

WDCS 422 Lab 10 – Assignment

BMP Compliance Assessment for Logging Operations in West Virginia

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Logging operations should follow the Best Management Practices (BMPs) published by WV Division of Forestry (WVDOP) to protect the quality of rivers, streams, and other sensitive areas in West Virginia. These BMPs are carefully explained in the publication, “Best Management Practice Guideline for Controlling Soil Erosion and Water Siltation” available free of charge from any local WVDOP district offices. The BMP manual can be viewed and downloaded using the following link: <http://www.wvforestry.com/BMP%20Book%202009.pdf>.

The following checklist is designed for use with the above manual. It highlights the BMPs which are critical for logging operations. This checklist is especially designed for this WDCS 422 lab and can be also used by loggers to gauge their level of compliance with the BMPs and determine where changes in their operations are needed. The following link will direct you to access the methods used for applying this checklist. The link directs you to a thesis, in which BMPs were assessed for application, effectiveness, and compliance.

<https://eidr.wvu.edu/eidr/documentdata.eIDR?documentid=4427>

Please use the attached checklist to measure the BMPs in haul roads, skid trails, at landing, and in SMZs:

- (1) Measurements in the haul road by pacing the distances determined by grade breaks or curves in the road starting from landing to the end. Then determine how many cross drainages are needed and the length needing seed/mulch and gravel.

Length - should be paced and recorded as feet.

Grade - measure using a clinometer to determine grade for each section. The grade should be less than 10%, and it can be up to 15% for 100 ft. or less.

Cross drainages – number of cross drainages in each section of haul road. The compliance is determined based on the number needed. Spacing of cross drainages in haul road should be approximately 100’ feet apart, but never more than 150’ feet apart.

Gravel – measured in feet from the public road. There should be 200 ft. of gravel from a public road entrance.

Seed/mulch – measure in feet, but is dependant on grade of haul road. If grade exceeds 15%, the section must be seeded and mulched.

- (2) Landings should be measured based on yes or no answers. For analysis purposes Yes=1 and No=0. Then the sum of the yes/no answers will be divided by the total number of fields measured to determine compliance.

SMZ violation – Is the landing inside of a SMZ? y/n

of roads/diverted – The number of trails leaving the landing. Do they have water diversions if they are coming down slope to the landing?

Smooth – The landing is smooth if it does not have any ruts, or ruts <6 inches deep.
y/n

Drained – Does the landing have a slope that will drain water off of it? y/n

Seeded/Mulched – Is the landing seeded and mulched for the entire area? y/n

- (3) Three 100 foot sections of skid trail should be measured on this site. Measurements will begin from the landing.

Grade – You need to use a clinometer for the measurements of each section. The grade should be less than 15%, and it can be up to 20% for 100 ft. or less.

Waterbars – Determine the number of waterbars present and the number required for each section based on length and grade.

Spacing to Use between Permanent Waterbars	
Minimum % Grade	Maximum Distance (ft.) of Road between Water Bars
<5%	100
5-20	50
>20	40

Always install a water bar at least 25 feet uphill of stream crossings and landings.

Smoothed – Section is smooth where ruts are not present or <6 inches deep (in feet).

Outsloped – Is the section outsloped properly for drainage? Ft.

Berm – The length of berm that was not removed for each section of trail in feet.

Seed/Mulch – The length in feet that was seeded/mulched. The first 100 ft. from the landing or if grade exceeds 20% the section must be seeded and mulched.

- (4) SMZs will be assessed only when present. The stream type should be determined and assessed accordingly.

Width – Measured in feet the distance left for a stream buffer from harvesting activity.

Equipment Operations – Were there operations inside of the designated SMZ? y/n

Soil Exposure – Is there bare soil exposed in the SMZ? y/n

Stabilized – Was the SMZ stabilized after harvesting? y/n

Landing, haul road, skid trail out of SMZ – Are these features the required distance from the stream (in feet)? 25 ft. for ephemeral stream and 100 ft. for perennial and intermittent streams.

Landing, haul road, skid trail reclaimed – Are sections in the SMZ seeded/mulched if landing, haul road, or skid trail was constructed in the SMZ? Ft.

Analysis

Analysis will be completed to determine compliance percentages for haul roads, skid trails, landings, and SMZs. These will be used to determine a compliance percentage for the entire tract. Procedures used to determine compliance are listed below.

Length measurements will be used to determine compliance percentages of the BMPs such as length smooth, berm removed, out-sloped, graveled, and in appropriate grade. The total distance of a segment will be divided by the distance that is in compliance and this will result in your compliance for that specific segment. The compliance for water bars applied can be obtained by dividing the number of water bars present in a road/trail segment by the number recommended for the same segment by the BMP guidelines. Some BMPs measured, either on landings or in SMZs, should be labeled “Yes” or “No”, which can be converted to 1 or 0. These are BMPs such as landing seeded or mulched, landing drained, etc. The percent compliance for these BMPs can be computed by dividing the number of samples answered “Yes” by the total number of samples for that tract or attribute. Results should list compliance by: (1) percent compliance by checklist, (2) average compliance of a site.

A group of four students should work together as a team for field measurements, data analysis, and summary report. Please provide me a typed summary report of BMP compliance assessment by the beginning of lab next week. Specifically, you need to summarize and detail the BMP compliance level for each of the four categories by using tabular format.

References

- Goff, T. 2005. Assessment of application, effectiveness, and compliance of forestry best management practices in West Virginia. M.S. Thesis. Division of Forestry and Natural Resources, West Virginia University, Morgantown, WV. 110 pp.
- Wang, J., J. McNeel, and S. Milauskas. 2004. Logging Sediment Control Act and Forestry Best Management Practices in West Virginia: A Review. *Northern Journal of Applied Forestry*. 21(2): 93-99.
- WVDOF. 2005. West Virginia Silvicultural Best Management Practices for Controlling Soil Erosion and Sedimentation from Logging Operations. WVDOF-TR-05-03 (11/05). Charleston, WV.

WDSC 422 BMP Compliance Checklist

Haul Road

Section	Length Ft.	Grade %	Cross Drainage (#)	Cross drain. Needed (#)	Gravel Ft.	Gravel Needed	Seed Ft.	Seed Needed	Mulch Ft.	Mulch Needed	SMZ Viol. y/n
1											
2											
3											
4											
5											
6											
7											
8											
9											

Landing

#	SMZ Viol	# of Rads	# Rads diverted	Smooth y/n	Drained y/n	Seeded y/n	Mulched y/n				
1											
2											

SMZ

#	Width (ft.)	Equip_ops y/n	Soil_exp y/n	Stabilized y/n	Landing_out y/n	Land_recl y/n	Haul_out y/n	Haul_recl y/n			
1											
2											

Skid Trail

Section	Length	Grade	# of	# of wb	Smooth	Berm	Outslope	Seed	Seed	Mulch	Mulch
	Ft.	%	Waterbars	needed	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.	Ft.
First 100 ft.											
1											
2											
3											
4											
5											
Second 100 ft.											
1											
2											
3											
4											
5											
Third 100 ft.											
1											
2											
3											
4											
5											