APPENDICIES

APPENDIX A

FIELD DATA COLLECTION SHEETS AND REFERENCE GUIDES

General Site Information

Site No.:_____ Name_____

Road Direction: N-S □ E-W □ Date_____

Direction road cut is facing: N □ S □ E □ W □

Location of road cut:_____

Length of road cut:_____(ft)_____(m) Posted Speed Limit: _____(mph)_____(km/h)

Physical conditions of the road cut with the roadway:

_____

_____

_____

Slope Geometry:

Single Angle Slope □ Multi-Angle Slope □ Benched Slope □

Slope Height: _____(ft)_____ (m)
Overall slope angle _____
Backslope angle_____
Backslope condition _____
_____
Number of benches_____
Bench height_____
Bench width _____
Bench condition _____

Ditch depth:_____(ft)_____(m)
Ditch width_____(ft)_____(m)
Ditch angle _____
Ritchie's depth_____(ft)_____ (m)
Ritchie's width_____(ft)_____(m)
Ritchie's score (NYS)_____
Oregon height_____
Oregon ditch effectiveness _____
CRSP percentage_____

Notes:

Ritchie's score is the ratio of the Ritchie prescribed criterion to the actual ditch measurements.

The Oregon height and ditch effectiveness are the scores related to the Oregon rating system.

CRSP percentage is the percentage of rocks entering the roadway from the CRSP computer program.

Vehicle Risk Potential:

Average Daily Traffic (ADT)_____ Average Annual Daily Traffic_____

Decision Sight Distance (DSD)_____ Actual Sight Distance (ASD)_____

Pavement Width_____(ft)_____(m) Stopping Sight Distance (SSD)_____

$$\left[\frac{\text{ADT} * \text{Slope Length}/24}{\text{Posted Speed Limit}}\right] * 100\% = \_\_\_\_\_$$

$$\left[\frac{\text{Actual Sight Distance}}{\text{Decision Sight Distance}}\right] * 100\% = \_\_\_\_\_$$

New York State Human Risk Potential

$$\text{Fa} = \text{AADT} \times \left[(\text{L} + \text{SSD})/(\text{V} \times 24000)\right] = \_\_\_\_\_$$

$$\text{Fp} = \log_{10}(\text{AADT}) \text{x} \log_{10}(\text{L})[\text{a}/\text{SSD} - \text{a})] = \_\_\_\_\_$$

Rockfall History

Last Record of Maintenance:_____

Estimated Size of removed material:_____

Last Know Rockfall Event: _____

Frequency of Rockfall Events:_____

*Distance to an operating mine (if applicable):*_____

Notes:

_____

_____

_____

Geologic Conditions:

Description of road cut geology (also see stratigraphic section):

_____

_____

_____

Joint Characteristics (also see detailed line survey):

_____

_____

_____

Strata Characteristics:

Competent Strata:

Bedding Thickness:_____

Discontinuity Spacing:_____

Discontinuity Features:_____

_____

Incompetent Strata:

Bedding Thickness:_____

Discontinuity Spacing:_____

Discontinuity Features:_____

_____

Slake Durability: _____

Undercutting:

Maximum Depth of Undercutting:_____

$$\frac{\text{Discontinuity Spacing within the Undercut layer}}{\text{Maximum Depth of Undercutting}} \quad \_\_\_\_\_$$

Block size/Volume of material:

Field estimation: _____ DSL EST.:_____

Hydrologic Conditions:

_____

_____

Notes:

_____

_____

Oregon Rating System

Slope height score_____

Ditch Effectiveness _____

Average Vehicle Risk _____

% Decision Sight Distance _____

Roadway Width _____

Geologic factor a. _____b. _____

Block size _____

Climate _____

Rockfall history _____

Oregon rating _____

New York Rating

Ritchie Score _____

Geology

Geology _____

Block size _____

Rock friction _____

Water/Ice _____

Rock fall _____

Backslope above cut _____

Sum / 10 _____

(Fa+Fp)/3 _____

NY rating_____

Slope Geometry Field Collection Sheet

Slope height					
Instrument	Instrument height	Theta	Beta	X distance	Height
Brunton					
Transit					
Inclinometer					
Altimeter	Reading 1	Reading 2			
				Overall Height	

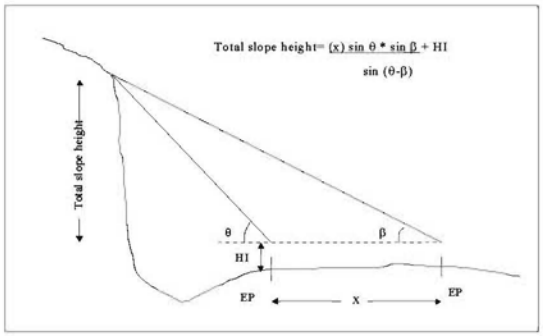
Site _____

Name _____

Date _____

Slope Angle			
Single angle		Benched overall angle	
Height of Benches/Ditch conditions			
Bench No.	Height	Condition	
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Ditch Paramters						
Type	1	2	3	4	5	Overall
Width ep						
Width angle						
Depth						
Loc. Depth						



Notes:

Bench or feature height	Instrument height	Theta	Beta	X distance	Height

Hardness Reference Guide with CRSP Coefficient Values				M. Woodard
Hardness input code	Consistency	Field Identification	Normal Coefficient Values (Rn)	Tangential Coefficient Values (Rt)
1	very soft	Easily penetrated several inches by fist	0.10	0.50
2	soft	Easily penetrated several inches by thumb	0.10	0.55
3	firm	Can be penetrated several inches by thumb with moderate effort	0.15	0.65
4	stiff	Readily indented by thumb but penetrated only with great effort	0.15	0.75
5	very stiff	Readily indented by thumbnail	0.20	0.80-0.85
6	hard	Indented with difficulty by thumbnail	0.20	0.90
7	extremely soft rock	Indented by thumbnail	0.15	0.70
8	very soft rock	Crumbles under firm blows with point of geological pick, can be peeled by a pocket knife	0.15	0.75
9	soft rock	Can be peeled by a pocket knife with difficulty, shallow indentations made by firm blow of geological pick	0.20	0.80
10	average rock	Cannot be scarped or peeled with pocket knife, specimen can be fractured with single firm blow of hammer end of geological pick	0.25	0.85
11	hard rock	Specimen required more than one blow with hammer end of geological pick to fracture it	0.25-0.30	0.95-1.0
12	very hard rock	Specimen required many blows of hammer end of geological pick to fracture it	0.25-0.30	0.95-1.0
13	extremely hard rock	Specimen can only be chipped with geological pick	0.25-0.30	1.0

Descriptive Classification of Discontinuity Spacing (Deere, 1964)			
Bedding	Spacing		Joints
very thin	< 2"	< 5cm	very close
thin	2" - 1'	5 - 30cm	close
medium	1' - 3'	30cm - 1m	moderately close
thick	3' - 10'	1m - 3m	wide
very thick	> 10'	> 3m	very wide

Detailed line survey data collection sheet

Site _____ Length of cut _____

Location of traverse _____ Overall plunge of cut _____

Name _____ Date _____

Rock Types

Ls- limestone

Ss- sandstone

Ms- siltstone

Sh- shale

Cs- claystone

Structure

B- bedding

J- joint

T- tension crack

Discontinuity No.	Traverse Trend	Distance (feet)	Rock		Structure Type	Dip Direction	Dip	Size		Infilling			Water	Rhgs	Remarks
			Type	Hdns				Length (ft)	End	Type	TH	Hdns			

Detailed line survey field reference guides

Hardness Reference Guide		
Hardness input code	Consistency	Field Identification
1	very soft	Easily penetrated several inches by fist
2	soft	Easily penetrated several inches by thumb
3	firm	Can be penetrated several inches by thumb with moderate effort
4	stiff	Readily indented by thumb but penetrated only with great effort
5	very stiff	Readily indented by thumbnail
6	hard	Indented with difficulty by thumbnail
7	extremely soft rock	Indented by thumbnail
8	very soft rock	Crumbles under firm blows with point of geological pick, can be peeled by a pocket knife
9	soft rock	Can be peeled by a pocket knife with difficulty, shallow indentations made by firm blow of geological pick
10	average rock	Cannot be scarped or peeled with pocket knife, specimen can be fractured with single firm blow of hammer end of geological pick
11	hard rock	Specimen required more than one blow with hammer end of geological pick to fracture it
12	very hard rock	Specimen required many blows of hammer end of geological pick to fracture it
13	extremely hard rock	Specimen can only be chipped with geological pick

End Reference Guide	
Input code	Description
1	Zero % intact rock along discontinuity
2	Zero to 5% intact rock along discontintuity
3	Greater than 5% intact rock along discontinuity

Water Reference Guide	
Input code	Degree of water
1	The discontinuity is tight; water flow along it does not appear possible.
2	The discontinuity is dry with no evidence of water flow.
3	The discontinutity is dry with evidence of water flow, rust staining of
4	The discontinutity is damp but no free water is present.
5	The disontinuity shows seepage, occasional drpos of water, no continuous flow.
6	The discontinuity shows a continuous flow of water.

Infilling Reference Guide	
Input code	Description
A	Air- total void exists between the walls of the plane
C	Clay
S	Sand
Z	Calcite
D	Detritus- debris washed into an open fracture
E	Evaporites- gypsum, halite, anhydrite
G	Gouge
O	Ore- valuable
Q	Quartz

Infilling Thickness Reference Guide	
Input code	Thickness
1	0"
2	0"- 0.25"
3	0.25"- 1.00"
4	1.00"- 2.00"
5	2.00"- 4.00"
6	> 4.00"

AASHTO Exhibit 3-3. Decision Sight Distance

Metric						US Customary					
Design speed (km/h)	Decision sight distance (m) Avoidance maneuver					Design speed (mph)	Decision sight distance (ft) Avoidance maneuver				
	A	B	C	D	E		A	B	C	D	E
50	70	155	145	170	195	30	220	490	450	535	620
60	95	195	170	205	235	35	275	590	525	625	720
70	115	235	200	235	275	40	330	690	600	715	825
80	140	280	230	270	315	45	395	800	675	800	930
90	170	325	270	315	360	50	465	910	750	890	1030
100	200	370	315	355	400	55	535	1030	865	980	1135
110	235	420	330	380	430	60	610	1150	990	1125	1280
120	265	470	360	415	470	65	695	1275	1050	1220	1365
130	305	525	390	450	510	70	780	1410	1105	1275	1445

Avoidance Maneuver A: Stop on rural road--t = 3.0s

Avoidance Maneuver B: Stop on urban road--t = 9.1s

Avoidance Maneuver C: Speed/path/direction change on rural road--t varies 10.2 and 11.2s

Avoidance Maneuver D: Speed/path/direction change on rural road--t varies 12.1 and 12.9s

Avoidance Maneuver E: Speed/path/direction change on rural road--t varies 14.0 and 14.5s

APPENDIX B

STRATIGRAPHIC SECTIONS AND WEATHERED PROFILES

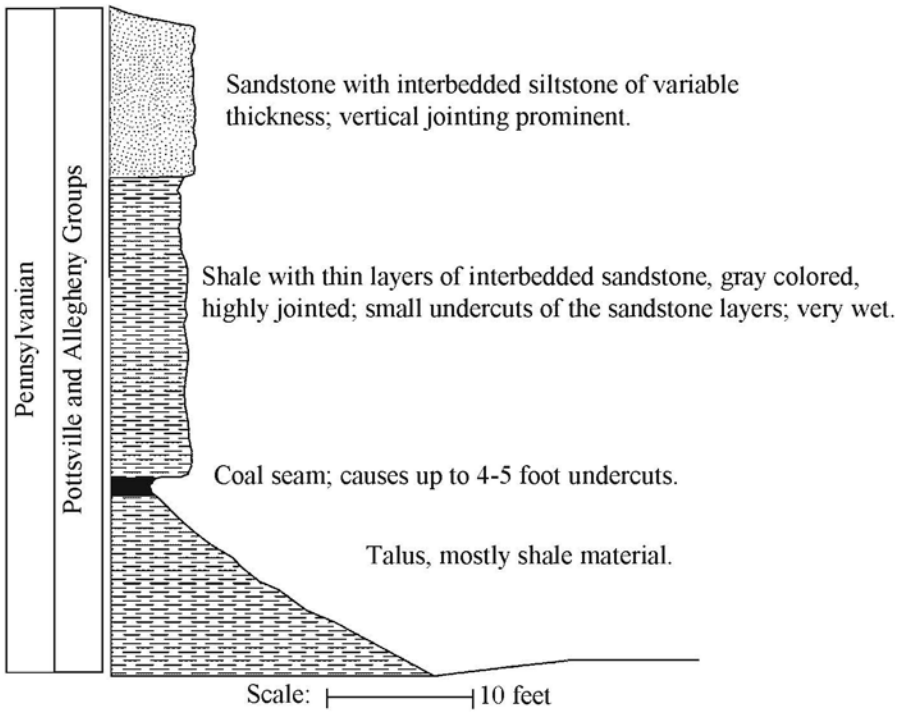


Figure B-4- 1. Stratigraphic section for slope located at STA-30-27.3.

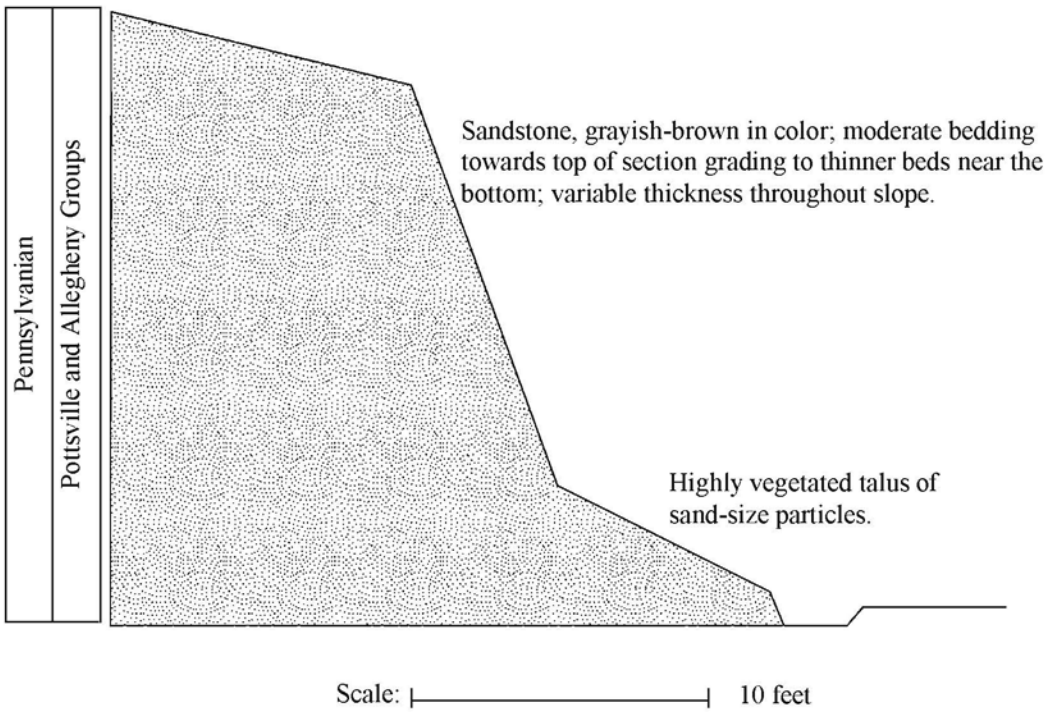


Figure B-4- 2. Stratigraphic section for slope located at STA-800-1.

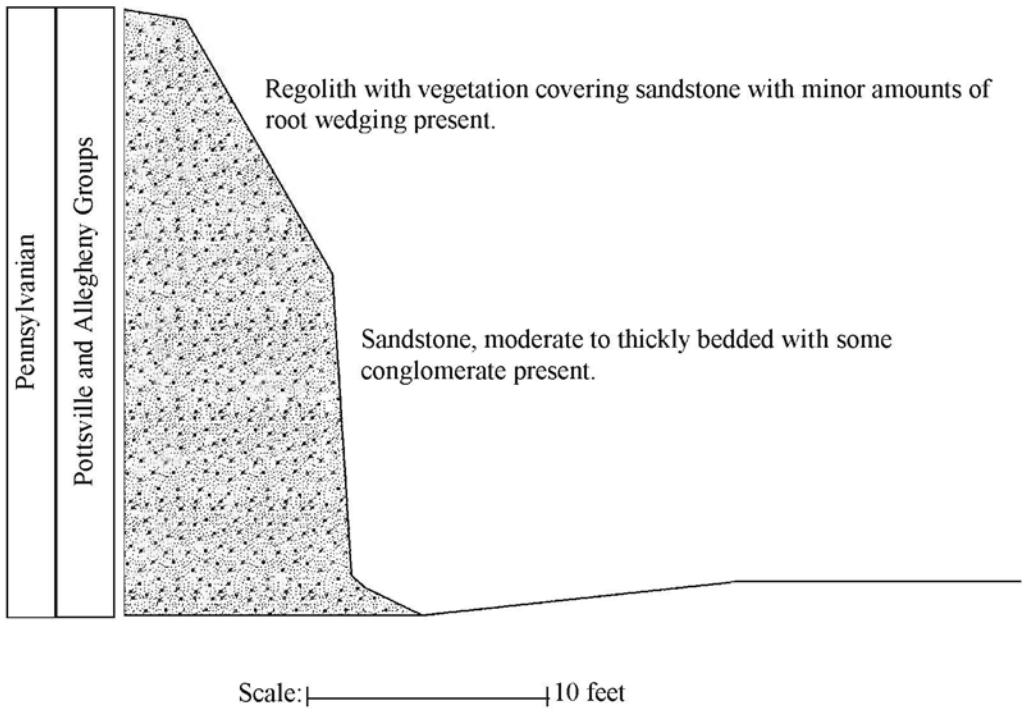


Figure B-4- 4. Stratigraphic section for slope located at SUM-76-17.

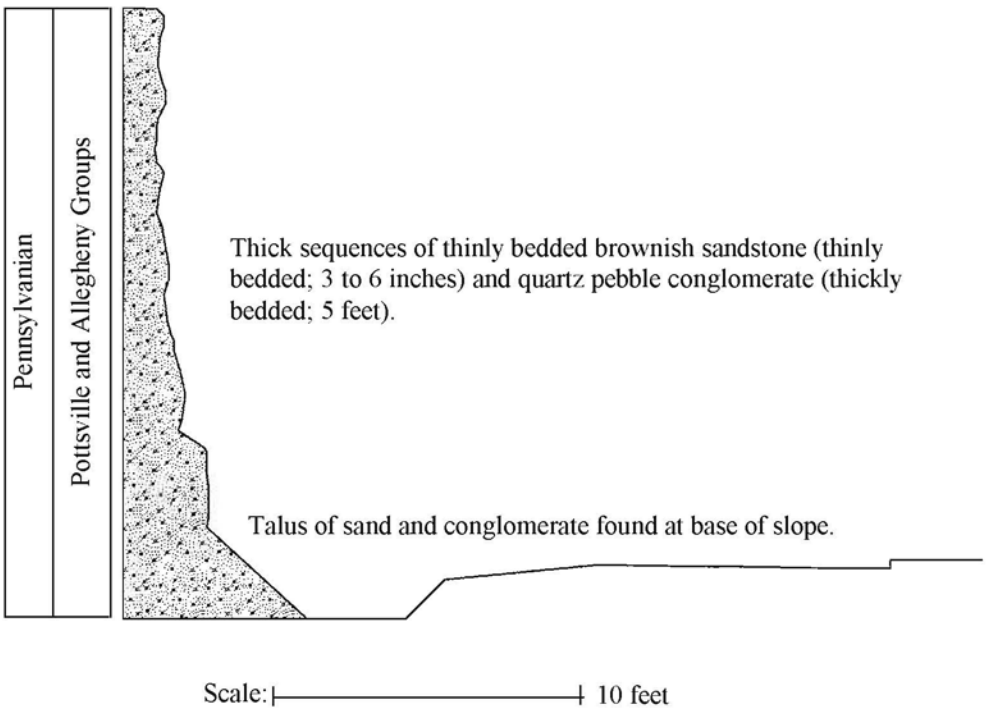


Figure B-4- 3. Stratigraphic section for slope located at SUM-76-20.

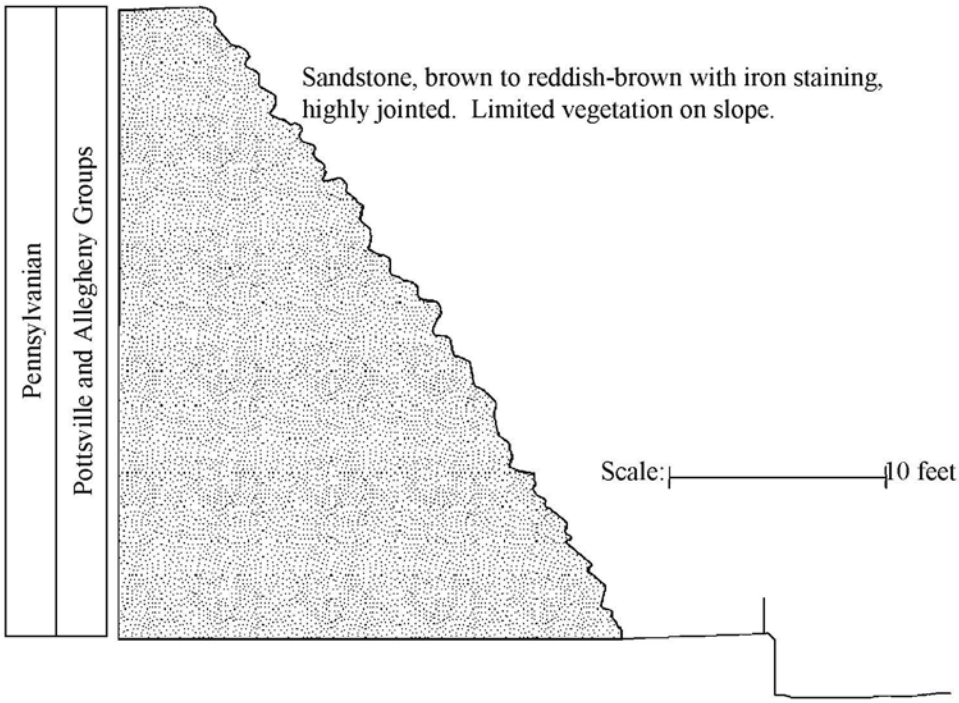


Figure B-4- 5. Stratigraphic section for slope located at SUM-76-23.5.

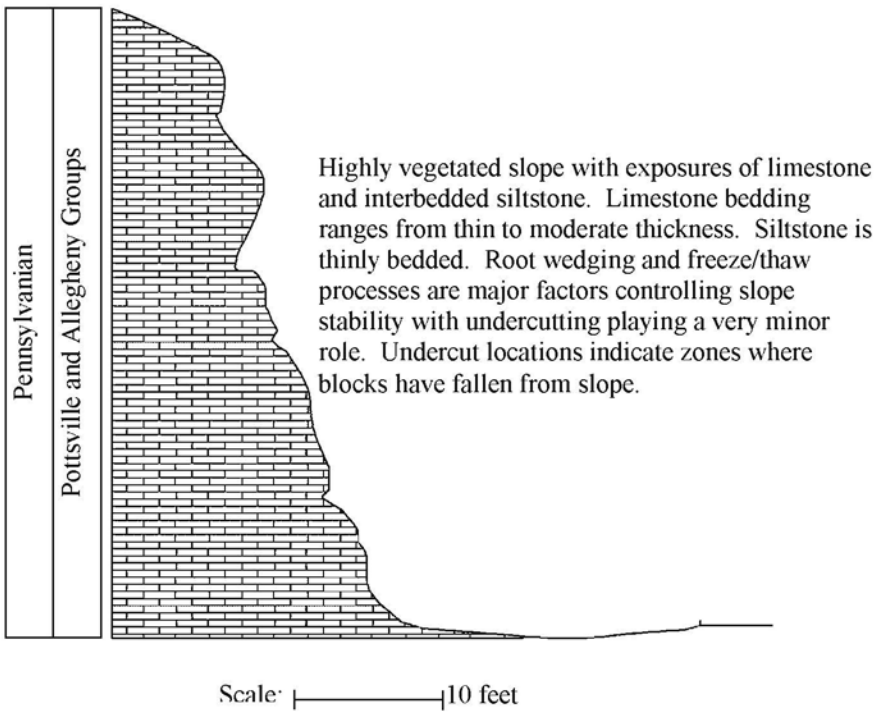


Figure B-5- 1. Stratigraphic section for slope located at COS-36-30.

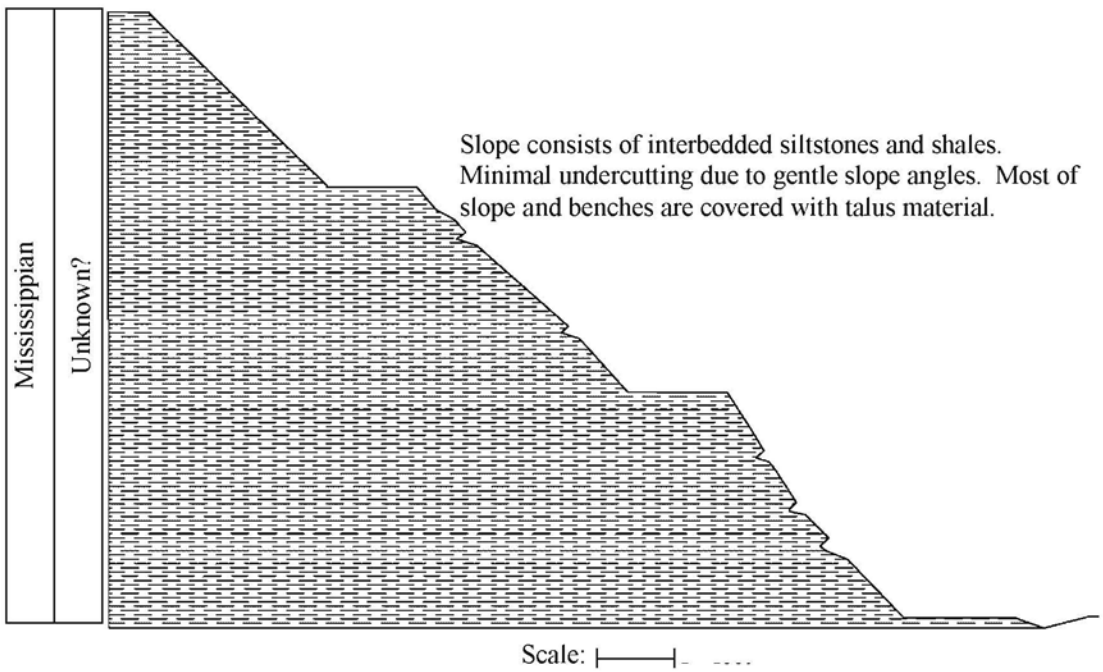


Figure B-5- 2. Stratigraphic section for slope located at COS-715-6.5.

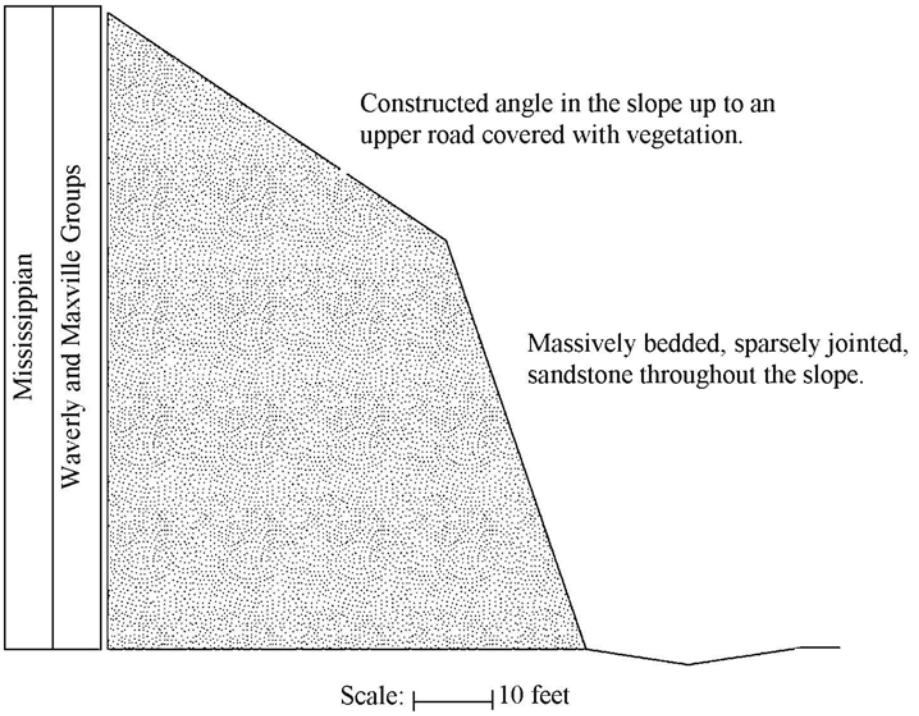


Figure B-5- 3. Stratigraphic section for slope located at LIK-16-28.

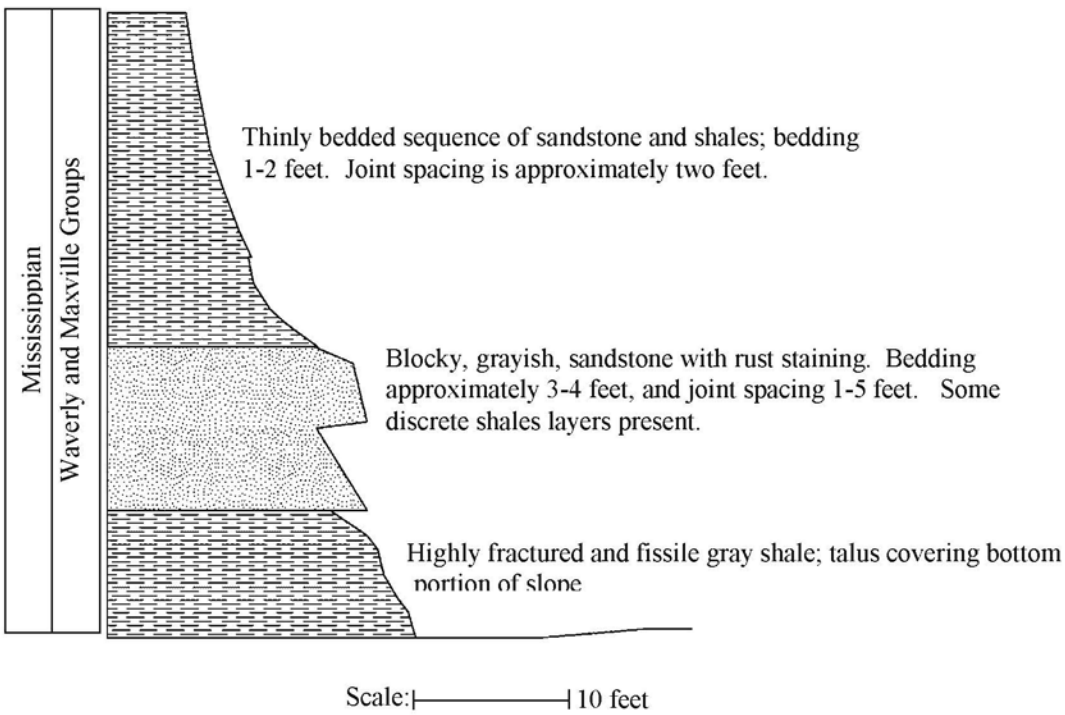


Figure B-5- 4. Stratigraphic section for slope located at LIK-70-135.

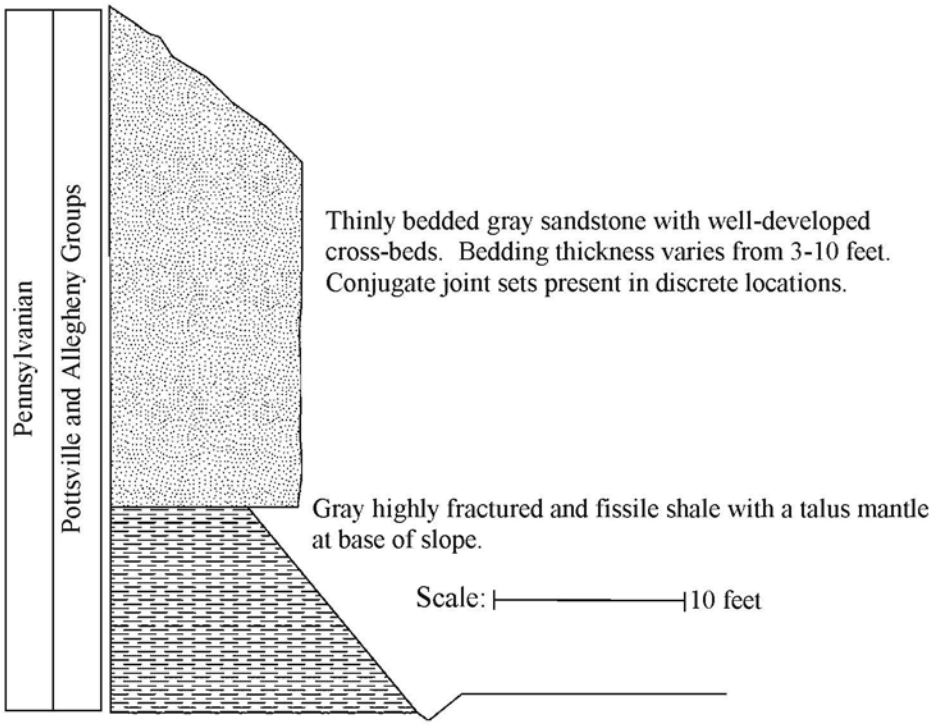


Figure B-5- 6. Stratigraphic section for slope located at MUS-60-6.9.

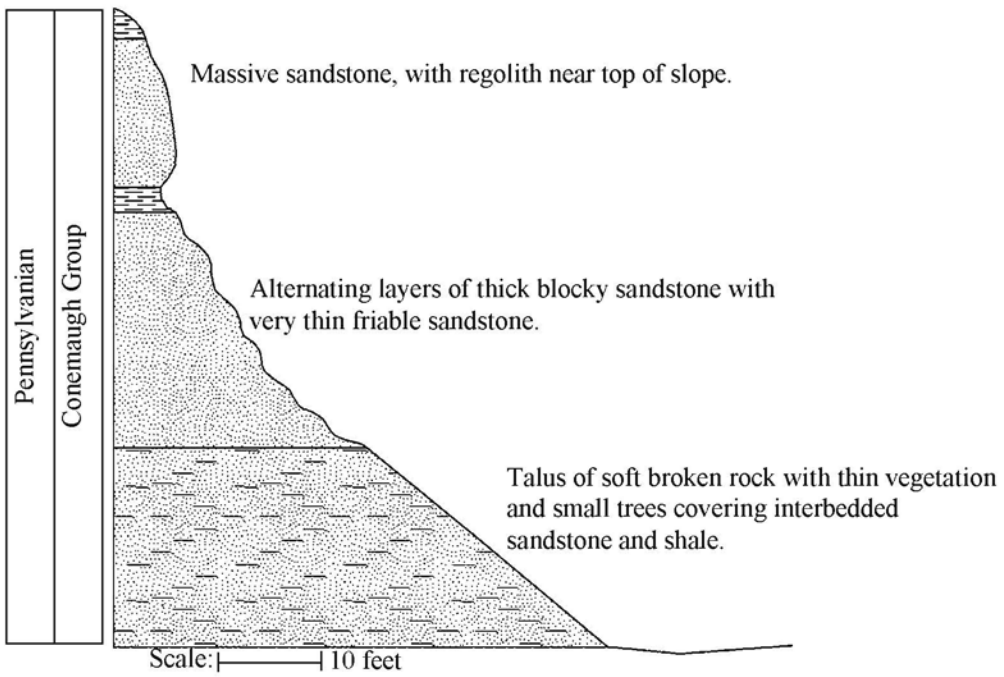


Figure B-5- 5. Stratigraphic section for slopes located at PER-13-5.1.

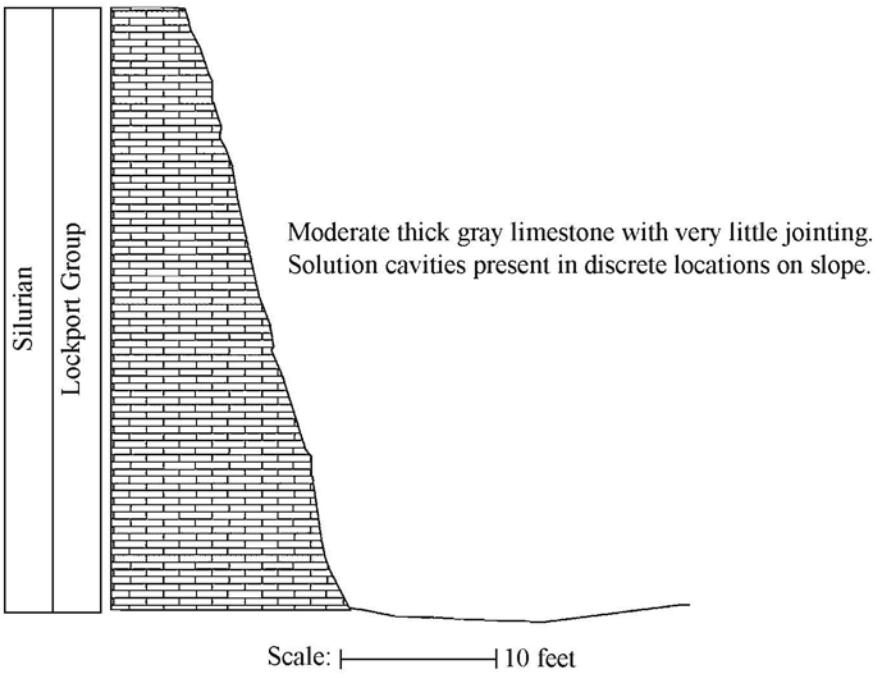


Figure B-7- 1. Stratigraphic section for slope located at CLA-68-7.

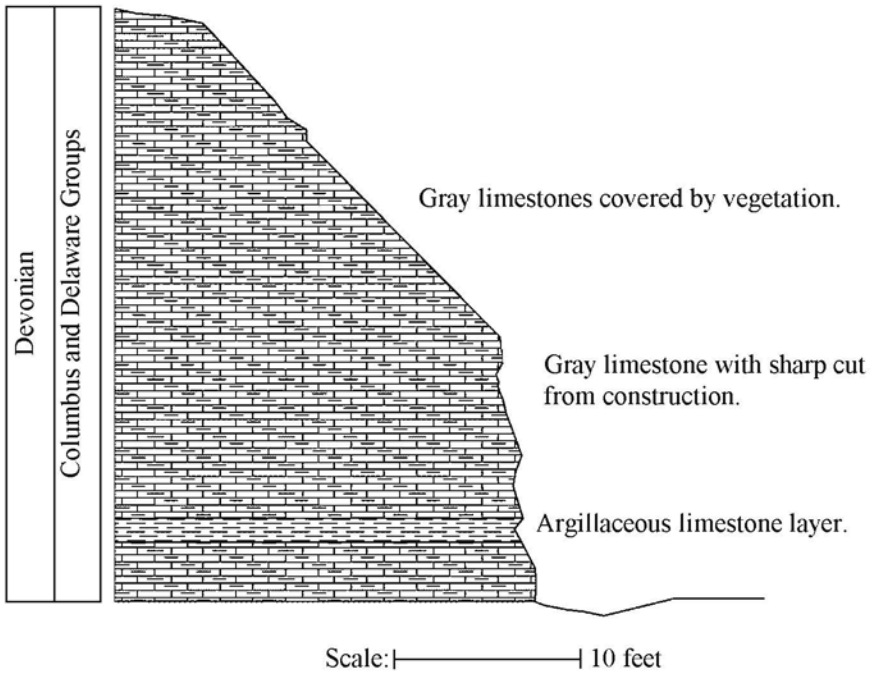


Figure B-7- 2. Stratigraphic section for slope located at LOG-297-2.6.

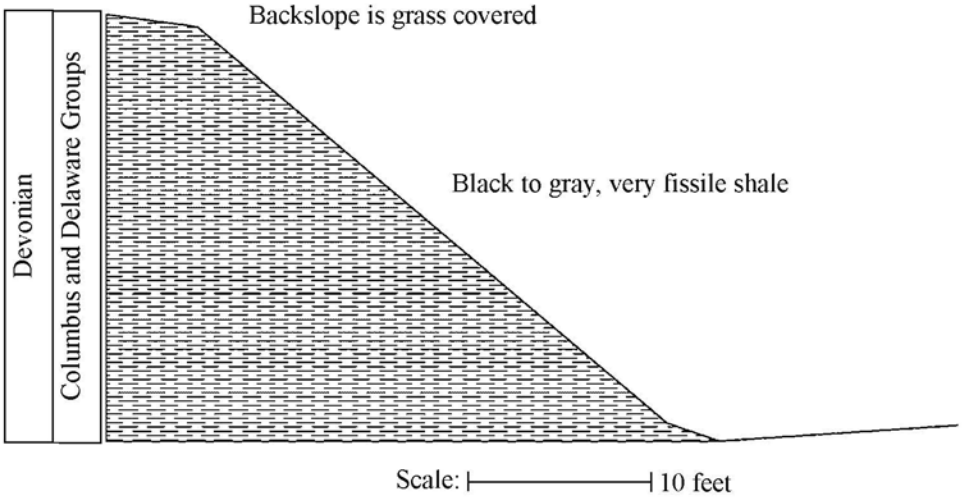


Figure B-7- 3. Stratigraphic section for slope located at LOG-33-20.5.

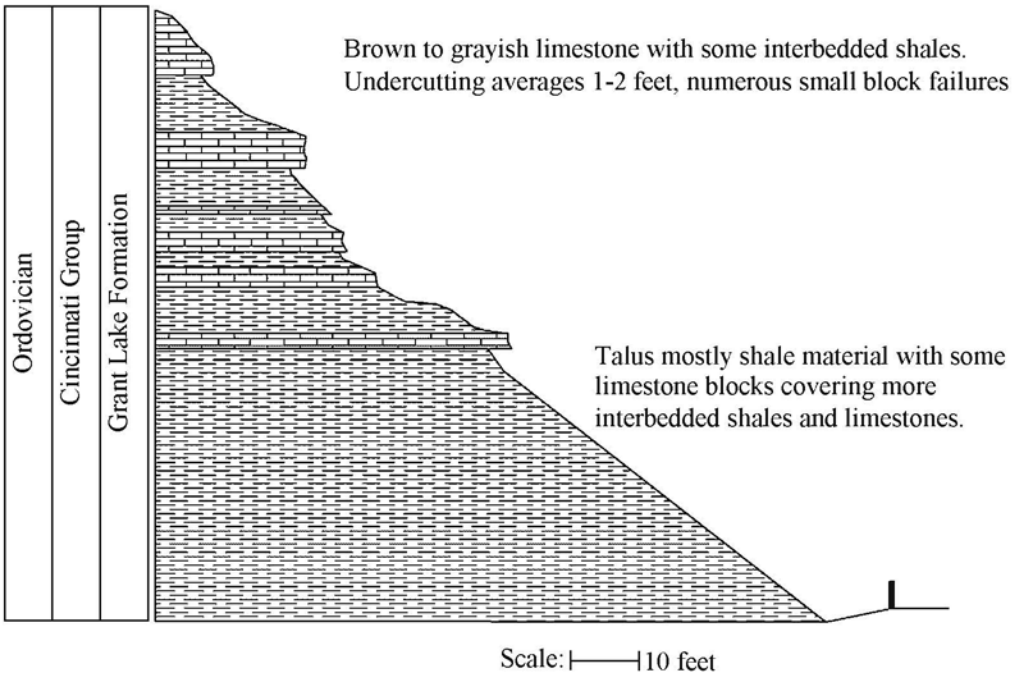


Figure B-8-1: Stratigraphic section for HAM-71-10.

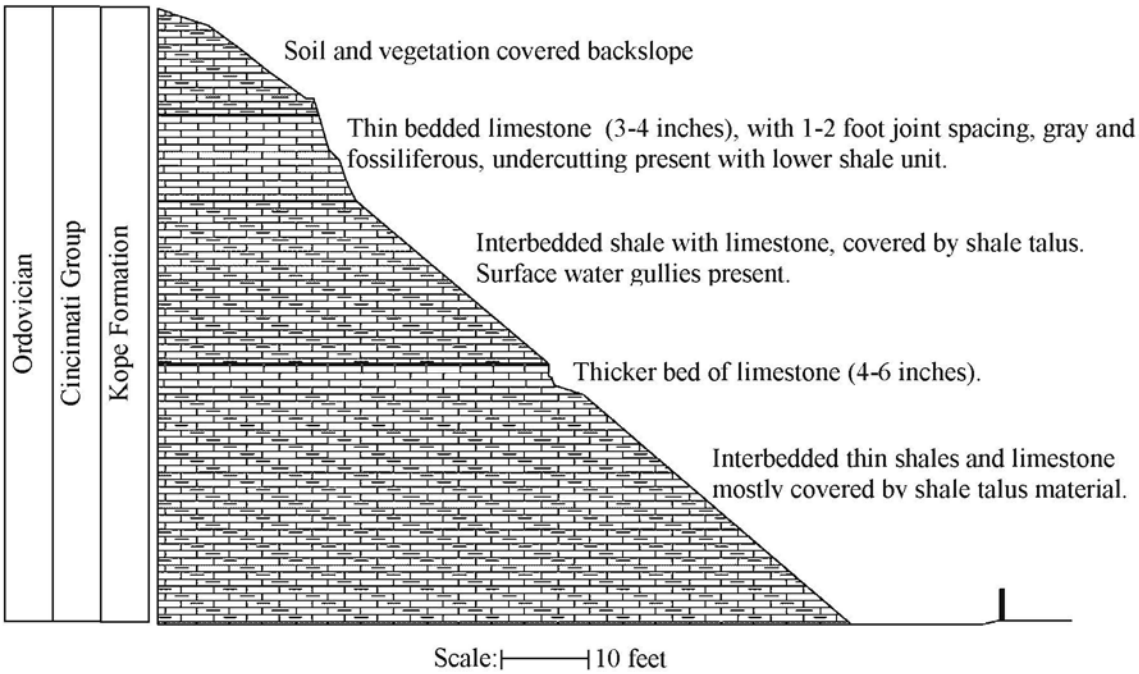


Figure B-8-2: Stratigraphic section of HAM-74-17.6.

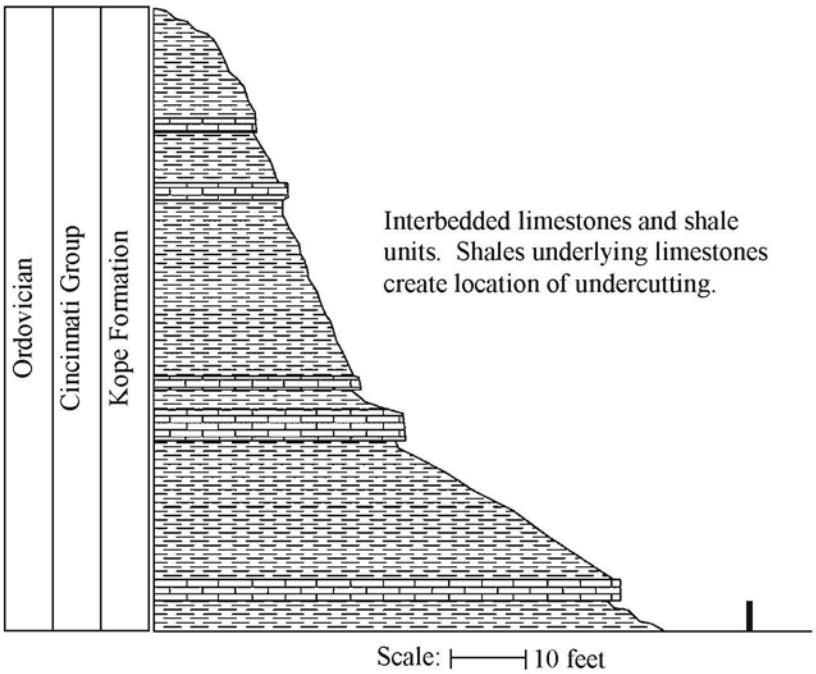


Figure B-8-3: Stratigraphic section for HAM-74-18.1.

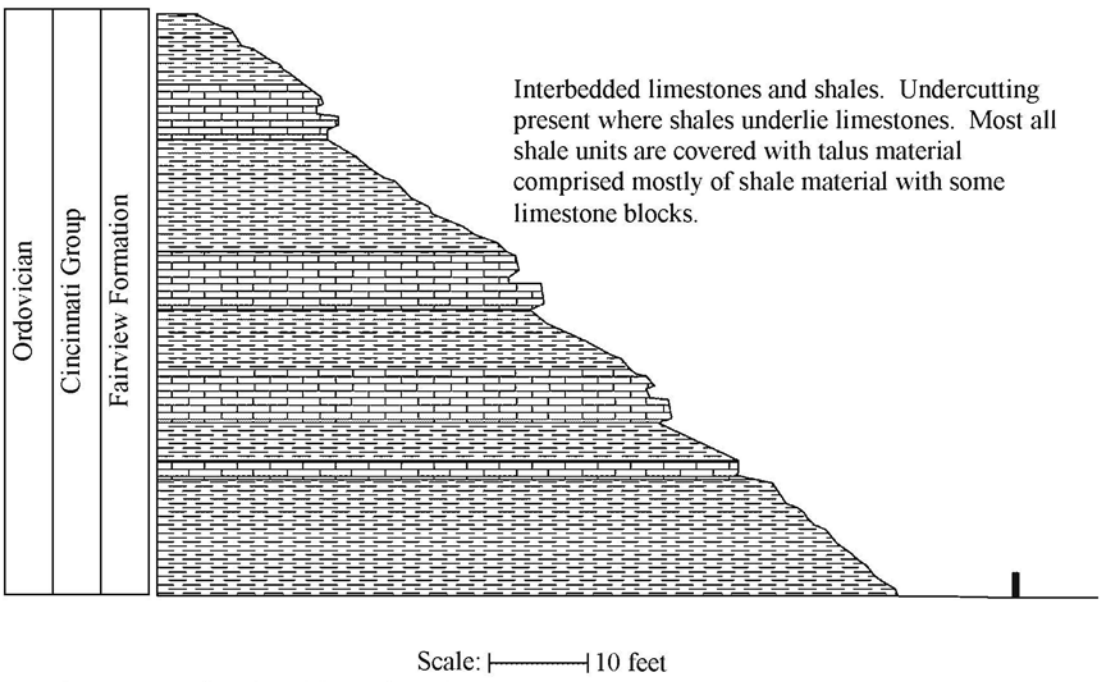


Figure B-8-4: Stratigraphic section of HAM-74-9.4.

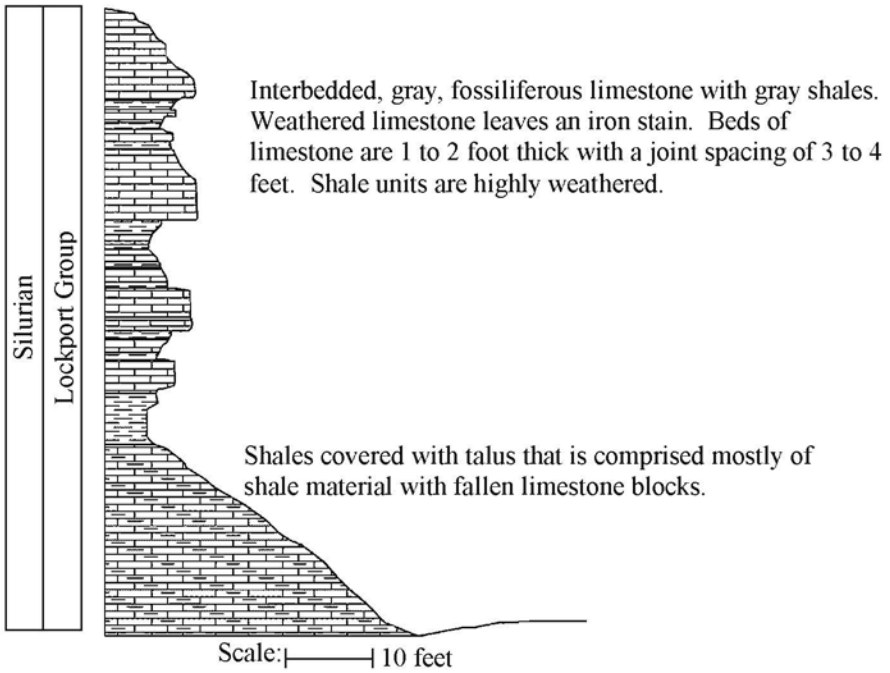


Figure B-9- 1. Stratigraphic section for slope located at ADA-41-16.1

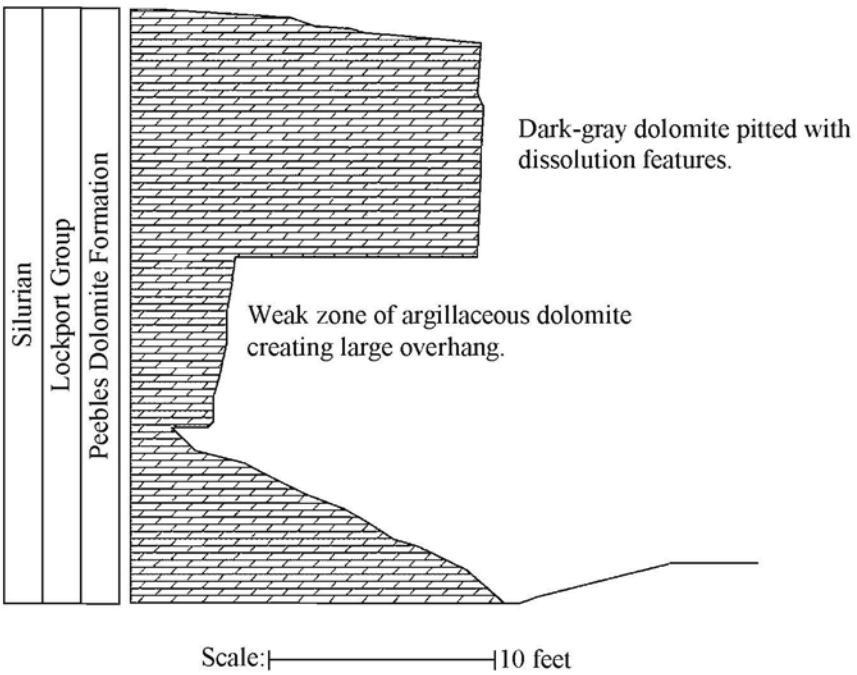


Figure B-9- 2. Stratigraphic section for slope located at ADA-52-23.1

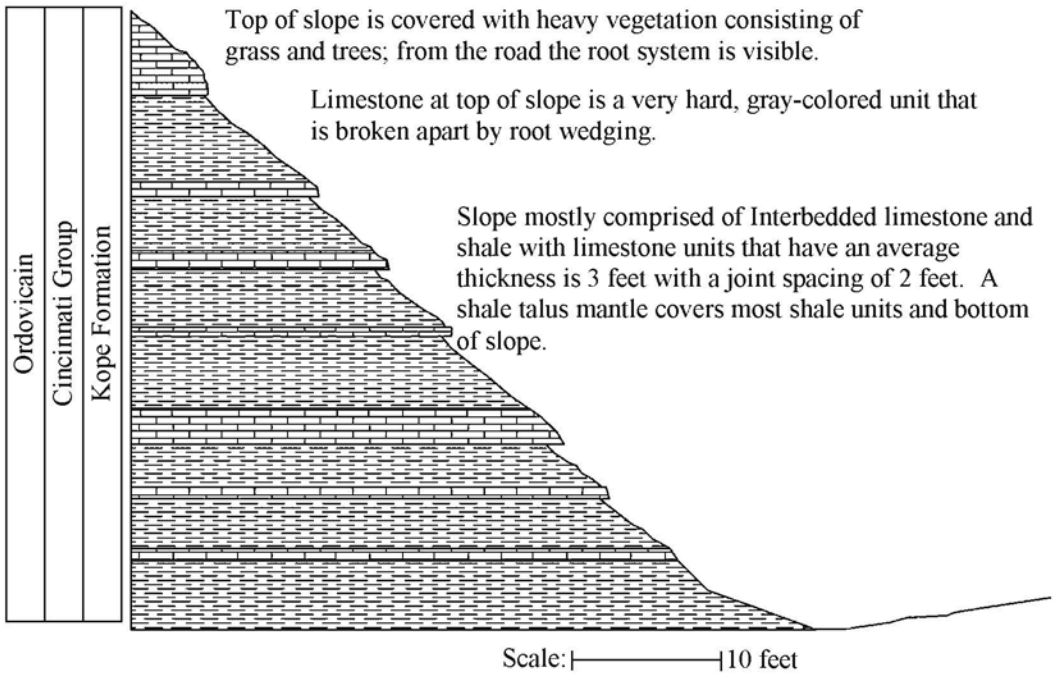


Figure B-9- 3. Stratigraphic section for slope located at BRO-52-22.

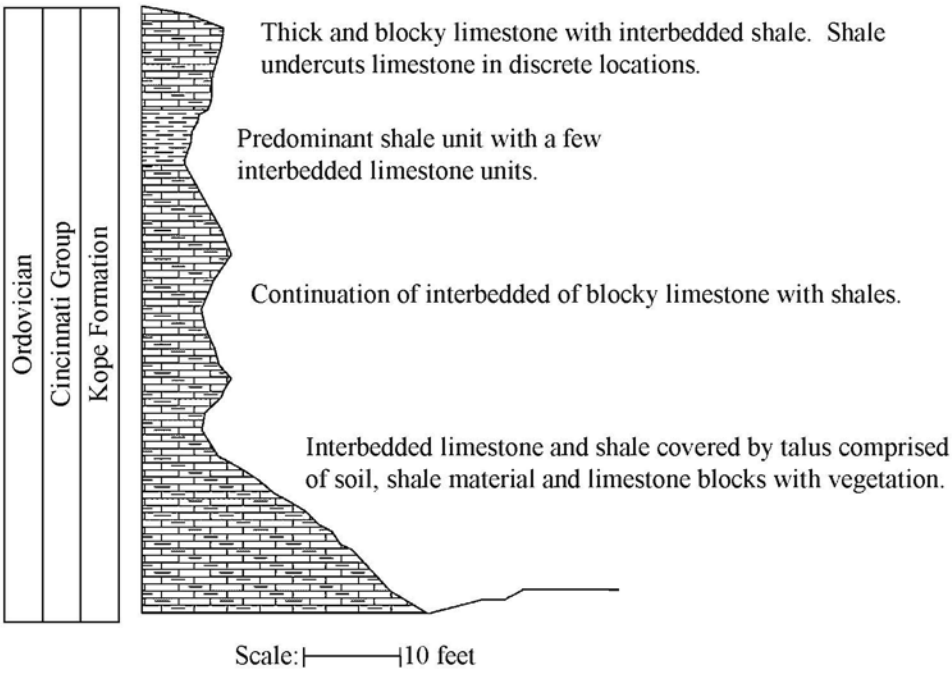


Figure B-9- 4. Stratigraphic section for slope located at BRO-62-9.0.

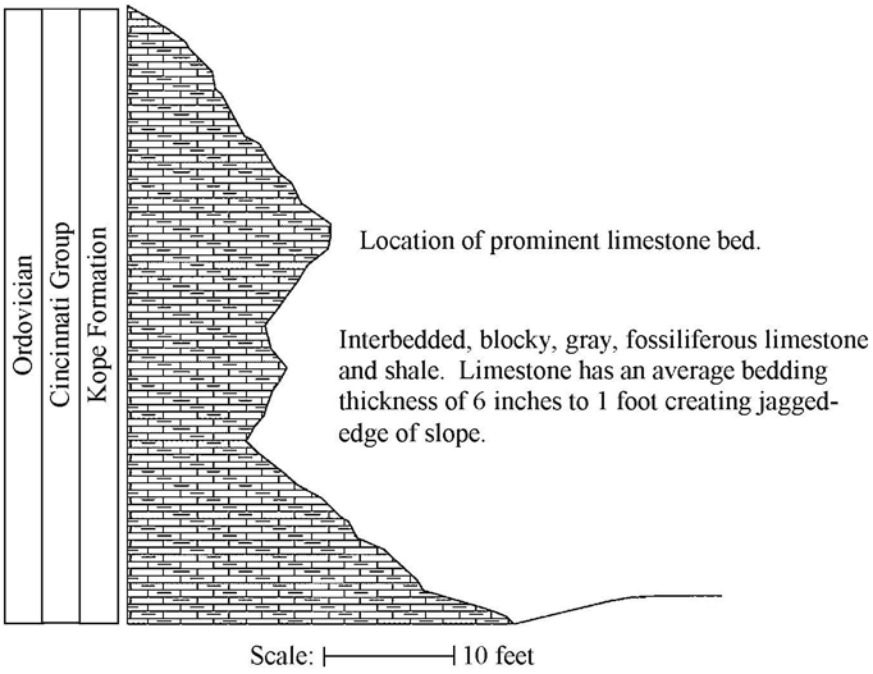


Figure B-9- 5. Stratigraphic section for slope located at BRO-62-9.1.

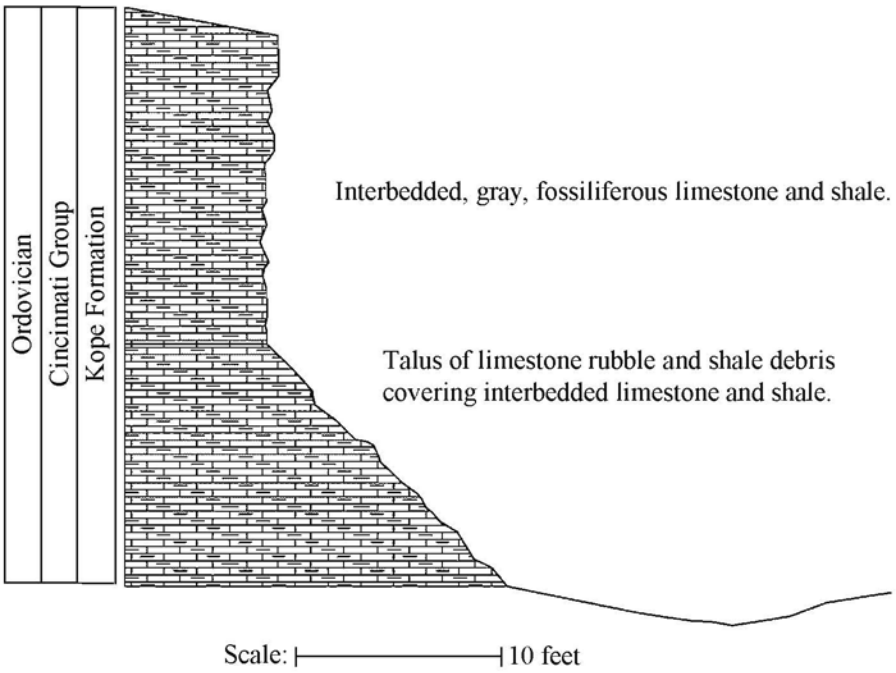


Figure B-9- 6. Stratigraphic section for slope located at BRO-62-9.2.

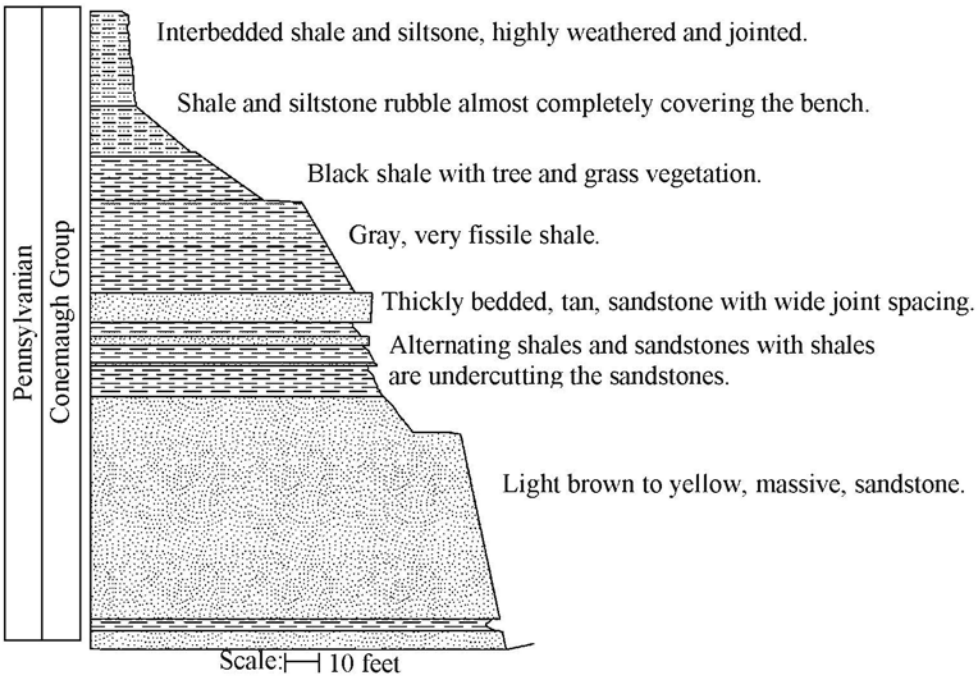


Figure B-9- 7. Stratigraphic section for slope located at LAW-52-12.5.

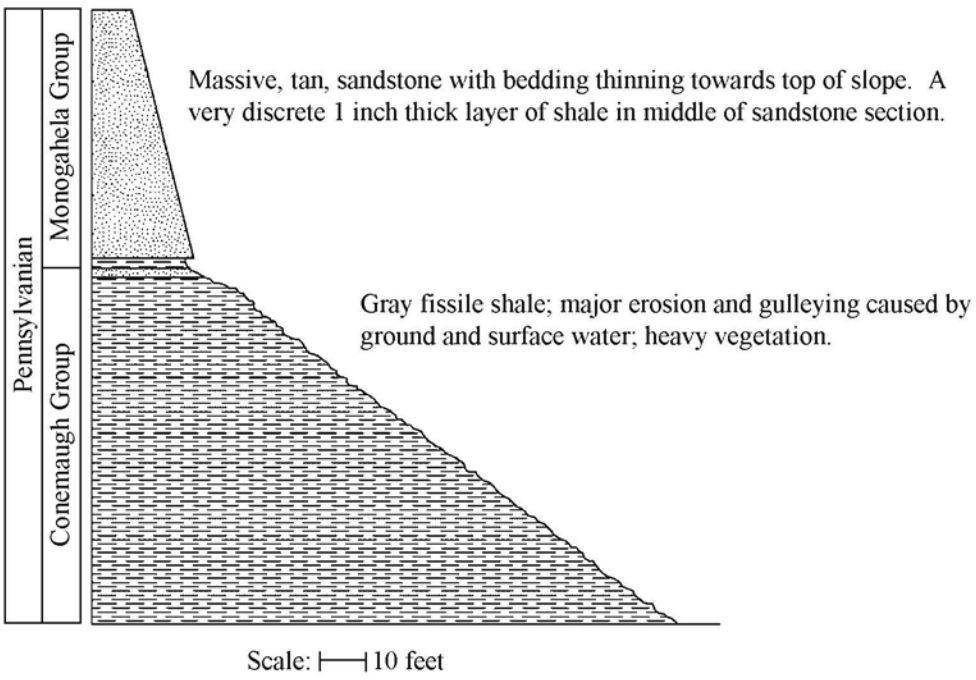


Figure B-9- 8. Stratigraphic section for slope located at LAW-7-2.

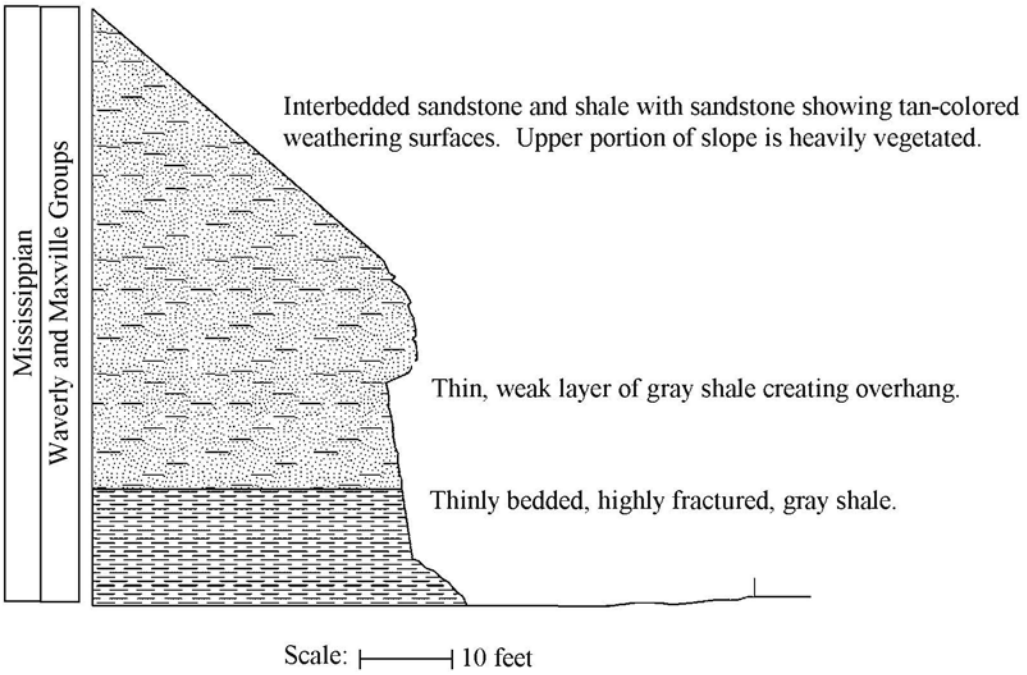


Figure B-9- 9. Stratigraphic section for slope located at SCI-52-25.5(a).

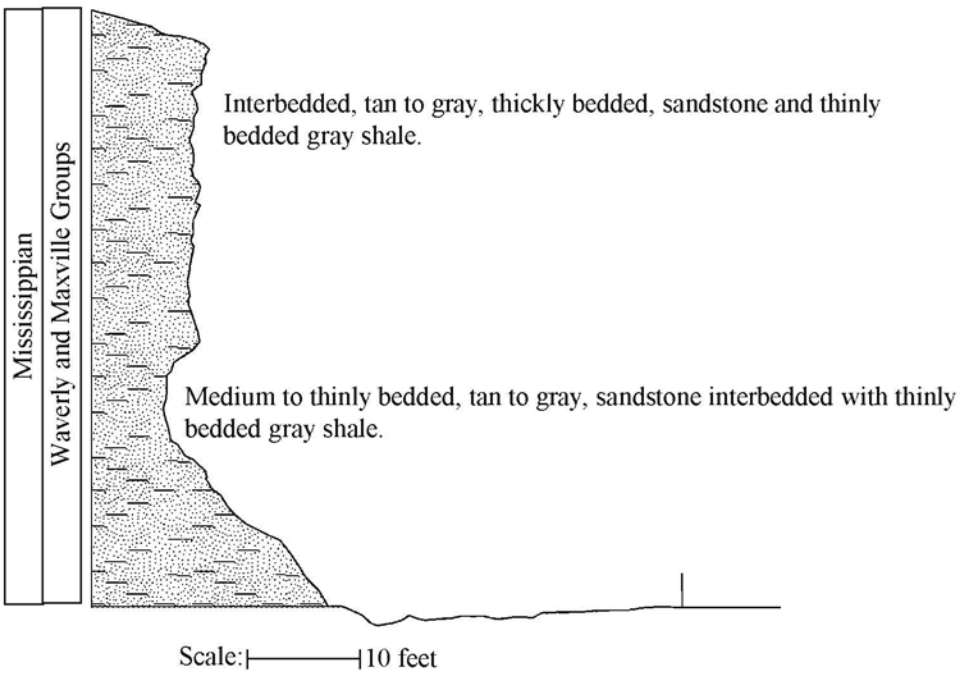


Figure B-9- 10. Stratigraphic section for slope located at SCI-52-25.5(b).

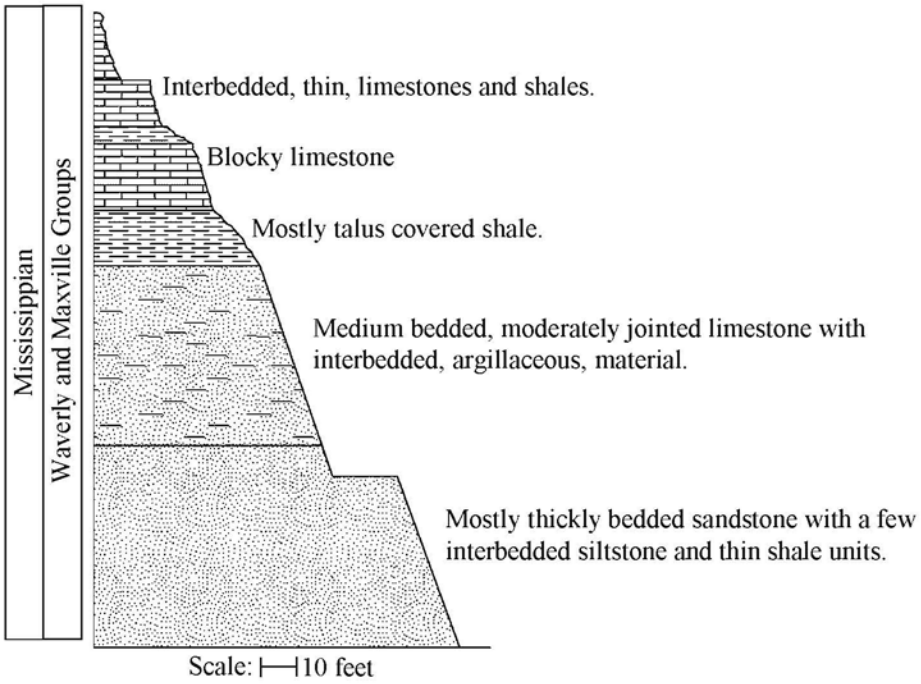


Figure B-9- 11. Stratigraphic section for slope located at SCI-52-25.5(c).

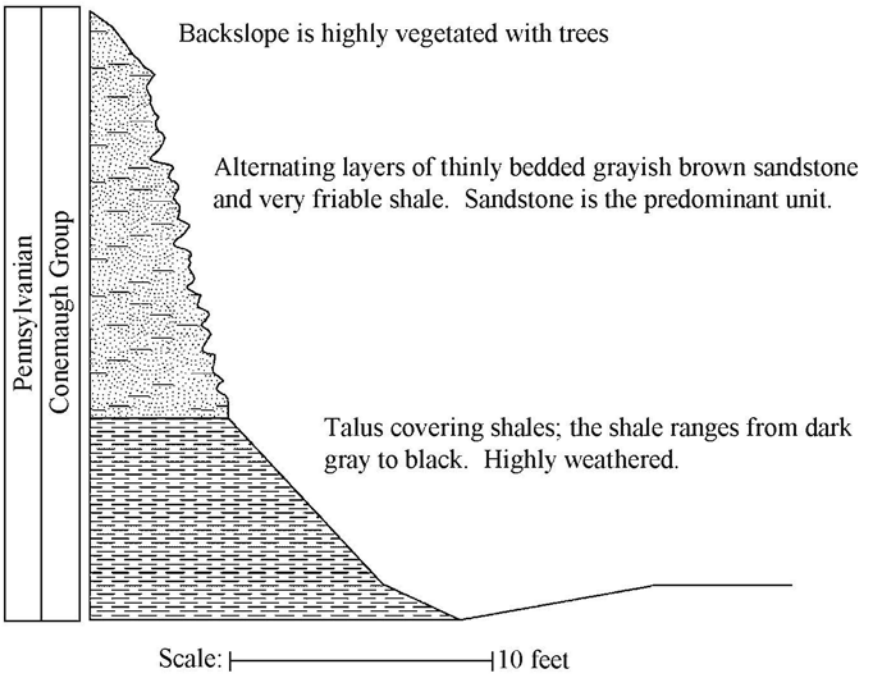


Figure B-10-1: Stratigraphic section for ATH-13-9.2.

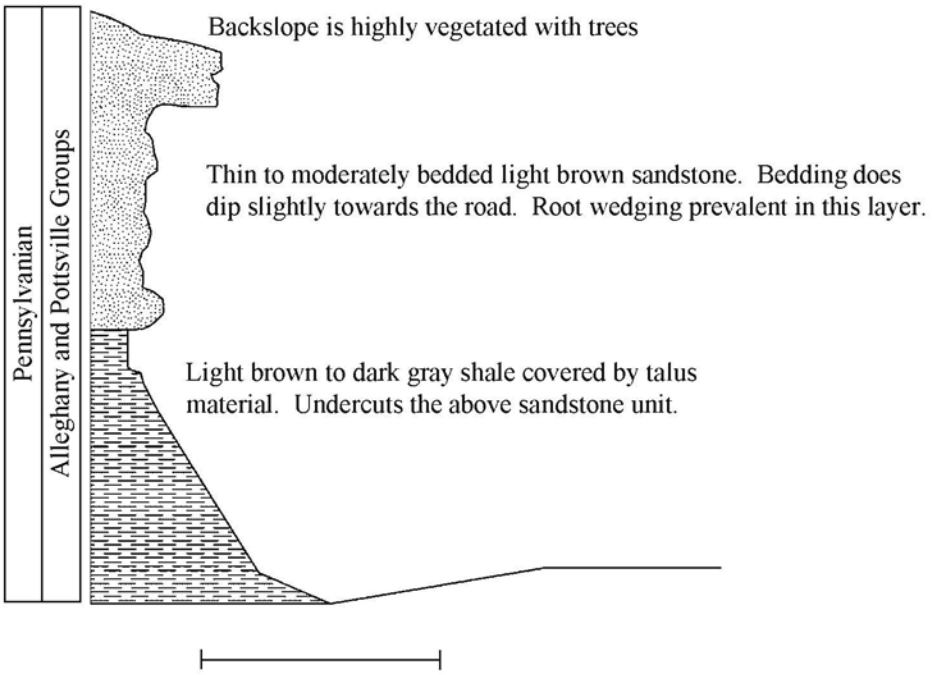


Figure B-10-2: Stratigraphic section for ATH-13-13.7.

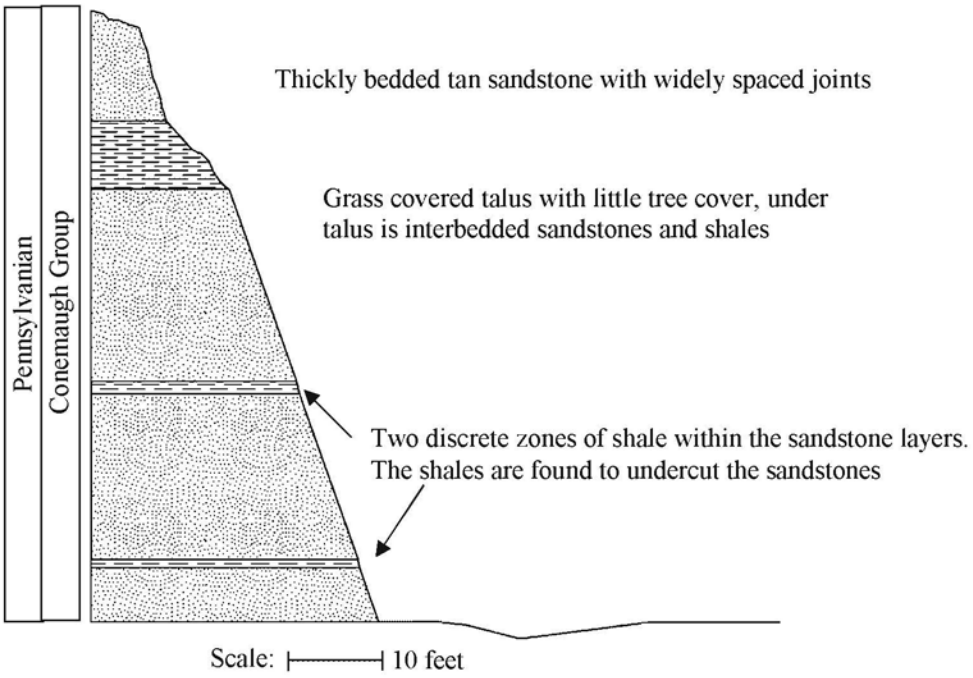


Figure B-10-3: Stratigraphic section for ATH-33-15(b).

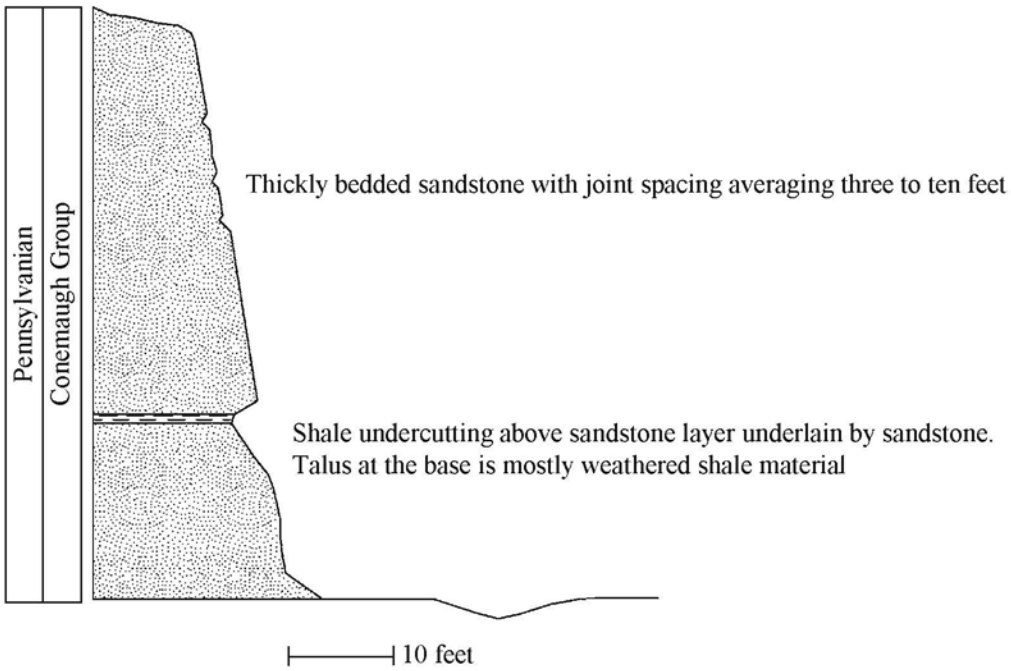


Figure B-10-4: Stratigraphic section for ATH-33-15(a).

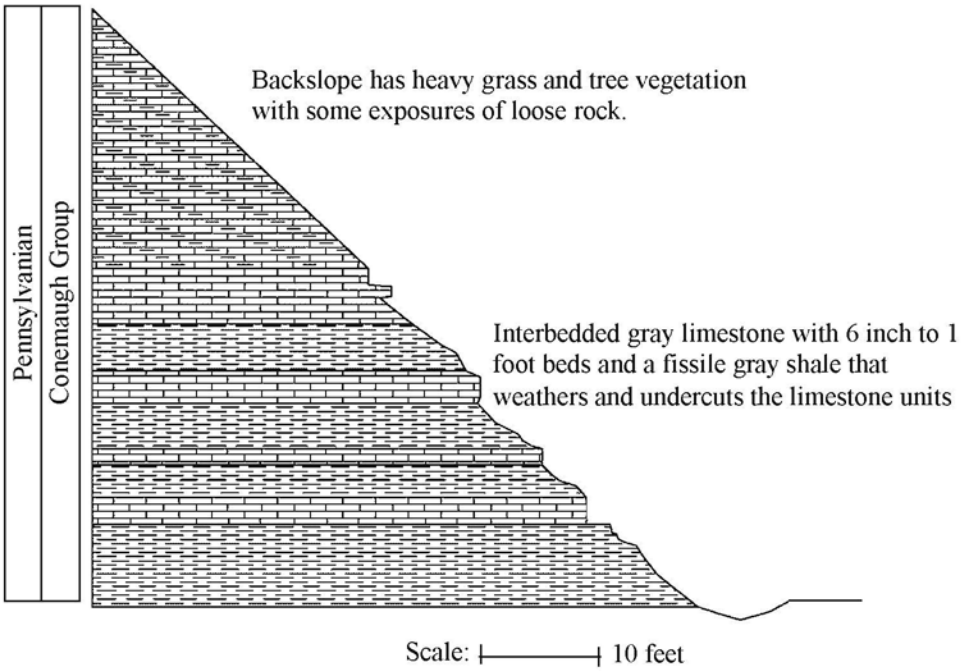


Figure B-10-5: Stratigraphic section for ATH-78-22.5.

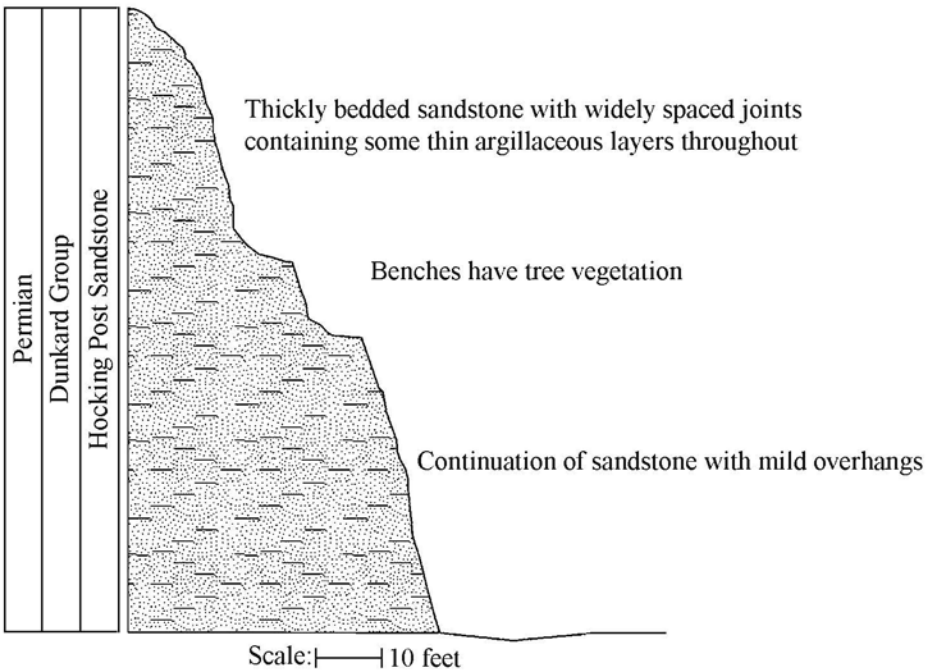


Figure B-10-6: Stratigraphic section for ATH-124-2.1

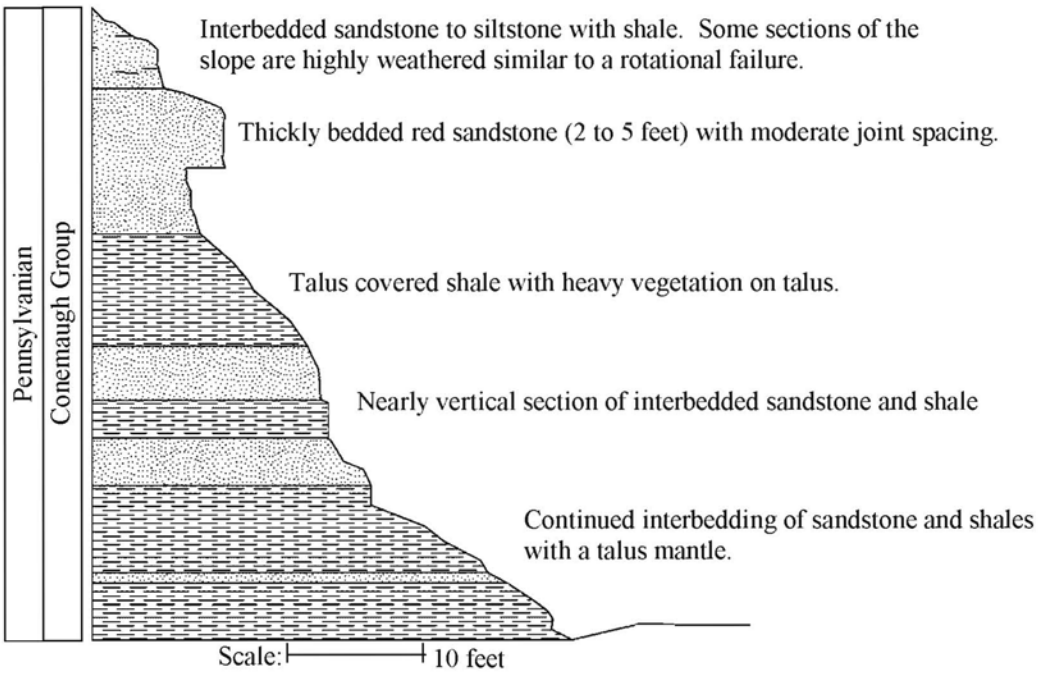


Figure B-10-7: Stratigraphic section for GAL-160-0.55.

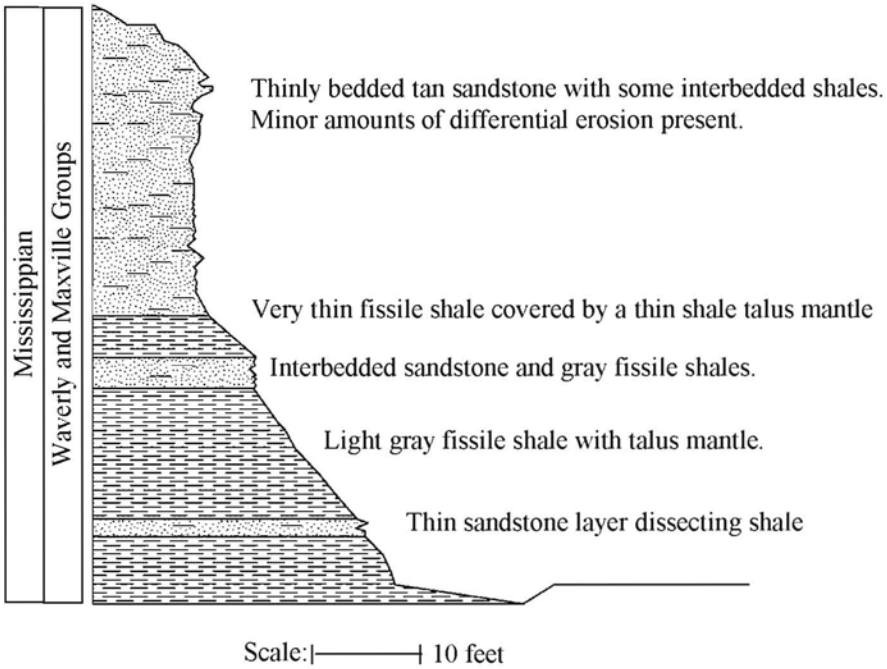


Figure B-10-8: Stratigraphic section of HOC-33-5.

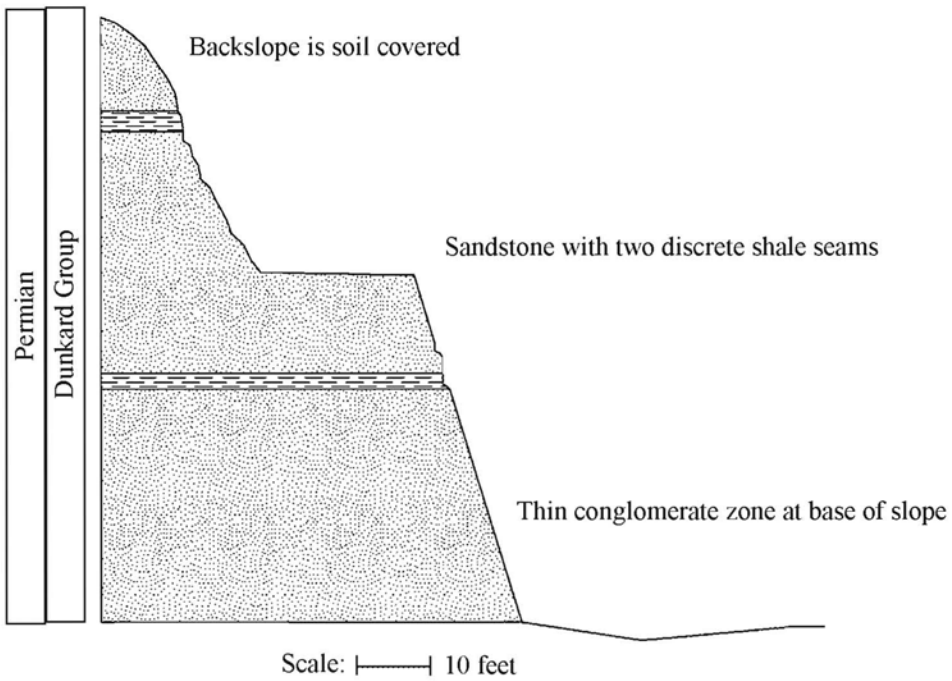


Figure B-10-9: Stratigraphic section for MEG-124-57.2.

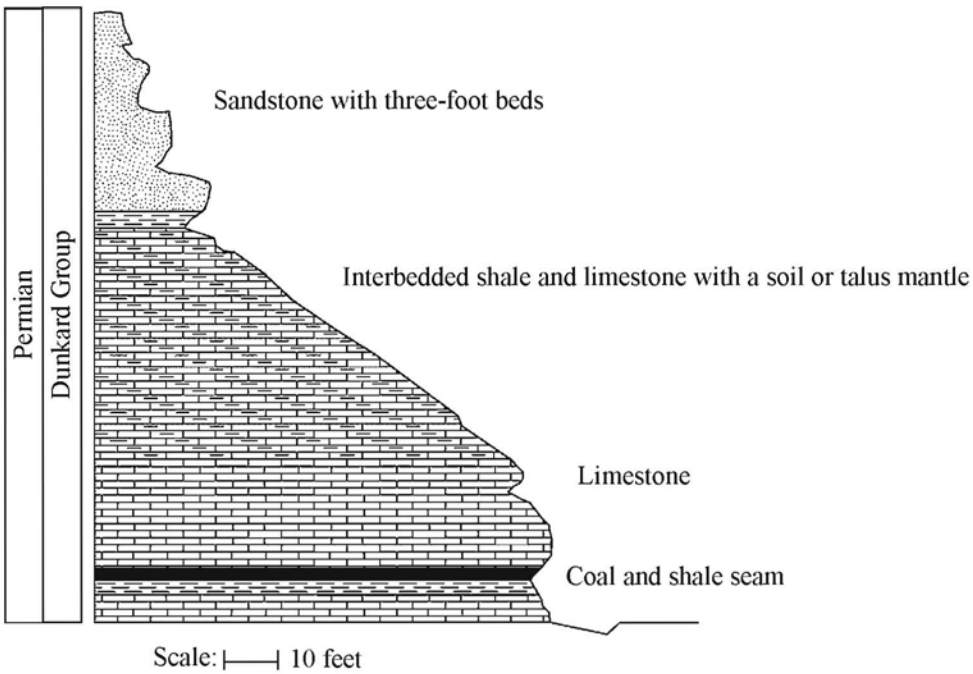


Figure B-10-10: Stratigraphic section for MOE-78-24.5.

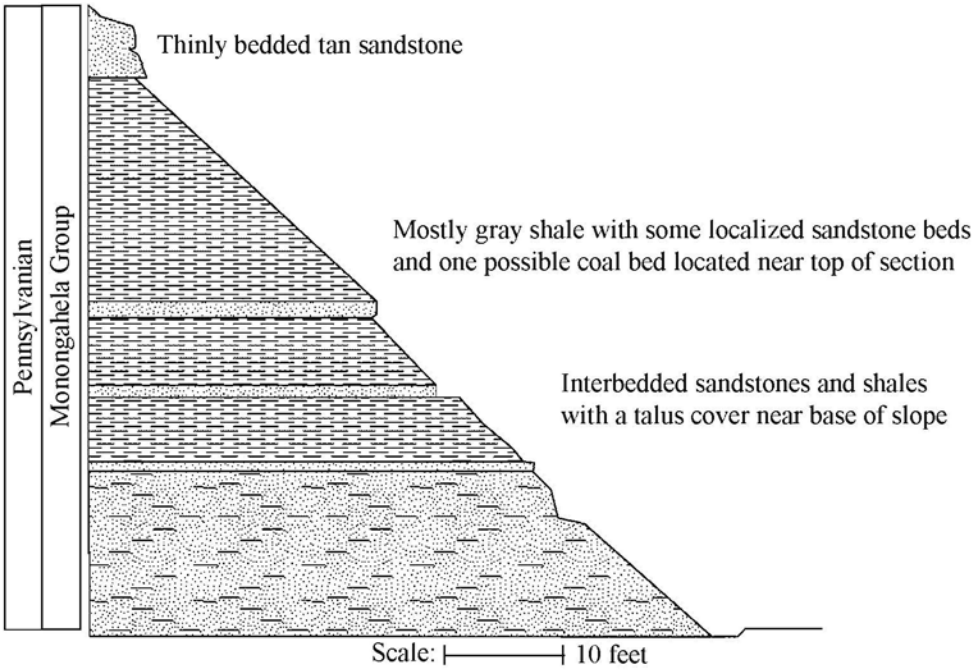


Figure B-10-11: Stratigraphic section of MOE-537-1.7.

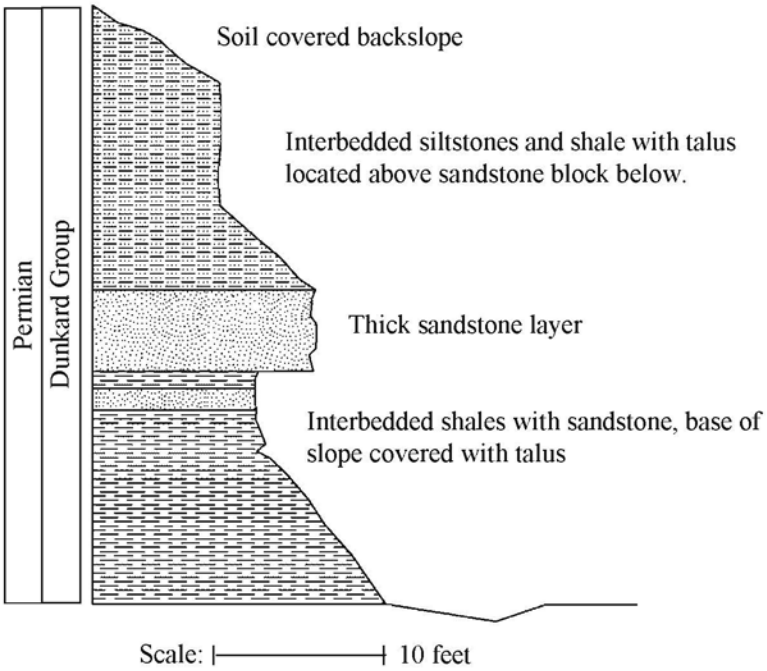


Figure B-10-12: Stratigraphic section for MOE-800-4.5.

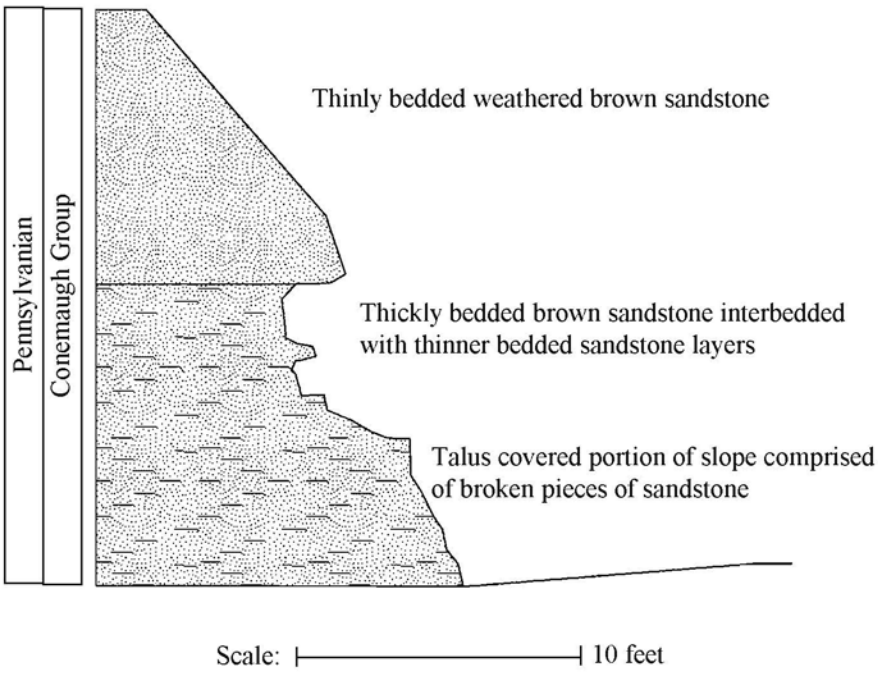


Figure B-10-13: Stratigraphic section for MRG-60-10.

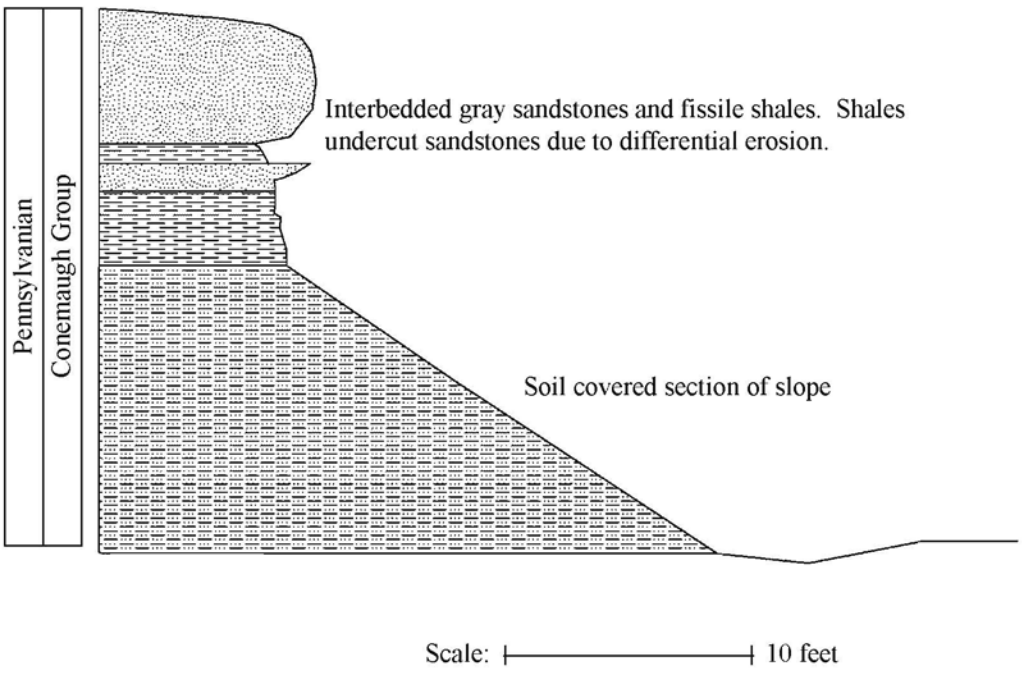


Figure B-10-14: Stratigraphic section for NOB-339-7.6.

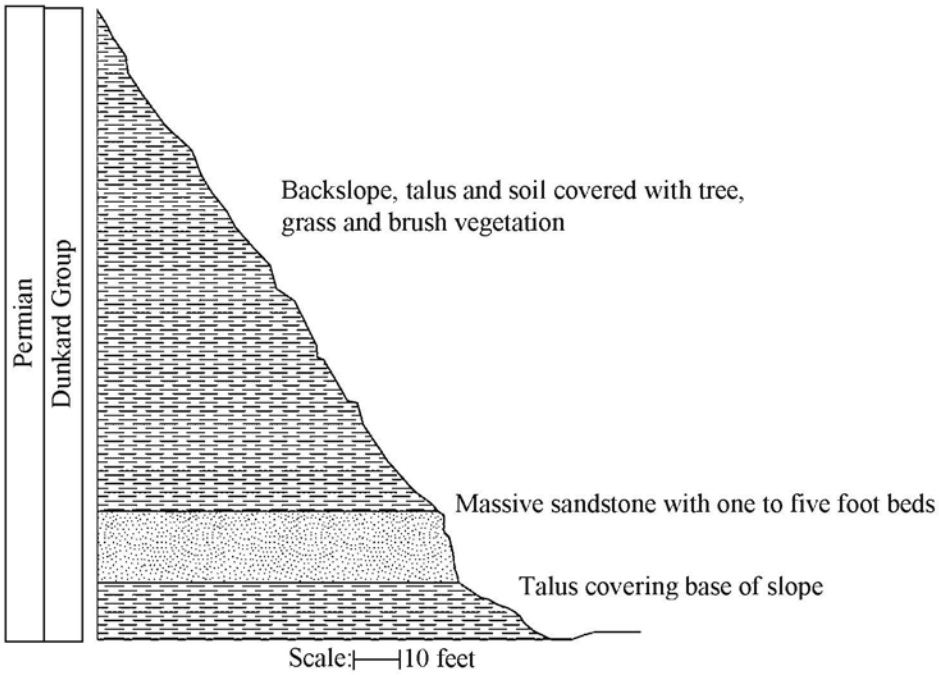


Figure B-10-7-1: Stratigraphic section for MOE-7-1.5

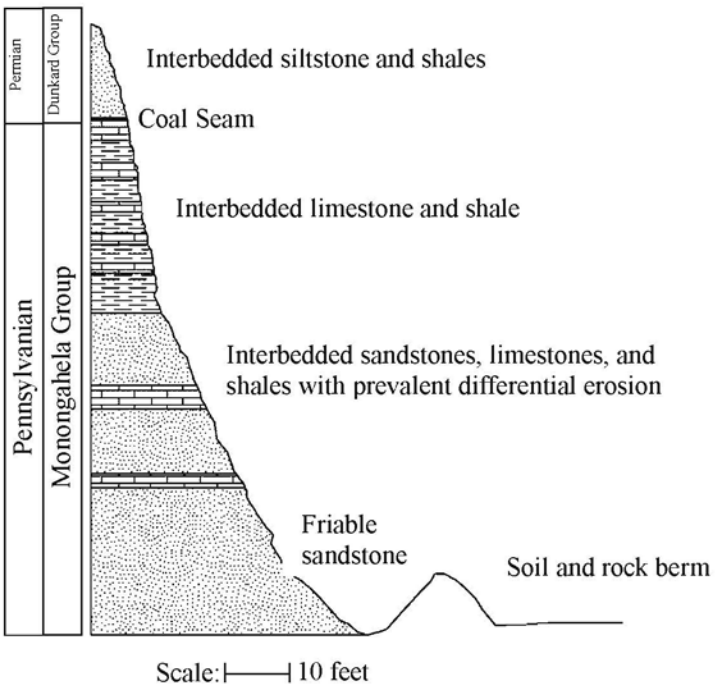


Figure B-10-7-2: Stratigraphic section for MOE-7-28.

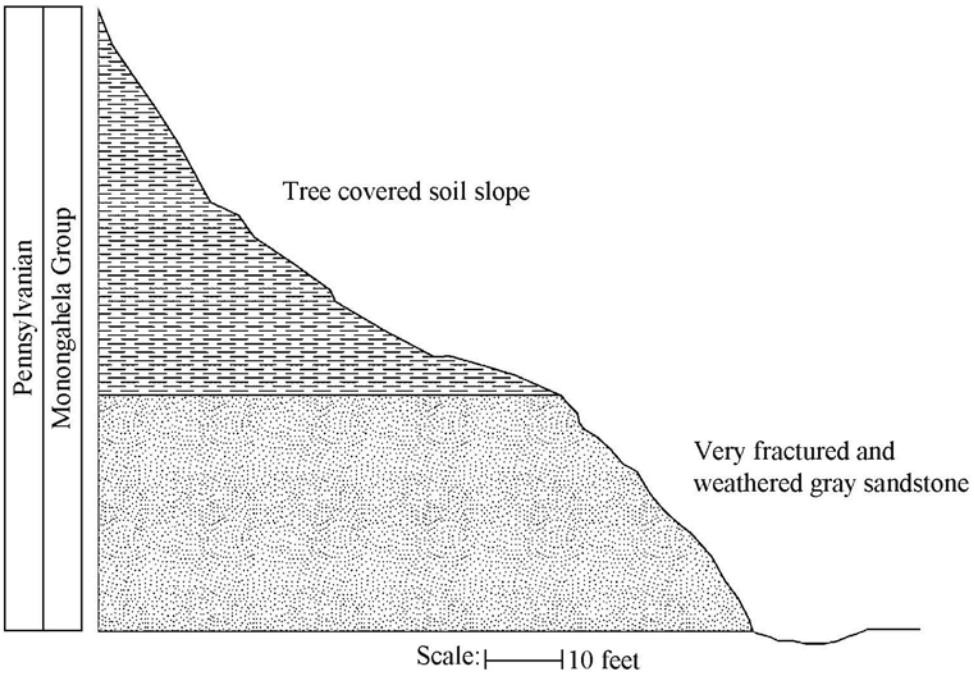


Figure B-10-7-3: Stratigraphic section for WAS-7-33.1.

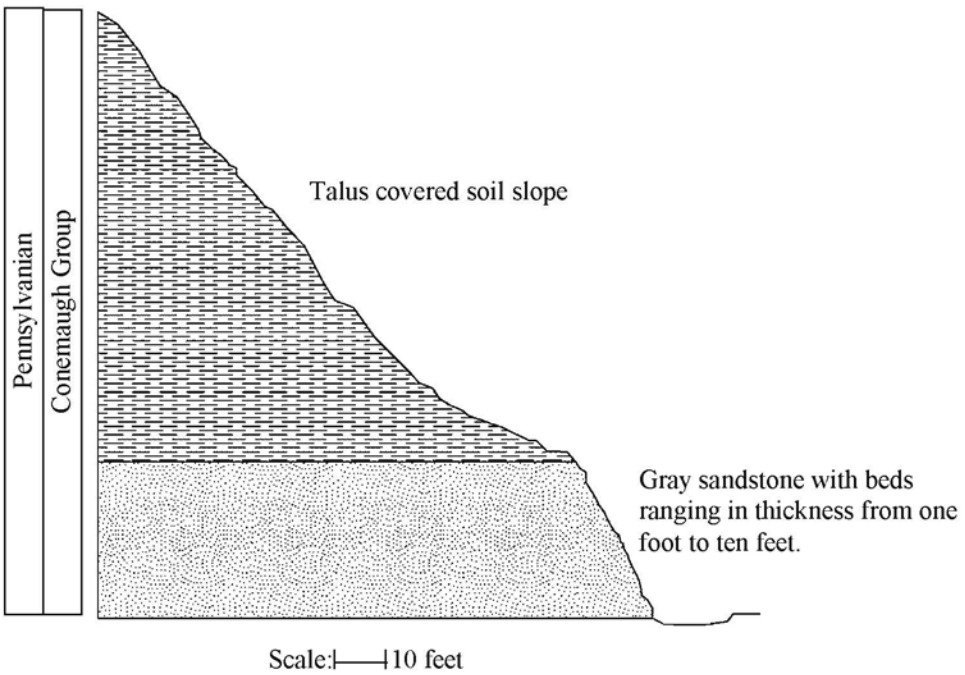


Figure B-10-7-4: Stratigraphic section of WAS-7-36.5.

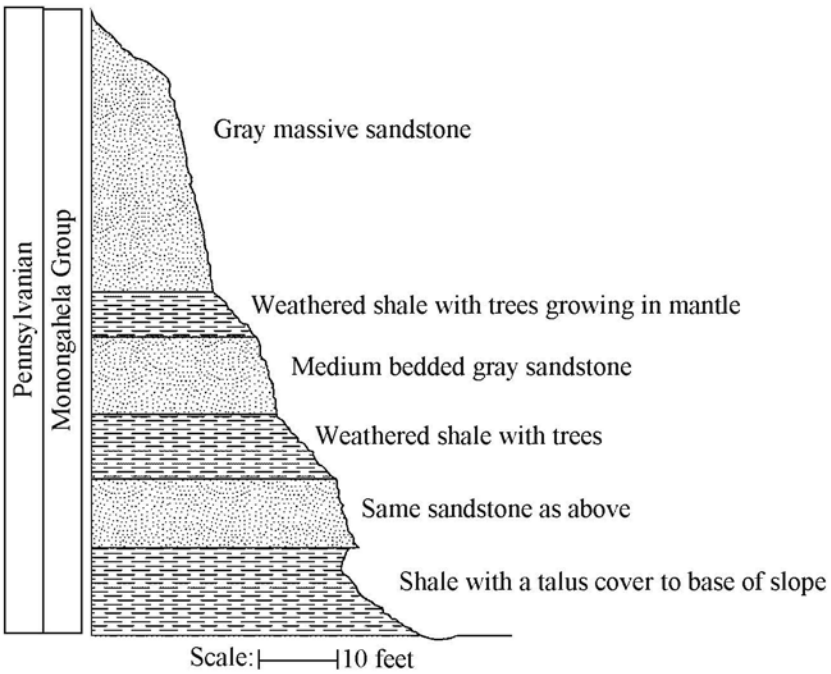


Figure B-10-7-5: Stratigraphic section for WAS-7-39.5.

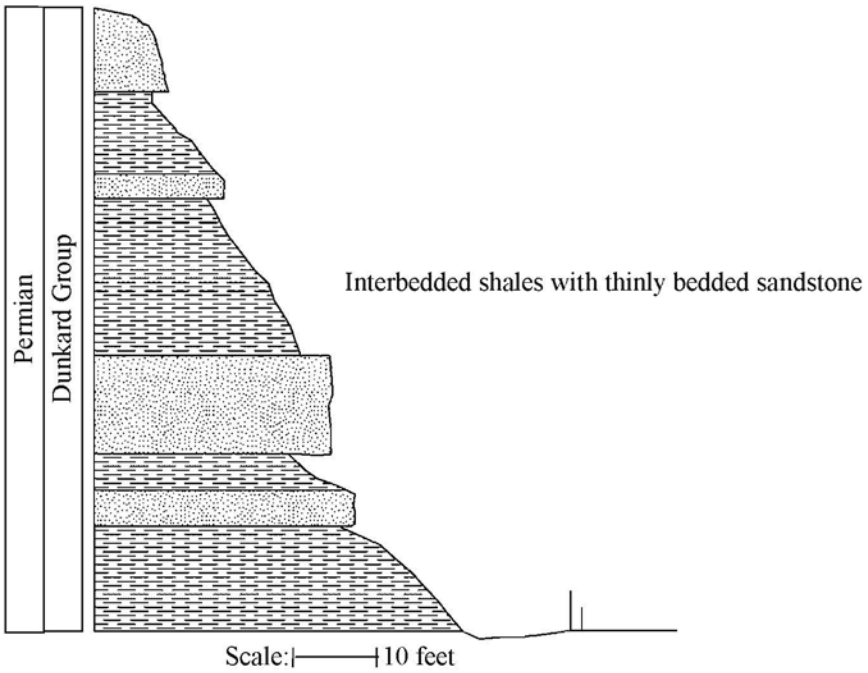


Figure B-11-1: Stratigraphic section for BEL-70-220.5.

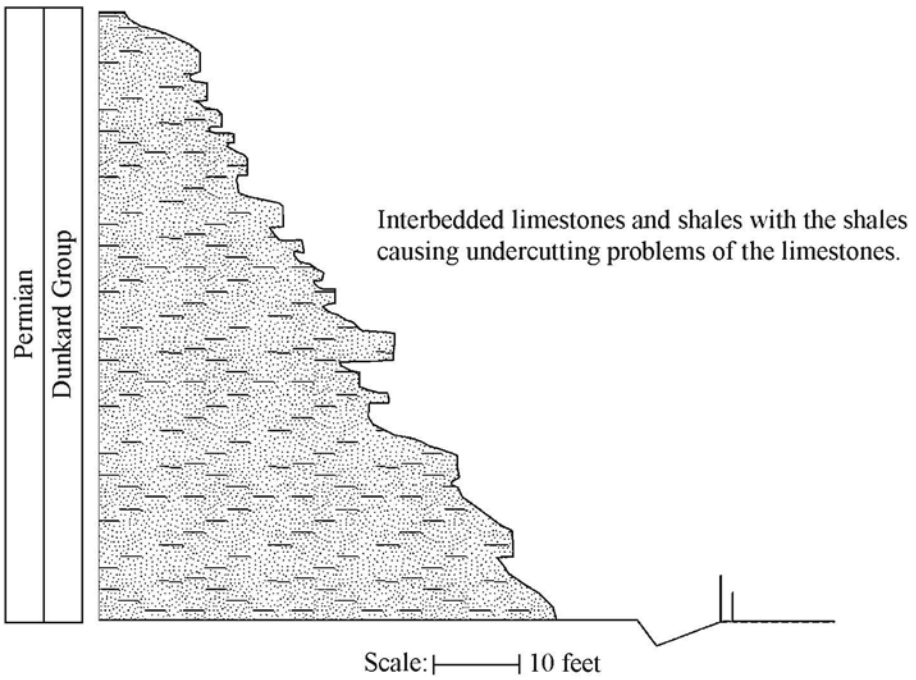


Figure B-11-2: Stratigraphic section of BEL-70-222.5.

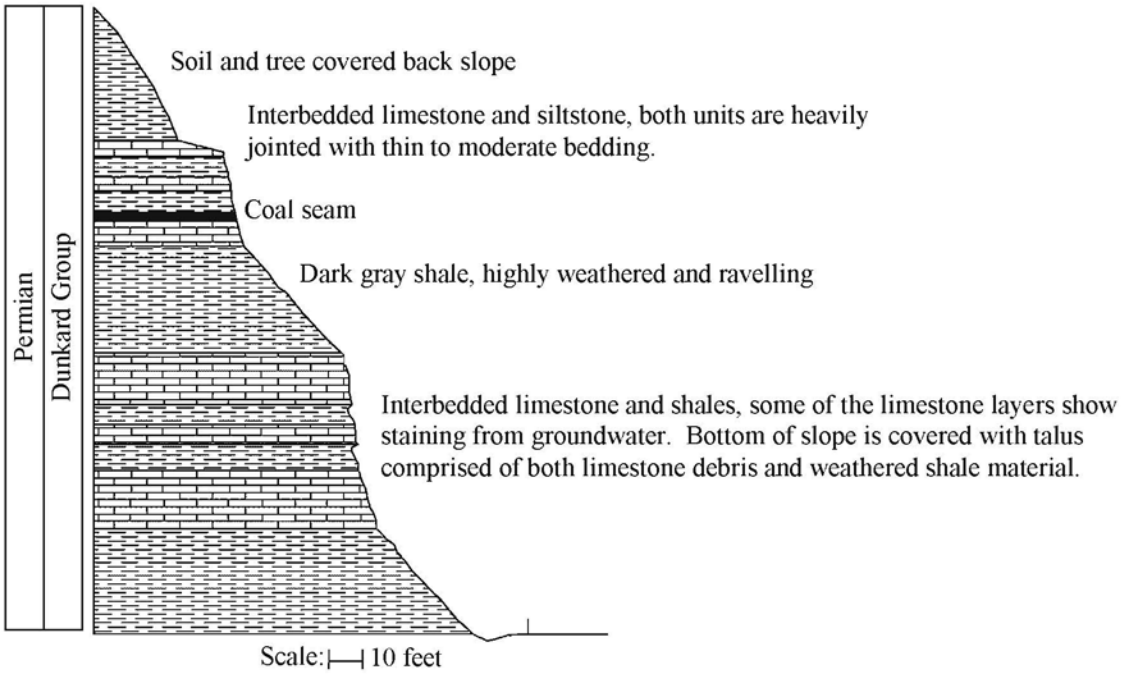


Figure B-11-3: Stratigraphic section for BEL-70-223.

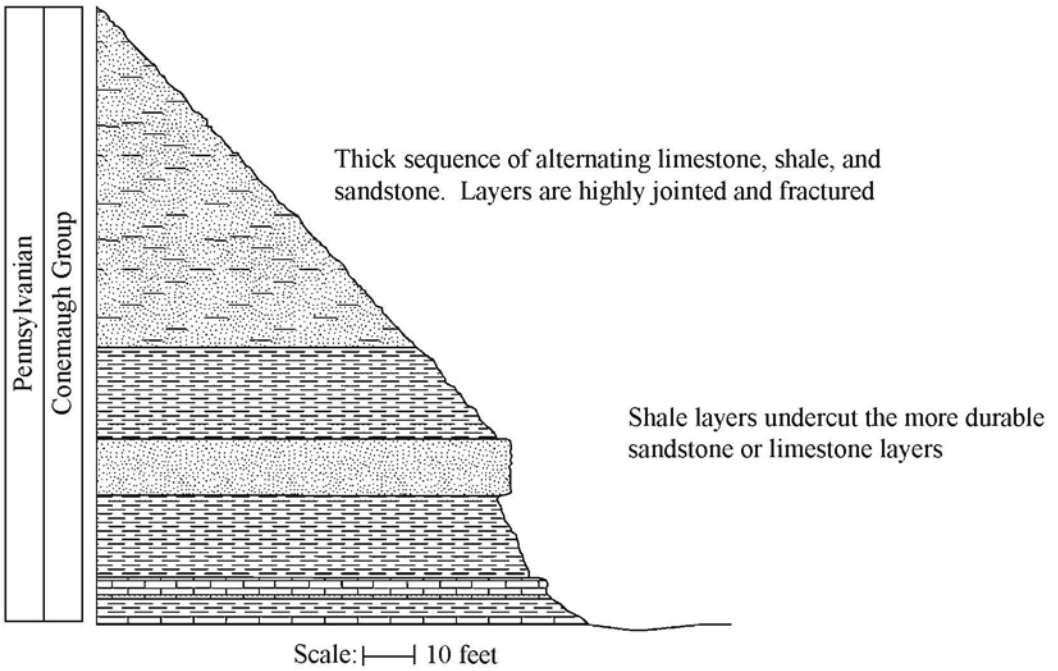


Figure B-11-4: Stratigraphic section for BEL-149-2.

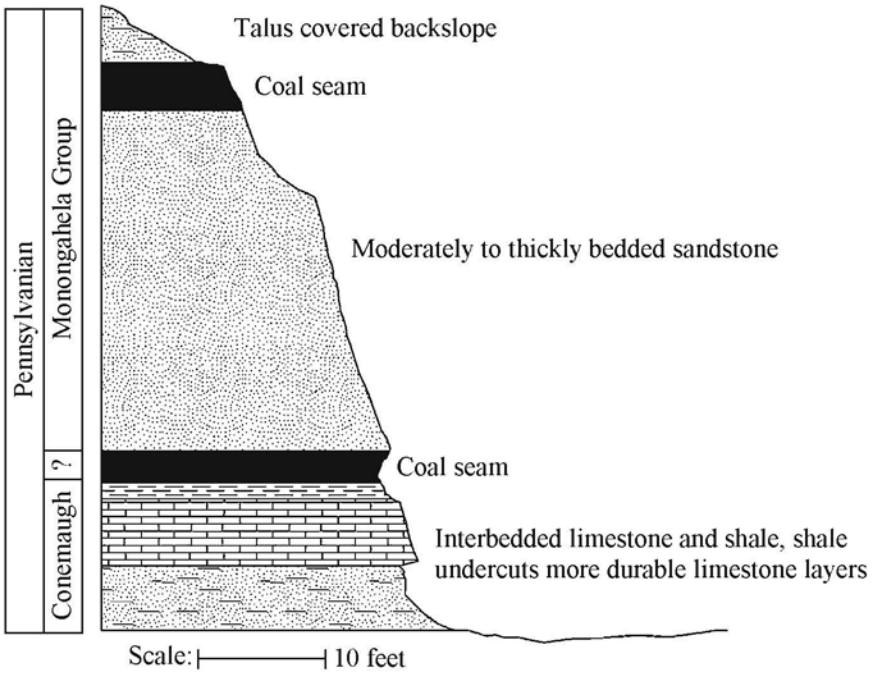


Figure B-11-5: Stratigraphic section for BEL-149-4.5.

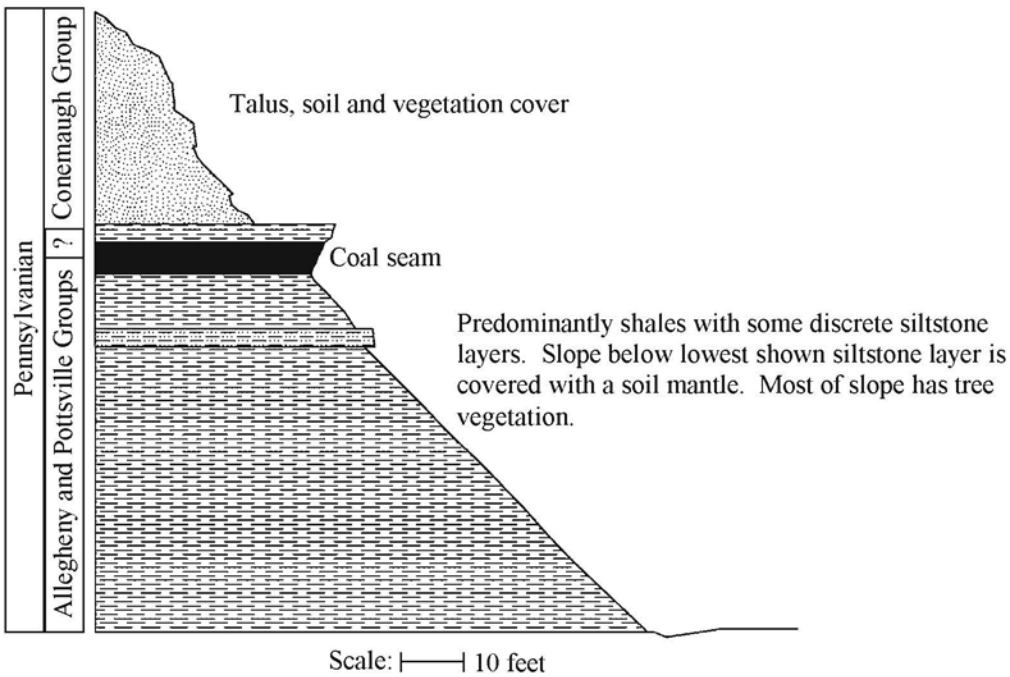


Figure B-11-6: Stratigraphic section for COL-45-20.15.

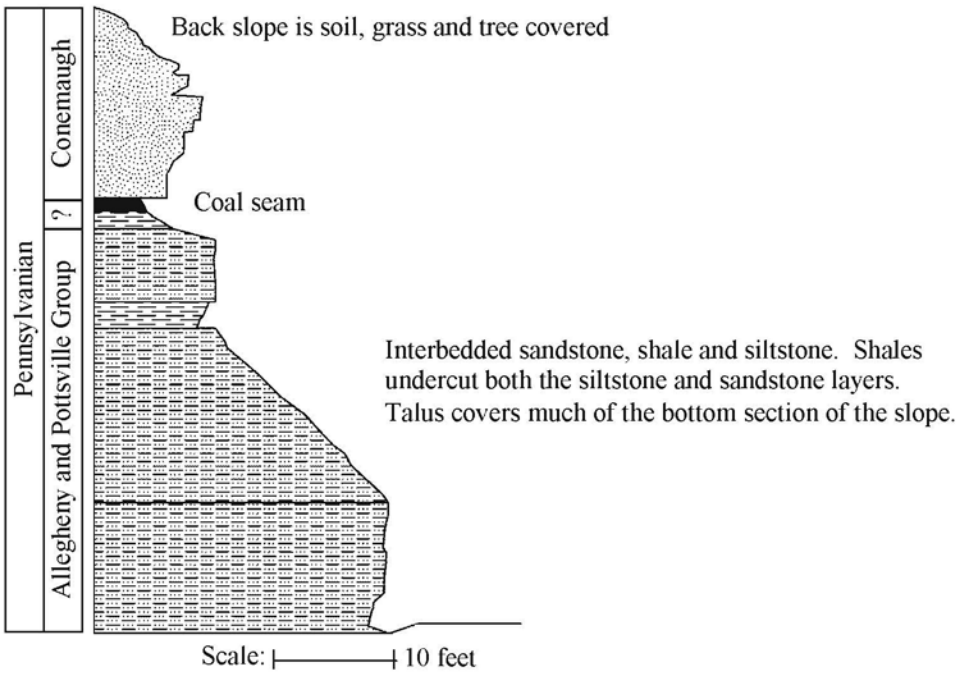


Figure B-11-7: Stratigraphic section for COL-170-13.

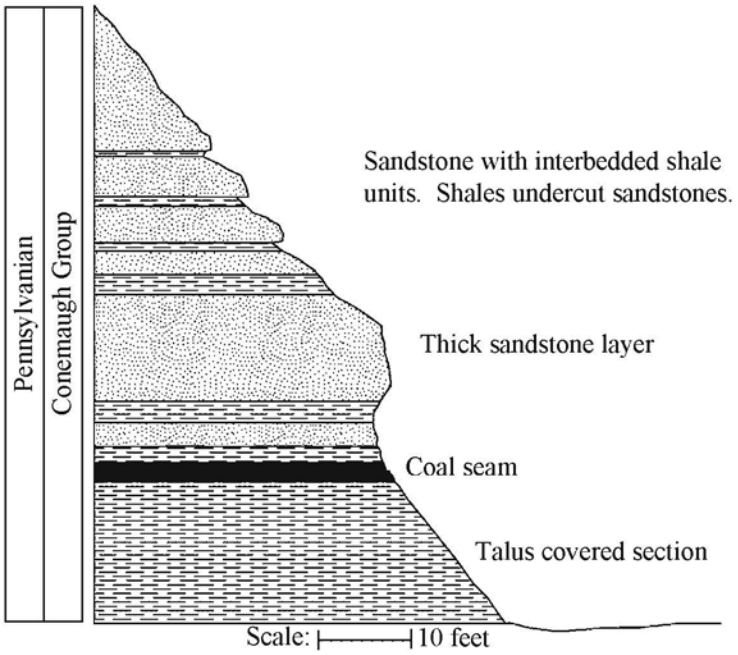


Figure B-11b-1: Stratigraphic section for JEF-22-8.0.

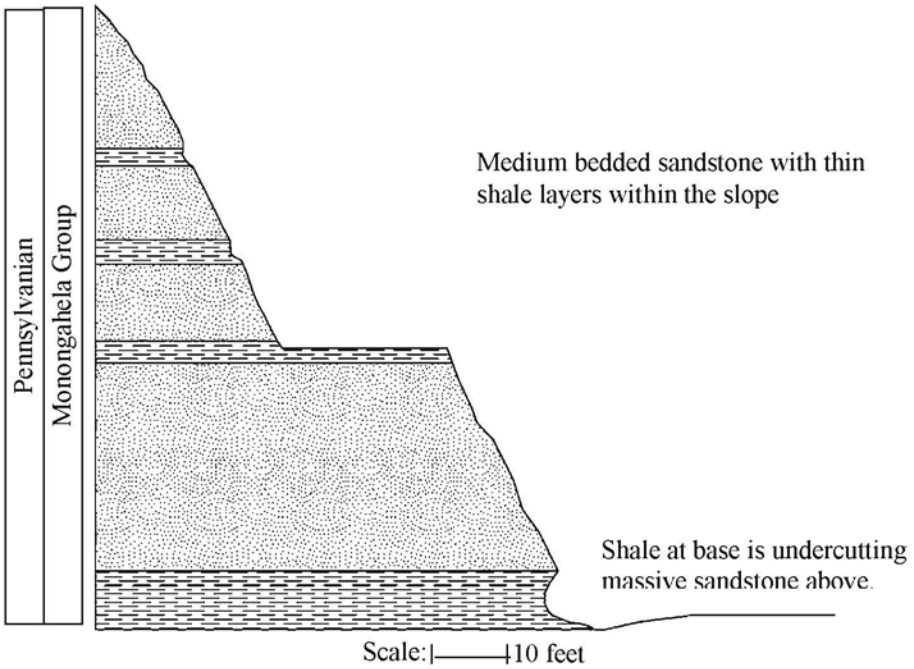


Figure B-11b-2: Stratigraphic section for JEF-22-13.2.

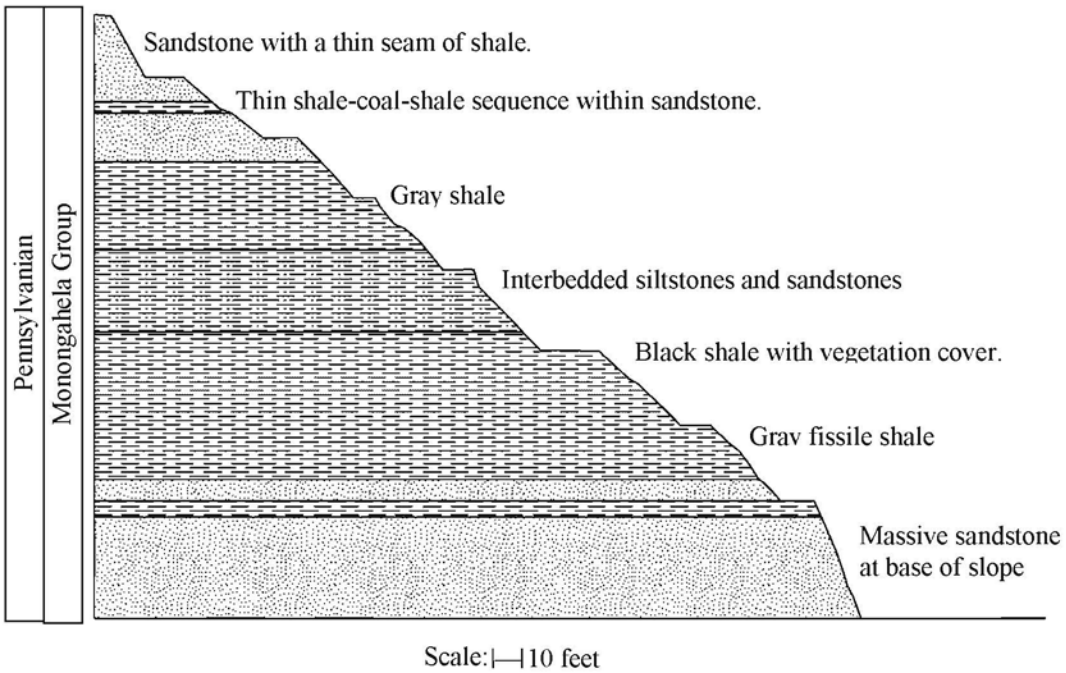


Figure B-11b-3: Stratigraphic section for JEF-22-13.9.

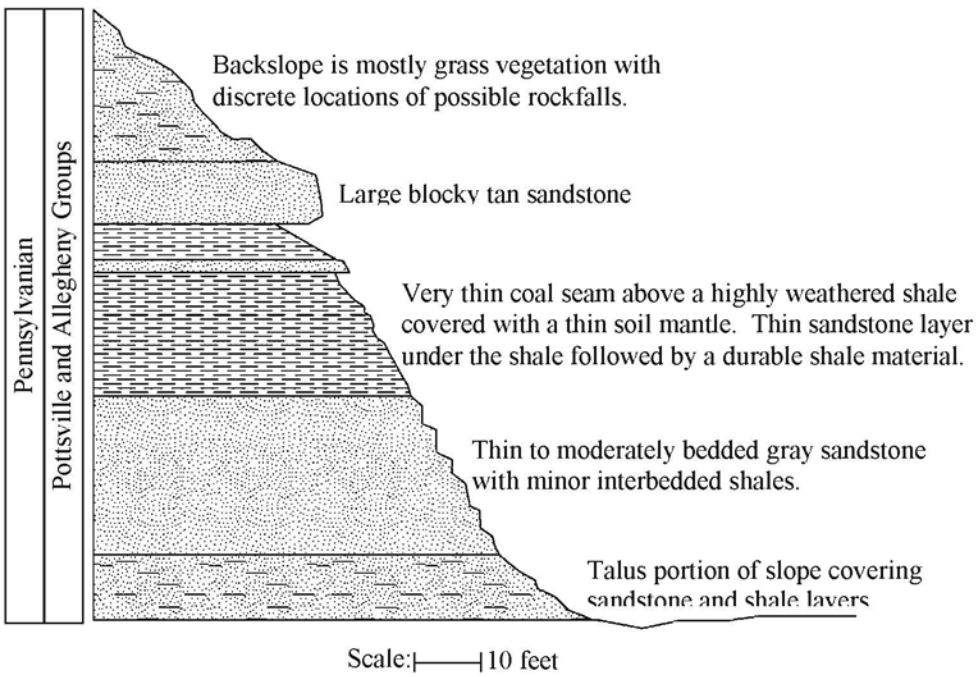


Figure B-11b-4: Stratigraphic section for TUS-36-0.0.

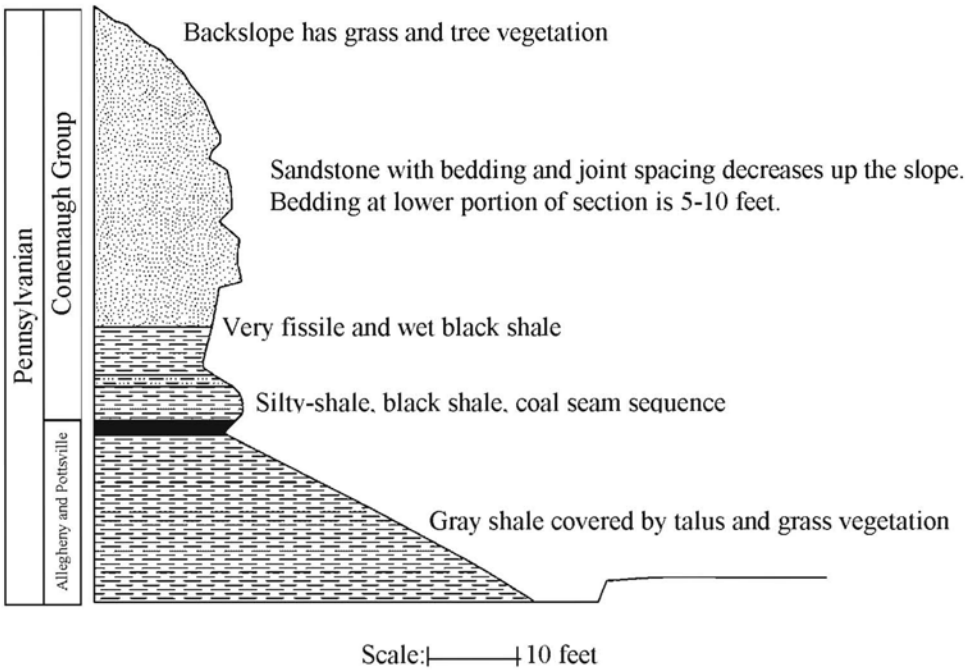


Figure B-11b-5: Stratigraphic section for TUS-77-60.2.

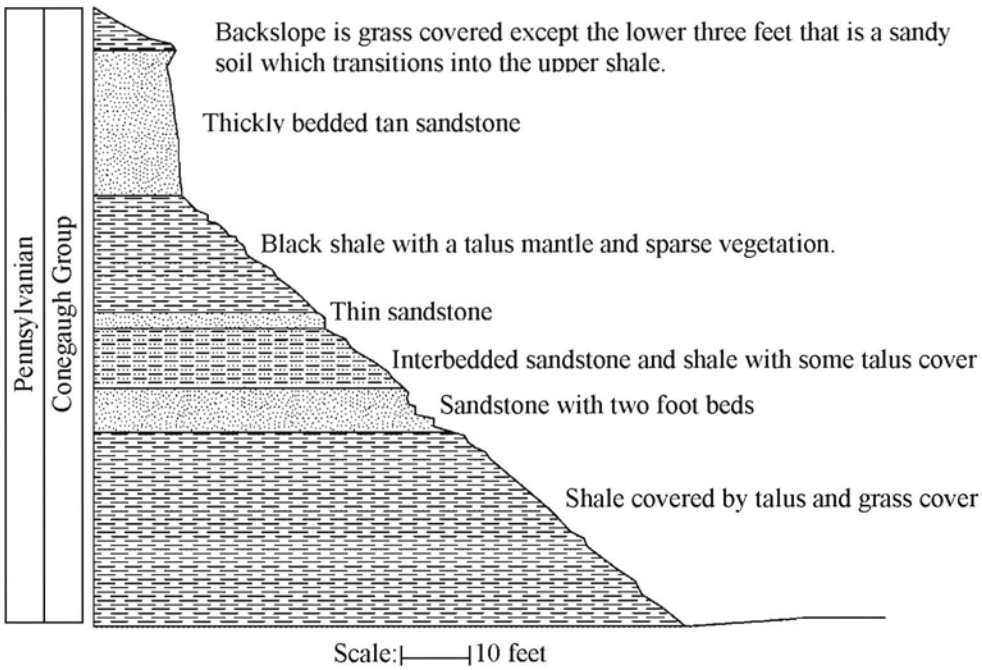


Figure B-11b-6: Stratigraphic section for TUS-77-63.3.

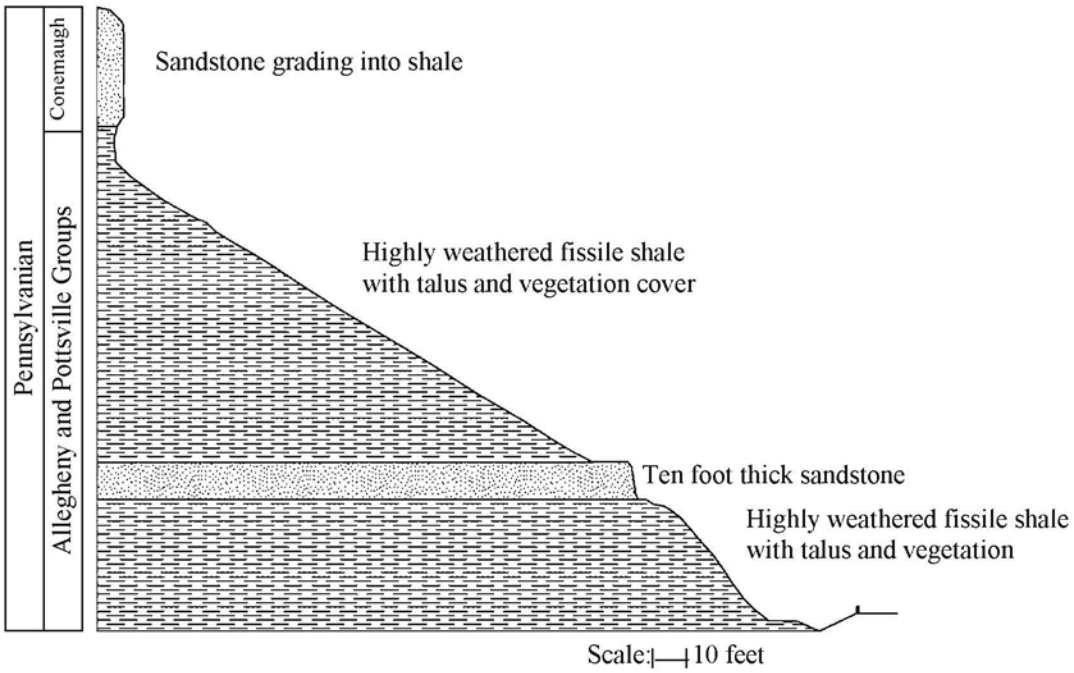


Figure B-11b-7: Stratigraphic section for TUS-250-12.3.

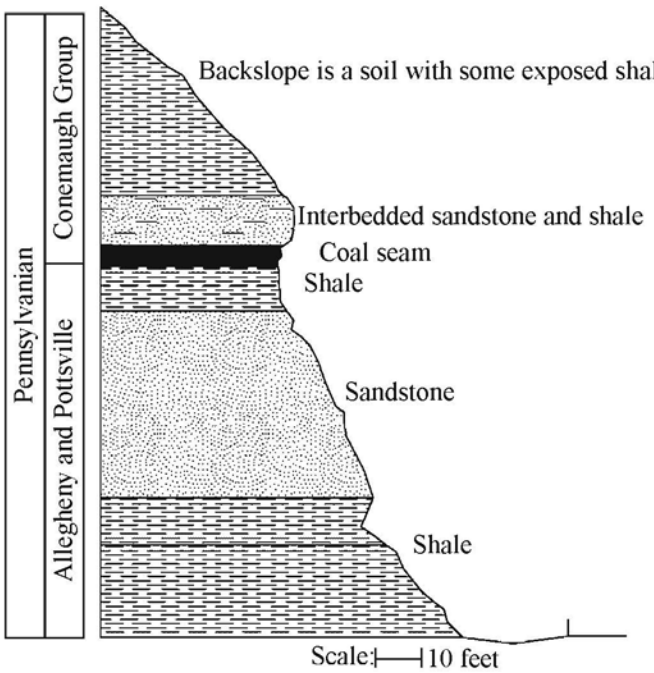


Figure B-11b-8: Stratigraphic section for TUS-250-23.

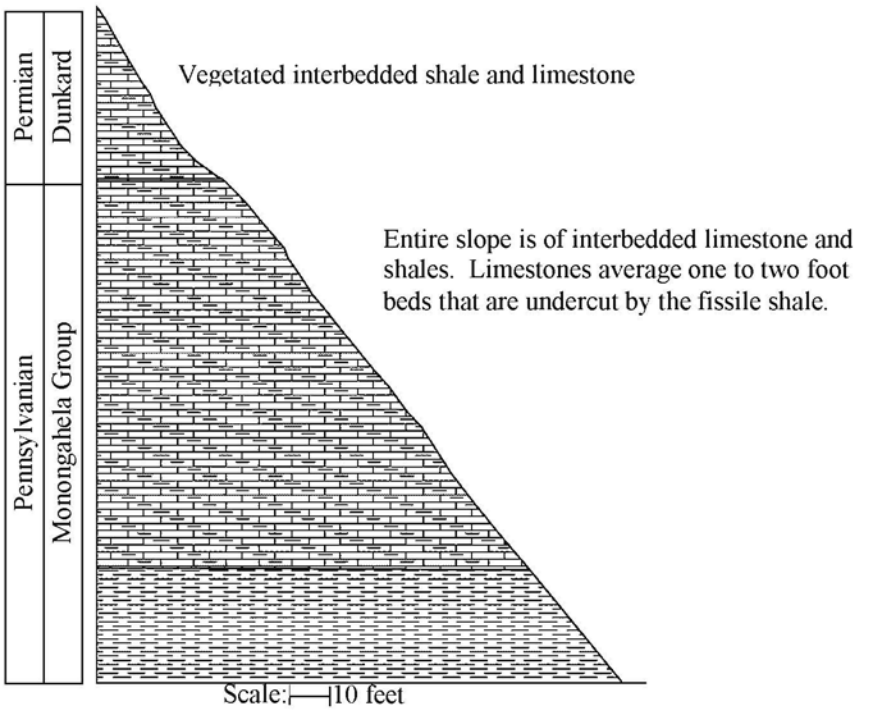


Figure B-11c-1: Stratigraphic section for BEL-7-5.9.

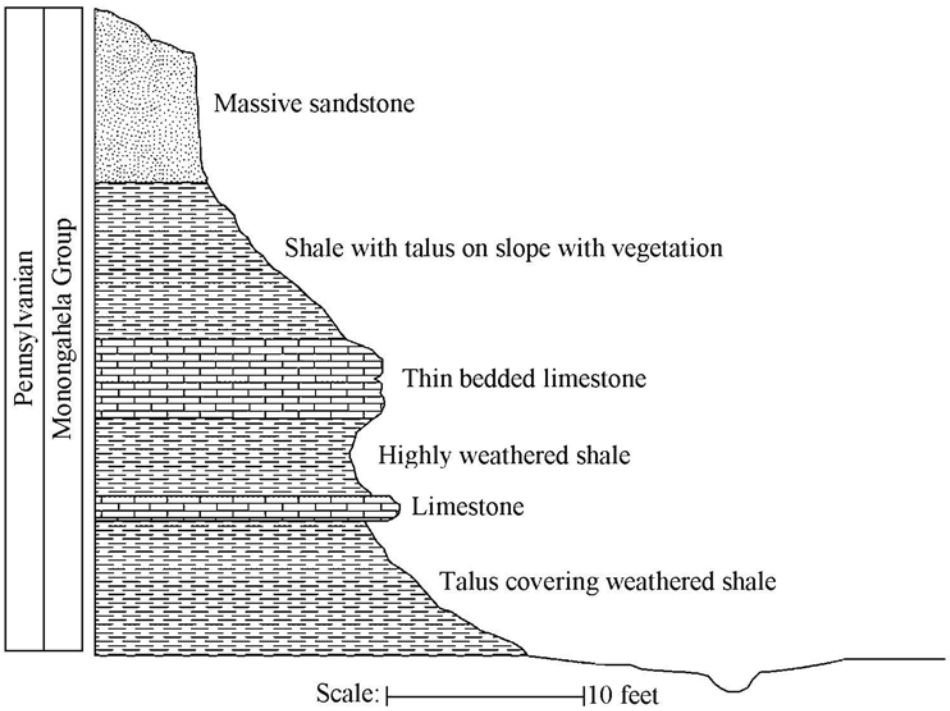


Figure B-11c-2: Stratigraphic section for BEL-7-6.3.

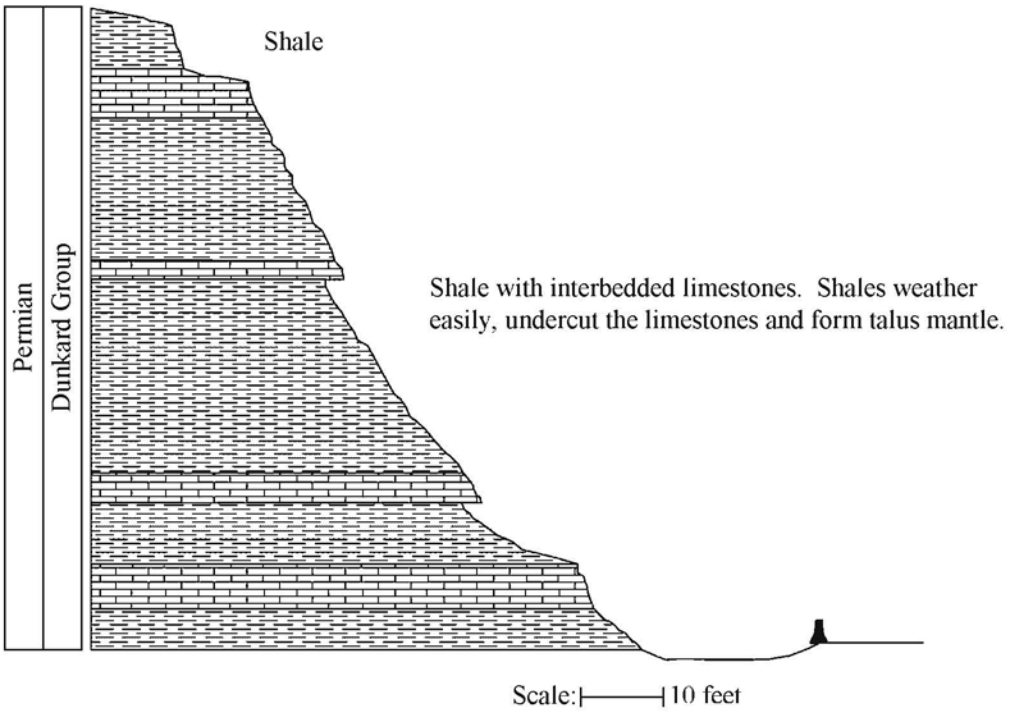


Figure B-11c-3: Stratigraphic section for BEL-7-9.

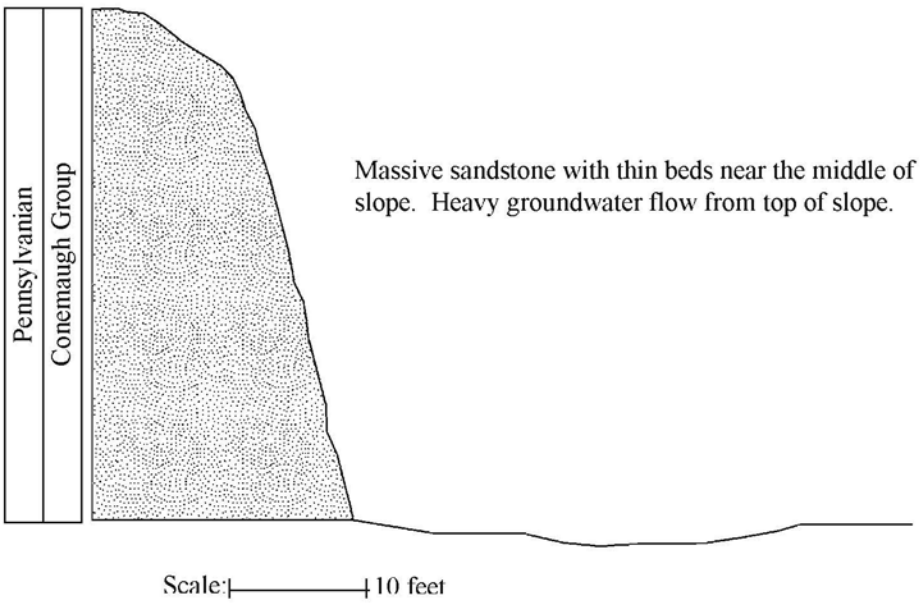


Figure B-11c-4: Stratigraphic section for BEL-7-18.6.

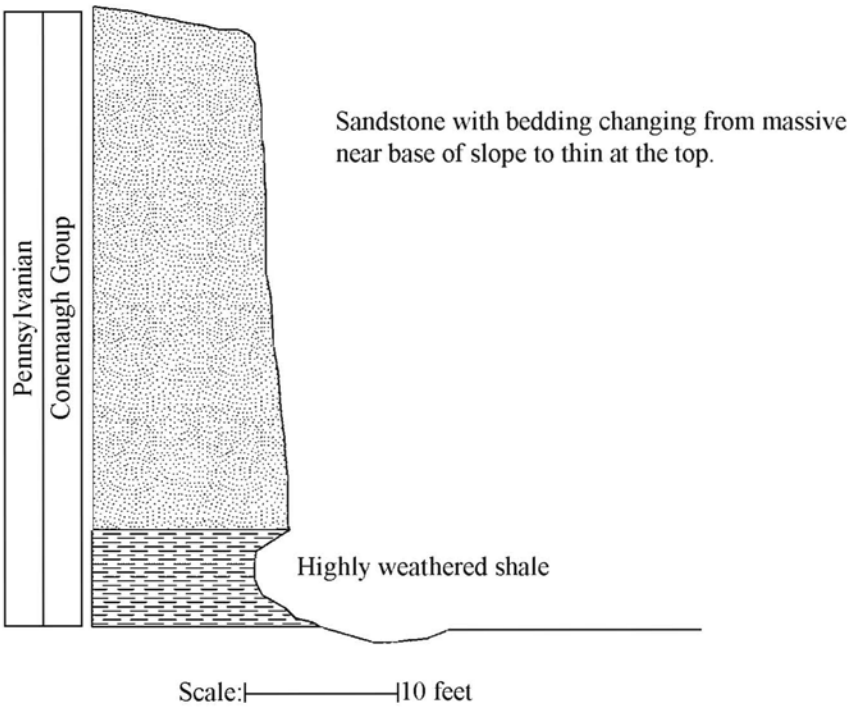


Figure B-11c-5: Stratigraphic section for BEL-7-23.1.

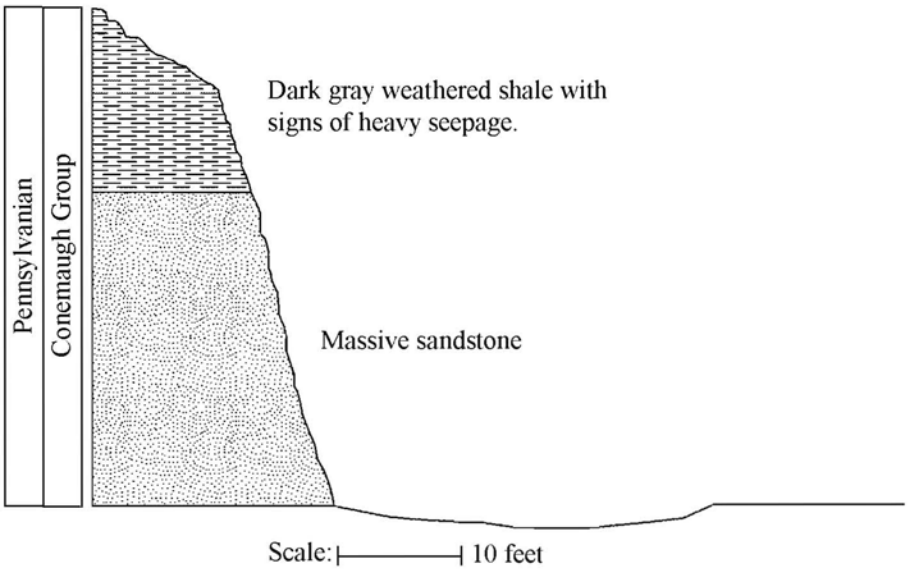


Figure B-11c-6: Stratigraphic section for BEL-7-26.8.

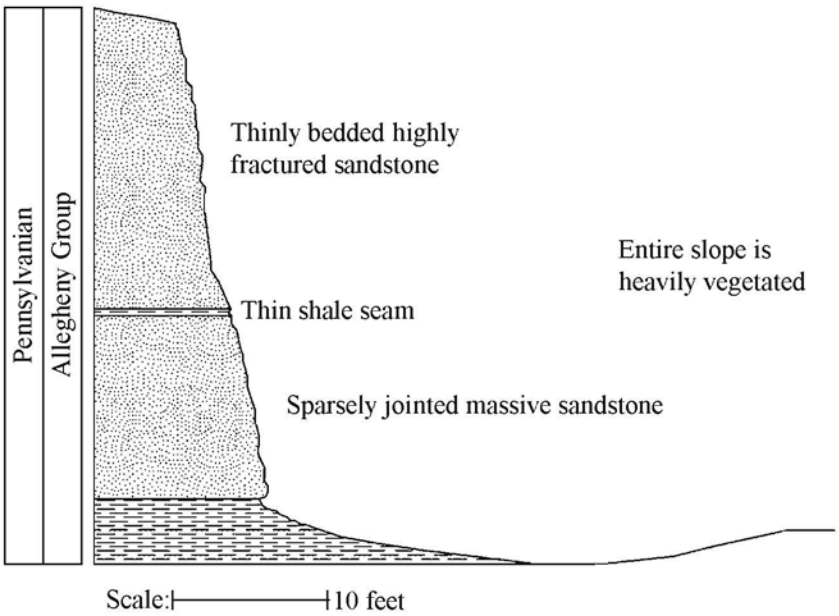


Figure B-11c-7: Stratigraphic section for COL-7-1.5.

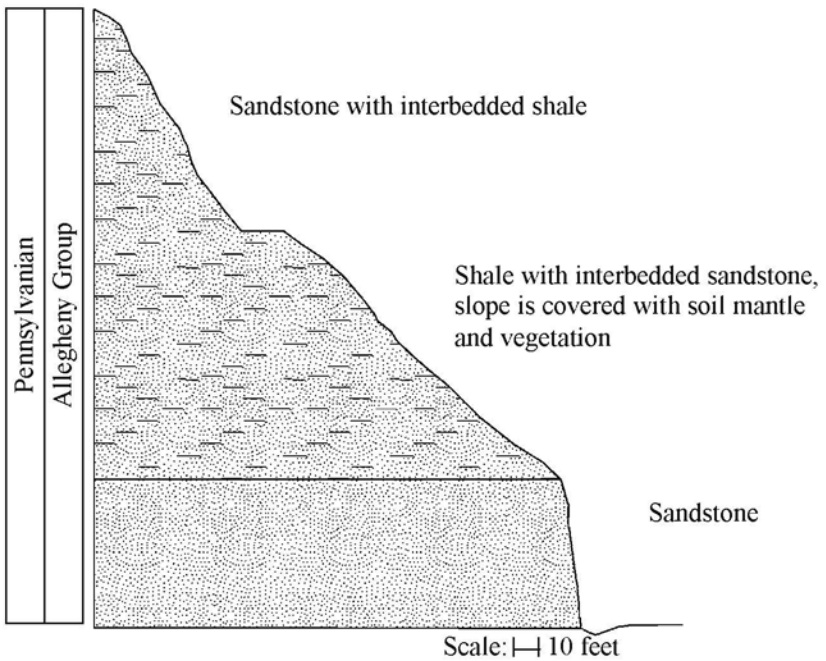


Figure B-11c-8: Stratigraphic section for COL-7-2.8.

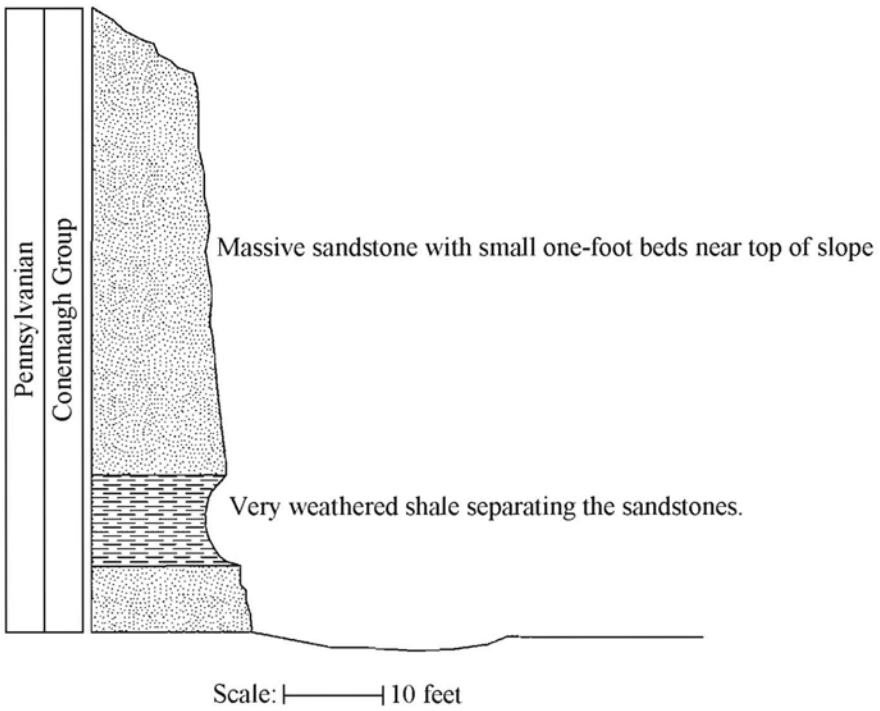


Figure B-11d-1: Stratigraphic section for JEF-7-0.

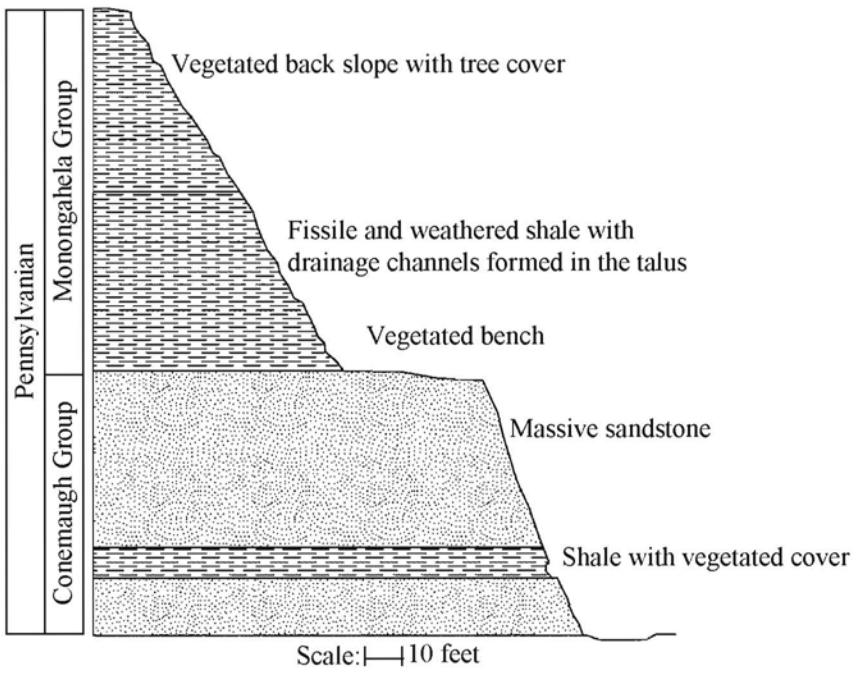


Figure B-11d-2: Stratigraphic section for JEF-7-0.5.

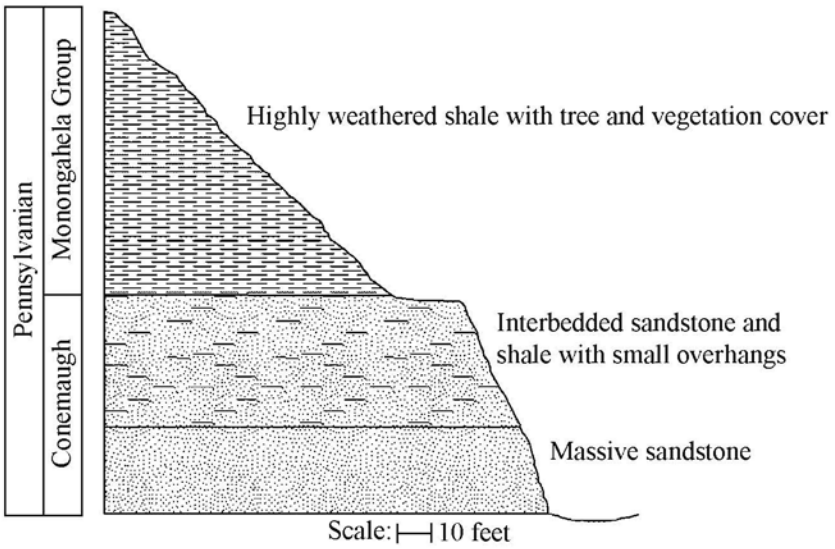


Figure B-11d-3: Stratigraphic section for JEF-7-1.5.

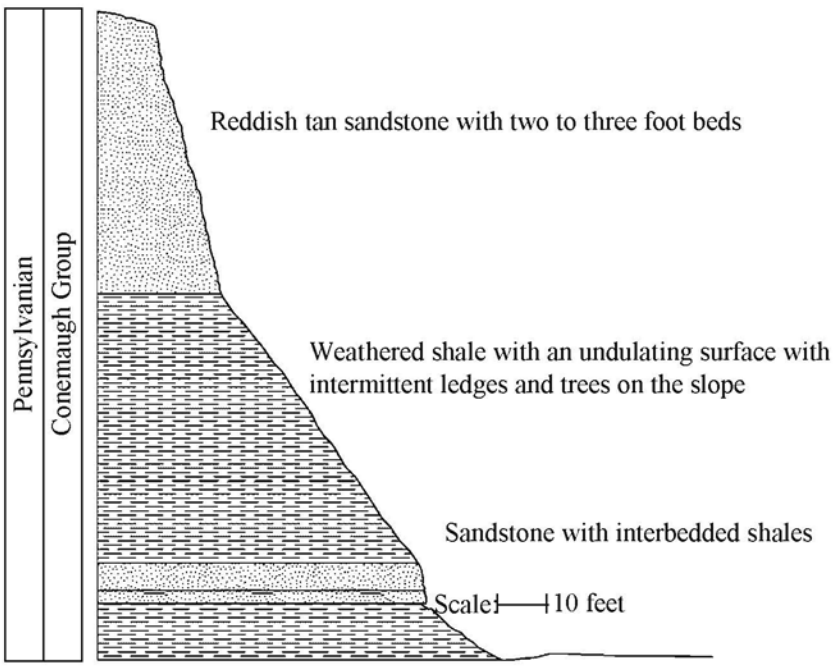


Figure B-11d-4: Stratigraphic section for JEF-7-5a.

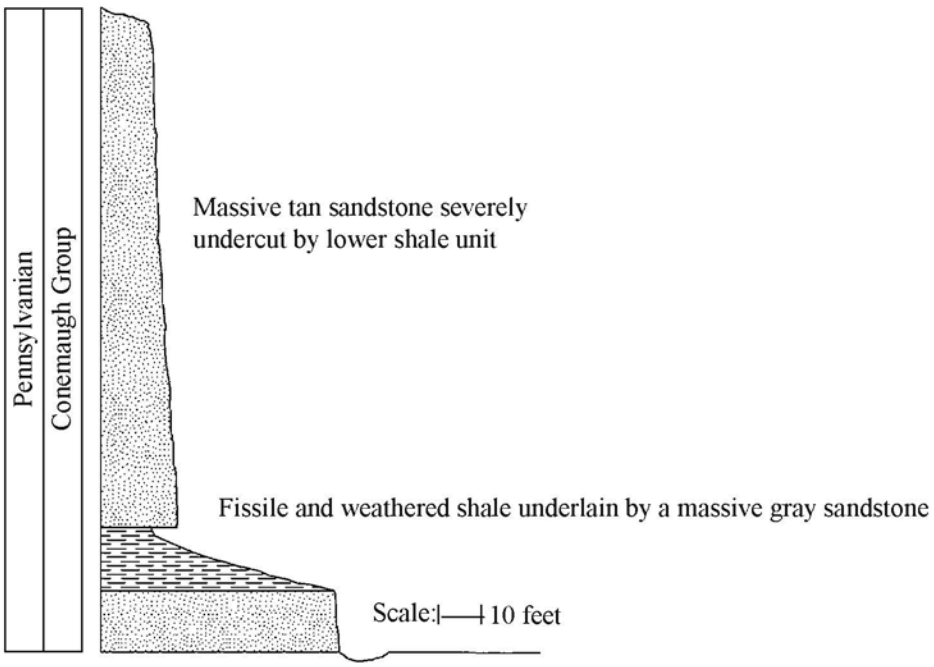


Figure B-11d-5: Stratigraphic section for JEF-7-5b.

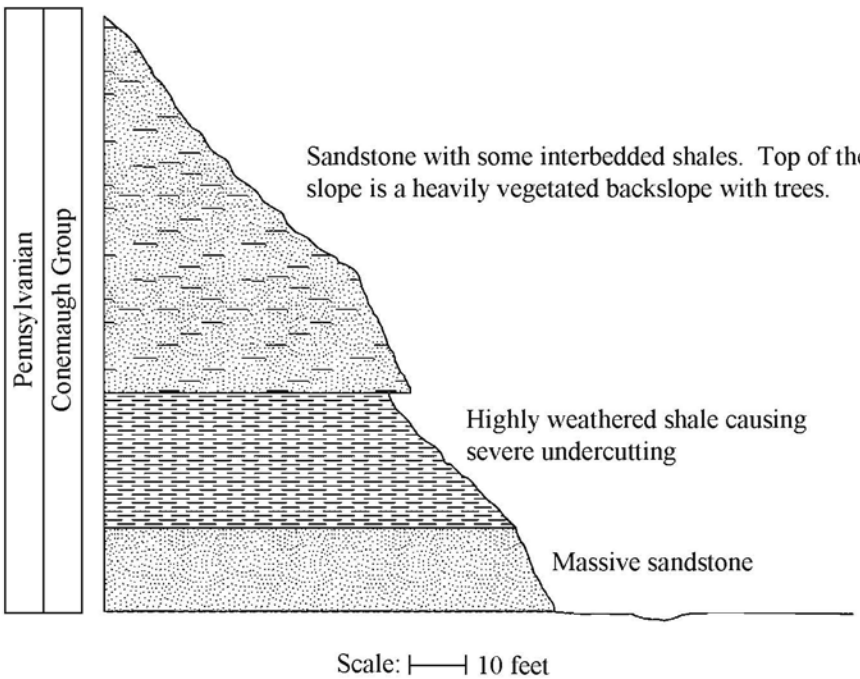


Figure B-11d-6: Stratigraphic section for JEF-7-6.

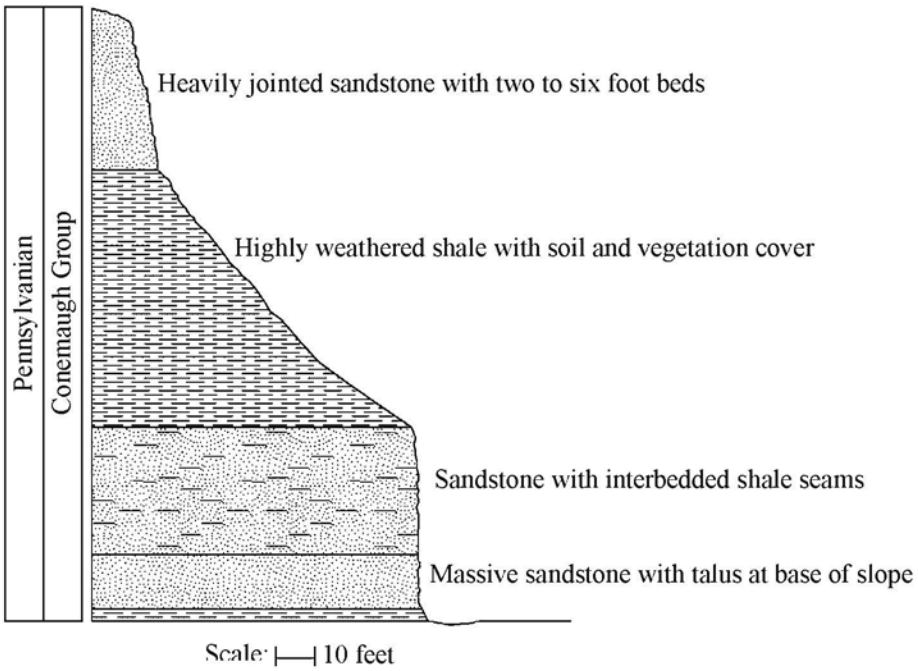


Figure B-11d-7: Stratigraphic section for JEF-7-10.6.

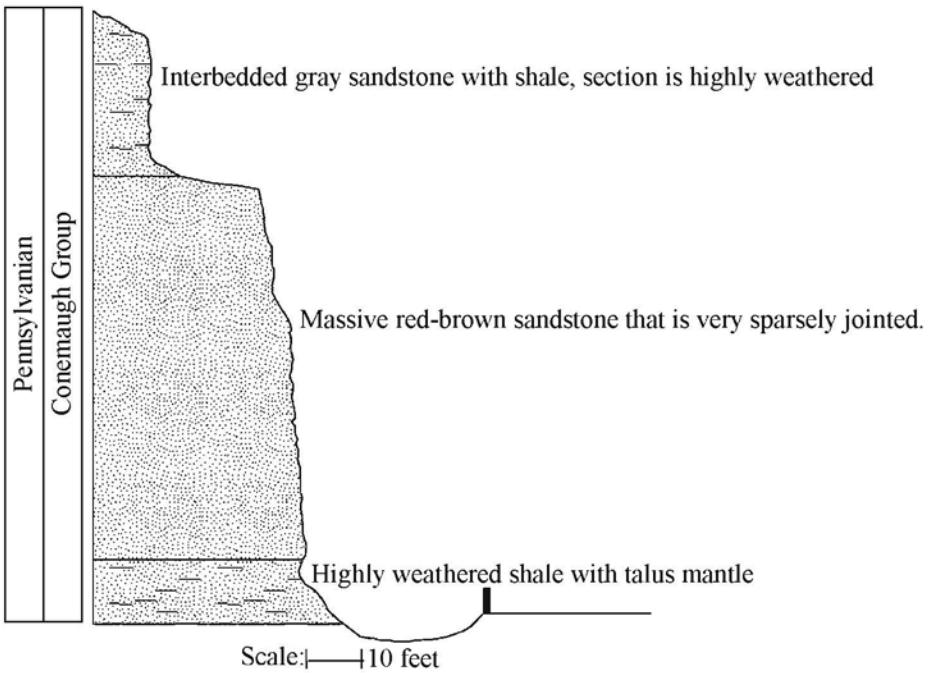


Figure B-11d-8: Stratigraphic section for JEF-7-14.4b.

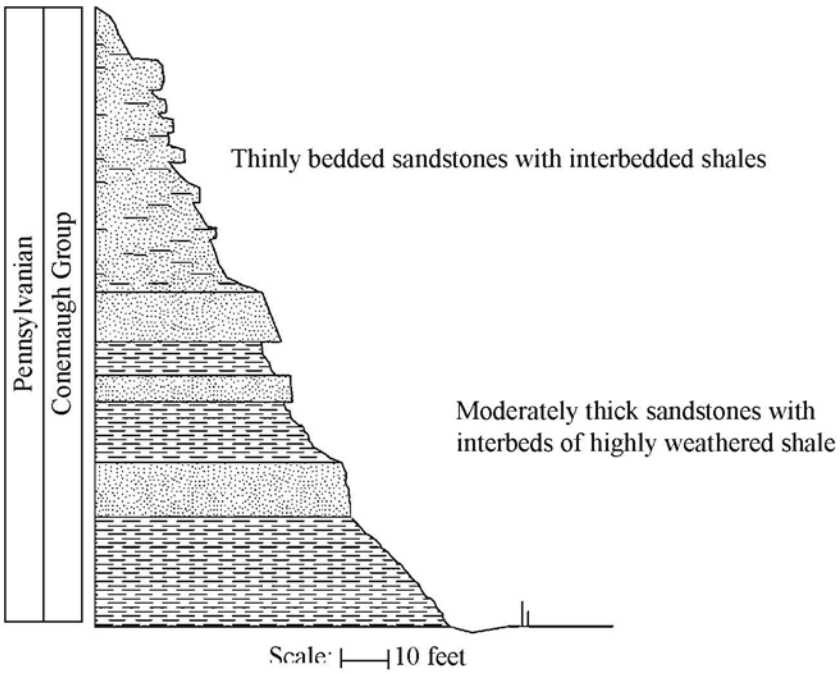


Figure B-11d-9: Stratigraphic section for JEF-7-14.4c.

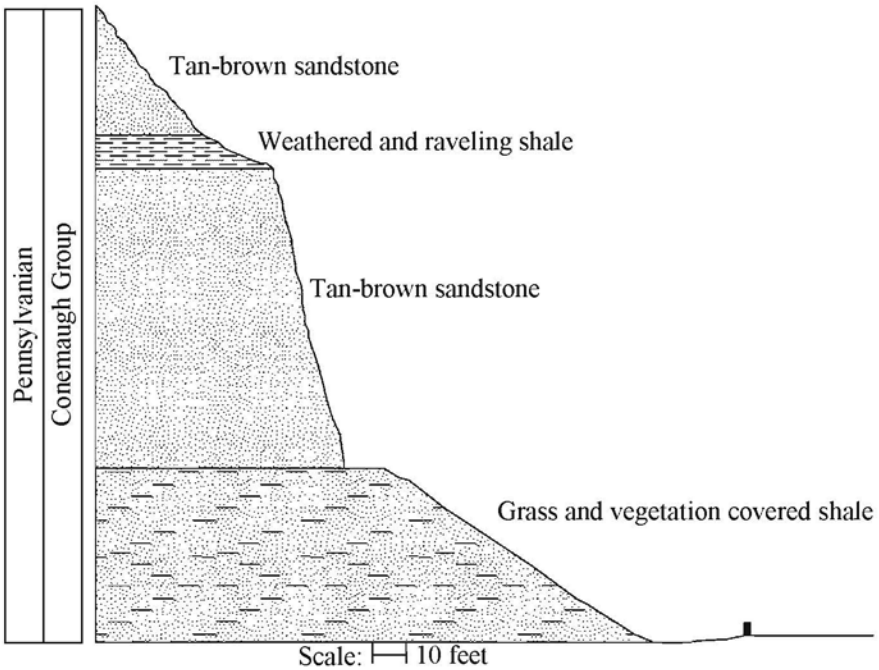


Figure B-11d-10: Stratigraphic section for JEF-7-14.6.

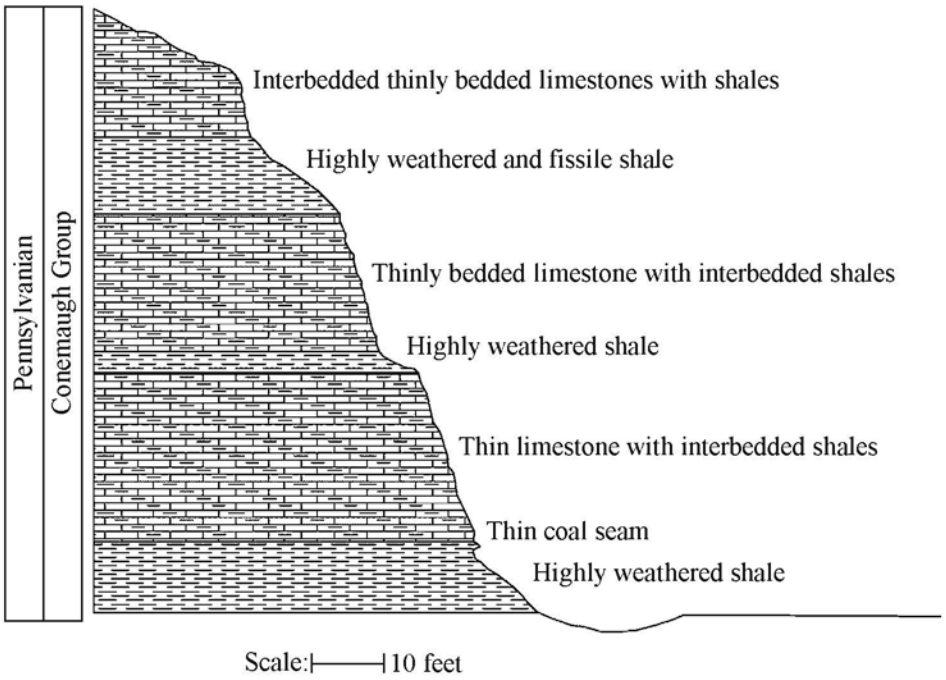


Figure B-11d-11: Stratigraphic section for JEF-7-20.5.

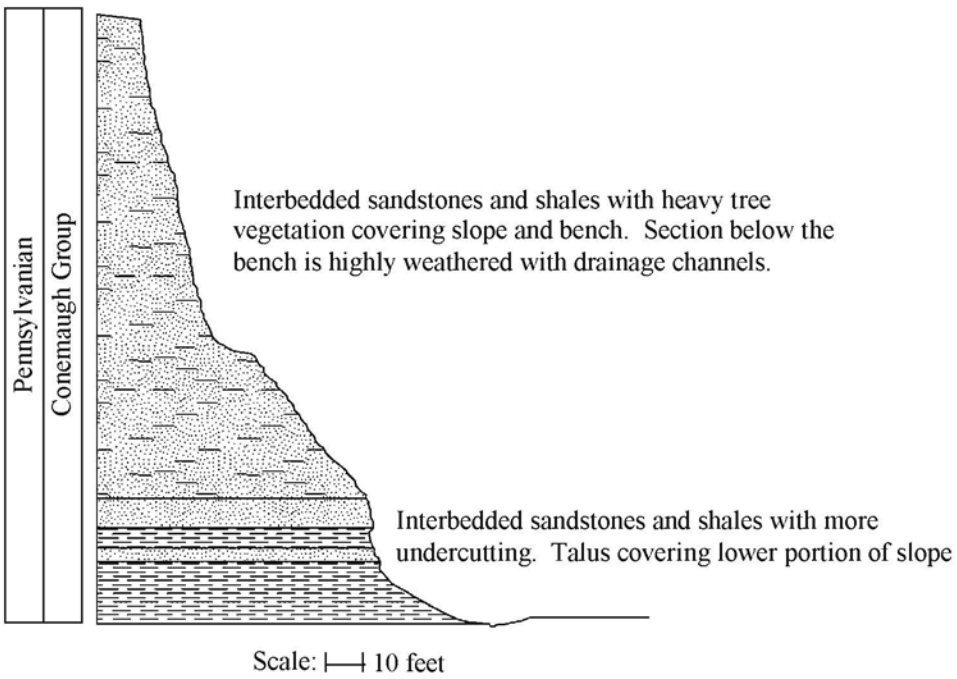


Figure B-11d-12: Stratigraphic section for JEF-7-22.6.

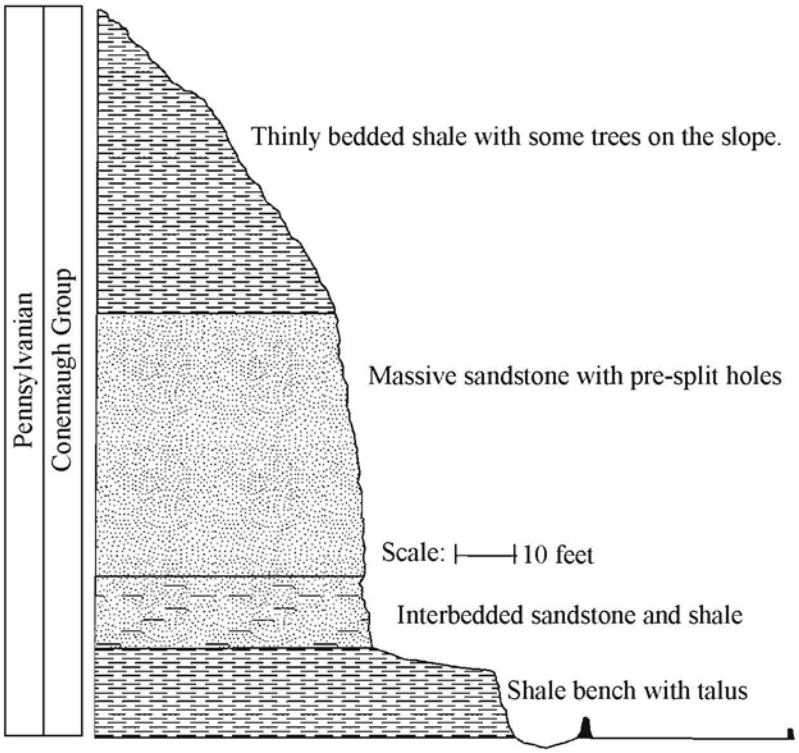


Figure B-11d-13: Stratigraphic section for JEF-7-28a.

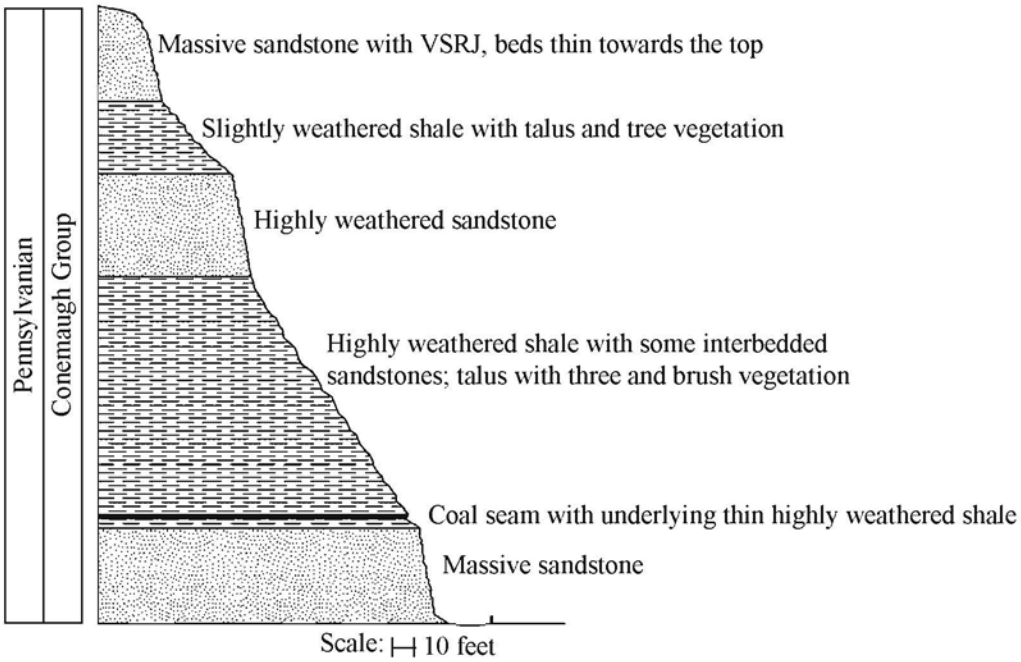


Figure B-11d-14: Stratigraphic section for JEF-7-28b.

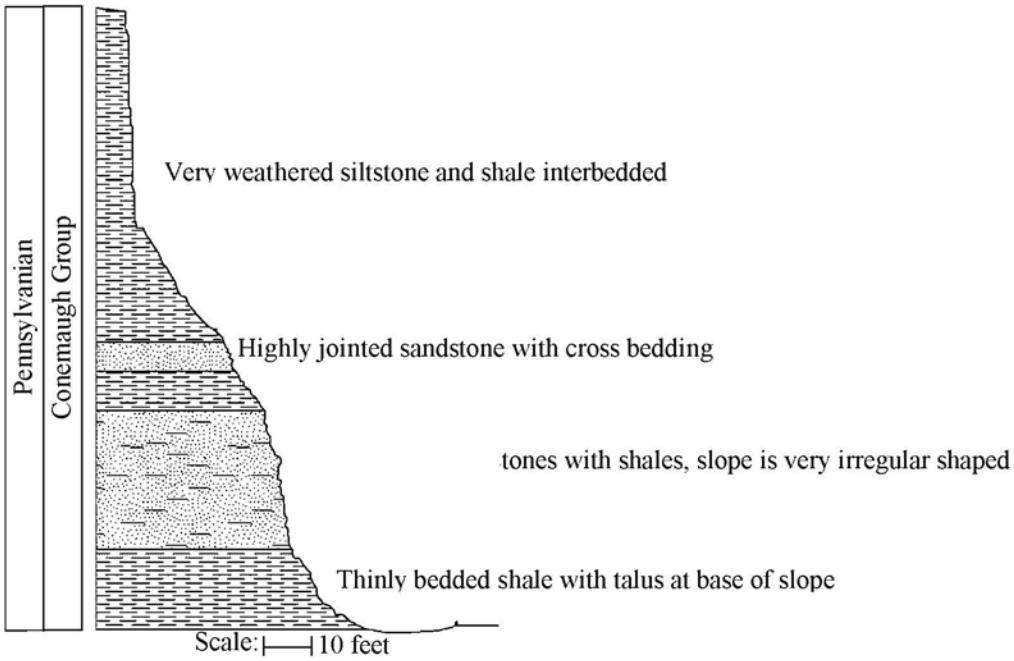


Figure B-11d-15: Stratigraphic section for JEF-7-33.3a.

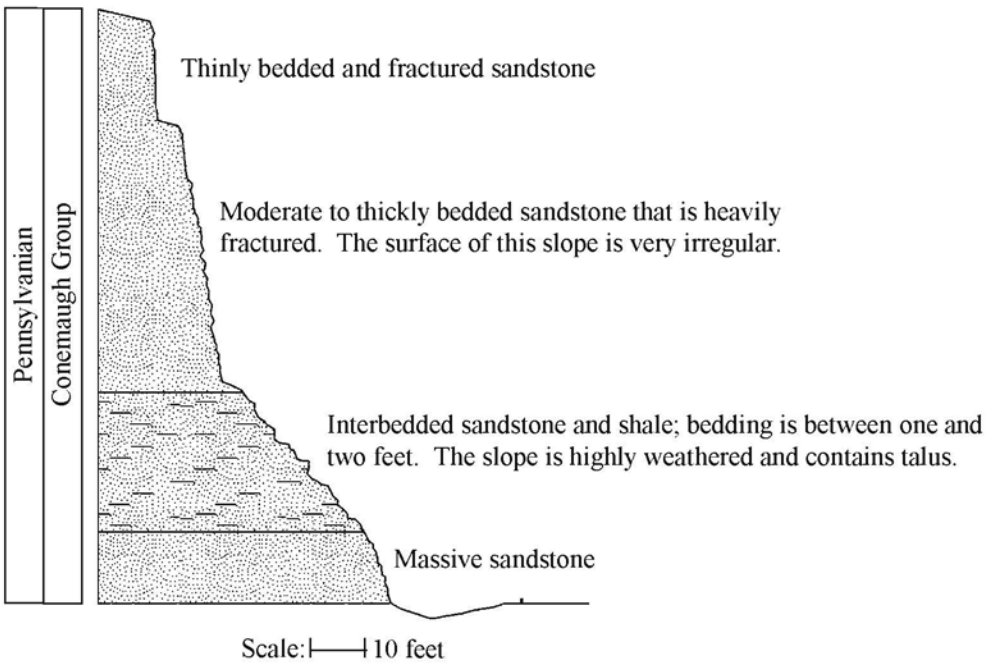


Figure B-11d-16: Stratigraphic section for JEF-7-33.3b.

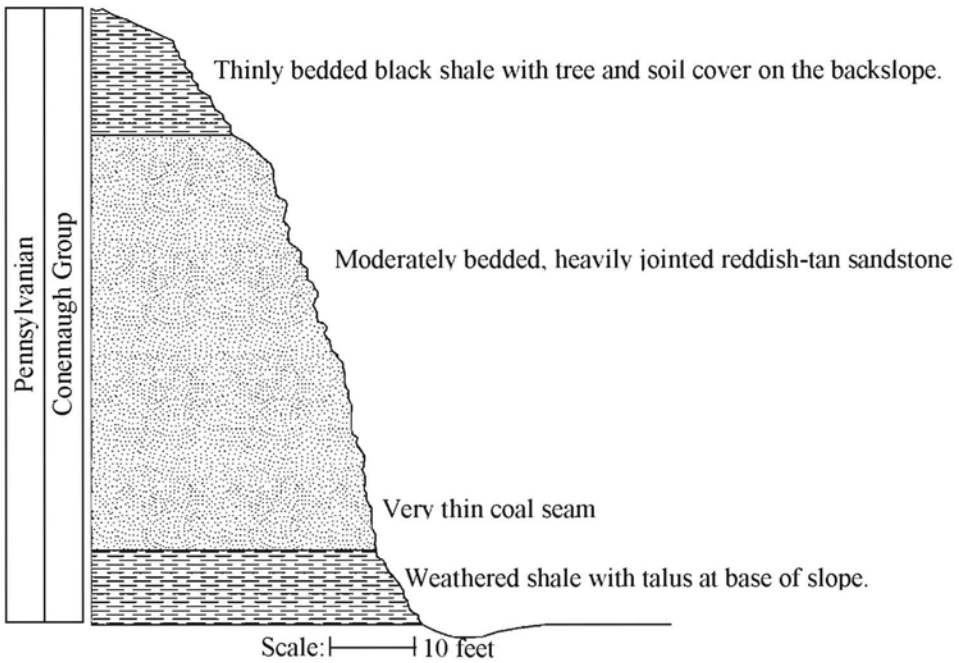


Figure B-11d-17: Stratigraphic section for JEF-7-3.3c.

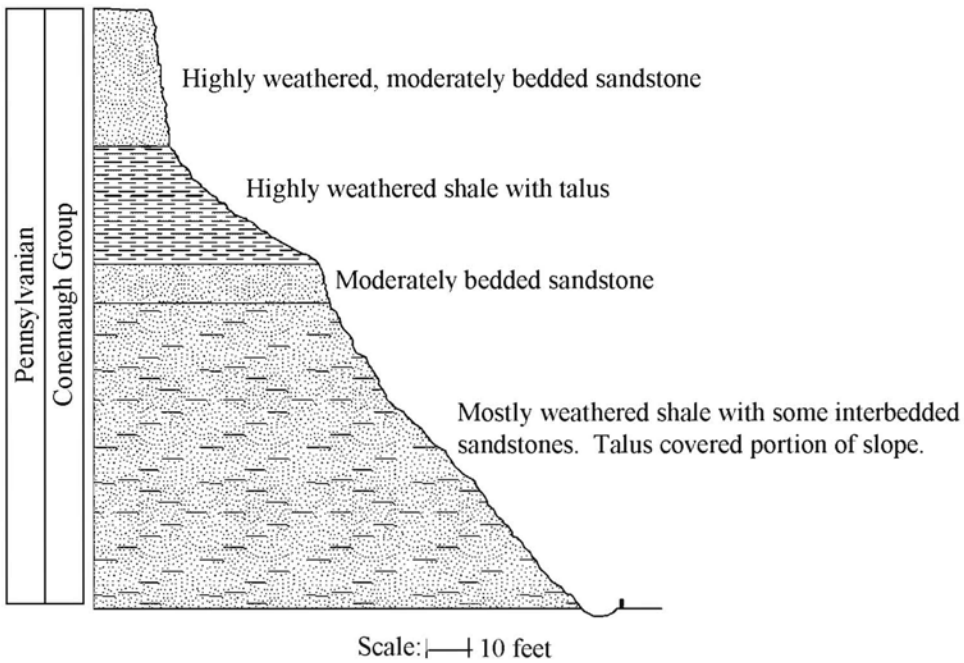


Figure B-11d-18: Stratigraphic section for JEF-7-34.5a.

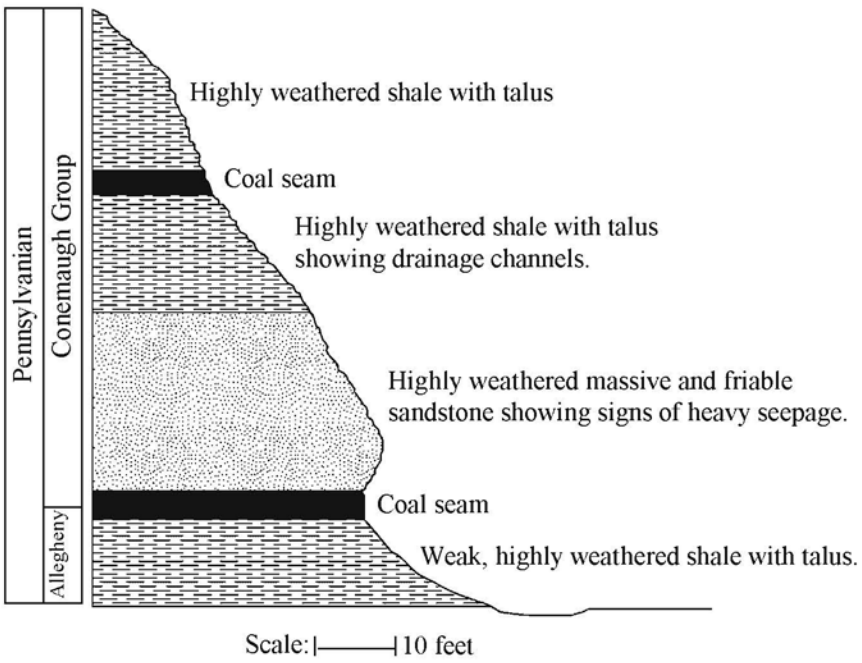


Figure B-11d-19: Stratigraphic section for JEF-7-34.5b.

APPENDIX C

RAW DATA COLLECTED FROM ALL SITES

Site	Slope Length (ft)	Slope Height (ft)	Slope Angle (degrees)	Backslope Angle(degrees)	ln Backslope Angle (degrees)	Ditch Depth (ft)	Ditch Width (ft)	Ritchie Score	2nd-cycle Slake Durability Index (%)	Maximum Amount of Undercutting (ft)	Typical Amount of Undercutting (ft)	Block Size (lbs)	Hydro Value (ft³)	Slope Orientation (degrees)	Roadway Width (ft)	ln Average Daily Traffic (cars/day)	Posted Speed Limit (mph)	Oregon Vehicle Risk	Percent Decision Sight Distance (%)
ADA-41-16.1	550	65	55	0	0.0	2	17.4	1.33	75	6.8	2.7	68	766000	110	33	8.23	55	30	100
ASD-30-2.25	775	40	90	0	0.0	1.1	15.8	1.18	100	2.5	2.0	61	284792	190	36.5	9.24	60	105	100
ASD-3-1.1	440	24	85	0	0.0	1	12	1.4	74	7.8	2.9	81	156250	100	33	7.50	55	11	100
ASD-3-1.8	400	28	55	8	2.1	1.1	15	1.2	100	7.0	3.0	82	227600	157	28	7.50	55	10	100
ASD-97-4.1	400	37	65	35	3.6	1.3	10.4	1.8	82	4.0	2.7	28	1070000	330	35	6.84	55	5	22
ATH-124-2	700	86	65	0	0.0	1	24	1.22	100	2.0	0.5	274	1808333	180	26	6.13	55	5	100
ATH-13-13.7	175	22	62	22	3.1	1.4	12.2	1.3	91	3.0	1.5	649	451888	90	21	7.41	35	7	100
ATH-13-9.2	1100	20	80	60	4.1	1.4	10.8	1.3	95	2.0	1.0	82	238678	90	22	8.40	35	110	100
ATH-33-15A	465	55	80	8	2.1	1.2	29	0.8	77	2.0	0.8	21304	1036306	5	21	9.77	55	116	99
ATH-33-15B	700	65	65	25	3.2	1.3	29	0.89	87	1.5	1.0	649	539568	5	37	9.77	55	175	100
BEL-149-1.8	1000	136	50	0	0.0	0.93	22	1.14	88	4.0	2.0	81	419373	120	24	8.78	45	114	100
BEL-149-4.5	1434	44	70	33	3.5	1.47	19.4	1.12	90	2.7	1.5	822	405699	300	24	8.26	55	81	100
BEL-70-220.5	1000	74	47	0	0.0	0.8	13	1.72	66	5.0	1.5	40	581016	0	24	8.11	65	41	100
BEL-70-222.5	900	65	56	0	0.0	0.58	8.4	1.43	66	5.0	1.0	81	529860	0	24	8.12	65	37	100
BEL-70-223	528	180	65	55	4.0	0.5	13	2.5	66	1.0	0.5	30	470283	0	30	8.12	65	22	100
BEL-7-11	5280	263	55	10	2.3	0.1	20	1.64	94	3.5	2.0	275	3818526	90	33	9.27	55	808	100
BEL-7-14	2400	43	85	20	3.0	0.8	21	0.9	95	4.0	2.0	81	3020655	90	43	9.37	55	404	100
BEL-7-18.6	575	30	85	10	2.3	1.2	32	4.6	100	0.0	0.0	274	806856	90	29	9.54	55	115	100
BEL-7-23.1	525	38	85	5	1.6	1	8.5	2.3	94	4.0	2.0	68	266100	135	33	9.80	55	136	100
BEL-7-26.8	2500	33	75	43	3.8	1.3	31	0.6	87	3.5	1.0	81	1711823	90	33	10.78	55	1725	100
BEL-7-5.9	1900	170	48	45	3.8	0.61	31.7	1.02	93	0.0	0.0	10	938480	135	31	8.70	55	164	100
BEL-7-6.3	950	31	65	10	2.3	1.5	19	1	97	3.0	1.0	28	1749976	135	39	8.70	55	82	100
BEL-7-9	2904	76	65	10	2.3	2	22	1.1	94	3.0	2.0	81	1069904	90	33	9.27	55	444	100
BRO-52-23	3000	44	45	15	2.7	2.75	28.6	0.65	71	0.8	0.3	40	4252000	180	31	8.48	55	207	100
BRO-62-9.0	550	58	60	0	0.0	1.85	14.2	1.66	80	4.0	1.8	160	533048	135	33	8.50	55	39	100
BRO-62-9.1	500	40	60	0	0.0	1.78	17.6	1.14	80	1.3	0.5	46	533047	135	33	8.50	55	35	100
BRO-62-9.2	400	27	60	0	0.0	1.95	20.2	0.91	80	1.0	0.5	8	533047	135	33	8.50	55	28	100
CLA-68-7	1830	38	75	0	0.0	1.4	22.8	0.85	100	0.0	0.0	81	4500000	260	38	9.90	65	443	100
COL-170-13.5	660	84	44	0	0.0	0.9	7.8	2.72	59	5.0	2.0	42	390113	270	20	8.15	55	33	100
COL-45-20.15	486	97	42	34	3.5	1	12	1.775	96	3.5	2.5	81	475549	50	32.5	9.29	55	76	100
COL-7-0.5	900	104	75	10	2.3	2.2	1.2	1.4	1	0.0	0.0	10	709835	90	34	9.15	55	122	100
COL-7-1.5	1056	32	80	12	2.5	1.5	29	0.62	100	2.0	0.5	274	608333	135	39	7.89	55	40	100
COL-7-2.8	1200	215	53	0	0.0	1.1	19	1.4	34	0.0	0.0	649	2341732	135	43	8.31	55	70	100
COL-7-3	880	113	75	0	0.0	1.5	25.8	1.2	34	5.5	3.0	649	1403117	135	33	8.31	55	52	100
COL-7-3.3	330	134	55	0	0.0	0.1	20.5	1.5	64	5.5	1.0	23864	2794155	135	33	8.31	35	30	100
COL-7-5	4858	262	55	30	3.4	1.1	30	1.1	64	0.0	0.0	274	2862477	160	33	9.77	55	1222	100
COS-36-28-30	1340	40	60	20	3.0	1.2	18	1.23	100	0.0	0.0	437	1465333	180	40	8.72	60	108	100
COS-715-6.5	400	83	45	0	0.0	1	9	1.7	93	0.0	0.0	81	1590000	225	25	8.72	55	35	45.6
GAL-160-0.55	400	44	65	15	2.7	1.3	9	2.32	94	1.5	1.0	81	915561	270	29	9.03	35	75	100
HAM-71-10	600	81	40	40	3.7	1.4	12.9	1.4	66	2.0	1.0	243	120000	325	27	11.72	35	1660	100
HAM-74-17.6	615	60	40	35	3.6	0.3	17.3	1.1	29	1.3	0.8	99	172500	45	27	10.70	55	393	100
HAM-74-18.1	1000	77	40	12	2.5	0.1	10.8	1.56	30	2.0	1.0	81	146500	335	27	10.99	65	717	100
HAM-74-9.4	1150	58	40	0	0.0	0.1	14	1.4	85	4.0	2.0	46	52500	0	27	10.31	65	418	100
HOC-33-5	750	51	65	5	1.6	1.7	24.1	0.9	94	3.0	1.0	81	346382	260	36	9.62	65	137	100
JEF-22-13.2	700	74	45	0	0.0	1.33	18	1.13	96	0.0	0.0	30	635941	10	48	9.71	65	140	100
JEF-22-13.9	1630	230	32	15	2.7	1.7	31.2	0.7	96	2.0	1.0	20	635941	45	48	9.71	65	326	100
JEF-22-8	1000	61	50	0	0.0	1.3	18	1.26	71	4.0	2.0	81	635941	300	48	8.86	65	86	100

Site	Slope Length (ft)	Slope Height (ft)	Slope Angle (degrees)	Backslope Angle(degrees)	ln Backslope Angle (degrees)	Ditch Depth (ft)	Ditch Width (ft)	Ritchie Score	2nd-cycle Slake Durability Index (%)	Maximum Amount of Undercutting (ft)	Typical Amount of Undercutting (ft)	Block Size (lbs)	Hydro Value (ft^3)	Slope Orientation (degrees)	Roadway Width (ft)	ln Average Daily Traffic (cars/day)	Posted Speed Limit (mph)	Oregon Vehicle Risk	Percent Decision Sight Distance (%)
JEF-7-0	525	57	80	15	2.7	1.5	29	0.8	94	3.0	2.0	81	454300	100	25	9.53	55	104	100
JEF-7-0.5	157	157	63	58	4.1	2.2	32	0.97	94	3.0	2.0	649	2658508	100	25	9.53	55	31	100
JEF-7-1.5	1750	122	47	42	3.7	1.2	30	0.8	94	0.0	0.0	81	1863348	100	17	9.53	55	346	100
JEF-7-10.6	2153	157	64	15	2.7	1.3	14	2.3	98	0.0	0.0	2191	1463750	95	33	9.69	55	499	100
JEF-7-14.4A	1925	60	60	45	3.8	1.8	23	1.1	83	6.0	3.0	80	635941	45	35	10.05	55	641	100
JEF-7-14.4B	467	105	75	18	2.9	2	30	1	1	5.0	1.5	81	292038	45	35	10.05	55	155	100
JEF-7-14.4C	624	144	70	20	3.0	1.4	17	1.8	1	6.0	3.0	81	90333	45	33	10.05	55	208	100
JEF-7-14.6	766	188	55	45	3.8	1.7	29	1.1	98	0.0	0.0	81	514234	45	32	10.05	55	255	100
JEF-7-18.8	1900	306	60	15	2.7	4.2	32	0.9	100	0.0	0.0	274	1218186	45	50	10.05	55	630	100
JEF-7-20.1	400	73	60	10	2.3	1.6	21.5	1.17	97	5.0	2.0	274	508333	120	33	9.71	55	94	100
JEF-7-22.1	1205	72	60	35	3.6	2.5	20	1.2	97	2.0	1.0	960	1201092	90	33	9.81	55	315	100
JEF-7-22.6	500	161	65	20	3.0	2	19	1.6	87	3.0	1.0	274	1074865	90	33	9.81	55	131	100
JEF-7-28A	350	102	65	10	2.3	1.1	10	2.96	80	1.0	0.5	148	385277	80	33	8.82	55	34	100
JEF-7-28B	350	267	60	10	2.3	1.2	15	2.1	80	0.0	0.0	81	160499	80	33	8.82	55	34	100
JEF-7-33.3A	645	128	60	10	2.3	1.2	20	1.6	48	5.0	2.0	649	1170161	45	35	9.05	55	79	100
JEF-7-33.3B	607	106	65	10	2.3	1.9	21	1.4	48	3.0	1.0	81	1170161	45	35	9.05	55	75	100
JEF-7-33.3C	370	69	65	10	2.3	1.5	14	1.9	48	3.5	1.3	81	1170161	45	35	9.05	55	45	100
JEF-7-34.5A	835	138	55	0	0.0	1.1	11	2.54	92	2.0	0.5	81	652330	90	33	9.14	55	112	100
JEF-7-34.5B	350	68	60	50	3.9	0.8	11	2.3	71	7.0	3.0	274	652330	90	33	9.14	55	47	100
JEF-7-5A	700	124	65	10	2.3	1	15	2.8	91	4.0	2.0	46	274398	110	33	9.41	55	123	100
JEF-7-5B	1600	145	57	5	1.6	3.5	12	2.3	91	6.0	4.0	649	1078860	110	33	9.41	55	280	100
JEF-7-6	2640	61	60	35	3.6	1.3	26	0.98	62	5.0	3.0	649	1915151	110	33	9.40	55	458	100
LAW-52-12	2650	200	57	10	2.3	1.1	32	1	87	6.0	3.0	5194	1532042	225	41	10.08	55	904	100
LAW-7-2	580	137	42	5	1.6	1.7	18	1.16	2	3.0	1.0	1461	7066667	180	36	9.58	55	120	100
LIC-16-28	450	82	50	5	1.6	0.8	2.8	0.9	100	1.0	1.0	81	385000	225	32	9.63	60	90	100
LIC-70-135	1500	41	65	8	2.1	0.9	15	1.5	100	0.0	0.0	197	306360	0	50	10.42	65	613	100
LOG-292-2.6	350	32	60	0	0.0	1.2	10.6	1.8	100	0.5	0.3	78	265300	180	24	6.43	55	3	100
LOG-33-20.5	700	22	40	25	3.2	0.8	16	0.98	99	0.5	0.3	24	325500	10	39	9.80	65	153	100
MED-271-5.2	850	37	75	65	4.2	2.3	21.6	0.9	100	4.0	2.0	487	2900700	0	44	10.17	65	270	100
MEG-124-57.2	2640	80	65	0	0.0	1.3	25	1.05	100	0.0	0.0	30	391375	90	32	6.49	55	25	100
MOE-537-1.7	230	52	50	40	3.7	0.88	15.5	1.4	89	3.0	1.0	81	320110	0	18	4.94	20	1	100
MOE-7-1.5	3168	135	70	55	4.0	1.5	15	1.2	100	0.0	0.0	81	1050347	65	32	7.94	55	127	100
MOE-7-27	260	58	52	38	3.6	5.3	17.5	0.71	70	1.0	0.5	20	564312	90	38	8.26	55	14	100
MOE-7-28	1250	92	55	30	3.4	5.5	28	0.7	70	1.5	0.5	20	1270563	135	33	8.26	55	69	100
MOE-78-24.5	180	112	54	0	0.0	1.9	13.6	1.77	94	3.0	2.0	1268	175713	135	30.5	7.95	55	7	100
MOE-800-4.5	360	32	30	10	2.3	1.6	9	1.6	93	3.0	1.7	81	651996	80	18	6.66	55	4	100
MOR-78-22.5	680	29	45	40	3.7	0.9	12.6	1.5	96	1.0	0.5	40	557924	180	31	7.01	55	11	100
MRG-60-10	400	20	60	0	0.0	1	9.9	1.4	89	3.0	1.0	81	346929	270	38	7.85	35	23	100
MUS-60-6.9	1270	30	90	35	3.6	0.6	4.5	3.7	93	5.6	3.0	40	1562500	270	33	8.49	55	89	100
NOB-339-7.6	275	21	45	0	0.0	0.8	8.1	1.9	96	0.0	0.0	61	51025	90	21	6.13	55	2	100
PER-13-5.1	475	62	43	5	1.6	0.75	25	0.82	100	4.5	1.5	81	211458	250	24	7.84	55	17	100
PER-155-1.83	500	30	50	20	3.0	1.5	20	0.92	82	3.5	3.0	1268	1223708	90	24	7.70	55	16	100
RIC-30-12.5	1400	38	80	0	0.0	2.5	19.7	0.9	100	4.5	2.0	81	122917	5	45	10.26	55	576	100
RIC-71-174	1200	100	70	0	0.0	1.7	32	0.95	100	2.0	1.1	1096	409375	205	39	10.43	65	495	100
SCI-52-25.5A	1584	36	85	41	3.7	0.9	32.8	0.6	94	2.0	1.0	40	1092100	200	24	10.12	55	562	100
SCI-52-25.5B	400	50	90	0	0.0	0.6	33	0.7	90	3.0	1.0	122	199675	200	24	10.12	55	142	100
SCI-52-25.5C	750	189	60	5	1.6	1.1	26.8	1.2	96	3.0	1.0	61	446570	200	24	10.12	55	266	100

Site	Slope Length (ft)	Slope Height (ft)	Slope Angle (degrees)	Backslope Angle(degrees)	ln Backslope Angle (degrees)	Ditch Depth (ft)	Ditch Width (ft)	Ritchie Score	2nd-cycle Slake Durability Index (%)	Maximum Amount of Undercutting (ft)	Typical Amount of Undercutting (ft)	Block Size (lbs)	Hydro Value (ft^3)	Slope Orientation (degrees)	Roadway Width (ft)	ln Average Daily Traffic (cars/day)	Posted Speed Limit (mph)	Oregon Vehicle Risk	Percent Decision Sight Distance (%)
STA-800-1	510	15	42	5	1.6	0.25	2	6.7	100	3.0	1.3	1	154881	90	30	8.79	55	48	100
SUM-76-17	400	24	75	5	1.6	1.3	16	0.92	100	1.5	0.5	81	700000	0	23	10.78	55	276	100
SUM-76-20	750	20	80	0	0.0	1.8	12.9	0.93	100	2.0	1.0	42	2300000	80	47	10.82	55	536	100
SUM-76-23.5	930	28	55	0	0.0	0.25	7.5	2.52	100	0.0	0.0	10	1080000	0	50	11.59	55	1447	89.6
TUS-250-12.3	400	180	42	20	3.0	2.87	23.4	0.82	89	4.0	2.0	2191	487987	45	48	9.81	65	89	100
TUS-250-23	634	160	48	42	3.7	1.3	17.3	1.8	91	4.0	2.0	80	408512	0	48	9.35	55	105	100
TUS-36-0	900	100	60	40	3.7	1.2	14	2.1	95	5.0	3.0	40	800040	40	35	8.76	60	76	100
TUS-77-60.9	600	53	60	32	3.5	1.3	21	1.1	18	6.0	3.0	10	572917	270	38	9.66	65	114	100
TUS-77-63	725	85	55	12	2.5	1.1	19.5	1.3	95	6.0	3.0	42	373851	300	38.5	9.66	65	138	100
WAS-7-33.2	600	82	45	30	3.4	1.8	14.5	1.4	100	0.0	0.0	81	1342457	135	33	8.75	55	54	100
WAS-7-36.5	500	30	65	35	3.6	1.5	17	1.1	100	0.0	0.0	81	1220220	135	32	8.75	55	45	100
WAS-7-39.5	2112	72	75	45	3.8	1.1	14	1.6	63	3.5	2.0	81	1186929	135	32	8.75	55	191	71.7
WAY-21-2.36	2640	33	90	0	0.0	2.25	13.4	1.27	60	5.1	3.5	2190	504167	40	36	9.34	60	397	100
WAY-3-2.4	215	21	45	0	0.0	0.4	3	5.1	100	0.0	0.0	9	193740	135	28.5	7.61	55	6	26.9

APPENDIX D

FREQUENCY-SISTRIBUTION HISTOGRAMS AND QQ-PLOTS

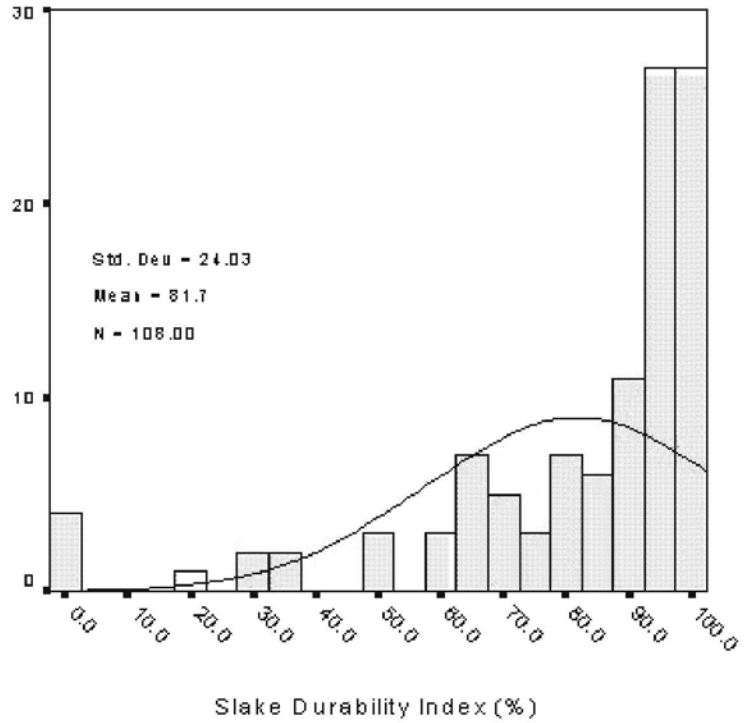


Figure D- 1: Frequency distribution histogram for slake durability index.

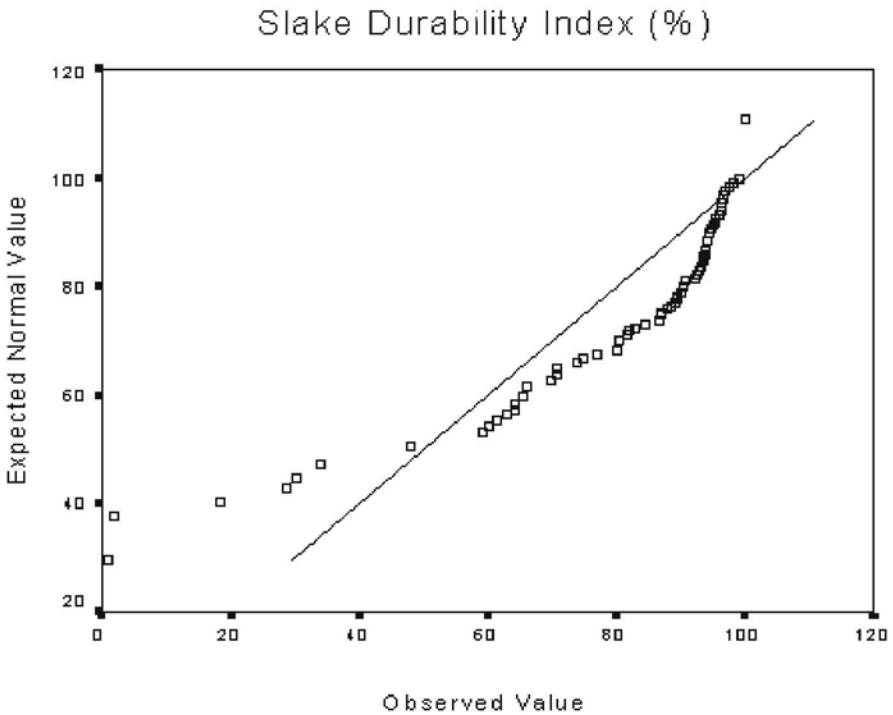


Figure D- 2: QQ-plot for slake durability index.

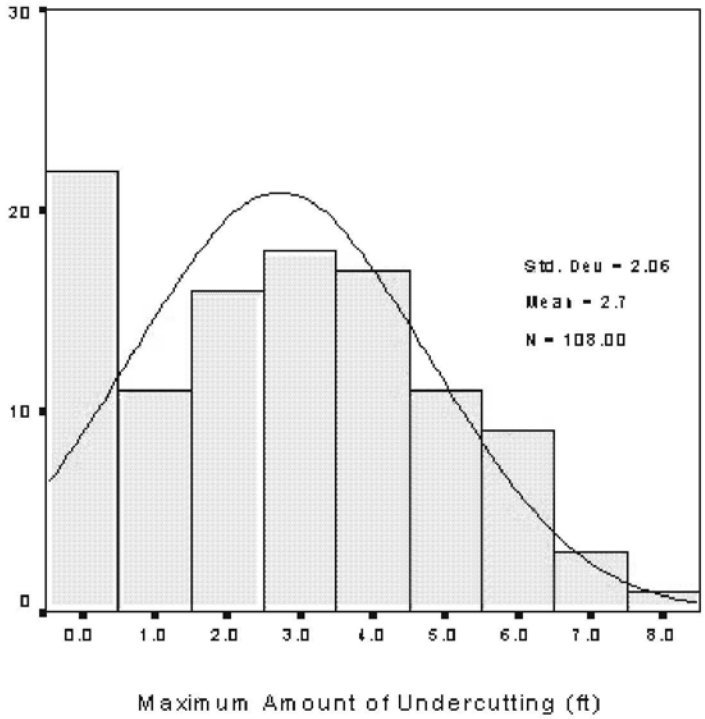


Figure D- 3: Frequency distribution histogram for maximum amount of undercutting.

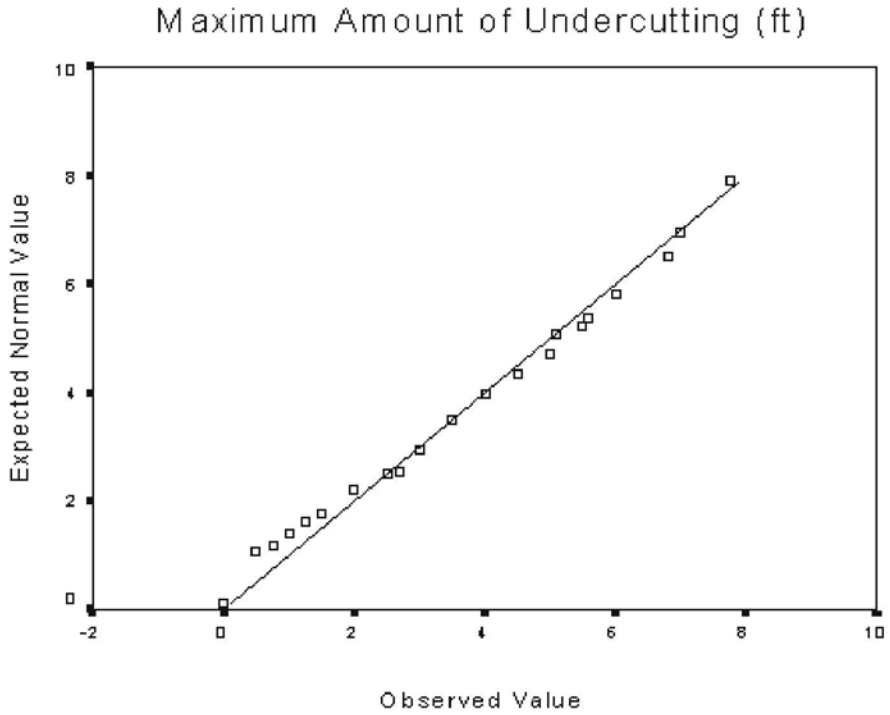


Figure D- 4: QQ-plot for maximum amount of undercutting

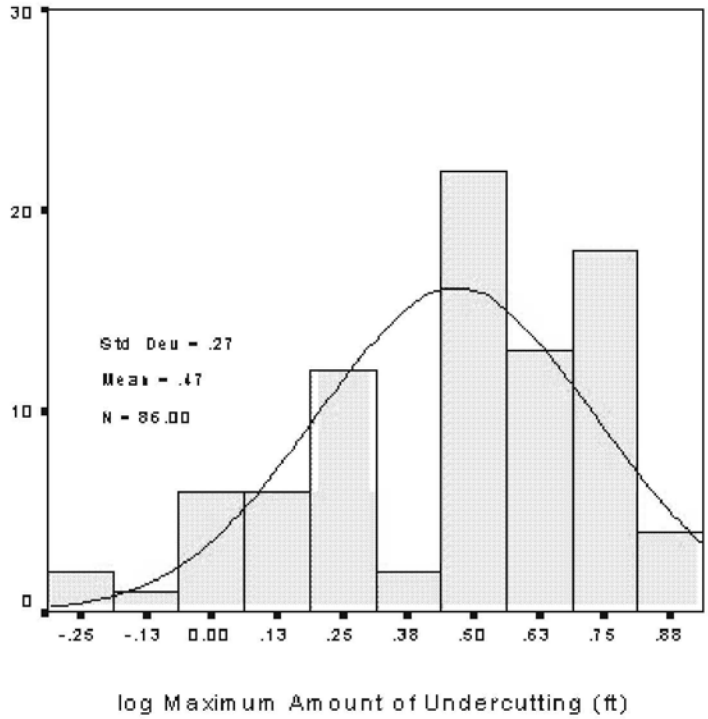


Figure D- 5: Frequency distribution histogram for log of maximum amount of undercutting.

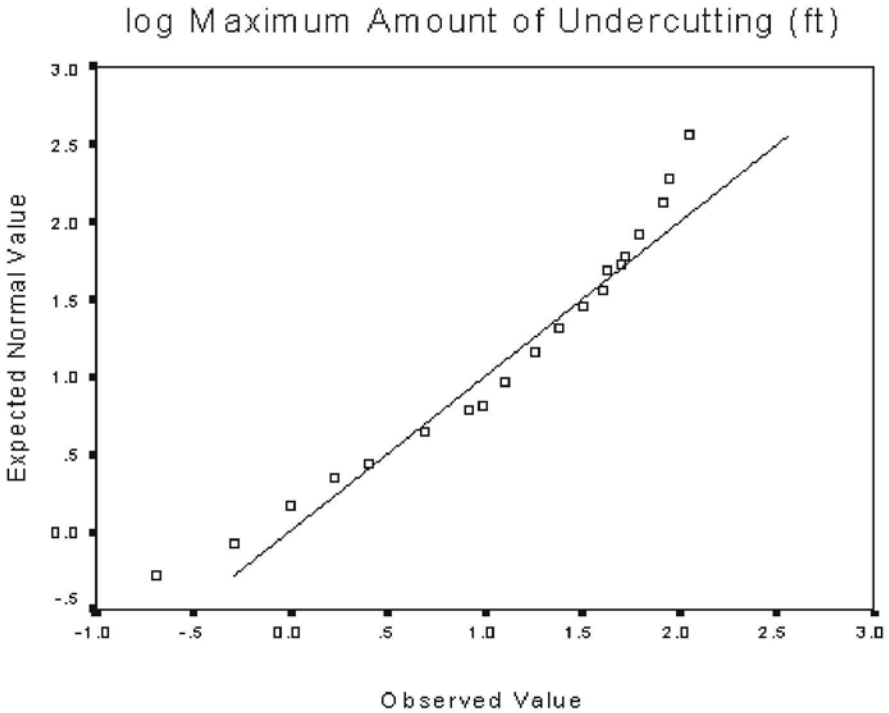


Figure D- 6: QQ-plot for log of maximum amount of undercutting.

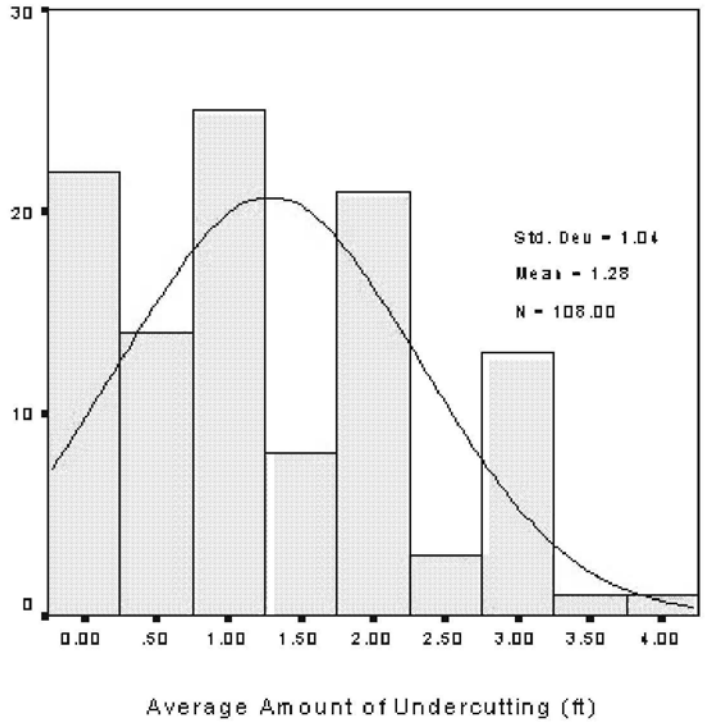


Figure D- 7: Frequency distribution histogram for average amount of undercutting.

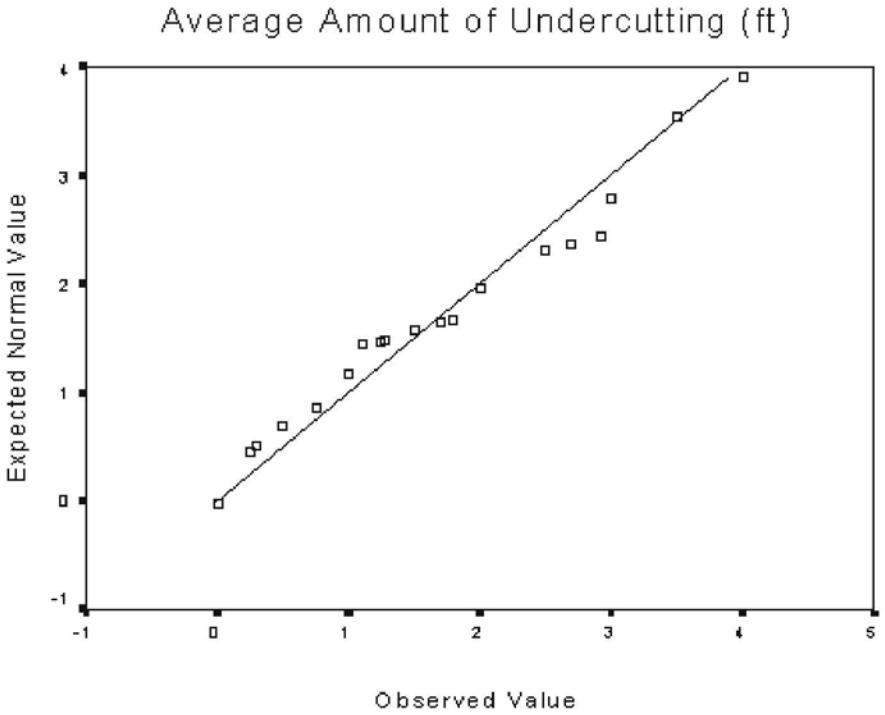


Figure D- 8: QQ-plot for average amount of undercutting.

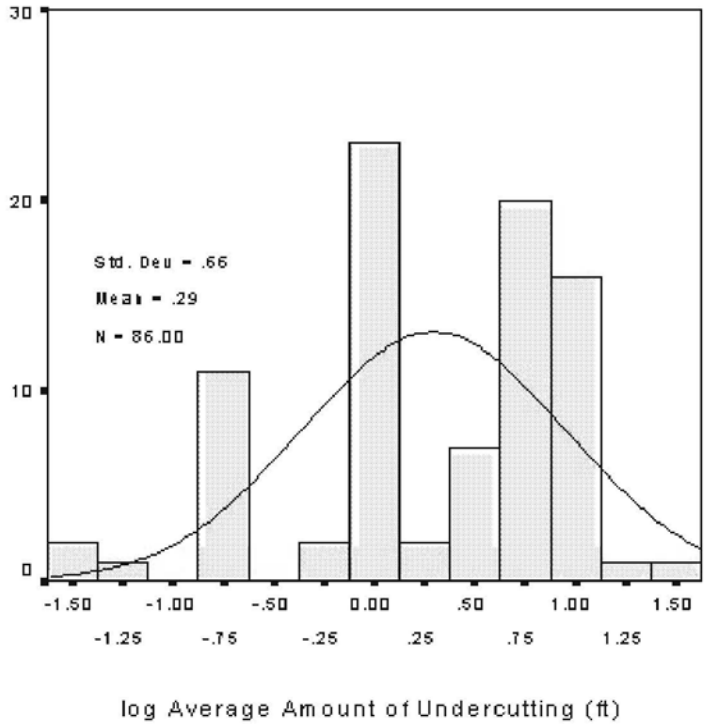


Figure D- 9: Frequency distribution histogram for the log of average amount of undercutting.

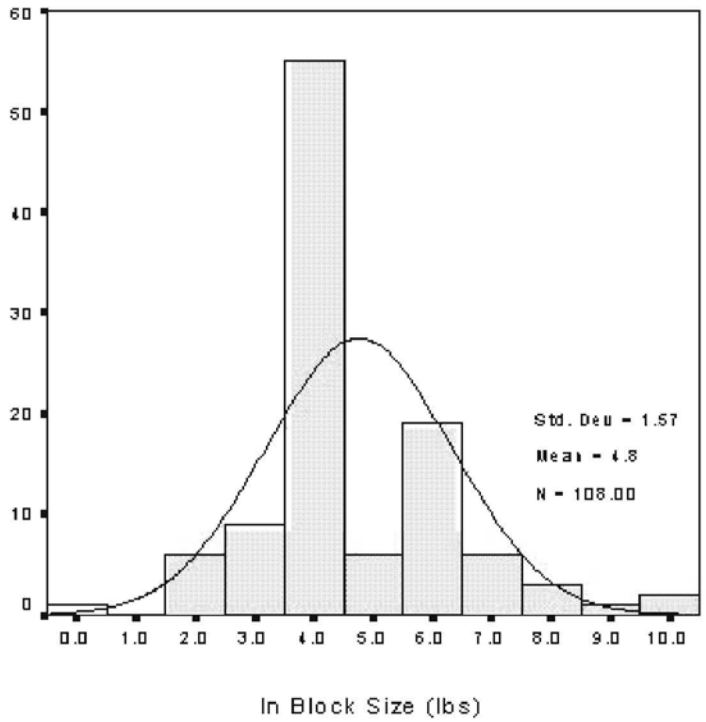


Figure D- 10: Frequency distribution histogram for the log of block size.

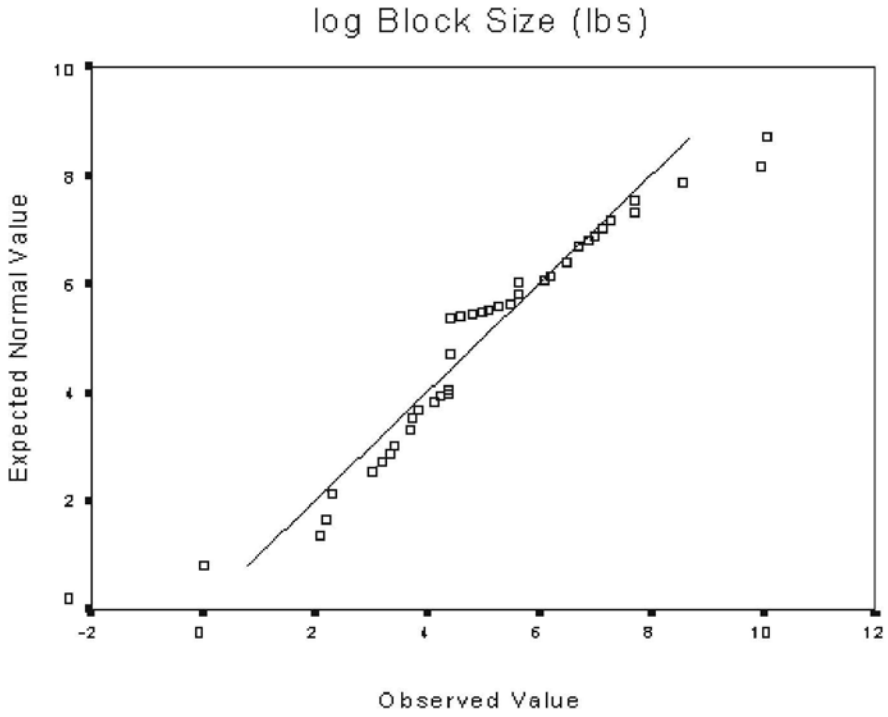


Figure D- 11: QQ-plot for the log of block size.

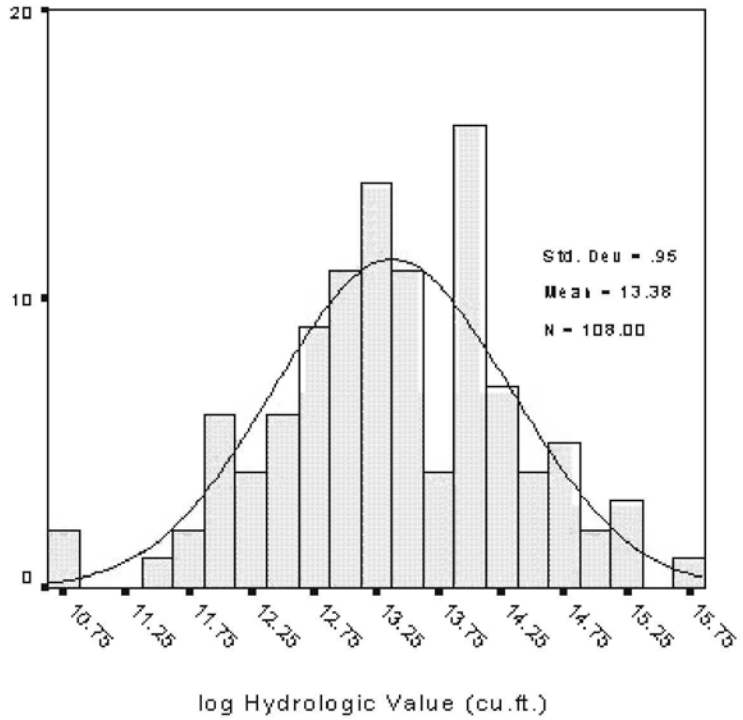


Figure D- 12: Frequency distribution histogram for the log of hydrologic value.

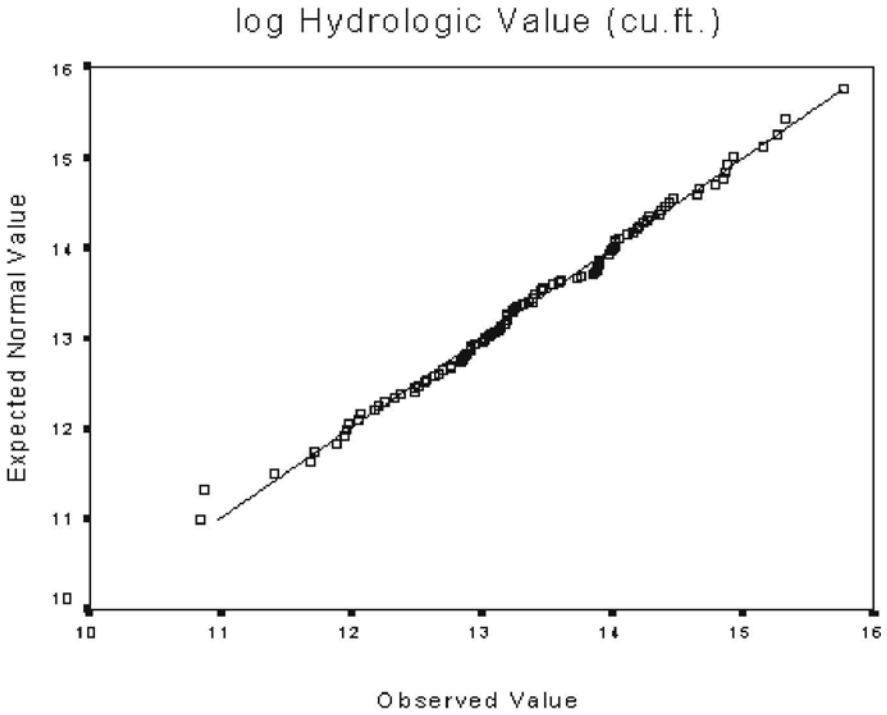


Figure D- 13: QQ-plot for the log of hydrologic value.

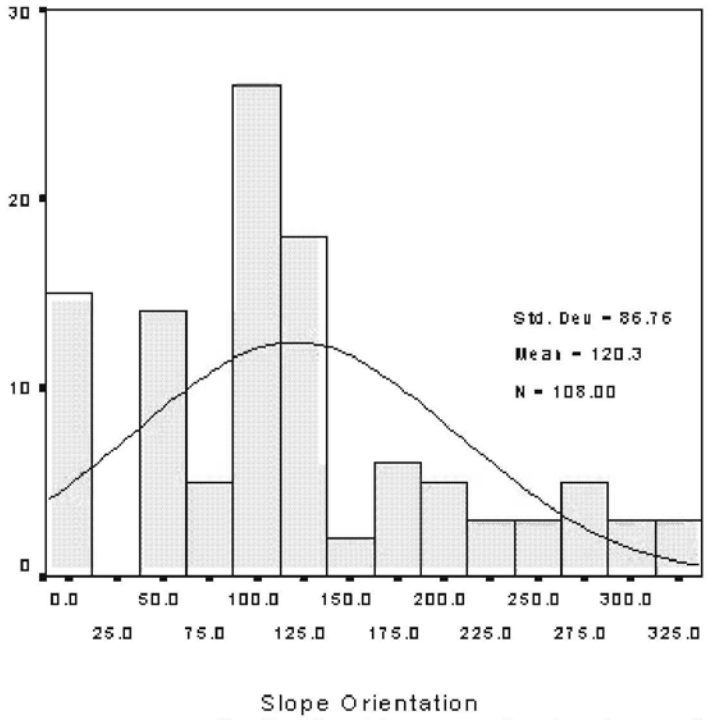


Figure D- 14: Frequency distribution histogram for the slope orientation.

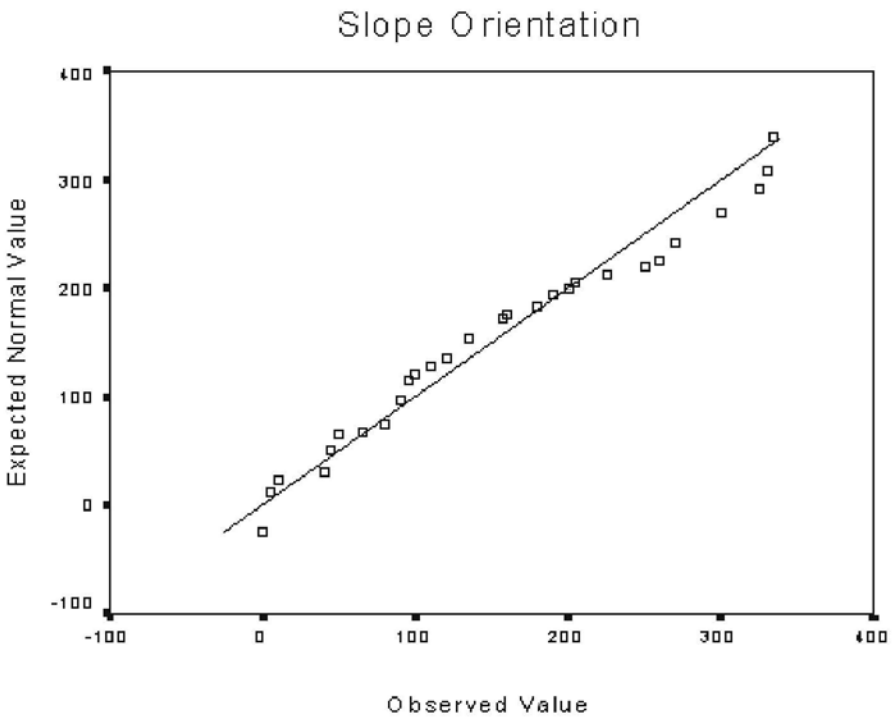


Figure D- 15: QQ-plot for the slope orientation.

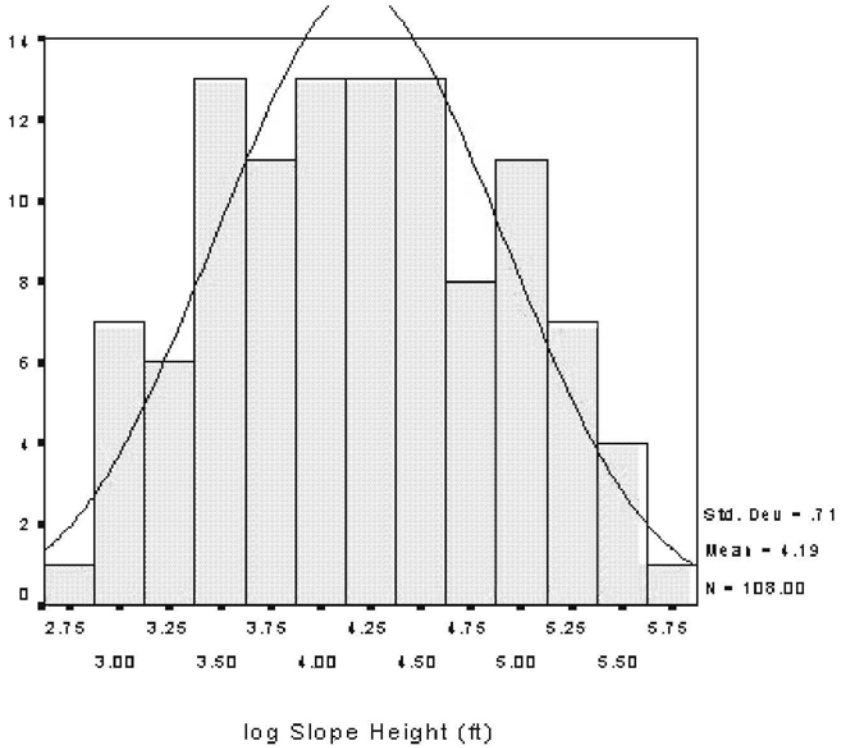


Figure D- 16: Frequency distribution histogram for the log of slope height.

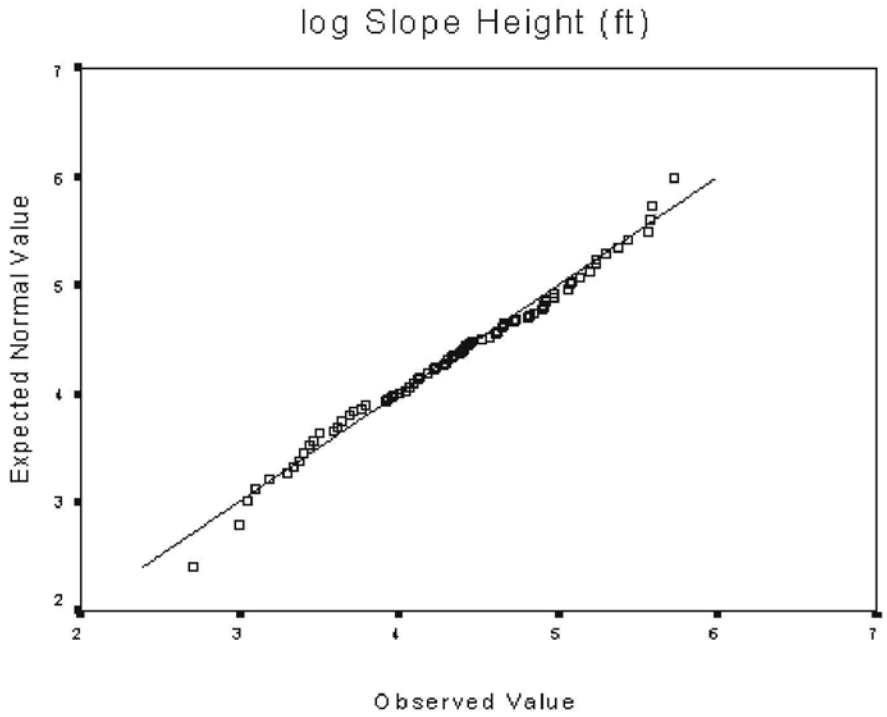


Figure D- 17: QQ-plot for the log of slope height.

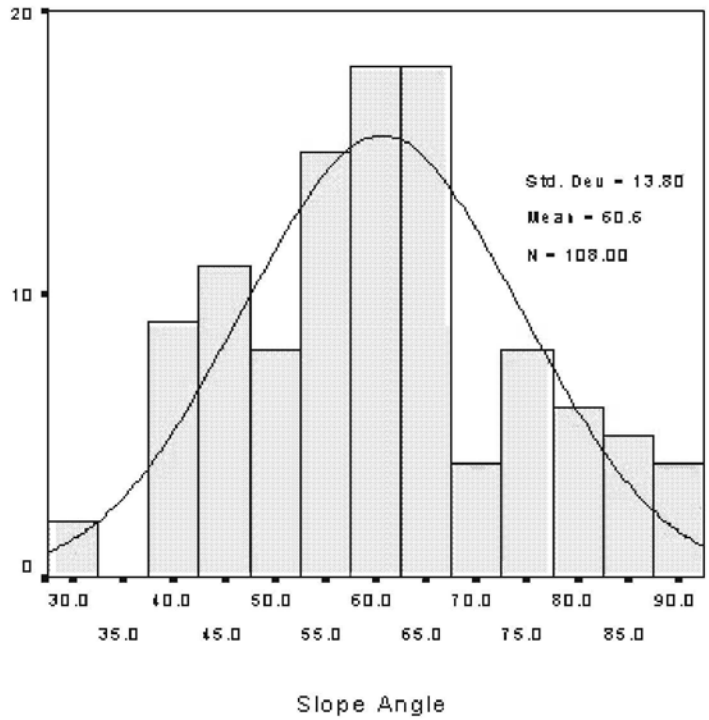


Figure D- 20: Frequency distribution histogram for the slope angle.

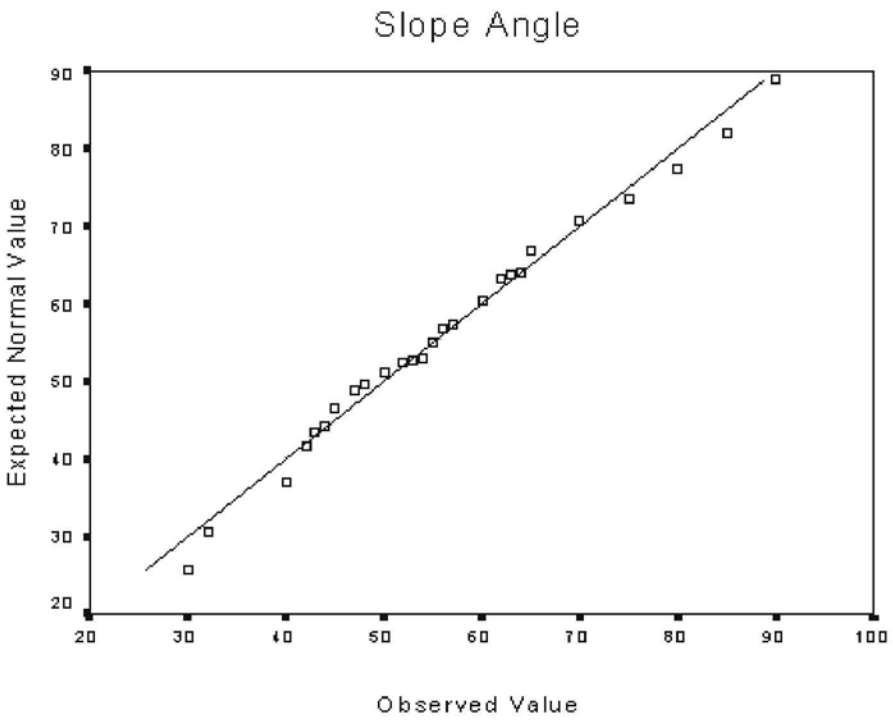


Figure D- 21: QQ-plot for the slope angle.

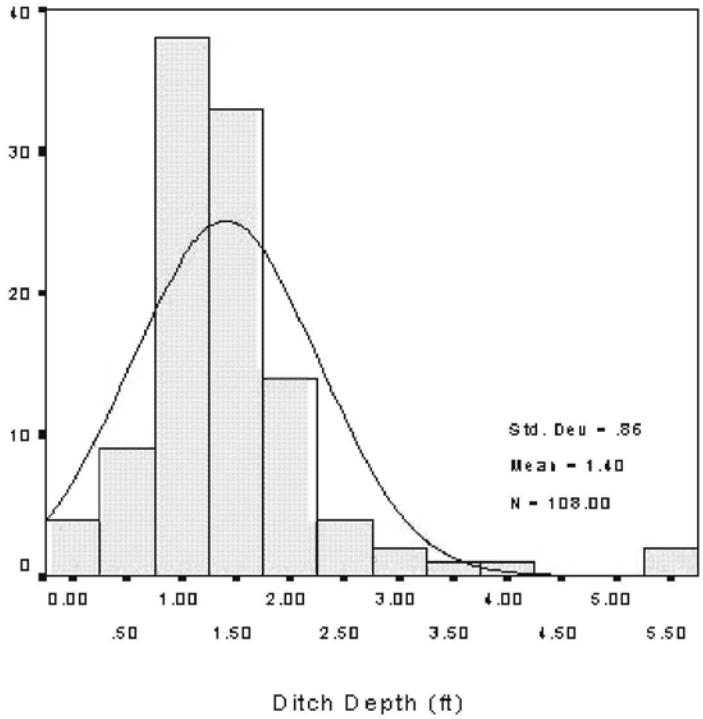


Figure D- 22: Frequency distribution histogram for the ditch depth.

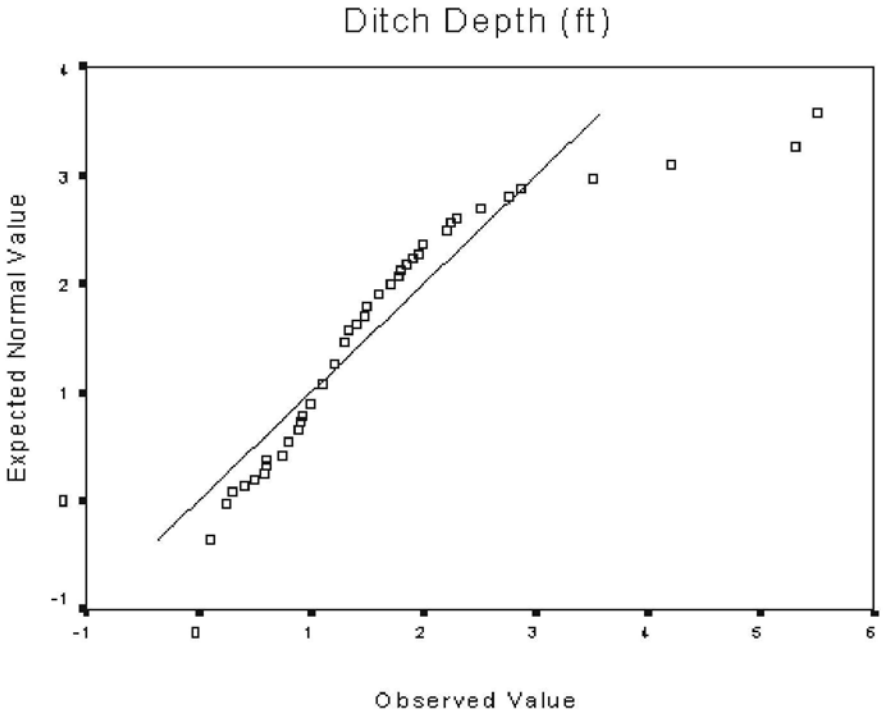


Figure D- 23: QQ-plot for the ditch depth.

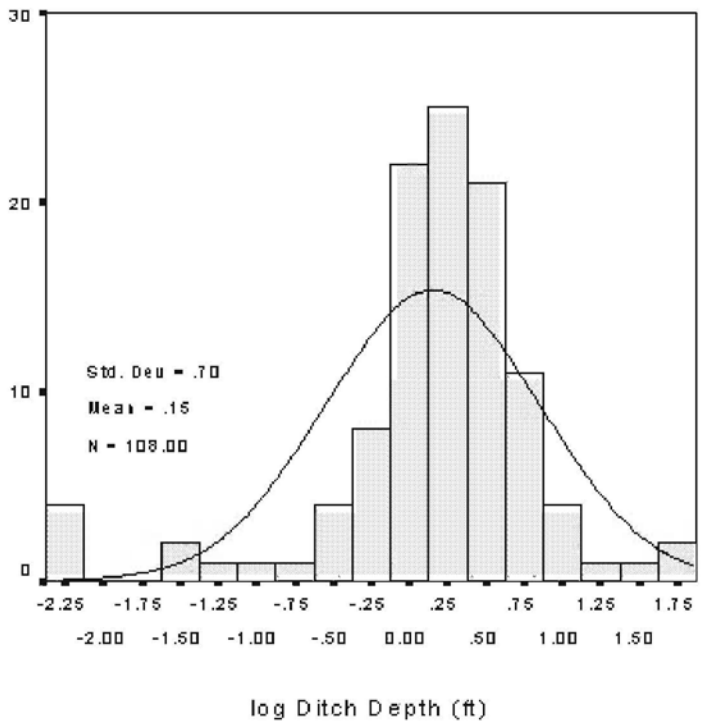


Figure D- 24: Frequency distribution histogram for log of ditch depth.

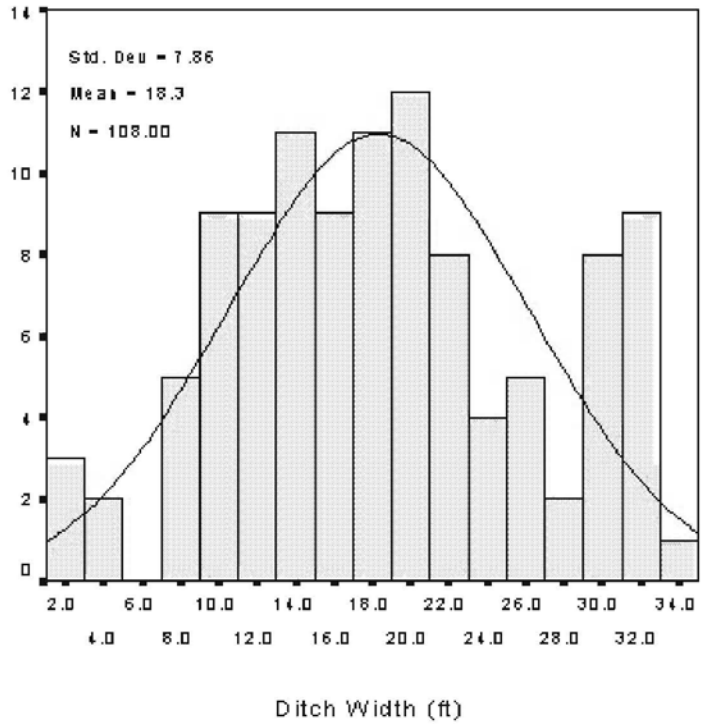


Figure D- 25: Frequency distribution histogram for the ditch width.

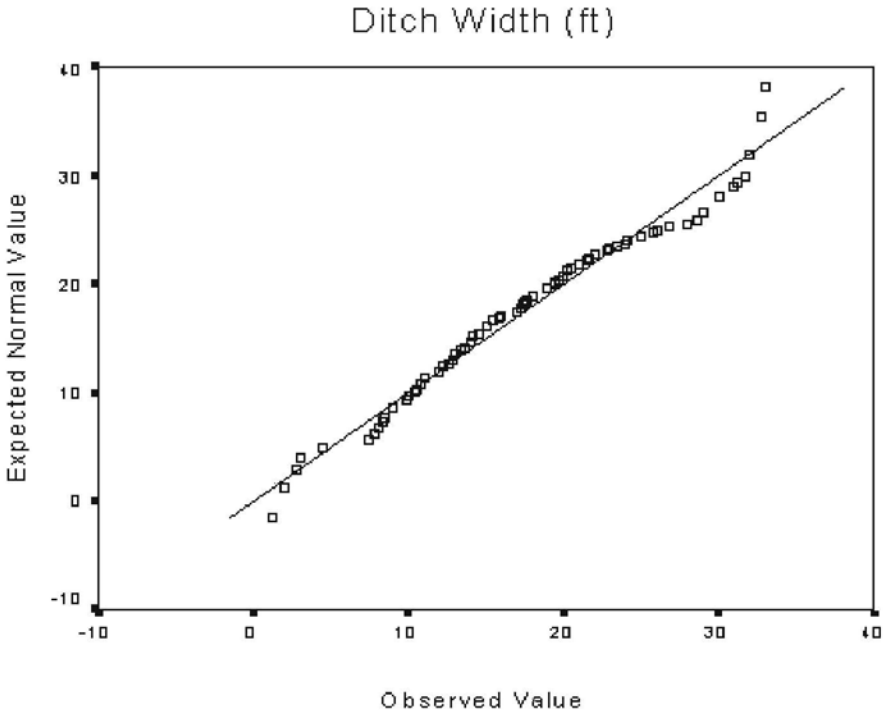


Figure D- 26: QQ-plot of ditch width.

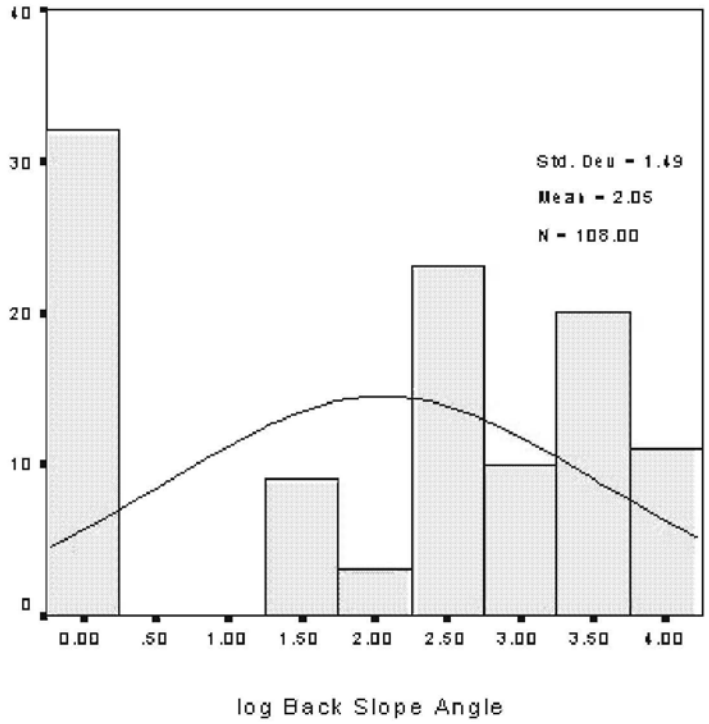


Figure D- 27: Frequency distribution histogram for the log of back slope angle.

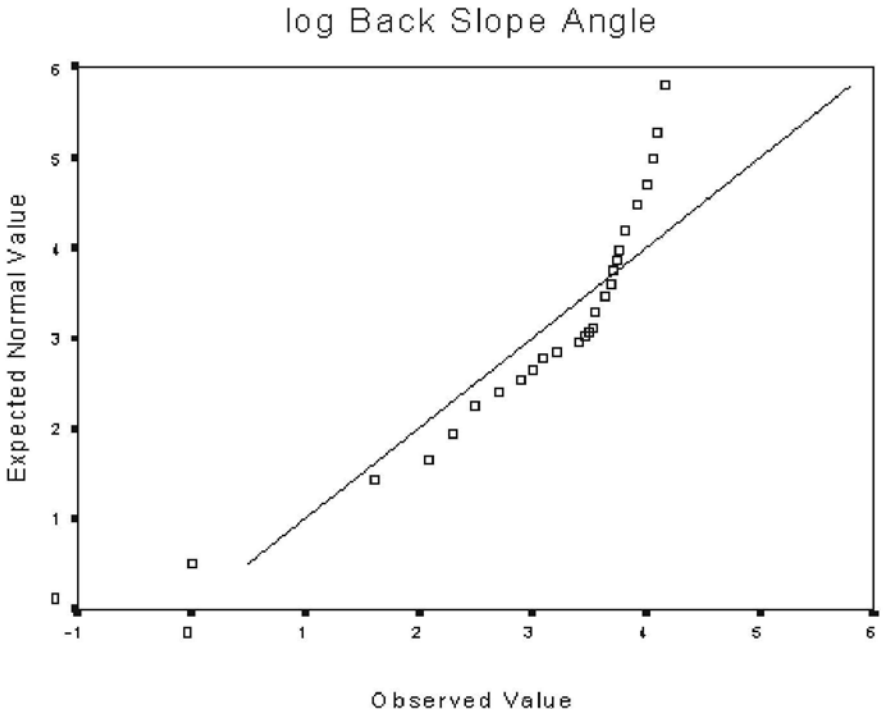


Figure D- 28: QQ-plot for the log of back slope angle.

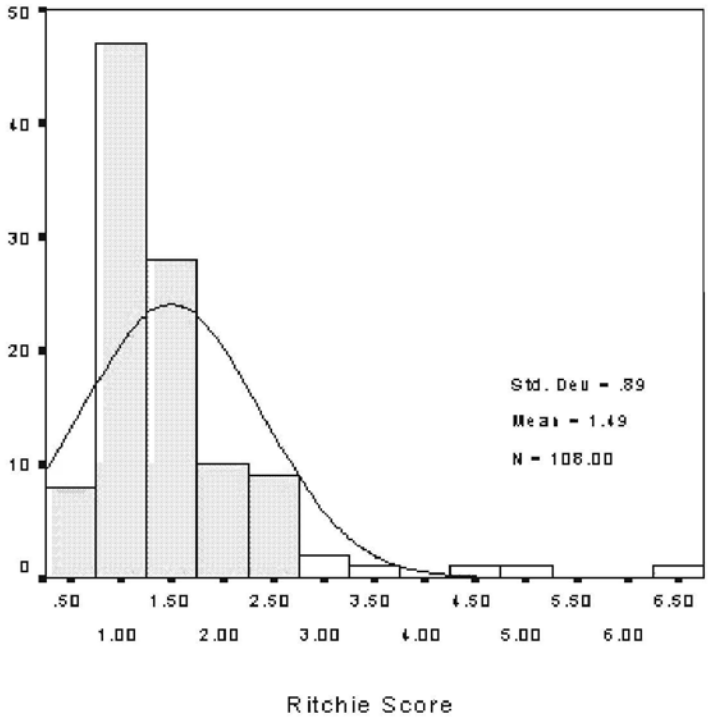


Figure D- 29: Frequency distribution histogram for the Ritchie score.

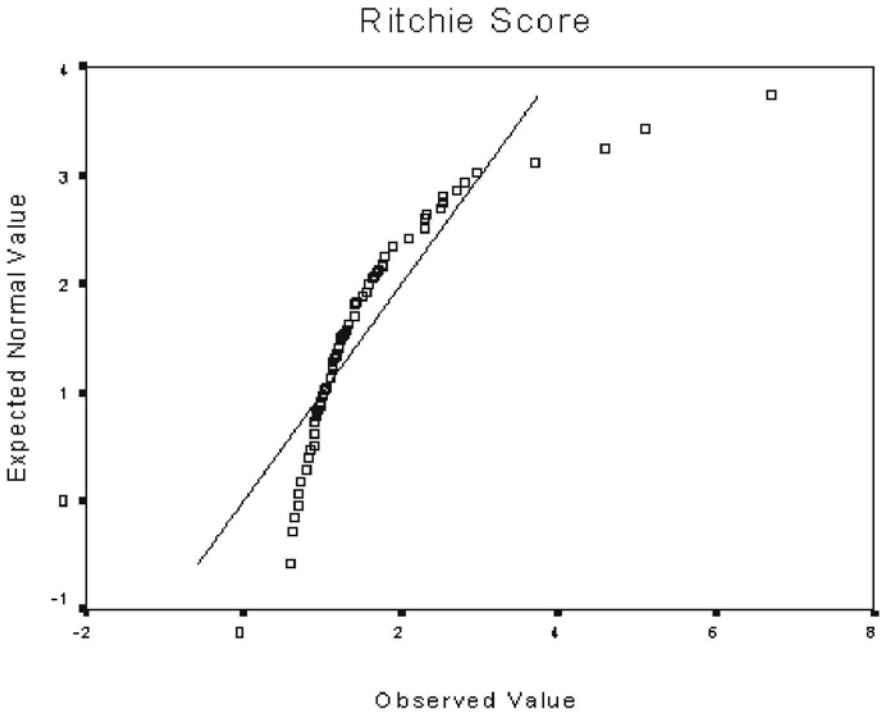


Figure D- 30: QQ-plot for the Ritchie score.

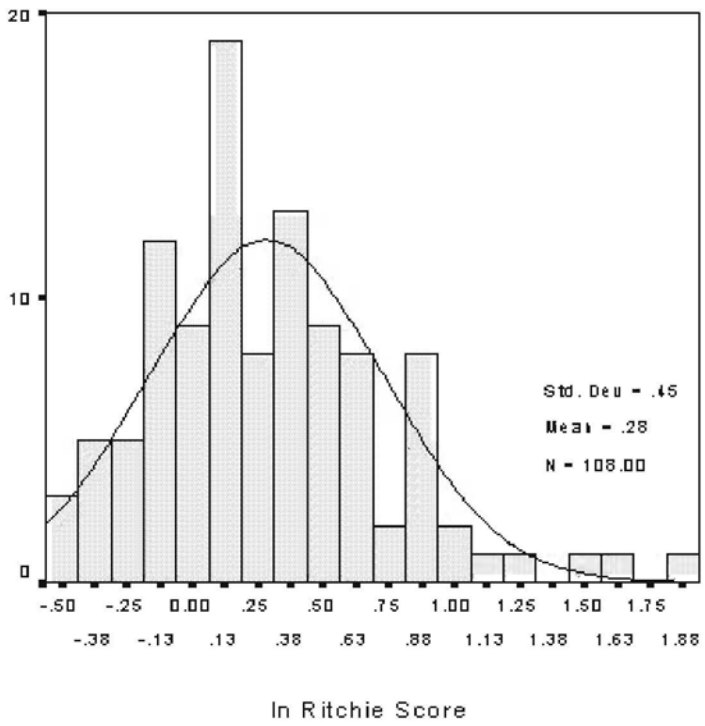


Figure D- 31: Frequency distribution histogram for the log of Ritchie score.

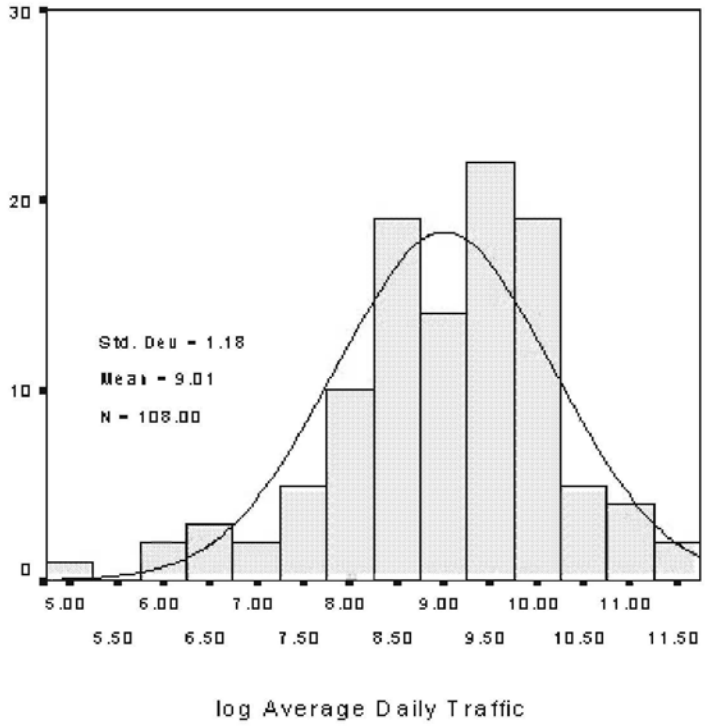


Figure D- 32: Frequency distribution histogram for the log of average daily traffic.

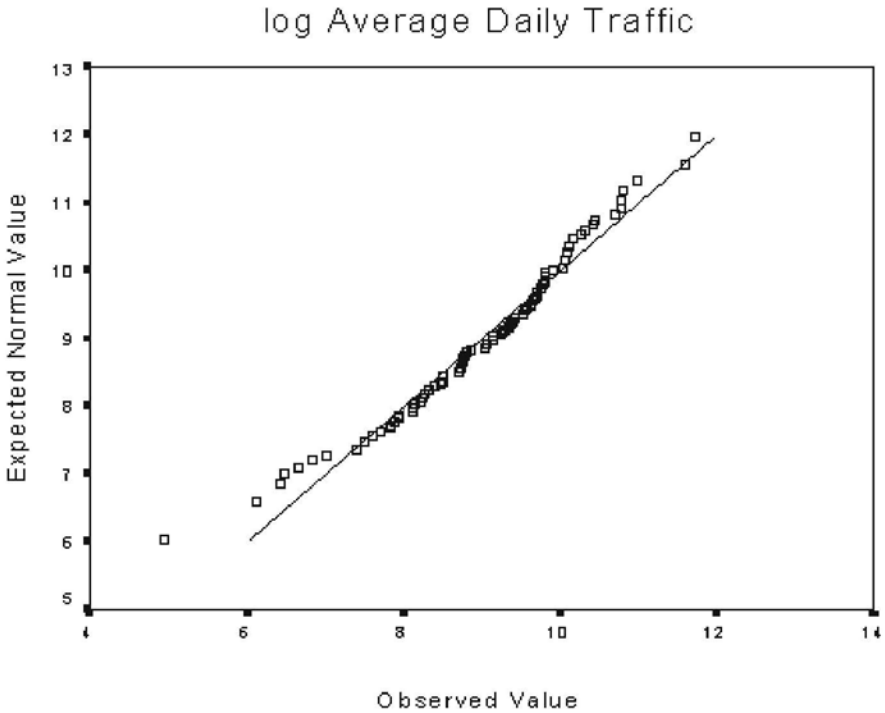


Figure D- 33: QQ-plot for the log of average daily traffic.

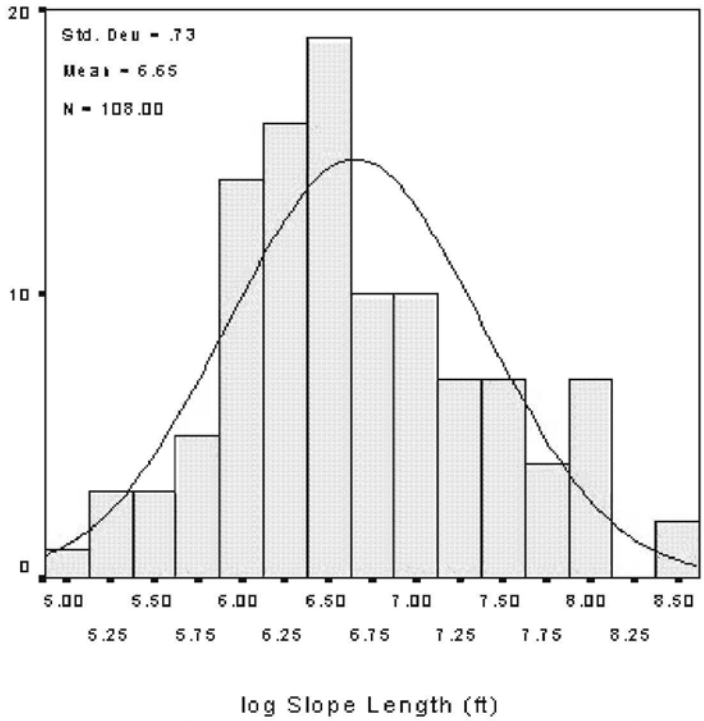


Figure D- 34: Frequency distribution histogram for the log of slope length.

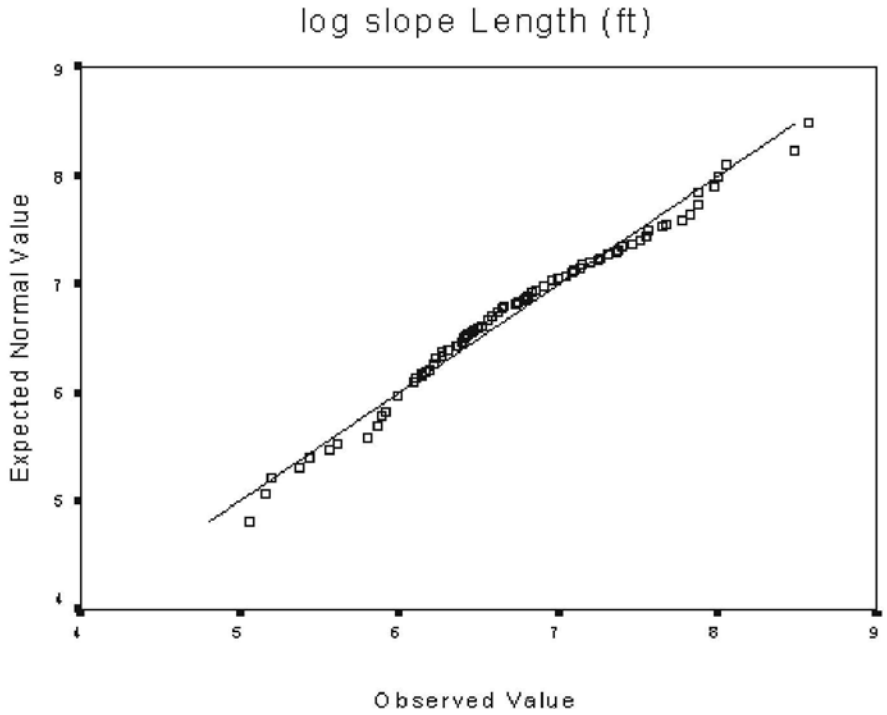


Figure D- 35: QQ-plot for the log of slope length.

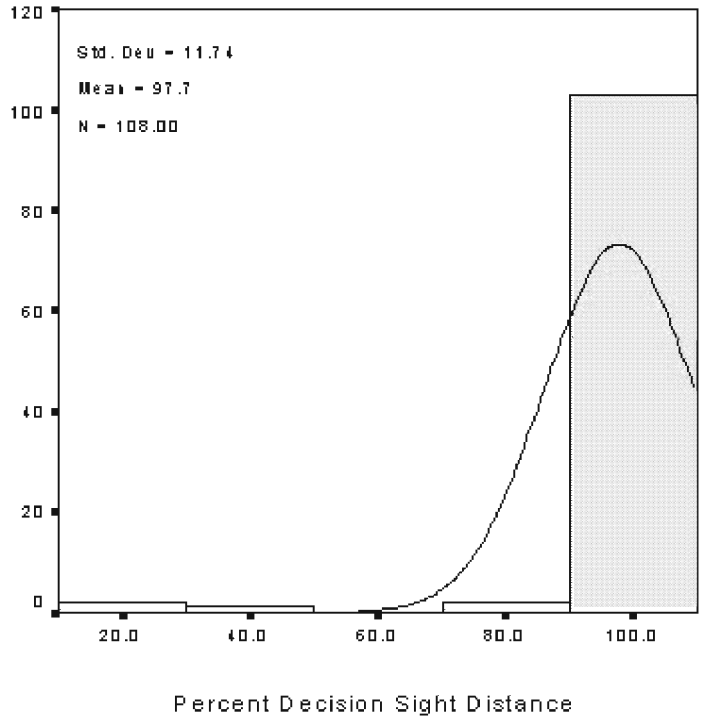


Figure D- 36: Frequency distribution histogram for the percent decision site distance.

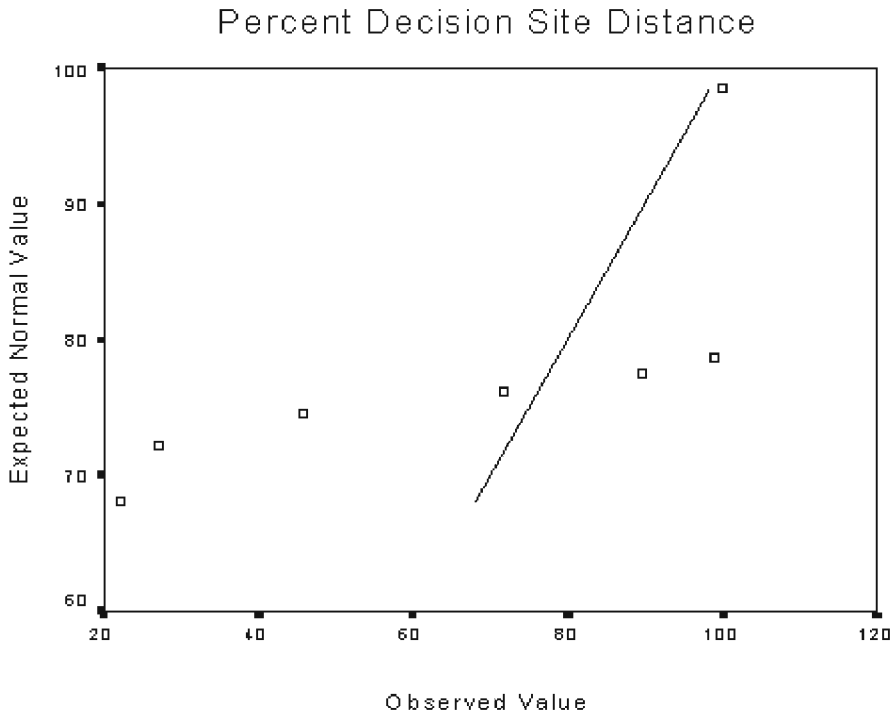


Figure D- 37: QQ-plot for the percent decision site distance.

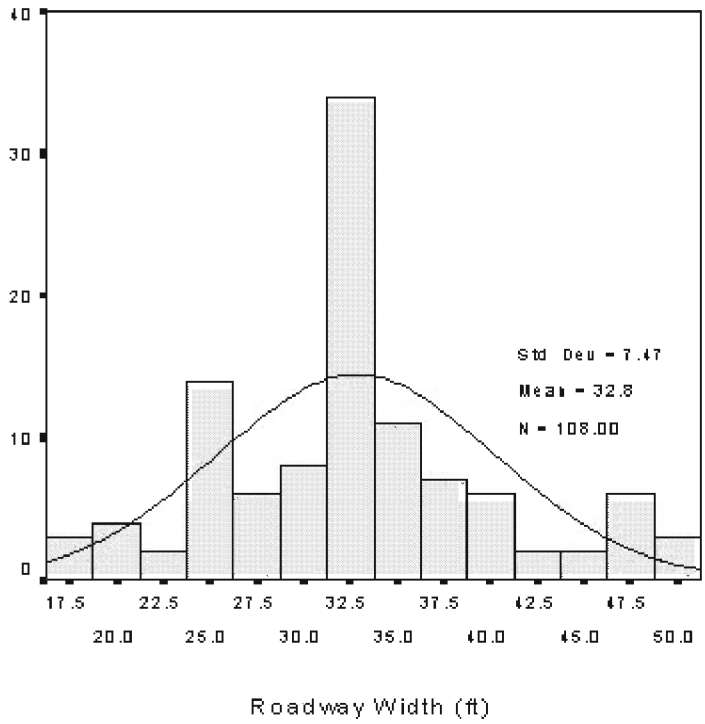


Figure D- 38: Frequency distribution histogram for the roadway width.

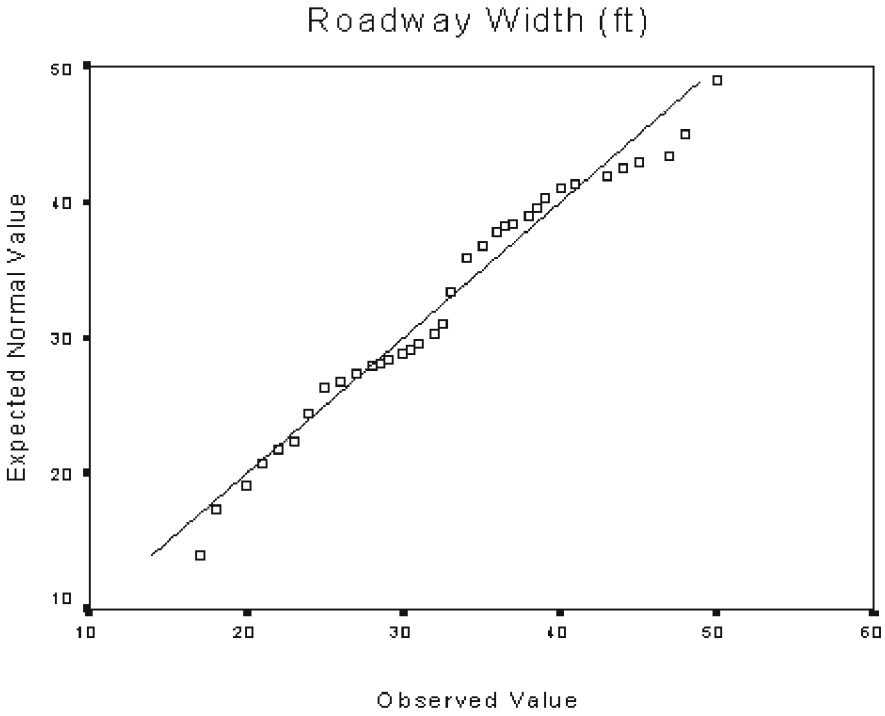


Figure D- 39: QQ-plot for the roadway width.

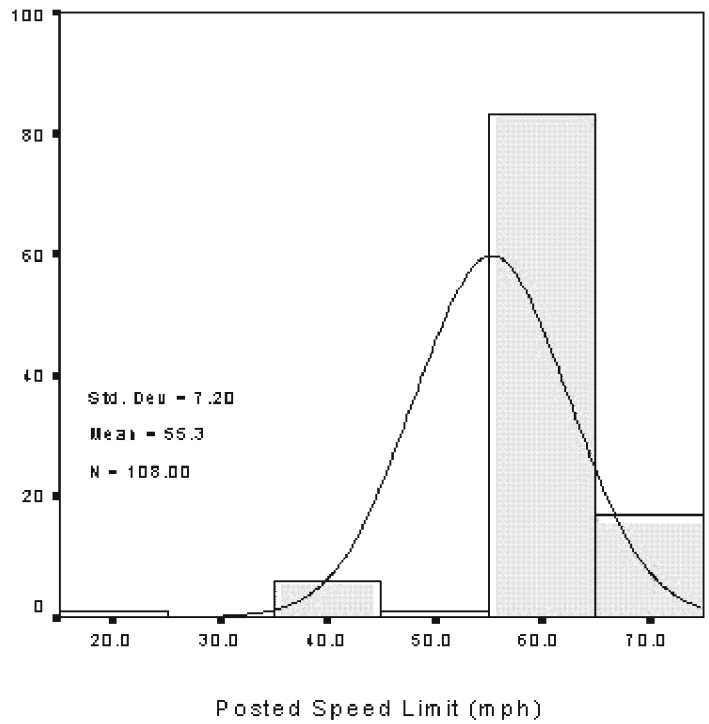


Figure D- 40: Frequency distribution histogram for the posted speed limit.

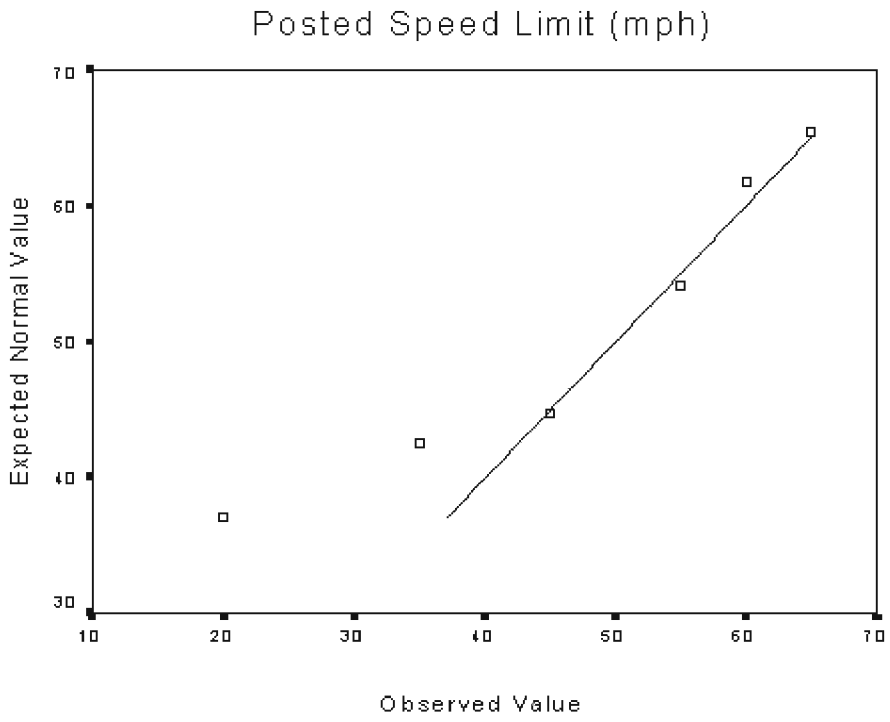


Figure D- 41: QQ-plot for the posted speed limit.

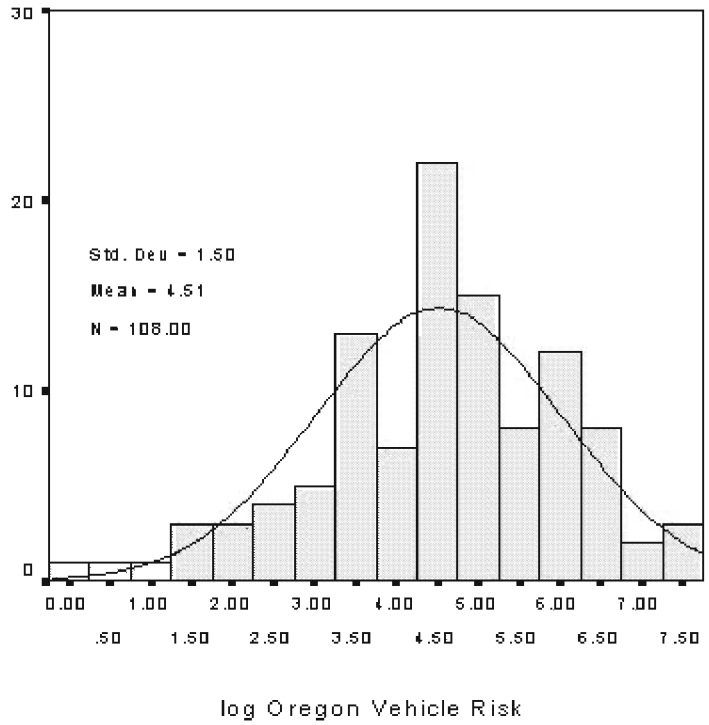


Figure D- 42: Frequency distribution histogram for the log of Oregon vehicle risk.

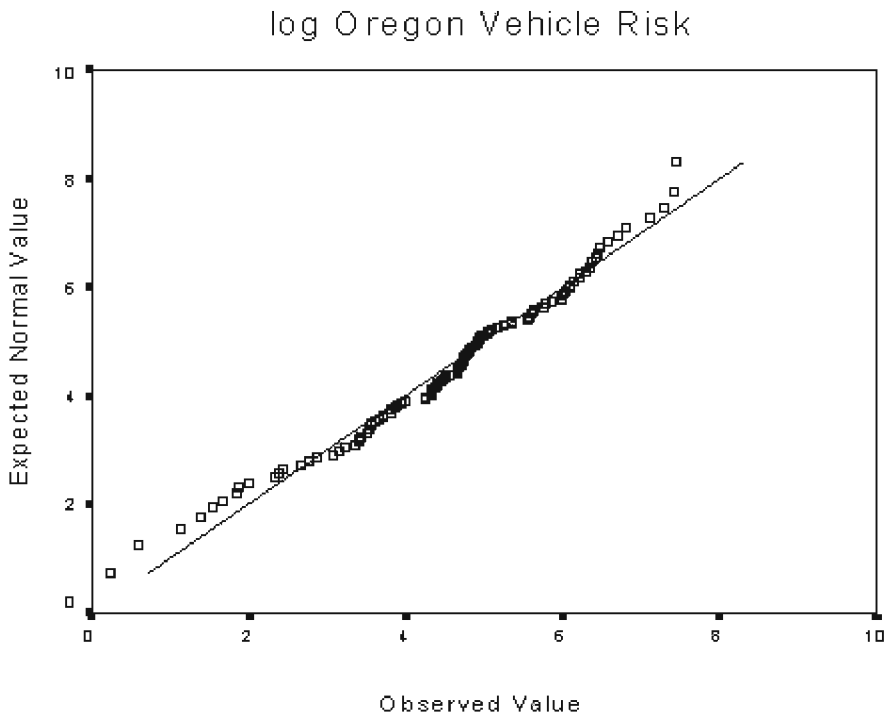


Figure D- 43: QQ-plot for the log of Oregon vehicle risk.

APPENDIX E

X-Y SCATTER PLOTS

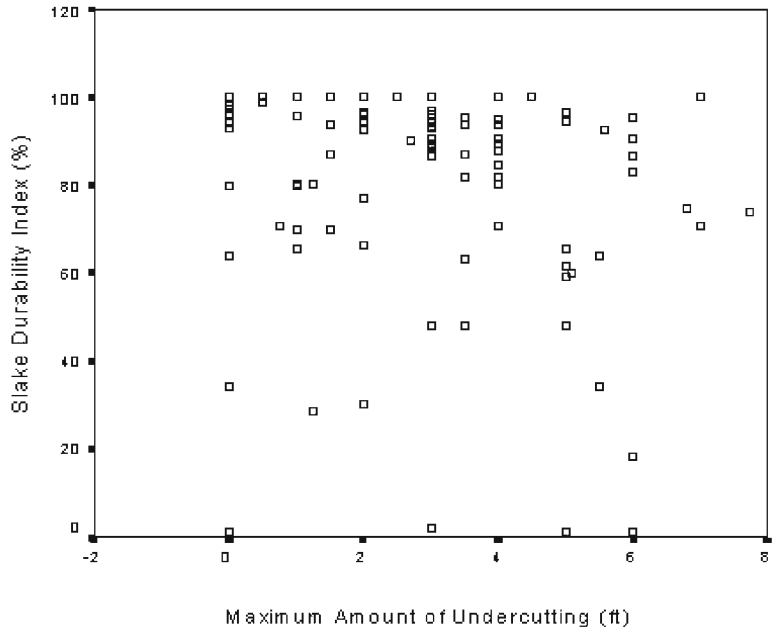


Figure E- 1: Scatter plot for the second-cycle slake durability index versus the maximum amount of undercutting.

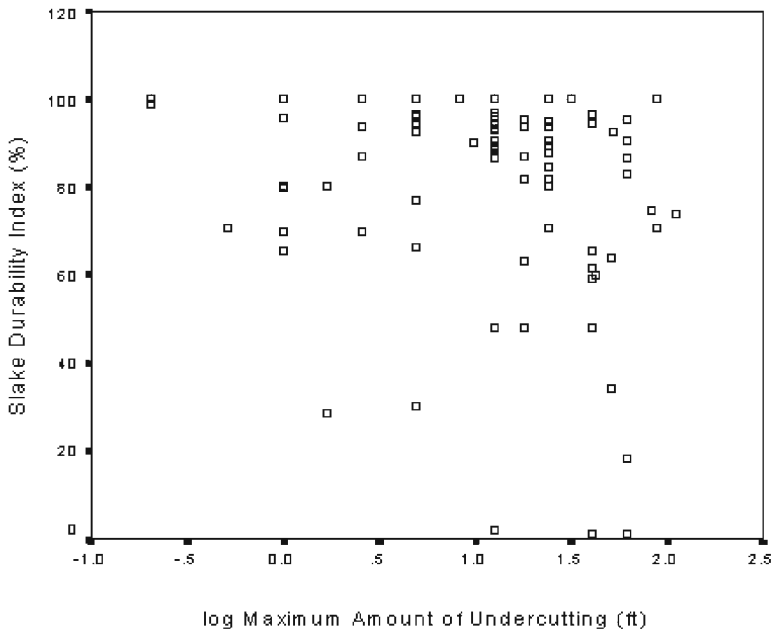


Figure E- 2: Scatter plot for the second-cycle slake durability index versus the log maximum amount of undercutting.

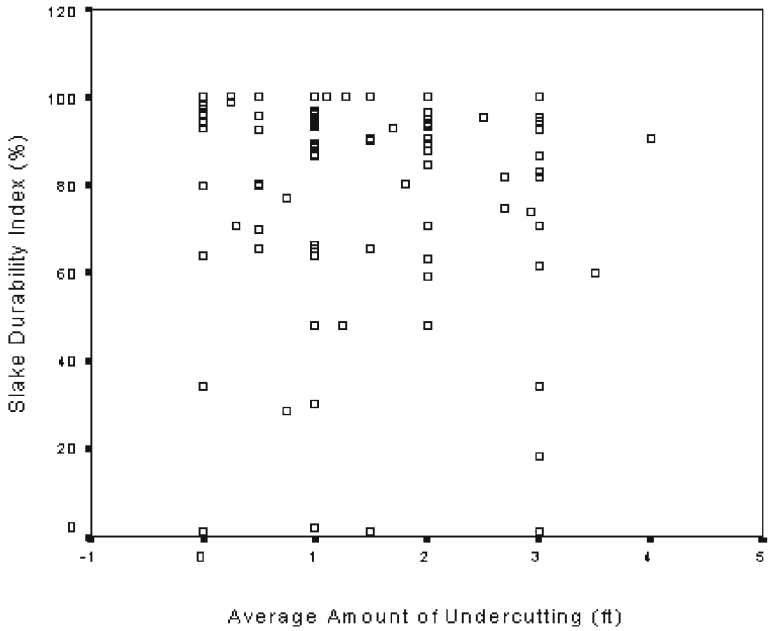


Figure E- 3: Scatter plot for the second-cycle slake durability index versus the typical amount of undercutting.

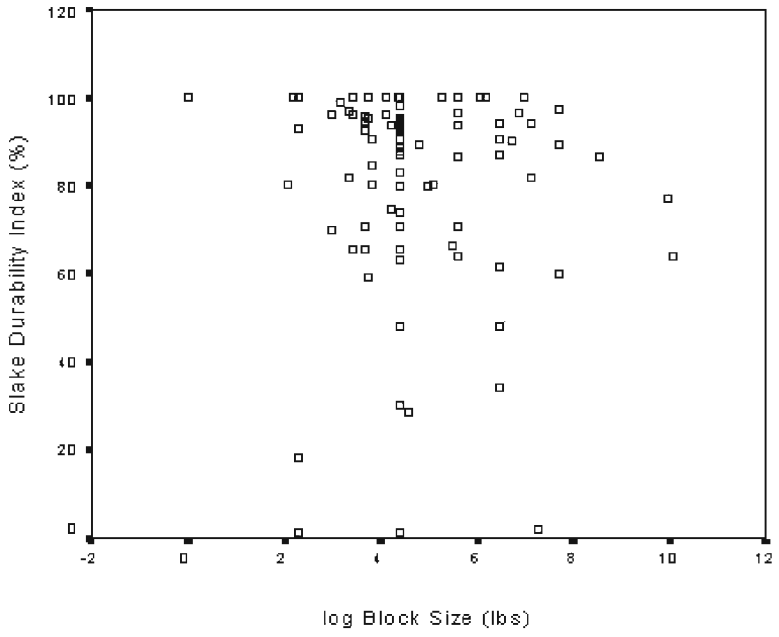


Figure E- 4: Scatter plot for the second-cycle slake durability index versus the log of block size.

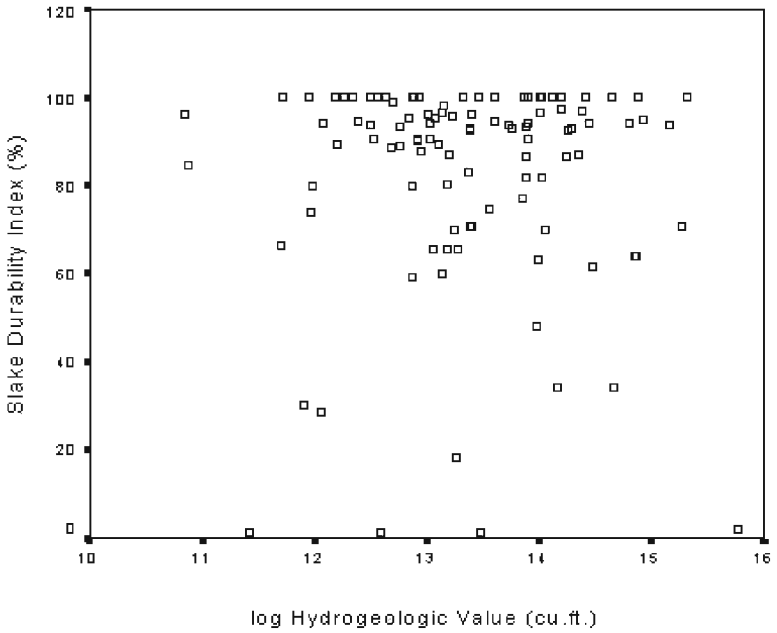


Figure E- 5: Scatter plot for the second-cycle slake durability index versus log of the hydrologic value.

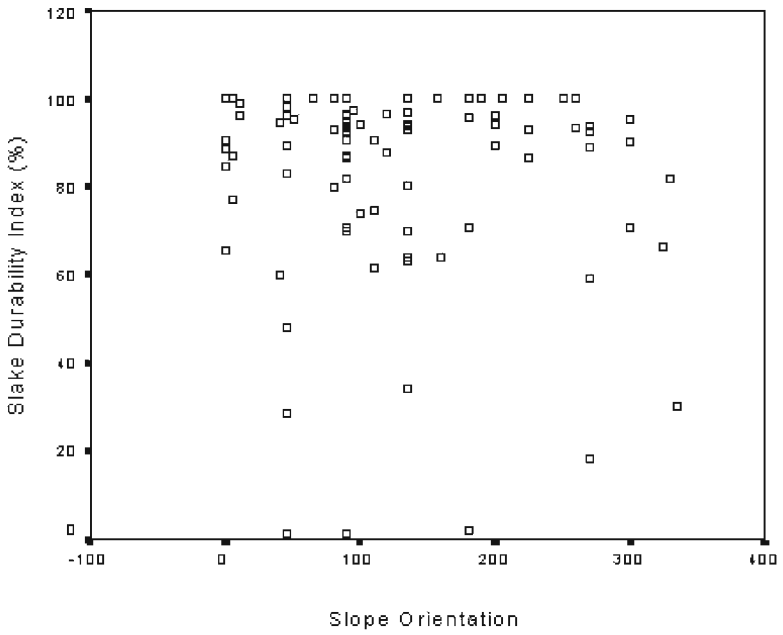


Figure E- 6: Scatter plot for the second-cycle slake durability index versus slope orientation.

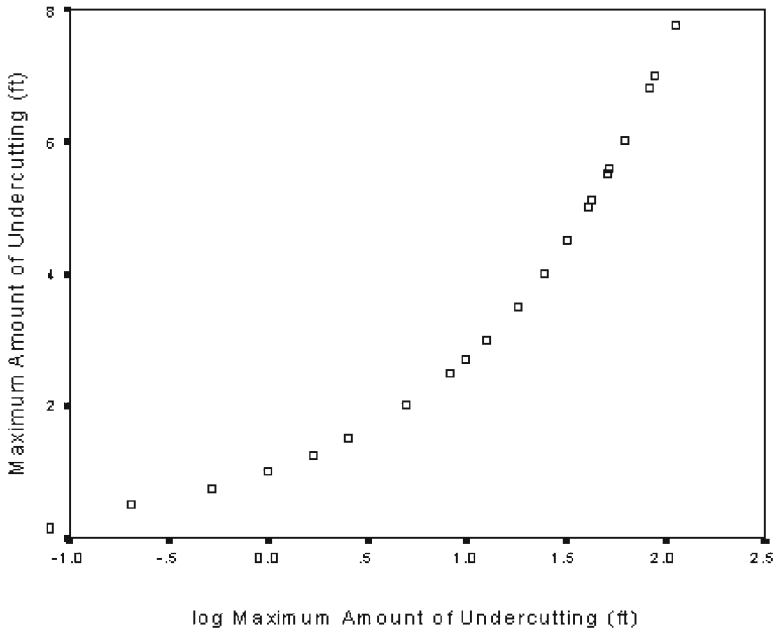


Figure E- 7: Maximum amount of undercutting versus the log of the maximum amount of undercutting.

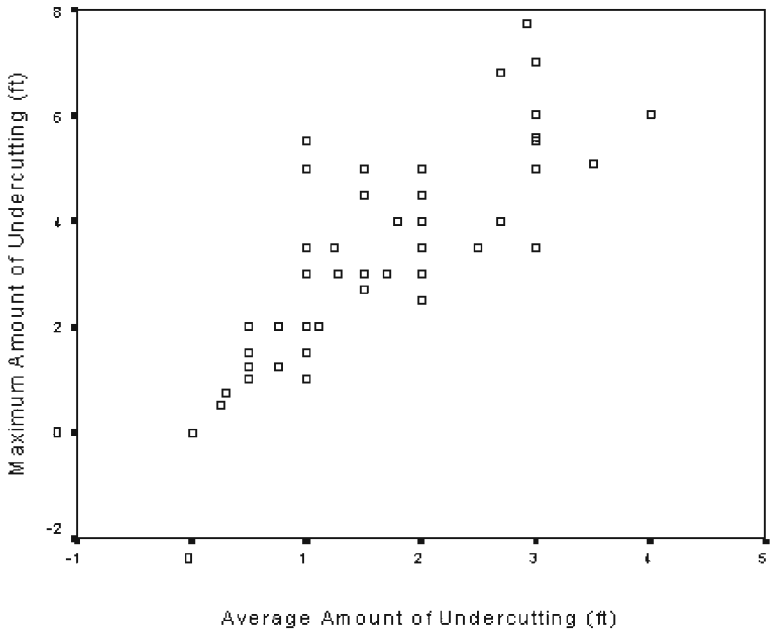


Figure E- 8: Scatter plot for the maximum amount of undercutting versus the average amount of undercutting.

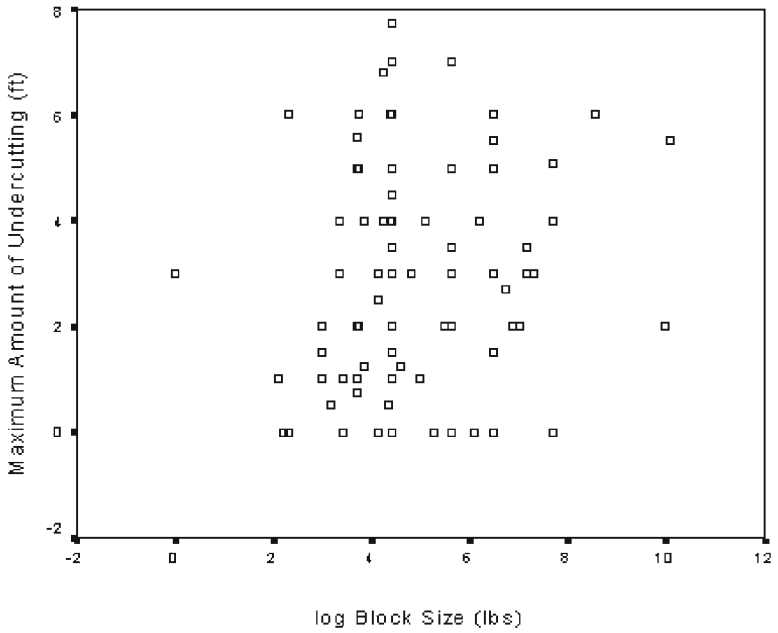


Figure E- 9: Scatter plot for the maximum amount of undercutting versus the log of block size.

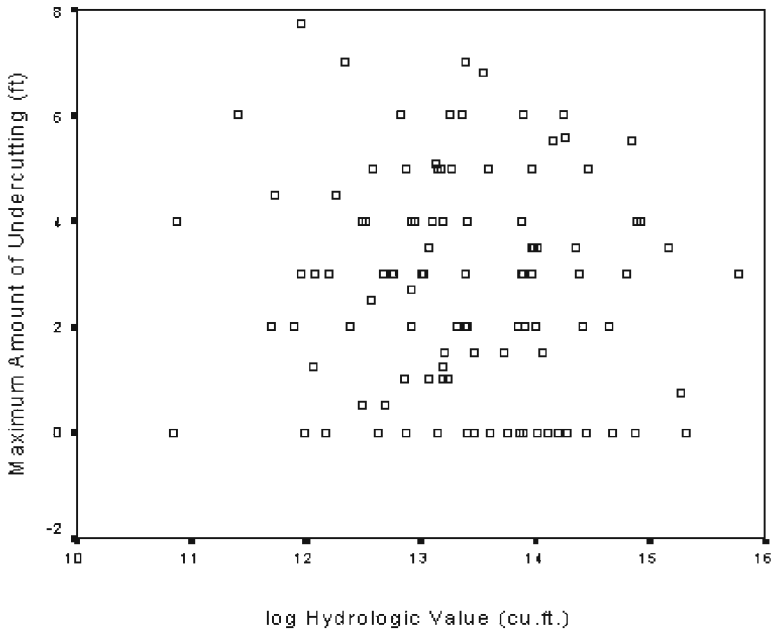


Figure E- 10: Scatter plot for the maximum amount of undercutting versus the log of the hydrologic value.

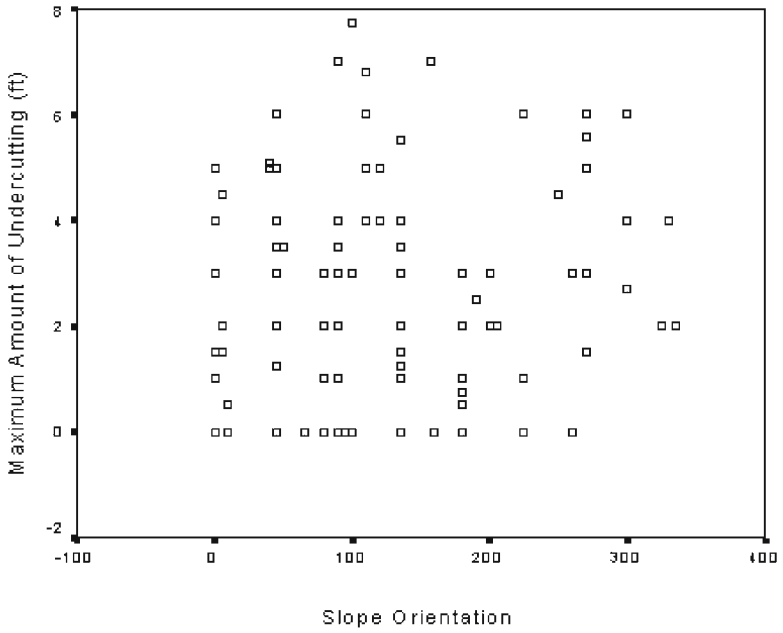


Figure E- 4: Scatter plot for the maximum amount of undercutting versus the slope orientation.

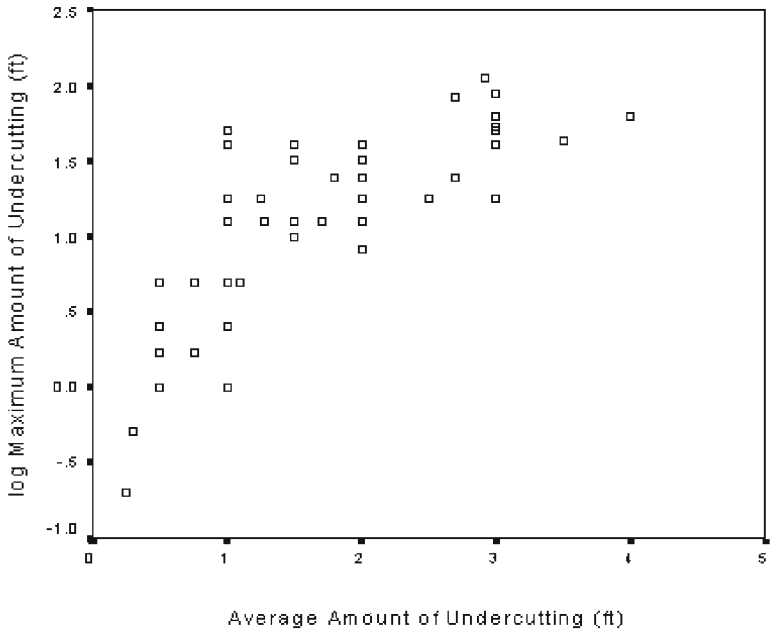


Figure E- 3: Scatter plot for the log of the maximum amount of undercutting versus the average amount of undercutting.

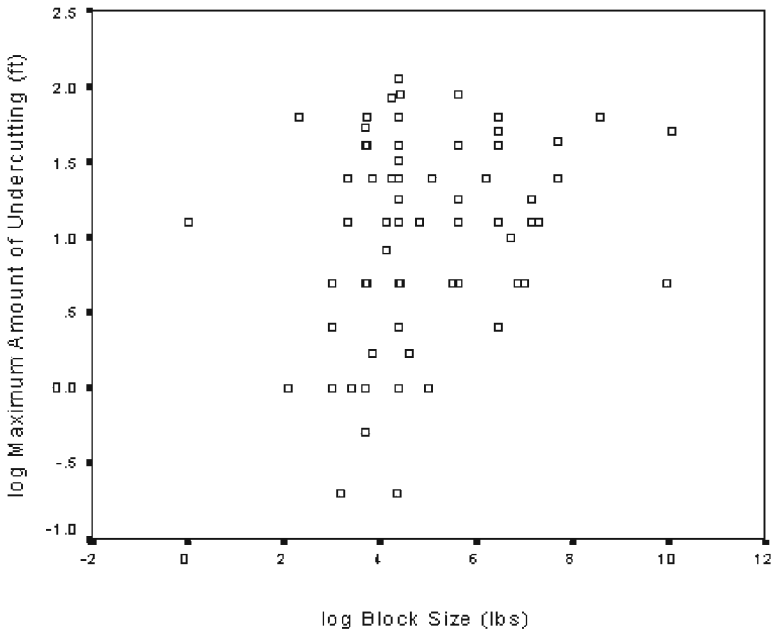


Figure E- 5: Scatter plot for the maximum amount of undercutting versus the log of the block size.

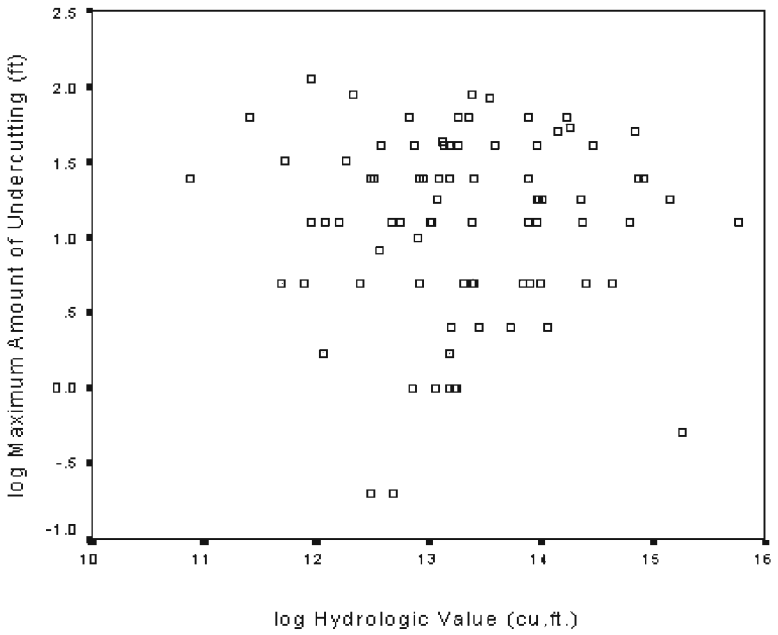


Figure E- 14: Scatter plot for the maximum amount of undercutting versus the log of the hydrologic value.

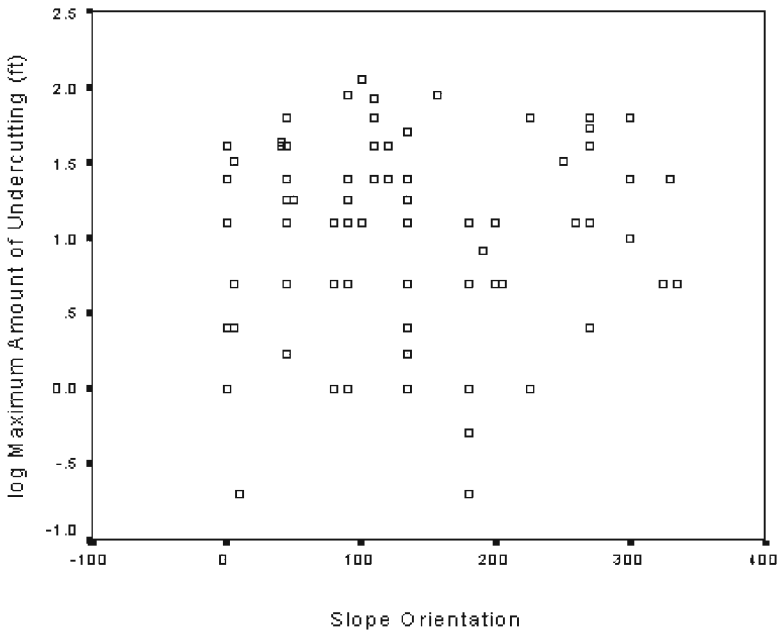


Figure E- 6: Scatter plot for the maximum amount of undercutting versus the aveslope orientation.

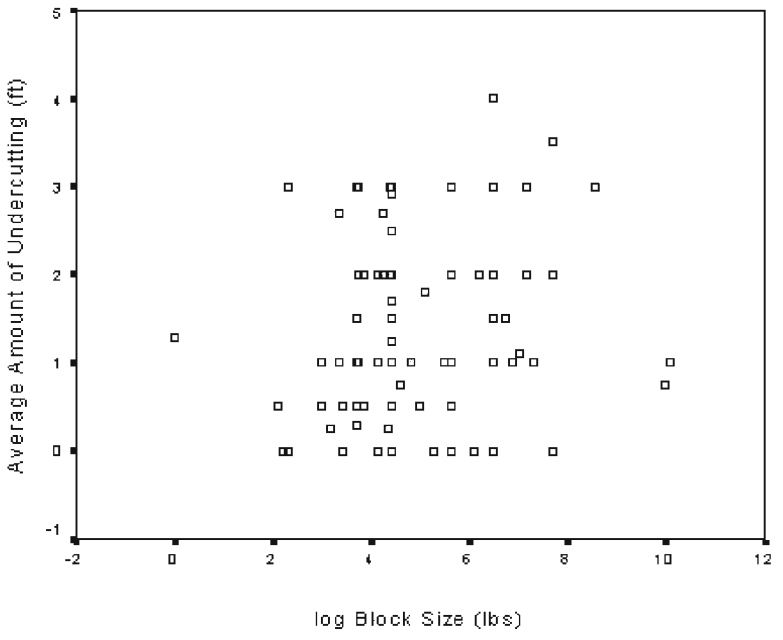


Figure E- 16: Scatter plot for the average amount of undercutting versus the log of the block size.

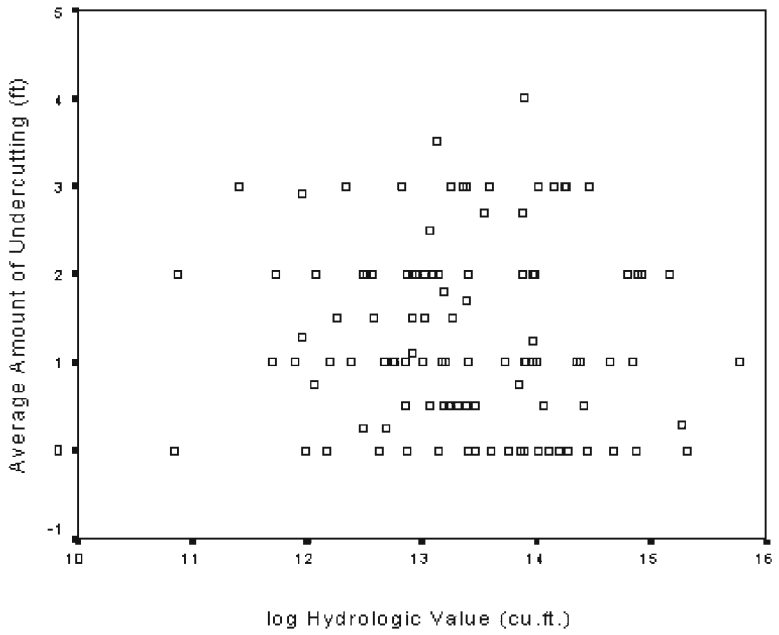


Figure E- 7: Scatter plot for the average amount of undercutting versus the log of the hydrologic value.

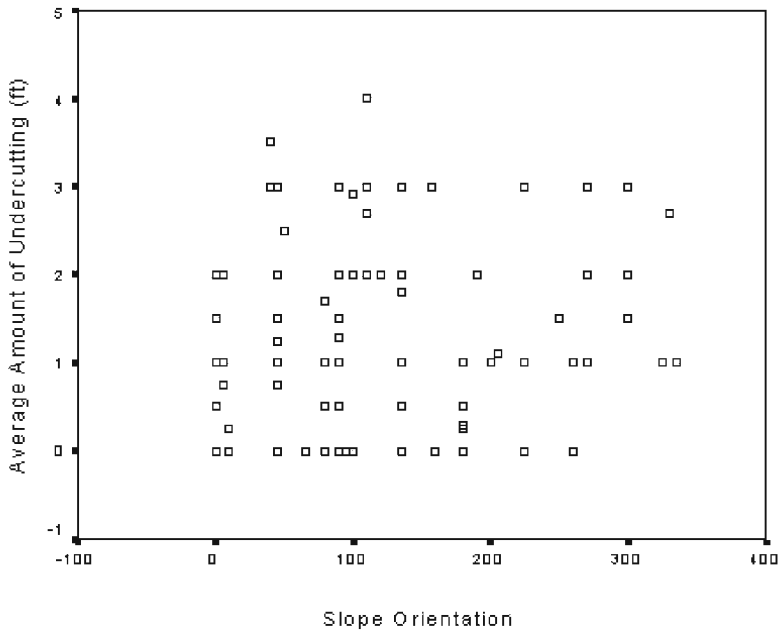


Figure E- 18: Scatter plot for the average amount of undercutting versus the slope orientation.

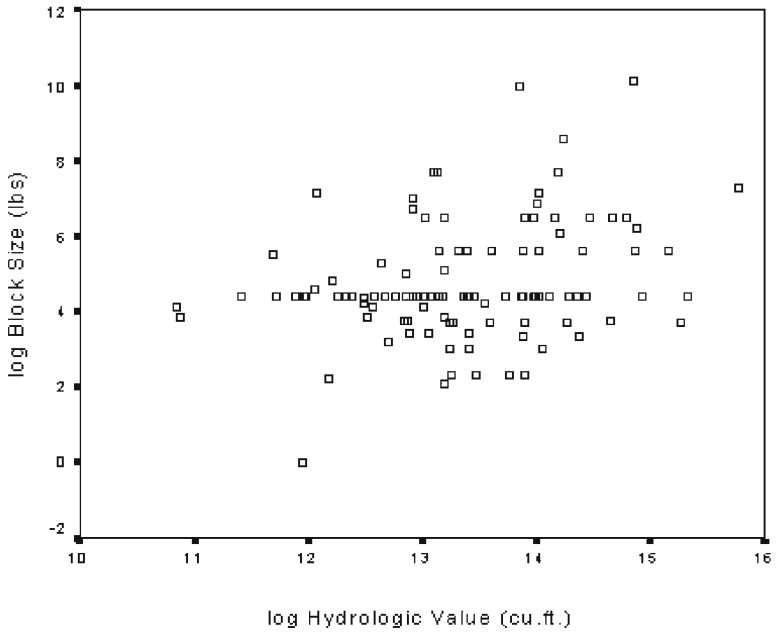


Figure E- 8: Scatter plot for the log of the block size versus the log of the hydrologic value.

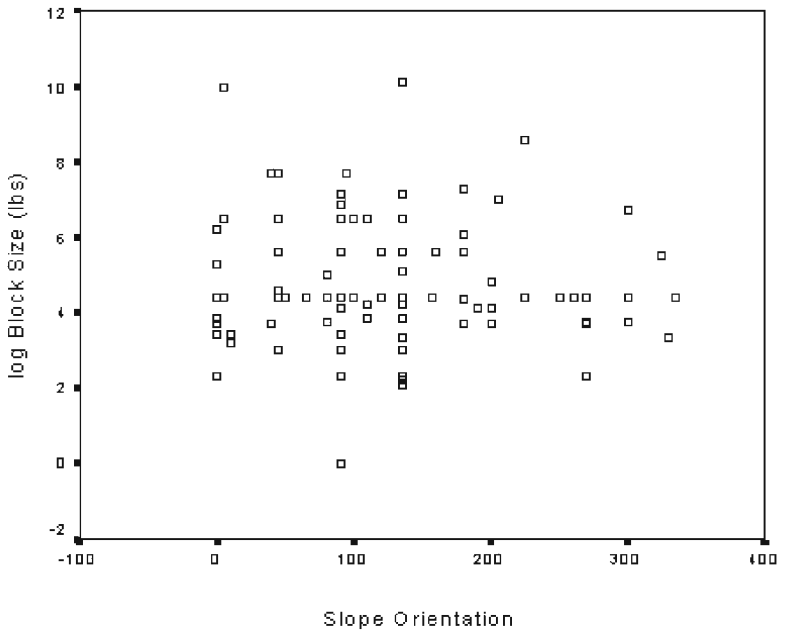


Figure E- 20: Scatter plot for the log of the block size versus the slope orientation.

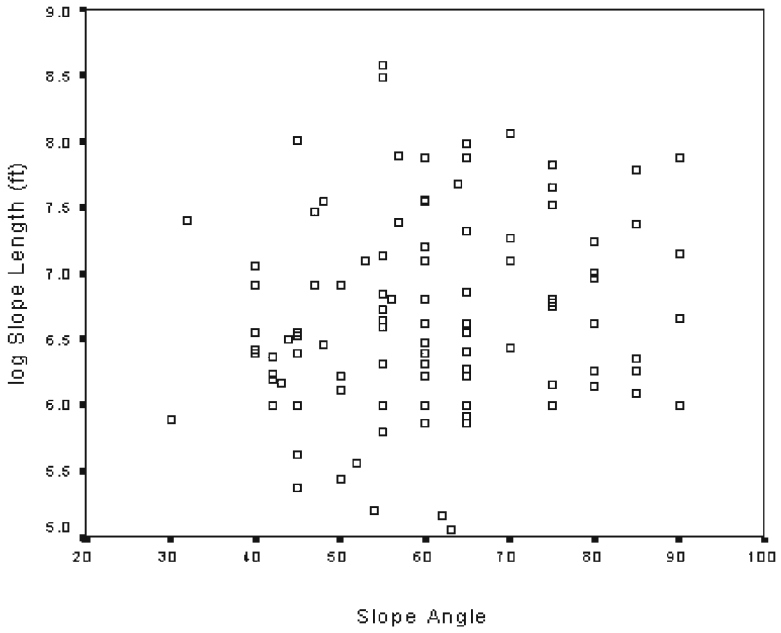


Figure E- 21: Scatter plot for the log of the slope length versus the slope angle.

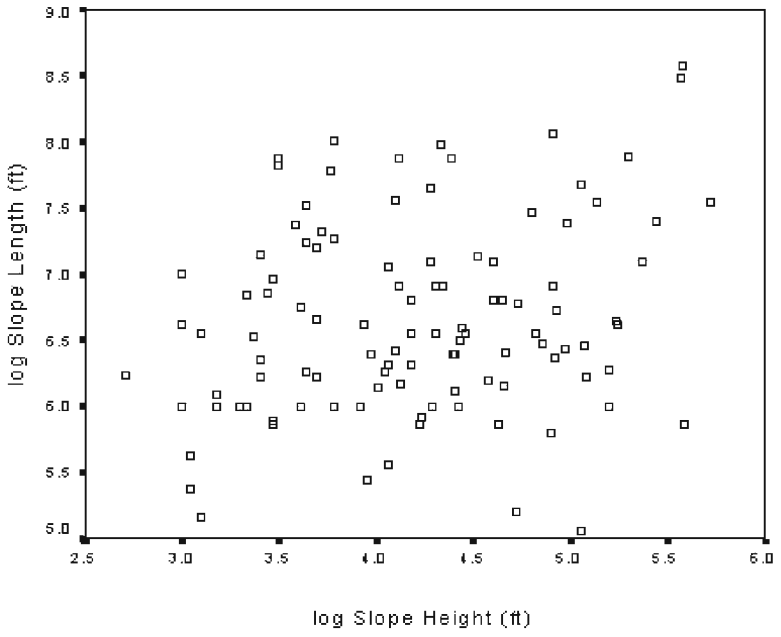


Figure E- 22: Scatter plot for the log of the slope length versus log of the slope height.

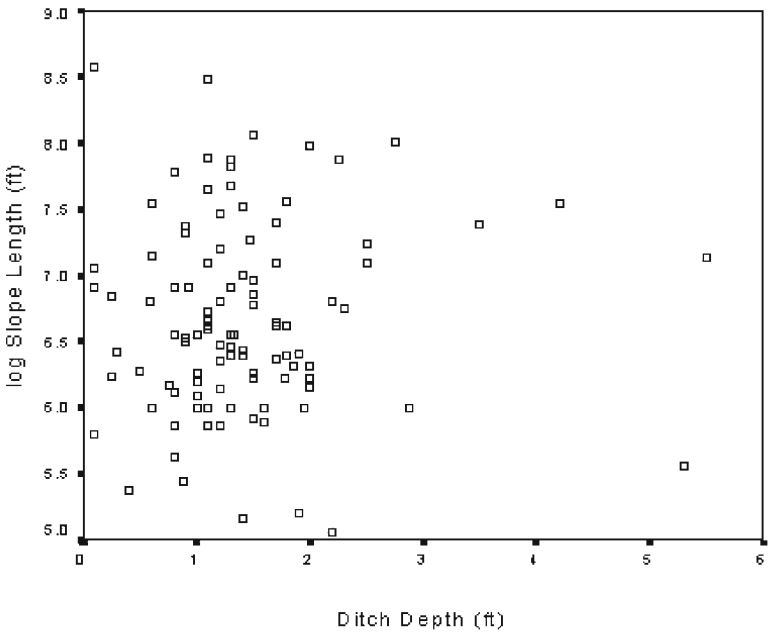


Figure E- 23: Scatter plot for the log of the slope length versus ditch depth.

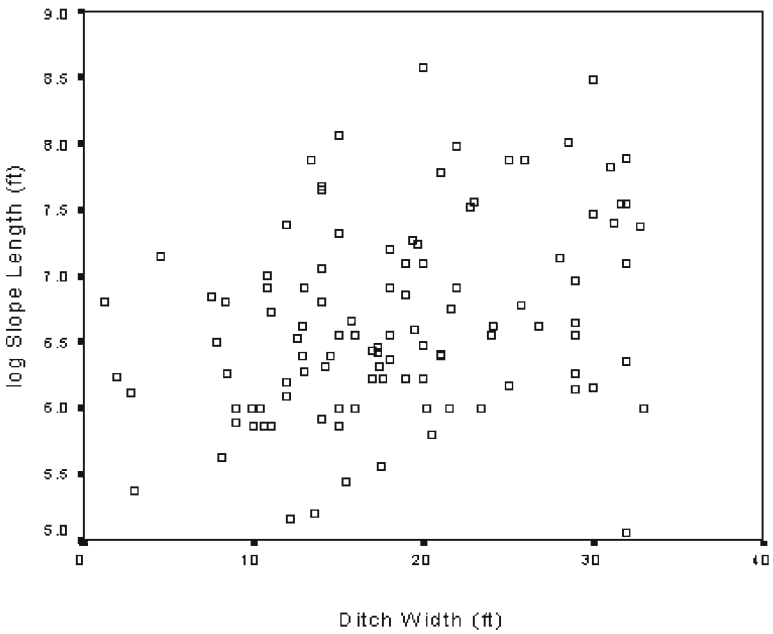


Figure E- 24: Scatter plot for the log of the slope length versus ditch width.

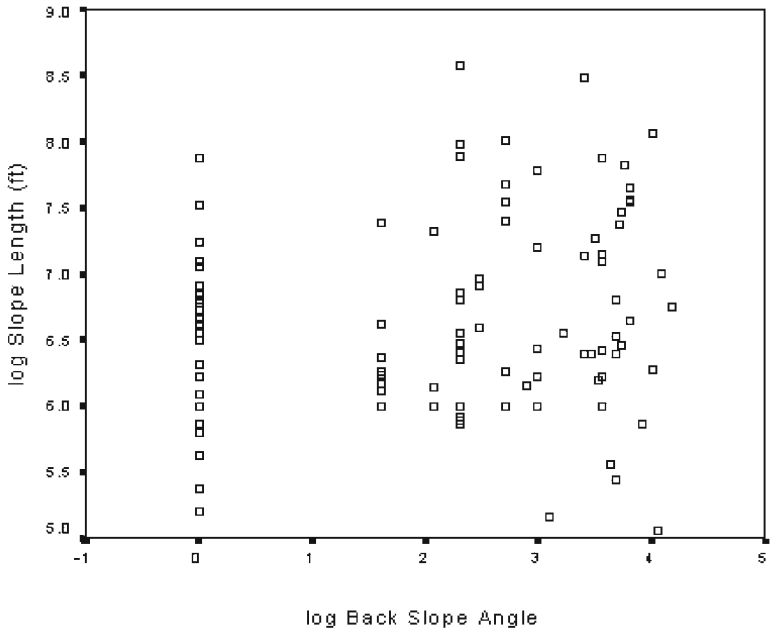


Figure E- 25: Scatter plot for the log of the slope length versus log of the back slope angle.

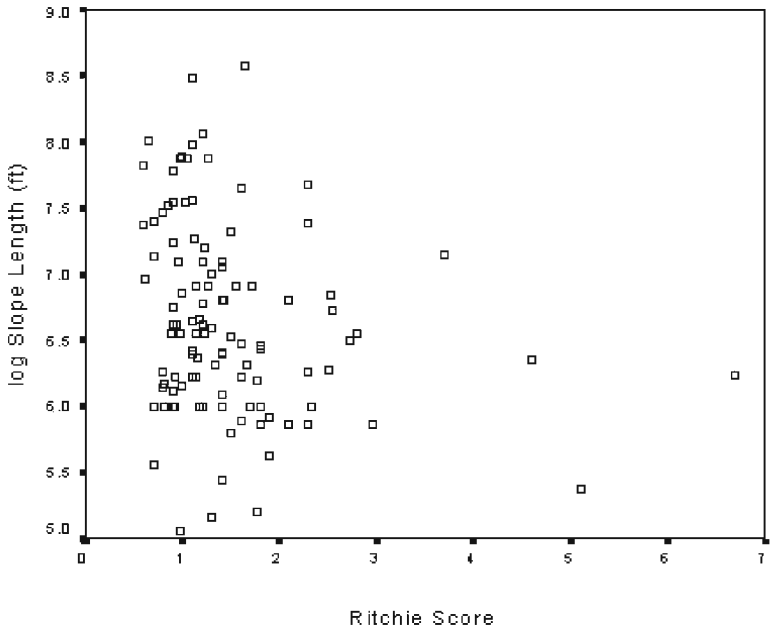


Figure E- 26: Scatter plot for the log of the slope length versus Ritchie score.

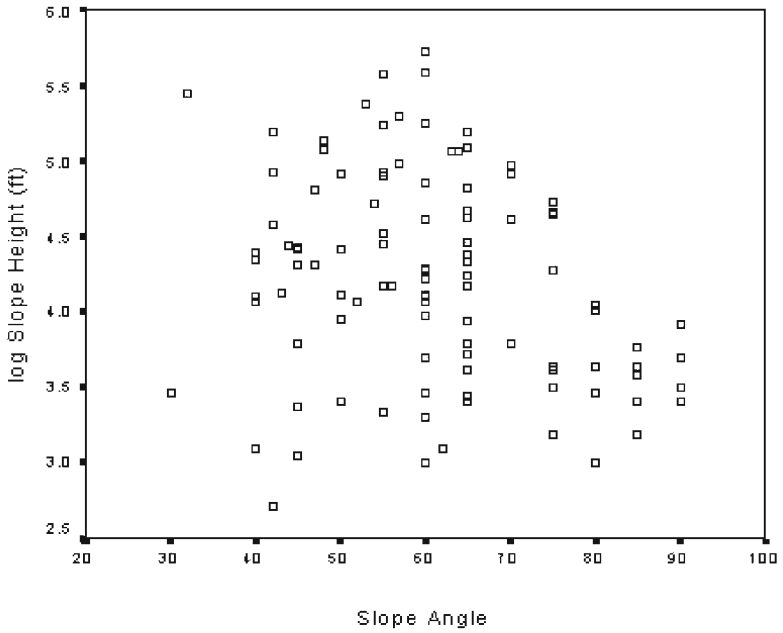


Figure E- 27: Scatter plot for the log of the slope height versus the slope angle.

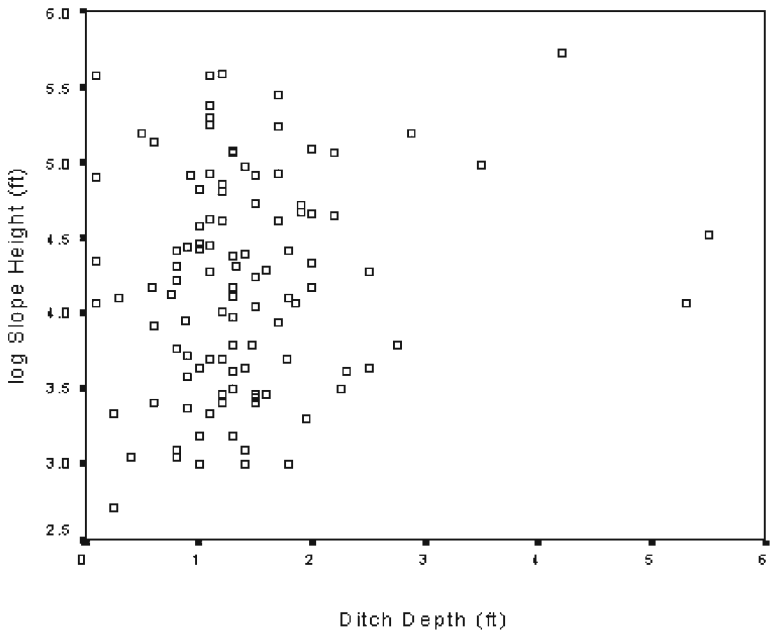


Figure E- 28: Scatter plot for the log of the slope height versus ditch depth.

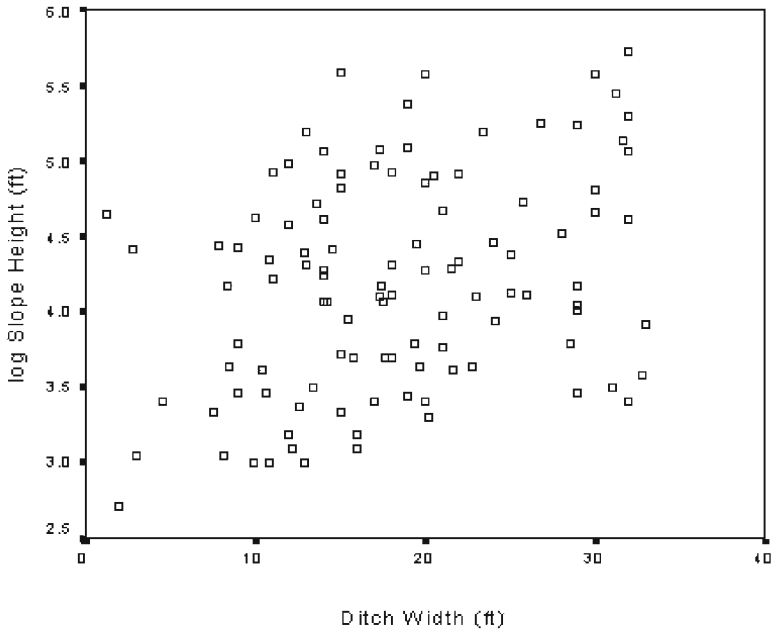


Figure E- 29: Scatter plot for the log of the slope height versus ditch width .

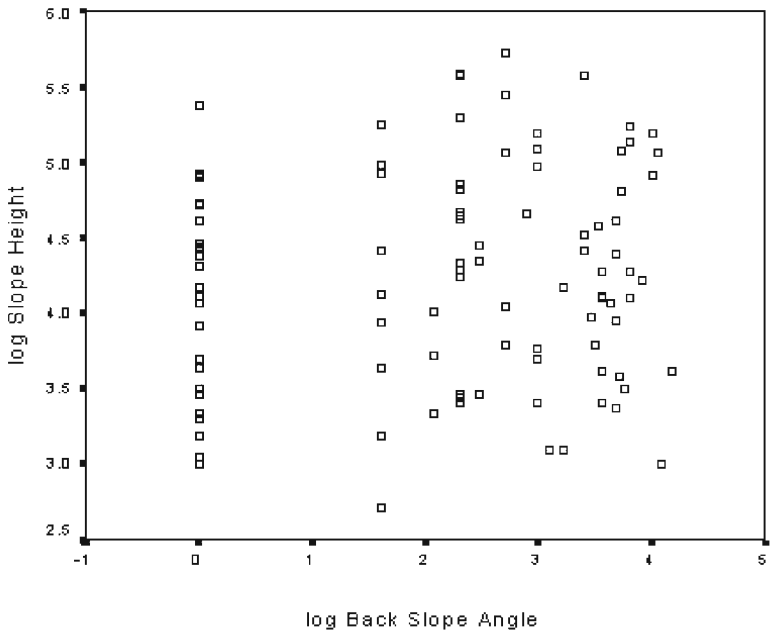


Figure E- 30: Scatter plot for the log of the slope height versus log of the back slope angle.

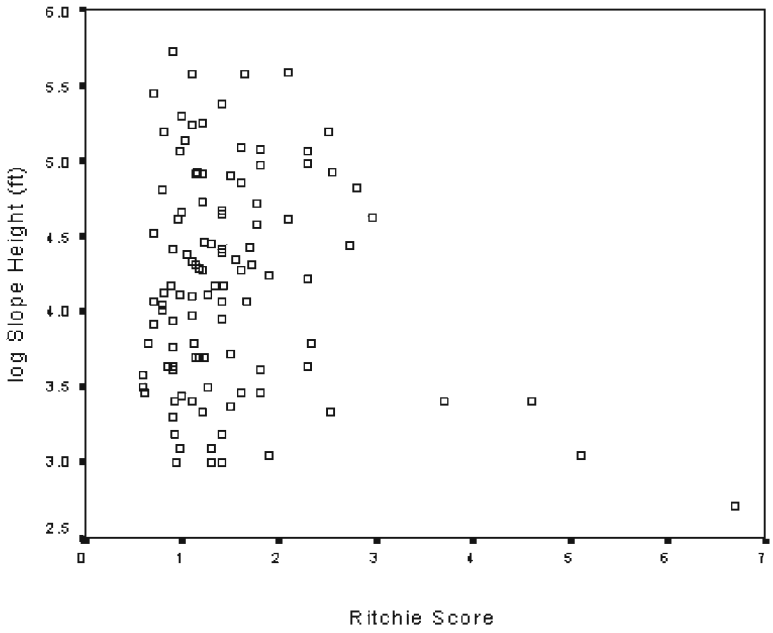


Figure E- 31: Scatter plot for the log of the slope height versus the Ritchie score.

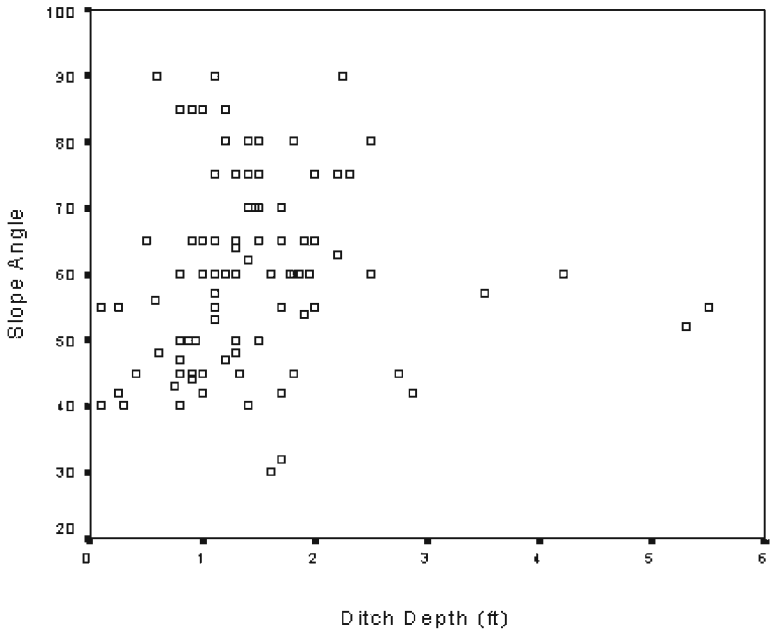


Figure E- 32: Scatter plot for the slope angle versus ditch depth.

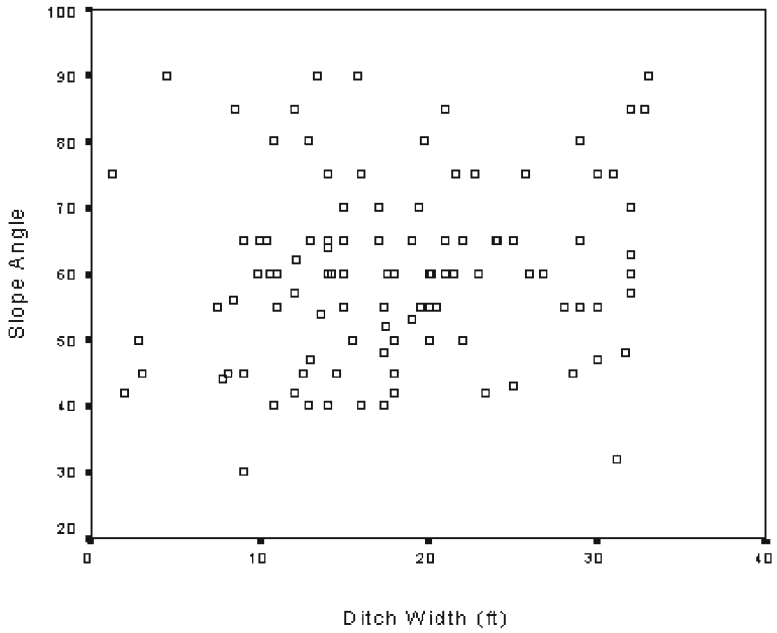


Figure E- 33: Scatter plot for the slope angle versus ditch width.

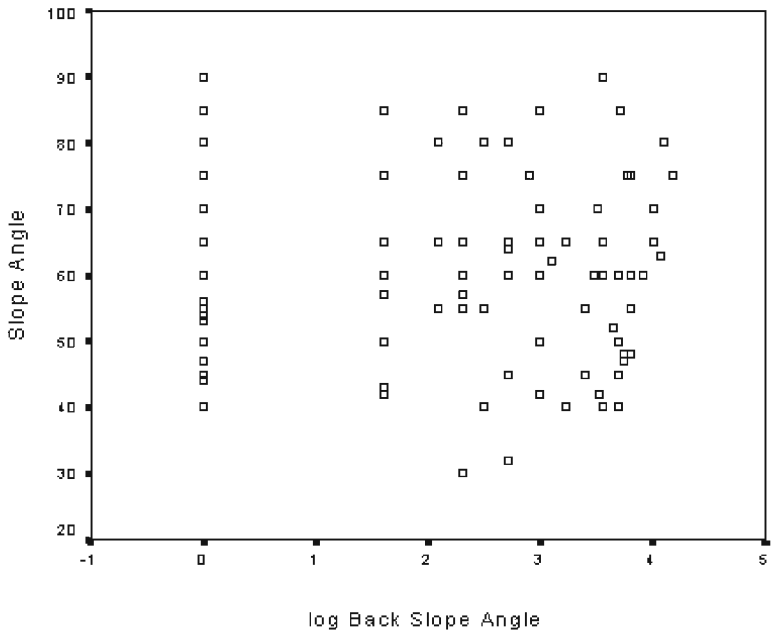


Figure E- 34: Scatter plot for the slope angle versus log of the back slope angle.

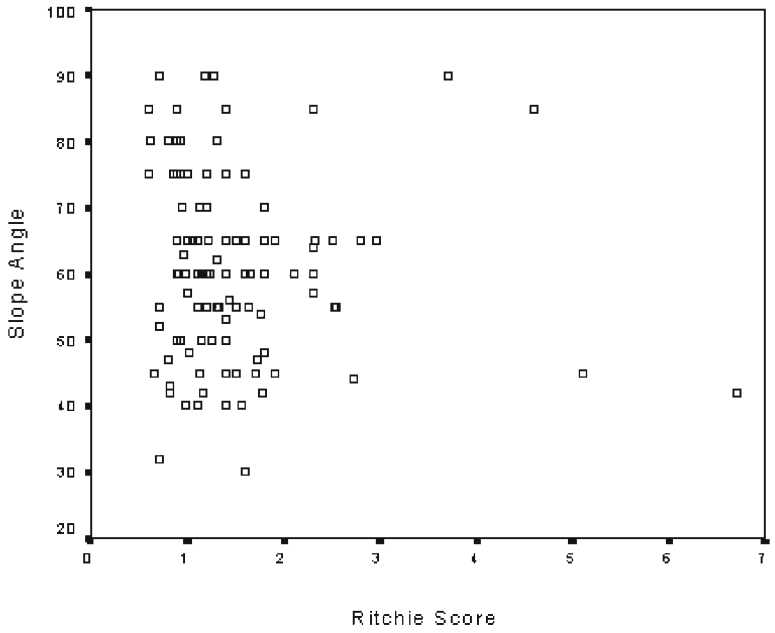


Figure E- 35: Scatter plot for the slope angle versus the Ritchie score.

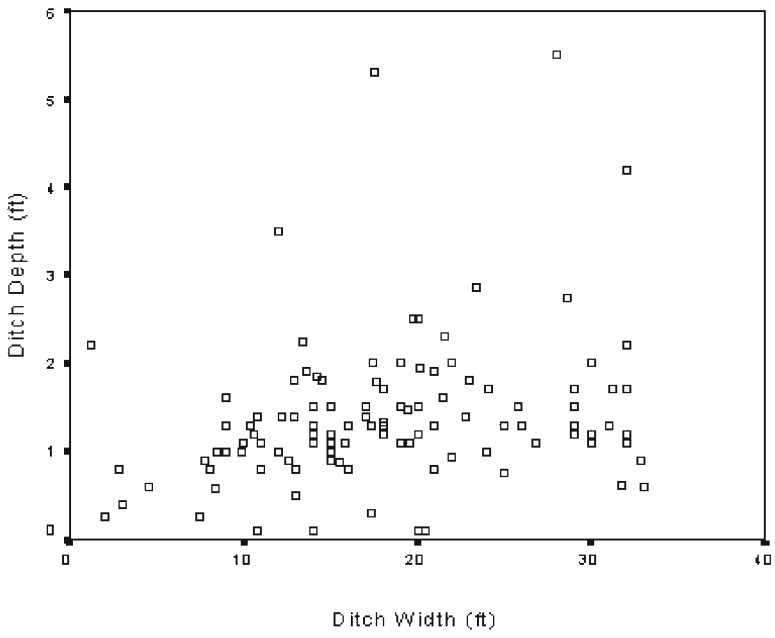


Figure E- 36: Scatter plot for the ditch depth versus the ditch width.

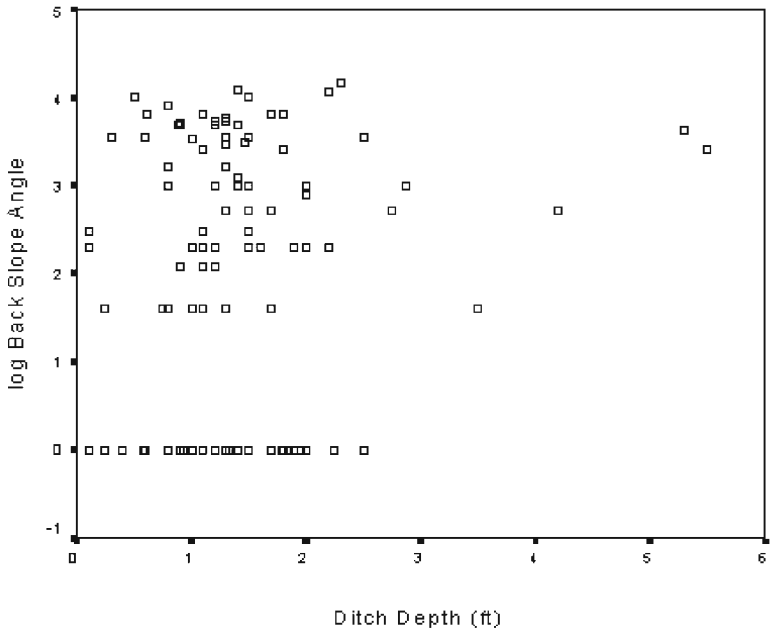


Figure E- 37: Scatter plot for the ditch depth versus the log of the back slope angle.

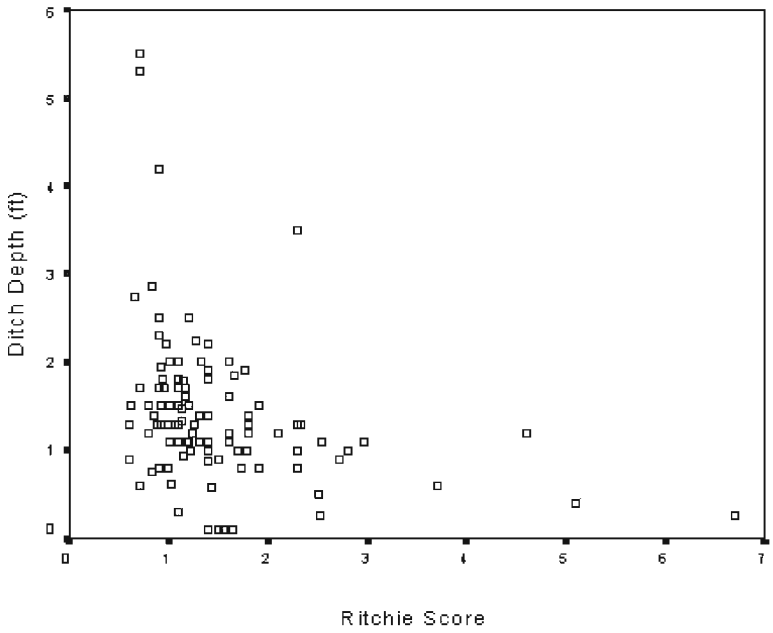


Figure E- 38: Scatter plot for the ditch depth versus the Ritchie score.

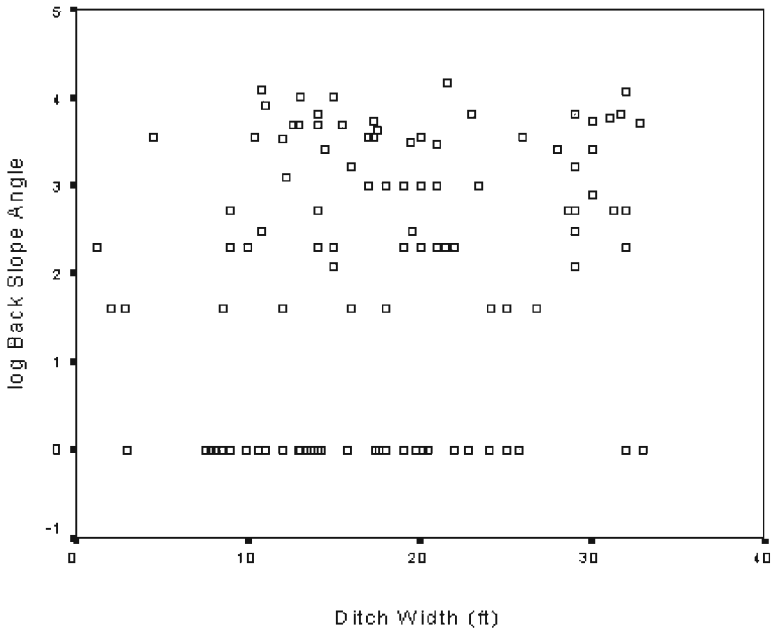


Figure E- 39: Scatter plot for the ditch width versus the log of the back slope angle.

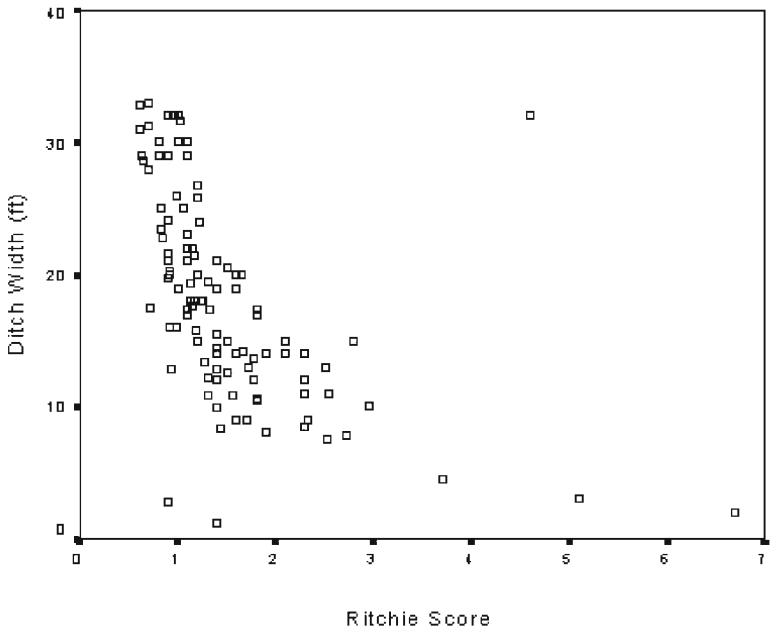


Figure E- 40: Scatter plot for the ditch width versus the Ritchie score.

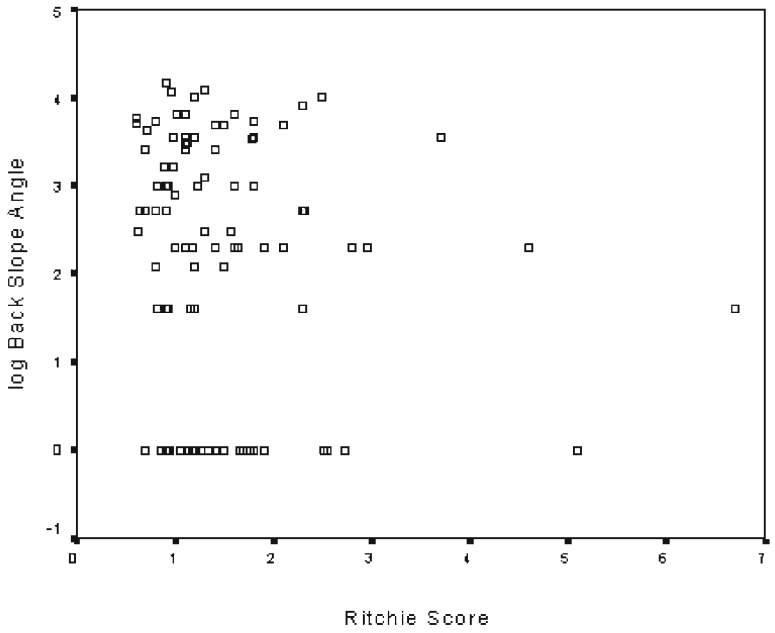


Figure E- 41: Scatter plot for the log of the back slope angle versus the Ritchie score.

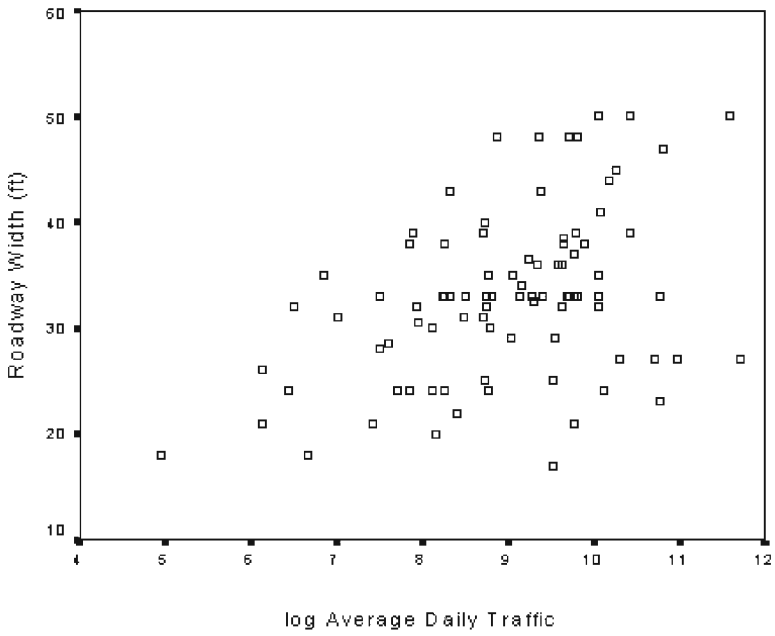


Figure E- 42: Scatter plot for the roadway width versus the log of the average daily traffic.

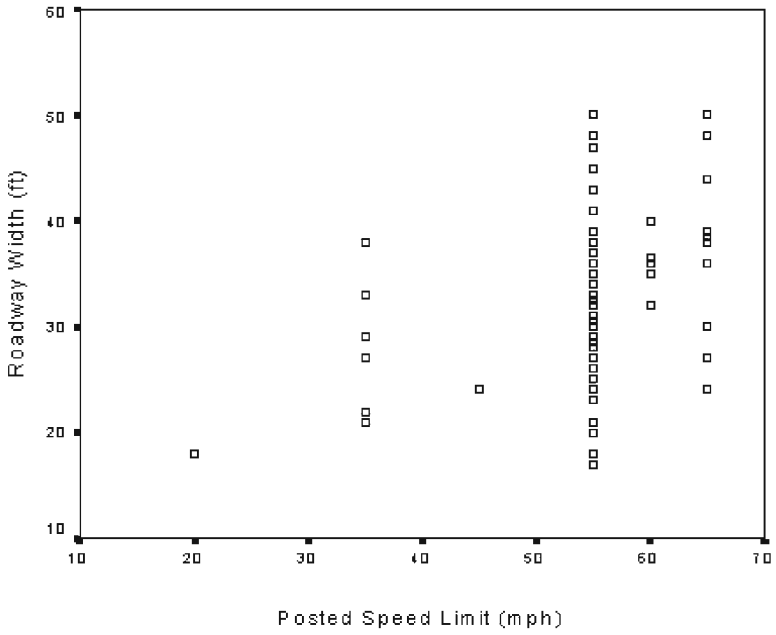


Figure E- 43: Scatter plot for the roadway width versus the posted speed limit.

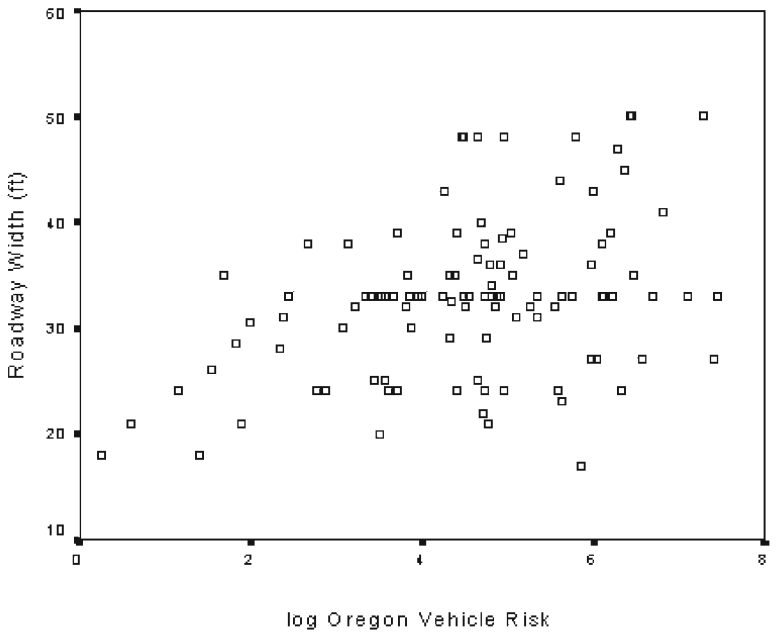


Figure E- 44: Scatter plot for the roadway width versus the log of the Oregon vehicle risk.

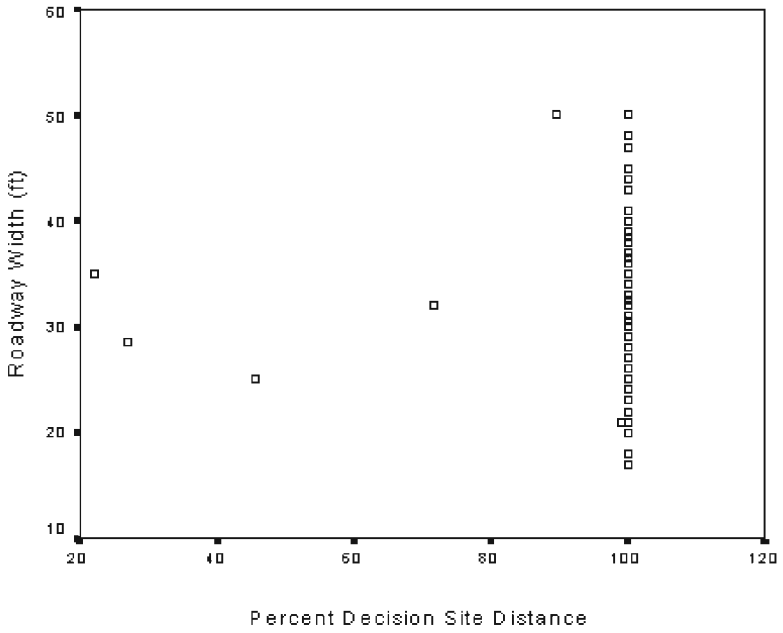


Figure E- 45: Scatter plot for the roadway width versus the percent decision site distance.

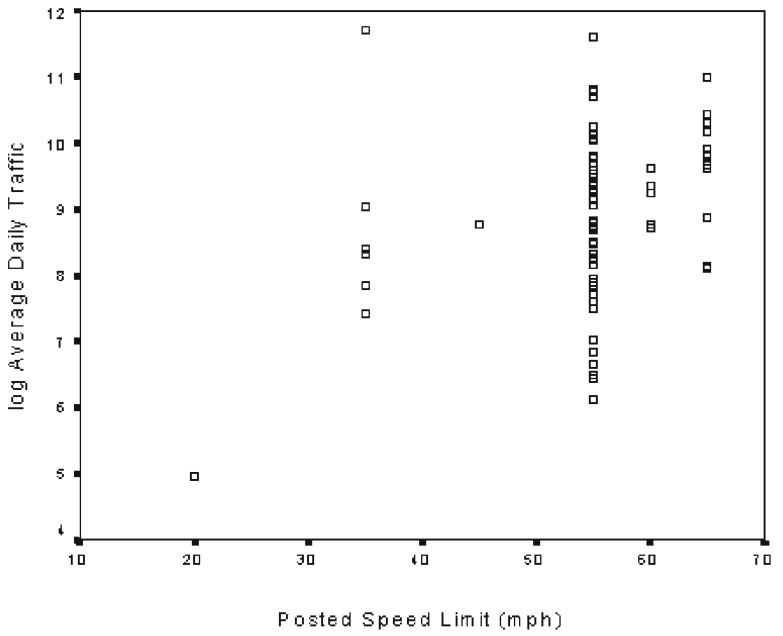


Figure E- 46: Scatter plot for the log of the average daily traffic versus the posted speed limit.

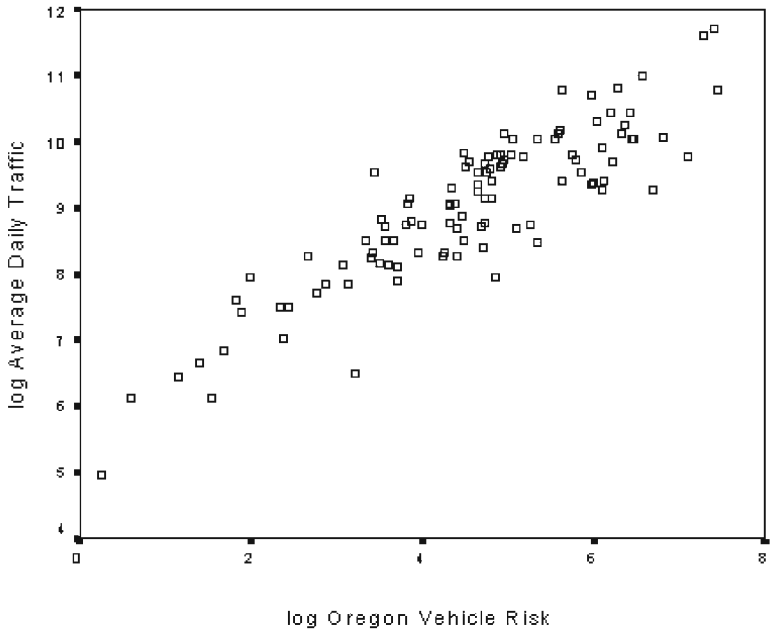


Figure E- 47: Scatter plot for the log of the average daily traffic versus the log of the Oregon vehicle risk.

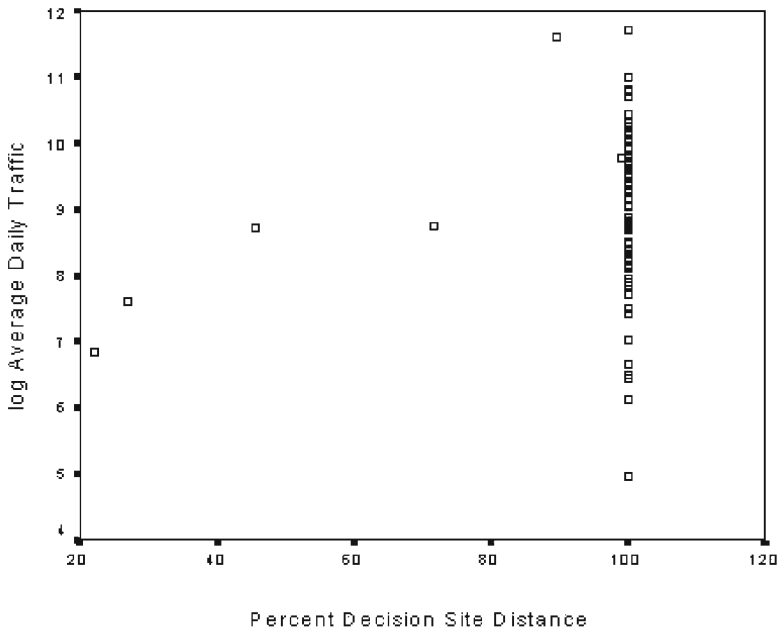


Figure E- 48: Scatter plot for the log of the average daily traffic versus the percent decision site distance.

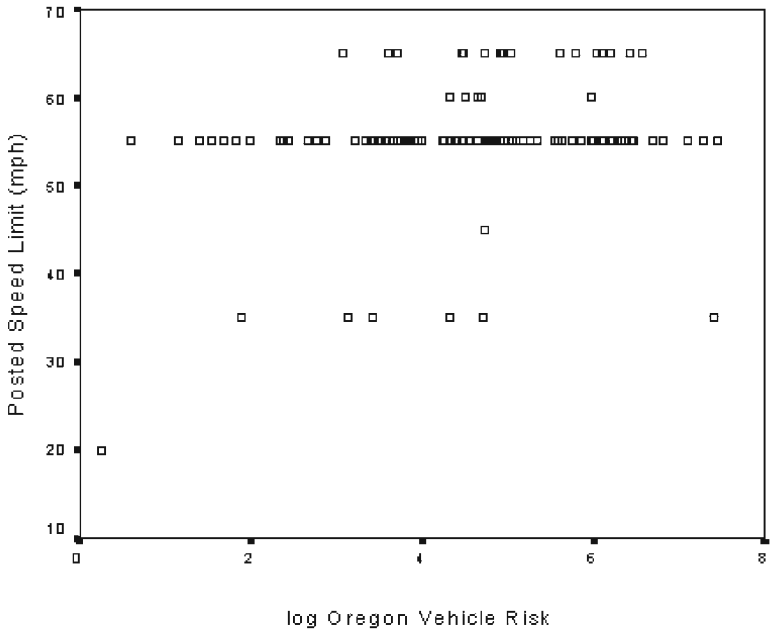


Figure E- 49: Scatter plot for the posted speed limit versus the log of the Oregon vehicle risk.

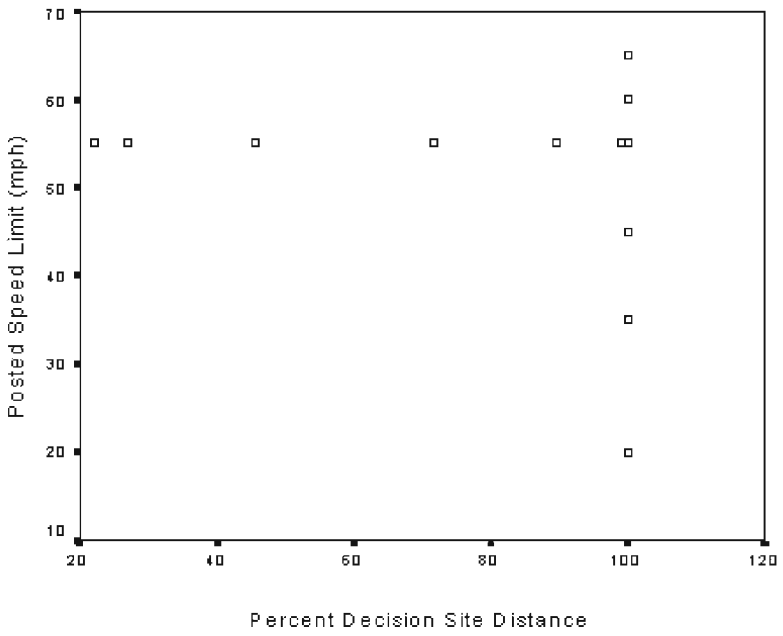


Figure E- 50: Scatter plot for the posted speed limit versus the percent decision site distance.

APPENDIX F

PHOTOGRAPHS OF SITES WITH ASSIGNED ROCK FALL HAZARD POTENTIAL CATEGORIES AND RATING SCORE

Figure F-1: JEF-7-5b, high hazard potential (157)

Figure F-2: COL-170-13.5, high hazard potential (146)

Figure F-3: JEF-7-14.4c, high hazard potential (139)

Figure F-4: MUS-60-6.9, high hazard potential (137)

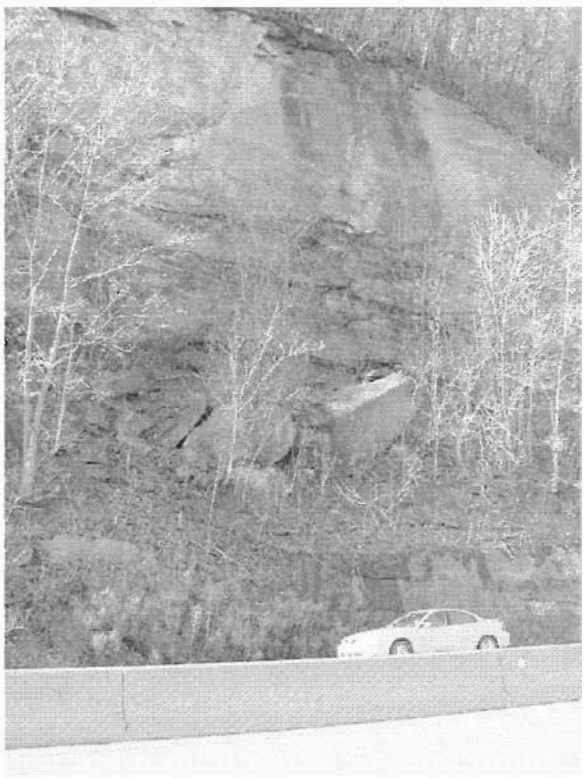


Figure F-5: JEF-7-5a, high hazard potential (136)

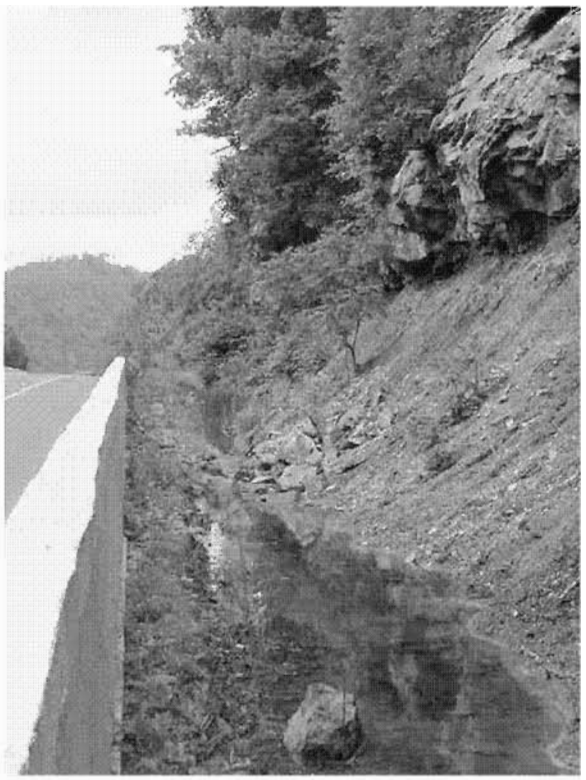


Figure F-6: JEF-7-34.5b, high hazard potential (134)

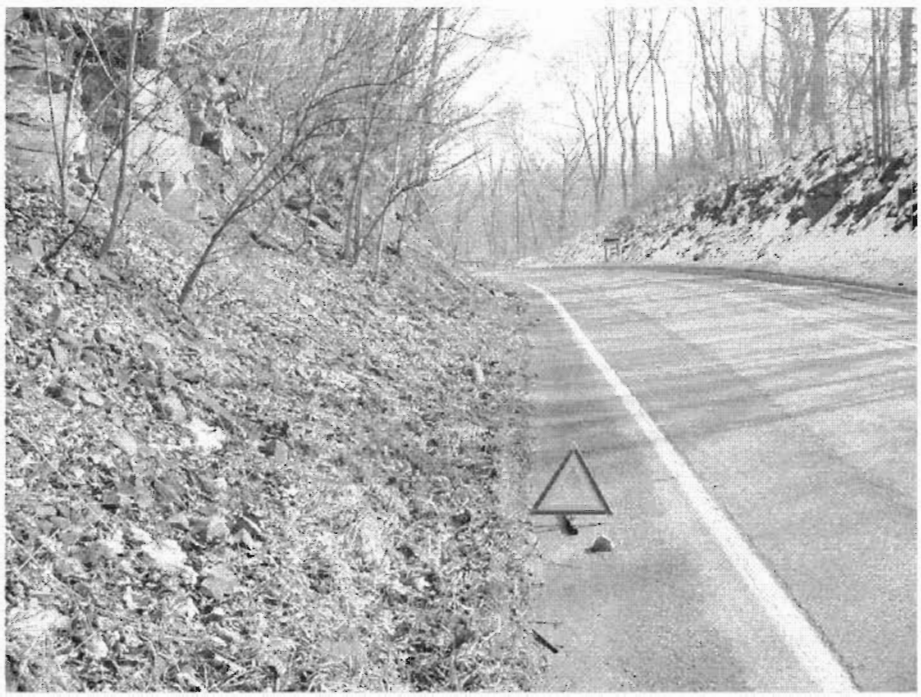


Figure F-7: WAY-3-2.4, high hazard potential (132)

Figure F-8: JEF-7-10.6, high hazard potential (132)

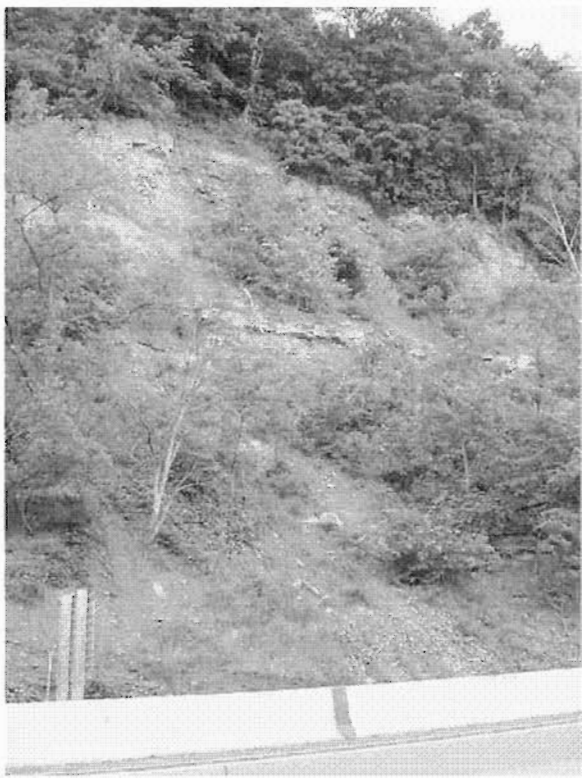


Figure F-9: JEF-34.5a, high hazard potential (129)

Figure F-10: JEF-7-33.3a, high hazard potential (126)

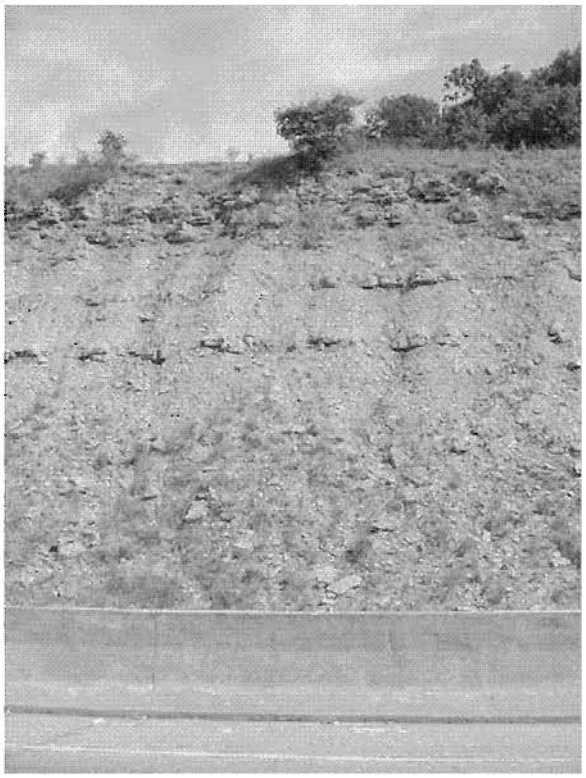


Figure F-11: HAM-74-18.1, high hazard potential (119)

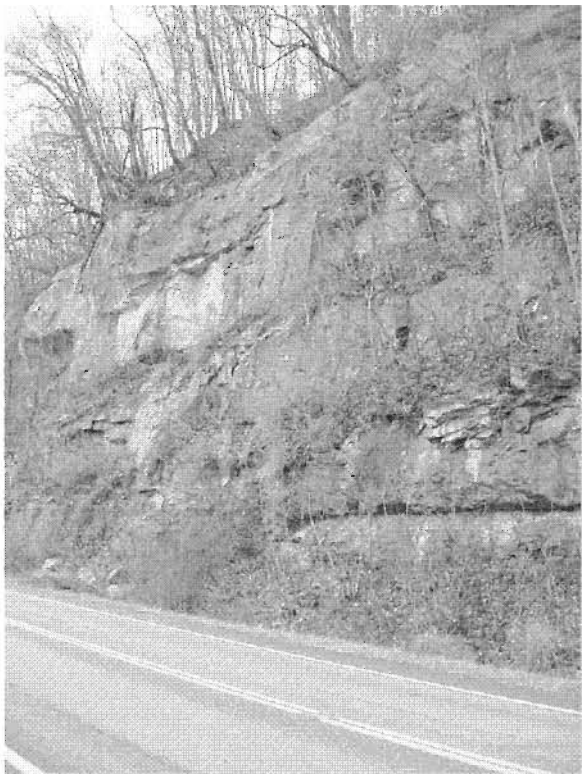


Figure F-12: WAS-7-39.5, high hazard potential (119)

Photograph not available

Figure F-13: BEL-7-23.1, high hazard potential (119)

Figure F-14: BEL-70-220.5, high hazard potential (118)

Figure F-15: JEF-7-28a, high hazard potential (117)

Figure F-16: STA-800-1, high hazard potential (115)

Figure F-17: SUM-76-23.5, high hazard Potential (111)

Figure F-18: JEF-7-33.3c, high hazard potential (111)

Figure F-19: BEL-70-223, high hazard potential (110)

Figure F-20: TUS-36-0, high hazard potential (109)

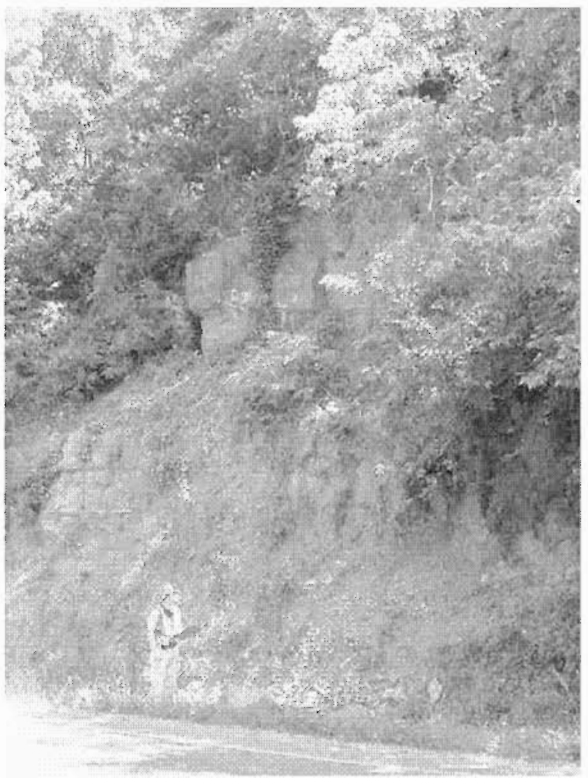


Figure F-21: GAL-160-0.55, high hazard potential (108)

Figure F-22: JEF-7-22.6, high hazard potential (106)

Figure F-23: ASD-97-4.1, high hazard potential (104)

Figure F-24: COL-7-3.3, high hazard potential (103)

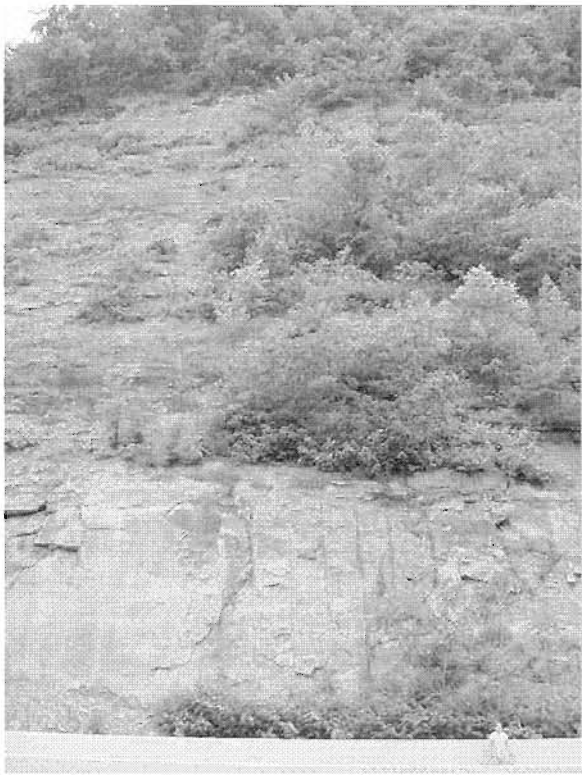


Figure F-25: JEF-7-28b, high hazard potential (101)

Figure F-26: TUS-77-60.9, high hazard potential (100)

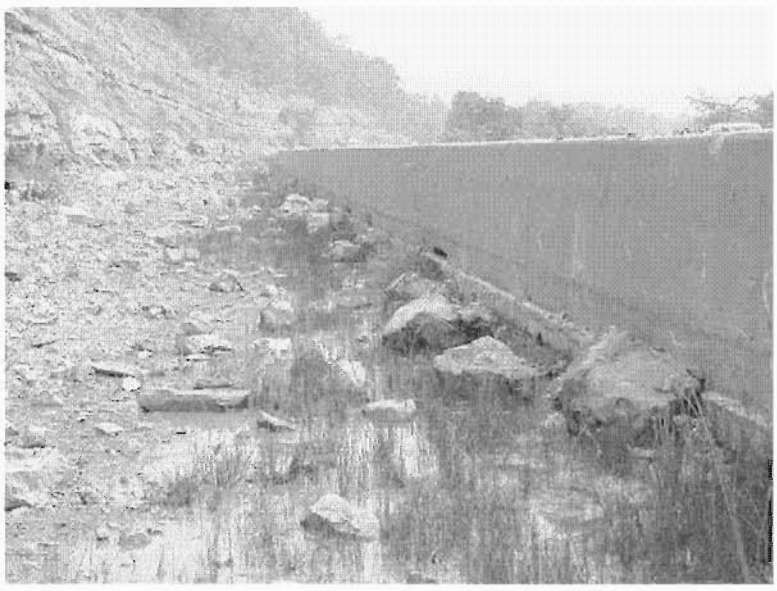


Figure F-27: BEL-7-11, moderate hazard potential (98)

Figure F-28: WAY-21-2.36, moderate hazard potential (98)

Figure F-29: HAM-74-17.6, moderate hazard potential (97)

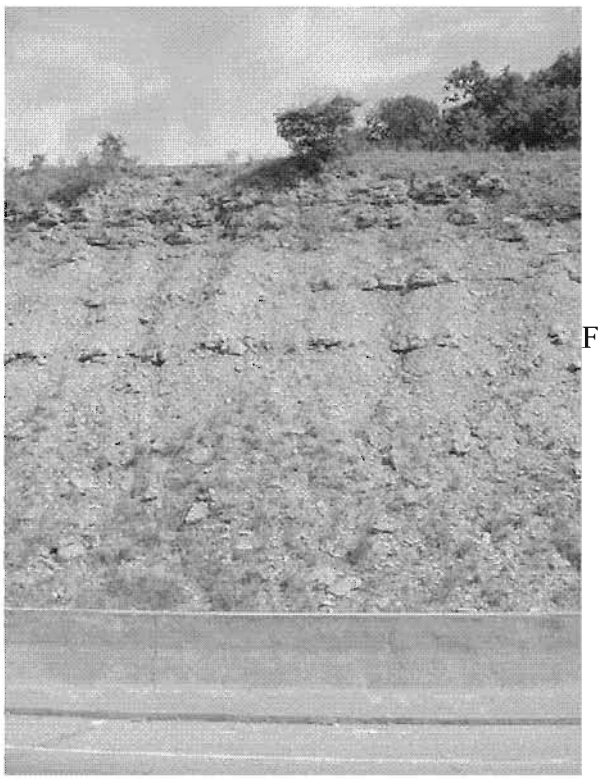


Figure F-30: HAM-74-9.4, moderate hazard potential (97)

Figure F-31: TUS-250-23, moderate hazard potential (97)

Figure F-32: HAM-71-10, moderate hazard potential (96)

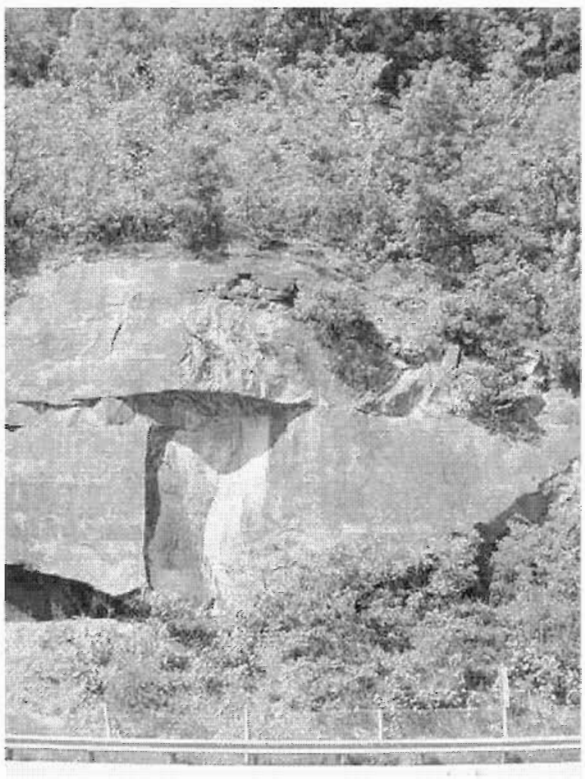


Figure F-33: JEF-7-14.4b, moderate hazard potential (95)

Figure F-34: COL-7-0.5, moderate hazard potential (94)

Figure F-35: BEL-70-222.5, moderate hazard potential (94)

Figure F-36: JEF-7-33.3b, moderate hazard potential (93)

Figure F-37: NOB-339-7.6, moderate hazard potential (92)

Photograph not available

Figure F-38: COL-45-20.15, moderate hazard potential (92)

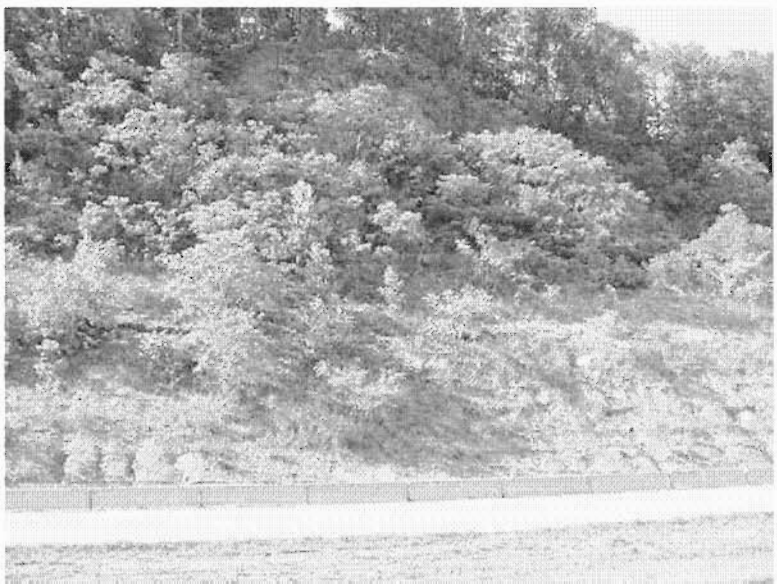


Figure F-39: LAW-7-2, moderate hazard potential (91)

Figure F-40: JEF-7-20.1, moderate hazard potential (91)

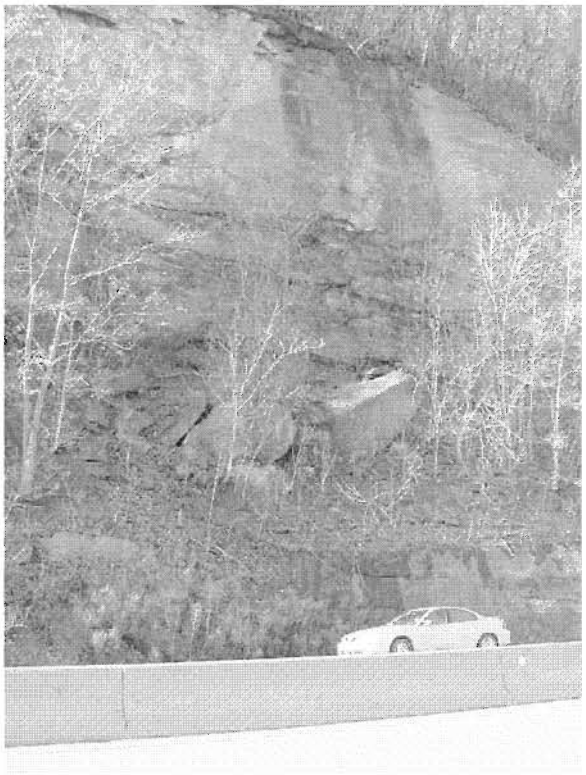


Figure F-41: JEF-7-6, moderate hazard potential (90)

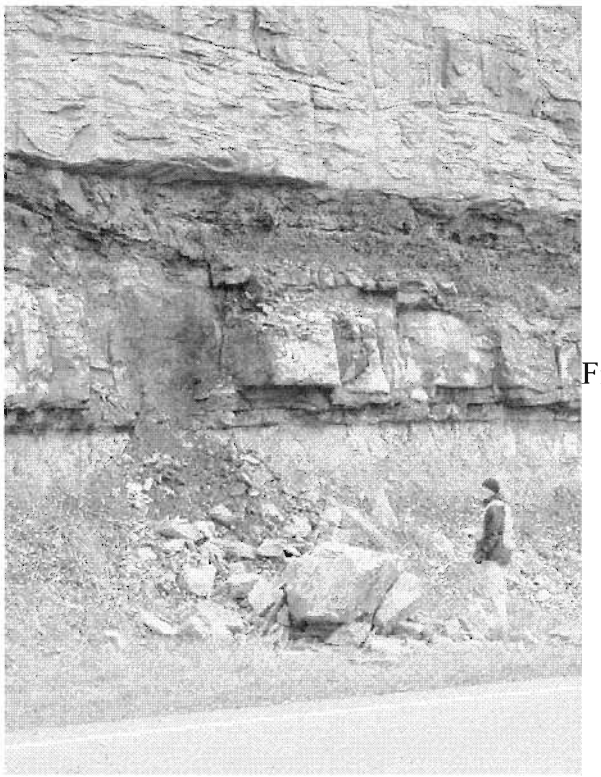


Figure F-42: BEL-149-1.8, moderate hazard potential (90)

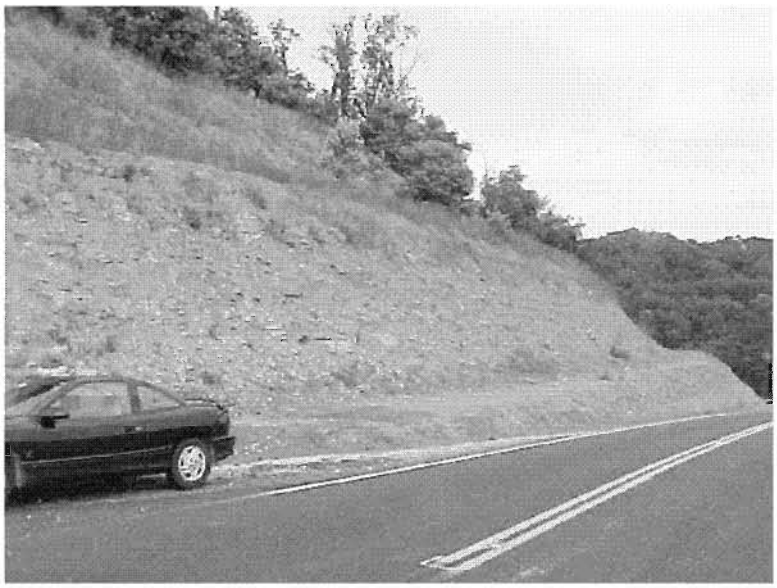


Figure F-43: COS-715-6.5, moderate hazard potential (90)

Figure F-44: ATH-13-9.2, moderate hazard potential (87)

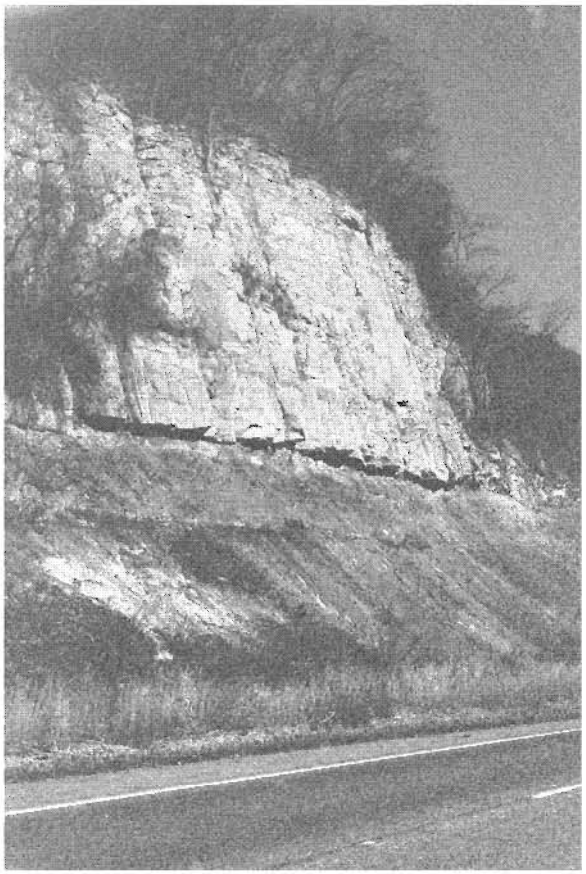


Figure F-45: COL-7-3, moderate hazard potential (87)

Figure F-46: SCI-52-25.5C, moderate hazard potential (85)

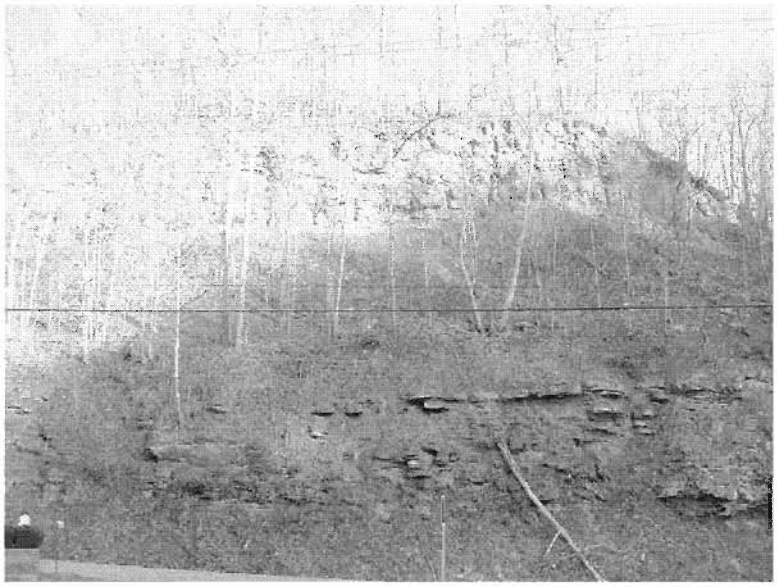


Figure F-47: MOE-78-24.5, moderate hazard potential (85)

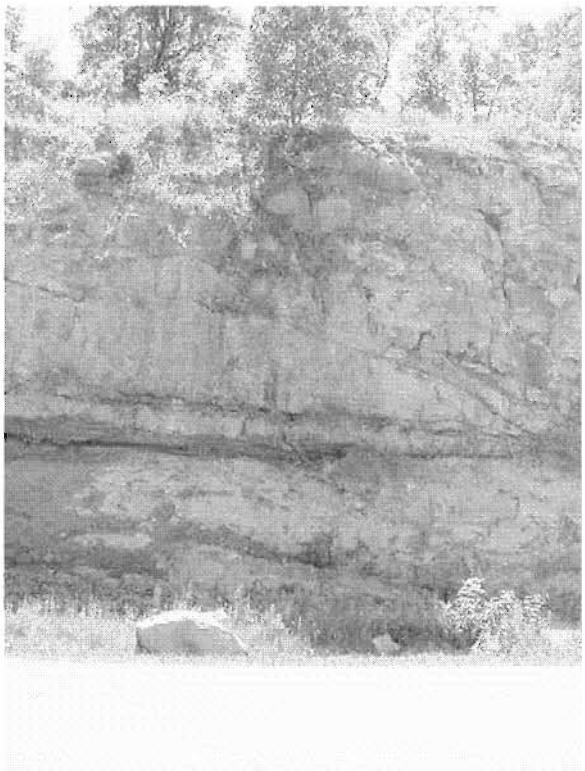


Figure F-48: ATH-33-15A, moderate hazard potential (84)

Figure F-49: LOG-292-2.6, moderate hazard potential (84)

Figure F-50: MOE-800-4.5, moderate hazard potential (82)

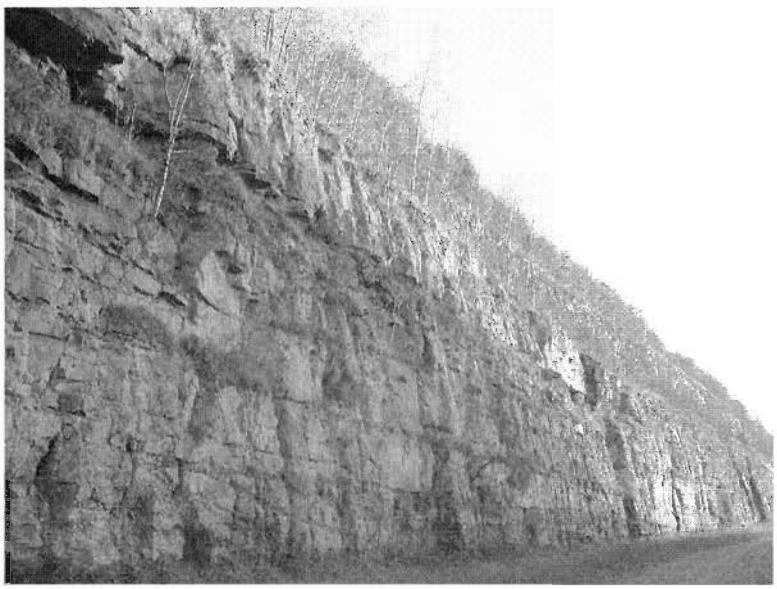


Figure F-51: TUS-77-63, moderate hazard potential (82)

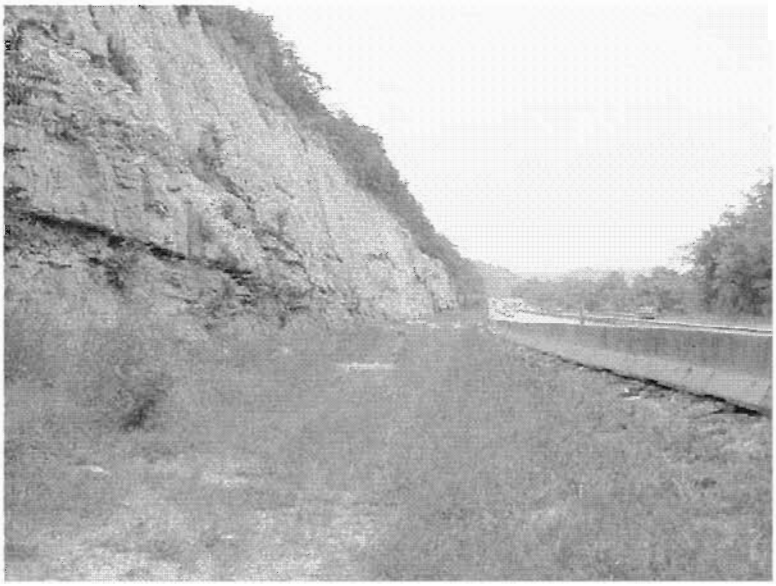


Figure F-52: LAW-52-12, moderate hazard potential (80)

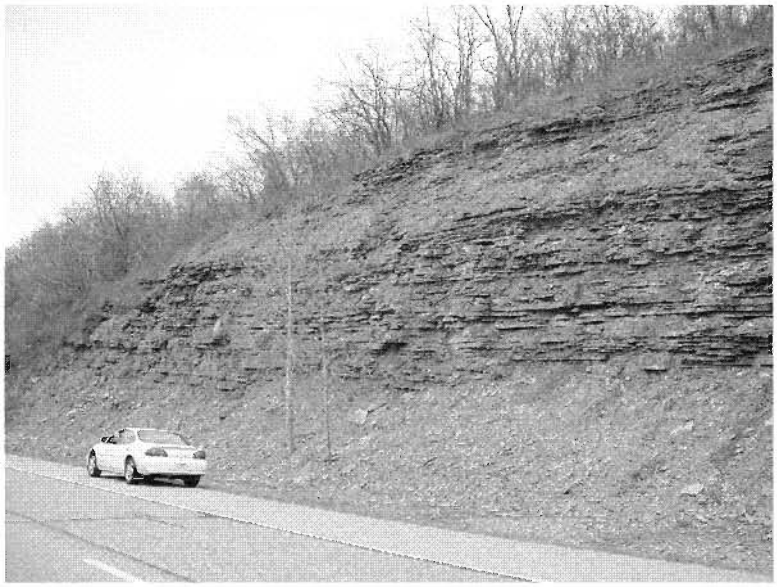


Figure F-53: BRO-62-9.0, moderate hazard potential (80)

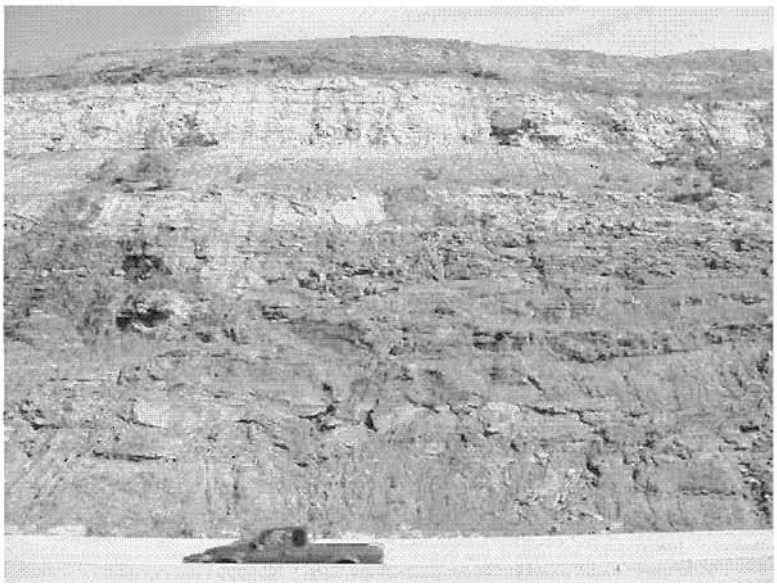


Figure F-54: COL-7-5, moderate hazard potential (80)

Figure F-55: ADA-41-16.1, moderate hazard potential (78)

Figure F-56: JEF-7-14.4A, moderate hazard potential (77)

Photograph not available

Figure F-57: ASD-3-1.1, moderate hazard potential (77)

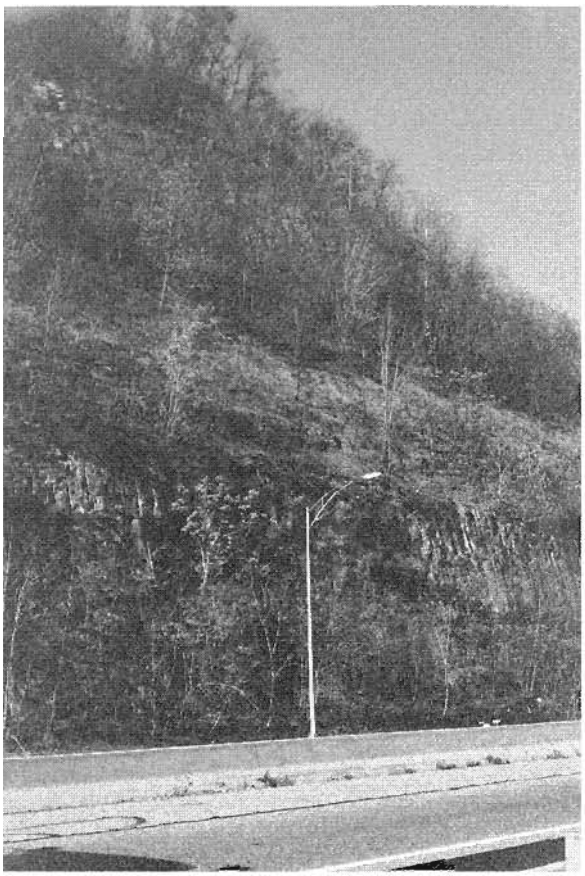


Figure F-58: COL-7-2.8, moderate hazard potential (76)

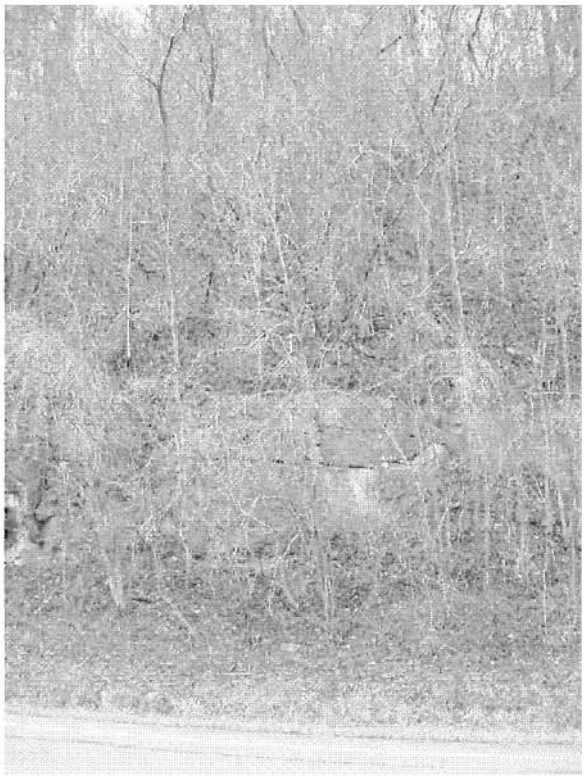


Figure F-59: MOE-7-1.5, moderate hazard potential (76)

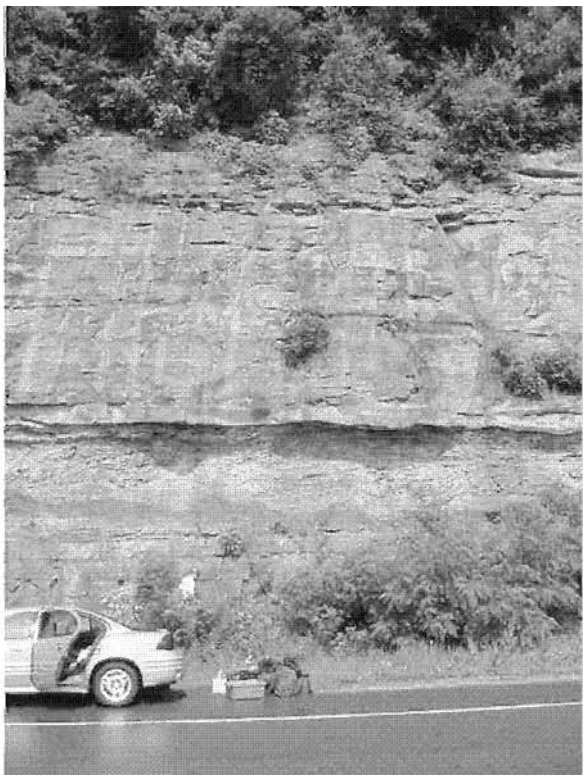


Figure F-60: JEF-7-0, moderate hazard potential (75)

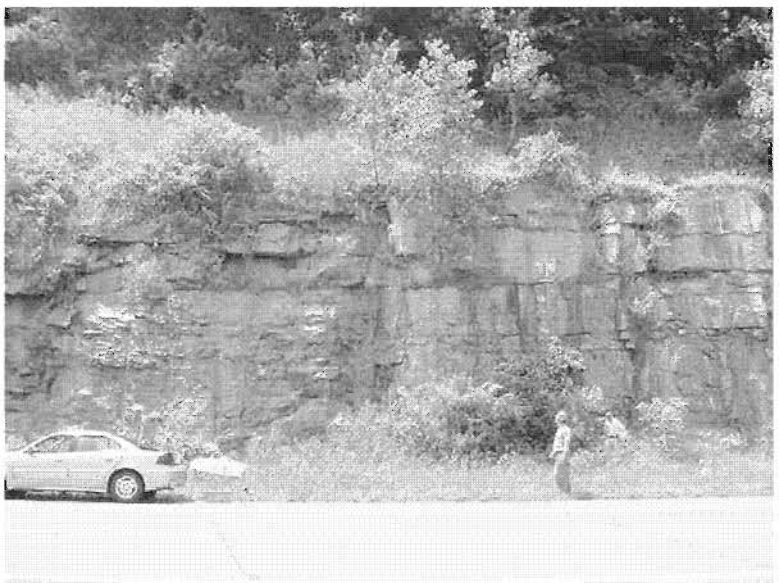


Figure F-61: BEL-7-18.6, moderate hazard potential (73)

Photograph not available

Figure F-62: BEL-149-4.5, moderate hazard potential (73)

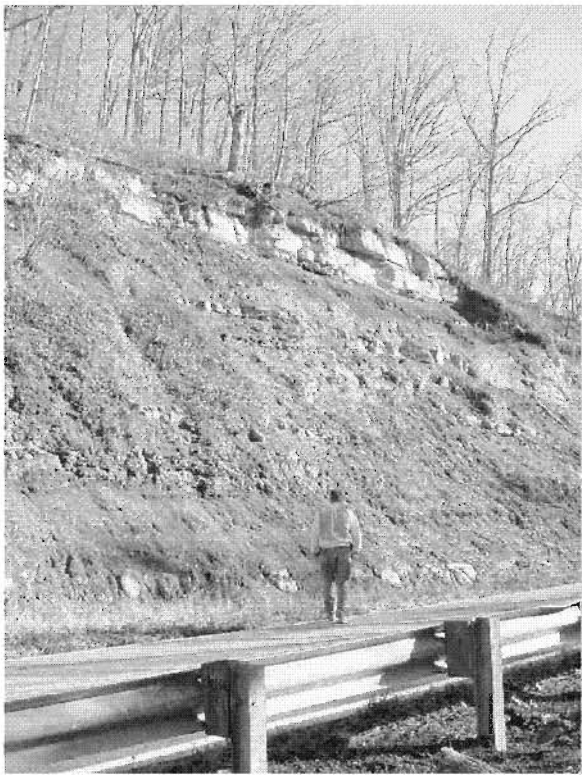


Figure F-64: MOE-537-1.7, moderate hazard potential (73)

Figure F-64: JEF-7-22.1, moderate hazard potential (72)

Figure F-65: SCI-52-25.5B, moderate hazard potential (72)

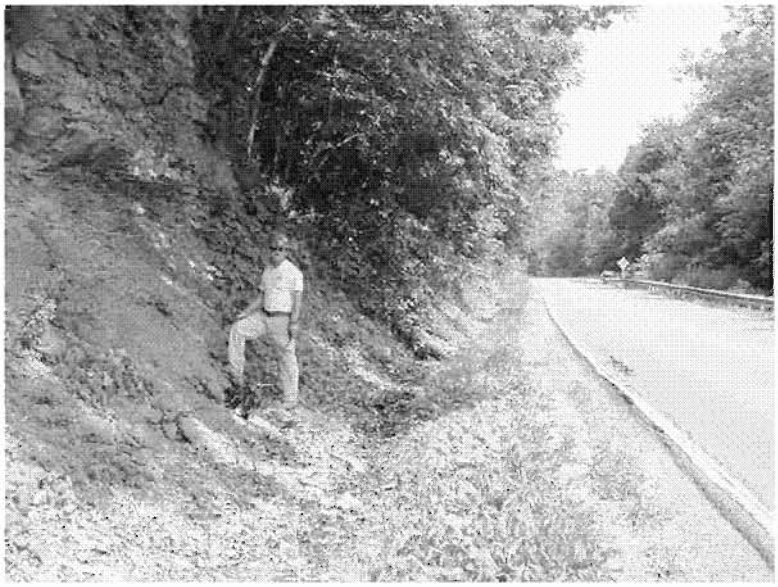


Figure F-66: ATH-13-13.7, moderate hazard potential (71)

Figure F-67: LIC-70-135, moderate hazard potential (71)

Figure F-68 SUM-76-17, moderate hazard potential (70)

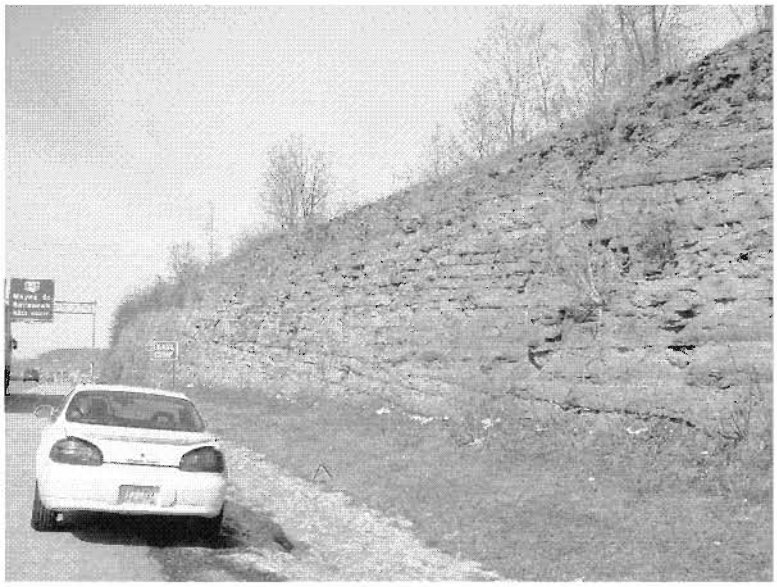


Figure F-69: RIC-30-12.5, moderate hazard potential (69)

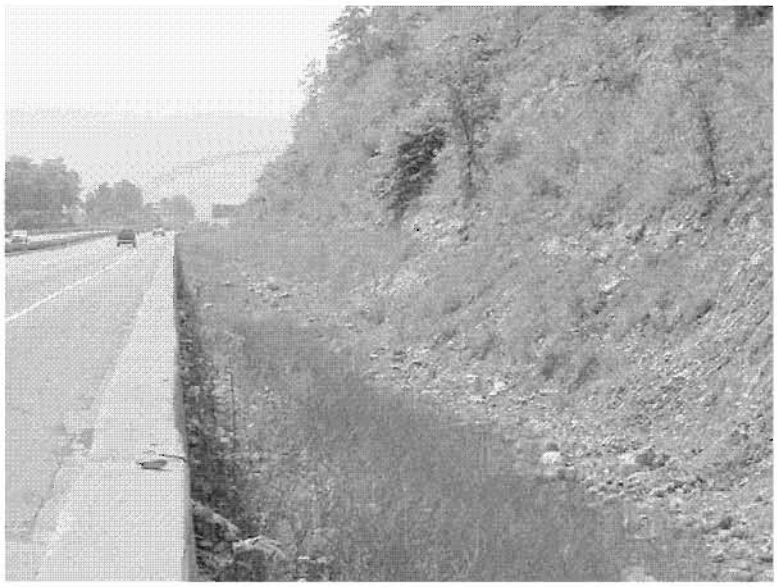


Figure F-70: BEL-7-9, moderate hazard potential (66)

Figure F-71: JEF-7-1.5, moderate hazard potential (64)

Figure F-72: SCI-52-25.5A, moderate hazard potential (64)

Figure F-73: BEL-7-14, moderate hazard potential (64)

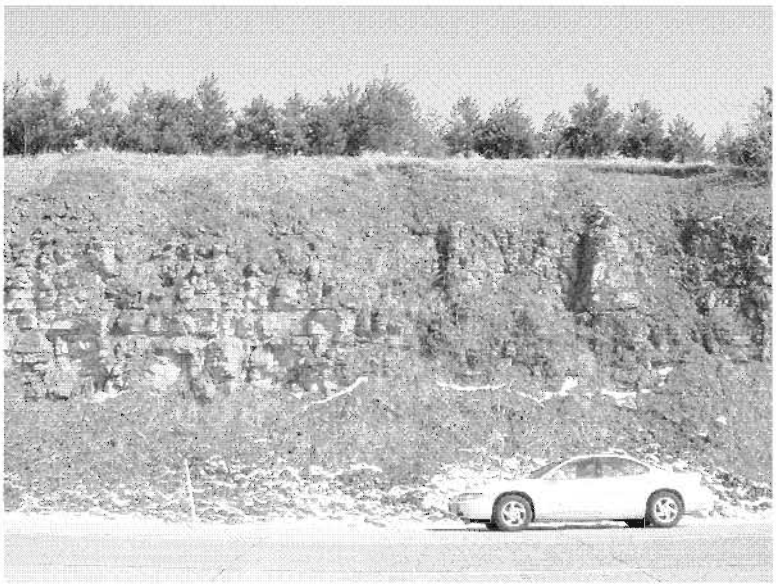


Figure F-74: ASD-30-2.25, moderate hazard potential (64)

Figure F-75: ASD-3-1.8, moderate hazard potential (63)

Figure F-76: BRO-52-23, moderate hazard potential (63)

Figure F-77: PER-155-1.83, moderate hazard potential (61)

Figure F-78: JEF-22-8, moderate hazard potential (60)

Figure F-79: COS-36-28, moderate hazard potential (60)

Figure F-80: BEL-7-26.8, moderate hazard potential (59)

Figure F-81: ATH-78-2.25, moderate hazard potential (58)

Figure F-82: ATH-124-2, moderate hazard potential (58)

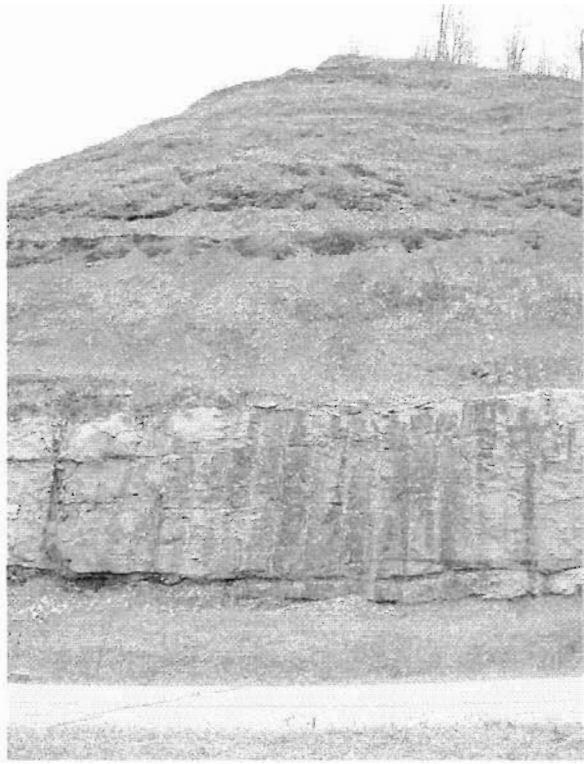


Figure F-83: JEF-22-13.9, moderate hazard potential (58)

Figure F-84: PER-13-5.1, moderate hazard potential (57)

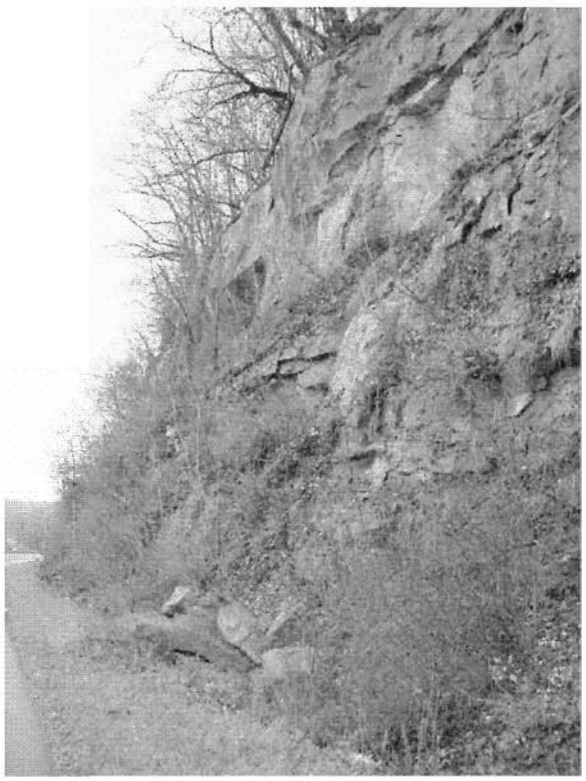


Figure F-85: WAS-7-33.2, moderate hazard potential (56)

Figure F-86: BEL-7-5.9, moderate hazard potential (56)

Figure F-87: JEF-7-14.6, moderate hazard potential (54)

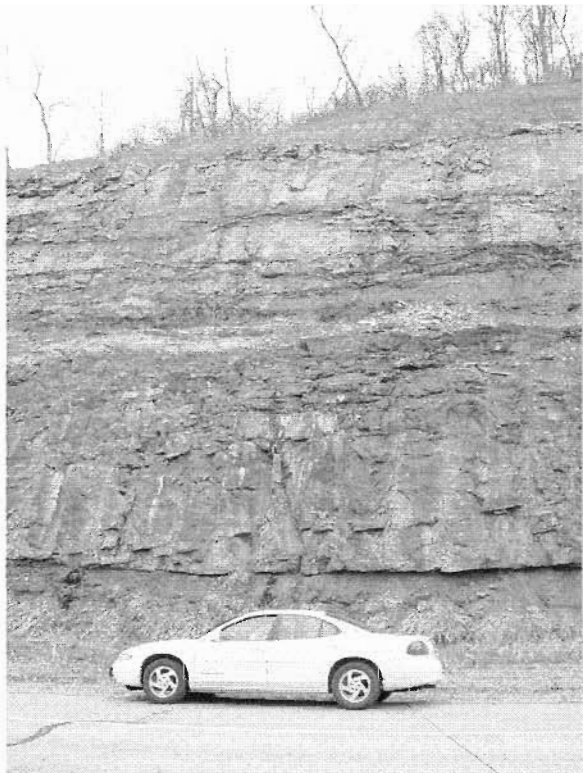


Figure F-88: JEF-22-13.2, moderate hazard potential (53)

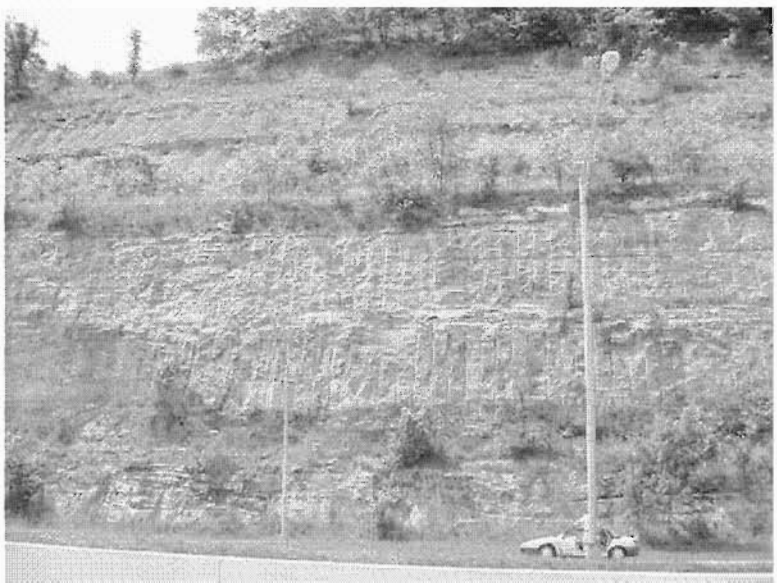


Figure F-89: JEF-7-0.5, moderate hazard potential (53)

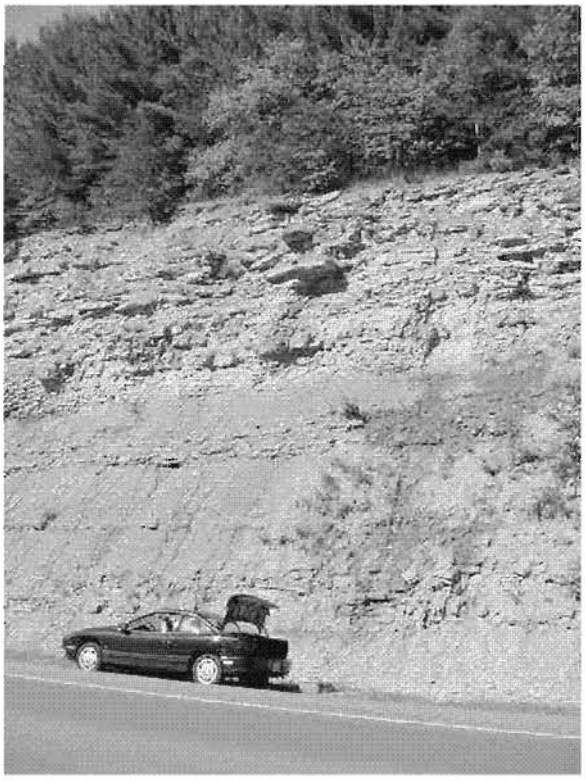


Figure F-90: HOC-33-5, moderate hazard potential (53)

Figure F-91: MED-271-5.2, low hazard potential (50)

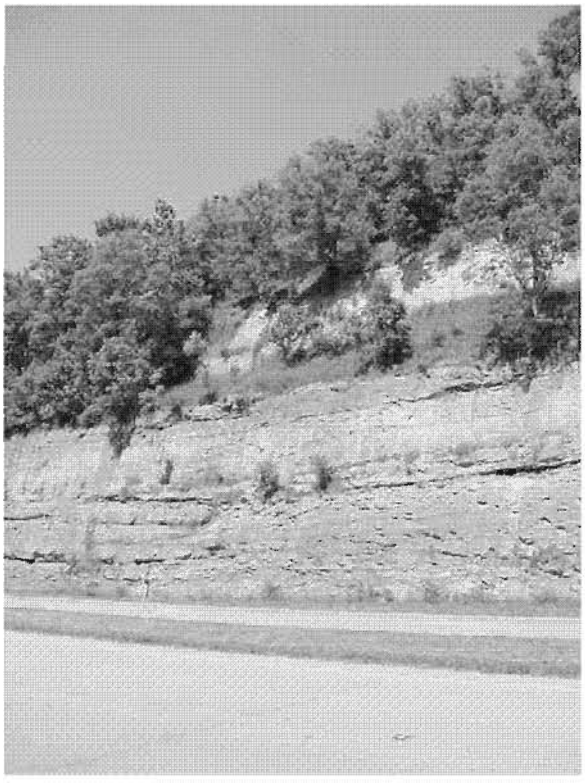


Figure F-92: ATH-33-15B, low hazard potential (50)

Figure F-93: RIC-71-174, low hazard potential (48)

Figure F-94: MRG-60-10, low hazard potential (45)

Figure F-95: MOE-7-28, low hazard potential (43)

Figure F-96: CLA-68-7, low hazard potential (42)

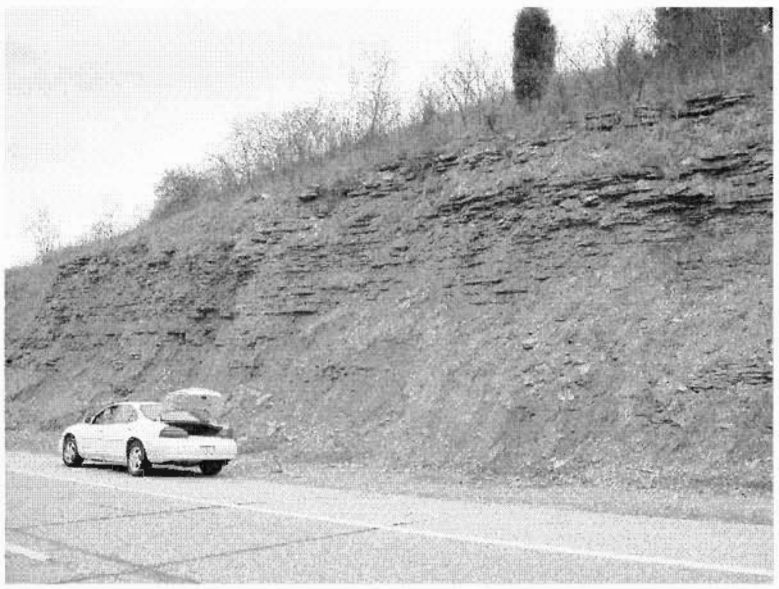


Figure F-97: BRO-62-9.1, low hazard potential (41)

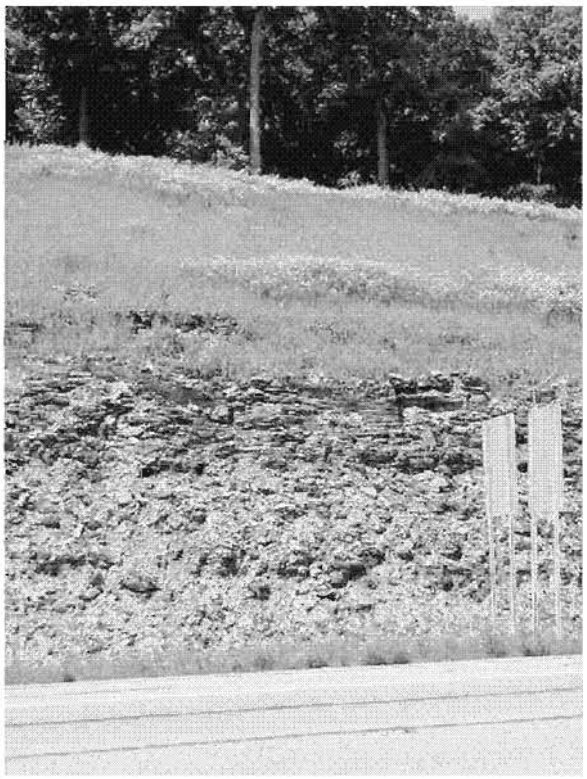


Figure F-98: LOG-33-20.5, low hazard potential (40)

Figure F-99: TUS-250-12.3, low hazard potential (40)

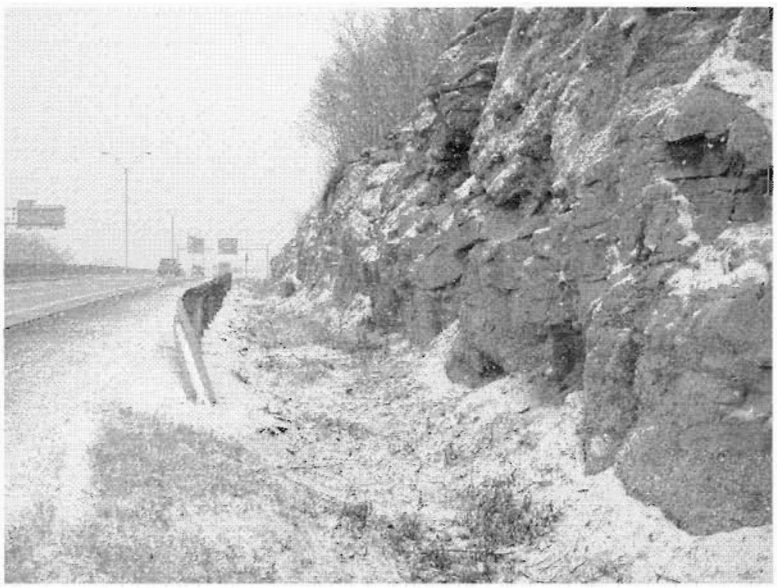


Figure F-100: SUM-76-20, low hazard potential (40)

Figure F-101: LIC-16-28, low hazard potential (38)

Figure F-102: JEF-7-18.8, low hazard potential (38)

Figure F-103: WAS-7-36.5, low hazard potential (37)

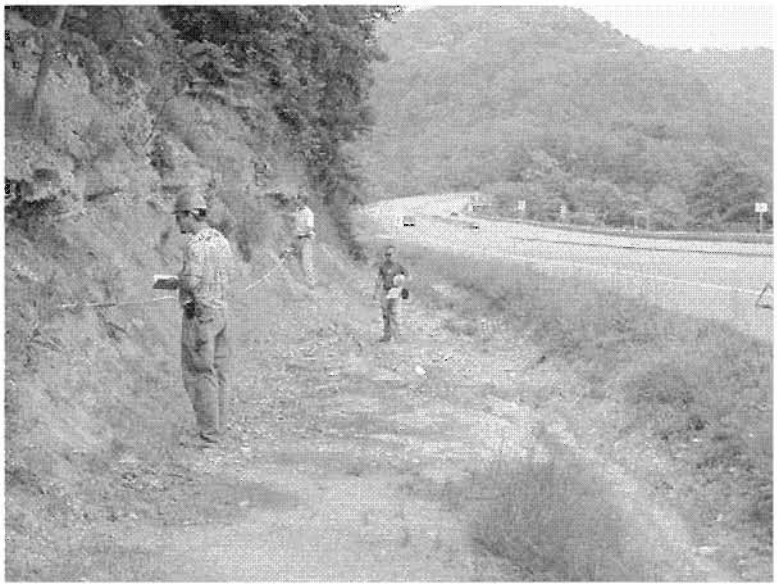


Figure F-104: BEL-7-6.3, low hazard potential (32)

Photograph not available

Figure F-105: MEG-124-57.2, low hazard potential (26)

Photograph not available

Figure F-106: BRO-62-9.2, low hazard potential (26)

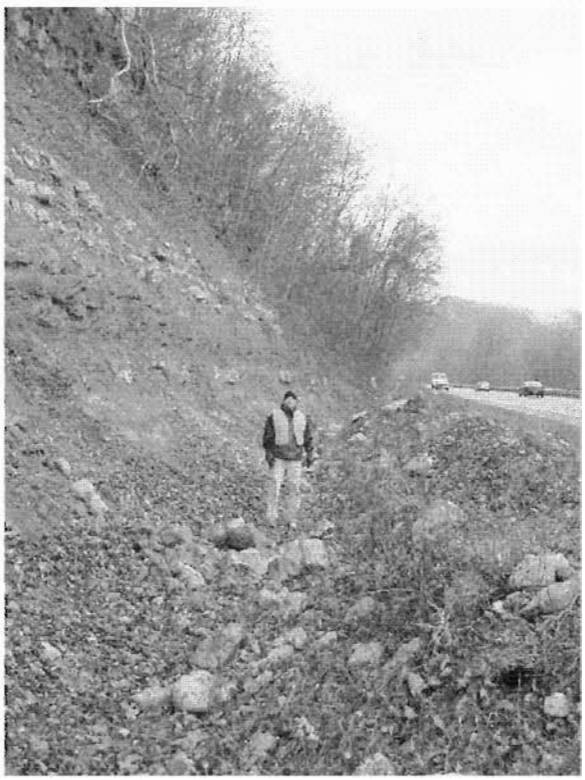


Figure F-107: MOE-7-27, low hazard potential (25)

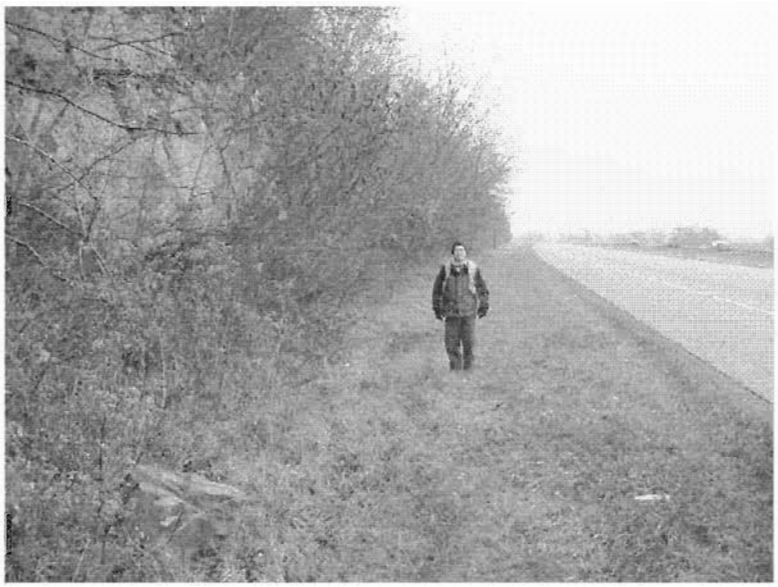


Figure F-108: COL-7-1.5, low hazard potential (23)

APPENDIX G

ROCK FALL HISTORY DATA COLLECTION SHEET

Rock Fall History Data Sheet

Location (County-Route-Mile marker):_____

Name of Recorder_____

Road Direction: N-S ☐ E-W ☐ Date/time_____

Direction road cut is facing: N ☐ S ☐ E ☐ W ☐

Location of road cut:_____

Posted Speed Limit: _____(mph)

Description of events impact on roadway:

_____

_____

Number of rocks reaching the roadway:

☐ 1 ☐ 2-5 ☐ 5-10 ☐ More than 10

Estimated volume or size of rock fall event:

Diameter (few rocks)	Volume (many rocks)
☐ 1 foot	☐ 1 cu. yd.
☐ 1-2 foot	☐ 1-2 cu. yd.
☐ 2-4 feet	☐ 2-4 cu. yd.
☐ Greater than 4 feet	☐ Greater than 4 cu. yd.

Distance of rocks in road from edge of rock cut (check the farthest one that applies)

☐ Not in road ☐ Shoulder ☐ One lane ☐ Two lanes ☐ More than two lanes

Accidents: ☐Yes ☐No, if yes accident number _____

Weather conditions _____

_____

Road conditions_____