

tions. Oriented samples, representative of each unit, were collected after the sections were measured and described.

The first measured section included those units which underlie the basalt capped ridge immediately west of Interstate 91 (figure 20). Measurement of the section was started on the south wall of the Route 72 West roadcut. 50 feet west of the Interstate 91 overpass. This section included the basalt, an underlying sequence of red siltstones, shales, and sandstones, and below that, a horizon of dark gray shales, claystones, and sandstones. At the base of the steep western slope of this ridge, the gray horizon is partially covered by overburden. However, on the north side of the roadcut a swale had been cut at the base of the ridge and the entire gray horizon is exposed at this point.

Hampden Basalt

and

East Berlin Formation

Location: 41° 38' 15" N. / 72° 41' 38" W.

to

41° 38' 15" N. / 72° 42' 00" W.

South side of Route 72 West roadcut (Plate 1). Description begins at the top of the stratigraphic interval and progresses from east to west.

Unit Number	Thickness		
	Ft.	In.	
1	25	0	Dark greenish gray (SGY 4/1), light greenish gray (SGY 6/1), to very dusky purple (5P 2/2) basalt. The lower 10 feet of the basalt is a dark greenish gray dense basalt whereas the upper 15 feet is a light greenish gray porphyritic basalt. A visicular zone six inches to one foot thick separates

Unit Number Thickness

Ft. In.

the two types of basalt.

Contact with the underlying sedimentary rocks is exposed in four roadcuts. The basalt appears to have metamorphosed the upper six inches to one foot of the underlying shales, but the degree of metamorphism appears to vary along the contact. At several points the shales are only slightly metamorphosed, whereas a few meters away they are metamorphosed to a high degree and are nearly indistinguishable from the basalt.

The lower six inches to one foot of the basalt is vesicular. The vesicles are generally filled with quartz, calcite, and prehnite. These minerals also fill the vesicles in the zone which separates the two types of basalt. Several pillow structures were noted along the contact in the roadcut for the Route 72 West south entrance ramp (figure 50). A 40 to 50 foot zone of amygduloidal basalt is exposed in the roadcuts for Route 72 West south entrance ramp (Plate 1). Some amygdules are filled with quartz, calcite, and prehnite, whereas others are barren. In general the basalt in this zone is highly weathered and much of it has eroded (figure 22).

Strike slip faults in the basalt range in orientation from N 15°E to N 65°E with dips ranging from 70° to 88° N.W. Slickensides are generally well preserved in the fault gouge and indicate a relative movement of north on the east and south on the west.

2A	0	6	Dark Gray (2.5 YR 4.5/0) shale and siltstone. In places dense and difficult to distinguish from overlying basalt. Dark color and density are due to contact metamorphism. Small contact areas have small holes similar to the vesicular zones in the basalt.
2B	2	11	Dark reddish brown (2.5YR 3/4) interbedded shale and siltstone. Upper 12 to 15 inches may locally have vesicular appearance. (Probably due to steam generated by lava flowing over wet sediments.)
3	5	11	Reddish brown (5YR 4/3) micaceous shale with lenses of sandstone. Low angle cross

Unit Number	Thickness		
	Ft.	In.	
			bedded laminae one to two millimeters thick occur in the more micaceous areas. Some bedding surfaces display mud cracks and rain drop impressions.
4	0	9	Reddish gray (10R 5/1) shale and medium-grained micaceous arkose. Unit is composed of three parts. The top and bottom parts are composed of cross bedded sandstones which are locally separated by three inches of shale. Shale fragments are found along cross bedding. Cross beds dip to the north-east, east, and southeast.
5	3	5	Dusky red (2.5YR 3/2) to gray (5YR 5/1) interbedded shale and very fine sandy siltstone. The siltstones contain 15 to 20 percent fine to very fine, subangular quartz and feldspar, and mica discs. Shaley units display mud cracks and salt or pyrite impressions (square holes) on bedding surfaces.
6	1	6	Dark reddish gray (10R 4/1) medium to fine-grained, immature arkose. Six inches below the top of the unit is a four inch gray (5YR 5/1) fine-grained micaceous arkose which is continuous over the entire roadcut area.
7	2	3	Dusky red (2.5YR 3/2) claystone. The unit contains concretions locally and consists of 30 percent fine grained clastic material. The base of the unit consists of calcareous concretions, (56 percent carbonate) which are two to three inches wide and three to eight inches long. These concretions caused depressions in the upper surface of Unit 8.
8 A	2	0	Reddish gray (5YR 5/2) siltstone. The unit contains large carbonate concretions 10 to 12 inches long and three to five inches wide.
8 B	0	8	Dark gray (5YR 4/1) micaceous shale.
9 A	1	0	Dark gray (5YR 4/1) massive siltstone with zones of rounded quartz and micas. The basal two to three inches consist of carbonate concretions, which are three inches wide by eight inches long.

Unit Number	Thickness		
	Ft.	In.	
9 B	1	3	Very dark gray (5YR 4.5/2) shaly siltstone with carbonate concretions one to three inches in diameter which occur in zones or layers parallel to bedding planes.
9 C	3	2	Reddish gray (5YR 5/1) shale with carbonate concretions eight inches long by three inches wide. Mud cracks appear on bedding surfaces. Lenses of fine-grained immature feldspathic graywacke up to two inches thick, occur in the lowest 15 inches of the unit.
9 D	1	5	Dark reddish gray (5YR 4/2) interbedded siltstone and shale. Zones of carbonate concretions occur throughout the unit. Bedding is usually distorted around the concretions.
9 E	1	8	Dusky red (2.5YR 3/2) massive siltstone with carbonate concretions one to two inches in diameter randomly distributed throughout the unit.
10 A	1	0	Weak red (2.5YR 4/2) shale with mud cracks and rain drop impressions displayed on bedding surfaces.
10 B	0	11	Dark gray (5YR 4/1) coarse to very fine-grained, immature micaceous arkose.
10 C	1	3	Dark gray (5YR 4/1) micaceous shale which displays mud cracks and rain drop impressions on the bedding surfaces.
10 D	1	5	Dark gray (5YR 4/1.5) fine-grained, immature, feldspathic graywacke.
11 A	2	8	Reddish gray (5YR 5/2) siltstone containing medium to fine-grained, immature micaceous arkose lenses up to two inches thick.
11 B	3	8	Gray (5YR 6/1) interbedded micaceous shale and fine-grained, immature arkose. The lowest nine inches of the unit is submature arkose containing small scale trough cross-stratification.
12	0	6	Gray (5YR 6/1) fine-grained, submature arkose. The unit is cross bedded and is

Unit Number	Thickness		
	Ft.	In.	
			similar to the submature arkose in the unit above. Tectonic fractures in the unit are coated with pyrite and calcite.
13 A	0	8	Reddish gray (5YR 5/2) siltstone with calcareous concretions one quarter inch in diameter.
13 B	0	10	Reddish gray (5YR 5/2) fine-grained immature arkose.
13 C	1	8	Reddish brown (5YR 5/3) micaceous siltstone.
14 A	3	11	Brown (7.5R 5/2) micaceous siltstone and shale with some lenses of arkose up to two inches thick.
14 B	1	7	Reddish gray (5YR 5/2) arkosic siltstone.
14 C	1	6	Dusky red (2.5YR 3/2) claystone which grades imperceptibly into very dark gray claystone below. The unit has buff weathering spots throughout.
15 A	2	6	Very dark gray (2.5YR 3/0) claystone with buff weathering spots throughout.
15 B	1	2	Gray (2.5YR 5/0) very fine-grained to silty, dense immature micaceous arkose.
15 C	1	3	Gray (7.5YR 5/0) very fine-grained, fissile, immature feldspathic graywacke.
15 D	2	1	Dark gray (7.5YR 4/0) shale containing pyrite crystals and carbonized plant remains. Mud cracks are found on some bedding surfaces.
15 E	2	6	Gray (2.5YR 5.5/0) shale interbedded with fine-grained arkosic units two to three inches thick. More resistant to weathering than the above unit. Laminae in shaly parts of the unit are one quarter inch thick.
15 F	2	1	Dark gray (2.5YR 4/0) shale with laminae one quarter to one inch thick. Pyrite crystals and carbonized plant remains are found in this unit.

Measurements on north side of Route 72 West roadcut.

15 G	2	7	Very dark gray (7.5YR 3/0) shale. The
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Unit Number	Thickness		
	Ft.	In.	
			upper one foot is like the overlying unit. The lower one and a half feet contains carbonate concretions.
15 H	5	0	Gray (7.5YR 5/0) siltstone grading into dark red (5YR 4/2) medium grained micaceous arkose in the lowest 20 inches. This lowest portion contains mud cracks, and current ripple marks with an amplitude of one half inch and a wave-length of three inches. These ripples indicate a current from the southeast.

Attitude: N. 32° E. / 10° S.E.

Measurements on north side of Route 72 West roadcut.

16 A	5	0	Dark reddish gray (5YR 4/2) massive claystone. Upper surface of the unit displays evidence of pre-lithification erosion.
16 B	3	10	Dark gray (5YR 4/1) medium to fine-grained sandy siltstone.
16 C	7	10	Reddish gray (5YR 5/2) coarse to fine-grained sandy siltstone with fractures at 10 inch intervals parallel to the bedding.
16 D	1	0	Dark red (5YR 4/1) and gray (2.5YR 5/0) variegated claystone.
17	3	3	Gray (7.5YR 5/0) siltstone with coarser areas of fine-grained immature arkose.
18	4	5	Dark gray (7.5YR 4/0) shale and claystone. Upper 20 inches are limonite stained on weathered surfaces. The basal eight inches of the unit have a high pyrite content consisting of crystals and pyrite replacement of plant material. Carbonized plant remains also occur in this lower section.
19 A	2	0	Very dark gray (7.5YR 3/0) claystone. Laminae are one quarter inch thick, but the unit fractures into blocks three inches thick.
19 B	1	4	Very dark gray (7.5YR 3/0) fissile shale, which contains several thin layers of calcite. The thickest one being one quarter inch thick and lying six inches below the

Unit Number	Thickness		top of the unit. A four inch zone which is 10 inches below the top of the unit is extremely shattered.
	Ft.	In.	

Attitude: N. 32° E. / 10° S.E.

Measurements on south side of Route 72 West roadcut.

20 A	0	8	Gray (7.5YR 6/0) micaceous shale with extremely small pyrite crystals and pyritized plant remains.
20 B	1	11	Gray (7.5YR 6/0) siltstone with 10 percent pyrite crystals which weather and cause spotty limonite stains.
20 C	2	6	Light gray (2.5YR 7/0) siltstone with a small amount of pyrite. The lowest 10 inches is somewhat fissile.

Attitude: N 32° E 10° S.E.

Measurements on north side of Route 72 West roadcut.

21 A	1	8	Brown (7.5YR 5/2) siltstone with fine-grained micaceous arkose in clastic dikes and small carbonate concretions scattered along the bedding. Mud cracks are found on some bedding surfaces.
21 B	2	0	Reddish gray (5YR 5/2) to dark reddish gray (5YR 4/2) siltstone with carbonate concretions around which the bedding is distorted. Ripple marks within the unit have an amplitude of two and one half inches.
21 C	3	8	Brown (7.5YR 5/2) sandy siltstone. Unit contains 30 percent medium to fine-grained sand. Zones of very coarse to medium-grained, cross bedded micaceous arkose occur within the unit. The basal eight inches of the unit is such a zone. Zones of vertical or nearly vertical clastic dikes also occur at several levels within the unit.
21 D	2	9	Gray to pale red (2.5YR 6/1) massive siltstone containing up to 30 percent very coarse grained sand. Siltstone grades laterally, in places, into very coarse-grained sand lenses which display grading and cross bedding. These coarse zones

Unit Numbers	Thickness		
	Ft.	In.	
			range in thickness from five to ten inches. The unit thickens to four feet eight inches on the south side of the roadcut. Clastic dikes can be seen in much of the unit.
21 E	1	10	Gray to pale red (2.5YR 6/1) massive siltstone. On the south side of the roadcut this unit contains carbonate concretions and can not be distinguished from subunit 21 F. The thickness of the combined subunits 21 E and 21 F on the south side of the roadcut is six feet four inches.
21 F	4	10	Light gray to gray (5YR 6.5/1) massive siltstone with carbonate concretions approximately one inch in diameter randomly distributed throughout the unit. On long exposed surfaces holes are found where the concretions have weathered out. Four inches below the top of the unit a 10 inch zone contains up to 30 percent medium to fine-grained sand.
21 G	7	9	Dark gray (5YR 4/1) massive siltstone which thins to the south to five feet nine inches and contains lenses of medium to fine arkose up to three inches thick.
21 H	1	2	Dark gray (5YR 4/1) and gray (2.5YR 6/0) variegated claystone which becomes thinner and sandier to the south.
21 I	3	5	Light gray (2.5YR 6/0) medium to fine-grained mature arkose with easterly dipping cross bedding. This unit thins to three feet and becomes interbedded with micaceous shales on the south side of the roadcut.
22 A	2	9	Dark gray (2.5YR 4/0) sandy claystone and shale with disturbed laminae. Weathered surfaces display limonite stains one half inch in diameter which resemble concretions.
22 B	1	8	Gray (7.5YR 5/0) sandy claystone and shale with lenses of medium to fine-grained arkose up to three inches thick. This subunit is less resistant to weathering than those immediately above and below.
22 C	3	0	Gray (7.5YR 5/0) claystone. The basal two feet contain tiny pyrite crystals.

Unit Number	Thickness		
	Ft.	In.	
22 D	2	0	Very dark gray (7.5YR 3/0) shale with basal five inches containing drag folds five inches in amplitude, which indicate a westward (up dip) movement of the units above, and an eastward (down dip) movement of the unit below. The shale in this folded zone is metamorphosed. It has the black shiny appearance of a plastic. In addition it cleaves into sheets in a manner similar to that in which the micas cleave.
22 E	6	2	Light gray to gray (7.5YR 6.5/0) micaceous siltstone which exhibits ripple marks in some horizons, and rib and furrow structures in others. Ripple marks have a one inch wave length and indicate a current sense from the northeast. Rib and furrow structures are four to five inches in width and one foot in length. Some carbonate concretions also occur in this subunit.

Attitude: N 30° E / 10° S.E.

East Berlin Formation

Dinosaur State Park

South of Dinosaur Park Fault

Location: 72° 03' 36" W. / 41° 40' 40" N.

Description begins at the top of the stratigraphic interval exposed.

Unit Number	Thickness		
	Ft.	In.	
1	0	6	Reddish gray (5YR 5/2) medium-grained, immature feldspathic graywacke.
2	0	3	Dark brown (7.5YR 4/4) shale.
3	0	5	Dark reddish gray (5YR 4/2) shale. Unit has lumpy appearance.
4	0	7	Light brownish gray (10YR 6/2) fine-grained immature, feldspathic graywacke.
5	0	7	Grayish brown (10YR 5/2) medium to fine-grained, immature micaceous arkose.

Unit Number	Thickness		
	Ft.	In.	
6	0	8	Brown (7.5YR 5/2) coarse to medium-grained, immature micaceous arkose.
7	0	6	Light gray (7.5YR 6.5/0) medium to fine-grained, immature feldspathic graywacke. <u>Anchisauripus</u> tracks occur in this unit.
8	0	7	Light gray (7.5YR 5/0) medium to fine-grained micaceous arkose.
9	2	3	Gray (7.5YR 5/0) claystone which breaks into plates a quarter inch thick, by five inches wide, by seven inches long. This unit correlates with Unit 4 on the north side of the fault.

Unit descriptions from Core 2
(corrected for dips of strata and coring rig)

10	7	1	Light gray (10YR 6/1) to dark gray (7.5YR 4/0) very coarse to fine-grained immature micaceous arkose. The top foot of the unit is equivalent to Unit 5 on the north side of the fault. Ripple marks with a wave length of one inch and an undetermined current sense are found within this unit.
11	4	8	Gray (7.5YR 7/0) silty shale.
12	4	2	Very dark gray (7.5YR 3/0) shale with horizontal calcite - dolomite veins, and some zones of slight folding.
13	2	7	Gray (2.5YR 6/0) fine-grained immature micaceous arkose.
14	2	6	Gray (2.5YR 6/0) silty shales.
15	4	2	Dark reddish brown (5YR 3/2) shale and pinkish gray (7.5YR 7/2) sandy shale.
16	1	8	Pinkish gray (7.5YR 7/2) medium-grained immature arkose.
17	1	8	Dark reddish brown (5YR 3/2) siltstone.
18	0	10	Pinkish gray (7.5YR 7/2) medium to fine-grained immature arkose.

Unit Number	Thickness		
	Ft.	In.	
19	1	7	Dark reddish brown (5YR 3/2) very coarse to medium-grained, sandy siltstone. Attitude: N 88° E / 12° S.

East Berlin Formation

Dinosaur State Park

North of Dinosaur State Park

Location: 72° 03' 46" W. / 41° 40' 45" N.

Description begins at the top of the stratigraphic interval exposed.

Unit Number	Thickness		
	Ft.	In.	
1	2	6	Gray (7.5YR 5/0) sandy shale and coarse to very fine-grained immature micaceous arkose. The unit contains some pyrite, and mud cracks occur on some bedding planes. The unit has a lumpy appearance.
2	0	9	Light gray (7.5YR 6.5/0) medium to fine-grained, immature feldspathic graywacke. This unit is cemented by calcite, quartz, and feldspar. Where the calcite has been removed by solution the rock has a spongy appearance. This unit correlates with Unit 7 south of the fault.
3	1	7	Gray (7.5YR 5/0) immature micaceous arkose. Unit contains mudcracks and some dinosaur tracks.
4	1	10	Dark gray (7.5YR 4/0) claystone. Unit fractures very readily into plates seven inches long, by five inches wide, by one quarter inch thick. This unit correlates with Unit 9 south of the fault.
5	0	10	Light gray (2.5YR 6.5/0) medium-grained immature, micaceous arkose. Unit can be divided into at least four subunits all of which contain <u>Eubrontes</u> tracks.

Unit descriptions from Core 1

Unit Number	Thickness		
	Ft.	In.	
6	4	3	Gray (2.5YR 6/0) medium-grained immature micaceous arkose. Unit is similar to Unit 5. It also contains a large number of Eubrontes tracks.
		1	1
7	5	8	Light gray (7.5YR 7/0) siltstones and silty shales interbedded with very dark gray (7.5YR 3/0) shales.
8	2	4	Very dark gray (7.5YR 3/0) shales with horizontal calcite - dolomite veins one quarter inch thick. Also some pyrite replacement of plant material. Some small drag folds one half inch to one inch in amplitude.
9	4	2	Light gray (7.5YR 7/0) siltstone.
10	3	0	Gray (7.5YR 6/0) medium to very fine grained micaceous arkose.
11	1	0	Dark reddish brown (5YR 3/2) siltstone and shale.
12	0	6	Pinkish gray (7.5YR 6/2) medium-grained immature arkose.
13	13	0	Dark reddish brown (5YR 3/2) shale and siltstone interbedded with pinkish gray (7.5YR 6/2) sandy shale and siltstone.
14	3	0	Pinkish gray (7.5YR 6/2) coarse-grained immature arkose.
15	12	0	Dark reddish brown (5YR 3/2) shale and siltstone interbedded with pinkish gray (7.5YR 6/2) sandy shale and siltstone.

Attitude N 10° W / 7° S.