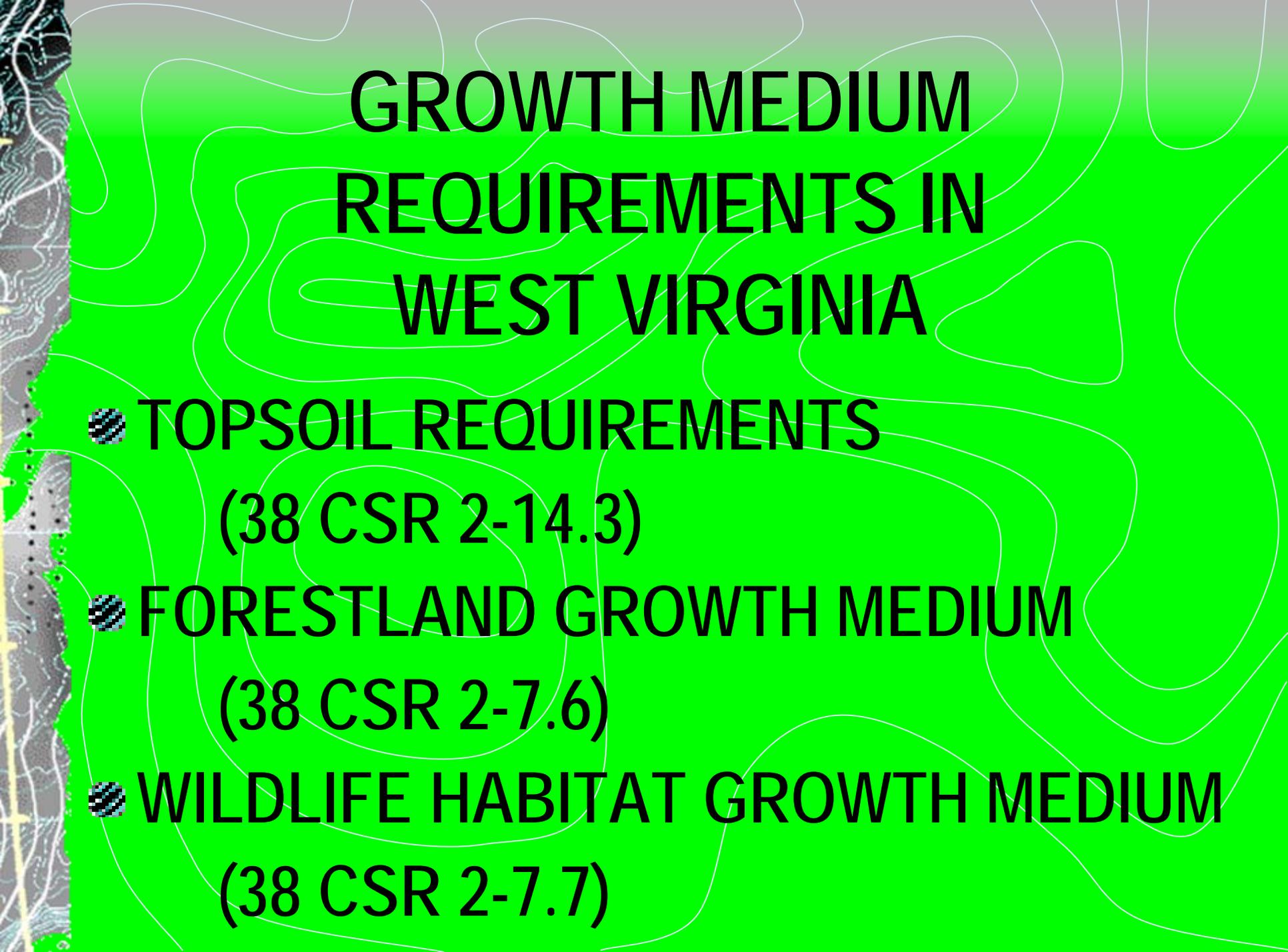




**FRA STEP #1,
SUITABLE ROOTING MEDIUM,
A REGULATORY PERSPECTIVE**

August 6, 2008

**Chief Logan Conference Center,
Logan, West Virginia**



GROWTH MEDIUM REQUIREMENTS IN WEST VIRGINIA

- **TOPSOIL REQUIREMENTS**
(38 CSR 2-14.3)
- **FORESTLAND GROWTH MEDIUM**
(38 CSR 2-7.6)
- **WILDLIFE HABITAT GROWTH MEDIUM**
(38 CSR 2-7.7)



TOPSOIL REQUIREMENTS (38 CSR 2-14.3)

- Topsoil must be stripped and redistributed in a separate layer unless a topsoil substitute is approved



TOPSOIL SUBSTITUTE REQUIREMENTS (38 CSR 2-14.3.c)

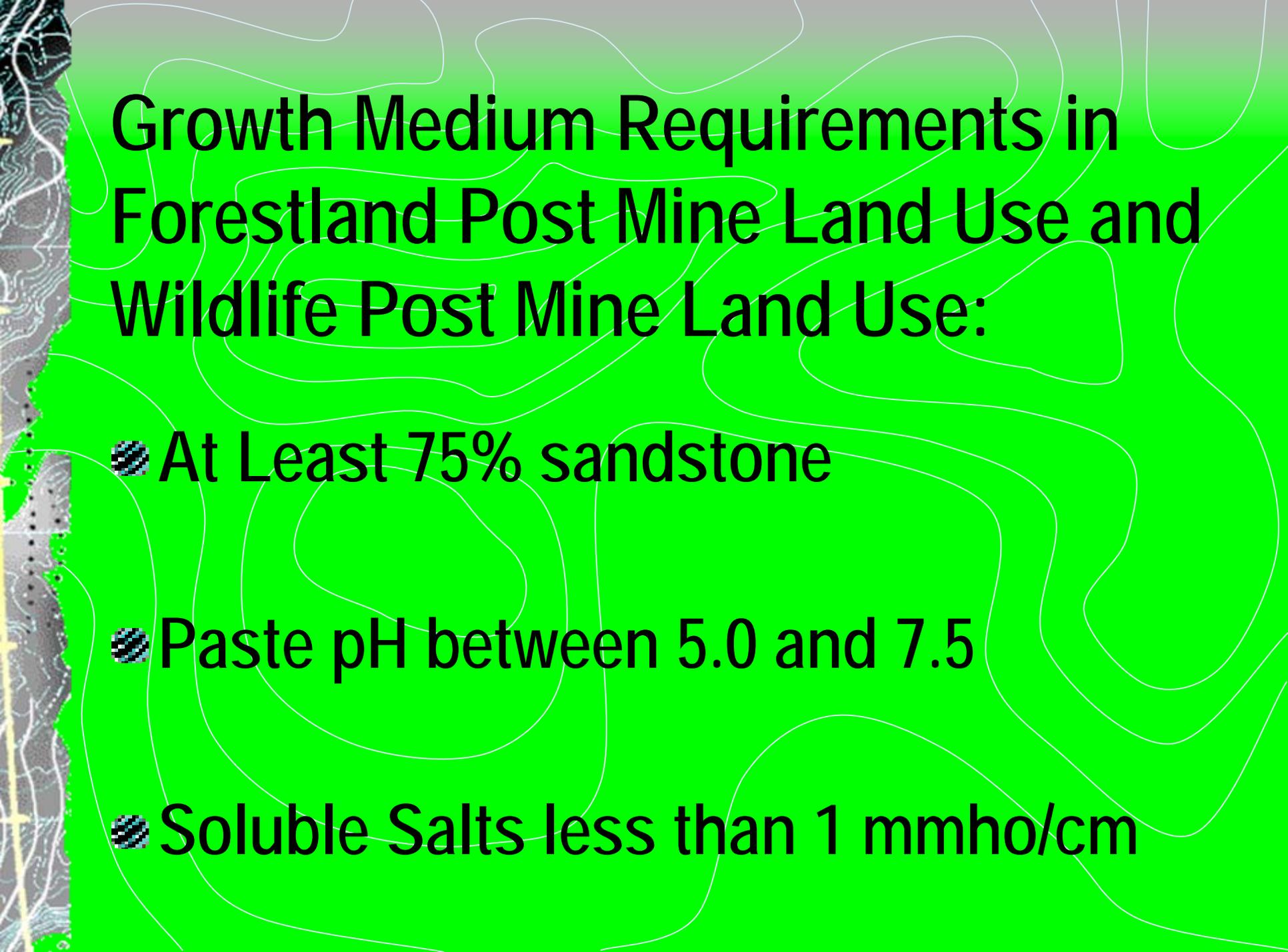
- Substitute material must be capable of supporting and maintaining the approved post mining land use
- This determination must be based on chemical and physical analyses of the overburden and topsoil

CHEMICAL AND PHYSICAL ANALYSES MUST INCLUDE:

- Depth
- Thickness
- Extent
- pH
- Texture Class
- % Coarse and % Fines
- Nutrient content

TOPSOIL SUBSTITUTE CERTIFICATION (38 CSR 2-14.3.c)

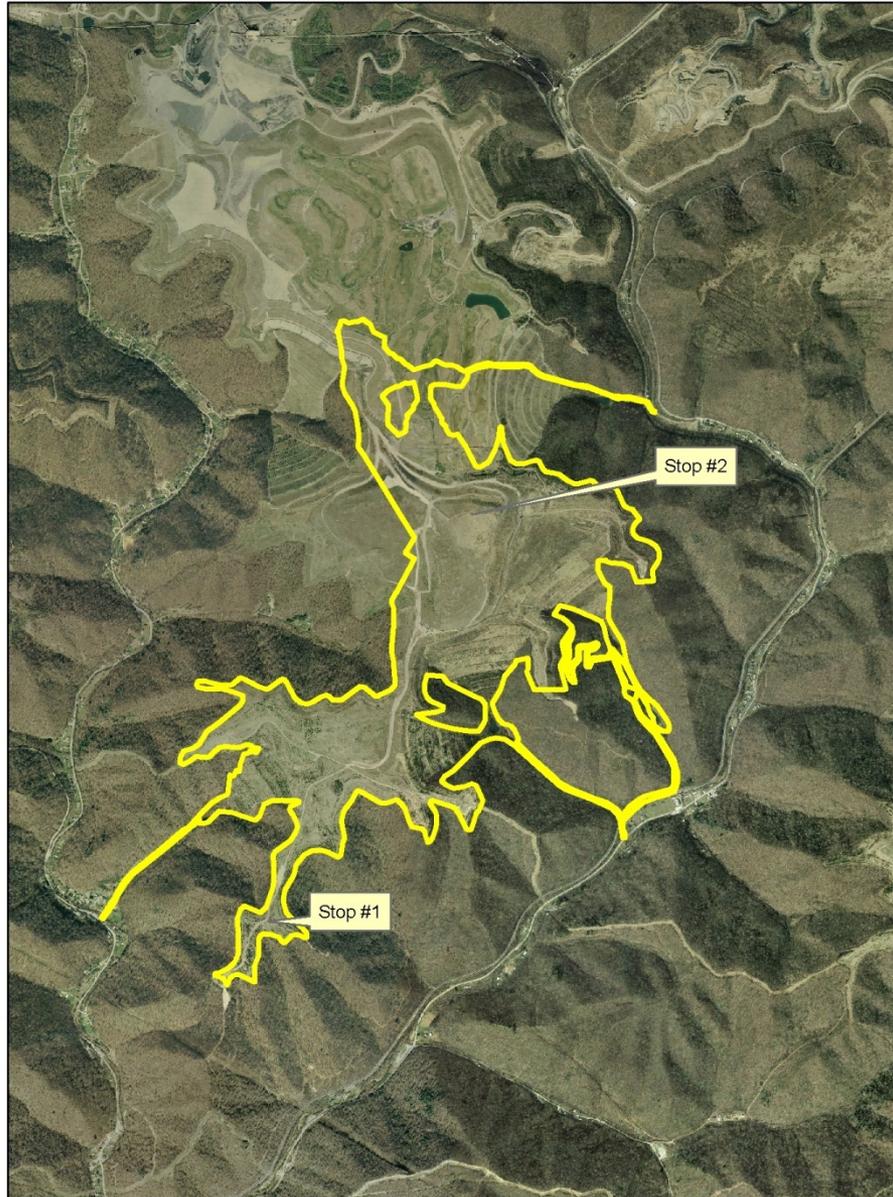
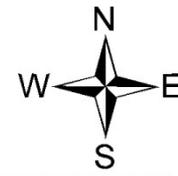
- Proposed substitute material is equally suitable for sustaining vegetation as the existing topsoil;
- Resulting soil medium is the best reasonably available in the permit area to support vegetation; and
- The analyses were conducted using standard testing procedures



Growth Medium Requirements in Forestland Post Mine Land Use and Wildlife Post Mine Land Use:

- At Least 75% sandstone
- Paste pH between 5.0 and 7.5
- Soluble Salts less than 1 mmho/cm

Cobra Natural Resources
S-5038-89



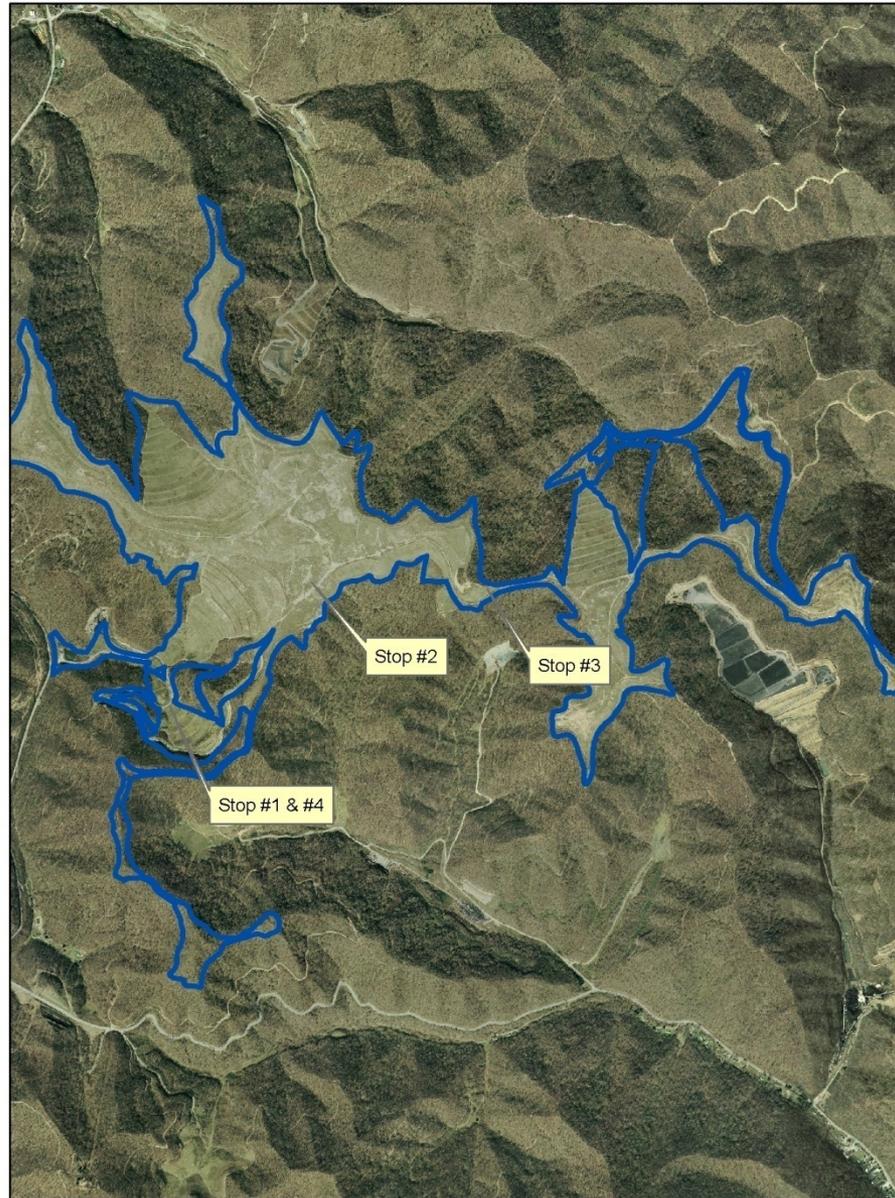
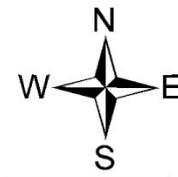








White Flame Energy
S-5077-92



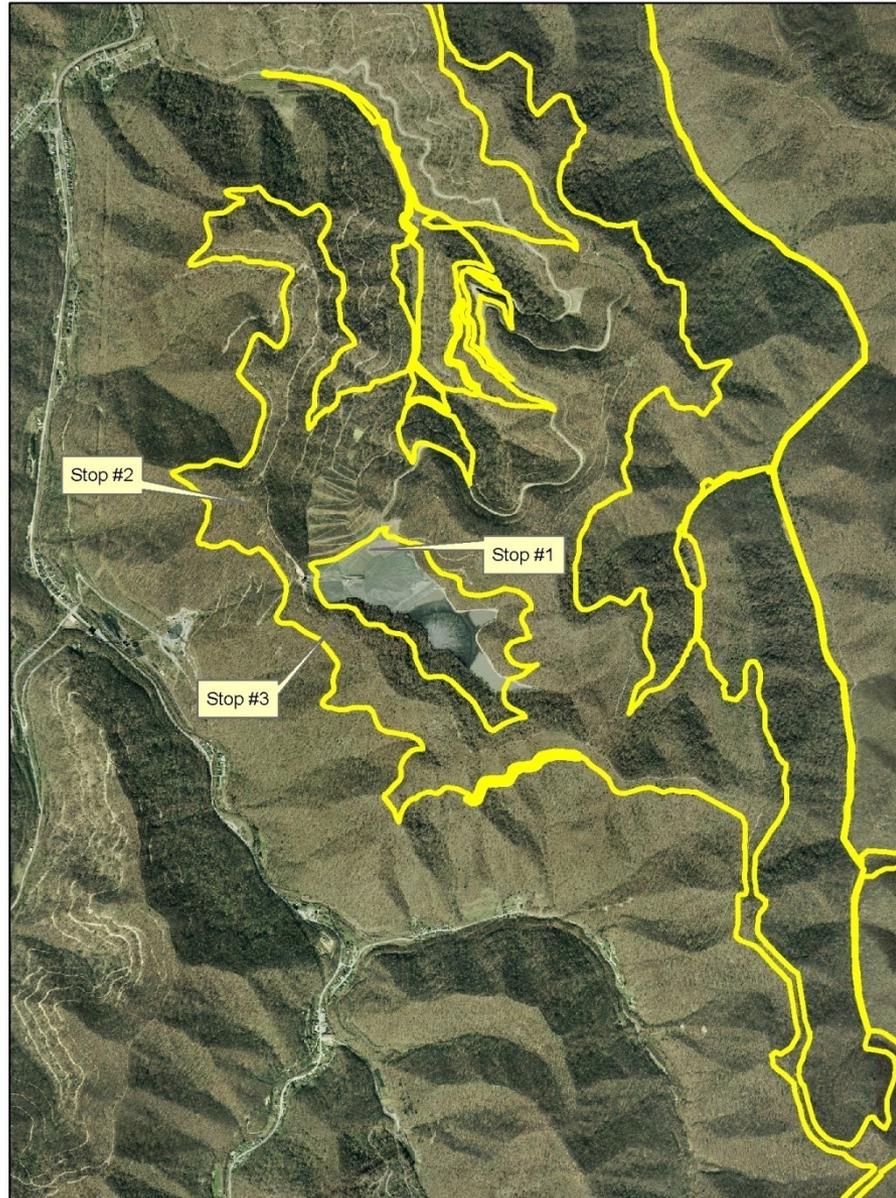
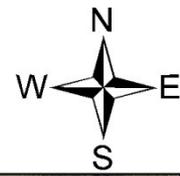








Road Fork Development S-5017-98









Road Forks
S-5017-98

SAMPLE

#2

		%
Mixture Gray	55	50
Brown	33	25
Shale		25

7/26/08 2:20 PM





Road Fork's

S-5017-98

SAMPLE

#1

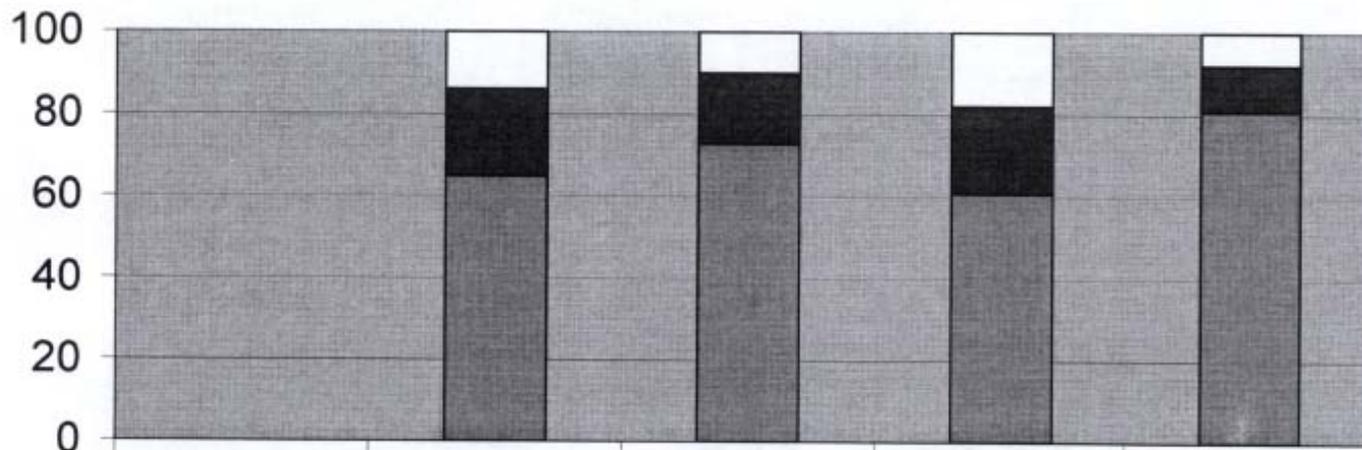
gray SS

07/08/08

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TEXTURAL ANALYSIS



	Sample	Cobra	White Flame	Road Fork Mix	Road Fork Gray
□ CLAY		14.00	10.00	18.00	8.00
■ SILT		21.20	17.20	21.20	11.20
■ SAND		64.80	72.80	60.80	80.80

§ 3:6 THE PARTICLE DENSITY OF MINERAL SOILS

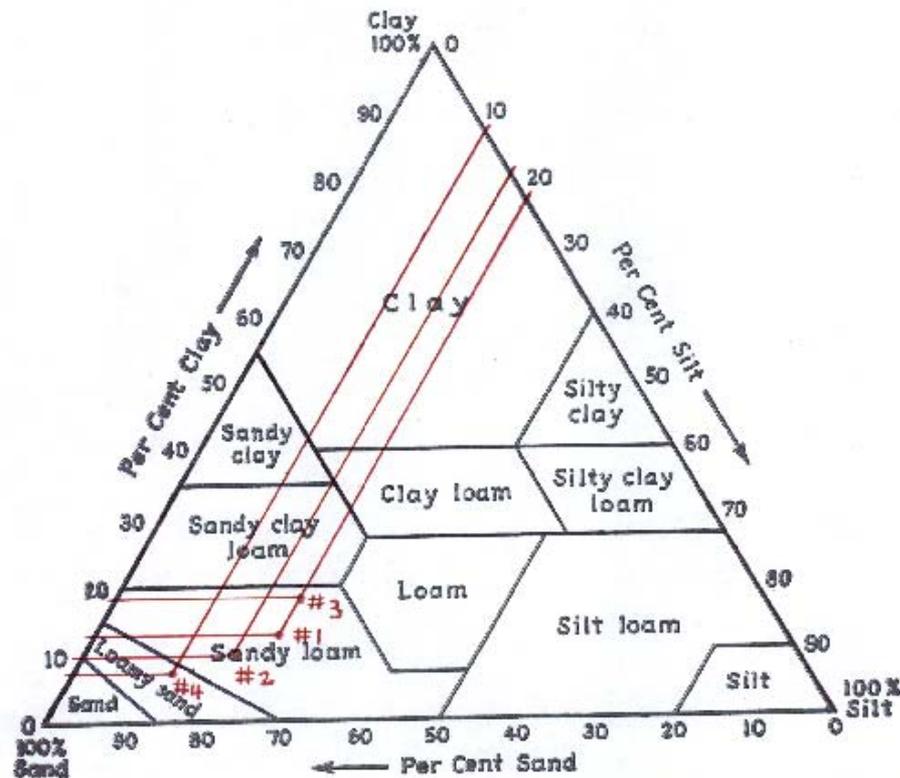
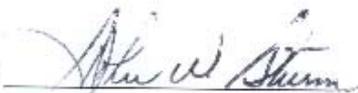


Figure 3:5. Diagram by means of which the textural name of a soil may be determined from a mechanical analysis. In using the diagram, the points corresponding to the percentages of silt and clay present in the soil under consideration are located on the silt and clay lines respectively. Lines are then projected inward, parallel in the first case to the clay side of the triangle and in the second case parallel to the sand side. The name of the compartment in which the two lines intersect is the class name of the soil in question.

COMPANY: WVDEP DIVISION OF MINING & RECLAMATION

DATE RECEIVED: JULY 10, 2008

SAMPLE ID	Color	Paste pH	Soluble Salts mmhos/cm
SAMPLE #1 Mingo Logan's S-5038-89	2.5Y 6/3	5.2	.166
SAMPLE #2 White Flame's S-5072-92	2.5Y 6/2	6.4	.146
SAMPLE #3 Road Fork Development's S-5017-97	2.5Y 7/3	5.7	.216
SAMPLE #4 Road Fork Development's S-5017-97	2.5Y 7/1	7.4	.133

Approved 



MUNSELL® SOIL COLOR CHART

2.5Y



2.5Y

COMPANY: WVDEP DIVISION OF MINING & RECLAMATION

DATE RECEIVED: JULY 10, 2008

AVAILABLE PLANT NUTRIENTS

SAMPLE NO	* Phosphorus P	* Potassium K	* Calcium Ca	* Magnesium Mg	1:1 pH	Lime Req. **
1	5.8	273.	1240.	511.	5.1	2.8
	Low	Very High	medium	Very High		
2	8.1	223.	1160.	457.	6.2	.8
	Low	High	medium	High		
3	2.0	252.	1470.	503.	5.5	2.0
	Low	Very High	medium	Very High		
4	2.0	193.	1080.	250.	7.2	0
	Low	High	medium	High		

* Pounds per acre ** Tons per acre

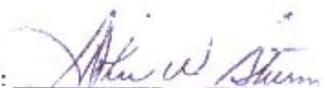
Sample #1 - Mingo Logan's S-5038-89

Sample #2 - White Flame's S-5077-92

Sample #3 - Road Fork Development's S-5017-97

Sample #4 - Road Fork Development's S-5017-97

Approved: _____





























IN SUMMARY, ALL THE SITES YOU SAW YESTERDAY:

- COMPLY WITH STATE AND FEDERAL REGULATIONS REGARDING FORESTRY GROWTH MEDIUM REQUIREMENTS
- INCORPORATED THE FRA
- WILL PRODUCE HIGHLY PRODUCTIVE FORESTLAND SOONER THAN TRADITIONAL RECLAMATION TECHNIQUES