

04-058
Chapter 27

MFS Rules

**Standards for Timber Harvesting and Timber
Harvesting Related Activities within Unorganized
and Deorganized Areas of the State**

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04-058
MAINE DEPARTMENT OF AGRICULTURE, CONSERVATION AND FORESTRY
DIVISION OF FORESTRY

04 DEPARTMENT OF AGRICULTURE, CONSERVATION AND FORESTRY**058 DIVISION OF FORESTRY****Chapter 27: STANDARDS FOR TIMBER HARVESTING ACTIVITIES WITHIN UNORGANIZED AND DEORGANIZED AREAS OF THE STATE**

Summary: This rule establishes the procedures for notifying the Department of Agriculture, Conservation and Forestry, Division of Forestry, of proposed timber harvesting activities and sets the standards for regulating those activities. The rule applies to all land within the unorganized and deorganized areas of the state classified by the Land Use Planning Commission as protection districts or management districts pursuant to 12 M.R.S. §685-A(1).

Section 1. Scope and Applicability

This rule applies to timber harvesting activities, the construction and maintenance of land management roads, water crossings on/for land management roads, and to gravel pits less than five acres in size in order to protect public resources, maintain safe and healthful conditions, prevent and control water pollution, and protect fish and wildlife habitat. This rule governs only lands within the unorganized and deorganized areas of the State of Maine that have been classified by the Commission as protection or management subdistricts pursuant to 12 M.R.S. §685-A(1), including those owned by state and local governmental units, nonprofit organizations, and private forest owners. It does not govern federal forest lands or tribal trust lands. Chapter 10 Sub-chapter II of the Commission's Rules and Standards describes these subdistricts and identifies the specific activities that are allowed within each one. Landowners and applicants should first identify within which subdistricts their proposed activity is located by referring to a Land Use Guidance Map of the appropriate town, plantation or township. These maps may be obtained from any of the Commission's offices.

For land within a P-RP Subdistrict, sub-areas identified in the resource or concept plan as development areas will be regulated (in regards to timber harvesting, land management roads, water crossings on/for land management roads, and gravel extraction) by the Land Use Planning Commission as Development Subdistricts. Areas not so identified will be regulated by the Maine Forest Service according to the underlying protection and/or management subdistrict. Specific standards incorporated into the resource or concept plans will continue to apply until the expiration or revision of the related plan.

Section 2. Definitions

For the purposes of 12 M.R.S., Chapter 805, sub-chapter 3-A, and for these rules, the following terms have the following meanings unless the context otherwise requires. Unless otherwise provided herein, this rule incorporates by reference the definitions contained in MFS Rule Chapter 20 (Forest Regeneration and Clearcutting Standards).

- A. **Agricultural Management Activities** mean land clearing if the land topography is not altered, tilling, fertilizing, including spreading and disposal of manure, liming, planting,

pesticide application, harvesting or cultivating crops, pasturing of livestock, minor drainage and maintenance of drainage, and other similar or related activities, but not the construction, creation or maintenance of land management roads, nor the land application of septage, sludge and other residuals and related storage and composting activities.

- B. **Areas of Special Flood Hazard** means lands in the floodplain having a one percent or greater chance of flooding in any given year, as specifically identified in a Flood Insurance Study, where available, and/or as determined on the Flood Insurance Rate Map (FIRM), Flood Hazard Boundary Map (FHBM), or the Commission's Land Use Guidance Map.
- C. **Base Flood** means a flood having a one percent chance of being equaled or exceeded in any given year, commonly called the 100-year flood.
- D. **Division** means the Maine Division of Forestry, Department of Agriculture, Conservation and Forestry, otherwise known as the Maine Forest Service.
- E. **Commission** means the Maine Land Use Planning Commission.
- F. **Critically Imperiled Natural Community (S1)** means an assemblage of plants, animals and their common environment that is extremely rare in Maine (five or fewer occurrences or very few remaining acres) or vulnerable to extirpation from the state due to some aspect of its biology. An example of an S1 community that occurs in freshwater wetlands is the Outwash Plain Pondshore community.
- G. **Cross-sectional area of a stream channel** is determined by multiplying the stream channel width by the average stream channel depth. The stream channel width is the straight line distance from the normal high water line on one side of the channel to the normal high water line on the opposite side of the channel. The average stream channel depth is the average of the vertical distances from a straight line between the normal high water lines of the stream channel to the bottom of the channel.
- H. **Development** means any land use activity or activities directed toward using, reusing or rehabilitating air space, land, water or other natural resources, excluding, however, such specific uses or classes and categories of uses which by the terms of this chapter do not require a permit.
- I. **Flood or Flooding** means:
1. A general and temporary condition of partial or complete inundation of normally dry land areas from:
 - a. The overflow of inland or tidal waters.
 - b. The unusual and rapid accumulation or runoff of surface waters from any source.
 2. The collapse or subsidence of land along the shore of a lake or other body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels or suddenly caused by an unusually high water level in a natural body of water, accompanied by a severe storm, or by an

unanticipated force of nature, such as a flash flood or an abnormal tidal surge, or by some similarly unusual and unforeseeable event which results in flooding.

- J. **Flood Boundary and Floodway Map (FBFM)** means an official map of a township, plantation or town, issued by the Federal Insurance Administrator, where the boundaries of the base flood and floodway have been designated.
- K. **Flood Elevation Study** means an examination, evaluation and determination of flood hazards and, if appropriate, corresponding water surface elevations.
- L. **Flood Hazard Boundary Map (FHBM)** means an official map of a township, plantation or town, issued by the Federal Insurance Administrator, where the boundaries of the base flood have been designated.
- M. **Flood Insurance Rate Map (FIRM)** means an official map of a township, plantation or town, on which the Federal Insurance Administrator has delineated both the special hazard areas and the risk premium zones applicable to the community.
- N. **Flood Insurance Study (FIS)**: See Flood Elevation Study.
- O. **Floodplain or Flood Prone Area** means any land susceptible to being inundated by water from any source (see Flood or Flooding).
- P. **Forest Management Activities** include timber cruising and other forest resource evaluation activities, pesticide or fertilizer application, timber stand improvement, pruning, timber harvesting and other forest harvesting, regeneration of forest stands, and other similar or associated activities, but not the construction, creation, or maintenance of land management roads.
- Q. **Forest Products** mean logs, pulpwood, veneer, boltwood, wood chips, stud wood, poles, pilings, biomass fuel wood, fuel wood or other products commonly know as forest products. It does not include Christmas trees, maple syrup, and nursery products used for ornamental purposes, wreaths, bough material, cones or other seed crops.
- R. **Gravel Extraction** means any extraction of a deposit of sand, fill or gravel pit less than five acres in size.
- S. **Gravel Pit** means a mining operation less than five acres in size undertaken primarily to extract and remove sand, fill or gravel.
- T. **Imperiled Natural Community (S2)** means an assemblage of plants, animals and their common environment that is rare in Maine (6-20 occurrences or few remaining acres) or vulnerable to further decline. Examples of S2 communities that occur in freshwater wetlands are Atlantic White Cedar Swamp, Alpine Bog-Meadow, Circumneutral Fen, Maritime Slope Bog, and Coastal Plain Pocket Swamp.
- U. **Land Management Road** means a road consisting of a bed of exposed soil or gravel constructed and used primarily for agricultural or forest management activities, but not including skid trails, skid roads, and winter haul roads.

V. **National Geodetic Vertical Datum (NGVD)**

The national vertical datum, whose standard was established in 1929, which is used by the National Flood Insurance Program (NFIP). NGVD was based upon mean sea level in 1929 and also has been called “1929 Mean Sea Level (MSL).”

W. **Normal High Water Line** means that line which is apparent from visible markings, changes in the character of soils due to prolonged action of the water or changes in vegetation, and which distinguishes between predominantly aquatic and predominantly terrestrial land. In the case of nonforested freshwater wetlands adjacent to streams and other water bodies, the normal high water line is the upland edge of the freshwater wetland, not the edge of the open water.

X. **Normal High Water Line of Tidal Waters** means that line on the shore of tidal waters reached by the shoreward limit of the rise of the medium tides between the spring and the neap, commonly referred to as the mean high water level. This line may be identified where appropriate by discerning the debris line left by tidal action.

Y. **North American Vertical Datum (NAVD)** means the national datum, established in 1988, which is the new vertical datum used by the National Flood Insurance Program (NFIP) for all new Flood Insurance Rate Maps.

Z. **Regulatory Floodway** means the channel of a river or other flowing water and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot. When not designated on the township’s, plantation’s, or town’s Flood Insurance Rate Map, Flood Boundary and Floodway Map, or Flood Hazard Boundary Map, it is considered to be the channel of a river or other flowing water and the adjacent land areas to a distance of one-half the width of the floodplain, as measured from the normal high water mark to the upland limit of the floodplain.

AA. **Responsible party** means all of the following persons or entities, jointly and severally:

1. The landowner, or landowners, who owned the property at the time a timber harvest subject to this rule was conducted;
2. The landowner’s designated agent at the time a timber harvest subject to this rule was conducted;
3. The Licensed Forester and/or the employer of the Licensed Forester who:
 - a. Signed the harvest plan for a timber harvest subject to this rule; or
 - b. Supervised a timber harvest subject to this rule; or
 - c. Certified that a timber harvest subject to this rule was conducted in accordance with a timber harvest plan required by this rule.
4. The timber harvester who conducted a timber harvest subject to this rule.

- BB. **Skid Road or Skid Trail** means a route repeatedly used by forwarding machinery or animal to haul or drag forest products from the stump to the yard or landing, the construction of which requires minimal excavation.
- CC. **Stream channel** means a channel between defined banks created by the action of surface water, which is characterized by the lack of terrestrial vegetation or by the presence of a bed, devoid of topsoil, containing waterborne deposits or exposed soil parent material or bedrock; and which is connected hydrologically with other water bodies. "Stream channel" does not include rills or gullies forming because of accelerated erosion in disturbed soils where the natural vegetative cover has been removed by human activity.
- DD. **Timber Harvesting** means the cutting or removal of timber for the primary purpose of selling or processing forest products.
- EE. **Timber Harvesting and Related Activities** means timber harvesting, the construction and maintenance of land management roads, the mining of gravel less than five acres, water crossings on/for land management roads, and other activities conducted to facilitate timber harvesting.
- FF. **Unorganized and Deorganized Areas** means "Unorganized and deorganized areas includes all unorganized and deorganized townships, plantations that have not received Commission approval under section 685-A, subsection 4 to implement their own land use controls, municipalities that have organized since 1971 but have not received Commission approval under section 685-A, subsection 4 to implement their own land use controls and all other areas of the State that are not part of an organized municipality except Indian reservations." 12 M.R.S.A. §682.
- GG. **Vegetative Clearing** means cutting, mowing, trimming, damaging, killing, or removing plants from a site.
- HH. **Violation** means the failure of an activity to be fully compliant with all applicable provisions of this rule.
- II. **Water Crossing** means any timber harvesting and related activity involving the passage of ground-based equipment from one side to the opposite side of a water body, or to an island or upland within a water body. Such activities include, but are not limited to construction of roads, fords, bridges, and culverts, as well as maintenance work on these crossings.
- JJ. **Winter Haul Road** means a route or track across frozen ground or compacted snow and ice used primarily for access to a yard or landing. It does not include a road with a gravel surface.
- KK. **Zones A, AE, A1-30, VE** mean areas identified by FEMA as areas of special flood hazard on Flood Insurance Rate Maps or Flood Hazard Boundary Maps.

Section 3. Notification Process for Landowners Intending to Conduct Timber Harvesting Activities within the Unorganized and Deorganized Areas of the State

Prior to conducting timber harvesting activities, a landowner or designated agent must notify the Division in accordance with Maine Forest Service rules, Ch 20, Section 3.

Section 4. Timber Harvesting Standards

- A. Timber harvesting requires a permit from the Division in P-MA, P-SG, P-RT, P-UA subdistricts; P-RR subdistricts established to protect a trail; P-RR subdistricts established to protect a flowing water when the timber harvesting is not in conformance with the standards for timber harvesting in P-SL1 subdistricts; water crossings of major flowing waters in P-RR subdistricts, and water crossings of all flowing waters surrounded by PRR and P-RT subdistricts established to protect such waters. In approving applications submitted to it pursuant to 12 M.R.S. §8867-D and §8867-E, the Division may impose such reasonable terms and conditions as the Division considers appropriate in order to satisfy the purpose set forth in its governing statutes and rules.
- B. Permits for timber harvesting in P-RT and P-UA subdistricts and P-RR subdistricts established to protect a trail or flowing water require review and approval by the Commission.
- C. The following requirements apply to timber harvesting within all management and protection subdistricts except as otherwise mentioned above or hereinafter provided:
1. Except when surface waters are frozen, skid trails and skid roads must not utilize stream channels bordered by a P-SL1 subdistrict except to cross such channels with a culvert or bridge according to the water crossing requirements of Section 5(C)(4) and (7)
 2. Skid trails, skid roads, and winter haul roads in P-RR subdistricts established to protect a trail or flowing water and P-RT subdistricts must follow the shortest practicable route in traversing such subdistrict and traverse such subdistrict the fewest number of times practicable.
 3. Skid trails, skid roads, and winter haul roads in P-RR subdistricts around a body of standing water must be discontinued, gated, obstructed, or otherwise made impassable to two wheel drive vehicles upon completion of timber harvesting, provided that, wherever such approval is legally required, the Maine Forest Service approves discontinuation of such road, which approval the owner must request.
 4. Timber harvesting in P-SL1, P-GP, P-GP2, and P-RR subdistricts must be conducted in the following manner:
 - a. Within 50 feet of the normal high water line, no clearcutting is allowed and harvesting operations must be conducted in such a manner that a well-distributed stand of trees is retained so as to maintain the aesthetic and recreational value and water quality of the area and to reasonably avoid sedimentation of surface waters.

- b. At distances greater than 50 feet from the normal high water line, harvesting activities may not create single openings greater than 14,000 square feet in the forest canopy. In such areas, single canopy openings of over 10,000 square feet must be no closer than 100 feet apart.
 - c. Harvesting must not remove, in any ten year period, more than 40 percent of the volume on each acre involved of trees 6 inches in diameter and larger measured at 4 ½ feet above ground level. Removal of trees less than 6 inches in diameter, measured as above, is permitted if otherwise in conformance with these regulations. For the purposes of these standards, volume may be determined as being equivalent to basal area.
 - d. No accumulation of slash must be left within 50 feet of the normal high water line of surface water protected by the P-SL1 and P-GP subdistricts. In such subdistricts, at distances greater than 50 feet from the normal high water line of such waters, all slash larger than 3 inches in diameter must be disposed of in such a manner that no part thereof extends more than 4 feet above the ground.
5. Timber harvesting in P-FW subdistricts must be conducted in the following manner:
- a. The landowner or designated agent must confer with the appropriate biologist at the Department of Inland Fisheries and Wildlife as to how the proposed activity is to occur within the P-FW subdistrict.
 - b. If a plan acceptable to the parties cannot be reached stating how the proposed activity should occur, the landowner or designated agent is required to obtain a permit from the Division. The applicant for such permit must show by a preponderance of the evidence that the proposed activity will be conducted in a manner which produces no undue adverse impact upon the resources and uses in the area;
 - c. If a plan acceptable to the parties can be reached, the landowner or designated agent must notify the Division in writing with a copy of the field investigation report by the biologist that states how and over what time period the activity is to occur. The notification letter must be signed by the person responsible for the proposed activity and the field investigation report must be signed by the biologist;
 - d. The landowner or designated agent may proceed with activity in conformity with the plan 14 days after the notification to the Division unless within such time period the Division disapproves the plan; and
 - e. The landowner or designated agent must notify the Division of completion of activity so that a follow-up field investigation may be carried out by the Division or its designee.

6. Timber harvesting in a P-RR subdistrict established to protect a flowing water must be carried out in compliance with the standards for timber harvesting in P-SL1 subdistricts as set forth in this section.
7. Except as provided in Section 4(B)(9), skid trails and other sites, where the operation of machinery used in timber harvesting results in the exposure of mineral soil, must be located such that an unscarified filter strip of at least the width indicated below is retained between the exposed mineral soil and the normal high water line of surface water areas:

Average Slope of Land Between Exposed Mineral Soil and Normal High Water Line (Percent)	Width of Strip Between Exposed Mineral Soil and Normal High Water Line (Feet Along Surface of the Ground)
0	25
10	45
20	65
30	85
40	105
50	125
60	145
70	165

Table 4-1. Unscarified filter strip width requirements for exposed mineral soil created by the operation of machinery used in timber harvesting.

The provisions of this subsection apply only on a face sloping toward the water, provided however, no portion of such exposed mineral soil on a back face shall be closer than 25 feet. The provisions of this subsection do not apply where skid roads cross such waters.

8. Timber harvesting operations must be conducted in such a manner that slash is not left below the normal high water line of a body of standing water or tidal waters, or below the normal high water line of stream channels downstream from the point where such channels drain 300 acres or more.
9. Except when surface waters are frozen, skid trails and skid roads must not utilize stream channels bordered by P-SL2 subdistricts except to cross the same by the shortest possible route. Unless culverts or bridges are installed in accordance with Section 5(C)(4) and (7), such crossings must only use channel beds which are composed of gravel, rock or a similar hard surface which would not be eroded or otherwise damaged. The requirements of this subsection may be modified according to the provisions of Section 4(B)(9).
10. Except as provided in Section 4(B)(9), skid trail and skid road approaches to stream channels must be located and designed so as to divert water runoff from the trail or road in order to prevent such runoff from directly entering the stream.

11. Timber harvesting operations in P-SL2 subdistricts along stream channels upstream from the point where they drain 300 acres or less, and in P-WL subdistricts adjacent to such P-SL2 subdistricts, may be conducted in a manner not in conformity with the requirements of the foregoing Sections 4(B)(5),(8)and (9)provided that such operations are conducted so as to avoid the occurrence of sedimentation of water in excess of 25 Jackson Turbidity Units as measurable at the point where such stream channel drains 1 square mile or more. Jackson Turbidity Units are a standard measurement of the relative amount of light that will pass through a sample of water compared with the amount of light that will pass through a reference suspension; the Jackson Turbidity Unit measurement for water without turbidity is 0;
12. Harvesting operations in P-SL2 subdistricts along stream channels downstream from the point where they drain 300 acres or more and along bodies of standing water must be conducted in such a manner that sufficient vegetation is retained to maintain shading of the surface waters; and
13. In addition to the foregoing minimum requirements, except as provided for in Section 4(B)(9), provision must be made to conduct timber harvesting operations to reasonably avoid sedimentation of surface waters.
14. In addition to the preceding standards, timber harvesting in proximity to an existing development must also comply with the applicable requirements of Chapter 10 of the Commission’s Rules and Standards, Land Use Districts and Standards, Section 10(27)(B), “Vegetation Clearing. “For purposes of this provision, “in proximity to an existing development” means the following:
 - a. For a lot developed with a single family dwelling unit with shoreline frontage on any body of standing water ten acres or greater, or a flowing water draining 50 square miles or more, the area within a rectangle measuring 200 feet along the shoreline centered on the primary structure by 250 feet perpendicular to the shoreline measured from the normal high water line of the waterbody.
 - b. For a lot developed with a single family dwelling unit with shoreline frontage on a standing body of water less than ten acres in size, or any tidal water, or flowing water draining less than 50 square miles, the area within a rectangle measuring 150 feet along the shoreline centered on the primary structure by 75 feet perpendicular to the shoreline measured from the normal high water line of the waterbody.
 - c. For a lot developed with a single family dwelling unit with road frontage on a public road, the area within a rectangle measuring 100 feet along the road right-of-way or similar boundary of the road centered on the primary structure by 50 feet perpendicular to the roadway measured from the edge of the road right-of-way.
 - d. For a commercially developed lot or lot developed with multiple structures located parallel to a water body with shoreline frontage on any body of standing water ten acres or greater, or a flowing water draining

50 square miles or more, the area within a rectangle measured from 50 feet from each end of the development along the shoreline and 250 feet perpendicular to the shoreline measured from the normal high water line.

- e. For a commercially developed lot or lot with multiple structures located parallel to a water body with shoreline frontage on a standing body of water less than ten acres in size, or any tidal water, or flowing water draining less than 50 square miles, the area within a rectangle measured from 50 feet from each end of development along the shoreline and 75 feet perpendicular to the shoreline measured from the normal high water line.
- f. For a commercially developed lot or lot developed with multiple structures located parallel to and with frontage on a public road, the area within a rectangle measured from 50 feet from each end of development along the road right-of-way or similar boundary of the road and 50 feet perpendicular to the roadway measured from the edge of the road right-of-way.

Section 5. Land Management Roads and Water Crossings

- A. Land management roads and water crossings on/for land management roads require a permit from the Division in P-AL, P-AR, P-FP, P-MA, P-RT, P-SG and P-UA subdistricts, P-RR subdistricts established to protect a body of standing water if the road is less than 1,000 feet from the normal high water line of the standing body of water, P-WL subdistricts for land management roads not in conformance with the standards of subsection 5(E)(3) of this rule, land management roads that will alter one acre or more in P-WL1 and P-WL2 subdistricts, and in FEMA zones A, AE, A1-30 and VE. In approving applications submitted to it pursuant to 12 M.R.S. §8867-D and §8867-E, the Division may impose such reasonable terms and conditions as the Division considers appropriate in order to satisfy the purpose set forth in its governing statutes and rules.
- B. Permits for land management roads and water crossings in P-RR, P-RT and P-UA subdistricts require review and approval by the Commission.
- C. Land management roads in P-RR subdistricts around a body of standing water must be discontinued, gated, obstructed, or otherwise made impassable to two wheel drive vehicles within three years of construction of the road, provided that, wherever such approval is legally required, the Maine Forest Service approves discontinuation of such road, which approval the owner must request.
- D. Water Crossings on/for land management roads require a permit from the Division in P-SL1 subdistricts and in any subdistrict when crossing a body of standing water. In approving applications submitted to it pursuant to 12 M.R.S. §8867-D and §8867-E, the Division may impose such reasonable terms and conditions as the Division considers appropriate in order to satisfy the purpose set forth in its governing statutes and rules.
- E. Permits for land management roads and water crossings in P-RR, P-RT and P-UA subdistricts require review and approval by the Commission.

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- F. The following land management road and water crossing requirements apply in P-WL1, P-WL2, P-SL1, P-SL2, P-FW, P-GP, P-GP2 and P-RR subdistricts if no permit is required above, and all management subdistricts:
1. Land management roads in P-FW subdistricts must be constructed using the following process:
 - a. A landowner or designated agent must confer with the appropriate biologist at the Department of Inland Fisheries and Wildlife as to how the proposed road will be constructed within the P-FW subdistrict.
 - b. If a plan acceptable to the parties cannot be reached stating how the proposed road should be constructed, the landowner or designated agent is required to obtain a permit from the Division. The applicant for such permit must show by a preponderance of the evidence that the proposed road will be built in a manner that produces no undue adverse impact upon the resources and uses in the area;
 - c. If a plan acceptable to the parties can be reached, the landowner or designated agent must notify the Division in writing with a copy of the field investigation report by the biologist that states how and over what time period the road will be built. The notification letter must be signed by the person responsible for the proposed activity and the field investigation report must be signed by the biologist;
 - d. The landowner or designated agent may proceed with road construction in conformity with the plan 14 days after notification to the Division unless within such time period the Division disapproves the plan; and
 - e. The landowner or designated agent must notify the Division of completion of road construction so that a follow-up field investigation may be carried out by the Division or its designee.
 2. Land management roads in a P-RR subdistrict:
 - a. Established to protect a trail must be constructed so that the road follows the shortest practicable route in traversing such subdistrict.
 - b. Established to protect a flowing water must be constructed so that the road follows the shortest practicable route in traversing such subdistrict and is built in compliance with the road standards for P-SL1 subdistricts, as set forth in Section 5(E),(3).
 3. The following requirements apply to construction and maintenance of roads:
 - a. All cut or fill banks and areas of exposed mineral soil outside the roadbed within 75 feet of a flowing water, body of standing water, tidal water, or a wetland must be revegetated or otherwise stabilized so as to prevent erosion and sedimentation of water bodies or wetlands;

- b. Road banks must have a slope no steeper than 2 horizontal feet to 1 vertical foot;
- c. Drainage ditches must be provided so as to effectively control water entering and leaving the road area. Such drainage ditches will be properly stabilized so that the potential for unreasonable erosion does not exist;
- d. In order to prevent road surface drainage from directly entering water bodies or wetlands, roads and their associated drainage ditches must be located, constructed, and maintained so as to provide an unscarified filter strip, of at least the width indicated below, between the exposed mineral soil of the road and the normal high water line of a surface water body or upland edge of a wetland:

Average Slope of Land Between Exposed Mineral Soil and Normal High Water Line (Percent)	Width of Strip Between Exposed Mineral Soil and Normal High Water Line (Feet Along Surface of the Ground)
0	25
10	45
20	65
30	85
40	105
50	125
60	145
70	165

Table 5-1. Unscarified filter strip width requirements for exposed mineral soil created by roads and their associated drainage ditches.

This requirement does not apply to road approaches to water crossings or wetlands.

- e. Drainage ditches for roads approaching a water crossing or wetland must be designed, constructed, and maintained to empty into an unscarified filter strip, of at least the width indicated in the table set forth in Section 5(E)(3)(d) above, between the outflow point of the ditch and the normal high water line of the water or the upland edge of a wetland. Where such filter strip is impracticable, appropriate techniques must be used to reasonably avoid sedimentation of the water body or wetland. Such techniques may include the installation of sump holes or settling basins, and/or the effective use of additional ditch relief culverts and ditch water turnouts placed so as to reasonably avoid sedimentation of the water body or wetland;
- f. Ditch relief (cross drainage) culverts, drainage dips and water turnouts will be installed in a manner effective in getting drainage onto

unscarified filter strips before the flow in the road or its drainage ditches gains sufficient volume or head to erode the road or ditch.

- i. Drainage dips may be used in place of ditch relief culverts only where the road grade is 10 percent or less;
- ii. On roads having slopes greater than 10 percent, ditch relief culverts must be placed across the road at approximately a 30 degree angle downslope from a line perpendicular to the center line of the road;
- iii. Ditch relief culverts, drainage dips and water turnouts must direct drainage onto unscarified filter strips as required in Section 5(E)(3)(d) and (e) above;
- iv. Ditch relief culverts must be sufficiently sized and properly installed in order to allow for effective functioning, and their inlet and outlet ends must be stabilized with appropriate materials; and
- v. Ditch relief culverts, drainage dips and associated water turnouts must be spaced along the road at intervals no greater than indicated in the following table. Spacing between ditch relief culverts, drainage dips and associated water turnouts decreases with increasing slope. For example, the spacing for 0% grade is 500 feet; the spacing for 2% grade is 300 feet.

Road Grade (Percent)	Spacing (Feet)
0-2	500-300
3-5	250-180
6-10	167-140
11-15	136-127
16-20	125-120
21+	100

Table 5-2. Spacing requirements for drainage dips and associated water turnouts.

4. The following requirements apply to water crossings when surface waters are unfrozen:
 - a. Bridges and culverts must be installed and maintained to provide an opening sufficient in size and structure to accommodate 10 year frequency water flows or with a cross-sectional area at least equal to 2 ½ times the cross-sectional area of the stream channel.
 - b. Culvert and bridge sizes may be smaller than provided in Section 5(E)(4)(a) if techniques are employed such that in the event of culvert or

bridge failure, the natural course of water flow is reasonably maintained and sedimentation of the water body is reasonably avoided; such techniques may include, but are not limited to, the effective use of any or all of the following:

- i. Removing culverts prior to the onset of frozen ground conditions;
 - ii. Using water bars in conjunction with culverts; or
 - iii. Using road dips in conjunction with culverts.
- c. Culverts utilized in water crossings must:
- i. Be installed at or below stream bed elevation;
 - ii. Be seated on firm ground;
 - iii. Have soil compacted at least halfway up the side of the culvert;
 - iv. Be covered by soil to a minimum depth of 1 foot or according to the culvert manufacturer's specifications, whichever is greater; and
 - v. Have a headwall at the inlet end which is adequately stabilized by rip-rap or other suitable means to reasonably avoid erosion of material around the culvert.

5. The design and construction of land management road systems through wetlands, other than those areas below the normal high water line of standing or flowing waters, must avoid wetlands unless there are no reasonable alternatives, and must maintain the existing hydrology of wetlands.

To maintain the existing hydrology of wetlands, road drainage designs must provide cross drainage of the water on the surface and in the top 12 inches of soil in wetlands during both flooded and low water conditions so as to neither create permanent changes in wetland water levels nor alter wetland drainage patterns. This must be accomplished through the incorporation of culverts or porous layers at appropriate levels in the road fill to pass water at its normal level through the road corridor. Where culverts or other cross-drainage structures are not used, all fills must consist of free draining granular material. To accomplish the above, the following requirements apply:

- a. Road construction on mineral soils or those with surface organic layers up to 4 feet in thickness.
 - i. Fill may be placed directly on the organic surface compressing or displacing the organic material until equilibrium is reached. With this method, culverts or other cross-drainage structures are used instead of porous layers to move surface and subsurface flows through the road fill material.

1. For road construction on mineral soils or those with surface organic layers less than 16 inches in thickness, culverts or other cross-drainage structures must be appropriately sized and placed at each end of each wetland crossing and at the lowest elevation on the road centerline with additional culverts at intermediate low points as necessary to provide adequate cross drainage. Culverts or other cross-drainage structures must be placed at maximum intervals of 300 feet.
 2. For road construction on surface organic layers in excess of 16 inches but less than 4 feet in thickness, cross drainage must be provided by placing culverts at each end of each wetland crossing and at the lowest elevation on the road centerline with additional culverts at intermediate low points as necessary to provide adequate cross drainage. Culverts or other cross-drainage structures must be placed at maximum 300-foot intervals. Culverts must be a minimum of 24 inches in diameter, or the functional equivalent, and buried halfway below the soil surface.
 3. Where necessary to maintain existing water flows and levels in wetlands, ditches parallel to the road centerline must be constructed along the toe of the fill to collect surface and subsurface water, carry it through the culvert(s) and redistribute it on the other side. Unditched breaks must be left midway between culverts to prevent channelization.
 - ii. Alternatively, a porous layer may be created to move surface and subsurface flows through the road fill materials. If a porous layer is used, geotextile fabric must be placed above and below fill material to increase the bearing strength of the road and to preserve the bearing strength of fill material by preventing contamination with fine soil particles.
- b. Road construction on soils with organic layers in excess of 4 feet in thickness.
- i. Such construction must only take place under frozen ground conditions.
 - ii. Geotextile fabric must be placed directly on the soil surface. Road fill or log corduroy must then be placed on the geotextile fabric.
 - iii. Cross drainage must be provided by either a continuous porous layer or appropriate placement of culverts or other cross-drainage structures and ditching as specified below:

1. A continuous porous layer or layers must be constructed by placement of one or more layers of wood corduroy and/or large stone or chunk wood separated from adjacent fill layers by geotextile fabric placed above and below the porous layer(s) such that continuous cross drainage is provided in the top 12 inches of the organic layer; or
 2. Cross drainage culverts or other cross-drainage structures must be placed at points where they will receive the greatest support. Culverts or other cross-drainage structures must be a minimum of 24 inches in diameter, or the functional equivalent, and buried halfway below the soil surface. Where necessary to maintain existing water flows and levels in wetlands, ditches parallel to the roadbed on both sides must be used to collect surface and subsurface water, carry it through the culvert(s) and redistribute it on the other side. Such ditches must be located three times the depth of the organic layer from the edge of the road fill. Unditched breaks must be left midway between culverts to prevent channelization.
6. Ditches, culverts, bridges, dips, water turnouts and other water control installations associated with roads must be maintained on a regular basis to assure effective functioning.
7. Maintenance of the above required water control installations must continue until the road is discontinued and put to bed by taking the following actions:
- a. Water bars must:
 - i. Be constructed and maintained across the road at intervals established below. Spacing between water bars decreases with increasing slope. For example, the spacing for 3% grade is 200 feet; the spacing for 5% grade is 135 feet.

Road Grade (Percent)	Distance Between Water Bars (Feet)
0-2	250
3-5	200-135
6-10	100-80
11-15	80-60
16-20	60-45
21+	40

Table 5-3. Spacing requirements for water bars.

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- ii. Be constructed at approximately 30 degrees downslope from the line perpendicular to the centerline of the road;
 - iii. Be constructed so as to reasonably avoid surface water flowing over or under the water bar; and
 - iv. Extend sufficient distance beyond the traveled way so that water does not reenter the road surface.
 - b. Any bridge or water crossing culvert in such road must satisfy one of the following requirements:
 - i. It must be designed to provide an opening sufficient in size and structure to accommodate 25 year frequency water flows;
 - ii. It must be designed to provide an opening with a cross-sectional area at least 3 ½ times the cross-sectional area of the stream channel; or
 - iii. It must be dismantled and removed in a fashion so as to reasonably avoid sedimentation of the water body.
 8. Provided they are properly applied and used for circumstances for which they are designed, methods including but not limited to the following are acceptable to the Divisions means of calculating the 10 and 25 year frequency water flows and thereby determining crossing sizes as required in Section 5(E)(4)and (7):
 - a. The USDA Natural Resources Conservation Service (SCS) Methods; specifically: "Urban Hydrology for Small Watersheds," June 1986 Natural Resources Conservation Service Technical Release #55.
 - b. The United States Geological Survey Series; specifically U.S.G.S. Maine Water Science Office. 1999. "Estimating the Magnitude of Peak Flows for Streams in Maine for Selected Recurrence Intervals." WRI 99-4008.
 9. In addition to the foregoing minimum requirements, provision must be made in the construction and maintenance of land management roads and water crossings in order to reasonably avoid sedimentation of surface waters.
 10. Roads and water crossings, including presently existing roads, not in conformance with the standards of this section, may be allowed upon issuance of a permit by the Division provided that such types of activities are allowed in the subdistrict involved. An applicant for such permit must show by a preponderance of the evidence that the proposed activity, which is not in conformance with the standards of this section, will be conducted in a manner that produces no undue adverse impact upon the resources and uses in the area.

Section 6. Gravel Extraction Less than Five Acres in Size

- A. Gravel pits in P-AL, P-AR, P-FP, P-FW, P-GP, P-GP2, P-SG and P-UA subdistricts, P-RR and P-RT subdistricts except those in conformance with Section 6(B)(6) below, and FEMA zones A, AE, A1-30 and VE require a permit from the Division. Unless otherwise indicated, pits may not exceed five acres in size. Gravel pits must not exceed one acre in size in P-FW and P-WL subdistricts. Gravel pits must not exceed two acres in size in P-GP2 subdistricts. Gravel pits between two acres and five acres in size require a permit from the Division in P-SL subdistricts. Gravel pits are not permitted in other protection subdistricts. In approving applications submitted to it pursuant to 12 M.R.S. §8867-D and §8867-E, the Division may impose such reasonable terms and conditions as the Division considers appropriate in order to satisfy the purpose set forth in its governing statutes and rules. Permits for gravel pits less than five acres in size in P-RR, P-RT and P-UA subdistricts require review and approval by the Commission.
- B. The following requirements apply to gravel extraction from pits less than five acres in size in a P-RR subdistrict established to protect a flowing water, gravel extraction from pits less than two acres in size in a P-SL subdistrict and all management subdistricts except as otherwise hereinafter provided:
1. A vegetative buffer strip must be retained between the ground area disturbed by the extraction activity and:
 - a. 75 feet of the normal high water line of any body of standing water less than ten acres in size, any flowing water draining less than 50 square miles, tidal water, or wetland identified as a P-WL1 subdistrict; and
 - b. 100 feet of the normal high water line of any body of standing water ten acres or greater in size or flowing water draining 50 square miles or more.
 2. No portion of any ground area disturbed by the extraction activity shall be closer than 250 feet from any public roadway, or 250 feet from any property line in the absence of the prior written agreement of the owner of such property.
 3. Within 250 feet of any water body the extraction area must be protected from soil erosion by ditches, sedimentation basins, dikes, dams, or such other control devices which are effective in preventing sediments from being eroded or deposited into such water body.

Any such control device must be deemed part of the extraction area for the purposes of Section 6(B)(1) above;
 4. A natural vegetative screen of not less than 50 feet in width must be retained from any facility intended primarily for public use, excluding privately owned roads; and
 5. If any gravel extraction operation located within 250 feet of any property line or public roadway or facility intended primarily for public use, excluding privately owned roads, is to be terminated or suspended for a period of one year or more, the site must be rehabilitated by grading the soil to a slope of 2 horizontal feet to 1 vertical foot, or flatter.

6. In addition to the forgoing requirements, gravel extraction for road purposes in P-RR and P-RT subdistricts established to protect flowing waters must:
 - a. Not be visible from the flowing water which the P-RR or P-RT subdistrict was established to protect;
 - b. Avoid use of the P-RR or P-RT subdistrict, except where necessary to provide gravel for local management operations where alternative sources are unavailable or impractical; and
 - c. Not exceed two acres in size.
 7. In addition to the forgoing requirements, gravel extraction for road purposes in P-AL subdistricts must:
 - a. Not be visible from the body of standing water which the P-AL subdistrict was established to protect; and
 - b. Avoid use of the P-AL subdistrict, except where necessary to provide gravel for local management operations where alternative sources are unavailable or impractical.
- C. The following requirements apply to gravel extraction for road purposes in P-FW subdistricts:
1. A landowner or designated agent must confer with the appropriate biologist of the Department of Inland Fisheries and Wildlife for the purpose of developing a plan as to how the proposed activity is to occur within the P-FW subdistrict and within what time period;
 2. If a plan acceptable to the parties cannot be reached stating how the proposed activity should occur, the landowner or designated agent is required to obtain a permit from the Division;
 3. If a plan acceptable to the parties can be reached, the landowner or designated agent must submit a copy of the agreed-upon plan, signed by both parties, to the Division;
 4. The landowner or designated agent may proceed with the activity in conformity with the plan 14 days following receipt of the plan by the Division unless, within such time period, the Division disapproves the plan; and
 5. The landowner or designated agent must notify the Division of completion of the activity so that a follow-up field investigation may be carried out by the Division or its designee.

Gravel extraction for road purposes from pitiless than five acres in size that are not in conformance with the standards of this section may be allowed upon issuance of a permit from the Division, provided that such type of activity is allowed in the subdistrict involved. An applicant for such permit must show by a preponderance of the evidence

that the proposed activity, which is not in conformance with the standards of this section, will be conducted in a manner that produces no undue adverse impact upon the resources and uses in the area.

Section 7. Timber Harvesting and Timber Harvesting Related Activities Located in Areas of Special Flood Hazard

- A. Areas identified by FEMA as areas of special flood hazard (Zones A, AE, A1-30 and VE) on Flood Insurance Rate Maps, Flood Hazard Boundary Maps, Flood Boundary and Floodway Maps or in Flood Insurance Studies in the unorganized areas of the state are hereby adopted by reference and declared to be part of this rule. In any case where the boundaries of a P-FP subdistrict on the official Land Use Planning Commission Map differs from the boundaries of the FEMA zones, the FEMA boundaries shall apply.

Title	Community/County ID# and/or Map Panel #	Effective Date
FIRM, FIS	Andrews Island, Maine, Knox County* 230967	02/23/2001
FIRM	Township of Argyle, ME, Penobscot County 230464A	09/18/1985
	<i>(See FIRM, FIS, Town of Greenbush, 230107, for Penobscot R. BFE*) 09/04/1987</i>	
FIRM, FIS	Baring Plantation, Maine, Washington County* 230468	03/15/1982
FIRM	Town of Benedicta, ME, Aroostook County 230420A	09/18/1985
FIRM	Town of Bristol, Maine, Lincoln County, and Unincorporated Islands* 230215	01/04/2002
FIRM	Township of Brookton, ME, Washington County 230470A	11/01/1985
FIRM	Plantation of Carroll, ME, Penobscot County 230461A	08/19/1985
FIRM,	Cary Plantation, ME, Aroostook County 230441A	02/01/1985
FIRM	Township of Concord, ME, Somerset County 230466A	02/01/1985
FIRM	Township of Connor, ME, Aroostook County 230451A	01/17/1985
FIRM	Plantation of Cyr, ME, Aroostook County 230443A	08/19/1985
FIRM	Township of Dallas Plantation, Maine, Franklin County* 230455	02/23/2000
FIRM	Township of Edmunds, ME, Washington County 230471A	08/19/1985
FIRM	Township of Freeman, ME, Franklin County 230457A	09/18/1985
FIRM	Plantation of Garfield, ME, Aroostook County 230444A	08/19/1985
FIRM	Grand Lake Stream Plantation, ME, Washington County 230469A	08/05/1985
FIA	Flood Hazard Boundary Map, Town of Greenfield, ME, Penobscot County 230388	02/21/1975
FIRM	Town of Hamlin, ME, Aroostook County 230445A	08/05/1985
FIRM	Township of Kingman, ME, Penobscot County 230474A	01/17/1985
FIRM,	Township of Lambert Lake T01 R03 TS, ME, Washington County 230472A	01/17/1985
FIRM	Plantation of Macwahoc, ME, Aroostook County 230446A	09/18/1985
FIRM	Town of Madrid, ME, Franklin County 230350A	08/19/1985
FIRM/FIS	Oxford County, Maine, (All Jurisdictions) <i>Milton Township</i> 23017C, Panels 0832D, 0833D, 0834D, 0845D, 0851D, 0852D, 0855D, 0856D, 0860D, 0865D	07/07/2009
FIRM	Plantation of Mt. Chase, ME, Penobscot County 230462A	09/18/1985
FIRM	Township of Orneville, ME, Piscataquis County 230465A	4/17/1987
FIRM	Plantation of Pleasant Ridge, ME, Somerset County 230367A	11/01/1985
FIRM	Plantation of Prentiss, ME, Penobscot County 230463A	08/19/1985
FIRM	Township of Rockwood Strip, ME, Somerset County 230467A	12/01/1987
FIRM	Plantation of St. John, ME, Aroostook County 230448A	09/27/1985
FIRM	Township of Silver Ridge, ME, Aroostook County 230452A	09/04/1985
FIRM	Township of T08-SD, ME, Hancock County (Fletcher's Landing) 230458A	10/01/1986
	<i>(See FIRM, FIS, Town of Ellsworth, 230066, for Graham L. BFE*) 11/04/1988</i>	
FIRM	Township of T17-R4 WELS, ME, Aroostook County (Sinclair Twp.) 230453A	10/01/1986

FIRM	Township of T17 R5 WELS, ME, Aroostook County (Cross Lake Twp.) 230454A	05/19/1987
FIRM	Township of Trescott, Maine, Washington County* 230473 (See FIRM, FIS, Town of Lubec, 230139, for bay and cove BFE*) 04/15/1992	02/08/1999
FIRM FIS	Kennebec County, Maine, (All Jurisdictions) Unity Township 230602 Panels 23011C0064D, 23011C0202D, 23011C0204D, 23011C0210D	06/16/2011
FIRM	Plantation of Winterville, ME, Aroostook County 230450A	11/01/1985

Notes: BFE – Base Flood Elevation FIS – Flood Insurance Study FIA – Federal Insurance Administration FIRM – Flood Insurance Rate Map

* – Indicates BFE data is available

- B. Land management roads, water crossings and gravel extraction from pits less than five acres in size located in P-FP subdistricts and FEMA zones A, AE, A1-30 and VE require a permit from the Division.

The Division must:

1. Review all permit applications to assure that proposed developments are reasonably safe from flooding and to determine that all pertinent development standards will be met;
2. Determine that all necessary permits have been obtained from those federal, state and local government agencies from which prior approval is required by federal or state law, including but not limited to Section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. §1344;
3. Notify adjacent communities, the Department of Environmental Protection and the Maine Floodplain Management Program at the Department of Agriculture, Agriculture, Conservation and Forestry and Forestry prior to any alteration or relocation of a water course and submit copies of such notifications to the Federal Emergency Management Agency;
4. Maintain as a permanent record, copies of all flood hazard development permit applications, corresponding permits issued and all data relevant thereto; and
5. Require an emergency action plan to remove any equipment or materials from the site before a potential flooding event.

- C. **Development in Flood Prone Areas.** Development in flood prone areas, including areas of special flood hazard, must:

1. Be designed or modified and adequately anchored to prevent flotation, collapse or lateral movement resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy;
2. Use construction materials that are resistant to flood damage; and
3. Use construction methods and practices that will minimize flood damage.

- D. **Watercourse Carrying Capacity.** All development associated with altered or relocated portions of a watercourse must be constructed and maintained in such a manner that no reduction occurs in the flood carrying capacity of the watercourse.
- E. **Development in Floodways**
1. In Zones A1-30 and AE adjacent to areas of flowing water, encroachments, including fill, construction, and other development shall not be permitted within a regulatory floodway which is designated on the township's, plantation's, or town's "Flood Insurance Rate Map" or "Flood Boundary and Floodway Map," unless a technical evaluation certified by a registered professional engineer is provided demonstrating that such encroachments will not result in any increase in flood levels during the occurrence of the base flood discharge.
 2. In Zones A1-30, AE, and A adjacent to areas of flowing water, for which no regulatory floodway is designated, encroachments, including fill, construction, and other development shall not be permitted in the floodway unless a technical evaluation certified by a registered professional engineer is provided demonstrating that the cumulative effect of the proposed development, when combined with all other existing development and anticipated development:
 - a. Will not increase the surface elevation of the base flood more than one foot at any point within the township, plantation, or town; and,
 - b. Is consistent with the technical criteria contained in Chapter 5 entitled "Hydraulic Analyses," Flood Insurance Study – Guidelines and Specifications for Study Contractors, (FEMA 37/ January 1995, as amended).
 3. In Zones A1-30, AE, and A adjacent to areas of flowing water for which no regulatory floodway is designated, the regulatory floodway is determined to be the channel of the river or other flowing water and the adjacent land areas to a distance of one-half the width of the floodplain as measured from the normal high water line to the upland limit of the floodplain.
- F. **Coastal Floodplains.** The use of fill in Zone VE is prohibited. Human alteration of sand dunes within Zone VE is prohibited unless it can be demonstrated that such alterations will not increase potential flood damage.
- G. **Bridges.** Any bridge or bridge improvement other than normal maintenance and repair must be designed such that:
1. When possible, the lowest horizontal member (excluding the pilings, or columns) is elevated to at least one foot above the base flood elevation; and
 2. A registered professional engineer must certify that:
 - a. The structural design and methods of construction meet the elevation requirements set forth in Section 7(G)(1) and the floodway standards set forth in Section 7(C) and (E); and

- b. The foundation and superstructure attached thereto are designed to resist flotation, collapse and lateral movement due to the effects of wind and water loads acting simultaneously on all structural components. Water loading values used must be those associated with the base flood.

Section 9. Responsibility

All responsible parties may be jointly and severally responsible for compliance with this rule and liable for violations of this rule.

Section 10. Variance

- A. A variance to the strict applications of these rules may be granted as specified in MFS Rule Chapter 20 (Forest Regeneration and Clearcutting Standards, Section 6) for activities in all subdistrict except P-FP.
- B. For activities located in P-FP subdistricts, the Division may grant a variance from the requirements of this rule consistent with state law and the following:
 1. Variances shall not be granted within any designated regulatory floodway if any increase in flood levels during the base flood discharge would result.
 2. Variances shall be granted only upon:
 - a. A showing of good and sufficient cause;
 - b. A determination that should a flood comparable to the base flood occur, the granting of a variance will not result in increased flood heights, additional threats to public safety, public expense or create nuisances, cause fraud or victimization of the public or conflict with existing local laws or ordinances;
 - c. A showing that the issuance of the variance will not conflict with other federal, state or local laws or ordinances; and
 - d. A determination that failure to grant the variance would result in undue hardship which in this subsection means:
 - i. That the land in question cannot yield a reasonable return unless a variance is granted;
 - ii. That the need for a variance is due to the unique circumstances of the property and not to the general conditions in the vicinity;
 - iii. That the granting of a variance will not alter the essential character of the locality; and
 - iv. That the hardship is not the result of action taken by the applicant or a prior owner.

3. Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, and to afford relief. The Division may impose conditions to a variance that it deems necessary.

Section 11. Violations

Any responsible party involved in any activity in violation of this rule commits a civil violation and shall be penalized in accordance with 12 M.R.S., chapter 809, and any other applicable laws.

Section 12. Appeals

Persons aggrieved by final actions of the Division, including any final decision of the Division with respect to any application for permit approval, may appeal therefrom in accordance with Title 5, chapter 375, subchapter 7.

Section 13. Severability

If any section of this rule is declared invalid by the courts, such decision shall not invalidate any other section or provision of this rule.

Section 14. Abrogation

This rule shall not in any way impair or remove the necessity of compliance with any other applicable laws, ordinances or regulations. Where this rule imposes a greater restriction, the provisions of this rule shall control.

Section 15. Effective Date

The effective date of this rule is March 3, 2013

STATUTORY AUTHORITY: 12 M.R.S. §§ 8867-D and 8867-E

EFFECTIVE DATE:

March 3, 2013 – filing 2013-044