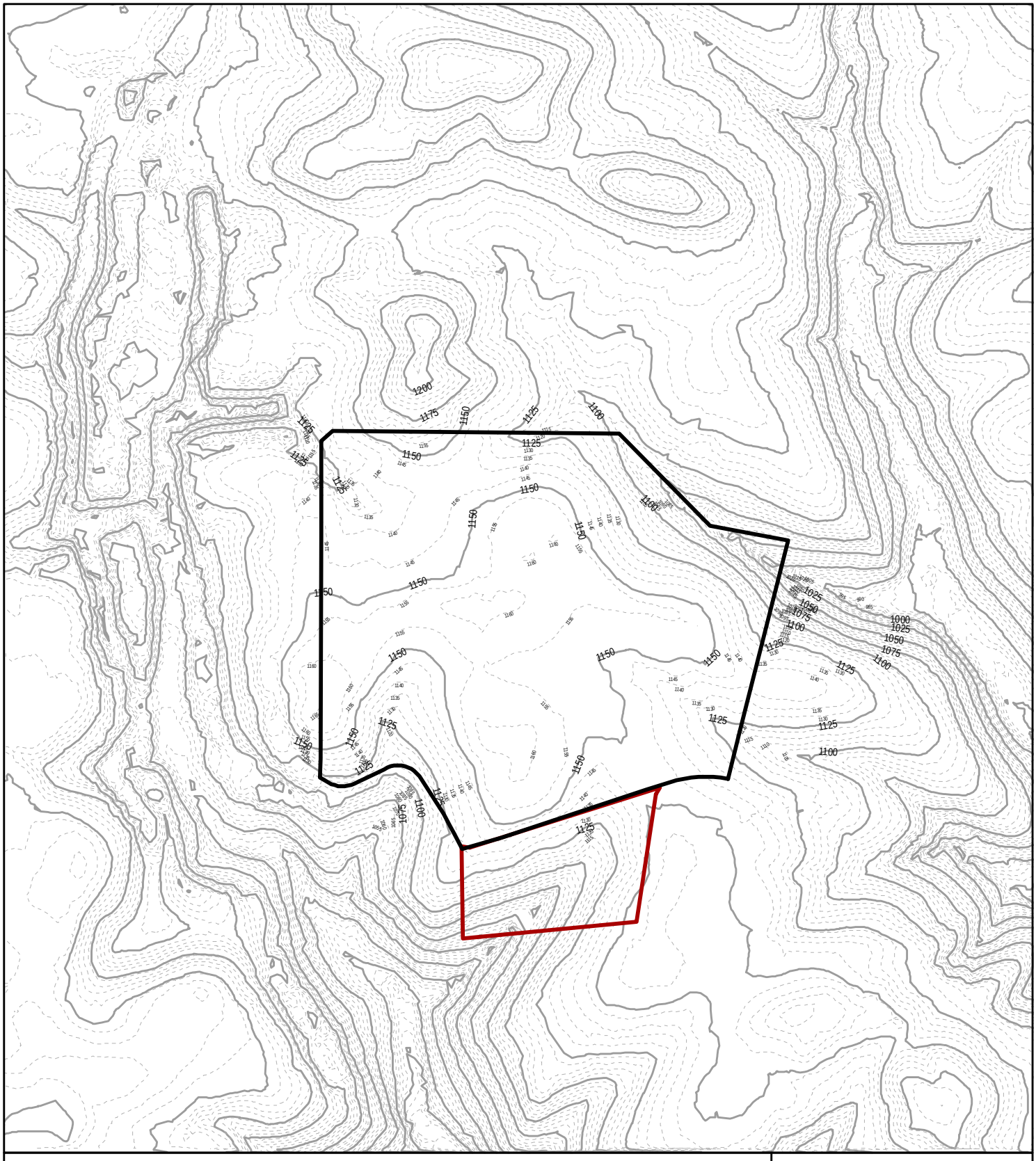

Figure 04-1
Existing Site Conditions

South Field Energy
Columbiana County, Ohio

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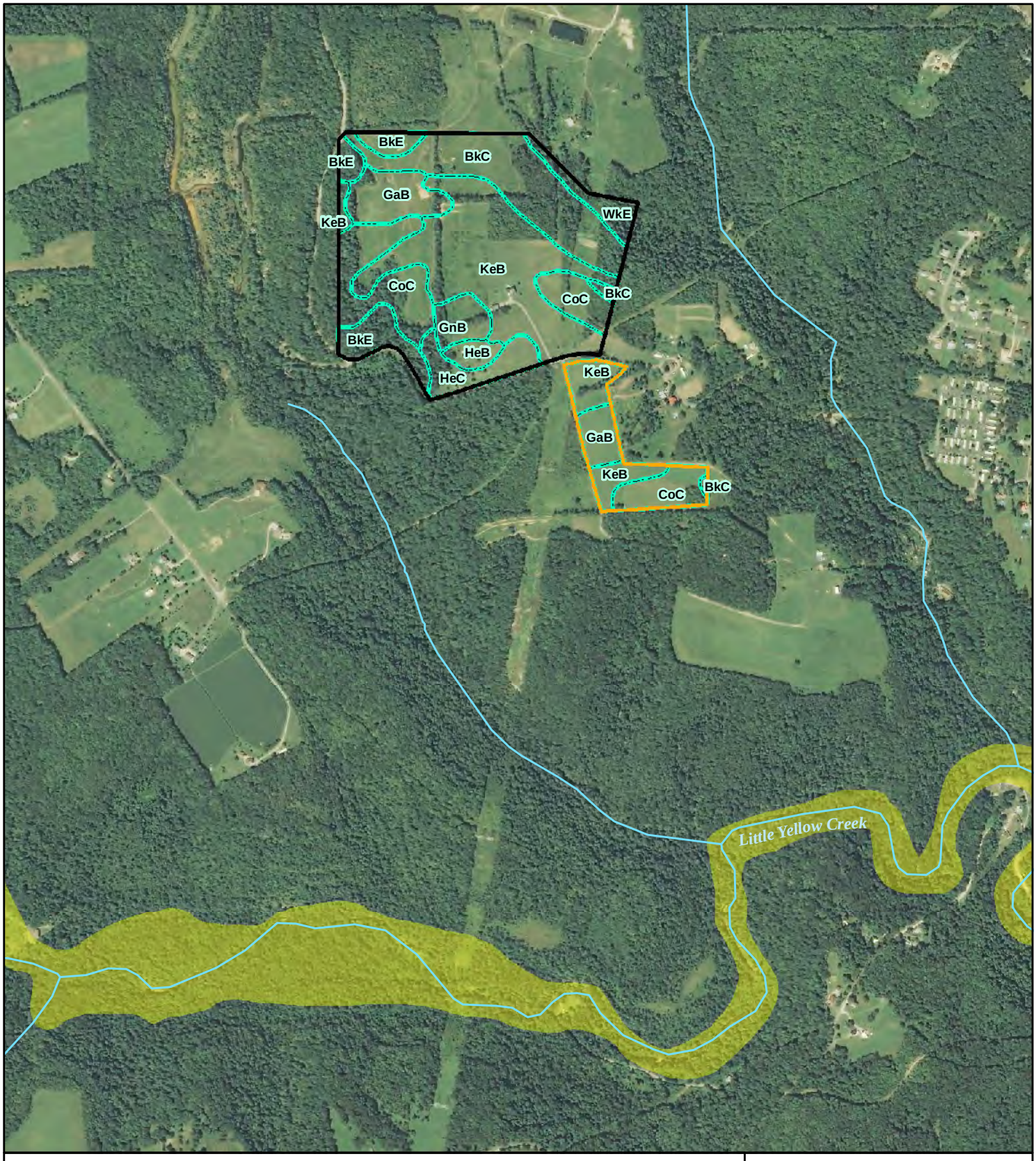

Legend

- Facility Site
- Construction Laydown Site
- 100-year Floodplain
- Soil Unit Boundary

Soil Unit:

BkC: Berks channery silt loam, 3-8% slopes
BkE: Berks channery silt loam, 25-35% slopes
CoC: Coshocton silt loam, 6-15% slopes
GaB: Gavers silt loam, 2-6% slopes
GnB: Gilpin silt loam, 3-8% slopes
HeB: Hazleton channery loam, 2-6% slopes
HeC: Hazleton channery loam, 6-15% slopes
KeB: Keene silt loam, 3-8% slopes
WkE: Westmoreland-Berks complex, 25-40% slopes

N

0 250 500 1,000 Feet

Figure 04-2
Soils and Floodplain

South Field Energy
Columbiana County, Ohio

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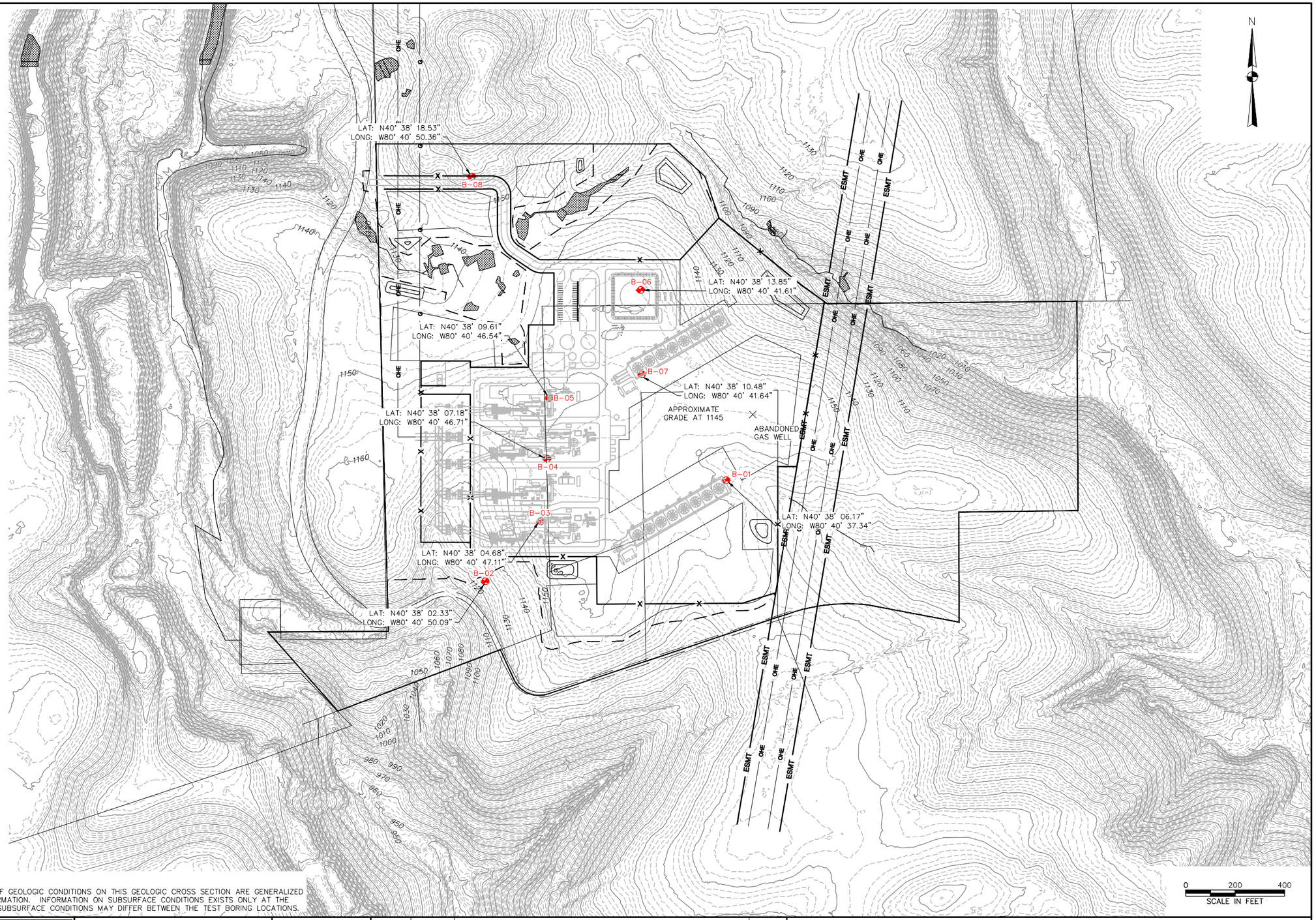

LEGEND

- 1160 — EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- EXISTING TREE LINE
- EXISTING ROAD
- EXISTING STREAM
- EXISTING BUILDING
- X — EXISTING FENCE
- 1160 — PROPOSED 10' CONTOUR
- PROPOSED 2' CONTOUR
- PROPERTY LINE
- TEST BORING
- EXISTING WETLAND

NOTE:

THE DEPTH AND THICKNESS OF GEOLOGIC CONDITIONS ON THIS GEOLOGIC CROSS SECTION ARE GENERALIZED FROM THE TEST BORING INFORMATION. INFORMATION ON SUBSURFACE CONDITIONS EXISTS ONLY AT THE TEST BORING LOCATION AND SUBSURFACE CONDITIONS MAY DIFFER BETWEEN THE TEST BORING LOCATIONS.

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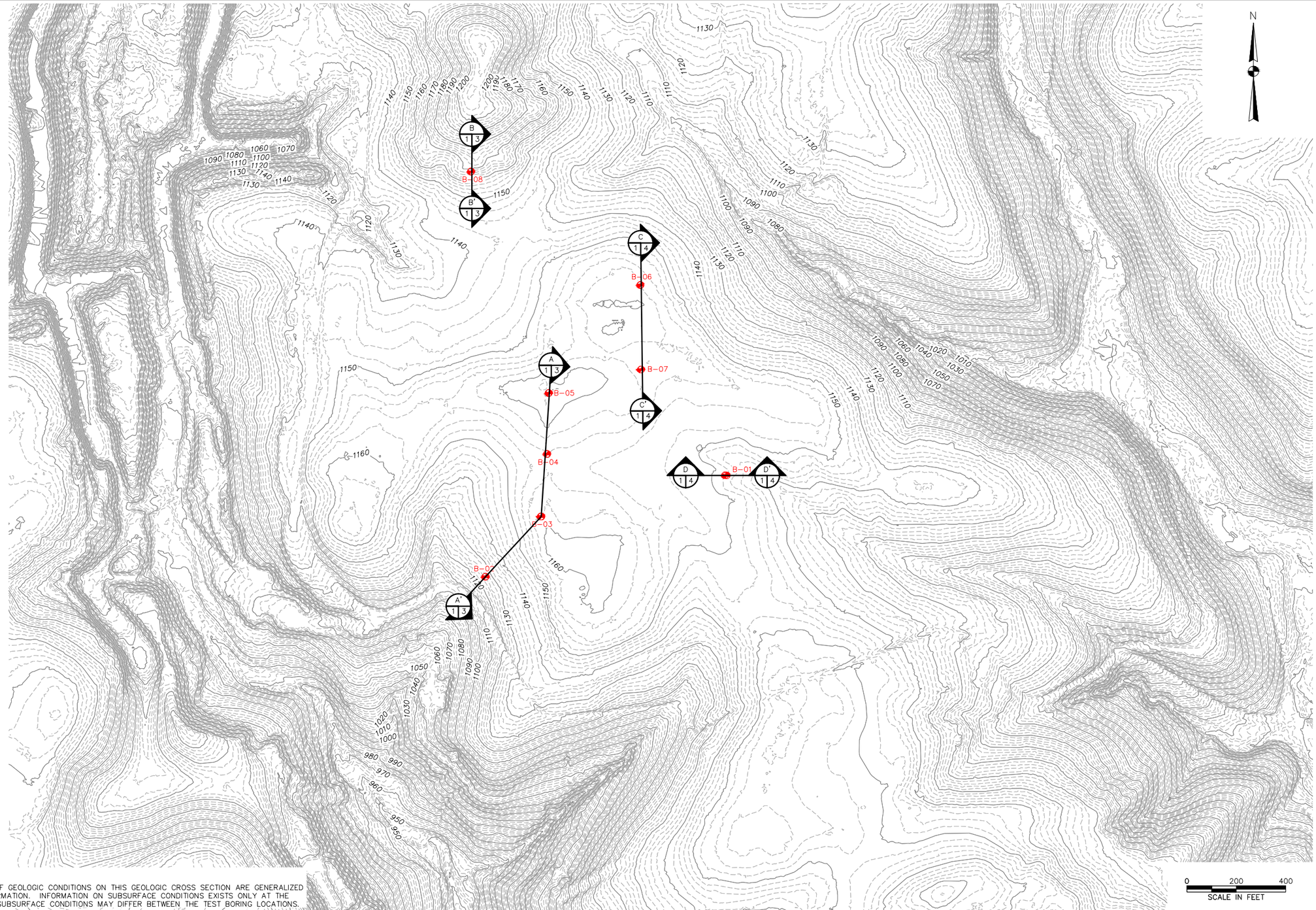
Figure 04-3
Soil Boring Locations

South Field Energy
Columbiana County, Ohio



LEGEND

1160 EXISTING 10' CONTOUR

EXISTING 2' CONTOUR

TEST BORING

SECTION LETTER

FIRST SHEET CUT ON

FIRST SHEET SHOWN ON

SECTION INDICATOR

DETAIL NUMBER

FIRST SHEET CALLED OUT ON

FIRST SHEET SHOWN ON

DETAIL INDICATOR

NOTE:

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Figure 04-4a
Geological Cross-Section

South Field Energy
Columbiana County, Ohio

TERMINOLOGY FOR ROCK DESCRIPTION

HARDNESS OF ROCK

HARDNESS	FIELD TEST
VERY HARD	MANY BLOWS WITH GEOLOGIC HAMMER REQUIRED TO BREAK INTACT SPECIMEN DOES NOT LEAVE A GROOVE ON THE ROCK SURFACE WHEN SCRATCHED WITH KNIFE.
HARD	HAND HELD SPECIMEN BREAKS WITH HAMMER END OF PICK UNDER MORE THAN ONE BLOW. LEAVES A FAINT GROOVE WHEN SCRATCHED WITH KNIFE.
MEDIUM HARD	CAN JUST BE SCRAPED OR PEELED WITH KNIFE.
SOFT	LEAVES A DEEP GROOVE WITH BROKEN EDGE.
VERY SOFT	CAN BE SCRATCHED WITH FINGERNAIL.

WEATHERING CLASSIFICATION OF ROCK

GRADE	DIAGNOSTIC FEATURES
FRESH	NO VISIBLE SIGN OF DECOMPOSITION OR;
SLIGHTLY WEATHERED	SLIGHT DISCOLORATION INWARDS FROM OPEN FRACTURES, OTHERWISE SIMILAR TO FRESH
MODERATELY WEATHERED	DISCOLORATION THROUGHOUT. WEAKER MINERALS SUCH AS FELDSPAR DECOMPOSED. STRENGTH SOMEWHAT LESS THAN FRESH ROCK BUT CORES CANNOT BE BROKEN BY HAND OR SCRAPED BY KNIFE. TEXTURED PRESERVED.
HIGHLY WEATHERED	MOST MINERALS SOMEWHAT DECOMPOSED. SPECIMENS CAN BE BROKEN BY HAND WITH EFFORT OR SHAVED WITH KNIFE. CORE STONES PRESENT IN ROCK MASS. TEXTURE BECOMING INDISTINCT BUT FABRIC PRESERVED.
COMPLETELY RESIDUAL SOIL	MINERALS DECOMPOSED TO SOIL BUT FABRIC ADVANCED STATE OF DECOMPOSITION RESULTING IN PLASTIC SOILS. ROCK FABRIC AND STRUCTURE COMPLETELY DESTROYED. LARGE VOLUME CHANGE.

BEDDING AND DISCOUNTINUITY SPACING OF ROCK

DETAILED DESCRIPTION			GENERAL DESCRIPTION	
DESCRIPTION FOR STRUCTURAL FEATURES: BEDDING OR FOLIATION	SPACING	DESCRIPTION FOR JOINTS, FAULTS OR OTHER FRACTURES	DEGREE OF BROKENESS	
			SPACING	
VERY THICKLY (BEDDED, FOLIATED, OR BANDED)	>6'	VERY WIDELY (FRACTURED OR JOINTED)	>6'	MASSIVE
THICKLY	2'–6'	WIDELY	3"–6"	SLIGHTLY BROKEN
MEDIUM	8"–24"	MEDIUM		
THINLY	2 1/2"–8"	CLOSELY	1"–3"	BROKEN
VERY THINLY	3/4"–2 1/2"	VERY CLOSELY	<1"	VERY BROKEN
INTENSELY LAMINATED	1/4"–3/4"	EXTREMELY CLOSE		
VERY INTENSELY LAMINATED	<1/4"			

ENGINEERING CLASSIFICATION FOR USE IN SITU ROCK QUALITY

RQD %	ROCK MASS QUALITY
90–100	EXCELLENT
75–90	GOOD
50–75	FAIR
25–50	POOR
0–25	VERY POOR

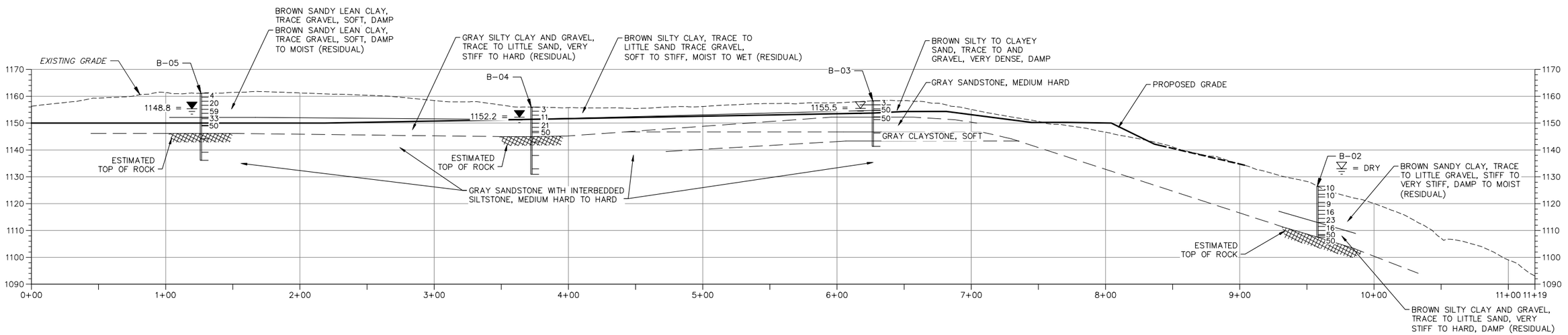
TERMINOLOGY FOR SOIL DESCRIPTION

CONSISTENCY OF COHESIVE SOILS		
CONSISTENCY	BLOWS/FT	UNCONFINED COMPRESSIVE STRENGTH T.S.F.
VERY SOFT	<2	<0.25
SOFT	2–4	0.25–0.50
MEDIUM STIFF	4–8	0.50–1.0
STIFF	8–15	1–2
VERY STIFF	15–30	2–4
HARD	>30	>4

DENSITY OF GRANULAR SOILS	
DESIGNATION	BLOWS/FT
VERY LOOSE	0–4
LOOSE	5–10
MEDIUM DENSE	11–30
DENSE	31–50
VERY DENSE	>50

STANDARD PENETRATION RESISTANCE (SPT) IS THE NUMBER OF BLOWS REQUIRED TO DRIVE A 2 INCH OD SPLIT SPOON SAMPLER INTO THE SOIL USING A 140 LB HAMMER FALLING FREELY THROUGH 30 INCHES. THE SAMPLE IS DRIVEN 18 INCHES AND THE COMBINED NUMBER OF BLOWS FOR THE LAST TWO 6 INCH INTERVALS IS DESIGNATED AS STANDARD PENETRATION RESISTANCE (SPT N–VALUES).

PROPORTIONS	
TRACE	0–10%
LITTLE	11–20%
SOME	21–35%
AND	35–50%



SECTION A–A (1 | 3)

SCALE: HORIZ: 1" = 40'
VERT: 1" = 20'

NOTE:

THE DEPTH AND THICKNESS OF GEOLOGIC CONDITIONS ON THIS GEOLOGIC CROSS SECTION ARE GENERALIZED FROM THE TEST BORING INFORMATION. INFORMATION ON SUBSURFACE CONDITIONS EXISTS ONLY AT THE TEST BORING LOCATION AND SUBSURFACE CONDITIONS MAY DIFFER BETWEEN THE TEST BORING LOCATIONS.

= GROUNDWATER ELEVATION AT 0 HRS

= GROUNDWATER ELEVATION AT 24 HRS

0 40 80
HORIZONTAL SCALE

0 20 40
VERTICAL SCALE

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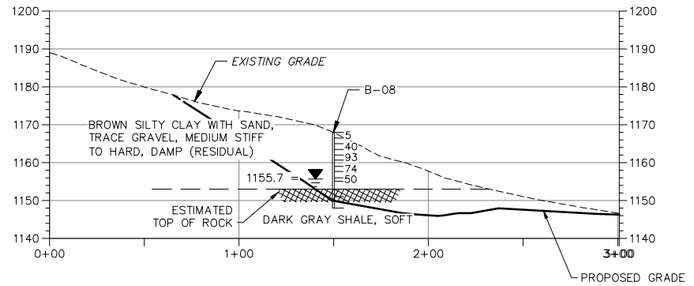
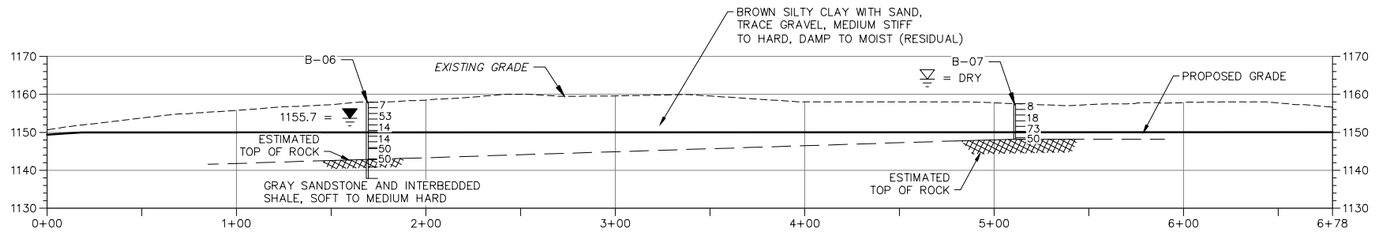
Figure 04-4b
Geological Cross-Section

South Field Energy
Columbiana County, Ohio



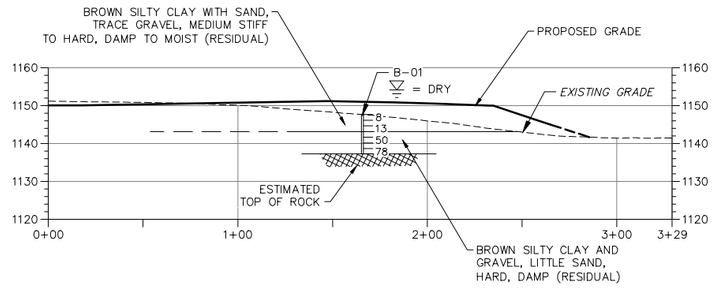
SECTION B-B (1 | 3)

SCALE: HORIZ: 1" = 40'
VERT: 1" = 20'



SECTION C-C (1 | 4)

SCALE: HORIZ: 1" = 40'
VERT: 1" = 20'



SECTION D-D (1 | 4)

SCALE: HORIZ: 1" = 40'
VERT: 1" = 20'

NOTE:

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= GROUNDWATER ELEVATION AT 0 HRS

= GROUNDWATER ELEVATION AT 24 HRS

0 40 80
HORIZONTAL SCALE

0 20 40
VERTICAL SCALE

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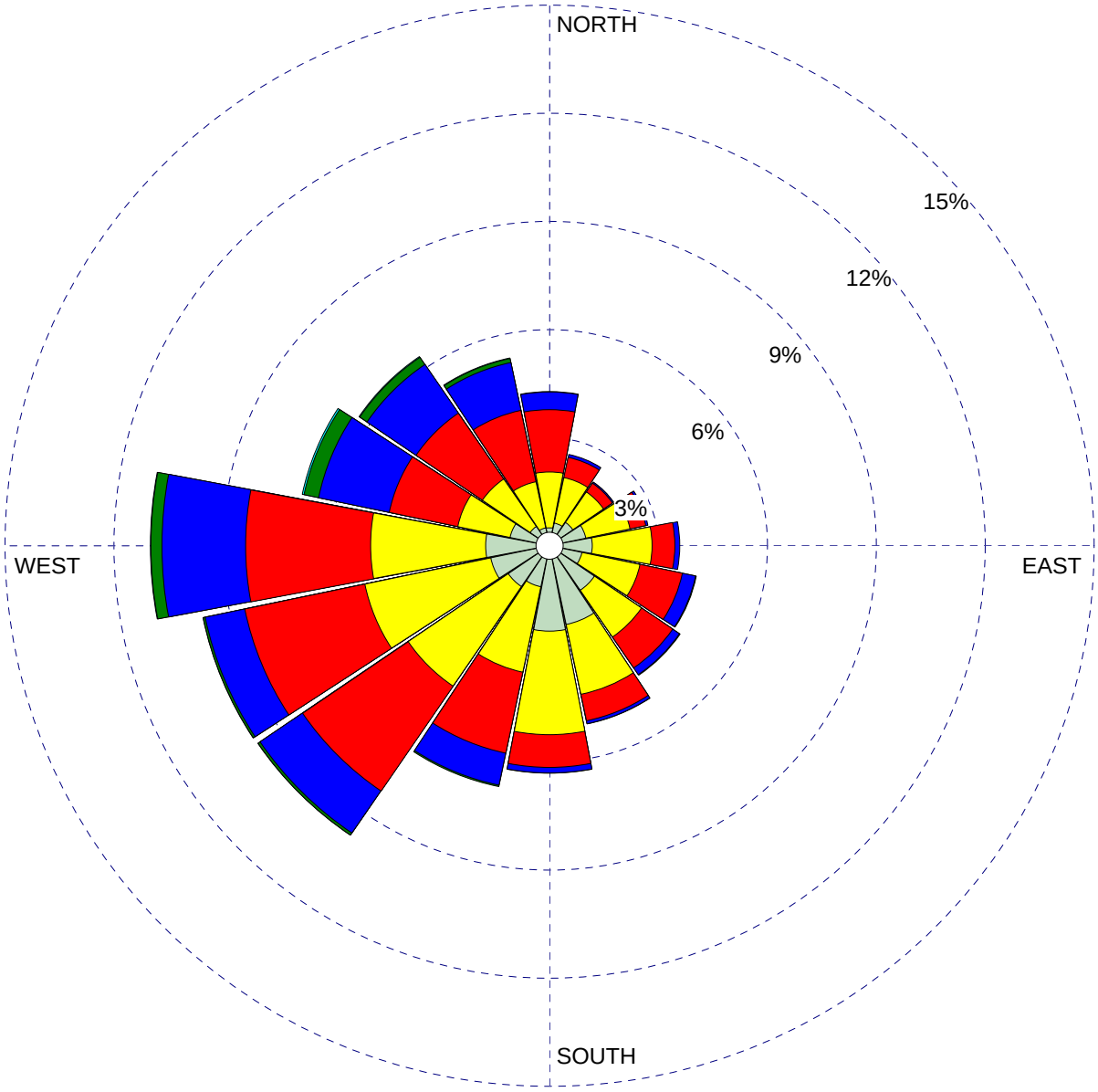
Figure 04-4c
Geological Cross-Section

South Field Energy
Columbiana County, Ohio



WIND SPEED
(m/s)

- >= 11.1
- 8.8 - 11.1
- 5.7 - 8.8
- 3.6 - 5.7
- 2.1 - 3.6
- 0.5 - 2.1

Calms: 9.05%

DATA PERIOD:

Start Date: 1/1/2010 - 00:00
End Date: 12/31/2014 - 23:00

CALM WINDS:

9.05%

AVG. WIND SPEED:

3.37 m/s

Figure 04-5
Wind Rose

South Field Energy
Columbiana County, Ohio

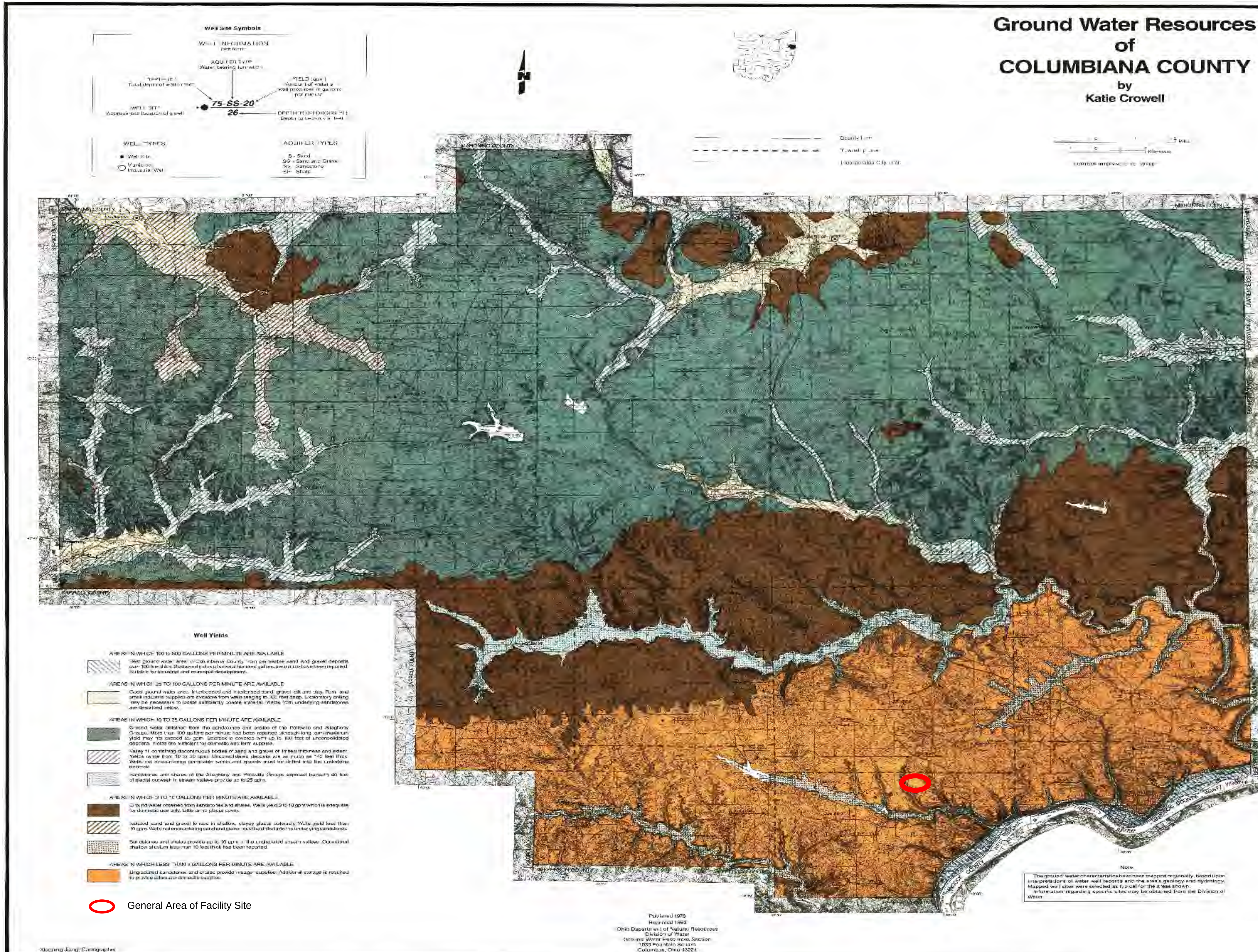
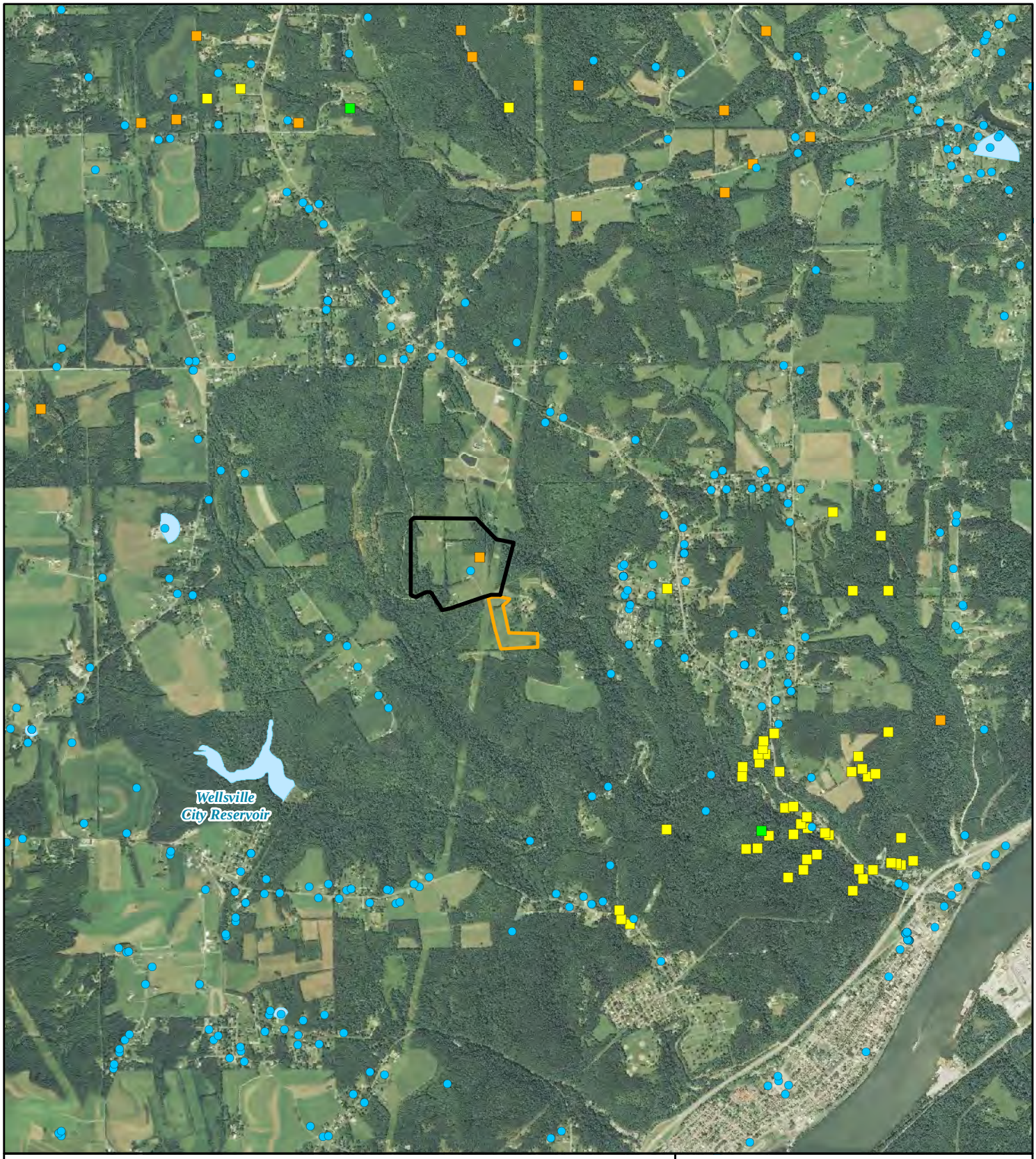


Figure 04-6
Aquifer Information

South Field Energy
Columbiana County, Ohio



Legend

- Facility Site
- Construction Laydown Site
- Gas Well
- Oil Well
- Oil and Gas Well
- Water Well
- Drinking Water Source Protection Area

N

0 2,000 4,000 Feet

Figure 04-7
Water Wells, Oil and Gas Wells and Drinking Water Source Protection Areas

South Field Energy
Columbiana County, Ohio

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Case No(s). 15-1716-EL-BGN

Summary: Application Figures for Section 4 electronically filed by Mr. Scott M Guttman on behalf of South Field Energy LLC