FEBRUARY 1957

MEMORANDUM TO: MR. H. O. REED, ENGINEER OF DESIGN

FROM: MR. JOHN D. McNEAL, CHIEF GEOLOGIST
By Wallace Taylor, R. P. Stuart and
Paul Clark, Geologists
Vance L. Darland, Regional Geologist

SUBJECT: Geological Report
Project No. 13-75 S-311 (3), Part II
Station 331/50 to 783/00
Pottawatomie County

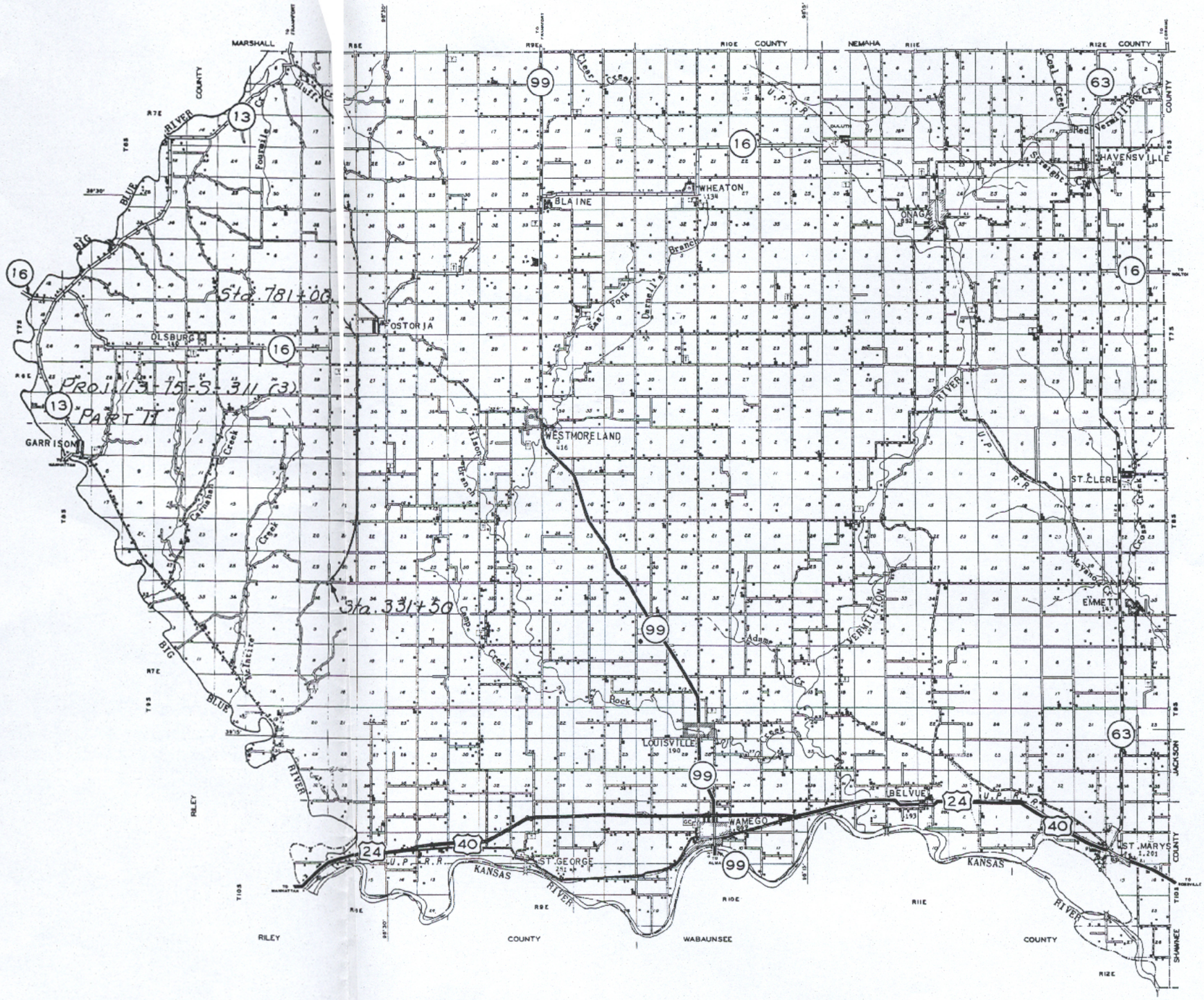
Fr. 1 Mi. W of Fostoria
South 8 Miles

INTRODUCTION

This report presents geological information obtained by the Kansas Highway Commission through field study and is submitted for use in the design and construction of the above project with reference to the formations that occur and the engineering problems affected by the geology of the project.

The report is divided into three sections for the purpose of grouping the information and discussion of the different phases. This report is intended to be complete within itself, but is best used in connection with the Geo-Engineering Survey.

INDEX OF SECTIONS



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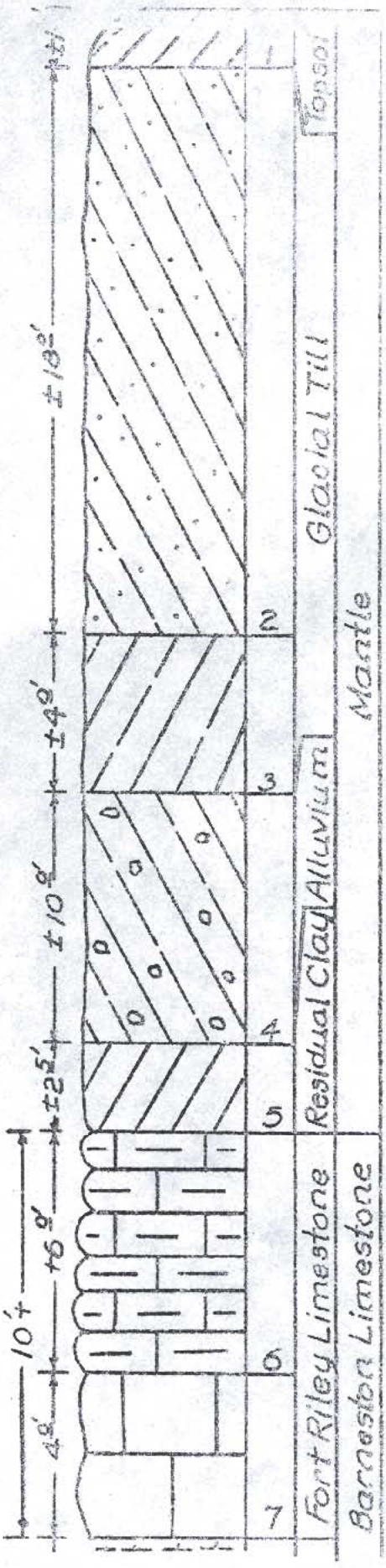
SCALE

Fold Line

POTTAWATOMIE – 75

SECTION I



Geological Description
and Formational Sequence

Mantle
Topsoil

1. Silty clay, grey-brown, contains chert fragments in some locations.

Glacial Till

2. Clay silty, reddish-brown, to a tan-brown, contains occasional sand grains.

3. Silty clay, tan.

Alluvium

4. Silty clay, grey-brown to tan-brown, with some chert and limestone fragments.

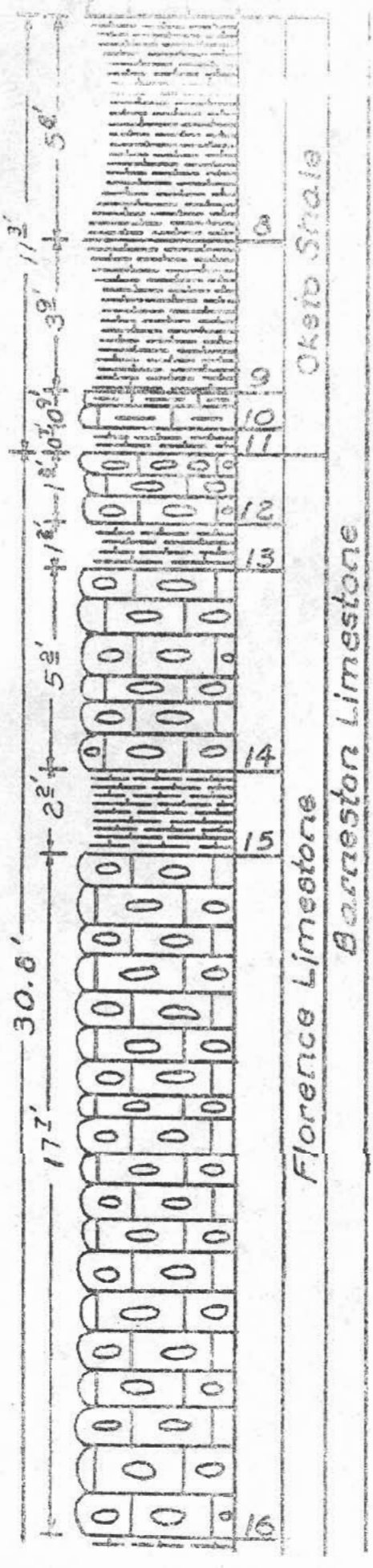
Residual Clay

5. Clay, dark red-brown.

Barneston Limestone Formation
Fort Riley Limestone Member

6. Shaly limestone, buff, platy.

7. "Rimrock", limestone, white, weathers buff, blocky, has a prominent horizontal break in its center.



Bonneston Limestone Formation
Upper Part Omitted

8. Very limy shale or shaly limestone, buff platy.

9. Limy shale, green, blocky.

10. Shaly limestone, buff, platy.

11. Limy shale, green, blocky.

Bonneston Limestone Formation
Florence Limestone Member

12. Limestone, buff, blocky, contains scattered chert nodules.

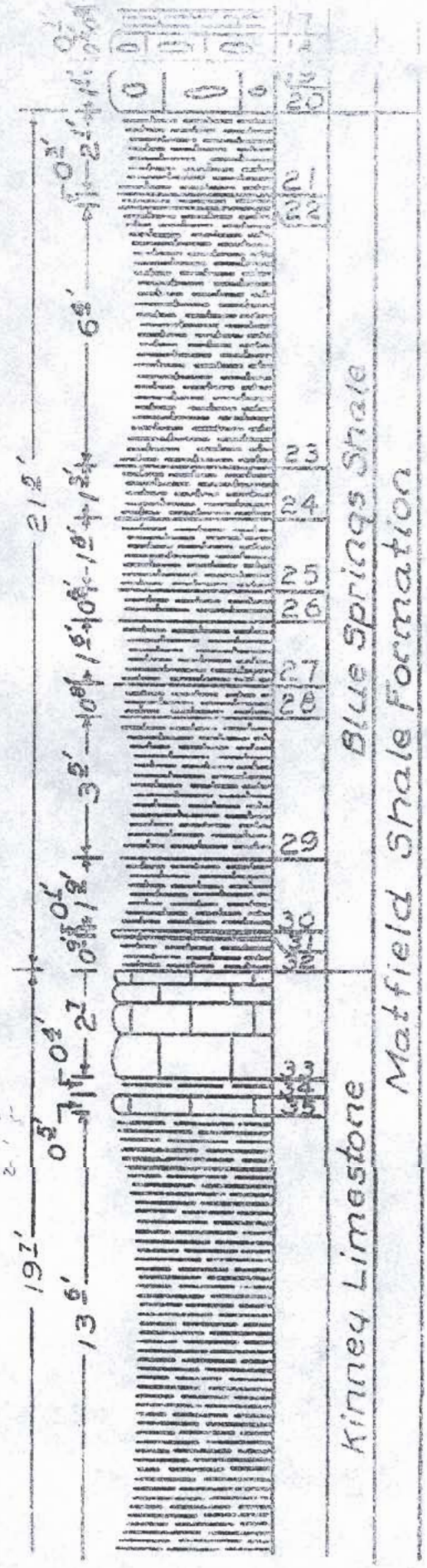
13. Limy shale, green, platy.

14. Limestone, buff, contains chert layers and nodules.

15. Limy shale, green, platy.

16. Limestone, buff, contains numerous chert bands.

17. Limy shale, green, platy.



18. Limestone, buff, blocky, has scattered [illegible]

19. Limy shale, green, platy varies in thickness.

20. Limestone, buff, blocky, contains chert, varies in thickness.

Matfield Shale Formation
Blue Springs Shale Member

21. Shale, green, blocky, limy.

22. Shale, black, platy.

23. Shale, green, blocky, limy.

24. Shale, dark maroon, blocky, limy.

25. Shale, maroon, blocky, limy.

26. Shale, green, blocky, limy.

27. Shale, maroon, blocky, limy.

28. Shale, green, blocky, limy.

29. Shale, maroon, blocky, limy.

30. Shale, dark green, blocky, limy.

31. Limestone, buff, blocky.

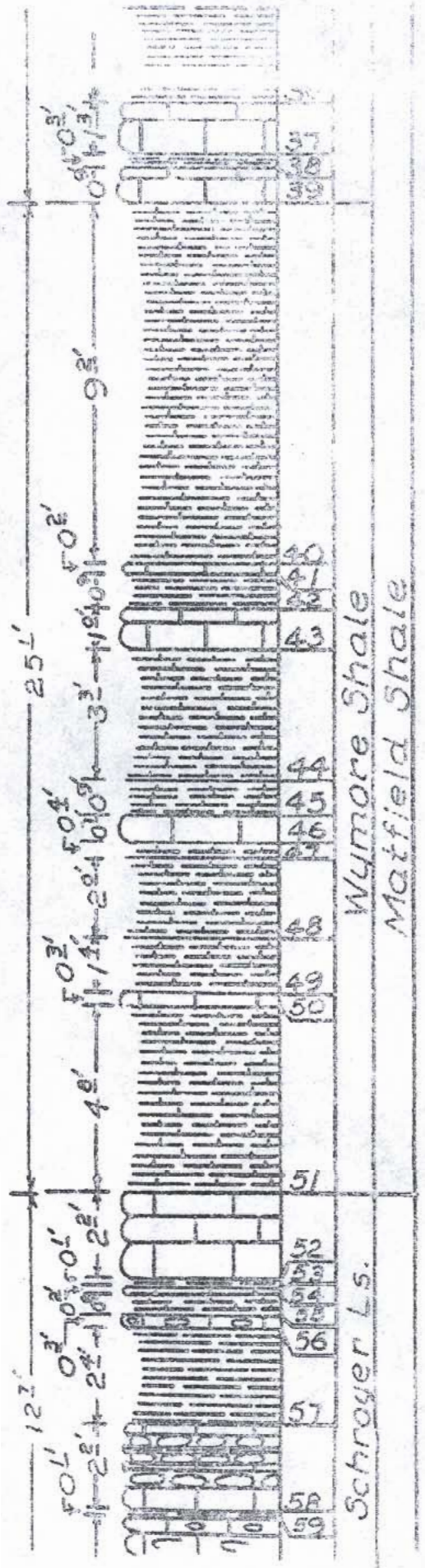
32. Shale, dark green, blocky, limy.

Matfield Shale Formation
Kinney Limestone Member

33. Limestone, grey, blocky, shaly, weathers brown.

34. Shale, bright green, platy.

35. Limestone, grey, blocky.



36. Shale, dark grey, blocky.

38. Shale, green, platy.

39. Limestone, buff, blocky, a variable zone, lenses.

Matfield Shale Formation
Wymore Shale Member

40. Shale, limy, tan, blocky, silty.

41. Impure limestone, light green, blocky.

42. Shale, bright green, platy.

43. Impure limestone, light green, nodular.

44. Shale, green, blocky, limy.

45. Shale, maroon, blocky, limy.

46. Impure limestone, light green, blocky, weathers to shale.

47. Shale, dark green, blocky, limy.

48. Shale, maroon, blocky, limy.

49. Shale, green, blocky, limy.

50. Impure limestone, light green, blocky.

51. Shale, green, blocky, limy.

Wreford Limestone Formation
Schroyer Limestone Member

52. Limestone, light grey, blocky, somewhat massive pitted and solutioned ordinarily.

53. Shale, green, platy.

54. Limestone, buff, blocky.

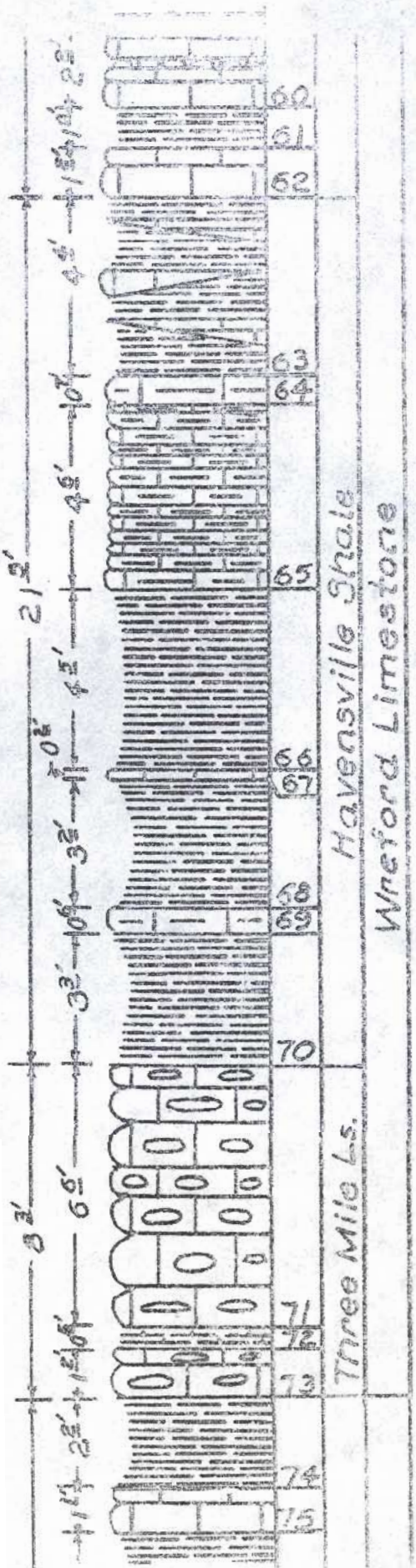
55. Shale, green, platy, limy.

56. Limestone, buff, blocky, contains some chert.

57. Shale, green, platy.

58. Limestone, buff, contains 3 chert bands that are persistent. The chert bands vary in thickness from 0.4 to 0.8.

59. Shale, green, platy.



60. Limestone, buff, contains a 0.3 chert band in its center plus scattered chert nodules.

61. Shale, green, platy.

62. Limestone, buff, blocky, sometimes contains chert. It is a variable zone.

Wreford Limestone Formation
Havensville Shale Member

General Note: The upper half of this shale member is highly variable in lithology. The shaly limestone lenses in and out and may be completely absent.

63. Shale, green, weathers tan-green, platy, a variable zone, contains lensing limestones.

64. Limestone, shaly, light green, platy.

65. Limestone, light grey, platy, weathers tan, somewhat shaly.

66. Shale, grey, platy.

67. Limestone, brown, blocky.

68. Shale, black, weathers blue-grey, platy.

69. Shaly limestone, blue grey, platy.

70. Shale, black, weathers blue-grey, platy.

Wreford Limestone Formation
Three Mile Limestone Member

71. Limestone, buff, blocky, cherty.

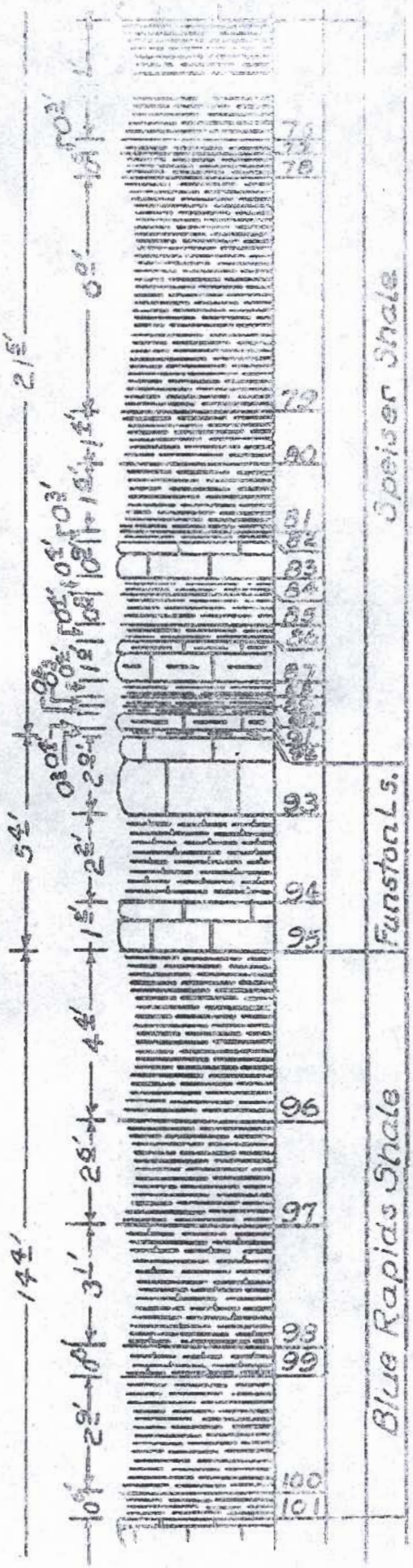
72. Limy shale, blue-grey, weathers green, platy.

73. Limestone, buff, blocky, cherty.

Speiser Shale Formation

74. Shale, green, platy.

75. Limestone, buff, blocky.



76. Shale, green, blocky.

77. [illegible]

78. Shale, green, blocky.

79. Shale, maroon, with a few green bands, blocky.

80. Shale, dark green, with a maroon band, blocky.

81. Shale, maroon, blocky.

82. Shale, green, blocky.

83. Limestone, light green, weathers tan, blocky.

84. Shale, green, blocky.

85. Shale, maroon, blocky.

86. Shale, green, blocky.

87. Impure limestone, light green, nodular.

88. Shale, green, blocky.

89. Shale, maroon, blocky.

90. Shale, green, blocky.

91. Shaly limestone, light green, blocky.

92. Shale, green, blocky.

Funston Limestone Formation

93. Limestone, light grey, blocky, sometimes massive.

94. Limy shale, green, blocky.

95. Limestone, light grey, nodular.

Blue Rapids Shale Formation

96. Shale, green, blocky.

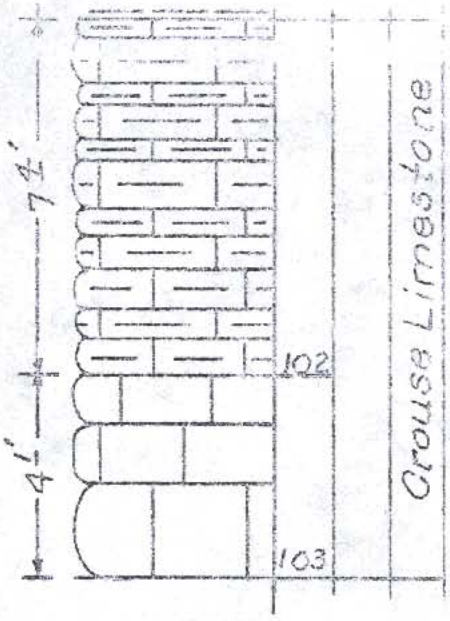
97. Shale, grey, blocky.

98. Shale, olive, blocky, somewhat limy.

99. Limy shale, light green, blocky.

100. Shale, olive, blocky.

101. Shale, grey, blocky.



Crouse Limestone Formation

102. Shaly limestone, white, platy.

103. Limestone, gray, weathers brown, blocky, somewhat massive.

SECTION II

Geology of the Project

This portion of the project begins approximately nine miles south of Fostoria and extends northward for about eight miles. It follows, for the most part, the existing county road to the intersection of Highway 16.

This area is in the mature stage of its erosional cycle. The hills are fairly steep and form prominent topographic mesas which are capped by the highly resistant cherty limestones of the upper Permian system. This area is typical of the Flint Hills type topography.

The mantle overlying the bedrock on this section of the project consists predominantly of a thin residual type which is composed of a reddish-brown clay with numerous chert and limestone fragments. On the flatter hills on the northern portion of this project there are some glacial till deposits. They consist mainly of a clay that contains some silt and scattered sand grains. The maximum thickness of the glacial till is 18 feet at Station 773+00.

The bedrock encountered on this project ranges from the Fort Riley limestone member to and including the Blue Rapids shale formation. These limestone and shale formations are fairly uniform in lithology except for the Havensville shale member. The shaly limestones of this member lense in and out and may be completely absent locally.

There are a large number of good wells and several springs which parallel this project. A majority of these springs are still flowing even in a time of prolonged period of low rainfall.