Pottawatomie County
63-75 FWS 87

GEOLOGIC REPORT
Project No. 63-75-1492 FWS 87
Pottawatomie County

November 27, 1938
From St. Marys, North

Formations to be Encountered:

Morrill Limestone (Rock Excavation) - A buff, fairly hard limestone with a molluscan fauna. Only one good outcrop of this limestone was found and it measures 1.6' thick.

Florena Shale (Common Excavation) - Hard, gray to olive green, calcareous shale. Contains abundant brachiopods and a fairly large amount of bryozoans. The thickness of this shale is 4.8'.

Cottonwood Limestone (Rock Excavation) - Gray to light gray and buff, massive to slabby bedding (massive when unweathered), contains an abundant amount of fusulinids and chert. The chert is mainly in the upper part. Medium grained and hard. Lower .4 to .7 shaley. The thickness of this limestone is fairly constant with a change from 6.1' to 6.5' with a good average thickness of 6.3'.

Eskridge Shale (Common Excavation) - Green and red shale. Shale is fairly hard, due somewhat to weathering. 7.0' below the Cottonwood Limestone (Top Eskridge sh.) is a .3' white limy hard shale. The average thickness is 33.5', varying from 32.3' - 34.8'.

Neva Limestone (Rock Excavation) - Gray to light buff limestone with some parts composed of buff and black shale. The upper 8.2' (varies 8.0'-8.5') is gray to light buff limestone, the upper 6.5'-6.7' is thin-bedded, in part platy, fine grained, unfossiliferous, shows vertical joints. At the base of this 8.2' Ls. is a 1.5'-2.0' massive ledge, which has a hard platy shale at the base ).3'-.5') containing fusulinids. Below this massive ledge with shale (gray buff) at the base is a black clay shale, usually about 1.5'. At the base of the black shale is a .7' hard, gray to buff, medium grained limestone. Below this .7' Ls. is 2.9' of gray and buff calcareous shale. The thickness of this may vary from 2.6'-3.3'. At the base of the Neva there is a 1.2' (1.0' 1.3') hard, fine grained blue-gray to buff limestone. The total thickness of the Neva Limestone is 14.7'.

Salem Point Shale (Common Excavation) - Gray and buff shale with one hard limy shale. The upper 3.1' (2.6'-3.5') is gray to buff calcareous shale with thin hard plates. Below this shale there is a 1.3' (1.0'-1.5') hard, buff, shaley limestone which would be classified as rock. Below this 1.3' shaley limestone is 3.5' (3.2'-3.8') gray, green gray shale, which is the base of the Salem Point Shale. The total average thickness is 8.0'.

Burr Limestone (Rock Excavation) - Gray to buff limestone, shaley limestone, buff and black shale. The upper 2.9' is divided, the upper 1.2 being a gray limestone, weathering into a roughly cubic shape, hard; the lower 1.7' is a gray shaley limestone. Underlying this upper 2.9' is 3.5' shale, which is divided; the upper .8'-1.0' being a buff shale and the lower 2.4'-2.8' a black shaley (clayey). The lower part of the Burr is a 3.2' Ls., gray to buff, fine grained, containing a few bryozoans and has a .3' gray shale parting in the middle. The total average thickness is 9.6'.

Roca Shale (Common Excavation) - The upper 4.5' is grey-green shale with some parts of black shale. Below this 4.5' is a 2.6' shaley limestone which is hard (Rock), gray-buff. The base of this is called Point B. Below this shaley limestone is green shale (10.9'). At the base of the green shale is a 2.5' of buff, very impure limestone. The classification of this limestone is rather difficult, it is fairly hard, yet it has so many solution holes that it may be classed as common excavation. Below this impure limestone is 2.5' shale, grey. The total average thickness os 24.0'.

Howe Limestone (Rock Excavation) - 1.1' of gray to buff limestone. Varies from a very impure limestone to a fairly hard and blocky member.

Bennett Shale (Common Excavation) - Gray and buff shale. Thickness is 6.0'.

Glenrock Limestone (Rock Excavation) - At the top is a 2.0' gray to buff limestone, below this limestone is 3.4' of hard platy gray shale, the basal part of this member is taken by a .6 gray ls. This whole member would be classified as rock without doubt. The thickness is 6.0'.

Johnson Shale (Common Excavation) - Gray, green and black shale. The black shale occurs at the top and is not persistent. The thickness of this shale is 16.5'.

Long Creek Limestone (Common Excavation) - This member is 6.0' thick and composed of gray and buff shale with an abundance of limy parts. The bedding is very irregular. This member would be classed as rock excavation.

Hughes Creek Shale (Common Excavation, with exceptions) - The Upper 7.1' of this member is gray and green shale, at the base there is a .7' light buff, limestone, fossiliferous (molluscan), below this .7' limestone is 1.7' gray shale, which has a 1.0' light buff limestone at its base. Both the .7' and the 1.0' limestones would be classified as rock. Below the 1.0' there is approximately 4.5' of gray shale, which has .2' gray to buff, gray to buff, 1.0' green-shale; .5' dark gray hard shale; .3' black hard limy shale; .3' dark gray clay shale; .6' (R) gray to buff fossiliferous (brachiopods, crinoid remains and molluscan), .8 gray shale; 1.1' (R) buff, massive hard, contains brachiopods, bryozoans; 3.4' gray sh.; 1.1' shaley limestone; the basal part of this member is gray, buff and green hard shale. The total thickness is 36.5'.

Americus Limestone (Rock Excavation) - Upper part is .9 buff massive limestone, contains an abundance of crinoid remains and other small fossil fragments. Below this upper limestone is 1.9' of buff (some black shale). The basal part of this member is a .5 light buff limestone, unfossiliferous. The average total thickness is 3.3'.

Oaks Shale (Common Excavation) - Gray and green shale. 23.0' thick.

Houchen Creek Limestone (Rock Excavation) - 2.3' of buff impure limestone. Upper .8' massive, lower 1.5' very impure with many solution holes.

Below the Houchen Creek Limestone there is a 42.7' interval that is covered.

West Branch Shale (Common Excavation) - Only the lower 8.4' of this member was found. The upper 1.2' is a platy grey limestone. Below this platy limestone is 4.7' of gray shale, then a .4' gray limestone. The base of the west Branch shale is 2.1' of gray shale.

Fall City Limestone (Rock Excavation) - The upper part of this formation is a 2.0' gray to buff, massive to slabby bedded limestone, contains bryozoans, brachiopods and crinoid remains. Below this limestone is 1.4' black shale. The basal part of this formation is a 1.2' gray to buff, fine-grained limestone. The thickness of this formation is 4.6'.

Hawaby Shale (Common Excavation) - The upper 12.0' of this formation is buff shale with small parts of black shale. Below this is: .4' gray limestone (R), .3' buff shale (R), .8' gray limestone (R), and 4. ' gray and buff shale as the basal part. The total thickness is 17.7'.

Aspinwall Limestone (Rock Excavation) - Gray to light buff, massive hard limestone 2.4' the only exposure found.

Directional Dip

The directional dip was obtained by taking elevations on the Cottonwood, Neva, Burr, and the Americus Limestones, in the main. All elevations were reduced to Point A (Neva Ls.).

The elevations when plotted and contoured did not reveal a definite uniform dip, but a rather irregular dip. However the dip stated in general directions would be to the northwest.

From Sta. 0-180 the dip was fairly uniform to the northwest. Stat. 180-390, revealed many irregularities which minor changes in direction of the dip. Irregularities in the dip are no doubt the result of convergence and divergence which is a reflection of the Pre-Cabrian granite ridge.

Hydrology

During the period that the field work was done on this project, no opportunity was presented to observe seepage zones. However, there are several places that might cause drainage problems, they are: Bottom CottonwoodLimestone, Neva Limestone-at base of two foot massive ledge and in the black shale, Burr Limestone, Americus Limestone, and the Fall City Limestone.

Remarks

The most outstanding problem on this project was the correlation of the different strata. Below the Burr Limestone the limestones were not definite and it was further complicated by many small limestones. In the final correlation use was made of intervals, keeping in mind the outstanding stratigraphic points. The names applied to the different formations are points of question, but the names were applied after serious study and in the best manner possible.

Another point that was very apparent in the field was the convergence and divergence of the shales. In some localities uniform conditions were totally lacking, limestone parts entering shales with no persistence.

There is a tendency in this locality for the shales to be very limy, thus hard enough in places to be classified as Rock Excavation.

One exposure of the Basal Stearns was found, it measured 2.0'.

Only the top of the Stine Sh. (green sh.) was found, below this is a 42.7' interval in which the Fine Point Limestone and the West Branch (less 8.4' at base) Sh. are not shown, as exposures could not be found.

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