

Marion County

Department of Public Works

Best Management Practices for Clean Water



Crew Manual
Spring 2009



BMPs can be found on-line at:
<http://pw.intra.co.marion.or.us/operations/All/BMPs/Index.htm>



Marion County Best Management Practices (BMPs) for Clean Water

How to use the BMPs:

1. Look up your activity in the MCPW Clean Water BMP crew manual.
2. Review the BMPs for that activity, and determine how they affect your project.
3. Adapt your activities so that they accommodate the BMPs and address the concerns listed in the BMP.
4. There are maps available in the break room and in dispatch that show streams and road crossings. You can use these to help plan your work.

Where to find additional materials:

If you need information beyond that found in the BMP manual, feel free to contact the MCPW Environmental Specialist, Matt Knudsen at 503-365-3187.

The latest version of the BMP crew manual is on the MCPW Intranet:

Just click the BMP icon that is on your computer screen.

Your part:

MCPW staff is expected to follow the guidelines provided by the BMPs. Though the BMPs and the maps were developed to be as practical as possible, they are not intended to replace good judgment or common sense in the field. Remember, the main focus of the BMPs is to keep chemicals and sediments out of the streams while still accomplishing our work.

Everyone has a role to play in keeping the streams of Marion County clean, and the BMPs are one way MCPW can have a positive impact on the local environment. As we continue to put these BMPs in place, we expect that the staff will come up with problems and improvements regarding implementation. Please feel free to share your ideas with your supervisor or with the MCPW Environmental Specialist, and they will be documented and considered for the next version.

BEST MANAGEMENT PRACTICES FOR CLEAN WATER

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I. INTRODUCTION AND PURPOSE

The purpose of the Marion County Public Works Best Management Practices for Clean Water is to enhance the recovery of native salmon and steelhead runs in Marion County. The specific objectives include:

- To establish a set of Best Management Practices (BMPs) to minimize the impacts of MCPW activities on salmon and steelhead runs.
- To train MCPW personnel on these BMPs.
- To identify and prioritize capital improvement projects that will help restore native salmon and steelhead habitat within the County.
- To insure that MCPW complies with the 4(d) rules published by NMFS, prohibiting take of listed salmon and steelhead by securing a programmatic limitation under Limit 10: Routine Road Maintenance.
- To insure that MCPW complies with NPDES Phase II and TMDL requirements as outlined by DEQ.

For further information, refer to our Best Management Practices for Salmon Recovery, Limit 10 Submittal Document.

A. ROAD MAINTENANCE ACTIVITIES

II. THE BEST MANAGEMENT PRACTICES

100088 A. Road Maintenance Activities

The purpose of the MCPW road maintenance program is to provide a transportation system that is safe and efficient for motorists and residents. Public and personal safety is always the primary concern for maintenance crews. The best management practices in this section are designed to eliminate the adverse impacts of road maintenance activities on salmonid habitat without compromising safety. In general, the BMPs are designed to:

- Keep rock, sediment, and foreign matter out of ditches, catch basins, and streams.
- Reduce the occurrences of erosion.
- Promote the ability of ditches to naturally filter contaminants.

306.001 1. Gravel Road Maintenance

a. Description

Gravel road maintenance includes restoring gravel roadway cross slope, drainage, and grade by blading, reshaping, and smoothing of existing surface materials using a motor grader. This also includes, transporting and placing of suitable aggregate material on existing gravel roads to repair soft spots and potholes, providing a suitable driving surface.

b. Concerns

- Rock and sediment deposits in ditches
- Dust
- Fuel spills during equipment refueling

c. Best management practices for MCPW will be to:

- Perform activity in dry weather, but with soil still containing some moisture to minimize dust.
- Use any practical means to prevent rock or sediments from entering the water bodies.
- Prevent material from falling into the ditch by maintaining a clear buffer space (meeting min. standards) from the edge of the road surface to the ditch.
- When practicable, protect/maintain existing vegetation.
- Refuel and repair equipment at least 25' from water bodies.
- Examine your work area on the Environmentally Sensitive Zone maps for this activity category. If in doubt, check with supervisor. Determine if there are any "caution" areas.

334.001 2. Dust Abatement

a. Description

Dust abatement practices help to stabilize gravel roads to reduce damage and maintenance costs. Depending on the type of road treated, application of dust palliatives creates a hard, compact surface that resists potholing, rutting and loss of aggregate.

In addition control of road surface soils reduces the short-term, localized air quality hazards associated with unpaved roads. For people living along dirt roads, dust can cause inconveniences from dust settling on their property. While, not all county gravel roads require dust abatement applications, there are situations where dust control is either requested or required.

Dust suppression involves the application of a dust palliative to non-paved road surfaces to temporarily stabilize surface soils, leading to a reduction of dust. Counties provide dust abatement with their own funding in only a few circumstances. In some cases, Counties apply palliatives when excessive truck traffic utilizes a non-paved gravel road such as a quarry or construction site. This practice is for the purpose of the reduction of dust as well as road stabilization. In other instances, private contractors apply dust palliatives to county roads for residents living along county roads to reduce the amount of dust produced by passing vehicles.

Application of dust palliatives often occurs at the beginning of the summer and depending on the road surface and grade, two “light” applications may be made to avoid run off of the palliative from the road surface. In preparation for palliative application, roads are graded and “roughed up” to allow for greater penetration of the palliative. Application normally consists of 0.5 gallons of material per square yard of road and is applied using an applicator truck.

Materials

The following materials are proposed for use in county road dust abatement practices on unpaved roads. They have been selected because of their effectiveness in controlling fugitive dust, as well as minimizing potential environmental impacts.

Lignosulfonates

Lignin is a polymer in the secondary cell wall of woody plant cells that helps to strengthen and stiffen the wall. During the various pulping processes, lignin by-products are produced. Lignosulfonate is a byproduct of the sulfite method for manufacturing paper from wood pulp. Sometimes it is called sulfonated lignin. Lignosulfonate is a complex mixture of small- to moderate-sized polymeric compounds with sulfonate groups attached to the molecule.

Lignosulfonates have a long history of use on roads as a method for dust control and surface stabilization. Lignosulfonates have a natural adhesive property when moist. When applied to gravel roads, the lignosulfonate solution coats individual road particles with a thin adhesive-like film that binds the particles together. The lignosulfonate acts as a dispersant. By attaching to the particle surface, it keeps the particle from being attracted to other particles and reduces the amount of water needed to use the product effectively. This allows the particles to pack closer together for a stronger surface. Consequently, water uptake by the roadbed surface is greatly reduced and the binder is less likely to be washed away by rain.

Lignosulfonates used for road applications are usually shipped in a concentrated solution and diluted with water on the job site to about a 25 percent solid content. Road conditions and climate can affect the application rate. However, as a general rule for dust control, a diluted solution of lignosulfonate is applied at a rate of one-half gallon per square yard.

Magnesium Chloride

Magnesium chloride is a naturally occurring element and is extracted from salt-water solutions such as those found in seawater. To extract the magnesium chloride brine, water is removed from the salt water by solar evaporation, other energy, and a simple refinement process until other chemicals have been extracted resulting in magnesium chloride brine. This brine can then be further dehydrated to produce magnesium chloride solids.

Magnesium chloride can be adapted and designed to provide highest efficiency depending on prevailing dust conditions, anticipated traffic, and type of soil. Dilution can also be varied to obtain the greatest possible economy and minimize environmental impact. Some soil types may be best treated with a one-time heavy application of product, whereas others may require several light applications. As a general rule, the rate of penetration of magnesium chloride is rapid in sandy soil, moderately fast in silty soil and slow in clay.

b. Concerns

- Runoff into streams
- Biochemical oxygen demand
- Aquatic toxicity
- Chemical spills

c. Best management practices for MCPW will be to:

- Refuel and repair equipment at least 25' from water bodies.
- Prepare gravel road surfaces by tight blading or processing (cut 2" and water, then lay gravel back to grade and roll).

- Within 25' of water bodies, construct 6" gravel berms on low shoulders of roads .
- Maintain a 1' buffer zone on the edge of gravel if the road width allows.
- Carry supplies for, and follow, small spill containment plan (diapers, rice ash, shovel, etc.)
- Perform activity in dry weather conditions.
- When practicable, a 3-day forecast of clear weather should follow any application.
- Use environmentally-sensitive cleaning agents when cleaning equipment and vehicles at approved sites.
- Excess materials will be disposed of at areas designated, and approved, for receiving such materials.
- Examine your work area on the Environmentally Sensitive Zone maps for this activity category. If in doubt, check with supervisor. Determine if there are any "caution" areas.

303.001 3. Grading Shoulders

a. Description

Grading shoulders includes restoration of unpaved shoulder sections by adding, reshaping, and compacting aggregate material. This action also includes removing excess shoulder material and/or vegetation for safety, to improve drainage, and to prevent standing water on roadways.

b. Concerns

- Rock and sediment deposits in streams
- Dust
- Disposal of material
- Fuel spills during equipment refueling

c. Best management practices for MCPW will be to:

- Install erosion control where the potential for runoff of sediments exists. (See the Erosion Control Table for appropriate measures in Appendix A.)
- Perform activity in dry weather, but with soil still containing some moisture to minimize dust.
- Modify width of grading whenever practical to minimize disturbance of vegetation.
- Use any practical means to prevent rock or sediments from entering the water bodies.
- Pick up excess gravel and debris when within 25' of salmon habitat and other flowing water bodies.
- Minimize the need for shoulder grading using mowing methods and seed selection, etc. when possible.
- Permanently stabilize disturbed soils with reseeded, where appropriate.

- Evaluate specific sites for alternatives such as berming, curbing, or paving the shoulder.
- Deposit excess material above the 100- year floodplain, at a supervisor-approved site, and not within 75’ of a stream, wetland, or riparian area. Follow Erosion Control Table in Appendix A.
- Refuel and repair equipment at least 25’ from water bodies.
- Examine your work area on the Environmentally Sensitive Zone maps for this activity category. If in doubt, check with supervisor. Determine if there are any “caution” areas.

335.001 4. Road Base Construction

a. Description

For the processing or construction of a gravel road base in preparation for paving, for major base repair of paved roads, gravel is placed on the road surface in 4-6 inch lifts, bladed, compacted, and then watered.

b. Concerns

- Rock and sediment deposits in ditches or catch basins
- Fuel spills during equipment refueling

c. Best management practices for MCPW will be to:

- Properly place base on roadway, compact, and water to minimize the release of suspended solids into the environment.
- Use any practical means to prevent rock or sediments from entering the water bodies.
- Cover catch basins, and other inlets, when appropriate.
- Use appropriate fish screen on pump inlets, observe water laws, and consult with the Environmental Specialist to ensure stream hydrology and ecology are not affected.
- Install erosion control where the potential for runoff of sediments exists. (See the Erosion Control Table for appropriate measures in Appendix A.)
- Refuel and repair equipment at least 25’ from water bodies.
- Examine your work area on the Environmentally Sensitive Zone maps for this activity category. If in doubt, check with supervisor. Determine if there are any “caution” areas.

340.001 5. Stockpiling Materials

a. Description

In loading, hauling, mixing, or stockpiling materials used for routine maintenance activities, placement of material at Marion County sites follows ODEQ guidelines.

b. Concerns

- Erosion

- Fuel spills during equipment refueling
- c. Best management practices for MCPW will be to:**
- Deposit excess material above the 100- year floodplain, at a supervisor-approved site, and not within 75’ of a stream, wetland, or riparian area. Follow Erosion Control Table in Appendix A.
 - Install erosion control where the potential for runoff of sediments exists. (See the Erosion Control Table for appropriate measures in Appendix A.)
 - Hydroseed the stockpiles if they are expected to be in place longer than 2 months. Consult with Environmental Specialist for seed species approval.
 - Locate stockpiles storage piles of loose materials away from waterbodies.
 - Refuel and repair equipment at least 25’ from water bodies.
 - Examine your work area on the Environmentally Sensitive Zone maps for this activity category. If in doubt, check with supervisor. Determine if there are any “caution” areas.

333.001 6. Gravel Road Paving (O-11 Process)

- a. Description**
- The O-11 process involves an application of alternating layers of emulsified rubber asphalt and rock over base material. Emulsified asphalt is applied to the road surface in five stages and does not runoff unless rained on prior to setting.
- b. Concerns**
- Asphalt spills
 - Rock and sediment deposits in ditches
 - Fuel spills during equipment refueling
- c. Best management practices for MCPW will be to:**
- Perform activity in dry weather conditions.
 - Use any practical means to prevent gravel, sand and asphalt from entering water bodies.
 - Use appropriate fish screen on pump inlets, observe water laws, and consult with the Environmental Specialist to ensure stream hydrology and ecology are not affected.
 - In case of spills, contain with a dike composed of native materials until diapers, berms or pillows can be set up.
 - Refuel and repair equipment at least 25’ from water bodies.
 - Load asphalt emulsions away from water bodies.
 - Carry supplies for, and follow, small spill containment plan (diapers, rice ash, shovel, etc.)
 - Examine your work area on the Environmentally Sensitive Zone maps for this activity category. If in doubt, check with supervisor. Determine if there are any “caution” areas.

332.005 7. Slurry Seal

a. **Description**

The process of slurry sealing involves mixing and placing a liquid emulsified asphalt and sand mixture over existing asphalt to seal and maintain the road surface. This activity also includes crack sealing prior to slurry seal. Road surface cracks are cleared with a hot air lance and then filled with hot liquid asphalt, no sand. The slurry ingredients are combined from storage tanks and stockpiles at MCPW shop yard and transported to the job site where they are mixed and applied.

b. **Concerns**

- Asphalt spills and runoff
- Sand deposits in ditches or catch basins

c. **Best management practices for MCPW will be to:**

- Perform activity in dry weather conditions.
- Use any practical means to prevent gravel, sand and asphalt from entering water bodies.
- Cover catch basins, and other inlets, when appropriate.
- Use environmentally-sensitive cleaning agents when cleaning equipment and vehicles at approved sites.
- Use less water in the slurry mixture when operating near roadside ditches or other water bodies.
- Carry supplies for, and follow, small spill containment plan (diapers, rice ash, shovel, etc.)
- Dispose of used cleaning agents with a licensed waste recycler.
- Excess materials will be disposed of at areas designated, and approved, for receiving such materials.
- Require contractors to comply with all MCPW BMP's by including them as part of the project specifications and instructing on them during the pre-construction conference.
- Examine your work area on the Environmentally Sensitive Zone maps for this activity category. If in doubt, check with supervisor. Determine if there are any "caution" areas.

331.002 8. Pavement Overlays

a. **Description**

The process of pavement overlays involves placement and compaction of hot mix asphalt concrete (a uniform mixture of hot asphalt oil and fine aggregate which hardens by cooling) over existing asphalt surfaces. Preparation work may include grinding of existing surface in some areas. Rock is added to the shoulders, afterward, to make them level with the new surface. This activity is performed by contractors and overseen by MCPW inspectors.

b. Concerns

- Asphalt spills and runoff
- Rock and sediment deposits in ditches and catch basins
- Disposal of material
- Fuel spills during equipment refueling

c. Best management practices for MCPW will be to:

- Perform activity in dry weather conditions.
- Use any practical means to prevent gravel, sand and asphalt from entering water bodies.
- Isolate activities near water bodies to avoid contact between fresh concrete and water.
- Cover catch basins, and other inlets, when appropriate.
- Sweep up and remove excess material.
- Fully contain cleaning agents in a safe system.
- Use environmentally-sensitive releasing agents such as vegetable oil based release agents (no diesel).
- Add the minimum amount of rock needed to match the shoulder to the new road surface.
- Use any practical means to prevent rock or sediments from entering the water bodies.
- Carry supplies for, and follow, small spill containment plan (diapers, rice ash, shovel, etc.)
- Dispose of used cleaning agents with a licensed waste recycler.
- Deposit excess material above the 100- year floodplain, at a supervisor-approved site, and not within 75' of a stream, wetland, or riparian area. Follow Erosion Control Table in Appendix A.
- Require contractors to comply with all MCPW BMP's by including them as part of the project specifications and instructing on them during the pre-construction conference.
- Refuel and repair equipment at least 25' from water bodies.
- Examine your work area on the Environmentally Sensitive Zone maps for this activity category. If in doubt, check with supervisor. Determine if there are any "caution" areas.

For Bridges: (Use overlay BMPs as well as the following)

- Cover scuppers and drains before performing the activity and clean them to remove any excess material after the activity.
- Use any practical means to prevent gravel, sand and asphalt from entering water bodies.
- Sweep up and remove excess material.
- Deposit excess material above the 100- year floodplain, at a supervisor-approved site, and not within 75' of a stream, wetland, or riparian area. Follow Erosion Control Table in Appendix A.

9. Pavement Repair

a. Description

Pavement repair includes major and minor patching of intermittent potholes, small depressions, edge breaks, and any surface irregularities with plant mixed asphalt concrete material. Preparation work may include grinding of existing surface in some areas.

b. Concerns

- Rock and sediment deposits in ditches and catch basins
- Asphalt spills and runoff
- Disposal of materials

c. Best management practices for MCPW will be to:

- Use heat sources to heat and clean tack nozzles during operations.
- Use environmentally-sensitive releasing agents such as vegetable oil based release agents (no diesel).
- Refuel and repair equipment at least 25' from water bodies.
- Carry supplies for, and follow, small spill containment plan (diapers, rice ash, shovel, etc.)
- Perform activity in dry weather conditions.
- Isolate activities near water bodies to avoid contact between fresh concrete and water.
- Cover catch basins, and other inlets, when appropriate.
- Sweep up and remove excess material.
- Dispose of used cleaning agents with a licensed waste recycler..
- Deposit excess material above the 100- year floodplain, at a supervisor-approved site, and not within 75' of a stream, wetland, or riparian area. Follow Erosion Control Table in Appendix A.
- Examine your work area on the Environmentally Sensitive Zone maps for this activity category. If in doubt, check with supervisor. Determine if there are any "caution" areas.

332.001 10. Chip Sealing

a. Description

Chip sealing involves applying a single layer each of liquid asphaltic material and aggregate to a paved roadway to seal the surface, restore surface life, flexibility, and skid resistance. Excess gravel is later swept onto the shoulders.

b. Concerns

- Rock in the ditches or streams
- Asphalt spills and runoff
- Fuel spills during equipment refueling

- c. **Best management practices for MCPW will be to:**
- Use environmentally-sensitive releasing agents such as vegetable oil based release agents (no diesel).
 - Use any practical means to prevent rock or sediments from entering the water bodies.
 - Use water, as needed, to reduce dust during sweeping.
 - Perform activity in dry weather conditions.
 - Cover scuppers and drains before performing the activity and clean them to remove any excess material after the activity.
 - Sweep up and remove excess material.
 - Install erosion control where the potential for runoff of sediments exists. (See the Erosion Control Table for appropriate measures in Appendix A.)
 - Carry supplies for, and follow, small spill containment plan (diapers, rice ash, shovel, etc.)
 - Refuel and repair equipment at least 25' from water bodies.
 - Examine your work area on the Environmentally Sensitive Zone maps for this activity category. If in doubt, check with supervisor. Determine if there are any "caution" areas.

470.001-470.003; 471.001-471.003, 490.001, 491.001

11. Road Striping and Pavement Marking

- a. **Description**
Road striping and pavement marking includes center line, shoulder line, intersection, and miscellaneous pavement painting activities utilizing paint, beads, etc. The process includes use of a grinder to remove markings, graffiti, center and shoulder lines, and disposal of waste paint.
- b. **Concerns**
- Total Suspended Solids
 - Rock in ditches and catch basins
- c. **Best management practices for MCPW will be to:**
- Perform activity in dry weather conditions.
 - Clean up spills on site with absorbents, shovels and buckets, return to shop for proper disposal.
 - Minimize drift by spraying on calm days.
 - Use shovels, brooms, buckets and vacuums to collect all grindings and shot and return to shop for proper disposal.
 - Cover catch basins, and other inlets, when appropriate.
 - Use only federally approved, low volatile organic compound (VOC) paint.
 - Refuel and repair equipment at least 25' from water bodies.
 - Examine your work area on the Environmentally Sensitive Zone maps for this activity category. If in doubt, check with supervisor. Determine if there are any "caution" areas.

308.001 12. Road Vacuum Sweeping

a. Description

Vacuum sweeping of roadways is done to remove dirt, debris, and other loose material. The material is removed to another location for disposal. Vacuum sweeping is performed in most weather to prepare for striping, remove sanding material and pavement marking debris, and to improve aesthetics.

b. Concerns

- Total Suspended Solids
- Oil & Grease
- Metals
- Disposal of removed materials

c. Best management practices for MCPW will be to:

- Deposit excess material above the 100- year floodplain, at a supervisor-approved site, and not within 75’ of a stream, wetland, or riparian area. Follow Erosion Control Table in Appendix A.
- Emphasize recycling of materials where appropriate.
- Schedule in damp weather, when possible, to minimize dust.
- Pick up excess gravel and debris when within 25’ of salmon habitat and other flowing water bodies.
- When feasible, coordinate crews to follow sweeping/flushing with bridge drainage cleaning. Sweep material away from scuppers.
- Use water, as needed, to reduce dust during sweeping.
- Perform activity more often during rainy season to minimize contamination of runoff.
- Refuel and repair equipment at least 25’ from water bodies.
- Examine your work area on the Environmentally Sensitive Zone maps for this activity category. If in doubt, check with supervisor. Determine if there are any “caution” areas.

336.001 13. General Excavation

a. Description

General excavation and/or embankment of native materials includes earthwork related to vision improvement, right-of-way clearing, road widening and typical cut and fill work. Excavated material is compacted and used as fill elsewhere.

b. Concerns

- Erosion
- Fuel spills during equipment refueling

c. Best Management Practices for MCPW will be to:

Environmental Contacts

Marion County
Public Works
503-588-5304

Department of
State Lands
503-378-3805 x231

Army Corp of
Engineers
503-808-4393

Oregon Department of
Fish and Wildlife
503-378-6925

National Marine
Fisheries Services
503-231-2202

Oregon Emergency
Management Agency
503-378-2911

- Follow Marion County's Supplemental Standard Specifications for Highway Construction Section 00280-Erosion and Sediment Control, or current version of this document.
- Install all specified perimeter controls prior to any major site grubbing operation. Perimeter controls include side ditches, berms in fill areas, and sediment fences or straw bales along the banks of existing streams and toes of slopes.
- Develop a schedule to assure that appropriate controls are implemented and maintained during the wet season work and work suspension periods.
- Temporarily stabilize bare soils and slopes not at finished grade, and bare soils and slopes at finished grade but outside permanent seeding dates as suggested in Table 4.
- Stabilize or complete appropriate control measures within 7 days of exposure of any areas within 30 m of waterways, wetlands, and other sensitive areas and within 14 days for all other areas.
- Permanently stabilize soils and slope at finished grade through permanent seeding and mulching, riprap protection or bioengineered slope stabilization.
- Use appropriate fish screen on pump inlets, observe water laws, and consult with the Environmental Specialist to ensure stream hydrology and ecology are not affected.
- Refuel and repair equipment at least 25' from water bodies.
- Examine your work area on the Environmentally Sensitive Zone maps for this activity category. If in doubt, check with supervisor. Determine if there are any "caution" areas.

310.001 14. Ditch Shaping, Grading, and Cleaning

a. Description

Machine cleaning, grading, and reshaping of ditches is done to maintain or improve drainage including removal, loading, hauling, and disposing of excess materials.

Ditch: a facility, typically parallel to a road or parking lot, which carries storm water runoff draining from the road or other constructed facilities. It is not a channelized stream, either with or without fish.

Stream: a channel that is usually flowing but can be dry. It may or may not be in its natural course, and can be parallel or perpendicular to the road. It may contain fish, but not necessarily so. The stream collects drainage water from its whole watershed, rather than just a facility.

b. Concerns

- Erosion
- Debris

- Disposal of material
- c. Best management practices for MCPW will be to:**
- Avoid disturbing sides of ditch and creating vertical back slopes unless necessary.
 - When practicable, protect/maintain existing vegetation.
 - Machine brush ditches instead of ditching when removal of soil is unnecessary and control of vegetation growth is adequate to ensure drainage.
 - Install erosion control where the potential for runoff of sediments exists. (See the Erosion Control Table for appropriate measures in Appendix A.)
 - Maintain erosion control until vegetation is re-established either naturally or through hydro-seeding.
 - Perform work when water flow in the ditch is low, except in cases of emergency where water is backed up onto the roadway or adjacent property.
 - Deposit excess material above the 100- year floodplain, at a supervisor-approved site, and not within 75' of a stream, wetland, or riparian area. Follow Erosion Control Table in Appendix A.
 - Reshape ditches to have flatter side-slopes where space exists and where vegetation can quickly re-establish.
 - Evaluate and modify existing ditch slopes to trap sediments, and support development of vegetation.
 - Use appropriate fish screen on pump inlets, observe water laws, and consult with the Environmental Specialist to ensure stream hydrology and ecology are not affected.
 - Refuel and repair equipment at least 25' from water bodies.
 - Examine your work area on the Environmentally Sensitive Zone maps for this activity category. If in doubt, check with supervisor. Determine if there are any "caution" areas.

309.001 15. Slot Drain Installation and Ditch Tiling

- a. Description**
- The purpose of installing a slot drain is to help direct water into a ditch. Slot drains are normally installed at the bottom of a steep driveway to prevent water from running onto the roadway and creating a road hazard. For ditch tiling, a pipe is placed to carry the flow of water and the ditch is filled in.
- b. Concerns**
- Erosion
 - Water quality
- c. Best management practices for MCPW will be to:**
- Divert runoff into a vegetated or rock-lined ditch, where possible.

- Avoid the practice of ditch tiling. Only perform activity when necessary for the widening of a driveway or a similar circumstance to be reviewed by engineering staff.
- Use any practical means to prevent rock or sediments from entering the water bodies.
- Use appropriate fish screen on pump inlets, observe water laws, and consult with the Environmental Specialist to ensure stream hydrology and ecology are not affected.
- Examine your work area on the Environmentally Sensitive Zone maps for this activity category. If in doubt, check with supervisor. Determine if there are any “caution” areas.

312.001 16. Construct, Clean, and Repair Catch Basins and UICs

a. Description

- Catch basins, junction boxes and Underground Injection Control(UIC) systems require construction, cleaning, and repair. Some catch basins and UICs are cleaned mechanically with a vacuum truck. The vacuumed material is stockpiled at The Silverton Road Public Works Facility during the summer, dewatered and tested for contaminants following the recommendations of MC Environmental Engineers. The material is then disposed of at an appropriate solid waste facility.

b. Concerns

- Sediment deposits in catch basins being removed prior to discharge downstream
- Disposal of removed material

c. Best management practices for MCPW will be to:

- Clean catch basins and UICs as roadway sediments build-up. Catch basins should all have a sump to help collect sediments that can be removed with a flusher during normal maintenance activities.
- Dispose of vacuumed materials at the detention pad at Brooks CSD.
- Perform activity in dry weather conditions.
- If construction is necessary during wet weather, use pre-cast structures.
- Isolate activities near water bodies to avoid contact between fresh concrete and water.
- Report location of catch basins with signs of illicit dumping (i.e. used motor oil) to supervisor.
- Install erosion control where the potential for runoff of sediments exists. (See the Erosion Control Table for appropriate measures in Appendix A.)
- During construction, follow appropriate water quality and storm water management regulations, such as NPDES Phase

- II, or other DEQ requirements or permits. Consult Environmental Specialist to review relevant regulations.
- Use appropriate fish screen on pump inlets, observe water laws, and consult with the Environmental Specialist to ensure stream hydrology and ecology are not affected.
- Refuel and repair equipment at least 25' from water bodies.
- Examine your work area on the Environmentally Sensitive Zone maps for this activity category. If in doubt, check with supervisor. Determine if there are any "caution" areas.

311.001 17. Minor Culvert and Inlet Cleaning and Repair

a. Description

Cleaning of culverts, siphons, box culverts (that are less than 6' in width), drop inlets, and other minor drainage facilities of dirt and debris are required to restore proper operation. Due to the vast number of culverts in the county and the difficulty of predicting which will soon present drainage problems, cleaning occurs mainly on an emergency basis when a back-up of water indicates the need. Cleaning is performed manually, as needed, with shovels and pitch forks. Material and debris are scattered or removed. Some culverts and drop boxes are cleaned mechanically with a vacuum truck. The vacuumed material is stockpiled and may be recycled as fill. Repairing and replacing may require excavating, diverting or impounding water, restoring, and backfilling. These situations are reviewed for priority and possible contract work.

b. Concerns

- Total Suspended Solids
- Debris
- Oil & Grease
- Metals
- Disposal or storage of material
- Fish passage

c. Best management practices for MCPW will be to:

- Install erosion control where the potential for runoff of sediments exists. (See the Erosion Control Table for appropriate measures in Appendix A.)
- Perform work when water flow in the ditch is low, except in cases of emergency where water is backed up onto the roadway or adjacent property.
- Deposit excess material above the 100- year floodplain, at a supervisor-approved site, and not within 75' of a stream, wetland, or riparian area. Follow Erosion Control Table in Appendix A.
- Clean culverts in water bodies containing flowing water, or during the ODWF in-stream work window, or as negotiated within water areas, except in cases of emergency.

- Use appropriate fish screen on pump inlets, observe water laws, and consult with the Environmental Specialist to ensure stream hydrology and ecology are not affected.
- Consult with the Environmental Specialist prior to routine work at culverts on water bodies that may carry salmon, as shown on the Environmentally Sensitive Zone maps.
- Culvert replacement or extension will frequently require permits outside the scope of this guide, potentially including a U.S. Army Corps of Engineers 404 permit, DSL permit, and other permits. Follow ODFW Guidelines: Criteria for Stream and Road Crossings.
- Inspect and prioritize repairs, incorporating bioengineering and fish-friendly elements in repairs where practical for stability and safety. Use ODFW fish passage standards.
- Refuel and repair equipment at least 25' from water bodies.
- Examine your work area on the Environmentally Sensitive Zone maps for this activity category. If in doubt, check with supervisor. Determine if there are any “caution” areas.

18. Emergency Maintenance

A. Storms, Floods, and other Events

a. Description

Emergency maintenance actions include fixing damage to roadways, the roadside and structures (bridges) caused by storms, floods, and other unanticipated events. These actions may not receive a state or federal declaration of emergency, however, failure to perform them may result in an immediate loss of life or property.

b. Concerns

- Erosion
- Impact to wetlands and stream morphology
- Disposal of material
- Fuel spills during equipment refueling

c. Best Management Practices

- Schedule transportation infrastructure repairs to address known maintenance issues in a timely manner and avoid emergency response situations.
- Provide a quick response and first inspection; notify appropriate resource staff in a timely manner.
- Immediately consult with Environmental Specialist and secure appropriate emergency work permits from ODFW and NOAA and Fisheries.
- In coordination with the Environmental Specialist, repair any damage to fishery or water resources caused by MCPW maintenance responses to the emergency.

- Maintenance and repairs will avoid additional impacts to wetlands or streams where possible.
- Install erosion control where the potential for runoff of sediments exists. (See the Erosion Control Table for appropriate measures in Appendix A.)
- Inspect and prioritize repairs, incorporating bioengineering and fish-friendly elements in repairs where practical for stability and safety. Use ODFW fish passage standards.
- Deposit excess material above the 100- year floodplain, at a supervisor-approved site, and not within 75’ of a stream, wetland, or riparian area. Follow Erosion Control Table in Appendix A.
- Use appropriate fish screen on pump inlets, observe water laws, and consult with the Environmental Specialist to ensure stream hydrology and ecology are not affected.
- Refuel and repair equipment at least 25’ from water bodies.
- Examine your work area on the Environmentally Sensitive Zone maps for this activity category. If in doubt, check with supervisor. Determine if there are any “caution” areas.

320.001 B. Settlements and Slides

a. Description

Repairing roadway settlements and slides includes loading, hauling, and placing of suitable materials. On settlements, the hole is filled and the grade is maintained. Slide material is moved to the side of the road until it can be disposed of properly.

b. Concerns

- Erosion
- Impact to wetlands
- Disposal of material

c. Best management practices for MCPW will be to:

- Provide a quick response and first inspection; notify appropriate resource staff in a timely manner.
- Install erosion control where the potential for runoff of sediments exists. (See the Erosion Control Table for appropriate measures in Appendix A.)
- Avoid additional mass wasting impacts to water bodies where possible.
- Inspect and prioritize repairs, incorporating bioengineering and fish-friendly elements in repairs where practical for stability and safety. Use ODFW fish passage standards.

- Immediately consult with Environmental Specialist and secure appropriate emergency work permits from ODFW and NOAA and Fisheries.
- In coordination with the Environmental Specialist, repair any damage to fishery or water resources caused by MCPW maintenance responses to the emergency.
- Deposit excess material above the 100- year floodplain, at a supervisor-approved site, and not within 75’ of a stream, wetland, or riparian area. Follow Erosion Control Table in Appendix A.
- Permanent solutions, such as artificial hillside drainage or permanent shoring, should be applied to chronically unstable areas through the project development process.

451.001 19. Fence and Sign Maintenance

a. Description

Repair and replacement of right of way and access control fences is needed to provide screening and restrict livestock access to county roads. This includes the installation and repair of road signs.

b. Concerns

- Total Suspended Solids
- Debris from repairs

c. Best management practices for MCPW will be to:

- Pick up debris.
- Install erosion control where the potential for runoff of sediments exists. (See the Erosion Control Table for appropriate measures in Appendix A.)
- Replace any vegetation and soil removed during sign or fence post installation when practical.
- Examine your work area on the Environmentally Sensitive Zone maps for this activity category. If in doubt, check with supervisor. Determine if there are any “caution” areas.

121.001, 122.001 20. Hazardous Materials Response

a. Description:

The following guidelines are for the proper containment and cleanup of hazardous material releases involving private citizens, the commercial transportation industry, illegal dumping and MCPW equipment failures or spills occurring during routine road maintenance activities.

b. Concerns:

- Vehicle fuels and fluids including
 - 1) Diesel

- 2) Gasoline
- 3) Antifreeze
- 4) Oils and other fluids
- Hazardous materials transported over county roads.
- Unknown Hazardous materials illegally dumped on county roadways.
- Hazardous materials used as part of MCPW road maintenance activities including
 - 1) Various herbicides,
 - 2) Road oils including CSS 1 or HFE 91-S
 - 3) Anti-icing agent
 - 4) Dust control agent
 - 5) Road marking paints

c. Best management practices for MCPW will be to:

- Train Public Works field staff at the Awareness, Operational or 40 Hour Hazwoper levels.
- Notify dispatch as to the nature and location of spills.
- Respond only within the scope of your level of Haz-Mat training.
- A stock of clean-up materials are located in the east end of building #10 of the Salem shops, all three MCPW Operations outlying shops, and the Incident Response Vehicle #648.
- If the spill is beyond your level of training or larger than the immediately available cleanup materials, contact Dispatch or Safety Specialist for additional assistance at (503) 588-5304. If further assistance is required, contact Salem Public Works Environmental Services at (503) 588-6063, Salem Fire Department Regional Haz/Mat Team, Private Environmental Clean-up Companies.
- Unknown material spills shall be isolated and the area secured. Make no effort to cleanup until material has been identified.
- Contain spills using the appropriate absorbent cleanup materials. Isolate and contain spill to restrict movement into, or from further containment of, waterways.
- If no absorbent materials are immediately available use native soil or rock to temporarily contain the spill.
- Dispose of hazardous materials in an approved manner per ODEQ requirements.
- Notify third party cleanups of Marion County Best Management practices.

Note: Notify Oregon Emergency Response system (1-800-452-0311) when a spill of 10 gallons or more of oil is released onto the ground or road surface; any amount of oil released to the water, or when there is a hazardous spill of concern.

102.001, 103.001 **21. Snow Removal and Anti-Icing**

a. Description

Snow removal and Anti-Icing involves applying abrasives or deicing chemicals to the roadway to provide a safe driving surface via removing snow, ice, and slush from the roadway and shoulders, including ramps and intersections, by plowing or blading.

b. Concerns

- Runoff of chemical agents and abrasives

c. Best management practices for MCPW will be to:

- To minimize sidecast, reduce plowing speed when adjacent to rivers, streams or approaches to bridges.
- Modify blade angles when within 25' of a water body to reduce sidecast.
- Apply ice control chemicals and sand at a minimal rate that is consistent with environmental, meteorological, and traffic conditions.
- Identify and create facilities to capture sanding material where appropriate.
- Pick up, or sweep, gravel and sand within 50' of bridge structures or flowing water bodies.
- Clean bridge scuppers after snow or ice hazard has passed, as soon as possible.
- Move toward using chemical deicers as the primary deicing method, as opposed to road sanding, in areas where there is a 25' vegetation buffer between the road surface and a watercourse or where there is a 100:1, or greater, dilution factor in the adjacent water body.
- Refuel and repair equipment at least 25' from water bodies.
- Examine your work area on the Environmentally Sensitive Zone maps for this activity category. If in doubt, check with supervisor. Determine if there are any "caution" areas.

B. VEGETATION MANAGEMENT

100089 B. VEGETATION MANAGEMENT

The purposes of vegetation management are to provide a safe road system, free of sight-hindering brush and limbs, maintain adequate drainage in ditches, and control noxious weeds (as defined by the Oregon Dept. of Agriculture.) Public safety and integrity of public facilities will be maintained, but with careful evaluation of impacts of disturbance to the watersheds and environment. MCPW employs a number of techniques to accomplish these goals including:

- **Mechanical:** Use of equipment such as mowers, brushers, chain saws, etc. to physically remove vegetation.
- **Cultural:** Vegetation planning that incorporates native, or more appropriate, plant material to out-compete the pest.
- **Chemical:** Application of herbicides.
- **Biological:** Prescribed use of insects and other organisms that will control specifically targeted noxious weeds.

MCPW Best Management Practices for Vegetation Management focus on minimizing the disturbance to native vegetation and maintaining ground cover to prevent erosion. When possible, MCPW will control vegetation through mechanical and cultural means before resorting to chemical methods.

352.001 1. Brush Cutting, Mowing, and Tree Removal

a. Description

Hand cutting, mechanical mowing, removing and disposing of brush, trees, and other undesirable vegetation on County right-of-way is conducted to maintain sight distance, vertical and horizontal vehicle clearance, and general public safety. Removal of hazardous vegetation disturbed by snow, ice, or windstorms is also performed.

b. Concerns

- Disposal of brush
- Riparian destruction, loss of shade
- Erosion
- Dust

c. Best management practices for MCPW will be to:

- Limit mowing, and other methods of vegetation removal, to the area from the edge of pavement to the catch point of the ditch line. Vegetation within the County right-of-way on the backside of the ditch will not be brushed, except where sight distance, drainage, or public safety is of concern. See Figure 1.
- Remove vegetation up to 10' beyond guardrails to maintain visibility.
- Provide a brush buffer of 10', or up to the back slope of the ditch line, along water bodies except where sight distance is of concern.

- Leave brush that is cut in riparian areas in place where doing so does not interfere with sight distance, create safety issues, cause fire hazards, involve noxious weeds, or hinder the proper functioning of highway features (e.g. drainage).
- Leave vegetated buffer strip widths at 100' for the Willamette and North Santiam Rivers, 70 feet for the Abiqua, Pudding, Butte Rivers, and Mill Creek, and 50 feet for the remaining small streams in the County, unless there is an existing road through the area. Such roads will follow the three preceding BMPs.
- Maintain shade trees along water bodies, when possible. Exception- consider removing any trees or snags, on or near a roadway/bridge that are found to be weakened, unsound, undermined, leaning or exposed that may fall across a roadway/bridge, as expectations to the above BMPs. Mitigation requirements will still be followed in these cases.
- If trees providing shade or bank stabilization within 50' of water bodies are determined to be a risk to public safety, the trees will be removed in consultation with the Environmental Specialist. Mature trees (greater than 12" diameter at breast height) that are removed will be replaced at a 2:1 ratio within the same watershed in an area that will not pose a future threat to bridge structures.
- Properly dispose of brush (processing through chipper) that is cut outside of riparian areas.
- Deposit excess material above the 100- year floodplain, at a supervisor-approved site, and not within 75' of a stream, wetland, or riparian area. Follow Erosion Control Table in Appendix A.
- Refuel and repair equipment at least 25' from water bodies.
- Examine your work area on the Environmentally Sensitive Zone maps for this activity category. If in doubt, check with supervisor. Determine if there are any "caution" areas.
- Follow guidelines for management of areas containing sensitive plant species as indicated by roadside markers, or as advised by supervisor.

352.001 2. Bridge Brush Maintenance:

- Remove brush on either side, either end, and under the structure only as needed to maintain sight distance and safety of the structure or control noxious weeds, maintaining adequate air flow to prevent moisture build-up on wood, steel, and concrete bridge components; dispose of brush appropriately.
- Maintain trees that lean, but pose no danger to structures or facilities.
- Remove 10' of brush, upstream, downstream, and on each side of culverts that are 6's in diameter or greater. Removal of noxious weeds may extend beyond this limit.
- Refuel and repair equipment at least 25' from water bodies.

- Examine your work area on the Environmentally Sensitive Zone maps for this activity category. If in doubt, check with supervisor. Determine if there are any “caution” areas.
- Follow guidelines for management of areas containing sensitive plant species as indicated by roadside markers, or as advised by supervisor.

Figure 1: Vegetation Management Standards

Zone A:
Vegetation free zone maintained with herbicide spraying.
Spray width is
 2 feet for local roads
 3 feet for collector roads
 5 feet for arterial roads

Zone B:
Mow to Ditch Catch Point May-Oct.
Brush every 7 years Sept.-Oct.
Spot spray noxious weeds Sept.-Oct.

Zone C:
No maintenance except for:

- 1. Emergency and/or dangerous circumstances**
- 2. Vision hazard**
- 3. Vegetation in Zone C is encroaching into Zones A or B, adversely affecting other maintenance activities and within the 16 foot vertical clearance.**
- 4. Tree limbs overhanging into the roadway or Zone A will be trimmed flush with Zone C.**

365.001, 366.001 3. Shoulder Spraying & Foliar Spraying

a. Description

The purpose of applying herbicides along the roadside is to eradicate, prevent, or retard the growth of noxious weeds, brush, and other undesirable vegetation. Tree stumps are hand-painted with stump killer. Shoulder spraying is truck applied. Foliar spraying is either truck applied, or hand/backpack applied. MCPW does not use any restricted-use chemicals to control vegetation. Herbicides used include broad-based foliar-active herbicides and soil residual herbicides.

b. Concerns

- Chemical runoff
- Overspray

- Spills

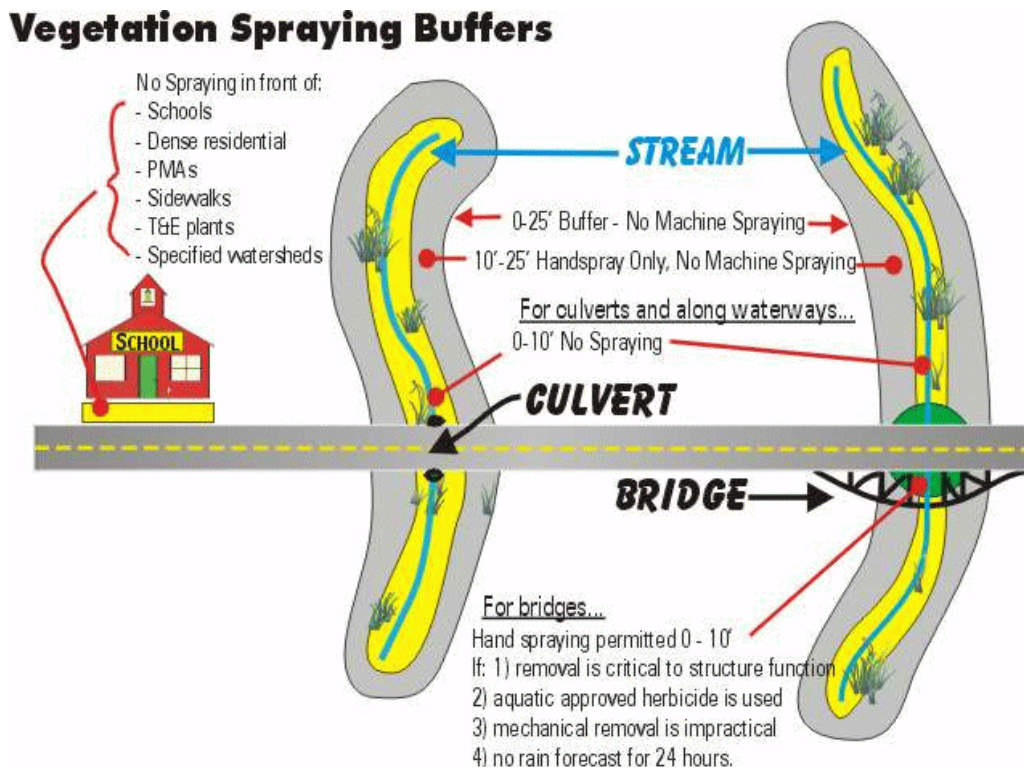
c. Best management practices for MCPW will be to:

- Spray shoulders no further than 2', 3', or 5' from edge of pavement except around road signs and when foliar spraying. (See Figure 1.)
- Maintain a no-machine-spray buffer zone within 25' of flowing water bodies including irrigation ditches, either dry or water-carrying.
- Maintain a no-hand-spray buffer zone within 10' of water bodies unless a bridge is present. Hand-spray around such structures with and herbiced approved for use near aquatic systems.
- Handspraying herbicide is allowed within 25' of bridges if 1) removal of vegetation is critical to the function of the structure, 2) mechanical removal is not practical, 3) rain is not forecast for 24 hours, and 4) an aquatic approved herbicide is used at the minimum required quantity.
- No herbicides will be applied to culvert crossings or ditches, where residual chemical can be carried by later rains.
- No herbicides will be applied to the Abiqua Creek drainage upstream of Abiqua Dam except for specific applications related to noxious weeds and approved by the Environmental Specialist.
- No herbicides will applied to the North Fork Road in the North Santiam watershed, except for specific applications related to noxious weeds and approved by the Environmental Specialist.
- No herbicides will be applied to driveways or field entrances where they could be tracked off of the shoulder.
- No herbicides will be applied to areas where farmers have obviously sprayed.
- No herbicides will be applied in front of schools, along paved or unpaved pedestrian walkways, or in high density residential areas except during road surface preparations such as slurry seals.
- No herbicides will be applied to areas of known threatened, or endangered, plants.
- No herbicides will be applied to private maintenance agreement areas.
- No herbicides will be applied to the Silver Creek drainage, upstream of the Silverton Reservoir, except for specific applications related to noxious weeds and approved by the Environmental Specialist.
- Use herbicides in accordance with EPA labels
- Apply only when wind speeds are within EPA label guidelines. Wind speed will be measured and logged prior to application and logged (periodically) throughout the day.
- Use lowest pressure compatible with adequate coverage.

- Dispose of empty herbicide containers in accordance with EPA guidelines.
- Carry supplies for, and follow, small spill containment plan (absorbent pads, bio bags, shovel, etc.)
- Require that all herbicide applicators, or anyone preparing or mixing herbicides, carry a current roadside applicator's license.
- Maintain a record-keeping system that documents the date, amount of pesticide applied, location of application, and temperature and windspeed at the beginning and end of application.
- Prior to each season, applicators will collectively review current labels for each chemical to be used.
- Training on these BMPs will be annual for applicators.
- Examine your work area on the Environmentally Sensitive Zone maps for this activity category. If in doubt, check with supervisor. Determine if there are any "caution" areas.
- Do not spray triclopyr, diuron, or 2,4-D within 60' of a salmon-bearing stream with any method (hand or machine). Check with vegetation foreman or environmental specialist for maps of salmon streams.

Figure 2: Vegetation Spraying Buffers

The following table lists the chemicals currently employed by MCPW for vegetation management. The toxicity data is the 96-hr LC₅₀ for rainbow trout unless another species is specified. Toxicity results were obtained from research done at OSU and manufacturers= MSDS. Adjutants are not included because they are added at significantly smaller concentrations. This table may be updated as new products and information become available.



370.001 4. Noxious Weed Program

a. Description

The noxious weed program includes researching, mapping locations, monitoring, and coordinating control of Oregon Department of Agriculture defined noxious weeds. The County is developing a formal noxious weed program that includes collaborative infestation control/prevention, community education, and information management.

b. Concerns

- Chemical contaminants
- Displacement of native habitat types with noxious weeds.

c. Best management practices for MCPW will be to:

- Favor physical and biological removal of weeds over chemical methods, whenever possible and when sensitive plant species are involved.
- Replant removal areas where further noxious weed invasion is probable, use native seeds when practical.
- Follow best management practices for spraying when chemical methods are employed.
- Examine your work area on the Environmentally Sensitive Zone maps for this activity category. If in doubt, check with supervisor. Determine if there are any “caution” areas.
- The Marion County Weed Control District will adhere to all the BMPs applicable to the activities performed under the District’s jurisdiction, including following integrated vegetation management guidelines which specify using the least toxic/most effective control for the situation at hand.

380.001 5. Planting

a. Description

Planting includes research, purchase, and placement of plants for miscellaneous beautification and stabilization programs. Roadside areas with chronic sight distance problems are often replanted with low-growing plants. Use native plant species wherever practical.

b. Concerns

- Erosion
- Displacement of native habitat types with noxious weeds.

c. Best management practices for MCPW will be to:

- Select vegetation that is best suited for the given situation, with preference given to local-genotype native plants.
- Utilize planting techniques that minimize the disturbance of soils such as, hydroseeding, manual planting, and no-till planting.

- Avoid the unnecessary use of fertilizers that can result in nutrient loading.
- Consult with Environmental Specialist/Botanist to develop appropriate seed mixes.
- Examine your work area on the Environmentally Sensitive Zone maps for this activity category. If in doubt, check with supervisor. Determine if there are any “caution” areas.
- Along waterways, choose native tree and shrub species that will provide a maximum amount of erosion control and shade.

360.001,362.001

6. Ankeny National Wildlife Refuge (NWR)

a. Description

The control of vegetation along county right-of-way within the Ankeny National Wildlife Refuge is to insure public safety. Control practices include manual brushing, mowing, and herbicide spraying. The Ankeny NWR area drains into Sydney Ditch.

b. Concerns

- Erosion
- Chemical runoff

c. Best management practices for MCPW will be to:

- Mow 5’ from the edge of the maintained shoulder every year during August or September (after bird nesting season).
- Use only herbicides approved for use near aquatic resources. Consult the Vegetation Management Foreman and the Environmental Specialist. Do not use herbicides in areas of identified sensitive plant populations.
- Manually brush and spot spray, in late summer, selected areas on the right-of-way where the vegetation is encroaching on the pavement despite other controls.
- Remove large, woody material that becomes established in the ditch once every five years only if it impedes drainage.
- Follow guidelines for management of areas containing sensitive plant species as advised by supervisor.
- Examine your work area on the Environmentally Sensitive Zone maps for this activity category. If in doubt, check with supervisor. Determine if there are any “caution” areas.

C. FERRY MAINTENANCE AND OPERATIONS

100086 C. FERRY MAINTENANCE AND OPERATIONS

MCPW maintains and operates two ferries on the Willamette River. The Wheatland Ferry carries passengers across just north of Willamette Mission Park and the Buena Vista Ferry operates about a mile downstream from the Santiam River confluence. The Wheatland Ferry is the only way to cross the Willamette River between Newberg and Salem. Annual ridership is 125,000 vehicles for Wheatland and 6,000 vehicles for Buena Vista. Best management practices focus on preventing material from falling off the ferry decks into the river, prevention and containment of fuel leaks, and minimizing disturbances to riverbeds.

A new ferry, designed to support these goals, has been in operation at Wheatland since 2002. Its design includes a deck containment system with drain holes in the deck that may route spills and wash water to a holding tank. The fuel tank is located in the hull, providing containment in case of leaks.

100137, 100138 1. **Wheatland and Buena Vista Ferry Operation and Repair**

a. Description

The ferry operations, include the maintenance, and repair of the ferryboats to transport vehicles approximately 700 ft. across the Willamette River. The Buena Vista Ferry is cable guided powered by a Diesel engine and two 20 HP electric motors. The Wheatland Ferry is powered by two 40 HP electric motors and cable guided. Power is received by diesel driven onboard generators. Repairs involve removal and replacement of damaged, worn, or defective parts on the boat such as cable rollers, cables, hinge pins, pneumatic cylinders, air compressors, electric motors, or prop shafts. Army Corps of Engineers permitted dredging is performed on occasion to prevent the build-up of the river bottom.

b. Concerns

- During low water the props stir up some sediment
- Oil film and sediments can wash off the deck into water
- Potential diesel spill from tanks or ruptured lines
- Dredging disturbances

c. Best management practices for MCPW will be to:

- Schedule all in-water work to fall within the ODFW In-Water Timing Guidelines. Any exceptions will be coordinated with ODFW. Secure necessary permits from Oregon Division of State Lands and US Army Corps of Engineers; consult with Environmental Specialist.
- Coordinate with the Environmental Specialist, ensuring that all permits are secured and requirements are met.
- Sweep and contain deck debris to prevent it from entering the water.

- Carry supplies for, and follow, small spill containment plan (diapers, rice ash, shovel, etc.)
- Maintain secondary containment reservoirs in case of fuel tank leaks.
- Inspect fuel lines regularly to detect potential problems before spill occurs.
- Examine your work area on the Environmentally Sensitive Zone maps for this activity category. If in doubt, check with supervisor. Determine if there are any “caution” areas.

D. BRIDGE MAINTENANCE

100086 D. BRIDGE MAINTENANCE

Best management practices for bridge maintenance are especially cautious due to the proximity to stream habitat. They are aimed to protect habitat areas and prevent all foreign matter from entering water bodies by requiring containment, sound housekeeping practices, minimal removal of materials from stream habitat, and proper timing of activities.

201.001 1. Seasonal Bridge and Box Culvert Maintenance

a. Description

Seasonal bridge and box culvert maintenance includes maintenance of the bridge structures, approaches, and box culverts, including sweeping/shoveling debris off of bridge decks, pressure washing deck and rails, brushing, and painting bridge rails. Maintenance and repair of box culverts includes concrete patching of rails.

b. Concerns

- Debris from deck may carry contaminants into water or flood plain.
- Paint may accidentally spill into water or flood plain.
- Loose concrete or form material can fall into water.

c. Best management practices for MCPW will be to:

- Prevent any material or debris from entering the stream, should any enter the waterway, remove.
- Sweep up and remove excess material.
- Capture paint overspray and contain it with a shield.
- Pressure wash only at times of high water level and only with low volume, high-pressure water.
- Temporarily block deck drains over streams when pressure washing, sandblasting, or scraping structures, to route water off deck and into vegetated areas.
- Use appropriate fish screen on pump inlets, observe water laws, and consult with the Environmental Specialist to ensure stream hydrology and ecology are not affected.
- Cease pressure washing if paint is displaced and set up containment to keep paint chips from entering the stream.
- Refuel and repair equipment at least 25' from water bodies.
- Examine your work area on the Environmentally Sensitive Zone maps for this activity category. If in doubt, check with supervisor. Determine if there are any "caution" areas.
- Follow guidelines for management of areas containing sensitive plant species as indicated by roadside markers, or as advised by supervisor.

202.001 2. Repair Bridges / Structures

a. Description

General bridge repair activities include removing and replacing deteriorated bridge components such as caps, pilings, posts, rails, wheel guards, decks, and stringers and repairing damaged concrete rails/posts.

b. Concerns

- Debris can fall into water or flood plain
- Sawdust from cutting on pressure treated lumber

c. Best management practices for MCPW will be to

- Operate on a scaffold work platform that will catch falling debris and sawdust that might otherwise fall into water or flood plain.
- Coordinate with the Environmental Specialist, ensuring that all permits are secured and requirements are met.
- Place booms in the water, as necessary, to prevent debris from entering the water.
- Use cofferdams for structural repairs as appropriate.
- Isolate activities near water bodies to avoid contact between fresh concrete and water.
- Use appropriate fish screen on pump inlets, observe water laws, and consult with the Environmental Specialist to ensure stream hydrology and ecology are not affected.
- Excess materials will be disposed of at areas designated, and approved, for receiving such materials.
- Prohibit use of creosote or “Penta” treated wood for permanent structures.
- Inspect and prioritize repairs, incorporating bioengineering and fish-friendly elements in repairs where practical for stability and safety. Use ODFW fish passage standards.
- Refuel and repair equipment at least 25’ from water bodies.
- Examine your work area on the Environmentally Sensitive Zone maps for this activity category. If in doubt, check with supervisor. Determine if there are any “caution” areas.
- Follow guidelines for management of areas containing sensitive plant species as indicated by roadside markers, or as advised by supervisor.
- If structures have lead-based paint, bridge crews will consult with the Environmental Specialist to set up appropriate containment processes.

203.001 3. Drift Removal / Channel Clearance

a. Description

Removal of drift material and channel clearance is performed to protect in-water structures from hazardous debris. Wood and debris are removed from pilings and piers. On rare occasions, gravel deposits that cause detrimental flow and currents around pilings and piers, or that change the channel alignment to threaten headers or embankments, are cleared and redistributed downstream.

b. Concerns

- Activity can temporarily increase turbidity
- Wood debris that may be creating habitat would be removed
- Destruction of spawning habitat

c. Best management practices for MCPW will be to:

- Only interfere with drift and gravel beds if the structure is threatened.
- Minimize amount of material removed.
- Allow drift wood to float free of bridge to lodge and create habitat elsewhere.
- Repair and restore riparian areas temporarily impacted by machinery during drift removal. Long-term access for drift removal will be coordinated with The Environmental Specialist.
- Schedule all in-water work to fall within the ODFW In-Water Timing Guidelines. Any exceptions will be coordinated with ODFW. Secure necessary permits from Oregon Division of State Lands and US Army Corps of Engineers; consult with Environmental Specialist.
- Evaluate the need for gravel deposit removal on a case-by-case basis and follow Oregon Division of State Lands permit process.
- Examine your work area on the Environmentally Sensitive Zone maps for this activity category. If in doubt, check with supervisor. Determine if there are any “caution” areas.
- Follow guidelines for management of areas containing sensitive plant species as indicated by roadside markers, or as advised by supervisor.

204.001 4. Metal Guardrail Maintenance, Construction, & Inspection

a. Description

MCPW conducts the construction, maintenance, repair, and inspection of metal guardrail and posts. All new construction is contracted outside of MCPW.

b. Concerns

- Erosion

c. Best management practices for MCPW will be to:

- Use caution to control the dispersal of excess soil and gravel.
- In unstable situations, areas downslope from guardrail replacement will be protected with erosion control measures (i.e. sediment fences).
- Require contractors to comply with all MCPW BMP's by including them as part of the project specifications and instructing on them during the pre-construction conference.
- Examine your work area on the Environmentally Sensitive Zone maps for this activity category. If in doubt, check with supervisor. Determine if there are any "caution" areas.
- Follow guidelines for management of areas containing sensitive plant species as indicated by roadside markers, or as advised by supervisor.

E. BUILDING/FACILITY MAINTENANCE

100697 E. BUILDING / FACILITY MAINTENANCE

441.001, 442.001 1. Shop Maintenance

a. Description

Shop maintenance includes miscellaneous routine maintenance performed on buildings, structures, and facilities such as septic tank maintenance, steam cleaner area cleanup and maintenance, etc.

b. Concerns

- Site runoff into the West Fork of the Little Pudding River, Mill Creek, or other adjacent creeks or wetland areas

c. Best management practices for MCPW will be to:

- Store chemicals at county shops with proper containment.
- Provide oil and sediment control on outfalls

444.001 2. Grounds Maintenance

a. Description

Grounds maintenance includes general yard maintenance activities such as lawn mowing, weeding, spraying, pruning, cleanup, etc.

b. Concerns

- Disposal of material
- Chemical runoff into the West Fork of the Little Pudding River, Mill Creek, or other adjacent creeks or wetland areas

c. Best management practices for MCPW will be to:

- Dispose of yard debris at a mulch pile which is processed and reused by homeowners.
- Minimize drift by spraying on calm days.
- Use herbicides in accordance with EPA labels
- Maintain a no-machine-spray buffer zone within 25' of flowing water bodies including irrigation ditches, either dry or water-carrying.
- Dispose of empty herbicide containers in accordance with EPA guidelines.
- A stock of clean-up materials are located in the east end of building #10 of the Salem shops, all outlying shops, and the Incident Response Vehicle #648.
- Maintain a record-keeping system that documents the date, amount of pesticide applied, location of application, and temperature and windspeed at the beginning and end of application.
- Refuel and repair equipment at least 25' from water bodies.

- Follow guidelines for management of areas containing sensitive plant species as indicated by roadside markers, or as advised by supervisor.

400.001 **3. Fueling Areas**

a. Description

Diesel and gasoline fueling areas located at Marion County Public Works facilities.

b. Concerns

- Fuel runoff into the West Fork of the Little Pudding River, Mill Creek, or other adjacent creeks or wetland areas

c. Best management practices for MCPW will be to:

- Public Works will design and/or maintain fueling areas so spills, overfills and leaks will not enter nearby waterbodies or stormdrains.
- Clean spills using dry methods such as absorbent materials. Fueling areas will be swept rather than sprayed down with a hose.
- Contact the safety specialist, the environmental specialist and Fleet if petroleum products enter waters of the state.

400.001, 442.001 **4. Aboveground Storage Tanks**

a. Description

Aboveground storage tanks are located at the Silverton RD campus and North Marion. The tanks are used for storing fluids to fuel equipment and for roadway maintenance activities. Fluids include petroleum products and deicing agents.

b. Concerns

- Fuel runoff into the West Fork of the Little Pudding River, Mill Creek, or other adjacent creeks or wetland areas

c. Best management practices for MCPW will be to:

- Label Tanks and piping.
- Secure valves in closed position and/or lock dispenser when not in use.
- Post warning signs and/or operating instructions
- Protect tanks from vehicle impact
- Use overfill indicators and/or overfill protection on fuel tanks
- Install tanks on a solid foundation if site appropriate.
- Provide secondary containment in areas where spills, leaks, or ruptures could enter nearby creeks or streams.

F. FLEET MAINTENANCE

100061 F. FLEET MAINTENANCE

414.001, 415.001 1. **Vehicle Washing**

a. Description

Vehicles are washed on concrete pads in two locations:

1. Vehicles are washed with water only (no detergent) and the water runs to a settling basin, and then through an oil/water separator before discharging to the West Fork of the Little Pudding River.
2. Vehicles are pressure washed (sometimes with soap) and the wash water is collected in a settling basin and then sent through a closed-loop treatment and recycle system.

b. Concerns

- Sediment
- Oil & grease
- Biochemical oxygen demand in water discharged to creek

c. Best management practices for MCPW will be to:

- Complete routine maintenance checks of all components of the water system to ensure proper operation at all times.
- Clean trough bimonthly, or as needed.
- Keep the water maze clean.

405.001, 406.001 2. **Vehicle Maintenance**

a. Description

General maintenance and repair of county vehicles includes adding fluids. Work is performed at county shops.

b. Concerns

- Chemical storage
- Oil/Chemical spills
- Disposal of materials

c. Best management practices for MCPW will be to:

- Endeavor to prevent or repair all equipment leakages before using equipment.
- Refuel and repair equipment at least 25' from water bodies.
- Store chemicals at county shops with proper containment.
- Carry supplies for, and follow, small spill containment plan (diapers, rice ash, shovel, etc.)
- A stock of clean-up materials are located in the east end of building #10 of the Salem shops, all outlying shops, and the Incident Response Vehicle #648.

- Excess materials will be disposed of at areas designated, and approved, for receiving such materials.
- Keep vehicles properly maintained.
- Refuel and repair equipment at least 25' from water bodies.

G. PARK MAINTENANCE

100285 G. PARK MAINTENANCE

The Marion County Parks system is currently comprised of 19 developed public parks. Six of these parks are located along the North Santiam River and the Little North Fork of the North Santiam River. Maintenance required at these sites is minimal compared to the other developed parks. MCPW also maintains some parcels of property that are not part of the parks system.

The County is also involved in acquiring more land to establish undeveloped, natural park areas through the Natural Heritage Parks Program. The goal of this program is to establish parks that restore ecosystems that existed prior to EuroAmerican settlement. These include, wetlands, upland prairie, oak savanna, and riparian woodland. Maintenance of all county parks is aimed at minimizing disturbance to the land and promoting a natural setting.

393.001, 394.001 1. Parks and Property Mowing

a. Description

Parks and property mowing includes the mowing of developed and undeveloped parkland. Specific project and/or property mowing activities utilizing a tractor mounted mechanical mower (i.e. Aumsville pond property, special requests from cities, other agencies, etc.). Neighborhood parks are trim mowed, leaving 3-4 inches of vegetation and undeveloped field parks are rough mowed, leaving 6-8" of vegetation. No cutting occurs in riparian areas with the following exceptions: Spong's Landing Park where a quarter acre is rough mowed for public access, and Scotts Mills Park where a mowed area is maintained near the wading pool.

b. Concerns

- Total Suspended Solids

c. Best management practices for MCPW will be to:

- Minimize the amount of mowing that occurs in riparian areas. Leave a 50' wooded buffer where practical.
- Refuel and repair equipment at least 25' from water bodies.
- Follow guidelines for management of areas containing sensitive plant species as indicated by roadside markers, or as advised by supervisor.

390.001 2. Water Systems Maintenance

a. Description

Water systems maintenance includes inspection and winterizing of water wells at Spong's Landing, St. Louis Ponds, and Niagara Falls Parks. The wells are sampled in the spring and summer to insure that they meet the County Environmental Health Department's drinking water standards. The water systems are emptied on the ground when the parks close in the fall.

- b. Concerns**
 - Well contamination
 - Erosion
- c. Best management practices for MCPW will be to:**
 - Keep pump houses locked to deter tampering.
 - When winterizing, empty water systems onto vegetated areas where erosion is not a concern.
 - Sample drinking water for water quality in spring and summer.

390.002 3. Water Area Maintenance

- a. Description**

Water area maintenance includes cleaning and maintenance of wading pools and fish runs, such as the concrete wading pool at Scotts Mills, located on Butte Creek. River rock that accumulates in the wading pool is removed. The wading pool provides passage to fish around the dam.
- b. Concerns**
 - Disposal of rock
 - Habitat disturbance
- c. Best management practices for MCPW will be to:**
 - Remove rock in the summer months only, when fish are not present and pool is dry.
 - Return rock to the bank of origin.
 - Inspect and prioritize repairs, incorporating bioengineering and fish-friendly elements in repairs where practical for stability and safety. Use ODFW fish passage standards.
 - Follow guidelines for management of areas containing sensitive plant species as indicated by as advised by supervisor.

391.001 4. Trail and Path Maintenance

- a. Description**

Trails are walked through once a year, in the spring, to clear trails and paths of hazardous vegetation. Weed-eaters, pruning shears, and sometimes a chainsaw may be used to cut branches and vegetation to insure public safety.
- b. Concerns**
 - Erosion
 - Loss of shade
- c. Best management practices for MCPW will be to:**

- When practicable, protect/maintain existing vegetation.
- Maintain shade trees along water bodies, when possible. Exception- consider removing any trees or snags, on or near a roadway/bridge that are found to be weakened, unsound, undermined, leaning or exposed that may fall across a roadway/bridge, as expectations to the above BMPs. Mitigation requirements will still be followed in these cases.
- If trees providing shade or bank stabilization within 50' of water bodies are determined to be a risk to public safety, the trees will be removed in consultation with the Environmental Specialist. Mature trees (greater than 12" diameter at breast height) that are removed will be replaced at a 2:1 ratio within the same watershed in an area that will not pose a future threat to bridge structures.
- Place woodchips and pea gravel along trails and paths, as needed, to reduce erosion.
- Install erosion control where the potential for runoff of sediments exists. (See the Erosion Control Table for appropriate measures in Appendix A.)
- Refuel and repair equipment at least 25' from water bodies.
- Follow guidelines for management of areas containing sensitive plant species as indicated by roadside markers, or as advised by supervisor.

392.001 5. Yard and Facility Maintenance

a. Description

Yard and facility maintenance includes weed-eating, spreading bark dust, repairing traffic barriers, cleaning parking lots, pavement markings, fence repair, removal of vandalism and litter pick-up. The majority of this maintenance occurs in the more developed parks located in the valley, and not in the riparian parks. This activity also includes the repair and painting of picnic tables, shelters, and restrooms. MCPW has almost completed replacing all pit toilets with new, completely sealed, concrete vault restrooms.

b. Concerns

- Litter
- Dust
- Paint
- Sewage

c. Best management practices for MCPW will be to:

- Pick up litter several times a week during the open seasons of spring and summer.
- Schedule in damp weather, when possible, to minimize dust.
- Minimize painting activities to reduce contamination potential.

- Picnic tables are removed in the winter and painted, as needed, at county shops.
- Refuel and repair equipment at least 25' from water bodies.
- Dispose of used cleaning agents with a licensed waste recycler.
- Pump restroom tanks annually, at the minimum, and send to a local municipality for treatment.

392.002, 392.003 **6. Tree Maintenance and Removal**

a. Description

Tree maintenance and removal includes the pruning and removal of trees for public safety and tree planting.

b. Concerns

- Erosion
- Loss of shade

c. Best management practices for MCPW will be to:

- Remove hazardous trees that could fall on a trail, picnic site, or other park facility.
- Maintain shade trees along water bodies, when possible. Exception- consider removing any trees or snags, on or near a roadway/bridge that are found to be weakened, unsound, undermined, leaning or exposed that may fall across a roadway/bridge, as expectations to the above BMPs. Mitigation requirements will still be followed in these cases.
- If trees providing shade or bank stabilization within 50' of water bodies are determined to be a risk to public safety, the trees will be removed in consultation with the Environmental Specialist. Mature trees (greater than 12" diameter at breast height) that are removed will be replaced at a 2:1 ratio within the same watershed in an area that will not pose a future threat to bridge structures.
- Branches providing shade over water bodies will not be pruned unless they pose a hazard to the public.
- Refuel and repair equipment at least 25' from water bodies.
- Follow guidelines for management of areas containing sensitive plant species as indicated as advised by supervisor.

392.004 7. Herbicide Application

a. Description

Herbicide application involves spraying chemical herbicides to control and manage vegetation (mostly grasses and broadleaves), and removal of noxious weeds and undesirable vegetation. Spraying usually occurs along gravel trails to control Himalayan blackberry bushes. Herbicides used include Round-up, Escort, Casoron, Norsac, and Crossbow. (See Table 2.)

b. Concerns

- Chemical runoff
- Drift

c. Best management practices for MCPW will be to:

- Keep herbicide use to a minimum.
- Apply herbicides with a backpack sprayer or a low ground pressure machine.
- Use lowest pressure compatible with adequate coverage.
- Apply no herbicides to riparian areas or anywhere in the North Santiam parks, except in consultation with Environmental Specialist.
- Apply no herbicides to walking paths.
- Minimize drift by spraying on calm days.
- Maintain a record-keeping system that documents the date, amount of pesticide applied, location of application, and temperature and windspeed at the beginning and end of application.
- Apply bark dust where possible after spraying activities to keep weeds from returning.
- Use herbicides in accordance with EPA labels
- Require that all herbicide applicators, or anyone preparing or mixing herbicides, carry a current roadside applicator's license.
- Follow guidelines for management of areas containing sensitive plant species as advised by supervisor.

H. SERVICE DISTRICTS

H. SERVICE DISTRICTS

100082 1. Brooks Service District

Treated wastewater from the Brooks Community Service District Lagoons is discharged to the Willamette River, following the DEQ-issued National Pollution Discharge Elimination System permit guidelines. Employees are contracted from MCPW and will follow BMPs during any work for this district.

100282 2. Fargo Interchange Service District

Untreated wastewater is collected and delivered in a closed system to the City of Donald wastewater treatment facility. Employees are contracted from MCPW and will follow BMPs during any work for this district.

100281 3. East Salem Service District (Waterway Maintenance)

Untreated wastewater is collected and delivered in a closed system to the City of Salem wastewater treatment facility. MCPW maintains the East Salem Service District drainage ditch.

The East Salem Service District waterways provide flood control for much of East Salem by routing rainfall runoff to Mill Creek, Claggett Creek, or the Little Pudding River. The waterways are very narrow and meander through many residential neighborhoods, limiting access by work crews. Vegetation management in the waterway is a necessity to ensure adequate drainage because the area is very flat, making it sensitive to any impediments to flow. Approximately nine miles of the waterway are maintained by MCPW.

Maintenance and construction projects in the ESSD will follow the BMPs in this guide as well as meet requirements for the National Pollutant Discharge Elimination System Phase II permit. The BMPs under this permit will correspond to the BMPs listed in the salmon recovery plan.

a. Description

Maintenance includes control and removal of undesirable vegetation through manual, mechanical, and chemical means to maintain adequate drainage and safety of nearby landowners. This activity also includes removal of litter. Maintenance activities are performed along the whole ditch once a year and more often at locations where material frequently builds-up. Since some areas are not accessible to mechanical mowers, hand brush cutting is the primary practice.

b. Concerns

- Herbicide runoff
- Disposal of brush
- Litter deposited by citizens

- c. **Best management practices for MCPW will be to:**
- Avoid disturbing sides of ditch and creating vertical back slopes unless necessary.
 - When practicable, protect/maintain existing vegetation.
 - Perform activity in dry weather conditions.
 - Where feasible, use mechanical mowers to cut brush.
 - Only spray herbicides where mechanical mowing and hand brush cutting are not practical.
 - Use only herbicides approved for use near aquatic resources, such as Rodeo and R-11. Consult the Vegetation Management Foreman and the Environmental Specialist.
 - Do not apply herbicides over flowing or standing water in the ditch.
 - Apply herbicides with a backpack sprayer or a low ground pressure machine.
 - Limit frequency of spraying to once a year.
 - Basal treat stumps, as needed, with Transline, or an herbicide of equal or greater safety to aquatic species.
 - Pick up debris.
 - Deposit excess material above the 100- year floodplain, at a supervisor-approved site, and not within 75' of a stream, wetland, or riparian area. Follow Erosion Control Table in Appendix A.
 - Refuel and repair equipment at least 25' from water bodies.
 - Examine your work area on the Environmentally Sensitive Zone maps for this activity category. If in doubt, check with supervisor. Determine if there are any "caution" areas.

I. SURVEYING

I. SURVEYING

1. Surveying

a. Description

Surveying includes recording the contour, dimensions, position, or other particulars of county land, including locating government corners and right-of-way and construction staking. Sometimes vegetation must be cut back to increase visibility. On occasion, excavation may be required to locate a government corner.

b. Concerns

- Loss of stream shade
- Disturbance to stream banks

c. Best management practices for MCPW will be to:

- Maintain shade trees along water bodies, when possible. Exception- consider removing any trees or snags, on or near a roadway/bridge that are found to be weakened, unsound, undermined, leaning or exposed that may fall across a roadway/bridge, as expectations to the above BMPs. Mitigation requirements will still be followed in these cases.
- Leave brush that is cut in riparian areas in place where doing so does not interfere with sight distance, create safety issues, cause fire hazards, involve noxious weeds, or hinder the proper functioning of highway features (e.g. drainage).
- If trees providing shade or bank stabilization within 50' of water bodies are determined to be a risk to public safety, the trees will be removed in consultation with the Environmental Specialist. Mature trees (greater than 12" diameter at breast height) that are removed will be replaced at a 2:1 ratio within the same watershed in an area that will not pose a future threat to bridge structures.
- Install erosion control where the potential for runoff of sediments exists. (See the Erosion Control Table for appropriate measures in Appendix A.)
- Maintain erosion control until vegetation is re-established either naturally or through hydro-seeding.
- Follow guidelines for management of areas containing sensitive plant species as indicated by roadside markers, or as advised by supervisor.

Table 1. Erosion and Sediment Control Techniques

Aggregate Construction Entrance	A driveway of coarse aggregate designed to allow removal of soil from equipment tires before entering the public road. Generally used for work in undeveloped sites accessed by paved roads.
Erosion Control Matting	A net of plastic and wood shavings designed to temporarily protect bare soil from raindrop impact.
Straw Bale Sediment Barrier	A lineal barrier of straw bales placed transverse to a slope, usually a fill slope.
Sediment Fence	Permeable filter fabric staked perpendicular to the ground allowing water to pass, but trapping sediments.
Aggregate Check Dam	A dam of coarse aggregate in roadside ditches designed to produce a slack water condition in the ditch during heavy rains.
Sediment Biofilter Bags	Mesh bags of organic material, usually wood chips, designed to slow water in ditches, allowing sediments to settle.
Temporary Sediment Basin	A temporary pond designed to allow soil to settle out before water is discharged from the site.
Plastic Sheeting	A waterproof membrane designed to protect bare soil on steep slopes where vegetative matter is undesirable.
Seed, Fertilize, and Mulch	A process where, seed, inorganic fertilizer, and mulch is applied to protect bare soil and to provide a permanent vegetative cover. Native plant seeds are now being used due to suitability for the climate and low maintenance. Generally all disturbed areas are planted.
Surface Roughening	Includes cat tracks, stair-step, furrows, and grooving immediately prior to seeding and mulching to achieve optimum seed germination and growth.
Ditch Lining Mat	A thick synthetic mat designed to hold soil and allow plant materials to grow through. Used on ditches where long-term erosion is likely due to flow or slope.
Riprap / Armor	A 100-150 mm layer of 150 mm angular rock over riprap geotextile designed to improve the ditch's long-term resistance to erosion without promoting vegetative growth.
Skip Ditching	When cleaning ditches, skip ditching is the practice of leaving sections of the ditch undisturbed, allowing for filtration of sediments through existing vegetation.
Bioengineered Stabilization	The use of natural, native habitat materials to stabilize stream banks
Oil Pillows	Material designed to absorb oil and other contaminants.
Inlet Protection	A filter fabric barrier to water entering a catch basin designed to block larger soil particles.

III. FISH PASSAGE PROGRAM

Culvert Survey (*See Appendix B*)

The Oregon Department of Fish and Wildlife (ODFW) recently conducted a survey of culverts in most areas of Western Oregon. The purpose of the survey was to identify which structures on fish sensitive streams are not fish friendly. ODFW classifies culverts as either high, medium, or low priority for repair based on whether a culvert was a partial or complete barrier, the fish species impacted and the quality and amount of habitat upstream from the culvert. ODFW identified all the culverts in Marion County as either medium or low priority. There were no high priority culverts. The ODFW survey provided information like culvert location, size, fish species, height of outlet drop, culvert slope, type of culvert, priority level and specific comments for some sites.

Marion County has already taken the first steps towards more fish friendly culverts. In March and April 1999 the Engineering Information Section inspected all the culverts in Marion County that were earlier identified as medium priority and field verified all of the ODFW data. Attached is a map showing the results of the field verification. Fish sensitive streams are shown as red lines and medium priority culverts are shown as green dots. All the ODFW culverts were found and located by Global Positioning System (GPS.) Table 5, included, shows data obtained by Marion County Public Works for the top twenty culverts.

These culverts can be fixed mostly by clearing out debris at the outlet or the inlet, by creating deeper outlet pools, or fixing fences that collect debris in the channel. Some culverts in this category however, have more subtle constraints such as turbid water, polluted streams, or not enough water. Marion County will actively seek funding to help retrofit or replace problematic culverts and will include replacement of culverts as part of routine maintenance as resources and opportunity allow.

Culvert Remediation

Design new culverts and retrofit existing culverts to perform within the specifications described in ODFW standards "Culvert Fish Passage Improvement: How to Retrofit/Remediate Existing Culverts That Don't Pass Fish."

Stream crossing culverts must:

1. Pass the peak flow required by regulations in a manner that protects the road and culvert.
2. Have water velocities during all periods when listed fish move upstream in the system that is below that allowed for the weakest swimming fish species present during that period.
3. Have water depths during all periods when listed fish move upstream or downstream that are greater than the minimum allowable for the largest fish for that period.

4. Have entrance (for upstream migrating fish) jump heights during all periods when listed fish move upstream in the system that are less than the feasible entrance jump for the weakest fish species present during that period.
5. Have adequate durability so as to require maintenance at an economically feasible frequency.
from Culvert Hydraulics for Fish Passage, Marvin Pyles (1998).

Initial elements to be considered in the design or retrofit of culverts include:

Fish species:	What are the passage requirements for the affected species?
Life stages:	Does this area provide habitat or passage for adults, juveniles, smolt, fry, or eggs?
Run timing:	When are the affected species present in the stream?
Hydrology:	What are the peak flow and low flow limits?
Hydraulics:	How will the water behave in the culvert and stream? (Velocity, direction, drops, pooling, etc.)
Morphology:	How will the culvert type work with the stream flow, shape, and composition?
Construction:	Which type of culvert is most appropriate? How and when should it be placed? What sort of remediation is needed in the construction area?

Prioritization:

Marion County will continue its efforts to systematically retrofit or replace culverts that do not perform within the above specifications. A prioritization of problematic culverts has been conducted by ODFW for Marion County. This list will help to determine the best sequence and the necessary adjustments to allow fish passage. In the absence of further funds or new information, these culverts will be remediated as they fail, given that there are no high priority culverts in the County.

IV. TRAINING PROGRAM

Employees will be instructed on the elements of this plan, dependent upon their responsibilities with MCPW. The goals of the training program are:

1. To educate our staff on Best Management Plans (BMPs) to restore fish runs
2. To educate our staff on the requirements of the Salmon Recovery Act
3. To interest our staff so they take ownership
4. To modify our practices to enhance fish runs
5. To develop our standards to do so, and to establish what resources we need to stockpile
6. To establish consistency throughout the County.
7. To provide sufficient training and information that staff members can suggest improvements to the recommended BMPs and other salmon recovery efforts.

All employees will be instructed to monitor their work activities and observe their work environment for any issues that may potentially threaten salmonids or cause a take. If any issues arise, employees are directed to immediately contact their supervisor or the Environmental Specialist. In emergency situations, where work stoppage is impractical, employees are directed to also determine any short-term remedies for the immediate situation. In non-emergency situations, employees are directed to stop any activities directly threatening salmonids and work with their supervisor or the Environmental Specialist to address the issues.

The training program will be implemented as follows:

- Formal training programs on Best Management Practices will be developed and implemented in beginning in 2003. Training will be documented in the existing training database. (MS Access database, built by MCPW IT staff, updated regularly upon receipt on new information, housed on the internal network.) This database provides a record of all formal training and professional development received by each staff member. These training sessions, performed by supervisory staff and consultants, will ensure that staff understands the intent and language of the best management practices.
- New Operations field staff (maintenance staff) will receive instruction on the plan, with an emphasis on Best Management Practices, during departmental new-employee orientations.
- Engineering staff will be responsible for instructing contractors on appropriate BMPs.
- Appropriate staff members will attend training (seminars, conferences, workshops) around the state to increase their knowledge of fish passage, erosion control, hazardous materials spill response and handling, and the National Pollutant Discharge Elimination System Phase II. These staff members will integrate relevant material into CIPs, maintenance activities, and training of other staff.
- As new information, tools, activities, and educational materials are developed, they will be integrated into the training program. Marion County will actively look for and, when appropriate, develop these new resources.
- New information and improved practices will be covered at monthly departmental meetings.
- Management, supervisory, and appropriate field staff will have direct access to this manual.

V. MONITORING PROCESS

Field Inspections

During BMP implementation, there will be field inspections of each major construction project to ensure compliance with BMPs and relevant environmental regulations. Additionally, the implementation of each category of BMPs will be inspected annually in the field. Any compliance problems observed during inspection will be resolved during, or shortly after, the inspection. The results of these inspections will be incorporated into the annual report. Complaints regarding PW activities - whether from PW staff, agency personnel or the public, will be investigated immediately, addressed appropriately, and incorporated in the annual report.

Staff allocations

Oversight for monitoring the implementation of BMPs in this report will be the responsibility of MCPW's Environmental Specialist. This individual, with appropriate staff support, will produce the biannual updates and work with the managers and supervisors to ensure that the annual reports are completed and outstanding issues resolved during the course of the year. The Environmental Specialist will also complete the comprehensive annual evaluations of BMP implementation and provide that document to NMFS upon request. Supervisory staff and management staff will be responsible for implementation of the BMPs in the field.

VI. DOCUMENTATION AND REPORTING

Biannual Updates

As part of the BMP implementation, there will be a biannual memorandum sent to all Public Works managers. This document will update those employees on developments in species listings, adjustment to BMPs and training programs, and provide a reminder of the implementation process.

Annual Reports and Program Evaluation

Division-specific, annual reports on BMP implementation will be produced by the heads of operations and engineering sections. This document will outline any unresolved problems that occurred during the course of the year and describe implementation problems that occurred on a regular basis. These reports will address each of the BMPs individually. In addition to supplying the annual BMP reports, management staff will meet annually to discuss the relevant implementation issues and ways to address potential problems. New technologies, techniques, and design standards will be presented at these meetings. This plan will be updated, as needed, at this time.

These meetings and division-specific reports will be summarized in a master document. This document will discuss the particular implementation problems and suggest changes in training and implementation strategies. This document will also evaluate relevant permit applications and progress in the overall salmon recovery program (including restoration efforts). It will provide a reference point for subsequent reports. This document will be provided to NMFS annually, with the reporting cycle beginning upon acceptance of MCPW Limit 10 submittal. These reports will be submitted to the Branch Chief of the Oregon State Branch of the Habitat Conservation Division, NMFS.

Process for Review

Every five years, Marion County will evaluate the need to rewrite the manual. The decision will be made on the number of substantive changes needed and new technologies to be incorporated. This decision will be, in part, based on new information from NMFS, Marion County's annual salmon recover reports, and new information from other sources regarding salmon recovery and BMPs. If management staff feels that substantial changes are required prior to that review process those changes will be negotiated with NMFS.

Implementation Schedule

Adoption of BMPs (*in progress*)

Initial training programs (*Started, yr. 2000*)

Review of BMPs by NMFS (*completed*)

Adjustments to BMPs based on recommendations (*completed*)
Acceptance of BMPs by NMFS (*pending review*)
Formal implementation of BMPs
Biannual update (*internal*)
Biannual update (*internal*)
Annual report (*beginning upon acceptance, internal and NMFS*)
Five-year review (*internal and NMFS*)

Appendix A		Control Measure														
Erosion and Sediment Control Matrix ^a		Aggregate Construction Entrance	Erosion Control Matting	Straw Bale Sediment Barrier	Sediment Fence	Aggregate Check Dam	Sediment Biofilter Bags	Temporary Sediment Basin	Plastic Sheeting	Seed, Fertilize and Mulch	Ditch Lining Mat	Riprap / Armor	Skip Ditching	Bio-engineered Stabilization	Oil Pillows	Inlet Protection
Activity	Embankment & Excavation Work (slope length > 8 ft)	Slope flatter than 1:2	X		X					X					Anytime the potential for oil contamination exists.	Anytime there is the potential for material to enter an inlet.
		Slope steeper than 1:2	X	X					X	X						
	Embankment & Excavation Work (slope length < 8 ft)	Slope flatter than 1:2	X							X						
		Slope steeper than 1:2	X	X						X						
	Clearing / Removing Vegetation	0-3% Gradient	X			X				X						
		3-10% Gradient	X	X	X					X						
		> 10% Gradient	X	X				X		X						
	Ditch Cleaning	0-3% Gradient					X	X					X			
		3-6% Gradient					X	X					X			
		> 6% Gradient					X ^b	X ^b	X		X	X	X			
Stream Bank Stabilization	Active Stream			X							X		X			

^a This matrix provides guidelines for the effective use of erosion control measures. Implementation of these measures will be based on the judgment of MCPW staff.

^b Frequent maintenance will be required. Devices should be monitored closely

