

**Montana Department of Transportation**

**MDT MAINTENANCE ENVIRONMENTAL  
BEST MANAGEMENT PRACTICES**

**May 2002**

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## ACRONYMS

AAH	Adopt-A-Highway
AASHTO	American Association of State Highway Officials
BMP	Best Management Practices
BPJ	Best Professional Judgment
CatEx	Categorical Exclusion (NEPA Compliance Documentation)
CFR	Code of Federal Regulations
MgCl	Magnesium Chloride
CMZ	Channel Migration Zone
Corps	US Army Corps of Engineers
DNRC	Montana Department of Natural Resources & Conservation
EA/FONSI	Environmental Assessment/Finding of No Significant Impact (NEPA)
EIS	Environmental Impact Statement (NEPA)
DEQ	Montana Department of Environmental Quality
EPA	US Environmental Protection Agency
ESA	Endangered Species Act (USFWS)
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
MDT	Montana Department of Transportation
MEPA	Montana Environmental Policy Act
MFWP	Montana Fish, Wildlife & Parks
MOA/MOU	Memorandum of Agreement or Understanding
MMS	Maintenance Management System
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
PNS	Pacific Northwest Snowfighters
SPA 124	Montana Stream Protection Act Permit (MFWP)
404 Permit	Clean Water Act Section 404 Permit (Corps)
USFS	US Forest Service
USFWS	US Fish & Wildlife Service

## DEFINITION OF TERMS

Anti-Icing: is the early application of temperature suppressant chemicals to prevent snow and ice accumulation or prevent a hard bond of snow and ice to the pavement. This is preventative in nature.

Bankfull width: is synonymous with floodplain and means that flat landscape feature immediately adjacent to most stream and river channels that begins at the edge of the bankfull channel and receives overbank flow during most years (Dune and Leopold 1977).

Best Management Practice (BMP): physical, structural and/or managerial practices that, when used singly or in combination, reduce water quality and aquatic habitat impacts of maintenance activities.

Channel Migration Zone (CMZ): is synonymous with 100-year floodplain and means the lateral extent of likely movement along a stream reach with evidence of active stream channel movement over the past 100 years.

Clear zone: a roadside area, cleared of obstructions, designed to allow for vehicular recovery. Design area is determined by traffic speed, actual daily traffic, horizontal curvature, and embankment slope (1996 AASHTO Roadside Design Guide).

Critical Areas: include the following areas and ecosystem: (a) Wetlands; (b) areas with a critical recharging effect on aquifers used for potable water; (c) fish and wildlife habitat conservation areas; (d) frequently flooded areas; and (e) geologically hazardous areas.

Danger Tree: Trees or snags, near the highway that are found to be weakened, unsound, undermined, leaning, or exposed so they may fall onto or across the highway. When permission to remove the trees cannot be obtained, it is necessary to trim and do whatever else is reasonable to alleviate the hazard.

De-icing: is the application of temperature suppressant chemicals to remove accumulated snow and ice. This is considered reactive in nature and requires more chemical.

Ditch: a drainage feature that is a constructed conveyance system that collects, conveys, channels, holds, inhibits or diverts the movement of storm water or ground water from the MDT facility and adjacent properties. It is not a channelized stream, or fish bearing stream.

Emergency: emergency consists of circumstances creating a substantial risk of loss, damage, interruption of services or threat to public health or safety that could not have been reasonably foreseen. An emergency is a situation involving an act of God, disasters, casualties, national defense or security measures, etc., and includes response activities that must be taken to prevent the imminent loss of human life or property (50 CFR 402.05).

Emergency Disaster Management: activities required to alleviate an emergency condition. Work activities are the same or similar to routine maintenance activities except that they are greater in magnitude and scope depending on the nature and intensity of the emergency. This work is not budgeted and/or scheduled and the emergency creates an immediate threat to life, the public, property or environmental degradation. This includes work accomplished on a damaged highway facility/element that has substantially retained the intended functionality of its original design. It does not include construction of new roadway elements. **Examples include:** erection, dismantling and maintenance of a Bailey bridge; establishment of detours and temporary minor structures; emergency traffic control; any work needed to protect and maintain the area affected by the emergency.

Forbs: a general name for any herbaceous plant, other than grass, which is found in grasslands or woodlands.

Maintenance Management System: (MMS): a specialized budget and accounting system for managers. The MMS is used for work planning, scheduling, performance evaluation, budgeting and expenditure control of maintenance activities.

Non-point Source: is sheet flow run off which does not collect in the form of concentrated flows.

Palliative: a liquid additive to stabilize dirt and gravel roadways.

Pollution: means contamination or other alteration of the physical, chemical or biological properties of state waters that exceeds that permitted by Montana water quality standards, including but not limited to standards relating to change in temperature, taste, color, turbidity or odor; the discharge, seepage, drainage, infiltration of liquid, gaseous, solid, radioactive, or other substance into state water that will or is likely to create a nuisance or render waters harmful, detrimental, or injurious to public health, recreation, safety, or welfare, to livestock, or to wild animals, birds, fish, or other wildlife.

Pre-wetting: is the controlled application of temperature suppressant chemicals to “burn” or “stick” abrasives to snow and ice pack. This practice can speed the removal of snow pack and ice.

Riparian Area: means the 300-foot (91.4 meter) slope distance from either side of the Channel Migration Zone (CMZ), or bank full width, whichever is greater.

Routine Maintenance: budgeted work, performed routinely on a scheduled basis. It is intended to maintain the highway facility/element so that it substantially retains its original intended use and function. **Examples include**: sweeping and debris removal; cleaning ditches, culverts and catch basins; correcting moderate slides and slope failures; vegetation management and litter pickup; routine bridge maintenance; rest area operation and maintenance; pavement patching, crack sealing and routine surface treatment; restoration/replacement of traffic control devices; maintaining access control; drainage restoration; placing riprap; snow and ice removal; traffic control.

Scupper: an opening in a bridge deck to facilitate drainage.

Sensitive (Critical) Areas: Sections of highways or highway features, the maintenance of which would detrimentally impact (directly or indirectly) fisheries or other aquatic species or habitat. Sensitive areas include: spawning streams and those inhabited by federally listed sensitive aquatic species, especially trout and other listed or candidate fish; those impaired water segments listed on DEQ’s 1996 “Section 303(d) List” for Total Maximum Daily Load (TMDL) Plan development and restoration; those receiving direct runoff from treated roads and highways where there would be less than 100:1 dilution; those where a large volume of highway runoff can directly reach small, poorly flushed ponds, lakes and wetlands; those where receiving water temperatures have warmed by the time highway runoff arrives; those areas where shallow ground water is overlain by coarse and permeable soils; facilities that allow surface water access to underground aquifers.

Thalweg: the line extending down a channel that follows the lowest elevation of the bed.

Unscheduled Maintenance: unanticipated activities that occur due to the unusual weather condition, vandalism, accident, etc. Work activities are conducted similar to routine maintenance activities except that work is unanticipated and poses imminent danger to the existing structures or traveling public. In cases of imminent danger, work will be only to repair existing structures, move obstructions, restore banks, protect property, or protect fish resources, to the serviceable function of its original design. It does not include construction of new roadway elements. **Examples include**: stream bank protection; bridge maintenance such as debris removal, scour abatement (approaches, abutments and piers); repair slides and slope failures; repair of culverts.

Waters of the State: means any body of water, irrigation system, or drainage system and applies to surface as well as ground water resources. The term does not apply to: ponds or lagoons used solely for treating, transporting, or impounding pollutants or irrigation or land application disposal waters when the waters are used up within the irrigation or land disposal system and the waters are not returned to state waters (MCA 75-5-103).

## INTRODUCTION

Highway Maintenance is broken down into two primary components: maintenance and operations.

“Maintenance” is work that is performed to care for and maintain the highway and associated features so that it substantially retains its original intended use and function.

Examples:

- Pavement patching and repairing pot holes
- Cleaning ditches and culverts so they retain design capacity for drainage
- Slope repair which includes repair of existing streambank stabilization structures
- Controlling vegetation so it does not block signs or obstruct intersections
- Painting stripes on the roadway surface.

“Operations” is work performed to operate the highway and associated facilities. Generally these activities affect the reliability of a direct service to customers using the highway, a facility or a system.

Examples:

- Rest area operations
- Highway lighting and traffic signal system operation
- Snow and ice control to keep highways operational during winter storms
- Emergency operations to keep highways or detours operational during an emergency or disaster

These two components are distributed across work groups. These work groups are divided into three categories of maintenance work classified as Routine Maintenance, Unscheduled Maintenance and Emergency/Disaster Maintenance (see Definition of Terms pages 4-5.)

When damage to a highway or an associated facility is extensive and the repair is beyond the available resources in Maintenance, the work is turned over to MDT’s Highway Construction Program and becomes a capital project. This work typically requires the use of preliminary engineering services and personnel and contract plans, specifications and estimates. The project goes out to bid and private sector contractors are hired to complete the repairs.

In this Guide, words and phrases such as 'where feasible', 'where appropriate' and 'where practicable' are used in conjunction with some minimization or avoidance activities. These phrases, which allow some exercise of professional judgement, are not to be used for convenience or ease of operation. Rather, they are included because MDT must prioritize its activities in accordance within constraints such as:

- weather
- equipment
- safety considerations to both the motoring public and MDT staff
- physical/topographical restrictions
- state, federal, tribal and local laws

Compliance with this guide means that MDT staff will use the discretion provided by these phrases where one or more of those constraints make implementation of the full measure impossible.

## **TRAINING**

Understanding and correctly implementing the BMP's for the maintenance activities described in this guide is the responsibility of maintenance personnel. The Montana Department of Transportation has an extensive outreach/training program for its maintenance personnel on environmental issues. Elements of the completed program include:

- New employee orientation
- Section Supervisor Meetings
- Safety Seminars
- Annual field visits with MDT and Resource Agency staff to identify and discuss issues
- Hazardous materials training
- Erosion and sediment control training
- Fish passage training
- Participation in professional symposiums/conference
- New product trials
- National Pollutant Discharge Elimination System requirements
- Resource agency coordination meetings

Training continues to be an integral component of MDT Maintenance. As appropriate courses are identified, these courses will be provided for Maintenance personnel.

## **DOCUMENTATION/REPORTING**

As required for water quality permits, air quality compliance, materials disposal.

## **MONITORING**

MDT monitors implementation and effectiveness of best management practices in the course of responding to specific issues. MDT may develop research programs, as appropriate, that monitor the effectiveness or impacts of the agency maintenance activities on habitat, air or water quality.

MDT will respond to complaints received from/by MDT staff, other agencies or members of the public on impacts to the environment by maintenance activities. In addition, MDT will continue to network with other states, agencies, tribal governments and municipalities on effective monitoring of non-point source pollution.

## **PROCESS FOR REVIEW**

MDT will utilize the Maintenance Section Supervisor meetings and the annual field visits to identify and announce any modifications/changes to the minimization/avoidance

actions identified in this guide. New technologies and design standards will also be presented at the team meetings.

Annually MDT will evaluate the need to update these guidelines. The decision will be made on the number of substantive changes needed and new technologies to be incorporated.

## **MDT MAINTENANCE MANAGEMENT SYSTEM (MMS)** **Descriptions of Minimization and Avoidance Best Management Practices**

### **Asphalt and Concrete Pavement Programs (MMS 1101-1107, 1109, 1307)**

Description: Surface overlay repair includes all repairs of road bases, surface, and shoulder irregularities, including asphalt and concrete surfaces. Asphalt plant production includes production of asphalt for patching materials, staging, moving, stockpiling and setup of asphalt plants.

#### Minimization and Avoidance:

Best Management Practices for surface and shoulder activity types will include:

- Strive to eliminate diesel and solvents as releasing or cleaning agents by using environmentally sensitive cleaning and releasing agents.
- Carrying adequate erosion control supplies (diapers, kitty litter, shovels, etc.) to keep materials out of water bodies.
- Disposing of excess material at sites appropriate for the material being disposed.

#### Best Management Practices for Asphalt Plant Production will include:

- If possible, MDT will ensure that Contractors and MDT staff who fuel and operate asphalt plants have an adequate spill plan and materials for spill containment.
- MDT's contractors will establish mixing plants outside of riparian corridors. Site location should be reviewed by the Maintenance Chief, in coordination with the MDT District Biologist.
- If possible MDT will use commercial asphalt production plants for asphalt supply, where economically feasible.
- MDT will perform surface work in dry weather, thus minimizing runoff of potentially hazardous material.

### **Blading and Shaping Gravel Surfaces (MMS 1108)**

Description: This action includes shoulder blading and rebuilding to correct rutting and buildup of materials, for safety, and to maintain proper drainage.

#### Minimization and Avoidance:

- Specific sites will be evaluated for alternatives to blading, such as berming, curbing or paving shoulders.
- Where practicable, MDT will evaluate the width of the blading activity and if appropriate, modify the width to minimize disturbance of vegetation.
- Where possible, MDT Maintenance will blade in dry weather, but while moisture is still present in soil and aggregate (to minimize dust). Special precautions may be necessary in PM-10 air quality non-attainment areas.
- Where appropriate, MDT will permanently stabilize disturbed soils using BMP's (seeding, plants, etc.).

#### **Dust Abatement for Blading and Shaping Gravel Surfaces**

Dust abatement involves application of a dust palliative to non-paved road surfaces to temporarily stabilize surface soils, leading to a reduction of dust during the dry season. Palliatives are typically applied in liquid form and could include magnesium chloride, calcium chloride, emulsified asphalts, or lignon sulfonates.

#### Minimization and Avoidance:

- During preparation for application of dust palliatives, gravel berms will be constructed at the low shoulders of the roadway to inhibit liquid palliatives from entering surface waters.
- Dust palliatives will not be applied during rain.
- Materials shall be applied in a manner that is not detrimental to either water or vegetation.
- Carry adequate spill protection, such as kitty litter, shovels, etc.
- Use environmentally sensitive cleaning agents.
- Dispose of excess materials at appropriate sites.

#### **Sweeping or Flushing (MMS 1201)**

Description: This activity includes sweeping and flushing of roadways and curbs to remove dirt and debris, and scupper (weep holes or direct drains on bridges) cleaning. Bridge decks over water should be swept with a pickup broom prior to flushing or washing. Flushing or washing should only be considered prior to concrete deck repair or application of sealant. Scupper cleaning involves sweeping of material away from clogged scuppers, typically using a steel rod.

Minimization and Avoidance: Best Management Practices will include:

- Use of water (as needed) to reduce dust during sweeping.
- Storage/disposal of removal materials at an appropriate site in an appropriate manner. Removed material may be temporarily stored in stable locations to prevent the material from entering wetlands or waterways.
- Where feasible, MDT Maintenance will schedule sweeping during damp weather, to minimize dust production.
- In PM-10 air quality non-attainment areas, provisions of the local State Implementation Plan (SIP) will apply.
- Where feasible, coordinate crews to follow sweeping/flushing with bridge drainage cleaning.
- MDT Maintenance will remove sweepings produced from paved surfaces within 25 feet of identified sensitive waters or water quality non-attainment waters as identified in coordination with resource agencies, if the design of the facility allows.
- Where appropriate and practical, place sediment barriers in site-specific locations along stream routes or direct drainage routes, to route swept material away from surface water.

**Cleaning, Repairing and Shaping Ditches (MMS 3106)**

Description: This action includes use of equipment for cleaning and reshaping of ditches including loading, hauling, and disposing of excess materials. This activity is performed in all weather. Material is removed to an appropriate location for disposal or storage. Vegetation located in the ditch is removed during cleaning.

Minimization and Avoidance:

- MDT Maintenance will dispose of removed material above the bank line and not in any waterway or wetland.
- MDT Maintenance will use erosion control devices such as check dams, silt fences, and other acceptable techniques, when the potential exists to have sediment or other materials enter a water of the State.
- MDT Maintenance will reseed drainage ditches and steep slopes as appropriate. Ditches functioning as rock fall areas as determined by the MDT Maintenance Chief (as opposed to drainage facilities) will not be reseeded.
- When possible, MDT Maintenance will perform ditch work in dry weather to minimize runoff potential.
- Evaluate and modify, where feasible and appropriate, existing ditch slopes to trap

sediments, and support development of vegetation.

- Recycle excavated material when feasible. This activity may require a Corps 404 permit (See "Wetland Decision Chart" Appendix A.)

**Cleaning Culverts, Culvert Openings and Basin Inlets (MMS 3101), Culvert Repair and Replacement (MMS 3102), includes Fish Passage/Habitat Restoration, cleaning of detention ponds, swales, and pump stations.**

Description: This action includes clearing of dirt and debris from culvert inlet/outlets to restore function, and repair of damaged passing devices (culverts, siphons, and box culverts, catch basins, drop inlets). Culvert cleaning is done by equipment including backhoe, vactor/jet router (a machine with a high-pressure hose and/or a powerful vacuum), and shovels. Vegetation may be removed during cleaning. Culvert cleaning is done in all weather. Culvert/inlet cleaning includes removal of beaver dam material that clogs culverts to prevent flooding and culvert failure.

Minimization and Avoidance:

- MDT Maintenance will install erosion/sediment control during culvert cleaning, where erosion control devices can feasibly be installed. MDT Maintenance will dispose of materials above the bank line and not in any waterway or wetland.
- Materials flushed from culverts will be contained and removed from the drainage.
- When and where possible, MDT Maintenance will perform work at low flow.

**Culvert and Inlet Repair**

This work also includes the installation of baffles in culverts or weirs for fish passage, construction of berms or detention facilities, installation of deck curbs, new culverts or jump pools for fish passage.

When repairing drainage features, MDT Maintenance will make every attempt (within the engineering solution) to incorporate fish passage solutions in coordination with the MDT Environmental Services District Biologist, MDT Hydraulics Section and the MFWP Regional Fisheries Biologist.

- Any work, which must be performed in flowing water, will be completed during MFWP SPA 124 Permit in-water work period for that system, or as otherwise negotiated with MFWP.
- MDT Maintenance will closely coordinate with the MDT Environmental Services District Biologist and MFWP on the removal of material from culvert when work is performed in streams reaches supporting fish species.
- Culvert replacement or extension will frequently require permits, including a Corps 404 permit, MFWP SPA 124 permit, Tribal permit and possibly other permits. Any culvert replacement or extension may be required to meet provisions for fish passage as required by MFWP. Culvert replacement for culverts identified as requiring fish passage

will only occur following guidelines and requirements provided by the MFWP Regional Biologist, and in coordination and cooperation with the MDT Environmental Services District Biologist.

- On culverts that convey live streams, MDT will remove 10 feet of brush on both sides of the culvert on the upstream end, and 10 feet of brush on both sides of the downstream end. If other brushing needs are identified, MDT will coordinate through the MDT Environmental Services Botanist with MFWP.

### **Slope Repair (MMS 2206)**

Description: This action involves repairing water damage to roadway slopes, including import and shaping of material to restore slope and grade lines. In-water work covered by this action could include, but is not limited to, replacement of riprap or rock which have been removed due to bank erosion, gabion baskets, etc. This action may include repair of settlements/slide repairs done primarily when a road is in danger of collapse, and to forestall an emergency.

#### Minimization and Avoidance:

- Any installation of material that exceeds the material removed by bank erosion (below bank full stage) may constitute a significant action under the ESA. Increases in the material profile may require additional coordination with regulating agencies, such as the Corps, MFWP and USFWS (See Appendix B **to be developed**).
- Replacement of riprap will follow MFWP in-water work periods, in non-emergency situations. Situations that require expedited MDT Maintenance action, but which are not technically defined as ‘ emergencies’ (under the ESA or by other federal or state statute) will be addressed through the MDT Environmental Services Project Biologist with MFWP, and potentially the Corps, U.S. Fish and Wildlife Service, and/or the Tribal governments.
- Erosion repair work will consider use of bioengineering solutions where practicable. Practicable use areas include areas not shaded by bridge elements, outside of the two-year flood plain where success is probable and safety of the structural elements are assured. (See Appendix C)
- Any erosion repair activities (responses and cleanup of erosion problems, not the erosive action itself) which cause significant changes in the topography or vegetation within the riparian management area will be coordinated through the MDT Environmental Services District Biologist with MFWP and/or other regulating agencies.

#### Best Management Practices will include:

- Disposal of removed material at appropriate stable sites so the material will not be washed into wetlands or waterways.
- Use of erosion control methods in a timely manner, including seeding and mulching specific areas with non-invasive species, installing silt fences and installing other devices as appropriate.

- MDT Maintenance will take precautionary measures on erodible areas (chicken wire, chain link, rock matting) where eroding areas are identified, and where precautionary measures can be successfully and safely applied.
- MDT Maintenance will coordinate through the MDT Environmental Services District Biologist, MFWP, and the wetland permitting agency (Corps, USFWS, Tribes) when placing riprap that is in addition to existing conditions and within the two-year floodplain of waters of the State. This activity may require an SPA 124 Permit and/or a Section 404 Permit, consultation with the USFWS and/or Tribal permit. (See Appendix D **to be developed**).

### **Maintenance and Repair of Structures (MMS 4101-4113)**

Maintenance and replacement of structures includes washing, painting, scraping and patching of curbs, rails, deck joints on bridge components.

#### Minimization and Avoidance

- All work within the flowing channel of any aquatic system will be performed during the appropriate in-water work window for that system, as identified in the SPA 124 Permit, or as otherwise negotiated with MFWP (except when there is imminent danger to life, limb, or structure).

#### Drift Removal

Drift removal involves either using boats to maneuver the drift, hydraulic tongs to reach over the side of the structure and dislodge the material, or pulling the drift from the side of the bridge (bank) and cutting it into pieces.

- MDT Maintenance will cut and turn drift to allow it to flow through and under the structure only where doing so would not endanger any other crossing structures downstream.
- MDT Maintenance will repair and restore riparian areas temporarily impacted by machinery during drift removal. Long-term access for drift removal will be coordinated with MFWP.

#### Bridge Cleaning/Maintenance

- The Clean Water Act and the NPDES (as regulated by the DEQ, or EPA on Tribal lands) regulate hazardous materials entering waters of the State. DEQ has stated that adequate measures, to the 'maximum extent practicable' will be taken in maintenance activities to ensure that paint and other hazardous material does not enter waters of the State. These avoidance measures, if followed, will be sufficient to avoid impacts to sensitive fisheries and other aquatic species.
- While performing maintenance on bridge structures (above water), reasonable attempts, to the maximum extent practicable, will be made to keep material from

falling from the structure into the water. Any material that does fall into the water will be removed (if possible) in the least destructive way possible, or left in place if this would be less destructive to fisheries habitat (See Appendix E).

- MDT Maintenance will temporarily block deck drains over streams and scuppers over streams when pressure washing, sandblasting, or scraping structures, to route water off deck and into vegetated areas where practicable.
- MDT Maintenance will remove debris from bridge decks in a manner that minimizes material entering water bodies. Preferred methods may include removal of debris from bridge decks with a pickup broom or a shovel. Material will be disposed of as appropriate.

### **Structure Repair**

In- water structure repair can include repair or replacement of riprap, drainage features, catch basins and replacement of structural members.

### **Minimization and Avoidance**

- Structure repair work that requires installation of riprap will consider use of bioengineering solutions, where practicable. "Practicable" use areas will include areas unshaded by bridge elements, above the full bank stage where success is probable and safety of the structure is assured.
- Structural repairs that require in-water work will be independently coordinated through the MDT Environmental Services District Biologist with MFWP to minimize impacts. These contacts will determine whether or not the action will require significant modification of the aquatic system and thus require an ESA Biological Assessment and consultation with the USFWS. In-water work may include permanent impacts, such as placing riprap, or temporary impacts such as installing falsework or stream access.
- MDT Maintenance will coordinate through the MDT Environmental Services District Biologist with MFWP, the wetland permitting agencies (Corps and Tribes), and other appropriate environmental regulators when placing riprap that is in addition to existing conditions and within the two year floodplain of waters of the State.
- MDT Maintenance will coordinate through the MDT Environmental Services District Biologist with MFWP and the Corps and Tribes (where and when necessary) to divert water away from concrete work areas during structural repairs of bridges and culverts.
- When repairing drainage features MDT Maintenance, will make every attempt (within the engineering solution) to incorporate fish passage solutions and enhancements, such as adding roughness (by adding cobble) in coordination with the MDT Environmental Services District Biologist, and/or the MFWP Regional Biologist and MDT Hydraulics.
- MDT Maintenance will perform any in-water work within the SPA 124 Permit in-water work window, or in time frames otherwise negotiated with MFWP (See Appendices B and C **to be developed**).

Best Management Practices for structure repair will include:

- Placing refuse material above the bank, away from waterways and wetlands.
- Ensuring that the active flowing stream will not come into contact with fresh, dissolvable concrete.
- Disposing of material in appropriate locations.
- Providing a stable, appropriate concrete truck chute clean-out area and requiring the contractor to use it, to keep material from being deposited in riparian corridors.
- Using cofferdams for structural repairs, as appropriate.
- Containing saw chips where feasible.
- Avoiding use of creosote or “Penta” treated wood for permanent structures.

## **VEGETATION MANAGEMENT**

***(Note: The MDT Vegetation Management Guideline Series (e.g. draft Mowing Guidelines) is presently being developed)***

Vegetation Management methods typically involve:

### **Mechanical Mowing (MMS 2201), Brush and Tree Removal (MMS 2202)**

Description: These actions are designed to restore sight distance, control noxious weeds, prevent snow drifting, reduce ice (due to shading) and to control/prevent slope failure. These actions involve mechanical mowing, trimming, removal of brush and cleanup. This includes vegetation management around existing bridges. The primary purpose of bridge vegetation management is to maintain sight distance. Bridge vegetation management must also maintain access to the bridge structure for maintenance, fire safety and to maintain the integrity of the structure.

#### Minimization and Avoidance

- No alterations to the mowing policy will be necessary to avoid impacts to fisheries and other aquatic species. The MDT Vegetation Management ***draft Mowing Guidelines*** identify mowing areas, and are designed to minimize impact to receiving waters while still maintaining grassed areas.
- Leave cut brush in place in riparian areas, where doing so does not interfere with sight distance, create safety issues, cause fire hazards, involve noxious weeds or the proper functioning of highway features (e.g. drainage).
- MDT Maintenance actions will limit mowing to no more than 8 to 10 feet off edge of

pavement in significant resource areas defined by DEQ as state water quality impaired segments, unless needed to maintain proper functioning of highway features (e.g. drainage or snow drift control).

- MDT Maintenance will maintain shade trees along streams and rivers, unless those trees are danger trees (as determined by the MDT Botanist and/or appropriate resource agency), could potentially impact bridge structures, constitute a probable clear zone hazard, or could impact line of sight. If trees provide shade or bank stabilization within 50 feet of streams and are determined to be danger trees that must be removed, tree removal will be coordinated through the MDT Environmental Services Botanist with MFWP or other regulatory agency. Only remove brush necessary to perform the activity.
- Only the brush within 20 feet (on either side) of and under all bridge structures will be removed for access and repair to the structure. (In some instances, road access under or adjacent to the structure will be outside the 20 foot buffer.) All other brush not within MDT's clear zones will be left in its current condition, unless the brush interferes with sight distance, shades the structure, shades the highway, or the brush is a noxious weed. Mapping of sensitive resource areas such as DEQ listed state water quality impaired water bodies may lead to additional areas not being brushed.
- On culverts that convey live streams; MDT Maintenance will remove 10 feet of brush on both sides of the culvert on the upstream end of the culvert and 10 feet on both sides on the downstream end, unless the brush around the culvert is a noxious weed. If other brushing needs are identified, MDT will coordinate through the MDT Environmental Services Botanist with MFWP.
- When removing mature trees (over 12-inch (30cm) diameter at breast height (dbh)) in riparian areas, MDT Maintenance will coordinate with the MDT Botanist or District Biologist to determine appropriateness of replanting two seedling/cuttings for every tree removed. MDT Maintenance will coordinate with the MDT Environmental Services Botanist and the MFWP on species and location of trees to be replanted within the same watershed. MDT will ensure that the replanted trees will not pose a future threat to MDT structures.

#### **Chemical Spraying (MMS 2204)**

Description: This action consists of spraying chemicals to control the growth and spread of noxious weeds or brush. Herbicides used include broad-based foliar-active herbicides and soil residual herbicides.

#### **Minimization and Avoidance**

Best Management Practices will include:

- MDT Maintenance will use chemicals approved for use near aquatic resources, whenever spraying near water.
- Herbicides will be used in accordance to EPA labels.
- MDT Maintenance will hand spray around structures within riparian areas.

water that require chemical vegetation control.

- MDT Maintenance will boom spray no further than eight feet from the edge of pavement within 25 feet of riparian areas.
- MDT Maintenance will stop all boom spraying within 25 feet of an active, flowing stream.

### **Other Vegetation Management**

Description: MDT Maintenance identifies and removes danger trees (see page 4 for definition) in coordination with the MDT Environmental Services Botanist and/or resource agency staff such as State Forestry or US Forest Service. MDT Maintenance also removes trees from forested areas which are weighting unstable slide areas, or where the trees or slide have the potential to reach the highway. MDT Maintenance also occasionally removes trees that threaten to fall and uproot large portions of bank area.

### **Minimization and Avoidance**

- Where possible, MDT Maintenance will attempt to maintain buffer strips along riparian areas: 100 feet in width for large rivers, 70 feet in width for medium rivers and no less than 50 feet in width for most streams (first-second order tributaries).
- MDT Maintenance will maintain shade trees along streams or rivers unless those trees are “danger trees” as described above. If trees provide shade or bank stabilization, are within 50 feet of streams, and are determined to be danger trees that must be removed, the trees will be removed in consultation with the MDT Environmental Services Botanist and MFWP Regional Biologist.
- Prior to removing trees within a riparian area to reduce weight on a failing slope, coordination will be performed with the MDT Environmental Services Botanist and District Biologist, MFWP Regional Biologist , and/or the appropriate regulatory agency. Removal of many trees from streamside areas will require a replanting and erosion control plan. Significant consideration will be given to retaining trees, which provide stream shading (e.g. within 50 feet of the active channel).
- Permanent solutions to chronically unstable areas will be pursued through the project development process. Solutions could include artificial hillside drainage or permanent shoring.
- When removing mature trees (over 12-inch (30cm) dbh) in riparian areas, MDT Maintenance will coordinate with the MDT Botanist or District Biologist to determine the appropriateness of replanting two seedling/cuttings for every tree removed. MDT Maintenance will coordinate with the MDT Environmental Services Botanist on species and location of seedling/cuttings to be replanted within the same watershed. MDT Maintenance will ensure that the replanted trees will not pose a future threat to MDT structures.

## **Guardrail Replacement (MMS 6106)**

**Description:** This activity involves repair and replacement of existing guardrail sections and cleaning of accumulated material from under the guardrail. Cleaning under the guardrail in or near riparian areas should consider the pickup and removal of material. Material should not be pushed down slope.

### **Minimization and Avoidance**

- In unstable situations, areas down slope from guardrail replacement will be protected with erosion control measures (silt fences and other appropriate devices) where appropriate to minimize additional sediment loadings into aquatic systems.

## **Snow Plowing, Ice Removal and Sanding (MMS 7202 and 7205)**

**Description:** Snow/ice removal consists of plowing snow and ice from bridges, roadways, and shoulders. Sanding activities place abrasives on road and bridge surfaces to provide for temporary traction and safer driving. Temperature suppressant chemicals such as magnesium chloride (MgCl), are applied as an anti-icer or de-icer, and for pre-wetting of abrasives, for general winter maintenance. Winter chemicals should be chosen from PNS approved products. Winter weather and level of service guidelines help determine rates of application for abrasives and winter chemicals.

### **Minimization and Avoidance:**

- Follow the general guidelines for maintaining water quality in snow and ice operations (Appendix F). **Sensitive Areas are: Sections of highways or highway features, the maintenance of which would detrimentally impact (directly or indirectly) fish or fish habitat. Further examples of sensitive receptors are included in the Appendix.**
- MDT Maintenance develops winter management and operation plans that identify sensitive/critical areas, levels of service for roads and methods for maintaining levels of service during winter weather.

### **Best Management Practices include:**

- Striving to reduce the overall amount of aggregates used through alternative treatment strategies.
- Applying MgCl alone, or in combination with, abrasives at site-specific sensitive locations where appropriate and practical.
- Adhering to the MDT/DEQ abrasive material specifications for PM-10 nonattainment areas (see Appendix G), where applicable.
- Placing barriers in site specific locations where appropriate and practical, along streams or direct drainages to route abrasives/anti-icing material away from

watercourses. If a culvert or catch basin could drain with a sediment impact to waterways, sediment control measures should be implemented whenever possible to prevent excess abrasives run-off into the waterway.

- Reducing plowing speed in Sensitive Areas.
- Stopping sidecast sweeping within 50 feet of structures over water, where structurally possible. Whenever possible avoid casting snow and/or ice into a waterway.
- Cleaning of structures in the spring. Abrasives should be recovered from bridges and the highway shoulder when weather and road conditions allow. Cleanup should also include removing material from under the guardrail.
- Hauling and disposing of removed snow in an appropriate manner away from sensitive sites.
- Educating MDT Maintenance staff on water quality and fishery resource issues.

### **Emergency Maintenance (No MDT MMS)**

Description: This action includes fixing damage to roadways, slopes and structures (bridges) caused by storms, floods, and other activities. These actions may not be technically defined as an emergency under the Endangered Species Act, Stream Protection Act, Clean Water Act (Presidential declaration and/or other state and federal emergency statutes), however, failure to perform these activities may result in immediate threat to life, limb or structures.

### **Minimization and Avoidance**

- MDT will provide quick response and first inspection, and notify appropriate resource staff in a timely manner.
- In coordination with the MDT Environmental Services District Biologist and/or the MFWP Regional Biologist and other resource agencies as appropriate, MDT Maintenance will repair any damage to fishery or water resources caused by MDT Maintenance responses to the emergency.
- MDT Maintenance will avoid additional impacts to wetlands or streams where possible.
- MDT Maintenance will provide, if possible, adequate erosion control or bank stabilization necessary to keep material from entering watercourses.
- MDT Maintenance will identify and plan for slide debris disposal at appropriate sites. Appropriate sites for long and short-term material disposal will be identified and cleared for any potential wetland or sensitive species impact and mapped.
- Remedial actions for emergencies will include bioengineering and fish friendly designs, where practicable, for stability and safety.

### **Stockpiling (MMS 8408)**

Description: Stockpiling materials for MDT Maintenance activities.

#### Minimization and Avoidance:

- MDT will develop site plans for areas adjacent to or near riparian areas to identify erosion and sediment control needs, and to ensure stability of the material.
- MDT will not stockpile material in-lieu of appropriate disposal.

## APPENDIX A

### **Guidance for Maintenance Activities in Wetland (“Wet”) Ditches**

#### **Background**

MDT maintenance crews regularly perform a variety of activities related to repair or maintenance of state highways which could involve regulated ditches and other waters of the US or wetlands. When these activities affect waterways or wetlands, a Section 404 permit from the Army Corps of Engineers (Corps) and/or a Montana Stream Protection Act 124 permit from Montanan Fish, Wildlife & Parks (MFWP) and/or, on Reservations, tribal water quality permits may be required. Ditch cleaning, reshaping and possible wetland impacts are of particular concern.

Guidelines for when a permit may be needed for ditch maintenance have been developed by MDT Environmental Services, the Corps and MFWP to help MDT Maintenance forces more efficiently do their work in compliance with all applicable state and federal regulations.

Also attached is a guidance tool designed to help maintenance personnel determine when they need to apply for permits for maintenance work.

#### **Clarification of Maintenance Activities and Section 404/SPA 124 Permits**

Two key considerations determine whether a permit will be needed for maintenance activities of a roadside drainage facility:

- **Is the drainage facility part of, or connected to, a stream system that contains fish or contributes resources that support fish?**

Answering the question “Are fish in the drainage facility?” is the key information that determines if a permit is needed for drainage facility maintenance activities. Contact with the MDT District Biologist and MFWP Regional Fisheries Biologist for information about whether fish are likely to be in a roadside drainage facility is the best means of differentiating whether a drainage facility is actually a stream, perennial or intermittent, which has been “captured” by the roadside ditch system.

- **Is the proposed activity “maintenance” or does it expand or change an existing drainage facility?**

All maintenance activities are allowed in a drainage ditch, even if it was constructed in a wetland, as long as the ditch is not expanded, or new structures added. The term “ditch” is used only when fish are not present in the drainage facility.

Maintenance activities allowed in a drainage ditch in a wetland include removal of sedimentation, re-grading the ditchline to the original ditchline, removal of vegetation by clearing, mowing or whatever other method is commonly used for vegetation management, culvert cleaning and any other regular maintenance activities. Side-casting of material removed from a ditch that lies in a wetland is considered “fill” and is not allowed. Sediments or material removed from a ditch in the ditch cleaning process must be disposed of in an appropriate upland disposal site.

Installing a new or additional culvert to add capacity to an existing culvert is new work, not maintenance, as is expanding the capacity of an existing ditch, adding rip-rap, revetments, or other bank protection materials which were not originally part of the drainage or ditch system. Any of these activities is subject to the permitting process, if the initial drainage ditch or structure was originally constructed in a wetland.

### Field Guidance

The next page of this appendix is a guidance flowchart for determining when permits might be needed for maintenance activities. This flowchart is intended to help maintenance forces determine when they may need to contact their MDT District Biologist before beginning any ditch maintenance activities.

## APPENDIX B

(This appendix will [may] be provided in cooperation with MFWP)

Montana Guidelines for  
Timing of In-Water Work  
To Protect Fish and  
Wildlife Resources

## APPENDIX C

(This appendix will be provided in cooperation with MFWP)

Montana Fish, Wildlife & Parks  
Guidelines and Criteria for  
Stream-Road Crossings.

## APPENDIX D

(This appendix will be provided in cooperation with MFWP)

Figure 1: Montana Guide to Required Permits – Cross Section of Stream, Bank and Floodplain

## APPENDIX F

### GUIDELINES FOR MAINTAINING WATER QUALITY IN SNOW & ICE OPERATIONS

#### GENERAL CONCERNS FOR ALL CHEMICALS & ABRASIVES

**Application:** Snow and ice control chemicals and abrasives should be applied at the least rate that is consistent with environmental, meteorological, and traffic conditions.

**Storage:** Sand and chemicals should be stored in a manner to minimize the potential for any contamination of surface or ground water. Care should be taken to prevent runoff from chemical tanks or chemical treated stockpiles. Covered storage for chemically treated abrasives is preferred.

**Contaminants:** Chemicals should comply with generally acceptable contaminant levels identified in the PNS Guidelines. Some contaminants include: Arsenic, Barium, Cadmium, Chromium, Fluoride, Lead, Mercury, Nitrate, Selenium, Other Heavy Metals, Hydrocarbons

**Inventory:** Identify all sensitive receptors or areas within the application areas.

**Documentation:** Records of chemical and abrasive application are necessary to determine both short and long range effects. All use of abrasives and chemicals should be continuously recorded through the MMS system.

**Critical (Sensitive) Areas:** Receptors that have any of the following attributes should be reviewed with natural resource agencies for special consideration:

1. Spawning streams and those inhabited by federally protected or state listed sensitive aquatic species, especially trout and other listed or candidate fish.
2. Those impaired water segments listed on DEQ's 1996 "Section 303(d) List" for Total Maximum Daily Load (TMDL) Plan development and restoration.
3. Those receiving direct runoff from treated roads and highways where there would be less than 100:1 dilution;
4. Those where a large volume of highway runoff can directly reach small, poorly flushed ponds, lakes and wetlands.
5. Those where receiving water temperatures have warmed by the time highway runoff arrives.

## **GUIDELINES FOR MAINTAINING WATER QUALITY IN SNOW & ICE OPERATIONS (cont.)**

6. Those areas where shallow ground water is overlain by very coarse and permeable soils.
7. Facilities that allow surface water access to underground aquifers.

### **SPECIFIC USAGE GUIDELINES:**

**Traction Aggregates:** Traction aggregates or abrasives are not without environmental impact. The following are some areas where careful review of the use of aggregate is indicated:

1. Those with PM-10 (dust) related air quality problems.
2. Those where there is danger of siltation in spawning streams, shallow lakes or ponds.
3. Those that have sensitive and/or rare plants near the roadside.

# APPENDIX G

## MDT/DEQ Sanding and Chip Seal Material Specifications for PM-10 Nonattainment Areas

**General Requirements.** The following test methods, as applicable, are used to evaluate surfacing aggregate quality:

Sieve Analysis For Fine and Coarse Aggregate.....	MT-202
Wear Test.....	MT-209
Liquid Limit, Plastic Limit, Plasticity Index .....	MT-208
Fracture.....	MT-217
Volume Swell of Bituminous Mixtures.....	MT-305
Cleanness Value.....	MT-228
Petrographic Examination.....	2-456-3*

\*Test method available from Materials Bureau

Furnish aggregate surfacing materials free of deleterious material except as permitted in Table 701-5.

Do not use scoria (fired clay commonly found in conjunction with burned coal in the lignite fields of the state) as aggregate to be bituminized. Sources of scoria are common but not limited to Daniels, Sheridan, Roosevelt, McCone, Dawson, Prairie, Wibaux, Custer, Fallon, Rosebud, Treasure, Bighorn, Powder River, and Carter counties. Meet Table 701-5 limits.

**TABLE 701-5  
LIMITS ON DELETERIOUS SUBSTANCES  
IN AGGREGATE SURFACING**

Substance	Maximum % by Wt*
Clay Lumps, Shale, Coal	1.5 each
Soft Particles	3.5 each

\* Determined by Test Method 2-456-3

Ensure no combination of shale, clay, coal, and soft particles exceed 3.5 percent. Ensure the aggregate is free of wood and other plant material.

That portion of the aggregate retained on the No. 4 sieve is coarse aggregate, and that passing the No. 4 sieve is fine aggregate.

When wear factors are specified in the Contract, the term "aggregate surfacing" includes all aggregates specified in Subsections 701.02.4 through 701.02.9.

## Crushed Top Surfacing Type "Washed Sand"

**TABLE 701-10  
TABLE OF GRADATIONS - CRUSHED TOP SURFACING TYPE "WASHED SAND"**

<b>SIEVE SIZE</b>	<b>Washed Sand</b>
3/8" (9.5 mm)	100
No. 4 (4.75 mm)	40-80
No. 10 (2.00 mm)	-
No. 40 ( )	0-40
No. 200 (0.075 mm)	0-2.5
PI	NP

Meet the following requirements for crushed top surfacing type "A", including added binder or blending material:

1. Dust Ratio: Ensure that portion passing the No. 200 sieve does not exceed two-thirds of the portion passing the No. 40 sieve.
2. Ensure the maximum liquid limit and plasticity index for the material passing the No. 40 sieve is 25 and 6 respectively.
3. Ensure the composite aggregate is free of adherent films of clay and other matter that prevents the aggregates thorough coating with bituminous material. Ensure the bituminous material adheres to the material upon contact with water.
4. Ensure that when the aggregate is to be bituminized, both the material source and the composite aggregate have a volume swell not exceeding 10 percent and not showing cracking or disintegration.
5. Do not remove intermediate sizes from the material during production, unless authorized in writing.
6. Ensure the aggregate has a wear factor not exceeding 50 percent at 500 revolutions.
7. Ensure at least 35 percent by weight of the aggregate retained on the No. 4 sieve has at least one mechanically fractured face.

**TABLE 701-12  
TABLE OF GRADATIONS - COVER MATERIAL**

SIEVE SIZE	Grade 4A
5/8" (16.0 mm)	
1/2" (12.5 mm)	
3/8" (9.5 mm)	100
No. 4 (4.75 mm)	0-30
No. 8 (2.36 mm)	0-15
No. 200 (0.075 mm)	0-2

Meet the following requirements:

1. Ensure the material for Grades 1A through 4A are non-plastic. For Grade 5A the liquid limit and plasticity index for the material passing the No. 40 sieve cannot exceed 25 and 6 respectively.
2. Ensure the composite aggregate is free of adherent films of clay, vegetable matter, frozen lumps, and other extraneous matter that prevents thorough coating with bituminous material. Ensure the bituminous material adheres to the material upon contact with water. Ensure no combination of shale, clay, coal, and soft particles exceed 1.5 percent.
3. Ensure the aggregate has a wear factor not exceeding 30 percent at 500 revolutions.
4. Ensure at least 70 percent by weight of the coarse aggregate for Grades 1A through 4A have at least one fractured face. Ensure at least 50% by weight of the coarse aggregate for Grade 5A has at least one fractured face.