STATE OF MICHIGAN

DEPARTMENT OF CONSERVATION

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GEOLOGICAL SURVEY DIVISION

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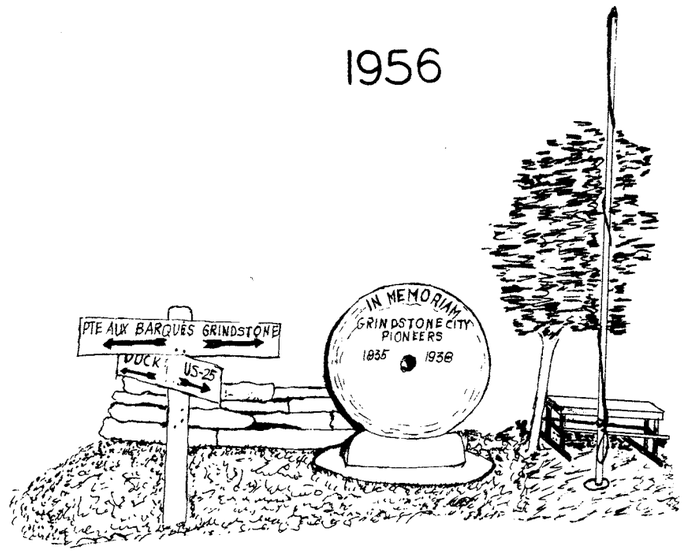
MICHIGAN'S MINERAL INDUSTRIES

1956



FEBRUARY 1958

MICHIGAN

MINERAL INDUSTRIES

1956

by

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FOREWORD

This report is a record of Michigan Mineral Industries for the calendar year 1956 compiled from statistical reports and information filed by the mineral producers of the state and in cooperation with the Bureau of Mines.

The estimated value of mineral production for 1957 was submitted by the United States Bureau of Mines on December 20, 1957. The section on developments in the mineral industries was prepared from office and field conferences with mineral producers, and from articles published in Pit and Quarry, Rock Products, Mining Journal, and other trade journals.

CONTENTS

LATE DEVELOPMENTS IN MICHIGAN'S MINERAL INDUSTRIES

Since the close of 1956 a number of noteworthy events have been recorded in activities of Michigan's mineral industries. In mid-September, 1957, Calumet and Hecla decided to reduce production of copper by suspending operation of some high cost mines. However, the company planned to absorb as many of the displaced employees as possible by increasing production of its higher grade properties. Although development work continued, about 500 men were laid off.

United States Metal Refining Company are operating six diamond drills in exploration of a large tract north of Wakefield, between the Gogebic Iron Range and the south shore of Lake Superior. The acreage is underlain by large potentially valuable copper-bearing formations.

Harry Hardenberg, Mining Geologist for the Geological Survey Division, estimated the 1957 iron ore reserve to be 154,208,852 tons a value of $93,815,000. This compares to 152,259,276 tons in 1956 valued at $90,716,500. Marquette Range has the largest reserves, 64,463,706 tons; the Menominee Range has 1,000,000 ± tons less than Marquette. The Gogebic Range has 26,209,049 tons and is the only range that showed a decline from 1956 estimate. The White Pine Copper Company valued at $11,000,000 was the largest Michigan copper property.

Cleveland Cliffs Iron Company's Mather mine on the Marquette Range constructed a tunnel under the large mine rescue training room at "B" shaft which is used for training mining rescue squads. The tunnel can be filled with smoke closely simulating conditions in an actual mine fire. The men receiving the training enter with oxygen apparatus and are taught such things as building a brattice from planks and poles placed near the mouth of the tunnel. (A brattice is a partition or wall used tc prevent air circulation and thus smother a fire) The men receive best possible preparation for the hazardous job of fighting a real underground fire. During 1956 Cleveland-Cliffs moved-in a diamond drill one mile north of Cooks, a small town in eastern Delta County near the west line of the Schoolcraft County, less than ten miles from Lake Michigan. The company considers the drilling "a wildcat exploration" as it is not near either the Menominee or Marquette range.

M. A. Hanna Company's new circular shaft is being sunk at a rate of about 8 feet (of completed shaft) per day as its project in the Mineral Hill area, Iron County, Michigan. The company is also erecting a new surface plant. Both projects are to save the Homer and Wauseca underground iron mines, by replacing existing facilities which will become inadequate as mining goes deeper. The new shaft will be 2,000 feet deep and will be ready for production in 1960.

Dannes Temple, a spokesman for the St. Lawrence Cement Company of Clarkston, Ontario, announced that a new multimillion-dollar cement plant is to be built near Dundee, Monroe County. St. Lawrence Cement Company is controlled by Holderbank Finance SA., a Swiss cement manufacturing group. It is reported that a 2000-acre site has been acquired by Senned Realties Corporation, a Delaware organization in which the St. Lawrence firm has an interest. St Lawrence plans to ship a large part of the cement for the construction of the plant from its plants in Villeneuve, Quebec, and Clarkston, Ontario.

The Huron Portland Cement Company celebrated its Golden Anniversary during 1957. It was founded on January 29, 1907, in Detroit and now operates the largest single cement mill in the world at Alpena. In 1956, 24 kilns produced more than 25,000 barrels of cement a day at the Alpena Mill. Output was increased during 1957 when two large new kilns, equipped with preheaters, were put into production. In 1915 Huron instituted a method of shipping cement in bulk from its main plant at Alpena to its processing and distribution plants throughout the Great Lakes region. Today Huron ships its production from Alpena, in its own fleet of six vessels to Detroit, Duluth, Cleveland, Buffalo, Toledo, Saginaw, Oswego, Muskegon, Milwaukee, Green Bay, and Superior. A new storage plant on the St. Joseph River near Benton Harbor, Berrien County, is under construction Desiring to have its own source of limestone Huron has bought the Wyandotte Chemical Corporation's mile-wide limestone quarry at Alpena, which has supplied Huron for 50 years. The sale did not include ownership of the limestone-carrying fleet of Wyandotte Transportation Company, a subsidiary of the chemical firm.

Garner A. Beckitt, president of the Riverside Cement Company, San Francisco, California, announced late in 1957 that negotiations are underway for a merger of the Riverside Cement Company, the Hercules Cement Corporation, Philadelphia, Pa., and the Peerless Cement Corporation, Detroit. The total annual capacity of the merged company will be approximately 18,500,000 bbl., making it one of the largest cement firms in the country. Under the plans, the combined company will have a new name. Properties and businesses now owned by the three corporations will operate as autonomous divisions of the combined company, but present brands and product names will not be changed.

An 11-week strike closed Penn-Dixie Cement plant at Petoskey, from mid-May to the end of July. Loss in production should reflect on 1957 cement output of The Michigan Portland cement industry.

U. S. Bureau of Mines reported that in 1956 the production of Portland cement for the nation was 6 percent greater than in 1955, reaching a high of 316,000,000 bbls. Shipments of Portland cement rose to 308,678,000 bbls., valued at $940,000,000, an average value of $3.05 per barrel.

Renaming ceremonies for two self-unloading vessels of the Bradley Transportation Line, operated by the Michigan Limestone Division of the United States Steel Corporation took place during the spring of 1957. The B. H. Taylor was rechristened the Rogers City in honor of the "Limestone Capitol of the World", and the A. F. Harvey became the Cedarville, in honor of the division's newest dolomite quarry.

The long abandoned Woolmith quarry, located about one mile northeast of Maybee, Monroe County, was dewatered late in 1956. Quarrying commenced the following year by Kramer and Sons to supply stone for Borin Aggregates of Detroit.

National Gypsum Company is proceeding with developments of its Tawas City gypsum quarry, anticipating production in the spring of 1958. Gyp-rock will be produced by open pit method. A year's supply of rock will stockpiled at National City, and the remainder shipped to new plants in

Ohio and Illinois.

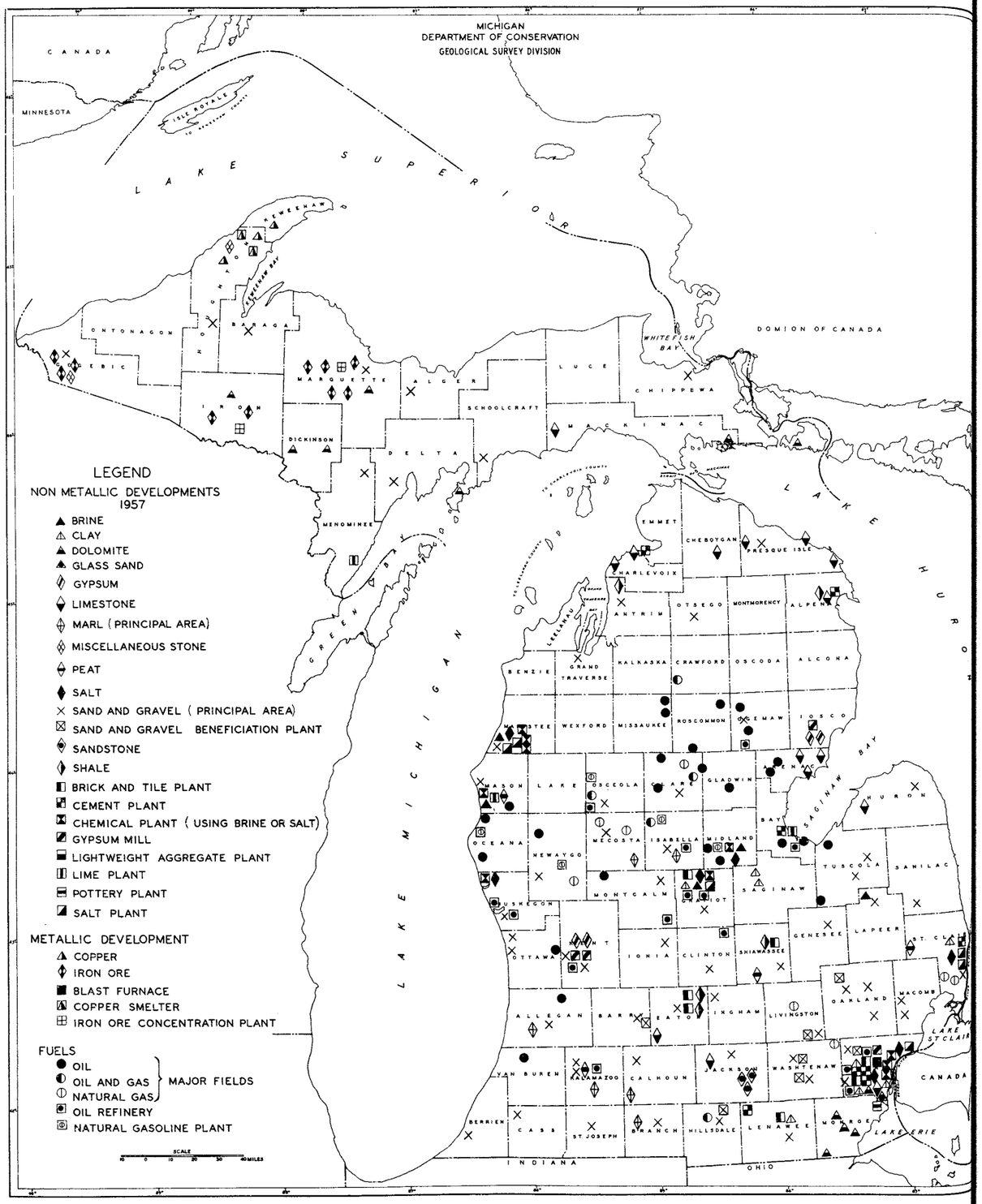
The first two pipe lines used to transport brine between two countries were laid in November of 1957 from Canadian Brine, Ltd., just north of Ojibway, Ontario, to The Solvay Process Division plant on Zug Island, Wayne County. The twin 10-inch heavy iron pipes, 20 feet apart and each a mile in length, will deliver brine amounting to a million tons of dry salt annually.

International Salt Company, Inc., Scranton, Pa. (owner and operator of the salt mine under Detroit) has been granted a 50-year lease by the state of Ohio for a $7,500,000 salt mine project under the water of Lake Erie. The company will sink a 2000-foot shaft on Whiskey Island where the company has purchased 16 acres and will tunnel from the bottom of the shaft to the salt deposit.

Michigan Chemical Industry, our sixth largest employer, provides jobs for nearly 40,000 persons, and continues to expand and to turn out innumerable varieties of chemical goods. Dow Chemical Company of Midland which employs 10,500 persons plans to build within the next two years a two-million dollar catalyst plant at Ludington, a petro-chemical plant in Bay City, and a half mile long new headquarters at Midland. Michigan Chemical Company plans a $2½ million expansion, Parke Davis Company of Detroit is planning a new research unit at Ann Arbor and the Upjohn Company, of Kalamazoo, recently expanded operations in the state. The Ott Chemical Company is constructing a $300,000 unit in Dalton Township to produce intermediate chemicals. The American Agricultural Chemical Company of New York opened plants at Bay City and Kalamazoo. The American Nitrogen Corporation built in Traverse City, and Cowles Chemical Company of Cleveland acquired a site for a new plant near Monroe, Monroe County. Wyandotte Chemical Corporation scheduled an oxide products plant in Wyandotte for completion in 1957. The plant will process polyethers which are said to improve life and lower manufacturing costs of items using polyurethane foam plastic.

American Aggregates Corporation, at its Green Oaks, Livingston County plant, largest gravel operation, uses 20-inch diameter steel pipe to carry material from the large dredges to the desanding tables. The rate is 1,000 tons of gravel per hour. Annual production capacity of the plant exceeds 2,500,000 tons.

Six commercial sand and gravel plants employing heavy media separation and one plant using a new process "elastic fractionation", based on difference in elastic nodule of sound hard stone and the deleterious soft and absorbent stones, have now been established in Michigan in pits and deposits that were considered incapable of producing quality gravel suitable for specified highway concrete. These concerns are: American Aggregate Corp., Green Oaks, Livingston County; Bundy Hill Gravel Company, Somerset Center, Hillsdale County; Harry Pickett, Northville, Wayne County; Killians Gravel Company, Ann Arbor, Washtenaw County; Groverland Gravel Company, near Davisburg, Oakland County; Nashville Gravel Company, Nashville, Barry County; and Whittaker and Gooding Gravel Company ("elastic fractionation process"), near Dexter, Washtenaw County.



MICHIGAN

MINERAL PRODUCTION

1956

To appreciate Michigan's mineral resources it is necessary to have some knowledge of the geology of the State.

In Michigan rocks of the Precambrian, Paleozoic, and Cenozoic eras are found. No deposits of the Mesozoic are in the state. The Cenozoic era is represented only by deposits of the Pleistocene and recent epochs.

The Precambrian rocks are chiefly igneous and metamorphic although some sedimentary rocks are represented. These rocks are near or at the surface in the western part of the Northern Peninsula.

The Paleozoic rocks of Michigan are sedimentary - sandstones, shales, limestones and dolomites, gypsum and salt. Paleozoic rocks are in the central part of the Southern Peninsula, and are flanked in circular fashion by older Paleozoic rocks, the oldest, the Cambrian, comes to the surface in the Northern Peninsula.

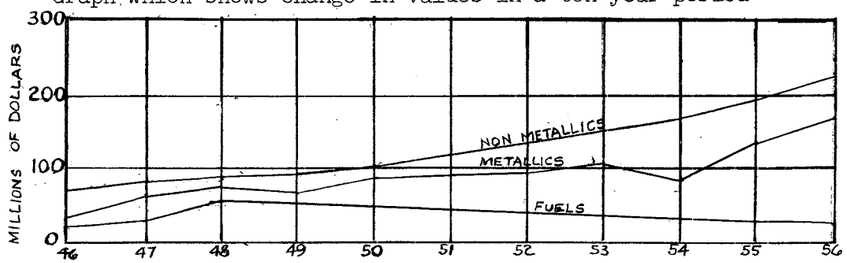
The youngest deposits, the Pleistocene, are known as glacial drift - gravels, sands, clays, and till, that cover the entire state. During 1956 Michigan's mineral production increased 9.5 percent over 1955 to an all time high. New production highs were established for bromine, cement, sand and gravel, salt, clay and shale, magnesium compounds, and calcium-magnesium chloride. Non-metallic mineral production increased 13 percent and metallic mineral production increased 8 percent. The production of fuels, however, declined 3 percent.

In volume of mineral production in 1956 in the United States Michigan ranks: First in gypsum, salt, and marl; Second in iron ore, bromine, magnesium compounds, sand and gravel and stone; Third in peat; Fourth in Portland cement; Sixth in copper.

The following table gives the value of Michigan mineral production in 1956:

	Value	Percent
Non-Metallics	$ 216,806,204	53.3
Metallics	157,219,225	38.7
Fuels	32,537,804	8.0
Total	$ 406,563,233	100.0

Graph which shows change in values in a ten-year period



Relative value of Minerals and Mineral Products in Michigan, 1946-56.

METALLIC MINERALS

Iron Ore

Geological formation - Huronian. Iron production is principally from four counties - Dickinson, Gogebic, Iron, and Marquette. The most important iron-bearing zone is in the middle Huronian.

Shipments of irom ore, from 29 underground mines and 10 open pits totaled 12,536,302 long tons (2,240 lbs.) in 1956, a decrease of 11.4 percent from 1955. Work stoppages caused by steel and shipping strikes resulted in the decreased production. However, iron ore held top position in value of minerals produced.

Iron Ore Shipments by Ranges, 1956

	Number of Mines		Iron Ore Shipped (Long Tons)		
Range	Underground	Open Pit	Direct Shipping	Siliceous	Total
Marquette	11	6	5,394,774	294,239	5,689,013
Menominee	12	3	3,782,566	106,647	3,899,213
Gogebic	6	1	2,958,076	. . .	2,958,076
Total	29	10	12,135,416	400,886	12,536,302

The Republic Mine began commercial operation early in 1956. This mine is the second and largest low grade iron ore operation utilizing Michigan "Jasper Ore". The mine is owned by the Marquette Iron Company, a union of the Cleveland-Cliffs Iron Company (which operates the property), Inland Steel Company, International Harvester Company, Jones and Laughlin Steel Corporation and the Wheeling Steel Corporation. Geared to an output of 550,000 tons per year, the Republic set-up follows the Humboldt Mine in this new activity in Northern Michigan iron ranges.

Working three shifts on a five-day week, the open pit operation supplies the mill with from 3,500 to 4,000 tons per day of 30 percent Jasper. Two tons of crude yields one ton of concentrate, 63 percent iron and 8 percent silica.

Republic features froth flotation treatment using an oil reagent from forest industries. Two units have 59 flotation cells.

The pelletizing plant located at Eagle Mills, also features new techniques: four Flying Saucer agglomerating discs and an updraft traveling grate that can turn out 2,000 tons of pellets per day. First shipments, about 4,500 tons of pellets, were made by boat to the International Harvester Steel Plant at Chicago on October 3, 1956.

M. A. Hanna Company announced plans to sink a 26-foot diameter, concrete circular shaft to a depth of 2,000 feet on what is known as the Minckler farm property, at Mineral Hill on the Menominee Range, Iron County. A large surface plant including offices, change house, and shops will be constructed at the shaft. This project will not open a new property but is

to be a joint plant to serve the Homer and Wauseca mines.

The Richmond mine, of the M. A. Hanna Company, located near Palmer, was closed permanently April 9, 1956. The Richmond Iron Company was incorporated in 1898 and operated the old Richmond mine until 1927 when a nearby property was opened and operated as the New Richmond until its abandonment.

Lake Superior and Ishpeming Railroad Company announced that they will construct an iron ore loading facility on Little Bay de Noc on Lake Michigan in the vicinity of Rapid River. The decision to establish this facility was largely due to the demand for iron ore at Chicago and the development and pelletization of low grade ores. The new dock will be a belt conveyor type to speed loading of boats and to minimize breakage in handling iron ore pellets.

Shipments and Value of Iron Ore, 1952-1956

Year	Shipments (Long Tons)	Value
1952	11,798,250	$ 83,942,523
1953	13,380,756	91,402,764
1954	9,722,882	69,226,417
1955	14,148,123	107,890,161
1956	12,536,302	105,688,087

Copper

Geological formation - Keweenawan. The production of copper in Michigan is entirely from rocks classified as Keweenawan. Copper is at many horizons throughout the Keweenawan series which extends from the Northern Peninsula south and westward into Wisconsin.

Production records begin in 1845, however, copper was mined at or near the surface prior to that time. Charred wood unearthed during an archaeological expedition to Isle Royale in Lake Superior was dated by radio-active carbon 14 method in a University of Michigan laboratory. According to Dr. R. W. Drier, Professor of Metallurgical Engineering at Michigan College of Mining and Technology, evidence found indicated mining pits were opened on the island as early as 2000 B.C. The ancient miners heated copper-bearing rocks with fire, then poured water on the rocks to split them.

Michigan produced 123,280,235 pounds of copper during 1956, an increase of 23 percent in production and 37 percent in value over 1955. Thirteen copper mines in Houghton, Keweenaw, and Ontonagon counties produced approximately 93 percent of the total copper output. The remaining 7 percent was recovered by three reclamation plants in Houghton County from tailings or waste rejected by earlier mill operations. The 1956 copper production in Michigan was the largest since 1930 when 169,297,775 pounds were produced. The year of peak production was 1916 when

269,794,531 pounds were produced. The average price used in calculating the value of copper in 1956 was 41.8 cents per pound.

Number 13 shaft of the Calumet and Hecla, Inc., Osceola lode in the Keweenaw Peninsula was completely unwatered. Mining started on the lower levels and a substantial rate of production was in progress. Unwatering of the Number 6 shaft was completed late in 1956 and mining of copper was expected to begin about mid-1957.

The White Pine Copper Company authorized the purchase of two long conveyor systems to replace the long underground truck haulage. When the conveyor system is installed the trucks will carry the ore from the headings to the conveyors which in turn will deliver the ore to the underground crusher and to the surface.

Copper Production, 1956

County	Mines	Reclamation	Copper Production (Pounds) Mines	Reclamation	Total
Houghton	5	3	12,374,918	9,024,928	$ 21,399,846
Keweenaw	6	0	25,267,891		25,267,891
Ontonagon	2	0	76,612,498		76,612,498
Total	13	3	114,255,307	9,024,928	$ 123,280,235

Copper Production, 1952-1956

Year	Quantity (Pounds)	Value
1952	43,939,304	$ 10,820,054
1953	47,999,690	13,832,951
1954	44,786,803	13,298,994
1955	99,996,160	37,489,560
1956	123,280,235	51,531,138

FUELS

Petroleum

Geological formation - Marshall, Berea, Traverse, Dundee, Detroit River, Salina-Niagaran, Trenton. Petroleum production in Michigan is chiefly from Devonian rocks, however, some production is from Mississippian, Silurian, and Ordovician rocks.

Petroleum production in Michigan in 1956 decreased 5 percent in quantity and 5 percent in value below 1955. At the end of 1956, 4,191 producing wells were in 40 counties. Approximately 32 percent of the total output was from Arenac, Isabella, and Clare counties. More than a million barrels were produced in each county.

During the year 463 wells were completed (196 oil producers, 12 gas producers, 227 dry holes). Of these completions 165 were wildcats (12 oil producers, 1 gas producer, and 152 dry holes). The remaining 270 completions were field wells (184 oil producers, 11 gas producers, and 75 dry holes).

Fifteen refineries, in ten counties, processed more than 99 percent of the crude oil produced in Michigan during 1956. Michigan crude supplies nearly one third of the oil refined in the state. The combined normal daily capacity of all Michigan refineries is approximately 165,000 barrels.

Detailed information for oil and gas operations is recorded in the pamphlet "1956 Summary of Operations, Oil and Gas Fields", available from Michigan Geological Survey.

Petroleum Production and Accumulated Oil by Formation, 1956

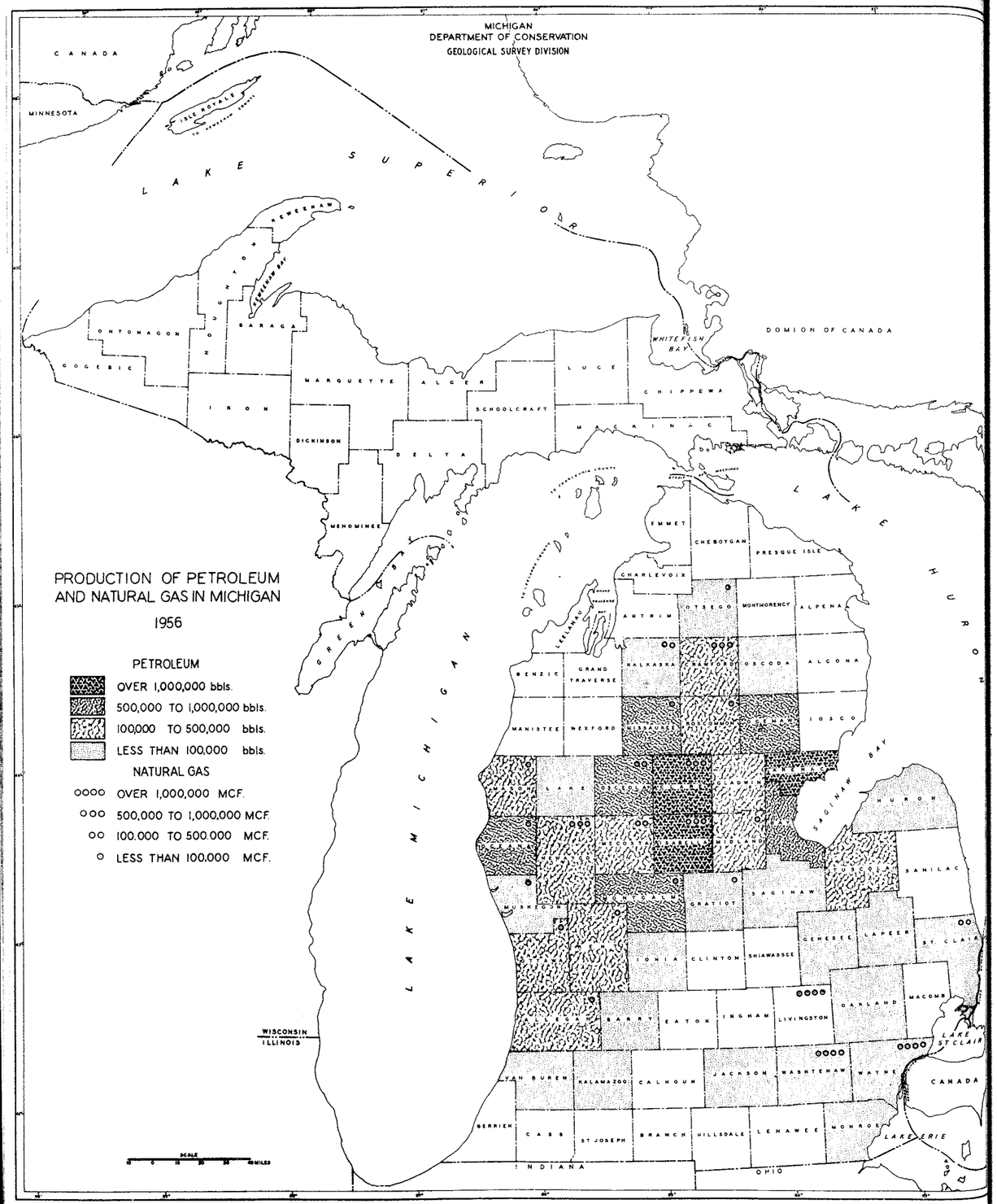
Formation	Production (Barrels)	Per Cent	Accumulated (Barrels)	Per Cent
Marshall	1,678	.02	59,142	.01
Berea	24,356	.23	2,076,630	.52
Traverse	1,971,416	18.35	81,447,462	20.58
Dundee	5,638,662	52.50	288,264,025	72.82
Detroit River	2,993,221	27.87	23,016,730	5.82
Salina-Niagaran	8,207	.08	62,556	.01
Trenton	102,157	.95	943,893	.24
Total	10,739,697	100.00	395,870,446	100.00

Petroleum and Natural Gas Production, 1952-1956

Year	Petroleum Barrels	Petroleum Value	Natural Gas M. cu. ft.	Natural Gas Value
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
1955	11,265,832	32,074,018	6,787,697	1,187,846
1956	10,739,697	30,607,137	8,840,933	1,556,575

Natural Gas

Geological formation - Glacial drift, Michigan Stray-Marshall, Berea, Antrim, Traverse, Dundee, Detroit River, Richfield, Salina-Niagara, Trenton. Natural gas production increased 30 percent to 8,840,933,000 cubic feet in 1955. Of this amount 1.97 billion cubic feet was oil well gas. Natural gas was produced from 310 wells in 23 counties. Washtenaw, Wayne, and Livingston counties led with 50 percent of the state total



Gas Production and Accumulated Gas by Formations - 1956

Formations	Production (M. cu. ft.)	Per Cent	Accumulated (M. cu. ft.)	Per Cent
Glacial Drift Michigan Stray)			8,020	.00
Marshall)	1,987,501	19.09	207,244,397	66.75
Berea	54,445	.64	10,234,100	3.30
Antrim	11,084	.13	127,494	.04
Traverse	13,376	.16	7,057,393	2.28
Dundee	451,343	5.33	38,599,555	12.45
Detroit River	202,188	2.39	737,999	.24
Richfield	1,323,335	15.62	10,011.179	3.23
Salina-Niagaran	2,713,634	32.04	22,848,937	7.37
Trenton	2,084,027	24.60	3,150,808	1.02
Unassigned			10,287,581	3.32
Total	8,840,933	100.00	310,307,463	100.00

Natural Gasoline

Michigan in 1956, produced a total of 3,740,916 gallons of natural gasoline and allied products valued at $374,092 from oil well gas. Crawford County, with 76 percent of the state total, ranked first among the six producing counties.

Natural Gasoline Production, 1952-1956

Year	Quantity(Gallons)	Value
1952	5,330,139	$ 533,014
1953	4,414,351	441,438
1954	3,898,312	389,831
1955	3,612,912	361,291
1956	3,740,916	374,092

NON-METALLIC MINERALS

Portland Cement

Portland cement is a chemical combination of lime, silica, alumina, iron oxide, and small amounts of other ingredients to which gypsum is added to regulate the set. Chief raw materials used in cement manufacturing in Michigan are limestone, shale, and clay. These raw materials are obtained from the Paleozoic limestones and shales and Pleistocene clays.

Portland cement was produced by eight cement plants in the state. 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 quarried in the northern part of the Southern Peninsula. All gypsum was purchased as no cement company owns gypsum deposits.

Raw Material Used in the Manufacture of Portland Cement, 1956

Raw Material	Short Tons
Limestone	5,436,431
Clay and shale	1,560,627
Gypsum	146,759

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

The Huron Portland Cement Company, operating the largest plant of its kind in the world, expanded its facilities at Alpena to the extent that it can produce 10,000,000 barrels of Portland cement and masonry cement annually and furnish employment to more than 1,100 men. The company purchased Sportsman's Dock at Benton Harbor, Berrien County, as the site of a storage and handling plant. The site, on the St. Joseph River, is near the Chesapeake and Ohio Railroad right-of-way.

The new Peerless Cement Corporation cement plant in Detroit was completed and produced at the rate of 1,250,000 barrels annually. This output, added to the former 5,000,000 barrels volume of Peerless cement, gives the company nearly 30 percent of the state's total cement production. One of the most important features of the new plant is the 450-foot rotary kiln, largest in the state. Automation of many processes permits a crew of only 70 workers to handle operation of 3 shifts, 7 days a week.

Portland Cement Shipments, 1952-1956

Year	Shipments (Barrels)	Value	Rank in U.S.	No. of Plants
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
1955	19,738,400	58,048,378	4	7
1956	21,880,222	67,798,262	4	8

Stone

Geological formation - Marshall, Traverse, Dundee-Rogers City, Detroit River, Bass Island, Engadine, Burnt Bluff, Keweenawan, Huronian.

The Precambrian and Paleozoic rocks of the state contain limestone and dolomite, however, the Paleozoic formations are much more important as a source of stone. Limestone and dolomite made up over 99 percent of Michigan stone production. Approximately 61 percent of the stone was quarried from

the Rogers City Dundee, and Traverse limestone in Presque Isle, Cheboygan, Alpena, and Wayne Counties. The remaining 39 percent was from the Niagaran limestone and dolomites in Mackinac and Chippewa counties, the Bass Island and Detroit River dolomites in Monroe County, and the Bayport limestone from Huron, Eaton, Jackson and Arenac counties. Dimensional limestone was produced in Eaton, Huron, and Presque Isle counties.

Sandstone for rough construction, rubble, and flaggine stone was quarried from the Marshall sandstone of Mississippian age in Jackson and Calhoun counties.

Basalt from Precambrian rocks was crushed and used for road construction in Houghton and Gogebic counties.

Stone Production, 1956

Commodity	Quantity (Short tons)	Value
Limestone and dolomite:		
Crushed	24,586,940*	$ 23,832,728
Dimensional	33,117	110,159
Sandstone:		
Dimensional	10,930	91,360
Basalt:		
Crushed	71,500	101,750
Total	24,702,487	$ 24,135,997

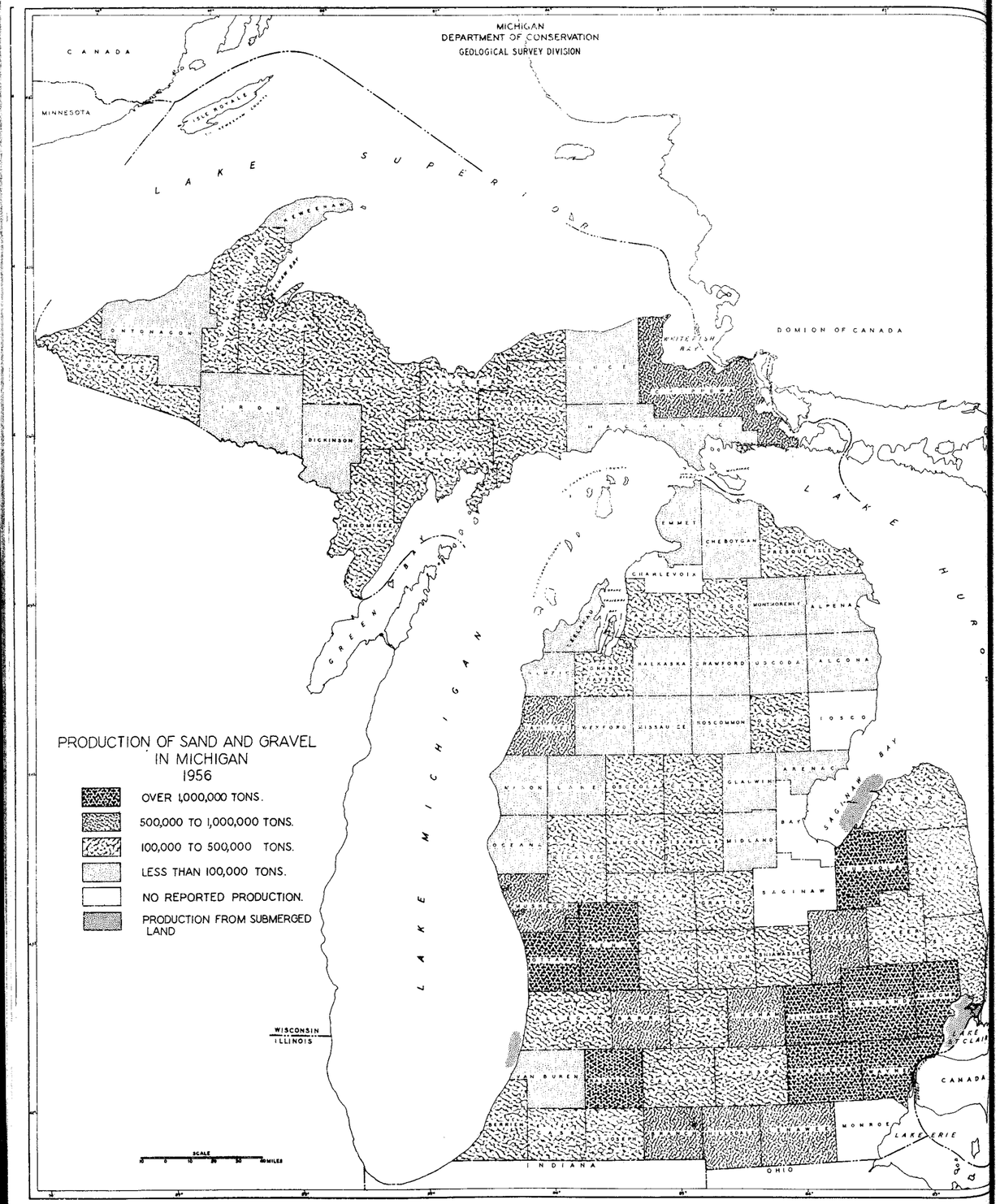
*Does not include 9.2 million tons of limestone used in the manufacture of Portland cement and lime.

Uses of Crushed Limestone and Dolomite, 1956

Uses	Per Cent of total	Quantity (short tons)	Value
Flux	57.1	14,039,485	$ 12,865,578
Concrete & Road metal	22.2	5,442,797	5,923,492
Chemical*	17.1	4,206,961	3,909,681
Agricultural	2.2	538,439	657,919
Railroad ballast	.8	204,210	241,157
Other**	.6	155,048	234,901
Total	100.0	24,586,940	$ 23,832,728

*Includes alkali, calcium-carbide, sugar, glass and paper.
**Includes paint filler, putty filler, asphalt, dust for coal mines, mineral food, store sand, and others.

Work was in progress on a multi-million dollar crushing plant at the Wyandotte Chemical Corporation, Alpena Quarry site. Wyandotte limestone was used in the manufacture of Portland cement at the adjacent Huron Portland Cement Corporation plant and for the production of alkali at the company's Wyandotte, Wayne County plant.



Production of Stone, 1952-1956

Year	Quantity (short tons)	Value	Rank in U.S.
1952	18,001,080	$ 15,590,573	4
1953	21,053,866	17,442,250	3
1954	19,461,818	17,526,743	3
1955	25,312,294	23,361,852	3
1956*	33,926,000	30,951,782	2

*Includes limestone used in the manufacture of cement and lime.

Sand and Gravel

Geological formation - Glacial Drift, Sylvania. Sand and gravel are obtained from glacial deposits - kames, eskers, outwash plains, delta of glacial streams, beach ridges, glacial drainage channels, beds of former glacial lakes and in less concentrated deposits in the glacial drift; from present-day beaches, river channels, and lakes; or from sand dunes. Sand is also obtained from the Lower Devonian Sylvania sandstone, a very pure quartz sand very loosely cemented, with grains of uniform fineness.

Uses of Sand and Gravel, 1956

Uses	Quantity (short tons)	Value	Per cent of total
Structural sand	6,147,165	$ 4,711,015	14.6
Paving and road sand	5,967,383	4,354,606	14.2
Molding sand	1,753,195	1,875,766	4.2
Grinding and polishing sand	243,082	85,078	.6
Other sand*	935,066	1,393,254	2.2
Paving and road gravel	21,287,457	16,874,824	50.5
Structural gravel	5,227,460	5,393,908	12.3
Railroad ballast gravel	233,721	226,509	.6
Other gravel	355,417	230,993	.8
Total	42,149,946	$ 35,145,953	100.0

*Includes glass sand, engine sand, filter sand, railroad ballast sand, and other sand.

Production and use of sand and gravel reached a new high in 1956. Quantity increased 14 percent and value 19 percent, or 42,149,946 tons value at $35,145,953. Sixty-five percent of the total sand and gravel output was used in road construction and 23 percent for structural purposes.

Production of sand and gravel was reported from 78 counties of Michigan. Approximately 59 percent of the total production was from nine counties in order of rank: Oakland, Livingston, Ottawa, Kent, Washtenaw, Wayne, Macomb, Tuscola, and Kalamazoo. About 47 percent of the state total was produced in Oakland County. Each of the other counties produced more than 1,000,000 tons. About 84 percent of the state's total was reported by commercial producers and the remaining 16 percent was noncommercial production by county road commissions and other governmental agencies.

Production of Sand and Gravel, 1952-1956

Year	Quantity (short tons)	Value	Rank in U.S.
1952	27,126,339	$ 21,050,125	2
1953	30,459,663	23,170,802	2
1954	32,035,729	25,458,503	2
1955	37,269,709	29,565,730	2
1956	42,149,946	35,145,953	2

Five commercial sand and gravel plants ranging in capacity from 100 to 300 tons per hour and employing heavy-media separation operated in the state at pits formerly considered incapable of producing premium-quality gravel suitable for specified highway concrete. These concerns are: American Aggregate Corp., Green Oaks, Livingston County: Bunday Hill Gravel Company, Somerset Center, Hillsdale County; Harry Pickitt, Northville, Wayne County; Killians Gravel Company, Ann Arbor, Washtenaw County; and Groveland Gravel Company, New Davisburg, Oakland County.

Salt

Geological formation - Marshall, Dundee, Detroit River, Salina.

Almost the entire Southern Peninsula of Michigan is underlain by great thicknesses of rock salt - one of the largest basins of salt deposition in the world. Artificial brines produced by dissolving 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 mined at Detroit is reached by a shaft approximately 1,100 feet in depth. Evaporated salt is produced from natural brines drawn from the Marshall and Dundee formations at St. Louis, Gratiot County, and from artificial brines from the Detroit River formation at Manistee, Manistee County. Artificial brines from the Detroit River formation are used at the chemical plant in Midland, Midland County.

Approximately 63 percent of the salt was used by chemical plants in Wayne, Midland and Muskegon counties. Over 1.9 million tons of salt were used in soda ash plants, and 1.5 million tons were used for the manufacture of chlorine and other chemicals.

Approximately 15 percent of the total production was dried and evaporated salt.

Uses of Salt, 1956

Uses	Quantity (short tons)
Chemical	3,733,500
Highway, Dust and ice control	798,600
Livestock	223,500
Textile, hides, and packers	203,500
Food processing	200,600
Table and other household	161,100
Metallurgy	54,800
Water treatment	44,800
Refrigeration	2,200
Other	125,600
Total	5,548,200

The 1956 production and value of salt reached an all-time high - 5,548,178 short tons valued at $35,643,860 was due primarily to use of a larger quantity of brine by chemical plants. Wayne ranked first of the six counties producing salt - Gratiot, Manistee, Muskegon, St. Clair, and Wayne. Four companies in Wayne County reported a combined total of 4,141,061 tons or approximately 75 percent of the state's total output.

Salt Production, 1952-1956

Year	Quantity (short tons)	Value	Percent of U.S. total	Rank in U.S.
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	24.5	1
1955	4,975,442	31,668,351	21.9	1
1956	5,548,178	35,643,860	22.9	1

Clay and Shale

Geological formation - Glacial Drift, Saginaw, Ellsworth, Antrim, Shale is exposed or under shallow cover in widely scattered areas in Michigan. Formations from Ordovician to Pennsylvanian age contain shale. The surface clays of Michigan are of three classes - drift clays, lake clays, and residual clays.

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. Saginaw shale used by three plants for manufacture of tile in Eaton and Shiawassee counties. 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 was set by the 11 producing counties. Wayne County led in production and value with 35 percent of the state's total output, followed by Alpena, Saginaw, and St. Clair counties. Approximately 74 percent of all raw clay and shale produced was used by the Portland cement industry. The remaining 26 percent 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 82 percent of the raw material for the manufacture of clay products and shale deposits the remaining 18 percent.

Production of Clay and Shale, and Clay Products, 1952-1956

	Raw Clay and Shale		Clay Products
Year	Quantity (short tons)*	Value**	Estimated Value
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
1955	1,937,593	2,091,077	7,292,477
1956	2,110,030	2,401,051	6,951,866

*Sold or Used.

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

Gypsum

Geological formation - Michigan. Large quantities of gypsum are in the Michigan formation of the state. Gypsum is near the surface in the vicinity of Grand Rapids, Kent County, and in the southeastern portion of Iosco County. Throughout the remainder of its belt of occurrence the gypsum is concealed by varying thicknesses of glacial drift. Underlying the remainder of the basin deep wells show the gypsum to be largely replaced by anhydrite.

Gypsum is quarried at Alabaster and National City, Iosco County, and is mined in two 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 plaster, wallboard, and allied building materials and as a Portland cement retarder.

Since 1945 Michigan, producing about 18 percent of the national total, has ranked first in the production of crude gypsum. In 1956, Michigan produced 1,715,832 short tons of crude gypsum valued at $5,861,152.

Production of Gypsum, 1952-1956

Year	Quantity (short tons)	Value	Per Cent of U.S.	Rank in U.S.
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
1955	1,762,105	5,660,587	-	1
1956	1,715,832	5,861,152	-	1

National Gypsum Company, Buffalo, N.Y. proceeded with development of the Tawas City Gypsum Quarry, anticipating production in the spring of 1958. Stripping of the overburden was started in the fall of 1956. New machinery delivered at the site included 40-ton trucks, bulldozers, graders and drills. Construction of the Crusher Building was in progress.

Gypsum will be extracted by open pit method. A year's supply of the gypsum rock will be stock-piled at National City, and the remainder shipped to new plants in Ohio and Illinois. The company may dredge a 12,000 ft. channel, 250 feet wide, in Lake Huron, near Tawas City, to permit loading of lake freighters.

Bestwall Gypsum Company, organized during 1956 at Ardmore, Pennsylvania, acquired and now operates the Certain-Teed Products Corp. Grand Rapids plant and mine. The name of the plant was officially changed to "Bestwall", July, 1, 1956.

Peat

Geological formation - Pleistocene. Peat deposits are very common in Michigan and practically every county in the state contains some peat. It is estimated by the United States Bureau of Mines that the glacial lakes and bogs of Michigan, Minnesota and Wisconsin contain 75 percent of the nation's total peat reserves. The quality of the peat varies greatly from bog to bog and within individual bogs. Much of the peat is very woody, some is sedgy and grassy, and some is pulpy. The United States Bureau of Soils publishes maps of the counties that have been surveyed for soils. These maps show peat areas. They may be obtained from the United States Bureau of Soils, Michigan State University, East Lansing. A report, "Peat, Origin, Uses and Distribution in Michigan", by Charles A. Davis, can be found in the Michigan Geological Survey Annual Report for 1906.

Peat production was reported in Lapeer, Shiawassee, Kalamazoo, and Mason counties in 1956. Michigan peat is used almost exclusively for horticultural purposes, marketed largely as a soil conditioner for lawns, golf courses, gardens, nurseries, and in greenhouses.

Production of Peat, 1952-1956

Year	Quantity (short tons)	Value	Per Cent of U.S.	Rank in U.S.
1952	36,020	$ 430,156	16.6	2
1953	25,439	257,176	12.5	4
1954	27,847	429,116	11.4	3
1955	30,000	465,000	11.0	3
1956	31,111	474,899	10.7	3

Marl

Geological Formation - Pleistocene.

The marl deposits of the state range considerable in extent as well as thickness depending in a large degree upon the character of the basin in which they develop and also upon the supply of calcareous material available to the inflowing water. Many of the larger and some of the smaller lakes of the state are floored throughout with marl of various degrees of thickness. In others, the marl may be a narrow rim or shelf around the margin which in places has developed a considerable thickness. The deposits of marl are limited in extent and thickness by the depression which confines them. They range in area from merely a fraction of an acre to several square miles in some localities and may contain thicknesses of 10 to 15 feet of marl but rarely is the thickness more than 30 feet.

All marl produced in the state is used for agricultural purposes. Commercial marl production was reported by 21 producers in 14 counties during 1956. Isabella County ranked first, followed by Kalamazoo, Calhoun, and Branch counties. These counties produced approximately 64 percent of the state output.

Production of Marl, 1952-1956

Year	Quantity (short tons)	Value	Rank in U.S.
1952	130,613	$ 119,705	1
1953	183,685	72,781	1
1954	106,668	37,724	1
1955	119,313	57,176	1
1956	157,246	94,821	1

Lime

Geological formation - Dundee, Burnt Bluff. Lime is either calcium oxide or the combined oxides of calcium and magnesium. It is obtained by heating limestone to a temperature at which the carbon dioxide is driven off. The stone is crushed, screened, and conveyed to rotary or vertical kilns where it is calcined at 2200° F into quick lime. Hydrated lime is produced by treating quick lime with water. Raw stone for the manufacture of lime

was obtained from the high calcium Dundee limestone in Presque Isle County and from the Burnt Bluff limestone in Mackinac County.

Production of lime in Michigan increased approximately 6 per cent in production and 13 percent in value over 1955. Mason County continued to rank first in production, followed by Menominee and Bay Counties. Ninety-three percent of the lime sold and used was quick lime. The remaining 7 percent was treated with water to form hydrated lime. All lime produced was sold or used for chemical and industrial use.

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. All 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.

Bromine, Calcium-Magnesium Chloride, Magnesium Compounds, Potash

Geological formations - Marshall, Dundee, Sylvania, Detroit River. Brines are produced in Michigan from a number of formations. The Marshall sandstone is in rocks under the central part of the state. The Sylvania sandstone is a broad belt from the Manistee-Ludington area to Detroit. The Detroit River formation is under almost the entire Southern Peninsula. The Traverse, Dundee, Berea and Parma which contain brine are present throughout the Southern Peninsula. Drillings find brine in one or more rock formations practically anywhere in the Southern Peninsula.

Natural brines from the Marshall, Dundee and Sylvania formations are used by chemical companies of Midland and Gratiot counties; and brine from the Filer sandstone of the Detroit River formation was used in Mason and Manistee counties. These natural brines are source material for many chemicals and chemical compounds.

Elemental bromine was produced in 1956 by four companies in six 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 company (Dow Chemical Company, 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-proof curing 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 1956 by the chemical plants increased 11 percent over the 1955 value. The greatest increase in value was recorded by bromine, followed by calcium-magnesium chloride, magnesium compounds, and potash.

Production of Magnesium Compounds, 1951-1956

Year	Quantity (tons)	Value	Rank in U.S.
1951	*	*	1
1952	*	*	2
1953	43,190	$ 4,591,922	2
1954	39,096	4,628,756	2
1955	86,264	5,630,978	2
1956	87,977	5,931,741	2

*Data concealed

Standard Lime and Cement Company expanded the capacity of their Manistee plant. Included in the expansion was an additional rotary kiln, more thickeners and settling basins, reactors, and accompanying equipment. Loading facilities at the plant were improved and enlarged.

Michigan Chemical Corporation announced its entry into the rare earth field through the acquisition of the Assets of Saturnium Corporation. In its new activities, the company will continue rare earth research as well as place in operation pilot-plant proceedures. The Saturnium research laboratory at California, Kentucky is being closed and its facilities moved to St. Louis, Michigan.

Water

Underground water is a source of watter supply for small communities in the state but large cities, with a few exceptions, either utilize waters of the Great Lakes or of the rivers on whose shores they were founded. During the retreat of the continental glacier deposits of glacial drift - sand, clay, gravel, boulders - were laid down on the bed rock. Many Michigan cities, villages, and rural areas now obtain fresh water from the sands and gravel beds of the glacial drift, from sands and gravels deposited in the moraines and outwash plains, or from the beaches and delta deposits of ancient glacial lakes and rivers. In other localities where the drift is relatively thin fresh water is recovered from underlying porous bedrock formations. In some places, however, it has been necessary to pipe large volumes of water from the Great Lakes to industrial areas or cities where ground-water resources are inadequate or

contain salty or brackish waters.

No data has been compiled on the gallons of water used for domestic, industrial, agricultural, scenic and recreational purposes and no dollar value has been assessed, however, best estimates available from the U. S. Department of Commerce are that 30,000 water wells are drilled in Michigan each year. Approximately one million water wells are in use for all purposes. Each citizen of modern society requires more than 1300 gallons daily to meet direct and indirect needs. Industry uses tremendous quantities for man's direct needs especially when we consider that for every 100 gallons of water a person uses directly, many times that amount is used for him by industry and service facilities. It takes 14,400 gallons of water to produce one ton of pig iron; 65,000 gallons to produce one ton of finished steel; 18 barrels of water to refine a barrel of oil; 15,000 gallons of water to make an automobile; 100 gallons of water to produce one slice of breakfast bacon.

Michigan is blessed with an abundance of water, however, since water resources are renewable (from rains and snows) and are transient (much water runs off to rivers, much is transpired to the air by plants) a great deal of information is required to adequately plan their development and uses. Appraisal of water resources is becoming more and more important to insure a lasting supply sufficient to meet needs of expanding industries as well as of an ever increasing population This appraisal includes consideration of climate, surface, and sub-surface, land forms, land uses, stream flow and other seemingly remote bits of information. Hydrological conditions regarding rainfall, runoff, and percolation must be understood in developing a water supply.

Precipitation from the atmosphere of water evaporated from the earth's surface is the source of all water supply. Only a small part of the rain-snow fall on the land is converted by man to his use. With an average rainfall of 30 to 33 inches per year only about 5 inches become useful groundwater. The remainder runs off to streams on its way back to the sea. Of the precipitation that enters the ground, plants transpire an enormous amount, and rainfall is not concentrated where water is most needed, in the industrial and irrigation areas.

Cities and areas plagued by water shortages grow in number every year. With adequate hydrological investigations, however, shortage in most communities can be met intelligently or avoided, by making an approximate analysis of the quantity and quality of water needed and by designing the systems on the basis of reliable information on the source of the water to be developed. Water can be provided in adequate quantity and quality in any part of the state if the funds are available to construct the necessary facilities.

GEM STONES

It is estimated by T. H. Miller, Deputy Director, United States Bureau of Mines that during 1956 some 50,000 "rock hounds" picked up stones and pebbles valued at more than $700,000 from the beaches, woods and fields of this country. Agates and thomsonite from the beaches of the Keweenaw Peninsula were the only reported gem stones collected in Michigan during the year. However, the following minerals and stones are frequently collected in the state, some when cut and polished are attractive enough to be classed as gem stones:

chlorastrolite
carnelian
prehnite
amethyst
algodonite
jaspilite
pyrolusite
martite
tourmaline
actinolite
celestite
Petoskey stone
rose quartz
datolite
chalcocite
chalcopyrite
whitneyite
goethite
psilomelane
grunerite
topaz
pyrite
gypsum
chalcedony
epidote
bornite
domeykite
natrolite
manganite
verde antique
garnet
tremolite
calcite (dog-tooth spar)

Value of Michigan's Minerals and Mineral Products, 1941-1956

Year	Value	Year	Value
1941	$ 135,492,921	1949	$ 207,607,694
1942	152,624,946	1950	238,474,008
1943	147,113,888	1951	257,529,882
1944	140,493,319	1952	267,089,423
1945	128,046,408	1953	287,693,135
1946	133,682,135	1954	286,549,922
1947	170,269,272	1955	371,356,604
1948	214,115,771	1956	406,563,233

TABLE I

MINERAL PRODUCTS OF MICHIGAN, 1956(1)

Product	Unit	Quantity	Value	Rank in U.S.(2)
Iron Ore	Long tons	12,536,302	$ 105,688,087	2
Cement	Barrels	21,880,222	67,798,262	4
Copper	Pounds	123,280,235	51,531,138	6
Natural Salines(3)	. . .	. . .	37,873,042	1
Salt	Short tons	5,548,178	35,643,860	1
Sand and Gravel	Short tons	42,149,946	35,145,953	2
Stone(4)	Short tons	33,926,000	30,951,782	2
Petroleum	Barrels	10,739,697	30,607,137	12
Clay Products	. . .	. . .	6,951,866	...
Gypsum	Short tons	1,715,832	5,861,152	1
Clay and shale	Short tons	2,110,030	2,401,051	9
Natural Gas	M. Cu. Ft.	8,840,933	1,556,575	16
Peat	Short tons	31,111	474,899	3
Natural Gasoline	Gallons	3,740,916	374,092	15
Marl	Short tons	157,246	94,821	1
Miscellaneous(5)			2,807,704	
Total			$ 406,563,233 (6)	

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

(2) Based upon quantity.

(3) Includes bromine, magnesium compounds, calcium-magnesium chloride and potash.

(4) Includes 9,223,513 short tons of limestone valued at $6,815,785 used in the manufacture of cement and lime.

(5) Includes lime, silver, mineral pigments, and gem stones.

(6) Value of limestone used in the manufacture of cement and lime and value of clay and shale used in cement and clay products not included in state total.

TABLE II

MINERAL PRODUCTS OF MICHIGAN, 1955(1)

Product	Unit	Quantity	Value	Rank in U.S.(2)
Iron Ore	Long tons	14,148,123	$107,890,161	2
Portland cement	Barrels	19,738,400	58,048,378	4
Copper	Pounds	99,996,160	37,489,560	6
Petroleum	Barrels	11,265,832	32,074,018	12
Salt	Short tons	4,975,442	31,668,351	1
Sand and Gravel	Short tons	37,269,709	29,565,730	2
Stone (3)	Short tons	25,312,294	23,361,852	3
Clay Products	. . .	. . .	7,292,477	...
Gypsum	Short tons	1,762,105	5,660,587	1
Magnesium Compounds	Short tons	86,264	5,630,978	2
Clay and Shale, raw	Short tons	1,886,976	(4)	9
Natural Gas	M. cu. ft.	6,787,697	1,187,846	17
Peat	Short tons	30,000	465,000	3
Natural Gasoline	Gallons	3,612,912	361,291	15
Marl	Short tons	119,313	57,176	1
Miscellaneous (5)	. . .	. . .	30,603,139	...
Total			$371,356,604	

(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, potassium salts, and gem stones (Agates, Datolite, Petoskey stone, Chlorastrolite, Jasper, and Thomsonite).

PRODUCTION AND VALUE
of
MINERALS AND MINERAL PRODUCTS
BY COUNTIES

1956

All counties reported mineral production for 1956. Marquette, Wayne, Ontonagon, Midland, Iron, Alpena and Gogebic led all others in value, contributing 59 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 contributing production data for 1956 are listed, by county, below production data. Location of the operation, when known, is given by section, township, and range, or nearest city to operation.

		Quantity	Value
ALCONA (78)			
Sand and gravel		73,303 tons	$ 34,763
Alcona County Road Comm.	NE SW 7 25N 6E	Sand and Gravel	
	SE SW 7 26N 9E	"	"
	NW NE 11 26N 9E	"	"
Michigan State Hwy. Dept.		"	"
ALGER (72)			
Sand and Gravel		119,967 tons	$ 72,921
Alger County Rd. Comm.	NW NE 4 45N 21W	Sand and Gravel	
Duluth, South Shore and Atlantic Railroad Co.		"	"
Michigan State Hwy. Dept.		"	"
Hilma Samuelson	NE SE 35 46N 21W	"	"
Olga Winkka		"	"

		Quantity	Value
	ALLEGAN (48)		
Petroleum		224,320 bbls.	$ 639,312
Sand and Gravel		211,423 tons	135,163
Marl (5th, 10%)		15,419 tons	7,196
Natural gas		21,091 M.cu.ft.	3,691
Total value			$ 785,362
Cleo L. Arndt	24 3N 16W		Sand and Gravel
L. Z. Arndt	Douglas ($3\frac{1}{2}$ mi. E. on 130th St.)		Marl
Gerald Arnsman	Hopkins		Marl
Ralph W. Bodine	SE SE 14 1N 12W		Sand and Gravel
Emil Pavlak	Martin		Marl
Harry Pickitt	NW SE 5 1N 14W		Sand and Gravel
	SW NE 34 3N 13W		
	NE 1 3N 13W		
	Edderback Pit		
	Monteray Pit		
	Pollett Pit		
Huitt and Son	NE SW 9 2N 13W		Sand and Gravel
Ben Waanders	NE NE 20 2N 13W		Sand and Gravel
West Shore Constr. Co.			Sand and Gravel
John G. Yerington	NE NE 22 3N 15W		Sand and Gravel
	ALPENA (6)		
Undistributed: Portland cement (1st), stone-crushed Limestone (5th), shale* (2nd), sand and gravel			**
Gilliland Gravel Co.			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

*Value of shale used in manufacture of Portland cement not included in county total.
**Mineral value included under undistributed at end of county breakdown.

		Quantity	Value
	ANTRIM (67)		
Sand and Gravel		250,747 tons	$ 154,845
Shale*			
Antrim Co. Rd. Comm.	NE NE 16 31N 6W		Sand and Gravel
	SE 26 32N 8W		" "
	NE SW 36 32N 9W		" "
Michigan State Hwy. Dept.			Sand and Gravel
Mid-American Engr. Corp.	Massa Pit near Alba		" "
Penn-Dixie Portland Cement Co.	SE 23 32N 8W		Shale
Harry Pickitt	Palus Pit near Alba		Sand and Gravel
The Taber Co.	NE SW 16 31N 6W		" "
	Central Lake		
	ARENAC (22)		
Petroleum (1st, 12%)		1,262,958 bbls.	$3,599,430
Stone		96,317 tons	97,037
Sand and Gravel		33,856 tons	26,489
Total value			$3,722,956
Arenac County Rd. Comm.	NW 5 19N 7E		Limestone
Eastman Gravel Pit	36 19N 5E		Sand and Gravel
Iosco Co. Rd. Comm.	SW 24 20N 7E		Limestone
Shirley Van Deusen	NE NW 17 19N 5E		Sand and Gravel
	BARAGA (42)		
Iron		122,401 tons	$1,016,233
Sand and Gravel		133,094 tons	75,643
Total value			$1,091,876
Baraga Co. Rd. Comm.	SW SE 7 49N 33W		Sand and Gravel
	SW SW 20 49N 33W		
	SW NE 23 51N 32W		
The Cleveland Cliffs Iron Co.			
Ohio-Webster (Open Pit)	22, 26, 27, 48N 31W		Iron Ore
Michigan State Hwy. Dept.			Sand and Gravel

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

		Quantity	Value
BARRY (50)			
Sand and Gravel		747,061 tons	$ 612,961
Petroleum		36,894 bbls.	105,148
Marl		6,250 tons	5,000
Total value			$ 723,109
Barry County Rd. Comm.	SW NW 25 2N 10W		Sand and Gravel
	SW NW 29 3N 9W		
	SE NW 4 4N 9W		
Bender Gravel Co.	SW NW 12 3N 9W		Sand and Gravel
Cole Gravel Co.	7 4N 10W		Sand and Gravel
Michigan State Hwy. Dept.			Sand and Gravel
Nashville Gravel Co.	NE 21 2N 7W		Sand and Gravel
A. D. Pennock	SW NW 1 2N 7W		Sand and Gravel
Harry Pickitt	SW NW 25 2N 10W		Sand and Gravel
	SE SE 26 2N 7W		
H.A. Carlton Schau	Kalamazoo		Marl
West Shore Constr. Co.			Sand and Gravel
John G. Yerington	SW SW 18 2N 8W		Sand and Gravel
	SW NW 12 3N 9W		
	Briggs Pit		
	Powers Pit		
	Gaskill Pit		
	Longstrout Pit		
Zeigler Sand and Gravel	SW 11 3N 8W		Sand and Gravel
BAY (10)			
Undistributed: Portland cement (3rd)			
Petroleum (5th, 7%), lime (3rd)			$ 10,864,185
Aetna Portland Cement Co.	Bay City		Portland cement
Monitor Sugar Co. Div.	Bay City		Lime
BENZIE (83)			
Sand and Gravel		10,011 tons	$ 10,011
Michigan State Hwy. Dept.			Sand and Gravel

		Quantity	Value
BERRIEN (59)			
Sand and Gravel		470,185 tons	$356,229
Binger and Haugh	NE 18 6S 19W		Sand
Ed Healy			Sand and Gravel
Ireland and Lester Co.	NW NW 24 4S 19W		Sand and Gravel
Harold Kiell	Niles		Sand and Gravel
Fred M. Ott	Troy		Sand and Gravel
Producers Core Sand Corp.	Sawyer		Sand
Wakeman and Neva Ryno	Coloma		Sand and Gravel
John G. Yerington	NE SW 36 7S 18W		Sand and Gravel
	NE SE 2 7S 17W		
	NW NW 20 5S 17W		
	NW SE 28 6S 18W		
	Ryne Pit		
	Phiscator Pit		
	Sill Pit		
BRANCH (57)			
Sand and Gravel		747,003 tons	$ 361,546
Marl (4th, 10%)		15,963 tons	6,244
Total value			$ 367,790
Branch Co. Rd. Comm.	1 Pit near Bronson		Sand and Gravel
	2 Pits near Coldwater		
Case Bros.	Bronson and Coldwater		Marl
Cleveland and Taylor			Marl
Harry Pickitt	NW NW 19 6S 6W		Sand and Gravel
H. Stukey Co.	SW SE 4 6S 6W		Sand and Gravel
Union City Gravel Co.	Union City		Sand and Gravel
Woodward-Pollock Lbr. Co.	NW SW 21 6S 6W		Sand and Gravel
CALHOUN (66)			
Sand and Gravel		299,541 tons	$ 175,326
Marl (3rd, 12%)		18,662 tons	8,411
Stone		50 tons	300
Total value			$ 184,037
John Alexander, Sr.	NW NE 33 2S 5W		Sand and Gravel
Carl Avery	2 Pits near Marshall		Marl
Battle Creek Gravel Co.	SW NE 15 1S 7W		Sand and Gravel
	NW SE 33 1S 8W		
	SW SE 4 2S 8W		

		Quantity	Value
CALHOUN (contd.)			
Calhoun Co. Rd. Comm.			Sand and Gravel
Case Bros.	Sherwood		Sand and Gravel
Emil Combs	NE SE 18 4S 5W		Sand and Gravel
Arnie Delebaugh	Union City		Marl
Earl A. Flock	NE NW 22 2S 7W		Sandstone
Harry Pickitt	Shippel Pit		Sand and Gravel
	Katz Pit		
	Pickitt Pit		
Clyde M. Reed	Union City		Marl
West Shore Constr. Co.			Sand and Gravel
CASS (68)			
Sand and Gravel		219,888 tons	$ 146,500
Marl		3,500 tons	2,100
Total value			$ 148,600
Cass Co. Rd. Comm.	NE NE 20 5S 13W		Sand and Gravel
	SE SE 17 6S 13W		Sand and Gravel
	NE SE 16 6S 15W		Sand and Gravel
Frank R. Hixon	Marcellus		Marl
Nieb Concrete Products Co.	NW NW 15 7S 16W		Sand and Gravel
John G. Yerington	Eby Pit		Sand and Gravel
CHARLEVOIX (81)			
Stone		10,785 tons	$ 20,935
Charlevoix Lime and Stone Co.	29 34N 8W		Limestone-crushed
CHEBOYGAN (74)			
Sand and Gravel		74,602 tons	$ 40,806
Stone		39,238 tons	26,032
Total value			$ 66,838
Hugh H. Mason and Sons	SE SW 32 33N 3W		Sand and Gravel
Michigan State Hwy. Dept.			Sand and Gravel
Harry Pickitt	NW SE 25 38N 1W		Sand and Gravel
	Gildner Pit		
Ralph Tanner and Assoc.	SE 25 35N 2W		Limestone-crushed

		Quantity	Value
CHIPPEWA (25)			
Stone-crushed Dolomite (3rd)			
Sand and Gravel			**
Chippewa Co. Rd. Comm.			Sand and Gravel
Drummond Dolomite, Inc.	36 42N 5E		Dolomite-crushed
Michigan State Hwy. Dept.			Sand and Gravel
I. L. Whitehead Co.	N½ NW 23 45N 2W		Sand and Gravel
	E½ 6 46N 5W		
	NE 17 46N 7W		
	NE SE 35 47N 1W		
	SE SW 14 47N 1W		
	NW NW 28 47N 3W		
CLARE (26)			
Petroleum (3rd, 9%)		1,016,973 bbls.	$ 2,898,373
Natural gas (4th, 9%)		759,374 M.cu.ft.	132,890
Sand and Gravel		104,527 tons	54,171
Total value			$ 3,085,434
Adrian Blades	SE 15 18N 4W		Sand and Gravel
CLINTON (56)			
Sand and Gravel		472,710 tons	$ 414,905
Shale*			
American Vitrified Products	SE 34 5N 4W		Shale
Boichot Concrete Products	NE SW 3 5N 2W		Sand and Gravel
Corp.	NW NW 27 5N 2W		Sand and Gravel
E.P. Brady and Co.	SE NW 22 8N 1W		Sand and Gravel
Clinton Co. Rd. Comm.	NE 13 5N 4W		Sand and Gravel
Grand Ledge Clay Products	SE 34 5N 4W		Shale
Harry Pickitt	N½ SE 25 8N 2W		Sand and Gravel
	NE 32 5N 1W		Sand and Gravel
Walling Gravel Co.	SE NW 34 8N 2W		Sand and Gravel
West Shore Constr. Co.			Sand and Gravel

*Value of shale used in manufacture of clay products not included in county total.
**Mineral value included under undistributed at end of county breakdown.

		Quantity	Value
CRAWFORD (44)			
Petroleum		227,723 tons	$ 649,011
Natural gasoline (1st, 76%)		2,838,300 gals.	283,830
Natural gas		495,409 M.cu.ft.	86,697
Sand and Gravel		17,714 tons	10,497
Total value			$ 1,030,035
Crawford Co. Rd. Comm.	34 26N 3W		Sand and Gravel
DELTA (61)			
Sand and Gravel		424,099 tons	$ 312,591
Bichler Bros.	SW SE 1 39N 23W		Sand and Gravel
Cloverland Milling and Supply Co.	Gladstone		Sand and Gravel
Days River Sand and Gravel Co.	Gladstone		Sand and Gravel
Delta Co. Rd. Comm.	SE SW 10 37N 24W		Sand and Gravel
	NE NE 5 38N 24W		Sand and Gravel
	SW NE 12 39N 23W		Sand and Gravel
	NE SW 24 40N 20W		Sand and Gravel
	NW NE 28 40N 23W		Sand and Gravel
Escanaba and Lake Superior R.R.			Sand and Gravel
Michigan State Hwy. Dept.			" "
DICKINSON (55)			
Iron Ore		106,647 tons	$ 265,588
Sand and Gravel		97,331 tons	41,928
Stone - crushed dolomite		5,895 tons	114,914
Total value			$ 422,430
Dickinson Co. Rd. Comm.	C SE 20 42N 28W		Sand and Gravel
	SE 28 42N 30W		Sand and Gravel
Globe Iron Co. Globe-Cornell Open Pit	20 40N 30W		Iron Ore
Jackson Iron and Steel Co. Bradley Open Pit	25 40N 31W		Iron Ore
The Metro-Nite Co.	NW 35 42N 28W		Dolomite-crushed
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

		Quantity	Value
EATON (34)			
Undistributed: Clay products (2nd), Sand and Gravel, Stone-crushed and dimensional limestone, Shale*			$ 1,633,272
American Vitrified Products	NE 10 41N 4W		Tile
Cheney Limestone Company	NW SE 20 1N 6W		Limestone-crushed
Grand Ledge Clay Products	SE 3 4N 6W		Shale-tile
Michigan State Hwy. Dept.			Sand and Gravel
Pryor Bros.	SE NW 15 3N 3W		Sand and Gravel
	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 (14)			
Portland cement (4th), Sand and Gravel			**
Michigan State Hwy. Dept.			Sand and Gravel
Penn-Dixie Cement Corp.	2 34N 6W		Limestone-crushed, Portland cement
GENESEE (51)			
Sand and Gravel		840,944 tons	$ 627,696
Petroleum		4,113 bbls.	11,722
Total value			$ 639,418
Ferguson Excavating Co.	Davison		Sand and Gravel
Hansen Gravel Co.	SW SE 25 8N 5E		Sand and Gravel
Kurtz Gravel Co.	SE SW 1 8N 7E		Sand and Gravel
	SE NE 20 8N 7E		Sand and Gravel
Mathews Gravel Co.	SW SE 1 8N 7E		Sand and Gravel
Michigan State Hwy. Dept.			Sand and Gravel
Otisville Stone Co.	NE 28 9N 8E		Sand and Gravel
Harry Pickitt	Barton Pit		Sand and Gravel
John Post and Sons	SW NW 7 6N 5E		Sand and Gravel
Saginaw Core Sand Co.	NE 28 9N 8E		Sand and Gravel
Justus Snelenberger	Burt		Sand and Gravel

*Value of shale used in manufacture of clay products not included in county total.
**Mineral value included under undistributed at end of county breakdown.

		Quantity	Value
GLADWIN (41)			
Petroleum		419,230 bbls.	$ 1,194,806
Sand and Gravel		23,191 tons	18,165
Total value			$ 1,212,971
Michigan State Hwy. Dept.			Sand and Gravel
Paul C. Miller			Sand and Gravel
GOGEBIC (7)			
Iron (3rd, 24%)		2,958,076 tons	$26,403,518
Sand and Gravel		138,283 tons	108,754
Stone		38,000 tons	18,000
Total value			$26,530,272
Gogebic Co. Rd. Comm.	SW SW 4 46N 42W		Sand and Gravel
	NE SW 33 48N 46W		Sand and Gravel
	SW NW 33 48N 48W		Sand and Gravel
Gogebic Co. Rd. Comm.			Stone
Ironwood Concrete Products Co.	Ironwood		Sand and Gravel
Lake Superior Gravel Co.	SW 31 48N 46W		Sand and Gravel
	SE 33 48N 46W		Sand and Gravel
Michigan State Hwy. Dept.			Sand and Gravel
Elmer Puspanen	SE NW 33 48N 46W		Sand and Gravel
Pickands Mather and Co.			Iron Ore
Anvil-Palms-Keweenaw Mine	11, 14, 47N 46W		
Davis Geneva Mine	18, 19, 47N 46W		
Newport, Bonnie Mine	24, 47N 46W		
Peterson Mine	16, 17, 47N 46W		
Sunday Lake Mine	9 47N 45W		
North Range Mining Co.			Iron Ore
Penokee Group			
GRAND TRAVERSE (71)			
Sand and Gravel		248,952 tons	$105,556
Michigan State Hwy. Dept.			Sand and Gravel
Paul C. Miller			Sand and Gravel

		Quantity	Value
GRATIOT (20)			
Salt, Magnesium Compounds (3rd.), Bromine (2nd), Calcium-Magnesium Chloride (3rd), Sand and Gravel, Petroleum, Clay Products, Natural Gas, Clay*			**
E.P. Brady and Co.	Gerald Rohn Pit E½ NW 32 9N 3W		Sand and Gravel
	Gratiot County Pit NE 25 12N 3W		Clay-Tile
Clay Products Co.	NW SE 9 10N 1W		Sand and Gravel
Roy Dayringer	NW SE 34 11N 4W		Sand and Gravel
Gratiot Co. Rd. Comm.	NW NW 18 12N 4W		
Michigan Chemical Corp.	St. Louis		Bromine, Calcium-Magnesium Chloride, Magnesium Compounds, Salt.
North Star Washed Sand & Gravel Co.	NW SE 22 10N 2W		Sand and Gravel
	NE SE 34 11N 4W		
The Taber Co.			Sand and Gravel
HILLSDALE (52)			
Sand and Gravel		580,243 tons	$ 590,589
Marl		1,863 sh. tons	1,118
			$ 591,707
Bundy Hill Gravel Co.	NE 7 5S 1W		Sand and Gravel
Cleveland and Taylor			Marl
Elliott Ice and Coal Co.	SE SE 15 6S 3W		Sand and Gravel
Hillsdale Co. Rd. Comm.	NE SE 11 5S 3W		Sand and Gravel
	SE SE 9 6S 3W		
	SW SE 5 7S 2W		
	SE NE 30 7S 4W		
Hoover Bros.	NE SW 23 8S 2W		Sand and Gravel
Northwest Materials, Inc.	Ransom		Sand and Gravel
Art Russell's Concrete Products	Hillsdale (1 mi. N.)		Sand and Gravel
Southern Michigan Materials, Inc.	Ransom		Sand and Gravel
HOUGHTON (13)			
Copper (3rd, 18%)		21,399,846 lbs.	$8,945,136
Sand and Gravel		148,624 tons	106,155
Stone-Traprock		33,500 tons	83,750
Total value			$9,135,041

*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
HOUGHTON (contd.)		
Calumet and Hecla, Inc.		Copper
Centennial Mine	18 56N 32W	
North Kearsarge Mine	5 56N 32W	
Osceola Mine	23 56N 33W	
Reclamation	12 55N 33W	
Copper Range Co.		Copper
Champion Mine	31 54N 34W	
Duluth, South Shore and Atlantic Railroad Co.		Sand and Gravel
Houghton Co. Rd. Comm.		Trap rock-Crushed
Michigan State Hwy. Dept.		Sand and Gravel
Quincy Mining Co. - Reclamation		Copper
HURON (45)		
Undistributed: Stone-crushed and dimensional limestone, sand and gravel, petroleum		$ 991,463
O.E. Gooding and Co.	NE SW 27 16N 15E	Sand and Gravel
Huron Co. Rd. Comm.	SE SE 17 16N 13E	Sand and Gravel
Michigan State Hwy. Dept.		Sand and Gravel
Wagner Sand and Gravel	NE SW 22 16N 15E	Sand and Gravel
The Wallace Stone Co.	5 16N 10E	Limestone-crushed and dimensional
INGHAM (49)		
Sand and Gravel (10th, 2%)	985,764 tons	$ 754,219
Central Michigan Sand and Gravel	SE SW 24 3N 2W	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
The Ferris Co., Inc.	Mason	Sand and Gravel
O.E. Gooding and Co.	SE SW 2 3N 2W Anderson Park Pit	Sand and Gravel
Ingham Co. Rd. Comm.	NE NE 10 2N 1E	Sand and Gravel
	SE NE 15 2N 1E	
	SW SE 34 3N 1E	
	NE NW 25 3N 2W	
	SW SE 25 3N 2W	
S.E. Ketchum and Sons	NW NW 36 3N 2W	Sand and Gravel
Mason Gravel Co.	Mason	Sand and Gravel
West Lansing Gravel Co.	NE 10 4N 2W	Sand and Gravel

	Quantity	Value
IONIA (60)		
Sand and Gravel, Petroleum		**
Ionia Co. Rd. Comm.	NE SW 18 5N 5W	Sand and Gravel
	SE SE 8 6N 5W	
	SW SE 21 7N 6W	
	NW NE 33 7N 7W	
Harry Pickitt	NW SE 21 7N 6W	Sand and Gravel
	NE NE 16 7N 5W	
IOSCO (19)		
Gypsum (1st)		**
National Gypsum Co.	16 21N 6E	Gypsum
U.S. Gypsum Co.	27 21N 7E	Gypsum
IRON (5)		
Iron (2nd, 30%)	3,782,566 tons	$ 29,365,168
Undistributed - Stone-crushed dolomite, sand and gravel		97,106
Total value		$ 29,462,274
Caspian Lbr. and Coal Co.	On M-73	Dolomite-crushed and dimensional
The Cleveland-Cliffs Iron Co.		Iron Ore
Spies-Virgil Mine	24 43N 35W	
M.A. Hanna Co.		Iron Ore
Cannon Mine	36 43N 35W	
Hiawatha Mine	35, 36, 43N 35W	
Homer-Cardiff-Minckler	22, 23, 43N 35W	
Wauseca-Aronson Mine	23 43N 35W	
Inland Steel Co.		Iron Ore
Bristol-Youngstown Mine	19, 20, 43N 32W	
Sherwood Mine	23 43N 35W	
Iron Co. Rd. Comm.	SW SW 7 43N 35W	Sand and Gravel
Iron River Lbr. and Fuel Co.		Dolomite-crushed
Michigan State Hwy. Dept.	NW NW 13 42N 35W	Sand and Gravel
North Range Mining Co.		Iron Ore
Book Mine	12 42N 33W	
Warner	9 44N 33W	

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

		Quantity	Value
Iron (contd.)			
Pickands Mather and Co.			Iron Ore
Baltic Group	6, 7, 42N 34W		
Fortune Lake Open Pit	24, 25, 26 43N 33W		
Lawrence Mine	36, 43N 33W		
Volunteer-Maitland Mine	30, 47N 26W		
Republic Steel Corp.			Iron Ore
Monongahela Mine	36 43N 33W		
Tobin-Columbia Mine	30, 31, 43N 32W		

ISABELLA (23)

Petroleum (2nd, 11%)	1,155,957 bbls.	$ 3,294,477
Sand and Gravel	376,477 tons	239,483
Natural Gas	571,564 M.cu.ft.	100,024
Undistributed: Marl (1st) and Natural gasoline (2nd, 10%)		70,998
Total value		$ 3,704,982

George Hubscher and Son	22 14N 5W	Sand and Gravel
	7 16N 3W	
William Stuart	SW SW 28 14N 5W	Marl
	NE NW 30 15N 5W	
	NW SE 25 15N 6W	
	C SE 19 16N 4W	
	NW NW 6 15N 5W	
	NW NE 23 16N 5W	
C. Utterback		Sand and Gravel

JACKSON (53)

Sand and Gravel	496,137 tons	$ 366,477
Stone	50,673 tons	171,865
Petroleum	1,957 bbls.	5,577
Marl	3,800 tons	1,330
		$ 545,249

Barnes and Van Antwerp	Horton	Marl
W.A. Cecil and Sons	Concord	Sand and Gravel
O.E. Gooding and Co.	SE SE 1 2S 2E	Sand and Gravel
	SW SE 27 2S 2W	
	Watkins Pit	
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
Original Sandstone Quarry	NE NW 6 4S 2E	Sandstone
Ed. Palmer and Sons		Sand and Gravel
Ray Sandstone Quarry	NE NW 6 4S 2E	Sandstone
Star Sandstone Co.	SW SE 31 3S 2E	Sandstone

		Quantity	Value
KALAMAZOO (46)			
Sand and Gravel (9th, 3%)		1,055,904 tons	$ 913,527
Marl (2nd, 15%)		23,750 tons	14,250
Petroleum		12,821 bbls.	36,540
Total value			$ 964,317
American Aggregate Corp.	SW NW 15 1S 11W		Sand and Gravel
Casper H. Hass Co.	NE SE 8 2S 11W		Sand and Gravel
City Eng. - Kalamazoo	NW SW 2 3N 11W		Sand and Gravel
Gravel Producers, Inc.	Portage & Cooper Twps.		Sand and Gravel
Lawrence Hayward	Scotts		Marl
Michigan State Hwy. Dept.			Sand and Gravel
Paul C. Miller			Sand and Gravel
Harry Pickitt	NE NW 34 1S 11W		Sand and Gravel
Dan Slack	Kalamazoo		Marl
John G. Yerington	NW SW 19 1S 9W		Sand and Gravel
	NW SW 24 1S 9W		
	NE NE 5 4S 12W		
	Jordine Pit		
	Avery Pit		

KALKASKA (62)

Petroleum	58,357 bbls.	$ 166,317
Natural Gas	495,409 M.cu.ft.	86,697
Sand and Gravel	68,948 tons	33,204
Total value		$ 286,218
Kalkaska Co. Rd. Comm.		Sand and Gravel
Paul C. Miller		Sand and Gravel

KENT (24)

Sand and Gravel (4th, 6%)	2,369,195 tons	$ 1,894,555
Undistributed: Gypsum (2nd), petroleum, natural gas		1,618,253
Total value		$ 3,512,808
Bestwall Gypsum Co.	SW 34 7N 12W	Gypsum
The Chesapeake & Ohio R.R.Co.		Sand and Gravel
City Eng. - Grand Rapids		Sand and Gravel
Coit Ave. Gravel Co.	Grand Rapids	Sand and Gravel
Ed DeVries and Sons	Grand Rapids	Sand and Gravel

		Quantity	Value
KENT (contd.)			
Grand Rapids Gravel Co.	SE SW 3 6N 12W		Sand and Gravel
	NW NE 9 6N 12W		Sand and Gravel
	SW 18 6N 12W		Sand and Gravel
Grand Rapids Plaster Co.	NE 34 7N 12W		Gypsum
Kent Co. Rd. Comm.	NE SW 27 5N 10W		Sand and Gravel
	SE SE 20 6N 9W		Sand and Gravel
	NE NE 32 7N 9W		Sand and Gravel
	SE SW 11 10N 12W		Sand and Gravel
Michigan State Hwy. Dept.			Sand and Gravel
Pekaar and Van Doorn	NW NE 16 6N 12W		Sand and Gravel
Harry Pickitt	Williams Pit		Sand and Gravel
	NE NW 25 5N 12W		
	SW SE 23 8N 11W		
H.F. Postma Gravel Co.	SW SE 9 6N 12W		Sand and Gravel
	SE SW 8 6N 12W		Sand and Gravel
Riverside Sand and Gravel Co.	Grand Rapids (1050 Maynard Ave.S.W.)		Sand and Gravel
United States Gypsum Co.	NE 34 7N 12W		Gypsum
West Shore Constr. Co.	NW NE 16 6N 12W		Sand and Gravel
KEWEENAW (11)			
Copper (2nd, 20%)		25,267,891 lbs.	$ 10,561,978
Sand and Gravel		39,234 tons	27,400
Total value			$ 10,589,378
Calumet and Hecla, Inc.			Copper
Ahmeek and Allouez	28 57N 32W		
Allouez No. 3	32 57N 32W		
Douglass	28 57N 32W		
Iroquois	22 57N 32W		
Peninsula	28 57N 32W		
Seneca No. 2	27 57N 32W		
Keweenaw Co. Rd. Comm.			Sand and Gravel
LAKE (73)			
Sand and Gravel		69,833 tons	$ 40,732
Petroleum		9,623 bbls.	27,426
			$ 68,158
Lake Co. Rd. Comm.	SE NE 23 18N 13W		Sand and Gravel
	NW SE 10 20N 14W		Sand and Gravel
The Taber Co.	John Brown Pit		Sand and Gravel

		Quantity	Value
LAPEER (64)			
Sand and Gravel		365,864 tons	$ 196,629
Petroleum		67 bbls.	191
Total value			$ 196,820
Lapeer Co. Rd. Comm.	SE SW 30 8N 10E		Sand and Gravel
	SW SE 16 9N 10E		Sand and Gravel
	SW NW 28 9N 12E		Sand and Gravel
Michigan State Hwy. Dept.			Sand and Gravel
Pine Sand and Gravel	NW 12 7N 10E		Sand and Gravel
LEELANAU (77)			
Sand and Gravel		96,744 tons	$ 41,439
Leelanau Co. Rd. Comm.	NE NW 16 28N 13W		Sand and Gravel
	SW SE 12 29N 13W		
	SW NW 19 32N 10W		
The Taber Co.	Schant Pit		Sand and Gravel
LENAWEE (18)			
Undistributed: Portland cement (5th), Sand and gravel, Clay products, Clay*(5th)			$4,949,669
Adrian Sand and Gravel	Adrian		Sand and Gravel
Bolenbaugh			Sand and Gravel
Comfort Brick and Tile Co.	SW 2 6S 5E		Clay and tile
Consolidated Cement Corp.	NE 5 5S 1E		Portland cement
	SW 5 7S 1E		Clay
O.E. Gooding and Co.	SW NE 19 7S 3W		Sand and Gravel
	Morence Pit		
	NE 19 7S 3E		
	W½ SE 8 5S 3E		
Hammond			Sand and Gravel
Lenawee Co. Rd. Comm.	NW NW 9 6S 4E		Sand and Gravel
	SE SE 4 6S 4E		Sand and Gravel
Cyril Page	Addison		Sand and Gravel
Harry Pickitt			Sand and Gravel
Porter Sand & Gravel Co.	NE SE 4 6S 4E		Sand and Gravel
Ramsdell			Sand and Gravel
William Sell			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
VanDorn			Sand and Gravel
John Woerner Pit	2½ mi. NW of Adrian		Sand and Gravel

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

		Quantity	Value
LIVINGSTON (21)			
Sand and Gravel (2nd, 8%)		3,461,607 tons	$3,995,526
Natural Gas (3rd, 14%)		1,142,925 M.cu.ft.	200,012
Total value			$4,195,538
American Aggregates Corp.	NE NE 11 1N 6E		Sand and Gravel
D. and J. Gravel Co.	SW SW 32 3N 4E		Sand and Gravel
Van E. Daily	Howell		Sand and Gravel
Michigan State Hwy. Dept.			Sand and Gravel
Harry Pickitt	NW 3, 4N 6E		Sand and Gravel
LUCE (79)			
Sand and Gravel		30,729 tons	$ 24,869
Luce Co. Rd. Comm.	SW SE 11 45N 11W		Sand and Gravel
	NE SE 11 45N 11W		
	NE NE 14 45N 11W		
MACKINAC (16)			
Undistributed: Stone (2nd), Sand and Gravel			$5,741,787
Duluth, South Shore and Atlantic R.R. Co.	NW SW 7 40N 3W		Sand and Gravel
Fiborn Limestone Co.	16 44N 7W		Limestone-crushed
Inland Lime and Stone Co.	6 42N 12W		Limestone-crushed
Michigan Limestone Div. - U.S. Steel Corp.	Cedarville		Limestone-crushed
MACOMB (37)			
Sand and Gravel (7th, 5%)		1,903,922 tons	$1,425,795
Advance Bldg. Materials Inc.	NE NW 8 4N 12E		Sand and Gravel
	SE NE 31 3N 12E		
Great Lakes Gravel Co.	NW NW 31 2N 12E		Sand and Gravel
Hygrade Sand and Gravel	NE 8 4N 12E		Sand and Gravel
Fred Kaatz	SE NW 21 4N 14E		Sand and Gravel
Macomb Co. Rd. Comm.	17 4N 12E		Sand and Gravel
Macomb Sand and Gravel	SW SW 30 3N 12E		Sand and Gravel

		Quantity	Value
MACOMB (contd.)			
Maertens Sand and Gravel Co.	SE NE 30 3N 12E		Sand and Gravel
	SE SW 5 4N 12E		Sand and Gravel
Louis Marsack and Sons	NW NW 3 1N 13E		Sand and Gravel
Michigan Sand and Gravel	SW NE 19 3N 12E		Sand and Gravel
Michigan State Hwy. Dept.			Sand and Gravel
Morgan Sand and Gravel Co.	Utica		Sand and Gravel
Ray Industries, Inc.	NE SW 18 3N 12E		Sand and Gravel
Bernie Rief	Fraser		Sand and Gravel
S. K. Rogers			Sand and Gravel
Rosteck Contractors			Sand and Gravel
Smith Sand and Gravel Co.	NW SE 8 4N 12E		Sand and Gravel
Underwood Sand and Gravel Co.			Sand and Gravel
Allen Zavitz	Mt. Clemens		Sand and Gravel
MANISTEE (12)			
Salt (4th), Magnesium Compounds (1st), Bromine (3rd), Sand and gravel, Calcium-Magnesium chloride			**
The Ann Arbor Railroad Co.			Sand and Gravel
Frank L. Gauthier	23 23N 16W		Sand and Gravel
Great Lakes Chemical Corp.	SE SW 18 21N 16W		Bromine
Manistee Co. Rd. Comm.	NE NW 18 22N 14W		Sand and Gravel
	NW SE 26 24N 16W		Sand and Gravel
Manistee Salt Works	Manistee		Salt
Michigan Chemical Corp.	NW 7 21N 16W		Bromine
Michigan State Hwy. Dept.			Sand and Gravel
Morton Salt Co.	12 21N 17W		Bromine, Calcium Magnesium Chloride, Magnesium Compounds, Salt
Sand Products Corp.	N½ 11 21N 17W		Sand
Standard Lime and Cement Co.	SE 18 21N 16W		Magnesium Compounds

**Mineral value included under undsitributed at end of county breakdown.

		Quantity	Value
MARQUETTE (1)			
Iron Ore (2nd, 30%)		5,566,612 tons	$48,637,580
Sand and Gravel		477,470 tons	548,875
Stone		63,614 tons	63,614
Total value			$49,250,069
The Bacco Construction Co.			Dolomite-crushed
The Cleveland Cliffs Iron Co.			Iron Ore
Bunker Hill Mine	6 47N 26W		
Cambria-Jackson Mine	35, 36 48N 27W		
Cliffs Shaft Mine	3, 9, 10 47N 27W		
Humbolt Open Pit	10, 15, 47N 29W		
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.			Iron Ore
New Richmond Open Pit	27 47N 27W		
Inland Steel Co.			Iron Ore
Morris Mine	1, 2, 47N 28W		
Greenwood Mine	14, 23 47N 28W		
Jones and Laughlin Steel Corp.			Iron Ore
Tracy Mine	7, 8, 48N 26W		
Lake Superior and Ishpeming Railway Co.			Sand and Gravel
A. Lindberg and Sons, Inc.	NW SE 8 47N 25W		Sand and Gravel
Marquette Co. Rd. Comm.	NE NW 17 47N 25W		Sand and Gravel
	SE SW 30 46N 23W		
Michigan State Hwy. Dept.			Sand and Gravel
North Range Mining Co.			Iron Ore
Champion Mine	31 48N 29W		
Pickands Mather and Co.			Iron Ore
Volunteer-Maitland Open Pit	25, 30, 47N 26W		
MASON (17)			
Calcium-Magnesium Chloride (2nd), Lime (1st), Petroleum, Bromine (4th), Magnesium Compounds (4th), Sand and Gravel, Natural gasoline (3rd, 5%), Natural gas			**
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

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

		Quantity	Value
MECOSTA (54)			
Petroleum		129,275 bbls.	$ 368,434
Natural Gas		463,498 M.cu.ft.	81,112
Sand and Gravel		169,545 tons	60,653
Marl (6th, 8%)		12,500 tons	7,500
Total value			$ 517,699
Wilson Frost	Blanchard		Marl
Steve Lyle Sand and Gravel	Big Rapids (1½ mi. E.)		Sand and Gravel
Mecosta Co. Rd. Comm.	NE NE 32 15N 9W		Sand and Gravel
Michigan State Hwy. Dept.			Sand and Gravel
Paul C. Miller	SW SE 31 51N 7W		Sand and Gravel
	NE SE 9 16N 7W		
Paris Gravel Co.			Sand and Gravel
MENOMINEE (47)			
Lime (2nd), Sand and Gravel			$ 946,603
Limestone Products Co.	Menominee		Lime
Menominee Co. Rd. Comm.	NE NE 9 39N 25W		Sand and Gravel
Walsh Sand and Gravel Co.	Menominee (6 mi. N.)		Sand and Gravel
MIDLAND (4)			
Bromine (1st), Calcium-Magnesium Chloride (1st), salt (2nd) magnesium compounds (2nd), petroleum, potash (1st) sand and gravel, natural gasoline natural gas			**
The Dow Chemical Co.	Midland		Bromine, calcium-magnesium chloride, potash, magnesium compounds, salt
Saginaw Core Sand Co.	SE 21 13N 2E		Sand
	NW 34 13N 2E		

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

		Quantity	Value
MISSAUKEE (36)			
Petroleum (9th, 5%)		526,546 bbls.	$ 1,500,656
Natural gasoline (4th, 5%)		178,267 gals.	17,827
Natural gas		25,106 M.cu.ft.	4,393
Marl		1,399 tons	951
Sand and gravel		4,000 tons	4,000
Total value			$ 1,527,827
C. Stanley Hooker	Cadillac		Marl
Michigan State Hwy. Dept.			Sand and Gravel
MONROE (35)			
Undistributed: Stone-crushed dolomite (4th), clay products, petroleum, clay*			$ 1,630,576
The France Stone Co.	SE 7 7S 9E		Dolomite-crushed
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
MONTCALM (29)			
Petroleum (6th, 6%)		672,195 bbls.	$ 1,915,756
Sand and gravel		498,264 tons	221,745
Natural gas		31,287 M. cu.ft.	5,485
Total value			$ 2,142,986
Crystal Gravel Co.			Sand and Gravel
A.L. Dyer and Sons	SE SE 8 12N 5W		Sand and Gravel
Paul C. Miller			Sand and Gravel
Montcalm Co. Rd. Comm.	NE SE 13 10N 6W		Sand and Gravel
	NE NE 24 10N 6W		
Frank H. Stoerk	Pierson		Sand and Gravel
The Taber Co.	SW NE 35 9N 8W		Sand and Gravel

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

		Quantity	Value
MONTMORENCY (80)			
Sand and Gravel		43,981 tons	$ 20,957
Montmorency Co. Rd. Comm.	SW NW 27 30N 1E		Sand and Gravel
	NE NW 9 32N 4E		
MUSKEGON (38)			
Undistributed: Sand and gravel salt (5th), petroleum, natural gas			$1,425,047
Hooker Electro-Chemical Co.	NE 31 12N 17W		Salt
Muskegon Gravel Co.			Sand and gravel
Nugent Sand Co., Inc.	Muskegon		Sand
Sand Products Corp.	CE¼ 28 10N 17W		Sand
NEWAYGO (43)			
Petroleum		319,271 bbls.	$ 909,922
Natural gas (5th, 7%)		628,955 M.cu.ft.	109,067
Sand and gravel		162,481 tons	70,953
Total value			$1,089,942
K. and V. Gravel Co.	Fremont		Sand and gravel
Michigan State Hwy. Dept.			Sand and gravel
Paul C. Miller			Sand and gravel
Harry Pickitt	Schant Pit		Sand and gravel
OAKLAND (15)			
Sand and Gravel (1st, 17%)		7,139,693 tons	$7,071,370
Petroleum		159 bbls.	453
Total value			$7,071,823
American Aggregates Corp.	NE NW 22 5N 10E		Sand and gravel
Avon Asphalt and Gravel Co.	NE 8 3N 11E		Sand and gravel
Floyd Beardslee	NE NW 11 2N 10E		Sand and gravel
	S½ SE 2 2N 10E		

		Quantity	Value
OAKLAND (contd.)			
The Benjamin Pit	Farmington		Sand and Gravel
Dachille Trucking Co.			Sand and Gravel
Dept. Public Works, Detroit			Sand and Gravel
Foley and Beardslee	NW NW 7 3N 9E		Sand and Gravel
	SW SE 36 4N 8E		
O.E. Gooding and Co.	Kensington Pit		Sand and Gravel
Holly Sand and Gravel Co.	NW SW 19 5N 8E		Sand and Gravel
John R. Sand and Gravel Co.	S½ 4 4N 10E		Sand and Gravel
Kemler Bros.	SW SW 36 5N 11E		Sand and Gravel
Koan Gravel Co.	SE NE 28 5N 7E		Sand and Gravel
Koenig Coal and Supply Co.	NW 1 3N 8E		Sand and Gravel
	SW SE 24 5N 10E		
Michigan State Hwy. Dept.			Sand and Gravel
Mickelson Bros.	NE NW 21 3N 8E		Sand and Gravel
Paul C. Miller			Sand and Gravel
Oakland Co. Rd. Comm.	SW SE 36 5N 11E		Sand and Gravel
	SE SE 9 2N 8E		
	SE SW 32 5N 9E		
	SE SW 8 4N 8E		
	NW NW 1 3N 10E		
New Hudson Sand and Gravel	NW NE 33 2N 7E		Sand and Gravel
J. Gladstone and Son	NE 8 3N 11E		Sand and Gravel
Groveland Gravel Co.	SW NE 32 5N 8E		Sand and Gravel
A.S. Leffler Gravel Co.	NE NE 5 4N 8E		Sand and Gravel
	NW NW 4 4N 8E		Sand and Gravel
Oakland Sand and Gravel Co.	SE SE 8 2N 8E		Sand and Gravel
Slaters Bald Mountain Gravel Pit	SW NW 1 3N 10E		Sand and Gravel
Underwood Sand and Gravel Co.	SW 2 3N 10E		Sand and Gravel
Lyle J. Walker Sand and Gravel	SE SW 2 2N 11E		Sand and Gravel
	NE SE 34 2N 7E		
F.S. Ward	NW NE 7 3N 9E		Sand and Gravel
White Lake Gravel, Inc.	Clarkston		Sand and Gravel
Wilkinson Sand and Gravel Co.	SE NW 35 3N 10E		Sand and Gravel

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OCEANA (33)

Petroleum (8th, 5%)	567,944 bbls.	$ 1,618,640
Sand and Gravel	27,923 tons	15,866
Natural gas	229 M.cu.ft.	40
Total value		$ 1,634,546

		Quantity	Value
OCEANA (contd.)			
Paul C. Miller			Sand and Gravel
Syers-Fleming-Larkin			Sand and Gravel
West Shore Constr. Co.			Sand and Gravel

OGEMAW (27)

Petroleum (4th, 8%)		827,709 bbls.	$2,358,971
Sand and Gravel		161,781 tons	62,619
Total value			$2,421,590
Michigan State Hwy. Dept.			Sand and Gravel
Ogemaw Co. Rd. Comm.	NE SE 3 21N 1E		Sand and Gravel
	NE SE 6 22N 2E		
	NW NW 28 22N 3E		
Walter Rosevear	NE SE 6 22N 2E		Sand and Gravel

ONTONAGON (3)

Copper (1st, 62%)		76,612,498 lbs.	$32,024,024
Sand and Gravel		97,143 tons	114,293
Total value			$32,138,317
Michigan State Hwy. Dept.			Sand and Gravel
Mid-American Eng. Corp.	SW NE 28 51N 42W		Sand and Gravel
Calumet and Hecla Inc. Caledonia Mine			Copper
White Pine Copper Co. White Pine Mine	4, 5, 9 5N 42W		Copper

OSCEOLA (31)

Petroleum (7th, 6%)		597,962 bbls.	$ 1,704,192
Sand and gravel		271,579 tons	210,835
Natural gas		340,250 M.cu.ft.	59,544
Marl		6,360 tons	4,325
Total value			$ 1,978,896
C. Stanley Hooker	Cadillac		Marl
Michigan State Hwy. Dept.			Sand and Gravel
Paul C. Miller			Sand and Gravel
The Taber Co.	SW SW 16 19N 7W		Sand and Gravel
The Wallace Stone Co. Hersey Sand & Gravel Div.	NW SW 20 17N 9W		Sand and Gravel

		Quantity	Value
OSCODA (82)			
Sand and gravel		9,251 tons	$ 9,251
Petroleum		2,320 bbls.	6,612
Total value			$ 15,863
Michigan State Hwy. Dept.			Sand and gravel
OTSEGO (75)			
Sand and gravel		132,858 tons	$ 58,870
Natural gas		11,084 M. cu.ft.	1,940
Petroleum		83 bbls.	237
Total value			$ 61,047
Hutchins Sand and gravel	SE NE 17 29N 3W		Sand and gravel
Otsego Co. Rd. Comm.	NW SW 2 30N 3W		Sand and gravel
	NW NW 3 31N 3W		
	NW NE 29 31N 3W		
Harry Pickitt	NW SW 29 32N 2W		Sand and gravel
	Mich. Dept. of Conservation Pit		
OTTAWA (28)			
Sand and gravel (3rd, 7%)		2,985,328 tons	$1,919,101
Petroleum		116,798 bbls.	332,874
Natural gas		7,904 M.cu.ft.	1,383
Marl		875 tons	525
Total value			$2,253,883
Construction Aggregates Corp.	SE SW 16 8N 15W		Sand and gravel
Henry DeWent	Hudsonville (2 mi. E.)		Sand and gravel
William Huizenga	Zeeland		Sand and gravel
Thomas F. Johnston	Ferrysburg		Sand and gravel
Ralph Meyers	West Olive		Marl
Michigan State Hwy. Dept.			Sand and gravel
Harry Pickitt	Ottawa Co. Pit.		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

		Quantity	Value
PRESQUE ISLE (9)			
Undistributed: Stone-crushed and dimensional limestone (1st) Sand and gravel			$11,843,937
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			Sand and gravel
Straits Aggregate and Equipment Corp.	Millersburg		Sand and gravel
Presque Isle Corp.	2 33N 8E		Limestone-crushed
ROSCOMMON (40)			
Petroleum (10th, 4%)		441,962 bbls.	$ 1,259,592
Sand and gravel		37,648 tons	37,648
Natural gasoline		35,920 gals.	3,592
Natural gas		7,692 M.cu.ft.	1,346
			$ 1,302,178
Michigan State Hwy. Dept.			Sand and gravel
SAGINAW (69)			
Petroleum, clay* (3rd)			**
Aetna Portland Cement Co.	35 12N 3E		Clay
Minco Products Corp.	NW NW 1 11N 3E		Clay
SANILAC (65)			
Sand and gravel		415,152 tons	$ 193,653
O.E. Gooding and Co.	25 14N 13E		Sand and gravel
Harold Peters	Decker		Sand and gravel
Michigan State Hwy. Dept.			Sand and gravel
Sanilac Co. Rd. Comm.	SW SW 23 9 N 14E		Sand and gravel
Robert Van Camp	SW SE 28 10N 15E		Sand and gravel

*Value of clay used in manufacture of Portland cement not included in county total.
**Mineral value included under undistributed at end of county breakdown.

	Quantity	Value
SCHOOLCRAFT (70)		
Undistributed: Sand and gravel, Stone		$ 112,435
Michigan State Hwy. Dept.		Sand and gravel
Schoolcraft Co. Rd. Comm.	SE SW 7 41N 17W	Sand and gravel
Thornton Constr. Co., Inc.	NE NW 5 43N 13W	Stone
SHIAWASSEE (39)		
Undistributed: Clay products (3rd), Shale*, Sand and gravel		$1,390,730
Comstock Constr. Co.	SW NW 22 8N 2E	Sand and gravel
Harry Fuess	Durand	Sand and gravel
O.E. Gooding and Co.		Sand and gravel
Michigan State Hwy. Dept.		Sand and gravel
The Michigan Vitrified Tile Co.	SE 22 7N 3E	Shale-Tile
Shenk Gravel Co.	NW NW 2 6N 4E	Sand and gravel
	NE NE 2 6N 4E	
Valley Gravel Co.	299005 M-47 Owosso, Mich.	
ST. CLAIR (8)		
Undistributed: Salt (3rd), Portland cement Sand and gravel, Natural gas, clay* (4th), Petroleum		$11,980,392
William Click, Sr.	NE NW 27 7N 15E	Sand and gravel
The Diamond Crystal Salt Co.	St. Clair	Evaporated salt
O.E. Gooding and Co.	Hainds, Steainer, Richard, Morgan Pits	Sand and gravel
Harvey G. Hall	Port Huron	Sand and gravel
Lakeport Sand and Gravel Co.	Port Huron	Sand and gravel
Morton Salt Co.	Marysville	Evaporated salt
Peerless Cement Corp.	Port Huron 32 6N 16E	Portland cement Clay

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

	Quantity	Value
ST. JOSEPH (58)		
Sand and gravel	395,285 tons	$362,286
Marl	4,405 tons	1,871
Total Value		$364,157
Aggregates Processors, Inc.	SW SW 5 8S 11W	Sand and gravel
Case Bros.	Sherwood	Marl
Leslie Knox	Colon (3½ mi. SW)	Marl
Michigan State Hwy. Dept.		Sand and gravel
Harry Pickitt	SE NW 15 5S 12W	Sand and gravel
St. Joseph Co. Rd. Comm.		Sand and gravel
Kenneth Wood	Colon	Marl
John G. Yerington	NE NE 14 6S 12W	Sand and gravel
	NW NW 1 8S 10W	
	SE NW 21 6S 12W	
TUSCOLA (32)		
Sand and gravel (8th, 3%)	1,277,277 tons	$1,109,723
Petroleum	168,758 bbls.	480,960
Calcium-magnesium chloride	25,000 tons	200,000
Total value		$1,790,683
Anderson Sand and Gravel Co.	NE NE 20 11N 9E	Sand and gravel
Bernthel Sand and Gravel Co.	SW SE 6 11N 9E	Sand and gravel
Comstock Constr. Co.	NW 33 10N 9E Engil Pit	Sand and gravel
Great Lakes Foundry Sand Co.		Sand
Hile Bros.	NW SE 3 12N 8E	Sand and gravel
C.R. Hunt	Cass City	Sand and gravel
Peterhans Bros.	SW NE 35 13N 9E	Sand and gravel
E.L. Schwaderer	NW NE 33 12N 10E	Sand and gravel
	SW SE 4 13N 11E	
	NW SE 36 12N 11E	
	NW NW 16 13N 10E	
	SW SE 33 14N 11E	
	NW SW 34 14N 11E	
Tuscola Co. Rd. Comm.		Sand and gravel
Vaughans Sand and Gravel	NE NE 25 12N 8E	Sand and gravel
Saginaw Core Sand Co.	NW 27 10N 7E	Sand
Wilkinson Chemical Co.		Calcium-magnesium chloride

		Quantity	Value
VAN BUREN (63)			
Petroleum		46,490 bbls.	$ 132,497
Sand and gravel		82,012 tons	86,974
Total value			$ 219,471
Garrett Sand Co.	NE 5 2S 17W		Sand
South Haven Sand Co.	South Haven		Sand and gravel
John G. Yerington	SE SE 12 3S 15W		Sand and gravel
	SW NE 36 3S 15W (Plopper Pit)		
WASHTENAW (30)			
Sand and gravel (5th, 6%)		2,357,688 tons	$1,519,561
Petroleum		78,904 bbls.	224,876
Natural gas (1st, 22%)		1,828,326 M.cu.ft.	319,936
Total value			$2,064,373
Dexter Gravel Co.	SW SE 5 2S 5E		Sand and gravel
O.E. Gooding and Co.	SW NE 14 1S 7E		Sand and gravel
	SE NW 22 1S 13E		
	NW SW 7 2S 3E (McCabe Pit)		
Killins Gravel Co.	SE SE 25 2S 3E		Sand and gravel
	SW SW 25 2S 5E		
Kruse Gravel Pit	Ypsilanti		Sand and gravel
Harry Pickitt			Sand and gravel
Scio Gravel Co.			Sand and gravel
Lawrence B. Skinner			Sand and gravel
Lamar Thumn	SW NE 25 3S 7E		Sand and gravel
Whittaker and Gooding Co.	SW NE 19 2S 7E		Sand and gravel
Youngs Sand and Gravel	NE NE 15 3S 6E		Sand and gravel
	SW SW 16 1S 3E		
Washtenaw Co. Rd. Comm.	24 3S 5E		Sand and gravel
Zahns Sand and Gravel	SE 9 3S 6E		Sand and gravel
WAYNE (2)			
Salt (1st)		4,141,061 tons	$18,227,285
Portland cement (2nd)		5,127,880 bbls.	16,130,252
Clay products (1st)			3,809,841
Sand and gravel (6th, 5%)		2,149,696 tons	3,026,672
Undistributed: Stone-crushed limestone, natural gas (2nd, 17%), petroleum, clay* (1st)			677,505
			$41,871,555

		Quantity	Value
WAYNE (contd.)			
Allied Chemical Dye Corp.	Trenton		Soda Ash
Clippert Brick Co.	NW 21 2S 11E		Clay-brick
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
Manning and Locklin Gravel Co.	NW SW 2 1S 8E		Sand and gravel
Michigan Foundation Quarry Co.	7 4S 11E		Limestone-crushed
Michigan Silica Co.	SW NE 15 5S 10E		Sand and gravel
Michigan State Hwy. Dept.			Sand and gravel
Moore Bros. Sand and Gravel	E½ SE 9 3S 9E		Sand and gravel
Northville Sand and Gravel	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 (Thompson & Reese Pits)		Sand and gravel
Thomson Sand and Gravel	Northville		Sand and gravel
U. S. Gypsum Co.	River Rouge		Gypsum Products
I. J. Warren	SW 10 3S 8E		Sand and gravel
Wayne Sand and Gravel Co.	NW SE 2 3S 8E		Sand and gravel
Wolverine Contr. Inc.	Roseville		Sand and gravel
Wyandotte Chemical Corp.	Wyandotte		Chlorine, Soda ash Portland cement
WEXFORD (76)			
Sand and gravel		53,473 tons	$ 53,674
Leo Dunbar	Cadillac		Sand and gravel
Michigan State Hwy. Dept.			Sand and gravel
Paul C. Miller			Sand and gravel
Harry Pickitt	SW SE 34 24N 12W		Sand and gravel
Wexford Gravel Co.	Cadillac		Sand and gravel

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

		Quantity	Value
VAN BUREN (63)			
Petroleum		46,490 bbls.	$ 132,497
Sand and gravel		82,012 tons	86,974
Total value			$ 219,471
Garrett Sand Co.	NE 5 2S 17W		Sand
South Haven Sand Co.	South Haven		Sand and gravel
John G. Yerington	SE SE 12 3S 15W		Sand and gravel
	SW NE 36 3S 15W (Plopper Pit)		
WASHTENAW (30)			
Sand and gravel (5th, 6%)		2,357,688 tons	$1,519,561
Petroleum		78,904 bbls.	224,876
Natural gas (1st, 22%)		1,828,326 M.cu.ft.	319,936
Total value			$2,064,373
Dexter Gravel Co.	SW SE 5 2S 5E		Sand and gravel
O.E. Gooding and Co.	SW NE 14 1S 7E		Sand and gravel
	SE NW 22 1S 13E		
	NW SW 7 2S 3E (McCabe Pit)		
Killins Gravel Co.	SE SE 25 2S 3E		Sand and gravel
	SW SW 25 2S 5E		
Kruse Gravel Pit	Ypsilanti		Sand and gravel
Harry Pickitt			Sand and gravel
Scio Gravel Co.			Sand and gravel
Lawrence B. Skinner			Sand and gravel
Lamar Thumn	SW NE 25 3S 7E		Sand and gravel
Whittaker and Gooding Co.	SW NE 19 2S 7E		Sand and gravel
Youngs Sand and Gravel	NE NE 15 3S 6E		Sand and gravel
	SW SW 16 1S 3E		
Washtenaw Co. Rd. Comm.	24 3S 5E		Sand and gravel
Zahns Sand and Gravel	SE 9 3S 6E		Sand and gravel
WAYNE (2)			
Salt (1st)		4,141,061 tons	$18,227,285
Portland cement (2nd)		5,127,880 bbls.	16,130,252
Clay products (1st)			3,809,841
Sand and gravel (6th, 5%)		2,149,696 tons	3,026,672
Undistributed: Stone-crushed limestone, natural gas (2nd, 17%), petroleum, clay* (1st)			677,505
			$41,871,555

		Quantity	Value
WAYNE (contd.)			
Allied Chemical Dye Corp.	Trenton		Soda Ash
Clippert Brick Co.	NW 21 2S 11E		Clay-brick
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
Manning and Locklin Gravel Co.	NW SW 2 1S 8E		Sand and gravel
Michigan Foundation Quarry Co.	7 4S 11E		Limestone-crushed
Michigan Silica Co.	SW NE 15 5S 10E		Sand and gravel
Michigan State Hwy. Dept.			Sand and gravel
Moore Bros. Sand and Gravel	E½ SE 9 3S 9E		Sand and gravel
Northville Sand and Gravel	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 (Thompson & Reese Pits)		Sand and gravel
Thomson Sand and Gravel	Northville		Sand and gravel
U. S. Gypsum Co.	River Rouge		Gypsum Products
I. J. Warren	SW 10 3S 8E		Sand and gravel
Wayne Sand and Gravel Co.	NW SE 2 3S 8E		Sand and gravel
Wolverine Contr. Inc.	Roseville		Sand and gravel
Wyandotte Chemical Corp.	Wyandotte		Chlorine, Soda ash Portland cement
WEXFORD (76)			
Sand and gravel		53,473 tons	$ 53,674
Leo Dunbar	Cadillac		Sand and gravel
Michigan State Hwy. Dept.			Sand and gravel
Paul C. Miller			Sand and gravel
Harry Pickitt	SW SE 34 24N 12W		Sand and gravel
Wexford Gravel Co.	Cadillac		Sand and gravel

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

	Quantity	Value
UNDISTRIBUTED		
Not segregated by counties (includes Alpena, Chippewa, Emmet, Gratiot, Ionia, Iosco, Manistee, Mason, Midland, Saginaw)		$ 94,708,553
Peat	31,111 tons	474,899
Silver	379,990 Fine oz.	343,910
Mineral Pigments	31,882 tons	294,930
Sand and gravel	227,526 tons	252,460
Gem stones		500
Total value		$ 96,075,252

Champion, Inc.		Sand and gravel
Fox Valley Constr. Co.		Sand and gravel
U. S. Forest Service		Sand and gravel
Cravens Peat Moss	NW SE 3 3S 10 E	Peat
Green Thumb Peat Humus Co.	24 7N 12 E	Peat
Michigan Peat, Inc.	24 7N 12 E	Peat
Perry Peat Co., Inc.	Morris	Peat
Irving L. Pratt and Sons	SE SW 35 19N 17W	Peat
Keweenaw Agate Shop	Ahmeek	Gem Stones
The Cleveland-Cliffs Iron Co.		Mineral pigments
M.A. Hanna Co.		Mineral pigments
Pickands Mather and Co.		Mineral pigments

TOTAL STATE VALUE $ 406,563,233

COUNTY MINERAL PRODUCTION

1956

County	Rank	Value	County	Rank	Value
Alcona	78	$ 34,763	Genesee	51	$ 639,418
Alger	72	72,921	Gladwin	41	1,212,971
Allegan	48	785,362	Gogebic	7	26,530,272
Alpena	6	*	Grand Traverse	71	105,556
Antrim	67	154,845	Gratiot	20	*
Arenac	22	3,722,956	Hillsdale	52	591,707
Baraga	42	1,091,876	Houghton	13	9,135,041
Barry	50	723,109	Huron	45	991,463
Bay	10	10,864,185	Ingham	49	754,219
Benzie	83	10,011	Ionia	60	*
Berrien	59	356,229	Iosco	19	*
Branch	57	367,790	Iron	5	29,462,274
Calhoun	66	184,037	Isabella	23	3,704,982
Cass	68	148,600	Jackson	53	545,249
Charlevoix	81	20,935	Kalamazoo	46	964,317
Cheboygan	74	66,838	Kalkaska	62	286,218
Chippewa	25	*	Kent	24	1,894,555
Clare	26	3,085,434	Keweenaw	11	10,589,378
Clinton	56	414,905	Lake	73	68,158
Crawford	44	1,030,035	Lapeer	64	196,820
Delta	61	312,591	Leelanau	77	41,439
Dickinson	55	422,430	Lenawee	18	4,949,669
Eaton	34	1,633,272	Livingston	21	4,195,538
Emmet	14	*	Luce	79	24,869

County	Rank	Value	County	Rank	Value
Mackinac	16	$ 5,741,787	Schoolcraft	70	$ 112,435
Macomb	37	1,425,795	Shiawassee	39	1,390,730
Manistee	12	*	St. Clair	8	11,980,392
Marquette	1	49,250,069	St. Joseph	58	364,157
Mason	17	*	Tuscola	32	1,790,683
Mecosta	54	517,699	Van Buren	63	219,471
Menominee	47	946,603	Washtenaw	30	2,064,373
Midland	4	*	Wayne	2	41,871,555
Missaukee	36	1,527,827	Wexford	76	53,674
Monroe	35	1,630,576	*Not segregated by counties (also includes Chippewa, Emmet, Gratiot, Ionia, Iosco, Manistee, Mason, Midland, Saginaw)		
Montcalm	29	2,142,986			
Montmorency	80	20,957			96,075,252
Muskegon	38	1,425,047			
Newaygo	43	1,089,942	TOTAL STATE VALUE		$ 406,563,233
Oakland	15	7,071,823			
Oceana	33	1,634,546			
Ogemaw	27	2,421,590			
Ontonagon	3	32,138,317			
Osceola	31	1,978,896			
Oscoda	82	15,863			
Otsego	75	61,047			
Ottawa	28	2,253,883			
Presque Isle	9	11,843,937			
Roscommon	40	1,302,178			
Saginaw	69	*			
Sanilac	65	193,653			

THE MINERAL INDUSTRY OF MICHIGAN IN 1957*

(Preliminary)

The total value of minerals produced in Michigan in 1957 was estimated at $393.2 million according to the Bureau of Mines, United States Department of the Interior. The decrease from the 1956 total of $394.5 million was less than one percent.

Although the value of copper production was reduced sharply because of a much lower unit price and gypsum production fell off, increased production of iron ore and cement and higher prices for sand and gravel and petroleum tended to equalize the losses.

Iron ore continued to rank first in value of minerals produced, followed by cement, sand and gravel, salt, copper, petroleum and stone.

METALS

Metallic minerals are mined in the upper Peninsula of Michigan. Copper is produced in Houghton, Keeweenaw and Ontonagon Counties and iron ore in Baraga, Dickinson, Gogebic, Iron, and Marquette Counties.

Metallic minerals accounted for 36 percent of the total value of the State mineral production in 1957.

Copper. - Copper production in Michigan in 1957, in terms of recoverable metal, was about 5 percent less, while value decreased 33 percent from 1956.

Because of the lower prices, Calumet & Hecla Inc. suspended operations in September at the Iroquois, Osceola No. 6 and No. 13 shafts, but continued development at the Osceola project. Production from other company mines and the reclamation plant was continued.

Copper Range Co. in addition to continuous operation of the Champion mine started reclamation of copper from the Redridge sands.

Quincy Mining Co. operated its reclamation plant and smelter continuously.

White Pine Copper Co. operated throughout the year except for a shutdown due to a strike that lasted from September 23 to October 28.

Silver production estimated at 430,000 fine ounces recoverable in 1957 is obtained only as a by-product when copper from the area is electrolytically refined. Production in 1956 was 380,000 fine ounces.

Average weighted price used for calculating the value of copper was 30 cents per pound in 1957 and 42.5 cents in 1956. After reaching a high of 48 cents per pound in March, 1956, copper prices began a downward trend. Copper opened 1957 at 36 cents and declined to a range of 25-27 cents towards the close of the year.

*Prepared December 20, 1957 by Donald F. Klyce, Commodity Industry Analyst, under the supervision of Samuel A. Gustavson, Chief, Minneapolis Field Office, Division of Mineral Industries, Region V.

Iron and Manganese. - Although demand was down in 1957, production of iron ore was greater than in 1956 primarily because of labor strikes in 1956. The year 1957 ushered in a new milestone for Michigan iron ore mining in the commercial mining of Jasper iron ores (non-magnetic taconites) by the Cleveland Cliffs Co.

A small quantity of iron ore containing over 5 percent manganese, natural was mined in 1957.

Dates of first and last lake shipments of ore in 1957 from Michigan and Wisconsin ports were: Ashland - C&NW-Soo, April 28-November 23; Escanaba - C&NW, April 1-November 29; Marquette - DSSA, May 17-October 21; Marquette - LS&I, April 27 - November 26; Superior - GN, April 17-December 3; Superior - NP-Soo, April 21-October 30.

NONMETALS

Several of the important minerals produced in Michigan are classified as nonmetallics. These include cement, clay, gypsum, lime, sand and gravel, stone, and salines derived from well brines. The salines are the source of raw materials in the production of several chemicals, notably bromine and magnesium compounds and common salt. The other nonmetallic minerals are used principally in the construction industry. Nonmetallics represented 55 percent of the value of the State's mineral production. Dollar-wise, about two thirds of the nonmetallics are used in the construction industry and one third in the chemical industry.

MINERAL FUELS

Mineral fuels (natural gas and natural gas products, peat and petroleum) accounted for 9 percent of the 1957 mineral output. Peat was utilized chiefly as a soil conditioner and none was sold as a fuel. No coal production was reported.

Mineral Production in Michigan, 1957 (1)
(Estimated)

Commodity	Short Tons (unless otherwise states)	Value
Cement:		
portland	20,575,000	$65,840,000
masonry	1,559,000	6,080,000
Clays	1,900,000	2,265,000
Copper (recoverable content of ores,etc)	58,750	35,250,000
Gem stones	(2)	500
Gypsum (crude)	1,441,300	4,929,200
Iron ore (usuable) long tons	12,882,000	(3)
Manganiferous ore (5 to 35 percent Mn)	10,080	(3)
Marl, calcareous	150,000	90,000
Natural gas (million cubic feet)	10,900	1,450,000
Peat	30,000	460,000
Petroleum (crude) thousand, 42 gal. bbls.	10,167	32,337,000
Salt (common)	5,500,000	36,500,000
Sand and gravel (4)	38,000,000	38,000,000
Silver (recoverable content of ores,etc.)		
troy ounces	430,000	389,172
Stone	32,750,000	30,000,000
Value of items that cannot be disclosed: Bromine, calcium chloride and calcium magnesium chloride, iron ore, lime magnesium compounds, manganiferous ore, natural gasoline and LP gases, potassium salts, recovered sulfur	--	145,397,350
Total Michigan (5)	--	$393,223,222

(1) Production as measured by mine shipments, sales, or marketable production (including consumption by producers).
(2) Weight not recorded.
(3) Included with value of items that cannot be disclosed.
(4) Includes friable sandstone.
(5) Total has been adjusted to eliminate duplication in value of clays and stone.

DIRECTORY OF PRODUCERS OF MINERALS AND MINERAL PRODUCTS, 1956

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 LaSalle Street Chicago, Illinois	Natural brine	Manistee, Manistee Co.
Pennsylvania Salt Mfg. Co. 1000 Widener Building Philadelphia 7 Pennsylvania	Salt	Wyandotte, Wayne Co.
Standard Lime & Cement 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	X		Manistee
Standard Lime & Cement Co.			X		Manistee
Wilkinson Chemical Co.		X			Lapeer

CEMENT MANUFACTURERS

Name and Address	Plant Location
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. (2 plants) 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*

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

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

CLAY PRODUCTS PRODUCERS

(Brick, Tile, Pottery, Lightweight Aggregate)

Name and Address	Raw Material	Plant Location
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. 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. 12720 Merriman Road Livonia, Michigan	Clay	Livonia, Wayne Co. (Lightweight aggregate)
The Michigan Vitrified Tile Co. P. O. Box 450 Findlay, Ohio	Shale	Corunna, Shiawassee Co. (Tile)
F.W. Ritter Sons Company, Inc. South Rockwood, Michigan	Clay	South Rockwood, Monroe Co. (Pottery)

GYPSUM PRODUCERS

Name and Address	Mine or Quarry Location	Mill Location
Bestwall Gypsum Co. 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

Name and Address	Plant Location
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

Name and Address	Mine Locations (Counties)
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
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

Name and Address	Mine Locations (Counties)
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

Name	Address	Pit Location (County)
	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
*Grant Brizendine	R.F.D. #2, Edwardsburg	Cass
*Case Bros.	R.F.D. #1, Sherwood	Branch, Calhoun
*Mathew J. Brown	R.F.D. #3, Byron Center	Kent
	C.	
Case Bros. Cleveland and Taylor	Sherwood Fremont, Indiana	Branch, Calhoun, St. Joseph, Branch, Hillsdale
	D.	
Arnie Delebaugh	R.F.D. #2, Union City	Calhoun
	E.	
*Ehinger Bros. *Clifford Ellis	West Branch Grand Junction	Ogemaw Van Buren
	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, Osceola
	K.	
Leslie Knox	Colon	St. Joseph
	M.	
*Claude Mastin	Climax	Kalamazoo
Ralph Meyers	R.F.D. #2, West Olive	Ottawa

Marl Producers (Contd.)

Name	Address	Pit Location County
	P.	
Emil Pavlak	R.F.D. #2, Hopkins	Allegan
	R.	
Clyde M. Reed	Union City	Calhoun
	S.	
H.A. Carlton Schau	858 Coy Blvd., Kalamazoo	Barry
Dan Slack	R.F.D. #4, Kalamazoo	Kalamazoo
William Stuart	Mt. Pleasant	Isabella
	W.	
Wierenga Bros.	Spring Lake	Ottawa
*Kenneth L. Wood	Colon	St. Joseph

*Producers with no output or failing to report in 1956

PEAT PRODUCERS

Name and Address	Pit Location
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 Morrice, Michigan	Near Morrice, Shiawassee County
Irving L. Pratt & Son Scottville, Michigan	Near Scottville, Mason County
Anderson Peat Capac, Michigan	Near Capac, Lapeer County

SALT COMPANIES

Name and Address	Product	Plant Location
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)

Name and Address	Pit Location (County)
A.	
Adrian Sand and Gravel, Adrian	Lenawee
Advance Bldg. Materials Co., 46461 Ryan Road Utica	Macomb
Aggregates Processors, White Pigeon	St. Joseph
John W. Alexander, Sr., Route #1, Marshall	Calhoun
American Aggregates Corp., Greenville, Ohio	Kalamazoo, Livingston** Oakland
Andersen Sand & Gravel Co., 1700 S. Werdock St. Saginaw	Tuscola
Arndt, Cleo L., Fennville	Allegan
Avon Asphalt & Gravel Co. J. Gladstone & Son, 423 Oak St., Rochester	Oakland
B.	
*Bark River Sand and Gravel Co.	Delta
Battle Creek Gravel Co. 3800 Dickman Highway, Battle Creek	Calhoun
Floyd Beardslee, R.F.D. #3, Pontiac	Oakland
Bender Gravel Co., 822 Benton St., Hastings	Barry
The Benjamin Pit, 30404 W.14 Mile Rd., Farmington	Oakland
Bernthel Sand & Gravel Co., R.F.D. #2, Reese	Tuscola
Bichler Bros., 1615 Ludington, Escanaba	Delta
*Big Rapids Gravel Co., Route #2, Big Rapids	Mecosta
*Don Bills, Hudson	Lenawee
Adrian Blades, Beaverton	Clare
Boichot Concrete Products Corp. 1800 Turner St., Lansing	Clinton
E.P. Brady & Co., 600 Citizens Bank Bldg. Flint 3	Gratiot, Clinton, Ogemaw, Presque Isle
Bundy Hill Gravel Co., Somerset Center	Hillsdale**
Bodine, Ralph W., 226 Court, Otsego	Allegan
C.	
Caspian Lbr. Co., Caspian	Iron, Baraga, Marquette, Ontonagon
W.A. Cecil & Son, 400 Albion Rd., Concord	Jackson
Central Michigan Sand and Gravel, P.O. Box 5, East Lansing	Ingham, Eaton
Champion, Inc., Iron Mountain	Dickinson, Iron, Marquette, Menominee
Cheney Gravel Co., Inc., Willoughby Rd., Holt	Ingham

Commercial Sand and Gravel Producers (contd.)

Name and Address	Pit Location (County)
C. (contd.)	
*William Cinader, 622 South Main St., Clawson	Oakland
William Click, Sr., 8783 Bryce Road., Goodells	St. Clair
Cloverland Milling, Supply Co. 801 Superior Ave., Gladstone	Delta
Coit Avenue Gravel Co., 4772 Coit Ave., N.E. Grand Rapids	Kent
Cole Gravel Co., Route #1, Dorr	Barry
Emil Combs, Route #1, Tekonsha	Calhoun
Comstock Constr. Co., Box 172, Bay City	Shiawassee, Tuscola
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	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
Edward De Vries & Sons, 959 Bristol Ave., Grand Rapids 4	Kent
Henry De Went, U.S. 21, Hudsonville	Ottawa
Delhi Gravel Co., U.S. 127, Holt	Ingham
*Denslow & Denslow, Weidman	Isabella
Dexter Gravel Co., 7100 Dexter Ann Arbor Road, Dexter	Washtenaw
*Dobb's Truck and Crane Service 1382 Beidler St., Muskegon	Kent
Leo Dunbar, 7658 U.S. 131, Cadillac	Wexford
A.L. Dyer & Sons, McBrides	Clare, Genesee, Gratiot, Isabella, St. Clair, Mecosta, Montcalm
E.	
Eastman Gravel Pit, Route #1, Standish	Arenac
Elliott Ice & Coal Co., 37 Monroe, Hillsdale	Hillsdale
W.L. Emery Co., 1375 E. Jefferson Ave., Detroit	Wayne (Dredge)
*George A. Everson, Sand & Gravel Co. 1033 First St., Menominee	Menominee

Commercial Sand and Gravel Producers (contd.)

Name and Address	Pit Location (County)
F.	
*Orville J. Fair, Route 2, Deckerville	Sanilac
Ferguson Excavating Co., 5360 N. State Rd. Davison	Genesee
The Ferris Co., Mason	Ingham
*Fisher Sand & Gravel Co., 921 S. Jefferson Ave. Midland	Midland
Foley & Beardslee, Route #3, Clarkston	Oakland
Harry Fuoss, Route 1, Durand	Shiawassee
Fox Valley Constr. Co., Box 827, Appleton, Wisc.	Ontonagon, Alger, Gogebic
*Fenner-Crane Constr. Co., Muskegon	Muskegon
G.	
Garrett Sand Co., 411 Phoenix St., South Haven	Van Buren
*Frank L. Gauthier, Onekama	Manistee
Gilliland Gravel Co., Route #2, Alpena	Antrim, Alcona, Cheboygan, Berrien, Montmorency, Ogemaw, Luce, Lapeer, Presque Isle
O.E. Gooding Co., 5800 Cherry Hill Rd., Ypsilanti	Ingham, Oakland, Wastenaw , Sanilac, Allegan, Shiawassee, St. Clair, Lenawee, Marquette, Livingston, Jackson**, Huron, Sanilac, Alcona
*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., 106 E. Kilgore Rd. Kalamazoo	Kalamazoo
*Great Lakes Foundry Sand Co., 720 United Artists Building, Detroit	Tuscola
Great Lakes Gravel Co., 2900 Auburn Road, Utica	Macomb
Groveland Gravel Co., Tindall Road, Holly	Oakland **
H.	
*Haley Gravel Co., 2016 Pattengill, Lansing	Ingham
Harvey G. Hall, 2854 20th Ave., Port Huron	St. Clair
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
Hale Bros., Rt. #2, Caro	Tuscola
Holly Sand & Gravel Co., Grange Hall, Route #1, Holly	Oakland
Hoover Bros., 1137 Tripp Rd., 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.)

Name and Address	Pit Location (County)
H. (contd.)	
C.R. Hunt, Cass City	Huron, Lapeer, Montmorency, Sanilac, Tuscola
Hutchins Sand & Gravel, Rodney C. Hutchins 320 S. Maple, Gaylord	Otsego
Hygrade Sand & Gravel Corp., 5000 E. 31 Mile Rd., Romeo	Macomb
I.	
Ireland & Lester Co., 220 N. Wayne St., St.Joseph	Berrien (Dredge)
Ironwood Concrete & Products Co., Route #1, Box 7A Ironwood	Gogebic
J.	
John R. Sand and Gravel Co., 1865 Indianwood Rd. Lake Orion	Oakland
*Leonard Johnson, Box 31, Chatham	Alger
Thomas F. Johnston (Tom Johnston Gravel Co.) 114 LaFayette St., Grand Haven	Ottawa
*Carl Jones Concrete Products, 7628 Toma Road Pinckney	Livingston, Washtenaw
K.	
K. & V. Gravel Co., Route #1, Fremont	Newaygo
Fred Kaatz, 62701 Richmond Road, Richmond	Macomb
Harold Keill, Route #3, Niles	Berrien
Kemler Bros., 5900 Cobb Creek Ct., Rochester	Oakland
S.E. Ketchum & Sons, Route #3, Mason	Ingham
Killins Gravel Co., 3305 Liberty Rd.,Ann Arbor	Washtenaw**
*King Sand & Gravel Co., 202 South St., Archbold, Ohio	Lenawee
Klumpp Bros., Chelsea	Jackson
Knight Gravel Co., 90 High St., Carsonville	Sanilac
Koan Gravel Co., Route #1, Holly	Oakland
Koenig Coal & Supply Co., 1486 Gratiot Ave. Detroit, Michigan	Oakland
Kruse Gravel Pit, 1090 Clark Rd., Ypsilanti	Washtenaw
Kurtz Gravel Co., G-5300 N. Dort Hwy., Flint	Genesee
L.	
Lake Superior Gravel Co., 640½ Lake Ave.,Ironwood	Gogebic
Lakeport Sand and Gravel Co., 7244 2nd St. Lakeport	St. Clair
A.S. Leffler Gravel Co., Davison	Oakland, Ogemaw
A. Lindberg & Sons, Inc., Box 154, Ishpeming	Marquette

Commercial Sand and Gravel Producers (contd.)

Name and Address	Pit Location (County)
L. (contd.)	
George Litchard, St. Ignace	Mackinac
Lowell Gravel Co., Grand River Drive R.F.D., Lowell	Kent
Steve Lyle, Sand & Gravel, 303 Spring St. Big Rapids	Mecosta
M.	
*Paul C. Martin, Newaygo	Newaygo
Macomb Sand & Gravel, 3295 Auburn Road, Utica	Macomb
Maertens Sand and Gravel Co., 1036 Buckingham Grosse Point	Macomb
*Mike Mangine, Cedarville	Mackinac
Manning-Locklin Gravel Co., Box 216, Northville	Wayne
Louis Marsack & Sons, 23633 Denhurst, St. Clair Shores	Macomb
*H.L. Martin Gravel Co., Box 154, Westphalia	Clinton
Mason Gravel Co., Mason	Ingham
Hugh H. Mason and Sons, 302 N, Center Ave., Gaylord	Cheboygan
Mathews Gravel Co., G-6226 E. Mt. Morris Rd. Mt. Morris	Genesee
Michigan Sand and Gravel, 3405 Hamlin Rd., Utica	Macomb
Michigan Silica Co., Rockwood	Wayne
Mickelson Bros., 1745 Seymore Lake Road, Oxford	Oakland
*Mid American Eng. Corp., 4842 Dempster St. Skokie, Illinois	Oceana, Ontonagon, Antrim, Manistee
Paul C. Miller, 10300 Sparta Ave., Sparta	Grand Traverse, Kalkaska, Kalamazoo, Wexford, Montcalm, Newaygo, Osceola, Oceana, Antrim, Ontonagon, Mecosta, Oakland, Gladwin
*Roy Millimaki, River St., Box 323, Ishpeming	Marquette
Moore Bros. Sand & Gravel, 7635 Wayne Rd., Wayne	Wayne
*Morains, Inc. 4842 Dempster St., Skokie, Ill.	Washtenaw
Morgan Sand & Gravel Co., 45095 Ryan Rd., Utica	Macomb
Muskegon Gravel Co., Muskegon	Muskegon
N.	
Nashville Gravel Co., R.F.D. #2, Nashville	Barry **
New Hudson Sand and Gravel, New Hudson	Oakland
Nieb Concrete Products, 1406 South 11th St., Niles	Cass
Niles Sand and Gravel Co., U.S. Highway and Fort St., Niles	Berrien
North Star Washed Sand & Gravel Co., Ithaca	Gratiot

Commercial Sand and Gravel Producers (contd.)

Name and Address	Pit Location (County)
N. (contd.)	
*Northland Construction Co., Box 160, Petoskey	Emmet
Northville Sand & Gravel Co., 18275 Beck Rd. Northville	Wayne
Northwest Materials, Inc., Bryan, Ohio	Hillsdale
Nugent Sand Co., Inc., P.O. Box 506, Muskegon	Muskegon
O.	
Oakland Sand & Gravel Co., 741 Glengary Road Route 3, Walled Lake	Oakland
Otisville Stone Co., 5300 N. Dort Hwy., Flint	Genesee
Fred M. Ott, Bridgman	Berrien
P.	
*Paris Gravel Co., Route #1, Big Rapids	Mecosta
*Packard Supply Co., 4536 Packard Road, Ypsilanti	Washtenaw
Cy Page, Manitou Beach	Lenawee
Edward Palmer & Son, 2531 E. South, Jackson	Jackson
*John Parks Sand & Gravel, R.F.D. 1, Perry	Shiawassee
Pekaar & Van Doorn, 2774 28th St., Grand Rapids 9	Kent
*Peninsula Asphalt & Construction Co. Route 4, Box 185, Traverse City	Grand Traverse
A.D. Pennock, Nashville	Barry
*William Perry & Son, Peffer S., Harbor Springs	Emmet
Peterhans Bros. Sand & Gravel, 506 Pear St., Caro	Tuscola
Harold Peters, Washed Sand & Gravel, Decker	Sanilac
Harry Pickitt, 409 Hubbard St., Allegan	Antrim, Allegan, Barry, Calhoun, Cheboygan, Clinton, Genesee, Ionia, Kalamazoo, Kent, Livingston, Newaygo, Otsego, Presque Isle, Wayne Kalkaska, Muskegon, Ottawa, Shiawassee, St. Joseph, Washtenaw**
Elmer Pilspanen, Route #1, Box 80, Bessemer	Gogebic
Pine Sand & Gravel, 2690 Imlay City Rd., Lapeer	Lapeer
*Polhamus Gravel Co., Ovid	Shiawassee
Porter Sand & Gravel Co., 802 W. Pottawatamie, Tecumseh	Lenawee
John Post & Sons, R.F.D. 2, Swartz Creek	Genesee
H.F. Postma, 3643 28th St., S.W., Grand Rapids	Kent
Producers Core Sand Corp., 323 Warren Bldg. Michigan Center, Ind.	Berrien
Pryor Bros., 725 N. Cochran, Charlotte	Eaton
*Lyle Pummond, Owosso	Shiawassee

Commercial Sand and Gravel Producers (contd.)

Name and Address	Pit Location (County)
R.	
Ray Industries, Inc., P.O. Box 165, Oxford	Macomb
*Ed Reetz, Box 58, W. Branch	Ogemaw
Bernie Rief, Fraser	Macomb
Riverside Sand & Gravel Co., 1050 Maynard Ave., S.W., Grand Rapids 4	Kent
*Kay Robinson, Contractor, 4491 Vrooman Road Jackson	Jackson
Walter Rosevear Pit, West Branch	Ogemaw
Rosteck Contractors, 15921 Fourteen Mile Road, Fraser	Macomb
Art Russell's Concrete Products, R.F.D. #1 Hillsdale	Hillsdale
S.K. Rogers, 48301 Sugar Bush Rd., New Baltimore	Macomb
S.	
*Ray Sablain, Inc., 2827 S. Cedar St., Lansing	Ingham
Saginaw Core Sand Co., Saginaw	Saginaw, Genesee, Midland, Tuscola
Mrs. Hilma Samuelson, Chatham	Alger
*John R. Sand & Gravel Co., 1865 Indian wood Rd. Lake Orion	Oakland
Sand Products Corp., 2489 First Nat'l. Bank Bldg., Detroit	Manistee, Muskegon
Scarlett Gravel, 1721 S. Cedar, Holt	Ingham
*Sargent Sand Co., 2840 Bay Rd., Saginaw	Tuscola, Mason
Justus Scelenberger, 1545 W. Fry Road, Burt	Genesee
Scio Gravel Co., 2911 W. Delhi, Box 233, Ann Arbor	Washtenaw
Shenk Gravel Co., Donald Shenk, Sr., Durand	Shiawassee, Genesee
Lawrence B. Skinner, 4536 Packard Rd., Ypsilanti	Washtenaw
Slaters Bald Mtn., 53055 N. Parke St., Pontiac 16	Oakland
Smith Sand and Gravel Co., Inc. 65985 Mound Road, Romeo	Macomb
South Haven Sand Co., P.O. 290, Grand Haven	Van Buren
Southern Michigan Materials Co., Bryan, Ohio	Hillsdale
Stamm Bros. Gravel Co., Route 1, Adrian	Lenawee
Standard Sand Co., 14201 Lake Shore Ave., P.O. Box 290, Grand Haven	Ottawa
*Gordon D. Stevick, 424 Patty Ave., Jackson	Jackson
Frank H. Stoerk, Pierson	Montcalm
Straits Aggregate & Equipment Corp., Box 569, East Tawas	Presque Isle
H. Stukey, Coldwater	Branch
Delmar Stanley Gravel Co., Durand	Shiawassee

Commercial Sand and Gravel Producers (contd.)

Name and Address	Pit Location (County)
T.	
The Tabor Co., 125 Front Ave., N.W. Grand Rapids	Antrim, Dickinson, Gd. Traverse, Leelanau, Manistee, Montcalm, Osceola, Lake, Gratiot
*Lawrence Tamlyn, 125 Burdette St., St. Ignace	Mackinac
Tecumseh Gravel Co., P.O. Box 496, Tecumseh	Lenawee
Thompson Sand & Gravel, 48399 W. 7 Mile Road Northville	Wayne
Lamar Thumm, 117 S. Grove St., Ypsilanti	Washtenaw
LeRoy Tirb, Clinton	Lenawee
*Twin Lakes Sand & Gravel Co., Riverdale	Montcalm
U.	
Underwood Sand & Gravel Co., 2255 Hamlin Rd., Utica	Oakland, Macomb
C. Utterback, R.F.D. #2, Mt. Pleasant	Isabella, Alcona
Union City Gravel Co., Union City	Branch
U.S. Aggregates, Inc., 3430 Armond Rd., Davisburg	Oakland
V.	
Valley Gravel Co., Owosso	Shiawassee
Vertel Van Camp, Brown City	Sanilac
Shirley Van Deusen, Route 1, Standish	Arenac
*Van Enkevorts Bros., Bark River	Delta
Chuck Vaughan Gravel and Excavating, 2685 Deckerville Rd., Caro	Tuscola
Vermontville Gravel Co., Karl S. Benson, Route 1, Vermontville	Eaton
*H.R. Vernon, Route 2, Fennville	Allegan
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	Oakland
Wallace Stone Co., Hersey Sand & Gravel Div., Hersey	Osceola
Walling Gravel Co., P.O. Box 52, St. Johns	Clinton
Walsh Sand and Gravel Co., 13th St., Menominee	Menominee
F.S. Ward, Route 1, Clarkston	Oakland
I.J. Warren, 8570 Moms Dr., Belleville	Wayne
Wayne Sand & Gravel Co., 40330 Tyler Road, Wayne	Wayne
Ronald Weaver, Route 1, Owosso	Shiawassee
West Lansing Gravel Co., 1911 Pattengill Ave. Lansing	Ingham

Commercial Sand and Gravel Producers (contd.)

Name and Address	Pit Location (County)
W. (contd.)	
West Shore Constr. Co., Zeeland	Allegan, Alpena, Barry, Eaton, Clinton, Calhoun, Ingham, Kent, Muskegon, Oceana, Ottawa
Wexford Gravel Co., P.O. Box 472, Cadillac	Wexford
I.L. Whitehead Co., Sault Ste. Marie	Baraga, Chippewa, Luce, Schoolcraft, Dickinson, Iron, Mackinac, Menominee
White Lake Gravel, Inc., 622 S. Main, Clawson	Alger, Oakland
Whittaker & Gooding Co., 5800 Cherry Hill Rd., Ypsilanti	Washtenaw, Ogemaw
Olga Winkka, 404 Center St., Marquette	Alger
John Woerner, R.F.D. #4, Adrian	Lenawee
Wolverine Contractors, Inc., 19440 James Couzens Highway, Detroit 35	Wayne
Woodward-Pollock Lbr. Co., Coldwater	Branch
Y.	
John G. Yerington, Route 3, Box 34, Benton Harbor	Barry, Berrien, Allegan, Cass, St. Joseph, Kalamazoo, Van Buren
Youngs Sand & Gravel, Harold-George Young 9095 S. Huron River Drive, Ypsilanti	Washtenaw
Z.	
Zahns Sand & Gravel, 2315 Ellsworth Rd. Ann Arbor	Washtenaw
Allen Zavitz, 37835 Mallast, Mt. Clemens	Macomb
*Zeigler Sand and Gravel, 901 W. State, Hastings	Barry
Harry Zeeff-Sons Gravel Co., 1029 Maynard Ave. S. Grand Rapids 4	Kent

*Producers with no output or failing to report for 1956
**Includes heavy-media separation

STONE PRODUCERS

Name and Address	Type of Stone	Quarry Location
Afton Stone and Lime Co. Afton, Michigan	Limestone, crushed	North of Afton Sec. 25, T.35N., R2W. Cheboygan County
H.C. Albaugh N. Parkview Marshall, Michigan	Sandstone	Marshall Sec.29, T.2S., R.6W. Calhoun County
Arenac County Road Commission	Limestone, crushed (non-commercial)	Northeast of Au Gres Sec. 5, T.19N., R.7E. Arenac County
Bacco Construction Co. Marquette, Michigan	Dolomite, crushed	Marquette County
Bay County Road Commission	Limestone, crushed (non-commercial)	North of Omer Sec.3, T.19N., R.5E. Arenac County
Borin Aggregates 14210 W. Chicago Detroit, Michigan	Dolomite, crushed	Monroe County Sec. 29, 5S., 8E.
Charlevoix Lime & Stone Company Vanderbilt, Michigan	Limestone, crushed	West of Charlevoix Sec. 29, T.34N., R.8W. Charlevoix County
Cheney Limestone Company Bellevue, Michigan	Limestone, crushed and dimensional	West of Bellevue Sec. 20, T.1N., R.6W. Eaton County
Presque Isle 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

Stone Producers - contd.

Name and Address	Type of Stone	Quarry Location
Gierke Brothers Fairport, Michigan	Dolomite, dimensional	North of Fairport Sec. 4, T.37N., R.19W. Delta County
Gogebic County Road Commission	Miscellaneous stone (non-commercial)	Gogebic County
Houghton County Road Commission Hancock, Michigan	Basalt, crushed (non-commercial)	Houghton County
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
Iron River Lumber & Fuel Co. Iron River, Michigan	Dolomite, crushed	Iron County
John C. Jeffery Box 107 Parma, Michigan	Limestone, crushed	Northeast of Parma Sec. 19, R.2S., R.2W. Jackson County
The Metro-nite Company P.O. Box 116, Station F. 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
" " "	Dolomite, crushed	and near Cedarville Sec. 10, R.42N., R.1E. Mackinac County
Michigan Silica Co.	Sandstone, crushed	near Rockwood Sec. 15, T.5S., R.10E. Wayne 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

Stone Producers - contd.

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
Ray Sandstone Quarry 303 Nottawaseppe Napoleon, Michigan	Sandstone	East of Napoleon Sec. 6, T.4S., R.2E. Jackson County
Somes' Quarry P.O. Box 41 Drummond Drummond Island, Michigan	Dolomite, dimensional	West of Drummond Sec. 23, T.42N., R.5E. Chippewa 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	Schoolcraft 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
RECENT				
PLEISTOCENE	GLACIAL DRIFT	SAND, GRAVEL, CLAY, boulders, marl	0-1000	SAND, GRAVEL, PEAT, MARL, FRESH WATER
"PERMO-CARBONIFEROUS"	"RED-BEDS"	SHALE, CLAY, SANDY SHALE, gypsum		
PENNSYLVANIAN	GRAND RIVER	SANDSTONE, sandy shale	80-95	BUILDING STONE, FRESH WATER
	SAGINAW	SHALE, SANDSTONE, limestone, coal	20-535	SHALE, COAL, FRESH WATER, BRINE, GAS
MISSISSIPPIAN	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
	ELLSWORTH-ANTRIM	SHALE, limestone	100-950	SHALE, GAS
DEVONIAN	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	
SILURIAN	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
ORDOVICIAN	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
OZARKIAN OR CANADIAN	PRAIRIE DU CHIEN	DOLOMITE, Shale	0-410	
	HERMANSVILLE	DOLOMITE, SANDY DOLOMITE, sandstone	15-500	
CAMBRIAN	LAKE SUPERIOR (Munising) (Jacobsville)	SANDSTONE	500-2000	BUILDING STONE FRESH WATER
ALGONKIAN	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
ARCHEAN	LAURENTIAN	SCHIST, GNEISS, GRANITE		ROAD METAL, BUILDING STONE, VERDE ANTIQUE, TALC, GOLD
	KEEWATIN	SCHIST, GREENSTONE, SLATE		ROAD METAL