Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont

SECTION 1: INTRODUCTION

The "Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont" ("AMPs") were first adopted on August 15, 1987 under the authority of Chapter 47 of Title 10 of the Vermont Statutes Annotated, Water Pollution Control (10 V.S.A. §1251a and 1259(f)). See Code of Vermont Rules 12 020 010. The initial adopted rule provided that "the AMPs are the proper method for the control and dispersal of water collecting on logging roads, skid trails and log landings to minimize erosion and reduce sediment and temperature changes in streams."

Act No. 64 of the Acts of 2015 amended 10 V.S.A. §2622 to require the Commissioner of the Department of Forests, Parks and Recreation to revise by rule the AMPs. The purpose of the acceptable management practices is to provide measures for loggers, foresters, and landowners to utilize, before, during, and after logging operations to comply with the Vermont Water Quality Standards and minimize the potential for a discharge from logging operations in Vermont in accordance with 10 V.S.A. §1259.

Pursuant to Section 2-03B.1 of the Vermont Water Quality Standards, there is a presumption that logging operations that are in compliance with the AMPs are also in compliance with the Vermont Water Quality Standards. However, any presumption provided by the Vermont Water Quality Standards shall be negated when a water quality analysis conducted according to Section 2-01(g) of the Vermont Water Quality Standards demonstrates that there is a violation of the Vermont Water Quality Standards.

Additionally, logging operations that are in compliance with the AMPs are exempt from the discharge permit requirements in accordance with 10 V.S.A. §1259(f), the stream alteration permit requirements pursuant to 10 V.S.A §1021(f), the stormwater permit requirements pursuant to 10 V.S.A. §1264(d)(1)(C), and wetland permit requirements pursuant to 10 V.S.A. §913(a) and Sections 6.01 – 6.05 of the Vermont Wetland Rules.

SECTION 2: POLICY AND PURPOSE

The purpose of the AMPs is to provide measures for loggers, foresters, and landowners to utilize, before, during, and after logging operations to comply with the Vermont Water Quality Standards and minimize the potential for a discharge from logging operations in Vermont in accordance with 10 V.S.A. §1259.

SECTION 3: AUTHORITY

This rule is adopted pursuant to 10 V.S.A. §2622(a) and (b), 10 V.S.A. §1259(f), 3 V.S.A. §801(b)(11) and 3 V.S.A. §2853(5).

SECTION 4: APPLICABILITY

The AMPs apply to all logging operations on public and private lands in Vermont regardless of the purpose of the logging. For example, logging may be conducted for forest management purposes or logging may be conducted for the purpose of clearing land for some other type of land use, such as commercial, residential or utility development.

SECTION 5: DEFINITIONS

For the purposes of this Rule, the following terms shall have the specified meaning:

5.1 ***"Agency"* or *"ANR"*** means the Vermont Agency of Natural Resources.

5.2 **"AMP" or "Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont"** means rules adopted under the authority of 10 V.S.A. §2622(a) and (b), 10 V.S.A. §1259(f), 3 V.S.A. §801(b)(11) and 3 V.S.A. §2853(5).

5.3 ***"Approaches to Stream Crossings"*** means that length of a truck road or skid trail associated with stream crossings that traverse through the forest buffer.

5.4 ***"At-Grade Ford"*** means a stream crossing on a truck road or, where no appropriate alternative exists, a skid trail, that is constructed perpendicular to the stream channel with approaches being properly stabilized with clean stone fill, and there is no change in existing stream channel cross-section and bed elevation except for minor bank grading at the point of the crossing.

5.5 ***"Broad-based Dip"*** means a drainage structure, usually used on truck roads where grades are less than or equal to 8 percent, that diverts the surface water runoff into a filter area.

5.6 ***"Brushed-in Crossing"*** means a temporary method of crossing intermittent streams during logging operations when the ground is frozen. Brushed-in crossings are constructed by placing logs in the bottom of the stream channel, parallel to the stream channel, and then placing topwood (tree limbs and branches) over the logs.

5.7 ***"Check Dam"*** means a small barrier constructed in a drainage structure, its outlet or in a small gully or other watercourse to decrease the water flow velocity, minimize channel scour and promote deposition of sediment. A check dam creates a small sediment basin. Check dams may be constructed of hay bales or other stable and semi-porous material.

5.8 ***"Continuous Forest Cover"*** means maintaining a minimum of 60 to 70 percent crown cover or B-level stocking as recommended in the U.S. Forest Service silvicultural guides.

5.9 ***"Drainage Ditch"*** means a ditch constructed along a truck road, skid trail or log landing to collect the surface water runoff and divert it into a filter area.

5.10 "***Drainage Structure"*** means a device, structure or method that diverts the surface water runoff from an impervious surface such as a truck road, skid trail or log landing into a drainage ditch or filter area.

5.11 ***"Filter Area"*** means a vegetated area where surface water runoff is diverted and dispersed so that sediment and other pollutants are trapped and retained. A filter area can include or be within a forest buffer.

5.12 ***"Forest Buffer"*** means an area of forested land adjacent to streams and other waters where forest management practices are modified to protect water quality. The width of the forest buffer shall be in accordance with Table 4.

5.13 ***"Forest Canopy"*** means a layer or multiple layers of branches and foliage at the top or crown of a forest's trees.

5.14 ***"Gully Erosion"*** means a form of soil erosion where gullies of six inches deep or more are created by surface water runoff.

5.15 ***"Hazardous Material"*** means any material determined by the Secretary to have an unusually harmful effect on water quality if discharged to the waters of the state. Hazardous substances associated with logging operations include but are not limited to petroleum products, solvents and coolants.

5.16 ***"Intermittent Stream"*** means a stream with a well-defined channel, evidence of sediment transport and which regularly experiences periodic interruption of surface flow throughout its length.

5.17 ***"Log Landing"*** means a place where trees and logs are gathered and sorted in or near the forest during a logging operation for further processing and transport to a mill or log yard facility.

5.18 ***"Logging Equipment"*** means equipment, implements, accessories, and contrivances used directly and principally in the cutting or removal of timber or other solid wood forest products. Logging equipment also includes equipment used to construct, maintain or install infrastructure necessary to and associated with the logging operation.

5.19 ***"Logging Slash"*** means any residual tree material, whole or part, including leaves, needles, bark, wood and root tissue, that is created as a result of a logging operation.

5.20 ***"Percent Grade/Percent Slope"*** means a measurement of incline or decline expressed as a percentage and as determined by dividing the length of vertical rise in elevation by the length of horizontal distance. (Example: A 6% grade would be a 6 foot vertical rise per 100 feet of horizontal distance: 6 ÷ 100 = .06 or 6%)

5.21 ***"Perennial Stream"*** means a watercourse or portion, segment or reach of a watercourse, generally exceeding 0.5 square miles in watershed size, in which surface flows are not frequently or consistently interrupted during normal seasonal low flow periods. Perennial streams that begin flowing subsurface during low flow periods, due to natural geologic conditions, remain defined as perennial. All other streams, or stream segments of significant length, shall be termed intermittent. A perennial stream shall not include the standing waters in wetlands, lakes, and ponds.

5.22 ***"Permanent Stream Crossing"*** means a bridge, culvert or at grade ford that is left in place after logging is completed.

5.23 ***"Permanent Truck Road"*** means a road that remains in place at the conclusion of a logging operation for continued long term access and is designed for year-round use.

5.24 ***"Person"*** means any landowner, logger, individual, partnership, company, corporation, association, joint venture, trust, municipality, the state of Vermont or any agency, department, or subdivision of the state, any federal agency, or any other legal or commercial entity.

5.25 ***"Pole Ford"*** means a temporary method of crossing intermittent or perennial streams using logs placed in and parallel to the stream channel.

5.26 ***"Rut"*** means a depression in the soils of the forest floor or depressions in dirt roads or skid trails made from the passage of any vehicles or logging equipment.

5.27 ***"Secretary"*** means the Secretary of the Agency of Natural Resources or the Secretary's authorized representative.

5.28 ***"Sediment"*** means soil that has been eroded from the land surface and is transported and deposited in streams or waters.

5.29 ***"Silt Fence"*** means a temporary sediment control device used to intercept and filter the surface water runoff to protect water quality in nearby streams and other waters.

5.30 ***"Skid Trail"*** means a cleared trail that is used by logging equipment during a logging operation to transport harvested trees and logs to a log landing.

5.31 ***"Stream"*** means the full length and width, including the bed and banks, of any watercourse, including rivers, streams, creeks, brooks, and branches, which experience perennial flow. "Stream" does not include ditches or other constructed channels primarily associated with land drainage or water conveyance through or around private or public infrastructure.

5.32 ***"Stream Channel"*** means an area that contains continuously or periodic flowing water that is confined by banks and a streambed.

5.33 **"Streambank"** means the portion of a stream channel that restricts lateral movement of water at normal water levels.

5.34 ***"Surface Water Runoff"*** means precipitation and snowmelt that does not infiltrate into the soil, including material dissolved or suspended in it.

5.35 ***"Temporary Stream Crossing Structure"*** means a bridge, culvert, pole ford or brushed-in crossing that is temporarily installed in or over a stream channel. Temporary stream crossing structures shall be removed after logging is completed or after a period of one year after installation, whichever is less.

5.36 ***"Temporary Truck Road"*** means a minimum-standard road designed for short-term use to access a logging operation. Temporary roads must be closed out at the conclusion of logging.

5.37 **"Top-of-bank"** means the location up-slope from the scoured channel of a stream, or shoreline of other waters, where an abrupt change of slope occurs.

5.38 ***"Truck Road"*** means a road that connects a log landing to a public road system. A "truck road" may be designed, constructed and maintained to provide either permanent or temporary access.

5.39 ***"Turn-up"*** means a method of construction of a downhill skid trail that diverts the surface water runoff from ditches and road or trail surfaces into a filter area by turning the skid trail up the hill a short distance then turning downhill again.

5.40 ***"Waterbar"*** means a type of drainage structure constructed across the width of a skid trail or truck road that diverts the surface water runoff from ditches and road or trail surfaces into a filter area.

5.41 ***" Waters"*** means any natural body of open water other than a stream that is a water of the state under 10 V.S.A. Chapter 47.

SECTION 6: ACCEPTABLE MANAGEMENT PRACTICES

6.1 Truck Roads – Practices to be Applied During Logging

6.1.1 Permanent and temporary truck roads shall not exceed 10 percent grade. Where no reasonable alternative exists, a steeper section exceeding 10 percent grade is allowed but shall not exceed 300 feet in length and shall be the minimum grade and length necessary due to physical constraints, property boundaries and ground conditions.

6.1.2 Drainage structures on permanent and temporary truck roads shall be correctly installed to divert the surface water runoff into road ditches or filter areas. Drainage structures shall be spaced at intervals according to Table 1 where existing soil, rock and ledge conditions allow.

6.1.3 Water entering a permanent or temporary truck road shall be moved under and away from the road and into a filter area. Culverts used for ditch drainage on truck roads shall be at least 15 inches in diameter, correctly installed to divert ditch water into a filter area and spaced according to Table 1 where existing soil, rock, ledge and road bed conditions allow.

6.1.4 Drainage ditches along permanent and temporary truck roads shall not terminate directly into streams or other waters. On approaches to stream crossings, ditches shall be turned out into a filter area a minimum of 25 feet away from the top of bank.

6.2 Truck Roads - Practices to be Applied Immediately After Logging

6.2.1 Waterbars on temporary truck roads shall be correctly installed to divert the surface water runoff into a filter area and shall be spaced at intervals according to Table 1 where existing soil, rock, ledge and road bed conditions allow.

6.3 Skid Trails - Practices to be Applied During Logging

6.3.1 Skid trails shall not exceed 20 percent grade. Where no reasonable alternative exists, a steep section of the minimum grade and length necessary due to physical constraints, property boundaries and ground conditions is allowed, but should not exceed 300 feet in length.

6.3.2 Waterbars and turn-ups shall be correctly installed on skid trails to divert the surface water runoff into a filter area and shall be spaced at intervals according to Table 1 where existing soil, rock, ledge and skid trail conditions allow.

6.4 Skid Trails - Practices to be Applied Immediately After Logging

6.4.1 Ruts on skid trails shall be smoothed where the skid trail grade is greater than 5 percent to prevent soil erosion and to prevent sediment from entering streams and other waters. All ruts of any depth shall be smoothed on approaches to stream crossings on skid trails within the forest buffer.

6.4.2 Waterbars on skid trails shall be correctly installed to divert the surface water runoff into a filter area and shall be spaced at intervals according to Table 1 where existing soil, rock, ledge and skid trail conditions allow.

6.5 Stream Crossings on Truck Roads and Skid Trails – Practices to be Applied During Logging

6.5.1 Streams and all waters shall be kept free of logging slash and logging debris.

6.5.2 Stream crossings shall be made perpendicular to the stream channel unless rock, ledge or other ground conditions prevent a perpendicular crossing and no other feasible alternative crossing exists. Stream crossings shall be located where the stream channel is narrow and well defined, the banks are stable and approaches are 10 percent grade or less.

6.5.3 Temporary stream crossings on truck roads shall be over a bridge, culvert or by constructing an at-grade ford. Culvert diameter and bridge structure opening shall be according to Table 2. Temporary bridges shall span the entire width of the stream channel. At-grade fords shall be used only where streams have low banks, stable beds (cobble or ledge) and stable, gradual approaches. All temporary stream crossing structures shall be removed after logging is completed or after a period of one year after installation, whichever is less.

6.5.4 Temporary stream crossings on skid trails shall be over a bridge, culvert or pole ford. Culvert diameter and bridge structure opening shall be according to Table 2. Temporary bridges shall span the entire width of the stream channel. Pole fords are allowed on skid trails where the streambed is gravel, cobble or ledge. Brushing-in is allowed but only on intermittent streams and only when the ground is frozen. All temporary stream crossing structures shall be removed after logging is completed or after a period of one year after installation, whichever is less. Streams may be crossed by using an at-grade ford only where streambeds and approaches to streams are cobble or ledge and only if no other alternative exists.

6.5.5 Permanent stream crossings on perennial streams shall be in compliance with standards set forth in the Vermont Agency of Natural Resources Stream Alteration Rule and General Permit. Environmental Protection Rule, Chapter 27, Subchapter 5.

6.5.6 Logging equipment shall be kept out of stream channels, except as necessary for the construction, maintenance, use, removal and stabilization of stream crossing structures or the use of at-grade fords.

6.5.7 On approaches to stream crossings, waterbars, turn-ups or broad-based dips shall be correctly installed on truck roads and skid trails to divert the surface water runoff into a filter area. They shall be installed as close to 25 feet away from the top of bank as existing soil, rock. ledge and ground conditions allow.

6.5.8 Except for the travelled portions of truck roads and skid trails, areas of exposed soil within 50 feet of the stream channel as measured from the top of bank shall be seeded and mulched, according to Table 3, immediately after installing stream crossing structures.

6.6 Stream Crossings on Truck Roads and Skid Trails – Practices to be Applied Immediately After Logging

6.6.1 All temporary structures on skid trails and truck roads shall be removed from streams and the channel restored to a stable condition immediately after logging is completed or after a period of one year after installation, whichever is less. Brushed-in crossings on intermittent streams shall be removed when skid trail use has been completed or as soon thereafter as ground conditions allow.

6.6.2 After removing temporary stream crossing structures, waterbars shall be correctly installed as close to 25 feet back from the top of bank as ground conditions allow to divert the surface water runoff into a filter area. All areas of exposed soil shall be seeded and mulched a minimum of 50 feet on each side of

the stream crossing. Seed and mulch at application rates according to Table 3 immediately after logging or as soon thereafter as ground conditions allow.

6.7 Forest Buffer

6.7.1 A forest buffer shall be left along streams and other waters in which only partial cutting can occur such that openings in the forest canopy are minimal and continuous forest cover is maintained. The width of the buffer shall be in accordance with Table 4 as measured from the top of bank.

6.7.2 New truck roads, skid trails and log landings shall not be constructed within a forest buffer, except for the necessary construction of stream crossings, unless there is no feasible alternative due to existing soil, rock, ledge or other ground conditions. Truck roads, skid trails and log landings that exist within the forest buffer prior to the adoption of this rule, in whole or in part, may only be used if there is no other feasible alternative for relocation or if construction of a new truck road, skid trail or log landing would result in greater potential for erosion and sediment discharge than would result from using the existing truck road, skid trail or log landing within the forest buffer.

6.7.3 Logging equipment shall not be driven within a 25-foot wide area along streams or other waters, as measured from the top of bank except as necessary for the construction, maintenance, use, removal and stabilization of stream crossings.

6.8 Petroleum Products and Hazardous Materials

6.8.1 Petroleum products and other hazardous materials shall be stored only outside of forest buffers and shall be removed immediately upon completion of logging.

6.9 Log Landings - Practices to be Applied During Logging

6.9.1 Log landings shall not be constructed in a forest buffer except where no feasible alternative exists due to existing soil, rock ledge or other ground conditions. Log landings that exist within the forest buffer prior to the adoption of this rule, in whole or in part, may only be used if there is no other feasible alternative for relocation or if construction of a new log landing would result in a greater potential for erosion and sediment discharge than would result from using the existing log landing. The width of the forest buffer shall be in accordance with Table 4.

6.9.2 Silt fencing, check dams and drainage structures shall be correctly installed on log landings to prevent sediment from entering streams and other waters.

6.10 Log Landings - Practices to be Applied Immediately After Logging

6.10.1 Log landings shall be stabilized and drainage structures shall be correctly installed to prevent sediment from entering streams and other waters.

6.11 Table 1: Distance (Feet) Between Drainage Structures on Truck Roads and Skid Trails

Road Grade (Percent Slope)	Skid Trails		Truck Roads Permanent Truck Roads During and After Logging. Temporary Truck Roads During Logging.		Temporary Truck Roads After Logging
	During Logging (Waterbars & Turn-Ups)	After Logging (Waterbars and Turn-Ups)	Broad-Based Dips	Ditch Relief Culverts	Waterbars
1	500	400	500	450	400
2	300	250	300	300	250
5	200	135	180	200	135
10	140	80	140	140	80
15	130	60	---	130	60
20	120	45	---	120	45
25	110	40	---	65	40
30	100	35	---	60	35
40	90	30	---	50	30

6.12 Table 2: Minimum Culvert Sizing for Temporary Stream Crossings

Drainage Area (Acres)	Minimum Size of Opening Required For Bridges and Culverts (Square Feet)	Minimum Culvert Diameter (Inches)
4	0.6	12
8	1.0	15
15	1.5	18
20	1.9	18
40	3.2	24
50	3.8	30
80	5.3	36
100	6.3	36
150	8.6	42
200	10.6	48
250	12.6	48
300	14.4	54
350	16.2	60
450	19.5	60
550	22.7	66
640	25.4	72

6.13 Table 3: Methods of Seeding and Mulching Truck Roads, Log Landings, Skid Trails and Stream Crossings

Options	Rate of Application	Timing of Application
Option 1. Hay or Straw Mulch with Annual Ryegrass	60 bales/acre or 1 ½ bales/1,000 square feet AND Annual ryegrass at 40 lbs./acre or 1 lb./1,000 square feet	Anytime
Option 2. Hay or Straw Mulch with Winter Rye	60 bales/acre or 1 ½ bales/1,000 square feet AND Winter rye at 112 lbs./acre or 2 ½ lbs./1,000 square feet	Anytime
Option 3. Hay or Straw Mulch with Soil Conservation Seed Mix	60 bales/acre or 1 ½ bales/1,000 square feet AND Soil Conservation Seed Mix at 42 lbs./acre or 1 lb./1,000 square feet	Anytime. Best when applied between April 15 – June 15 OR August 1 – September 15

6.14 Table 4: Minimum Forest Buffer Widths

Percent Slope of Land Between Skid Trails, Truck Roads or Log Landings and Streams or Other Waters	Width from Top of Bank (Feet Along Surface of Ground Measured Perpendicular to the Stream or Other Waters)
0-10	50
11-20	70
21-30	90
31-40*	110

*Add 20 feet for each additional 10 percent slope