

STATEMENT OF BASIS

Permit Number: SDG070000

Permit Type: General Permit for Temporary Discharge Activities

This document is intended to explain the basis for the requirements contained in the draft Surface Water Discharge (SWD) General Permit. This document provides guidance to aid in complying with the general permit requirements. This guidance is not a substitute for reading the draft general permit and understanding its requirements.

APPLICABILITY

This general permit is proposed for various activities that result in temporary discharges of relatively uncontaminated water to surface waters of the state. Discharge activities will be reviewed on a case-by-case basis to determine eligibility for coverage under this general permit. Discharges that are not temporary in nature are not eligible for coverage under this general permit. In addition, discharges that contain sanitary wastewater or toxic pollutants in toxic amounts are not eligible for coverage under this permit.

PERMIT DESCRIPTION

Various activities often result in temporary discharges to waters of the state. All point source discharges are subject to the requirements of the South Dakota Pollution Control Act and Administrative Rules of South Dakota (ARSD), Chapters 74:52:01 through 74:52:11. Due to the nature of the scheduling of temporary activities, obtaining an individual SWD permit may significantly impact the timing of a project due to administrative delays. The intent of the general permit for temporary discharges is to:

1. Facilitate the scheduling of temporary discharge activities by reducing the administrative delays in their authorization;
2. Establish uniform criteria for management practices and effluent limits for discharges from these activities; and,
3. Promote a consistent permitting and enforcement posture with respect to these temporary discharge activities.

Typical activities which may result in a discharge include, but are not limited to, construction dewatering, hydrostatic testing, pump testing of water wells, draining swimming pools and similar structures, dewatering petroleum contaminated ground water, dewatering ground water with other contaminants, and other various short-term discharges.

BACKGROUND

ARSD Section 74:52:02:46 provides for the issuance of general permits where covered facilities:

1. Involve the same or substantially similar types of operations;
2. Discharge the same types of waste;
3. Require the same effluent limitations, operating conditions, or standards;
4. Require the same or similar monitoring; and,
5. Are more appropriately controlled under a general permit.

Activities that result in a temporary discharge of relatively uncontaminated water to surface waters of the state meet the criteria in ARSD 74:52:02:46. Therefore, the department is proposing a general permit for these types of discharges. This draft general permit contains discharge requirements and limits that are based on technology and water quality considerations, prohibitions, Best Management Practices (BMPs, Attachment 1), and other conditions applicable to temporary discharges.

DISCHARGE DESCRIPTION

There are a variety of discharges of relatively uncontaminated water that may potentially occur from temporary discharge activities. The following is a listing and description of some of the typical discharges regulated by the draft general permit.

Construction Dewatering

During construction activities, dewatering of the excavation site is often necessary. The presence of water in the excavated area is generally the result of either ground water intrusion or runoff from a precipitation event accumulating in the excavated area. Removal of this water from the construction site is often critical to the operation of equipment and the integrity of the structure being constructed.

This draft general permit covers the operation of temporary dewatering without any distinction as to whether the dewatering is for the foundation of a building, a dam, trenching for a pipeline, etc. The principal pollutant of concern is total suspended solids, because of erosional effects or improper pumping procedures. In addition, there exists some potential for oil and grease in the discharge from the pumping systems. The draft general permit limits the level of oil and grease that will be allowed in the discharge. The South Dakota Department of Environment and Natural Resources (SDDENR) reviews each request for coverage before authorizing the discharge under this draft general permit to identify any exceptional situations where an individual permit or additional requirements under this draft general permit may be needed.

Hydrostatic Testing

Pipeline and/or vessel installations must occasionally be tested for leakage before placing them in operation. Water is generally used to hydrostatically test the system and is the only test medium that is allowed to be discharged under this draft general permit.

The sources of hydrostatic testing water may be surface, ground, or well water. In general, nothing is added to the raw water used for the test. The test water could possibly be contaminated from residual materials or fluids in the pipe or vessel. Consideration of the potential for such contamination must be made for each test and will be assessed during the review of the information submitted with the original request for discharge authorization. It is unlikely that virgin pipe (the most common subject of hydrostatic tests) would pose any problem.

Pump Testing of Water Wells

Testing of wells is sometimes needed to determine the ability of the well to meet the required flow rates and water quality. Testing may also be required to determine the impacts of the well on the aquifer. The testing can result in a large amount of water being discharged over a short period of time, which could lead to significant erosion. The pollutant of concern would be suspended solids due to erosion. In some cases, there may be other naturally occurring pollutants in the water that will be regulated by this draft general permit on a case-by-case basis.

Swimming Pools and Similar Structures

Swimming pools, hot tubs, spas, and similar structures, such as water slides and water amusement parks, periodically discharge water due to draining, cleaning, and filter backwash. This water can contain chlorine in amounts high enough to be toxic to aquatic life. Therefore, the total residual chlorine concentration must be non-detectable by the time the discharge reaches waters of the state.

Petroleum Contaminated Ground Water

Ground water can become contaminated by leaks from gasoline or diesel storage tanks. These can be either above ground or underground tanks. This draft general permit will regulate short term discharges of water from the remediation of this contamination. The pollutants of concern in these discharges could include benzene, toluene, ethylbenzene, xylene, and other petroleum hydrocarbons.

Ground Water with Other Contaminants

Ground water can also have contamination from previous industrial activities at a location. Dewatering of this contaminated ground water may be necessary during the construction phase of redeveloping a site. The pollutants of concern would typically be heavy metals and/or solvents. These pollutants will be regulated by this draft general permit on a case-by-case basis.

Other Short-Term Discharges

There are potentially many other activities that could result in the need for a temporary discharge. These activities may be eligible for coverage under this general permit providing the following conditions are met:

1. The general permit limits, monitoring requirements, and management practices are appropriate;
2. The discharge type is not covered under an alternative general permit;
3. The discharge is of a temporary nature; and
4. The discharge consists of relatively uncontaminated water.

When a request for coverage is received SDDENR shall determine if the discharge meets the above criteria. If there is a potential for the discharge to contain pollutants other than those limited in the draft general permit, SDDENR may require the discharger to demonstrate that the pollutants in question are below surface water quality standards to receive coverage under this draft general permit. This can be accomplished by sampling the water to be discharged, analyzing it for the pollutants in question, and comparing the results with the surface water quality standards for that parameter according to approved methods. The permittee may be required to periodically reaffirm the absence of potential pollutants during the period of coverage. If it is shown that significant pollutants other than those limited by this draft general permit are present, a permittee's coverage under this draft general permit shall be terminated. Any further discharges would need to be covered by an individual or alternative general permit.

PERMIT COVERAGE

Inclusion of the above-described activities under a single surface water discharge general permit appears to be reasonable approach in regulating these related discharges. The characteristics of the discharged water from these activities are similar because they discharge the same types of wastes, involve similar operations, are temporary in nature, and are appropriately controlled by the similar effluent limits. Therefore, SDDENR has determined that these activities will be more appropriately controlled under a general permit rather than individual permits.

If effluent guidelines are promulgated for any of the permitted discharges, those discharges shall be evaluated to determine whether it can be authorized to discharge under this draft general permit or be required to apply for an individual SWD permit.

Appendix A of the draft general permit contains a copy of the application form for coverage under the general permit. This represents the minimum information SDDENR needs in order to provide coverage under the general permit.

In addition to obtaining coverage under this draft general permit, a temporary water use permit is often required by the Water Rights Program when water is pumped from ground water or surface water. To aid the permittee in obtaining the appropriate permits in a timely and efficient manner, the information required to receive a temporary water use permit is contained in the Notice of Intent form. The form will be forwarded to the Water Rights Program for their use. The submittal of the Notice of Intent shall be considered an application for both a temporary water use permit (if necessary) and the temporary discharge permit.

Discharges Not Covered

This draft general permit will not cover the following discharges:

1. Section 404 permitted discharges;
2. Discharges of sanitary wastewater;
3. Discharges that are not temporary in nature. This general permit does not authorize discharges which are not temporary in nature. For purposes of this general permit, temporary is defined as discharges which occur for one year or less. Discharges that are not temporary will be required to obtain an individual Surface Water Discharge permit, or obtain coverage under an appropriate alternative general discharge permit.
4. Discharges of toxic pollutants in toxic amounts;
5. Discharges that may present a health hazard;
6. Discharges that may be a significant contributor of pollution;
7. Discharges that may cause or contribute to an exceedance of the water quality standards of the receiving stream;
8. Discharges threatening endangered species. This general permit does not authorize a temporary discharge that will not ensure the protection of species that are federally-listed as endangered under the federal Endangered Species Act.
9. Discharges of regulated substances, hazardous substances, or oil resulting from on-site spills.
10. Discharges Containing Aquatic Invasive Species. This general permit does not authorize the discharge, transfer, or introduction of aquatic invasive species to waters of the state.

Temporary discharge activities will be reviewed on a case-by-case basis to determine eligibility for coverage under the draft general permit.

REQUIRING AN INDIVIDUAL PERMIT

In accordance with ARSD 74:52:02:47, the Secretary may require any owner or operator covered under the draft general permit to apply for an individual permit if any of the following occur:

1. The discharge is a significant contributor of pollution to waters of the state, presents a health hazard, or is in noncompliance with the conditions of the draft general permit;
2. A change has occurred in the availability of demonstrated technology or practices for the control or abatement of pollutants applicable to the point source;

3. Effluent limitation guidelines are promulgated for point sources covered by this draft general permit;
4. A water quality management plan containing requirements applicable to such point sources is approved;
5. SDDENR determines there is reasonable potential for the discharge to contain whole effluent toxicity;
6. The discharge is to an impaired water body, and the best management practices and effluent limits are not sufficient to implement the assigned wasteload allocation in a total maximum daily load; or
7. Other conditions or standards change so that the permittee no longer qualifies for coverage under the draft general permit, such as changes in necessary effluent pollutant monitoring, the discharge is no longer considered temporary, or other items that would necessitate an individual Surface Water Discharge permit.

The Secretary will notify the general permittee in writing that an application for an individual permit is required. When an individual permit issued to a permittee covered under this draft general permit, the permittee's general permit coverage shall be automatically terminated upon the effective date of the individual permit. In addition, an owner or operator covered by this draft general permit may apply for an individual permit pursuant to the provisions in ARSD 74:52:02:46.

RECEIVING WATERS

Any discharge from the temporary discharge activities covered by this draft general permit have the possibility of discharging to any waterbody in South Dakota, which are classified by the South Dakota Surface Water Quality Standards (SDSWQS), ARSD Sections 74:51:03:01 and 74:51:03:06 for the following beneficial uses:

- (1) Domestic water supply waters;
- (2) Coldwater permanent fish life propagation waters;
- (3) Coldwater marginal fish life propagation waters;
- (4) Warmwater permanent fish life propagation waters;
- (5) Warmwater semipermanent fish life propagation waters;
- (6) Warmwater marginal fish life propagation waters;
- (7) Immersion recreation waters;
- (8) Limited contact recreation waters;
- (9) Fish and wildlife propagation, recreation, and stock watering waters;
- (10) Irrigation waters; and
- (11) Commerce and Industry waters.

When an applicant submits a Notice of Intent for coverage under the draft general permit, SDDENR will review the potential receiving waterbody to determine compliance with the applicable water quality standards. The draft general permit was developed to ensure these beneficial uses are maintained and protected.

TOTAL MAXIMUM DAILY LOAD

Section 303(d) of the federal Clean Water Act requires states to develop Total Maximum Daily Loads (TMDLs) for waters at levels necessary to achieve and maintain water quality standards. TMDLs are calculations of the amount of pollution a waterbody can receive and still maintain applicable water quality standards. TMDLs are necessary for waters that do not meet or are not expected to meet water quality standards with the application of technology-based controls for point sources. TMDLs address specific waterbodies, segments of waterbodies, or even entire watersheds, and are pollutant specific. TMDLs must allow for seasonal variations and a margin of safety, which accounts for any lack of knowledge concerning the relationship between pollutant loads and water quality.

The draft general permit requires best management practices to ensure the surface water quality standards are met and maintained. Therefore, the draft general permit will authorize discharges to waterbodies that are listed as impaired or have an approved TMDL. However, if SDDENR determines a specific site has the potential to cause or contribute to an impairment of the SDSWQS, DENR can require the owner to implement additional controls and/or obtain an individual permit.

ANTIDegradation REVIEW

SDDENR has fulfilled the antidegradation review requirements for this draft general permit. In accordance with South Dakota's Antidegradation Implementation Procedure and the SDSWQS, no further review is required since the permitted discharges will not cause significant degradation of the quality of the receiving stream. The results of SDDENR's review are included in Attachment 2.

MONITORING DATA

Permittees that discharge to waters of the state under this general permit are required to monitor and sample discharges, and submit sample results to SDDENR. Monitoring data for permittees previously or currently covered under the general permit are available from SDDENR upon request.

EFFLUENT LIMITS

1. The Total Suspended Solids (TSS) concentration shall not exceed 90 mg/L in any single sample. This limit applies to discharges to all waters of the state **except** discharges to waters classified as coldwater permanent fish life propagation waters, in accordance with ARSD Chapter 74:51:03. This limit is based on permit writer's judgment and the current permit limits, using the SDSWQS (ARSD 74:51:01:46 - :48) as a guideline.

The TSS concentration shall not exceed 53 mg/L in any single sample for discharges to all waters of the state classified as coldwater permanent fish life propagation waters. This limit is based on the SDSWQS (ARSD 74:51:01:45).

Alternative treatment technologies and BMPs are available to reduce the TSS concentration in the discharge (Attachment 1). However, the cost effectiveness of using these various technologies and BMPs varies from site to site because of the differences in water and sediment characteristics, duration of the discharge, scope of the project, geography of the site, and other factors. Temporary settling ponds and or portable treatment units (i.e., filters) have been the most common treatment technologies used for TSS control.

Technology-based limits for most industries are derived assuming that the subject facilities are ongoing operations. Because of the relatively short duration of these temporary discharges, directly comparing TSS levels achieved by industries that are more permanent would not be a sound basis for deriving technology-based effluent limits.

A facility exercising reasonably diligent control of TSS through the use of a pond system, filtration, or other BMP should be capable of reliably achieving a TSS level of 90 mg/L or less. Effluent guidelines for conventional pollutants do not currently exist for the categories of point source discharges covered by this draft general permit.

Because of the large variety of available chemical flocculants, the use of such settling aids must be approved by SDDENR prior to any use.

2. The oil and grease concentration shall not exceed 10.0 mg/L in any single sample. This effluent limit applies to discharges to all waters of the state **except** discharges to waters classified as domestic water supply waters, in accordance with ARSD Chapter 74:51:03. This limit is based on permit writer's judgment and the SDSWQS (ARSD 74:51:01:52).

The oil and grease concentration shall not exceed 1.0 mg/L in any single sample for discharges to all waters of the state classified as domestic water supply waters. This limit is based on the SDSWQS (ARSD 74:51:01:44).

Total petroleum hydrocarbons and other oils and greases may be present in the discharge due to pump lubricant contamination, contaminated ground water, or contaminated runoff entering the discharge. If petroleum contaminated ground water is expected, the permittee shall take a sample for oil and grease on the first day of the discharge.

The oil and grease concentration shall be determined using United States Environmental Protection Agency (U.S. EPA) method 1664A oil and grease hexane extraction with silica gel.

3. The total BTEX concentration shall not exceed 100 µg/L in any single sample. BTEX shall be measured as the sum of benzene, ethyl benzene, toluene, and xylene. This limit is

based on EPA guidance for discharges of wastewater from petroleum-contaminated ground water remediation sites, permit writer's judgment, and current permit limits.

4. The benzene concentration shall not exceed 5.0 µg/L in any single sample. This limit is based on EPA guidance for discharges of wastewater from petroleum-contaminated ground water remediation sites, permit writer's judgment, and current permit limits.
5. The pH shall not be less than 6.5 standard units or greater than 9.0 standard units in any single analysis and/or measurement. These limits are based on the SDSWQS and the current permit limits.

Note: SDDENR specifies that pH analyses are to be conducted within 15 minutes of sample collection with a pH meter. Therefore, the permittee must have the ability to conduct onsite pH analyses. The pH meter used must be capable of simultaneous calibration to two points on the pH scale that bracket the expected pH and are approximately three standard units apart. The pH meter must read to 0.01 standard units and be equipped with temperature compensation adjustment. Readings shall be reported to the nearest 0.1 standard units.

6. The Total Residual Chlorine (TRC) concentration in any one sample shall not exceed 0.019 mg/L. This limit is based on permit writer's judgment and current permit limits, using the SDSWQS as a guideline.

Note: SDDENR considers the analytical detection limit for total residual chlorine to be 0.05 mg/L. If the effluent value is less than the analytical detection limit, "Below Detection Level" shall be used for reporting purposes.

Alternative treatment technologies and BMPs are available to reduce the total residual chlorine in the discharge. However, the cost effectiveness of using these various technologies and BMPs varies from site to site because of the differences in initial concentration, duration of the discharge, scope of the project, geography of the site, and other factors. BMPs used for erosion or total suspended solids may also work to lower chlorine residuals, as they allow time, exposure to light and air, and space for the chlorine to dissipate. If these BMPs are not effective, several temporary dechlorination technologies are available.

7. There shall be no discharge of process generated wastewater except wastewater resulting from the temporary activities described in the Notice of Intent form and authorized by SDDENR. This limit is based on permit writer's judgment and current permit limits.
8. There shall be no discharge of sanitary wastewater from toilets or related facilities. This limit is based on permit writer's judgment and current permit limits.
9. There shall be no discharge of toxic pollutants in toxic amounts. The individual toxics concentrations shall not exceed the values established on a case by case basis from the acute aquatic life water quality standards in any single sample.

The human health and chronic aquatic life standards will not be used as they are based on long-term exposure and the discharges allowed by this draft general permit will be up to one year.

10. There shall be no discharge of floating solids or visible foam in other than trace amounts. This limit is based on the SDSWQS (ARSD 74:51:01:06).

Collected screenings, grit, solids, sludges, or other pollutants removed in the course of treatment shall be disposed of in such a manner so as to prevent any pollutant from entering any waters of the state or creating a health hazard.

11. No discharge shall impart a visible film or sheen to the surface of the water or adjoining shoreline. This limit is based on the SDSWQS (ARSD 74:51:01:10).
12. The permittee shall take all reasonable measures to prevent or minimize the possibility of stream channel scouring or erosion caused by the discharge with the implementation of appropriate BMPs. Some examples of BMPs are included in Attachment 1. This limit is based on permit writer's judgment and the current permit limits.
13. No chemicals, such as chlorine, shall be used without prior written permission. This limit is based on permit writer's judgment and the current permit limits.

If the permittee identifies other potential contaminants which may be present in the discharge, limits or monitoring for those identified parameters may be included in the permit. This will be determined on a case-by-case basis with consideration given to the type of discharge and the receiving stream beneficial use classifications.

SELF MONITORING REQUIREMENTS

Monitoring is required of each activity that will result in a discharge to waters of the state. The following table shows the sample type and frequency for various parameters for temporary discharge activities.

Parameter	Monitoring Frequency ¹	Sample Type
Flow Rate (gpd)	Daily	Calculate/Estimate
Total Flow (gallons)	Monthly	Calculate/Estimate
pH (standard units)	Weekly	Instantaneous ²
Oil and Grease	Daily	Visual
Oil and Grease (mg/L)	Contingent	Grab ^{3,4}
TSS (mg/L) ⁵	Weekly ⁶	Grab
Benzene (µg/L) ⁷	Weekly	Grab
Total BTEX (µg/L) ⁷	Weekly	Grab
Total Residual Chlorine (mg/L) ⁸	Daily	Instantaneous
Floating Solids/Visible Foam	Daily	Visual
There shall be no discharge of process wastewater not identified in the NOI or sanitary wastewater.		
No chemicals, including chlorine, shall be added to the discharge without prior approval from SDDENR.		

¹ If the duration of the discharge is shorter than the required sample frequency, a minimum of one sample shall be taken for all parameters.

² The pH shall be taken within 15 minutes of sample collection with a pH meter. The pH meter must be capable of simultaneous calibration to two points on the pH scale that bracket the expected pH and are approximately three standard units apart. The pH meter must read to 0.01 standard units and be equipped with temperature compensation adjustment.

³ Oil and grease shall be visually monitored daily. If a visual sheen is observed, an oil and grease sample shall be taken and analyzed using EPA method 1664A oil and grease hexane extraction with silica gel.

⁴ An oil and grease sample shall be taken the first day of the discharge if petroleum contaminated ground water is expected.

⁵ In lieu of sampling for this parameter, the permittee may implement a pollution prevent plan that includes best management practices to prevent total suspended solids from entering waters of the state. The discharge must still be monitored visually for suspended solids. If suspended solids are seen, the permittee must sample for TSS at the frequency indicated until solids are no longer observed in the discharge, and the samples must meet the effluent limits in this section.

⁶ If suspended solids are observed in the discharge, daily monitoring and sampling of TSS is required until sample results are below the numeric daily maximum limit.

⁷ Benzene and BTEX monitoring is only required if petroleum contamination is possible in the water being discharged. This monitoring will be required by the department on a case-by-case basis.

⁸ This limit is only applicable if the permittee is adding chlorine as part of its disinfection process. If a permittee does not add chlorine, chlorine monitoring and limits will not be required. In lieu of sampling for this parameter, the permittee may implement a pollution prevent plan that includes best management practices to prevent total residual chlorine from entering waters of the state.

Effluent monitoring results shall be summarized and recorded on separate Discharge Monitoring Report (DMR) forms (Appendix E in the draft permit), and submitted to SDDENR by the **28th day of the month following the discharge**. If no discharge occurs during a month, no DMR shall be submitted.

On October 22, 2015, the U.S. EPA published in the federal register a rule that makes electronic reporting of permit reporting requirements mandatory for all SWD permits by December 21, 2020. EPA's rule will require all permit reporting requirements (such as DMRs, permit applications, violation reports) to be submitted electronically. SDDENR is working on programs to meet this requirement and will notify facilities as they become available.

Monitoring shall consist of inspections of the facility and the discharge location to verify that proper operation and maintenance procedures are being practiced. **Daily** inspections are required when discharging; **weekly** inspections are required when there is no discharge. Documentation of each of these visits shall be kept in a notebook. Inspections, DMRs, and any other reports submitted to SDDENR shall be kept for a minimum of three years. Such records will be subject to inspection by SDDENR and EPA.

POLLUTION PREVENTION PLAN

The permittee may develop and implement a pollution prevention plan (Section 4.0 of the draft permit) in lieu of sampling for TSS and/or TRC. The permittee must develop and implement the pollution prevention plan prior to beginning the temporary discharge activities. The plan must detail the BMPs the permittee will use to reduce or eliminate any discharge of pollutants and include a site description with a site map in accordance with Section 4.0 of the draft permit.

In lieu of TSS sampling, the following requirements must also be met:

1. The discharge shall not contain visible pollutants. The permittee must visually monitor the discharge for suspended solids on a daily basis.
2. If suspended solids are observed in the discharge, the permittee must implement the following requirements:
 - a. Sample the discharge for total suspended solids on a daily basis until there is no longer a discharge of visible solids.
 - b. The samples must be analyzed in accordance with Title 40 of the Code of Federal Regulations, Part 136.
 - c. If the total suspended solids value exceeds the numeric daily maximum limit specified in the Effluent Limits table in the draft permit in any sample or measurement, cease the discharge to surface waters of the state until additional best management practices are employed to eliminate the visible pollutants. The pollution prevention plan must be updated to include these additional steps

The pollution prevention plan must be updated to reflect current operating conditions. The plan must be made available upon request from SDDENR or U.S. EPA.

DRAINAGE ISSUES

Counties have the authority to regulate drainage. The permittee is responsible for getting any necessary drainage permits from the responsible county **prior** to discharging.

ENDANGERED SPECIES

This is a renewal of an existing general permit. No listed endangered species are expected to be impacted by activities related to this general permit.

TERMINATION OF COVERAGE

When the temporary discharge activities are complete, the permittee is required to submit a Notice of Termination to SDDENR (Appendix D of the draft general permit). The Notice of Termination indicates that all temporary discharge activities have ended.

The permittee is required to terminate coverage within thirty days after all authorized discharges have ceased. Authorized discharges are those discharges that were included in the permittee's Notice of Intent form.

All required reports and submissions shall be submitted to SDDENR prior to terminating coverage.

PERMIT EXPIRATION

A five-year general permit is recommended.

If this general permit should expire before a new permit is reissued, the terms and conditions of the expired general permit will remain effective and enforceable until the effective date of the reissued general permit. SDDENR will continue the general permit coverage for each facility covered under the draft general permit upon the expiration date, provided the facility submits a Notice of Intent for Reauthorization to continue coverage.

PERMIT CONTACT

This statement of basis and the draft general permit were developed by Jill Riedel, Engineer III for the Surface Water Quality Program. Any questions pertaining to this statement of basis or the draft general permit can be directed to the Surface Water Quality Program, at (605) 773-3351.

January 16, 2018

ATTACHMENT 1

Best Management Practices (BMPs)

**BEST
MANAGEMENT
PRACTICES
GUIDE**

Silt Fences



https://www.landandwater.com/features/vol50no2/vol50no2_2.html

Purpose

Silt fences are a temporary sediment control used to contain soil on exposed portions of a site as well as soil stockpiles. Metal or wooden posts hold up the porous fabric that makes up the silt fence. In proper operating condition, the silt fence will allow water to pass through while retaining sediment on-site. Silt fences are most effective on larger particles and may allow finer particles to pass through. It is recommended that you consider you other BMPs alongside silt fences to prevent sediment from discharging offsite.

Application

Drive stakes to support the silt fence into the ground so that half the stake's height is below ground. Use strong plastic zip ties to attach the fabric to the stakes. Trench the fabric at least 6-8 inches into the ground, which can be achieved used a static slicing machine or a trencher. The fabric should be upright and taut along the entire length of the silt fence. Driving a tractor wheel over each side of the silt fence helps to compact the soil around the fence, preventing the fence from washing out.

For peak effectiveness, avoid long runs of silt fences, as failure in one section of the fence will render the entire run ineffective. Instead, install short runs of adjacent silt fences in the "J" shape to share the sediment load. The area draining to a silt fence should not exceed 0.25 acres per 100 feet of silt fence.

Maintenance

Inspect silt fences at least weekly and after rain events. Repair or replace silt fences that are no longer in effective operating condition. Remove sediment or add an additional silt fence when sediment reaches half the height of the silt fence.

Season

Silt fences can be an effective measure of sediment control all year if installed properly.

References

Oregon DEQ (Department of Environmental Quality). 2013. *Construction Stormwater Best Management Practices Manual*. Oregon Department of Environmental Quality, Water Quality Division, Portland, OR.

USEPA (U.S. Environmental Protection Agency). 2014. *Water: Best Management Practices, Seeding*. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

SDDOT (SD Department of Transportation). 2014. *Erosion and Sediment Control and Stormwater Management*. SD Department of Transportation, Pierre, SD.

Vegetative Buffers



https://www.dot.state.oh.us/Divisions/ConstructionMgt/OnlineDocs/Specifications/2002CMS/2003_Manual_for_web/207.htm

vegetative buffer will depend on the slope of the buffer zone, the slope of adjacent disturbed areas, type and density of vegetation, and other factors. When practicable, avoid disturbing preexisting vegetation onsite. Soil compaction, soil stockpiles, and grading near or on vegetation can impact vegetation onsite and reduce the effectiveness of the vegetative buffer.

Grasses are recommended for establishing vegetative buffers, due to their extensive coverage above ground to slow and filter runoff, as well as a dense root system to hold sediment in place. Other types of vegetation can also be effective as vegetative buffers and the optimum type of vegetation will depend upon onsite conditions.

Maintenance

Inspect vegetation regularly, especially before vegetation is completely established. Remove sediment if the buffer zone becomes full of sediment. Reseed, fertilize, or otherwise encourage vegetative growth until dense vegetative cover is established. Clearly mark vegetative buffer zones on the SWPPP and onsite to prevent disturbance of vegetative buffer zones.

Season

Vegetative buffers can be an effective form of sediment control all year, if properly implemented.

References

Oregon DEQ (Department of Environmental Quality). 2013. *Construction Stormwater Best Management Practices Manual*. Oregon Department of Environmental Quality, Water Quality Division, Portland, OR.

USEPA (U.S. Environmental Protection Agency). 2014. *Water: Best Management Practices, Seeding*. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

SDDOT (SD Department of Transportation). 2014. *Erosion and Sediment Control and Stormwater Management*. SD Department of Transportation, Pierre, SD.

Purpose

Vegetative buffers are a form of sediment control that: filter runoff, control runoff velocity, and trap sediment to prevent sediment and other pollutants from discharging off-site. Vegetative buffers can include areas of preexisting vegetation left undisturbed or areas where vegetation is established for the purpose of controlling runoff.

Application

Perimeter boundaries of the site can be left undisturbed, if already vegetated, or seeded to establish a vegetative buffer. The necessary width of

Construction Entrances



<https://www.pca.state.mn.us/water/construction-stormwater>

Purpose

Construction entrances prevent vehicles from tracking sediment offsite. Rock pads, rumble tracks, wheel washes, or other forms of sediment removal can all be used as construction entrances/exits.

Application

Install construction entrances/exits in each area where vehicles will access the site. Strategic placement of entrances/exits may reduce costs by decreasing the number of entrances/exits necessary.

A rock pad should be placed over a filter cloth or geotextile to prevent packing the rock into the fine material beneath, allowing sediment to escape. Rocks used in rock pads should be large rock, 4-6 inches in diameter. Install the rock at least 6 inches deep to ensure sediment is removed properly.

A rumble track can be placed temporarily on paved roads to prevent discharging sediment offsite. Wheel washes can be used at construction exits to wash sediment from truck tires.

Maintenance

Add rock to the rock pad when necessary. Remove sediment from rumble tracks as necessary. Remove any sediment that has been tracked offsite by performing street sweeping or other sediment removal BMPs.

Season

Construction entrances can be an effective form of track out control all year, if properly implemented.

References

Oregon DEQ (Department of Environmental Quality). 2013. *Construction Stormwater Best Management Practices Manual*. Oregon Department of Environmental Quality, Water Quality Division, Portland, OR.

USEPA (U.S. Environmental Protection Agency). 2014. *Water: Best Management Practices, Seeding*. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

SDDOT (SD Department of Transportation). 2014. *Erosion and Sediment Control and Stormwater Management*. SD Department of Transportation, Pierre, SD.

Sediment Basins



<http://www.fairfaxcounty.gov/nvswcd/newsletter/esc.htm>

Purpose

A sediment basin is usually a temporary, but can be a permanent, sediment storage area to prevent sediment from washing offsite. Sediment basins allow water to flow into the basin, and then contain the water to allow sediment to settle to the bottom. Sediment basins are most effective for large sites more than 5 acres.

Application

Form earth embankments over low areas or excavate to build sediment basins. Design in such a way that the flow from the inlet to outlet is slow enough to allow sediment to settle out of the water.

Maintenance

In time, permanent sediment basins will lose holding capacity as they fill with sediment. The time between sediment removals is dependent on size of the basin and the area contributing to the sediment basin. This usually involves the use of an excavator to scoop out the sediment. Mowing of the seeded embankment may be required. Removal of foreign objects that may clog the outlet is required to ensure proper flow through the basin.

Season

Construction should occur prior to the wet season for the particular location of the basin. Sediment basins can be effective forms of sediment control throughout the year when runoff containing sediment flows to the sediment basin.

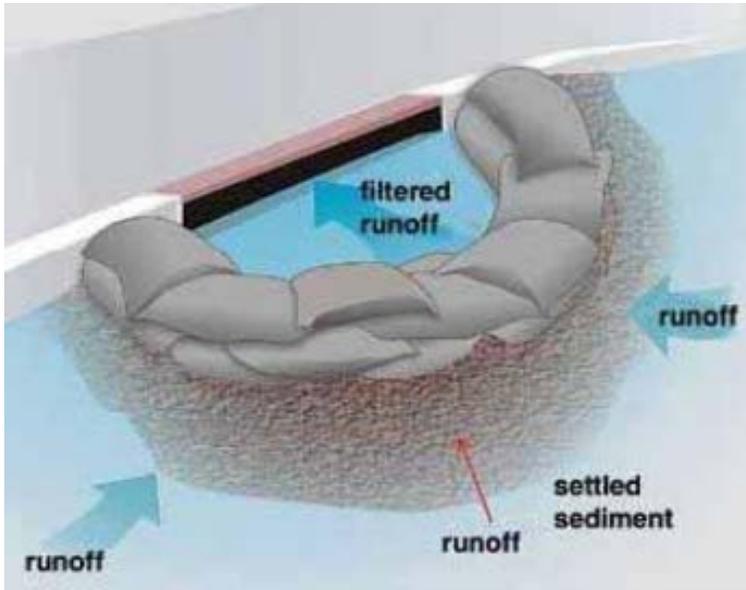
References

Oregon DEQ (Department of Environmental Quality). 2013. *Construction Stormwater Best Management Practices Manual*. Oregon Department of Environmental Quality, Water Quality Division, Portland, OR.

USEPA (U.S. Environmental Protection Agency). 2014. *Water: Best Management Practices, Seeding*. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

Illinois DOT (Department of Transportation), 2014. *Sediment Basin*. Illinois Department of Transportation.

Storm Drain Inlet Protection



https://stormwater.pca.state.mn.us/index.php?title=Sediment_control_practices_-_Storm_drain_inlet_protection

Purpose

Storm drain inlet protection prevents sediment and other debris from entering and potentially clogging or reducing the effectiveness of storm drains. A variety of methods can be used to allow water to flow into the storm drain inlet while preventing sediment from entering.

Application

Excavating around the inlet, fabric barriers, sandbags, or other methods can be used to protect storm drain inlets from sediment runoff. If excavating around the inlet, excavate 1-2 feet deep. Make sure fabric inlet protection is staked firmly into the ground if inlets are adjacent to soils to prevent soil flowing beneath the fabric.

Install inlet protection on all storm

drain inlets that could receive runoff from the construction site. Inlet protection should be properly installed before construction begins. When installing inlet protection BMPs, make sure that there are no gaps that could allow sediment to reach the storm drain.

Different inlet protection BMPs may be necessary during winter months to avoid damage from snow removal equipment. Winter inlet protection methods require lots of upkeep, usually daily installation and removal. Temporarily stabilize the site before removing inlet protection for the night. Filter inserts; compost, wood chip, or rock filter logs; and sediment moats are all types of winter inlet protection.

Maintenance

Inspect storm drain inlets frequently to ensure that controls remain in effective operating condition. During rain events inspect inlet protection to verify water is flowing into the drain, but sediment is blocked. Repair or replace inlet protection as necessary, and remove sediment when the controls become full and when sediment controls are removed after construction ends.

Season

Inlets should be protected all year, though the type of inlet protection used may vary in the winter months.

References

Oregon DEQ (Department of Environmental Quality). 2013. *Construction Stormwater Best Management Practices Manual*. Oregon Department of Environmental Quality, Water Quality Division, Portland, OR.

USEPA (U.S. Environmental Protection Agency). 2014. *Water: Best Management Practices, Seeding*. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

MNDOT (MN Department of Transportation). November 14, 2010. *Winter Stabilization Best Management Practice Guidance Document*. MN Department of Transportation, St. Paul, MN.

Surface Roughening



<http://prj.geosyntec.com/npsmanual/surfacerooughening.aspx>

seasonally appropriate, seed and mulch soils after surface roughening. Surface roughening should not be the only erosion control BMP on a site but, with other BMPs, can be an effective method to prevent discharging soil offsite. Do not use surface roughening for rocky soils.

Maintenance

Inspect areas of surface roughening at least weekly and after rain events to look for erosion rills. Re-roughen soils if ridges are washed out.

Season

Surface roughening can be a useful means of erosion control all year when used in conjunction with other BMPs, and is particularly useful for winter erosion control, when other BMPs may be more difficult to implement.

References

- Oregon DEQ (Department of Environmental Quality). 2013. *Construction Stormwater Best Management Practices Manual*. Oregon Department of Environmental Quality, Water Quality Division, Portland, OR.
- USEPA (U.S. Environmental Protection Agency). 2014. *Water: Best Management Practices, Seeding*. U.S. Environmental Protection Agency, Office of Water, Washington, DC.
- SDDOT (SD Department of Transportation). 2014. *Erosion and Sediment Control and Stormwater Management*. SD Department of Transportation, Pierre, SD.

Rip Rap



[https://stormwater.pca.state.mn.us/index.php?title=Sediment_control_practices - Outlet energy dissipation](https://stormwater.pca.state.mn.us/index.php?title=Sediment_control_practices_-_Outlet_energy_dissipation)

Purpose

The purpose of rip rap is to prevent erosion in areas with high flow and slow the velocity of the water flow. Rip rap consists of large rocks piled together to hold sediment in place.

Application

Place a filter layer below a layer of durable, varied-size stones to form rip rap. Use larger stones for areas of higher flow, with diameters from 2-24 inches. Rip rap is not an appropriate erosion control technique on slopes greater than 2 horizontal to one vertical.

Rip rap can be an effective means of preventing erosion at outlet points, especially

outlets that experience high flows. Use stone that can withstand winter conditions and remain in proper operating condition. Install rip rap at ground level, not on top of soil. Excavation may be necessary to ensure that rip rap is at ground level.

Maintenance

Inspect rip rap frequently, at least weekly and after rain events. If maintenance is necessary, make repairs to rip rap as soon as possible.

Season

Rip rap can be an effective means of erosion control all year, if installed properly.

References

Oregon DEQ (Department of Environmental Quality). 2013. *Construction Stormwater Best Management Practices Manual*. Oregon Department of Environmental Quality, Water Quality Division, Portland, OR.

USEPA (U.S. Environmental Protection Agency). 2014. *Water: Best Management Practices, Seeding*. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

SDDOT (SD Department of Transportation). 2014. *Erosion and Sediment Control and Stormwater Management*. SD Department of Transportation, Pierre, SD.

Straw Bales



<https://www.cityofmadison.com/engineering/stormwater/ECPracticeExamples.cfm>

Purpose

Straw bales can be used to reduce the velocity of water runoff and retain some sediment onsite. The EPA recommends avoiding the use of straw bales in favor of other BMP practices.

Application

Do not use straw bales in drainage channels, or other areas with potential for high flows. Straw bales are not effective for large rain events

Always stake straw bales firmly into the ground, trench bales at least 4 inches into

the ground, and fill in gaps after trenching.

String or wire should bind the bale

horizontally, so that the string or wire does not

touch the ground. Steel wire should be at least 16 gauge in diameter, and nylon or polypropylene string should be at least 12 gauge in diameter. Place bales end to end, with no gaps in between bales, to control sheet runoff.

For winter use, wrap straw bales in a geotextile fabric.

Maintenance

Straw should be replaced approximately every 3 months. Remove sediment that has collected around straw bales when it reaches one half the height of the bale, at a minimum. Inspect bales frequently, and repair or replace bales as necessary, or every 3 months at a minimum.

Season

Straw bales can help to control sediment runoff all year, if installed properly.

References

MNDOT (MN Department of Transportation). November 14, 2010. *Winter Stabilization Best Management Practice Guidance Document*. MN Department of Transportation, St. Paul, MN.

USEPA (U.S. Environmental Protection Agency). 2014. *Water: Best Management Practices, Seeding*. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

Washington State Department of Ecology. September 2004. *Stormwater Management Manual for Eastern Washington*. Washington State Department of Ecology, Water Quality Program, Olympia, WA.

Erosion Control Blanket (Mat)



<https://www.codot.gov/programs/environmental/water-quality/documents/CDOT%20Pocket%20Guide%20122211.pdf>

Purpose

Erosion control blankets, or mats, are fabrics used as a temporary erosion and sediment control measure. They are often made of synthetic or biodegradable materials.

Application

Place erosion control blanket on slopes and disturbed soils to provide quick temporary sediment and erosion control until permanent measures can be established. Erosion control blankets can also help to establish vegetation. Some erosion control blankets have seeding inside, but if seeding separately, seed the ground before installing erosion control blankets.

Erosion control blankets should be staked to the ground. The entire blanket should maintain contact with the ground, except where blankets overlap. Uphill blankets should overlap on top of downhill blankets to ensure stormwater does not wash under the mats; however, blankets should be installed vertically on long slopes.

The best type of erosion control blanket depends on site conditions. Consider factors such as length of time mat will be in use, rainfall expected, slope gradients, and other site conditions when selecting the appropriate material for an erosion control blanket.

For winter installation, clear snow from soil, if necessary, and install erosion control blankets directly on disturbed soils.

Maintenance

Inspect erosion control blankets frequently, at least weekly and after rain events, for flaws such as holes and tears. Repair or replace blankets with flaws as soon as possible upon discovery. Make sure that erosion control blankets stay in contact with the ground.

Season

Erosion control mats can be an effective form of temporary erosion and sediment control all year.

References

- MNDOT (MN Department of Transportation). November 14, 2010. *Winter Stabilization Best Management Practice Guidance Document*. MN Department of Transportation, St. Paul, MN.
- Oregon DEQ (Department of Environmental Quality). 2013. *Construction Stormwater Best Management Practices Manual*. Oregon Department of Environmental Quality, Water Quality Division, Portland, OR.
- USEPA (U.S. Environmental Protection Agency). 2014. *Water: Best Management Practices, Seeding*. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

Mulching



https://stormwater.pca.state.mn.us/index.php?title=Temporary_construction_erosion_and_sediment_control

Purpose

The purpose of mulching is to establish temporary erosion control using grass, straw, hay, wood, or other plant material to protect disturbed soils. Mulching stabilizes seeds as well as soils and can protect seeds and soils from temperature variance in addition to stormwater runoff.

Application

Install mulches directly on top of disturbed soils. The rate of mulch applied per acre will vary depending on the type of mulch selected, follow manufacturer specifications. Use tackifier or netting to

hold mulch in place if necessary, especially on steep slopes. Soil should not be discernible beneath the mulch. If seeding, seed soils before applying mulch.

In the winter, mulch may be applied on top of snow and will approach the soil surface as snow melts. Disk anchoring or other anchoring methods may be necessary to ensure mulch is not blown away.

Hydraulic mulches are applied by hydroseeding equipment and typically used in areas with steeper slopes or where equipment access would be difficult.

Maintenance

Inspect mulched areas frequently, weekly and after rain events. Reseed and reapply mulch in areas where mulch has loosened or washed out.

Season

Mulching can be an effective form of erosion control all year, if installed properly.

References

MNDOT (MN Department of Transportation). November 14, 2010. *Winter Stabilization Best Management Practice Guidance Document*. MN Department of Transportation, St. Paul, MN. [h](#)

Oregon DEQ (Department of Environmental Quality). 2013. *Construction Stormwater Best Management Practices Manual*. Oregon Department of Environmental Quality, Water Quality Division, Portland, OR.

USEPA (U.S. Environmental Protection Agency). 2014. *Water: Best Management Practices, Seeding*. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

Seeding



<http://www.sddot.com/resources/manuals/SDDOTESCFieldGuidev10Press.pdf>

Purpose

The purpose of seeding is to establish vegetative cover, which can be a form of temporary or permanent stabilization. After vegetation has been established, roots will help to hold soils in place to prevent erosion. Vegetation will also protect soils from disturbance by wind or rain.

Application

The ground to be seeded should contain 4-6 inches of topsoil or compost. The most suitable type of vegetation for any site depends on climate, soil types,

and landscape. Follow manufacturer's specifications to determine how much seed your site will require.

Mulch or matting can be used to secure and protect the seed before vegetative cover is established. If seeding is not immediately achievable, or will not produce immediate cover (such as dormant seed that will not germinate until spring), mulching and tackifier may be necessary as temporary stabilization, before permanent vegetative cover can be established.

Hydro seeding (see Hydro seeding page), the spreading of a mix of mulch, seed, and fertilizer can be used to establish vegetative cover, but will often require more than one application to achieve 70% native vegetative cover.

Maintenance

The goal of seeding is to establish perennial vegetative cover, but maintenance may be required. Watering is critical in establishing vegetative cover. The soil should be kept moist after seeding, until vegetative cover is established. After vegetation has been established, follow manufacturer specifications regarding fertilizing and watering. Areas that do not achieve 70% of the native vegetative cover may need to be reseeded. Mowing may be required depending on the type of vegetation that is established.

Season

The optimal time for seeding will depend on the type of vegetation to be seeded, but seeding should be complete before October 1st.

References

Oregon DEQ (Department of Environmental Quality). 2013. *Construction Stormwater Best Management Practices Manual*. Oregon Department of Environmental Quality, Water Quality Division, Portland, OR.

USEPA (U.S. Environmental Protection Agency). 2014. *Water: Best Management Practices, Seeding*. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

Wisconsin Department of Natural Resources. 2003. *Seeding for Construction Site Erosion Control*. Wisconsin Department of Natural Resources, Madison, WI.

Hydro Seeding



https://stormwater.pca.state.mn.us/index.php?title=Temporary_construction_erosion_and_sediment_control

Purpose

Hydro seeding is a method used to establish temporary or permanent vegetative cover to stabilize disturbed soils, preventing erosion and controlling sediment runoff.

Application

Hydro seeding is the spreading of a mix of mulch, seed, and fertilizer, and can be used to establish vegetative cover, but will often require more than one application to achieve 70% native vegetative cover.

Choose a composition of hydro seed that is compatible with onsite conditions. Use mixes specific for winter use when hydro seeding during

the winter. Hydro seeding must occur directly on soil; do not attempt to hydro seed over snow cover.

Maintenance

If hydro seeding occurs in areas where stormwater runoff may be expected to flow, use erosion control mats to hold the hydro seeding mix in place.

Season

Seasonal appropriateness of hydro seeding will depend on type of mix and local conditions, but temporary stabilization methods may be required over hydro seeding if hydro seeding occurs during winter months.

References

MNDOT (MN Department of Transportation). November 14, 2010. *Winter Stabilization Best Management Practice Guidance Document*. MN Department of Transportation, St. Paul, MN.

Oregon DEQ (Department of Environmental Quality). 2013. *Construction Stormwater Best Management Practices Manual*. Oregon Department of Environmental Quality, Water Quality Division, Portland, OR.

USEPA (U.S. Environmental Protection Agency). 2014. *Water: Best Management Practices, Seeding*. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

Sodding



http://www.extension.umn.edu/garden/landscaping/maint/newlawn_9.html

Purpose

Sodding can be a temporary or permanent form of stabilization. Sod controls stormwater runoff velocity as well as erosion. Sod can be used to quickly establish vegetative stabilization on disturbed areas, as well as channels of stormwater runoff.

Application

The type of sod selected will depend on the conditions of the site to be sodded. Choose sod types adapted to the conditions onsite.

Make sure that sod is uniform thickness. Clear the soil of any large rocks or clods. Apply sod perpendicular to the

direction of stormwater flow and stagger section placement so the ends of each section are placed away from the end of sections above and below. Anchor the sod into the soil during establishment.

Dormant sod can be placed during times of year when seeding or normal sodding is not appropriate. Make sure soil is properly prepared for dormant sodding and sod is anchored into soil.

Maintenance

Water sod frequently during establishment and regularly after sod has been established. Fertilize as necessary, during times appropriate for the type of sod selected. Reapply sod or reseed areas that are not established.

Season

Sod can be an effective means of erosion and sediment control during much of the year, but may be difficult to establish during the winter months.

References

MNDOT (MN Department of Transportation). November 14, 2010. *Winter Stabilization Best Management Practice Guidance Document*. MN Department of Transportation, St. Paul, MN.

USEPA (U.S. Environmental Protection Agency). 2014. *Water: Best Management Practices, Seeding*. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

Washington State Department of Ecology. September 2004. *Stormwater Management Manual for Eastern Washington*. Washington State Department of Ecology, Water Quality Program, Olympia, WA.

Dust Control



<http://www.sddot.com/resources/manuals/Erosionsedimentcontrolconstman.pdf>

disturbing or removing vegetative cover of areas that will not be immediately worked whenever possible. Phase construction to minimize the amount of soil exposed at once whenever practicable. If possible, limit work that creates dust when there is high wind.

Purpose

Dust control reduces the creation of dust onsite, reducing wind erosion as health risks associated with breathing in the dust.

Application

A variety of methods can be used to control dust onsite. Watering the ground can be effective in controlling dust, but water must not be allowed to run offsite. Vegetative cover, mulching, tilling, windscreens, and chemical dust suppressants can all be effective forms of dust control.

To avoid creating dust, it is best to avoid

Maintenance

Maintenance depends on the type of dust control selected. Inspect BMPs regularly to ensure continued effectiveness of dust control techniques.

Season

The seasonal appropriateness of dust control BMPs will depend on the type of control selected, site conditions, and local climate. Ensure that the dust control BMPs selected are appropriate for the seasonal conditions onsite.

References

USEPA (U.S. Environmental Protection Agency). 2014. *Water: Best Management Practices, Seeding*. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

Washington State Department of Ecology. September 2004. *Stormwater Management Manual for Eastern Washington*. Washington State Department of Ecology, Water Quality Program, Olympia, WA.

Floating Silt (Turbidity) Curtain



<https://connect.ncdot.gov/projects/Roadway/RoadwayDesignAdministrativeDocuments/Best%20Management%20Practices%20for%20Construction%20and%20Maintenance%20Activities.pdf>

Purpose

Floating silt curtains, or floating turbidity curtains, block sediment in waterbodies and cause sediment to settle to the bottom of the water body.

Application

Floating silt curtains should be installed near the shore of the waterbodies to float on the surface of the water and should also be secured to the bottom of the waterbody. The installment of the silt curtain should allow for the rise and fall of water levels.

Floating silt curtains alone are not an effective form of sediment control to prevent sediment from being discharged offsite, but can help reduce the effect of sediment that has bypassed other forms of perimeter control.

Maintenance

Inspect floating silt curtains regularly, weekly and after rain events, to ensure continued effectiveness. Check buoys, anchor lines and anchors regularly and remove debris as needed. Minimize turbidity when removing silt curtains.

Season

Silt curtains may not be effective during winter months if the surface of the water body is subject to freezing.

References

SDDOT (SD Department of Transportation). 2014. *Erosion and Sediment Control and Stormwater Management*. SD Department of Transportation, Pierre, SD.

Mississippi DEQ, 2011. *Erosion Control, Sediment Control and Stormwater management on Construction Sites and Urban Areas*. Mississippi Department of Environmental Quality

Check Dams



https://stormwater.pca.state.mn.us/index.php?title=File:Example_of_rock_check_dam.jpg

Purpose

Check dams decrease the velocity of concentrated flows in areas of water conveyance.

Application

Check dams are made of rock, logs, sandbags, or gravel and placed in ditches or areas of concentrated flow, perpendicular to direction of water flow. Do not build check dams in streams unless you have prior approval from the State.

Place a filter fabric or geotextile material beneath the check dam. Check dams should not be constructed by dumping a pile of material in

ditch. The center of the check dam should be lower than the edges. The top of the downhill check dam should be at the least as high in elevation as the bottom of the uphill check dam, if built in series.

Maintenance

Inspect check dams regularly, at least weekly and after rain events, and repair or replace dams that are no longer in proper operating condition. Additional rock or other material may be necessary to keep the check dam in proper operating condition. Remove sediment that has collected in front of check dams when it reaches one half the height of the check dam, or more frequently.

Season

Check dams can be an effective form of velocity control all year, if installed properly.

References

USEPA (U.S. Environmental Protection Agency). 2014. *Water: Best Management Practices, Seeding*. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

Washington State Department of Ecology. September 2004. *Stormwater Management Manual for Eastern Washington*. Washington State Department of Ecology, Water Quality Program, Olympia, WA.

Gabions



<http://prj.geosyntec.com/npsmanual/gabions.aspx>

Purpose

Gabions decrease surface exposure of soil near water, especially flowing water. Based on the material used to fill the gabion, they can be used to decrease the flow velocity.

Application

Gabions are wire baskets filled with rock to hold back soil while allowing water to seep through. Gabions can be used for structural integrity or as a water control structure. They are effective in preventing erosion in locations exposed to flowing water. They can be filled with a variety of material ranging from sand to large stones. The fill material will affect

the infiltration rate of the Gabions as well as the roughness coefficient.

When designing a gabion the surrounding soil's percolation and infiltration rates should be considered when determining the proper fill material. A stable foundation should be provided. A filter fabric behind and under the gabion should be installed to prevent soil migration into and through the gabion, while still allowing water to flow through.

Maintenance

Need to be checked for broken wires which may allow rock to be released due to the force of the flowing water. Large vegetative growth should be removed as it may damage the cage structure of the gabion. The soil behind the gabion should be inspected for erosion and the cause should be determined and corrected. Soil below the gabion should be inspected for signs of undercutting.

Season

Gabions can be effective throughout the year, especially during times of moderate flow. Installation should occur during dry period as access to the location is improved.

References

Fischenich, J. C., and Freeman, G. E. , May 2000. "Gabions for Streambank Erosion Control" EMRRP Technical Notes Collection (ERDC TN-EMRRP-SR-22), U.S. Army Engineer Research and Development Center, Vicksburg, MS.

Sediment Trap



Purpose

Sediment traps detain runoff long enough to allow sediment to settle out before discharging the runoff.

Application

Sediment traps are small ponding areas made with an earth embankment to collect water and a rip-rap outlet structure. An outlet pipe and riser may be used as an outlet structure.

<http://erieconserves.org/your-development/construction/> Sediment traps should only be used for areas draining 5 acres or less. Side slopes should be 2:1 or less. Sediment traps should be installed prior to start of construction.

Sediment traps only remove medium sized particles,

Maintenance

Inspect sediment traps regularly, at least weekly and after rain events. Additional rock or other material may be necessary to keep the outlet in operating condition. Remove sediment that has collected in the outlet and when the sediment trap fills to half the design depth. Check to see if side slopes need maintenance or repairs.

Sediment traps should be removed once upslope areas are stabilized.

Season

Sediment traps can be an effective all year, if installed properly.

References

Idaho Department of Environmental Quality. September 2005. *Storm Water Best Management Practices Catalog*. Idaho Department of Environmental Quality State Office, Water Quality Division, Boise, ID.

Washington State Department of Ecology. September 2004. *Stormwater Management Manual for Eastern Washington*. Washington State Department of Ecology, Water Quality Program, Olympia, WA.

ATTACHMENT 2

Antidegradation Review

Permit Type: General Permit for Temporary Discharge Activities – Renewal
Permit #: SDG070000
Receiving Stream: Varies Classification: Varies

APPLICABILITY

1. Is the permit or the stream segment exempt from the antidegradation review process under ARSD 74:51:01? Yes No If no, go to question #2. If yes, check those reasons why the review is not required:

- Existing facility covered under a surface water discharge permit is operating at or below design flows and pollutant loadings;
- *Existing effluent quality from a surface water discharge permitted facility is in compliance with all discharge permit limits;
- *Existing surface water discharge permittee was discharging to the current stream segment prior to March 27, 1973, and the quality and quantity of the discharge has not degraded the water quality of that segment as it existed on March 27, 1973;
- *The existing surface water discharge permittee, with DENR approval, has upgraded or built new wastewater treatment facilities between March 27, 1973, and July 1, 1988;
- The existing surface water discharge permittee discharges to a receiving water assigned only the beneficial uses of (9) and (10); the discharge is not expected to contain toxic pollutants in concentrations that may cause an impact to the receiving stream; and DENR has documented that the stream cannot attain a higher use classification. This exemption does not apply to discharges that may cause impacts to downstream segments that are of higher quality;
- Receiving water meets Tier 1 waters criteria. Any permitted discharge must meet water quality standards;
- The permitted discharge will be authorized by a Section 404 Corps of Engineers Permit, will undergo a similar review process in the issuance of that permit, and will be issued a 401 certification by the department, indicating compliance with the state's antidegradation provisions; or
- Other: This permit authorizes temporary discharges. Any change in water quality will be temporary.

*An antidegradation review is not required where the proposal is to maintain or improve the existing effluent levels and conditions. Proposals for increased effluent levels, in these categories of activities are subject to review.

No further review required.

ANTIDEGRADATION REVIEW SUMMARY

2. The outcome of the review is:
- A formal antidegradation review was not required for reasons stated in this worksheet. Any permitted discharge must ensure water quality standards will not be violated.
 - The review has determined that degradation of water quality should not be allowed. Any permitted discharge would have to meet effluent limits or conditions that would not result in any degradation estimated through appropriate modeling techniques based on ambient water quality in the receiving stream, or pursue an alternative to discharging to the waterbody.
 - The review has determined that the discharge will cause an insignificant change in water quality in the receiving stream. The appropriate agency may proceed with permit issuance with the appropriate conditions to ensure water quality standards are met.
 - The review has determined, with public input, that the permitted discharge is allowed to discharge effluent at concentrations determined through a total maximum daily load (TMDL). The TMDL will determine the appropriate effluent limits based on the upstream ambient water quality and the water quality standard(s) of the receiving stream.
 - The review has determined that the discharge is allowed. However, the full assimilative capacity of the receiving stream cannot be used in developing the permit effluent limits or conditions. In this case, a TMDL must be completed based on the upstream ambient water quality and the assimilative capacity allowed by the antidegradation review.
 - Other: _____

3. Describe any other requirements to implement antidegradation or any special conditions That are required as a result of this antidegradation review: **This permit authorizes temporary discharges only. Any change in water quality will be temporary. Therefore no formal antidegradation review is necessary.**

Jill M. Riedel
Reviewer

January 16, 2018
Date

Albert Spangler, PE
Team Leader

January 16, 2018
Date