PETROGRAPHIC EVALUATION OF SIX SIDEWALL CORE SAMPLES FROM THE BURGER SITE WELL BELMONT COUNTY, OHIO

Job Number: 071029GA

Prepared for:

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PETROGRAPHIC ANALYSIS

This report presents the results of thin section analysis performed on six (6) sidewall core samples from the Burger Site Well, located in Belmont County, Ohio. The objectives of this study are to determine texture, mineralogy, pore-filling constituents, pore types, and diagenetic features. A list of samples analyzed is presented in Table 1. Thin section photomicrographs are attached as Plates 1 to 6. The six (6) analyzed samples consist of four (4) dolostones, one (1) argillaceous siltstone, and one (1) sandstone (Table 1).

Dolostone: Four samples (6782.0, 6865.0, 6905.0, 7476.0 feet) are dolostones. Two dolostones (6782.0, 6865.0 feet) are probably derived from silty claystone and claystone. Dolomite is the dominant mineral; minor amounts of detrital quartz grains are still present. Trace amounts of barite (?) are present and have locally replaced dolomite. Micropores are the principal pore type in these two dolostones; visible pores are rare and mainly associated with the dolomitized silt-rich laminae.

Two dolostones (6905.0, 7476.0 feet) are probably derived from limestones (grainstone and wackestone). Visible pores are moderate to common and consist of interparticle and intercrystalline pores. Peloids are the most common allochem grains in the dolograinstone. Fractures are locally observed (Plate 3) and have been filled with clear dolomite crystals. Dolomite is locally replaced by barite.

Argillaceous siltstone: One sample (8133.0 feet) is an argillaceous siltstone, which is locally burrowed. The most common framework grains are quartz, K-feldspar and plagioclase; these grains are silt-sized, subangular in shape and moderately sorted. Intergranular areas are occluded by detrital clay matrix; hematite is highly dispersed in the matrix and shows a reddish color under reflected light. Visible pores are absent; micropores are the major pore type and associated with the detrital clay matrix.

TABLE 1

ANALYTICAL PROGRAM AND PETROGRAPHIC SUMMARY

Battelle Memorial Institute, Burger Site Well

Sample ID	Depth (feet)	Thin Section	Formation	Lithology	Plate No.
Burger_23_6782	6782.0	X	Salina anhydrite/salt/dolomite	Dolostone (dolomitized silty claystone)	1
Burger_20_6865	6865.0	X	Salina anhydrite/salt/dolomite	Dolostone (dolomitized claystone)	2
Burger_19_6905	6905.0	X	Salina anhydrite/salt/dolomite	Dolostone (dolomitized grainstone)	3
Burger_13_7476	7476.0	X	Lockport dolomite/limestone	Dolostone (dolomitized wackestone)	4
Burger_9_8133	8133.0	X	Red Clinton siltstone	Argillaceous siltstone	5
Burger_6_8235	8235.0	X	White Clinton sandstone	Sandstone	6

Thin Section Photomicrographs
with
Descriptions

PLATE 1 A-B

THIN SECTION PHOTOMICROGRAPHS

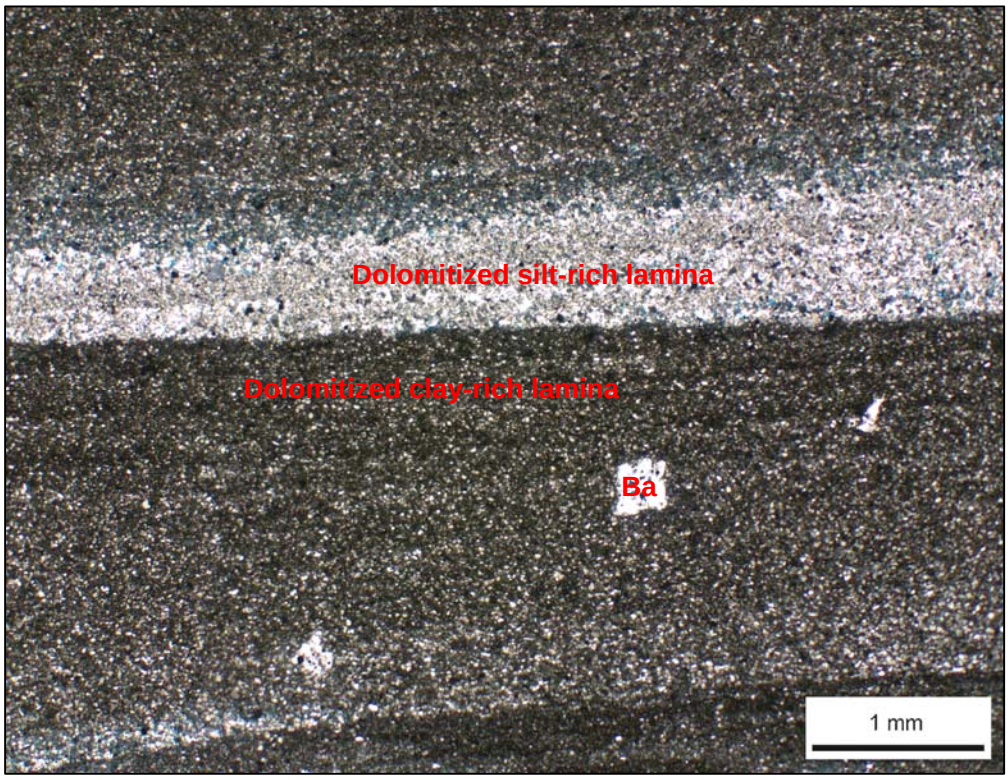
Battelle Memorial Institute
Burger Site Well
Belmont County, Ohio

Depth (feet): 6782.0

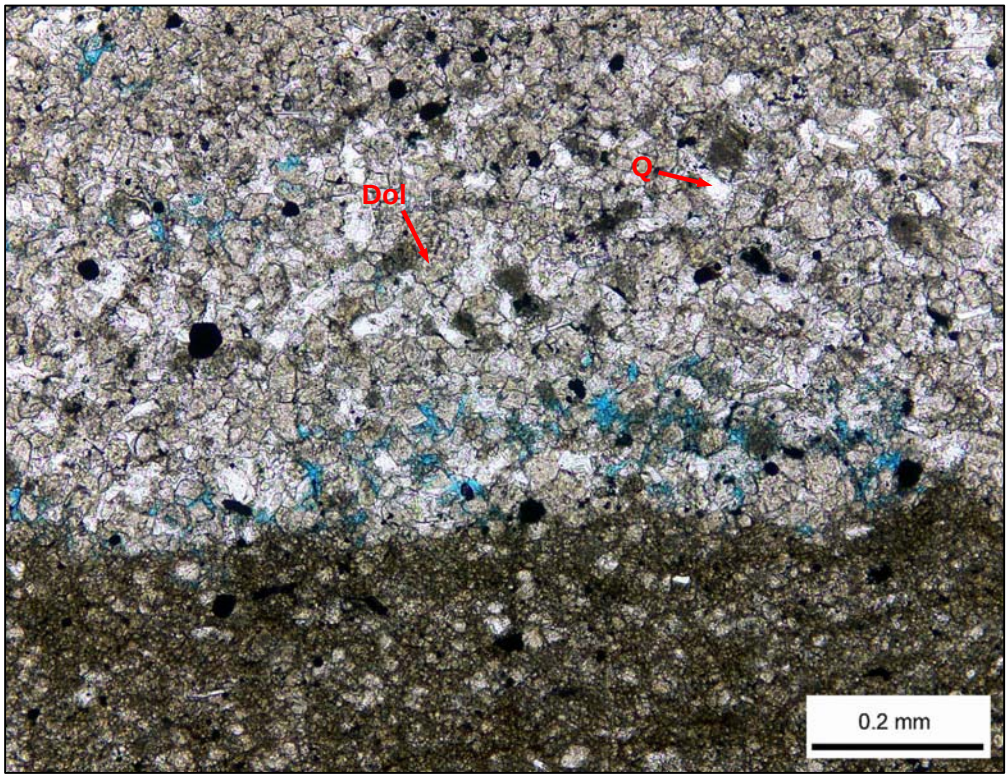
Lithology: Dolostone (dolomitized silty claystone)
Foramtion: Salina anhydrite/salt/dolomite
Sample ID: Burger_23_6782

Dolomite is the dominant mineral in this sample; minor amounts of detrital quartz grains (Q) are still present. The original rock was probably a silty claystone composed of silt-rich and clay-rich laminae, which have been extensively replaced by dolomite (Dol). Trace amounts of barite? (Ba) are present, replacing dolomite. Visible pores (blue) are minor in abundance and mainly associated with the dolomitized silt-rich laminae. Micropores among the dolomite crystals are the principal pore type in this sample.

Battelle Memorial Institute
Burger Site Well
Belmont County, Ohio
Depth (feet): 6782.0



1A



1B

PLATE 2 A-B

THIN SECTION PHOTOMICROGRAPHS

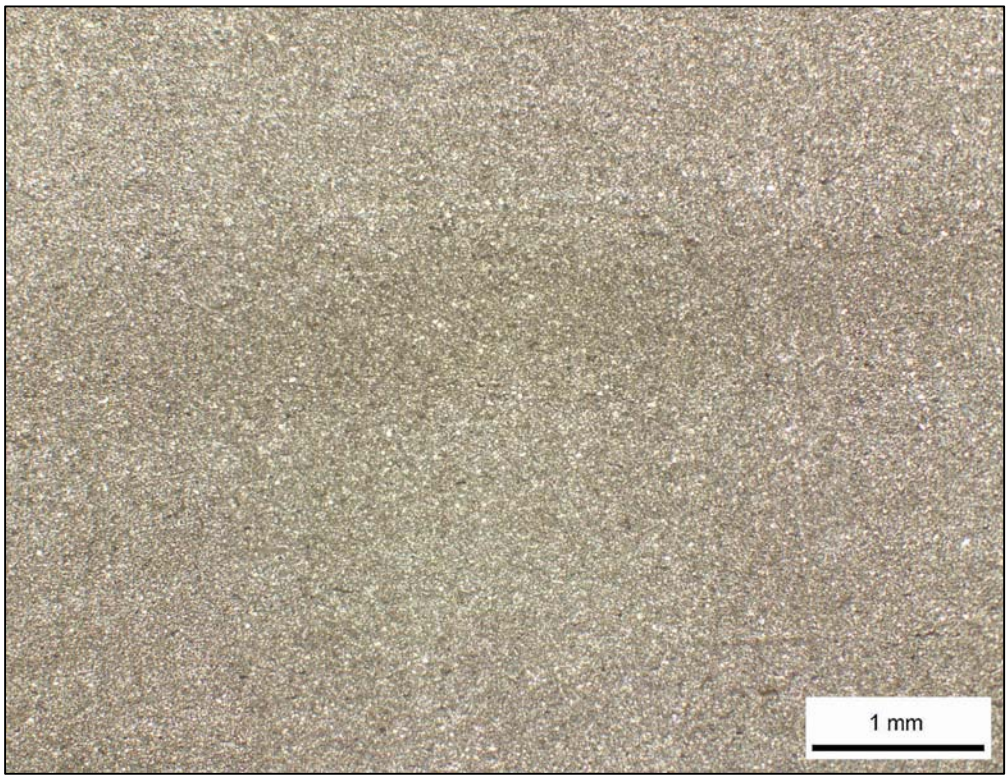
Battelle Memorial Institute
Burger Site Well
Belmont County, Ohio

Depth (feet): 6865.0

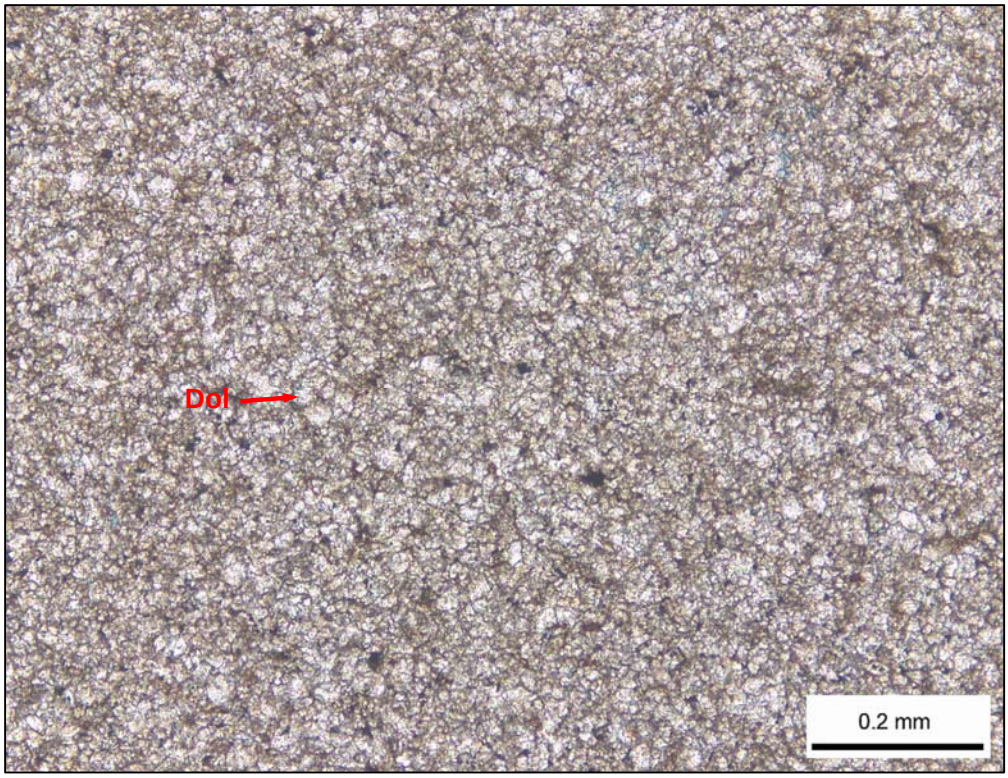
Lithology: Dolostone (dolomitized claystone)
Foramtion: Salina anhydrite/salt/dolomite
Sample ID: Burger_20_6865

This sample is a dolostone; it appears that the original rock was a laminated claystone, which has been thoroughly replaced by dolomite (Dol). Dolomite crystals are finely crystalline and exhibit an interlocking texture. Visible pores (blue) are very rare; micropores among the dolomite crystals make up the principal pore system in this sample.

Battelle Memorial Institute
Burger Site Well
Belmont County, Ohio
Depth (feet): 6865.0



2A



2B

PLATE 3 A-B

THIN SECTION PHOTOMICROGRAPHS

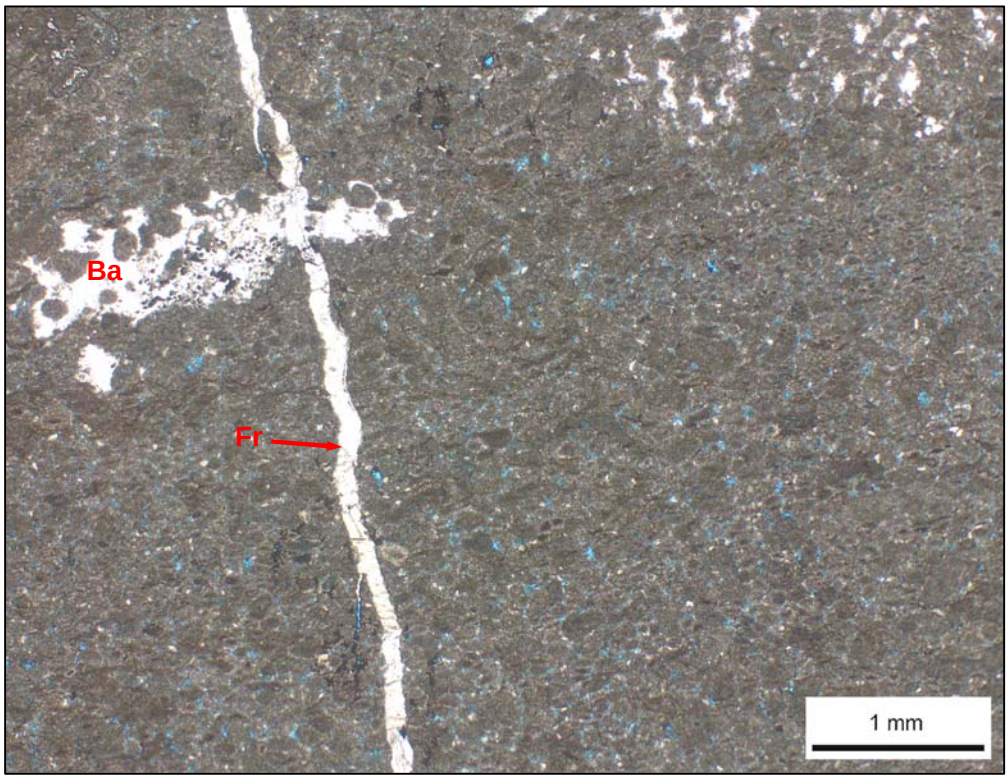
Battelle Memorial Institute
Burger Site Well
Belmont County, Ohio

Depth (feet): 6905.0

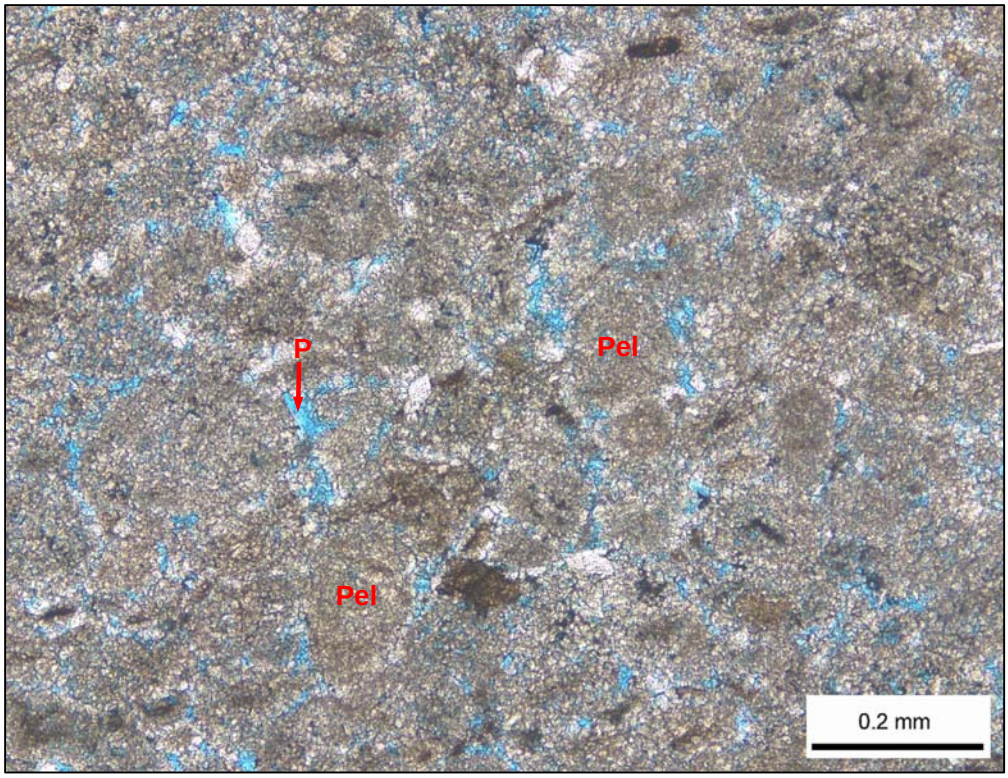
Lithology: Dolostone (dolomitized grainstone)
Foramtion: Salina anhydrite/salt/dolomite
Sample ID: Burger_19_6905

Visible pores (blue) are moderate to common in this dolostone and consist of interparticle (P) and intercrystalline pores. The original rock was a lime grainstone; peloids (Pel) are the most common allochem grains, which have been completely dolomitized. Fractures (Fr) are locally present and have been filled with clear dolomite crystals. Note that dolomite is locally replaced by barite (Ba).

Battelle Memorial Institute
Burger Site Well
Belmont County, Ohio
Depth (feet): 6905.0



3A



3B

PLATE 4 A-B

THIN SECTION PHOTOMICROGRAPHS

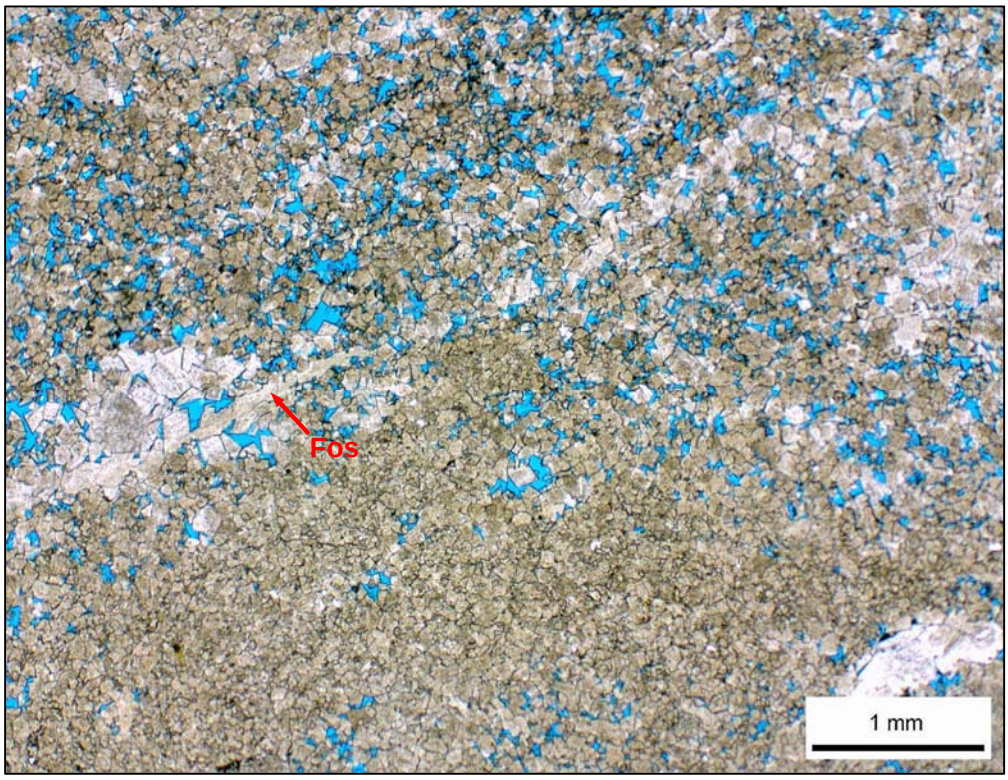
Battelle Memorial Institute
Burger Site Well
Belmont County, Ohio

Depth (feet): 7476.0

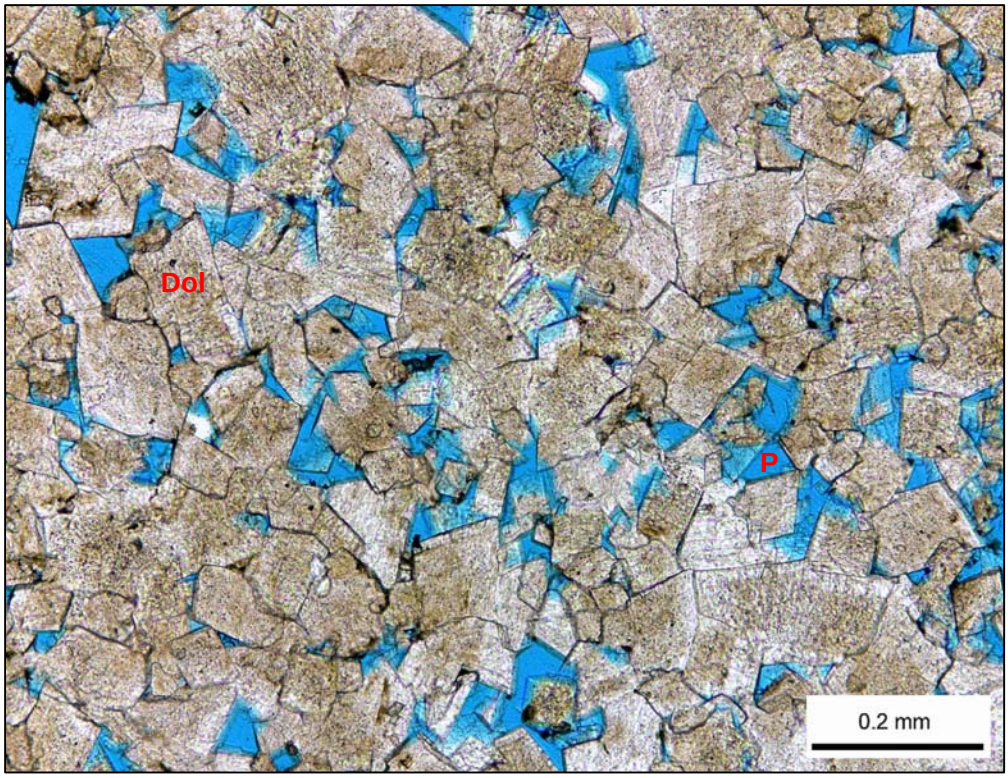
Lithology: Dolostone (dolomitized wackestone)
Foramtion: Lockport dolomite/limestone
Sample ID: Burger_13_7476

Visible pores (blue) are moderate to common in this dolostone and mostly intercrystalline pores (P). Intercrystalline pores are unevenly distributed; dolomite crystals are medium crystalline in texture. The original rock was probably a lime wackestone, which has been dolomitized. Some dolomitized "ghost" fossil fragments (Fos) are still recognizable.

Battelle Memorial Institute
Burger Site Well
Belmont County, Ohio
Depth (feet): 7476.0



4A



4B

PLATE 5 A-B

THIN SECTION PHOTOMICROGRAPHS

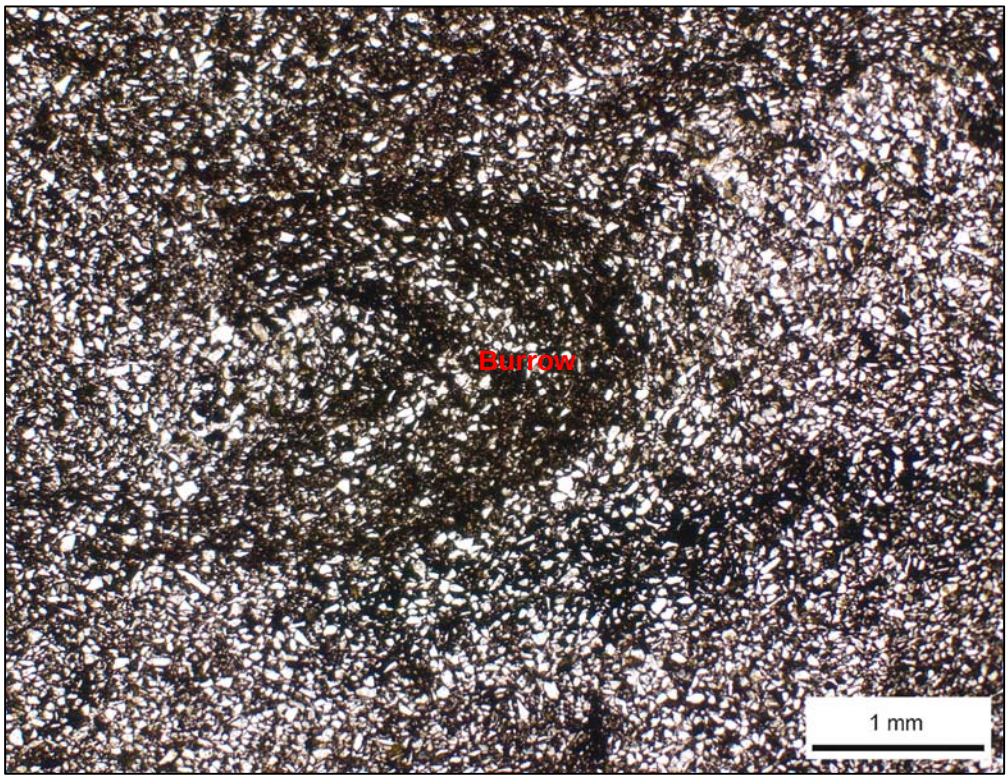
Battelle Memorial Institute
Burger Site Well
Belmont County, Ohio

Depth (feet): 8133.0

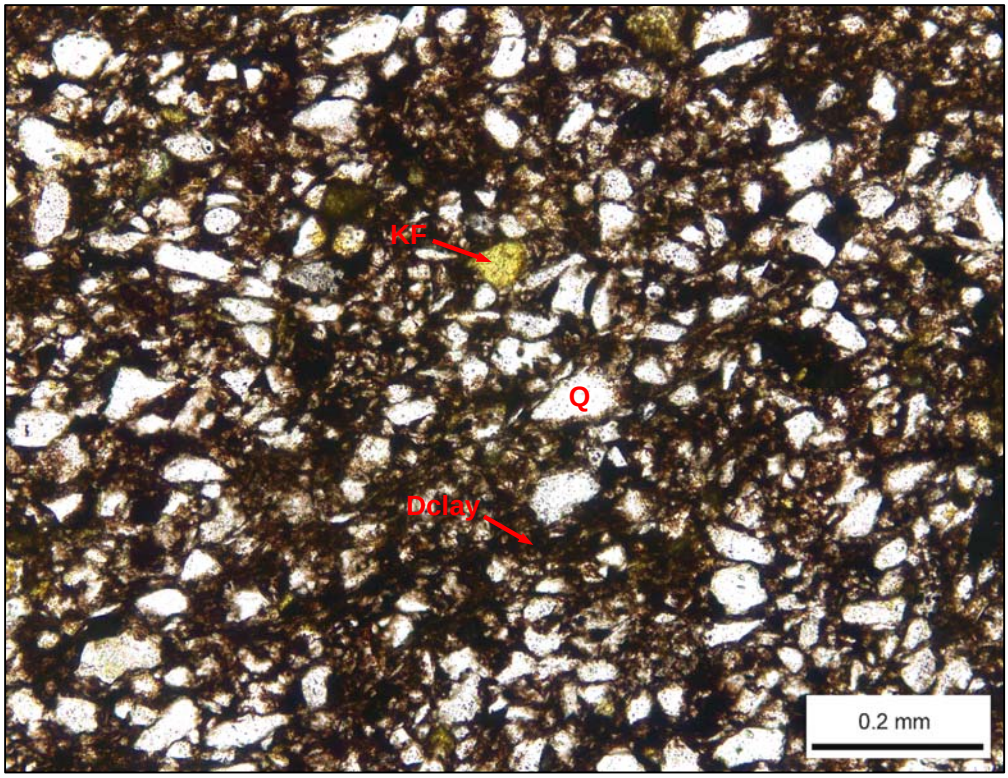
Lithology: Argillaceous siltstone
Foramtion: Red Clinton siltstone
Sample ID: Burger_9_8133

This sample is an argillaceous siltstone and is locally burrowed. The most common framework grains are quartz (Q), K-feldspar (KF; stained yellow) and plagioclase; these silt-sized grains are subangular in shape and moderately sorted. Intergranular areas are occluded by detrital clay matrix (Dclay), which contains minor amounts of highly dispersed hematite. No pores are visible; micropores associated with the detrital matrix are the principal pore type.

Battelle Memorial Institute
Burger Site Well
Belmont County, Ohio
Depth (feet): 8133.0



5A



5B

PLATE 6 A-B

THIN SECTION PHOTOMICROGRAPHS

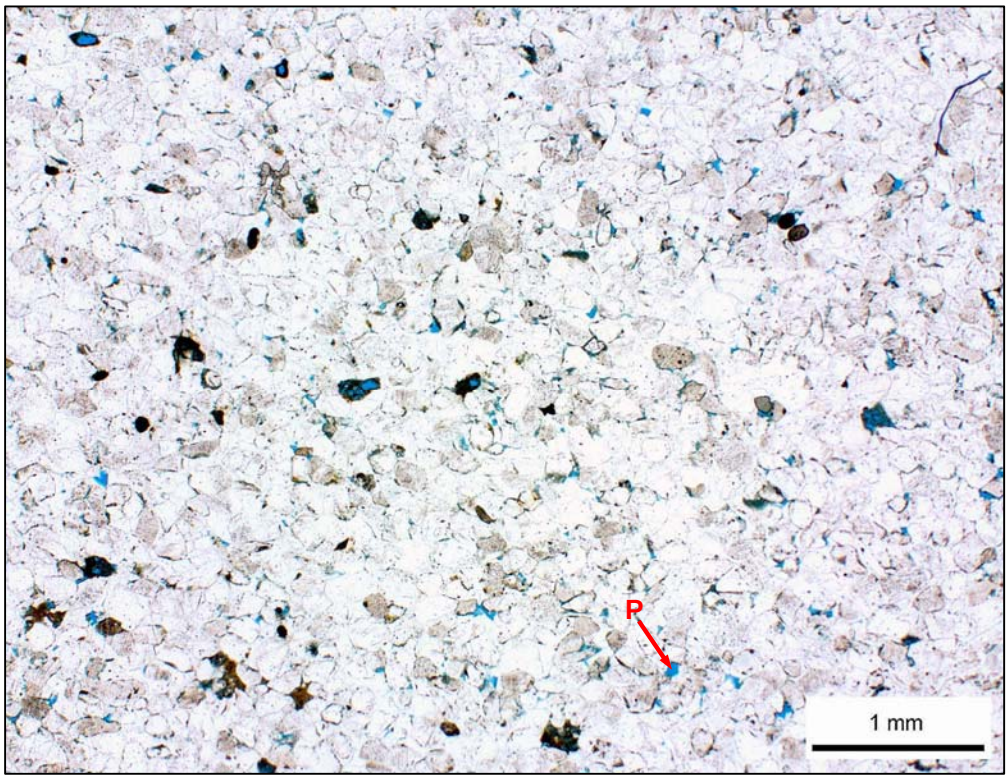
Battelle Memorial Institute
Burger Site Well
Belmont County, Ohio

Depth (feet): 8235.0

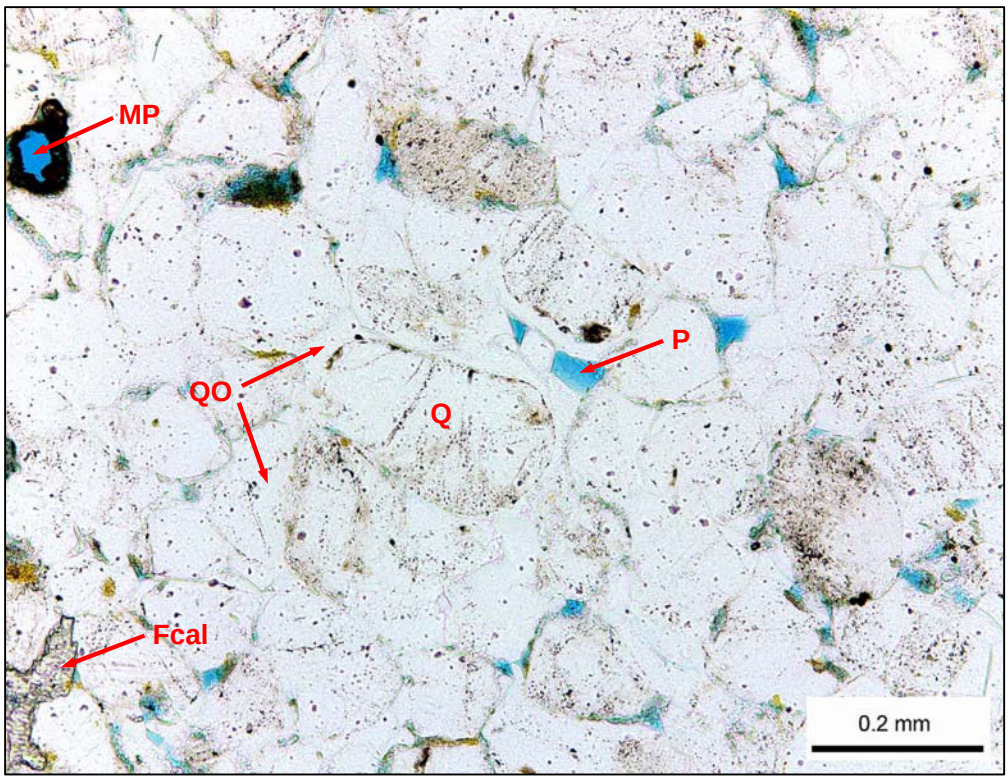
Lithology: Sandstone
Foramtion: White Clinton sandstone
Sample ID: Burger_6_8235

Quartz (Q) is the predominant framework constituent in this fine-grained sandstone; feldspars and lithic fragments (dark grains) are much less common. Framework grains are subrounded to rounded and well sorted. Intergranular areas are largely occluded by abundant quartz overgrowths (QO) and trace amounts of Fe-calcite (Fcal). Intergranular (P) and moldic (MP) pores are minor in abundance; micropores are probably minor and mainly associated with lithic fragments. Moldic pores are derived from the dissolution of feldspar grains and lithic fragments.

Battelle Memorial Institute
Burger Site Well
Belmont County, Ohio
Depth (feet): 8235.0



6A



6B