

County...PUTNAM.....
T. 14 N.....R. 4 W.....
Sec....13, 14, and 24.....
Other Survey.....

Quarry or Pit.....Core. X....Dim.....Other....
Name. Dames and Moore cores.....
Former Names.....
.....
Operator.....
Former Operators.....

POSTAGE

INDUSTRIAL MINERALS SECTION
INDIANA GEOLOGICAL SURVEY
DEPARTMENT OF NATURAL RESOURCES
611 NORTH WALNUT GROVE
BLOOMINGTON, INDIANA, 47401

MEMORANDUM REPORTS BY:

Name	Date
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REMARKS

put IBM 12

IBM CORE HOLE 12
SE¼SW¼SW¼ sec. 13, T. 14 N., R. 4 W.
150' NL, 560' EL
Putnam County
Total Depth 106 ft
Elevation 854.6 ft
Description by J. R. Hill
September 1983

Unit	Description	Depth		Sample
	St. Louis Limestone			
1	Limestone, pale yellowish-orange (10YR8/5); fine silty to micritic; fine joints filled with sparry calcite; differential iron staining; scattered vugs which average less than 2mm in diameter; limonitic worm-tube fills scattered throughout.	8.0	9.0	DC83-0003
2	Limestone, light brownish-gray (10YR6/1 to N6); micritic; medium bedded; mud coats on solution openings and joint surfaces; occasional sparry calcite vug and joint fills.	9.0	10.4	DC83-0004
	Interval from 10.4 to 11.9 ft missing			
3	Dolomite, grayish-orange (10YR7/4) and light brownish-gray (5YR6/1); dolosiltite; scattered sparry calcite veins; dense; inclusions of light gray (5YR to N7) dolomite with fine pyritic sand near base of interval.	11.8	12.8	DC8-0005
4	Limestone, pale yellowish-orange (10YR8/6) to very pale orange (10YR8/2); soft and crumbly; calcilutite	12.8	13.0	
5	Limestone (dolomitic), light gray (N7); fine sandy to silty; medium bedded. Units 4 and 5.	13.0	14.3	DC83-0006
6	Shale, light greenish-gray (5G8/1); claystone; single thin bed. No sample.	14.3	14.6	
7	Dolomite, very light gray (N8); calcareous; pyrite in sand fraction, widely scattered.	14.6	15.0	DC83-0007
8	Limestone, very light brownish-gray (5YR6/0); micritic; massive; occasional thin beds of dolomite; scattered stylolites; sparry calcite joint fills moderate to abundant; widely scattered patches of glauconite; finely disseminated pyrite crystals.	15.0	20.0	DC83-0008
9	Limestone, white (N9); dolomitic; soft and silty; glauconitic; scattered fine pyrite crystals. Unit grades downward to very light gray dolosiltite at base.	20.0	21.5	DC83-0009
10	Limestone, light gray (N7) and very light gray (N8), mottled; calcarenite; abundant fractures filled with sparry calcite.	21.5	21.7	DC83-0010
11	Limestone, light gray (N7); micritic at the top of the interval grading to calcarenite from 22 ft to base of interval.	21.7	23.1	DC83-0011
12	Shale, greenish-gray (5GY6/1); calcareous; fissile; 23.1-23.7 thinly laminated; soft. Not sampled.	23.1	23.7	
13	Limestone, light gray (N7); calcarenite; abundant sparry calcite cement containing pelletal fossil fragments; sparry calcite vug fills.	23.7	25.3	DC83-0012

14	Dolomite, very light gray (N8 to N7.5); dolosiltite.	25.3	26.0	DC83-0013
15	Dolomite, light greenish gray (5G8/1) to light gray (N7); dolosiltite.	26.0	26.1	DC83-0013
16	Limestone, light brownish-gray (5YR6/1); micritic; numerous sparry calcite patches and joints filled with sparry calcite.	26.1	27.1	DC83-0014
17	Dolomite, light bluish-gray (587/1); dolosiltite; slightly argillaceous in places.	27.1	28.0	DC83-0015
18	Limestone, light gray (N7) arenaceous; dense.	28.0	28.7	DC83-0016
19	Dolomite, very light gray (N8); silty/clayey (dolomitic mudstone); wavy to convoluted laminae of light greenish-gray (5G8/1) color throughout the otherwise massive dolomite. Grades downward to light gray (N7) dolomite that is also laminated.	28.7	29.7	DC83-0017
20	Dolomite, light gray (N7) and pinkish-gray (5YR8/1) finely mottled; arenaceous; scattered patches of glauconite and fine pyrite crystals.	29.7	30.0	DC83-0018
21	Limestone, light brownish-gray (5YR6/1); very fine calcarenite to micrite; single band of anastomosing thin laminae composed of dolomitic calcite (medium light gray); color gradations vary vertically between light brownish-gray and medium light gray.	30.0	31.3	DC83-0019
22	Dolomite, very light gray (N8) grading downward to light gray (N7) fine sandy to silty texture; medium bedded.	31.3	34.5	DC83-0020
23	Limestone, very light gray (NB) to yellowish-gray (5Y8/1); dendritic pyrite veins scattered throughout.	34.5	34.7	DC83-0021
24	Dolomite, light gray (N7); thin argillaceous zone at top (1 cm thick); calcareous in places; appears to grade into dolomitic limestone at base of interval.	34.7	36.0	DC83-0022
25	Limestone, mostly light gray (N7); occasional argillaceous partings that occur at semiregular intervals of 20 to 30 cm; micritic to pelletal-micritic. Shaly zones are greenish-gray (5GY6/1).	36.0	45.0	DC83-0023
26	As above but less calcareous and lighter gray; calcareous dolomite.	45.0	46.0	DC83-0024
	Salem Limestone			
27	Limestone, light brownish-gray (5YR6/1) to light gray (N7); calcarenite; numerous sparry calcite vug fills.	46.0	46.5	DC83-0025
28	Limestone, light gray (N7) to light brownish-gray (5YR6/1); bioclastic calcarenite (pelletal); numerous forams in sparry calcite cement.	46.5	47.6	
29	Limestone, light gray (N7) to light brownish gray (5YR6/1); pelletal-micritic to fine bioclastic calcarenite; calcite cement; scattered stylolites and sparry calcite vug fills; stylolite at 54 ft interval has conic slickensided surface; essentially massive	47.6	50.0	DC83-0026 46.5 to 50.0
29	Limestone, light gray (N7) to light brownish gray (5YR6/1); pelletal-micritic to fine bioclastic calcarenite; calcite cement; scattered stylolites and sparry calcite vug fills; stylolite at 54 ft interval has conic slickensided surface; essentially massive	50.0	56.0	DC83-0027 50.0 to 56.0
30	Limestone, light gray (N7) to very light gray (N8); pelletal calcarenite; possible endothryra; scattered stylolites; thick to massive bedded; degree of rounding and size grading of bioclastic debris varies.	56.0	60.0	DC83-0028

30	Limestone, light gray (N7) to very light gray (N8); pelletal calcarenite; possible endothyra; scattered stylolites; thick to massive bedded; degree of rounding and size grading of bioclastic debris varies.	60.0	66.0	DCB8-0029
31	Limestone, light gray (N7) to very light gray (N8), and light brownish-gray (5YR6/1); fine to medium pelletal calcarenite; grades vertically from fine calcarenite of well rounded bioclastic detritus and forams to medium sand-size biofragmental limestone; stylolite scattered throughout.	66.0	71.1	DC83-0030
32	Limestone, very light gray (N8); micritic to very fine pelletal calcarenite; 1 cm-thick "chalky" zone half way through the interval.	71.1	71.8	DC83-0031
33	Limestone, light gray (N7); pelletal calcarenite; calcite cement as above; scattered stylolites.	71.8	74.2	DC83-0032
34	Limestone, very light gray (N8); pelletal micritic to micritic; calcite cemented as above.	74.2	76.0	DC83-0033
35	Limestone (dolomitic to argillaceous), very light gray (N8); fine calcarenite to micrite; scattered sparry calcite vug fills.	76.0	78.3	DC83-0034
36	Dolomite (calcareous), very light gray (NB); numerous dusky yellowish-brown (10YR4/2) stylolites.	78.3	79.1	DC83-0035
37	Limestone, very light gray (N8); fine bioclastic calcarenite with abundant calcite cement.	79.1	80.8	DC83-0036
38	Mud seam; calcareous; soft.	80.8	80.9	not sampled
39	Limestone, yellowish-gray (5Y8/1) medium to very fine bioclastic calcarenite; fine wavy shale partings near top of interval over a depth of 13 cm.	80.9	84.3	DC83-0037
40	Limestone, light olive gray (5Y6/1) thinly laminated calcarenite; argillaceous.	84.3	85.2	DC83-0039
41	Limestone, very light gray (N8); calcarenite; sparry calcite inclusion midway through interval.	85.2	86.0	DC83-0039
42	Dolomite (calcareous), light olive gray (5Y6/1); calcarenite; argillaceous; thin laminae near top of interval.	86.0	88.2	DC83-0040
43	As above but more calcareous.	88.2	89.2	DC83-0041
44	Limestone, light gray (N7 to N8); medium biofragmental calcarenite; widely scattered stylolites.	89.2	96.0	DC83-0042
45	Limestone, pinkish-gray (5YR8/1) medium pelletal calcarenite; well graded fossil hash, much of which is fairly well rounded; scattered incipient stylolites.	96.0	98.8	DC83-0043
	Harrodsburg Limestone (?)			
46	Limestone, light gray (N7); coarse bioclastic crinoid fragments abundant (mostly columnals); sparry calcite cement; grades over lower 8 cm to fine calcarenite.	98.8	100.6	DC83-0044
47	Limestone, yellowish-gray (5Y8/1) fine calcarenite to pelletal limestone; silty in places; well developed stylolite at 104 ft; lower 15 cm of interval is medium bioclastic limestone.	100.6	106.0	DC83-0045
	Total depth	106.0		

Core File Numbers - 621 & 620
Samples 11773
- 11774

May 30, 1980

Indiana Geological Survey
611 North Walnut Grove
Bloomington, IN 47405

Attention: Mr. Kurt Ault

Gentlemen:

Re: Donation of Rock Core Samples

In accordance with our conversations, Dames & Moore has agreed to donate 29 boxes of NX rock core from a site investigation conducted by our firm, approximately 2 miles west of Greencastle in Putnam County, Indiana. These cores were taken from five borings in Sections 13, 14, and 24; Township 14 north; Range 4 west. Approximate borehole locations are shown on the attached topographic map. All holes have been sealed with cement grout and are no longer accessible.

The following information is pertinent.

	Core Boring Number				
	<u>2</u>	<u>12</u>	<u>14</u>	<u>18</u>	<u>20</u>
Ground surface elevation (MSL)	835.4	854.6	836.0	822.4	813.4
Depth to ground water (feet)	28.0	61.8	32.8	36.4	11.6
Depth to top of rock (feet)	48.5	7.5	6.8	53.5	11.5
Total depth of hole (feet)	95.0	106.0	54.7	94.5	66.0
Strata penetrated:	- Salem Harrodsburg -	St. Louis Salem Harrodsburg -	St. Louis Salem - -	- - Harrodsburg Ramp Creek	- Salem Harrodsburg Ramp Creek

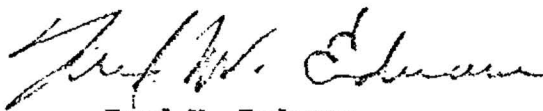
Indiana Geological Survey
May 30, 1980
Page -2-

We request that these cores be used only for research purposes by direct employees of the Indiana Geological Survey; they are not to be viewed or otherwise examined by any outside party without the express written consent from Dames & Moore or our client, The IBM Corporation. We also request that the name of The IBM Corporation not be attached to geologic logs or other records associated with these cores (i.e., do not refer to them as "IBM cores," etc.); however, we would like to suggest that you acknowledge the IBM Corp., Office Products Division of Greencastle, Indiana if any information derived from these cores is used in a formal publication. Otherwise our client should not be identified to any party outside of the Indiana Geological Survey.

Dames & Moore would also like to receive copies of any published or unpublished studies performed on these cores, particularly confirmation of stratigraphic "tops," etc. We appreciate your interest in utilizing these rock core samples for scientific purposes and trust that our mutual interests will be served by such cooperative efforts.

Very truly yours,

DAMES & MOORE



Fred W. Erdmann
Senior Geologist

FWE/ds

CC: Mr. Virgil Thompson, IBM Corp.

*Confidential only until
Sept. 1982
see letter to Erdmann
Sept 11, 1980*

Sept. 11, 1980

Mr. Fred Erdmann
Senior Geologist
Dames and Moore
1150 West Eighth St.
Cincinnati, OH 45203

Dear Mr. Moore:

In reference to your letter of May 30, 1980, concerning core samples from 5 wells drilled in secs. 13, 14, and 24, T. 14 N., R. 4 E., Putnam County, Indiana, we have made a preliminary examination of the cores and will proceed by splitting cores #12 and #18, describing them in detail, filing a split half of the cores, and submitting the other half to our Geochemistry Section for chemical analysis. We chose the above two cores for permanent file because they overlap stratigraphically and include all of the stratigraphic section that was penetrated in any of the wells.

The three remaining cores will be described from the whole core and stored briefly (a few months) to inform prospective researchers of their availability. Then these three cores will be disposed of unless you wish to pick them up.

All of the information and data will be forwarded to you and kept on a confidential status as discussed in your letter, including the cores themselves, until September, 1982. Our usual procedure is to set a time period for confidentiality, usually two years, because we have discovered many times that after several years have passed we cannot find the original donor or someone who is willing to take on the responsibility for releasing the data.

If two years are insufficient or if this method of handling the confidentiality of the data is unacceptable, please let me know.

Thanks again for the cores.

Sincerely,

Curtis H. Ault, Associate Head
Coal & Industrial Minerals Section

CHAs

IBM CORE HOLE 12

SE 1/4 SW 1/4 SW 1/4 sec. 13, T. 14 N., R. 4 W.

150' NL, 560' EL

Putnam County

Total Depth 106 ft

Elevation 854.6 ft

Description by J. R. Hill

September 1983

Unit	Description	Depth (ft)
St. Louis Limestone		
1	Limestone, pale yellowish-orange (10YR8/5); fine silty to micritic; fine joints filled with sparry calcite; differential iron staining; scattered vugs which average less than 2mm in diameter; limonitic worm-tube fills scattered throughout. DC83-3	8 - 9
2	Limestone, light brownish-gray (10YR6/1 to N6); micritic; medium bedded; mud coats on solution openings and joint surfaces; occasional sparry calcite vug and joint fills. DC83-4	9 -10.4
Interval from 10.4 to 11.8 ft missing		
3	Dolomite, grayish-orange (10YR7/4) and light brownish-gray (5YR6/1); dolosiltite; scattered sparry calcite veins; dense; inclusions of light gray (5YR to N7) dolomite with fine pyritic sand near base of interval. DC83-5	11.8-12.8
4	Limestone, pale yellowish-orange (10YR8/6) to very pale orange (10YR8/2); soft and crumbly; calcilutite	12.8-13.0
5	Limestone (dolomitic), light gray (N7); fine sandy to silty; medium bedded. Units 4 and 5, DC83-6	13.0-14.3
6	Shale, light greenish-gray (5G8/1); claystone; single thin bed. No sample.	14.3-14.6
7	Dolomite, very light gray (N8); calcareous; pyrite in sand fraction, widely scattered. DC83-7	14.6-15.0
8	Limestone, very light brownish-gray (5YR6/0); micritic; massive; occasional thin beds of dolomite; scattered stylolites; sparry calcite joint fills moderate to abundant; widely scattered patches of glauconite; finely disseminated pyrite crystals. DC83-8	15.0-20.0

9	Limestone, white (N9); dolomitic; soft and silty; glauconitic; scattered fine pyrite crystals. Unit grades downward to very light gray dolosiltite at base. DC83-9	20.0-21.5
10	Limestone, light gray (N7) and very light gray (N8), mottled; calcarenite; abundant fractures filled with sparry calcite. DC83-10	21.5-21.7
11	Limestone, light gray (N7); micritic at the top of the interval grading to calcarenite from 22 ft to base of interval. DC83-11	21.7-23.1
12	Shale, greenish-gray (5GY6/1); calcareous; fissile; 23.1-23.7 thinly laminated; soft. Not sampled.	
13	Limestone, light gray (N7); calcarenite; abundant sparry calcite cement containing pelletal fossil fragments; sparry calcite vug fills. DC83-12	23.7-25.3
14	Dolomite, very light gray (N8 to N7.5); dolosiltite	25.3-26.0
15	Dolomite, light greenish gray (5G8/1) to light gray (N7); dolosiltite. Units 14 and 15, DC83-13	26.0-26.1
16	Limestone, light brownish-gray (5YR6/1); micritic; numerous sparry calcite patches and joints filled with sparry calcite. DC83-14	26.1-27.1
17	Dolomite, light bluish-gray (5B7/1); dolosiltite; slightly argillaceous in places. DC83-15	27.1-28.0
18	Limestone, light gray (N7) arenaceous; dense. DC83-16	28.0-28.7
19	Dolomite, very light gray (N8); silty/clayey (dolomitic mudstone); wavy to convoluted laminae of light greenish-gray (5G8/1) color throughout the otherwise massive dolomite. Grades downward to light gray (N7) dolomite that is also laminated. DC83-17	28.7-29.7
20	Dolomite, light gray (N7) and pinkish-gray (5YR8/1) finely mottled; arenaceous; scattered patches of glauconite and fine pyrite crystals. DC83-18	29.7-30.0
21	Limestone, light brownish-gray (5YR6/1); very fine calcarenite to micrite; single band of anastomosing thin laminae composed of dolomitic calcite (medium light gray); color gradations vary vertically between light brownish-gray and medium light gray. DC83-19	30.0-31.3

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| 22 | Dolomite, very light gray (N8) grading downward to light gray (N7) fine sandy to silty texture; medium bedded. DC83-20 | 31.3-34.5 |
| 23 | Limestone, very light gray (N8) to yellowish-gray (5Y8/1); dendritic pyrite veins scattered throughout. DC83-21 | 34.5-34.7 |
| 24 | Dolomite, light gray (N7); thin argillaceous zone at top (1 cm thick); calcareous in places; appears to grade into dolomitic limestone at base of interval. DC83-22 | 34.7-36.0 |
| 25 | Limestone, mostly light gray (N7); occasional argillaceous partings that occur at semiregular intervals of 20 to 30 cm; micritic to pelletal-micritic. Shaly zones are greenish-gray (5GY6/1). DC83-23 | 36.0-45.0 |
| 26 | As above but less calcareous and lighter gray; calcareous dolomite. DC83-24 | 45.0-46.0 |

Salem Limestone

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| 27 | Limestone, light brownish-gray (5YR6/1) to light gray (N7); calcarenite; numerous sparry calcite vug fills. DC83-25 | 46.0-46.5 |
| 28 | Limestone, light gray (N7) to light brownish-gray (5YR6/1); bioclastic calcarenite (pelletal); numerous forams in sparry calcite cement. | 46.5-47.6 |
| 29 | Limestone, light gray (N7) to light brownish gray (5YR6/1); pelletal-micritic to fine bioclastic calcarenite; calcite cement; scattered stylolites and sparry calcite vug fills; stylolite at 54 ft interval has conic slickensided surface; essentially massive. 46.5 to 50.0, DC83-26; 50.0 to 56.0, DC83-27 | 47.6-56.0 |
| 30 | Limestone, light gray (N7) to very light gray (N8); pelletal calcarenite; possible endothyra; scattered stylolites; thick to massive bedded; degree of rounding and size grading of bioclastic debris varies. 56.0 to 60.0, DC83-28; 60.0 to 66.0, DC83-29 | 56.0-66.0 |
| 31 | Limestone, light gray (N7) to very light gray (N8), and light brownish-gray (5YR6/1); fine to medium pelletal calcarenite; grades vertically from fine calcarenite of well rounded bioclastic detritus and forams to medium sand-size biofragmental limestone; stylolite scattered throughout. DC83-30 | 66.0-71.1 |

32	Limestone, very light gray (N8); micritic to very fine pelletal calcarenite; 1 cm-thick "chalkly" zone half way through the interval. DC83-31	71.1-71.8
33	Limestone, light gray (N7); pelletal calcarenite; calcite cement as above; scattered stylolites. DC83-32	71.8-74.2
34	Limestone, very light gray (N8); pelletal micritic to micritic; calcite cemented as above. DC83-33	74.2-76.0
35	Limestone (dolomitic to argillaceous), very light gray (N8); fine calcarenite to micrite; scattered sparry calcite vug fills. DC83-34	76.0-78.3
36	Dolomite (calcareous), very light gray (N8); numerous dusky yellowish-brown (10YR4/2) stylolites. DC83-35	78.3-79.1
37	Limestone, very light gray (N8); fine bioclastic calcarenite with abundant calcite cement. DC83-36	79.1-80.8
38	Mud seam; calcareous; soft. Not sampled.	80.8-80.9
39	Limestone, yellowish-gray (5Y8/1) medium to very fine bioclastic calcarenite; fine wavy shale partings near top of interval over a depth of 13 cm. DC83-37	80.9-84.3
40	Limestone, light olive gray (5Y6/1) thinly laminated calcarenite; argillaceous. DC83-38	84.3-85.2
41	Limestone, very light gray (N8); calcarenite; sparry calcite inclusion midway through interval. DC83-39	85.2-86.0
42	Dolomite (calcareous), light olive gray (5Y6/1); calcarenite; argillaceous; thin laminae near top of interval. DC83-40	86.0-88.2
43	As above but more calcareous. DC83-41	88.2-89.2
44	Limestone, light gray (N7 to N8); medium biofragmental calcarenite; widely scattered stylolites. DC83-42	89.2-96.0
45	Limestone, pinkish-gray (5YR8/1) medium pelletal calcarenite; well graded fossil hash, much of which is fairly well rounded; scattered incipient stylolites. DC83-43	96.0-98.8

Harrodsburg Limestone (?)

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| 46 | Limestone, light gray (N7); coarse bioclastic crinoid fragments abundant (mostly columnals); sparry calcite cement; grades over lower 8 cm to fine calcarenite. DC83-44 | 98.8-100.6 |
| 47 | Limestone, yellowish-gray (5Y8/1) fine calcarenite to pelletal limestone; silty in places; well developed stylolite at 104 ft; lower 15 cm of interval is medium bioclastic limestone. DC83-45 | 100.6-106.0 |

Total depth 106.0