

State of Maryland
MARYLAND GEOLOGICAL SURVEY
Kenneth N. Weaver, Director

THE MINERAL INDUSTRY OF MARYLAND IN 1983

by

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The Mineral Industry of Maryland

This chapter has been prepared under a Memorandum of Understanding between the Bureau of Mines, U.S. Department of the Interior, and the Maryland Geological Survey for collecting information on all nonfuel minerals.

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Maryland's nonfuel mineral production was valued at \$199.4 million in 1983, a dramatic \$27.9 million increase from that of 1982. Mineral commodity sales, which increased for the first time in the past 4 years, were 16% over 1982 levels and 3% over the alltime high of \$193 million reported in 1979. Production included crushed stone and cement, which led the increases, and

construction sand and gravel, slag, common clay and shale, dimension stone, and lime. Also produced were ball clay, industrial sand, and peat. Alumina, copper anode, and iron ore concentrate were shipped into the State for the production of metals. Gypsum and vermiculite shipments were received for further processing. Titanium dioxide pigments were also manufactured.

Table 1.—Nonfuel mineral production in Maryland¹

Mineral	1982		1983	
	Quantity	Value (thousands)	Quantity	Value (thousands)
Clays ² thousand short tons..	405	\$1,346	484	\$1,747
Gem stones.....	NA	2	NA	2
Lime..... thousand short tons..	7	396	7	383
Peat..... do.....	^r 4	^r W	4	W
Sand and gravel (construction)..... do.....	9,720	32,386	^e 10,600	^e 37,800
Stone:				
Crushed..... do.....	^e 15,100	^e 73,500	19,284	80,429
Dimension..... do.....	^e 32	^e 1,001	12	682
Combined value of cement, clays (ball clay), and values indicated by symbol W.....	XX	^r 62,891	XX	78,366
Total.....	XX	^r 171,522	XX	199,409

^eEstimated. ^rRevised. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" figure. XX Not applicable.

¹Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

²Excludes ball clay; value included with "Combined value" figure.

Table 2.—Value of nonfuel mineral production in Maryland, by county¹

(Thousands)

County	1981	1982	Minerals produced in 1982 in order of value
Allegany -----	W	(²)	
Anne Arundel -----	(³)	\$7,485	Sand and gravel (construction).
Baltimore ⁴ -----	W	W	Sand and gravel (construction), clays.
Caroline -----	(³)	--	
Carroll -----	W	W	Cement, clays.
Cecil -----	W	W	Sand and gravel (construction).
Charles -----	(³)	4,816	Do.
Dorchester -----	(³)	W	Do.
Frederick -----	W	W	Cement, clays, lime, sand and gravel (construction).
Garrett -----	W	W	Sand and gravel (construction), peat.
Harford -----	W	509	Do.
Howard -----	W	(²)	
Kent -----	\$27	23	Clays.
Montgomery -----	10,469	(²)	
Prince Georges -----	196	7,559	Sand and gravel (construction), clays.
Queen Annes -----	W	(²)	
St. Marys -----	(³)	376	Sand and gravel (construction).
Washington -----	W	W	Cement, clays.
Wicomico -----	(³)	W	Sand and gravel (construction).
Worcester -----	(³)	1,168	Do.
Undistributed ⁵ -----	132,963	75,081	
Sand and gravel (construction)	^e \$1,800	XX	
Stone:			
Crushed -----	XX	^e 73,500	
Dimension -----	XX	^e 1,001	
Total -----	175,455	^e 171,522	

^eEstimated. W Withheld to avoid disclosing company proprietary data; included with "Undistributed." XX Not applicable.

Calvert, Somerset, and Talbot Counties are not listed because no nonfuel mineral production was reported. County distribution for construction sand and gravel (1981), and crushed and dimension stone (1982) is not available; total State values shown separately under "Sand and gravel (construction)" or "Stone."

²Stone, either crushed or dimension, was produced; data not available by county.

³Construction sand and gravel was produced; data not available by county.

⁴Includes Baltimore City.

⁵Includes gem stones that cannot be assigned to specific counties and values indicated by symbol W.

^eData do not add to total shown because of independent rounding.

Table 3.—Indicators of Maryland business activity

	1982	1983 ^P	Change, percent
Employment and labor force, annual average:			
Total civilian labor force ----- thousands --	2,165.8	2,200.8	+1.6
Unemployment ----- do -----	190.7	149.0	-21.9
Employment (nonagricultural):			
Mining ¹ ----- do -----	1.7	1.2	-29.4
Manufacturing ----- do -----	207.7	212.7	+2.4
Contract construction ----- do -----	83.7	91.2	+9.0
Transportation and public utilities ----- do -----	84.8	86.0	+1.4
Wholesale and retail trade ----- do -----	397.3	416.4	+4.8
Finance, insurance, real estate ----- do -----	95.4	95.6	+2
Services ----- do -----	386.4	398.9	+3.2
Government ----- do -----	389.8	385.5	-1.1
Total nonagricultural employment ¹ ----- do -----	1,646.8	1,687.5	+2.5
Personal income:			
Total ----- millions --	\$52,243	\$55,934	+7.1
Per capita ----- do -----	\$12,237	\$12,994	+6.2
Construction activity:			
Number of private and public residential units authorized ----- do -----	21,085	37,530	+78.0
Value of nonresidential construction ----- millions --	\$918.5	\$947.0	+3.1
Value of State road contract awards ----- do -----	\$219.9	\$250.1	+13.7
Shipments of portland and masonry cement to and within the State thousand short tons --	1,158	1,379	+19.1
Nonfuel mineral production value:			
Total crude mineral value ----- millions --	\$171.5	\$199.4	+16.3
Value per capita, resident population ----- do -----	\$40	\$46	+15.0
Value per square mile ----- do -----	\$16,210	\$19,064	+17.6

^PPreliminary.

¹Includes bituminous coal and gas extraction.

Trends and Developments.—The trend in the overall State economy, like that of the Nation, has been upward since the December 1982 bottoming of the 1981-82 recession. In Maryland, the number of private and public residential units authorized increased by 78%, while in the United States that indicator increased by 59%. In the area of private nonresidential construction, Maryland's value increased by \$28.5 million (+3%), while that value across the Nation increased by 8%. Also significant were the increases in the value of State road contract awards and the shipments of cement to and within the State of Maryland, up 14% and 19%, respectively. And while total unemployment dropped by 22%, employment in contract construction increased by 9%.

After 4 years of economic recession, the producers and processors of the State's industrial minerals, whose fortunes are tied to residential, heavy, and highway construction, rebounded in all areas except for lime production and dimension stone.

Production of crushed stone increased by 28%. Portland cement shipments increased 27%, and masonry cement shipments climbed by 28%, while value soared by 80%. The production of common clay and shale and construction sand and gravel increased 20% and 9%, respectively. Lime production remained essentially unchanged from 1982 levels, while dimension stone fell by 62%.

Shipments of wallboard, like those of cement, extend well beyond the borders of Maryland, as shown by the 17% increase in the value of Maryland calcined gypsum for the manufacture of wallboard. In 1983, the Atlantic region experienced the largest gain in the consumption of portland and masonry cement, and the leading sales region for wallboard products was the South Atlantic region. Parts of these regions comprise the marketing area of Maryland's four cement plants and its wallboard manufacturer.

The economic recovery in 1983 helped some of Maryland's industrial mineral producers more than others. Uncertainties regarding the economy continued to discourage some buyers and developers, and a number of potential property sales in Maryland were delayed by sewer moratoriums and building restrictions.

The Arundel Corp. completed two unusually large supply contracts for construction material in early 1983—stone for the Hart and Miller Island Project and concrete for the Fort McHenry Tunnel. The dike

disposal area to confine material dredged from Baltimore Harbor and the access channel required over 300,000 tons of riprap and 100,000 tons of smaller stone. The tunnel required 500,000 cubic yards of concrete and over 2,000,000 tons of aggregate. Increased construction activity on the Eastern Shore of Maryland offset in part the completion of the large supply contracts.

During the recovery of 1983, primary metal producers in Maryland only managed to cut their losses. In 1983, the State's work force in the primary metals sector declined 16% from that of 1982. About 4,000 employees were idled in 1983. This sector lost 4,200 jobs in 1982. Employment in the fabricated metals sector fell by 5.5% for the same period, with 500 workers losing jobs. In 1982, 1,500 fabricated metal workers were idled.

Despite the general economic recovery in 1983, steel consumption in the capital goods markets of machinery, nonresidential construction, rail transportation, shipbuilding, and oil and gas remained severely depressed, even below 1982 steel consumption levels. Demand in the automotive and other consumer durable markets increased during the year, and several of the capital goods markets showed signs of recovery during the latter part of the year. Bethlehem Steel Corp. managed to cut its operating losses from \$312 million in 1982 to \$81 million in 1983 in basic steel operations, and from \$48 million in 1982 to \$21 million in 1983 in fabricating and other steel operations. At Bethlehem Steel's Sparrows Point facility, pig iron production was down 37% from the level of 1981 and 11% below that of 1982.

The depressed state of the domestic copper industry continued in 1983, as the excess world supply of copper continued and imports of refined copper increased. Kennecott Refining Corp., which operates a copper refinery and rod mill at Curtis Bay, cut its total company losses from \$189 million in 1982 to \$91 million in 1983. For Kennecott's refinery in Anne Arundel County, which had been operating on a reduced work schedule since January, poor copper demand and unstable feed suppliers led to closing the refinery in mid-July. The refinery had depended heavily on blister from the company's Ray Mines Division smelter in Hayden, AZ, which had been shut since May 1982. This recently modernized cast rod mill was kept open at a sharply reduced rate in order to meet customer demand.

In primary metals production, one of the most positive responses to the general economic recovery came from the aluminum industry, as apparent total consumption increased significantly in 1983 compared to the previous 3 years. Potlines, which continued to be closed in the first quarter, were restarted as the building and transportation industries recovered and the packaging industry demand remained high. At the East-alco Aluminum Co. in Frederick, the production rate on July 1 had dropped to 132,000 tons per year, the lowest level since 1976. By yearend, the plant was operating at 90% capacity and full production levels were anticipated in early 1984. Production in 1983 was 7% below 1982 levels and about 22% below the production levels of 1979-81.

Legislation and Government Programs.—The Maryland Geological Survey, an agency of the Department of Natural Resources, conducted applied research in the fields of geology, minerals, water resources, and archeology. Survey expenditures of \$1.9 million in fiscal year 1983 were 5.6% over 1982 levels. Of this total, 67% was State general funds, 19% was special funds, 4.5% was Federal funds, and 9.5% was reimbursable funds. The mineral resources aspects of the program include mapping of present and potential resources and mined land, minerals zoning, and monitoring the current extraction of minerals. A booklet, "Building Stones of Maryland," and a leaflet, "Gold in Maryland," were published by the Survey. Maps showing lands for potential mineral resources development for the six western counties were published through a grant from the U.S. Geological Survey. Of further interest to the State's nonfuel minerals industry were studies to be initiated in 1984: geomorphic studies on the Marlboro clay of the Coastal

Plain Province and commodity studies on mineral resources statewide. Work on the Marlboro clay and the commodity studies of sand and gravel and carbonate rocks will be completed prior to 1989.

The Avondale Research Center, 1 of 10 U.S. Bureau of Mines research facilities, is located near Washington, DC, in Prince Georges County. Technology developed at the Center was recently proved effective in protecting turbine blades against premature failure due to a lack of erosion resistance. The Bureau's titanium diboride coatings, second only to diamonds in hardness, were produced by electrodeposition techniques.

Foreign Oceanborne Commerce.—The Port of Baltimore experienced an almost record year in the important shipping category of container traffic, while having one of its worst years in the export of coal and grains, down 41.5% and 52.7%, respectively, from 1982 levels. The worldwide demand for coal has diminished, and the flow of grain from the United States, as a whole, to export markets greatly decreased during 1983. About 47,000 tons of coke (including petroleum coke, pitch, and asphalt) was exported in 1983, down 11.3% from 1982 levels. Import trade in fertilizer and fertilizer materials totaled 265,042 tons, up 42.1% from 1982. Less than 5,000 tons was exported.

Import trade of nonfuel mineral commodities in 1983 included iron ore, manganese ore, miscellaneous ores and concentrates (including chrome ore), ferroalloys, salt, gypsum, bauxite, and clay. Of these, manganese ore, ferroalloys, gypsum, and bauxite increased from 1982 levels. The import trade of mineral commodities in short tons at the Port of Baltimore since 1981, as published by the Maryland Port Administration, was as follows:

Commodity	1981	1982	Change, percent	1983	Change, percent
Iron ore	6,070,999	3,889,854	-35.9	3,425,721	-11.9
Manganese ore	89,234	27,238	-69.5	30,660	+12.6
Miscellaneous ores and concentrates, including chrome	180,411	136,312	-24.4	64,349	-52.8
Ferroalloys		86,267		147,776	+71.3
Salt	136,388	258,721	+89.7	215,333	-16.8
Gypsum	603,112	519,386	-13.9	592,964	+14.2
Bauxite	183,968	128,971	-29.9	316,519	+145.4
Clays		19,466		18,636	-4.3
Residual fuel oil	1,135,725	922,518	-18.8	592,085	-35.8
Petroleum, crude and partly refined	751,086	556,238	-25.9	185,651	-66.6
Miscellaneous petroleum products	226,854	93,698	-58.7	307,838	+228.5

There continued to be no export trade in mineral commodities.

REVIEW BY NONFUEL MINERAL COMMODITIES

NONMETALS

Cement.—Lehigh Portland Cement Co. at Union Bridge and Lone Star Cement Inc. at Hagerstown produced both portland and masonry cement. Coplay Cement Co. at Lime Kiln continued to produce only portland cement. In November 1982, Genstar Stone Products Co. discontinued its grinding operation and the manufacture of masonry cement at its ready-mix concrete plant in Frederick. From 1982 to 1983, portland cement shipments increased 27% and value increased 21%. Concurrently, masonry cement shipments increased 28% while value soared by 80%. In spite of these gains, Atlantic Cement Co. Inc. continued to experience weak demand for slag cement produced at its new Sparrows Point plant.

Clays and Shale.—Common clay and shale were mined by five companies at seven pits in Carroll, Frederick, Prince Georges, and Washington Counties for the production of expanded shale, and the manufacture of face and common bricks and portland cement. Production totaled 484,000 tons, up 19.5% from 1982 levels. Value increased to \$1.7 million, up 30% from \$1.3 million in 1982. Recovery of the construction industry during the year spurred the impressive gains in the production of common clay and shale. The Chestertown Brick Co. Inc. in Kent County, which discontinued brick manufacturing operations in August 1982 owing to weak demand and high energy costs, remained idle throughout 1983. The company had manufactured face brick.

During the year, Kaiser Aluminum & Chemical Corp. was selling its refractory plant in Frostburg. The clay and high-alumina plant had been serving as a distribution point for the company's eastern markets.

Ball clay was produced by Cyprus Industrial Minerals Co. at its operation 5 miles northeast of Baltimore on Route 46. Major end uses of the ball clay were in the manufacture of floor and wall tiles, ceramics, and sanitary ware. Maryland is one of six ball clay producing States. Recovery of the housing industry during 1983 aided impressive gains in ball clay production.

Gypsum (Calcined).—Crude gypsum imported from Nova Scotia and New Brunswick, Canada, was calcined by both National Gypsum Co. and United States Gypsum Co. at facilities in Baltimore for manufacture of wallboard. Production increased 6% over 1982 levels, while value increased 17%.

SCM Corp., Glidden Pigments Group plant in Baltimore, produced byproduct gypsum from the neutralization of waste sulfuric acid effluent water resulting from its production of titanium dioxide pigments. In 1983, for the second year, the U.S. Gypsum plant blended into its flow sheet considerable quantities of this chemical gypsum in its manufacture of wallboard. Although this technology has been available and in use in Japan and Europe, U.S. wallboard producers have been reluctant to upset their materials handling equipment with such a high-moisture chemical precipitate.

Lime.—S. W. Barrick & Sons Inc. at its Woodsboro plant in Frederick County produced industrial and agricultural lime as well as crushed limestone. Production and value of lime remained essentially unchanged over 1982 levels at 7,000 short tons and \$383,000. Both quicklime and hydrated lime were produced. The hydrate comprised 55% of production and 70% of value. Barrick is the State's only producer.

Peat.—Garrett County Processing & Packaging Corp. mined reed-sedge and humus peat near the town of Accident in the western corner of the State. About 85% of the peat was sold in bulk for agricultural purposes. The remainder was packaged and sold as a soil conditioner under the trade name "Free State Peat." Garrett is the State's sole producer of peat. In May, the company made the top bid for an additional bog at an estate auction. It paid \$275,000 for the 470 acres, which contains the 75-acre bog. Only the peat company and the Nature Conservancy were in the bidding after the last coal company dropped out at \$200,000.

Sand and Gravel.—*Construction.*—Construction sand and gravel production is surveyed by the U.S. Bureau of Mines for even-numbered years only; therefore, this chapter contains only estimates for 1983. The data for odd-numbered years are based on annual company estimates made before yearend.

Based on these preliminary estimates, production increased 9% while value increased 17% over 1982 levels. These increases compare favorably with U.S. totals, where production and value increased 10% and 16%, respectively.

Within the construction sand and gravel industry, the following were noteworthy developments in 1983:

In Cecil County, York Building Products

Co. Inc. sought approval to mine sand and gravel from beneath Racine School Road and an adjacent 300-acre property south of Racine School Road on Elk Neck while 2,500 feet of the roadway is temporarily relocated. Approval was sought by way of a modification to a special exception that York was granted in April 1981 to mine 607 acres on the north side of Racine School Road. York began mining that property in the fall of 1982 after the Maryland Court of Special Appeals had affirmed the Cecil County Board of Appeals decision. York proposed to shift Racine School Road 300 feet south while the materials are mined. Once mining is completed, that portion of the road would be replaced to its original position and repaved at York's expense. The

roadway would be lowered an average of 15 feet and nearly 30 feet in some spots. York is one of Maryland's principal producers of sand and gravel.

In Charles County, B. F. Asher Co. Inc., a sand and gravel producer, wanted its load limit increased from 30 to 50 loads per day and its workday increased by 1-1/2 hours to meet increased orders for construction materials. Asher also requested a special zoning exception to mine sand and gravel on a 19-acre portion of its 113-acre tract fronting on Oaks Road. Both requests were opposed by the Oaks Road Citizen Association.

Industrial.—Harford Sands Inc., the State's sole producer of industrial sands, continued operations in Magnolia.

Table 4.—Maryland: Construction sand and gravel sold or used by producers

	1982			1983 ^e		
	Quantity (thousand short tons)	Value (thous- ands)	Value per ton	Quantity (thousand short tons)	Value (thous- ands)	Value per ton
Sand -----	5,517	\$18,977	\$3.44	NA	NA	NA
Gravel -----	3,224	11,330	3.51	NA	NA	NA
Sand and gravel (unprocessed) -----	979	2,079	2.12	NA	NA	NA
Total or average -----	9,720	32,386	3.33	10,600	\$37,800	\$3.57

^eEstimated. NA Not available.

Slag, Iron and Steel.—The Maryland Slag Co., a wholly owned subsidiary of Arundel, operated under an agreement with Bethlehem Steel at Bethlehem Steel's Sparrows Point Plant. Maryland Slag received molten iron slag from Bethlehem Steel's blast furnaces and then processed and marketed this slag in the form of construction aggregates. In recent years, the amount of blast furnace slag recovered by Maryland Slag declined substantially due to a reduction in the production of slag available to the company and to cutbacks in steel production. Since March 1982, the slag produced at Bethlehem Steel's Giant "L" blast furnace has gone directly to the new 800,000-ton-per-year water-granulated slag cement plant of Atlantic Cement. As a replacement for cement, ground-granulated blast furnace slag offers a savings in the energy required to manufacture cement clinker. Compared to 1981 and 1982 figures, production of iron slag remained essentially unchanged. However, when compared to 1982, value increased by 170%.

In 1983, Arundel entered into an agreement to serve as exclusive distributor in the

marketing of steel slag processed by C. J. Langenfelder & Sons Inc. at Bethlehem Steel's Sparrows Point Plant.

Stone.—Stone production is surveyed by the U.S. Bureau of Mines for odd-numbered years only; the 1982 chapter gave estimates. Data for even-numbered years are based on annual company estimates made before yearend.

Crushed.—In 1983, 20 companies operated 29 quarries in 10 of Maryland's 23 counties and produced 19.3 million tons of crushed stone valued at \$80.4 million. Production increased by 4.2 million tons (28%) from that of 1982, while value increased by \$6.9 million (9.4%). The average value per ton fell by 70 cents to \$4.17. At 5.6 million tons, Baltimore County was the leading producer in Maryland. Over 90% of shipments were by truck, 3.5% were by waterway from Harford County, and a small amount was shipped by rail from Washington County. A total of 60% of the material was crushed from marble and metalimestone, 20% was from limestone, 10% was from granites and gneiss, and 10% was from sandstone, traprock, quartzite, and other

metamorphic rock types. C. J. Langenfelder & Sons crushed oystershells dredged from Chesapeake Bay for use as aggregate and poultry grit.

Genstar, the States's largest producer of crushed stone and 1 of the top 10 U.S. producers, completed installation of a new \$12 million processing plant at its Frederick limestone quarry that will increase capacity from 450 tons to 1,000 tons per hour. The new plant uses a computerized process control system.

Genstar also operates a white calcite quarry at Texas some 15 miles north of Baltimore. The quarry is located within a mile-wide band of the Cockeysville marble. The layered marble member is mined by surface and underground methods and is processed on-site for its high-purity calcium carbonate. The product lines for application as fillers are marketed throughout the Eastern United States and Canada. Approximately 30% of production goes into paint and coatings, 40% into a variety of plastic end uses, and 30% into paper coatings, caulks and sealants, adhesives, and miscel-

laneous uses. Genstar recently introduced new grades of specialty-type products aimed at specific end uses—stearate-coated grades for the plastics industry and an ultrafine product for the paint and paper industries. Genstar, in a joint venture with Anglo-American Corp., processes and markets the ultrafines from the zone of high-purity, white calcite marble.

Another Maryland crushed stone producer, D. M. Stoltzfus & Son, has upgraded crushing and processing capacity. At the 300-ton-per-hour Conowingo plant in Harford County, the production crew can meet State specifications for materials up to 1-1/2-inch maximum size simply by changing deck panels in a parallel three-deck final screening station. Limestone is drawn from a 100-acre quarry on the Pennsylvania State line. In addition to the immediate 40-mile market area, the product is shipped to Virginia, New Jersey, and Delaware. The Conowingo facility, on-line since March 1979, is one of six corporate plants in operation.

Table 5.—Maryland: Crushed stone¹ sold or used by producers, in 1983, by use

(Thousand short tons and thousand dollars)

Use	Quantity	Value
Coarse aggregate (+1-1/2 inch):		
Macadam	1,929	6,106
Riprap and jetty stone	396	1,828
Coarse aggregate, graded:		
Concrete aggregate, coarse	2,921	10,223
Bituminous aggregate, coarse	2,210	9,304
Bituminous surface treatment aggregate	307	1,322
Railroad ballast	66	233
Fine aggregate (-3/8 inch):		
Stone sand, concrete	156	1,044
Stone sand, bituminous mix or seal	667	2,325
Coarse and fine aggregate:		
Graded road base or subbase	1,833	8,094
Unpaved road surfacing	4,169	19,512
Crusher run or fill or waste	1,243	3,842
Chemical and metallurgical:		
Cement manufacture	2,275	4,351
Lime manufacture	14	53
Special: Other ²	1,099	12,190
Total ³	19,284	80,429

¹Includes marble, metalimestone, granite, gneiss, sandstone, quartzite, shell, traprock, and miscellaneous stone.

²Includes agricultural limestone, other agricultural uses, poultry grit and mineral food, filter stone, flux stone, mine dusting or acid water treatment, asphalt fillers or extenders, whitening or whitening substitute, other fillers or extenders, screening (undesignated), and uses not specified.

³Data do not add to totals shown because of independent rounding.

Dimension.—In 1983, eight companies operating eight separate quarries produced 12,193 tons of dimension stone valued at \$682,000. Production fell 62% from 1982 levels, while value decreased 32%. Irregular shaped stone, cut stone, rough blocks, flagging, and a small amount of house stone

veneer were produced. Of the total production, 70% was granite gneiss and 30% was quartzite and sandstone. Granite gneiss was produced in Montgomery County, quartzite was produced in Baltimore and Howard Counties, and a small amount of sandstone was produced in Garrett County.

Vermiculite (Exfoliated).—The Construction Products Div. of W. R. Grace & Co. at Muirkirk in Prince Georges County exfoliated South Carolina-mined vermiculite. Most of the production was used in insulating fill and Monokote fireproofing. Sales value increased 3% from that of 1982.

METALS

Aluminum.—In August, Alumax Inc. purchased the assets of Howmet Aluminum Corp. The acquisition gave Alumax full ownership of Eastalco in Frederick. At mid-year, production of primary aluminum at Eastalco had dropped to 75% of capacity, the lowest level since 1976. By yearend, however, production had climbed to 90%, 960 employees were working full-time, and none were on layoff. Normal production at full capacity is 176,000 short tons annually.

Kaiser discontinued production at its heavy-press extrusion plant in Halethorpe at yearend. The plant was closed because its costs were not competitive with those of other hard alloy extrusion plants. The company could not reach agreement with the union on contract modifications regarding wage and benefit concessions. The plant's 75 hourly workers were laid off, and its 35 salaried workers had their jobs terminated or were transferred. The Halethorpe facility supplied aluminum extruded materials to the aircraft, aerospace, and transportation industries. Kaiser's remaining extrusion plants are located in Dolton, IL, Newark, OH, Los Angeles, CA, Sherman, TX, and Toronto, Canada. In June 1983, Kaiser closed its Woodbury, NY, extrusion plant.

An aluminum beverage bottle, a new type of recyclable container, was manufactured on a pilot line in Baltimore. The container is resealable and can be filled by conventional bottling machinery.

Copper.—Refining operations at Kennecott, Curtis Bay, were shut down at mid-year because of depressed copper industry conditions and a lack of raw material availability. About 175 hourly and salaried workers were laid off. Copper refinery operations were maintained on a standby basis throughout the remainder of the year; continuous cast rod operation continued, using cathodes from inventory at Kennecott's Utah operations. Prior to its shutdown, the refinery had been processing primarily toll material, having lost its supply from Kennecott's Hayden, AZ, smelter, and had been on a reduced work schedule since January.

During 1983, American Telephone &

Telegraph Co. (AT&T) reduced the work force at its Baltimore Works by over 1,300 because of decreased demand for the facility's output of copper communications cable. Increased use of fiber-optic transmission systems and other technology that increases the capacity of copper wire was cited by AT&T as causing the reduced demand. The plant, built in 1920, employed about 3,500 workers at yearend.

Steel.—Bethlehem Steel signed financial agreements and began site preparation at yearend for the construction of the 2.9-million-ton-per-year continuous caster at Sparrows Point. Startup is scheduled for January 1986. Under the financing agreement, Bethlehem Steel will lease the "con-caster" with payments based on steel production. New desulfurization stations and new ladle metallurgy treatment facilities to be completed in early 1984 were also being installed to improve steel quality by reducing sulfur and enhancing internal cleanliness. The company stopped manufacturing pipe at Sparrows Point with the shutdown of the two mills that had been operating on a limited basis for several months. Wire and nail manufacturing operations were also shutdown during the year. In the second half of the year, the company began phasing out its tin mill operation at Burns Harbor, IN; it will concentrate tin-plate production at Sparrows Point.

Armco Inc. began operations at the new rotary forge complex at its Baltimore stainless steel division. The project, including a horizontal continuous caster, came on-stream at yearend. The Baltimore Works, the company's main stainless steel plant, produces ingots, billets, bars, rods, and wire products.

Eastern Stainless Steel Corp. (ESS), Baltimore, became the first domestic company to produce "duplex" stainless steel plate. Duplex, containing 22% chromium, 5% nickel, and 3.5% molybdenum, offers a good combination of corrosion resistance and strength. ESS produces flat-rolled stainless steel products and is the country's largest stainless steel plate producer. During 1983, it operated at a capacity utilization rate of 45% to 60%. The company generally uses scrap stainless steel to produce new stainless steel.

Titanium Dioxide (Pigments).—The SCM Glidden Pigments Group plant in Baltimore continued to produce titanium dioxide pigments for use in paints, varnishes, lacquers, paper, and plastics. The plant's pigment

capacity is 66,000 tons per year by the sulfate process and 42,000 tons per year by the chloride process.

SCM also operated a 42,000-ton-per-year chloride-process plant in Ashtabula, OH, and, following a Federal Trade Commission decision not to oppose the acquisition, purchased for \$48 million a 35,000-ton-per-year sulfate-process plant at Ashtabula from Gulf + Western Industries Inc. SCM plans to spend \$20 million to convert the plant to its chloride process. SCM ended the year with a total annual titanium dioxide

capacity of 185,000 tons (20% of U.S. capacity). U.S. production and consumption of titanium dioxide pigments were 760,000 tons and 851,000 tons, respectively—20% and 19% higher than 1982 levels. Consumption of titanium dioxide pigments rose to a new peak, mainly because of recovery in the homebuilding industry. Domestic uses in 1983 were in paints (48%), paper (27%), plastics (13%), rubber (3%), ceramics (1%), and other applications (8%).

¹State Liaison Officer, Bureau of Mines, Pittsburgh, PA.

Table 6.—Principal producers

Commodity and company	Address	Type of activity	County
Aluminum: Eastalco Aluminum Co -----	5601 Manor Woods Rd. Frederick, MD 21701	Reduction plant	Frederick.
Cement: Portland: Coplay Cement Co. ¹ -----	4120 Buckeystown Pike Lime Kiln, Box D Frederick, MD 21701	Quarry and plant.	Do.
Portland and masonry: Lehigh Portland Cement Co. ^{1 2}	Box L Union Bridge, MD 21791	---do---	Carroll.
Lone Star Cement Inc. ¹ -----	Box 650 Hagerstown, MD 21740	---do---	Washington.
Clays: Ball clay: Cyprus Industrial Minerals Co., Cyprus Mines Corp.	9420 Pulaski Highway Baltimore, MD 21220 Box 188 White Marsh, MD 21162	Pit and plant --	Baltimore.
Common clay: Baltimore Brick Co -----	9801 Rocky Ridge Rd. Rocky Ridge, MD 21778	---do---	Frederick.
Lehigh Portland Cement Co --	Box L Union Bridge, MD 21791	Pits and plant --	Carroll and Frederick.
Victor Cushwa & Sons Inc ---	Clearspring Rd. & Route 68N Box 160 Williamsport, MD 21795	Pits-----	Washington.
Copper: Kennecott Refining Corp -----	Kenbo Rd. Curtis Bay, MD 21226 Box 3407 Baltimore, MD 21226	Refinery-----	Anne Arundel.
Gypsum: Byproduct: SCM Corp., Glidden Pigments Group.	3901 Glidden Rd. Baltimore, MD 21226	Plant-----	Baltimore.
Calcined: National Gypsum Co., Gold Bond Building Products.	2301 South Newkirk St. Baltimore, MD 21224	---do---	Do.
United States Gypsum Co ---	500 Quarantine Rd. Box 3472 Baltimore, MD 21226	---do---	Do.
Iron and steel: Armco Inc -----	3501 East Biddle St. Box 1697 Baltimore, MD 21203	Mill (stainless steel).	Do.
Bethlehem Steel Corp -----	Sparrows Point, MD 21219-----	Mill -----	Do.
Eastern Stainless Steel Co-----	7700 Rolling Mill Rd. Dundalk, MD 21222 Box 1975 Baltimore, MD 21203	---do---	Do.
Lime: S. W. Barrick & Sons Inc. ¹ -----	Woodsboro, MD 21798 -----	Quarry and plant.	Frederick.
Peat: Garrett County Processing & Pack- ing Corp.	RFD 1 Accident, MD 21520	Bog-----	Garrett.
Sand and gravel: Construction (1982): Charles County Sand & Gravel Co. Inc.	Waldorf Industrial Center Box 548 Waldorf, MD 20601	Pits and plants --	Anne Arundel, Charles, St. Marys.

See footnotes at end of table.

Table 6.—Principal producers —Continued

Commodity and company	Address	Type of activity	County
Sand and gravel —Continued			
Construction (1982) —Continued			
Genstar Stone Products Co. ³ --	Executive Plaza 4 11350 McCormick Rd. Hunt Valley, MD 21031	Pits and plants --	Anne Arundel and Baltimore.
J. E. Owens, III -----	5893 Upper Pindell Rd. Lothian, MD 20820	Pit (bankrun) --	Anne Arundel.
York Building Products Co. Inc.	910 Old Philadelphia Rd. Aberdeen, MD 21001	Pits and plants --	Cecil.
Industrial:			
Harford Sands Inc. ⁴ -----	Box 25 40 Fort Hoyle Rd. Joppa, MD 21085	---do---	Harford.
Slag:			
Iron:			
Atlantic Cement Co. Inc -----	Box 6687 Sparrows Point, MD 21219	Plant -----	Do.
Maryland Slag Co -----	Sparrows Point, MD 21219 -----	---do---	Do.
Steel:			
C. J. Langenfelder & Sons Inc --	8427 Pulaski Highway Baltimore, MD 21221	---do---	Do.
Stone:			
Crushed:			
The Arundel Corp -----	110 West Rd. Baltimore, MD 21204	Quarries and plants.	Baltimore, Frederick, Harford.
Genstar Stone Products Co --	Executive Plaza 4 11350 McCormick Rd. Hunt Valley, MD 21031	---do---	Baltimore, Carroll, Frederick, Harford.
Rockville Crushed Stone Inc --	Box 407 13900 Piney Meetinghouse Rd. Rockville, MD 20850	Quarry and plant.	Montgomery.
Dimension:			
Butler Artcraft Stone Corp --	1611 St. Paul St. Hampstead, MD 21074	---do---	Baltimore.
Piccirilli Quarries -----	795 Marriottsville Rd. Marriottsville, MD 21164	---do---	Howard.
Stoneyhurst Quarries -----	Box 34463 8101 River Rd. Bethesda, MD 20817	---do---	Montgomery.
Titanium dioxide (pigments):			
SCM Corp., Glidden Pigments Group.	3901 Glidden Rd. Baltimore, MD 21226	Chemical plant --	Baltimore.
Vermiculite (exfoliated):			
W. R. Grace & Co., Construction Products Div.	12340 Conway Rd. Beltsville, MD 20705	Plant -----	Prince Georges.

¹Also crushed stone.²Also common clay and shale.³Also calcite.⁴Also construction sand and gravel.