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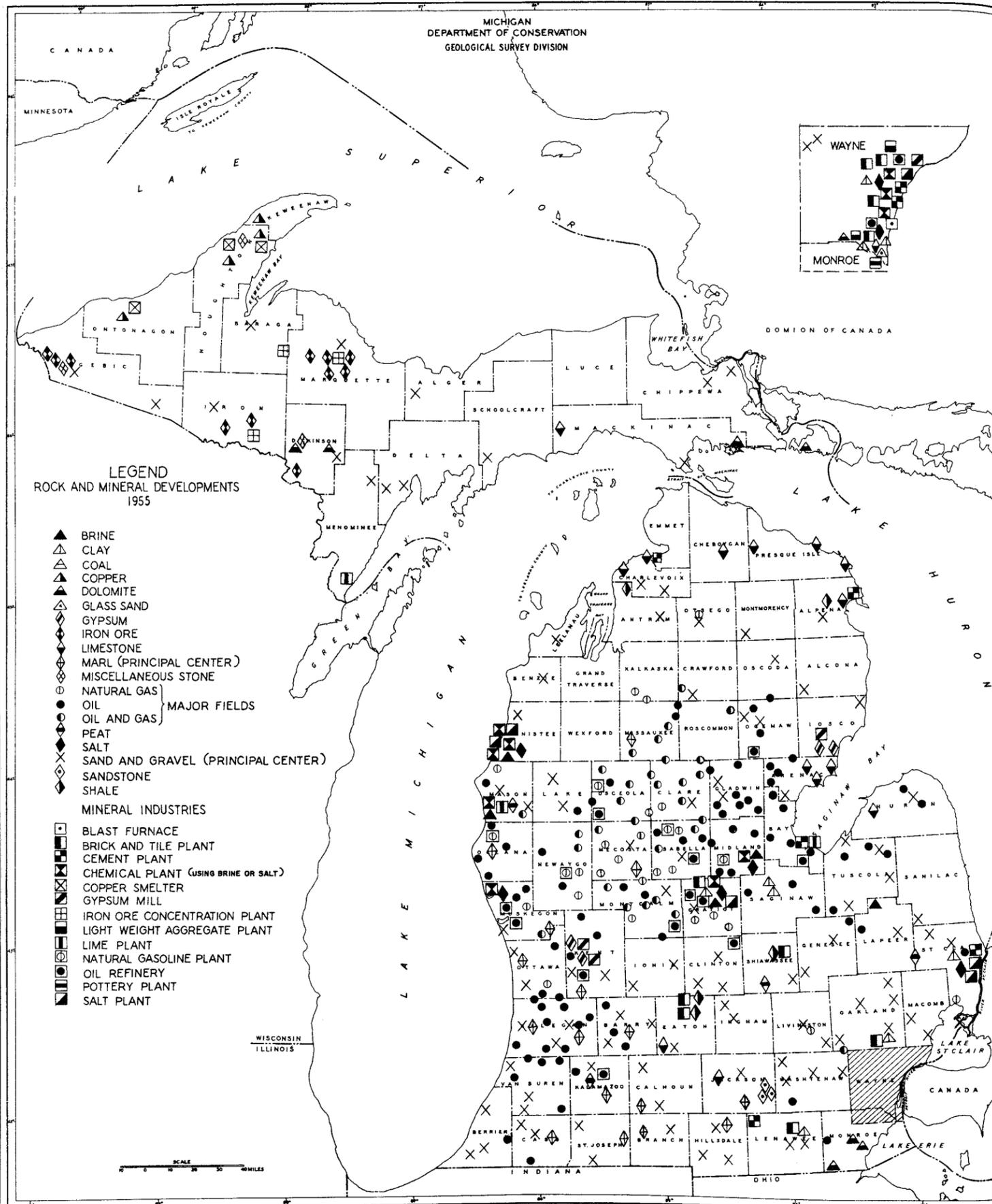
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MINERAL RESOURCES OF MICHIGAN

1954



HARRY O. SORENSEN and EMERY T. CARLSON - Geologists.



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## FOREWORD

This report is a record of Michigan Mineral Industries for the calendar year 1954. Reports filed by the mineral producers of individual operations throughout the state supplied the information for the study which was made in cooperation with the Bureau of Mines of the United States Department of Interior and Bureau of the Census of the United States Department of Commerce.

The estimated value of mineral production for 1955 was submitted by the United States Bureau of Mines on January 27, 1956. The section on developments in the mineral industries was prepared through office and field conferences with mineral producers and from articles published in Pit and Quarry, Rock Products, Mining Journal and other trade journals.

## LATE DEVELOPMENTS IN MICHIGAN'S MINERAL INDUSTRIES

A brief resumé of late developments in Michigan mineral industries show that progress will continue in 1956. The Cleveland Cliffs Iron Company is reported to begin operations of The Republic beneficiation plant early in 1956. At this plant, which has an annual capacity rated at 400,000 tons, iron ore concentrate will be recovered by flotation process from low-grade jasper ore. Concentrates will be shipped to Eagle Mills, east of Negaunee, where the fine mill product will be agglomerated in the peltitizing plant now under construction.

The surface plant of the M. A. Hanna Company's Cannon Mine, near Stambaugh, Iron County, was completed and the first iron ore was hoisted through the new shaft late in March 1955. Shaft sinking of the Cannon property started August 22, 1951. Ore is now being hoisted 1,000 feet from the new seventh level.

Republic Steel Company announced plans to open the Genesee iron ore body, which lies adjacent to the Tobin mine, Crystal Falls location.

One of the nation's largest blast furnaces (hearth diameter 30 feet 3 inches) has been constructed at **Ecorse**, Wayne County for Great Lakes Steel Corporation. Operation of this furnace began in 1955.

Calumet & Hecla, Incorporated completed dewatering and rehabilitation of the No. 13 shaft of the Osceola Mine at Calumet, Houghton County in 1955, and that part of the mine will go into full production in 1956. Meanwhile, dewatering and rehabilitation of No. 6 shaft continues, with completion scheduled for late in the year.

Construction of a new cement plant at Detroit by the Peerless Cement Corporation is now underway. The plant is scheduled to go into production in 1956 and will supply a million barrels of cement annually to the Michigan market. At the company's Port Huron plant, a stack dust collecting system was installed to eliminate air pollution in the nearby residential district.

Facilities to increase production of the Huron Portland Cement Company at Alpena, the world's largest cement plant, are underway and completion is scheduled for April 1956. New raw grinding, clinker burning and finish grinding equipment are being installed. Changes and improvements in the vessel-loading system and equipment for handling, conveying and apportioning raw material have been completed. Company officials announced the purchase of the "E. C. Collins", a 440 foot bulk ore carrier. Addition of the "Collins" and the "Presque Isle", purchased in 1954, make a total of six ships owned by Huron.

Penn-Dixie, now owner of the Petoskey Portland Cement Company plant at Petoskey, announced that the new 375-foot long kiln should increase cement production by 50 per cent. Addition of the kiln is part of a \$4,000,000 expansion program which includes installation of a stone crusher and several new tool and work houses.

Wyandotte Chemical Corporation, Wyandotte, Wayne County, has announced the expansion of its cement plant facilities at a cost of approximately \$2,500,000. This expansion will double production to almost 2,500,000 barrels of cement annually. Air pollution control equipment, including an electro-static precipitator, will be installed. Clinker coolers have been installed and linings have been extended to the full length of the plant stacks. Addition of two silos, cement conveying systems, and extension of bulk loading facilities are included in the expansion program. The Company also manufactures chlorine, soda ash, caustic soda, and specialized cleaning compounds.

Shipment of limestone from the new \$15,000,000 quarry and plant of the Presque Isle Corporation, owned by five steel companies and located 3 miles north of Bell, Presque Isle County began in April 1955. Five grades of high calcium limestone are produced for open hearth and blast furnace flux stone. Some stone is produced for cement and lime. Chemstone Corporation, Cleveland, Ohio (formerly Kelley Island Lime and Transport Company) manages and operates the plant on a fee basis. This plant, said to be the second largest flux stone plant in the nation, has a capacity of 2,000 tons of limestone per hour. Stone is quarried from the 50 to 55 foot thick high calcium Rogers City limestone.

The year 1955 closed a decade of operation by the Drummond Dolomite Corporation, Drummond Island, Chippewa County. Starting from scratch, in 1945, this company has grown into one of the world's largest dolomite producers, by providing a high quality raw material for chemical, steel and construction purposes throughout the Great Lakes area. The aggregate for the piers and foundation work of the Mackinac Bridge was supplied from Drummond Island. When the 1956 quarrying season begins the company will use a new 120-foot tower equipped with two 90 degree radial stacking conveyors, beneath which a new tunnel will be extended. Another prominent feature now in use, located on high ground near the mill, is a new 7,200 square foot Butler-type office-maintenance storage building.

Huron River Quarry Corporation opened a quarry just west of Flat Rock, Wayne County. Dolomitic rock quarried from the Amherstberg member of the Detroit River formation is marketed for parking lot and general building purposes.

The new flux stone operation of the Michigan Limestone Division, United States Steel Corporation, near Cedarville, Mackinac County, began full scale production in 1955. The first cargo left their new port, "Port Dolomite", on April 16, 1955. This Northern Peninsula dolomite quarry was opened to supplement the high calcium limestone produced at the company's Rodgers City operation in the Southern Peninsula.

Fenner-Crane and Construction Service Company, Muskegon, purchased a 30-acre tract in Cedar Creek township, Muskegon County, for sand recovery operations. The sand is sold as hardtopping road mix and for construction work by the Great Lakes Dock and Material Corporation.

Michigan Gravel Company, Muskegon, opened a 90-ton-per-hour sand and gravel plant in Casnovia township near Muskegon. The plant produces washed mortar and concrete sand and several sizes of gravel. A gravel jig for removing impurities is to be installed.

The Holly Sand and Gravel Company, Holly, Oakland County, has opened a new \$300,000 processing plant. Production capacity has been increased 300 per cent to 400 tons of sand and gravel an hour. This expansion permits increased production of ready-mixed concrete by J.P. Burrough & Sons, Incorporated, the parent company.

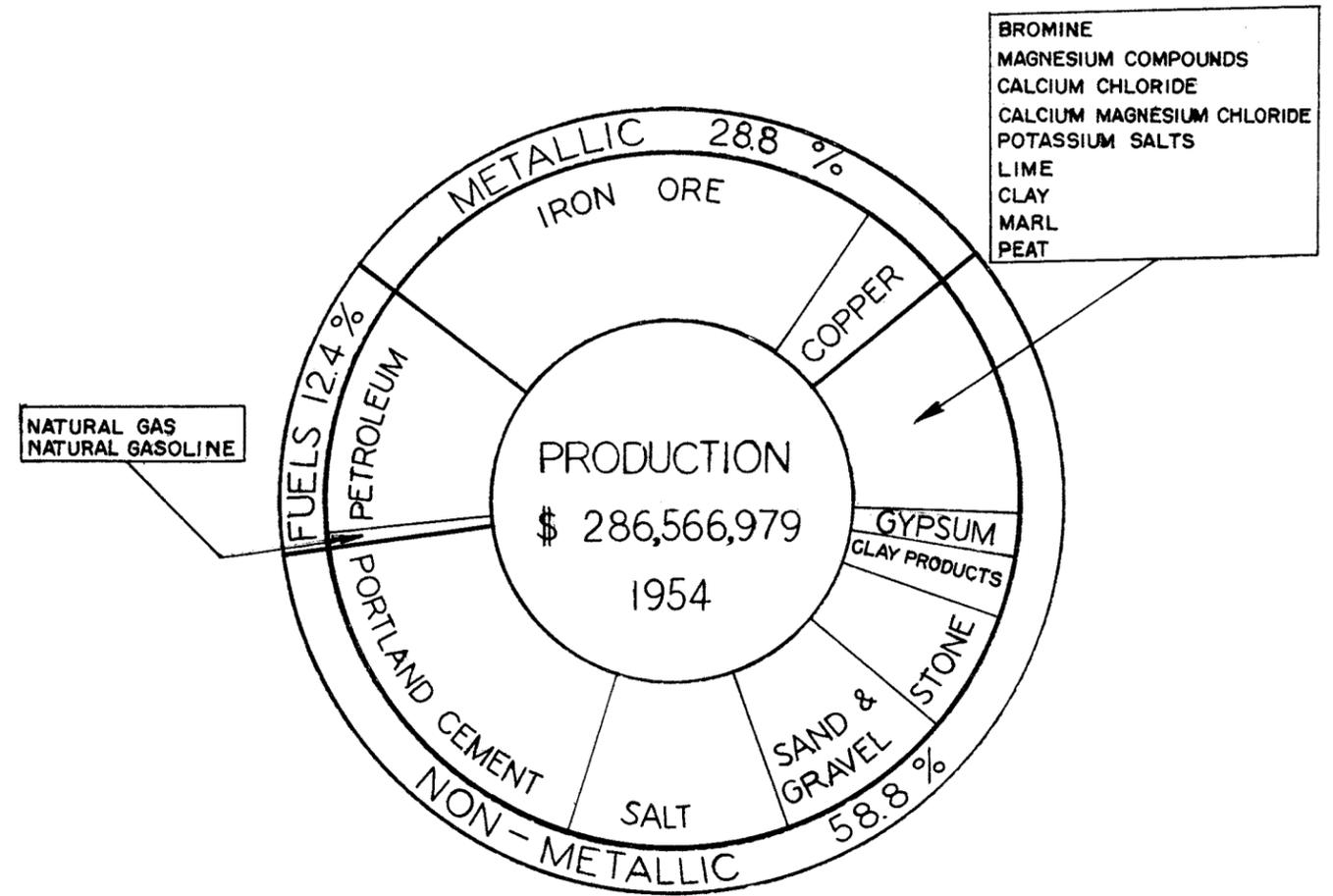
The waste rock piles and stamp sands of the old copper mines are coming into use. Waste piles of the Hancock Mining Company, now owned by the Thornton Construction Company, are used as ballast for railroad crossing and paving between Dollar Bay and Lake Linden, Keweenaw County. The huge deposit of stamp sand at the old Isle Royal mill in Portage Lake, near Houghton, is being used as a source of railroad ballast by the D.S.S. & A. Railroad Company. In addition the Houghton County Road Commission is using a considerable quantity of the sand for road repair in both Portage and Chassell townships, Houghton County. On September 15, 1955 the company started quarrying dolomitic rock from Limestone Mountain at Alston. The stone is crushed and used for agricultural fertilizers.

Plans for an aerial tramway, sticking more than a mile out into Lake Huron from a point just south of Tawas City, are part of a \$90,000,000 expansion program by National Gypsum Company, which operates quarries and a gypsum plant 12 miles southwest of Tawas. New quarries in the area are included in the program. The 6,000-foot tramway will carry gypsum out to lake freighters.

MICHIGAN  
 MINERAL PRODUCTION  
 1954

Mineral production in Michigan in 1954 declined only four-tenths of one per cent from the all time high of the previous year of 1953. New production highs were established for bromine, clay, shale, sand, gravel, and cement. Non-metallic mineral production increased 16 per cent, but production of fuels and metallic minerals declined.

Michigan's rank in the United States in volume of mineral production for 1954 is: First in gypsum and salt; Second in iron ore, bromine, magnesium compounds, sand and gravel; Fourth in stone and peat; Fifth in portland cement.



## METALLIC MINERALS

IRON ORE: Shipments of iron ore, from 32 underground mines and 9 open pits totaled 9,722,884 long tons (2,240 lbs.) in 1954, a decrease of 27.3 per cent from 1953. This is the lowest total shipment since 1946 when 8,477,425 long tons were shipped and the pre-war year 1938 when 4,092,904 long tons left the Northern Peninsula. The 1954 season was the first full season since 1939 in which iron ore requirements were not affected by the demands of an active war or the prospect of imminent war. The 1954 decrease in shipment resulted from the low rate of operation of the steel industry operated throughout most of the year, and because a very substantial tonnage of ore was in stock at the lower lakes at the start of the 1954 shipping season.

For many years the possibilities of using a flotation process for concentrating Lake Superior ores has been discussed and investigated. The first commercial plant for such a process was put into operation in 1954 and its successful operation marks another milestone for the industry. This flotation plant located at the Humboldt Mine, at Humboldt, Marquette County, is owned jointly by the Ford Motor Company and the Cleveland-Cliffs Iron Company, with Cleveland-Cliffs as operator. The low grade ore (jasper and specular hematite) is mined by the open pit method and hauled to the plant where it is crushed. The ore is then ground to flotation size, approximately 65 mesh. Through flotation and filtering processes a high grade concentrate containing approximately 64 per cent iron is recovered.

The filtered concentrate is shipped to steel plants where it is mixed with coarser ores before sintering.

Cleveland-Cliffs during the year had a larger mill under construction at the nearby Republic property where similar ore will be concentrated by the process used at the Humboldt plant. The plant will contain a primary crushing and flotation section to treat the low-grade (jasper) hematite.

Production of direct shipping ore ceased at the Book mine, near Alpha, Iron County early in the year. Production was maintained during the shipping season, however, by reclaiming ore from the old lean ore and rock piles of a heavy media plant. Meanwhile, underground development of low grade ore was carried on in the mine. In 1955, low grade ore was to be mined, hoisted to the surface and treated in the heavy media plant to obtain a shipping product.

The Blueberry Mine, located 7 miles west of Ishpeming, on the Marquette Iron Range, was permanently closed December 3, 1954, because of exhaustion of the ore reserves. Underground working had been carried to a depth of 2,000 feet, but there the ore bodies are small and non-commercial. The Blueberry is the third Michigan mine to be labeled "exhausted" in the past 2 years, following the Davidson and James mines at Mineral Hills, Iron County. North Range Mining Company took over the operation of the Blueberry from Ford Motor Company in 1933. From 1926, the year of first shipment, until the mine was closed in 1954, the mine shipped approximately 6 million tons of ore.

Inland Steel Company's Cagia mine near Crystal Falls, Iron County was closed permanently in January, 1954. Sand and water from the overburden filled the mine, and since no safe and economical method of resuming operation could be devised, the mine had to be abandoned. Only a small tonnage of ore had been mined.

The surface plant of the M. A. Hanna Company's Cannon Mine, Stambaugh, Iron County was completed and the shaft sinking neared its objective of 1,700 feet. Plant construction neared completion and underground development progressed at the state's two other new mines, the Peterson at Bessemer, Gogebic County, and the Tracy at Negaunee, Marquette County.

#### Iron Ore Shipments by Ranges, 1954

Range	Number of mines		Iron Ore Shipped (Long tons)		
	Underground	Open Pit	Direct Shipping	Siliceous	Total
Marquette	13	5	3,514,270	161,159	3,675,429
Menominee	13	3	3,616,467	53,243	3,669,710
Gogebic	6	1	2,377,743	•••	2,377,743
Totals	32	9	9,508,480	214,402	9,722,882

#### Shipments and Value of Iron Ore, 1950-1954

Year	Shipments (Long tons)	Value
1950	12,926,756	\$73,214,839
1951	13,673,873	78,120,718
1952	11,798,250	83,942,523
1953	13,380,756	91,402,764
1954	9,722,882	69,226,417

**COPPER:** Michigan produced 44,786,803 pounds of copper during 1954. This was 3,212,887 pounds or 3 per cent below the 1953 production. Eleven copper mines in Houghton, Keweenaw, and Ontonagon counties produced approximately 85 per cent of the total copper output. The remaining 15 per cent was recovered by two reclamation plants in Houghton County from waste or tailings rejected by earlier mill operations.

Calumet and Hecla, Inc. continued dewatering operations and rehabilitation of the Osceola mine during 1954 to make available a new supply of copper-bearing rock. The mine originally was open in 1873 but abandoned in 1931 because of low price of copper.

White Pine Copper Company, a subsidiary of Copper Range Company, continued underground development and construction of surface facilities at the White Pine mine, Ontonagon County. By the close of 1954 development in the mine had progressed far enough so that actual mining operations could be started. On October 4, 1954 some 700,000 tons of ore had been stockpiled on the surface. All surface construction, townsite and utility facilities were almost completed by the end of 1954. The mill was started at partial capacity on October 5. The White Pine mine is unique in Michigan because the ore in the Nonsuch shale is mainly copper sulphide (chalcocite, with minor amounts of native copper). The copper mines of Houghton and Keweenaw counties obtain native copper from the Keweenawan lava flows and interbedded rhyolite conglomerates.

#### Copper Production, 1954

County	Number of		Copper Production (Pounds)		
	Mines	Reclamations	Mines	Reclamation	Total
Houghton	4	2	13,371,884	6,530,840	19,902,724
Keweenaw	6	0	23,805,586	-	23,805,586
Ontonagon	1	0	1,078,493	-	1,078,493
Totals	11	2	38,255,963	6,530,840	44,786,803

#### Copper Production, 1950-1954

Year	Quantity (Pounds)	Value
1950	51,788,017	\$10,997,185
1951	49,297,864	12,077,976
1952	43,939,304	10,820,054
1953	47,999,690	13,832,951
1954	44,786,803	13,298,994

#### Fuels

**PETROLEUM:** Petroleum production in Michigan in 1954 decreased 2 per cent in quantity and approximately 4 per cent in value below 1953. At the end of 1954 there were 4,174 producing wells in 37 counties. Approximately 36 per cent of the total output was from Arenac, Isabella, and Clare counties. More than one million barrels were produced in each county.

During the year 567 wells were completed (219 oil producers, 10 gas producers, and 338 dry holes). Among these completions were 243 wildcats (22 Oil producers, 2 gas producers, and 219 dry holes). The remaining 324 completions were field wells (197 oil producers, 8 gas producers, and 119 dry holes).

Fourteen refineries, in nine counties, processed more than 99 per cent of the crude oil produced in Michigan during 1954. Of the total oil refined in the state, Michigan crude supplied nearly one-third. The combined normal daily capacity of all Michigan refineries is approximately 137,500 barrels.

Detailed information for oil and gas operations is recorded in the pamphlet entitled 1954 Summary of Operations, Oil and Gas Fields, available from Michigan Geological Survey

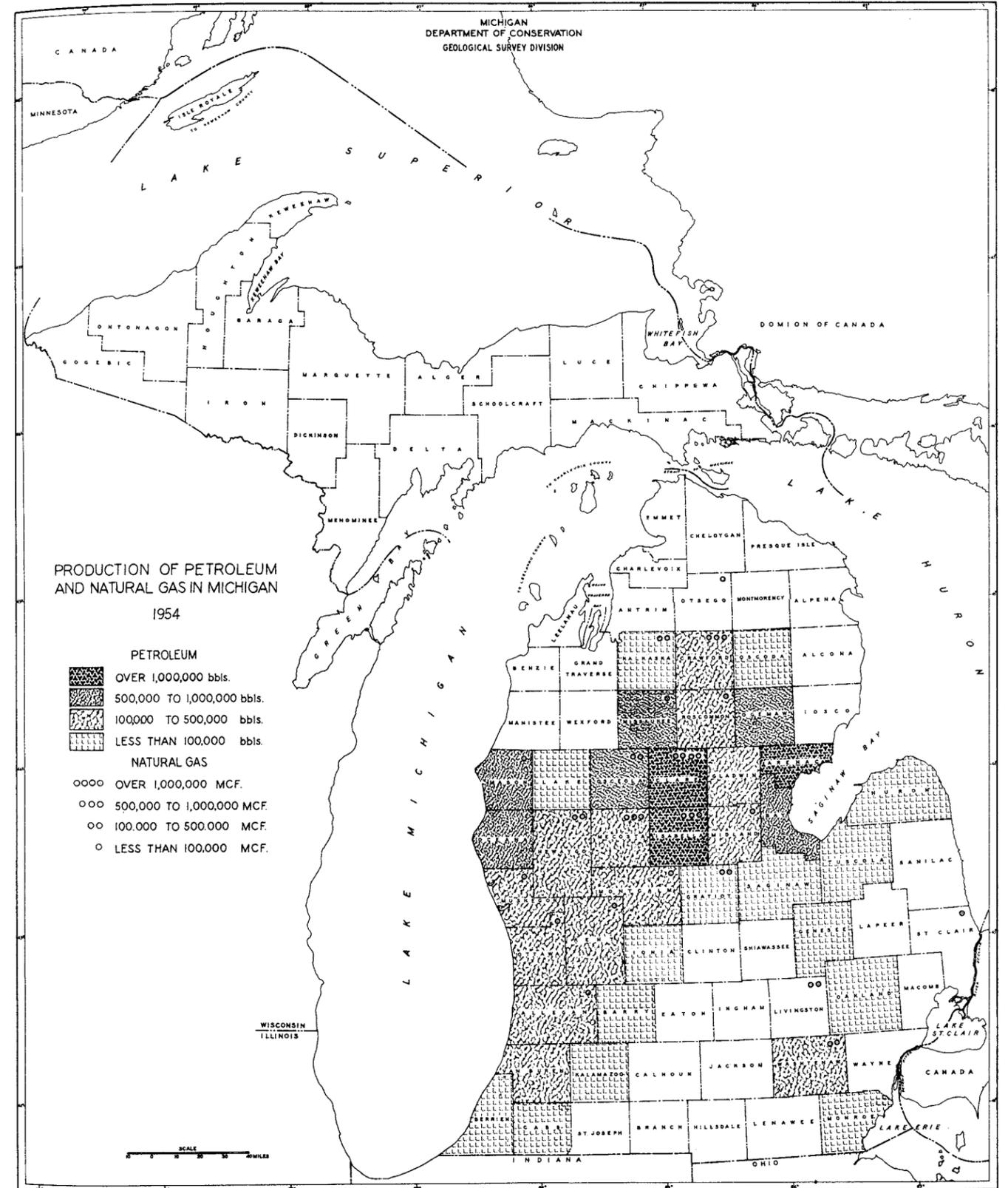
Petroleum Production and Accumulated Oil by Formations, 1954

Formation	Production (Barrels)	Per Cent	Accumulated (Barrels)	Per Cent
Marshall	1,875	.02	55,802	.02
Berea	22,217	.18	2,026,082	.54
Traverse	2,450,967	20.38	77,469,490	20.72
Dundee	6,402,152	53.22	276,632,009	73.99
Detroit River	2,967,174	24.67	16,914,711	4.53
Salina-Niagaran	15,692	.13	43,091	.01
Trenton	167,982	1.40	723,732	.19
Total	12,028,059	100.00	373,864,917	100.00

Petroleum and Natural Gas Production, 1950-1954

Year	Petroleum		Natural Gas	
	Barrels	Value	M. cu. ft.	Value
1950	15,826,148	\$43,157,902	12,614,024	\$1,967,788
1951	13,926,518	37,949,762	10,524,495	1,641,821
1952	13,251,387	36,176,306	8,677,737	1,353,727
1953	12,284,510	35,644,982	7,089,985	1,246,106
1954	12,028,059	34,279,968	5,698,175	997,180

NATURAL GAS: Natural gas production declined 19.6 per cent to 5,698,175,000 cubic feet in 1954. Of this amount 1.88 billion cubic feet was oil well gas. Natural gas was produced from 301 wells in 21 counties. Clare, Crawford, and Isabella counties led with 55 per cent of the state total.



## Gas Production and Accumulated Gas by Formations - 1954

<u>Formations</u>	<u>Production (M. cu. ft.)</u>	<u>Per Cent</u>	<u>Accumulated (M. cu. ft.)</u>	<u>Per Cent</u>
Glacial Drift	. . . .	. . . .	8,020	.00
Michigan Stray)	3,035,260	53.27	200,455,581	68.02
Marshall )			2,381,033	.81
Berea	114,317	2.01	10,108,200	3.43
Antrim	7,528	0.13	108,121	.04
Traverse	64,852	1.14	11,135,498	3.78
Dundee	727,694	12.77	40,697,907	13.81
Detroit River	1,272,651	22.33	535,811	.18
Richfield	. . . .	. . . .	7,255,209	2.46
Salina-Niagaran	465,148	8.16	18,932,585	6.43
Trenton	10,725	.19	10,725	.00
Unassigned	. . . .	. . . .	<u>3,050,143</u>	<u>1.04</u>
Total	5,698,175	100.00	294,678,833	100.00

NATURAL GASOLINE: Michigan, in 1954, produced from oil-well gas a total of 3,898,312 gallons of natural gasoline and allied products valued at \$389,831. Of the six producing counties, Crawford ranked first with 62 per cent of the state total.

## Natural Gasoline Production, 1950-1954

<u>Year</u>	<u>Quantity (Gallons)</u>	<u>Value</u>
1950	5,218,794	\$349,660
1951	6,871,119	387,112
1952	5,330,139	533,014
1953	4,414,351	441,438
1954	3,898,312	389,831

## NON-METALLIC MINERALS

PORTLAND CEMENT: Portland cement was produced by seven cement plants in the state. Raw materials used in cement manufacturing include clay, shale, limestone and gypsum. Antrim shale from Alpena County and Ellsworth shale from Antrim County were used by the northern plants; all southern plants use local glacial or lake clays. The greater part of the limestone used was from the Traverse and Dundee formations in the northern part of the Southern Peninsula. All gypsum was purchased.

## Raw Material Used in the Manufacture of Portland Cement, 1954

<u>Raw Material</u>	<u>Short Tons</u>
Limestone	4,313,093*
Clay and shale	1,425,014
Gypsum	112,497

\*Includes lime mud.

Shipments and value of Portland cement increased for the tenth consecutive year. Nearly all plants operated at or near capacity during the year. Alpena County continued as the leading producer, and Wayne County ranked second. Portland cement was produced also in Bay, Emmet, Lenawee, and St. Clair counties.

During 1954 the Huron Portland Cement Company increased its capacity about 25 per cent by the installation of four new 10 by 153-foot Allis Chalmers kilns with corresponding increases in raw and finish grinding capacity. The clinker storage was relocated by the addition of a new 2,000,000 barrel storage. Reclamation is through a 600-foot concrete tunnel under the storage.

In March, 1954, the Bay City Aetna Portland Cement Company completed an expansion program which increased annual capacity by 500,000 barrels to a total of 2,200,000 barrels. Expansion included installation of a new 10 by 175-foot kiln (making a total of four kilns), a waste heat boiler, a grate-type clinker cooler, a 7 by 26-foot raw mill, a 9½ by 16-foot finish mill, and other equipment. During the summer larger slurry tanks were built and four new 6,000 barrel silos were under construction.

Late in the year Penn-Dixie purchased the Petoskey Transportation Company and the Petoskey Portland Cement Company plant at Petoskey. A modernization and expansion program was announced which included quarry improvement, and the installation of new crusher equipment, kiln, cooler and several new tool and work houses. The Petoskey plant is now operated under the Penn-Dixie name.

#### Portland Cement Shipments, 1950-1954

Year	Shipments (Barrels)	Value	Rank in U.S.	No. of Plants
1950	12,854,423	\$29,619,766	5	7
1951	14,112,639	35,121,324	5	7
1952	14,760,783	36,819,041	5	7
1953	15,853,096	41,860,464	5	7
1954	18,106,975	50,460,566	5	7

STONE: Limestone and dolomite made up over 99 per cent of Michigan stone production. Approximately 66 per cent of the stone was quarried from the Rogers City, Dundee, and Traverse limestones in Presque Isle, Cheboygan, Alpena, Wayne and Emmet counties. The remaining 34 per cent was from the Niagara limestones and dolomites in Mackinac and Chippewa counties, the Bass Island and Detroit River dolomites in Monroe County, and the Bayport limestone in Huron, Eaton, Jackson and Arenac counties.

Dimensional limestone was produced in Eaton, Huron and Presque Isle counties. Sandstone for rough construction, rubble and flagging stone was quarried in Jackson County. Basalt was crushed and used for road construction, in Houghton and Ontonagon counties. Crushed diorite was used for road construction, in Marquette County.

#### Stone Production, 1954

Commodity	Quantity (Short tons)	Value
Limestone and dolomite:		
Crushed	19,357,455	\$17,318,514
Dimensional	8,938	68,984
Sandstone:		
Crushed	11,151	6,058
Dimensional	3,574	31,435
Basalt:		
Crushed	80,700	101,752
Total	19,461,818*	\$17,526,743

\*Does not include 8.02 million tons of limestone used in the manufacture of Portland cement and lime.

In 1954, stone production dropped approximately 2,000,000 tons below 1953 production, due largely to lesser demands for flux stone by the steel industry. However, more than three million tons of limestone and dolomite were produced from: Chippewa, Mackinac, and Presque Isle counties.

#### Uses of Crushed Limestone and Dolomite, 1954

Uses	Per cent of Total	Quantity (Short Tons)	Value
Flux	55.9	10,815,128	\$ 9,032,464
Concrete & road metal	21.4	4,151,096	4,445,300
Chemical*	18.3	3,528,324	2,995,047
Agricultural	2.9	534,306	485,252
Railroad ballast	.6	114,916	143,618
Riprap	0	38,134	22,549
Others**	.9	175,551	194,284
Totals	100.0	19,357,455	\$17,318,514

\* Includes alkali, calcium-carbide, sugar, glass and paper.

\*\* Includes putty filler, asphalt, roof filter, carbon, mineral feeds, stone sand, dust for coal, ornamental concrete, and others.

Work on the Michigan Limestone Division, United States Steel Corporation, Cedarville project continued during the year. Five miles of railroad track were laid from the quarry to the harbor "Port Dolomite", a primary crusher was erected on the floor of the quarry, and a processing plant and loading dock were constructed at Port Dolomite.

Information regarding the new Presque Isle Corporation plant which began quarrying in December, may be found in the section on late Developments.

Production of Stone, 1950-1954

Year	Quantity (Short Tons)	Value	Rank in U. S.
1950	19,095,703	\$15,389,684	3
1951	20,935,767	17,082,206	3
1952	18,001,080	15,590,573	4
1953	21,053,866	17,442,250	-
1954	19,461,818	17,526,743	-

**SAND AND GRAVEL:** Production and use of sand and gravel continued to a new high. The reported increase of 1,576,066 tons over 1953 production may be owing to the fact - that by the canvass of the U. S. Bureau of the Census, data was obtained from a number of sand and gravel operators who had not reported production in former years. The increased production figure, therefore, may in large measure be due to a more complete canvas of the industry. On the other hand, production of molding sand decreased by 848,070 tons and production of railroad ballast decreased by 221,421 tons.

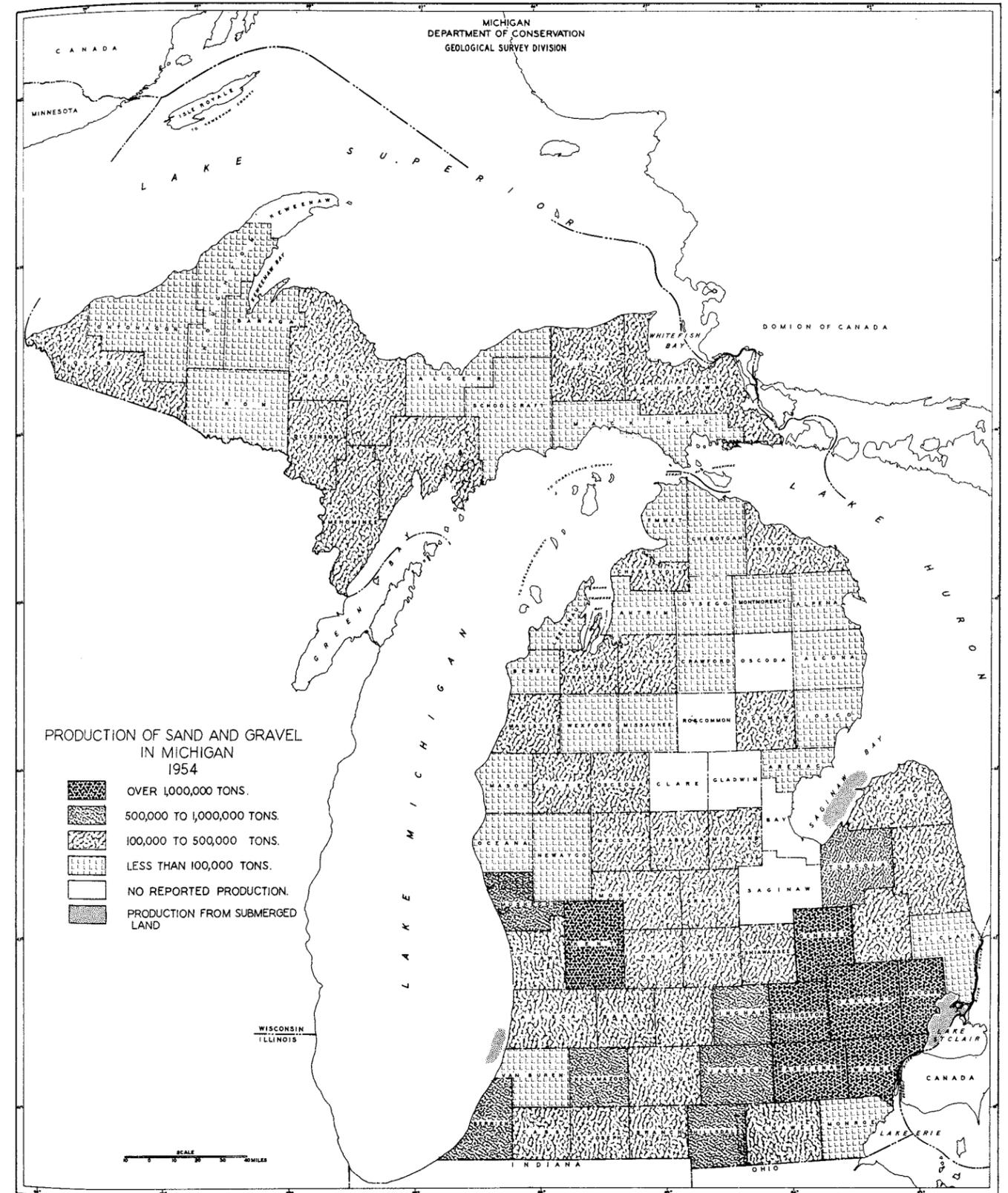
Approximately three-quarters of the total sand and gravel output was used in road construction. Structural purpose use increased about 29 per cent.

Production of sand and gravel was reported from 77 of the 83 counties of Michigan. Approximately 55 per cent of the total production was from seven counties in order of rank - each producing more than 1,000,000 tons: Oakland (about 19 per cent of state total), Livingston, Washtenaw, Wayne, Kent, Macomb, and Genesee. About 81 per cent of the state's total was reported by 198 commercial producers and the remaining 19 per cent was non commercial production by county road commissions and other governmental agencies.

Uses of Sand and Gravel, 1954

Uses	Quantity (Short tons)	Value	Per Cent of Total
Molding sand	1,117,737	\$ 1,273,601	3.4
Structural sand	4,718,488	3,530,110	14.7
Paving and road sand	3,525,463	2,562,190	11.0
Engine sand	33,324	25,798	.1
Other sand *	1,076,697	1,338,940	3.4
Structural gravel	4,922,085	4,730,736	15.4
Paving and road gravel	15,983,613	11,516,231	49.9
Railroad ballast gravel	284,306	267,750	.9
Other gravel	374,016	213,138	1.2
<b>Totals</b>	<b>32,035,729</b>	<b>25,458,503</b>	<b>100.1</b>

\*Includes glass, sand, grinding and polishing sand, blast sand, railroad ballast sand, and other sand.



## Production of Sand and Gravel, 1950 - 1954

<u>Year</u>	<u>Quantity (Short tons)</u>	<u>Value</u>	<u>Rank in U. S.</u>
1950	24,559,253	\$16,699,203	2
1951	24,688,264	18,324,872	2
1952	27,126,339	21,050,125	2
1953	30,459,663	23,170,802	-
1954	32,035,729	25,458,503	-

SALT: Artificial brines formed by dissolving rock salt from the Salina formation are recovered by six plants in Muskegon, St. Clair, and Wayne counties for production of evaporated salt and for use in chemical plants. Salina rock salt was mined at Detroit by means of a shaft approximately 1,100 feet in depth. Evaporated salt was produced from natural brines drawn from the Marshall and Dundee formations at St. Louis and from artificial brines from the Detroit River formation at Manistee. Artificial brines from the Detroit River formation are used at the chemical plant at Midland.

Approximately 60 per cent of the salt produced was used by chemical plants in Wayne, Midland and Muskegon counties. Some two million tons of salt were used in soda ash plants, and 1.4 million tons were used for the manufacture of chlorine and other chemicals. Approximately 16 per cent of the total production was dried and evaporated salt.

## Uses of Salt, 1954

<u>Uses</u>	<u>Quantity (Short tons)</u>
Chemical	3,369,400
Highway, dust and ice control	553,100
Food processing	405,100
Livestock	256,400
Water treatment	104,000
Table and other household	90,100
Metallurgy	67,300
Textile, hides, and leather processing	28,900
Refrigeration	6,500
Agricultural	000
Others	182,305
Total	5,063,600

Although tonnage of salt declined slightly in 1954, the value reached an all-time high, due largely to the higher value placed by producers on the brine used. Of the six counties producing salt, Gratiot, Manistee, Midland, Muskegon and St. Clair - Wayne County ranked first. Four companies in Wayne County reported a combined total of 3,862,803 tons or approximately 76 per cent of the state's total output.

## Salt Production, 1950 - 1954

Year	Quantity (Short tons)	Value	Per cent of U.S. Total	Rank in U. S.
1950	4,446,667	\$19,178,765	26.7	1
1951	5,137,639	21,221,330	25.4	1
1952	4,778,347	21,406,382	24.4	1
1953	5,127,387	22,171,988	24.7	1
1954	5,063,633	29,396,812	...	1

The Hooker Electro-Chemical Company, of Niagara Falls, New York, opened a new \$12,000,000 plant on the north shore of White Lake, about 2 miles south-west of Montague, Muskegon County. Artificial brines are obtained from Salina salt at a depth of 3,100 feet and are used in the production of caustic soda, hydrogen, and chlorine.

CLAY AND SHALE: Clay and shale are produced at widespread localities throughout the state. Antrim shale from Alpena County and Ellsworth shale from Antrim County quarries are used in the manufacture of Portland cement. In Eaton and Shiawassee counties, Saginaw shale is used by three plants for manufacture of tile. Other tile, brick, pottery, and light-weight aggregate plants and some southern Michigan cement plants use local surface clay deposits. Glacial lake clay, produced in Saginaw County, is sold for oil well drilling mud, for molding sand bond; for fungicide and insecticide base and for cosmetic "beauty packs".

A new record high for raw clay and shale production was set by the 11 producing counties. Wayne County lead in production and volume with 30 per cent of the state's total output, followed by Alpena, St. Clair and Saginaw counties. Approximately 75 per cent of all raw clay and shale produced was used by the Portland Cement industry. The remaining 25 per cent was used for the manufacture of a small quantity of prepared clays and for clay products - brick, tile, pottery and lightweight aggregates.

Clay deposits furnish about 78 per cent of the raw materials for the manufacture of clay products and shale deposits supply the remaining 22 per cent.

## Production of Clay and Shale, and Clay Products, 1950-1954

Year	Raw Clay and Shale		Clay Products
	Quantity (Short tons)*	Value*	Estimated Value
1950	1,426,659	\$1,137,002	\$5,499,000
1951	1,531,732	1,592,137	5,112,000
1952	1,580,123	1,615,122	4,534,000
1953	1,605,804	1,646,113	6,995,181
1954	1,890,950	1,940,408	7,331,998

\*Sold or used. Value of clay used in cement and heavy clay products not included in total value of state.

GYPSUM: Gypsum is quarried at Alabaster and National City, Iosco County, and is mined in two underground mines at Grand Rapids, Kent County. The raw material is processed in gypsum mills at National City, Grand Rapids and River Rouge, Wayne County. Principal uses for gypsum are in the manufacture of a variety of plasters, wall board, and allied building materials and as a Portland cement retarder.

Since 1945 Michigan, producing about 18 per cent of the national total, has ranked first in the production of crude gypsum. In 1954, Michigan produced 1,693,279 short tons of crude gypsum valued at \$5,035,550.

## Production of Gypsum, 1950-1954

Year	Quantity (Short Tons)	Value	Per Cent of U. S.	Rank in U. S.
1950	1,474,210	4,090,777	18	1
1951	1,566,276	4,402,725	18	1
1952	1,487,642	4,200,418	18	1
1953	1,446,973	4,091,002	18	1
1954	1,693,279	5,035,550	-	1

PEAT: Peat is produced in Lapeer, Shiawassee, Kalamazoo, and Mason counties. Michigan peat is used almost exclusively for horticultural purposes, marketed largely as a soil conditioner for lawns, golf courses, gardens, nurseries, and greenhouses. It is estimated by the United States Bureau of Mines that the glacial lakes and bogs of Michigan, Minnesota and Wisconsin contain 75 per cent of the nation's total peat reserves.

## Production of Peat, 1950-1954

Year	Quantity (Short Tons)	Value	Per Cent of U. S.	Rank in U. S.
1950	13,625	\$186,000	10.4	4
1951	20,180	320,100	10.4	5
1952	36,020	430,156	16.6	2
1953	25,439	257,176	12.5	4
1954	27,847	429,116	-	-

MARL: All marl produced in the state is used for agricultural purposes. Commercial marl production was reported by 23 producers in 14 counties during 1954. Kalamazoo County ranked first, followed by Calhoun, Allegan, and Branch counties. Combined, these counties produced approximately 57 per cent of the state output.

## Production of Marl, 1950-1954

Year	Quantity (Short tons)	Value	Rank in U. S.
1950	218,429	\$122,212	1
1951	144,731	125,212	1
1952	130,613	119,705	1
1953	183,685	72,781	1
1954	106,668	37,724	..

LIME: Production of lime in Michigan was approximately the same in 1954 as in 1953. Raw stone for its manufacture was obtained from the high calcium Dundee limestone in Presque Isle County and from the Burnt Bluff limestone in Mackinac County. All lime produced was sold for chemical and industrial use. Mason County continued to rank first in production, followed by Menominee and Bay counties.

Until the turn of the century, when the chemical industries began to grow rapidly, lime was used almost entirely in building and agriculture. Since then, progressively larger amounts have been employed in chemical tests and processes. More than 90 per cent of the lime produced in the state is now sold or used for chemical purposes. Lime is used to soften and purify water, to make glass, petrochemicals, bleaches, pharmaceuticals, insecticides, sugar and leather, and as a causticizing agent in paper and pulp manufacturing. It is used as a flux in the purification of steel. It continues to be used widely in mortar, stucco, plastering material and as a fertilizer.

Lime is obtained by calcining or cooking limestone rock. The rock is crushed, screened, and conveyed to rotary or vertical kilns where it is calcined at 2200° F. into quick lime (calcium oxide) by removal of carbon dioxide as gas. Ninety per cent of the lime was sold or used as quick lime. The remaining 10 per cent is treated with water to form hydrated lime, a fine white powder.

BROMINE, CALCIUM-MAGNESIUM CHLORIDE, MAGNESIUM COMPOUNDS, POTASH: Natural brines from the Marshall, Dundee, and Sylvania formations were used by chemical companies of Midland and Gratiot counties; and from the Filer sandstone of the Detroit River formation in Mason and Manistee counties. These natural brines are source material for many chemicals and chemical compounds.

Elemental bromine was produced by three companies in five plants in Gratiot, Manistee, Mason and Midland counties. Bromine compounds were produced by three companies in Gratiot, Manistee, and Midland counties. Magnesium compounds were produced by four companies in Gratiot, Manistee, Mason and Midland counties. Calcium chloride and calcium-magnesium chloride were produced by three companies in Gratiot, Lapeer, Mason, and Midland counties. Only one plant (Dow Chemical Co., Midland) reported production of potassium salts from natural brines.

Most of the calcium-magnesium chloride sold was for stabilization of dirt roads and for dust control. Other important uses for calcium chloride are the "freeze-proofing" of coal, iron ore and other materials shipped in bulk in railroad cars or stockpiled in the open and for the freeze-proofing curing of

of cement. Magnesium compounds have a variety of uses and are particularly important in the manufacture of fertilizers, oxychloride cement, rayon and rubber. Magnesium chloride is at present the principal raw material used in the production of metallic magnesium. Magnesium sulfate, carbonate, oxide and hydroxide are used extensively in pharmaceuticals.

The value of the natural salines recovered from natural brines in 1954 by the chemical plants increased 12 per cent over the 1953 value. The increase was due mainly to increased production of bromine used in preparation of ethylene dibromide for gasoline and anti-knock mixtures.

## Production of Bromine and Calcium-Magnesium Chloride, 1949-1954

Year	Bromine		Per Cent of U. S. Total	Rank in U.S.	Magnesium Compounds		Rank in U.S.
	Quantity (Pounds)	Value			Quantity (Tons)	Value	
1949	28,034,765	\$7,023,211	32.0	2	*	*	..
1950	*	*		2	59,036	\$4,998,342	2
1951	*	*		2	*	*	1
1952	*	*		2	*	*	2
1953	*	*		2	43,190	4,591,922	2
1954	*	*		2	39,096	4,628,756	-

\*Data concealed

Value of Michigan's Minerals  
and  
Mineral Products

1938-1954

Year	Value	Year	Value
1938	\$ 75,897,923	1947	\$170,269,272
1939	109,867,740	1948	214,115,771
1940	117,991,285	1949	207,607,694
1941	135,492,921	1950	238,474,008
1942	152,624,946	1951	257,529,882
1943	147,113,888	1952	267,089,423
1944	140,493,319	1953	287,693,135
1945	128,046,408	1954	286,549,922
1946	133,682,135		

TABLE I  
MINERAL PRODUCTS OF MICHIGAN, 1954 (1)

<u>Product</u>	<u>Unit</u>	<u>Quantity</u>	<u>Value</u>	<u>Rank in U.S.(2)</u>
Iron ore	Long tons	9,722,882	\$69,226,417	2
Portland Cement	Barrels	18,106,975	50,460,566	5
Petroleum	Barrels	12,028,059	34,279,968	...
Salt	Short tons	5,063,633	29,396,812	1
Sand and Gravel	Short tons	32,035,729	25,458,503	2
Stone (3)	Short tons	19,461,818	17,526,743	4
Copper	Pounds	44,786,803	13,298,994	...
Clay Products	...	...	7,331,998	...
Gypsum	Short tons	1,693,279	5,035,550	1
Magnesium Compounds	Short tons	39,096	4,628,756	2
Clay and Shale, raw	Short tons	1,886,976	(4)	...
Natural Gas	M. cu. ft.	5,698,175	997,180	...
Natural Gasoline	Gallons	3,898,312	389,831	...
Peat	Short tons	27,847	429,116	2
Marl	Short tons	106,668	37,724	1
Miscellaneous (5)	...	...	<u>28,068,821</u>	...
Total			\$286,566,979	

(1) Statistics compiled in co-operation with the United States Bureau of Mines.

(2) Based upon quantity.

(3) Limestone used in the manufacture of Portland cement and lime not included.

(4) Value of clay and shale used in clay products and cement industries not included in state total value; value of other clays included under miscellaneous.

(5) Includes bromine, calcium chloride, calcium-magnesium chloride, clay, lime, and potassium salts.

TABLE II  
MINERAL PRODUCTS OF MICHIGAN, 1953<sup>(1)</sup>

Product	Unit	Quantity	Value	Rank in U. S. (2)
Iron ore	Long tons	13,380,756	\$91,402,764	2
Portland cement	Barrels	15,853,096	41,860,464	...
Petroleum	Barrels	12,284,510	35,644,982	...
Sand and gravel	Short tons	30,459,663	23,170,802	...
Salt	Short tons	5,127,387	22,171,988	1
Stone (3)	Short tons	21,453,866	17,442,250	...
Copper	Pounds	47,999,690	13,832,951	...
Clay products	...	...	6,995,000	...
Magnesium compounds	Short tons	43,190	4,591,922	2
Gypsum	Short tons	1,446,973	4,091,002	1
Clay and shale, raw	Short tons	1,605,804	(4)	...
Natural gas	M. cu. ft.	7,089,985	1,246,106	...
Natural gasoline	Gallons	4,414,371	441,438	...
Peat	Short tons	25,439	257,176	4
Marl	Short tons	183,685	72,781	...
Miscellaneous (5)	...	...	24,471,509	...
Total			\$287,693,135	

(1) Statistics compiled in co-operation with the United States Bureau of Mines.

(2) Based upon quantity.

(3) Limestone used in the manufacture of Portland cement and lime not included.

(4) Value of clay and shale used in clay products and cement industries not included in state total value; value of other clays included under miscellaneous.

(5) Includes bromine, calcium chloride, calcium-magnesium chloride, clay, lime, and potassium salts.

PRODUCTION AND VALUE  
of  
MINERALS AND MINERAL PRODUCTS  
BY COUNTIES

1954

All counties reported mineral production for 1954. Wayne, Marquette, Midland, Iron and Alpena led all others in value, contributing 47 per cent of the state's total.

The quantity and value of mineral production are given on a county basis, where possible. In some cases it has been necessary to show the county value as an undistributed total or to combine them as one group at the end of the county breakdown portion to avoid disclosure of individual company operations. The number in parentheses, following the county name, indicates the county's rank in the state in value of mineral production. Figures in parentheses, following a mineral resource, show the rank of the county in the production.

All indicated tonnage is in short tons (2,000 lbs.), with the exception of iron ore, which is reported in long tons (2,340 lbs.).

Mineral producers and their products are listed, by counties, below production data. Location of the operation, when known, is given by section, township, and range, or nearest city to operation.

	Quantity	Value
ALCONA (77)		
Sand and gravel	93,419 tons	\$ 38,437
Alcona County Road Comm.	NE SW 7 25N 6E ) SE SW 7 26N 9E ) NW NE 11 26N 9E )	Sand and gravel
E. P. Brady & Co.		Sand and gravel
Michigan State Hwy. Dept.		Sand and gravel
ALGER (75)		
Sand and gravel	47,881 tons	\$ 50,000
Alger County Rd. Comm.	NW NE 4 45N 21W	Sand and gravel
E. P. Brady and Co.		
Hilma Samulson pit	NE SE 35 46N 21W )	Sand and gravel
Sayre Ostrander pit		
Duluth, South Shore & Atlantic Ry.		Sand and gravel
Leonard Johnson	Chatham	Sand and gravel

	<u>Quantity</u>	<u>Value</u>
ALLEGAN (41)		
Petroleum	249,354 bbls.	\$710,659
Sand and gravel	227,188 tons	138,728
Marl (3rd)	13,513 tons	5,136
Natural gas	23,333 M.cu.ft.	4,083
Total value		\$858,606

Cleo L. Arndt	Saugatuck Twp.	Sand and gravel
L. Z Arndt	Douglas	Marl
Gerald Arnsman	Hopkins	Marl
Ralph W. Bodine		Sand and gravel
Huitt and Sons	NE SW 9 2N 13W	Sand and gravel
Emil Pavlak	Hopkins	Marl
Harry Pickitt	NW SW 5 1N 14W )	
	SW NE 34 3N 13W)	Sand and gravel
H. R. Vernon	Fennville	Sand and gravel
Ben Waanders	Allegan	Sand and gravel
West Shore Constr. Co.		Sand and gravel
John Yerington	NE NE 22 3N 15W)	
	SE NW 15 4N 11W)	Sand and gravel

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ALPENA (5)

Undistributed: Portland cement (1st),  
stone-crushed limestone (4th),  
shale\* (2nd), sand and gravel

\$23,631,864

E. P. Brady and Co.	NE NE 2 30N 6E	Sand and gravel
Huron Portland Cement Co.	NE 30 31N 7E	Shale
	24 31N 8E	Portland cement
Wyandotte Chemical Corp.	13 31N 8E	Limestone-crushed

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ANTRIM (74)

Shale*, sand and gravel		**
Antrim Co. Rd. Comm.	NE NE 19 30N 6W)	
	SE 26 32N 8W)	
	NE SW 36 32N 9W)	Sand and gravel
Northland Constr. Co.		Sand and gravel
Petoskey Portland Cement Co.	SE 23 32N 8W	Shale

\*Value of shale used in manufacture of Portland cement not included in county total.

\*\*Mineral value included under undistributed at end of county breakdown.

	<u>Quantity</u>	<u>Value</u>
ARENAC (14)		
Petroleum (1st, 16%)	1,885,888 bbls.	\$5,374,781
Stone - crushed limestone	128,861 tons	150,670
Sand and gravel	30,804 tons	14,391
Total value		\$5,539,842

Arenac County Rd. Comm.	NW 5 19N 7E	Limestone
Deep River Block and Sand Co.	Standish	Sand and gravel
Van Deusen Sand & Stone	SE SE 26 19N 5E	Sand and gravel
Eastman Gravel Pit	Omer	Sand and gravel
Iosco County Rd. Comm.	SW 24 20N 7E	Limestone

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BARAGA (48)

Iron ore	82,873 tons	\$550,857
Sand and gravel	99,140 tons	49,072
Total value		\$599,929

Baraga County Road Comm.	SW SE 7 49N 33W )	
	SW SW 20 49N 33W)	Sand and gravel
	SW NE 23 51N 32W)	
The Cleveland Cliffs Iron Ohio-Webster mine	22,26,27, 48N 31W	Iron ore
Michigan State Hwy. Dept.		Sand and gravel

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BARRY (58)

Sand and gravel	355,474 tons.	\$171,706
Petroleum	38,449 bbls.	109,580
Marl	5,000 tons	1,750
Total value		\$283,036

Barry County Rd. Comm.	SW NW 25 2N 10W)	
	SW NW 29 3N 9W )	Sand and gravel
	SE NW 4 4N 9W )	
	7 4N 10W	Sand and gravel
Cole Gravel Co.		Sand and gravel
Michigan State Hwy. Dept.		Sand and gravel
Nashville Gravel Co.		Sand and gravel
Pennock Concrete Products	SW NW 1 2N 7W	Sand and gravel
Harry Pickitt		Sand and gravel
Steenbock Gravel Co.	SW NW 12 3N 9W	Sand and gravel
John G. Yerington		Sand and gravel

		<u>Quantity</u>	<u>Value</u>
BAY (10)			
Undistributed: Portland cement (3rd), petroleum (7th, 6%), lime (3rd)			\$7,239,238
Aetna Portland Cement Co.	Bay City		Portland cement
Monitor Sugar Co. Div.	Bay City		Lime
BENZIE (80)			
Sand and gravel		35,100 tons	\$15,600
Benzie Co. Road Comm.	SE SW 8 25N 13W ) SE NE 8 26N 14W ) SW SE 26 26N 15W ) SE SW 16 27N 13W ) SE NE 31 27N 13W ) NW SE 26 27N 15W )	Sand and gravel	
BERRIEN (52)			
Sand and gravel		531,124 tons	\$448,013
Petroleum		1,383 bbls.	3,942
Total value			<u>\$451,955</u>
Ireland and Lester Co.	NW NW 24 4S 19W		Sand and gravel
Kiell Trucking			Sand and gravel
Michigan State Hwy. Dept.			Sand and gravel
Nieb Concrete Products	Niels		Sand and gravel
Fred M. Ott			Sand and gravel
Producers Core Sand Corp.	Sawyer		Sand
St. Jns. Co. Hwy. Dept.			Sand and gravel
Wakeman and Neva Ryno			Sand and gravel
John G. Yerington	NE SW 36 7S 18W		Sand and gravel
BRANCH (68)			
Sand and gravel		121,260 tons	\$92,359
Marl (4th, 10%)		10,871 tons	3,353
Total value			<u>\$95,712</u>
Branch County Rd. Comm.			Sand and gravel
Case Bros.			Marl
Michigan State Hwy. Dept.			Sand and gravel
H. Stuhey Co.	SW SE 4 6S 6W		Sand and gravel
Kenneth L. Wood	Colon		Marl

		<u>Quantity</u>	<u>Value</u>
CALHOUN (59)			
Sand and gravel		417,178 tons	\$258,418
Marl (2nd, 10%)		16,221 tons	5,873
Total value			<u>\$264,291</u>
Carl Avery	Athens		Marl
Battle Creek Gravel Co.	SW NW 15 1S 7W ) NW SE 33 1S 8W ) SW SE 4 2S 8W )		Sand and gravel
Case Bros.			Marl
City of Battle Creek	Battle Creek		Sand and gravel
Emil Combs Gravel	NE SE 18 4S 5W		Sand and gravel
Harry Pickitt			Sand and gravel
Clyde M. Reed	Union City		Marl
John G. Yerington			Sand and gravel
CASS (67)			
Sand and gravel		219,063 tons	96,682
Marl		8,421 tons	3,354
Petroleum		316 bbls.	901
Total value			<u>\$100,937</u>
Grand Brizendine	Edwardsburg		Marl
Cass Co. Rd. Comm.	NE NE 20 5S 13W ) SE SE 17 6S 13W ) NE SE 16 6S 15W ) SW NE 8 7S 16W )		Sand and gravel
Heide's Sand and Gravel	Marcellus		Sand and gravel
Frank R. Hixon			Marl
Michigan State Hwy. Dept.			Sand and gravel
Harry Pickitt	NE SW 10 5S 16W		Sand and gravel
John G. Yerington	NW SE 10 5S 16W		Sand and gravel
CHARLEVOIX (73)			
Sand and gravel		120,962 tons	\$72,320
Charlevoix Co. Rd. Comm	SE NE 5 32N 7W ) NW SW 13 32N 5W ) SE NW 27 33N 6W ) NW NE 28 33N 7W ) SE NE 5 33N 8W )		Sand and gravel
Michigan State Hwy. Dept.			Sand and gravel
Harry Pickitt			Sand and gravel

		Quantity	Value
CHEBOYGAN (76)			
Sand and gravel		36,060 tons	\$24,737
Stone- crushed limestone		36,975 tons	20,902
Total value			<u>\$45,639</u>
Hugh M. Mason & Sons	SE SW 32 33N 3W		Sand and gravel
The Tabor Co.			Sand and gravel
Ralph Tanner & Assoc.	SE 25 35N 2W		Limestone-crushed

CHIPPEWA (24)			
Stone - crushed dolomite (3rd)			
sand and gravel		**	
Chippewa Co. Rd. Comm.	NW SE 15 45N 2W		Sand and gravel
Corps of Eng., Detroit	NW SW 32 51N 5W		Sand and gravel
Drummond Dolomite, Inc.	36 42N 5E		Sand and gravel
Fox Valley Constr. Co.			Sand and gravel
I. L. Whitehead	SW SE 13 45N 1W )		
	N 1/2 NW 23 45N 2W )		
	E 1/2 6 46N 5W )		Sand and gravel
	NE 17 46N 7W )		
	NE SE 35 47N 1W )		
	SE SW 14 47N 1W )		
	NW NW 25 47N 3W )		

CLARE (22)			
Petroleum (3rd, 9%)		1,070,174 bbls.	\$3,049,996
Natural gas (1st, 27%)		1,558,677 M.cu.ft.	272,768
Total value			<u>\$3,322,764</u>

CLINTON (60)			
Sand and gravel		361,793 tons	\$260,604
Boichot Concrete	NE SW 3 5N 2W )		
Products Corp.	NW NW 27 5N 2W )		Sand and gravel
Clinton Co. Rd. Comm.	NE 13 5N 4W		Sand and gravel
Harry Pickitt	NE 32 5N 1W		Sand and gravel

\*\*Mineral value included under undistributed at end of county breakdown.

		Quantity	Value
CRAWFORD (35)			
Petroleum		283,423 bbls.	\$807,756
Natural gasoline (1st, 75%)		2,910,600 gals.	291,060
Natural gas (2nd, 15%)		827,471 MCF	144,807
Sand and gravel		23,017 tons	13,735
Total value			<u>\$1,257,358</u>

Crawford Co. Rd. Comm.	NW SW 9 25N 3W )		
	SW SW 27 26N 3W )		Sand and gravel
	S 1/2 SW 28 26N 3W )		
The Tabor Co.			Sand and gravel

DELTA (66)			
Sand and gravel		149,381 tons	\$115,377
Bichler Brothers	SW SE 1 39N 23W		Sand and gravel
Cloverland Milling & Supply	Gladstone		Sand and gravel
Days River Sand & Gravel Co.	Gladstone		Sand and gravel
Delta Co. Rd. Comm.	SE SW 10 37N 24W )		
	NE NE 5 38N 24W )		
	SW NE 12 39N 23W )		Sand and gravel
	NE SW 24 40N 20W )		
	NW NE 28 40N 23W )		
Van Enkevoorts Bros.	SE NE 8 38N 24W		Sand and gravel

DICKINSON (55)			
Undistributed: stone-crushed dolomite, iron ore, sand and gravel			\$347,337

Champion, Inc.	SW SE 42N 28W		Sand and gravel
Dickinson Co. Rd. Comm.	C SE 20 42N 28W )		
	SE 28 42N 30W )		Sand and gravel
Globe Iron Co.:			
Globe-Cornell (open pit)	20 40N 30W		Iron ore
Jackson Iron & Steel Co.:			
Bradley (open pit)	25 40N 31W		Iron ore
Superior Rock Products Co.	SW SE 30 42N 29W		Hornblende schist-crushed
	SE SE 19 42N 29W		Feldspar - crushed
	NW SW 35 42N 30W		Dolomite-crushed
The Metro-Nite Co.	NW 35 42N - 28W		Dolomite-crushed

		Quantity	Value
EATON (31)			
Undistributed: Clay products, shale*, stone-crushed and dimensional limestone, sand and gravel			\$ 1,604,498
American Vitrified Products	NE 10 4N 4W		Shale - tile
F. G. Cheney Limestone Co.	NW SE 20 1N 6W		Limestone - crushed
A.L. Dyer & Sons	McBride		Sand and gravel
Eaton County Rd. Comm.	SE SW 32 1N 3W ) SE NW 23 4N 6W )		Sand and gravel
Grand Ledge Clay Products	SE 3 4N 6W		Shale - tile
Harry Pickitt			Sand and gravel
Pryor Bros.	SE NW 15 3N 3W ) SW SE 3 3N 3W )		Sand and gravel
Vermontville Gravel Co.	Vermontville		Sand and gravel
West Shore Constr. Co.	NW NE 18 1N 5W		Sand and gravel
EMMET (19)			
Portland cement (4th), stone, crushed limestone			**
Northland Construction Co.	Petoskey		Sand and gravel
Wm. Perry & Son			Sand and gravel
Petoskey Portland Cement	2 34N 6W		Portland cement, Limestone-crushed
GENESEE (43)			
Sand and gravel (7th, 3%)		1,010,959 tons	\$ 761,892
Petroleum		3,972 bbls.	11,320
Total value			\$ 773,212
E. P. Brady & Co.			Sand and gravel
Ferguson Excavating Co.			Sand and gravel
Hanson Gravel Co.	Flushing		Sand and gravel
Kurtz Gravel Co.	SE NE 20 8N 7E		Sand and gravel
A.S. Leffler Gravel Co.	SW SE 7 8N 8E		Sand and gravel
Mathews Gravel Co.	SE SW 1 8N 7E		Sand and gravel
Otisville Stone Co.	Otisville		Sand and gravel
John Post and Sons	SW NW 7 6N 5E		Sand and gravel
Saginaw Core Sand Co.			Sand and gravel
Justus Snellenberger	Burt		Sand and gravel

\*Value of clay used in manufacture of clay products not included in county total.

\*\*Mineral value included under undistributed at end of county breakdown.

		Quantity	Value
GLADWIN (33)			
Petroleum (10th, 4%)		472,987 bbls.	\$1,348,013
GOGEBIC (6)			
Iron ore (3rd, 24%)		2,377,743 tons	\$16,520,689
Sand and gravel		163,125 tons	73,863
Total value			\$16,594,552
Gogebic County Rd. Comm.	SW SW 4 46N 42W ) NE SW 33 48N 46W ) SW NW 33 48N 48W )		Sand and gravel
Ironwood Concrete & Product Co.	Ironwood		Sand and gravel
Lake Superior Gravel Co.	SW 31 48N 46W ) SE 33 48N 46W )		Sand and gravel
Oliver Iron Mining Div.- Davis Geneva Mine	18,19 47N 46W		Iron ore
Pickands Mather & Co.- Anvil-Palms-Keweenaw mine	11,14 47N 46W ) 24 47N 46W )		Iron ore
Peterson Mine	16,17 47N 46W )		
Sunday Lake Mine	9, 10 47N 45W )		
Emil Piispanen	SE NW 33 48N 46W		Sand and gravel
Republic Steel Corp.- Penochee Group	23 47N 47W		Iron ore
GRAND TRAVERSE (69)			
Sand and gravel		154,590 tons	\$89,765
Roy Dayringer			Sand and gravel
Paul C. Miller			Sand and gravel
Peninsula Asphalt & Construction Co.	SE SE 15 27N 11W		Sand and gravel
GRATIOT (20)			
Salt (5th), magnesium compounds (3rd), bromine (2nd), calcium-magnesium chloride (4th), sand and gravel, clay products, natural gas, clay*, petroleum			**

\*Value of clay used in manufacture of clay products not included in county total.

\*\*Mineral value included under undistributed at end of county breakdown.

		<u>Quantity</u>	<u>Value</u>
Gratiot Co. - contd.			
Clay Products Co.	NE 25 12N 3W	Clay - tile	
Roy Dayringer	NW SE 9 10N 1W	Sand and gravel	
A. L. Dyer & Sons		Sand and gravel	
Gratiot Co. Rd. Comm.	NW SE 34 11N 4W ) NW NW 18 12N 4W )	Sand and gravel	
Michigan Chemical Corp.	St. Louis	Bromine, calcium - magnesium chloride, magnesium compounds, salt.	
Montcalm Co. Rd. Comm.		Sand and gravel	
North Star Washed Sand & Gravel Co.	NW SE 22 10N 21W ) NE SE 34 11N 4W )	Sand and gravel	
The Tabor Co.		Sand and gravel	

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HILLSDALE (51)

Sand and gravel (10th, 2%)	704,492 tons	\$536,068
Marl	3,313 tons	1,160
Total value		<u>\$537,228</u>

Bundy Hill Gravel Co.	NE 7 5S 1W	Sand and gravel
Barnes and Van Antwerp	Horton	Marl
Elliott Ice and Coal Co.	SE SE 15 6S 3W	Sand and gravel
Hillsdale Co. Rd. Comm.	NE SE 11 5S 3W ) SE SE 9 6S 3W ) SW SE 5 7S 2W ) SW SE 5 7S 2W ) SE SE 1 7S 4W ) SE NE 30 7S 4W )	Sand and gravel
Hoover Gravel pit	NE SW 23 8S 2W	Sand and gravel
Virgil Kintigh	Jonesville	Marl
Mich. State Hwy. Dept.		Sand and gravel
Northwest Materials, Inc.		Sand and gravel
Art Russell's Concrete Prod.	Hillsdale	Sand and gravel
Southern Michigan Materials, Inc.	Ransom	Sand and gravel

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HOUGHTON (12)

Copper (2nd, 44%)	19,902,724 lbs.	\$5,909,915
Stone - traprock	27,069 tons	19,058
Sand and gravel	47,987 tons	9,744
Total value		<u>\$5,938,717</u>

		<u>Quantity</u>	<u>Value</u>
Houghton Co. - contd.			
Calumet and Hecla, Inc.-			
Centennial Mine	18 56N 32W )		
North Kearsarge Mine	5 56N 32W )		
Osceola Mine	23 56N 33W )		Copper
Reclamation	12 55N 33W )		
Copper Range R.R. Co.			Sand and gravel
Copper Range Co.-			
Champion	31 54N 34W		Copper
Duluth South Shore & Atlantic Ry.			Sand and gravel
Houghton County Rd. Comm.			Trap rock - crushed
Mich. State Hwy. Dept.			Sand and gravel
Quincy Mining Co.-			
Reclamation	23 55N 33W		Copper

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HURON (46)

Stone - crushed and dimensional limestone	447,000 tons	\$540,900
Sand and gravel	182,365 tons	104,674
Petroleum	3,997 bbls.	11,391
Total value		<u>\$656,965</u>

E. P. Brady & Co.		Sand and gravel
Huron Co. Road Comm.	SE SE 17 16N 13E	Sand and gravel
Michigan State Hwy. Dept.		Sand and gravel
Wagner Sand & Gravel Co.	NE SW 22 16N 15E	Sand and gravel
The Wallace Stone Co.	5 16N 10E	Limestone - crushed and dimensional

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INGHAM (49)

Sand and gravel (9th, 2%)	726,710 tons	\$582,539
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Angell Constr. Co.	Lansing	Sand and gravel
Cheney Gravel Co.	SW SE 11 3N 2W	Sand and gravel
Delhi Gravel Co.	NW SW 24 3N 2W	Sand and gravel
Eaton Rd. Comm.	SW NW 7 2N 2W	Sand and gravel
Haley Gravel Co.		Sand and gravel
Ingham Co. Rd. Comm.	NE NE 10 2N 1E ) SE NE 15 2N 1E ) SW SE 34 3N 1E )	Sand and gravel

S. E. Ketchum & Sons		Sand and gravel
Lansing City Engr.	SW NE 11 3N 2W	Sand and gravel
Mason Gravel Co.	Mason	Sand and gravel
Harry Pickitt		Sand and gravel
Ray Sablain, Inc.	SW SW 2 3N 2W ) SE SE 27 4N 2W )	Sand and gravel

		Quantity	Value
IONIA (63)			
Sand and gravel		198,438 tons	\$118,548
Petroleum		7,603 bbls.	<u>21,669</u>
Total value			\$140,217
Ionia Co. Rd. Comm.	NE SW 18 5N 5W ) SE SE 8 6N 5W ) SW SE 21 7N 6W ) NW NE 33 7N 7W )	Sand and gravel	
H. L. Martin Gravel Co.	Westphalia	Sand and gravel	
Mich. State Hwy. Dept.		Sand and gravel	
Harry Pickitt	NE NE 16 7N 5W ) NW SE 21 7N 6W )	Sand and gravel	
IOSCO (18)			
Gypsum (1st), sand and gravel		**	
National Gypsum Co.	16 21N 6E	Gypsum	
Harry Pickitt		Sand and gravel	
U.S. Gypsum Co.	27 21N 7E	Gypsum	
IRON (4)			
Iron ore (1st, 37%)		3,616,467 tons	\$24,124,255
Sand and gravel		97,011 tons	<u>73,268</u>
Total value			\$24,197,523
Champion, Inc.	NE NW 1 43N 36W	Sand and gravel	
The Cleveland-Cliffs Iron Company-			
Cannon Mine	36 43N 35W )		
Hiawatha Mine	35, 36 43N 35W )	Iron ore	
Homer-Cardiff Minckler	22, 23 43N 35W )		
Spiess-Virgil Mine	24 43N 35W )		
Wauseca-Aronson Mine	23 43N 35W )		
Inland Steel Co. -			
Bristol-Youngstown Mine	19, 20 43N 32W )	Iron ore	
Sherwood Mine	23 43N 35W )		
Iron County Rd. Comm.	SW SW 7 43N 35W	Sand and gravel	
Michigan State Hwy. Dept.	NW NW 13 42N 35W ) NW SW 17 45N 33W )	Sand and gravel	
North Range Mining Co.-			
Book Mine	12 42N 33W )	Iron ore	
Warner	9 44N 33W )		

\*\*Mineral value included under undistributed at end of county breakdown.

		Quantity	Value
Iron Co. - contd.			
Pickands Mather & Co.-			
Baltic Group	6,7, 42N 34W )		
Fortune Lake Mine	24,25,26 43N 33W )	Iron ore	
Lawrence Mine	36 43N 33W )		
Volunteer-Maitland Mine	30 47N 26W )		
Republic Steel Corp.-			
Monongahela Mine	36 43N 33W )	Iron ore	
Tobin-Columbia Mine	30, 31 43N 32W )		
ISABELLA (16)			
Petroleum (2nd, 12%)		1,394,275 bbls.	\$3,973,684
Natural gas (3rd, 13%)		757,871 MCF	132,627
Sand and gravel		152,850 tons	103,335
Natural gasoline (2nd, 11%)		432,870 gals.	<u>43,287</u>
Total value			\$4,252,933
George Hubscher & Son	SW NE 25 14N 5W	Sand and gravel	
C. E. Utterback		Sand and gravel	
JACKSON (53)			
Sand and gravel		547,721 tons	\$301,636
Stone - crushed limestone, sandstone-dimensional		30,574 tons	85,135
Marl		3,750 tons	<u>1,050</u>
Total value			\$387,821
Barnes and Van Antwerp			Marl
Jackson Co. Rd. Comm.	SE SE 29 1S 1W		Sand and gravel
John C. Jeffery	SE 30 2S 2W		Limestone - crushed
Klumpp Bros.	SE SE 1 2S 2E		Sand and gravel
Palmer Sand & Gravel			Sand and gravel
Ray Sandstone Quarry	NE NW 6 4S 2E		Sandstone
Star Sandstone Co.	SW SE 31 3S 2E		Sandstone
Gordon D. Stevick	NW SE 26 2S 1W ) SE SW 17 3S 2E )		Sand and gravel
W. A. Cecil & Son			Sand and gravel
Kay Robinson Contractor	NE NE 25 3S 2W		Sand and gravel
KALAMAZOO (50)			
Sand and gravel		643,339 tons	\$539,136
Marl (1st, 21%)		22,521 tons	6,967
Petroleum		341 bbls.	<u>972</u>
Total value			\$547,075

		Quantity	Value
Kalamazoo Co. - contd.			
American Aggregate Corp.	SW NW 15 1S 11W	Sand and gravel	
Gravel Producers, Inc.	Portage & Cooper twps.	Sand and gravel	
Casper Hass Co.		Sand and gravel	
Kalamazoo City Engr.	NW SW 2 3N 11W	Sand and gravel	
Lawrence Hayward	Scott	Marl	
Michigan State Hwy. Dept.		Sand and gravel	
Claude Mastin		Marl	
Harry Pickitt		Sand and gravel	
Alvin Roe	SW SW 23 25 9W	Marl	
Dan Slack		Marl	
John G. Yerington	NW SW 19 1S 9W	Sand and gravel	

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KALKASKA (61)

Petroleum	59,279 bbls.	\$168,945
Sand and gravel	139,071 tons	55,728
Natural gas	149,657 MCF	26,190
Total value		<u>\$250,863</u>

Kalkaska Co. Rd. Comm.	Sand and gravel
Paul C. Miller	Sand and gravel

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KENT (23)

Sand and gravel (5th, 5%)	1,630,506 tons	\$1,569,775
Natural gas	9,584 M.cu.ft.	1,677
Marl	3,256 tons	1,130
Undistributed: Gypsum (2nd), petroleum		<u>1,393,665</u>
Total value		<u>\$2,966,247</u>

Certain-Teed Products Corp.	SW 34 7N 12W	Gypsum
Coit Avenue Gravel Co.	Grand Rapids	Sand and gravel
Cross and White		Sand and gravel
E. DeVries & Sons	Grand Rapids	Sand and gravel
Dobb's Truck and Crane Service		Sand and gravel
The Grande Brick Co.	Grand Rapids	Sand and gravel
Grand Rapids Gravel Co.	SE SW 3 6N 12W ) NW NE 9 6N 12W ) SW 18 6N 12W )	Sand and gravel
Grand Rapids Plaster Co.	NE 34 7N 12W	Gypsum
Kent County Rd. Comm.	NE SW 27 5N 10W ) SE SE 20 6N 9W ) NE NE 32 7N 9W ) SE SW 11 10N 12W )	Sand and gravel
Lowell Gravel Co.	Lowell	Sand and gravel

		Quantity	Value
Kent Co. - contd.			
Mid-American Engr. Corp.		Sand and gravel	
Harry A. Olthouse	Caledonia	Marl	
Pekaar and Van Doorn	NW NE 16 6N 12W	Sand and gravel	
Harry Pickitt		Sand and gravel	
H. F. Postma Gravel Co.	SE SW 8 6N 12W SW SE 9 6N 12W	Sand and gravel	
Riverside Sand & Gravel Co.		Sand and gravel	
The Tabor Co.		Sand and gravel	
United States Gypsum Co.	NE 34 7N 12W	Gypsum	
West Shore Constr. Co.	NW NE 16 6N 12W	Sand and gravel	
Harry Zeeff & Sons Gravel	SW SW 33 7N 12W	Sand and gravel	

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KEWEENAW (11)

Copper (1st, 53%)	23,805,586 lbs.	\$7,068,831
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Calumet & Hecla, Inc.-			
Ahmeek & Allouez	28 57N 32W )		
Allouez No. 3	32 57N 32W )		
Douglass	28 57N 32W )		Copper
Iroquois	22 57N 32W )		
Peninsula	28 57N 32W )		
Seneca No. 2	27 57N 32W )		

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LAKE (72)

Sand and gravel	103,808 tons	\$49,338
Petroleum	10,037 bbls.	28,605
Total value		<u>\$77,943</u>

Lake Co. Rd. Comm.	SE NE 23 18N 13W ) NW SE 10 20N 14W )	Sand and gravel
The Taber Co.		Sand and gravel

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LAPEER (54)

Sand and gravel	366,417 tons	\$225,315
Calcium-magnesium chloride (3rd)	5,100 tons	150,000
Total value		<u>\$375,315</u>

Lapeer Co. Rd. Comm.	SE SW 30 8N 10E ) SW SE 16 9N 10E ) SW NW 28 9N 12E )	Sand and gravel
Mich. State Hwy. Dept.		Sand and gravel
Pine Sand and Gravel	NW 12 7N 10E	Sand and gravel
Sanilac Co. Rd. Comm.		Sand and gravel
Wilkinson Chemical Co.		Calcium-magnesium

		Quantity	Value
LEELANAU (79)			
Sand and gravel		59,853 tons	\$27,634
Leelanau Co. Rd. Comm.	NE NW 16 28N 13W ) SW SE 12 29N 13W )	Sand and gravel	
Michigan State Hwy. Dept.	SW NW 19 32N 10W )	Sand and gravel	

		Quantity	Value
LENAWEE (17)			
Sand and gravel		490,398 tons	\$315,048
Undistributed: Portland cement (5th), clay products, clay*			<u>\$3,729,557</u>
Total value			\$4,044,605

Don Bills		Sand and gravel	
Donald F. Clark	Morenci	Sand and gravel	
Comfort Brick and Tile Co.	SW 2 6S 5E	Clay-tile	
Consolidated Cement Corp.	NE 5 5S 1E	Portland cement	
O.E. Gooding Co.		Sand and gravel	
King Sand & Gravel Co.	SE NW 19 5S 2E	Sand and gravel	
Lenawee Co. Rd. Comm.	SE SE 4 6S 4E NW NW 9 6S 4E	Sand and gravel	
Cyril Page		Sand and gravel	
Porter Sand & Gravel Co.	NE SE 4 6S 4E	Sand and gravel	
Stamm Bros. Gravel Co.	SW NE 19 7S 3E	Sand and gravel	
Tecumseh Gravel Co.	SW NE 4 6S 4E	Sand and gravel	
John Woerner Pit.	2½ mi. NW of Adrian	Sand and gravel	

		Quantity	Value
LIVINGSTON (25)			
Sand and gravel (2nd, 8%)		2,715,066 tons	\$2,644,363
Natural gas		297,810 M.cu.ft.	<u>52,117</u>
Total value			\$2,696,480
American Aggregate Corp.	NE NE 11 1N 6E	Sand and gravel	
D. & J. Gravel Co.	SW SW 32 3N 4E	Sand and gravel	
Van E. Daily	Howell	Sand and gravel	
Paul E. Miller		Sand and gravel	

\*Value of clay used in manufacture of clay products not included in county total

		Quantity	Value
LUCE (64)			
Sand and gravel		101,435 tons	\$128,792
E. P. Brady & Co.			
Luce Co. Rd. Comm.	SW SE 11 45N 11W ) NE SE 11 45N 11W ) NE NE 14 45N 11W )	Sand and gravel	
I. L. Whitehead Co.		Sand and gravel	

		Quantity	Value
MACKINAC (21)			
Stone-crushed limestone (2nd)		3,910,361 tons	\$3,212,873
Sand and gravel		93,410 tons	<u>120,186</u>
Total value			\$3,333,059

Duluth So. Shore Atlantic Railway	NW SW 7 40N 3W	Sand and gravel	
Fiborn Limestone Co.	16 44N 7W	Limestone-crushed	
Inland Lime & Stone Co.	6 42N 12W	Limestone-crushed	
Mich. State Hwy. Dept.		Sand and gravel	
Lawrence Tamlyn	St. Ignace	Sand and gravel	
I. L. Whitehead Co.	NW NE 36 42N 5W	Sand and gravel	

		Quantity	Value
MACOMB (37)			
Sand and gravel (6th, 5%)		1,598,335 tons	\$1,131,612
Advance Building Mat. Co.	Utica	Sand and gravel	
Bollig Sand & Gravel	Mt. Clemens	Sand and gravel	
Great Lakes Gravel Co.	NW NW 31 2N 12E	Sand and gravel	
Hygrade Sand & Gravel Corp.	NE 8 4N 12E	Sand and gravel	
Fred Kaatz Sand & Gravel		Sand and gravel	
Macomb Co. Rd. Comm.	17 4N 12E	Sand and gravel	
Macomb Sand & Gravel	SW SW 30 3N 12E	Sand and gravel	
Maertens Sand & Gravel Co.	SE NE 30 3N 12E ) SE SW 5 4N 12E )	Sand and gravel	
Louis Marsack & Sons	NW NW 3 1N 13E	Sand and gravel	
Michigan Sand & Gravel	SW NE 19 3N 12E	Sand and gravel	
Michigan State Hwy. Dept.		Sand and gravel	
Morgan Sand & Gravel	Utica	Sand and gravel	
Ray Industries, Inc.	NE SW 18 3N 12E	Sand and gravel	
Rosteck Contractors		Sand and gravel	
Smith Sand & Gravel Co., Inc.	NW SE 8 4N 12E	Sand and gravel	
Underwood Sand & Gravel Co.		Sand and gravel	

		Quantity	Value
MANISTEE (9)			
Salt (4th), Magnesium compounds (1st), bromine (3rd), sand and gravel			**
Frank L. Gauthier		Sand and gravel	
Great Lakes Chemical Corp.	SE SW 18 21N 16W	Bromine	
Manistee Co. Rd. Comm.	NE NW 18 22N 14W ) NW SE 26 24N 16W )	Sand and gravel	
Michigan Chemical Corp.	NW 7 21N 16W	Bromine	
Morton Salt Co.	12 21N 17W	Bromine, magnesium, compounds, salt.	
Sand Product Corp.	N $\frac{1}{2}$ 11 21N 17W	Sand	
Standard Lime & Stone Co.	SE 18 21N 16W	Magnesium compounds	
MARQUETTE (2)			
Iron ore (2nd, 36%)		3,592,556 tons	\$27,868,409
Sand and gravel		287,951 tons	224,034
Stone-crushed		44,778 tons	79,150
Total value			\$28,171,593
Champion, Inc.	SW SE 23 48N 30W ) NW NE 26 48N 30W )	Sand and gravel	
The Cleveland Cliffs Iron Co.-			
Athens-Bunker Hill Mine	6 47N 26W )		
Cambria -Jackson Mine	35, 36 48N 27W )		
Cliffs Shaft Mine	3,9,10 47N 27W )		
Humboldt Open pit	10,15 47N 29W )		
Lloyd-East Lloyd Mine	6 47N 27W )	Iron ore	
Maas-Race Course Mine	31 48N 26W )		
Mather "A" Mine	2 47N 27W )		
Mather "B" Mine	1 47N 27W )		
Republic Open Pit	7 46N 29W )		
Tilden Open Pit	26 47N 27W )		
M. A. Hanna Co.-			
New Richmond Open Pit	27 47N 2W	Iron ore	
Inland Steel Co.-			
Morris Mine	1, 2 47N 28W	Iron ore	
Greenwood Mine	14,23, 47N 28W	Iron ore	
Jones & Laughlin Steel Corporation-			
Tracy Mine	7, 8 47N 26W	Iron ore	
Lake Superior & Ishpeming Railway Co.		Sand and gravel	
A. Lindberg & Sons, Inc.	NW SE 8 47N 25W	Stone, sand and gravel	
Marquette Co. Rd. Comm.	NE NW 17 47N 25W ) SE SW 30 46N 23W )	Sand and gravel	
Michigan State Hwy. Dept.		Sand and gravel	

\*\*Mineral value included under undistributed at end of county breakdown.

		Quantity	Value
Marquette Co. - contd.			
Roy Millimaki		Sand and gravel	
North Range Mining Co.-			
Blueberry Mine	3,4 47N 28W )		
Champion Mine	31 48N 29W )	Iron ore	
Pickands Mather & Co.-			
Volunteer-Maitland Open pit	25, 30 47N 26W	Iron ore	
MASON (15)			
Magnesium compounds (4th), lime (1st), bromine (4th), calcium-magnesium chloride (2nd), petroleum (9th), sand and gravel			**
The Dow Chemical Co.	NW SW 23 18N 18W	Bromine, calcium- magnesium chloride, magnesium compounds, lime	
Mason Co. Rd. Comm.	SW SW 11 18N 15W	Sand and gravel	
Michigan State Hwy. Dept.		Sand and gravel	
MECOSTA (45)			
Petroleum		181,401 bbls.	\$516,993
Natural gas (4th, 12%)		713,604 M.cu.ft.	124,881
Sand and gravel		123,061 tons	54,255
Marl		7,875 tons	2,756
Total value			\$698,885
A. L. Dyer & Sons		Sand and gravel	
Wilson Frost	Blanchard	Marl	
Steve Lyle Sand & Gravel	Big Rapids	Sand and gravel	
Mecosta Co. Rd. Comm.	NE NE 32 15N 9W	Sand and gravel	
Michigan State Hwy. Dept.		Sand and gravel	
MENOMINEE (42)			
Undistributed: Lime (2nd), Sand and gravel			\$839,159

\*\*Mineral value included under undistributed at end of County breakdown.

		<u>Quantity</u>	<u>Value</u>
Menominee Co. - contd.			
Champion, Inc.	NW NW 26 34N 27W	Sand and gravel	
George A. Everson		Sand and gravel	
Limestone Products Co.	Menominee	Lime	
Menominee Co. Rd. Comm.	NE NE 9 39N 25W	Sand and gravel	

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MIDLAND (3)

Bromine (1st), calcium-magnesium chloride (1st, magnesium compounds (2nd), petroleum, salt (3rd), potash (1st), natural gas, natural gasoline (4th, 3%), sand and gravel			**
The Dow Chemical	Midland	Bromine, calcium-magnesium chloride, etc.	
A.L. Dyer & Sons.		Sand and gravel	
Midland Co. Rd. Comm.		Sand and gravel	
Saginaw Core Sand Co.		Sand	

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MISSAUKEE (30)

Petroleum (8th, 5%)	602,366 bbls.	\$1,716,743
Natural Gasoline (3rd, 5%)	200,822 gals.	20,082
Sand and gravel	8,754 tons	8,754
Natural Gas	22,937 M.cu.ft.	4,014
Marl	858 tons	548
Total value		<u>\$1,750,141</u>

C. Stanley Hooker	Marl
Michigan State Hwy. Dept.	Sand and gravel

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MONROE (32)

Undistributed: stone-crushed dolomite (5th), clay products, petroleum, clay*, sand and gravel		\$1,450,711
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\*Value of clay used in manufacture of clay products not included in county total.

\*\*Mineral value included under undistributed at end of county breakdown.

		<u>Quantity</u>	<u>Value</u>
Monroe Co. - contd.			
The France Stone Co.	SE 7 7S 9E	Dolomite-crushed	
Maritime Trades, Inc.		Sand and gravel	
Michigan Stone Co.	SW 25 8S 6E	Dolomite-crushed	
Monroe Co. Rd. Comm.	SW 13 6S 7E	Dolomite-crushed	
F.W. Ritter Sons Co., Inc.	NW 21 5S 10E	Clay-pottery	

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MONTCALM (39)

Petroleum	297,842 bbls.	\$848,850
Sand and gravel	277,173 tons	124,087
Natural gas	71,620 M.cu.ft.	12,534
Total value		<u>\$985,471</u>

A.L. Dyer and Sons	SE SE 8 12N 5W	Sand and gravel
Michigan State Hwy. Dept.		Sand and gravel
Montcalm Co. Rd. Comm.	NE SE 13 10N 6W ) NE NE 24 10N 6W )	Sand and gravel
Frank H. Stoerk	Pierson	Sand and gravel
Twin Lakes Sand & Gravel, Inc.		Sand and gravel

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MONTMORENCY (81)

Sand and gravel	33,225 tons	\$15,484
Montmorency Co. Rd. Comm.	SW NW 27 30N 1E ) NE NW 9 32N 4E )	Sand and gravel

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MUSKEGON (40)

Undistributed: Sand and gravel, petroleum, natural gas, salt		\$866,479
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Dobbs Truck & Crane Service		Sand and gravel
Hacker Electro-Chemical Co.	NE 31 12N 17W	Salt
Melvin Wolf & Lee Brandon		Marl
Muskegon Co. Rd. Comm.	SW SE 32 10N 13W	Sand and gravel
Nugent Sand Co.	Muskegon	Sand
Harry Pickitt		Sand and gravel
Sand Products Corp.	C E $\frac{1}{2}$ 28 10N 17W	Sand

	Quantity	Value
NEWAYGO (44)		
Petroleum	226,768 bbls.	\$646,289
Sand and gravel	81,805 tons	56,930
Natural gas	293,981 M.cu.ft.	51,447
Total value		\$754,666
K. & V. Gravel Co.	Sand and gravel	
Michigan State Hwy. Dept.	Sand and gravel	
Harry Pickitt	Sand and gravel	
West Shore Constr. Co.	Sand and gravel	
OAKLAND (13)		
Sand and gravel (1st, 19%)	6,054,961 tons	\$5,160,097
Clay products		547,375 est.
Clay*	21,895 tons	
Petroleum	1,734 tons	4,942
Total value		\$5,712,414
American Aggregate Corp.	NE NW 22 5N 10E	Sand and gravel
Avon Asphalt & Gravel Co.		
Floyd Beardslee	S $\frac{1}{2}$ SE 2 2N 10E ) NE NW 11 2N 10E )	Sand and gravel
The Benjamin Pit		Sand and gravel
William Clinader		Sand and gravel
Dachille Trucking Co.		Sand and gravel
Foley and Beardslee	NW NW 7 3N 9E ) SW SE 36 4N 8E )	Sand and gravel
O. E. Gooding & Co.		Sand and gravel
Kemler Bros.	SW SW 36 5N 4E	Sand and gravel
Koan Gravel Co.	SE NE 28 5N 7E	Sand and gravel
Koenig Coal & Supply Co.	SW SE 24 5N 10E	Sand and gravel
Michelson Bros.	NE NW 21 3N 8E	Sand and gravel
Michigan State Hwy. Dept.		Sand and gravel
Natco Corp.	SE 36 2N 9E	
Oakland Sand & Gravel Co.	Walled Lake	Sand and gravel
Salem Gravel & Constr. Company, Inc.	Salem	Sand and gravel
John R. Sand & Gravel Co.	S $\frac{1}{2}$ 4 4N 10E	Sand and gravel
Slaters Construction Co.		Sand and gravel
Underwood Sand & Gravel Co.	SW 2 3N 10E	Sand and gravel
Lyle J. Walker Sand & Gravel	SE SW 2 2N 11E	Sand and gravel
F.S. Ward	NW NE 7 3N 9E	Sand and gravel
Wolverine Contractors, Inc.		Sand and gravel

	Quantity	Value
OCEANA (26)		
Petroleum (4th, 7%)	875,446 bbls.	\$2,495,021
Sand and gravel	93,872 tons	62,757
Marl	3,349 tons	1,945
Total value		\$2,559,723
Bechman Bros.	Shelby	Marl
C. Stanley Hooker		Marl
Michigan State Hwy. Dept.		Sand and gravel
Muskegon Co. Rd. Comm		Sand and gravel
West Shore Constr. Co.		Sand and gravel
OGEMAW (27)		
Petroleum (5th, 7%)	840,691 bbls.	\$2,395,972
Sand and gravel	112,821 tons	72,001
Total value		\$2,467,973
E. P. Brady & Co.		Sand and gravel
Ogemaw Co. Rd. Comm.	NE SE 3 21N 1E ) NE SE 6 22N 2E ) NW NW 28 22N 3E ) NE SE 6 22N 2E )	Sand and gravel
Walter Rosevear Pit		
ONTONAGON (57)		
Copper (3rd)	1,078,493 lbs.	\$320,248
Stone	20,004	9,602
Sand and gravel	410	410
Total value		\$330,260
Michigan State Hwy. Dept.		Sand and gravel
Ontonagon Co. Rd. Comm.		Sand and gravel
White Pine Copper Co.- White Pine Mine	4,5,9, 5N 42W	Copper
OSCEOLA (28)		
Petroleum (6th, 6%)	722,044 bbls.	\$2,057,825
Sand and gravel	200,000 tons	200,000
Natural gas (5th, 7%)	415,755 M.cu.ft.	72,757
Total value		\$2,330,582
Hersey Gravel Co.	NW SW 20 17N 9W	Sand and gravel

	<u>Quantity</u>	<u>Value</u>
OSCODA (82)		
Sand and gravel	7,976 tons	\$7,976
Petroleum	2,523 bbls.	<u>7,191</u>
Total value		\$15,167
Michigan State Hwy. Dept.	Sand and gravel	
OTSEGO (78)		
Sand and gravel	62,604 tons	\$33,485
Natural gas	7,528 M.cu.ft.	<u>1,317</u>
Total value		\$34,802
Hutchins Sand & Gravel Co.	SE NE 17 29N 3W	Sand and gravel
Otsego Co. Rd. Comm.	NW SW 2 30N 3W ) NW NW 3 31N 3W ) NW NE 29 31N 3W)	Sand and gravel
OTTAWA (47)		
Petroleum	127,281 bbls.	\$362,751
Sand and gravel	379,856 tons	271,969
Natural gas	6,747 M.cu.ft.	1,181
Marl	3,125 tons	<u>1,094</u>
Total value		\$636,995
Bunce Gravel	NW NE 5 9N 13W	Sand and gravel
William Huizenga		Sand and gravel
Tom Johnston Gravel Co.	Ferrysburg	Sand and gravel
Ralph Meyers	West Olive	Marl
Harry Pickitt		Sand and gravel
Standard Sand Co.	NW 4 7N 16W	Sand
West Shore Constr. Co.	SW 9 6N 13W	Sand and gravel
Wierenga Bros.	Spring Lake	Marl
PRESQUE ISLE (8)		
Stone - crushed and dimensional limestone (1st)	10,368,035 tons	\$8,502,276
Sand and gravel	235,754 tons	<u>219,329</u>
Total value		\$8,721,605

	<u>Quantity</u>	<u>Value</u>
Presque Isle - contd.		
E. P. Brady and Co.		Sand and gravel
Michigan Limestone Div.- U.S. Steel Corp.	23 35N 5E	Limestone-crushed
Michigan State Hwy. Dept.		Sand and gravel
Onaway Stone Co.	5 34N 2E	Limestone-dimensional
Harry Pickitt	SE NW 22 34N 7E	Sand and gravel
Straits Aggregate & Equip. Corporation	Millersburg	Sand and gravel
ROSCOMMON (36)		
Petroleum	408,969 bbls.	\$1,165,556
Natural gasoline	87,116 gals.	8,712
Natural gas	7,031 M.cu.ft.	<u>1,230</u>
Total value		\$1,175,498
SAGINAW (71)		
Clay* (4th), petroleum		**
Minco Products Corp.	NW NW 1 11N 3E	Clay
Saginaw Clay Products	NW NW 1 11N 3E	Clay
SANILAC (65)		
Sand and gravel	311,588 tons	\$118,512
Glenn A. Comstock	Cass City	Sand and gravel
Michigan State Hwy. Dept.		Sand and gravel
Harold Peters		Sand and gravel
Sanilac Co. Road Comm.		Sand and gravel
Robert Van Camp		Sand and gravel
SCHOOLCRAFT (70)		
Sand and gravel	95,218 tons	\$87,358
E. P. Brady & Co.		Sand and gravel
Schoolcraft Co. Road Comm.	SE SW 7 41N 17W	Sand and gravel

\*\*Mineral value included under undistributed at end of county breakdown.

\* Value of clay or shale used in manufacture of Portland cement and clay products not included in county total.

		<u>Quantity</u>	<u>Value</u>
SHIAWASSEE (34)			
Undistributed: Clay products, shale*, sand and gravel			\$1,330,839
Fuoss Gravel Co.	Durand	Sand and gravel	
The Michigan Vitrified Tile Co.	SE 22 7N 3E	Shale - tile	
John Parks Sand & Gravel	NE 13 5N 1E	Sand and gravel	
Shenk Gravel Co.	NW NW 2 6N 4E ) NE NE 2 6N 4E )	Sand and gravel	
ST. CLAIR (7)			
Salt (2nd)		413,705 tons	\$7,976,330
Portland cement (6th)		803,867 bbls.	2,194,484
Sand and gravel		47,172 tons	39,724
Natural gas		30,895 M.cu.ft.	5,407
Clay* (3rd)		257,235 tons	...
Total value			<u>\$10,215,945</u>
William Click, Sr.	NE NW 27 7N 15E	Sand and gravel	
The Diamond Crystal Salt Co.	St. Clair	Evaporated salt	
Michigan State Hwy. Dept.		Sand and gravel	
Morton Salt Co.	Marysville	Evaporated salt	
Peerless Cement Corp.	Port Huron	Portland cement	
Sanilac County Rd. Comm.		Sand and gravel	
ST. JOSEPH (62)			
Sand and gravel		246,240 tons	\$190,730
Marl		4,595 tons	1,608
Total value			<u>\$192,338</u>
Aggregate Processors, Inc.		Sand and gravel	
Leslie Knox	3½ mi. SW of Colon	Marl	
Harry Pickitt		Sand and gravel	
St. Joseph Co. Rd. Comm.		Sand and gravel	
West Shore Constr. Co.		Sand and gravel	
Kenneth L. Wood		Marl	

		<u>Quantity</u>	<u>Value</u>
TUSCOLA (38)			
Sand and gravel		781,955 tons	\$ 827,660
Petroleum		65,392 bbls.	<u>186,367</u>
			\$1,014,027
Anderson Sand and Gravel Company	NW SW 19 11N 9E ) NW NE 20 11N 9E )	Sand and gravel	
Berenthal Sand & Gravel	SW SE 6 11N 9E	Sand and gravel	
Great Lakes Foundry Sand Company		Sand	
C. R. Hunt	Cass City	Sand and gravel	
Michigan State Hwy. Dept.		Sand and gravel	
Peterhans Bros.	SW NE 35 13N 9E	Sand and gravel	
Saginaw Core Sand Co.		Sand	
E.L. Schwaderer	NW NE 33 12N 10E ) NW SE 36 12N 11E ) NW NW 16 13N 10E ) SW SE 33 14N 11E ) NW SW 34 14N 11E )	Sand and gravel	
Tuscola County Rd. Comm.		Sand and gravel	
Vaughans Sand & Gravel Co.	NE NE 25 12N 8E ) NW NW 25 12N 8E )	Sand and gravel	
VAN BUREN (56)			
Petroleum		101,420 bbls.	\$289,047
Sand and gravel		66,095 tons	<u>53,365</u>
Total value			\$342,412
Garrett Sand Co.	South Haven	Sand	
Michigan State Hwy. Dept.		Sand and gravel	
Harry Pickitt	NW SW 24 3S 14W	Sand and gravel	
John G. Yerington	SW NW 11 3S 15W ) SE SE 12 3S 15W ) SW NE 36 3S 15W ) NE NE 33 4S 15W )	Sand and gravel	
WASHTENAW (29)			
Sand and gravel (3rd, 7%)		2,237,331 tons	\$1,402,094
Petroleum		148,121 bbls.	422,145
Natural gas		123,837 M.cu.ft.	<u>21,671</u>
Total value			\$1,845,910
George H. Campbell	NE NE 15 3S 6E	Sand and gravel	
Chubb Sand and Gravel	Northville	Sand and gravel	

		<u>Quantity</u>	<u>Value</u>
Washtenaw Co. - contd.			
Dexter Gravel Co.	Dexter	Sand and gravel	
Jones Gravel Co.		Sand and gravel	
Killians Gravel Co.	SE SE 25 2S 3E	Sand and gravel	
Kruse Gravel Pit		Sand and gravel	
Michigan State Hwy. Dept.		Sand and gravel	
Morains Inc.		Sand and gravel	
Packard Supply Co.		Sand and gravel	
Harry Pickitt		Sand and gravel	
Scio Gravel Co.		Sand and gravel	
Thumm's Sand & Gravel		Sand and gravel	
Washtenaw Co. Rd. Comm.	SE NE 14 1S 4E )		
	NE SW 9 2S 6E )	Sand and gravel	
	SE SW 23 3S 7E )		
Whittaker & Gooding Co.	SW NE 19 2S 7E	Sand and gravel	
Youngs Sand & Gravel Co.	NE NE 15 3S 6E )		
	SW SW 16 1S 3E )	Sand and gravel	
Zohn Sand & Gravel Co.		Sand and gravel	
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WAYNE (1)			
Salt (1st)		3,862,803 tons	\$15,379,586
Sand and gravel (4th, 6%)		1,876,025 tons	2,342,487
Undistributed: Portland cement (2nd), clay products, clay*(1st), stone- crushed limestone			<u>16,477,826</u>
Total value			\$34,199,899
Allied Chemical Dye Corp.	Trenton	Chlorine, soda ash, caustic soda, etc.	
Clippert Brick Co.	NW 21 2S 11E	Clay-brick	
Continental Sand Co.		Sand and gravel	
W. L. Emery Co.		Sand and gravel	
Flat Rock Clay Products	NW SE 30 4S 10E	Clay-tile	
International Salt Co., Inc.	SW 32 2S 11E	Rock salt	
Lightweight Aggregate Corp.	NE 27 2S 11E	Clay-lightweight aggregate	
Maning & Locklin Gravel Co.	NW SW 2 1S 8E	Sand and gravel	
Michigan Silica Co.	SW NE 15 5S 10E	Silica sand	
Michigan State Highway Dept.		Sand and gravel	
Moore Bros. Sand & Gravel	E½ SE 9 3S 9E	Sand and gravel	
Northville Sand & Gravel Co.	SE NE 8 1S 8E	Sand and gravel	
Peerless Cement Corp.	Detroit	Portland cement	
Pennsylvania Salt Mfg. Co.	Wyandotte	Chlorine, caustic soda	
Harry Pickitt	SE NE 8 1S 8E	Sand and gravel	
U.S. Gypsum Co.	River Rouge	Gypsum products	
Wayne Sand and Gravel Co.	NW SE 2 3S 8E	Sand and gravel	
Wolverine Contractors, Inc.	Roseville	Sand and gravel	

\*Value of clay used in manufacture of Portland cement and clay products not included in county total.

		<u>Quantity</u>	<u>Value</u>
Wayne County - contd.			
Wyandotte Chemical Corp.	Wyandotte	Soda ash, chlorine, caustic soda, etc.	
Wyandotte Chemical Corp.	Wyandotte	Portland cement	
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WEXFORD (83)			
Sand and gravel		12,544 tons	\$10,469
Wexford Gravel Co.		Sand and gravel	
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UNDISTRIBUTED			
Not segregated by counties (includes Antrim, Chippewa, Emmet, Gratiot, Iosco, Manistee, Mason, Midland, Saginaw).			\$53,348,377
Bureau of Forestry		Sand and gravel	
O. E. Gooding Co.		Sand and gravel	
Michigan State Hwy. Dept.		Sand and gravel	
Ronald F. Weaver		Sand and gravel	
Cravens Peat Moss		Peat	
Green Thumb Peat Humus Co.	24 7N 12E	Peat	
Michigan Peat, Inc.	24 7N 12E	Peat	
Perry Peat Co., Inc.	Morris	Peat	
Irving L. Pratt and Sons	SE SW 35 19N 17W	Peat	
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TOTAL STATE VALUE			\$286,566,979



## THE MINERAL INDUSTRIES OF MICHIGAN IN 1955\*

(Preliminary)

The estimated value of mineral production in Michigan in 1955 was 346.6 million, an increase of nearly 23 per cent over 1954, according to the Bureau of Mines, United States Department of the Interior. Major increases, over 10 per cent, were recorded in the production of copper, iron ore, marl, sand and gravel, lime and limestone. Gains of less than 10 per cent were noted in other nonmetallic minerals. Clay output decreased. Output of petroleum and natural gasoline decreased and no coal was produced.

Iron ore continued to rank first in value of the minerals produced with 29 per cent, followed by cement, 15 per cent; copper, 11 per cent; petroleum, 10 per cent; salt, 9 per cent; sand and gravel, 8 per cent; stone, (excepting limestone for cement and lime) 6 per cent and all others 12 per cent. Of the total value of output, nonmetallic minerals accounted for 50 per cent, metals, 40 per cent and fuels, 10 per cent.

## Metallic Minerals

**COPPER:** Production of copper in Michigan in 1955, in terms of recoverable metal, was more than double production of 1954. The increase was primarily the result of output from the White Pine mine of the White Pine Copper Co., a subsidiary of Copper Range Co. The mine is in Ontonagon County. The Calumet & Hecla, Inc. operated its group of mines, Ahmeek mill and Tamarack reclamation plant in Houghton and Keweenaw counties. The company experienced a labor strike from May 2 through August 21. During the labor strike at Calumet & Hecla, Inc. mines and plants, unwatering of the company's Osceola mine was reduced to maintaining of the water level attained May 2. Quincy Mining Company's reclamation plant and Copper Range Company's Champion mine were operated throughout the year.

Average weighted prices used for calculating the value of copper were 37 cents per pound in 1955 and 29.5 cents in 1954. Quoted market prices for copper per pound, delivered at Connecticut Valley, opened 1955 at 30 cents, rose to 36 cents by March 31, then 40 cents August 18; reached a maximum of 45.35 cents on September 1 and closed 1955 at 43.275 cents.

**IRON & MANGANESE:** Good demand for iron ore and a favorable shipping season accounted for the 44 per cent increase in shipments of iron ore and concentrates from Michigan mines in 1955 over 1954. Mines are located in Baraga, Dickinson, Gogebic, Iron and Marquette counties. Dates of first and last lake shipments of ore in 1955 from Michigan and Wisconsin ports were: Ashland - Soo, April 24 -

\*Prepared, January 27, 1956, by Donald H. Mullen, Commodity Industrial Analysts, under the supervision of Samuel A. Gustavson, Chief, Minneapolis Field Office, Division of Mineral Industries, Region V, 2908 Colfax Ave., So. Minneapolis 8, Minnesota.

November 28; Ashland - C & NW, April 24 - November 20; Escanaba - E and NW, April 7 - December 8; Marquette - DSS & A, April 22 - November 13; Marquette - LS & I, April 18 - December 3; Superior - GN, April 14 - December 3; Superior - NP - Soo, April 21 - November 26.

No shipment of ore containing over 5 per cent manganese were reported from Michigan mines in 1955. Shipments in 1954, all Ferruginous manganese ore (10-35 per cent Mn) total 13,715 long tons (15,361 short tons), gross weight.

## Nonmetallic

Michigan produces numerous nonmetallic minerals. Construction materials, cement, clay, gypsum, lime, sand and gravel and crushed stone, excluding clay and limestone used for manufacture of cement and lime, accounted for about 32 per cent of the value of 1955 mineral output and an increase over 1954 of nearly 10 per cent. Common salt (NaCl) from one underground mine and brine wells and salines from brine wells are the source of raw material in the production of several chemicals. In addition to salt (NaCl) the brines contain substantial quantities of bromine and magnesium. Sales of salt and salines produced, accounted for 18 per cent of the total mineral value of the state in 1955.

## Fuels

Fuels produced in Michigan were petroleum, peat, natural gas and natural gas products. In 1955 the production of petroleum decreased by 6 per cent and natural gasoline 47 per cent. Production of natural gas remained about the same. Output of natural gas liquids increased about 3 per cent. Production of peat, all used as a soil conditioner, was estimated to be slightly greater than in 1954.

Mineral Production in Michigan, 1955<sup>(1)</sup>  
(Estimated)

Commodity	Short Tons (unless other- wise stated)	Value
Cement	376 pound barrels	19,600,000
Clay:		\$54,700,000
Used in manufacture of cement	1,666,000	(2)
Other	426,000	480,000
Copper (recoverable content of ores, etc.)	50,247	37,183,000
Gypsum (crude)	2,117,000	6,286,000
Iron ore (usable) long tons, gross weight	14,022,005	102,500,000
Marl, calcareous	131,000	55,000
Natural gas	thousand cubic feet	6,900,000
Peat	30,000	465,000
Petroleum (crude)	42-gallon barrels	11,258,000
Salt (common)	5,200,000	30,200,000
Sand and gravel	34,600,000	27,500,000
Stone:		
Used in manufacture of cement and lime	5,218,000	(2)
Other (granite, limestone, sandstone, and miscellaneous stone)	20,884,750	19,485,000
Undistributed: bromine, calcium chloride and calcium magnesium chloride, lime, magnesium compounds, magnesium chloride (1954), manganiferous ore (1954), natural gasoline, liquid petroleum gases, potassium salts, ground sand and sandstone		33,149,000
Total Michigan		\$346,600,000

(1) Production as measured by mine shipments or mine sales (including consumption by producers), except that fuels and gypsum are strictly production. Copper, iron and manganese ores, natural gas liquids, peat, potash, and sand and gravel data on this table were collected jointly by Bureau of Mines (U. S. Department of the Interior) and Bureau of Census (U. S. Department of Commerce) for census year 1954.

(2) Value not assigned to avoid duplication.

DIRECTORY OF PRODUCERS OF MINERALS  
AND  
MINERAL PRODUCTS, 1954

CHEMICAL PLANTS  
(Using Natural Brine or Salt)

Name and Address	Raw Material	Plant Location
Allied Chemical & Dye Corp. The Solvay Process Division P. O. Box 271 Syracuse 1 New York	Salt	Detroit, Wayne Co.
The Dow Chemical Company Midland, Michigan	Natural brine and salt	Midland, Midland Co. Ludington, Mason Co.
Great Lakes Chemical Corp. 502 Michigan National Bank Building Grand Rapids 2 Michigan	Natural brine	Filer City, Manistee Co.
Hooker Electrochemical Co. Niagara Falls, New York	Salt	Montague, Muskegon Co.
Michigan Chemical Corp. 500 North Bankson St. Louis, Michigan	Natural brine	St. Louis, Gratiot Co. East Lake, Manistee Co.
Morton Salt Company 120 South La Salle Street Chicago, Illinois	Natural brine	Manistee, Manistee Co.
Pennsylvania Salt Mfg. Co. 1000 Widener Building Philadelphia 7. Pennsylvania	Salt	Wyandotte, Wayne Co.
Standard Lime & Stone Co. 2000 First National Bank Building Baltimore 3 Maryland	Natural brine	Stronack, Manistee Co.
Wyandotte Chemical Corp. Wyandotte, Michigan	Salt	Wyandotte, Wayne Co.

PRODUCERS OF BROMINE, CALCIUM-MAGNESIUM CHLORIDE,  
MAGNESIUM COMPOUNDS AND POTASH

(From Well Brines)

	Bromine	Calcium- Magnesium Chloride	Magnesium Compounds	Potash	
Dow Chemical Company	X	X	X		Mason
Dow Chemical Company	X	X	X	X	Midland
Great Lakes Chemical Corp.	X				Manistee
Michigan Chemical Corp.	X	X	X		Gratiot
Michigan Chemical Corp.	X				Manistee
Morton Salt Company	X		X		Manistee
Standard Lime & Stone Company			X		Manistee
Wilkinson Chemical Company		X			Lapeer

CEMENT MANUFACTURERS

<u>Name and Address</u>	<u>Plant Location</u>
Aetna Portland Cement Company P. O. Box 392 Bay City, Michigan	Bay City, Bay Co.
Consolidated Cement Corporation 1003 National Bank Building Jackson, Michigan	Cement City, Lenawee Co.
Huron Portland Cement Co. 1325 Ford Building Detroit, Michigan	Alpena, Alpena Co.
Peerless Cement Corporation 1144 Free Press Building Detroit 26, Michigan	Detroit, Wayne Co. Port Huron, St. Clair Co.
Penn-Dixie Cement Corp. P. O. Box No. 152 Nazareth, Pa.	Petoskey, Emmet Co.
Wyandotte Chemical Corporation Wyandotte, Michigan (Operated by Huron Portland Cement Co.)	Wyandotte, Wayne Co.

CLAY PRODUCERS\*

<u>Name and Address</u>	<u>Pit Location</u>
Minco Products Corporation Box 367 2305 Miller Road South Saginaw, Michigan	Near Paines, Saginaw Co. Section 1, T.11N., R.3E.
Robinson Clay Products Company 65 West State Street Akron 9, Ohio	Near Rockland, Ontonagon Co. Section 17, T.50N., R.39W.
Saginaw Clay Products Box 275 Saginaw, Michigan	Near Paines, Saginaw Co. Section 1, T.11N., R.3E.

\*Producers of clay used in clay products, Portland cement, and lightweight aggregate manufacturers not included.

## CLAY PRODUCTS PRODUCERS

(Brick, Tile, Pottery, Lightweight Aggregate)

<u>Name and Address</u>	<u>Raw Material</u>	<u>Plant Location</u>
American Vitrified Products Co. 701 National City Bank Bldg. Cleveland, Ohio	Shale	Grand Ledge, Eaton (Tile)
Clay Products Company R.F.D. 2 St. Louis, Michigan	Clay	St. Louis, Gratiot Co. (Tile)
Clippert Brick Company Wyoming and Southern Avenues Detroit 10 Michigan	Clay	Near Dearborn, Wayne Co. (Brick)
Comfort Brick and Tile Co. R.F.D. No. 1 Tecumseh, Michigan	Clay	Tecumseh, Lenawee Co. (Tile)
Flat Rock Clay Products Co. Flat Rock 3 Michigan	Clay	Flat Rock, Wayne Co. (Tile)
Grand Ledge Clay Products Co. West Jefferson Street Grand Ledge, Michigan	Shale	Grand Ledge, Eaton Co. (Tile)
Lightweight Aggregate Corp. 12601 Merriman Road Livonia, Michigan	Clay	Livonia, Wayne Co. (Lightweight aggregate)
The Michigan Vitrified Tile Co. P. O. Box 59 Findlay, Ohio	Shale	Corunna, Shiawassee Co. (Tile)
Natco Corporation 327 Fifth Avenue Pittsburgh 22 Pennsylvania	Clay	Franklin, Oakland Co. (Tile)
F. W. Ritter Sons Company, Inc. South Rockwood, Michigan	Clay	South Rockwood, Monroe Co. (Pottery)

## GYPSUM PRODUCERS

<u>Name and Address</u>	<u>Mine or Quarry Location</u>	<u>Mill Location</u>
Certain-Teed Products Corp. 120 East Lancaster Avenue Ardmore, Pennsylvania	Grand Rapids, Kent County (mine)	Grand Rapids, Kent Co.
Grand Rapids Plaster Company 1204 Peoples National Bank Bldg. Grand Rapids 2, Michigan	Grand Rapids, Kent County (mine)	Grand Rapids, Kent Co.
National Gypsum Company 325 Delaware Avenue Buffalo 2, New York	National City, Iosco Co. (quarry)	National City, Iosco County
United States Gypsum Company 300 West Adams Street Chicago 6, Illinois	Alabaster, Iosco Co. (quarry)	Grand Rapids, Kent Co. River Rouge, Wayne Co.

## LIME PRODUCERS

<u>Name and Address</u>	<u>Plant Location</u>
The Dow Chemical Company Ludington Division Midland, Michigan	Ludington, Mason County
Limestone Products Company 320 First Street Menominee, Michigan	Menominee, Menominee Co.
Monitor Sugar Company Division Robert Gage Coal Company South Euclid Avenue Bay City, Michigan	Bay City, Bay County

## IRON MINING COMPANIES

<u>Name and Address</u>	<u>Mine Locations (Counties)</u>
The Cleveland-Cliffs Iron Company 14th Floor Union Commerce Building Cleveland 14, Ohio	Baraga, Iron, Marquette
Globe Iron Company Jackson, Ohio	Dickinson
M. A. Hanna Company 1300 Leader Building Cleveland 14, Ohio	Iron and Marquette
Inland Steel Company 38 South Dearborn Street Chicago 3, Illinois	Iron and Marquette
Jackson Iron and Steel Company Jackson, Ohio	Dickinson
Jones and Laughlin Steel Corporation 401 Liberty Avenue Gateway Center Pittsburgh 30, Pennsylvania	Marquette
North Range Mining Company Negaunee, Michigan	Iron, Marquette, Gogebic
Oliver Iron Mining Division U. S. Steel Corporation Wolvin Building Duluth 2, Minnesota	Gogebic
Pickands Mather and Company 2000 Union Commerce Building Cleveland 14, Ohio	Gogebic, Iron, Marquette
Republic Steel Corporation Republic Building Cleveland 1, Ohio	Iron

## COPPER PRODUCERS

<u>Name and Address</u>	<u>Mine Locations (Counties)</u>
Calumet and Hecla, Incorporated Calumet, Michigan	Houghton and Keweenaw
Copper Range Co. Painsdale, Michigan	Houghton
Quincy Mining Co. Hancock, Michigan	Houghton
White Pine Copper Co. 53 West Jackson Blvd. Chicago, Illinois	Ontonagon

## MARL PRODUCERS

<u>Name</u>	<u>Address</u>	<u>Pit Location (County)</u>
A.		
L. Z. Arndt	R.F.D. #2, Fennville	Allegan
Gerald Arnsman	R.F.D. #1, Hopkins	Allegan
Carl Avery	Athens	Calhoun
B.		
Barnes & Van Antwerp	Horton	Jackson
Bechman Bros.	Shelby	Oceana
Grant Brizendine	R.F.D. #2, Edwardsburg	Cass
Case Bros.	R.F.D. #1, Sherwood	Branch, Calhoun
F.		
Wilson Frost	Blanchard	Mecosta
H.		
Lawrence Hayward	Scotts	Kalamazoo
Frank R. Hixon	R.F.D. #2, Marcellus	Cass
C. Stanley Hooker	608 Colfax St., Cadillac	Missaukee, Oceana
K.		
Virgil Kintigh	R.F.D. #2, Jonesville	Hillsdale
Leslie Knox	Colon	St. Joseph
M.		
Claude Mastin	Climax	Kalamazoo
Ralph Meyers	R.F.D. #1, West Olive	Ottawa
O.		
Harry H. Olthouse	R.F.D. #2, Caledonia	Kent
P.		
Emil Pavlak	R.F.D. #2, Hopkins	Allegan

## Marl Producers (contd.)

<u>Name</u>	<u>Address</u>	<u>Pit Location (County)</u>
R.		
Clyde M. Reed	Union City	Calhoun
Alvin Roe	Climax	Kalamazoo
S.		
H. A. Carlton Schau	620 Terrace Ave., Kalamazoo	Barry
Dan Slack	R.F.D. #4, Kalamazoo	Kalamazoo
W.		
Wierenga Bros.	Spring Lake	Ottawa
Kenneth L. Wood	Colon	St. Joseph, Branch

## PEAT PRODUCERS

<u>Name and Address</u>	<u>Pit Location</u>
Cravens Peat Moss R.F.D. #5, Box 359 Kalamazoo, Michigan	Near Kalamazoo, Kalamazoo County
Green Thumb Peat Humus Company Capac, Michigan	Near Capac, St. Clair and Lapeer counties
Michigan Peat, Incorporated 267 Fifth Avenue New York 16, New York	Near Capac, Lapeer and St. Clair counties
Perry Peat Company, Incorporated Box 667 Monroe, Michigan	Near Morrice, Shiawassee County
Irving L. Pratt & Son Scottville, Michigan	Near Scottville, Mason County

## SALT COMPANIES

<u>Name and Address</u>	<u>Product</u>	<u>Plant Location</u>
Diamond Crystal Salt Co. St. Clair, Michigan	Evaporated Salt	St. Clair, St. Clair Co.
International Salt Co., Inc. Scranton, Pennsylvania	Rock Salt	Detroit, Wayne County
Manistee Salt Works 800 South Vandeventer Ave. St. Louis 10, Missouri	Evaporated Salt	Manistee, Manistee Co.
Michigan Chemical Corp. 500 North Bankson St. Louis, Michigan	Evaporated Salt	St. Louis, Gratiot Co.
Morton Salt Company 120 South LaSalle St. Chicago, Illinois	Evaporated Salt	Manistee, Manistee Co. Marysville, St. Clair Co.

## COMMERCIAL SAND AND GRAVEL PRODUCERS

(Addresses are all in Michigan unless otherwise designated)

<u>Name and Address</u>	<u>Pit Location (County)</u>
A.	
Advance Bldg. Materials Co., 46461 Ryan Road Utica	Macomb
Aggregates Processors, White Pigeon John W. Alexander, Sr. Route #1, Marshall	St. Joseph Calhoun
American Aggregates Corp., Greenville, Ohio	Kalamazoo, Livingston, Oakland
Andersen Sand & Gravel Co., 401 Atwater St. Saginaw	Saginaw, Tuscola
Angell Construction Co., P.O. Box 5, East Lansing	Ingham
Arndt, Cleo L., Fennville	Allegan
Avon Asphalt & Gravel Co. J. Gladstone & Son, 423 Oak St., Rochester	Oakland
B.	
Amos G. Baker, Kalamazoo	Kalamazoo
A. T. Barnes Constr. Co., Cass City	Tuscola
Battle Creek Gravel Co. 3800 Dickman Highway, Battle Creek	Calhoun
Floyd Beardslee, R.F.D. #3, Pontiac	Oakland
Harold J. Beck, Sec'y., 209 Mt. Clemens Savings Bank Bldg., Mt. Clemens	
The Benjamin Pit, 30404 W. 14 Mile Road, Farmington	Oakland
Berthel Sand & Gravel Co., Reese	Tuscola
Bichler Bros., Escanaba	Delta
Don Bills, Hudson	Lenawee
Adrian Blades, Beaverton	Gladwin
Boichot Concrete Products Corp. 1800 Turner St., Lansing	Ingham, Clinton
Daniel J. Bollig, 38068 Lakeshore Dr. Route 6 Mt. Clemens	Macomb
E. P. Brady & Co., 600 Citizens Bank Bldg. Flint 3	Genesee, Alcona, Alger, Huron, Alpena, Luce, Ogemaw, Presque Isle, Schoolcraft
Bunce Gravel, Route #1, Ravenna	Muskegon, Ottawa
Bundy Hill Gravel Co., Somerset Center	Hillsdale
Bodine, Ralph W., 226 Court, Otsego	Allegan
C.	
Geo. H. Campbell, 606 E. Cross St., Ypsilanti	Washtenaw
W. A. Cecil & Son, 400 Albion Rd., Concord	Jackson
Champion, Inc., Iron Mountain	Dickinson, Iron, Marquette, Menominee
Cheney Gravel Co., Inc., Willoughby Road, Holt	Ingham

## Commercial Sand and Gravel Producers (contd.)

<u>Name and Address</u>	<u>Pit Location (County)</u>
C. (contd.)	
William Cinader, 622 South Main St., Clawson	Oakland
Donald F. Clark, Route #1, Morenci	Lenawee
William Click, Sr., 8783 Bryce Rd., Goodells	St. Clair
Cloverland Milling, Supple Co. 801 Superior Ave., Gladstone	Delta
Coit Avenue Gravel Co., 4772 Coit Ave., N.E. Grand Rapids	Kent
Cole Gravel Co., Route #1, Dorr	Allegan, Barry
Emil Combs, Route #1, Tekonska	Calhoun
Glen A. Comstock, Box 172, Bay City	Sanilac
Construction Aggregates Corp., 33 N. LaSalle St. Chicago, Illinois	Ottawa (Dredge)
Continental Sand Co., 15381 Plainview, Detroit 23	Wayne
Cross and White, 3849 Three Mile Road, Grand Rapids	Kent
H. C. Cushman, Star Route, Sears	Osceola
D.	
D. & J. Gravel Co., Route 1, Fowlerville	Livingston
Dachill Trucking Co., 18945 W. 8 Mile Rd., Detroit	Wayne, Oakland
Van E. Daily, 410 W. Sibley St., Howell	Livingston
Roy Dayringer, Route 4, Ithaca	Gratiot
Days River Sand & Gravel Co., Route #1, Gladstone	Delta
Harold De Mint, Route #1, Grass Lake	Jackson
Edward De Vries & Sons, 1400 Walker St. Grand Rapids 4	Kent
Henry De Went, U.S. 21, Hudsonville	Kent
Deep River Block & Sand Co., Standish	Arenac
Delhi Gravel Co., U.S. 127, Holt	Ingham
Denslow & Denslow, Weidman	Isabella
Dexter Gravel Co., 7100 Dexter Ann Arbor Road, Dexter	Washtenaw
H. H. Dickenson Co., Detroit	Wayne
Dobb's Truck and Crane Service 1382 Beidler St., Muskegon	Kent
A. L. Dyer & Sons, McBrides	Montcalm
E.	
Eastman Gravel Pit, Route #1, Standish	Arenac
Elliott Ice & Coal Co., Paul W. Elliott Hillsdale	Hillsdale
W. L. Emery Co., 1375 E. Jefferson Ave., Detroit	Wayne (Dredge)
George A. Everson, Sand & Gravel Co. 1033 First St.	Menominee

## Commercial Sand and Gravel Producers (contd.)

<u>Name and Address</u>	<u>Pit Location (County)</u>
F.	
Orville J. Fair, Route 2, Deckerville	Sanilac
Fenner-Crane and Constr. Service Co., Muskegon	Muskegon
Ferguson Excavating Co., 5360 N. State Rd. Davison	Genesee
The Ferris Co., Mason	Ingham
Fisher Sand & Gravel Co., Ralph J. Fisher Route #2, Midland	Midland
Foley & Beardslee, Route #3, Clarkston	Oakland, Chippewa
Harry Fuoss, Route 1, Durand	Shiawassee
The J. Fouss Co., Route 1, Rochester	Oakland
G.	
Garrett Sand Co., 411 Phoenix St., South Haven	Van Buren
Frank L. Gauthier, Onekama	Manistee
Gilliland Gravel Co., Alpena	Various
O. E. Gooding Co., 125 N. Normal St., Ypsilanti	Washtenaw, Lenawee, Oakland
James A. Gordon, U.S. 2, Sault Ste. Marie	Chippewa
Grande Brick Co., 1456 Fuller Ave., S.E. Grand Rapids 7	Kent
Grand Rapids Gravel Co. 2200 Chicago Dr., S.W. Grand Rapids 9	Kent
Gravel Producers, Inc., Kalamazoo 85	Kalamazoo
Great Lakes Foundry Sand Co., 720 United Artists Building, Detroit	Wayne, Tuscola
Great Lakes Gravel Co., 2900 Auburn Road, Utica	Macomb
H.	
Haley Gravel Co., 2016 Pattengill, Lansing	Ingham
Hansen Gravel Co., Harry Hansen, Pierson Rd. Flushing	Genesee
Casper H. Hass Co., 1800 RA, Kalamazoo	Kalamazoo
Heides Sand & Gravel, 1683 Thomson Road, Route #1, Niles	Berrien, Cass
Charles R. Hemkes Co., Wakefield	Gogebic
Hersey Gravel Co., Ray D. Beardsley, Hersey	Osceola
Holland Construction Co., Holland	Ottawa
Holly Sand & Gravel Co., Grange Hall, Route #1, Holly	Oakland
Gunner Holmberg, Route #1, Gladstone 1	Delta
Hoover Bros., K.F. Hoover, Waldron	Hillsdale
George Huescher & Son, 1111 E. Pickard St. Mt. Pleasant	Isabella
Huitt & Sons, 322 Water St., Allegan	Allegan
William Huizenga, Route #2, Zeeland	Ottawa

## Commercial Sand and Gravel Producers (contd.)

<u>Name and Address</u>	<u>Pit Location (County)</u>
H. (contd.)	
C. R. Hunt, Cass City Hutchins Sand & Gravel, Rodney C. Hutchins Gaylord Hygrade Sand & Gravel Corp., 707 Majestic Bldg., Detroit	Tuscola Otsego Macomb
I.	
Ireland & Lester Co., 220 N. Wayne St., St. Joseph Ironwood Concrete & Products Co., Route #1, Box 7A Ironwood	Berrien (Dredge) Gogebic
J.	
Leonard Johnson, Box 31, Chatham Thomas F. Johnston (Tom Johnston Gravel Co.) 114 LaFayette St., Grand Haven Carl Jones Concrete Products, 7628 Toma Road Pinckney	Alger Ottawa Livingston, Washtenaw
K.	
K. & V. Gravel Co., Route #4, Fremont Fred Katz, 62701 Richmond Road, Richmond Harold Keill, Route #3, Niles Kelley Isle Line-Transport, Sandusky, Ohio Kemler Bros., 206 Walnut St., Rochester S. E. Ketchum & Sons, Route #3, Mason Killins Gravel Co., 3305 Liberty Road, Ann Arbor King Sand & Gravel Co., 202 South St., Archbold, Ohio Klumpp Bros., Chelsea Knight Gravel Co., 90 High St., Carsonville Koan Gravel Co., Route #1, Holly Koenig Coal & Supply Co., 1486 Gratiot Ave. Detroit, Michigan Kruse Gravel Pit, 1090 Clark Rd., Ypsilanti Kurtz Gravel Co., G-5300 N. Dort Hwy., Flint	Newaygo Macomb Berrien Sanilac, Macomb Oakland Ingham Washtenaw Jackson, Lenawee Washtenaw, Jackson Sanilac Oakland Wayne, Oakland Washtenaw Genesee
L.	
Lake Superior Gravel Co., Peter Giacherio Pres. Ramsey Lakeport Sand and Gravel Co., Lakeport A.S. Leffler Gravel Co., Davison A. Lindberg & Sons, Inc., Box 134, Ishpeming	Gogebic St. Clair Genesee Marquette

## Commerical Sand and Gravel Producers (contd.)

<u>Name and Address</u>	<u>Pit Location (County)</u>
L. (contd.)	
George Litchard, St. Ignace Lowell Gravel Co., Grand River Drive R.F.D., Lowell Steve Lyle, Sand & Gravel, 124 W. Pine, Big Rapids	Mackinac Kent Mecosta
M.	
Macomb Sand & Gravel, 3295 Auburn Road, Utica Maertens Sand and Gravel Co., 1036 Buckingham, Grosse Point Mike Mangine, Cedarville Manning-Locklin Gravel Co., Box 216, Northville Maritime Trades, Inc., 2010 Danforth Lane, Toledo, Ohio Leo E. Marr, Onsted Louis Marsack & Sons, 23633 Denhurst, St. Clair Shores H. L. Martin Gravel Co., Box 154, Westphalia Mason Gravel Co., Mason Hugh H. Mason & Sons, 302 N. Center Ave., Gaylord Mathews Gravel Co., 626 S. Mt. Morris Rd., Mt. Morris Michigan Sand and Gravel, Utica Michigan Silica Co., Rockwood Mickelson Bros., 1745 Seymore Lake Road, Oxford Mid American Eng. Corp., 4842 Dempster St. Skokie, Illinois Paul C. Miller, 10300 Sparta Ave., Sparta Roy Millimaki, River St., Box 323, Ishpeming Anthony Montano, U.S. 2, Sault Ste. Marie Moore Bros. Sand & Gravel, 7635 Wayne Road, Wayne Morains, Inc. 4842 Dempster St., Skokie, Ill. Morgan Sand & Gravel Co., 45095 Ryan Rd., Utica Muskegon Gravel Co., Muskegon	Macomb Macomb Mackinac Wayne Monroe Lenawee Macomb Clinton, Ionia Ingham Otsego, Cheboygan Genesee Macomb Wayne Oakland Kent Kent Marquette Chippewa Wayne Washtenaw Macomb Muskegon
N.	
Nashville Gravel Co., R.F.D. 2, Nashville New Hudson Sand & Gravel Co., New Hudson New Hudson Sand & Gravel Co., 19426 Grand River, Detroit 19 Nieb Concrete Products, Route 1, Niles Niles Sand & Gravel Co., U.S. Highway & Fort St., Niles North Star Washed Sand & Gravel Co. (Donald & Rood Owner), Ithaca Northern Sand and Gravel Co., Lake Road, Sault Ste. Marie	Barry Oakland Wayne Berrien Berrien Gratiot Chippewa

## Commercial Sand and Gravel Producers (contd.)

Name and AddressPit Location (County)

## N. (contd.)

Northland Construction Co., Box 160, Petoskey  
Northville Sand & Gravel Co., 18275 Beck Rd.  
Northville  
Northwest Materials, Inc., Bryan Ohio,  
Nugent Sand Co., Inc., P.O. Box 506, Muskegon

Emmet  
Wayne  
Hillsdale  
Muskegon

## O.

Oakland Sand & Gravel Co., 741 Glengary Road,  
Route 3, Walled Lake  
Otisville Stone Co., 5300 N. Dort Hwy., Flint  
(Howard & Bigelow Partners)  
Fred M. Ott, Bridgman  
Packard Supply Co., 4536 Packard Road, Ypsilanti  
Cy Page, Manitou Beach  
Edward Palmer & Son, 2527 E. South, Jackson  
John Parks Sand & Gravel, R.F.D. 1, Perry  
Pekaar & Van Doorn, 2774 S. Beltline S.W.  
Grand Rapids 9  
Peninsula Asphalt & Construction Co.  
Route 4, Box 185, Traverse City  
A. D. Pennock, Nashville  
William Perry & Son, Peffer St., Harbor Springs  
Peterhans Bros. Sand & Gravel, 506 Pear St. Caro  
Harold Peters, Washed Sand & Gravel, Decker  
Emil Piispanen, Bessemer  
Harry Pickitt, 409 Hubbard St., Allegan

Oakland  
Genesee  
Berrien  
Washtenaw  
Lenawee  
Jackson  
Shiawassee  
Kent  
Grand Traverse  
Barry  
Emmet  
Tuscola  
Sanilac  
Gogebic  
Allegan, Barry, Calhoun,  
Cass, Charlevoix, Clinton,  
Eaton, Ingham, Muskegon,  
Iosco, Kalamazoo, Kent,  
Newaygo, Ottawa, Presque  
Isle, St. Joseph, Van Buren,  
Washtenaw, Wayne.  
Lapeer  
Lapeer  
Lenawee  
Genesee  
Kent  
Berrien

E. J. Pine, Lapeer  
Pine Sand & Gravel, 2690 Imlay City Rd., Lapeer  
Porter Sand & Gravel Co., P. & H. Cement  
Products, Route 2, Tecumseh  
John Post & Sons, R.F.D. 2, Swartz Creek  
H. F. Postma, 2777 28th St., S.W., Grand Rapids  
Producers Core Sand Corp., 323 Warren Bldg.  
Michigan Center, Ind.

## R.

Ray Industries, Inc., P.O. Box 165, Oxford  
Ed Reetz, Box 58, W. Branch  
Riverside Sand & Gravel Co., Route 5,  
Grand Rapids 4

Oakland, Macomb  
Ogemaw  
Kent

## Commercial Sand and Gravel Producers (contd.)

Name and AddressPit Location (County)

## R. (contd)

Kay Robinson, Contractor, 4491 Vrooman Road,  
Jackson  
Rocks Sand & Gravel Co., 2500 Chicago Drive, S.W.  
Grand Rapids  
Walter Rosevear Pit, West Branch  
Rosteck Contractors, 15921 Fourteen Mile Road,  
Fraser  
Art Russell's Concrete Products, Hillsdale

Jackson  
Kent  
Ogemaw  
Macomb  
Hillsdale

## S.

Ray Sablain, Inc., 2827 S. Cedar St., Lansing  
Saginaw Core Sand Co., Saginaw  
Salem Gravel-Constr. Co., Inc. Box 45,  
5 Mile-Curtis Rd., Salem  
Mrs. Hilma Samuelson, Chatham  
John R. Sand & Gravel Co., 1865 Indianwood Rd.  
Lake Orion  
Sand Products Corp., 2489 First Nat'l. Bank  
Bldg., Detroit  
Sargent Sand Co., 2840 Bay Rd., Saginaw  
Justus Scelenberger, 1545 W. Fry Road, Burt  
E. L. Schwaderer, Cass City  
Scio Gravel Co., 2911 W. Delhi, Box 233,  
Ann Arbor  
Shenk Gravel Co., Donald Shenk, Sr., Durand  
Slaters Bald Mtn., 53055 N. Parke St., Pontiac 16  
Smith Sand and Gravel Co., Inc., 65985 Mound  
Road, Romeo  
Southern Michigan Materials Co., Bryan, Ohio  
Stamm Bros. Gravel Co. Route 1, Adrian  
Standard Sand Co., 14201 Lake Shore Ave.,  
P. O. Box 290, Grand Haven  
Stein Bock Gravel Co., Route 2, 822 Benton St.  
Hastings  
Gordon D. Stevick, 424 Patty Ave., Jackson  
Frank H. Stoerk, Pierson  
Helen Esther Stone, 308 E. State, St. Johns  
Straits Aggregate & Equipment Crop. Box 569,  
East Tawas  
H. Stukey, Coldwater

Ingham  
Saginaw, Genesee,  
Midland, Tuscola.  
Washtenaw, Oakland  
Alger  
Oakland  
Wayne, Manistee,  
Muskegon  
Saginaw  
Saginaw, Genesee  
Tuscola  
Washtenaw  
Shiawassee  
Oakland  
Macomb  
Hillsdale  
Lenawee  
Ottawa  
Barry  
Jackson  
Montcalm  
Clinton  
Iosco, Presque Isle  
Branch

## Commerical Sand and Gravel Producers (contd.)

<u>Name and Address</u>	<u>Pit Location (County)</u>
T.	
The Tabor Co., 125 Front Ave., N.W. Grand Rapids	(Cheboygan, Crawford
Lawrence Tamlyn, 125 Burdette St., St. Ignace	(Kent, Gratiot, Lake
Tecumseh Gravel Co., P.O. Box 496, Tecumseh	Mackinac
Thompson Sand & Gravel, 48399 W. 7 Mile Road	Lenawee
Northville	Wayne
Lamar Thumm, 117 S. Grove St., Ypsilanti	Washtenaw
Le Roy Tirb, Clinton	Lenawee
Twin Lakes Sand & Gravel Co., Riverdale	Gratiot, Montcalm
U.	
Underwood Sand & Gravel Co., 16525 Woodward Ave.,	
Detroit 3	Oakland, Macomb
C. Utterback, R.F.D. #2, Mt. Pleasant	Isabella
V.	
Robert Van Camp, Route 2, Peck Road, Croswell	Sanilac
Shirley Van Deusen, Route 1, Standish	Arenac
Van Enkevorts Bros., Bark River	Delta
Vaughans Sand & Gravel Co., 2685 Deckerville Rd.,	Tuscola
Caro	
Vermontville Gravel Co., Karl S. Benson,	Eaton
Route 1, Vermontville	Allegan
H. R. Vernon, Route 2, Fennville	
W.	
Ben Waanders, Route 5, Allegan	Allegan
Aubrey Wagner, Harbor Beach	Huron
Wakeman & Neva Ryns, Route 1, Coloma	Berrien
Lyle J. Walker Sand & Gravel, 21040 Coolidge Hwy.	
Detroit 35	Wayne, Oakland
Walling Gravel Co., P.O. Box 52, St. Johns	Clinton
F. S. Ward, Route 1, Clarkston	Oakland
Wayne Sand & Gravel Co., 40330 Tyler Road,	
Wayne	Wayne
Ronald Weaver, Route 1, Owosso	Shiawassee
N. Weitzel, Bad Axe	Huron
West Lansing Gravel Co., 1911 Pattengill Ave.	
Lansing	Ingham
West Shore Constr. Co., Zeeland	Ottawa, Allegan, Eaton,
	Kent, Newaygo, Oceana,
	St. Joseph
Wexford Gravel Co., P. O. Box 472, Cadillac	Wexford
I. L. Whitehead Co., Sault Ste. Marie	Chippewa

## Commercial Sand and Gravel Producers (contd.)

<u>Name and Address</u>	<u>Pit Location (County)</u>
W. (contd.)	
Whittaker & Gooding Co., 5800 Cherry Hill Rd.,	
Ypsilanti	Washtenaw
Olga Winkka, Box 926, Marquette	Marquette
John Woerner, Adrian	Lenawee
Wolverine Contractors, Inc., 19449 James Couzens	
Highway, Detroit 35	Wayne, Oakland
Y.	
John G. Yerington, Route 3, Box 34, Benton Harbor	Berrien, Calhoun
	Van Buren
Youngs Sand & Gravel, Harold-George Young	
9095 S. Huron River Drive, Ypsilanti	Washtenaw
Z.	
Elmer Zahn, Hillcrest St., Ypsilanti	Washtenaw
Zahns Sand & Gravel, 2315 Ellsworth Rd.	
Ann Arbor	Washtenaw
Harry Zeeff-Sons Gravel Co., 1029 Maynard Ave. S.	
Grand Rapids 4	Kent

## STONE PRODUCERS

<u>Name and Address</u>	<u>Type of Stone</u>	<u>Quarry Location</u>
Afton Stone and Lime Co. Afton, Michigan	Limestone, crushed	North of Afton Sec.25,T.35N.,R.2W. Cheboygan County
H. C. Albaugh III N. Parkview Marshall, Michigan	Sandstone	Marshall Sec.29,T.2 S.,R.6W Calhoun County
Arenac County Road Commission	Limestone, crushed (non-commercial)	Northeast of Au Gres Sec.5,T.19N.,R.7E. Arenac County
Bay County Road Commission	Limestone, crushed (non-commercial)	North of Omer Sec.3,T.19N.,R.5E. Arenac County
Charlevoix Lime & Stone Company Charlevoix, Michigan	Limestone, crushed	West of Charlevoix Sec.29,T.34N.,R.8W. Charlevoix County
F. G. Cheney Limestone Company, Incorporated	Limestone, crushed and dimensional	West of Bellevue Sec.20,T.1N.,R.6W. Eaton County
Chemstone Corporation 1122 Leader Bldg. Cleveland 14, Ohio	Limestone, crushed	Sec.2,T.33N.,R.8E. Presque Isle County
Drummond Dolomite, Inc. P. O. Box 688 Sheboygan, Wisconsin	Dolomite, crushed	Western end Drummond Is. Sec.24,T.42N.,R.5E. Chippewa County
Fiborn Limestone Co. Saulte Ste. Marie Ontario, Canada	Limestone, crushed	Sec.16,T.44N.,R.7W. Mackinac County
Earl A. Flock 50 Waubascon Rd. Battle Creek, Michigan	Sandstone	East of Battle Creek Sec.22,T.2S.,R.7W. Calhoun County
The France Stone Co. 1800 Toledo Trust Bldg. Toledo 14, Ohio	Dolomite, crushed	Monroe Sec.7,T.7S.,R.9E. Monroe County
Gogebic County Road Commission	Miscellaneous stone (non-commercial)	Gogebic County
Houghton County Road Commission Hancock, Michigan	Basalt, crushed (non-commercial)	Houghton County

## Stone Producers - contd.

<u>Name and Address</u>	<u>Type of Stone</u>	<u>Quarry Location</u>
Huron River Quarry Corp. Flat Rock, Michigan	Dolomite, crushed	Sec.36,T.4S.,R.9E. Wayne County
Inland Lime and Stone Co. Manistique, Michigan	Limestone, crushed	North of Hunt Spur Sec.6,T.42N.,R.12W. Mackinac County
Iosco County Road Commission	Limestone, crushed (non-commercial)	Northeast of Au Gres Sec.24,T.20N.,R.7E. Iosco County
John C. Jeffery Box 107 Parma, Michigan	Limestone, crushed	Northeast of Parma Sec.19,T.2S.,R.2W. Jackson County
The Metro-nite Company 3523 W. Silver Spring Dr. Milwaukee 9, Wisconsin	Dolomite, crushed	Near Felch Sec.26,T.42N.,R.28W. Dickinson County
Michigan Foundation Quarry Company Trenton, Michigan	Limestone, crushed	Trenton Sec.7,T.4S.,R.11E. Wayne County
Michigan Limestone Div. U. S. Steel Corporation 170 East Woodward Ave. Rogers City, Michigan	Limestone, crushed	Near Rogers City Sec.23,T.35N.,R.5E. Presque Isle County and
" "	Dolomite, crushed	Near Cedarville Sec.10,T.42N.,R.1E. Mackinac County
Michigan Stone Company R.F.D. #2 Ottawa Lake, Michigan	Dolomite, crushed	East of Ottawa Lake Sec.25,T.8S.,R.6E. Monroe County
Monroe County Road Commission Monroe, Michigan	Dolomite, crushed (non-commercial)	East of Dundee Sec.13,T.6S.,R.7E. Monroe County
Onaway Stone Company Onaway, Michigan	Limestone, dimensional	North of Onaway Sec.5,T.34N.,R.2E. Presque Isle County
The Original Sandstone Quarry Napoleon, Michigan	Sandstone	East of Napoleon Sec.6,T.4S.,R.2E. Jackson County
Penn-Dixie Cement Corp. 60 E. 42nd St. New York 17, New York	Limestone, crushed	West of Petoskey Sec.3,T.34N.,R.6W. Emmet County

## Stone Producers - contd.

Name and Address	Type of Stone	Quarry Location
Ray Sandstone Quarry 303 Nottawaseppee Napoleon, Michigan	Sandstone	East of Napoleon Sec.6,T.4S.,R.2E. Jackson County
Star Sandstone Company Box 102 Napoleon, Michigan	Sandstone	East of Napoleon Sec.31,T.3S.,R.2E. Jackson County
Superior Rock Products Company Sagola, Michigan	Dolomite, crushed Mica schist, crushed Feldspar, crushed	East of Randville Sec.35,T.42N.,R.30W. Secs. 19 and 30,T.42N., R.29W. Dickinson County
Thornton Construction Co. Hancock, Michigan	Dolomite, crushed	Northeast of Alston Sec.23,T.51N.,R.35W. Houghton County
The Wallace Stone Company Bayport, Michigan	Limestone, crushed and dimensional	Southeast of Bayport Sec.6,T.16N.,R.10E. Huron County
Wyandotte Chemicals Corporation Wyandotte, Michigan	Limestone, crushed	Alpena Sec.24,T.31N.,R.8E. Alpena County

# GENERALIZED COLUMNAR SECTION OF MICHIGAN

## MICHIGAN GEOLOGICAL SURVEY DIVISION

SYSTEM. SERIES	FORMATION. GROUP	LITHOLOGY	THICKNESS	ECONOMIC PRODUCTS
<b>RECENT</b>				
<b>PLEISTOCENE</b>	GLACIAL DRIFT	SAND, GRAVEL, CLAY, boulders, marl	0-1000	SAND, GRAVEL, PEAT, MARL, FRESH WATER
"PERMO-CARBONIFEROUS"	"RED-BEDS"	SHALE, CLAY, SANDY SHALE, gypsum		
<b>PENNSYLVANIAN</b>	GRAND RIVER	SANDSTONE, sandy shale	80-95	BUILDING STONE, FRESH WATER
	SAGINAW	SHALE, SANDSTONE, limestone, coal	20-535	SHALE, COAL, FRESH WATER, BRINE, GAS
<b>MISSISSIPPIAN</b>	BAY PORT	LIMESTONE, SANDY OR CHERTY LIMESTONE, SANDSTONE	2-100	LIMESTONE, FRESH WATER
	MICHIGAN	SHALE, gypsum, anhydrite, sandstone	0-500	GYPSUM
	"MICHIGAN STRAY"	SANDSTONE	0-80	GAS
	MARSHALL	SANDSTONE, sandy shale	100-400	FRESH WATER, BRINE BUILDING STONE
	COLDWATER	SHALE, sandstone, limestone	500-1100	SHALE, FRESH WATER
	SUNBURY	SHALE	0-140	
	BEREA - BEDFORD	SANDSTONE, SHALE	0-325	GAS, OIL
<b>DEVONIAN</b>	ELLSWORTH - ANTRIM	SHALE, limestone	100-950	SHALE, GAS
	TRAVERSE	LIMESTONE, SHALE	100-800	LIMESTONE, OIL, GAS, FRESH WATER
	BELL	SHALE, Limestone	0-80	SHALE
	ROGERS CITY - DUNDEE	LIMESTONE	0-475	LIMESTONE, OIL, GAS, FRESH WATER
	DETROIT RIVER	DOLOMITE, limestone, salt anhydrite	150-1400	LIMESTONE, DOLOMITE, OIL, GAS, SALT, BRINE, FRESH WATER
	SYLVANIA	SANDSTONE, SANDY DOLOMITE	0-550	GLASS SAND, FRESH WATER
	BOIS BLANC	DOLOMITE, CHERTY DOLOMITE	0-1000	
<b>SILURIAN</b>	BASS ISLAND	DOLOMITE	50-570	DOLOMITE, FRESH WATER
	SALINA	SALT, DOLOMITE, Shale, anhydrite	50-4000	SALT, GAS, OIL
	NIAGARAN (Guelph - Lockport - Engadine) (Manistique - Burnt Bluff) (Cataract)	DOLOMITE, Limestone, shale	150-800	LIMESTONE, DOLOMITE, OIL, GAS, FRESH WATER
	<b>ORDOVICIAN</b>	CINCINNATIAN (Richmond) (Maysville - Eden)	SHALE, LIMESTONE	250-800
TRENTON - BLACK RIVER		LIMESTONE, DOLOMITE	200-1000	OIL, GAS, LIMESTONE, FRESH WATER
ST. PETER		SANDSTONE	0-150	FRESH WATER
<b>OZARKIAN OR CANADIAN</b>	PRAIRIE DU CHIEN	DOLOMITE, Shale	0-410	
	HERMANVILLE	DOLOMITE, SANDY DOLOMITE, sandstone	15-500	
<b>CAMBRIAN</b>	LAKE SUPERIOR (Munising) (Jacobsville)	SANDSTONE	500-2000	BUILDING STONE FRESH WATER
<b>ALGONKIAN</b>	KEWEENAW (Copper formations)	LAVA FLOWS, conglomerate, shale, sandstone	9800-35000	COPPER, SILVER, ROAD METAL, SEMI-PRECIOUS GEM STONES
	KILLARNEY GRANITE	GRANITE, GNEISS, diorite, syenite		
	HURONIAN (Iron formations)	SLATES, HEMATITE, SCHIST, QUARTZITE, GRANITE, marble, dolomite	2000+	IRON ORE, ROOFING SLATE, ROAD METAL, GRAPHITE MARBLE
<b>ARCHEAN</b>	LAURENTIAN	SCHIST, GNEISS, GRANITE		ROAD METAL, BUILDING STONE, VERDE ANTIQUE, TALC, GOLD
	KEEWATIN	SCHIST, GREENSTONE, SLATE		ROAD METAL