THE MINERAL INDUSTRY OF TEXAS

This chapter has been prepared under a Memorandum of Understanding between the U.S. Geological Survey and the University of Texas at Austin on behalf of the Texas Bureau of Economic Geology, for collecting information on all nonfuel minerals.

In 1997, for the second consecutive year, Texas ranked seventh in the Nation in total nonfuel mineral production value,[1] according to the U.S. Geological Survey (USGS). The estimated value for 1997 was $1.7 billion, a less than 2% decrease from that of 1996. This followed a 3% increase from 1995 to 1996 (based on final 1996 data). The State accounted for nearly 4.5% of the total U.S. nonfuel mineral production value.

Nearly 77% of Texas' nonfuel mineral value came from the mining and processing of the top 5 industrial minerals, in descending order of value: portland cement, crushed stone, construction sand and gravel, salt, and lime. (All the following mineral listings are in descending order of relative change.) In 1997, significant decreases in the values of magnesium metal, construction sand and gravel, and crushed stone together were greater than the combined increased values of portland cement, industrial sand and gravel, ball clay, crude gypsum, common clay, and kaolin, resulting in a net decrease for the State (*table 1*). Smaller increases occurred for masonry cement, lime, talc, gemstones, dimension stone, and crude helium; all other nonfuel minerals showed small decreases in value for the year. In 1996, portland cement and crushed stone value increases contributed the most to Texas' $50 million net increase in total value. Smaller increases in value occurred in dimension stone, construction sand and gravel, salt, and masonry cement; these increases did not balance similar-sized decreases that occurred in magnesium metal, Frasch sulfur, bentonite, crude gypsum, Grade-A helium, industrial sand and gravel, and kaolin. All other changes were smaller and inconsequential to the State's net change in value.

Based on USGS estimates of the quantities of minerals produced in the 50 States in 1997, Texas remained first of 3 magnesium metal-producing States; second in portland cement, crushed stone, salt, crude gypsum, ball clays, talc, and zeolites (this and listings to follow are in descending order of value); and second in each of 2 Frasch sulfur-, 2 sodium sulfate-, and 3 crude helium-producing States. The State continued to rank third in common clays; third of five Grade-A helium-producing States; fifth in dimension stone; sixth in lime and magnesium compounds; and seventh in industrial sand and gravel and masonry cement. Texas dropped from second to third in construction sand and gravel.

Magnesium metal, extracted from seawater, was the only metal produced from the State's natural resources. In addition to the production of magnesium metal, the Texas metal industry produced raw steel, primary aluminum, copper, lead, and smaller amounts of other metals. Sources of plant feed included scrap metal and ores acquired from other domestic or foreign sources. Texas produced an estimated 4.45 million metric tons of raw steel, as reported by the American Iron and Steel Institute. The State ranked eighth in primary aluminum production.

The following narrative information was provided by the Texas Bureau of Economic Geology[2] (BEG). The increase in population and growth in various industries promoted continued activity in the mineral production industries by creating demand for materials used in developing infrastructure. Production of aggregates, dimension stone, and other industrial minerals needed for manufacturing building products responded to changes in construction activity.

Annual job growth in mining, reported by the Texas Labor Market Review, was both strong and relatively stable from March through December 1997. Growth during this period was about 4.0%. Mining created more than 6,300 jobs in 1997 and has created over 9,000 jobs since January 1996, the start of the most recent upturn in job growth.

BEG records show increases in employment in construction and manufacturing related to mineral products during 1997. The construction job annual growth rate was 4.5%. Jobs related to stone, clay, and glass products increased by 2.5% and those related to concrete, gypsum, and plaster products increased by about 3.8% compared with employment figures of 1996.

According to the BEG, Texas producers reported an 8% increase in aggregates production from 1996 to 1997. Construction activity for roads and streets is expected to continue at about the same rate in 1998, but production levels may be reduced slightly to a growth rate of about 5%. However, the approval of a $545 million bond package by the city of Houston for construction and repair of streets, sidewalks, and storm drainage tends to boost the 1998 aggregate industry forecast.

Overall, exploration for nonfuel minerals in Texas showed no significant increase during 1997. However, the BEG received several inquiries regarding possible sources of limestone, sand and gravel materials, industrial sands, and clays.

Vulcan/ICA Distribution Co., the U.S. distributer of limestone

[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or 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 1997 USGS mineral production data published in this chapter are estimates as of January 1998. For some commodities (for example, construction sand and gravel, crushed stone, and portland cement), estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset, and request Document # 1000 for a telephone listing of all mineral commodity specialists, or call USGS information at (703) 648-4000 for the specialist's name and number. This telephone listing may also be retrieved over the Internet at http://minerals.er.usgs.gov/minerals/contact/comdir.html. All Mineral Industry Surveys–mineral commodity, State, and country–also may be retrieved by way of MINES FaxBack or over the Internet at http://minerals.er.usgs.gov/minerals/.

[2]L. Edwin Garner, Research Associate, authored the text of mineral industry information submitted by the Bureau of Economic Geology of the University of Texas at Austin.

produced in the Yucatan Peninsula (Mexico), started construction of a grinding facility at its aggregate distribution terminal on the Houston Ship Channel. The terminal is located in Green Bayou Industrial Park and is owned by Vulcan Materials Co. of Birmingham, AL, and Empress ICA of Mexico City. The plant will produce high purity micro-sized calcium carbonate filler for use in adhesive, floor coverings, joint compound, paint, and plastics,. Plant production is expected to begin in mid-1998.

Record second quarter gains were reported by Centex Construction Products (CXP). Earnings for the quarter ending on September 30 increased by 37% to a record high of $17.7 million. Revenue for concrete and aggregates increased 16% over 1996 to $11.6 million. The company attributed the increases to a higher volume of concrete and aggregate sales and higher concrete operating margins. The volume of aggregate sales climbed 551,000 metric tons in the second quarter, a 12% increase. The active Texas market and a large contract in northern California contributed to the CXP gains.

U.S. Lime and Minerals, Inc. started work on a $20 million modernization and expansion project for its Texas lime plant in Johnson County. The project includes a new stone crushing and handling system; addition of a preheater to one of the kilns; additional storage, screening, and shipping capacities; and new support facilities.

Overall, activity in the nonfuel mineral industry was above average during 1997. Prospects for continued population increase and commercial development also suggest that production of the State's mineral resources will continue to show strong gains.

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN TEXAS 1/ 2/

(Thousand metric tons and thousand dollars unless otherwise specified)

Mineral	1995		1996		1997 p/	
	Quantity	Value	Quantity	Value	Quantity	Value
Cement:						
Masonry	202	17,600	216	20,300 e/	220	21,100 e/
Portland	8,090	499,000	8,240	532,000 e/	8,400	553,000 e/
Clays:						
Ball	101	2,800	101	W	W	W
Common	2,320	15,500	2,290	15,000	2,240	18,100
Kaolin	36	7,700	28	W	W	W
Gemstones	NA	353	NA	511	NA	932
Gypsum, crude	1,880	16,200	2,240	12,100	2,150	15,400
Helium:						
Crude million cubic meters	5	4,730	W	W	W	W
Grade-A do.	W	W	W	W	14	27,000
Lime	1,370	85,800	1,360	86,300	1,370	87,100
Salt	9,110	85,000	9,700	88,900	9,700	87,700
Sand and gravel:						
Construction	61,100	271,000	61,300	278,000	53,700	249,000
Industrial	1,600	40,300	1,420	38,200	1,590	47,500
Stone:						
Crushed	81,100	310,000	86,500	341,000	81,200	325,000
Dimension metric tons	54,000	13,300	86,600	21,100	87,000	21,200
Talc do.	294,000	5,840	225,000	5,100	249,000	5,800
Combined value of clays [bentonite (1995), fuller's earth], magnesium compounds, magnesium metal, sodium sulfate (natural), sulfur (Frasch), and values indicated by symbol W	XX	301,000	XX	293,000	XX	240,000
Total	XX	1,680,000	XX	1,730,000	XX	1,700,000

e/ Estimated. p/ Preliminary. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. XX Not applicable.
1/ Production as measured by mine shipments, sales, or marketable production (including consumption by producers).
2/ Data are rounded to three significant digits; may not add to totals shown.

TABLE 2
TEXAS: CRUSHED STONE SOLD OR USED, BY KIND 1/

Kind	1995 Number of quarries	1995 Quantity (thousand metric tons)	1995 Value (thousands)	1995 Unit value	1996 Number of quarries	1996 Quantity (thousand metric tons)	1996 Value (thousands)	1996 Unit value
Limestone	110	76,100	$291,000	$3.82	118	82,500	$323,000	$3.92
Dolomite	1	W	W	2.83	1	W	W	2.95
Marble	20	W	W	W	28	W	W	W
Calcareous marl	2	W	W	2.13	2	W	W	2.27
Granite	1 r/	W	W	W	2	W	W	6.25
Traprock	2	W	W	4.20	2	W	W	6.69
Sandstone	6	1,100	W	W	5	746	W	W
Volcanic cinder	1	W	W	5.39	2	W	W	4.45
Miscellaneous stone	4	986	2,410	2.44	4	703	1,720	2.44
Total	XX	81,100	310,000	3.82	XX	86,500	341,000	3.94

r/ Revised. W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.
1/ Data are rounded to three significant digits; may not add to totals shown.

TABLE 3
TEXAS: CRUSHED STONE SOLD OR USED BY PRODUCERS
IN 1996, BY USE 1/ 2/

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Riprap and jetty stone	329	$2,340	7.10
Filter stone	200	765	3.83
Other coarse aggregate 3/	666	3,410	5.11
Coarse aggregate, graded:			
Concrete aggregate, coarse	11,300	50,900	4.49
Bituminous aggregate, coarse	8,990	46,500	5.18
Bituminous surface-treatment aggregate	579	3,070	5.30
Railroad ballast	755	3,640	4.82
Other graded coarse aggregate	2,690	12,400	4.62
Fine aggregate (-3/8 inch):			
Stone sand, concrete	2,590	9,250	3.57
Stone sand, bituminous mix or seal	1,860	7,710	4.15
Screening, undesignated	1,590	7,430	4.67
Other fine aggregate	W	W	5.48
Coarse and fine aggregates:			
Graded road base or subbase	21,200	63,800	3.01
Unpaved road surfacing	399	1,670	4.19
Terrazzo and exposed aggregate	W	W	25.63
Crusher run or fill or waste	2,980	7,940	2.66
Other coarse and fine aggregates	2,090	10,700	5.14
Other construction materials 4/	1,550	8,560	5.53
Agricultural:			
Agricultural limestone	262	1,120	4.27
Poultry grit and mineral food	(5/)	(5/)	8.02
Other agricultural uses	(5/)	(5/)	9.35
Chemical and metallurgical:			
Cement manufacture	9,910	23,500	2.38
Lime manufacture	1,080	5,260	4.87
Chemical stone	(5/)	(5/)	4.55
Sulfur oxide removal	546	2,100	3.85
Special:			
Asphalt fillers or extenders	(5/)	(5/)	10.22
Whiting or whiting substitute	(5/)	(5/)	10.99
Other fillers or extenders	479	11,300	23.61
Unspecified: 6/			
Actual	1,450	6,210	4.29
Estimated	12,200	43,400	3.57
Total	86,500	341,000	3.94

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."
1/ Includes calcareous marl, dolomite, granite, limestone, marble, miscellaneous stone, sandstone, traprock, and volcanic cinder and scoria.
2/ Data are rounded to three significant digits; may not add to totals shown.
3/ Includes macadam.
4/ Includes waste material.
5/ Withheld to avoid disclosing company proprietary data; included in "Total."
6/ Includes production reported without a breakdown by end use and with estimates fornonrespondents.

TABLE 4
TEXAS: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 1996, BY USE AND DISTRICT 1/ 2/

(Thousand metric tons and thousand dollars)

Use	District 1		District 4		District 5	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:						
Coarse aggregate (+1 1/2 inch) 3/	(4/)	3	6	49	517	2,910
Coarse aggregate, graded 5/	W	W	W	W	10,100	51,700
Fine aggregate (-3/8 inch) 6/	W	W	W	W	3,490	15,700
Coarse and fine aggregate 7/	235	992	1,930	9,320	7,440	32,700
Agricultural 8/	--	--	--	--	(9/)	(9/)
Chemical and metallurgical 10/	--	--	(9/)	(9/)	(9/)	(9/)
Special 11/	--	--	--	--	(9/)	(9/)
Unspecified: 12/						
Actual	--	--	(9/)	(9/)	137	538
Estimated	1,090	2,950	(9/)	(9/)	5,820	22,800
Total	1,330	3,950	7,360	28,500	31,400	144,000

	District 7		District 9		District/unspecified	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:						
Coarse aggregate (+1 1/2 inch) 3/	671	3,540	--	--	--	--
Coarse aggregate, graded 5/	13,500	59,900	--	--	--	--
Fine aggregate (-3/8 inch) 6/	3,700	15,000	--	--	--	--
Coarse and fine aggregate 7/	15,800	41,500	2,550	6,900	--	--
Agricultural 8/	(9/)	(9/)	--	--	--	--
Chemical and metallurgical 10/	7,240	19,000	--	--	--	--
Special 11/	(9/)	(9/)	--	--	--	--
Unspecified: 12/						
Actual	687	2,010	(9/)	(9/)	--	--
Estimated	1,450	4,790	(9/)	(9/)	212	661
Total	43,600	157,000	2,600	7,080	212	661

W Withheld to avoid disclosing company proprietary data; included with "Coarse and fine aggregate."
1/ Production reported in District 2 and 3 was included with "District 4"; District 6 was included with "District 5"; District 8 was included with "District 7"; to avoid disclosing company proprietary data.
2/ Data are rounded to three significant digits; may not add to totals shown.
3/ Includes filter stone, macadam, riprap and jetty stone, and other coarse aggregate.
4/ Less than 1/2 unit.
5/ Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, railroad ballast, and other graded coarse aggregate.
6/ Includes stone sand (concrete), stone sand (bituminous mix or seal), screening (undesignated), and other fine aggregate.
7/ Includes graded road base or subbase, terrazzo and exposed aggregate, unpaved road surfacing, crusher run (select material or fill), other coarse and fine aggregates, other construction materials, and waste material.
8/ Includes agricultural limestone, poultry grit and mineral food, and other agricultural uses.
9/ Withheld to avoid disclosing company proprietary data; included in "Total."
10/ Includes cement manufacture, chemical stone for alkali works, lime manufacture, and sulfur oxide removal.
11/ Includes asphalt fillers or extenders, other fillers or extenders and whiting or whiting substitute.
12/ Includes production reported without a breakdown by end use and with estimates for nonrespondents.

TABLE 5
TEXAS: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1996,
BY MAJOR USE CATEGORY 1/

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	23,200	$115,000	$4.96
Plaster and gunite sands	259	1,590	6.13
Concrete products (blocks, bricks, pipe, decorative, etc.)	325	817	2.51
Asphaltic concrete aggregates and other bituminous mixtures	1,330	7,910	5.94
Road base and coverings 2/	2,460	7,970	3.24
Fill	4,350	9,230	2.12
Other miscellaneous uses 3/	964	3,840	3.98
Unspecified: 4/			
Actual	6,460	31,000	4.80
Estimated	22,000	100,000	4.57
Total or average	61,300	278,000	4.53

1/ Data are rounded to three significant digits; may not add to totals shown.
2/ Includes road and other stabilization (cement and lime).
3/ Includes filtration, railroad ballast, and roofing granules.
4/ Includes production reported without a breakdown by end use and with estimates for nonrespondents.

TABLE 6
TEXAS: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1996,
BY USE AND DISTRICT 1/ 2/

(Thousand metric tons and thousand dollars)

Use	District 1		District 3		District 4	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products 3/	568	3,830	(4/)	(4/)	527	5,150
Asphaltic concrete aggregates and road base materials 5/	767	4,900	(4/)	(4/)	64	268
Other miscellaneous uses 6/	1	9	--	--	10	89
Unspecified: 7/						
Actual	53	250	182	741	2	19
Estimated	1,670	7,830	1,410	6,700	1,580	8,740
Total	3,060	16,800	2,840	14,800	2,180	14,300

Use	District 5		District 6		District 7	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products 3/	8,010	40,600	(4/)	(4/)	2,460	11,300
Asphaltic concrete aggregates and road base materials 5/	818	2,470	(4/)	(4/)	1,270	2,810
Other miscellaneous uses 6/	88	145	--	--	3	7
Unspecified: 7/						
Actual	3,500	17,100	--	--	1,750	9,270
Estimated	5,150	20,300	668	3,460	1,630	5,480
Total	17,600	80,600	1,020	5,100	7,110	28,900

Use	District 8		District 9	
	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products 3/	8,510	34,900	(4/)	(4/)
Asphaltic concrete aggregates and road base materials 5/	4,600	11,300	(4/)	(4/)
Other miscellaneous uses 6/	862	3,590	--	--
Unspecified: 7/				
Actual	978	3,660	--	--
Estimated	6,200	26,700	3,660 8/	21,100 8/
Total	21,100	80,200	6,410 8/	37,100 8/

1/ Production reported in District 2 was included with "District 3" to avoid disclosing company proprietary data.
2/ Data are rounded to three significant digits; may not add to totals shown.
3/ Includes plaster and gunite sands.
4/ Withheld to avoid disclosing company proprietary data; included in "Total."
5/ Includes fill and road and other stabilization (cement and lime).
6/ Includes filtration, railroad ballast, and roofing granules.
7/ Includes production reported without a breakdown by end use and with estimates for nonrespondents.
8/Includes production within the state with no district reported.