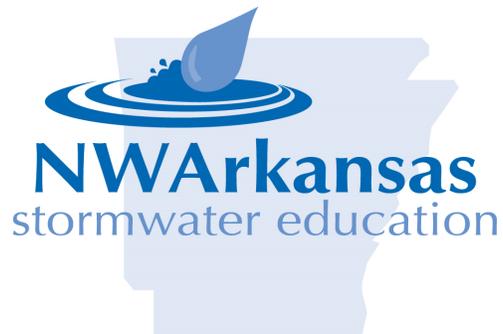


STORMWATER POLLUTION PREVENTION, GRADING, AND EROSION CONTROL

Best Management Practices Manual



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Revised October 2014

Table of Contents

Table of Contents	ii
Figures & Tables	iv
Executive Summary	v
Glossary	vi
Introduction to Construction Stormwater Pollution Prevention	viii
Standards and Specifications for Best Management Practices	x

Note: BMP numbers are skipped to allow the expansion of this document as additional methods of achieving compliance are made known; as additional requirements by federal, state, and local ordinances are added; or as new technologies are developed.

Chapter 1: Prevention BMPs

BMP 101: Preserving Natural Vegetation	1 of 17
BMP 102: Buffer Zones	2 of 17
BMP 103: Wetland Preservation, Creation, and Re-creation	3 of 17
BMP 104: Floodway and Floodplain	3 of 17
BMP 105: Watershed vs. Site Drainage	4 of 17
BMP 110: Dust Prevention and Control	5 of 17
BMP 120: Kits and Containment Materials	7 of 17
BMP 121: Material Delivery	8 of 17
BMP 122: Material Storage	9 of 17
BMP 123: Material Containment	10 of 17
BMP 124: Concrete Waste Management	11 of 17
BMP 125: Saw-Cutting and Surfacing Pollution Prevention	12 of 17
BMP 130: Gross Solids and Solid Waste	13 of 17
BMP 131: Sanitary Service	13 of 17
BMP 132: Washouts	14 of 17
BMP 140: Qualified Site Official (QSO)	14 of 17
BMP 150: Scheduling and Sequencing	15 of 17
BMP 170: Storm Water Pollution Prevention Plans	16 of 17

Chapter 2: Access and Source Control BMPs

BMP 201: High Visibility Fence	1 of 22
BMP 202: Stake and Wire Fence	1 of 22
BMP 210: Stabilized Construction Exit	2 of 22
BMP 211: Rumble Strips and Wheel Wash	4 of 22
BMP 212: Construction Road and Parking Area Stabilization	6 of 22
BMP 220: Temporary & Permanent Seeding	7 of 22
BMP 221: Mulching	9 of 22
BMP 230: Nets & Blankets	11 of 22
BMP 240: Sodding	14 of 22
BMP 241: Top-soiling	15 of 22
BMP 250: PAM for Soil Erosion Protection	17 of 22
BMP 260: Surface Roughening	19 of 22
BMP 261: Gradient Terrace	21 of 22

Chapter 3: Conveyance BMPs

BMP 301: Interceptor Dike and Swale	1 of 27
BMP 302: Grass-Lined Channel	2 of 27
BMP 303: Reinforced Channel Lining	5 of 27
BMP 304: Vegetated Strip	6 of 27
BMP 310: Diversionary Ditch	7 of 27
BMP 311: Pipe-Slope Drain	8 of 27
BMP 312: Subsurface Drain	10 of 27
BMP 313: Level Spreader	11 of 27
BMP 320: Waddles or Wattles	12 of 27
BMP 321: Check Dam	14 of 27
BMP 322: Geo-textile Encased Check Dam	16 of 27
BMP 323: Brush Barrier	17 of 27
BMP 324: Gravel Filter Berm	18 of 27
BMP 330: Storm Drain Inlet Protection	18 of 27
BMP 340: Outlet Protection	22 of 27
BMP 341: Energy Dissipaters	23 of 27
BMP 350: Secondary Embedded Reinforced Perimeter Sediment Barrier	23 of 27

Chapter 4: Treatment BMPs

BMP 401: Sediment Trap	1 of 12
BMP 402: Temporary Sediment Pond	3 of 12
BMP 410: Retention/Detention Pond	6 of 12
BMP 420: De-watering	7 of 12
BMP 421: Turbidity Removal	8 of 12
BMP 430: Chemical Treatments	8 of 12
BMP 440: Filtration	11 of 12

Appendixes

Appendix A: Planning	A-1
Appendix B: Low Impact Development	B-1
Appendix C: Standard Comments for ESC Plans	C-1
Appendix D: Information on Chemical Treatments	D-1
Appendix E: Construction SWPPP Checklist	E-1
Appendix F: Minimum Requirements for Training Course	F-1

Figures

Figure 2.1	Stake and Wire Fence	2-2
Figure 2.2	Stabilized Construction Exit with Sediment Trap	2-3
Figure 2.3	Wheel Wash	2-6
Figure 2.4	Slope Installations of Nets and Blankets	2-12
Figure 2.5	Channel Installations of Nets and Blankets	2-13
Figure 2.6	Surface Roughening by Tracking and Contour Furrows	2-20
Figure 2.7	Gradient Terrace	2-21
Figure 3.1	Typical Grass-Lined Channels	3-3
Figure 3.2	Trapezoidal Channel Liners	3-4
Figure 3.3	Pipe-Slope Drains	3-8
Figure 3.4	Cross Section of Level Spreader	3-12
Figure 3.5	Detail of Level Spreader	3-12
Figure 3.6	Straw Wattles	3-13
Figure 3.7	Check Dam	3-15
Figure 3.8	Brush Barrier	3-17
Figure 3.9	Block and Gravel Filter	3-20
Figure 3.10	Catch Basin Filter	3-21
Figure 3.11	Curb and Gutter Sediment Trap (or “J” Hook)	3-22
Figure 3.12	Secondary Embedded Reinforced Perimeter Sediment Barriers	3-24
Figure 3.13	Secondary Embedded Reinforced Perimeter Sediment Barriers by Slicing Method	3-26
Figure 4.1	Cross Section of Sediment Trap	4-2
Figure 4.2	Sediment Trap Outlets	4-2
Figure 4.3	Sediment Pond Plan View	4-3
Figure 4.4	Sediment Pond Cross Section	4-4
Figure 4.5	Sediment Pond Riser Detail	4-4
Figure 4.6	Riser Inflow Curves	4-5

Tables

Table 1	On-Hand Containment Materials	1-8
Table 2	Geo-Textile Standards for Construction Exit Pads	2-2
Table 3	Wet Area Seed Mix	2-8
Table 4	Meadow Seed Mix	2-9
Table 5	Mulch Standards and Guidelines	2-10
Table 6	PAM and Water Application Rates	2-17
Table 7	Interceptor Dike Criteria	3-1
Table 8	Interceptor Swale Criteria	3-2
Table 9	Vegetative Strip	3-6
Table 10	Diversionary Ditch Spacing Guidelines	3-7
Table 11	Storm Drain Inlet Protection	3-19
Table 12	Geo-Textile Standards	3-24

Stormwater Management Manual for Construction Stormwater Pollution Prevention

Executive Summary

Prepared by the Stormwater Compliance Group of Northwest Arkansas

This manual was written for the small Municipal Separate Stormwater Sewer Systems (MS4s) in Northwest Arkansas to serve as a common guidance document for the design and implementation of control measures for construction site runoff control and post-construction runoff controls. It was proposed by members of the NWA Stormwater Focus Team that this document should be used by MS4 jurisdictions as a guide to the development of their individual construction BMP ordinances. In this way, EPA Phase II jurisdictions would retain the flexibility in developing their BMPs to meet their individual needs. The NWA Stormwater Focus Team – municipal representatives of local and county governments, the University of Arkansas, their designated program overseers (such as a private engineering company), and other individuals or parties with an interest in stormwater in NW Arkansas) - strongly recommends that the information in this document be followed as closely as possible in order to promote regional consistency. This will be an important step in helping to standardize the BMPs used by design engineers & architects, developers, contractors, and erosion control professionals in Northwest Arkansas.

While this document is not intended to be an all-encompassing document, it is to serve as a guide or minimum standard for employees of NWA cities, counties, colleges, universities, and contractors during construction or its planning process.

With the promulgation of the NPDES Stormwater Phase II regulations by the U.S. EPA, small MS4s in urbanized areas must implement a Storm Water Management Program (SWMP), which as a minimum must include the following six control measures:

1. Public education and outreach
2. Public participation and involvement
3. Illicit discharge detection and elimination
4. Construction site runoff control
5. Post-construction runoff control
6. Pollution prevention and good housekeeping

Glossary

- ADEQ:** Arkansas Department of Environmental Quality
- AHTD:** Arkansas Highway and Transportation Department
- AKART:** All Known, Available, and Reasonable means have been Taken
- ASTM:** American Society for Testing and Materials
- ATB:** Asphalt-Treated Base
- BFM:** Bonded-Fiber Matrix
- BMP:** Best Management Practice; schedule of activities, practices, or procedures to prevent or reduce the pollution of water; includes treatments, structural and non-structural controls, drainage, storage, cleaning and disposal of raw or created gases, liquids, and solids
- BOD:** Biological Oxygen Demand
- CCSO:** Certified Contractor's Site Official
- CESCP:** Contractor's Erosion and Sediment Control Plan
- CESSI:** Certified Erosion, Sediment, and Stormwater Inspector
- CFR:** Code of Federal Regulations
- CMS4S:** Certified MS4 Specialist
- COE:** Corps of Engineers
- CPESC:** Certified Professional in Erosion and Sediment Control
- CPSWQ:** Certified Professional in Storm Water Quality
- CWA:** Clean Water Act (federal); also referred to as the Federal Water Pollution Control Act; Federal Water Pollution Control Act Amendments of 1972; Publication L. 92-500, as amended Publication L. 95-217; Publication L. 95-576, Publication L. 97-117, 33 U.S.C. 1251, et. seq.
- DOT:** Department Of Transportation (either federal or state)
- Dry Season:** the part of a 12-month yearly cycle that is least likely to receive any quantity of stormwater; in NW Arkansas this time period is generally between May 1 and September 30.
- ELG:** Effluent Limitation Guidelines
- EPA:** United States Environmental Protection Agency
- ESA:** Endangered Species Act
- E&SC or ESC:** Erosion and Sediment Control
- FEMA:** Federal Emergency Management Agency
- Hog fuel:** sawdust, tree bark, wood chips or shavings, mulch, other wood and yard-waste-type materials from sawmills and other raw wood processors that is used for fuel, landfill cover, animal feed, and surfacing materials; should not contain rocks, dirt, metal, plastic, or slag and should not have been subjected to saltwater.
- HUC:** Hydrologic Unit Code; a unique series of 2 to 8 numbers used to identify a watershed; the first 2 digits represent the division of the US into 21 regions, the second 2 digits represent sub-regions, the next 2 digits represent accounting units, and last pair of digits are cataloging units; efforts are underway to add 2 additional sets of numbers to further identify sub-watershed areas and reaches
- IDDE:** Illicit Discharge Detection and Elimination; a system of processes, procedures, plans, or programs instituted to detect, locate, and prevent illicit connections and discharges
- IECA:** International Erosion Control Association; multi-national association devoted to helping people solve the problems caused by erosion and sediment
- Illicit connection:** any conveyance (usually man-made) transporting a prohibited discharge to a NPDES-permitted MS4 entity or its stormwater system
- Illicit discharge:** any prohibited discharge to a stormwater system; any discharge to a stormwater system that is not exclusively stormwater, rain, snow, ice, or hail,
- MBFM:** Mechanically Bonded Fiber Matrix

MCM: Minimum Control Measure; one of 6 elements required of a MS4's management program or plan; 6 elements working together with the expectation to produce results in the significant reduction of pollutants discharged to a water body

MEP: Maximum Extent Practicable

MS4: Municipal Separate Stormwater Sewer System; can be a single or mixture of municipalities, private or public universities, hospitals, or other government-run operations (such as military bases or prisons) within an UA the are required to meet requirements of the NPDES, CWA, EPA, ESA, USFWS, and other federal regulatory agencies or legislation

NOEC: No Observed Effects Concentration

NOI: Notice of Intent; the mechanism to “register” for coverage under a permit issued by a higher regulating authority

NOT: Notice of Termination; the mechanism to “terminate” coverage of a permit issued by a higher regulating authority once stabilization requirements have been met

NPDES: National Pollutant Discharge Elimination System

NPDES permit: tailored permit containing limits on discharges; monitoring and reporting requirements; and other provisions to ensure water quality and address other health or safety concerns

NTU: Nephelometric Turbidity Unit; unit measuring the lack of clarity of water; Water containing 1 milligram of finely divided silica per liter has a turbidity of 1 NTU

NWA: NorthWest Arkansas

Operator: the party or parties that meet one or more of the following descriptions:

- Has operational control over construction plans and specifications including the ability to make modifications to them;
- Has daily operational control over activities at a site to ensure that compliance with a SWP3, permit, or other regulatory actions

Owner: the party or parties that own or otherwise have financial control over activities on a site

PAM: Poly-acryl Amide; a polymer formed from acryl amide subunits; highly water-absorbent; used to flocculate or coagulate solids in a liquid; used as a soil conditioner to protect the water quality

Phase I CWA: federal regulations enacted in 1990 mandating stormwater management for locations meeting certain requirements

Phase II CWA: federal regulations enacted in 2003 mandating stormwater management for (smaller urbanized) locations meeting certain requirements

pH: measurement of how acidic or basic a material is

Qualified Person: an individual who has received education, training and/or certification at a stormwater event that is recognized by either a local, state, or national organization. Certifications include those issued by the Hot Springs (AR) QLP and states other than Arkansas. Other certifications also include – but are not limited to - CPESC, CESSWI, CMS4S, and CPSWQ

Recharge Area: area or location where stormwater drains into the ground that later re-surfaces as a spring, flows from a well, or other groundwater source

Receiving Water: a water body serving as the “collector” of one or more watersheds

RUSLE: Revised Universal Soil Loss Equation

Scour: to scrub or rub hard on the surface of something especially by swift-flowing water

Storm water or **Stormwater:** defined by 40 CFR §122.26(b)(13); includes runoff of water (in all forms) as it falls from the sky or is released from a certified drinking water supply onto the surface of the ground, or the drainage of the runoff

Sump depth: the depth of a receptacle or reservoir into which stormwater is drained in order to be pumped out after being treated for sediment and other possible pollutants collected

SWMM: Storm Water Management Manual

SWMP: Storm Water Management Program or Storm Water Master Plan; a comprehensive written document to define and manage how storm water and its runoff will be dealt with by a MS4, including how each of 6 MCMs will be used to address the quality (and possibly quantity) of runoff before leaving

its jurisdiction

SWPPP or **SWP3**: Storm Water Pollution Prevention Plan; a living document that indicates how erosion and sediment will be controlled through the use of various BMPs

TESC: Temporary Erosion and Sediment Control

TMDL: Total Maximum Daily Load

TSS: Total Suspended Solids

UA: Urbanized Area; as defined by the U.S. Census Bureau, a contiguously-connected land area contains portions or all of one or more municipalities (incorporated or not) with a total population over 50,000 people and an overall density of at least 1,000 people per square mile

USDA: United States Department of Agriculture

USFWS: U.S. Fish & Wildlife Service

Ultimate Receiving Water: a surface water body that receives discharges from multiple watersheds, often a river or substantial-size lake with an 8-digit (or fewer) HUC

Watershed: the ground surface area that drains all stormwater runoff to a single discharge location

Wet Season or **Rainy Season**: the part of a yearly weather cycle that is most likely for regular, large quantities in significant amounts of stormwater fall; in tropical climates are often referred to as the monsoon season; in NW Arkansas this time period is generally between October 1 and April 30

Units of measure:

cfs: cubic feet per second

fps: feet per second

gpm: gallons per minute

pcf: pounds per cubic foot

psf: pounds per square foot

psi: pounds per square inch

sf: square foot or square feet

µm: micrometer; the fraction of one millionth of a meter

Locations within the 2000 NWA UA (Code 297):

- Benton County
- Bentonville
- Bethel Heights
- Elkins
- Elm Springs
- Farmington
- Fayetteville
- Greenland
- Johnson
- Little Flock
- Lowell
- Rogers
- Springdale
- University of Arkansas - Fayetteville campus
- Washington County

Locations added to the northwest Arkansas Urbanized Area due to the 2010 Census:

- Bella Vista
- Cave Springs
- Centerton
- Pea Ridge
- Prairie Grove
- Tontitown

Introduction

This Stormwater Best Management Practice (BMP) Manual is entirely devoted to stormwater effects and controls associated with construction activities. It addresses the planning, design, and implementation of stormwater management activities prior to and during the construction phase of projects.

The objective of this manual is to provide guidance for avoiding adverse stormwater impacts from construction activities on downstream resources and on-site stormwater facilities. Minimizing stormwater

flows, prevention of soil erosion, capture of water-borne sediment that has been unavoidably released from exposed soils, and protection of water quality from on-site pollutant sources are all readily achievable when the proper BMPs are planned, installed, and properly maintained.

Initial discussions between the project proponents and their designer, contractors, and compliance inspectors can identify approaches to accomplishing a high quality, cost-effective project without compromising environmental protection. Often new ways are found to stage, time, and phase parts of a project to economize a contractor's schedule and use of construction materials. This collaborative planning process can produce methods to minimize or eliminate vulnerability and unnecessary risk associated with some traditional construction practices and techniques.

The construction phase of a project is usually considered a temporary condition, which will be supplanted by the permanent improvements and facilities for the completed project. However, construction work may take place over an extended period of time, including several seasons of multiple years. All management practices and control facilities used in the course of construction should be of sufficient size, strength, and durability to readily outlast the longest possible construction schedule and the worst anticipated rainfall conditions.

Linear projects, such as roadway construction and utility installations, are special cases of construction activities and present their own, unique set of stormwater protection challenges. Many of the BMPs can be adapted and modified to provide the controls needed to adequately address these projects. It may be advantageous to segment long, linear projects into a series of separate units that can apply all necessary controls pertinent to that particular unit in a timely manner.

The goal of a Stormwater Pollution Prevention Plan (SWPPP) is to avoid immediate and long-term environmental loss and degradation typically caused by poorly managed construction sites. Prompt design and ***implementation*** of a Construction SWPPP can provide a number of benefits. These include minimizing construction delays, reducing resources spent on repairing erosion, improving the relationship between the contractor and the permitting authority, and limiting adverse effects on the environment. Many of the BMPs contained in this volume can be adapted and modified to provide the erosion and sediment controls needed for other activities.

The Construction Stormwater Pollution Prevention Plan requires that new development and redevelopment projects address stormwater pollution prevention during construction. The SWPPP must describe construction practices, stabilization techniques, and structural BMPs that are to be implemented to prevent erosion and minimize sediment transport. Erosion prevention, sediment control, and pollution control BMP guidance and design criteria are provided later in this manual. Projects that clear more than an acre must prepare a City Grading Permit and a Stormwater Pollution Prevention Plan (SWPPP) that is reviewed by the State of Arkansas. The SWPPP must contain sufficient information to satisfy the state that the problems of pollution have been adequately addressed for the proposed project, or that will discharge stormwater from the site, or into storm drainage systems that discharge to a surface water.

Final stabilization must be completed for stormwater discharges that originate from the site after construction has been completed. Final stabilization means the completion of all soil disturbing activities at the site and the establishment of a permanent vegetative cover, or equivalent permanent stabilization measures such as native stone, gabions, or geo-textiles which will prevent erosion and pollution from leaving the site.

Stormwater discharges are subject to applicable federal and state water quality standards. Neither the federal or state Stormwater General Construction Permit authorizes the violation of those standards. ADEQ expects that the selection and implementation of appropriate BMPs outlined in this or equivalent manuals will result in compliance with water quality standards. Proper implementation and maintenance of

appropriate BMPs is critical to adequately control any adverse water quality impacts from construction activity.

Stormwater discharges from construction sites must not cause or contribute to violations of Arkansas’s surface water quality standards, sediment management standards, ground water quality standards, and human health.

Standards and Specifications for Best Management Practices

Best Management Practices (BMPs) are defined as schedules of activities, prohibitions of practices, maintenance procedures, and structural and/or managerial practices, that when used singly or in combination, prevent or reduce the release of pollutants to waters of the state. This manual contains standards and specifications for various temporary and permanent BMPs to be used prior to, during, and/or after the design and construction phases of a project. Permanent BMPs included must meet their own Maintenance Standards to remain effective during their post-construction life.

Chapter 1 contains the standards and specifications for Preventative BMPs.

Chapter 2 contains the standards and specifications for Access and Source Control BMPs.

Chapter 3 contains the standards and specifications for Conveyance BMPs.

Chapter 4 contains the standards and specifications for Treatment BMPs.

The standards for each individual BMP are divided into four sections:

1. Purpose
2. Conditions of Use
3. Design and Installation Specifications
4. Maintenance Standards

“Conditions of Use” refers to site conditions. As site conditions change, BMPs must be maintained or changed to remain in compliance.

“Design and Installation Specifications” may be determined by a designer, manufacturer, installer, and/or regulating entities (such as a local or state agency). Trademarked, brand name, and/or patented BMPs shall be ruled by their manufacturing and installation disclaimers. This manual will try to avoid referencing such devices but may generally describe a “class” of devices that are similar in installation, operation, and purpose and that can be found through various suppliers and dealers. The terms and guidelines for the BMP devices listed are the preferred techniques of Northwest Arkansas municipal stormwater inspectors (who helped create this manual) and supervisors, and are controlled by the collective (regional) stormwater ordinance(s) of those municipalities listed before the Introduction on pages viii and ix.

“Maintenance Standards” must be met to keep each BMP effective. If the BMP and/or its devices are not regularly inspected and maintained, it/they will need to be replaced during the project’s construction phase to keep the overall site in compliance.