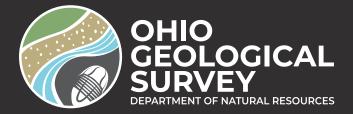


compiled by Christopher E. Wright





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2020 Report on Ohio Mineral Industries: An annual summary of the state's economic geology

compiled by Christopher E. Wright

STATE OF OHIO DEPARTMENT OF NATURAL RESOURCES DIVISION OF GEOLOGICAL SURVEY Michael P. Angle, Chief

PREFACE

The year 2020 will long be remembered as a year of masks, hand sanitizer, work shutdowns and layoffs, working from home, sickness, and sadly death, all as a result of the effects from the COVID-19 pandemic that ravaged the globe. The aftereffects of the COVID-19 pandemic can be seen in the economic downturn that occurred throughout the world, and the coal and industrial mineral producers of Ohio were not immune to this downturn. Decreases in production, sales, value, and employment were much more common among a number of commodities in 2020 than they have been in recent years.

The 2020 Report on Ohio Mineral Industries continues in the efforts of the ODNR Division of Geological Survey to present a clear and concise representation of mining production, sales, and employment for Ohio's mineral industry commodities. This report provides a brief discussion of each geologic commodity and a bulleted listing of commodity statistics for 2020. Percent change comparisons of 2020 production and sales values for each commodity with those of the previous year are notated, with the 2019 data coming from the 2019 edition of this report (Wright, 2020).

The Map of Active Mineral Industry Operations in Ohio is included at the end of the report and acts as a standalone product. The map includes a table with information about each labeled point, including the company name and total combined tonnage of material(s) mined at each operation location.

The appendices are not included within the report and are instead available as downloadable files on the ODNR Division of Geological Survey webite at **ohiodnr.gov/industrialminerals**. These appendices include data for all commodities categorized by company, commodity, and county. Digital versions of these appendices allow users to view and organize data in a way that is convenient to them.

Chris Wright Geologist



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2020 OHIO ECONOMIC GEOLOGY IN BRIEF

The total tonnage of coal and industrial minerals produced in Ohio during 2020 was 111,559,936 tons or approximately 9.5 tons per capita. In 2020, the total value¹ of coal was \$141,207,916; the value of oil and gas was \$4,663,309,002; and the value¹ of all nonfuel industrial minerals was \$1,262,343,562 (figs. 1, 2, 3; table 1). The combined value of fuel and nonfuel minerals produced in Ohio during 2020 was \$6,066,860,480 or approximately \$514 per capita.

Reported and estimated total direct employment in the extractive industries of Ohio in 2020 was more than 10,000 people. Industrial-mineral production increased for salt, sandstone and conglomerate, clay, shale, and peat, while production decreased for coal, limestone and dolomite, and sand and gravel. The total value of nonfuel industrial minerals exceeded \$1 billion for the seventh straight year. In 2020, the production-leading commodity of limestone and dolomite was down 5.4%, with the second leading commodity of sand and gravel down 2.9% from 2019; the third leading commodity of coal was down 53.9% from 2019 values.

Includes reported and estimated values. Some operations reporting sales did not report a value for those sales. A statewide-average price per ton was calculated for each industrial-mineral commodity based on sales for which the value was reported. A statewide-average price per ton was calculated for coal based on method of production for which sales or value was reported. These calculated averages were used to estimate the value of the sales for which the actual values were not reported.

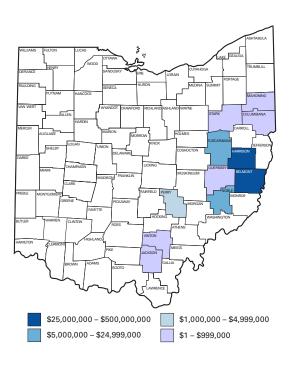


FIGURE 1. Total value of coal sold in Ohio in 2020, by county.

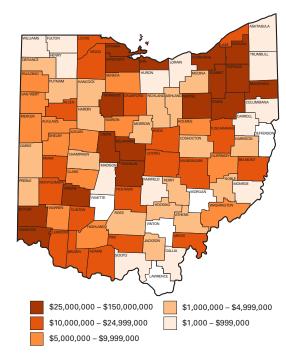
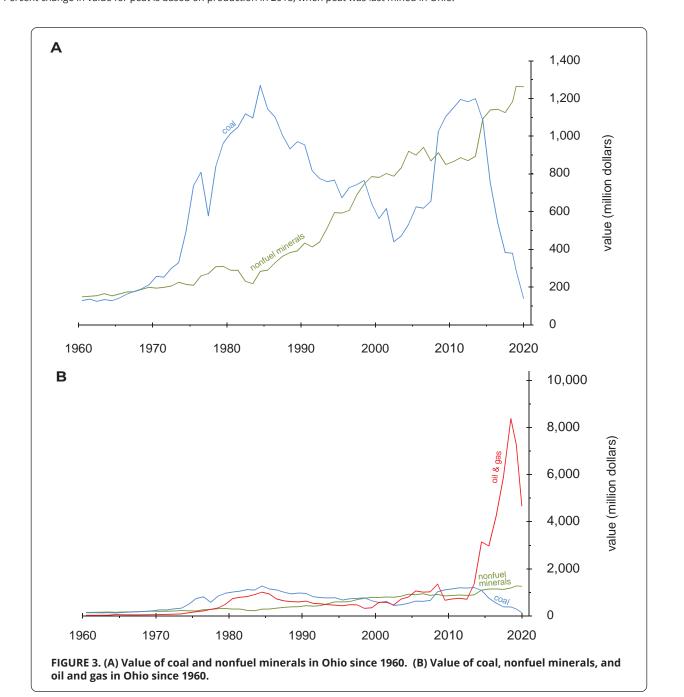


FIGURE 2. Total value of industrial minerals sold in Ohio in 2020, by county.

TABLE 1. Fuel and nonfuel mineral sales and production in Ohio in 2020

Commodity	Production ¹	Sales²	Value ³	Change in value from 2019 (percent)⁴	
Limestone and dolomite	67,199,822 tons	67,792,822 tons	\$737,163,213	+ 0.6	
Coal	3,786,974 tons	4,002,170 tons	\$141,207,916	- 50.7	
Sand and gravel	33,248,864 tons	32,556,986 tons	\$286,327,202	+ 6.2	
Salt	4,488,979 tons	3,200,844 tons	\$183,320,754	- 11.4	
Sandstone and conglomerate	1,334,430 tons	1,203,656 tons	\$43,763,625	- 2.8	
Shale	404,060 tons	404,060 tons	\$3,899,358	- 6.5	
Clay	1,096,104 tons	1,096,104 tons	\$7,857,610	+ 5.3	
Peat	728 tons	728 tons	\$11,800	+ 195.0	
Gas	2,365,078,017 thousand cubic feet	not available	\$3,807,775,607	- 34.1	
Oil	23,957,810 barrels	not available	\$855,533,395	- 41.7	

¹The production figures for industrial minerals are estimates, as many operators do not know actual production. For those operators that do not



report production, production is assumed equal to sales or estimated from ODNR Division of Mineral Resources Management records.

Includes material for captive use.

The FOB value of industrial minerals sold was estimated for mines that failed to report this information and for those producing material for captive use. These estimates were calculated using a statewide-average price per ton calculated using reported FOB values.

Percent change in value for peat is based on production in 2018, when peat was last mined in Ohio.

COAL

Commodity summaries and directories of operators are available at: ohiodnr.gov/industrialminerals

Coal was first recognized in Ohio by pioneers during the 1740s, and the first map of Ohio coal deposits was made in 1752 (Crowell, 1995). Coal production first occurred in Jefferson County during 1800 and amounted to 100 tons. Columbiana County was the next to report coal production starting in 1803 (Crowell, 1995). Since that time, nearly 4 billion tons of coal have been mined from coal seams in the state (see fig. 4; Crowell, 1995); this represents a value of more than \$200 billion in 2020 dollars.²

Throughout 2020, ODNR issued one underground-mine expansion permit and one surface-mine expansion permit. There were two new permits issued, both being surface mines, and no new underground mines. Several coal operations ceased or curtailed production in 2020 because of less-expensive, competing natural gas and decreased demand, in large part as a result of the global COVID-19 pandemic.

²The following link will provide more information about the formation and uses of Ohio's coal resources: ohiodnr.gov/coalgeology.

Production

- Tons produced = 3,786,974 (-53.9% from 2019)
- U.S. ranking: 15th out of 22 producing states (USDOE, 2021)
- Leading counties (percentage of statewide production):
 - Belmont (51.2%)
 - Harrison (26.3%)
 - Noble (12.2%)
 - Tuscarawas (5.5%)
- Top producing seams (table 5):
 - Pittsburgh (No. 8)
 - Upper Freeport (No. 7)
 - Meigs Creek (No. 9)

Sales

(See figs. 5, 6 and tables 2, 6, 7)

- Tons sold = 4,002,170 (-48.6% from 2019)
- Value = \$141,207,916

Employment

(See table 8)

- Production employees reported = 456
- Nonproduction employees reported = 103
- Average employee wages:

Surface-mine production = \$46,728 Underground-mine production = \$79,616

Total wages earned = \$60,743,849

SYSTEM	GROUP	LITHOSTRATIGRAPHIC UNITS
Permian	Dunkard	Washington (No. 12) coal
	Monongahela	Waynesburg (No. 11) coal Uniontown (No. 10) coal Meigs Creek (No. 9, Sewickley) coal Pomeroy (No. 8a, Redstone) coal Pittsburgh (No. 8) coal
ian	Conemaugh	Ames marine zone Harlem coal Anderson coal Wilgus coal Brush Creek marine zone Mahoning (No. 7a) coal
Pennsylvanian	Allegheny	Upper Freeport (No. 7) coal Lower Freeport (No. 6a) coal Middle Kittanning (No. 6) coal Strasburg (No. 5a) coal Lower Kittanning (No. 5) coal Vanport marine zone Clarion (No. 4a) coal Winters coal Newland (No. 4, Brookville) coal
	Pottsville	Tionesta (No. 3b) coal Upper Mercer (No. 3a) coal Lower Mercer (No. 3) coal Quakertown (No. 2) coal Sharon (No. 1) coal

FIGURE 4. Stratigraphic column of coals mined in Ohio during 2020 (black), other significant coal beds (red), and associated key beds (blue) used for stratigraphic correlation. Modified from Brant and Delong (1960, table 9), Collins (1979, fig. 3), and Larsen (1991, fig. 2).



FIGURE 5. Coal sales in Ohio in 2020, by county and quantity.

TABLE 2. 2020 Ohio coal production and sales by county, in descending order of production

accomming or act of production								
County	Production (short tons)	Sales (short tons)						
Belmont	1,939,253	2,198,606						
Harrison	996,066	1,009,620						
Noble	460,912	460,912						
Tuscarawas	209,945	209,812						
Perry	162,089	104,831						
Vinton	15,456	15,456						
Mahoning	1,396	1,396						
Stark	1,213	1,213						
Columbiana	357	241						
Jackson	283	79						
Guernsey	4	4						
TOTAL	3,786,974	4,002,170						

TABLE 3. 2020 Ohio coal production, by production size group and change from 2019

and change from 2019							
	202	0	Change from				
Production size group	Number of mines reporting	Production (short tons)	Change from 2019 (short tons)				
1,000,000 tons and over	1	1,689,297	-3,045,749				
500,000 to 999,999 tons	0	0	-1,333,309				
250,000 to 499,999 tons	2	641,749	-317,680				
100,000 to 249,999 tons	6	1,075,721	253,408				
50,000 to 99,999 tons	3	225,070	56,801				
25,000 to 49,999 tons	2	70,960	-74,863				
Less than 25,000 tons	13	84,177	33,919				
TOTAL	27	3,786,974	-4,427,473				

TABLE 4. 2020 Ohio coal production, by county and mining method

				Unde	rground		Surface								
C	All methods	(short tons) of mines of mines reporting Total Longwall Continuous report					Number	Prod	uction (short	tons)	Number		Production (s	short tons)	
County	(short tons)		of mines reporting	Total	Strip	Auger	Highwall								
Belmont	1,939,253	3	1	1,689,297	1,583,808	105,489	2	249,956	144,229	12,167	93,560				
Columbiana	357	1					1	357	357						
Guernsey	4	1					1	4	4						
Harrison	996,066	4	2	641,749		641,749	2	354,317	312,816		41,501				
Jackson	283	1					1	283	283						
Mahoning	1,396	2					2	1,396	1,396						
Noble	460,912	4					4	460,912	460,912						
Perry	162,089	1	1	162,089		162,089									
Stark	1,213	1					1	1,213	1,213						
Tuscarawas	209,945	8	1	101,086		101,086	7	108,859	108,859						
Vinton	15,456	1					1	15,456	15,456						
TOTAL ¹	3,786,974	27	5	2,594,221	1,583,808	1,010,413	22	1,192,753	1,045,525	12,167	135,061				

¹Any tally inconsistencies are because of rounding of production tonnages.

TABLE 5. 2020 Ohio coal production, by county and seam

						Product	ion (short to	ns)				
County ¹	Total	Upper Mercer (No. 3a)	Newland (No. 4, Brookville)	Clarion (No. 4a)	Lower Kittanning (No. 5)	Strasburg (No. 5a)	Middle Kittanning (No. 6)	Upper Freeport (No. 7)	Pittsburgh (No. 8)	Pomeroy (No. 8a, Redstone)	Meigs Creek (No. 9, Sewickley)	Waynesburg (No. 11)
Belmont	1,939,253								1,902,090		26,137	11,026
Columbiana	357				357							
Guernsey	4										4	
Harrison	996,066							641,749	263,925	63,676	26,716	
Jackson	283				283							
Mahoning	1,396				1,396							
Noble	460,912										460,912	
Perry	162,089						162,089					
Stark	1,213		1,213									
Tuscarawas	209,945	2,278	37,811		31,670	6,870	131,316					
Vinton	15,456			6,536	4,096		4,824					
TOTAL ²	3,786,974	2,278	39,024	6,536	37,802	6,870	298,229	641,749	2,166,015	63,676	513,769	11,026

¹ Production from mines operating in more than one county was evenly split between the counties involved unless a county-specific breakdown was provided by the operator.

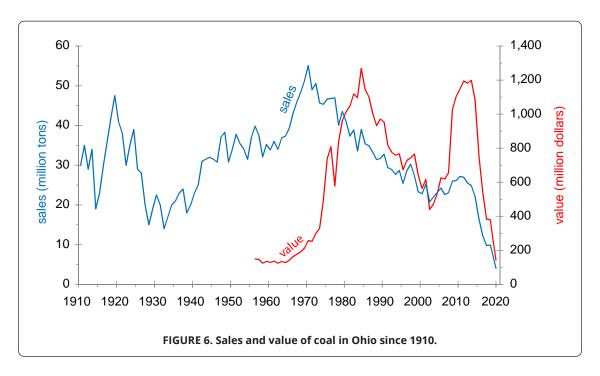
TABLE 6, 2020 Disposition of Ohio coal, by county

TABLE 6. 2020 Disposition of Onio Cour, by Country									
	Number of		Disposition¹ (short tons)						
County ¹	mines	Total ²	Rail	Water	Truck	Conveyor	Stored		
Belmont	3	2,198,606	454,310		1,744,296		50,523		
Columbiana	1	241			241		116		
Guernsey	1	4			4				
Harrison	4	1,009,620	49,231		960,389				
Jackson	1	79			79		204		
Mahoning	2	1,396			1,396				
Noble	4	460,912			460,912				
Perry	1	104,831			104,831		3,792		
Stark	1	1,213			1,213				
Tuscarawas	8	209,812	101,086		108,726				
Vinton	1	15,456			15,456				
TOTAL ³	27	4,002,170	604,627	0	3,397,543	0	54,635		

Tonnage of coal shipped from mines operating in more than one county was evenly split between the counties involved and type(s) of disposition reported unless county-specific information was provided by the operator.

2Does not reflect tonnage stored. Reflects tonnage sold and shipped from mine.

3Any tally inconsistencies are because of rounding.



²Any tally inconsistencies are because of rounding of production tonnages.

TARIE 7	2020 Dollar va	lue of coal	l at mine	hy county and	mining method
IADLE /.	2020 Dollar va	iue oi coai	at mine.	DV COUNTY and	mining method

							mire, by count						
			Total			Underground				Surface			
County ¹	No. of mines	Tonnage sold (short tons)	Value at mine² (dollars)	Per ton average (dollars)	No. of mines	Tonnage sold (short tons)	Value at mine² (dollars)	Per ton average (dollars)	No. of mines	Tonnage sold (short tons)	Value at mine²(dollars)	Per ton average (dollars)	
Belmont	3	2,198,606	\$74,408,834	\$33.84	1	1,953,535	\$66,864,616	\$34.23	2	245,071	\$7,544,218	\$30.78	
Columbiana	1	241	\$22,563	\$93.62					1	241	\$22,563	\$93.62	
Guernsey	1	4	\$109	\$27.25					1	4	\$109	\$27.25	
Harrison	4	1,009,620	\$42,592,068	\$42.19	2	652,388	\$30,019,169	\$46.01	2	357,232	\$12,572,899	\$35.20	
Jackson	1	79	\$79	\$1.00					1	79	\$79	\$1.00	
Mahoning	2	1,396	\$54,355	\$38.94					2	1,396	\$54,355	\$38.94	
Noble	4	460,912	\$12,633,597	\$27.41					4	460,912	\$12,633,597	\$27.41	
Perry	1	104,831	\$4,822,207	\$46.00	1	104,831	\$4,822,207	\$46.00					
Stark	1	1,213	\$23,054	\$19.01					1	1,213	\$23,054	\$19.01	
Tuscarawas	8	209,812	\$6,237,677	\$29.73	1	101,086	\$4,346,698	\$43.00	7	108,726	\$1,890,979	\$17.39	
Vinton	1	15,456	\$413,373	\$26.75					1	15,456	\$413,373	\$26.75	
TOTAL	27	4,002,170	\$141,207,916	\$35.28	5	2,811,840	\$106,052,690	\$37.72	22	1,190,330	\$35,155,226	\$29.53	

^{&#}x27;Sales reported from mines operating in more than one county were evenly split between the counties involved unless county-specific information was provided

TABLE 8. 2020 Wage and salary payments to Ohio coal mine employees, by county and occupational group

TABLE 6. 2020 Wage and Salary payments to omo cour nime employees, by county and occupational group									
	Wage and salary payments (nearest whole dollar) ²								
County ¹	All occupations	Underground production employees	Surface production employees	Other					
Belmont	\$40,177,703	\$12,395,367	\$1,905,552	\$25,876,784					
Harrison	\$10,925,696	\$7,616,754	\$1,598,918	\$1,710,024					
Jefferson	\$16,668			\$16,668					
Mahoning	\$45,653		\$45,653						
Noble	\$3,575,825		\$3,575,825						
Perry	\$1,628,585	\$1,200,000		\$428,585					
Stark	\$142,150		\$2,400	\$139,750					
Tuscarawas	\$1,969,314	\$1,000,818	\$577,130	\$391,366					
Vinton	\$565,432		\$565,432						
TOTAL ³	\$59,047,026	\$22,212,939	\$8,270,910	\$28,563,177					

For those operations reporting activity in more than one county, wage and salary payments were evenly split between the counties involved unless county-specific information was provided by the operator.

³Any tally inconsistencies are because of rounding.



by the operator.

²The FOB value of coal sold was estimated for those mines that failed to report this information. These estimates were calculated using a statewide-average price per ton by mining method, based on reported FOB values deemed to be reliable.

²For those operations reporting only a total wage and salary payment for all workers, an equal pay rate was assumed for all employees. In cases where quarterly employment was reported but wage and salary payments were not, wage and salary payments for that quarter were estimated from reported payments in the other quarters to arrive at the annual figure.

INDUSTRIAL MINERALS

Commodity summaries and directories of operators are available at: ohiodnr.gov/industrialminerals

Industrial minerals are nonmetallic, nonfuel rocks or minerals that have economic value and are essential to modern society. Industrial minerals have been mined or quarried in Ohio since the establishment of early settlements and include limestone, dolomite, sand, gravel, sandstone, conglomerate, clay, shale, salt, gypsum, and peat. Hundreds of construction projects and industrial products rely on the availability of industrial minerals.

The production of multiple commodities is important to the economic success of mine operations in many areas of Ohio. The production of sand and gravel along with clay is often located in glaciated portions of northern and western Ohio, where deposits of sand and gravel can occur with clay-rich glacial tills. The Pennsylvanian-age cyclic sedimentation in eastern Ohio includes coals, clays, shales, and limestones in close proximity, allowing for economic recovery of multiple commodities.³

Industrial minerals were reported as produced or sold at 347 operations in 83 Ohio counties during 2020. The combined value of all industrial minerals sold in 2020 was \$1,262,343,562 (table 9). This is the seventh consecutive year that the combined value of all nonfuel minerals has exceeded one billion dollars. The statewide combined employment for all nonfuel industrial mineral extraction was 3,930 employees (table 10).

Peat sales were reported in Portage County by one company that also produces sand and gravel and clay. Total sales were 728 tons with a value of \$11,800. This is the highest peat production since 2009. However, total peat sales in 2020 were small enough to have negligible effect on the total value of all industrial minerals mined in Ohio (table 9).

³The following links will provide more information on the general bedrock and glacial geology of Ohio: **ohiodnr.gov/bedrockgeology** and **ohiodnr.gov/glacialgeology**

Commodity	Sales (tons)	Change from 2019 (tons/percent)¹	Value ²	Percent of total value
Limestone and dolomite	67,792,822	-1,586,025/-2.3	\$737,163,213	58.4
Sand and gravel	32,556,986	-1,078,638/-3.2	\$286,327,202	22.7
Salt	3,200,844	-1,190,080/-27.1	\$183,320,754	14.5
Sandstone and conglomerate	1,203,656	-46,568/-3.7	\$43,763,625	3.5
Shale	404,060	-1,834/-0.5	\$3,899,358	0.3
Clay	1,096,104	+145,867/+15.4	\$7,857,610	0.6
Peat	728	+328/+82.0	\$11,800	0.0
TOTAL	106,255,200	-3,756,550/-3.4	\$1,262,343,562	100.0

TABLE 9. 2020 Value of Ohio industrial minerals

²The FOB value of industrial minerals sold was estimated for those mines that failed to report this information and for those producing material for captive use. These estimates were calculated using a statewide-average price per ton based on reported FOB values.



¹ Percent change in sales for peat is based on production in 2018, when peat was last mined in Ohio.

TABLE 10. 2020 Employment at Ohio industrial-mineral operations, by county

County	Total Employees ²	Production Employees	Nonproduction Employees
Adams	18	10	8
Allen	20	11	9
Ashland	16	12	4
Ashtabula	7	4	3
Athens	13	10	3
Auglaize	10	10	0
Belmont	293	46	247
Brown	31	16	15
Butler	144	49	95
Carroll ¹	0	0	0
Champaign	11	6	5
Clark	14	7	7
Clermont	48	40	8
Clinton ¹	0	0	0
Columbiana	8	4	4
Coshocton	32	21	11
Crawford	15	15	0
Cuyahoga	261	228	33
Darke	7	5	2
Defiance	21	12	9
Delaware	23	23	0
Erie	135	91	44
Fairfield	1	1	0
Franklin	170	112	58
Fulton	1	1	0
Gallia	1	1	0
Geauga	61	56	5
Greene	48	39	9
Guernsey	38	21	17
Hamilton	116	57	59
Hancock	6	6	0
Hardin	10	5	5
Harrison	2	2	0
Henry ¹	0	0	0
Highland	23	19	4
Hocking	63	34	29
Holmes	45	26	19
Huron	2	1	1
Jackson	11	10	1
Knox	65	40	25
Lake	123	75	48
Licking	31	21	10
Logan	51	31	20
Lorain	3	2	1
Lucas	54	42	12

County	Total Employees ²	Production Employees	Nonproduction Employees
Madison	5	3	2
Mahoning	90	59	31
Marion	13	11	2
Medina	14	12	2
Meigs	22	16	6
Mercer	16	11	5
Miami	33	22	11
Monroe	8	8	0
Montgomery	51	38	13
Morrow	5	5	0
Muskingum	53	42	11
Noble	18	15	3
Ottawa	105	86	19
Paulding	40	34	6
Perry	12	8	4
Pickaway	21	10	11
Pike	25	22	3
Portage	137	96	41
Preble	29	21	8
Putnam	4	4	0
Richland	22	22	0
Ross	19	12	7
Sandusky	194	166	28
Scioto	4	3	1
Seneca	65	51	14
Shelby	17	13	4
Stark	109	76	33
Summit	100	1	99
Trumbull	10	8	2
Tuscarawas	203	60	143
Union	56	38	18
Van Wert	31	26	5
Warren	28	15	13
Washington	71	21	50
Wayne	61	34	27
Williams ¹	0	0	0
Wood	60	48	12
Wyandot	127	107	20
TOTAL 83 counties	3,930	2,446	1,484

Counties

1 Counties where commodities were extracted but no employment information was provided are represented with zeros in the employment fields.

2 Any tally inconsistencies are because of computer rounding produced by partial-year employment.

LIMESTONE AND DOLOMITE

Limestone and dolomite are Ohio's most versatile industrial minerals. Each is used as aggregate in the construction industry, as an essential ingredient in the cement industry, to produce lime, as a flux in the steel and glass industries, as filler in a multitude of products, as an agricultural supplement, in water purification, and as a building stone. Ohio has long been a national leader in the production of lime and construction aggregates.

Devonian- and Silurian-age carbonates located in the western half of Ohio are the primary geologic units producing crushed stone. Pennsylvanian- and Mississippian-age limestones are important sources of aggregate in local markets of eastern Ohio (Stout, 1941; Lamborn, 1951).

Production

- Tons produced = 67,199,822 (-5.4% from 2019)
- · U.S. ranking:
 - 5th out of 50 producing states for crushed stone (USGS, 2021a)
 - In the top 5 of the 28 producing states for lime (USGS, 2021b)
- Top Producing Geologic Units (fig. 7):
 - Columbus/Delaware Limestones (Devonian)
 - Lockport Dolomite (Silurian)
 - Greenfield/Peebles/Tymochtee Dolomites (Silurian)
 - Cedarville Dolomite (Silurian)

Sales

(See figs. 8, 9)

- Tons sold = 67,792,822 (-2.3% from 2019; table 11, 12)
- Value⁴ = \$737,163,213 (table 9)
- Leading counties (percentage of statewide sales):
 - Franklin (12.7%)
 - Wyandot (11.3%)
 - Ottawa (8.5%)
 - Erie (6.4%)

Employment

(See table 10)

- Production employees reported = 1,216
- Nonproduction employees reported = 630
- Average employee annual wage = \$60,678
- Total wages earned = \$81,429,251
- Average days worked per operation = 195

⁴Includes reported and estimated values. See footnote 1, p. 1.



TABLE 11. 2020 Ohio limestone and dolomite sales, by county and use

							וחוס כווחו							
		-			Crushed an	Crushed and broken stone	e.					Stone for		
Total all types	Total	Riprap	Flux stone	Stone for portland cement concrete	Stone for asphaltic concrete	Road construction/ resurfacing	Commercial building	Railroad ballast	Extenders/ fillers	Extenders/ Unspecified/ fillers other	Dimension stone	re	Agricultural stone (aglime)	Raw stone for burning
929,049	929,049									929,049				
1,065,405	1,061,017	24,797		123,967	203,375	94,823	37,167			576,888			4,388	
29,750	29,750									29,750				
563,008	563,008	6'829		54,619	28,000		270,530			203,000				
992,844	992,844	40,061				307,146	206,116			439,521				
1,873,617	1,873,617									1,873,617				
132,303	132,303									132,303				
2,106,334	2,106,334			106,912	282,435	103,100	1,613,887							
2,119,819	2,098,769	40,620		73,023	550,168	626,948	715,157	2,287		90,566			21,050	
8,837	8,837					8,837								
1,109,000	1,011,000	14,000		312,000	300,000					385,000			000'86	
328,897	328,897	1,714		16,683	100,099	112,233	75,000			23,168				
3,144,000	3,135,000	20,000		422,000	414,000					2,279,000			6,000	
4,360,681	4,332,750	22,932				284,034				4,025,784	27,440		491	
8,609,187	8,547,629	14,664		439,743	453,366	213,464	2,145,279			5,281,113			61,558	
1,420,670	604,565									604,565		816,105		
378,198	378,198					378,198								
23,551	23,551									23,551				
433,000	433,000			20,000	138,000			1,000		274,000				
225,004	225,004									225,004				
348,108	348,108					348,108								
529,846	517,498	8,138			36,182	301,452	171,726						12,348	
12,372	12,372			2,053	3,010	126	4,086			2,302				
28,077	28,077	1,153				26,924								
72,800	72,800									72,800				
7,964	7,964					426	7,538							
4,623	4,623						4,623							
821,759	821,759	39,368		269,955		28,120	224,962			259,354				
2,192,976	2,192,976									2,192,976				
2,027,190	2,027,190		27,809			413,620				1,585,761				
477,000	477,000	4,000		76,000	71,000					326,000				
607,018	607,018									607,018				
1,284,134	1,196,169	10,015	11,700	115,743	10,000	289,331	265,634		140,000	353,746			87,965	
40,602	40,602					40,602								
797,847	660,153					11,256	12,362			636,535		137,694		
1,090,586	698'886	5,346								980,523			104,717	
286,658	286,658	9,246				564,699				12,713				
5,757,542	5,513,701	23,041		70,698	557,182	3,284,237	125,000			1,453,543				243,841
1,153,138	607,710									607,710		545,428		
0000										036 236				

TABLE 11. 2020 Ohio limestone and dolomite sales, by county and use (cont.)

								Tons sold							
						Crushed an	Crushed and broken stone	je e							
County	Total all types	Total	Riprap	Flux stone	Stone for portland cement concrete	Stone for asphaltic concrete	Road construction/ resurfacing	,Commercial building	Railroad ballast	Extenders/ fillers	Road Commercial Railroad Extenders/ Unspecified/ Stone resurfacing ballast fillers other		stone jor portland cement manufacture	Agricultural Raw stone stone for burning (aglime)	Raw stone for burning
Pickaway	213,416	213,416	6,500		50,000	80,000	20,000	20,000	2,000		31,916				
Pike	1,048,040	1,034,140	88,000		250,000	350,000	200,000	125,000	10,000		11,140			13,900	
Portage	100	100							100						
Putnam	431,000	431,000			70,000	48,000					313,000				
Ross	256,541	256,541	1,500				150,000	100,000			5,041				
Sandusky	2,889,633	1,113,816	3,042		245,131	133,283	254,750	408,469			69,141			23,631	1,752,186
Seneca	1,181,369	465,892	2,293								463,599	1,884		23,714	689,879
Shelby	969'999	969'999									969'999				
Stark	43,491	43,491					43,491								
Tuscarawas	242,273	242,273	10,810				231,463								
Union	2,644,290	2,644,290									2,644,290				
Van Wert	896'929	626,968			24,000						896′209				
Warren	212	212									212				
Wayne	2,105	1,801						1,801						304	
Wood	2,240,584	2,230,392	18,196		144,934	566,343	625,907	289,080		12,701	573,231			10,192	
Wyandot	7,645,350	7,609,350	54,000	29,000	1,409,447	768,357	5,884	377,442	27,000	63,000	4,875,220			36,000	
TOTAL	67,792,822	63,071,107	470,295	68,509	4,296,908	5,092,800	8,669,974	8,669,974 7,200,859	45,387	215,701	37,010,674	29,324	1,499,227	Ц	507,258 2,685,906

SYSTEM	GROUP	LITHOSTRATIGRAPHIC UNITS
Permian Quaternary		Glacial clay Glacial sand and gravel
Permian	Dunkard	
	Mononga- hela	Fishpot limestone Redstone limestone
vanian	Cone- maugh	Bellaire sandstone Ames limestone Buffalo sandstone Brush Creek limestone
Pennsylvanian	Pottsville Allegheny	Upper Freeport sandstone Lower Kittanning clay Vanport limestone Clarion shale Putnam Hill limestone
	Pottsville	Newland-Brookville clay Tionesta clay Middle Mercer clay Massillon sandstone Sharon conglomerate
Mississippian		Maxville Limestone Logan Formation Black Hand Sandstone
Devonian	Detroit River	Buena Vista Sandstone Berea Sandstone Bedford Shale Ohio Shale Chagrin Member Ten Mile Creek Dolomite Dundee Limestone Delaware Limestone Columbus Limestone
Silurian	Salina	Salina Dolomite "Salt beds" Tymochtee Dolomite Greenfield Dolomite Peebles Dolomite Cedarville Dolomite Lockport Dolomite Laurel Limestone Dayton Limestone Brassfield Formation
Ordovician	Black River	Black River Limestone

FIGURE 7. Stratigraphic column of nonfuel industrial minerals mined in Ohio during 2020. Modified from Brant and Delong (1960, table 9), ODNR Division of Geological Survey (1990), and Slucher and others (2006).

TABLE 12. 2020 Production of lime from Ohio, by county and use

County	Total tons¹	Building (tons)	Chemical and industrial (tons)	Refractory (tons)
Ottawa	110,837	62,186	48,651	
Sandusky	761,820		761,820	
Seneca	317,049		317,049	
TOTAL	1,189,706	62,186	1,127,520	0

¹Burning produced a 44.3% weight loss.

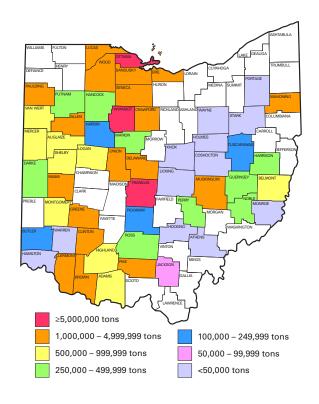
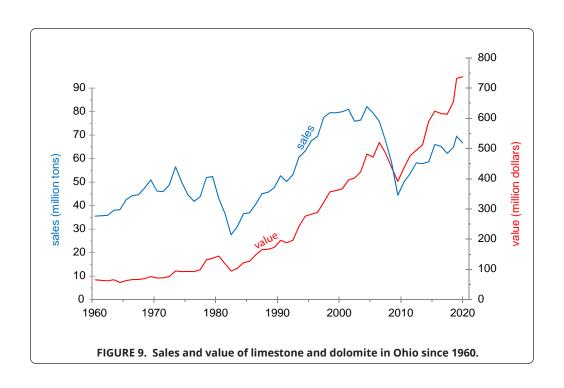


FIGURE 8. Sales of limestone and dolomite in Ohio in 2020, by county and quantity.



SAND AND GRAVEL

Sand and gravel are common raw materials that are major constituents of asphalt, concrete, mortar, landscaping, roofing shingles, soil additives, and many other products. Sand-and-gravel production increased rapidly in Ohio beginning in the 1950s with the development of improved mining and processing machinery and increased demand from road building (ODNR Division of Geological Survey, 1959). Many depleted sand-and-gravel operations have been redeveloped as parks, residential spaces, or commercial facilities because of their proximity to urban areas.

Sand-and-gravel deposits in Ohio primarily are associated with Quaternary-age glacial outwash and kame terraces in the valleys and tributaries of the Great Miami, Scioto, and Muskingum Rivers located in the southwestern, central, and eastern portions of the state, respectively. Important sand-and-gravel deposits also are found in glacial kames in northeastern Ohio, beach ridges associated with ancestral Lake Erie, and alluvium of modern floodplains of the Ohio River and its tributaries.

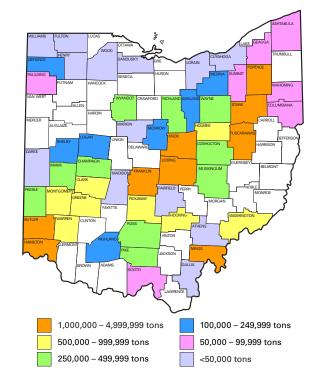


FIGURE 10. Sales of sand and gravel in Ohio in 2020, by county and quantity.

Production

- Tons produced = 33,248,864 (-2.9% from 2019)
- U.S. ranking:
 - 7th out of 50 producing states (USGS, 2021c)

Sales

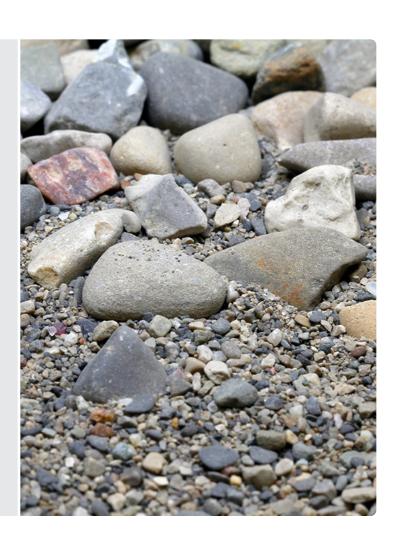
(See figs. 10, 11)

- Tons sold = 32,556,986 (-3.2% from 2019; table 13)
- Value⁵ = \$286,327,202 (table 9)
- Leading counties (percentage of statewide sales):
 - Stark (12.5%)
 - Hamilton (10.5%)
 - Portage (10.0%)
 - Butler (8.3%)
 - Franklin (5.9%)

Employment

(See table 10)

- Production employees reported = 936
- Nonproduction employees reported = 638
- Average employee annual wage = \$51,368
- Total wages earned = \$68,216,338
- Average days worked per operation = 174



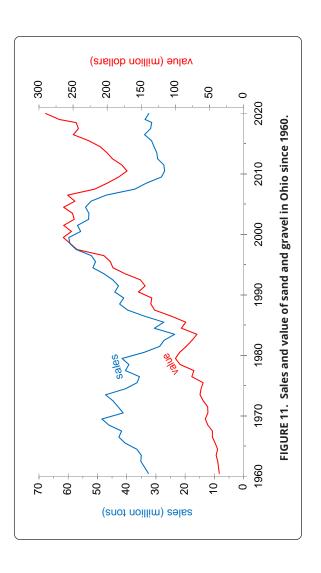
 $^{\rm 5}$ Includes reported and estimated values. See footnote 1, p. 1.

TABLE 13. 2020 Ohio sand and gravel sales, by county and use

								Tons sold	plos								
County	Total sand	Total sand	Total gravel	Building	ing	Portland cement concrete	rement	Asphaltic concrete	concrete	Road construction/ resurfacing	ruction/ rcing	Filtration		Foundry	Foundry Industrial	Other/unspecified	pecified
	and graver			Sand	Gravel	Sand	Gravel	Sand	Gravel	Sand	Gravel	Sand	Gravel	sana	sana	Sand	Gravel
Ashland	225,812	99,473	126,339	29,842	37,902					59,684	75,803					9,947	12,634
Ashtabula	74,075	44,226	29,849	6,761	10,503	9,775										27,690	19,346
Athens	26,285	17,743	8,542	2,235	19			15,508	8,523								
Butler	2,694,783	1,309,159	1,385,624	251,252	375,768	371,262	253,576				154,509					686,645	601,771
Champaign	467,562	199,244	268,318		15,550	167,000	75,400		80,000	2,600	4,500					29,644	92,868
Clark	840,678	384,728	455,950	15,700	15,242	000'69	102,600	53,200	94,500	35,320	32,100					211,508	211,508
Columbiana	52,429	26,214	26,215	24,840	24,840					1,374	1,375						
Coshocton	406,211	163,953	242,258	17,911	6:639	209		978			46,728	842				143,615	188,591
Cuyahoga	48,903	48,903														48,903	
Darke	19,402	13,860	5,542	13,860	5,542												
Defiance	223,238	194,569	28,669	15,034	17,508	179,535											11,161
Fairfield	7,120	3,800	3,320													3,800	3,320
Franklin	1,924,709	1,102,226	822,483	50,872	317,579	723,909	181,543	44,221	27,076							283,224	296,285
Fulton	40,069	40,069														40,069	
Gallia	1,832	1,832														1,832	
Geauga	66,280	33,140	33,140													33,140	33,140
Greene	949,091	434,844	514,247	12,000	10,000	22,000	28,000	55,000	22,000	58,000	10,000					287,844	444,247
Hamilton	3,421,628	1,918,654	1,502,974	642,559	963,493	332,836	147,553				63'069				200	943,059	328,859
Henry	24,241	24,241										000′9			2,000	13,241	
Highland	159,391	86,492	72,899		18,409	79,959			25,825			6,533	3,958				24,707
Hocking	532,625	398,074	134,551	400		99,601	24,301	25,404	25,611	19,961	4,477					252,708	80,162
Holmes	831,118	399,728	431,390	38,632	148,323	155,904	67,048	116,799	75,888	57,288	91,042	25,875	45,598			5,230	3,491
Knox	1,239,302	499,995	739,307	25,378	281,793	207,542	33,391	44,151	141,834		91,528		57,121			222,924	133,640
Licking	1,165,473	619,340	546,133	94,649	257,680	175,914	1,750	59,279	27,045							289,498	259,658
Logan	198,341	94,855	103,486	1,169		4,396										89,290	103,486
Lorain	360	180	180	180	180												
Madison	5,389	2,829	2,560	2,829	2,560												
Mahoning	51,742	21,237	30,505	4,019	4,200						2,780	2,600	15,280		9,386	232	8,245
Marion	8,276	942	7,334			168						245	1,217			529	6,117
Medina	196,500	78,600	117,900													78,600	117,900
Meigs	1,209,002	811,546	397,456			576,056	144,805									235,490	252,651
Miami	372,044	174,956	197,088		85,460	42,440										132,516	111,628
Montgomery	969,527	433,489	536,038	186,959	256,929	41,000	48,700			09	240		35,000		10,300	195,170	195,169
Morrow	237,000	000′56	142,000	1,000		46,000		23,000								25,000	142,000
Muskingum	388,386	324,699	63,687					71,083	18,147	961	205					252,655	45,335
Paulding	62,185		62,185						50,158		12,027						
Pickaway	905,920	504,453	401,467		763	367,000	77,000	65,500	67,500	15,814	25,152					56,139	231,052
Pike	286,865	205,362	81,503													205,362	81,503
Portage	3,243,459	2,245,910	997,549	176,942	323,972	976,323	30,913	173,959	326,463	177,717	57,548	1,037	55,392			739,932	203,261
Preble	383,249	183,850	199,399	23,831	122,207											160,019	77,192

TABLE 13. 2020 Ohio sand and gravel sales, by county and use (cont.)

								Tons sold	plos								
County	Total sand	Total sand	Total sand Total gravel	Building	ling	Portland cement concrete	cement	Asphaltic concrete	concrete	Road construction/ resurfacing	truction/ scing	Filtration		Foundry Industrial	ndustrial	Other/unspecified	pecified
	and graver			Sand	Gravel	Sand	Gravel	Sand	Gravel	Sand	Gravel	Sand	Gravel	puns	Duns.	Sand	Gravel
Richland	297,542	227,264	70,278		11,289			12,093	8,020	1,297	9,203					213,874	41,766
Ross	278,721	178,551	100,170	3,089	23,531	19,701	229	12,050		544	794					143,167	75,168
Sandusky	313	313				313											
Scioto	73,693	48,398	25,295	12,850	16,316	29,164	2,595									6,384	6,384
Shelby	176,979	88,489	88,490													88,489	88,490
Stark	4,071,812	2,229,119	1,842,693	53,238	240,281	569,232	29,205	607,874	826,673	324,515	330,231					674,260	416,303
Summit	68,034	68,034		10,654												57,380	
Tuscarawas	1,364,328	856,404	507,924	245,998	102,860	27,779	42,595	180,173	106,162	245,523	102,188					156,931	154,119
Warren	576,120	264,057	312,063	255,630	300,496			7,250	7,250							1,177	4,317
Washington	839,517	495,076	344,441	40,905	7,182	230,313	14,366		43,219		32,065					223,858	247,609
Wayne	430,539	264,764	165,775	126,889	145,589	66,446	3,473	55,580	7,734	13,372	206'9	2,477	2,072				
Williams	700	350	350													350	350
Wood	11,756	11,702	54		54	11,702											
Wyandot	406,430	295,701	110,729	63,384	58,736	61,808		161,000				4,844	47,993			4,665	4,000
TOTAL1	32,556,986	18,270,637	14,286,349	2,451,491	4,209,695	5,664,685	1,309,491	1,784,102	1,989,628	1,014,030	1,154,471	55,453	263,631	0	24,886	7,275,990	5,359,433
¹Anv tallv incons	¹ Any tally inconsistencies are because of rounding.	cause of round	ling.														



SANDSTONE AND CONGLOMERATE

Extensive high-quality sandstone and conglomerate deposits are located in central and eastern Ohio, from near Lake Erie to the Ohio River. During the mid-1800s, these geologic resources were developed into large building stone and glass production industries, and to support the steel and associated industries. Many prominent buildings in the state use local building stones, including the Ohio Statehouse, Cleveland's Old Stone Church, The Ohio State University's Orton Hall, Cincinnati's City Hall, and numerous other churches, monuments, and historic structures.

Ohio led the nation in sandstone production for many decades; this natural resource continues to support the state's industries today. Historically, the Pennsylvanian-age Massillon sandstone and the Devonian-age Berea Sandstone of northern Ohio, as well as the Mississippian-age Buena Vista Sandstone in southern Ohio, have been the primary geologic units quarried for building stone (Bownocker, 1915; see also fig. 7).

Production

- Tons produced = 1,334,430 (+11.1% from 2019)
- U.S. ranking:
 - 5th out of 50 producing states for crushed stone (USGS, 2021a)
 - The 2020 U.S. state rankings for the 34 dimension-stone producing states were unavailable (USGS, 2021d).
- Top Producing Geologic Units (fig. 7):
 - Sharon conglomerate (Pennsylvanian)
 - Logan Formation (Mississippian)
 - Berea Sandstone (Devonian)
 - Cuyahoga Formation (Mississippian)

Sales

(See figs. 12, 13)

- Tons sold = 1,203,656 (-3.7% from 2019; table 14, 15)
- Value⁶ = \$43,763,625 (table 9)
- Leading counties (percentage of statewide sales):
 - Geauga (47.9%)
 - Mahoning (17.5%)
 - Wayne (9.9%)
 - Pike (7.5%)
 - Lake (5.7%)

Employment

(See table 10)

- Production employees reported = 169
- Nonproduction employees reported = 50
- Average employee annual wage = \$62,722
- Total wages earned = \$13,547,883
- Average days worked per operation = 139

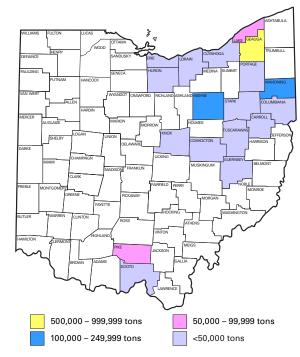


FIGURE 12. Sales of sandstone and conglomerate in Ohio in 2020, by county and quantity.



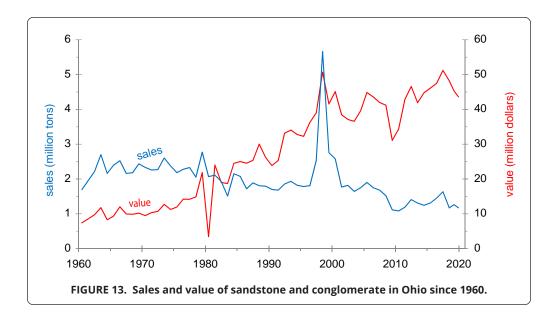


TABLE 14. 2020 Ohio sales of crushed sandstone and conglomerate, by county and use

							Tons	sold							
County	Total	Foundry sand	Glass sand	Metallurgical pebble	Refractory	Riprap	Aggregate	Silica flour	Polishing/ grinding sand		Engine sand	Frac sand	Construction	Industrial sand	Other/ unspecified
Carroll	2,000														2,000
Columbiana	12,225												8,665	3,560	
Geauga	577,148	62,048	30,371	6,350	4,915		31,916						233,922	25,378	182,248
Guernsey	21,174					1,000	20,174								
Knox	38,712								15,256		4,086		2,724	13,822	2,824
Lake	69,025						57,073						11,952		
Lorain	724						724								
Mahoning	210,407												210,407		
Pike	88,866												8,687		80,179
Portage	25,836														25,836
Seneca	3,833												3,833		
Tuscarawas	19,291					35							19,256		
Wayne	119,734					18,954	86,746						634		13,400
TOTAL	1,188,975	62,048	30,371	6,350	4,915	19,989	196,633	0	15,256	0	4,086	0	500,080	42,760	306,487

TABLE 15. 2020 Ohio sales of dimension sandstone, by county and use

					Ton	s sold				
County	Total	Refractory	Rough construction	Rubble	Grindstones	Rough architectural	Finished	Curbing	Flagging	Other/ unspecified
Columbiana	282									282
Coshocton	1,028									1,028
Cuyahoga	224									224
Erie	7,935		5,225	26			2,684			
Huron	2,332		2,332							
Knox	57						57			
Lorain	2,256		2,256							
Scioto	346									346
Tuscarawas	221									221
TOTAL	14,681	0	9,813	26	0	0	2,741	0	0	2,101

CLAY AND SHALE

The ceramics industry in Ohio has a long and dynamic history. Potteries were established by the early 1800s to supply dinnerware, and by the early 1900s, Ohio was producing tremendous amounts of building bricks, sewer pipes, roof and floor tiles, paving bricks, art pottery, and refractory products. Edward Orton, Jr., established the first ceramics engineering program in the nation at Ohio State University in 1894. Ohio clay and shale still are being used to produce important ceramic products, though production tonnages are much less than 100 years ago. Ohio ceramic products are shipped throughout the eastern United States and Canada. Nearly all clay and shale produced in Ohio is used to produce value-added products (e.g., building bricks, industrial ceramics, pottery, expanded aggregate, quarry tile), thus the economic impact is much greater than the combined mined value.

Pennsylvanian-age shales and clays of eastern Ohio are the primary sources of raw materials for the ceramics industry; Mississippian- and Devonian-age shales of northern and central Ohio and Quaternary-age glacial clays of western Ohio are important secondary sources. General discussions of clay and shale geology in Ohio can be found in Lamborn and others (1938) and Stout and others (1923).

Production

- Tons produced (clay) = 1,096,104 (+15.2% from 2019)
- Tons produced (shale) = 404,060 (+1.5% from 2019)
 - The 2020 U.S. state rankings for the 39 clay and shale producing states were unavailable (USGS, 2021e).

Sales

(See figs. 14, 15, 16, 17)

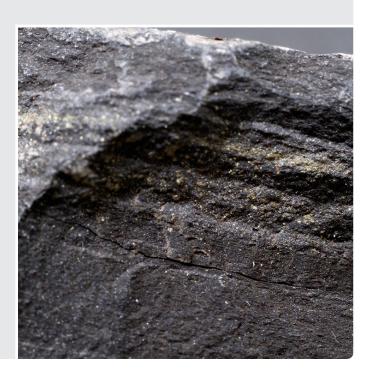
- Clay:
 - Tons sold = 1,096,104 (+15.4% from 2019; table 16)
 - Value⁷ = \$7,857,610 (table 9)
- Leading counties for clay (percentage of statewide sales):
 - Athens (24.3%)
 - Tuscarawas (22.2%)
 - Greene (14.3%)
 - Lucas (9.9%)
 - Paulding (5.5%)
- Shale:
 - Tons sold = 404,060 (+2.9% from 2019; table 17)
 - Value⁸ = \$3,899,358 (table 9)
- Leading counties for shale (percentage of statewide sales):
 - Tuscarawas (33.9%)
 - Guernsey (22.9%)
 - Athens (7.4%)
 - Coshocton (6.4%)
 - Harrison (6.4%)

Employment

(See table 10)

- Production employees reported = 144
- Nonproduction employees reported = 137
- Average employee annual wage = \$49,100
- Total wages earned = \$11,234,879
- Average days worked per operation = 99

⁷Includes reported and estimated values. See footnote 1, p. 1. ⁸Includes reported and estimated values. See footnote 1, p. 1.



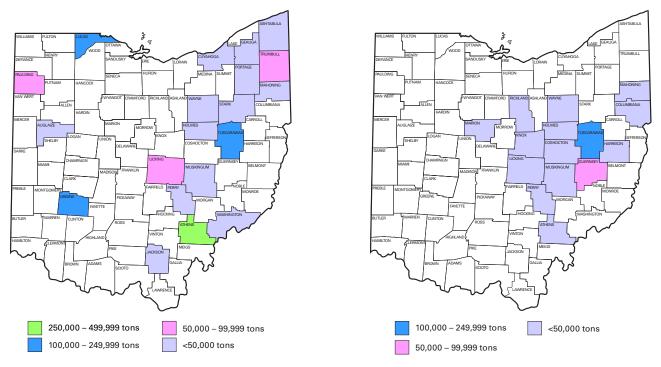
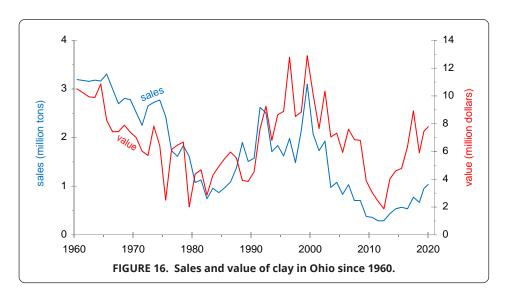


FIGURE 14. Clay sales in Ohio in 2020, by county and quantity.

FIGURE 15. Shale sales in Ohio in 2020, by county and quantity.



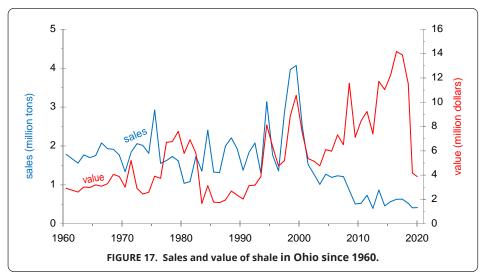


TABLE 16. 2020 Ohio clay sales, by county and use

					Tons sold				
County	Total	Common clay products	Stoneware	Vitrified products	Cement manufacture	Refractories	Construction	Landfill use	Other/ unspecified
Ashtabula	4,835						709		4,126
Athens	266,500							266,500	
Auglaize	1,610	1,610							
Cuyahoga	2,181	12							2,169
Geauga	4,772								4,772
Greene	157,240				157,240				
Holmes	29	29							
Jackson	23,325					2,000			21,325
Licking	54,780								54,780
Lucas	108,900							108,900	
Mahoning	7,856	650							7,206
Muskingum	25,582	15,553			10,029				
Paulding	60,800				60,800				
Perry	12,306	11,294		1,012					
Portage	15,447	372					15,000		75
Stark	1,015	1,015							
Trumbull	51,000							51,000	
Tuscarawas	242,924	232,394					10,530		
Washington	11,772						11,772		
Wayne	43,230	21,342					546		21,342
TOTAL	1,096,104	284,271	0	1,012	228,069	2,000	38,557	426,400	115,795

TABLE 17. 2020 Ohio shale sales, by county and use

		IAI	BLE 17. 2020 O	hio shale sales,	by county and t	use		
				Tons	sold			
County	Total	Common clay products	Vitrified products	Cement manufacture	Lightweight aggregate	Construction	Landfill use	Other/ unspecified
Athens	30,000							30,000
Columbiana	11,635	11,635						
Coshocton	25,924						25,924	
Guernsey	92,653					92,653		
Harrison	25,840	25,840						
Holmes	14,861	440						14,421
Knox	1,216							1,216
Licking	11,008	11,008						
Mahoning	975							975
Marion	19,927							19,927
Muskingum	9,600	9,600						
Perry	22,141	6,480	15,661					
Richland	80							80
Tuscarawas	136,994	136,994						
Wayne	1,206					1,200		6
TOTAL	404,060	201,997	15,661	0	0	93,853	25,924	66,625

SALT

Salt was one of the first industrial minerals produced in Ohio and was a valuable commodity to early pioneers who obtained it from natural springs. The first State Legislature enacted laws concerning salt springs in 1803–1804, and wells were drilled in Jackson and Muskingum Counties, leading to the first commercial salt production in the state. The most important area for early salt production was in Meigs County, beginning in 1850. By 1903, Ohio was producing 14.7 percent of all salt in the United States (Bownocker, 1906).

The modern salt industry in Ohio began in 1956 with the construction of the underground salt mine at Fairport Harbor in Lake County. A second large underground operation was constructed in Cleveland, beginning in 1957. The primary use for Ohio salt in 2020 was ice control. Salt also was used as an additive in animal feed, for cattle blocks, and as a commercial and residential water-softening agent.

Salt production in 2020 increased when compared to 2019 values, while sales decreased. The recent stretch of unusually warm winters with lower-than-average precipitation have resulted in municipalities not needing to replenish salt supplies every year, resulting in lower sales and value.

Production

- Tons produced = 4,488,979 (+15.8% from 2019)
- · U.S. ranking:
 - In the top 7 of 16 producing states (USGS, 2021f)
- Top producing geologic units (fig. 7):
 - Salina Group (Silurian)

Sales

(See figs. 18, 19)

- Tons sold = 3,200,844 (-27.1% from 2019)
- Value⁹ = \$183,320,754 (table 9)

Employment

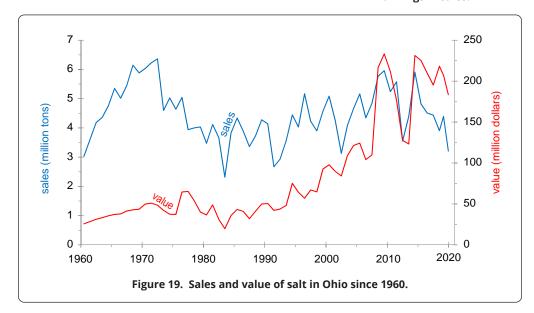
(See table 10)

- Production employees reported = 304
- Nonproduction employees reported = 176
- Average employee annual wage = \$68,320
- Total wages earned = \$32,793,482
- Average days worked per operation = 304

⁹Includes reported and estimated values. See footnote 1, p. 1.



FIGURE 18. Counties producing salt in Ohio in 2020 and their rankings in sales.

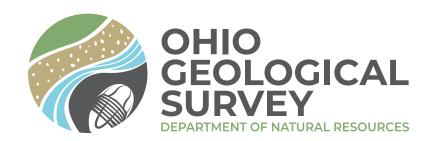




REFERENCES CITED

- Bownocker, J.A., 1906, Salt deposits and the salt industry in Ohio: Columbus, Geological Survey of Ohio, Fourth Series, Bulletin No. 8, 42 p.
- Bownocker, J.A., 1915, Building stones of Ohio: Columbus, Geological Survey of Ohio, Fourth Series, Bulletin 18, 160 p.
- Brant, R.A., and Delong, R.M., 1960, Coal resources of Ohio: Columbus, Ohio Department of Natural Resources, Division of Geological Survey Bulletin 58, p. 25–28.
- Collins, H.R., 1979, The Mississippian and Pennsylvanian (Carboniferous) Systems in the United States - Ohio: U.S. Geological Survey Professional Paper 1110-E, 26 p.
- Crowell, D.L., 1995, History of the coal-mining industry in Ohio: Columbus, Ohio Department of Natural Resources, Division of Geological Survey Bulletin 72, 204 p.
- Lamborn, R.E., 1951, Limestones of eastern Ohio: Columbus, Geological Survey of Ohio, Fourth Series, Bulletin 49, 377 p.
- Lamborn, R.E., Austin, C.R., and Schaaf, Downs, 1938, Shales and surface clays of Ohio: Columbus, Geological Survey of Ohio, Fourth Series, Bulletin 39, 281 p.
- Larsen, G.E., 1991, Historical development and problems within the Pennsylvanian nomenclature of Ohio: Ohio Journal of Science, v. 91, no. 1, p. 69–76.
- ODNR Division of Geological Survey, 1959, A century and a half of Ohio's Minerals: Columbus, Ohio Department of Natural Resources, Division of Geological Survey Information Circular 24, 61 p.
- ODNR Division of Geological Survey, 1990, Generalized column of bedrock units in Ohio: Columbus, Ohio Department of Natural Resources, Division of Geological Survey, 1 sheet. [Revised 2000, 2004.]
- Slucher, E.R., Swinford, E.M., Larsen, G.E., Schumacher, G.A., Shrake, D.L., Rice, C.L., Caudill, M.R., and Rea, R.G., 2006, Bedrock geologic map of Ohio: Columbus, Ohio Department of Natural Resources, Division of Geological Survey Map BG-1, version 6.0, scale 1:500,000.

- Stout, Wilber, 1941, Dolomites and limestones of western Ohio: Columbus, Geological Survey of Ohio, Fourth Series, Bulletin 42, 468 p.
- Stout, Wilber, Stull, R.T., McCaughey, W.J., and Demorest, D.J., 1923, The coal formation clays of Ohio: Columbus, Geological Survey of Ohio, Fourth Series, Bulletin 26, 588 p.
- U.S. Department of Energy (USDOE), 2021, Monthly Coal Production Estimates, January–December 2020: U.S. Department of Energy, Energy Information Administration, last accessed July 26, 2021, at http://www.eia.gov/coal/production/weekly/archive/monthprod2020tot.xls>.
- U.S. Geological Survey (USGS), 2021a, Crushed Stone: U.S. Geological Survey, Mineral Commodity Summaries, p. 154, last accessed July 26, 2021, at https://pubs.usgs.gov/periodicals/mcs2021/mcs2021-stone-crushed.pdf.
- U.S. Geological Survey (USGS), 2021b, Lime: U.S. Geological Survey, Mineral Commodity Summaries, p. 96, last accessed July 26, 2021, at https://pubs.usgs.gov/periodicals/mcs2021/mcs2021-lime.pdf>.
- U.S. Geological Survey (USGS), 2021c, Sand and Gravel: U.S. Geological Survey, Mineral Commodity Summaries, p. 140, last accessed July 26, 2021, at https://pubs.usgs.gov/periodicals/mcs2021/mcs2021-sand-gravel-construction.pdf.
- U.S. Geological Survey (USGS), 2021d, Dimension Stone: U.S. Geological Survey, Mineral Commodity Summaries, p. 156, last accessed July 26, 2021, at https://pubs.usgs.gov/periodicals/mcs2021/mcs2021-stone-dimension.pdf>.
- U.S. Geological Survey (USGS), 2021e, Clays: U.S. Geological Survey, Mineral Commodity Summaries, p. 48, last accessed July 26, 2021, at https://pubs.usgs.gov/periodicals/mcs2021/mcs2021-clays.pdf>.
- U.S. Geological Survey (USGS), 2021f, Salt: U.S. Geological Survey, Mineral Commodity Summaries, p. 138, last accessed July 26, 2021, at https://pubs.usgs.gov/periodicals/mcs2021/mcs2021-salt.pdf.
- Wright, C.E., compiler, 2020, 2019 Report on Ohio mineral industries—An annual summary of the state's economic geology: Columbus, Ohio Department of Natural Resources, Division of Geological Survey, 22 p.



STATE OF OHIO DEPARTMENT OF NATURAL RESOURCES DIVISION OF GEOLOGICAL SURVEY Michael P. Angle, Chief

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MAP OF ACTIVE MINERAL **INDUSTRY OPERATIONS IN OHIO**

Christopher E. Wright GIS Database Administration by Joseph G. Wells

ABOUT THE MAP

GIS Cartography by Dean R. Martin

This map is based on operators included in the supplementary appendices of the 2020 Report on Ohio Mineral Industries (Wright, 2021) and is intended for general reference. Locations of mineral extraction operations are Industries (Wright, 2021) and is intended for general reference. Locations of mineral extraction operations are approximate and are based on permitting information on file at the Ohio Department of Natural Resources (ODNR), Division of Mineral Resources Management. The letters and numbers adjacent to the symbols are the state mine numbers assigned to operations listed in the downloadable directories of the 2020 Report on Ohio Mineral industries. More information about specific operations may be found using the state mine number to refer to the table included on this map or in the directories of operators reporting production, sales, and value in the report appendices. An interactive map of mineral industries and operator information can be viewed online. More information is available on the ODNR Division of Geological Survey website

2020 OHIO ECONOMIC GEOLOGY IN BRIEF

The total tonnage of coal and industrial minerals produced in Ohio during 2020 was 111,559,936 tons or approximately 9.5 tons per capita. In 2020, the total value¹ of coal was \$141,207,916; the value of oil and gas was \$4,663,309,002; and the value¹ of all nonfuel industrial minerals was \$1,262,343,562 (table 1; fig. 1). The combined value of fuel and nonfuel minerals produced in Ohio during 2020 was \$6,066,860,480 or approximately \$514 per capita.

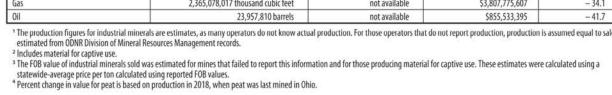
Reported and estimated total direct employment in the extractive industries of Ohio in 2020 was more than 10,000 people. Industrial-mineral production increased for salt, sandstone and conglomerate, clay, shale, and peat, while production decreased for coal, limestone and dolomite, and sand and gravel. The total value of nonfuel industrial minerals exceeded \$1 billion for the seventh straight year. In 2020, the production-leading commodity of limestone and dolomite was down 5.4%, with the second leading commodity of sand and gravel down 2.9% from 2019; the third leading commodity of coal was down 53.9% from 2019 values.

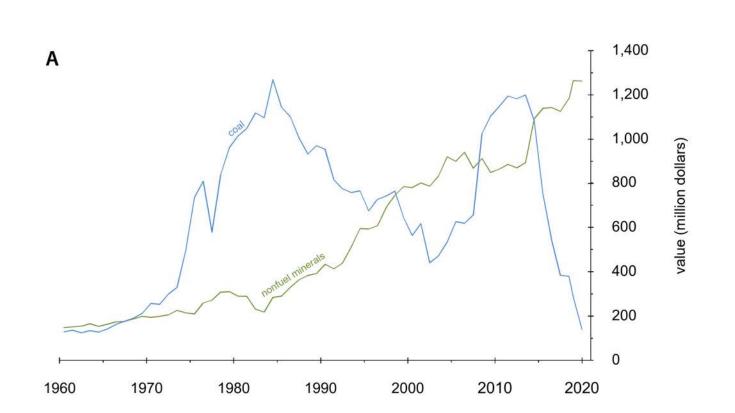
REFERENCES CITED

Wright, C.E., compiler, 2021, 2020 Report on Ohio mineral industries—An annual summary of the state's economic geology: Columbus, Ohio Department of Natural Resources, Division of Geological Survey, 22 p.

¹Includes reported and estimated values. Some operations reporting sales did not report a value for those sales. A statewide-average price per ton was calculated for each industrial-mineral commodity based on sales for which the value was reported. A statewide-average price per ton was calculated for coal based on method of production for which sales or value was reported. These calculated averages were used to estimate the value of the sales for which the actual values were not reported.

Commodity	Production ¹	Sales ²	Value ³	Change in value from 2019 (percent) ⁴ + 0.6	
Limestone and dolomite	67,199,822 tons	67,792,822 tons	\$737,163,213		
Coal	3,786,974 tons	4,002,170 tons	\$141,207,916	-50.7	
Sand and gravel	33,248,864 tons	32,556,986 tons	\$286,327,202	+ 6.2	
Salt	4,488,979 tons	3,200,844 tons	\$183,320,754	- 11.4	
Sandstone and conglomerate	1,334,430 tons	1,203,656 tons	\$43,763,625	-2.8	
Shale	404,060 tons	404,060 tons	\$3,899,358	-6.5	
Clay	1,096,104 tons	1,096,104 tons	\$7,857,610	+ 5.3	
Peat	728 tons	728 tons	\$11,800	+195.0	
Gas	2,365,078,017 thousand cubic feet	not available	\$3,807,775,607	- 34.1	
Oil -	23,957,810 barrels	not available	\$855,533,395	-41.7	





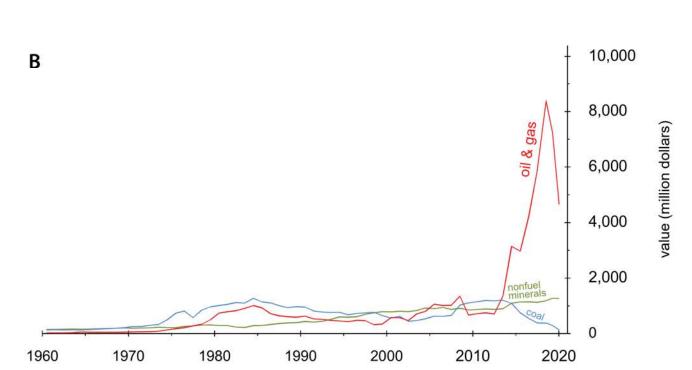
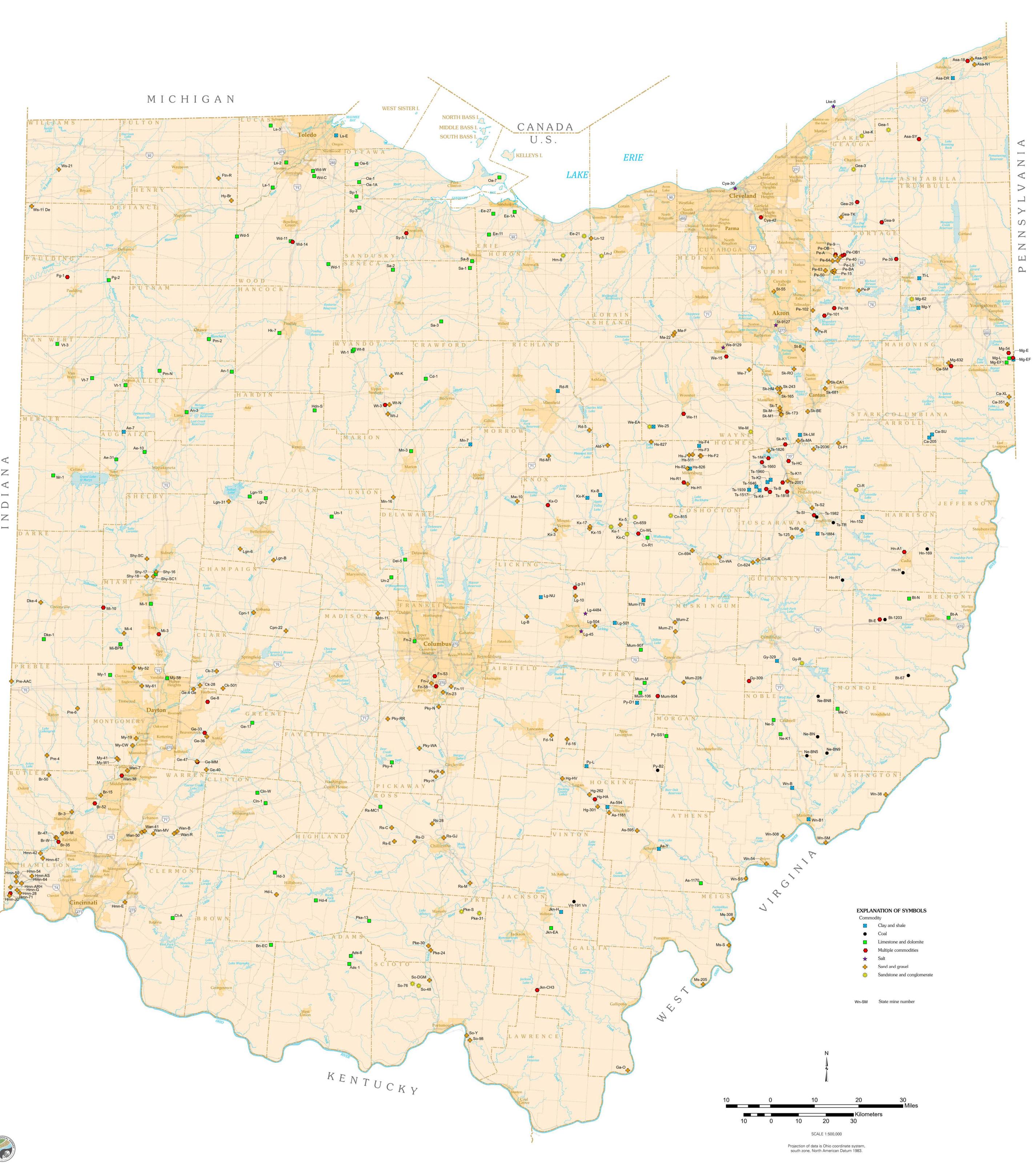


FIGURE 1: A. Value of coal, nonfuel minerals in Ohio since 1960. B. Value of coal and nonfuel minerals, and oil and gas in Ohio since 1960.



STATE MINE NUMBER	COMPANY NAME	MINE NAME	TOTAL PRODUCTION (TONS)	TOTAL SALES (TONS)	STATE MINE NUMBER	COMPANY NAME	MINE NAME	TOTAL PRODUCTION (TONS
s County	Hanson Aggregates Davon LLC	Plum Run Quarry	914,576	893,649	Medina County Ma-22	Friendsville Sand, LP	Friendsville Sand	202,600
County	Elko East, LLC Bluffton Stone Co.	Adams-Hoop Quarry Bluffton Stone Co.	35,400 434,510	35,400 423,405	Ma-F Meigs County Ms-205	Friendsville Sand, LP Martin Marietta Aggregates	Friendsville Sand Apple Grove Plant	305,44
-3 hland County I-Y	National Lime & Stone Co. Young's Sand & Gravel Co.	Lima Plant Spreng	642,000 225,812	642,000 225,812	Ms-308 Ms-S Mercer County	Jaymar, LLC Shelly Materials, Inc.	Reedsville Pit Portland Plant	720,86 236,96
shtabula County sa-15 sa-18	R. W. Sidley, Inc. Joe Simak & Sons Trucking, Inc.	Sidley-Kingsville Plant North Ridge Pit	5,307 51,162	15,987 51,162	Mr-1 Miami County Mi-1	Stoneco, Inc. Piqua Materials, Inc.	Celina Quarry Piqua Minerals Division	598,62 604,46
sa-DR sa-N1 sa-SY	Taryn Development, LLC Nelson Sand & Gravel, Inc. JNS Farms	Taryn Development, LLC Nelson Sand & Gravel, Inc. JNS Farms #1	443 11,000 318	443 11,000 318	Mi-10 Mi-3 Mi-4	C. F. Poeppelman, Inc. Martin Marietta Aggregates Milton Materials, LLC	C. F. Poeppelman, Inc. Troy Sand & Gravel Milton Materials Fenner Pit	484,47 145,91 131,23
thens County s-1161	McKee Materials, LLC	McKee Materials	24,031	24,031 29,750	Mi-BPM Monroe County Me-C	Barrett Paving Materials, Inc. Christman Quarries	Ludlow Quarry #394 Christman Quarry	290,25
s-1170 s-594 s-595	Elko Aggregates, LLC Athens Hocking Reclamation Center Cochran Transportation Services, Inc.	Athens-Putnam Quarry Athens-Hocking Clay Mine Circle Hill	29,750 266,500 2,254	266,500 2,254	Montgomery Count My-1	y Martin Marietta Aggregates	Phillipsburg	681,57
s-Y uglaize County e-10	York Paving Co. National Lime & Stone Co.	Harmony Road Buckland Plant	30,000 276,000	30,000 276,000	My-19 My-41 My-52	Barrett Paving Materials, Inc. Ernst Enterprises Inc. Phillips Companies, LLC	West Carrollton Sand & Gravel Ernst Aggregate Plant #5 Phillips Vandalia	373,5: 207,7: 237,6:
e-31 e-7 elmont County	Con-Ag, Inc. Sandkuhl Clay Works, Inc.	Con-Ag, Inc. Sandkuhi Clay Works, Inc.	314,000 1,610	287,008 1,610	My-58 My-61 My-CW	Fairborn Cement Co., LLC Tipp Stone Co., Inc. Carter & Carter, Inc.	G-Tract Tipp Stone Co., Inc. Carter & Carter, Inc.	261,3 6,1 3
-1203 -67	CCU Coal and Construction, LLC Belmont County Coal Resources, Inc.	Shugert North Century Mine	222,387 1,689,297	217,502 1,953,535	My-W1 Morrow County	Weidle Sand & Gravel, Inc.	Weidle Sand & Gravel	163,5
:-A :-E :-N	Sidwell Materials, Inc. Egypt Valley Stone, LLC Sidwell Materials, Inc.	Blaine Aggregates Egypt Valley Stone - Shugert Mine Uniontown Stone	238,652 507,151 376,357	206,116 507,151 307,146	Mw-10 Muskingum County Mum-106	Shelly Materials, Inc.	Chesterville Plant East Fultonham	237,0 899,3
rown County n-EC utler County	Hanson Aggregates Davon LLC	Eagle Crushed Stone	1,739,450	1,873,617	Mum-228 Mum-776 Mum-904	S & S Aggregate, Inc. Bowerston Shale Co. Valley Clay Mining Co.	S & S Aggregate #1 Frazeysburg Spring Pit	360,0 3,6 34,5
r-15 r-3 r-35	Watson Gravel, Inc. The Gravel Company Martin Marietta Aggregates	Mecco, Inc. New Miami Pit Fairfield Sand & Gravel	487,270 600 902,284	487,270 600 909,767	Mum-907 Mum-M Mum-Z	Thompson Mining Co. Maysville Materials, LLC Zemba Farms, Ltd.	Pleasant Valley Limestone Maysville Materials, LLC N. Farm	107,0 155,3 19,5
-47 -50 -52	Watson Gravel, Inc. Dingledine Basic Materials, Inc.	Watson Pit Dingledine Basic Materials, Inc.	884,082 25,271	884,082 25,271	Mum-Z1 Noble County	Zanesville Materials, LLC	Zanesville Materials	14,0
r-M r-W	Martin Marietta Aggregates Miami Valley Topsoil, LLC Welch Sand & Gravel, Inc.	Trenton Miami Valley Topsoil, LLC Hamilton City Plant	377,253 54,236 9,744	456,116 54,236 9,744	Ne-BN Ne-BN5 Ne-BN8	B & N Coal, Inc. B & N Coal, Inc. B & N Coal, Inc.	Estadt Mine Westfork Mine Whigville VI	56,8 81,1 235,8
erroll County -R nampaign County	Romig Excavating	Romig Excavating	2,000	2,000	Ne-BN9 Ne-K1 Ne-S	B & N Coal, Inc. King Quarries, Inc. Sharon Stone Co.	Schramm King Quarries, Inc. Sharon Stone	87,0 162,1 124,5
on-1 on-22 ark County	Morrow Gravel Co. Mechanicsburg Sand & Gravel, Inc.	Urbana Materials Mechanicsburg Sand & Gravel, Inc.	345,050 122,512	345,050 122,512	Ottawa County Oa-1 Oa-1A	Graymont Dolime (OH), Inc. Genoa Limestone, LLC	Graymont Dolime (OH), Inc. Genoa Limestone	195,6 345,0
c-28 c-3 c-501	Barrett Paving Materials, Inc. Enon Sand & Gravel, LLC Enon Sand & Gravel, LLC	Haddix Sand & Gravel #399 Enon Sand & Gravel, LLC Enon Plant 2	451,418 417,620 42	423,016 417,620 42	0a-6 0a-7 Paulding County	Stoneco, Inc. Lafarge Marblehead	Clay Center Quarry Lafarge Marblehead	1,407,3 3,802,1
ermont County -A	Arch Materials, LLC	Batavia Mine	2,455,000	2,106,334	Pg-1 Pg-2	Holcim US Inc. Stoneco, Inc.	Paulding Quarry Auglaize Quarry	668,4 611,6
inton County n-1 n-W	The Melvin Stone Co., LLC Shamrock Materials, Inc.	The Melvin Stone Co Wilmington Clinton Limestone	2,097,711 22,108	2,097,711 22,108	Perry County Py-B2 Py-D1	CCU Coal and Construction, LLC, Buckingham TOM, LLC	Burr Oak Mine No. 6 Saltillo	162,0 17,7
olumbiana County a-205 a-351	A CONTRACTOR OF THE CONTRACTOR	Summitville Tiles, Inc.	2,658	2,658 2,749	Py-L Py-SS1 Pickaway County	The Logan Clay Products Co. CCU Coal and Construction, LLC	Webb Summit Deavertown	16,6 275,0
a-SM a-SU	Solomon's Mines, Inc. Summitville Tiles, Inc.	Solomon's Mines, Inc. Summitcrest, Inc.	12,864 8,977 49,680	12,748 8,977	Pky-4 Pky-H	The Melvin Stone Co., LLC Hoffman, William A., Jr. National Lime & Stone Co.	Williamsport Plant Hoffman Pit New South Columbus	213,4 3
n-XI poshocton County n-624	X. L. Sand & Gravel Co., Inc. LBC Clay Co., LLC	X. L. Mine 2 Clark Clay Co.	163,368	49,680 163,368	Pky-N Pky-R Pky-RR	National Lime & Stone Co. The Melvin Stone Co., LLC Roush, Roy M.	New South Columbus Circleville Plant R Farm S & G	492,0 290,5 2,8
n-659 n-694 n-815	Briar Hill Stone Co. Shelly Materials, Inc. Briar Hill Stone Co.	Quarry #3 Coshocton Plant #1305 Quarry #55	74 134,790 954	74 161,243 954	Pky-WA Pike County Pke-13	Westfall Aggregate & Materials, Inc. Latham Limestone, LLC	Hill Road Pit Latham Limestone	121,3
n-R n-R1	Razor Lake Materials Inc. Rohr Excavating, Ltd. William Albert, Inc.	Razor Lake S. & G. Miller William Albert, Inc., Pit 2	29,900 8,837 12,796	30,687 8,837 11,346	Pke-24 Pke-30 Pke-31	Hanson Aggregates Davon LLC South Central Sand & Gravel Covia Corp.	Piketon Sand & Gravel South Central Sand & Gravel Best Sand Corp Southern Division	145,3 139,3 92,2
n-WL rawford County	Walhonding Sand & Gravel	Walhonding Valley Sand & Gravel	65,491	65,491	Pke-S Portage County	Southern Ohio Sand, LLC	Southern Ohio Sand	39,3
1-1 uyahoga County /a-30	National Lime & Stone Co. Cargill, Incorporated	Bucyrus Plant Cargill Deicing Technology	1,109,000 2,636,544	1,343,195	Pe-101 Pe-102 Pe-15	D & K Materials, Inc. Core Aggregates LLC S & S Aggregate, Inc.	D & K Materials, Inc. Core Aggregates, LLC S & S Aggregate #16	149,4 75,0 435,1
va-42 arke County ke-1	P & P Valley View Holdings, Inc. Morrow Gravel Co.	Boyas Recycling Walls Material	51,308 328,897	51,308 328,897	Pe-18 Pe-39 Pe-40	Ray Bertolini Trucking Co. Miller's Sand & Gravel, Inc. Lakeside Sand & Gravel Co.	Sober Sand & Gravel Co. Miller Sand & Gravel, Inc. Lakeside - Plant 1	193,6 1,6 356,0
ke-4 efiance County 's-11 De	Foureman's Sand & Gravel, Inc. Weber Sand & Gravel, Inc.	Foureman's Sand & Gravel, Inc. Weber Sand & Gravel, Inc.	19,402 223,238	19,402 223,238	Pe-50 Pe-63 Pe-64	Beck Sand & Gravel, Inc. Shelly Materials, Inc. Aurora Aggregate Supplies	Beck Sand & Gravel, Inc. Jefferson Materials Aurora Aggregate Supplies	242,7 671,3 33,3
elaware County el-5 ie County	National Lime & Stone Co.	Delaware Plant	3,144,000		Pe-9 Pe-A Pe-BA	Oscar Brugmann Sand & Gravel, Inc. Lakeside Sand & Gravel Co. Ballentine Sand & Gravel, LLC	Oscar Brugmann Sand & Gravel, Inc. Solak Pit Ballentine Lake	417,8
e-11 e-1A	Hanson Aggregates Midwest, Inc. Hanson Aggregates Midwest, Inc.	Sandusky Crushed Stone Wagner Quarry	1,470,021		Pe-LS Pe-OB	Lakeside Sand & Gravel Co. Oscar Brugmann Sand & Gravel, Inc.	Lakeside Sand & Gravel Co. Plant 1 Oscar Brugmann Sand & Gravel, Inc.	103,8 483,0 93,5
e-21 e-27 sirfield County	IRG Operating, LLC, dba Cleveland Quarries Erie Materials, Inc.	IRG Operating, LLC Erie Blacktop Quarry	7,935 334,897	7,935 334,897	Pe-OB1 Pe-P Pe-R	Oscar Brugmann Sand & Gravel, Inc. Patrick Excavating, Inc. Rockwell Sand & Gravel, Inc.	Oscar Brugmann Sand & Gravel, Inc. Patrick Suffield Aggregate, LLC	55,7 4 17,6
I-14 I-16 anklin County	Paul D. Beery Trucking Co. Digg Enterprises, LLC	Paul D. Beery Trucking Co. Downard Pit	2,640 4,736	2,384 4,736	Preble County Pre-4 Pre-6	Wysong Gravel Co. Wysong Gravel Co.	West Alexandria Plant Camden Plant	81,0 81,4
1-11 1-2	Mason's Sand & Gravel Co. Shelly Materials, Inc.	Mason's Sand & Gravel Co. Marble Cliff Plant #0332	27,701 895,457	27,701 958,345	Pre-AAC Putnam County	U.S. Aggregates, Inc.	U.S. Aggregates - Richmond Plant	228,5
n-23 n-53 n-58	Shelly Materials, Inc. Shelly Materials, Inc. Olen Corp.	Lockbourne #1344 Columbus Limestone #331 Columbus - Plant #3 (S&G)	457,958 4,379,644 5,037,654	457,643 4,418,774 4,653,433	Pm-2 Pm-N Richland County	National Lime & Stone Co. National Lime & Stone Co.	Ottawa Stone Rimer Plant	194,0 237,0
i-J ilton County n-R	National Lime & Stone Co. Robert H. Parker Sr.	Grove City Plant 5-1 Pit	46,713	18,000 40,069	Rd-5 Rd-M1 Rd-R	S & S Aggregate, Inc. Mid Ohio Resources Revty Holdings, LLC	S & S Aggregate #14 Bellville West Richland shale road rail depot	307,0
allia County a-0 eauga County	Ours Sand & Gravel	Ours Sand & Gravel	1,832	1,832	Ross County Rs-28 Rs-C	Detillion Landscape Materials, LLC Calvin's Hauling, Inc.	Detillion Landscape Calvin's Hauling, Inc.	6,4
ea-1 ea-29 ea-3	R. W. Sidley, Inc. The Arms Trucking Company Covia Corp.	Thompson Pit Arms Sand & Gravel Best Sand Corp.	188,000 67,856 474,931	132,512 67,856 444,636	Rs-D Rs-E Rs-GJ	D.G.M., Inc. Edgington, David E. G & J Asphalt & Material Inc.	Tow Path - Warwick Edgington Pit G & J Asphalt & Materials	46,9 8,0 63,1
ea-9 ea-TK	Soltis Sand & Gravel T & K Kuhnle LTD	Soltis Sand & Gravel Munn Materials	3,116	3,116 80	Rs-M Rs-MC1	S & S Aggregate, Inc. The Melvin Stone Co., LLC	S & S Aggregate Plant #7 Plano Road	160,5 256,5
reene County e-17 e-33	Martin Marietta Aggregates Martin Marietta Aggregates	Cedarville Limestone Xenia S & G	620,463 255,860	599,781 213,096	Sandusky County Sy-1 Sy-3	Martin Marietta Magnesia Specialties, LLC Carmeuse Lime, Inc.	Woodville Quarry Area Aggregates, LLC Woodville - Plant #	1,765,4 #10 1,196,3
e-36 e-4 Ge e-40	Phillips Companies, LLC Barrett Paving Materials, Inc. R. J. Martin Service & Excavating	Phillips Sand & Gravel Xenia Fairborn Sand & Gravel #398 Horseshoe Bend Sand & Gravel, Inc.	237,000 3,200 35	217,000 0 35	Sy-5-1 Scioto County So-48	Precision Aggregates, LLC Waller Bros. Stone Co.	Precision Aggregates III, LLC Inskeep Quarry 1 & 2	140,0
e-47 e-8	M. J. Coates Construction Co., Inc. Fairborn Cement Co., LLC	M. J. Coates Construction Miller, Schieder, Batdorf, Stewart	111,346 973,345	160,026 973,345	So-76 So-98	Waller Bros. Stone Co. BCE Materials, Inc.	Crabtree Quarry Cab Pit	1 11,2
e-MM uernsey County y-309	Martin Marietta Aggregates Cumberland Limestone, LLC	Cook Rd. Cumberland Limestone, LLC	316,649 222,864	363,718 378,202	So-DGM So-Y Seneca County	D.G.M., Inc. Youngs Sand and Gravel	Tow Path - Lucasville Youngs Sand & Gravel	60,9 4
y-329 y-R amilton County	Zemba Farms, Ltd. Rocky Enterprise	Meadowbrook Rocky Enterprise - Robins Ridge	92,653 21,174	92,653 21,174	Sa-1 Sa-2 Sa-3	Hanson Aggregates Midwest, Inc. Carmeuse Lime, Inc. Hanson Aggregates Midwest, Inc.	Flat Rock Maple Grove Bloomville	689,8 268,7
nn-28 nn-42 nn-50	The Gravel Company Welch Sand & Gravel, Inc. Hanson Aggregates Davon LLC	The Gravel Company Fernald Pit Dry Fork Sand & Gravel	210 584,211 614,015	210 584,211 592,321	Sa-8 Shelby County Shy-16	Heitsche North Shore Stone Quarries, LLC Barrett Paving Materials, Inc.	North Shore Stone Quarries Rock Run	239,7
mn-54 mn-64	Ashcraft Sand & Gravel, Inc. Watson Gravel, Inc.	Ashcraft Sand & Gravel, Inc. Minges-Getz-East Miami R. L., Ltd.	167,259 540,953	167,259 540,953	Shy-17 Shy-18	Barrett Paving Materials, Inc. Barrett Paving Materials, Inc.	Miami River Quarry #400 Jones Deposit Hardin Sand & Gravel #396	690,2 1 275,2
nn-67 nn-71 nn-ARH	R. L., Ltd. Martin Marietta Aggregates Watson Gravel, Inc.	E-town Sand & Gravel Harrison #2	1,450 474,158 856,537	1,450 477,220 856,537	Shy-SC Shy-SC1 Stark County	Barrett Paving Materials, Inc. Barrett Paving Materials, Inc.	Schmidt Deposit	7
nn-AS nn-E nn-G	Allgeier & Son, Inc. Evans Gravel, Inc. Top Dog Service Company	Allgeier & Son, Inc., Pit 2 Evans Gravel Whitewater Reclamation Company	45,000 203,476 815	45,000 178,903 815	CI-P1 Sk-165 Sk-173	Phoenix Asphalt Company, Inc. Oster Sand & Gravel, Inc. Shelly Materials, Inc.	Smith Sand & Gravel #1 Massillon Plant Massillon Aggregates	169,8 648,9 634,3
nn-JC ancock County k-7	Lost Bridge National Lime & Stone Co.	Lost Bridge	300 433,000	300 433,000	Sk-243 Sk-681 Sk-BE	American Sand & Gravel, Inc. Central-Allied Enterprises, Inc. The Reaver Expansion Company	Plant #4 Canton Aggregate Div. Stone Products	498,9 690,0
ardin County dn-S	National Lime & Stone Co. Shelly Materials, Inc.	Findlay Plant Forest Quarry	433,000	225,004	Sk-CA1 Sk-HM	The Beaver Excavating Company Central-Allied Enterprises, Inc. HMS Construction and Rental Co. Kimble Clay & Limestone Co.	Central Sand & Gravel Div. Rohr & Sons Nursery Tree Farm	35,0 318,2 94,4
arrison County n-152 n-169	Bowerston Shale Co. Hopedale Mining, LLC	Bowerston (Calwell) Hopedale Mining, LLC	25,840 281,612	25,840 292,251	Sk-K1 Sk-LM Sk-M	Kimble Clay & Limestone Co. L & M Mineral Co. Massillon Materials, Inc.	Slankard Barr Farm Massillon Materials, Inc.	48,5 1,0 294,6
n-A1 n-H n-R1	CCU Coal and Construction, LLC CCU Coal and Construction, LLC Rosebud Mining Company	Sandy Ridge Sexton 2 (Harrison) Vail Mine	540,347 162,078 360,137	540,902 164,438 360,137	Sk-M1 Sk-R0 Sk-T	Massillon Materials, Inc. American Sand & Gravel, Inc. Tiger Sand & Gravel, LLC	MMI Warmington Plant Plant #6 Tiger Sand & Gravel, LLC	148,8 8,1 468,2
enry County y-Br ighland County	Burdette H Rathge and Sons LTD	Vorwerk Farms	24,241	24,241	Summit County St-55 St-9127	Perrin Family, LLC Cargill Salt	Perrin Cargill Salt	57,3 330,5
1-3 1-4 1-L	Ohio Asphaltic Limestone Corp. Marshall Quarry, Inc. Ervin Hill Enterorises, Inc.	Ohio Asphaltic Limestone Corp. Marshall Quarry, Inc. Ervin Hill Enterprises, Inc.	508,846 21,000 159,391	508,846 21,000 159,391	St-B Trumbull County TI-L	Bontrager Excavating Co.	Gilbert	10,6 51,0
ocking County g-262	Ervin Hill Enterprises, Inc. Hocking Valley Concrete, Inc.	Hocking Valley Concrete	159,391 106,095	106,095	Tuscarawas Count Ts-125	Stocker Sand & Gravel Co.	Stocker Sand & Gravel - Island plant	393,3
g-301 g-HA g-HV	S & S Aggregate, Inc. KCI Sand & Gravel S & S Aggregate, Inc.	S & S Aggregate Plant #3 KCI Sand & Gravel Mar-Zane Materials Enterprise	11,888 75,563 357,811	11,888 91,056 335,958	Ts-1517 Ts-1646 Ts-1660	The Belden Brick Company, LLC The Belden Brick Company, LLC Regeneration Materials	Moomaw Pit Belden Pit Dundee Mine	20,1 9,5 1,5
olmes County s-511 s-82	Feikert Sand & Gravel, Inc. Holmes Redimix, Inc.	Feikert Sand & Gravel, Inc. Holmes Redimix, Inc.	154,655 8,721	154,655 8,721	Ts-1818 Ts-1826 Ts-1841	Kimble Clay & Limestone Co. Soehnlen Bros. Sand & Gravel, Inc. Belden Brick Co.	Kimble Clay & Limestone Co. Soehnlen Bros. Sand & Gravel, Inc. Wallick Pit	355,1 272,7 54,2
s-826 s-827	Kurt McDowell Humphrey Sand & Gravel, LLC	Millersburg Humphrey Sand & Gravel	880 13,740	880 13,740	Ts-1884 Ts-1939	L & M Mineral Co. The Belden Brick Company, LLC	Heil Shanesville Pit	3,5 115,4
s-F2 s-F3 s-F4	Feikert Sand & Gravel, Inc. Feikert Sand & Gravel, Inc. Feikert Sand & Gravel, Inc.	Feikert Sand & Gravel Feikert Sand & Gravel - Taylor Bottom Hendrix	15,697 114,485 13,981	15,697 114,485 13,981	Ts-1960 Ts-1982 Ts-2001	The Belden Brick Company, LLC L & M Mineral Co. Newton Asphalt Paving, Inc.	Beagle Pit Spring State Route 516 Pit	34,4 21,7 160,6
s-H1 s-J s-R1	Holmes Supply Corp. Holmes Supply Corp. Rohr Excavating, Ltd.	Holmes Supply Millersburg Site Holmes Supply Corp. Rohr	459,469 64,351 28,106	459,469 64,351 28,106	Ts-2036 Ts-69 Ts-B	Oster Sand & Gravel, Inc. Stocker Sand & Gravel Co. Belden Brick Co.	Oster Sand & Gravel - Bolivar plant Stocker Sand & Gravel - Gnaden Plant Plotner/Troyer Pit	25,4 299,1 5,0
rn-8 ackson County	Mesenburg Bros., Inc.	Mesenburg Bros., Inc.	2,332	2,332	Ts-HC Ts-K11 Ts-K2	CCU Coal and Construction, LLC Kimble Clay & Limestone Co. Kimble Clay & Limestone Co.	Strasburg Slurry Ervin Spooky Hollow – Penn-Ohio Coal Co.	22,1 54,6 37,1
cn-CH3 cn-EA	Cedar Heights Clay Co. Elko Aggregates, LLC	Phillips Broken Aro Quarry	21,608 72,800 2,000	21,404 72,800 2,000	Ts-K4 Ts-MA	Kimble Clay & Limestone Co. Massillon Materials, Inc.	Spooky Hollow Bolivar Plant MMI	16,7
ox County -1	HarbisonWalker International Inc. Leister Legacy Ltd.	Canter Millwood Mine	40,749	38,712	Ts-S2 Ts-SI Ts-TR	Sidco Development, Inc. L & M Mineral Co. Rosebud Mining Company	Midvale Sand & Gravel Midvale Tusky Mine	175,8 34,4 101,0
c-15 c-17 c-3	Small's Sand & Gravel, Inc. Small's Sand & Gravel, Inc. United Aggregates, Inc.	Small's Sand & Gravel, Inc. Small's Sand & Gravel, Inc. United Aggregates, Inc.	343,849 366 148,498	343,849 366 238,233	Union County Un-1 Un-2	Shelly Materials, Inc. Shelly Materials, Inc.	York Center Quarry Ostrander Quarry	467,2 1,964,4
(-5 (-B (-C	United Aggregates, Inc. Buckland, Edsel L. IRG Newcastle, LLC	United Aggregates, Inc. Buckland Fletcher	38,393 200 222	35,426 200 57	Van Wert County Vt-1 Vt-3	National Lime & Stone Co. Stoneco, Inc.	Delphos Quarry Scott Quarry	83,0 329,2
ι- K ι-Ο	Knox County Engineers Office Olen Corp.	Apple Valley Fredericktown - Plant #2	1,016 569,981	1,016 629,392	Vt-7 Vinton County	Ridge Township Quarry	Ridge Township Quarry	231,4
e-6 e-K	Morton International, Inc. Keeney Sand & Stone, Inc.	Fairport Mine Keeney Sand & Stone, Inc.	1,060,653 69,025	1,084,813 69,025	Vn-191 Vn Warren County Wan-38	Cheyenne Resources Ohio, Inc. Martin Marietta Aggregates	Dundas-Oreton Franklin Gravel	15,4 43,5
cking County -10 -31	Shelly Materials, Inc. Olen Corp.	St. Louisville St. Louisville - Plant #5	555,861 496,041	488,832 452,420	Wan-41 Wan-50 Wan-7	Oeder & Son Garage, Inc. L & I Natural Resources, Inc. Ernst Enterprises Inc.	Carl E. Oeder and Sons Sand & Gravel L & I Pit & Mine Ernst Agg Plant #7	403,3 43,3
-4484 -45 -501	Royalty Enterprises, Inc. R. H. Penick Co., Ltd. Bowerston Shale Co.	King #1 R. H. Penick Co. Hanover Pit	310 381 11,008	310 381 11,008	Wan-B Wan-MV Wan-R	Little Miami Acres, LLC Miami View Mining Co., Ltd. Daniel L. Browning Riverside Sand & Gravel	Little Miami Acres Miami View Riverside Sand and Gravel	1,3 14,5 2
-504 -B	Hains Co., LLC Brookside Materials, LLC	Newark Materials Brookside Materials	19,844 209,000	19,844 209,000	Washington Count Wn-38	S & S Aggregate, Inc.	Plant#2	23,2
gan County pn-15	Nuway Services Duff Quarry, Inc.	Hopewell Duff Quarry, Inc.	54,780 262,405	54,780 562,405	Wn-508 Wn-54 Wn-B	Briggs Sand & Gravel, Inc. Atlas Towing Co. Burkhart Trucking, Inc.	Briggs Sand & Gravel, Inc. Belpre Bank Run Triple B#2	60,8 3,4 7
n-2 n-31 n-6	Shelly Materials, Inc. Duff Quarry, Inc. Neer's Sand & Gravel	Belle Center Duff Sand Co. Neer's Sand & Gravel	270,966 5,565 189,410	259,354 5,565 189,410	Wn-B1 Wn-SM Wn-SS	Burkhart Trucking, Inc. Shelly Materials, Inc. Belpre Sand & Gravel Co.	Triple B #1 Reno Belpre Sand & Gravel	11,0 442,2 307,7
n-B erain County	Jeff Boyd Excavating	Boyd Excavating	3,366	3,366	Wayne County We-11	Olen Corp.	Wooster - Plant #8	375,8
1-12 1-J ucas County	Guy Schieve Excavating Johnson Stone Products, Inc.	Schieve Pit Johnson Stone Products	360 2,981	360 2,980	We-15 We-25 We-7	Zollinger Sand & Gravel Co. Route 3 Stone Products, LLC Rupp Construction, Inc.	Zollinger Sand & Gravel Co. Route 3 Stone Products, LLC Rupp Construction, Inc.	2,3 42,6 84,0
:-1 :-2 :-3	Hanson Aggregates Midwest, Inc. Stoneco, Inc. Hanson Aggregates Midwest, Inc.	Waterville Quarry Maumee Quarry Sylvania Quarry	282,936 818,937 1,074,881	299,868 878,729 1,014,379	We-9129 We-EA We-M	Morton International, Inc. Wood Land & Cattle Co., Ltd. Mt. Eaton Reclamation, Inc.	Morton Salt Well Field 9129 #1 Mt. Eaton Reclamation, Inc.	460,4 105,6 13,4
-E adison County dn-11	Envirosafe Services of Ohio, Inc. Tuffco Sand & Gravel, Inc.	Johlin Property Clay Mine Tuffco Sand & Gravel, Inc.	108,900	108,900	Williams County Ws-21 Wood County	Thiel Construction Co., Inc.	Thiel Construction Co.	7
ahoning County g-54	East Fairfield Coal Co.	Honey Creek	174,020	169,499	Wd-1 Wd-11	Gerken Materials, Inc. Stoneco, Inc.	Gerken Materials, Inc. Portage Quarry	231,5 355,0
g-62	City Stone, LLC Solomon's Mines, Inc. East Fairfield Coal Co.	City Stone, LLC Solomon's Mines, Inc. Withers-Petersburg	210,407 51,742 17,255	210,407 51,742 17,255	Wd-14 Wd-5 Wd-C	Precision Aggregates, LLC Custar Stone Co., Inc. Cardinal Aggregates, Inc.	Precision Aggregates II, LLC Custar Stone Co., Inc. Cardinal Aggregates	125,3 519,3 644,0
g-632 g-E		Raushel	2,167	2,167	Wd-W	Wylie and Sons Landscaping LLC	Wylie & Sons	290,0
g-632	East Fairfield Coal Co. Subtropolis Mining Shelly Materials, Inc. Joe Yochman	Kemp Mine Petersburg Yochman	1,359,023 460,030 650	1,406,417 441,429 650	Wyandot County Wt-1 Wt-3	National Lime & Stone Co. Olen Corp.	Carey Plant Upper Sandusky - Plant #6	4,104,0 805,9

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