Plattsburg Limestone: (Total Thickness: 21.92 ft.)
Spring Hill Limestone Mbr.: (4.58-23.42 ft.)
  - Packstone (4.58-5.62 ft.); Osagia coated grains
  - Ooid Grainstone (9.94-16.08 ft.)
  - Wackestone (16.08-23.42 ft.)
Hickory Creek Shale Mbr.: (23.42-23.58 ft.)
  - Shale; black
Merriam Limestone Mbr.: (23.58-26.5 ft.)
  - Packstone (23.58-23.83 ft.)
  - Wackestone (23.83-25.67 ft.); bedding plane at 25 ft. could be shale...may correlate to M-38.
  - Packstone (25.67-26.5 ft.)
Lane Shale (Total Thickness: 63.25 ft.)
Bonner Springs Shale Mbr.: (26.5-47.37 ft.)
  - Shale (26.5-30.75 ft.); nodules 26.5-27.5 ft., slight maroon coloration
  - Interbedded Silt/Shale (30.75-35.67 ft.)
  - Siltstone (35.67-38.83 ft.)
  - Interbedded Silt/Shale (38.83-41.25 ft.)
  - Siltstone (41.25-41.42 ft.)
  - Interbedded Silt/Shale (41.42-47.37 ft.)
Upper Farley Limestone Mbr.: (47.37-67.75 ft.)
  - Phylloid Bafflestone/Wackestone (47.37-67.75 ft.)
  - Middle Farley Shale Mbr.: (67.75-89.75 ft.)
  - Fossiliferous Shale (67.75-68.29 ft.)
  - Ooid Grainstone (68.29-70.29 ft.)
  - Interbedded Silt/Shale (70.29-89.75 ft.); plant debris (@ 77.42 ft.), fine plant debris throughout; silt decreases with depth
---

**KDOT: M-5 Core, Miami County, NE Kansas**

**KID:** 1035179820  
**Location:** T16S R22E, Sec. 8 NE NE NW  
**Longitude:** -95.0037868  
**Latitude:** 38.6795119°  
**Elevation:** 1059 GL  
**Total Depth:** 59 feet  
**Note:** S. side of 247th Rd., 0.45 mi E. of Indianapolis Rd.

**Fe-Staining:** 5'11”- 20'10” (5.92-20.83 ft.)

**Stanton Limestone:** (Total Thickness: 30.03 ft.)
- Wackestone (5.92-8.0 ft.)
- Drill Lag? (8.0-8.33 ft.)
- Wackestone (8.33-18.42 ft.)
- Eudora Shale Mbr.: (18.42-24.58 ft.)
  - Shale; weathered until 20.83 ft. then fissile
  - Captain Creek Lst. Mbr.: (24.58-35.95 ft.)
  - Phylloid Bafflestone/Wackestone (24.58-31.54 ft.)
  - mottled intraclast facies (24.58-25.5 ft.)
  - Wackestone (31.54-35.95 ft.)

**Vilas Shale:** (Total Thickness: 6.09 ft.)
- Calcareous Siltstone (35.95-39.21 ft.)
- Silty Shale (39.21-39.67 ft.)
- Calcareous Siltstone (39.67-40.04 ft.)
- Silty Shale (40.04-42.04 ft.)

**Plattsburg Limestone:** (Total Thickness: 14.72 ft.)
- Spring Hill Limestone Mbr.: (42.04-54.26 ft.)
  - Packstone (42.04-42.5 ft.)
  - Fossiliferous Shale (42.5-42.65 ft.)
  - Ooid Grainstone (42.65-48.13 ft.)
  - Fossiliferous Shale (48.13-48.19 ft.)
  - Ooid Grainstone (48.19-49.42 ft.)
  - Fossiliferous Shale (49.42-49.63 ft.)
  - Wackestone (49.63-54.26 ft.)
- Hickory Creek Shale Mbr.: (54.26-54.44 ft.)
  - Fossiliferous Shale
- Merriam Limestone Mbr.: (54.44-56.75 ft.)
  - Wackestone (54.44-56.5 ft.)
  - Packstone (56.5-56.76 ft.)

**Lane Shale** (Total Thickness: 2.74 ft.)
- Bonner Springs Shale Mbr.: (68.67 –74.75 ft.)
- Shale (56.76-59.5 ft.)

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**Core Logged and Illustrated by:** Stephan C. Oborny, University of Iowa
Franz J. Schmidt, K.U.

Lithostratigraphy

KID: 1035023963
Location: T16S R22E,
Sec. 21 SW SE 32
Longitude: -94.9870878
Latitude: 38.6374468
Elevation: 1088 GL
Total Depth: 104 feet
Note: N. side of 271st Rd.,
0.25 mi E. of Bethel
Church Rd.

Fe-Staining: 5’4”- 24’2” (5.33-24.17 ft.)

Stanton Limestone: (Total Thickness: 18.71 ft.)
Phylloid Bafflestone/Wackestone (5.33-9.0 ft.)
Shale; 0.33 ft. thick; depth interval uncertain
Phylloid Bafflestone/Wackestone (7.0-9.0 ft.)
Eudora Shale Mbr.: (9.0-13.54 ft.)
Shale; weathered; non-black in color
Captain Crk Lst. Mbr.: (13.54-24.04 ft.)
Phylloid Bafflestone/Wackestone (13.54-23.42 ft.)
Wackestone (23.42-24.04 ft.)

Vilas Shale: (Total Thickness: 13.96 ft.)
Calcareous Siltstone (24.04-25.21 ft.)
Siltstone (25.21-25.58 ft.)
Calcareous Siltstone (25.58-26.0 ft.)
Siltstone (26.0-35.5 ft.)
Shale (35.5-36.92 ft.)
Packstone (36.92-46.33 ft.)
Wackestone (46.33-46.67 ft.)

Plattsburg Limestone: (Total Thickness: 14.67 ft.)
Spring Hill Limestone Mbr.: (38.0-51.17 ft.)
Wackestone (38.0-41.12 ft.)
Packstone (41.12-41.67 ft.)
Ooid Grainstone (41.67-42.90 ft.)
Fossiliferous Shale (42.90-42.92 ft.)
Ooid Grainstone (42.92-43.58 ft.)
Phylloid Bafflestone/Wackestone (43.58-46.33 ft.)
Fossiliferous Shale (46.33-46.67 ft.)
Wackestone (46.67-51.17 ft.)

Hickory Creek Shale Mbr.: (51.17-51.21 ft.)
Fossiliferous Shale

Merriam Limestone Mbr.: (51.21-52.67 ft.)
Wackestone

Lane Shale (Total Thickness: 53.41 ft.)
Bonner Springs Shale Mbr.: (52.67 –77.92 ft.)
Calcareous Siltstone (52.67-54.0 ft.)
Silty Shale (54.0-60.13 ft.; Nodules (55.0-56.0 ft.)
Interbedded Silt/Shale (60.13-63.42 ft.)
Siltstone (63.42-65.92 ft.)
Interbedded Silt/Shale (65.92-71.75 ft.)
Packstone (71.75-71.79 ft.)
Interbedded Silt/Shale (71.79-77.92 ft)

Upper Farley Limestone Mbr.: (77.92-100.58 ft.)
Phylloid Bafflestone/Wackestone (77.92-94.92 ft.)
Wackestone <Argillaceous> (94.92-95.08 ft.)
Phylloid Bafflestone/Wackestone (95.08-97.42 ft.)
Wackestone <Argillaceous> (97.42-97.54 ft.)
Phylloid Bafflestone/Wackestone (97.54-100.58 ft.)
Middle Farley Shale Mbr.: (100.58 –106.08 ft.)
Interbedded Silt/Shale

Core Logged and Illustrated by: Stephan C. Oborny, University of Iowa
KDOT: M-7/8 Core, Miami County, NE Kansas

KID: 1035023964
Location: T15S R22E, Sec: 24 N2 NE NW
Longitude: -94.9199777
Latitude: 38.7373987
Elevation: 1093 GL
Total Depth: 70 feet
Note: S. side off 215 Rd., W. side of RWD #7 Tower

Fe-Staining: 7’10”–15’3” (7.83-15.25 ft.)

South Bend Limestone: (Total Thickness: 5.37 ft.)
Little Kawi Limestone Mbr.: (7.25-12.62 ft.)
Rock Lake Shale:
Stanton Limestone: (Total Thickness: 0.3 ft.)
Rock Lake Shale:
South Bend Limestone: (Total Thickness: 5.37 ft.)
Little Kawi Limestone Mbr.: (7.25-12.62 ft.)
Wackestone (12.62-12.92 ft.)
Stanton Limestone: (Total Thickness: 30.25 ft.)
Stanton Limestone Mbr. (12.92-27.42 ft.)
Wackestone (12.92-16.75 ft.)
Eudora Shale Mbr.: (27.42-33.96 ft.)
Shale; several different weathering profiles are visible within the shale unit. Bottom 5 inches of shale is fossil rich.
Captain Crk Lst. Mbr.: (33.96-43.17 ft.)
Calcarenite Siltstone (43.17-45.17 ft.)
Siltstone (45.17-46.5 ft.)
Interbedded Silt/Shale (46.5-49.79 ft.)
Shale (49.79-55.42 ft.)
Wackestone (55.42-59.58 ft.)
Wackestone (59.58-60.00 ft.)
Wackestone (60.00-64.62 ft.)
Hickory Creek Shale Mbr.: (64.62-64.83 ft.)
Fossiliferous Shale <few fossils>
Merriam Limestone Mbr.: (64.83-68.67 ft.)
Wackestone (64.83-66.42 ft.)
Fossiliferous Shale <abundant> (66.42-66.58 ft.)
Packstone (66.58-68.67 ft.)
Lane Limestone (Total Thickness: 6.08 ft.)
Bonner Springs Shale Mbr.: (68.67-74.75 ft.)
Calcarenite Siltstone (68.67-70.71 ft.)
Mudstone (70.71-72.79 ft.)
Shale (72.79-74.75 ft.); red coloration (73.33 ft.)
KDOT: M-11 Core, Miami County, NE Kansas

Fe-Staining: 7’9” - 17’0” (7.75-17.0 ft.)
Dissolution and friability visible (not extensive)

**Stanton Limestone:** (Total Thickness: 7.5 ft.)
- *Stoner Limestone Mbr.:* (7.75-15.25 ft.)
  - Phylloid Bafflestone/Wackestone
- *Eudora Shale Mbr.:* (15.25-23.67 ft.)
  - Shale; several different weathering profiles are visible within the shale unit. Bottom 5 inches of shale is fossil rich.
- *Captain Crk Lst. Mbr.:* (23.67-31.5 ft.)
  - Phylloid Bafflestone/Wackestone; mottled intraclast facies for top foot.

**Vilas Shale:** (Total Thickness: 8.87 ft.)
- Siltstone (31.55-32.58 ft.)
- Interbedded Silt/Shale (32.58-40.42 ft.); silt dominated (37.55-39.0 ft.)
- Mudstone (40.42-40.5 ft.)

**Plattsburg Limestone:** (Total Thickness: 13.33 ft.)
- *Spring Hill Limestone Mbr.:* (40.5-52.04 ft.)
  - Packstone (40.5-46.58 ft.); Brachiopod Packstone (43.42-44.0 ft.)
  - Phylloid Bafflestone/Wackestone (46.58-49.67 ft.)
  - Packstone (49.67-51.08 ft.)
  - Wackestone (51.08-52.04 ft.)
- *Hickory Creek Shale Mbr.:* (52.04-53.83 ft.)
  - Fossiliferous Shale
- *Merriam Limestone Mbr.:* (53.83-53.97 ft.)
  - Phylloid Bafflestone/Wackestone

**Lane Shale** (Total Thickness: 39.42 ft.)
- *Bonner Springs Shale Mbr.:* (53.83-77.12 ft.)
  - Fossiliferous Shale (53.83-53.97 ft.)
  - Calcareous Siltstone (53.97-58.25 ft.); burrows and foresets visible
  - Mudstone (58.25-60.0 ft.); nodular Shale (60.0-64.92 ft.); red staining (61.0-63.75 ft.)
  - Interbedded Silt/Shale (64.92-77.12 ft.); foresets common, increased mud with depth
- *Upper Farley Limestone Mbr.:* (77.12-86.58 ft.)
  - Phylloid Bafflestone/Wackestone
- *Middle Farley Shale Mbr.:* (86.58-93.25 ft.)
  - Shale (88.5-93.25 ft.), plant debris increases with depth, gastropods and bi-valves visible.
KDOT: M-12 Core, Miami County, NE Kansas

**Lithostratigraphy**

- **Conodont Zone**: Missourian, Upper Pennsylvanian
  - Kansas City Group
    - Zarah Subgroup
      - Lane Shale
      - Bonner Springs Shale Mbr.
      - Upper Farley Limestone Mbr.
      - Middle Farley Shale Mbr.

**Lane Shale** (Total Thickness: 51.25 ft.)
- Bonner Springs Shale Mbr.: (7.92–31.71 ft.)
  - Shale (7.92–20.2 ft.); red staining (13.75–17.25 ft.)
  - Interbedded Silt/Shale (20.2–22.64 ft.)
  - Siltstone (22.64–23.88 ft.)
  - Interbedded Silt/Shale (23.88–24.33 ft.)
  - Siltstone (24.33–25.75 ft.)
  - Interbedded Silt/Shale (25.75–26.0 ft.)
  - Siltstone (26.0–26.25 ft.)
  - Interbedded Silt/Shale (26.25–28.67 ft.)
  - Siltstone (28.67–29.17 ft.)
  - Interbedded Silt/Shale (29.17–31.5 ft.)
  - Fossiliferous Shale (31.5–31.71 ft.)

- Upper Farley Limestone Mbr.: (31.71–53.38 ft.)
  - Packstone (31.71–34.42 ft.)
  - Phylloid Bafflestone/Wackestone (34.42–52.83 ft.); mottled/mottling throughout; sharp increase in mottling (51.5–53.17 ft.)
  - Packstone (52.83–53.38 ft.)

**Middle Farley Shale Mbr.**: (53.38–59.17 ft.)
- Fossiliferous Shale (53.38–53.58 ft.); plant debris visible
- Interbedded Silt/Shale (53.58–59.17 ft.); plant debris visible

**Location**: T16S R24E, Sec. 18 SE SW SW
- **Longitude**: -94.8041046°
- **Latitude**: 38.6510946°
- **Elevation**: 1060 GL
- **Total Depth**: 59 feet
- **Note**: Middle of triangle at t-intersection of Ridgeview Rd. and 263rd Rd.

**Core Logged and Illustrated by**: Stephan C. Oborny, University of Iowa
Fe-Staining: 4’7”–~11’3” (4.58-11.25 ft.)
Dissolution and friability visible (non-extensive)

**Stanton Limestone:** (Total Thickness: 6.42 ft.)
- Captain Creek Lst. Mbr. (4.58-11.0 ft.)
- Phylloid Bafflestone/Wackestone

**Vilas Shale:** (Total Thickness: 7.25 ft.)
- Mudstone (11.0-11.17 ft.)
- Calcareous Siltstone (11.17-12.08 ft.)
- Interbedded Silt/Shale (12.08-18.25 ft.); silt increases from 15.5-17.5 ft.

**Plattsburg Limestone:** (Total Thickness: 13.25 ft.)
- Spring Hill Limestone Mbr. (18.25-31.5 ft.)
  - Packstone (18.25-24.0 ft.); Brachiopod Packstone (20.33-20.92 ft.)
  - Phylloid Bafflestone/Wackestone (24.0-25.33 ft.)
  - Packstone (25.33-26.25 ft.)
  - Fossiliferous Shale (26.25-26.5 ft.)
  - Phylloid Bafflestone/Wackestone (26.5-30.33 ft.)
  - Packstone (30.33-31.08 ft.)
- Hickory Creek Shale Mbr. (31.08-31.5 ft.)
- Shale
  - Merriam Limestone Mbr. (31.5-36.75 ft.)
    - Phylloid Bafflestone/Wackestone (31.5-32.83 ft.)
    - Packstone (32.83-33.0 ft.)
    - Fossiliferous Shale (33.0-33.33 ft.)
    - Packstone (33.33-36.75 ft.); matrix appears greenish in color (33.33-34.0 ft.)
- Lane Shale (Total Thickness: 13.58 ft.)
  - Bonner Springs Shale Mbr. (36.75 –53.0 ft.)
    - Calcareous Siltstone (36.75-38.0 ft.); silt content increases with depth
    - Interbedded Silt/Shale (38.0-50.58 ft.); silt dominated
    - Silty Mudstone (50.58-50.92 ft.)
    - Calcareous Siltstone (50.92-51.25 ft.)
    - Silty Mudstone (51.25-53.0 ft.)
### KDOT: M-17A Core, Miami County, NE Kansas

**KID:** 1035023968  
**Location:** T16S R25E, Sec. 3 SW SW NW  
**Longitude:** -94.6368639°  
**Latitude:** 38.6875444°  
**Elevation:** 1085 GL  
**Total Depth:** 60 feet  
**Note:** E. side of Bellview Mission Rd., ~ 0.5 mi S. of 239th Rd.

#### Lithostratigraphy

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<td>Zarah Subgroup</td>
<td>Undiff. Farley &amp; Argentine Limestone mbrs.</td>
<td>Missourian</td>
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<td>Undiff. Wyandotte Lst. / Lane Sh.</td>
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<td>Liberty Memorial Shale</td>
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#### Fe-Staining:
- **4’2”- ~30’0” (4.17-30.0 ft.):** Dissolution and friability visible (moderate)  
- **Increase in Fe-Staining at ~10’8” (10.67 ft.):** Undifferentiated Lane Sh. & Wyandotte Lst.

**Undifferentiated Lane Sh. & Wyandotte Lst.**  
(Total Thickness: 40.83 ft.)

- **Undifferentiated Farley & Argentine Lst. mbrs.:** Phylloid Bafflestone/Wackestone (4.17-39.83 ft.)  
- **Quindaro Shale Mbr.:** (39.83-41.2 ft.)
  - Fossiliferous Shale  
  - *Streptognathodus gracilis*
- **Frisbie Limestone Mbr.:** (41.2-45.0 ft.)
  - Wackestone (41.2-42.75 ft.)  
  - Packstone (42.75-43.47 ft.)  
  - Wackestone (43.47-45.0 ft.)

**Liberty Memorial Shale** (Total Thickness: 11.75 ft.)
- Calcereous Siltstone (45.0-48.25 ft.); silt dominated  
- Interbedded Silt/Shale (48.25-56.75 ft.); mud dominated

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Core Logged and Illustrated by: Stephan C. Oborny, University of Iowa
**Fe-Staining:** 6'-0" - 39'-0" (6.0-39.0 ft.)
Increase in Fe-Staining (24.58-39.0 ft.)

**Lane Shale** (Total Thickness: 18.58 ft.)
- *Lower Farley Limestone Mbr.:* (6.0-24.58 ft.)
  - Phylloid Bafflestone/Wackestone
- *Island Creek Shale Mbr.:* (Absent)

**Wyandotte Limestone** (Total Thickness: 26.17 ft.)
- *Argentine Limestone Mbr.:* (24.58-49.21 ft.)
  - Phylloid Bafflestone/Wackestone (24.58-48.5 ft.)
  - Osagia (47.25-48.08 ft.)
  - Packstone (48.5-49.21 ft.)
- *Quindaro Shale Mbr.:* (49.21-50.75 ft.)
  - Fossiliferous Mudstone
- *Frisbie Limestone Mbr.:* (Absent)

**Liberty Memorial Shale** (Total Thickness: 4.17 ft.)
- Silty Shale (50.75-54.92 ft.)
KDOTT: M-24 Core, Miami County, NE Kansas

**Lithostratigraphy**

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<td>Liberty Memorial</td>
<td>Shale</td>
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</table>

**Fe-Staining:** 7'9"-30'6" (7.75-30.5 ft.)

**Lane Shale** (Total Thickness: 19.0 ft.)
- Middle Farley Shale Mbr.: (7.75-8.83 ft.)
  - Mudstone (7.75-8.38 ft.)
  - Fossiliferous Shale (8.38-8.83 ft.)
- Lower Farley Limestone Mbr.: (8.83-26.75 ft.)
  - Phylloid Bafflestone/Wackestone (8.83-9.42 ft.)
  - Fossiliferous Shale (9.42-9.54 ft.)
  - Phylloid Bafflestone/Wackestone (9.54-26.75 ft.)
  - <Abundant Dissolution>

**Island Creek Shale Mbr.** (Absent)

**Wyandotte Limestone** (Total Thickness: 18.83 ft.)
- Argentine Limestone Mbr.: (26.75-41.67 ft.)
  - Wackestone (26.75-41.67 ft.)
  - <Disconformity at 26.75 ft.>
  - <Abundant silicification & Friability>
  - (26.75-28.25 ft.)
- Quindaro Shale Mbr.: (41.67-42.25 ft.)
  - Fossiliferous Shale
- Frisbie Limestone Mbr.: (42.25-45.58 ft.)
  - Packstone <Argillaceous> (42.25-43.60 ft.)
  - Packstone (43.60-44.08 ft.)
  - Wackestone (44.08-45.08 ft.)
  - Packstone <Argillaceous> (45.08-45.58 ft.)

**Liberty Memorial Shale** (Total Thickness: 9.0 ft.)
- Interbedded Silt/Shale (45.58-54.58 ft.); increase in silt beneath 50.42 ft.

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Core Logged and Illustrated by: Stephan C. Oborny, University of Iowa
KDOT: M-30 Core, Miami County, NE Kansas

Fe-Staining: 3’3”- 11’6” (3.25-11.5 ft.)
Increase in Dissolution (3.25-10.67 ft.)

Lane Shale: (Total Thickness: 33.17 ft.)
Upper Farley Limestone Mbr.: (3.25-29.04 ft.)
Intraclast facies: (3.25-22.0 ft.)
Wakestone (3.25-4.42 ft.)
Phylloid Bafflestone/Wackestone (4.42-29.04 ft.)
Osagia (22.75-27.75 ft.)
Middle Farley Shale Mbr.: (29.04-29.83 ft.)
Shale (29.04-29.42 ft.)
Shale <Fossiliferous> (29.42-29.83 ft.)
Island Creek Shale Mbr.: (29.83-36.42 ft.)
Packstone (29.83-30.42 ft.)
Shale (30.42-30.63 ft.)
Phylloid Bafflestone/Wackestone (30.63-30.92 ft.)
Shale <Fossiliferous> (30.92-31.25 ft.)
Phylloid Bafflestone/Wackestone (31.25-32.30 ft.)
Shale <Fossiliferous> (32.30-32.67 ft.)
Phylloid Bafflestone/Wackestone (32.67-34.46 ft.)
Shale <Fossiliferous> (34.46-34.75 ft.)
Phylloid Bafflestone/Wackestone (34.75-34.92 ft.)
Shale <Fossiliferous> (34.92-35.04 ft.)
Phylloid Bafflestone/Wackestone (35.04-35.5 ft.)
Shale <Fossiliferous> (35.5-35.75 ft.)
Phylloid Bafflestone/Wackestone (35.75-36.33 ft.)
Shale <Fossiliferous> (36.33-36.42 ft.)

Wyandotte Limestone: (Total Thickness: 18.66 ft.)
Argentine Limestone Mbr.: (36.42-53.91 ft.)
Phylloid Bafflestone/Wackestone (36.42-53.58 ft.)
Osagia (42.0-53.58 ft.)
Packstone (53.58-53.91 ft.)
Quindaro Shale Mbr.: (53.91-55.08 ft.)
Shale <Fossiliferous> (53.91-55.08 ft.)
Frisbie Limestone Mbr.: (Absent)
Liberty Memorial Shale: (Total Thickness: 3.75 ft.)
Shale (55.08-58.83 ft.)

Core Logged and Illustrated by: Stephan C. Oborny, University of Iowa
**Lithostratigraphy**

**Upper Pennsylvania**
- **Missourian**
  - **Kansas City Group**
    - **Zarah Subgroup**
      - **Lane Shale**
      - **Wyandotte Limestone**
      - **Wilson Shale**
      - **Paola Limestone**

**Kansas City Group** (Total Thickness: 335.4 ft.)
- **Raytown Limestone Mbr.** (55.71-63.17 ft.)
  - **Packstone** (55.71-56.33 ft.)
  - **Phylloid Bafflestone/Wackestone (56.33-63.17 ft.)
- **Muncie Creek Shale Mbr.** (63.17-63.42 ft.)
  - **Shale** (63.17-63.42 ft.)
- **Paola Limestone Mbr.** (63.42-66.33 ft.)
  - **Phylloid Bafflestone/Wackestone (63.42-66.0 ft.)
  - **Packstone (66.0-66.33 ft.)
**Chanute Shale** (Total Thickness: 23.42 ft.)
- **Silty Shale (66.33-73.33 ft.)
- **Calcereous Siltstone (73.33-77.08 ft.)
- **Silty Shale (77.08-80.17 ft.)
- **Calcereous Siltstone (80.17-83.75 ft.)
- **Silty Shale (83.75-86.08 ft.); horizons of hematitic staining throughout (up to 0.33” thick)
- **Coal (86.08-86.33 ft.)
- **Shale (86.33-89.75 ft.)

**Missourian** (Total Thickness: 160.7 ft.)
- **Upper Farley Limestone Mbr.** (4.6-12.21 ft.)
  - **Phylloid Bafflestone/Wackestone**
- **Middle Farley Shale Mbr.** (12.21-13.37 ft.)
  - **Fossiliferous Shale**
  - **Calcareous Siltstone (12.87-13.37 ft.)
- **Lower Farley Limestone Mbr.** (13.37-16.79 ft.)
  - **Silty Mudstone (13.37-13.92 ft.)
  - **Calcareous Siltstone (13.92-16.79 ft.)
- **Island Creek Shale Mbr.** (16.79-21.79 ft.)
  - **Silty Mudstone (16.79-19.29 ft.)
  - **Shale (19.29-21.12 ft.)
  - **Fossiliferous Shale (21.12-21.79 ft.)
- **Wyandotte Limestone** (Total Thickness: 15.58 ft.)
  - **Argentine Limestone Mbr.** (21.79-37.37 ft.)
  - **Phylloid Bafflestone/Wackestone (21.79-37.04 ft.)
  - **Packstone (37.04-37.37 ft.)
**Liberty Memorial Shale** (Total Thickness: 18.34 ft.)
- **Silty Shale (37.37-38.37 ft.)
- **Silty Shale (38.37-55.12 ft.); horizon of hematitic staining at 46.62 ft. (0.33” thick)
- **Fossiliferous Shale (55.12-55.71 ft.)
- **Iola Limestone** (Total Thickness: 10.62 ft.)
  - **Raytown Limestone Mbr.** (55.71-63.17 ft.)
  - **Packstone (55.71-56.33 ft.)
  - **Phylloid Bafflestone/Wackestone (56.33-63.17 ft.)
- **Muncie Creek Shale Mbr.** (63.17-63.42 ft.)
  - **Shale (63.17-63.42 ft.)
  - **Phylloid Bafflestone/Wackestone (63.42-66.0 ft.)
  - **Packstone (66.0-66.33 ft.)

**Fe-Staining**
- **4’6” - 11’10” (4.5-11.83 ft.)
- Dissolution and friability visible (extensive)

**Core Logged and Illustrated by:** Stephan C. Oborny, University of Iowa
KDOT: M-36 Core, Miami County, NE Kansas

KID: 1035180064
Location: T17S R22E, Sec. 13 NW SW NW
Longitude: -94.9356659
Latitude: 38.5736342
Elevation: 1070 GL
Total Depth: 80 feet
Note: E. side of Osawatomie Rd, 0.3 miles S. of 303rd Rd.

Fe-Staining: None

Vilas Shale: (Total Thickness: 1.75 ft.)
Shale <No Silt> (8.25-9.0 ft.)
Wackestone (9.0-9.3 ft.)
Shale <No Silt> (9.3-10.0 ft.)

Plattsburg Limestone: (Total Thickness: 16.79 ft.)
Spring Hill Limestone Mbr. (10.0-12.17 ft.)
Wackestone (10.0-12.3 ft.)
Packstone <Brachiopod> (12.38-13.21 ft.)
Grainstone (13.21-17.63 ft.)
Shale <Fossiliferous> (17.63-17.83 ft.)
Wackestone (17.83-23.17 ft.)

Hickory Creek Shale Mbr.: (23.17-24.67 ft.)
Shale (23.17-23.42 ft.)
Wackestone (23.42-23.96 ft.)
Shale <Fossiliferous> (23.96-24.13 ft.)
Wackestone (24.13-24.58 ft.)
Shale (24.58-24.67 ft.)

Merrim Limestone Mbr.: (24.67-26.79 ft.)
Wackestone (24.67-25.21 ft.)
Phylloid Bafflestone/Wackestone (25.21-26.46 ft.)
Packstone (26.46-26.79 ft.)

Lane Shale: (Total Thickness: 53.88 ft.)
Bonner Springs Shale Mbr.: (26.79-46.30 ft.)
Shale <Fossiliferous> (26.79-26.88 ft.)
Shale (26.88-28.58 ft.)
Mudstone (28.58-32.58 ft.)
< Nodules; 30.54-31.0 ft. >
Shale (32.58-41.17 ft.)
Interbedded Silt/Shale (41.17-44.88 ft.)
Siltstone (44.88-45.08 ft.)
Interbedded Silt/Shale (45.08-46.21 ft.)
Shale <Fossiliferous> (46.21-46.30 ft.)

Upper Farley Limestone Mbr.: (46.30-63.13 ft.)
Phylloid Bafflestone/Wackestone
Middle Farley Shale Mbr.: (63.13-80.67 ft.)
Shale <Fossiliferous> (63.13-63.25 ft.)
Shale (63.25-73.04 ft.) <Plant Material>
Coal <Weak> (73.04-73.13 ft.)
Interbedded Silt/Shale (73.13-78.42 ft.)
Siltstone <Coarse> (78.42-78.83 ft.)
Interbedded Silt/Shale (78.83-79.33 ft.)
Siltstone <Coarse> (79.33-79.6 ft.)
Interbedded Silt/Shale (79.5-80.67 ft.)
KDOT: M-38 Core, Miami County, NE Kansas

**Lithostratigraphy**

- **Upper Pennsylvanian Missourian**
  - Kansas City Group
    - Zarah Subgroup
      - Lane Shale
        - Upper Farley Limestone Mbr.
        - Middle Farley Shale Mbr.
  - Bonner Springs Shale Mbr.
  - Spring Hill Limestone Mbr.
  - Plattsburg Limestone Mbr.
  - Merriam Limestone Mbr.
  - Captain Creek Limestone Mbr.
  - Vila Shale:
    - Calcareous Siltstone
    - Silty Shale
    - Fossiliferous Shale

- **Formation & Member**
  - Plattsburg Limestone:
    - Packstone
    - Ooid Grainstone
    - Wackestone
    - Packstone
    - Grainstone
    - Packstone
  - Vila Shale:
    - Calcareous Siltstone
    - Silty Shale
    - Fossiliferous Shale
  - Merriam Limestone:
    - Wackestone
    - Fossiliferous Shale
    - Packstone
  - Captain Creek Limestone:
    - Claystone
    - Limestone

**Series/Stage Group**

- **Formation & Member**
  - **Upper Farley Limestone Mbr.**
  - **Middle Farley Shale Mbr.**
  - **Upper Pennsylvanian Missourian**
  - **Kansas City Group**
  - **Zarah Subgroup**
  - **Lane Shale**
  - **Bonner Springs Shale Mbr.**
  - **Spring Hill Limestone Mbr.**
  - **Plattsburg Limestone Mbr.**
  - **Merriam Limestone Mbr.**
  - **Captain Creek Limestone Mbr.**
  - **Hky. Crk Sh. Mbr.**
  - **Vila Shale**

**Mudstone**

- **Shale**
  - **Wackestone**
  - **Packstone**
  - **Ooid Grainstone**
  - **Phylloid Bafflestone/Wackestone**
  - **Mudstone**
  - **Silty Mudstone**

**Conodont**

- *Idiognathodus eudoraensis*
- *Streptognathodus gracilis*
- *Idiognathodus eudoraensis*
- *Streptognathodus gracilis*

**Core Logged and Illustrated by:** Stephan C. Oborny, University of Iowa
KDOT: M-45 Core, Miami County, NE Kansas

**Lithostratigraphy**

- **Upper Pennsylvanian**
  - **Kansas City Group**
    - **Zarah Subgroup**
      - **Spring Hill Limestone Mbr.**
      - **Hickory Creek Shale Mbr.**
      - **Merriam Limestone Mbr.**
  - **Lansing Group**
    - **Lane Shale**
      - **Bonner Springs Shale Mbr.**
      - **Upper Farley Limestone Mbr.**
      - **Middle Farley Shale Mbr.**
  - **Missourian**
    - **Upper Farley Limestone Mbr.**
    - **Merriam Limestone Mbr.**

**Series & Stage**

- **Kansas City Group**
  - **Zarah Subgroup**
  - **Lansing Group**
  - **Missourian**

**Formation & Member**

- **Spring Hill Limestone Mbr.**
- **Hickory Creek Shale Mbr.**
- **Merriam Limestone Mbr.**
- **Lane Shale**
  - **Bonner Springs Shale Mbr.**
  - **Upper Farley Limestone Mbr.**
  - **Middle Farley Shale Mbr.**
- **Merriam Limestone Mbr.**
- **Spring Hill Limestone Mbr.**
- **Hickory Creek Shale Mbr.**
- **Merriam Limestone Mbr.**
- **Lane Shale**
  - **Bonner Springs Shale Mbr.**
  - **Upper Farley Limestone Mbr.**
  - **Middle Farley Shale Mbr.**
- **Merriam Limestone Mbr.**

**Fe-Staining:** 0'5"- 4'1" (0.42-4.08 ft.)
Dissolution and friability visible (extensive)

**Plattsburg Limestone:** (Total Thickness: 16.33 ft.)
- **Spring Hill Limestone Mbr.:** (0.42-6.87 ft.)
  - Phylloid Bafflestone/Wackestone (0.42-2.0 ft.)
  - Wackestone (2.0-6.0 ft.)
  - Packstone (6.0-6.87 ft.)
- **Hickory Creek Shale Mbr.:** (6.87-8.25 ft.)
  - Shale <Non Fossiliferous>
- **Merriam Limestone Mbr.:** (8.25-16.75 ft.)
  - Wackestone (8.25-9.0 ft.)
  - Packstone (9.0-9.42 ft.)
  - Phylloid Bafflestone/Wackestone (9.42-11.0 ft.)
  - Shale <Fossiliferous> (11.0-11.67 ft.)
  - Packstone (11.67-13.62 ft.)
  - Wackestone (13.62-15.75 ft.)
  - Phylloid Bafflestone/Wackestone (15.75-16.08 ft.)
  - Wackestone (16.08-16.75 ft.)

**Lane Shale:** (Total Thickness: 36.17 ft.)
- **Bonner Springs Shale Mbr.:** (16.75-17.0 ft.)
  - Shale <Fossiliferous>
- **Upper Farley Limestone Mbr.:** (17.0-43.12 ft.)
  - Packstone (17.0-20.17 ft.)
  - Phylloid Bafflestone/Wackestone (20.17-43.12 ft.)
- **Middle Farley Shale Mbr.:** (43.12-52.92 ft.)
  - Calcareous Siltstone (43.12-44.5 ft.)
  - Interbedded Silt/Shale (44.5-51.92 ft.)
  - Siltstone (51.92-52.17 ft.)
  - Interbedded Silt/Shale (52.17-52.92 ft.)

**Conodont Sample:**

- **Streptognathodus gracilis**

Core Logged and Illustrated by: Stephan C. Oborny, University of Iowa
Wackestone
Phylloid Bafflestone/Wackestone
Packstone
Silty Shale
Calcareous Siltstone
Sandstone
Siltstone
Shale
Silty Mudstone
Mudstone
Trough Cross Bedding

Lithostratigraphy

Missourian
Kansas City Group
Zarah Subgroup
Lane Shale
Upper Farley Limestone Mbr.
Middle Farley Shale Mbr.

Fe-Staining: 6'-8"-12'0" (6.67-12.00 ft.)

Lane Shale: (Total Thickness: 59.41 ft.)
Bonner Springs Shale Mbr.: (6.67-13.75 ft.)
Sandstone (V-Fine, Trough Cross Bedding) (6.67-7.50 ft.)
Interbedded Silt/Shale (7.50-8.67 ft.)
Sandstone (V-Fine) (8.67-9.83 ft.)
Interbedded Silt/Shale (8.83-10.08 ft.)
Sandstone (V-Fine) (10.08-10.21 ft.)
Interbedded Silt/Shale (10.21-10.62 ft.)
Sandstone (V-Fine) (10.62-10.79 ft.)
Interbedded Silt/Shale (10.79-12.58 ft.)
Calcareous Siltstone (Coarse) (12.58-12.71 ft.)
Interbedded Silt/Shale (12.71-13.21 ft.)
Shale <Fossiliferous> (13.21-13.75 ft.)
Almost an Argillaceous-Packstone
Upper Farley Limestone Mbr.: (13.75-37.42 ft.)
Phylloid Bafflestone/Wackestone
Middle Farley Shale Mbr.: (37.42-66.08 ft.)
Silty Shale <Fossiliferous> (37.42-38.12 ft.)
Calcareous Siltstone (Medium) (38.12-38.37 ft.)
Interbedded Silt/Shale (38.37-41.79 ft.)
Mud increases w/ depth (39.58-41.79 ft.)
Calcareous Siltstone (Medium) (41.79-57.54 ft.)
Silt increases w/ depth (55.52-57.54 ft.)
Sandstone (V-Fine) (57.54-57.75 ft.)
Calcareous Siltstone (Medium) (57.75-59.75 ft.)
Sandstone (V-Fine, Trough Cross Bedding) (59.75-59.87 ft.)
Calcareous Siltstone (Medium) (59.58-60.58 ft.)
Sandstone (V-Fine, Trough Cross Bedding) (60.58-60.87 ft.)
Calcareous Siltstone (Medium) (60.87-66.08 ft.)
KDOT: M-51 Core, Miami County, NE Kansas

Fe-Staining: 4'4" - 4'7" (4.33 - 4.58 ft); 16'2" - 16'8" (16.17 - 16.67 ft); 22'0" - 31'8" (22.0 - 31.67 ft)

Plattsburg Limestone: (Total Thickness: 0.25 ft.)
Merriam Limestone Mbr.: (4.33 - 4.58 ft.)
Wackestone
Lane Shale: (Total Thickness: 58.75 ft.)
Bonner Springs Shale Mbr.: (6.33 - 20.08 ft.)
Silty Shale <Non Fossiliferous> (4.58 - 12.71 ft.)
Sillstone (Coarse, Trough Cross Bedding) (12.71 - 16.71 ft.)
Silty Shale (16.71 - 16.83 ft.)
Shale (16.83 - 17.0 ft.)
Shale <Fossiliferous> (17.0 - 17.21 ft.)
Silty Shale (17.21 - 17.42 ft.)
Calcareous Siltstone (Course) (17.42 - 21.08 ft.)

Upper Farley Limestone Mbr.: (21.08 - 38.96 ft.)
Packstone <Arglilaceous> (21.08 - 21.42 ft.)
Phylloid Bafflestone/Wackestone (21.42 - 38.46 ft.)
Wackestone (38.46 - 38.96 ft.)
Middle Farley Shale Mbr.: (38.96 - 63.33 ft.)
(Trough Cross Bedding Throughout)
Silty Mudstone (38.96 - 39.21 ft.)
Calcareous Siltstone (Coarse) (39.21 - 39.83 ft.)
Interbedded Silt/Shale (39.83 - 40.33 ft.)
Sillstone (Coarse) (40.33 - 41.5 ft.)
Interbedded Silt/Shale (41.5 - 45.08 ft.)
Sillstone (Coarse) (45.08 - 45.58 ft.)
Interbedded Silt/Shale (45.58 - 47.08 ft.)
Sillstone (Coarse) (47.08 - 47.29 ft.)
Calcareous Siltstone (Medium) (47.29 - 48.08 ft.)
Interbedded Silt/Shale (48.08 - 49.96 ft.)
Sillstone (Coarse) (49.96 - 50.29 ft.)
Interbedded Silt/Shale (50.29 - 52.92 ft.)
Sillstone (Coarse) (52.92 - 53.25 ft.)
Interbedded Silt/Shale (Plant Material) (53.25 - 53.58 ft.)
Sillstone (Coarse) (53.58 - 53.92 ft.)
Interbedded Silt/Shale (53.92 - 54.08 ft.)
Sillstone (Coarse) (54.08 - 56.17 ft.)
Interbedded Silt/Shale (56.17 - 56.58 ft.)
Sillstone (Coarse) (56.58 - 56.96 ft.)
Interbedded Silt/Shale (56.96 - 57.54 ft.)
Sillstone (Coarse, Foresets) (57.54 - 57.62 ft.)
Interbedded Silt/Shale (57.62 - 57.79 ft.)
Sillstone (Coarse) (57.79 - 58.08 ft.)
Interbedded Silt/Shale (58.08 - 58.25 ft.)
Sillstone (Coarse) (58.25 - 59.21 ft.)
Interbedded Silt/Shale (59.21 - 59.75 ft.)
Sillstone (Coarse) (59.75 - 60.12 ft.)
Calcareous Siltstone (Medium) (60.12 - 60.58 ft.)
Sillstone (Coarse) (60.58 - 60.67 ft.)
Interbedded Silt/Shale (60.67 - 60.75 ft.)
Sillstone (Coarse) (60.75 - 60.87 ft.)
Interbedded Silt/Shale (60.87 - 61.08 ft.)
Sillstone (Coarse, Plant Material) (61.08 - 61.42 ft.)
Interbedded Silt/Shale (61.42 - 61.83 ft.)
Sillstone (Coarse) (61.83 - 62.12 ft.)
Interbedded Silt/Shale (62.12 - 63.33 ft.)

Core Logged and Illustrated by: Stephan C. Oborny, University of Iowa
**Lithostratigraphy**

**Conodont Zone**

- **Missourian**
  - **Upper Pennsylvanian**
  - **Missourian**
    - **Undiff. K.-C. & Lsg. Subs.**
      - Nellie Bly Formation

**Series**

- **Upper Pennsylvanian**

**Group**

- **Undiff. Lim & Znub Subs.**

** Radiation**

- **Spring Hill Lmbr.**
- **Wyandotte Lmbr.**
- **Lane Sh.**
- **Plattsburg Lmbr.**
  - **Undiff. Liberty Mem. & Chanute Shale Absent**

**Member**

- **Spring Hill Lmbr.**
  - **Undiff. Min. 10% & Lt. Sh. Mbrs.**
- **Hickory Creek Shale Mbr.**
  - **Undiff. Merriam, Farley, & Argentine Lst. mbrs.**
  - **Wackestone**
  - **Quindaro Shale Mbr.**
  - **Cement City Lmbr.**
    - **Phylloid Bafflestone/Wackestone**
    - **Packstone**
    - **Silty Mudstone**
    - **Plant Material**

**Core Logged and Illustrated by:** Stephan C. Oborny, University of Iowa
KDOT: M-53A Core, Miami County, NE Kansas

KID: 1035023979
Location: T19S R22E, Sec. 14 NE NE SW
Longitude: -94.9466828
Latitude: 38.3955377
Elevation: 887 GL
Total Depth: 100 feet
Note: S. side of 403rd. Rd., 0.4 mi. E. of Plum Crk. Rd.

Fe-Staining: 5'6" - 6'1" (5.5-6.08 ft.)

Cherryvale Fm.: (Total Thickness: 22.29 ft.)
- Wackestone (5.5-5.67 ft.)
- Shale <Fossiliferous> (5.67-6.08 ft.)
- Phylloid Bafflestone/Wackestone (6.08-6.54 ft.)
- Shale <Fossiliferous> (6.54-7.04 ft.)
- Phylloid Bafflestone/Wackestone (7.04-7.67 ft.)
- Shale <Fossiliferous> (7.67-8.15 ft.)
- Packstone <Argillaceous> (8.15-8.21 ft.)
- Shale <Fossiliferous> (8.21-8.46 ft.)
- Packstone (8.46-8.58 ft.)
- Packstone <Argillaceous> (8.58-9.30 ft.)
- Packstone (9.30-9.40 ft.)
- Packstone <Argillaceous> (9.40-9.54 ft.)
- Packstone (9.54-9.83 ft.)
- Wackestone (9.83-14.92 ft.)

Fontana Shale Mbr.: (14.92-27.79 ft.)
- Shale (14.92-23.67 ft.)
- <Fossil Horizon @ 19.33 ft.>
- Packstone <Argillaceous> (23.67-27.46 ft.)
- Shale (27.46-27.79 ft.)

Dennis Lst.: (Total Thickness: 40.21 ft.)
- Winterset Limestone Mbr.: (27.79-62.58 ft.)
- Wackestone (27.79-35.83 ft.)
- <@ ~31.0 ft. mud increases>
- Shale <Fossiliferous> (35.83-36.19 ft.)
- Phylloid Bafflestone/Wackestone (36.19-41.52 ft.)
- <Top 0.33 ft. Oolitic>
- Ooid Grainstone (41.52-43.46 ft.)
- Shale <w/ Ca-Nodules> (43.46-43.75 ft.)
- Mudstone <Ostracodes> (43.75-44.30 ft.)
- Shale (44.30-44.46 ft.)
- Wackestone (44.46-48.17 ft.)
- <Birds Eye, 47.42-48.0 ft.>
- Phylloid Bafflestone/Wackestone (48.17-58.67 ft.)
- Wackestone <Argillaceous> (58.67-61.96 ft.)
- Phylloid Bafflestone/Wackestone (61.96-63.32 ft.)
- Wackestone (63.32-65.68 ft.)
- <Abundant Stylolitization>
- Shale <Fossiliferous> (65.68-67.42 ft.)
- Shale <Black, Fissile> (67.42-67.90 ft.)
- Shale <Fossiliferous> (67.90-68.0 ft.)

Stark Shale Mbr.: (62.58-68.0 ft.)
- Shale <Fossiliferous> (62.58-62.75 ft.)
- Shale <Black, Fissile> (62.75-67.42 ft.)
- Shale <Fossiliferous> (67.42-67.90 ft.)
- Shale <Black, Fissile> (67.90-68.0 ft.)

Galesburg Shale: (Total Thickness: 2.17 ft.)
- Mudstone (68.0-70.17 ft.)

Swope Limestone: (Total Thickness: 29.91 ft.)
- Bethany Falls Limestone Mbr.: (70.17-93.75 ft.)
- Wackestone (70.17-71.92 ft.)
- Ooid Grainstone (71.92-79.33 ft.)
- <Abundant Stylolitization>
- Wackestone (79.33-93.75 ft.)
- <Abundant Stylolitization>
- Hushpuckney Shale Mbr.: (93.75-97.96 ft.)
- Shale <Black, Fissile> (96.90-97.96 ft.)
- Middle Creek Limestone Mbr.: (97.96-100.08 ft.)
- Wackestone

Core Logged and Illustrated by: Stephan C. Oborny, University of Iowa
KDOT: M-54B Core, Miami County, NE Kansas

KID: 1035023980
Location: T19S R22E, Sec. 9 SW NW SW
Longitude: -94.9905772
Latitude: 38.4083588
Elevation: 962 GL
Total Depth: 40 feet
Note: E. side of Bethel Church Rd., 0.2 mi. S. of 395th Rd.

Fe-Staining: 5’9”-7’5” (5.75-7.42 ft.); 10’1”-10’2” (10.08-10.17 ft.); 10’5”-10’8” (10.42-10.67 ft.)

Iola Lst., Wyandotte Lst., Lane Sh., & Plattsburg Lst [Liberty Mem. & Chanute Shale Absent]
(Total Thickness: 16.79 ft.)
Spring Hill Limestone Mbr.: (5.75-6.04 ft.)
Wackestone
Hickory Creek Shale Mbr.: (6.04-6.88 ft.)
Shale <Fossiliferous>
Undiff. Merriam, Farley, & Argentine Ist. mbrs.: (6.88-10.96 ft.)
Wackestone <Osagia coating> (6.88-10.83 ft.)
Packstone (10.83-10.96 ft.)
Quindaro Shale Mbr.: (10.96-11.46 ft.)
Shale <Fossiliferous>
Undiff. Frisbie & Raytown Ist. mbrs.: (11.46-22.33 ft.)
Packstone (11.46-12.63 ft.)
Wackestone (12.63-22.17 ft.)
Packstone (22.17-22.33 ft.)
Muncie Creek Shale Mbr.: (22.33-22.54 ft.)
Shale

Dewey Limestone (Total Thickness: 3.79 ft.)
Cement City Limestone Mbr.: (22.54-26.33 ft.)
Wackestone (22.54-26.17 ft.)
Packstone <Argillaceous> (26.17-26.33 ft.)

Nellie Bly Formation: (Total Thickness: 8.59 ft.)
Siltstone <Coarse> (26.33-27.25 ft.)
Calcareous Siltstone <Medium> (27.25-29.0 ft.)
Interbedded Silt/Shale (29.0-30.30 ft.)
Calcareous Siltstone <Medium> (30.30-31.0 ft.)
Interbedded Silt/Shale (31.0-34.92 ft.)
KDOT: M-57 Core, Miami County, NE Kansas

Core Logged and Illustrated by: Stephan C. Oborny, University of Iowa
KDOT: M-60 Core, Miami County, NE Kansas

Fe-Staining: 10”-5’11” ft (1.83-5.92 ft.)

**Dennis Lst.** (Total Thickness: 25.42 ft.)
*Winterset Limestone Mbr:* (1.83-21.46 ft.)
<Footages 1-5 are from 2005 study due to missing core>
Wackestone (1.83-3.83 ft.)
<Fe-stained; likely calcilutite>
Mudstone (3.83-3.88 ft.)
Wackestone (3.88-4.0 ft.)
Interval Uncertain (4.0-5.92 ft.)
<13” of core missing; 4” mudstone, 6” wackestone>
Wackestone <calcilutite> (5.92-10.75 ft.)
<Missing Core; 6.46-6.71 ft, 7.17-7.42 ft.>
Shale <Fossiliferous> (10.75-10.79 ft.)
Phylloid Bafflestone/Wackestone (10.79-11.42 ft.)
Shale <Fossiliferous> (11.42-11.58 ft.)
Phylloid Bafflestone/Wackestone (11.58-19.25 ft.)
Shale <Fossiliferous> (19.25-19.35 ft.)
Phylloid Bafflestone/Wackestone (19.35-20.71 ft.)
<Argillaceous; 20.38-20.71 ft.>
Shale <Fossiliferous> (20.71-20.96 ft.)
Wackestone (20.96-21.46 ft.)
**Stark Shale Mbr.:** (21.46-27.08 ft.)
Shale <Fossiliferous> (21.46-22.0 ft.)
Shale (22.0-27.08 ft.)
**Canville Limestone Mbr.:** (27.08-27.25 ft.)
Packstone <Argillaceous>

**Galesburg Shale:** (Total Thickness: 2.96 ft.)
Shale <Fossiliferous> (27.25-27.46 ft.)
Shale (27.46-27.92 ft.)
Mudstone (27.92-30.21 ft.)

**Swope Limestone:** (Total Thickness: 24.37 ft.)
*Bethany Falls Limestone Mbr:* (30.21-48.42 ft.)
Wackestone (30.21-48.42 ft.)
<Calcilutite w/ birds eye; 30.21-34.08 ft.>
<Argillaceous; 44.38-44.46 ft., 46.08-46.5 ft., 46.96-47.17 ft.>
<Abundant Stylolitization; 34.08-48.42 ft.>

**Hushpuckney Shale Mbr.:** (48.42-53.04 ft.)
Shale <Fossiliferous> (48.42-49.58 ft.)
Shale <Black, Fissile> (49.58-53.0 ft.)
Shale <Fossiliferous> (53.0-53.04 ft.)
**Middle Creek Limestone Mbr.:** (53.04-54.58 ft.)
Wackestone <Argillaceous; 53.38-53.63 ft.>

**KID:** 1035180096
**Location:** T19S R23E, Sec. 11 SE SW NE
**Longitude:** -94.8314091
**Latitude:** 38.4115696
**Elevation:** 925 GL
**Total Depth:** 55 feet
**Note:** N. side of 395th Rd., 0.2 mi. E. of Lone Elm Rd.
KDOT: M-62A Core, Miami County, NE Kansas

**Lithostratigraphy**

<table>
<thead>
<tr>
<th>Series</th>
<th>Stage</th>
<th>Group</th>
<th>Formation &amp; Member</th>
<th>Conodont Zone</th>
<th>Note</th>
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<tr>
<td>Upper Pennsylvania</td>
<td>Missourian</td>
<td>Kansas City Group</td>
<td>Nellie Bly Fm.</td>
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<td>Bronson Subgroup</td>
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<td>Linn Subgroup</td>
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<td>Cherryvale Fm.</td>
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<td>Winterset Limestone Mbr.</td>
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<td>Bethany Falls Limestone Mbr.</td>
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<td>Fontana Sh. Mbr.</td>
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<td>Stark Shale Mbr.</td>
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<td>Hushpuckney Sh. Mbr.</td>
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<td>Canville Limestone Mbr.</td>
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**Conodont Zone**

Missourian

- Galesburg Shale
- Bethany Falls Limestone Mbr.
- Fontana Sh. Mbr.
- Winterset Limestone Mbr.
- Stark Shale Mbr.
- Hushpuckney Sh. Mbr.
- Canville Limestone Mbr.

**KID:** 1035023983

**Location:** T18S R24E, Sec. 25 SW SW SW

**Latitude:** 38.4482821

**Elevation:** 987 GL

**Total Depth:** 100 feet

**Note:** NE corner of 375th Rd. & Spring Valley Rd.

**Fe-Staining:** 7'6"-14'3.5" ft (7.5-14.30 ft.)

**Nellie Bly Fm.:** (Total Thickness: 1.71 ft.)
- Shale (7.5-8.08 ft.)
- Shale <Fossiliferous> (8.08-9.21 ft.)

**Cherryvale Fm.:** (Total Thickness: 17.21 ft.)
- Block Limestone Mbr.: (9.21-13.92 ft.)
  - Wackestone (9.21-12.13 ft.)
  - Phylloid Bafflestone/Wackestone (12.13-13.92 ft.)
- Fontana Shale Mbr.: (13.92-26.42 ft.)
  - Shale <Fossiliferous> (13.92-14.08 ft.)
  - Shale (14.08-19.40 ft.)
  - Shale <Fossiliferous> (19.40-19.58 ft.)
  - Shale (19.58-25.98 ft.)
  - Shale <Fossiliferous> (25.98-26.42 ft.)
- Dennis Lst.: (Total Thickness: 41.62 ft.)
  - Winterset Limestone Mbr.: (26.42-62.0 ft.)
    - Wackestone (26.42-29.92 ft.)
    - Shale <Fossiliferous> (29.92-30.0 ft.)
    - Wackestone (30.0-31.40 ft.)
    - Shale <Fossiliferous> (31.40-31.5 ft.)
    - Wackestone (31.5-32.0 ft.)
    - Shale <Fossiliferous> (32.0-32.13 ft.)
    - Wackestone (32.13-33.04 ft.)
    - Shale <Fossiliferous> (33.04-33.13 ft.)
    - Wackestone (33.13-35.35 ft.)
    - Shale <Fossiliferous> (35.35-35.54 ft.)
    - Wackestone (35.54-37.13 ft.)
    - Shale <Fossiliferous> (37.13-37.73 ft.)
    - Wackestone <Oolitic> (37.73-39.69 ft.)
    - Oolitic Grainstone (39.69-42.35 ft.)
    - Shale (42.35-42.90 ft.)
    - Calcareous Shale (42.90-43.25 ft.)
    - Wackestone <Calcilutite> (43.25-49.10 ft.)
    - <Birds Eye; 44.54-45.5, 46.63-47.0 ft.>
    - <Interbedded Carb./Mud; 43.25-43.83 ft., 45.75-46.5 ft.>
    - Wackestone (49.10-50.71 ft.)
    - <Silicification, 50.25-50.58 ft.>
    - Phylloid Bafflestone/Wackestone (50.71-55.0 ft.)
    - Wackestone (55.0-59.15 ft.)
    - Shale <Fossiliferous> (59.15-59.38 ft.)
    - Wackestone (59.38-60.08 ft.)
    - Shale <Fossiliferous> (60.08-60.21 ft.)
    - Wackestone (60.21-61.48 ft.)
    - Shale <Fossiliferous> (61.48-61.73 ft.)
    - Wackestone (61.73-62.0 ft.)
- Stark Shale Mbr.: (62.0-67.44 ft.)
  - Shale <Fossiliferous> (62.0-62.25 ft.)
  - Shale (62.25-67.44 ft.)
- Canville Limestone Mbr.: (67.44-68.04 ft.)
  - Packstone <Argillaceous>

**Core Logged and Illustrated by:** Stephan C. Oborny, University of Iowa
**Galesburg Shale:** (Total Thickness: 4.63 ft.)
- Shale <Fossiliferous> (68.04-68.30 ft.)
- Shale (68.30-70.67 ft.)
- Wackestone Intraclast (70.67-71.60 ft.)
  - <Birds Eye within Intraclast>
- Mudstone (71.60-71.85 ft.)
- Interbedded Carb Intraclast/Mud (71.85-72.44 ft.)
  - <Birds Eye within Intraclast>
- Mudstone (72.44-72.67 ft.)

**Swope Limestone:** (Total Thickness: 24.08 ft.)
- *Bethany Falls Limestone Mbr.*: (72.67-90.63 ft.)
  - Oolitic Grainstone (72.67-76.71 ft.)
  - Wackestone (76.71-76.25 ft.)
    - <Abundant Stylolitization>
  - Shale <Fossiliferous> (72.25-87.42 ft.)
  - Wackestone (87.42-88.0 ft.)
  - Shale <Fossiliferous> (88.0-88.08 ft.)
  - Wackestone (88.08-88.67 ft.)
  - Shale <Fossiliferous> (88.67-89.0 ft.)
  - Phylloid Bafflestone/Wackestone (89.0-90.33 ft.)
  - Wackestone (90.33-90.63 ft.)
- *Hushpuckney Shale Mbr.*: (90.63-95.15 ft.)
  - Shale <Fossiliferous> (90.63-91.0 ft.)
  - Shale <Black, Fissile> (91.0-94.90 ft.)
  - Shale <Fossiliferous> (94.90-95.15 ft.)
- *Middle Creek Limestone Mbr.*: (95.15-96.75 ft.)
  - Wackestone

**Elm Branch Shale:** (Total Thickness: 0.92 ft.)
- Shale <Fossiliferous> (96.75-97.22 ft.)
- Shale (97.22-97.67 ft.)
KDOT: M-62A Core, Miami County, NE Kansas

**Lithostratigraphy**

<table>
<thead>
<tr>
<th>Series</th>
<th>Stage</th>
<th>Group</th>
<th>Formation &amp; Member</th>
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<th>KID: 1035023983</th>
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<td>Upper Pennsylvania</td>
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<td>Stark Shale Mbr.</td>
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<td>Fe-Staining: 7’6”-14’3” ft (7.5-14.30 ft.)</td>
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<td>Nellie Bly Fm.: (Total Thickness: 1.71 ft.)</td>
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<td>Shale (7.5-8.08 ft.)</td>
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<td>Shale &lt;Fossiliferous&gt; (8.08-9.21 ft.)</td>
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<td>Cherryvale Fm.: (Total Thickness: 17.21 ft.)</td>
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<td>Fontana Shale Mbr.: (13.92-26.42 ft.)</td>
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<td>Shale (13.92-14.08 ft.)</td>
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<td>Wackestone (26.42-29.92 ft.)</td>
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<td>Shale (42.35-42.90 ft.)</td>
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<td>Calcereous Shale (42.90-43.25 ft.)</td>
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<td>Wackestone &lt;Calcilitite&gt; (43.25-49.10 ft.)</td>
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<td>&lt;Birds Eye; 44.54-45.5, 46.63-47.0 ft.&gt;</td>
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<td>&lt;Interbedded Carb./Mud; 43.25-43.83 ft., 45.75-46.5 ft.&gt;</td>
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<td>&lt;Silicification, 50.25-50.58 ft.&gt;</td>
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<td>Wackestone (59.38-60.08 ft.)</td>
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<td>Shale &lt;Fossiliferous&gt; (60.08-60.21 ft.)</td>
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<td>Stark Shale Mbr.: (62.0-67.44 ft.)</td>
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<td>Shale &lt;Fossiliferous&gt; (62.0-62.25 ft.)</td>
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<td>Canville Limestone Mbr.: (67.44-68.04 ft.)</td>
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<td>Packstone &lt;Argillaceous&gt;</td>
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</table>

**Note:** NE corner of 375th Rd. & Spring Valley Rd.

Core Logged and Illustrated by: Stephan C. Oborny, University of Iowa
**Galesburg Shale:** (Total Thickness: 4.63 ft.)
- Shale \(<\text{Fossiliferous}>\) (68.04-68.30 ft.)
- Shale (68.30-70.67 ft.)
- Wackestone Intraclast (70.67-71.60 ft.)
  - \(<\text{Birds Eye within Intraclast}>\)
- Mudstone (71.60-71.85 ft.)
- Interbedded Carb Intraclast/Mud (71.85-72.44 ft.)
  - \(<\text{Birds Eye within Intraclast}>\)
- Mudstone (72.44-72.67 ft.)

**Swpepe Limestone:** (Total Thickness: 24.08 ft.)
- *Bethany Falls Limestone Mbr.:* (72.67-90.63 ft.)
  - Oolitic Grainstone (72.67-76.71 ft.)
  - Wackestone (76.71-78.25 ft.)
  - \(<\text{Abundant Stylolitization}>\)
- Shale \(<\text{Fossiliferous}>\) (78.25-78.42 ft.)
- Wackestone (78.42-88.0 ft.)
- Shale \(<\text{Fossiliferous}>\) (88.0-88.08 ft.)
- Wackestone (88.08-88.67 ft.)
- Shale \(<\text{Fossiliferous}>\) (88.67-89.0 ft.)
- Phylloid Bafflestone/Wackestone (89.0-90.33 ft.)
- Wackestone (90.33-90.63 ft.)
- *Hushpuckney Shale Mbr.:* (90.63-95.15 ft.)
  - Shale \(<\text{Fossiliferous}>\) (90.63-91.0 ft.)
  - Shale \(<\text{Black, Fissile}>\) (91.0-94.90 ft.)
  - Shale \(<\text{Fossiliferous}>\) (94.90-95.15 ft.)
- *Middle Creek Limestone Mbr.:* (95.15-96.75 ft.)
  - Wackestone

**Elm Branch Shale:** (Total Thickness: 0.92 ft.)
- Shale \(<\text{Fossiliferous}>\) (96.75-97.22 ft.)
- Shale (97.22-97.67 ft.)
**Lithostratigraphy**

**Conodont Zones**

**Series** | **Stage** | **Group** | **Formation & Member** | **Idiognathodus condensatus**
---|---|---|---|---
Upper Pennsylvanian | Missourian | Kansas City Group | Boone Subgroup | Stark Shale Mbr.

**KID:** 1035180100  
**Location:** T19S R24E, Sec. 1 SE SW SE  
**Longitude:** -94.7014965°  
**Latitude:** 38.4190457°  
**Elevation:** 973 GL  
**Total Depth:** 69 feet  
**Note:** N. side of 391st Rd., 0.3 mi W. of Jingo Rd.

**Dennis Lst.:** (Total Thickness: 33.67 ft.)
- Wackestone (2.0-2.08 ft.)  
- Shale <Fossiliferous> (2.08-2.21 ft.)  
- Wackestone (2.21-3.35 ft.)  
  - Phylloid Bafflestone/Wackestone (2.35-5.0 ft.)  
    - Wackestone (5.0-5.65 ft.)
    - Shale <Fossiliferous> (5.65-6.0 ft.)
    - Wackestone (6.0-8.42 ft.)  
      - <Argillaceous; 6.67-6.73 ft.>
      - Grainstone <oolitic> (8.42-8.92 ft.)  
      - Wackestone (8.92-17.42 ft.)  
        - Phylloid Bafflestone/Wackestone (17.42-18.58)  
          - <oolitic>
          - Wackestone (18.58-19.42 ft.)  
            - <oolitic>
            - Phylloid Bafflestone/Wackestone (19.42-22.23 ft.)  
              - Wackestone (22.23-23.54 ft.)
              - Phylloid Bafflestone/Wackestone (23.54-24.13 ft.)
              - Wackestone (24.13-26.38 ft.)
              - Phylloid Bafflestone/Wackestone (26.38-28.04 ft.)
              - Shale <Fossiliferous> (28.04-28.32 ft.)
              - Wackestone (28.32-28.63 ft.)
              - Shale <Fossiliferous> (28.63-28.71 ft.)
              - Wackestone (28.71-29.83 ft.)

- Stark Shale Mbr.: (29.83-35.19 ft.)
  - Shale <Fossiliferous> (29.83-30.46 ft.)
  - Shale (30.46-35.19 ft.)

- Canville Limestone Mbr.: (35.19-35.67 ft.)
  - Shale <Fossiliferous; Calcareous> (35.19-35.33 ft.)
  - Shale (35.33-35.67 ft.)

- Galesburg Shale: (Total Thickness: 1.65 ft.)
  - Mudstone <Greenish Coloration> (35.67-37.32 ft.)

- Swope Limestone: (Total Thickness: 25.93 ft.)
  - Bethany Falls Limestone Mbr.: (37.32-56.83 ft.)
    - Wackestone
      - <Abundant Stylolitization throughout>
      - <Oolitic, 39.83-42.1 ft.; Birds eye, 39.75-42.0 ft.>
      - <Argillaceous, 53.19-53.30 ft., 54.30-54.75 ft., 54.85-55.17 ft., 55.33-55.54 ft.>
  - Hushpuckney Shale Mbr.: (56.83-61.25 ft.)
    - Shale <Black, Fissile>
    - Shale <Fossiliferous> (61.19-61.25 ft.)
  - Middle Creek Limestone Mbr.: (61.25-63.25 ft.)
    - Wackestone
      - <Argillaceous; 62.25-62.38 ft.>

- Elm Branch Shale: (Total Thickness: 5.0 ft.)
  - Shale <blocky> (63.25-65.58 ft.)
  - Mudstone <Green Coloration> (65.58-66.88 ft.)
  - Shale (66.88-68.25 ft.)

**Kansas City Group**

Core Logged and Illustrated by: Stephan C. Oborny, University of Iowa
Kansas City Group
Bronson Subgroup
Linn Sbgp.
Stark Shale Mbr.

Wackestone
Phylloid Bafflestone/Wackestone
Packstone
Ooid Grainstone
Silty Shale
Siltstone
Shale
Silty Mudstone
Calcareous Siltstone
Mudstone

KDOT: M-74 Core, Miami County, NE Kansas

Cherryvale Fm.: (Total Thickness: 17.71 ft.)
Block Limestone Mbr.: (6.08-10.21 ft.)
Wackestone
Fontana Shale Mbr.: (10.21-23.79 ft.)
Shale (10.21-15.17 ft.)
Shale <Fossiliferous> (15.17-15.38 ft.)
Shale (15.38-23.13 ft.)
Shale <Fossiliferous> (23.13-23.79 ft.)

Dennis Lst.: (Total Thickness: 41.63 ft.)
Winterset Limestone Mbr.: (23.79-60.21 ft.)
Packstone (23.79-24.10 ft.)
<Argillaceous, 23.94-24.10 ft.>
Wackestone (24.10-24.46 ft.)
Phylloid Bafflestone/Wackestone (24.46-24.92 ft.)
Wackestone (24.92-26.04 ft.)
Shale <Fossiliferous> (26.04-26.10 ft.)
Wackestone (26.10-30.21 ft.)
Shale <Fossiliferous> (30.21-30.30 ft.)
Wackestone (30.30-32.94 ft.)
Shale <Fossiliferous> (32.94-33.10 ft.)
Wackestone <Oolitic> (33.10-34.58 ft.)
Shale <Fossiliferous> (34.58-35.19 ft.)
Wackestone (35.19-36.52 ft.)
Phylloid Bafflestone/Wackestone (36.52-36.75 ft.)
Packstone (36.75-37.88 ft.)
Shale <Fossiliferous> (37.88-38.33 ft.)
Mudstone (38.33-38.75 ft.)
Wackestone (38.75-43.67 ft.)
<birds eye (39.75-41.5 ft.)>
Packstone (43.67-44.04 ft.)
Shale <Fossiliferous> (44.04-44.15 ft.)
Phylloid Bafflestone/Wackestone (44.15-45.54 ft.)
Wackestone (45.54-46.17 ft.)
Phylloid Bafflestone/Wackestone (46.17-49.33 ft.)
Wackestone (49.33-55.33 ft.)
Packstone (55.33-55.9 ft.)
Phylloid Bafflestone/Wackestone (55.9-58.75 ft.)
Packstone (58.75-59.0 ft.)
Wackestone (59.0-59.38 ft.)
Shale <Fossiliferous> (59.38-59.71 ft.)
Wackestone (59.71-60.21 ft.)

Stark Shale Mbr.: (60.21-64.81 ft.)
Shale <Fossiliferous> (60.21-60.38 ft.)
Shale (60.38-64.81 ft.)
Canville Limestone Mbr.: (64.81-65.42 ft.)
Packstone <Argillaceous> (64.81-65.10 ft.)
Wackestone (65.10-65.42 ft.)
**KDOT: M-75 Core, Miami County, NE Kansas**

**KID:** 1035180103  
**Location:** T15S R24E, Sec. 24 NW NW NW  
**Longitude:** -94.7034935°  
**Latitude:** 38.7371884°  
**Elevation:** 1123 GL  
**Total Depth:** 69 feet  
**Note:** E. side of Switzer Rd., just N. of R.R. Tracks, E. of town of Bucyrus

**Fe-Staining:** 6'10"~12'2" (6.08-12.17 ft.)  
Moderate friability

**Stanton Limestone:** (Total Thickness: 20.92 ft.)  
- Stoner Limestone Mbr.: (6.08-12.0 ft.)  
- Phylloid Bafflestone/Wackestone  
- Eudora Shale Mbr.: (12.0-15.96 ft.)  
  - Shale; several different weathering profiles are visible within the shale unit.  
- Captain Creek Lst. Mbr.: (15.96-27.0 ft.)  
  - Phylloid Bafflestone/Wackestone

**Vilas Shale:** (Total Thickness: 21.0 ft.)  
- Silty Mudstone (27.0-29.12 ft.)  
- Interbedded Silt/Shale (29.12-29.5 ft.)  
- Siltstone (29.5-32.0 ft.)  
- Interbedded Silt/Shale (32.0-40.17 ft.)  
- Silty Mudstone (40.17-43.0 ft.)  
- Interbedded Silt/Shale (43.0-47.5 ft.)  
- Mudstone (47.5-48.0 ft.)

**Plattsburg Limestone:** (Total Thickness: 13.87 ft.)  
- Spring Hill Limestone Mbr.: (48.0-59.25 ft.)  
  - Wackestone (48.0-50.08 ft.)  
  - Packstone (50.08-53.0 ft.)  
- Wackestone (53.0-59.25 ft.)  
- Hickory Creek Shale Mbr.: (59.25-59.58 ft.)  
- Shale  
- Merriam Limestone Mbr.: (59.58-61.87 ft.)  
  - Wackestone (59.58-61.08 ft.)  
  - Packstone (61.08-61.5 ft.)  
- Fossiliferous Shale (61.5-61.71 ft.)  
- Packstone (61.71-61.87 ft.)

**Lane Shale** (Total Thickness: 7.63 ft.)  
- Bonner Springs Shale Mbr.: (61.87–69.5 ft.)  
  - Calcareous Siltstone (61.87-63.17 ft.)  
  - Interbedded Silt/Shale (63.17-63.92 ft.)  
  - Siltstone (63.92-65.17 ft.)  
- Calcareous Siltstone (65.17-66.75 ft.)  
- Shale (66.75-67.37 ft.)  
  - Calcareous Siltstone (67.37-69.5 ft.); green in coloration.

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**Core Logged and Illustrated by:** Stephan C. Oborny, University of Iowa
Lithostratigraphy

Conodont Zone

Missourian

Upper Pennsylvanian

Kansas City Group

Zarah Subgroup

Lane Shale

Wynandotte Lst.

Argentine Limestone Mbr.

Island Creek Shale Mbr.

Quindaro Sh. Mbr.

Fe-Staining: 6’8”-~26’5” (6.67-26.42 ft.)

Lane Shale (Total Thickness: 30.87 ft.)

Bonner Springs Shale Mbr.: (6.67-33.17 ft.)

Upper Farley Limestone Mbr.: (7.08-27.92 ft.)

Phylloid Bafflestone/Wackestone (7.08-27.92 ft.)

Packstone (27.92-28.25 ft.)

Middle Farley Shale Mbr.: (28.25-28.42 ft.)

Shale <fossiliferous> (28.25-28.42 ft.)

Lower Farley Shale Mbr.: (28.42-33.17 ft.)

Phylloid Bafflestone/Wackestone (28.42-33.17 ft.)

Island Creek Shale Mbr.: (33.17-37.5 ft.)

Shale <fossiliferous> (33.17-33.25 ft.)

Wackestone (33.25-33.42 ft.)

Shale <fossiliferous> (33.42-33.54 ft.)

Phylloid Bafflestone/Wackestone (33.54-37.5 ft.)

Shale <fossiliferous> (37.5-37.54 ft.)

Wyandotte Limestone (Total Thickness: 41.46 ft.)

Argentine Limestone Mbr.: (37.54-78.92 ft.)

Phylloid Bafflestone/Wackestone (37.54-77.0 ft.)

Wackestone (77.0-78.92 ft.)

Osagia (78.0-78.5 ft.)

Quindaro Shale Mbr.: (78.92-79.0 ft.)

Calcareous Siltstone

Core Logged and Illustrated by: Stephan C. Oborny, University of Iowa

Undifferentiated Lane Sh. & Wyandotte Lst.
(Total Thickness: 49.85 ft.)
* Bonner Springs Shale Mbr.: (6.5-6.83 ft.)
  Shale
  *Upper Farley Lst. Mbr.: (6.83-14.42 ft.)
    Phylloid Bafflestone/Wackestone
    <Dissolution Common, 2” Silicification @ ~11.5 ft.>
    Fossiliferous Shale (12.42-12.5 ft.)
    Phylloid Bafflestone/Wackestone (12.5-13.96 ft.)
    <Dissolution Common>
    Shale (13.96-14.04 ft.)
    Phylloid Bafflestone/Wackestone (14.04-14.42 ft.)
  *Middle Farley Shale Mbr.: (14.42-15.08 ft.)
    Fossiliferous Shale (14.42-14.85 ft.)
    Packstone <Argillaceous> (14.85-15.0 ft.)
    Fossiliferous Shale (15.0-15.08 ft.)
  *undifferentiated Lower Farley & Argentine Lst. mbrs.:
    (15.08-51.0 ft.)
    Phylloid Bafflestone/Wackestone (15.08-35.08 ft.)
    <Dissolution Common, 18.08-19.42 ft.>
    <Abundant Dissolution, 19.92-24.0 ft.>
    <Silicification, 20.75-21.0 & 22.75-23.17 ft.>
    Wackestone (35.08-51.0 ft.)
    <Silicification, @ ~39.33 & 41.42 ft.>
  *Quindaro Shale Mbr.: (51.0-53.58 ft.)
    Fossiliferous Shale
    Packstone (52.21-52.54 ft.)
    Packstone <Argillaceous> (52.54-53.21 ft.)
    Packstone (53.21-53.5 ft.)
    Fossiliferous Shale (53.5-53.58 ft.)
  *Frisbie Limestone Mbr.: (53.58-56.35 ft.)
    Wackestone (53.58-55.83 ft.)
    Packstone <Silty> (55.83-56.35 ft.)
  *Liberty Memorial Shale (Total Thickness: 3.15 ft.)
    Calcareous Siltstone (56.35-57.83 ft.)
    Interbedded Silt/Shale (57.83-59.5 ft.)
KDOT: M-78 Core, Miami County, NE Kansas

KID: 10351800107
Location: T17S R22E, Sec. 17 SE SE SE
Longitude: -94.9934097°
Latitude: 38.5650817°
Elevation: 1080 ft.
Total Depth: 140 feet
Note: W. side of Bethel Church Rd., 100 yds N. of 311th Rd.

Fe-Staining: 4’6”- 10’10” (4.50-10.83 ft.)
Stanton Limestone: (Total Thickness: 6.13 ft.)
Captain Crk Lst. Mbr.: (4.50-10.63 ft.)
Wackestone (7.92-10.63 ft.)
Vilas Shale: (Total Thickness: 4.62 ft.)
Shale <No Silt> (10.63-15.25 ft.)
Plattsburg Limestone: (Total Thickness: 21.71 ft.)
Spring Hill Limestone Mbr.: (15.25-33.58 ft.)
Packstone <Osagia coating> (15.25-17.92 ft.)
Shale <Fossiliferous> (17.92-18.25 ft.)
Packstone <Osagia coating> (18.25-24.92 ft.)
<Brachiopod Packstone; 24.0-24.58 ft.>
Grainstone <Oolitic> (24.92-28.08 ft.)
Wackestone (28.08-28.50 ft.)
Wackestone (28.50-33.58 ft.)

Hickory Creek Shale Mbr.: (33.58-33.67 ft.)
Shale <Fossiliferous>
Merriam Limestone Mbr.: (33.67-36.96 ft.)
Wackestone (33.67-36.04 ft.)
Packstone (36.04-36.96 ft.)
< Mud Increase; 36.33-36.58 ft.>

Lane Shale (Total Thickness: 100.37 ft.)

Bonner Springs Shale Mbr.: (36.96 –61.04 ft.)
Silty Shale (36.96-41.0 ft.)
Calcareous Siltstone (41.0-42.79 ft.)
Silty Shale (42.79-46.54 ft.)
< Nodules; 43.08-43.46 ft.>
Siltstone (46.54-49.21 ft.)
Silty Shale (49.21-50.88 ft.)
Interbedded Silt/Shale (50.88-61.04 ft.)

Upper Farley Limestone Mbr.: (61.04-73.08 ft.)
Phylloid Bafflestone/Wackestone (61.04-71.75 ft.)
<Intraclast; 62.71-68.33 ft.>
Wackestone (71.75-73.08 ft.)
Middle Farley Shale Mbr.: (73.08 –137.33 ft.)
  Siltstone (73.08-77.83 ft.)
  Silty Shale (77.83-78.88 ft.)
  Coal (78.88-79.08 ft.)
  Silty Shale (79.08-81.34 ft.)
  Coal <Most Developed Coal> (81.34-81.50 ft.)
  Silty Shale (81.34-83.19 ft.)
  Coal (83.19-83.33 ft.)
  Silty Shale <Coaly> (83.33-84.33 ft.)
  Calcareous Siltstone (84.33-86.58 ft.)
  Sandstone <Fine> (86.58-89.30 ft.)
  Calcareous Siltstone (89.30-89.88 ft.)
  Sandstone <Fine> (89.88-91.33 ft.)
  Calcareous Siltstone (91.33-92.0 ft.)
  Interbedded Fine Sand/Shale (92.0-107.5 ft.)
  Calcareous Siltstone (107.5-107.75 ft.)
  Interbedded Silt/Shale (107.75-111.21 ft.)
  Calcareous Siltstone (111.21-111.58 ft.)
  Interbedded Silt/Shale (111.58-111.88 ft.)
  Calcareous Siltstone (111.88-112.25 ft.)
  Interbedded Silt/Shale (112.25-116.96 ft.)
  Calcareous Siltstone (116.96-118.67 ft.)
  Interbedded Silt/Shale (118.67-123.33 ft.)
  Calcareous Siltstone (123.33-126.08 ft.)
  Interbedded Silt/Shale (126.08-137.33 ft.)
**Lithostratigraphy**

<table>
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<th>Stage</th>
<th>Group</th>
<th>Formation &amp; Member</th>
<th>Conodont Zone</th>
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<td><strong>Kansas City Group</strong></td>
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<td><strong>Spring Hill Limestone Mbr.</strong></td>
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**KID:** 10351800107  
**Location:** T17S R22E, Sec. 17 SE SE SE  
**Longitude:** -94.9934097”  
**Latitude:** 38.5650817”  
**Elevation:** 1080 GL  
**Total Depth:** 140 feet  
**Note:** W. side of Bethel Church Rd., 100 yrs N. of 311th Rd.

**Fe-Staining:** 4’6” - 10’10” (4.50-10.83 ft.)  
**Stanton Limestone:** (Total Thickness: 6.13 ft.)  
- Captain Crk Lst. Mbr.: (4.50-10.63 ft.)  
  - Phylloid Bafflestone/Wackestone (4.50-7.92 ft.)  
  - Wackestone (7.92-10.63 ft.)  
**Vilas Shale:** (Total Thickness: 4.62 ft.)  
- Shale <No Silt> (10.63-15.25 ft.)

**Plattsburg Limestone:** (Total Thickness: 21.71 ft.)  
- Spring Hill Limestone Mbr.: (15.25-33.58 ft.)  
  - Packstone <Osagia coating> (15.25-17.92 ft.)  
  - Shale <Fossiliferous> (17.92-19.42 ft.)  
  - Packstone <Osagia coating> (18.25-24.92 ft.)  
  - Grainstone <Oolitic> (24.92-28.08 ft.)  
  - Phylloid Bafflestone/Wackestone (28.08-28.50 ft.)  
  - Wackestone (28.50-33.58 ft.)  
**Hickory Creek Shale Mbr.:** (33.58-37.64 ft.)  
  - Shale <Fossiliferous>  
  - Merriam Limestone Mbr.: (33.67-36.96 ft.)  
    - Wackestone (33.67-36.04 ft.)  
    - Packstone (36.04-36.96 ft.)  
    - <Mud Increase; 36.33-36.58 ft.>

**Lane Shale** (Total Thickness: 100.37 ft.)  
- Bonner Springs Shale Mbr.: (36.96 – 61.04 ft.)  
  - Silty Shale (36.96-41.0 ft.)  
  - Calcareous Siltstone (41.0-42.79 ft.)  
  - Silty Shale (42.79-46.54 ft.)  
  - <Nodules; 43.08-43.46 ft.>  
  - Siltstone (46.54-49.21 ft.)  
  - Silty Shale (49.21-50.88 ft.)  
  - Interbedded Silt/Shale (50.88-61.04 ft.)  
**Upper Farley Limestone Mbr.:** (61.04-73.08 ft.)  
  - Phylloid Bafflestone/Wackestone (61.04-71.75 ft.)  
  - <Intraclast; 62.71-68.33 ft.>  
  - Wackestone (71.75-73.08 ft.)
Middle Farley Shale Mbr.: (73.08 –137.33 ft.)
  Siltstone (73.08-77.83 ft.)
  Silty Shale (77.83-78.88 ft.)
  Coal (78.88-79.08 ft.)
  Silty Shale (79.08-81.34 ft.)
  Coal <Most Developed Coal> (81.34-81.50 ft.)
  Silty Shale (81.34-83.19 ft.)
  Coal (83.19-83.33 ft.)
  Silty Shale <Coaly> (83.33-84.33 ft.)
  Calcareous Siltstone (84.33-86.58 ft.)
  Sandstone <Fine> (86.58-89.30 ft.)
  Calcareous Siltstone (89.30-89.88 ft.)
  Sandstone <Fine> (89.88-91.33 ft.)
  Calcareous Siltstone (91.33-92.0 ft.)
  Interbedded Fine Sand/Shale (92.0-107.5 ft.)
  Calcareous Siltstone (107.5-107.75 ft.)
  Interbedded Silt/Shale (107.75-111.21 ft.)
  Calcareous Siltstone (111.21-111.58 ft.)
  Interbedded Silt/Shale (111.58-111.88 ft.)
  Calcareous Siltstone (111.88-112.25 ft.)
  Interbedded Silt/Shale (112.25-116.96 ft.)
  Calcareous Siltstone (116.96-118.67 ft.)
  Interbedded Silt/Shale (118.67-123.33 ft.)
  Calcareous Siltstone (123.33-126.08 ft.)
  Interbedded Silt/Shale (126.08-137.33 ft.)
Fe-Staining: 2’2”-10’7.75” ft (2.17-10.65 ft.)

**Dennis Lst.:** (Total Thickness: 13.73 ft.)

- *Winterset Limestone Mbr.:* (2.17-10.13 ft.)
  - Phylloid Bafflestone/Wackestone (2.17-7.30 ft.)
  - Shale <Fossiliferous> (7.30-7.38 ft.)
  - Wackestone (7.38-9.75 ft.)
  - <Argillaceous; 7.38-9.44 ft.>
  - Shale <Fossiliferous> (9.75-9.83 ft.)
  - Wackestone (9.83-10.13 ft.)

- *Stark Shale Mbr.:* (10.13-15.58 ft.)
  - Shale <Fossiliferous> (10.13-10.81 ft.)
  - Shale (10.81-15.58 ft.)

- *Canville Limestone Mbr.:* (15.58-15.90 ft.)
  - Packstone <Argillaceous> (15.58-15.71 ft.)
  - Shale <Fossiliferous> (15.71-15.83 ft.)
  - Packstone <Argillaceous> (15.83-15.90 ft.)

**Galesburg Shale:** (Total Thickness: 3.04 ft.)

- Shale <Fossiliferous> (15.90-16.15 ft.)
- Shale (16.15-16.40 ft.)
- Mudstone (16.40-18.94 ft.)

**Swope Limestone:** (Total Thickness: 25.04 ft.)

- *Bethany Falls Limestone Mbr.:* (18.94-37.73 ft.)
  - Wackestone <Oolitic> (18.94-23.25 ft.)
  - Wackestone <Calciulutite> (23.25-24.79 ft.)
  - <Abundant Stylolitization>
  - Wackestone (24.79-37.73 ft.)
  - <Argillaceous; 34.88-35.04 ft., 35.94-36.21 ft.,
  36.54-36.88 ft.>
  - <Abundant Stylolitization; 34.08-48.42 ft.>
  - *Hushpuckney Shale Mbr.:* (37.73-41.68 ft.)
  - Shale <Black, Fissile> (37.73-41.42 ft.)
  - Shale <Fossiliferous> (41.42-41.68 ft.)

- *Middle Creek Limestone Mbr.:* (41.69-43.98 ft.)
  - Wackestone
  - <Argillaceous; 41.92-42.15 ft., 43.67-43.88 ft.>

**Elm Branch Shale:** (Total Thickness: 2.02 ft.)

- Shale <vf fossils> (43.98-45.13 ft.)
- Grainstone (45.13-46.0 ft.)
KDOT: M-81 Core, Miami County, NE Kansas

Fe-Staining: 8’9.5”-25’7” (8.75-25.58 ft.)

Southbend Limestone: (Total Thickness: 4.75 ft.)
- Little Kaw Limestone Mbr.: (8.79-13.54 ft.)
  - Wackestone (8.79-11.71 ft.)
  - Ooid Grainstone (11.71-12.33 ft.)
  - Wackestone <Oolitic> (12.33-12.54 ft.)
  - Ooid Grainstone (12.54-12.67 ft.)
  - Sandstone <V-Fine> (12.67-12.79 ft.)
  - Wackestone (12.79-12.90 ft.)
  - Sandstone <V-Fine> (12.90-13.04 ft.)
  - Wackestone (13.04-13.21 ft.)
  - Sandstone <V-Fine> (13.21-13.54 ft.)

Rock Lake Shale: (Total Thickness: 0.98 ft.)
- Shale (13.54-14.52 ft.)

Stanton Limestone: (Total Thickness: 30.48 ft.)
- Stoner Limestone Mbr.: (14.52-28.08 ft.)
  - Wackestone
- Eudora Shale Mbr.: (28.08-34.38 ft.)
  - Shale <Fossiliferous> (28.08-28.30 ft.)
  - Shale <Fissile> (28.30-33.83 ft.)
  - Shale <Fossiliferous> (33.83-34.38 ft.)
- Captain Creek Lst. Mbr.: (34.38-45.0 ft.)
  - Wackestone <Argillaceous> (34.38-34.63 ft.)
  - Wackestone (34.63-35.21 ft.)
  - Wackestone (35.21-35.44 ft.)
  - Wackestone (35.44-35.81 ft.)
  - Packstone (35.81-36.0 ft.)
  - Wackestone (36.0-45.0 ft.)

Vilas Shale: (Total Thickness: 6.38 ft.)
- Silty Shale (45.0-45.33 ft.)
- Calcareous Siltstone <Coarse> (45.33-45.5 ft.)
- Silty Shale (45.5-46.0 ft.)
- Calcareous Siltstone <Coarse> (46.0-46.17 ft.)
- Siltstone <Coarse; Trough Cross Bedding> (46.17-48.13 ft.)
- Calcareous Siltstone <Coarse> (48.13-48.96 ft.)
- Silty Shale (48.96-51.08 ft.)
- Shale <Fossiliferous> (51.08-51.38 ft.)

Plattsburg Limestone: (Total Thickness: 20.08 ft.)
- Spring Hill Limestone Mbr.: (51.38-70.71 ft.)
  - Wackestone <Osagia coating> (51.38-52.5 ft.)
  - Shale <Fossiliferous> (52.5-52.92 ft.)
  - Grainstone (52.92-61.46 ft.)
  - Phylloid Bafflestone/Wackestone (54.83-55.17 ft.)
  - Phylloid Bafflestone/Wackestone (61.46-62.46 ft.)
  - Wackestone (62.46-70.71 ft.)
  - <Argillaceous> (64.25-64.67 ft.)
- Hickory Creek Shale Mbr.: (70.71-70.99 ft.)
  - Shale <Fossiliferous>
- Merrimac Limestone Mbr.: (70.79-71.46 ft.)
  - Wackestone (70.79-70.92 ft.)
  - Shale <Fossiliferous> (70.92-71.0 ft.)
  - Wackestone (71.0-71.46 ft.)

Lane Shale (Total Thickness: 2.87 ft.)
- Bonner Springs Shale Mbr.: (71.46-74.33 ft.)
  - Mudstone (71.46-73.33 ft.)
  - <Nodules: 72.17-72.59 ft., 73.0-73.58 ft.>
  - Calcareous Siltstone <Coarse> (73.33-74.33 ft.)
KDOT: M-82 Core, Miami County, NE Kansas

**KID:** 1035180112  
**Location:** T15S R22E, Sec. 30 SE NE NE  
**Longitude:** -95.00171°  
**Latitude:** 38.72086°  
**Elevation:** 1028 GL  
**Total Depth:** 55 feet  
**Note:** W. side of Sunflower Rd., 0.2 miles S. of 223rd Rd.

**Fe-Staining:** 9’9” 1/2” - 12’4” (9.79-12.33 ft.)

**South Bend Limestone** (Total Thickness: 2.54 ft.)  
*Little Kaw Limestone Mbr.* (9.79-12.33 ft.)  
Wackestone

**Rock Lake Shale:** (Total Thickness: 1.34 ft.)  
Sandstone: fine grain (12.33-12.58 ft.)  
Wackestone: (12.58-13.33 ft.)  
Sandstone: fine grain; fossiliferous (13.33-13.67 ft.)

**Stanton Limestone:** (Total Thickness: 33.08 ft.)  
*Stoner Limestone Mbr.* (13.67-30.92 ft.)  
Ooid-Grainstone: (13.67-15.87 ft.)  
Wackestone: (15.87-30.92 ft.)

**Eudora Shale Mbr.:** (30.92-36.42 ft.)  
Shale; top 3.5 inches and bottom 4 inches of shale is fossiliferous

**Captain Crk Lst. Mbr.:** (36.42-46.75 ft.)  
Phylloid Bafflestone/Wackestone: (36.42-42.08 ft.)  
mottled intraclast facies (36.42-39.5 ft.)  
Wackestone: (42.08-46.75 ft.)

**Vilas Shale:** (Total Thickness: 7.96 ft.)  
Calcareous Siltstone (46.75-49.37 ft.)  
Interbedded Silt/Shale (49.37-54.42 ft.); silt dominated  
Calcareous Siltstone (54.42-54.71 ft.)

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Core Logged and Illustrated by: Stephan C. Oborny, University of Iowa
Lithostratigraphy

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<th>Series</th>
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<th>Formation &amp; Member</th>
<th>Conodont Zone</th>
<th>KDOT ID: 4-061-08</th>
<th>Location: T16S R24E, Sec. 12 East Half; T16S R25E Sec. 7 West Half</th>
<th>Longitude: -94.6887527°</th>
<th>Latitude: 38.6745055°</th>
<th>Elevation: 1054 GL</th>
<th>Note: Composite Section, N. side of quarry</th>
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RWD2 Core, Miami County, NE Kansas

Fe-Staining: 23°9'-41°5' (23.75-41.42 ft.); Fe-filled vugs (23.75-33.25 ft.); friable (33.25-41.42 ft.)

Lane Shale: (Total Thickness: 23.54 ft.)
- Upper Farley Limestone Mbr.: (9.71-10.79 ft.)
- Wackestone (9.71-10.0 ft.)
- Drill Lag? (10.0-10.21 ft.)
- Wackestone (10.21-10.79 ft.)
- Middle Farley Shale Mbr.: (10.79 -13.0 ft.)
- Shale (0.58 ft. total); exact location unknown due to missing core; Core Missing (10.79-13.0 ft.)
- Lower Farley Limestone Mbr.: (13.0-13.88 ft.)
- Phylloid Bafflestone/Wackestone (13.0-13.88 ft.)
- Packstone (13.88-14.46 ft.)
- Wackestone (14.46-21.25 ft.)
- Wackestone (21.25-21.58 ft.)
- Phylloid Bafflestone/Wackestone (21.58-33.25 ft.)
- Island Creek Shale Mbr.: (Absent)

Wyandotte Limestone: (Total Thickness: 16.63 ft.)
- Argentine Limestone Mbr.: (33.25-47.92 ft.)
- Phylloid Bafflestone/Wackestone (33.25-38.92 ft.)
- Wackestone (38.92-47.67 ft.)
- Packstone (47.67-47.92 ft.)
- Quindaro Shale Mbr.: (47.92-50.96 ft.)
- Fossiferous Shale (47.92-48.46 ft.)
- Packstone (48.46-48.56 ft.)
- Fossiferous Shale (48.56-48.88 ft.)
- Wackestone (48.88-49.88 ft.)
- Fossiferous Shale (49.88-50.96 ft.)
- Friesie Limestone Mbr.: (50.96-53.21 ft.)
- Wackestone (50.96-51.33 ft.)
- Shale (51.33-51.38 ft.)
- Wackestone (51.38-52.30 ft.)
- Packstone (52.30-53.21 ft.)

Liberty Memorial Shale (Total Thickness: 51.46 ft.)
- Siltstone (53.21-57.17 ft.)
- Interbedded Silt/Shale (57.17-60.21 ft.)
- Calcareous Siltstone (60.21-61.04 ft.)
- Interbedded Silt/Shale (61.04-104.38 ft.)
- Fossiferous Shale (104.38-104.67 ft.)

Iola Limestone (Total Thickness: 9.29 ft.)
- Raytown Limestone Mbr.: (104.67 -111.0 ft.)
- Packstone (104.67-105.0 ft.)
- Wackestone (105.0-109.46 ft.)
- <Intraclast Facies? (107.67-108.58 ft.)>
- Phylloid Bafflestone/Wackestone (109.46-110.25 ft.)
- Wackestone (110.25-111.0 ft.)
- Muncie Creek Shale Mbr.: (111.0-111.38 ft.)
- Fossiferous Shale
- Paola Limestone Mbr.: (111.38-113.96 ft.)
- Wackestone

Chanute Shale (Total Thickness: 2.37 ft.)
- Shale (113.96-116.33 ft.)

Core Logged and Illustrated by: Stephan C. Oborny, University of Iowa