (construction), stone (crushed).
Arkansas	762,000	31	1.07	Bromine, cement (portland), sand and gravel (construction), sand and gravel (industrial), stone (crushed).
California	3,450,000	4	4.86	Boron minerals, cement (portland), sand and gravel (construction), soda ash, stone (crushed).
Colorado	1,460,000	16	2.06	Cement (portland), gold, molybdenum mineral concentrates, sand and gravel (construction), stone (crushed).
Connecticut[6]	206,000	42	0.29	Clay [common clay and (or) shale], sand and gravel (construction), stone (crushed), stone (dimension).
Delaware[6]	23,500	50	0.03	Magnesium compounds, sand and gravel (construction), stone (crushed).
Florida	3,420,000	5	4.83	Cement (masonry and portland), phosphate rock, sand and gravel (construction), stone (crushed).
Georgia	1,830,000	13	2.57	Cement (portland), clay (kaolin and montmorillonite), sand and gravel (construction), stone (crushed).
Hawaii	118,000	46	0.17	Gemstones (natural), sand and gravel (construction), stone (crushed).
Idaho	594,000	35	0.84	Lead, phosphate rock, sand and gravel (construction), silver, stone (crushed).
Illinois[6]	1,230,000	20	1.73	Cement (portland), sand and gravel (construction), sand and gravel (industrial), silica (tripoli), stone (crushed).
Indiana	1,000,000	25	1.42	Cement (portland), lime, sand and gravel (construction), stone (crushed), stone (dimension).
Iowa[6]	575,000	28	0.81	Cement (portland), lime, sand and gravel (construction), sand and gravel (industrial), stone (crushed).
Kansas[6]	650,000	23	0.92	Cement (portland), helium (crude and Grade-A), salt, stone (crushed).
Kentucky[6]	506,000	29	0.71	Cement (portland), lime, sand and gravel (construction), sand and gravel (industrial), stone (crushed).
Louisiana[6]	548,000	33	0.77	Clay [common clay and (or) shale], salt, sand and gravel (construction), sand and gravel (industrial), stone (crushed).
Maine[6]	110,000	44	0.16	Cement (portland), peat, sand and gravel (construction), stone (crushed), stone (dimension).
Maryland[6]	352,000	34	0.50	Cement (masonry and portland), clay [common clay and (or) shale], sand and gravel (construction), stone (crushed).
Massachusetts[6]	296,000	40	0.42	Clay [common clay and (or) shale], lime, sand and gravel (construction), stone (crushed), stone (dimension).
Michigan	2,620,000	8	3.70	Cement (portland), iron ore, nickel, salt, sand and gravel (construction).
Minnesota[6]	2,740,000	7	3.86	Iron ore, sand and gravel (construction), sand and gravel (industrial), stone (crushed), stone (dimension).
Mississippi[6]	200,000	43	0.28	Clay (ball clay and montmorillonite), sand and gravel (construction), sand and gravel (industrial), stone (crushed).
Missouri	2,500,000	9	3.52	Cement (portland), lead, lime, sand and gravel (industrial), stone (crushed).
Montana	905,000	26	1.28	Cement (portland), copper, palladium, platinum, sand and gravel (construction).
Nebraska[6]	193,000	39	0.27	Cement (portland), lime, sand and gravel (construction), sand and gravel (industrial), stone (crushed).
Nevada	7,780,000	1	10.96	Copper, gold, lime, sand and gravel (construction), silver.
New Hampshire[6]	113,000	47	0.16	Sand and gravel (construction), stone (crushed), stone (dimension).
New Jersey	275,000	41	0.39	Peat, sand and gravel (construction), sand and gravel (industrial), stone (crushed).
New Mexico	1,370,000	18	1.93	Cement (portland), copper, potash, sand and gravel (construction), stone (crushed).
New York[6]	1,390,000	15	1.97	Cement (portland), clay [common clay and (or) shale], salt, sand and gravel (construction), stone (crushed).
North Carolina[6]	1,100,000	17	1.54	Clay [common clay and (or) shale], phosphate rock, sand and gravel (construction), sand and gravel (industrial), stone (crushed).
North Dakota[6]	97,300	48	0.14	Clay [common clay and (or) shale], lime, sand and gravel (construction), sand and gravel (industrial), stone (crushed).
Ohio[6]	1,130,000	14	1.59	Cement (portland), lime, salt, sand and gravel (construction), stone (crushed).
Oklahoma	758,000	32	1.07	Cement (portland), helium (Grade-A), sand and gravel (construction), sand and gravel (industrial), stone (crushed).
Oregon	391,000	36	0.55	Cement (portland), diatomite, perlite (crude), sand and gravel (construction), stone (crushed).

See footnotes at end of table.

TABLE 3—Continued

VALUE OF NONFUEL MINERAL PRODUCTION IN THE UNITED STATES AND PRINCIPAL NONFUEL MINERALS PRODUCED IN 2016[1]

State	Value[2] (thousands)	Rank[3]	Percent of U.S. total[4]	Principal commodities[5]
Pennsylvania[6]	$1,810,000	12	2.55	Cement (masonry and portland), lime, sand and gravel (construction), stone (crushed).
Rhode Island[6]	51,300	49	0.07	Sand and gravel (construction), sand and gravel (industrial), stone (crushed).
South Carolina[6]	771,000	30	1.09	Cement (masonry and portland), clay (kaolin), sand and gravel (construction), stone (crushed).
South Dakota	367,000	38	0.52	Cement (portland), gold, lime, sand and gravel (construction), stone (crushed).
Tennessee	1,030,000	24	1.45	Cement (portland), sand and gravel (construction), sand and gravel (industrial), stone (crushed), zinc.
Texas	4,830,000	3	6.80	Cement (portland), lime, sand and gravel (construction), sand and gravel (industrial), stone (crushed).
Utah	2,250,000	11	3.17	Cement (portland), copper, gold, salt, sand and gravel (construction).
Vermont[6]	118,000	45	0.17	Sand and gravel (construction), stone (crushed), stone (dimension), talc (crude).
Virginia	1,230,000	21	1.74	Cement (portland), kyanite, lime, sand and gravel (construction), stone (crushed).
Washington	869,000	27	1.23	Cement (portland), gold, sand and gravel (construction), stone (crushed), zinc.
West Virginia[6]	197,000	37	0.28	Cement (masonry and portland), lime, sand and gravel (industrial), stone (crushed).
Wisconsin[6]	1,040,000	22	1.46	Lime, sand and gravel (construction), sand and gravel (industrial), stone (crushed), stone (dimension).
Wyoming	2,290,000	10	3.23	Cement (portland), clay (bentonite), helium (Grade-A), sand and gravel (construction), soda ash.
Undistributed	2,950,000	XX	4.16	XX
Total	70,900,000	XX	100.00	XX

XX Not applicable.

[1]Table includes data from the commodity chapters published in the U.S. Geological Survey 2016 Minerals Yearbook as they were completed and released through March 2019.

[2]Data are rounded to no more than three significant digits; may not add to totals shown.

[3]Rank based on total, unadjusted, State values.

[4]Reported to two decimal places. Calculated using partial totals.

[5]Principal commodities based on value. Listed in alphabetical order.

[6]Partial total; excludes values that must be withheld to avoid disclosing company proprietary data, which are included with "Undistributed."

TABLE 4

VALUE OF NONFUEL MINERAL PRODUCTION PER CAPITA AND PER SQUARE KILOMETER IN 2016, BY STATE[1]

State	Land area[2] (square kilometers)	Population[2] (thousands)	Value of nonfuel mineral production[3]				
			Total (thousands)	Per capita		Per square kilometer	
				Dollars	Rank[4]	Dollars	Rank[4]
Alabama	131,171	4,865	$1,310,000	269	13	9,960	21
Alaska	1,477,953	742	3,300,000	4,450	1	2,230	44
Arizona	294,207	6,945	5,870,000	845	5	19,900	5
Arkansas	134,771	2,990	762,000	255	17	5,650	34
California	403,466	39,209	3,450,000	88	42	8,540	26
Colorado	268,431	5,541	1,460,000	263	15	5,440	35
Connecticut	12,542	3,579	206,000 [5]	58	46	16,500	7
Delaware	5,047	949	23,500 [5]	25	48	4,660	24
Florida	138,887	20,630	3,420,000	166	26	24,700	3
Georgia	148,959	10,305	1,830,000	177	24	12,300	15
Hawaii	16,635	1,428	118,000	83	43	7,110	30
Idaho	214,045	1,683	594,000	353	12	2,770	42
Illinois	143,793	12,827	1,230,000 [5]	96	39	8,540	25
Indiana	92,789	6,633	1,000,000	151	29	10,800	18
Iowa	144,669	3,132	575,000 [5]	184	16	3,970	33
Kansas	211,754	2,911	650,000 [5]	223	11	3,070	39
Kentucky	102,269	4,438	506,000 [5]	114	22	4,950	28
Louisiana	111,898	4,678	548,000 [5]	117	33	4,900	32
Maine	79,883	1,331	110,000 [5]	83	37	1,380	45
Maryland	25,142	6,005	352,000 [5]	59	38	14,000	2
Massachusetts	20,202	6,826	296,000 [5]	43	49	14,700	9
Michigan	146,435	9,952	2,620,000	264	14	17,900	6
Minnesota	206,232	5,523	2,740,000 [5]	495	8	13,300	13
Mississippi	121,531	2,988	200,000 [5]	67	45	1,640	48
Missouri	178,040	6,087	2,500,000	410	10	14,000	12
Montana	376,962	1,041	905,000	869	4	2,400	43
Nebraska	198,974	1,906	193,000 [5]	101	23	968	47
Nevada	284,332	2,920	7,780,000	2,660	3	27,300	1
New Hampshire	23,187	1,342	113,000 [5]	84	41	4,870	36
New Jersey	19,047	8,875	275,000	31	50	14,400	11
New Mexico	314,161	2,093	1,370,000	654	7	4,350	40
New York	122,057	19,642	1,390,000 [5]	71	44	11,400	14
North Carolina	125,920	10,157	1,100,000 [5]	108	35	8,700	17
North Dakota	178,711	754	97,300 [5]	129	30	545	50
Ohio	105,829	11,635	1,130,000 [5]	97	34	10,600	10
Oklahoma	177,660	3,927	758,000	193	20	4,270	41
Oregon	248,608	4,091	391,000	96	40	1,580	49
Pennsylvania	115,883	12,784	1,810,000 [5]	141	32	15,600	8
Rhode Island	2,678	1,057	51,300 [5]	49	47	19,200	4
South Carolina	77,857	4,958	771,000 [5]	155	27	9,900	20
South Dakota	196,350	863	367,000	425	9	1,870	46
Tennessee	106,798	6,645	1,030,000	155	28	9,650	22
Texas	676,587	27,937	4,830,000	173	25	7,130	29
Utah	212,818	3,043	2,250,000	739	6	10,600	19
Vermont	23,871	624	118,000 [5]	189	21	4,940	38
Virginia	102,279	8,411	1,230,000	147	31	12,100	16
Washington	172,119	7,295	869,000	119	36	5,050	37
West Virginia	62,259	1,831	197,000 [5]	108	18	3,170	31
Wisconsin	140,268	5,773	1,040,000 [5]	180	19	7,410	27
Wyoming	251,470	584	2,290,000	3,920	2	9,110	23
Undistributed	XX	XX	2,950,000	XX	XX	XX	XX
Total or average	9,147,436 [6]	322,385 [6]	70,900,000	220	XX	7,760	XX

See footnotes at end of table.

TABLE 4—Continued

VALUE OF NONFUEL MINERAL PRODUCTION PER CAPITA AND PER SQUARE KILOMETER IN 2016, BY STATE[1]

XX Not applicable.

[1]Table includes data from the commodity chapters published in the U.S. Geological Survey 2016 Minerals Yearbook as they were completed and released through March 2019.

[2]Source: U.S. Census Bureau State and national total values.

[3]Data are rounded to no more than three significant digits; may not add to totals shown.

[4]Rank based on total, unadjusted, State values.

[5]Partial total; excludes values that must be withheld to avoid disclosing company proprietary data, which are included with "Undistributed."

[6]Excludes Washington, DC (which has no mineral production), with an area of 158 square kilometers and a population of 686,575.

TABLE 5

NONFUEL MINERAL PRODUCTION IN THE UNITED STATES, BY STATE[1, 2, 3]

(Thousand metric tons and thousand dollars unless otherwise specified)

Commodity		2014		2015		2016	
		Quantity	Value	Quantity	Value	Quantity	Value
Alabama:							
Clay:							
Bentonite		(4)	W	(4)	W	76	9,370
Common clay and (or) shale		1,190 r	5,690 r	1,180 r	4,600 r	1,260	4,900
Gemstones, natural[e]		NA	7	NA	92	NA	82
Lime		2,280	294,000	2,340	302,000	2,290	296,000
Sand and gravel:							
Construction		8,850	61,000	9,630 r	67,400 r	11,500	77,200
Industrial		1,150	33,800	972	23,700	664	16,700
Stone, crushed		36,500 r	362,000 r	34,900 r	363,000 r	36,400	405,000
Combined values of bauxite, cement, clay (kaolin), iron oxide pigments (crude), salt, stone (dimension), and values indicated by symbol W		XX	446,000	XX	534,000	XX	497,000
Total		XX	1,200,000 r	XX	1,290,000 r	XX	1,310,000
Alaska:							
Gemstones, natural[e]		NA	60	NA	73	NA	17
Gold[5]	kilograms	31,400	1,280,000	28,000	1,050,000	27,600	1,110,000
Lead[5]	metric tons	166,000	388,000	161,000	324,000	164,000	341,000
Sand and gravel, construction		8,360	63,200	9,020 r	79,000 r	8,670	74,300
Silver[5]	kilograms	481,000	295,000 r	490,000	248,000	520,000	287,000
Stone, crushed		959	12,400	1,040	12,100 r	749	15,300
Zinc[5]	metric tons	660,000	1,560,000	629,000	1,330,000	658,000	1,470,000
Total		XX	3,600,000	XX	3,040,000 r	XX	3,300,000
Arizona:							
Copper[5]		893	6,260,000	961	5,430,000	969	4,800,000
Gemstones, natural[e]		NA	2,370	NA	1,420	NA	2,090
Sand and gravel, construction		35,900 r	310,000 r	39,500 r	363,000 r	40,300	370,000
Silver	kilograms	91,400	56,100 r	99,200	50,100	86,700	47,800
Stone:							
Crushed		8,520	67,900	10,200 r	94,300 r	10,500	102,000
Dimension		55	6,080	62	6,660	70	5,850
Combined values of cement, clay [bentonite (2015–16) and common clay and (or) shale (2014–16)], gold, gypsum (crude), helium [Grade-A (2016)], lime, molybdenum mineral concentrates, perlite (crude), rhenium, salt, sand and gravel (industrial), zeolites		XX	738,000	XX	558,000 r	XX	537,000
Total		XX	7,440,000	XX	6,500,000 r	XX	5,870,000
Arkansas:							
Gemstones, natural[e]		NA	429	NA	441	NA	406
Sand and gravel:							
Construction		8,080	69,800	7,510	66,000	7,510	66,800
Industrial		3,180	248,000	1,990	146,000	1,330	60,700
Silica stone, special	metric tons	146 e	36 e	205	49	300 e	72 e
Stone:							
Crushed		26,000	212,000	27,800 r	236,000 r	29,800	263,000
Dimension		10	1,290	10	1,290	8	1,110
Combined values of bauxite, bromine, cement, clay [common clay and (or) shale and kaolin], gypsum (crude), lime, silica (tripoli)		XX	383,000 r	XX	379,000 r	XX	370,000
Total		XX	915,000	XX	829,000 r	XX	762,000
California:							
Cement:							
Masonry		186	20,100 e	188	20,800 e	220	25,800 e
Portland		9,810	829,000 e	9,770	887,000 e	9,600	907,000 e
Gemstones, natural[e]		NA	1,210	NA	882	NA	769
Gypsum, crude		689	5,510 r	690	5,380 r	814	6,510

See footnotes at end of table.

TABLE 5—Continued
NONFUEL MINERAL PRODUCTION IN THE UNITED STATES, BY STATE[1, 2, 3]

(Thousand metric tons and thousand dollars unless otherwise specified)

Commodity		2014		2015		2016	
		Quantity	Value	Quantity	Value	Quantity	Value
California:—Continued							
Rare earths[e, 6]	metric tons	5,400	W	5,900	W	--	--
Sand and gravel:							
Construction		85,900 r	1,000,000	95,400 r	1,070,000 r	95,400	1,120,000
Industrial		1,520	52,500	1,860	66,100	1,620	54,200
Stone:							
Crushed		37,200 r	318,000 r	41,100 r	360,000 r	41,600	370,000
Dimension		23	9,170	21	7,780	17	6,750
Combined values of boron minerals, clay [bentonite, common clay and (or) shale, montmorillonite, kaolin], diatomite, feldspar, gold, lime, magnesium compounds, pumice and pumicite, salt, silver, soda ash, zeolites, and values indicated by symbol W		XX	917,000 r	XX	969,000 r	XX	955,000
Total		XX	3,160,000	XX	3,390,000 r	XX	3,450,000
Colorado:							
Gemstones, natural[e]		NA	451	NA	326	NA	1,070
Sand and gravel, construction		34,200	242,000	33,600 r	260,000	34,900	283,000
Stone:							
Crushed		12,700	108,000	13,100 r	121,000 r	13,800	133,000
Dimension		17	6,230	20	9,570	20	10,200
Combined values of cement, clay [bentonite (2014), common clay and (or) shale (2014–16), fire clay (2014–16)], gold, gypsum (crude), helium [crude (2015) and Grade-A (2014–16)], lime, molybdenum mineral concentrates, sand and gravel (industrial), silver		XX	1,230,000	XX	898,000 r	XX	1,030,000
Total		XX	1,590,000	XX	1,290,000 r	XX	1,460,000
Connecticut:							
Clay, common clay and (or) shale		(4)	(7)	(4)	(7)	(4)	(7)
Gemstones, natural[e]		NA	7	NA	8	NA	13
Sand and gravel, construction		5,360	55,300	5,120	48,600 r	5,330 r	51,800
Stone:							
Crushed		9,220	144,000	9,360	142,000	9,900	155,000
Dimension		(4)	(7)	(4)	(7)	(4)	(7)
Total		XX	200,000	XX	191,000 r	XX	206,000
Delaware:							
Gemstones, natural[e]		NA	1	NA	2	NA	2
Magnesium compounds		(4)	(7)	(4)	(7)	(4)	(7)
Sand and gravel, construction		1,500	15,100	2,370	19,800	2,810	23,500
Stone, crushed		(4)	(7)	(4)	(7)	(4)	(7)
Total		XX	15,100	XX	19,800	XX	23,500
Florida:							
Cement:							
Masonry		365	47,700 e	400	51,900 e	509	70,700 e
Portland		4,990	453,000 e	5,500	551,000 e	5,860	600,000 e
Gemstones, natural[e]		NA	2	NA	2	NA	4
Peat	metric tons	370,000	7,340	317,000	7,110	292,000	6,810
Sand and gravel:							
Construction		16,000	152,000	17,200	175,000 r	19,100	204,000
Industrial		219	12,100	485	32,100	392	12,900
Stone, crushed		57,700	681,000	67,400 r	802,000 r	73,000	929,000
Combined values of clay (attapulgite and kaolin), lime, phosphate rock, staurolite, titanium mineral concentrates (ilmenite), zirconium mineral concentrates		XX	1,550,000 r	XX	1,510,000 r	XX	1,600,000
Total		XX	2,900,000 r	XX	3,130,000 r	XX	3,420,000

See footnotes at end of table.

TABLE 5—Continued
NONFUEL MINERAL PRODUCTION IN THE UNITED STATES, BY STATE[1, 2, 3]

(Thousand metric tons and thousand dollars unless otherwise specified)

Commodity	2014		2015		2016	
	Quantity	Value	Quantity	Value	Quantity	Value
Georgia:						
Clay, kaolin[e]	5,410 r	819,000 r	5,190 r	827,000 r	4,720 r	788,000
Gemstones, natural[e]	NA	103	NA	24	NA	11
Sand and gravel:						
Construction	5,490	37,000	6,110 r	42,400 r	6,360	43,800
Industrial	520	18,000	(4)	W	(4)	W
Stone:						
Crushed	43,400 r	541,000 r	48,200 r	643,000 r	53,900	782,000
Dimension	152	15,500	140	13,000	139	13,100
Combined values of barite, bauxite, cement, clay [common clay and (or) shale and montmorillonite], feldspar (2014), lime, mica (crude), titanium mineral concentrates [ilmenite (2015–16) and rutile (2016)], zirconium mineral concentrates (2015–16), and values indicated by symbol W	XX	152,000 r	XX	212,000 r	XX	200,000
Total	XX	1,580,000 r	XX	1,740,000 r	XX	1,830,000
Hawaii:						
Gemstones, natural[e]	NA	136	NA	103	NA	69
Sand and gravel, construction	492	7,830	459	10,300	357	7,720
Stone, crushed	4,900 r	95,700 r	5,150 r	101,000 r	5,200	110,000
Total	XX	104,000 r	XX	112,000 r	XX	118,000
Idaho:						
Gemstones, natural[e]	NA	399	NA	1,630	NA	1,680
Sand and gravel, construction	13,800	82,300	14,100 r	83,000 r	14,900	86,100
Stone:						
Crushed	4,410 r	28,600 r	5,200 r	34,800 r	4,660	32,600
Dimension	64	8,640	45	7,050	46	7,970
Combined values of copper (2014–15), feldspar, garnet (industrial), gold (2015), lead, lime, molybdenum mineral concentrates (2014), perlite (crude), phosphate rock, pumice and pumicite, silver, zeolites, zinc	XX	585,000	XX	413,000 r	XX	466,000
Total	XX	705,000	XX	539,000 r	XX	594,000
Illinois:						
Cement, portland	1,220	126,000 e	1,410	153,000 e	1,550	178,000 e
Gemstones, natural[e]	NA	10	NA	11	NA	11
Sand and gravel:						
Construction	18,400 r	126,000	22,000 r	152,000 r	20,600	139,000
Industrial	13,500	1,290,000	14,100	867,000	10,600	350,000
Stone, crushed	52,400 r	522,000 r	54,600 r	571,000 r	52,200	560,000
Combined values of clay [common clay and (or) shale and montmorillonite], peat, silica (tripoli), stone (dimension)	XX	(7)	XX	(7)	XX	(7)
Total	XX	2,060,000	XX	1,740,000	XX	1,230,000
Indiana:						
Cement, portland	2,400	208,000 e	2,560	254,000	(4)	W
Gemstones, natural[e]	NA	4	NA	5	NA	5
Sand and gravel, construction	17,600	132,000	17,300	132,000 r	17,500	133,000
Stone:						
Crushed	44,400	342,000	49,500	384,000 r	47,100	390,000
Dimension	200	34,400	211	39,700	236	42,800
Combined values of cement (masonry), clay [ball clay and common clay and (or) shale], gypsum (crude), lime, peat, sand and gravel (industrial), and value indicated by symbol W	XX	169,000 r	XX	161,000	XX	439,000
Total	XX	886,000	XX	972,000 r	XX	1,000,000

See footnotes at end of table.

TABLE 5—Continued
NONFUEL MINERAL PRODUCTION IN THE UNITED STATES, BY STATE[1, 2, 3]

(Thousand metric tons and thousand dollars unless otherwise specified)

Commodity	2014		2015		2016	
	Quantity	Value	Quantity	Value	Quantity	Value
Iowa:						
Gemstones, natural[e]	NA	3	NA	3	NA	3
Sand and gravel:						
Construction	13,500	92,700	14,900 r	118,000	14,900	117,000
Industrial	(4)	W	1,790	133,000	1,340	53,600
Stone, crushed	33,400 r	320,000 r	36,000 r	380,000 r	37,700	404,000
Combined values of cement, clay [common clay and (or) shale], gypsum (crude), lime, peat, and value indicated by symbol W	XX	(7)	XX	(7)	XX	(7)
Total	XX	413,000 r	XX	632,000 r	XX	575,000
Kansas:						
Cement, portland	2,010	202,000 e	2,140	207,000 e	2,230	223,000 e
Gemstones, natural[e]	NA	1	NA	2	NA	2
Salt	2,930	194,000	2,830	207,000	2,560	209,000
Sand and gravel, construction	8,570 r	48,600	9,080 r	55,500 r	10,100	59,800
Stone:						
Crushed	16,300 r	138,000 r	17,700 r	162,000 r	17,300	158,000
Dimension	14	1,330	11	1,090	13	1,270
Combined values of cement (masonry), clay [common clay and (or) shale and montmorillonite], gypsum (crude), helium (crude and Grade-A), pumice and pumicite	XX	(7)	XX	(7)	XX	(7)
Total	XX	585,000 r	XX	632,000 r	XX	650,000
Kentucky:						
Gemstones, natural[e]	NA	11	NA	16	NA	13
Sand and gravel, construction	8,510	41,500	9,040	45,500	8,540	40,300
Stone, crushed	51,100 r	461,000 r	54,000 r	503,000 r	49,100	466,000
Combined values of cement, clay [ball clay and common clay and (or) shale], lime, sand and gravel (industrial)	XX	(7)	XX	(7)	XX	(7)
Total	XX	502,000	XX	549,000 r	XX	506,000
Louisiana:						
Gemstones, natural[e]	NA	7	NA	8	NA	34
Salt	14,800	344,000	12,700	325,000	12,200	306,000
Sand and gravel:						
Construction	17,800	220,000	16,300 r	185,000	17,200	198,000
Industrial	2,120	147,000	1,530 r	62,000 r	1,330	44,200
Combined values of clay [common clay and (or) shale], gypsum (crude), lime, stone (crushed)	XX	(7)	XX	(7)	XX	(7)
Total	XX	711,000	XX	572,000 r	XX	548,000
Maine:						
Gemstones, natural[e]	NA	370	NA	376	NA	378
Sand and gravel, construction	7,250	54,100	7,810 r	61,400 r	9,040	74,400
Stone:						
Crushed	3,840 r	31,500	4,240 r	33,200 r	4,200	33,500
Dimension	5	2,820	3	1,840	3	1,880
Combined values of cement, clay [common clay and (or) shale], peat	XX	(7)	XX	(7)	XX	(7)
Total	XX	88,800 r	XX	96,900 r	XX	110,000
Maryland:						
Gemstones, natural[e]	NA	1	NA	2	NA	2
Sand and gravel, construction	7,110	91,600	7,380 r	92,600 r	7,380	92,800
Stone:						
Crushed	21,700	222,000	22,700 r	246,000 r	22,100	258,000
Dimension	3	723	4	728	6	1,380
Combined values of cement and clay [common clay and (or) shale]	XX	(7)	XX	(7)	XX	(7)
Total	XX	315,000	XX	339,000 r	XX	352,000

See footnotes at end of table.

TABLE 5—Continued
NONFUEL MINERAL PRODUCTION IN THE UNITED STATES, BY STATE[1, 2, 3]

(Thousand metric tons and thousand dollars unless otherwise specified)

Commodity		2014		2015		2016	
		Quantity	Value	Quantity	Value	Quantity	Value
Massachusetts:							
Clay, common clay and (or) shale		(4)	(7)	(4)	(7)	(4)	(7)
Gemstones, natural[e]		NA	1	NA	2	NA	2
Lime		(4)	(7)	(4)	(7)	(4)	(7)
Sand and gravel, construction		11,000	88,200	10,100	92,200 r	9,830	89,600
Stone:							
Crushed		10,600	147,000 r	12,100 r	159,000 r	12,600	167,000
Dimension		165	43,100	160	41,900	159	40,200
Total		XX	278,000	XX	293,000 r	XX	296,000
Michigan:							
Cement:							
Masonry		43	6,100 e	92	14,000 e	83	13,900 e
Portland		3,950	399,000 e	4,190	470,000 e	4,100	510,000 e
Cobalt[e, 8]	metric tons	120	W	760	W	690	W
Copper[9]	do.	3,910	W	24,300	W	23,400	W
Gemstones, natural[e]		NA	2	NA	15	NA	22
Gypsum, crude		233	1,860 r	(4)	W	(4)	W
Iron ore[10]		12,100	1,240,000	10,800	852,000	11,000	844,000
Lime		526	65,400	474	60,200	519	66,400
Nickel[9, 11]	metric tons	4,300	W	27,200	W	24,100	W
Sand and gravel:							
Construction		36,300 r	204,000	39,100 r	237,000 r	41,300	249,000
Industrial		1,590	112,000	3,370	77,300	3,410	54,000
Stone, crushed		26,300	195,000 r	27,700	199,000 r	27,700	199,000
Combined values of clay [common clay and (or) shale], gold (2016), magnesium compounds, peat, salt, stone (dimension), and values indicated by symbol W		XX	427,000	XX	836,000	XX	687,000
Total		XX	2,650,000	XX	2,750,000	XX	2,620,000
Minnesota:							
Clay, common clay and (or) shale		(4)	(7)	--	--	--	--
Gemstones, natural[e]		NA	7	NA	8	NA	8
Iron ore		43,000	3,410,000	35,400	2,890,000	30,800	2,210,000
Lime		(4)	(7)	(4)	(7)	(4)	(7)
Peat	metric tons	47,700	2,740	58,300	2,860	71,000	4,900
Sand and gravel:							
Construction		41,800 r	188,000 r	49,300 r	239,000 r	46,700	227,000
Industrial		7,220	574,000	5,170	335,000	3,110	180,000
Stone:							
Crushed		9,020 r	106,000 r	7,780 r	97,800 r	7,490	94,200
Dimension		51	21,000	51	20,800	51	20,500
Total		XX	4,300,000	XX	3,590,000	XX	2,740,000
Mississippi:							
Gemstones, natural[e]		NA	1	NA	2	NA	2
Sand and gravel:							
Construction		10,700	82,100	9,950	78,900	10,300	85,000
Industrial		373	5,520	451	5,260	1,100	6,500
Stone, crushed		2,180 r	61,500 r	1,900 r	55,200 r	2,170	64,100
Combined values of clay [ball clay, bentonite, common clay and (or) shale, montmorillonite]		XX	41,800	XX	42,800	XX	43,900
Total		XX	191,000 r	XX	182,000 r	XX	200,000
Missouri:							
Cement, portland		8,780	844,000 e	8,540	849,000 e	8,340	909,000 e
Sand and gravel:							
Construction		10,600	67,500	9,890 r	67,700 r	10,300	73,500
Industrial		4,290	289,000	6,290	385,000	8,050	268,000

See footnotes at end of table.

TABLE 5—Continued
NONFUEL MINERAL PRODUCTION IN THE UNITED STATES, BY STATE[1, 2, 3]

(Thousand metric tons and thousand dollars unless otherwise specified)

Commodity		2014		2015		2016	
		Quantity	Value	Quantity	Value	Quantity	Value
Missouri:—Continued							
Stone, crushed		69,800 r	557,000 r	70,900 r	532,000 r	69,900	550,000
Combined values of cement (masonry), clay [common clay and (or) shale, fire clay, montmorillonite], copper, gemstones (natural), lead, lime, silica (tripoli), silver, stone (dimension), zinc		XX	903,000	XX	781,000 r	XX	698,000
Total		XX	2,660,000	XX	2,610,000 r	XX	2,500,000
Montana:							
Gemstones, natural[e]		NA	544	NA	583	NA	600
Palladium[5]	kilograms	12,400	324,000	12,500	280,000	13,100	259,000
Platinum[5]	do.	3,660	163,000	3,670	125,000	3,890	124,000
Sand and gravel, construction		10,900	89,600	12,100 r	92,300 r	11,400	91,600
Stone:							
Crushed		2,910	26,100 r	2,820 r	28,200 r	2,800	25,700
Dimension		28	1,970	24	1,000	(4)	W
Combined values of cement, clay [bentonite and common clay and (or) shale], copper, garnet (industrial), gold, iodine (2014), lime, molybdenum mineral concentrates, rhenium, silver, talc (crude), and value indicated by symbol W		XX	566,000	XX	484,000	XX	404,000
Total		XX	1,170,000	XX	1,010,000	XX	905,000
Nebraska:							
Gemstones, natural[e]		NA	4	NA	5	NA	5
Sand and gravel, construction		12,100	86,800 r	12,700 r	91,000 r	12,700	94,200
Stone, crushed		7,470 r	90,800 r	7,680 r	95,300 r	7,670	98,300
Combined values of cement, clay [common clay and (or) shale], lime, sand and gravel (industrial)		XX	(7)	XX	(7)	XX	(7)
Total		XX	178,000 r	XX	186,000 r	XX	193,000
Nevada:							
Copper[5]		(4)	W	(4)	W	74	367,000
Gold[5]	kilograms	151,000	6,160,000	162,000	6,050,000	165,000	6,630,000
Sand and gravel, construction		13,600	87,900	15,400	89,700	17,500	109,000
Silver[5]	kilograms	326,000	200,000 r	290,000	147,000	278,000	153,000
Stone, crushed		8,710 r	77,500 r	9,010 r	83,900 r	9,960	84,800
Combined values of barite, cement, clay [attapulgite (2014, 2016), bentonite, kaolin], diatomite, gemstones (natural), gypsum (crude), lime, lithium carbonate, magnesite, molybdenum mineral concentrates, perlite (crude), salt, sand and gravel (industrial), stone (dimension), and values indicated by symbol W		XX	985,000 r	XX	897,000 r	XX	436,000
Total		XX	7,510,000 r	XX	7,260,000 r	XX	7,780,000
New Hampshire:							
Gemstones, natural[e]		NA	7	NA	8	NA	8
Sand and gravel, construction		6,360	53,600	6,230 r	52,200 r	6,910	57,500
Stone:							
Crushed		5,180	44,800	5,550	51,500	5,660	55,300
Dimension		28	3,460	(4)	(7)	(4)	(7)
Total		XX	102,000	XX	104,000	XX	113,000
New Jersey:							
Gemstones, natural[e]		NA	1	NA	2	NA	2
Peat		(4)	(12)	(4)	(12)	(4)	(12)
Sand and gravel:							
Construction		12,100	93,300	11,800 r	94,600 r	12,500	103,000
Industrial		961	37,200	950	35,500	879	35,900
Stone, crushed		16,900	154,000	17,800 r	161,000 r	16,600	136,000
Total		XX	284,000	XX	291,000 r	XX	275,000

See footnotes at end of table.

TABLE 5—Continued
NONFUEL MINERAL PRODUCTION IN THE UNITED STATES, BY STATE[1, 2, 3]

(Thousand metric tons and thousand dollars unless otherwise specified)

Commodity	2014		2015		2016	
	Quantity	Value	Quantity	Value	Quantity	Value
New Mexico:						
Copper[5, 13]	156	1,090,000	181	1,020,000	174	864,000
Gemstones, natural[e]	NA	18	NA	47	NA	35
Sand and gravel, construction	8,230 r	83,900 r	8,720 r	78,600 r	9,510	85,200
Stone, crushed	4,890 r	44,500 r	5,120 r	45,700 r	4,760	43,800
Combined values of cement, clay [common clay and (or) shale], gold, gypsum (crude), molybdenum mineral concentrates (2014), perlite (crude), potash pumice and pumicite, rhenium (2014), salt, silver, stone (dimension), zeolites	XX	537,000	XX	472,000	XX	375,000
Total	XX	1,760,000	XX	1,620,000 r	XX	1,370,000
New York:						
Clay, common clay and (or) shale	512	24,000	525 r	25,300 r	668	28,400
Gemstones, natural[e]	NA	104	NA	94	NA	104
Salt	7,740	577,000	7,320	615,000	6,710	566,000
Sand and gravel, construction	27,600	252,000	30,600 r	297,000 r	30,500	315,000
Stone:						
Crushed	36,900 r	415,000 r	40,600 r	482,000 r	38,600	473,000
Dimension	126	17,600	126	17,200	93	13,200
Combined values of cement, garnet (industrial), peat, sand and gravel (industrial), wollastonite	XX	(7)	XX	(7)	XX	(7)
Total	XX	1,290,000	XX	1,440,000 r	XX	1,390,000
North Carolina:						
Clay, common clay and (or) shale	654 r	16,700 r	771 r	25,800 r	936	(7)
Gemstones, natural[e]	NA	235	NA	299	NA	574
Sand and gravel:						
Construction	7,350	48,600	7,940	52,200 r	8,120	52,900
Industrial	2,640	41,500	4,050	55,100	4,180	58,900
Stone:						
Crushed	46,200	727,000	49,700 r	782,000 r	57,800	965,000
Dimension	44	20,700	91	18,600	92	18,000
Combined values of andalusite, clay [kaolin (2014)], feldspar, mica (crude), phosphate rock, pyrophyllite (crude)	XX	(7)	XX	(7)	XX	(7)
Total	XX	855,000 r	XX	934,000 r	XX	1,100,000
North Dakota:						
Gemstones, natural[e]	NA	4	NA	5	NA	5
Sand and gravel, construction	20,600	147,000	18,400 r	118,000 r	13,000	90,500
Stone, crushed	1,130	12,000	788 r	6,650 r	728	6,840
Combined values of clay [common clay and (or) shale], lime, sand and gravel (industrial)	XX	(7)	XX	(7)	XX	(7)
Total	XX	159,000	XX	125,000 r	XX	97,300
Ohio:						
Cement, portland	864	90,000 e	916	104,000 e	(4)	(7)
Clay, common clay and (or) shale	670 r	10,500 r	662 r	12,300 r	652	12,200
Gemstones, natural[e]	NA	4	NA	5	NA	5
Lime	1,800	234,000	1,500	201,000	1,530	205,000
Sand and gravel:						
Construction	30,500	228,000	32,900 r	271,000 r	32,600	266,000
Industrial	2,850	211,000	1,440	79,400	1,310	51,800
Stone:						
Crushed	53,500	477,000	58,400 r	523,000 r	59,600	585,000
Dimension	21	5,150	22	6,070	17	6,810
Combined values of cement (masonry), clay [fire clay (2015–16)], peat, salt	XX	(7)	XX	(7)	XX	(7)
Total	XX	1,250,000	XX	1,200,000	XX	1,130,000

See footnotes at end of table.

TABLE 5—Continued
NONFUEL MINERAL PRODUCTION IN THE UNITED STATES, BY STATE[1, 2, 3]

(Thousand metric tons and thousand dollars unless otherwise specified)

Commodity	2014		2015		2016	
	Quantity	Value	Quantity	Value	Quantity	Value
Oklahoma:						
Clay, common clay and (or) shale	660 r	2,050 r	741 r	2,310 r	862	2,800
Gemstones, natural[e]	NA	4	NA	5	NA	5
Sand and gravel:						
Construction	11,300 r	86,300 r	10,800 r	88,300 r	10,200	84,200
Industrial	3,340	122,000	2,980 r	70,700 r	3,420	72,800
Stone:						
Crushed	39,500	321,000	38,400 r	340,000 r	36,800	334,000
Dimension	62	5,240	67	5,920	67	5,790
Combined values of cement, feldspar, gypsum (crude), helium [crude (2015) and Grade-A (2014–16)], iodine (crude), lime, pumice and pumicite (2014), salt	XX	282,000 r	XX	273,000 r	XX	258,000
Total	XX	818,000 r	XX	780,000	XX	758,000
Oregon:						
Gemstones, natural[e]	NA	1,090	NA	1,180	NA	2,330
Sand and gravel, construction	11,000	94,000	12,200 r	108,000 r	12,400	111,000
Stone, crushed	17,700 r	136,000 r	18,300 r	132,000 r	20,700	151,000
Combined values of cement, clay [bentonite and common clay and (or) shale], diatomite, emery [crude (2014)], lime, perlite (crude), pumice and pumicite, sand and gravel (industrial), zeolites	XX	132,000 r	XX	153,000 r	XX	127,000
Total	XX	363,000 r	XX	395,000 r	XX	391,000
Pennsylvania:						
Cement:						
Masonry	152	22,100 e	179	26,600 e	170	26,300 e
Portland	3,830	352,000 e	3,920	396,000 e	3,820	405,000 e
Clay, common clay and (or) shale	270 r	2,710 r	406 r	2,930 r	350	2,640
Gemstones, natural[e]	NA	1	NA	2	NA	2
Lime	1,080	148,000	968	132,000	915	116,000
Peat	(4)	(7)	(4)	(7)	(4)	(7)
Sand and gravel:						
Construction	9,730	95,100	9,310 r	101,000 r	8,710	92,500
Industrial	(4)	(7)	(4)	(7)	(4)	(7)
Stone:						
Crushed	81,900 r	1,010,000	87,500 r	1,100,000 r	87,300	1,160,000
Dimension	51	5,720	42	6,410	41	6,600
Total	XX	1,630,000	XX	1,760,000 r	XX	1,810,000
Rhode Island:						
Gemstones, natural[e]	NA	1	NA	2	NA	2
Sand and gravel:						
Construction	2,830	32,800	2,130 r	27,000 r	2,140	26,900
Industrial	(4)	(7)	(4)	(7)	(4)	(7)
Stone, crushed	1,990 r	21,500 r	2,360 r	25,300 r	2,280	24,500
Total	XX	54,400 r	XX	52,300 r	XX	51,300
South Carolina:						
Cement:						
Masonry	160	23,700 e	168	26,000 e	185	28,500 e
Portland	2,890	273,000 e	3,070	318,000 e	2,860	300,000 e
Clay, kaolin[e]	338 r	29,200 r	346 r	30,600 r	347	31,200
Gemstones, natural[e]	NA	1	NA	2	NA	2
Sand and gravel:						
Construction	8,080	42,000	8,350 r	44,300 r	8,650	49,600
Industrial	589	26,800	551	24,400	495	21,000

See footnotes at end of table.

TABLE 5—Continued
NONFUEL MINERAL PRODUCTION IN THE UNITED STATES, BY STATE[1, 2, 3]

(Thousand metric tons and thousand dollars unless otherwise specified)

Commodity		2014		2015		2016	
		Quantity	Value	Quantity	Value	Quantity	Value
South Carolina:—Continued							
Stone, crushed		20,300	219,000	23,900 r	275,000 r	28,200	341,000
Combined values of clay [common clay and (or) shale], stone [dimension (2014–15)], vermiculite		XX	(7)	XX	(7)	XX	(7)
Total		XX	613,000 r	XX	719,000 r	XX	771,000
South Dakota:							
Sand and gravel, construction		11,900	59,100	11,200 r	55,000 r	10,200	50,000
Stone, crushed		6,900	52,000	6,580	47,600	6,850	51,200
Combined values of cement, clay [common clay and (or) shale], feldspar, gemstones (natural), gold, gypsum (crude), lime, mica (crude), sand and gravel (industrial), silver, stone (dimension)		XX	221,000	XX	226,000	XX	266,000
Total		XX	332,000 r	XX	329,000 r	XX	367,000
Tennessee:							
Clay, ball clay[e]		648	27,400	601	27,900	568	25,300
Sand and gravel:							
Construction		5,790	41,000	6,620 r	52,900 r	7,450	57,500
Industrial		1,490	60,500	1,540	49,100	1,570	48,500
Stone:							
Crushed		38,200	483,000	40,300 r	486,000 r	43,300	549,000
Dimension		51	11,000	52	10,200	57	9,840
Combined values of cadmium (byproduct of zinc production), cement, clay [common clay and (or) shale and montmorillonite], gemstones (natural), lime, salt, zinc		XX	423,000 r	XX	413,000 r	XX	341,000
Total		XX	1,050,000 r	XX	1,040,000 r	XX	1,030,000
Texas:							
Cement:							
Masonry		277	43,300 e	268	46,200 e	287	48,700 e
Portland		11,000	1,170,000 e	10,400	1,200,000 e	10,900	1,260,000 e
Clay:							
Bentonite		59	10,400	51	8,570	43	8,170
Common clay and (or) shale		1,630 r	14,100 r	1,910 r	39,000 r	1,950	24,500
Gemstones, natural[e]		NA	170	NA	180	NA	33
Lime		1,490	171,000	1,460	170,000	1,530	176,000
Salt		8,010	182,000	7,570	173,000	7,420	169,000
Sand and gravel:							
Construction		77,100	693,000	82,900 r	787,000 r	85,800	818,000
Industrial		16,500	1,300,000	14,200	706,000	10,900	417,000
Stone:							
Crushed		155,000 r	1,340,000	163,000 r	1,630,000 r	166,000	1,720,000
Dimension		922	159,000	1,060	142,000	1,180	130,000
Combined values of clay (ball clay, fire clay, kaolin, montmorillonite), gypsum (crude), helium (crude), iodine [crude (2015)], talc (crude), zeolites		XX	56,700 r	XX	65,400 r	XX	54,100
Total		XX	5,150,000	XX	4,960,000 r	XX	4,830,000
Utah:							
Beryllium	metric tons	270	W	205	W	155	W
Gemstones, natural[e]		NA	860	NA	174	NA	417
Iron ore		998	83,000	--	--	--	--
Salt		2,360	157,000	2,010	226,000 r	2,080	212,000
Sand and gravel, construction		25,200 r	188,000 r	28,800 r	214,000 r	31,600	235,000

See footnotes at end of table.

TABLE 5—Continued
NONFUEL MINERAL PRODUCTION IN THE UNITED STATES, BY STATE[1, 2, 3]

(Thousand metric tons and thousand dollars unless otherwise specified)

Commodity	2014		2015		2016	
	Quantity	Value	Quantity	Value	Quantity	Value
Utah:—Continued						
Stone:						
Crushed	8,290	65,300	8,200	59,500 r	7,950	58,900
Dimension	(4)	W	6	620	7	996
Combined values of cement, clay [bentonite and common clay and (or) shale], copper, gold, gypsum (crude), helium [crude (2015) and Grade-A (2015–16)], iron oxide pigments, lime, magnesium compounds, magnesium metal, molybdenum mineral concentrates, phosphate rock, potash, rhenium, silver, and values indicated by symbol W	XX	3,000,000	XX	1,690,000	XX	1,740,000
Total	XX	3,490,000	XX	2,190,000 r	XX	2,250,000
Vermont:						
Gemstones, natural e	NA	1	NA	2	NA	2
Sand and gravel, construction	4,790	32,800	4,970 r	36,100 r	5,390	39,300
Stone:						
Crushed	5,080 r	51,300 r	4,890 r	49,700 r	4,800	49,500
Dimension	92	24,100	87	27,900	99	29,100
Talc, crude	(4)	(7)	(4)	(7)	(4)	(7)
Total	XX	108,000 r	XX	114,000 r	XX	118,000
Virginia:						
Kyanite metric tons	88,600 r	29,000 r, e	109,000 r	38,000 r, e	79,700	28,000 e
Sand and gravel, construction	7,110	80,400	7,660	82,500 r	7,420	84,100
Stone:						
Crushed	44,200	686,000	52,300 r	817,000 r	54,400	868,000
Dimension	13	7,730	12	7,690	13	8,360
Combined values of cement, clay [common clay and (or) shale and montmorillonite], feldspar, gemstones (natural), lime, mica [crude 2014–15)], salt, sand and gravel (industrial), staurolite (2015), talc (2014), titanium mineral concentrates [ilmenite (2014–15)], vermiculite (crude), zirconium mineral concentrates (2014–15)	XX	275,000 r	XX	283,000 r	XX	245,000
Total	XX	1,080,000 r	XX	1,230,000 r	XX	1,230,000
Washington:						
Gemstones, natural e	NA	59	NA	99	NA	61
Sand and gravel, construction	32,000	238,000	33,400 r	274,000 r	35,400	284,000
Stone, crushed	13,700	180,000 r	14,400 r	212,000	15,800	234,000
Combined values of cement (portland), clay [common clay and (or) shale (2015–16) and fire clay (2014)], diatomite, gold, lead, lime, olivine (2016), peat, sand and gravel (industrial), stone [dimension (2015–16)], zinc	XX	284,000	XX	319,000	XX	351,000
Total	XX	702,000	XX	805,000 r	XX	869,000
West Virginia:						
Gemstones, natural e	NA	1	NA	2	NA	2
Sand and gravel:						
Construction	618	5,240	583	4,950	556	4,720
Industrial	536	29,500	681	37,500	588	32,400
Stone, crushed	14,900	168,000	15,000	166,000 r	14,300	160,000
Combined values of cement, clay [common clay and (or) shale], lime, salt	XX	(7)	XX	(7)	XX	(7)
Total	XX	202,000	XX	208,000	XX	197,000
Wisconsin:						
Gemstones, natural e	NA	7	NA	8	NA	8
Lime	(4)	(7)	(4)	(7)	(4)	(7)
Sand and gravel:						
Construction	26,100 r	154,000 r	28,000	208,000 r	27,100	183,000
Industrial	38,300	3,150,000	32,200	1,390,000	16,800	637,000

See footnotes at end of table.

TABLE 5—Continued
NONFUEL MINERAL PRODUCTION IN THE UNITED STATES, BY STATE[1, 2, 3]

(Thousand metric tons and thousand dollars unless otherwise specified)

Commodity	2014		2015		2016	
	Quantity	Value	Quantity	Value	Quantity	Value
Wisconsin:—Continued						
Stone:						
Crushed	21,700 r	149,000	22,700 r	171,000 r	22,300	181,000
Dimension	190	40,200	199	41,200	225	38,500
Total	XX	3,490,000	XX	1,810,000 r	XX	1,040,000
Wyoming:						
Clay, bentonite	4,340	289,000	3,580 r	254,000 r	3,200	229,000
Gemstones, natural e	NA	18	NA	18	NA	18
Sand and gravel, construction	13,700	118,000	15,000	134,000	9,860	91,700
Stone, crushed	11,300	48,700 r	18,400	52,800	9,950	46,000
Combined values of cement, clay [common clay and (or) shale], gypsum (crude), helium (Grade-A), lime, soda ash	XX	2,050,000	XX	2,040,000	XX	1,920,000
Total	XX	2,510,000	XX	2,480,000	XX	2,290,000
Undistributed:						
Combined values of Connecticut, Delaware, Illinois, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Minnesota, Mississippi, Nebraska, New Hampshire (2015–16), New York, North Carolina, North Dakota, Ohio, Pennsylvania, Rhode Island, South Carolina, Vermont, West Virginia, Wisconsin	XX	3,170,000 r	XX	2,910,000 r	XX	2,950,000

eEstimated. rRevised. do. Ditto. NA Not available. W Withheld to avoid disclosing company proprietary data; included in "Combined values" data for each State. XX Not applicable. -- Zero.

[1]Table includes data from the commodity chapters published in the U.S. Geological Survey 2016 Minerals Yearbook as they were completed and released through March 2019.

[2]Production as measured by mine shipments, sales, or marketable production (including consumption by producers). Mine output measured as sold or used by producers is primarily shown in the tables, because values can be assigned. Where sold or used data are not available, actual mine output is used as the production measurement and value is estimated average price of the mineral commodity for that year. Data are reported in gross weight unless otherwise specified.

[3]Data are rounded to no more than three significant digits; may not add to totals shown.

[4]Withheld to avoid disclosing company proprietary data.

[5]Recoverable content of ores and concentrates. Also refers to lode mine (copper, gold, lead, silver, zinc) in "Combined values" individual State categories.

[6]Rare-earth-oxide (REO) basis.

[7]Withheld to avoid disclosing company proprietary data; value included in "Undistributed."

[8]Content of mineral concentrates.

[9]Source: Lundin Mining Corp., 2017, Management's Discussion and Analysis for the year ended December 31, 2016: Toronto, Ontario, Canada, Lundin Mining Corp., 96 p. (Accessed March 25, 2019, at https://www.lundinmining.com/site/assets/files/3747/2016ye.pdf.)

[10]Production based on publicly available data; refer to the Minerals Yearbook iron ore chapter.

[11]Recoverable content of nickel sulfide concentrates.

[12]Withheld to avoid disclosing company proprietary data; included in "Total."

[13]Source: Freeport-McMoRan Copper & Gold Inc., 2017, Form 10–K—2016: U.S. Securities and Exchange Commission, 222 p. (Accessed March 25, 2019, at https://s22.q4cdn.com/529358580/files/doc_financials/10-K/10_k2016.pdf.)

TABLE 6

NONFUEL RAW MINERAL PRODUCTION IN THE COMMONWEALTH OF PUERTO RICO[1, 2, 3]

(Thousand metric tons and thousand dollars)

Commodity	2014		2015		2016	
	Quantity	Value	Quantity	Value	Quantity	Value
Cement, portland	588	W	536	W	458	W
Clay, common clay and (or) shale[e]	58	320	61	335	61	335
Lime	(4)	W	(4)	W	(4)	W
Salt[e]	45	1,720	46	1,790	46	1,790
Sand and gravel, construction	NA	NA	NA	NA	NA	NA
Stone, crushed	6,070	56,600	5,210 [r]	47,400 [r]	4,470	42,400
Total	XX	58,600	XX	49,500 [r]	XX	44,500

[e]Estimated. [r]Revised. NA Not available. W Withheld to avoid disclosing company proprietary data; excluded from "Total." XX Not applicable.

[1]Table includes data from the commodity chapters published in the U.S. Geological Survey 2016 Minerals Yearbook as they were completed and released through March 2019.

[2]Production as measured by mine shipments, sales, or marketable production (including consumption by producers). Mine output measured as sold or used by the producers is primarily shown in the tables, because values can be assigned. Where sold or used data are not available, actual mine output is used as the production measurement and value is estimated average price of the mineral commodity for that year. Data are reported in gross weight.

[3]Data are rounded to no more than three significant digits; may not add to totals shown.

[4]Withheld to avoid disclosing company proprietary data.

TABLE 7

U.S. EXPORTS OF PRINCIPAL MINERALS AND PRODUCTS, EXCLUDING MINERAL FUELS[1, 2]

(Thousand metric tons and thousand dollars unless otherwise specified)

Commodity		2015		2016	
		Quantity	Value	Quantity	Value
Metals:					
Aluminum:					
Crude, semicrude, and scrap	metric tons	3,010,000	8,450,000	2,820,000	7,660,000
Manufactures	do.	105,000	454,000	98,600	406,000
Antimony:					
Metal, alloys, waste and scrap	do.	1,440	5,740	623	3,090
Oxide, Sb content	do.	1,760	12,000	1,330	7,690
Arsenic metal, As content[3]	do.	1,670	NA	1,760	NA
Bauxite and alumina:					
Alumina, calcined equivalent		2,240 r	912,000 r	1,370	570,000
Bauxite:					
Calcined, refractory and other grade		10	1,480 r	20	6,230
Crude and dried		4	NA	5	NA
Beryllium, unwrought including powders, waste and scrap, other, Be content	kilograms	28,900	15,300	34,400	20,900
Bismuth, metal, alloys, waste and scrap, Bi content	do.	519,000	5,350	421,000	4,820
Cadmium:					
Pigments	do.	3,310,000	20,500	2,190,000	41,300
Sulfide, gross weight	do.	3,740	829	625	125
Unwrought metal and powders	do.	350,000	783	157,000	228
Waste and scrap	do.	147	3	11,900	53
Chromium:					
Ores and concentrate	metric tons	7,210	5,680	2,760	1,650
Metals and alloys:					
Metal, unwrought powders, waste and scrap, other	do.	801	15,700	506	14,300
Ferroalloys, high-carbon, low-carbon, ferrochromium-silicon	do.	1,080	1,820	1,540	2,400
Chemicals:					
Oxides, trioxide, other	do.	5,260 r	26,900 r	--	--
Sulfates	do.	244 r	1,210 r	165	815
Salts of oxometallic or peroxometallic acids, zinc and lead chromate, sodium dichromate, potassium dichromate, other	do.	411 r	2,770 r	338	2,680
Pigments and preparations	do.	757 r	4,860 r	499	3,700
Cobalt:					
Acetates	do.	180	1,390	314	1,580
Chlorides	do.	(4)	7	1	17
Oxides and hydroxides	do.	192	2,690	134	1,380
Metal, unwrought, powders, waste and scrap, mattes, other intermediate products of metallurgy	do.	3,640	87,000	3,990	78,100
Copper:					
Ore and concentrate	do.	392,000	2,870,000	331,000	2,210,000
Unmanufactured, does not include unalloyed scrap, Cu content	do.	113,000 r	556,000 r	163,000	722,000
Semimanufactures, excludes sulfate	do.	245,000	1,770,000	250,000	1,520,000
Sulfate	do.	6,160	32,000	5,840	34,900
Scrap, unalloyed	do.	426,000	1,610,000	411,000	1,310,000
Ferroalloys not listed elsewhere:					
Ferrophosphorus	do.	976	1,760	463	855
Other	do.	3,380	9,530	6,300	11,600
Gold:					
Ores and concentrates	kilograms	5,280	193,000	4,220	157,000
Dore and precipitates	do.	121,000 r	4,640,000 r	147,000	5,730,000
Bullion, refined	do.	352,000 r	13,300,000 r	241,000	9,650,000
Waste and scrap	do.	348,000 r	1,360,000 r	321,000	2,260,000
Metal powder	do.	504 r	9,250 r	438	11,100
Compounds	do.	171,000 r	93,600 r	1,060,000	106,000

See footnotes at end of table.

TABLE 7—Continued

U.S. EXPORTS OF PRINCIPAL MINERALS AND PRODUCTS, EXCLUDING MINERAL FUELS[1, 2]

(Thousand metric tons and thousand dollars unless otherwise specified)

Commodity		2015		2016	
		Quantity	Value	Quantity	Value
Metals:—Continued					
Iron and steel:					
Steel mill products		9,050	NA	8,450	NA
Fabricated steel products		1,870	NA	1,800	NA
Cast iron and steel products		221	NA	188	NA
Iron and steel scrap:					
Ferrous, includes tinplate and terneplate, excludes used rails for rerolling and other uses and ships, boats, and other vessels for scrapping		12,800	4,010,000	12,600	3,550,000
Pig iron, all grades	metric tons	17,300	5,450	16,700	4,200
Direct-reduced iron, steelmaking grade	do.	20,200	548 r	178,000	21,600
Ships, boats, and other vessels for scrapping		4	641	3	435
Used rails for rerolling and other uses, includes mixed (used plus new) rails		35	45,300	16	18,600
Iron ore		8,030 r	652,000 r	8,770	581,000
Lead:					
Base bullion, gross weight	metric tons	596	1,470	1,310	3,230
Ore and concentrates, Pb content	do.	350,000 r	469,000 r	341,000	480,000
Refined lead and alloys, unwrought, gross weight	do.	50,100 r	49,400 r	36,400	32,300
Wrought and other products, gross weight	do.	2,850 r	10,000 r	2,590	8,130
Scrap, gross weight	do.	29,100 r	31,100 r	16,700	16,200
Magnesium, gross weight:					
Waste and scrap	do.	432 r	895	996	2,040
Metal	do.	5,220	18,300	5,270	23,000
Alloys	do.	7,490	27,200	10,700	37,000
Powder, sheets, tubing, ribbons, wire, other forms	do.	2,060	71,800 r	2,080	48,800
Manganese, gross weight:					
Ores and concentrates with 20% or more manganese	do.	700	1,550	630	1,440
Ferromanganese, all grades	do.	5,140	5,630	6,580	6,850
Silicomanganese	do.	1,220	1,340	2,410	2,290
Metal, including alloys and waste and scrap	do.	5,390	7,660	6,460	9,300
Dioxide	do.	3,270	7,940	4,130	7,240
Mercury:					
Metal	kilograms	30	3	--	--
Amalgams of precious metals whether or not chemically defined	do.	94,600 r	375,000	107,000	297,000
Molybdenum:					
Ore and concentrates, including roasted and other, Mo content	metric tons	36,800	587,000	27,700	343,000
Chemicals, gross weight:					
Oxides and hydroxides	do.	1,300	19,400 r	853	11,600
Molybdates, all	do.	2,020	22,300	1,440	17,200
Ferromolybdenum, Mo content	do.	565 r	15,000 r	455	13,300
Other, includes powders, unwrought, bars and rods, waste and scrap, wire, other, gross weight	do.	1,180	77,700 r	1,030	62,700
Nickel:					
Primary, unwrought and chemicals, Ni content	do.	9,610 r	416,000 r	10,300	334,000
Secondary, stainless steel scrap and waste and scrap, Ni content	do.	51,900	746,000 r	63,700	541,000
Wrought, not alloyed, bars, rods, profiles, wire, sheets, strip, foil, tubes, pipes, Ni content	do.	526	21,400	746	23,100
Alloyed, unwrought ingot, bars, rods, profiles, wire, sheets, strip, foil, tubes, pipes, other alloyed articles, gross weight	do.	46,500	1,810,000	41,300	1,520,000
Niobium (columbium) and tantalum, gross quantity:					
Synthetic concentrates, tantalum-niobium	kilograms	138,000	3,260	379,000	6,030
Niobium:					
Ores and concentrates	do.	73,400	557	14,300	103
Ferroniobium	do.	2,140,000	26,300	2,180,000	25,500

See footnotes at end of table.

TABLE 7—Continued
U.S. EXPORTS OF PRINCIPAL MINERALS AND PRODUCTS, EXCLUDING MINERAL FUELS[1, 2]

(Thousand metric tons and thousand dollars unless otherwise specified)

Commodity		2015		2016	
		Quantity	Value	Quantity	Value
Metals:—Continued					
Niobium (columbium) and tantalum, gross quantity:—Continued					
Tantalum:					
Ores and concentrates	kilograms	98,200	4,860	162,000	7,300
Unwrought powders	do.	230,000	84,600	192,000	73,800
Unwrought, other	do.	5,300	2,140	31,100	9,000
Waste and scrap	do.	280,000	42,700	171,000	23,200
Wrought	do.	57,300	36,200	58,000	34,300
Platinum-group metals:					
Palladium, Pd content	do.	23,000	458,000	17,500	272,000
Platinum, includes waste and scrap and metal, Pt content	do.	261,000	1,360,000	287,000	1,130,000
Iridium, osmium, ruthenium, gross weight	do.	781 r	13,800	736	11,300
Rhodium, Rh content	do.	759	25,800	794	19,600
Rare earths, estimated rare-earth-oxide (REO) content:					
Compounds:					
Cerium compounds	do.	440,000	10,700	309,000	4,840
Scandium or yttrium oxides	do.	38,700	588,000	2,060	453,000
Other	do.	4,500,000	43,800	245,000	11,800
Metals:					
Ferrocerium and other pyrophoric alloys	do.	1,220,000	15,800	943,000	8,270
Other, metals and alloys	do.	60,100 r	3,750	103,000	3,120
Selenium and tellurium:					
Selenium, Se content	do.	468,000	8,160	150,000	1,770
Tellurium, Te content	do.	40,800	2,530	4,150	660
Silicon, Si content:					
Ferrosilicon	metric tons	8,780	31,300	7,110	23,400
Metal	do.	36,800	1,280,000	59,600	1,620,000
Silver:					
Ores and concentrates, Ag content	kilograms	2,500	8,480	15,900	27,500
Bullion, Ag content	do.	781,000	557,000	237,000	139,000
Dore, Ag content	do.	34,400	18,300	35,800	21,300
Metal powder, gross weight	do.	617,000	375,000	772,000	468,000
Nitrate, gross weight	do.	28,900	3,170	43,600	4,040
Semimanufactured forms containing 99.5% or more by weight of silver, gross weight	do.	265,000	140,000	702,000	427,000
Waste and scrap, gross weight	do.	14,700,000	1,430,000	13,400,000	1,460,000
Unwrought, other, gross weight	do.	126,000	118,000	231,000	166,000
Thorium and thorium-bearing materials, compounds	do.	2,160	779 r	63,900	1,790
Tin:					
Unwrought:					
Refined	metric tons	807	14,900	1,150	21,600
Alloys	do.	2,540	19,400	1,040	17,400
Wrought:					
Bars, rods, profiles, wire	do.	5,180	40,700	4,620	39,700
Foil	do.	33	563	41	622
Plates, sheet, strip	do.	300	2,280	725	2,950
Tubes, pipes, tube and pipe fittings	do.	114	1,630	141	2,120
Waste and scrap	do.	2,530	7,360 r	4,570	11,200
Flakes and powders	do.	110	2,470	124	2,290
Tinplate and terneplate	do.	110,000 r	84,300 r	110,000	72,500
Titanium:					
Metal, scrap, unwrought, wrought products and castings, ferrotitanium and ferrosilicon titanium	do.	35,400	1,470,000	39,000	1,530,000
Ores and concentrates	do.	2,040	3,490 r	7,330	9,830
Pigment, dioxide and oxide	do.	649,000 r	1,460,000	651,000	1,430,000

See footnotes at end of table.

TABLE 7—Continued
U.S. EXPORTS OF PRINCIPAL MINERALS AND PRODUCTS, EXCLUDING MINERAL FUELS[1, 2]

(Thousand metric tons and thousand dollars unless otherwise specified)

Commodity		2015		2016	
		Quantity	Value	Quantity	Value
Metals:—Continued					
Tungsten, W content:					
Ammonium paratungstate	metric tons	310	3,280	108	1,800
Carbide powder	do.	901	46,600	763	34,600
Metal powders	do.	312	23,000	308	17,900
Miscellaneous tungsten-bearing materials, ferrotungsten, ferrosilicon tungsten, unwrought, waste and scrap, wrought, compounds	do.	1,840	40,300	2,020	61,200
Ores and concentrates	do.	398	6,890	183	2,080
Vanadium:					
Aluminum-vanadium master alloy, gross weight	kilograms	229,000	6,450	95,200	2,210
Ferrovanadium, V content	do.	122,000	3,190	400,000	7,280
Metal, including waste and scrap, gross weight	do.	5,200	354	18,700	641
Pentoxide, anhydride, V content	do.	356,000	3,430	5,150	108
Other oxides and hydroxides, V content	do.	99,800	841	81,300	681
Zinc:					
Compounds, gross weight:					
Oxide	metric tons	21,800	28,900	55,300	56,300
Sulfate	do.	726	751	558	850
Chromates of zinc or of lead, lithopone, chloride, sulfide	do.	XX	22,700	XX	23,400
Ores and concentrates, Zn content	do.	708,000 r	986,000 r	597,000	938,000
Refined	do.	12,700	NA	46,900	NA
Zirconium:					
Ferrozirconium	do.	973 r	2,330 r	476	839
Ores and concentrates	do.	4,920 r	13,600 r	5,050	12,200
Oxide, includes germanium oxide and zirconium dioxide	do.	5,700 r	NA	5,420	NA
Unwrought, including powders	do.	213 r	7,320 r	203	7,350
Waste and scrap and other zirconium	do.	1,320	116,000	948	95,500
Total, metals		XX	60,000,000 r	XX	53,600,000
Industrial minerals:					
Abrasives, manufactured:					
Aluminum oxide, crude	metric tons	15,000	51,900	14,200	46,700
Metallic abrasives	do.	35,900	45,600	28,600	35,700
Silicon carbide, crude, ground and refined	do.	19,700	38,300	6,820	20,300
Asbestos, includes reexports:					
Manufactured	do.	1,720	26,100 r	2,710	35,400
Unmanufactured	do.	517	116	587	116
Barite, natural barium sulfate	do.	147,000 r	54,800 r	78,500	30,100
Boron minerals and compounds:					
Boric acid, includes orthoboric and anhydrous	do.	195,000 r	149,000 r	241,000	150,000
Sodium borates	do.	504,000 r	264,000	552,000	284,000
Bromine, Br equivalent:					
Compounds, inorganic and organic	do.	21,000 r	70,800 r	19,800	67,500
Elemental	do.	3,960	8,850	5,330	13,400
Cement, hydraulic and clinker[5]		1,540 r	236,000 r	1,280	192,000
Clay:					
Artificially activated clay and earth		173	91,300	143	80,100
Ball clay		48	10,200	41	9,320
Bentonite		938	199,000	801	174,000
Fire clay		217	40,600	184	36,400
Fuller's earth		77	31,700	86	34,400
Kaolin		2,420	557,000	2,290	527,000
Other, n.e.c.[6]		268	73,600	256	72,700

See footnotes at end of table.

TABLE 7—Continued

U.S. EXPORTS OF PRINCIPAL MINERALS AND PRODUCTS, EXCLUDING MINERAL FUELS[1, 2]

(Thousand metric tons and thousand dollars unless otherwise specified)

Commodity		2015		2016	
		Quantity	Value	Quantity	Value
Industrial minerals:—Continued					
Diamond:					
Exclusive of industrial diamond, including reexports	thousand carats	12,200	18,500,000	11,500	19,400,000
Industrial including exports and reexports:					
Unworked, reexports	do.	569	21,500	526	15,400
Powder, dust and grit, natural and synthetic	do.	157,000	74,500	152,000	71,500
Diatomite		74 r	40,800 r	66	37,300
Feldspar	metric tons	15,100	4,920	5,890	1,520
Fluorspar	do.	13,700	2,210	11,900	1,900
Garnet, industrial	do.	14,700	11,000	13,400	10,800
Graphite, natural and synthetic	do.	43,700	198,000	44,400	166,000
Gypsum and gypsum products:					
Crude		63	28,000	42	18,600
Plasters		95	41,700 r	93	36,800
Boards		767	137,000	725	131,000
Other		XX	79,100	XX	75,900
Helium, Grade-A	million cubic meters	64.0 r	NA	62.3	NA
Iodine:					
Crude, resublimed	metric tons	1,210 r	29,400 r	1,050	23,300
Potassium iodide	do.	282	5,640 r	246	4,020
Iron oxide pigments and hydroxides:					
Pigment grade	do.	8,930	17,200	15,800	45,600
Other grade	do.	58,100 r	32,700	47,800	26,100
Kyanite and related materials	do.	39,900	13,900	37,100	13,000
Lime		346	62,600 r	329	64,500
Lithium chemicals, Li content:					
Carbonate	metric tons	255	7,880	195	6,150
Carbonate, U.S.P.[7]	do.	16	1,960	20	2,720
Hydroxide	do.	1,520	74,800 r	1,300	70,600
Magnesium compounds:					
Chloride, hydroxide and peroxide, sulfate		XX	35,100	XX	29,800
Magnesite, crude and processed:					
Caustic-calcined magnesia	metric tons	5,680	3,810	8,060	5,490
Dead-burned and fused magnesia	do.	24,800	16,700	48,400	30,300
Other magnesia	do.	13,100	13,500	9,370	9,820
Crude	do.	520	764	523	620
Mica:					
Scrap and flake:					
Powder	do.	7,100	9,570 r	6,020	8,440
Waste	do.	279	89	207	82
Sheet:					
Unworked	do.	57	253	116	423
Worked	do.	911 r	20,500	687	16,400
Nitrogen, major compounds, N content		1,260	NA	1,230	NA
Peat		28	NA	30	NA
Perlite, crude[e]		30 r	4,260	21	3,290
Phosphate rock:					
Diammonium phosphate		2,110	943,000 r	1,710	588,000
Elemental phosphorus	metric tons	18,600 r	61,200 r	16,500	59,000
Monoammonium phosphate		2,280 r	1,090,000 r	2,580	947,000
Phosphoric acid		415 r	152,000 r	663	204,000
Potash, gross weight:					
Potassium chloride	metrics tons	27,700	NA	22,300	NA
Potassium sulfates, all grades	do.	350,000	NA	320,000	NA
Potassium nitrate	do.	8,870 r	NA	8,040	NA
Pumice and pumicite		11	NA	9	NA

See footnotes at end of table.

TABLE 7—Continued

U.S. EXPORTS OF PRINCIPAL MINERALS AND PRODUCTS, EXCLUDING MINERAL FUELS[1, 2]

(Thousand metric tons and thousand dollars unless otherwise specified)

Commodity		2015		2016	
		Quantity	Value	Quantity	Value
Industrial minerals:—Continued					
Salt		830 r	141,000 r	716	146,000
Sand and gravel:					
Construction:					
Sand		60	16,900	22	8,020
Gravel		11	4,790	12	5,860
Industrial		3,910 r	382,000 r	2,780	316,000
Soda ash		6,400 r	1,320,000	6,780	1,320,000
Stone:					
Crushed		427 r	44,200 r	530	47,100
Dimension		XX	74,900 r	XX	65,500
Strontium carbonate, precipitated	kilograms	145,000	147	154,000	147
Sulfur:					
Elemental		1,840 r	284,000 r	2,050	213,000
Sulfuric acid, 100% H_2SO_4	metric tons	177,000 r	30,700	177,000	30,000
Talc, excludes powders-talcum (in package), face, compact, or cut and sawed talc	do.	206,000	59,400	239,000	82,800
Vermiculite		2	NA	2	NA
Wollastonite[e]	metric tons	<10,000	NA	<10,000	NA
Zeolites[e]	do.	<1,000 r	NA	<1,000	NA
Total, industrial minerals		XX	26,100,000	XX	26,200,000
Grand total		XX	86,000,000 r	XX	79,800,000

[e]Estimated. [r]Revised. do. Ditto. NA Not available. XX Not applicable. -- Zero.

[1]Table includes data from the commodity chapters published in the U.S. Geological Survey 2016 Minerals Yearbook as they were completed and released through March 2019.

[2]Data are rounded to no more than three significant digits; may not add to totals shown.

[3]Listed as metal only, but may include alloys, waste, and compounds.

[4]Less than ½ unit.

[5]Excludes Puerto Rico.

[6]Not elsewhere classified.

[7]United States pharmaceutical-grade lithium carbonate.

TABLE 8

U.S. IMPORTS FOR CONSUMPTION OF PRINCIPAL MINERALS AND PRODUCTS, EXCLUDING MINERAL FUELS[1, 2]

(Thousand metric tons and thousand dollars unless otherwise specified)

Commodity		2015		2016	
		Quantity	Value[3]	Quantity	Value[3]
Metals:					
Aluminum:					
Crude, semicrude, and scrap	metric tons	5,080,000	12,200,000	6,020,000	12,400,000
Manufactures	do.	399,000 r	1,200,000	481,000	1,250,000
Antimony:					
Metal	do.	5,790	44,400	7,130	47,500
Ore and concentrate, Sb content	do.	308	3,330	119	1,030
Oxide, Sb content	do.	16,700	111,000	16,200	92,400
Arsenic:					
Metal	do.	514	1,400	793	2,260
Sulfides	do.	--	--	35	98
Trioxide	do.	7,810	4,470	7,000	4,000
Bauxite and alumina:					
Alumina, calcined equivalent		1,570	705,000	1,140	507,000
Bauxite:					
Calcined, refractory and other grade		526	58,400 r	574	51,300
Crude and dried		10,700	387,000 [4]	5,010	172,000 [4]
Beryllium, ores and concentrates, oxide and hydroxide, unwrought including powders, waste and scrap, other, beryllium-copper master alloy, beryllium-copper plates, sheets, strip, Be content	kilograms	66,100 r	19,300	68,100	11,800
Bismuth, metallic	do.	1,950,000	35,500	2,190,000	21,600
Cadmium:					
Oxide	do.	50,000	624	58,600	626
Pigments	do.	281,000	9,260	249,000	4,380
Sulfide, gross weight	do.	1,870	343	--	--
Unwrought metal and powders	do.	237,000	769	240,000	713
Waste and scrap	do.	70,500	551	51,700	125
Chromium:					
Chromite ore, Cr_2O_3 content	metric tons	81,900 r	28,300	64,600	26,400
Metals and alloys, Cr content:					
Ferroalloys, high-carbon, low-carbon, ferrochromium-silicon	do.	228,000	517,000	266,000	467,000
Metal, unwrought powders, waste and scrap, other	do.	12,800	144,000	13,800	137,000
Chemicals, gross weight:					
Oxides, hydroxides, trioxide and other	do.	10,800	35,100	5,360	19,200
Sulfates	do.	500	452	482	340
Salts of oxometallic or peroxometallic acids, zinc and lead chromate, sodium dichromate, potassium dichromate, other	do.	1,010	5,130	1,970	6,260
Carbide	do.	109	2,550	100	1,940
Pigments and preparations based on chromium	do.	1,560	7,830 r	1,780	8,070
Cobalt, Co content:					
Metal, unwrought, excluding alloys and waste and scrap, includes cathode and metal powder, may include intermediate products of cobalt metallurgy	do.	9,290	267,000	10,800	267,000
Oxides and hydroxides	do.	1,260	40,200	1,410	39,300
Other forms, includes acetates, carbonates, chlorides, sulfates	do.	855	26,300	677	20,500
Copper:					
Ore and concentrate, Cu content	do.	295	1,380	67	178
Unmanufactured, does not include unalloyed scrap, Cu content	do.	690,000	4,000,000 r	709,000	3,440,000
Semimanufactures, excludes sulfate	do.	198,000	1,320,000 r	206,000	1,160,000
Sulfate	do.	43,900	94,900	45,200	80,800
Scrap, unalloyed, Cu content	do.	28,600	129,000 r	29,200	117,000
Ferroalloys not listed elsewhere:					
Ferrophosphorus	do.	6,160	3,450	5,550	2,850
Other	do.	10,100	20,900	6,760	11,500
Gallium:					
Unwrought and powders	kilograms	28,600	7,120	10,500	2,910
Gallium arsenide wafers, doped and undoped	do.	2,690,000	245,000	1,290,000	209,000

See footnotes at end of table.

TABLE 8—Continued

U.S. IMPORTS FOR CONSUMPTION OF PRINCIPAL MINERALS AND PRODUCTS, EXCLUDING MINERAL FUELS[1, 2]

(Thousand metric tons and thousand dollars unless otherwise specified)

Commodity		2015		2016	
		Quantity	Value[3]	Quantity	Value[3]
Metals:—Continued					
Germanium, metal	kilograms	20,100	31,300 r	11,000	12,700
Gold:					
Ores and concentrates	do.	447	18,400	258	8,330
Dore and precipitates	do.	174,000	6,710,000	196,000	7,940,000
Bullion, refined	do.	89,800	3,380,000	177,000	7,190,000
Waste and scrap	do.	60,900	618,000	23,000	464,000
Metal powder	do.	373	10,100	260	8,970
Compounds	do.	57,300 r	5,950 r	44,400	6,210
Indium, unwrought metal and powders	do.	140,000	55,500	160,000	35,100
Iron and steel:					
Steel mill products		35,200	NA	30,000	NA
Fabricated steel products		5,740	NA	5,600	NA
Cast iron and steel products		540	NA	504	NA
Stainless steel	metric tons	1,290,000	NA	896,000	NA
Iron and steel scrap:					
Ferrous, includes tinplate and terneplate, excludes used rails for rerolling and other uses and ships, boats, and other vessels for scrapping		3,510	955,000	3,860	949,000
Pig iron, all grades	metric tons	4,530,000	1,290,000	3,870,000	948,000
Direct-reduced iron, steelmaking grade	do.	1,860,000	483,000	1,600,000	334,000
Ships, boats, and other vessels for scrapping		(5)	256	(5)	509
Used rails for rerolling and other uses, includes mixed (used plus new) rails	metric tons	103,000	29,900	95,400	22,800
Iron ore		4,550	455,000	3,010	241,000
Lead, gross weight:					
Base bullion	metric tons	342 r	492 r	237	396
Refined lead, unwrought	do.	417,000	762,000	416,000	809,000
Wrought and other products	do.	1,660	6,420	2,840	7,130
Scrap	do.	3,530	2,310	1,980	1,090
Magnesium:					
Waste and scrap, gross weight	do.	21,300	44,300 r	21,900	50,300
Metal, gross weight	do.	13,800 r	54,000 r	13,300	46,000
Alloys, Mg content	do.	7,870 r	43,600 r	7,040	38,100
Powder, sheets, tubing, ribbons, wire, other forms, Mg content	do.	6,270 r	28,800 r	3,260	20,800
Manganese:					
Ores and concentrates with 20% or more Mn, all grades, Mn content	do.	216,000	92,500	140,000	42,000
Ferromanganese, all grades, Mn content	do.	228,000	343,000	172,000	213,000
Silicomanganese, Mn content	do.	203,000 r	304,000 r	178,000	195,000
Metal, unwrought, other wrought, waste and scrap, gross weight	do.	30,000 r	70,000 r	22,900	47,700
Chemicals, gross weight:					
Manganese dioxide	do.	6,800 r	15,100	5,510	11,700
Potassium permanganate	do.	908	2,370	736	1,840
Mercury:					
Metal	kilograms	25,800	602	24,300	276
Amalgams of precious metals whether or not chemically defined	do.	21,400 r	45,200 r	20,200	34,300
Molybdenum:					
Ores and concentrates, including roasted and other, Mo content	metric tons	12,900	206,000	14,900	215,000
Chemicals:					
Oxides and hydroxides, gross weight	do.	756	10,100	3,280	41,400
Molybdates, all, Mo content	do.	578	12,000	1,580	32,700
Orange, gross weight	do.	609	2,580	737	2,420
Ferromolybdenum, Mo content	do.	1,610	36,300	1,900	46,900
Other, includes powders, unwrought, bars and rods, waste and scrap, wire, other, gross weight	do.	1,650 r	55,800	1,920	50,800
Nickel:					
Primary, unwrought and chemicals, Ni content	metric tons	130,000	1,770,000	111,000	1,230,000
Secondary, stainless steel scrap and waste and scrap, Ni content	do.	27,100	337,000	32,300	325,000

See footnotes at end of table.

TABLE 8—Continued

U.S. IMPORTS FOR CONSUMPTION OF PRINCIPAL MINERALS AND PRODUCTS, EXCLUDING MINERAL FUELS[1, 2]

(Thousand metric tons and thousand dollars unless otherwise specified)

Commodity		2015		2016	
		Quantity	Value[3]	Quantity	Value[3]
Metals:—Continued					
Nickel:—Continued					
Wrought, not alloyed, bars, rods, profiles, wire, sheets, strip, foil, tubes, pipes, Ni content	metric tons	790	19,800	774	19,900
Alloyed, unwrought ingot, bars, rods, profiles, wire, sheets, strip, foil, tubes, pipes, other alloyed articles, gross weight*	do.	32,200	887,000 r	26,700	718,000
Niobium (columbium) and tantalum, gross quantity:					
Synthetic concentrates, tantalum-niobium	kilograms	--	--	9,150	46
Niobium:					
Ores and concentrates	do.	--	--	1,160	18
Oxide	do.	1,410,000	50,900	1,220,000	41,200
Ferroniobium	do.	10,100,000	271,000	10,900,000	244,000
Unwrought powders	do.	886,000	45,300 r	1,230,000	58,700
Tantalum:					
Ores and concentrates	do.	730,000	49,300	675,000	37,300
Unwrought, powders	do.	150,000	58,400	156,000	52,200
Unwrought, other	do.	266,000 r	91,200 r	164,000	45,400
Waste and scrap	do.	565,000 r	55,400 r	489,000	41,900
Wrought	do.	41,300	21,500	47,900	20,600
Platinum-group metals:					
Platinum, grains and nuggets, sponge, other unwrought, other, waste and scrap, coins, Pt content	do.	XX	2,370,000	XX	2,180,000
Palladium, unwrought, Pd content	do.	75,700 r	1,650,000 r	68,100	1,340,000
Palladium, other, Pd content	do.	9,600	228,000	12,300	275,000
Iridium, unwrought and other forms, Ir content	do.	1,010	17,400	1,300	23,000
Osmium, unwrought, Os content	do.	8	59	27	159
Ruthenium, unwrought, Ru content	do.	8,230	14,600	8,410	14,500
Rhodium, unwrought and other forms, Rh content	do.	10,600	336,000	10,700	230,000
Rare earths, estimated equivalent rare-earth-oxide (REO) content:					
Cerium compounds, including oxides	do.	1,440,000	24,300 r	1,830,000	21,600
Other rare-earth compounds:					
Carbonates, lanthanum and other	do.	540,000	2,540	1,600,000	4,520
Chlorides, includes mixtures of oxides or chlorides	do.	176,000	3,550	256,000	2,480
Oxides, except cerium oxide	do.	3,120,000	19,000	3,420,000	11,500
Unspecified	do.	3,830,000	92,300 r	4,310,000	64,900
Yttrium materials and compounds content by weight greater than 19% but less than 85% oxide equivalent	do.	50,400	11,400	71,000	4,620
Metals and alloys:					
Ferrocerium and other pyrophoric alloys	do.	356,000	6,310	268,000	4,360
Cesium, unalloyed	do.	144,000 r	1,040	104,000	467
Lanthanum, unalloyed	do.	72,600 r	464	50,900	396
Neodymium, unalloyed	do.	5,520 r	417	8,360	327
Other, unalloyed	do.	73,700	1,050	52,100	1,360
Other, alloys	do.	89,100	1,380	188,000	1,310
Rhenium:					
Metal	do.	25,400	63,600	25,900	65,500
Ammonium perrhenate	do.	9,130	13,900	8,570	14,000
Selenium and tellurium:					
Selenium, Se content:					
Selenium	do.	444,000	19,300	411,000	12,500
Dioxide	do.	19,200	629	29,600	537
Tellurium, Te content	do.	76,000	5,990	72,700	4,880
Silicon, Si content:					
Ferrosilicon	metric tons	162,000	322,000	155,000	246,000
Metal	do.	139,000	464,000	122,000	379,000

See footnotes at end of table.

TABLE 8—Continued

U.S. IMPORTS FOR CONSUMPTION OF PRINCIPAL MINERALS AND PRODUCTS, EXCLUDING MINERAL FUELS[1, 2]

(Thousand metric tons and thousand dollars unless otherwise specified)

Commodity		2015		2016	
		Quantity	Value[3]	Quantity	Value[3]
Metals:—Continued					
Silver:					
Ash and residues, ores and concentrates, Ag content	kilograms	2,700 r	814 r	4,630	1,530
Bullion, Ag content	do.	4,660,000	2,410,000	4,870,000	2,680,000
Dore, Ag content	do.	1,270,000	993,000	1,290,000	1,090,000
Metal powder, gross weight	do.	514,000	113,000	356,000	52,500
Nitrate, gross weight	do.	2,550	352 r	3,390	731
Semimanufactured forms containing 99.5% or more by weight of silver, gross weight	do.	441,000	199,000	692,000	357,000
Waste and scrap, gross weight	do.	5,400,000	293,000	6,650,000	260,000
Unwrought, other, gross weight	do.	237,000	98,200	343,000	164,000
Thorium:					
Thorium ore, monazite concentrate	do.	--	--	16,000	3
Thorium and thorium-bearing materials, compounds	do.	2,740 r	216 r	3,130	284
Tin, gross weight:					
Unwrought:					
Refined	metric tons	33,600	546,000	32,200	540,000
Alloys	do.	2,720	43,400	1,910	30,000
Wrought:					
Bars, rods, profiles, wire	do.	1,220	63,800 r	1,200	63,800
Foil	do.	96	3,400	86	2,150
Plates, sheet, strip	do.	90	502	94	500
Tubes, pipes, tube and pipe fittings	do.	12	149	1	32
Waste and scrap	do.	32,700	12,300	27,200	5,460
Flakes and powders	do.	238	5,400	219	5,160
Oxides	do.	417	7,340	383	6,270
Tinplate and terneplate	do.	700,000	729,000	805,000	726,000
Titanium:					
Concentrate:					
Ilmenite	do.	649,000	139,000 r	592,000	84,200
Rutile, natural and synthetic	do.	393,000	282,000	349,000	230,000
Metal:					
Waste and scrap	do.	22,100 r	124,000 r	18,500	93,600
Unwrought:					
Sponge	do.	20,700	203,000	16,200	148,000
Ingots	do.	404 r	10,700 r	689	15,100
Powder	do.	129 r	8,260 r	161	12,000
Other	do.	1,490 r	33,400 r	1,230	31,900
Wrought products and castings, includes bar, castings, foil, pipe, plate, profile, rod, sheet, strip, tube, wire, other	do.	6,260 r	317,000 r	7,190	351,000
Ferrotitanium and ferrosilicon titanium	do.	1,730	6,260	3,140	7,840
Pigment, dioxide and oxide	do.	221,000 r	547,000 r	247,000	535,000
Titaniferous iron ore	do.	64,700	32,400	15,200	1,430
Titaniferous slag	do.	399,000	248,000	402,000	254,000
Tungsten, W content:					
Ammonium paratungstate	do.	1,270	35,500	1,020	20,700
Ferrotungsten and ferrosilicon tungsten	do.	269	9,060	236	6,130
Miscellaneous tungsten-bearing materials, metal powders, carbide powder, unwrought, waste and scrap, wrought, oxides, calcium tungstate, other tungstates, other compounds	do.	4,740 r	190,000 r	5,040	164,000
Ores and concentrates	do.	3,970	98,700	3,580	65,100
Vanadium:					
Aluminum-vanadium master alloy, gross weight	kilograms	204,000	4,520	235,000	4,120
Ferrovanadium, V content	do.	1,980,000 r	64,100 r	1,590,000	47,800
Metal, including waste and scrap, gross weight	do.	182,000	3,450	45,300	1,040
Miscellaneous chemicals, sulfates and vanadates, V content	do.	186,000	2,460 r	325,000	4,520

See footnotes at end of table.

TABLE 8—Continued

U.S. IMPORTS FOR CONSUMPTION OF PRINCIPAL MINERALS AND PRODUCTS, EXCLUDING MINERAL FUELS[1, 2]

(Thousand metric tons and thousand dollars unless otherwise specified)

Commodity		2015		2016	
		Quantity	Value[3]	Quantity	Value[3]
Metals:—Continued					
Vanadium:—Continued					
Pentoxide, anhydride, V content	kilograms	2,870,000 r	32,800	2,460,000	25,400
Vanadium-bearing ash and residues from the manufacture of iron and steel, V content	do.	8,210,000 r	36,000 r	5,030,000	10,000
Other oxides and hydroxides, V content	do.	93,700	1,840	660,000	10,000
Zinc:					
Compounds, gross weight:					
Oxide	metric tons	116,000	250,000	123,000	239,000
Sulfate	do.	89,000	68,100	79,900	60,400
Chloride, chromates of zinc or of lead, lithopone, sulfide	do.	XX	13,000	XX	9,740
Ores and concentrates, Zn content	do.	22	NA	60	NA
Refined	do.	771,000	NA	713,000	NA
Zirconium and hafnium:					
Hafnium, unwrought, including powders	do.	72	19,400	180	32,600
Zirconium:					
Ferrozirconium	do.	158	669 r	59	240
Ores and concentrates	do.	32,000 r	37,300 r	38,400	38,100
Oxide	do.	4,140 r	NA	2,620	NA
Unwrought, including powder	do.	953 r	17,400	841	27,700
Waste and scrap, and other	do.	361 r	27,900 r	399	29,300
Total, metals		XX	55,600,000 r	XX	57,000,000
Industrial minerals:					
Abrasives, manufactured:					
Aluminum oxide, crude, ground and refined	metric tons	164,000	136,000	155,000	106,000
Metallic abrasives	do.	52,800	30,900	54,100	29,300
Silicon carbide, crude, ground and refined	do.	139,000	114,000	116,000	87,200
Asbestos:					
Chrysotile and other unspecified type	do.	386 r	808 r	702	1,430
Products with basis of asbestos, cellulose, or other minerals		NA	5,240	NA	7,660
Barite:					
Chloride, oxide, hydroxide, peroxide, precipitated carbonate		XX	8,550	XX	9,430
Crude	metric tons	521,000	76,100	270,000	44,100
Ground	do.	1,120,000	146,000	966,000	117,000
Other sulfates	do.	25,400 r	24,400 r	20,900	30,500
Boron minerals and compounds:					
Borax		136	49,200	173	60,400
Boric acid	metric tons	39,700 r	25,700 r	46,300	27,800
Colemanite		35	11,900	35	11,400
Ulexite		70	4,620	43	4,790
Bromine:					
Compounds, Br content	metric tons	55,500	117,000	55,400	114,000
Elemental	do.	2,530	7,270	2,690	8,090
Cement, hydraulic and clinker[6]		11,300 r	803,000 r	13,200	884,000
Clay:					
Artificially activated clay and earth		24	13,600	26	14,400
Ball clay		2	457	(5)	103
Bentonite		16	9,350	22	8,190
Chamotte or Dinas Earth		(5)	163	1	115
Kaolin		426	43,700	389	43,600
Fire clay		40	6,900	22	6,400
Fuller's earth		2	101	(5)	217
Other, n.e.c.[7]		9	5,300	11	5,460

See footnotes at end of table.

TABLE 8—Continued

U.S. IMPORTS FOR CONSUMPTION OF PRINCIPAL MINERALS AND PRODUCTS, EXCLUDING MINERAL FUELS[1, 2]

(Thousand metric tons and thousand dollars unless otherwise specified)

Commodity		2015		2016	
		Quantity	Value[3]	Quantity	Value[3]
Industrial minerals:—Continued					
Diamond, industrial:					
Diamond stones, natural industrial and miners', natural and synthetic	thousand carats	1,310	22,900	1,370	18,700
Powder, dust and grit, natural and synthetic	do.	275,000	54,600	216,000	49,200
Feldspar and nepheline syenite:					
Feldspar	metric tons	120,000	7,090	36,900	3,430
Nepheline syenite	do.	449,000	67,600	572,000	73,000
Fluorspar:					
Aluminum fluoride	do.	32,400	41,600	20,500	23,100
Cryolite	do.	18,900	14,700	15,700	12,800
Fluorspar	do.	376,000	107,000	383,000	102,000
Hydrofluoric acid	do.	120,000	196,000	126,000	190,000
Garnet, industrial	do.	240,000 r	54,000 r	150,000	30,000
Gemstones	thousand carats	2,600,000	25,100,000	1,890,000	25,200,000
Graphite:					
Natural	metric tons	46,700	58,600 r	38,900	47,600
Synthetic	do.	80,600	128,000	75,000	127,000
Electric furnace electrodes	do.	71,200	231,000	58,900	143,000
Gypsum:					
Crude		4,030	54,100	4,340	63,200
Plasters		21	7,210	41	15,300
Boards		348	86,100	399	94,800
Other		XX	37,000	XX	35,600
Helium, Grade-A	million cubic meters	15.9 r	NA	23.4	NA
Iodine:					
Crude	metric tons	5,630	156,000	4,320	98,000
Potassium iodide	do.	262	4,720	202	3,730
Iron oxide pigments:					
Natural	do.	3,600	2,660	7,110	3,480
Synthetic	do.	172,000	206,000	172,000	193,000
Kyanite and related materials	do.	11,500	3,680	2,510	710
Lime		391	64,600 [4]	376	59,700 [4]
Lithium chemicals, Li content:					
Carbonate	metric tons	2,420	57,800 r	2,920	76,100
Carbonate, U.S.P.[8]	do.	6	774	3	508
Hydroxide	do.	324	13,600	211	11,700
Magnesium compounds:					
Compounds, chlorides, hydroxide, peroxide, sulfates	do.	XX	59,300 r	XX	60,300
Magnesite, crude and processed:					
Caustic-calcined magnesia	do.	183,000	53,800 r	158,000	43,600
Dead-burned and fused magnesia	do.	259,000	138,000 r	149,000	88,600
Other magnesia	do.	51,000	29,900 r	39,800	23,600
Crude	do.	77,900	10,400	1,270	1,980
Mica:					
Scrap and flake:					
Powder	do.	28,000 r	17,600	27,200	17,800
Waste	do.	5,170	2,860	4,320	2,630
Sheet:					
Unworked	do.	112	437	61	155
Worked	do.	2,010 r	16,400 r	2,000	17,300
Nitrogen, major compounds, N content		9,060	6,750,000	8,170	4,550,000
Peat		1,150	312,000	1,130	314,000
Perlite, processed crude		143 r	14,800	188	18,000

See footnotes at end of table.

TABLE 8—Continued

U.S. IMPORTS FOR CONSUMPTION OF PRINCIPAL MINERALS AND PRODUCTS, EXCLUDING MINERAL FUELS[1, 2]

(Thousand metric tons and thousand dollars unless otherwise specified)

Commodity		2015		2016	
		Quantity	Value[3]	Quantity	Value[3]
Industrial minerals:—Continued					
Phosphate rock and phosphatic materials:					
Phosphate rock:					
Unground		1,520	150,000 [4]	1,320	118,000 [4]
Ground		442 [r]	75,600 [r, 4]	267	42,100 [4]
Dicalcium phosphate		11	13,000 [r, 4]	28	21,200 [4]
Elemental phosphorus		14	52,500 [r, 4]	5	18,000 [4]
Triple superphosphate		201 [r]	81,000 [r, 4]	295	89,400 [4]
Diammonium phosphate		599 [r]	290,000 [r, 4]	586	213,000 [4]
Monoammonium phosphate		582	300,000 [r, 4]	853	334,000 [4]
Fertilizer containing nitrates and phosphates		87	43,300 [r, 4]	32	12,600 [4]
Phosphoric acid		1	197 [r, 4]	2	401 [4]
Potash, gross weight:					
Potassium chloride	metric tons	7,990,000	2,570,000	7,310,000	2,030,000
Potassium sulfate	do.	134,000	62,900	113,000	40,700
Potassium nitrate	do.	122,000	88,400	66,000	43,900
Potassium sodium nitrate mixture	do.	1,830	534	4,130	1,910
Pumice:					
Crude or unmanufactured	do.	64,000	1,860	170,000	4,260
Wholly or partially manufactured	do.	216	600	190	516
Salt		21,600	578,000	12,100	390,000
Sand and gravel:					
Construction		3,890	61,400 [4]	3,490	45,500 [4]
Industrial		289 [r]	16,400 [r, 4]	281	15,400 [4]
Soda ash		40	6,780 [r, 4]	35	6,670 [4]
Stone:					
Crushed, chips, calcium carbonate fines, excludes precipitated carbonates		19,900 [r]	200,000 [r, 4]	19,700	184,000 [4]
Dimension		XX	2,380,000 [r]	XX	2,170,000
Strontium:					
Carbonate	kilograms	9,710,000	8,030	8,960,000	7,260
Celestite	do.	55,800,000	2,850	10,100,000	787
Metal	do.	141,000	1,080	83,900	521
Nitrate	do.	2,720,000	3,540	2,430,000	3,020
Oxide, hydroxide, peroxide	do.	103,000	172	36,800	82
Sulfur:					
Elemental[9]		2,240 [e]	136,000	1,820 [e]	79,800
Sulfuric acid, 100% H_2SO_4	metric tons	3,540,000	208,000	3,220,000	139,000
Talc, unmanufactured	do.	322,000	109,000	378,000	130,000
Vermiculite		21	NA	46	NA
Wollastonite[e]	metric tons	≤4,000	NA	≤4,000	NA
Zeolites[e]	do.	<1,000 [r]	NA	<1,000	NA
Total, industrial minerals		XX	43,300,000	XX	39,600,000
Grand total		XX	98,900,000 [r]	XX	96,600,000

[e]Estimated. [r]Revised. do. Ditto. NA Not available. XX Not applicable. -- Zero.

[1]Table includes data from the commodity chapters published in the U.S. Geological Survey 2016 Minerals Yearbook as they were completed and released through March 2019.

[2]Data are rounded to no more than three significant digits; may not add to totals shown.

[3]Customs value unless otherwise specified.

[4]Cost, insurance, and freight value.

[5]Less than ½ unit.

[6]Excludes Puerto Rico. Data adjusted by the U.S. Geological Survey.

[7]Not elsewhere classified.

[8]United States pharmaceutical-grade lithium carbonate.

[9]General imports.

[*]Correction posted on September 29, 2021.

TABLE 9

WORLD AND U.S. PRODUCTION OF SELECTED NONFUEL MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity		World total					United States	
		2012	2013	2014	2015	2016	2016	Percent of world total
Metals:								
Alumina, calcined equivalent[2]		97,100 r	106,000 r	111,000 r	119,000 r	121,000	2,360	1.95
Aluminum, primary[3]		49,600 r	52,200 r	54,200	58,000 r	58,900	818	1.39
Antimony, Sb content	metric tons	174,000 r	193,000 r	157,000 r	143,000 r	144,000	--	--
Arsenic trioxide[4]	do.	39,200 r	38,300 r	36,500 r	37,100 r	37,100	--	--
Bauxite		255,000 r	295,000 r	258,000 r	299,000	270,000	W [5]	W
Beryl, gross weight[6]	metric tons	7,410 r	7,400 r	8,430 r	6,730 r	5,500	3,870	70.4
Bismuth, refinery	do.	16,700 r	17,000 r	19,800 r	19,500 r	17,100 p	--	--
Cadmium, refinery[7, 8]	do.	22,500 r	22,600 r	23,700 r	22,800 r	23,900	W	W
Chromite, gross quantity		26,900 r	30,000 r	30,500 r	31,200 r	30,400	--	--
Cobalt, Co content:								
Mine[9]	metric tons	96,800 r	106,000 r	115,000 r	121,000 r	113,000	690 e	0.61
Refinery[10]	do.	77,900 r	86,700	92,700	99,800 r	96,600	--	--
Copper:								
Mine, recoverable, Cu content[11]		16,700 r	18,300	18,500 r	19,200 r	20,100	1,430	7.10
Smelter, gross weight[12]		15,900 r	16,600 r	18,000 r	18,500	18,900	563	2.98
Refinery[13]		20,400 r	21,300 r	22,800 r	23,200 r	23,400	1,220	5.22
Gold, mine	metric tons	2,750	2,930 r	3,030 r	3,090 r	3,120	222	7.13
Indium, refinery	kilograms	784,000	816,000 r	881,000	731,000 r	682,000 p, e	--	--
Iron ore[14]		2,070,000 r	2,200,000 r	2,340,000 r	2,320,000 r	2,350,000	41,800	1.78
Iron and steel:								
Direct-reduced iron[15]		70,800 r	71,100 r	75,800 r	69,700 r	72,700	1,800	2.48
Pig iron[16]		1,120,000	1,170,000 r	1,190,000 r	1,160,000 r	1,160,000	22,300	1.92
Raw steel[16, 17]		1,560,000 r	1,610,000 r	1,670,000	1,620,000	1,630,000	78,500	4.82
Lead:								
Mine, concentrates, Pb content		5,050 r	5,250 r	5,260 r	4,970 r	4,700	346 [18]	7.36
Refinery[19]		10,700 r	11,100 r	10,700 r	10,800 r	10,200	986	9.69
Magnesium, primary[7]	metric tons	840,000	910,000 r	1,000,000	979,000 r	998,000 p	W	W
Manganese ore, Mn content[20]		16,200	17,200	16,400	17,000	15,700	--	--
Mercury, mine[7]	metric tons	1,830	2,330 r	2,770 r	2,330 r	2,480 p	--	--
Molybdenum, mine, Mo content	do.	272,000 r	281,000 r	306,000 r	288,000 r	279,000 e	36,200	13.0
Nickel, Ni content:								
Mine, recoverable	do.	2,420,000 r	2,660,000 r	2,170,000 r	2,180,000 r	2,040,000	24,100 [21]	1.18
Plant	do.	1,810,000	1,980,000	2,000,000	2,000,000 r	1,930,000	--	--
Niobium (columbium) mineral concentrates, Nb content	do.	62,700	59,300 r	68,600	63,300 r	64,100	--	--
Platinum-group metals:								
Palladium	kilograms	203,000 r	204,000	193,000	218,000 r	212,000	13,100 [22]	6.18
Platinum	do.	181,000	193,000 r	150,000 r	195,000 r	191,000	3,890 [22]	2.04
Other[e]	do.	447,000 r	461,000 r	390,000 r	478,000 r	473,000	--	--
Rare earths, rare-earth-oxide (REO) equivalent[e]	metric tons	106,000	107,000	125,000	130,000	129,000	--	--
Rhenium[e]	kilograms	50,900	46,600	47,100 r	49,700 r	51,600	8,440 [23]	16.4
Selenium, refinery, Se content[e, 7]	metric tons	2,260 r	2,170	2,250	2,190 r	2,250 p	W	W
Silver, mine[24]	do.	24,900 r	25,900 r	26,700 r	27,000 r	26,600	1,150	4.31
Tantalum mineral concentrates, Ta content	do.	1,020 r	1,290	1,430 r	1,200 r	1,220	--	--
Tellurium, Te content	kilograms	93,700	104,000	115,000	119,000	133,000 p	W	W
Tin, Sn content:								
Mine[24]	metric tons	226,000 r	254,000 r	288,000 r	341,000 r	288,000	--	--
Smelter[25]	do.	341,000 r, *	346,000 r	393,000 r, *	353,000 r, *	330,000 *	11,100 *	3.37 *
Titanium mineral concentrates:								
Ilmenite and leucoxene		7,250 r	8,270 r	7,640 r	6,980 r	7,000	100 [26]	1.43
Rutile[7]	metric tons	811,000 r	640,000 r	660,000 r	760,000 r	889,000	W	W

See footnotes at end of table.

TABLE 9—Continued
WORLD AND U.S. PRODUCTION OF SELECTED NONFUEL MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity		World total					United States	
		2012	2013	2014	2015	2016	2016	Percent of world total
Metals:—Continued								
Tungsten, W content	metric tons	77,700 r	85,400 r	88,500 r	89,700 r	88,100	--	--
Vanadium, V content[27]	do.	74,900	81,400 r	85,700 r	84,600 r	79,000 p	--	--
Zinc:								
Mine, Zn content of mineral concentrates and direct shipping ore		13,300 r	13,700 r	13,600 r	13,500 r	12,600	805 [18]	6.41
Smelter		12,600	13,000	13,400 r	13,900	13,800	126	0.91
Zirconium mineral concentrates, gross weight		1,420 [7]	1,080 r, 7	1,680 r, 7	1,520	1,330 p, 7	W	W
Industrial minerals:								
Asbestos, marketable fiber		1,900 r	1,630 r	1,510 r	1,310 r	1,280	--	--
Barite		9,790 r	9,000 r	9,870 r	8,390 r	7,320	240 [28]	3.28
Bromine[e, 7]	metric tons	422,000 r	389,000	375,000 r	301,000 r	345,000	W	W
Celestite[e]	do.	282,000 r	240,000 r	249,000 r	264,000 r	202,000	--	--
Cement, hydraulic		3,820,000 e	4,070,000 e	4,190,000 e	4,100,000 e	4,140,000 e	85,153 [29, 30, 31]	2.06
Clay:								
Bentonite		16,800 r	16,300 r	18,000 r	19,500 r	19,000	3,600	18.9
Fuller's earth		3,280 r	3,500 r	3,450 r	3,460	3,370	1,860 [32]	55.2
Kaolin		33,300 r	34,700 r	37,500 r	37,800 r	37,500	5,320 e	14.2
Diamond, natural[33]	thousand carats	128,000	130,000	125,000	127,000	134,000	--	--
Diatomite		2,890 r	2,920 r	3,230 r	3,140 r	2,990 p	686 [28]	23.0
Feldspar		22,100 r	22,400 r	24,000 r	23,100 r	23,400	470 [e, 34, 35]	2.01
Fluorspar[36]		7,930 r	7,110 r	6,780 r	6,090 r	5,930	NA	NA
Graphite, natural[e]		1,030 r	1,100 r	987 r	1,180 r	1,150	--	--
Gypsum		250,000 r	259,000 r	265,000 r	260,000 r	261,000	17,000 [37]	6.52
Iodine, crude[7]	metric tons	27,800	30,800	29,600	32,600 r	32,500	W	W
Kyanite and related minerals	do.	327,000 r	377,000 r	364,000 r	408,000	393,000	79,700 [38]	20.3
Lime[39]		330,000 r, 35	340,000 r, 35	350,000 35	340,000 r, 35	350,000 r, 35	17,700 [30]	5.05
Magnesite[7, 40]		24,400 r	25,500 r	24,400 r	27,100 r	27,300	W	W
Mica	metric tons	340,000 r	310,000 r	272,000 r	275,000 r	294,000	30,900 [41]	10.5
Monazite mineral concentrates, gross weight	do.	6,380 r	4,250	6,570	6,860	9,430	--	--
Nitrogen, N content of ammonia		139,000 r	144,000	141,000 r	147,000 r	144,000	10,200 [42]	7.04
Peat		26,600 r	30,000 r	27,800 r	26,600 r	26,100	441 [43]	1.69
Perlite, processed ore		4,540 r	4,430 r	4,410 r	4,300 r	4,390	513	11.7
Phosphate rock, gross weight		216,000	232,000	237,000	263,000 r	255,000	27,100 [28]	10.6
Potash, marketable, K_2O equivalent		32,800	36,100 r	41,200 r	40,700	39,300	500 [35]	1.28
Pumice and related materials		15,500 r	15,100	16,900	17,100 r	17,100 p, e	374 [28]	2.18
Salt, all forms		261,000	280,000 r	275,000 r	277,000 r	274,000	41,700 [30, 44]	15.2
Sand and gravel, industrial, silica		146,000 r	159,000 r	206,000 r	203,000 r	179,000	77,700 [28]	43.4
Soda ash, natural and manufactured		51,700 e	51,400 r, e	52,800 r, e	53,500 r, e	53,600 p, e	11,800 [45]	22.0
Sulfur, all forms[46]		71,400 r	69,800 r	71,300 r	73,800 r	73,500	9,740	13.3
Talc and pyrophyllite		7,620 r	8,130 r	8,240 r	7,830 r	7,700 e	536 [47]	6.96
Vermiculite		363 r	359 r	384 r	379 r	404 p	100 [e, 28, 48]	24.8

[e]Estimated. [p]Preliminary. [r]Revised. do. Ditto. NA Not available. W Withheld to avoid disclosing company proprietary data; not included in "World total." -- Zero.

[1]Data are rounded to no more than three significant digits, unless otherwise specified.

[2]Calcined alumina or the total of calcined alumina plus the calcined equivalent of hydrate.

[3]Primary aluminum is defined as "The weight of liquid aluminum as tapped from pots, excluding the weight of any alloying materials as well as that of any metal produced from either returned scrap or remelted material."

[4]Includes calculated arsenic trioxide equivalent of output of elemental arsenic compounds other than arsenic trioxide; inclusion of such materials would not duplicate reported arsenic trioxide production.

[5]U.S. production is nonmetallurgical grade.

[6]Beryl ore for the production of beryllium and excludes gem-quality beryl. U.S. production is mine shipments; includes bertrandite ore, calculated as equivalent to beryl containing 11% beryllium oxide.

[7]"World totals" do not include U.S. production.

[8]Includes unwrought production from ores, concentrates, flue dusts, and other materials of both domestic and imported origin.

[9]Recoverable cobalt content of ores, mineral concentrates, or intermediate products from cobalt, copper, nickel, platinum, or zinc operations. U.S. production is cobalt content of concentrates.

TABLE 9—Continued
WORLD AND U.S. PRODUCTION OF SELECTED NONFUEL MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

[10]Cobalt refined from ores, concentrates, or intermediate products and does not include production of downstream products from refined cobalt.
[11]Copper content of concentrates produced (includes cement copper). U.S. production includes mineral concentrates and electrowon leaching.
[12]Includes total production of smelted copper metal, including low-grade cathode produced by electrowinning methods. The smelter feed may be derived from ore, concentrates, copper precipitate or matte (primary), and (or) scrap (secondary). U.S. production is primary only.
[13]Includes total production of refined copper whether produced by pyrometallurgical or electrolytic refining methods and whether derived from primary unrefined copper or from scrap. Copper cathode derived from electrowinning processing is also included. U.S. production is secondary only.
[14]Production of usable ore represents total for all iron ore products used in steelmaking.
[15]Sources: Midrex Technologies, Inc., governments, and companies.
[16]Source: American Iron and Steel Institute (AISI).
[17]Raw steel is defined by AISI as steel formed in solid state after melting, suitable for further processing or sale.
[18]Total content of ores and mineral concentrates. Table 1 reports recoverable content.
[19]Total output of refined lead whether derived from ores and concentrates (primary) or scrap (secondary); includes the lead content of antimonial lead but does not include, to the extent possible, simple remelting of scrap.
[20]Mostly concentrates or comparable shipping product.
[21]Recoverable content of nickel sulfide mineral concentrates.
[22]Excludes that produced as a byproduct from gold-copper ores.
[23]Based on 80% recovery of estimated rhenium contained in molybdenum mineral concentrates.
[24]Recoverable content of ores and mineral concentrates.
[25]Includes primary production (from ores and concentrates) and secondary production (recovered from scrap). U.S. production is secondary only.
[26]Includes U.S. production, rounded to one significant digit, of ilmenite, leucoxene, and rutile to avoid disclosing company proprietary data.
[27]Production from ores, concentrates, and slag.
[28]Sold or used by producers and (or) marketable production.
[29]Datum is not rounded. Refer to the Minerals Yearbook cement chapter.
[30]Includes Puerto Rico.
[31]Portland and masonry cements only. Includes a small (less than 0.3% per year) component of double-counting where portland cement (not clinker) is consumed to make masonry cement; the precise amount of double-counting cannot be determined because of the involvement of portland cement stockpiles.
[32]Does not include attapulgite.
[33]Includes gem and industrial. Source: Kimberley Process Certification Scheme.
[34]Includes hand-cobbed feldspar, flotation-concentrate feldspar, feldspar in feldspar-quartz mixtures, and aplite.
[35]Rounded to no more than two significant digits.
[36]Includes production by grade (acid, ceramic, and metallurgical).
[37]Does not include byproduct gypsum.
[38]Does not include synthetic mullite. Estimated using several prior-years' output as reported to the Virginia Department of Mines.
[39]Quicklime, hydrated lime, and dead-burned dolomite.
[40]Crude salable magnesite.
[41]Includes scrap and flake. Does not include, if any, U.S. production of low-quality sericite and sheet mica.
[42]Synthetic anhydrous ammonia; does not include coke oven byproduct ammonia.
[43]Production. Table 1 reports sales by producers.
[44]Includes brine, rock, solar, and vacuum and open pans.
[45]U.S. production is natural only.
[46]Includes byproduct of metallurgy, natural gas, oil sands and petroleum. Frasch, native, and pyrites.
[47]Does not include pyrophyllite.
[48]Rounded to the nearest 100,000 metric tons.
[*]Correction posted on August 31, 2021.