

# Appendix B

## Best Management Practices

### Introduction

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Federal agency compliance with pollution control is addressed through Section 313 of the Clean Water Act, Executive Order 12580 (January 23, 1987), National Nonpoint Source Policy (December 12, 1984), USDA Nonpoint Source Water Quality Policy (December 5, 1986) and the Environmental Protection Agency in their guidance "Nonpoint Source Controls and Water Quality Standards" (August 19, 1987). In order to comply with State and local non-point pollution controls the Forest Service will apply Best Management Practices (BMPs) to all possible non-point sources resulting from management activities proposed in this Environmental Assessment. These BMPs are the Soil and Water Conservation Practices described in the FSH 2509.22.

BMPs are the primary mechanism for achievement of water quality standards (EPA, 1987). This appendix describes the Forest Service's BMP process in detail, and lists the key Soil and Water Conservation Practices that have been selected to be used in the action alternatives analyzed in this EA.

BMPs include, but are not limited to, structural, and non-structural controls, operations, and maintenance procedures. BMPs can be applied before, during, or after pollution-producing activities to reduce or eliminate the introduction of pollutants into the receiving watershed (40 CFR 130.2, EPA Water Quality Standards Regulation). BMPs are usually applied as a system of practices rather than a single practice. They are selected on the basis of site-specific conditions that reflect natural background conditions and political, social, economic, and technical feasibility.

The Flathead National Forest emphasizes the application of BMPs "to protect or improve the quality of the water resource" (Forest Plan, page II-40). Practices compiled from the Flathead Drainage 208 Project (May 1980), Flathead National Forest Hydrologic Guidelines (1980), and other sources are listed in the Water and Soils Sections of Chapter II, Forest-Wide Standards portion of the Flathead Forest Plan (pp. II-40 thru II-46). Additional BMPs are listed with the descriptions of individual management areas and in Appendix Q, Landtype Guidelines (pp. Q-1 through Q-9). The Water Standards section further states that "Water quality) limits listed in the State Water Quality Standards are coordinated with BMPs" (p. II-40).

### Road Maintenance Associated with the Porter Mount Project

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As summarized on the following table, road maintenance (application BMPs) would occur on **61.46 miles** of specified road used for haul of commercial products.

**TABLE B-1  
 ROAD MAINTENANCE ASSOCIATED WITH THE  
 PORTER MOUNT MANAGEMENT PROJECT**

Road Number	Miles
FDR #213	2.83
FDR #1644	2.07
FDR #1644A	0.29
FDR #1645	3.03
FDR #1645B	0.47
FDR #2945	0.8
FDR #2983	1.64
FDR #2984	8.19
FDR #2986	1.5
FDR #2986A	0.23
FDR #2987	7.48
FDR #5369	1.69
FDR #5370	2.31
FDR #5371	0.28
FDR #5373	4.0
FDR #5380	0.93
FDR #5386	4.4

**TABLE B-1  
 ROAD MAINTENANCE ASSOCIATED WITH THE  
 PORTER MOUNT MANAGEMENT PROJECT**

Road Number	Miles
FDR #9510	0.36
FDR #9659	1.1
FDR #9660	0.35
FDR #9661	0.5
FDR #9662	6.16
FDR #9663	1.19
FDR #9669	1.61
FDR #9669A	0.47
FDR #9673	1.1
FDR #9673A	0.16
FDR #9674	0.77
FDR #10501	1.16
FDR #10703	2.18
FDR #10704	2.21
<b>Total BMPs</b>	<b>61.46</b>

### State Requirements for Protection of Water Quality

Montana State Water Quality Standards require the use of reasonable land, soil, and water conservation practices (similar to BMPs) as the controlling mechanism for non-point pollution. The use of BMPs is also required in the Memorandum of Understanding between the Forest Service and the State of Montana as part of the agency's responsibility as the designated water quality management agency on NFS lands.

### BMP Implementation Process

In cooperation with the State, the Forest Service's primary strategy for the control of non-point sources of pollution is based on the implementation of preventive practices (i.e., BMPs). The BMPs have been designed and selected to protect the identified beneficial uses of the watershed.

The Forest Service non-point source management system consists of the following steps:

1. **BMP Selection and Design** - Water quality goals are identified in the Forest Plan. These goals meet or exceed applicable legal requirements including State water quality regulations, the Clean Water Act, and the NEPA. Environmental assessments for projects are tiered to Forest Plans using the NEPA process. The appropriate BMPs are selected for each project by an ID Team. In each new location, there is flexibility to design different BMPs depending on local conditions and values and downstream beneficial uses of water. The BMP selection and design are dictated by the proposed activity, water quality objectives, soils, topography, geology, vegetation, and climate. Environmental impacts and water quality protection options are evaluated, and alternative mixes of practices are considered. A final collection of practices is selected that not only protect water quality but meet other resource needs. These final selected practices constitute the BMPs for the project.
2. **BMP Application** - The BMPs are translated into contract provisions, special use permit requirements, project plan specifications, and so forth. This ensures that the operator or

person responsible for applying the BMPs actually is required to do so. Site-specific BMP prescriptions are taken from plan-to-ground by a combination of project layout and Resource Specialists (hydrology, fisheries, soils, etc.). This is when final adjustments to fit BMP prescriptions to the site are made.

3. BMP Monitoring - When the resource activity begins (e.g., timber harvest or road building), Timber Sale Administrators, Engineering Representatives, Resource Specialists, and others ensure the BMPs are implemented according to plan. BMP implementation monitoring is done before, during, and after resource activity implementation. This monitoring answers the question: Did we do what we said we were going to do? Once BMPs have been implemented, further monitoring is done to evaluate if the BMPs are effective in meeting management objectives and protecting beneficial uses. If monitoring indicates that water quality standards are not being met or beneficial uses are not being protected, corrective action will consider the following:
  - a. Is the BMP technically sound? Is it really best or is there a better practice that is technically sound and feasible to implement?
  - b. Was the BMP applied entirely as designated? Was it only partially implemented? Were personnel, equipment, funds, or training lacking which resulted in inadequate or incomplete implementation?
  - c. Do the parameters and criteria that constitute water quality standards adequately reflect human-induced changes to water quality and beneficial uses?
4. Feedback - Feedback on the results of BMP evaluation is both short and long term in nature. Where corrective action is needed, immediate response will be undertaken. This action may include: modification of the BMP, modification of the activity, ceasing the activity, or possibly modification of the State Water Quality Standard. Cumulative effects over the long-term may also lead to the need for possible corrective actions. Effectiveness of BMPs is based on audit results. Audit results specific to the Swan Lake Ranger District of the Flathead National Forest are on file at the District Office.

## **Best Management Practice Effectiveness**

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In looking at the effectiveness of BMPs for the Flathead National Forest, it is reasonable to group BMP audit results for the Kootenai and Flathead Forests together since they have similar soils. Both Forests are dominated by soils formed in the glacial till formed in material weathered from Belt rocks. This material is topped with wind blown volcanic ash from west coast eruptions up to 6000 years ago.

BMP audits have occurred on the Flathead National Forest and Kootenai National Forest since 1988. Audits are done to determine if BMPs were properly applied and, if so, if they were effective at maintaining soil and water quality. Since 1988, individual BMPs have been audited or monitored 2,232 times on the Flathead and Kootenai National Forests. They were effective 2,211 times.

In order to analyze the results of the BMP audits, they were grouped according to the soil type on which they occurred. The simplest way is to group them by two classes:

1. Residual soils that formed from the underlying bedrock, or
2. Soils formed from glacial till.

Looking at these soil criteria, BMPs were effective when properly applied on glacial soils 1,585 times out of 1,596 applications. BMPs were effective when properly applied on residual soils 154 out of 156 applications. An additional 480 BMPs were monitored without reference to the soil types on which they are applied. Of these, 472 were effective at protecting soil and water quality.

In summary, BMPs were effective 99.3 percent of the time they were properly applied on glacial till soils. Lumping all the audit results together regardless of their soil types and including the earliest audits that were not specific to soil type, BMPs were effective 99 percent of the time they were properly applied on the Flathead and Kootenai National Forests.

## **Items Common to All Soil and Water Conservation Practices**

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### **Responsibility for Implementation**

The Swan Lake District Ranger is responsible for ensuring that all applicable SWCPs are applied and implemented. The Timber Management Assistant is responsible for ensuring that the objectives of the SWCPs identified in this appendix are incorporated into the Timber Sale Contract by use of the appropriate Timber Sale Contract CT provisions. The Timber Sale Administrator and Engineering Representative/Contracting Officer's Representative (ER/COR) is responsible for ensuring that contract provisions are properly administered on the ground.

### **Monitoring**

The Timber Sale Administrator, ER/COR, Forest Soil Scientist, and Forest Hydrologist as needed, will monitor the effectiveness of the applied SWCPs. If the practice is not effective in meeting State or Forest Plan standards, the practice or project activity will be redesigned, rescheduled, or dropped. Feedback of the results of the site-specific SWCP monitoring to the Forest Soil Scientist will ensure that the best practices are incorporated into all projects impacting water quality. This requirement conforms to the objectives of Practice 11.02 - Soil and Water Resource Monitoring and Evaluation.

**SITE-SPECIFIC BEST MANAGEMENT PRACTICES**

Description of the soil and water conservation practices from the Forest Service Soil and Water Conservation Handbook (FSH 2509.22) will be applied in all alternatives. The location where the practices will be applied is specified in the table below. For a more detailed description of a specific BMP, refer to the Soil and Water Conservation Handbook.

**Abbreviations used in this table:**

- SPS = Special Project Specification
- TSC = Timber Sale Contract
- TSA = Timber Sale Administrator
- SMZ = Streamside Management Zone
- IDT = Interdisciplinary Team
- SWCP = Soil and Water Conservation Practice
- RHCA = Riparian Habitat Conservation Area
- INFS = Inland Native Fish Strategy
- FNF = Flathead National Forest
- PSF = Pre Sale Forester
- ER = Engineering Representative
- COR = Contracting Officer's Representative
- SAM = Sale Area Map
- FMO = Fire Management Officer
- EA = Environmental Assessment

SWCP	MT BMP	SWCP OBJECTIVE	APPLICABLE UNITS/ROADS	RECOMMENDED BEST MANAGEMENT PRACTICES BY IDT/TSA	CONSIDERATIONS FOR BEST MANAGEMENT PRACTICES	PERSON(S) RESPONSIBLE	STANDARD CONTRACT PROVISIONS	STEWARDSHIP CONTRACT PROVISIONS
14.01	IV. A-C	TIMBER SALE PLANNING - To incorporate soil and water resource considerations into Timber Sale Planning	All Activities	<ol style="list-style-type: none"> <li>1. Unit design, mitigation, and effects analysis was done by IDT.</li> <li>2. TSC will be prepared by PSF that will include management constraints and Design Criteria from EA.</li> <li>3. Use standard interim RHCA widths unless modified through watershed analysis.</li> <li>4. Use exiting skid trails where feasible.</li> </ol>	IDT has evaluated watershed characteristics and estimated response to proposed activities. EA identifies Design Criteria to protect soil and water resources. Timber sale contracts will include provisions to meet water quality, soils, and other resources as directed by the Decision.	IDT, PSF	N/A	N/A

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14.02	IV. A	TIMBER HARVEST UNIT DESIGN - To insure that timber harvest unit design will secure favorable conditions of water flow, maintain water quality and soil productivity, and reduce soil erosion and sedimentation.	All Activities	<ol style="list-style-type: none"> <li>Cumulative effects analysis and unit design were performed by IDT.</li> <li>The prescriptions and unit design are consistent with direction outlined in the considerations for Best Management Practices.</li> <li>Use standard interim RHCA widths unless modified through watershed analysis.</li> <li>Use exiting skid trails where feasible.</li> </ol>	Proposed activities were evaluated to estimate the potential watershed response. Prescriptions will be designed to assure an acceptable level of protection for soil and water resources. Management will protect soil/water values by avoiding sensitive areas, adjusting unit boundaries, adding specific BMPs to meet specific SWCPs, applying mitigation, and applying implementation/effectiveness monitoring.	IDT	N/A	N/A
14.03	N/A	USE OF SALE AREA MAPS (SAMs) FOR DESIGNATING SOIL AND WATER PROTECTION NEEDS - To delineate the location of protected areas and available water sources and insure their recognition, proper consideration, and protection on the ground.	All Activities	<ol style="list-style-type: none"> <li>Water courses identified and protected using SMZ buffers as a minimum.</li> <li>Skidding on soil when moisture is &lt;18%.</li> <li>Use designated skid trails agreed to by TSA.</li> <li>Use standard interim RHCA widths unless modified through watershed analysis.</li> </ol>	The IDT will identify water courses to be protected, unit boundaries, and other features. Ground verification and preparation of SAMs to be included in TSC will be done by PSF. TSA reviews areas of concern with purchaser before operations.	IDT, PSF, TSA	B(T)1.1 B(T)6.5 C(T)6.50# C(T)6.4#	B.1 G.5 K-G.5.0# K-G.4#
14.04	IV. A-2, B-1,2 VI. A	LIMITING THE OPERATION PERIOD OF TIMBER SALE ACTIVITIES - To minimize soil erosion, sedimentation, and a loss in soil productivity by insuring that the purchaser conducts his/her operations in a timely manner.	All Activities	<ol style="list-style-type: none"> <li>Units located on soils sensitive to compaction and/or displacement have been identified.</li> <li>Designate units needing harvest on frozen or snow covered ground.</li> <li>All other ground disturbing activities will occur during dry, frozen, or snow-covered conditions.</li> </ol>	If limited operating periods are identified and recommended during the analysis by the IDT, the PSF will prepare a contract that includes appropriate provisions.	IDT, PSF, TSA	B(T)6.31 B(T)6.311 B(T)6.6 C(T)6.6 C(T)6.316# C(T)6.4#	G.3.1 G.3.1.1 G.6 K-G.6 K-G.3.1.6# K-G.4#
14.05	IV. A-B III A-2-4	PROTECTION OF UNSTABLE AREAS - To protect unstable areas and avoid triggering mass movements of the soil mantle and resultant erosion and sedimentation.	All Activities	<ol style="list-style-type: none"> <li>Unstable landtypes will be identified during the planning process.</li> <li>Units found to need further protection will use alternative yarding techniques, seasonal restrictions, and/or unit boundary adjustments.</li> </ol>	If the NEPA analysis concluded that soils/geology in the area were unstable, BMPs would be designed to prevent irreversible soil and water effects.	IDT, PSF, TSA	C(T)6.316# C(T)6.4#	K-G.3.1.6# K-G.4#

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14.06	II	RIPARIAN AREA DESIGNATION - To minimize the adverse effects on riparian areas with prescriptions that manage nearby logging and related land disturbance activities.	All Activities	<ol style="list-style-type: none"> <li>1. Identify areas with or adjacent to wet areas.</li> <li>2. Default RHCA widths will be adhered to unless modified through watershed analysis. SMZ widths will be used as a minimum if modification is proposed.</li> <li>4. Areas found during sale layout will be reported to the Hydrologist and afforded the same protections as those identified earlier.</li> </ol>	All streams and wetlands in the project area will comply with FNF Forest Plan as amended by INFS. The width of the riparian areas will be decided upon by the IDT. These widths will be included on the sale area map, marked on the ground and included in the TSC.	IDT, PSF	B(T)1.1 B(T)6.5, C(T)6.4# C(T)6.41# C(T)6.50#	B.1 G.5 K-G.4# K-G.4.1# K-G.5.0#
14.07	IV, A-2 B-1	DETERMINING TRACTOR-LOGGABLE GROUND - To protect water quality from degradation caused by tractor logging ground disturbance.	All Activities	<ol style="list-style-type: none"> <li>1. Tractor loggable units have been identified during the planning process.</li> <li>2. Those areas found not to be tractor loggable were designated as alternative logging systems or were dropped from the unit.</li> </ol>	IDT has identified tractor-loggable ground (in conjunction with personnel from timber operations) during transportation and timber sale planning process. The results have been used to determine intensity of and restrictions for land disturbance activities. TSC and SAM indicate areas and conditions under which tractors can operate.	IDT, PSF	B(T)1.1 B(T)6.42 C(T)6.4# C(T)6.316#	B.1 G.4.2 K-G.4# K-G.3.1.6#
14.08	IV, A-B	TRACTOR SKIDDING DESIGN - To minimize erosion and sedimentation and protect soil productivity by designing skidding patterns to best fit the terrain.	All Activities	<ol style="list-style-type: none"> <li>1. Identify units with designated or dispersed skid trails.</li> <li>2. TSA and purchaser agree on proposed locations before operation.</li> </ol>	IDT has identified sensitive areas during the planning process. The TSA will execute the plan on the ground by locating the skid trails with the timber purchaser or by agreeing to the purchaser's proposed locations prior to operation.	IDT; TSA	B(T)6.422 C(T)6.4#	G.4.2 K-G.4#
14.09	IV, A-2	SUSPENDED LOG YARDING IN TIMBER HARVESTING - To protect the soil from excessive disturbance and accelerated erosion and maintain the integrity of the riparian areas and other sensitive areas.	Cable Logging Units	<ol style="list-style-type: none"> <li>1. Units that have slopes that are unsuitable for or sensitive to ground base skidding will be identified.</li> <li>2. Units with sustained slopes &gt;40% will be designated cable harvest units.</li> </ol>	IDT recognizes the hazards associated with operating on steep and/or rocky slopes. Areas found to be of concern will use appropriate harvest systems that provide for a safe work environment and protect natural resources.	IDT, PSF	B(T)6.42 C(T)6.4# C(T)6.50#	G.4.2 K-G.4# K-G.5.0#

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14.10	IV. A-5,6 B-4	LOG LANDING LOCATION AND DESIGN - To locate in such a way as to avoid soil erosion and water quality degradation.	All Activities	<ol style="list-style-type: none"> <li>1. TSA and purchaser agree on landing locations before operation.</li> <li>2. Use minimum size and least excavation needed.</li> <li>3. No side-cast material into sensitive areas or waterways.</li> <li>4. Install proper drainage.</li> </ol>	TSA must agree to landing locations proposed by the purchaser. Approved landing locations will meet the criteria of: minimal size, least excavation needed, minimum skid roads necessary, no side-cast material into sensitive areas, and have proper drainage.	TSA	B(T)6.422 C(T)6.422	G.4.2.2 K-G.4.2.2
14.11	IV. A-5,6 B-4	LOG LANDING EROSION PREVENTION AND CONTROL- To reduce erosion and subsequent sedimentation from log landing through the use of mitigating measures.	All Activities	<ol style="list-style-type: none"> <li>1. Proper drainage will be installed and maintained during operation.</li> <li>2. Landings will be scarified, seeded and fertilized upon completion of harvest activities.</li> <li>3. TSA will assess conditions and take necessary steps to ensure soil and water protection.</li> </ol>	PSF and TSA assess what is necessary to prevent erosion from landings and to ensure stabilization. It is up to the TSA to request technical assistance as needed.	PSF, TSA	B(T)6.6 B(T)6.64 C(T)6.6 C(T)6.632# C(T)6.633#	G.6 G.6.4 K-G.6 K-G.6.3.2# K-G.6.3.3#
14.12	IV. A-C	EROSION PREVENTION AND CONTROL MEASURES DURING THE TIMBER SALE OPERATION - To ensure that the purchaser's operations shall be conducted reasonably to minimize soil erosion.	All Activities	<ol style="list-style-type: none"> <li>1. Designate units with seasonal restrictions.</li> <li>2. Do not operate during wet periods including spring-snowmelt and/or intense or long-duration rain storms.</li> <li>3. TSA ensures that erosion control is kept current and prevents operation when excessive impacts are possible.</li> </ol>	PSF and TSA sets purchaser's responsibility to prevent soil/water resource damage in TSC. TSA ensures that erosion control is kept current and prevents operation when excessive impacts are possible.	PSF, TSA	A16 B(T)6.6 B(T)6.64 C(T)6.6 C(T)6.601# C(T)6.316#	A.16 G.6 G.6.4 K-G.6 K-G.6.6.1 K-G.3.1.6#
14.13	IV. B 5,6	SPECIAL EROSION PREVENTION MEASURES ON AREAS DISTURBED BY HARVEST ACTIVITIES - To prevent erosion and sedimentation on disturbed areas.	All Activities	<ol style="list-style-type: none"> <li>1. Waterbar, slash, seed, and/or fertilize skid trails and landings.</li> <li>2. Rehabilitate constructed skid trails and temporary roads.</li> <li>3. BMPs may be adjusted by the TSA to meet operational requirements.</li> </ol>	IDT identifies locations needing special stabilization measures. If any such areas are identified, BMPs may be adjusted by the TSA to meet operational requirements.	IDT, TSA	C(T)6.601# C(T)6.32# C(T)6.633#	K-G.6.0.1# K-G.6.3.2# K-G.6.3.3#

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14.14	IV. B 5	REVEGETATION OF AREAS DISTURBED BY HARVEST ACTIVITIES - To establish a vegetative cover on disturbed areas to prevent erosion and sedimentation.	All Activities	1. Seed and fertilize areas of exposed soil with FNF approved vegetative and fertilizer mix.	IDT has established vegetation and fertilizer mix to be used in the project area with outlines on the extent to which it should be used. TSA is responsible for seeing that revegetation work required by purchaser is done correctly and in a timely manner. The purchaser will be responsible for revegetation immediately after the completion of harvest. Funds will be collected for the District to do follow-up seeding/fertilizing in years two and three after harvest.	IDT, TSA	C(T)6.01# C(T)6.633#	K-G.6.0.1# K-G.6.3.3#
14.15	IV. A- 4,5 B- 5,6	EROSION CONTROL ON SKID TRAILS - To protect water quality by minimizing erosion and sedimentation derived from skid trails.	All Activities	1. Ensure proper skid trail location. 2. Ensure proper drainage on skid trails. 3. Rehabilitate constructed skid trails and temporary roads. 4. Ensure maintenance of erosion control structures by purchaser.	Erosion control measures may be recommended by the IDT, but site-specifically adjusted by the TSA. TSA will ensure erosion control measures are applied prior to expected hydrologic events (spring runoff, high-intensity storms, etc.). Maintenance of erosion control structures by the purchaser may be necessary and requested by the TSA.	TSA	B(T)6.6 B(T)6.65 B(T)6.66 C(T)6.6 C(T)6.633#	G.6 G.6.5 G.6.6 K-G.6 K-G.6.3.3#
14.16	IV. B- 2	WET MEADOW PROTECTION DURING TIMBER HARVESTING - To avoid damage to the ground cover, soil, and water in meadows.	All Activities	1. Identify units with or adjacent to wet meadows. 2. Units with unmapped wet areas will be reported to Hydrologist and afforded the same protection as those identified during the planning process. 3. Standard interim RHCA widths will be adhered to unless modification is in place. 2. SMZ law will be met or exceeded.	IDT has identified areas needing special protection. PSF will verify the areas needing protection and prepare the contract to prevent damage to meadows. The TSA will be responsible for on-the-ground protection of meadows. If meadows are found by the TSA during operations, it is their responsibility to either afford them the proper protection or pursue a contract modification.	IDT, PSF, TSA	B(T)1.1 B(T)6.422 B(T)6.61 C(T)6.4# C(T)6.62#	B.1 G.4.2.2 G.6.1 K-G.4# K-G.6.2#
14.17	V. A- C	STREAM CHANNEL PROTECTION (IMPLEMENTATION AND ENFORCEMENT) - Protect natural stream flows; provide unobstructed passage of flows; reduce sediment input; and restore flow if diverted by timber sale activity.	All Activities	1. Standard interim RHCA widths will be adhered to unless modification is in place. 2. SMZ widths will be used at a minimum if modification in place. 3. SMZ law will be met or exceeded.	IDT has identified the location of channels in the decision area. PSF will prepare a SAM locating the channels needing protection. Layout crew marks boundaries and trees according to HB-731 and FP guidelines. TSA will see that TSC items are carried out on the ground. Technical assistance will be consulted as needed.	IDT, PSF, TSA	B(T)1.1 B(T)6.5 B(T)6.6 C(T)6.50# C(T)6.6	B.1 G.5 G.6 K-G.5.0# K-G.6

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14.18	IV. A-C	EROSION CONTROL STRUCTURE MAINTENANCE - To insure that constructed erosion control structures are stabilized and working effectively.	All Activities	1. During the period of the TSC, the purchaser is responsible for maintaining their erosion control features.	During the period of the TSC, the purchaser is responsible for maintaining their erosion control features. If work is needed beyond this time, the District will pursue other sources of funding.	TSA	B(T)6.66 B(T)6.67	G.6.6 G.6.7
14.19	IV. A-C	ACCEPTANCE OF TIMBER SALE EROSION CONTROL MEASURES BEFORE SALE CLOSURE - To assure the adequacy of required erosion control work on timber sales.	All Activities	1. TSA reviews erosion prevention work before each harvest unit is considered complete. 2. The inspection will determine if the work is acceptable and will meet the objective of the erosion control feature.	A careful review of erosion prevention work will be made by the TSA before each harvest unit is considered complete. The inspection will determine if the work is acceptable and will meet the objective of the erosion control feature. A feature is considered not acceptable if it does not meet standards or is not expected to protect soil/water values. Technical assistance will be used as necessary.	TSA	B(T)6.36	G.3.6
14.20	IV. C	SLASH TREATMENT IN SENSITIVE AREAS - To protect water quality by protecting sensitive tributary areas from degradation that would result from using mechanized equipment for slash disposal.	All Activities	1. Where harvest is proposed within riparian areas, either slash should be removed with the tree or scattered and not treated. 2. Mechanical fuels treatments should not be used on sensitive land types.	All activities will comply with the FNF Forest Plan as amended by INFISH. Where harvest within riparian areas is proposed, either the slash would be removed with the tree or scattered and not treated.	TSA, FMO	B(T)6.5 B(T)6.7 C(T)6.50# C(T)6.7 C(T)6.71 C(T)6.753	G.5 G.7 K-G.5.0# K-G.7# K-G.7.1 K-G.7.5.3
14.22	N/A	MODIFICATION OF THE TSC - To modify the TSC if new circumstances or conditions indicate the timber sale will cause irreversible damage to soil, water, or watershed values.	All Activities	1. Environmental modification procedure.	If TSC is not adequate to protect soil/water resources, the TSA and Contracting Officer are responsible for recommending modification of the TSC.	TSA	B(T)8.33	i.3.3
15.01	III. A-E	GENERAL GUIDELINES FOR TRANSPORTATION PLANNING - To introduce soil and water resource considerations into transportation planning.	All Roads	1. Complete a roads analysis. 2. Transportation plans include installation and maintaining proper drainage.	The IDT has evaluated watershed characteristics and estimated the response of soil and water resources to proposed transportation alternatives and activities.	IDT, ER	N/A	

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15.02	III. A-B	GENERAL GUIDELINES FOR THE LOCATION AND DESIGN OF ROADS AND TRAILS - To locate and design roads and trails with minimal soil and water impact while considering all Design Criteria.	New Road and Trail Construction	<ol style="list-style-type: none"> <li>1. Follow INFS Standards and Guidelines for road management.</li> <li>2. Identify sensitive land types, riparian areas, and wetlands during planning.</li> <li>3. Use the minimum amount of roads and trails necessary.</li> </ol>	The IDT has insured that the location and design of roads and trails are based on multiple resource objectives. Mitigation measures have been designed to protect the soil and water resources identified in the NEPA process. Contract provisions will be prepared by the ER that meets the soil and water resource protection requirements.	IDT, ER		
15.03	III. A-E	ROAD AND TRAIL EROSION CONTROL PLAN - To prevent, limit, and mitigate erosion, sedimentation, and resulting water quality degradation prior to the initiation of construction by timely implementation of erosion control practices.	New Road and Trail Construction	<ol style="list-style-type: none"> <li>1. Seed and fertilize disturbed areas.</li> <li>2. Install proper ditching and road slope.</li> <li>3. Install proper drainage.</li> <li>4. Incorporate road grade breaks.</li> <li>5. Use minimum road or trail length/width necessary.</li> <li>6. Avoid wet areas or areas of sensitive soil types.</li> </ol>	IDT has established soil/water conservation objectives and mitigation measures. ER will then prepare a contract that reflects the objectives. ER will see that erosion control measures are approved and completed in a timely manner. IDT reviews projects to check effectiveness of erosion control features.	IDT, ER	B(T)6.31 B(T)6.312 B(T)6.6 C(T)6.601#	G.3.1 G.3.1.2 G.6 K-G.6.0.1#
15.04	III. D 1, 4	TIMING OF CONSTRUCTION ACTIVITIES - To minimize erosion by conducting operations during minimal runoff periods.	New Road and Trail Construction	<ol style="list-style-type: none"> <li>1. Avoid construction during wet periods.</li> </ol>	IDT has outlined detailed erosion control measures in NEPA process. ER puts these measures into contract provisions. Compliance is assured by Contracting Officer or ER.	IDT, ER	B(T)6.31 B(T)6.312 B(T)6.6 SPS 204	G.3.1 G.3.1.2 G.6
15.05	III. A-E	SLOPE STABILIZATION AND PREVENTION OF MASS FAILURES - To reduce sedimentation by minimizing the chances for road-related mass failures, including landslides and embankment slumps.	New Road and Trail Construction	<ol style="list-style-type: none"> <li>1. Avoid construction across unstable areas.</li> <li>2. Construct embankments following approved engineering practices.</li> <li>3. Use minimum road or trail length/width necessary.</li> </ol>	Road and trail construction in mountainous terrain requires cutting and loading natural slopes which may lead to landslides and/or embankment failures. In areas with intrinsic slope stability problems, appropriate technical resource personnel must be involved in an interdisciplinary approach to route location.	IDT,; ER	N/A	

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15.06	III. A-E	MITIGATION OF SURFACE EROSION AND STABILIZATION OF SLOPES - To minimize soil erosion from road cut slopes, fill slopes, and travel ways.	All Haul Roads	<ol style="list-style-type: none"> <li>1. Seed and fertilize cut and fill slopes.</li> <li>2. Install proper ditching and road slope.</li> <li>3. Install proper drainage.</li> <li>4. Incorporate road grade breaks.</li> <li>5. Install ditch relief culverts before/after stream crossings.</li> </ol>	IDT has outlined detailed erosion control measures in the NEPA process. Stabilization techniques are included in contract provisions. Compliance is assured by Contracting Officer or ER.	IDT, ER	SPS 203, 204, 206A 210, 412 619, 625, 626 630 B(T)5.3 B(T)6.6 B(T)6.63 B(T)6.66 B(T)6.312 C(T)5.314# C(T)6.6 C(T)6.601#	F.3 G.6 G.6.3 G.6.6 G.3.1.2 K-F.3.1.4# K-G.6 K-G.6.0.1#
15.07	III. E-2	CONTROL OF PERMANENT ROAD DRAINAGE - To minimize the erosive effects of concentrated water and degradation of water quality by proper design and construction of road drainage systems and drainage control structures.	All Haul Roads	<ol style="list-style-type: none"> <li>1. Avoid long, steep grades.</li> <li>2. Maintain adequate surface drainage.</li> <li>3. Prevent erosion of culvert fills.</li> <li>4. Maintain ditches.</li> <li>5. Ditch relief culverts before/after stream crossings.</li> </ol>	IDT has identified locations, Design Criteria, drainage control features, and mitigation. Compliance will be assured by the ER/Contracting Officer.	ER	B(T)5.3 B(T)6.6 C(T)5.31# C(T)6.6	F.3 G.6 K-F.3.1# K-G.6
15.08	III. D	PIONEER ROAD CONSTRUCTION - To minimize sediment production and mass wasting associated with pioneer road construction.	New Road and Trail Construction	<ol style="list-style-type: none"> <li>1. Ensure stable slopes during construction.</li> <li>2. Seed and fertilize exposed soil.</li> <li>3. Avoid construction during wet periods.</li> <li>4. Use slash filter windrows.</li> </ol>	ER/Contracting Officer will be responsible for enforcing contract specifications. The purchaser is responsible for submitting an operating plan that includes erosion control measures.	ER	B(T)5.23 B(T)6.31 B(T)6.311 B(T)6.312 B(T)6.6 C(T)6.601# SPS 204	F.2.3 G.3.1 G.3.1.1 G.3.1.2 G.6 K-G.6.0.1#
15.09	III. E-7,8	TIMELY EROSION CONTROL MEASURES ON INCOMPLETE ROADS AND STREAM CROSSING PROJECTS - To minimize erosion of and sedimentation from disturbed ground on incomplete projects.	All Road construction, reconstruction, and maintenance	<ol style="list-style-type: none"> <li>1. Avoid construction during wet periods.</li> <li>2. Use slash filter windrows or silt fence.</li> <li>3. Seed and fertilize disturbed areas.</li> </ol>	IDT has identified project location and mitigation measures in NEPA process. Protective measures will be kept current on all areas of disturbed, erosion-prone areas. TSA ensures contract compliance.	IDT, TSA	B(T)5.23 B(T)6.31 B(T)6.6 B(T)6.66 C(T)6.6 C(T)6.601#	F.2.3 G.3.1 G.6 G.6.6 K-G.6 K-G.6.0.1#

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15.10	III. D-8	CONTROL OF ROAD CONSTRUCTION, EXCAVATION, AND SIDE-CAST MATERIAL - To reduce sedimentation from unconsolidated excavated and side-cast material caused by road construction, reconstruction, or maintenance.	All Road construction, reconstruction, and maintenance	<ol style="list-style-type: none"> <li>1. Do not side-cast into waterways or sensitive areas.</li> <li>2. Use slash filter windrows or silt fence.</li> </ol>	IDT has identified project location and mitigation measures in NEPA process. Protective measures will be kept current on all areas of disturbed, erosion-prone areas. TSA ensures contract compliance.	IDT, TSA	B(T)5.3 C(T)5.31# SPS 203 SPS 204	F.3 K-F.3.1#
15.11	VII. A-1,2	SERVICING AND REFUELING EQUIPMENT - To prevent contamination of waters from accidental spills of fuels, lubricants, bitumens, and other harmful materials.	All Activities	<ol style="list-style-type: none"> <li>1. Ensure proper fuel storage and transportation.</li> <li>2. Keep fuel from streams, wetlands, ponds, and lakes.</li> </ol>	ER/TSA/Contracting Officer will designate the location, size, and uses of service refueling areas. All projects will adhere to the FNF Hazardous Substance Spill Plan in case of accidents.	ER, TSA	B(T)6.222 B(T)6.34 B(T)6.341	G.2.2.2 G.3.4 G.3.4.1
15.12	III A. 4	CONTROL OF CONSTRUCTION IN RIPARIAN AREAS - To minimize the adverse effects on riparian areas from roads.	New Road and Temporary Road Construction	<ol style="list-style-type: none"> <li>1. Follow INFS Standards and Guidelines for construction within riparian areas.</li> <li>2. Use slash filter windrows or silt fence.</li> <li>3. Install ditch relief culverts and surface water deflectors before/after stream crossings.</li> </ol>	Proposed new and temporary roads will adhere to guidelines in the Montana Streamside Management Zone Law (HB-731). All road activities will follow INFS Standards and Guidelines for road management.	ER, TSA	B(T)6.5 B(T)6.62 C(T)6.50# SPS 206 SPS 206A	G.5 G.6.2 K-G.5.0#
15.13	V. C-1	CONTROLLING IN-CHANNEL EXCAVATION - To minimize stream channel disturbances and related sediment production.	All Road construction, reconstruction, and maintenance	<ol style="list-style-type: none"> <li>1. Use silt fence to minimize introduced sediment.</li> <li>2. Use minimum amount of road.</li> <li>3. Construct minimum number of crossings.</li> </ol>	BMP improvements at crossings would adhere to the guidelines in Montana Streamside Management Zone Law (HB-731) and the INFS Standards and Guidelines for road management.	ER, TSA	B(T)6.5 SPS 204 SPS 206 206A	G.5
15.14	V. A, C	DIVERSION OF FLOWS AROUND CONSTRUCTION SITES - To minimize downstream sedimentation by insuring all stream diversions are carefully planned.	All Work at Stream Crossings	<ol style="list-style-type: none"> <li>1. Divert stream flow around construction.</li> <li>2. Use silt fence to minimize introduced sediment.</li> <li>3. Construction during low-flow</li> </ol>	The IDT has determined, where stream crossings meet multiple resource objectives, the crossings would require a State 124 permit. This would require the State Fish, Wildlife, and Parks to review the adequacy of the proposed mitigation. Compliance with contract provisions would be done by the ER.	IDT, ER	B(T)6.5 B(T)6.31 C(T)6.50# C(T)6.6	G.5 G.3.1 K-G.5.0# K-G.6

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15.15	V. A-C	STREAM CROSSINGS ON TEMPORARY ROADS - To keep temporary roads from unduly damaging streams, disturbing channels, or obstructing fish passage.	All Roads	<ol style="list-style-type: none"> <li>1. Consult Hydrologist on placement of crossing</li> <li>2. Use minimum number of stream crossings.</li> <li>3. Construction during low-flow.</li> <li>4. Follow INFS Standards and Guidelines for construction within riparian areas.</li> </ol>	The IDT identifies areas in need of a temporary road during the NEPA process. Proposed stream crossings would adhere to the guidelines in Montana Streamside Management Zone Law (HB-731).	PSF, ER, TSA	N/A	
15.16	V. C 1-7	BRIDGE AND CULVERT INSTALLATION - To minimize sedimentation and turbidity resulting from excavation for in-channel structures.	All Road construction, reconstruction, and maintenance	<ol style="list-style-type: none"> <li>1. Installation should be done during periods of low flow.</li> <li>2. In-stream sediment retention devices should be used throughout implementation.</li> </ol>	IDT has identified project location and mitigation measures in NEPA process. Protective measures will be kept current on all areas of disturbed, erosion-prone areas. TSA ensures contract compliance.	IDT, TSA	C(T)5.31# (T-310) B(T)6.312	K-F.3.1# (T-618) G.3.1.2
15.17	III. D-9	REGULATION OF BORROW PITS, GRAVEL SOURCES, AND QUARRIES - To minimize sediment production from borrow pits, gravel sources, and quarries and limit channel disturbance in those gravel sources suitable for development in floodplains.	N/A			ER	B(T)6.5 C(T)6.50#	G.5 K-G.5.0#
15.18	III. D-8	DISPOSAL OF RIGHT-OF-WAY AND ROADSIDE DEBRIS - To insure that debris generated during road construction is kept out of streams and prevent slash and debris from subsequently obstructing channels.	All Road construction, reconstruction, and maintenance	<ol style="list-style-type: none"> <li>1. Debris and slash generated during road construction should not be side-cast into streams.</li> </ol>	Proposed road construction will adhere to the guidelines in the Montana Streamside Management Zone Law (HB-731).	ER	Std Spec 201 SPS 201	
15.19	III. A	STREAM BANK PROTECTION – To minimize sediment production from stream banks and structural abutments in natural waterways.	All Road construction, reconstruction, and maintenance	<ol style="list-style-type: none"> <li>1. Take precautions to minimize or eliminate disturbance to stream banks.</li> <li>2. Maintain in-stream structures.</li> </ol>	IDT has identified project location and mitigation measures during NEPA process. Protective measures will be kept current on all areas of disturbed soils. TSA and ER ensure contract compliance.	IDT, ER, TSA	Std Spec 619	

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15.20	N/A	WATER SOURCE DEVELOPMENT CONSISTENT WITH WATER QUALITY PROTECTION - To supply water for road construction and maintenance and fire protection while maintaining water quality.	N/A			ER, FMO	Std Spec 207	
15.21	III. E	MAINTENANCE OF ROADS - To maintain all roads in a manner that provides for soil and water protection by minimizing rutting, failures, side-cast, and blockage of drainage facilities.	All Road reconstruction, and maintenance	1. Maintain all roads in a manner that provides for soil and water protection	Road maintenance associated with a timber sale is the responsibility of purchaser. The ER/TSA will ensure that the purchaser maintains roads according to the appropriate maintenance level.	ER, TSA	B(T)5.12 B(T)5.3 B(T)6.6 C(T)6.6 C(T)5.31#	F.1.2 F.3 G.6 K-G.6 K-F.3.1#
15.22	III. E-1	ROAD SURFACE TREATMENT TO PREVENT LOSS OF MATERIALS - To minimize the erosion of road surface materials and, consequently, reduce the likelihood of sediment production.	All Haul Roads	1. Maintenance of road surface should include proper blading and/or dust abatement. 2. Use crush-gravel where necessary.	Protective measures will be kept current on all areas of disturbed, erosion-prone areas. ER ensures contract compliance.	IDT, ER	B(T)5.3 C(T)5.31# C(T)5.314#	F.3 K-F.3.1# K-F.3.1.4#
15.23	III. E-6	TRAFFIC CONTROL DURING WET PERIODS - To reduce the potential for road surface disturbance during wet weather and reduce sedimentation.	All Haul Roads	1. Avoid hauling during wet periods.	Road restrictions and traffic control measures will be implemented on all haul roads when damage would occur during spring breakup. The decision to restrict a road is made by the ER. Hauling restrictions would be controlled by the TSA.	ER, TSA	B(T)6.6 C(T)6.6 C(T)5.316# C(T)5.41#	G.6 K-G.6 K-F.3.1.6# K-F.4.1#
15.24	III.E-4 VI. A-B	SNOW REMOVAL CONTROLS - To minimize the impact of snow melt on road surfaces and embankments and reduce the probability of sediment production resulting from snow removal operations.	All Winter Haul Roads	1. Be careful not to leave snow berm at edge of road. 2. Ensure proper drainage by opening sections of berm to allow water to leave road surface. 3. Ensure no side cast material enters waterways.	Snow removal will be kept current on all roads associated with winter logging operations. The TSA ensures compliance with contract provisions.	IDT, TSA	C(T)5.316# Std Spec 203.09	K-F.3.1.6#

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15.25	III. E 7, 8	OBLITERATION OF TEMPORARY ROADS - To reduce sediment generated from temporary roads by obliterating them at the completion of their intended use.	All Temporary Roads	<ol style="list-style-type: none"> <li>1. Re-contour road fully where feasible.</li> <li>2. Seed and fertilize exposed soil.</li> <li>3. Pull slash and woody debris back onto rehabilitated road.</li> </ol>	This work will be done on all new temporary roads in the decision area. The work will be done by the purchaser with compliance by the TSA.	TSA	B(T)6.63 C(T)6.6 C(T)6.632# C(T)6.633# C(T)6.601#	G.6.3 K-G.6 K-G.6.3.2# K-G.6.3.3# K-G.6.0.1#
18.03	IV. C -8	PROTECTION OF SOIL AND WATER FROM PRESCRIBED BURNING EFFECTS - To maintain soil productivity, minimize erosion, and prevent ash, sediment, nutrients, and debris from entering surface water.	All Prescribed Burning	<ol style="list-style-type: none"> <li>1. Follow INFS Standards and Guidelines for burning in RHCAs.</li> <li>2. Adhere to SMZ Law.</li> <li>3. Where harvest within riparian areas is proposed, either the slash should be removed with the tree or scattered and not treated.</li> </ol>	Prescribed burning adjacent to riparian areas will adhere to guidelines in the Montana Streamside Management Zone Law (HB-731). Prescribed burn plans identify the conditions necessary to prevent soil damage and meet site preparation objectives.	FMO	N/A	