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## APPENDIX B

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Best Management Practices (BMPs) are measures certified by the State Water Quality Board and approved by the Environmental Protection Agency (EPA) as the most effective way of protecting water quality from impacts stemming from non-point sources of pollution. These practices have been applied in timber sales and road construction projects in this and other watersheds over the last 20 years and have been found to be effective in protecting water quality within the Eldorado National Forest. Specifically, effective application of the R-5 U.S. Forest Service BMPs has been found to maintain water quality that is in conformance with the Water Quality Objectives for the Central Valley Regional Water Quality Control Board. The Region 5 Forest Service BMPs have been monitored and modified since their original implementation in 1979 to make them more effective. The Forest monitors the implementation and effectiveness of BMPs on randomly selected projects each year.

The following list of BMPs would be implemented in the Big Grizzly Project sale area if an Action Alternative is selected for implementation. A description of the objective of each BMP is included. Chapter 2 of the EIS contains a detailed description of specific measures - Resource Protection Measures – that would be implemented to prevent resource damage.

**BMP 1.1 – TIMBER SALE PLANNING PROCESS: REQUIRES THE INTERDISCIPLINARY TEAM (IDT) TO CONSIDER METHODS OF REDUCING WATER QUALITY IMPACTS DURING THE PLANNING PHASE OF A PROJECT. THE PROJECT DESIGN INCORPORATED THE FOLLOWING TO REDUCE WATER QUALITY IMPACTS:** Earth Scientists or other trained and qualified individuals have participated in the environmental documentation process to evaluate onsite watershed characteristics and evaluate the potential environmental consequences of the proposed timber harvest and related activities.

**BMP 1.2 – TIMBER HARVEST UNIT DESIGN:** Requires the IDT to consider methods of reducing water quality impacts due to changes in unit design.

**BMP 1.3 – USE OF EROSION HAZARD RATING (EHR) FOR UNIT DESIGN:** Identifies high or very high erosion hazard areas and adjusts management activities to prevent downstream water quality impacts; and to increase soil cover for those areas that have a high risk of contributing sediment into streams.

**BMP 1.4 – USE OF SALE AREA MAPS FOR DESIGNATING WATER QUALITY PROTECTION:** Identifies sensitive areas and water uses as part of the Timber Sale Contract to assist operators in locating watershed concerns and applying protection methods.

**BMP 1.5 – LIMITING OPERATING PERIOD OF TIMBER SALE:** To prevent soil compaction and erosion from operations during wet weather; and to ensure placement of erosion control structures prior to the onset of winter to reduce water quality impacts.

**BMP 1.8 – STREAMSIDE MANAGEMENT ZONE (SMZ) DESIGNATION:** Designates zones adjacent to water and/or riparian areas as zones of special management.

**BMP 1.9 – DETERMINING TRACTOR LOGGABLE GROUND:** The objective is to minimize erosion and sedimentation resulting from ground disturbance of tractor logging systems.

**BMP 1.10 – TRACTOR SKIDDING DESIGN:** Designates a tractor skid pattern to avoid over-steepened areas, designates tractor crossings, and reduces skid patterns in sensitive areas to reduce erosion and compaction.

**BMP 1.12 – LOG LANDING LOCATION:** To avoid watershed impacts and associated water quality degradation with the location of new landings or reuse of old landings.

**BMP 1.13 – EROSION PREVENTION AND CONTROL MEASURES DURING TIMBER SALE OPERATIONS:** Ensures that the Purchaser's operations shall be conducted reasonably to minimize soil erosion.

**BMP 1.14 – SPECIAL EROSION PREVENTION MEASURES ON DISTURBED LAND:** The objective is to provide appropriate erosion and sedimentation protection for disturbed areas.

**BMP 1.15 – REVEGETATION OF AREAS DISTURBED BY HARVEST ACTIVITIES:** The objective is to establish a vegetative ground cover on disturbed sites to prevent erosion and sedimentation.

**BMP 1.16 – LOG LANDING EROSION PREVENTION AND CONTROL:** The objective of this BMP is to reduce erosion and prevent subsequent sedimentation from log landings. The Timber Sale Contract provides for erosion prevention and control measures on all landings.

**BMP 1.17 – EROSION CONTROL ON SKID TRAILS:** Employs preventative measures such as water bars, mulching, spreading slash, or chipping to reduce water concentration and erosion. This is accomplished during the operations phase of the project

**BMP 1.18 – MEADOW PROTECTION DURING TIMBER HARVESTING:** Avoids damage to the ground cover, soil, and water in meadows.

**BMP 1.19 – STREAM COURSE PROTECTION:** Protects the natural flow of streams and reduces the entry of sediment and any other pollutants into streams.

**BMP 1.20 – EROSION CONTROL STRUCTURE MAINTENANCE:** Requires periodic inspection of erosion control structures to assess maintenance needs and effectiveness. This is accomplished during the operations and post-operations phase of the project; this ensures the adequacy of erosion control measures.

**BMP 1.21 – ACCEPTANCE OF EROSION CONTROL MEASURES BEFORE TIMBER SALE CLOSURE:** Erosion control measures are inspected for adequacy to ensure erosion control as planned. This is accomplished during the post-operations phase of the project during the contract final inspection.

**BMP 1.22 SLASH TREATMENT IN SENSITIVE AREAS:** Special slash treatment site preparation is prescribed in sensitive areas to facilitate slash disposal without use of mechanized equipment. Meadows, wetlands, SMZs, and landslide areas are typically sensitive areas where equipment use is normally prohibited. Slash treatment and site preparation methods are specified in environmental documents both are indicated, where applicable, for each cut unit in project/contract documents such as a TSC, project map or SAM

**BMP 1.25 – MODIFICATION OF THE TIMBER SALE CONTRACT (AS NEEDED):** Allows contract language to be modified to add or increase protection of water quality not identified in the planning process.

**BMP 2.1 – GENERAL GUIDELINES FOR THE LOCATION AND DESIGN OF ROADS:** The objective is to locate and design roads with the minimal resource damage.

**BMP 2.2 EROSION CONTROL PLAN:** The objective is to limit and control sedimentation through effective planning prior to the initiation of construction activities and through effective contract administration. During the pre-operations meeting between the Forest Service and the Purchaser, an erosion control plan is agreed to. During the operations phase of the project the plan is implemented.

**BMP 2.3 TIMING OF CONSTRUCTION ACTIVITIES:** The objective is to minimize erosion by conducting operations during minimal runoff periods. This is accomplished during the operation phase of the project by the contract administrator and by the hydrologist.

**BMP 2.4 ROAD SLOPE STABILIZATION (PREVENTATIVE PRACTICES):** The objective is to improve road slope stabilization by applying mechanical and vegetative measures. This is accomplished during the operations phase of the project.

**BMP 2.5 ROAD SLOPE STABILIZATION:** The objective is to reduce sedimentation by minimizing erosion from road slopes and by minimizing the chances of slope failures along roads. This is accomplished by road design measures during the planning phase of the project. WWOA guidelines would be followed.

**BMP 2.7 – CONTROL OF ROAD DRAINAGE (PREVENTATIVE PRACTICES):** The objective is to minimize the erosive effects of water concentrated by road drainage features; to disperse runoff from disturbances within the road clearing limits; to lessen the sediment yield from roaded areas; to minimize erosion of the road prism by runoff from road surfaces and from uphill areas.

**BMP 2.10 – CONSTRUCTION OF STABLE EMBANKMENTS:** The objective is to construct embankments with materials and methods, which minimize the possibility of failure and subsequent water quality degradation.

**BMP 2.11 MINIMIZATION OF SIDECAST MATERIAL:** The objective is to minimize sediment production originating from material side cast during road construction or maintenance. This is accomplished during the design phase of the project by the contract inspector.

**BMP 2.12 SERVICING AND REFUELING OF EQUIPMENT:** The objective is to prevent pollutants such as fuels and lubricants from being discharged into or near rivers, streams, impoundments, or natural and man-made channels which lead into them.

**BMP 2.13 – CONTROL OF CONSTRUCTION AND MAINTENANCE ACTIVITIES ADJACENT TO SMZS:** The objective is to protect water quality by controlling construction and maintenance actions within and adjacent to any streamside management zone so that SMZ functions are not impaired.

**BMP 2.14 – CONTROLLING IN CHANNEL EXCAVATION:** The objective is to minimize stream channel disturbances and related sediment production.

**BMP 2.16 – STREAM CROSSINGS ON TEMPORARY ROADS:** The objective is to ensure that temporary roads do not unduly damage stream channels and to ensure that fish passage is unimpeded by stream crossing structures.

**BMP 2.17 – BRIDGE AND CULVERT INSTALLATION:** The objective is to ensure that sedimentation and turbidity resulting from excavation for in-channel structures be minimized.

**BMP 2.19 – DISPOSAL OF RIGHT OF WAY AND ROADSIDE DEBRIS:** The objectives are to ensure that organic debris generated during road construction is kept out of streams so that channels and downstream facilities are not obstructed, and to ensure debris dams are not formed which obstruct fish passage, or which could result in downstream damage from high water flow surges after dam failure.

**BMP 2.21 WATER SOURCE DEVELOPMENT CONSISTENT WITH WATER QUALITY PROTECTION:** The objective is to limit and mitigate the effects of water source development through the planning of impoundments and withdrawals.

**BMP 2.22 – MAINTENANCE OF ROADS:** The objective is to limit sedimentation and erosion by road drainage maintenance and road surface protection. This is accomplished during the operations phase of the project and the post-operations final inspection.

**BMP 2.23 – ROAD SURFACE TREATMENT TO PREVENT LOSS OF MATERIALS:** The objective is to reduce road-related erosion through treatment of the road surface, usually through spot rocking and dust abatement. This is accomplished during the operations phase of the project.

**BMP 2.24 – TRAFFIC CONTROL DURING WET PERIODS:** The objective is to reduce damage to road drainage and limit sedimentation from roads during wet periods. This is generally achieved by increased surfacing and/or road closures during the operations phase of the project.

**BMP 5.2 – SLOPE LIMITATION FOR MECHANICAL EQUIPMENT OPERATIONS:** The objective is to reduce sheet and gully erosion and associated sediment production by limiting tractor use.

**BMP 5.5 – DISPOSAL OF ORGANIC DEBRIS:** The objective is to prevent gully and surface erosion with associated reduction in sediment production and turbidity during and after treatment.

**BMP 5.6 – SOIL MOISTURE LIMITATIONS FOR MECHANICAL EQUIPMENT OPERATIONS:** The objective is to prevent soil compaction, rutting, and gulling that may result in increased sedimentation and turbidity.

**BMP 5.7 – PESTICIDE USE PLANNING PROCESS:** The objective is to introduce water quality and hydrologic considerations into the pesticide use planning process.

**BMP 5.8 – PESTICIDE APPLICATION ACCORDING TO LABEL DIRECTIONS AND APPLICABLE LEGAL REQUIREMENTS:** The objective is to avoid water contamination by complying with all label instructions and restrictions for use.

**5.9 PESTICIDE APPLICATION AND MONITORING AND EVALUATION:** The objective is to determine whether pesticides have been applied safely, restricted to intended target areas, and have not resulted in unexpected non-target effects; to document and provide early warning of possible hazardous conditions resulting for possible contamination of water or other non-target areas by pesticides; and to determine the extent, severity and possible duration of any potential hazard that might exist.

**5.10 – PESTICIDE SPILL CONTINGENCY PLANNING:** The objective is to reduce contamination of water by accidental pesticide spills.

**5.11 CLEANING AND DISPOSAL OF PESTICIDE CONTAINERS AND EQUIPMENT:** The objective is to prevent water contamination resulting from the cleaning, or disposal of pesticide containers.

**5.12 – STREAMSIDE WET AREA PROTECTION DURING PESTICIDE SPRAYING:** The objective is to minimize the risk of pesticide inadvertently entering waters, or unintentionally altering riparian areas, SMZ, or wetland.

**5.13 – CONTROLLING PESTICIDE DRIFT DURING SPRAY APPLICATIONS:** The objective is to minimize the risk of pesticide falling directly into water or non-target areas.

**BMP 6.1 – FIRE AND FUELS MANAGEMENT ACTIVITIES:** The objective is to reduce the effects of wildfires on water quality by informing the public, and the development of access plans, fuel breaks, and fuel reduction programs.

**BMP 6.2 – CONSIDERATION OF WATER QUALITY IN FORMULATING FIRE PRESCRIPTIONS:** The objective is to provide for water quality while achieving management objectives of prescribed fire. This is done during the planning phase of the project.

**BMP 6.3 – PROTECTION OF WATER QUALITY FROM PRESCRIBED BURNING EFFECTS:** The objective is maintain soil productivity, minimize erosion, and minimize ash, sediment, nutrients, and debris from entering water bodies.