

Plan Reviewer for Erosion and Sediment Control Course

Participant Guide



Training provided by the Virginia Department of Environmental Quality
Office of Training Services
Version 3.0 (Revised)

AGENDA

Plan Reviewer for Erosion and Sediment Control

(3 Day Class – Time spent on each section listed may vary)

Agenda Day 1

- 8:30 – 9:15 Module 1 – Course Overview & Certification
- 9:15 – 10:00 Module 2 – Fundamentals of Erosion and Stormwater Runoff
- 9:45 – 10:00 Break
- 10:00 – 12:00 Module 3 – VESCP Elements and VESCL Overview
- 12:00 – 1:00 Lunch
- 1:00 – 2:15 Module 4 – Regulatory Requirements for Land Disturbing Activities
- 2:15 – 2:30 Break
- 2:30 – 4:00 Module 5 – ESC Plan Elements and the Plan Review Process
- 4:00 – 4:30 Questions and Answers

Agenda Day 2

- 8:30 – 9:45 Module 6 – Erosion and Sediment Control Measures (ESC Handbook)
- 9:45 – 10:00 Break
- 10:00 – 10:45 Module 6 – Erosion and Sediment Control Measures (cont.)
- 10:45 – 12:00 Module 7 – Sediment Traps and Sediment Basin Review
- 12:00 – 1:00 Lunch
- 1:00 – 2:00 Module 8 – Outlet Protection Review
- 2:00 – 2:45 Module 9a – ESC Narrative review
- 2:45 – 3:00 Break
- 3:00 – 4:00 Module 9b – ESC Site plan review
- 4:00 – 4:30 Questions and Answers

Agenda Day 3

- 8:30 – 9:30 Module 10 – Hydrology for Plan Reviewers
- 9:30 – 9:45 *Module 10 Exercises*
- 9:45 – 10:00 Break
- 10:00-11:00 Module 11 – Graphical Peak Discharge
- 11:00 - 11:30 *Module 11 Exercises*
- 11:30 – 12:00 Module 12 – Channel adequacy and Ditch Computations
- 12:00 – 1:00 Lunch
- 1:00 – 1:30 *Module 12 Exercises*
- 1:30 – 2:30 Module 13 – Stormwater Quantity Requirements and MS-19
- 2:30-2:45 Break
- 2:45 – 4:00 Module 14 – Channel and Flood protection
- 4:00 – 4:30 Questions and Answers

Table of Contents

Module 1: Introduction and Course Overview

- 1a. Overview of the Virginia Erosion and Sediment Control Program
 - Goal and purpose of the Virginia Erosion and Sediment Control Law (VESCL)
 - Brief History of the VESCL
 - Integration of the Virginia Stormwater Management Program (VSMP)
- 1b. Training and Certification Program
 - Law and regulation requirements
 - Required training courses and/or work experience
 - Provisional certification
 - Licensed professionals
 - Examinations
 - Dual certificates
 - Re-certification

Module 2: Fundamentals of Erosion and Runoff

- 2a. Overview
 - Goal
- 2b. Erosion defined
 - Five stages of erosion
 - Four factors influencing erosion
 - Soil K factor
- 2c. Runoff
- 2d. Principles of Erosion and Sediment Control

Module 3: VESCP Elements, Law Overview for Plan Reviewers

- 3a. Overview-Roles of VESCP Officials
- 3b. Program Statutory requirements, Law overview
 - Definitions
 - Plan submission and approval
 - Annual Specifications
 - RLD
 - Plan review process
 - Changes to an approved ESC plan
 - Multi-jurisdictional projects
 - Bonds and surety
 - Inspections
 - Notice to comply
 - Stop work order
 - Judicial proceedings
 - Civil penalties
- 3c. Program Review by DEQ

Module 4: Regulatory Requirements for Land Disturbing Activities

4a. VESCP Regulatory Requirements Overview

- Definitions and propose
- Scope and applicability
- Minimum Standards 1-18
- Minimum Standard 19
- VSMP requirements
- Variances
- Criteria for determining status of land-disturbing activity

Module 5: Erosion and Sediment Control Plan Elements and the Plan Review Process

- 5a. Basic Plan Reading Skills
- 5b. The Erosion and Sediment Control Plan Overview
- 5c. The Plan Review Process and Checklist

Module 6: Erosion and Sediment Control Practices (The Virginia Erosion and Sediment Control handbook)

Module 7: Sediment Basins and Sediment Traps

Module 8: Outlet Protection Review

Module 9: Erosion and Sediment Control Measures

- 9a. ESC Narrative review (Exercise)
- 9b. ESC Site plan review (Exercise)

Module 10: Hydrology for Plan Reviewers

- 10a. Hydrology and Stormwater Engineering Concepts
- 10b. Changes in the Hydrologic Cycle
 - Reduced evapotranspiration and infiltration from loss of vegetation
 - Reduced infiltration from removal of topsoil and compaction of subsoil
 - Reduced groundwater recharge and reduced stream base flows
 - Reduced infiltration from built or traditional drainage systems
- 10c. Understanding the Water Quantity Requirements
 - 10c1. Rainfall-Runoff Relationships**
 - Estimating Runoff
 - Precipitation
 - 10c2. Time of Concentration and Travel Time**
 - Flow Segments (Overland Sheet, Shallow Concentrated and Chanel Flow)
 - Overland (Sheet) Flow
 - Shallow Concentrated Flow
 - Channel Flow

Rainfall-Runoff Coefficients

10c2. Rational Method

Runoff Coefficient (C)

Weighted Runoff Coefficient (C)

Time of Concentration (T_c) for Rational Method

Rainfall Intensity (I)

Rational Method Assumptions

Rational Method Limitations

10c3. Modified Rational Method

Modified Rational Method Assumptions

Modified Rational Method Limitations

Modified Rational Method Design Parameters

Module 11: Graphical Peak Discharge Method (TR-55)

Module 12: Channel Adequacy and Computations

12a. Channel Analysis

12b. Reviewing Channel Design

12c. Manning's Equation

Manning's "n" Values

Hydraulic Radius

Slope

Verifying the Permissible Velocity

12d. Continuity Equation

12d. Understanding the Inputs

Channel Lining

Cross-Sectional Area

Slope

12e. Channel Design

Module 13: Stormwater Quantity Requirements and Minimum Standard 19

13a. The Evolution of MS 19 Channel Protection Criteria

Erosion and Sediment Control Regulations:

Virginia Stormwater Management Regulations (Part IIC):

Virginia Erosion and Sediment Control and Stormwater Management Law:

New Virginia Stormwater Management Regulations (Part IIB):

13b. MS-19 Post 2014

Channel Adequacy

Module 14: Channel and Flood Protection

14a. Channel Protection Criteria and the Energy Balance Method

14b. Energy Balance Design Example

14c. Flood Protection

14d. Sheet Flow

Course Goal

Acronyms

Course Goal

Provide participants with the knowledge and tools needed to effectively implement an Erosion and Sediment Control Program consistently with the regulatory requirements of the Virginia Erosion and Sediment Control Act and Regulations and to ensure the general health, safety and welfare of the citizens of Virginia, as well as provide protection for state waters.

This course is designed to provide participants with the basic knowledge and tools needed to operate an effective Erosion and Sediment Control plan review program for compliance of regulated land-disturbing activities (LDAs).

After completing this training, the participant will be able to:

- Conduct and document erosion and sediment control plan reviews for regulated LDAs in accordance with the requirements of the *Virginia Erosion and Sediment Control Act* (Virginia Code § 62.1-44.15:51 et seq.), and the *Virginia Erosion and Sediment Control Regulations* (9VAC25-840).
- Identify and examine erosion and sediment control practice specifications from the Virginia Erosion and Sediment Control Handbook used for design, planning, and construction.
- Evaluate plans for compliance with the flow rate capacity and velocity requirements in accordance the *Virginia Stormwater Management Program (VSMP) Regulations* (9VAC25-870-66) and the *Virginia Stormwater Management Act* (Virginia Code § 62.1-44.15:24 et seq.).

Participant expectations

- Use the training materials as you like. This participant guide is prepared for your use and can be used as a reference during the Plan Review certification examination.
- More in-depth coverage of stormwater quantity requirements is provided in the Plan Reviewer for Stormwater Management course.

Acronyms

BMP: Best Management Practice

CA: Composted amended soils

CBPA: Chesapeake Bay Preservation Area

CFS: Cubic Feet per Second

CN: Curve number

CWA: Clean Water Act

DEQ: Virginia Department of Environmental Quality

EPA: United States Environmental Protection Agency

ESC: Erosion and Sediment Control

ESCL: Erosion and Sediment Control Law

ESD: Environmental Site Design

GP or Construction GP: Construction General Permit

HSG: Hydrologic Soil Groups

I-D-F curves: Intensity-Duration-Frequency curves

LDA: Land Disturbing Activity

LID: Low Impact Development

MS4: Municipal Separate Stormwater Sewer System

NRCS TR-55: Natural Resources Conservation Service Technical Release 55

NOAA: National Oceanic and Atmospheric Administration

NPDES: National Pollutant Discharge Elimination System

NPS: Non-Point Source

RR: Runoff Reduction

RRM: Runoff Reduction Method

SWM: Stormwater Management

SWPPP: Stormwater Pollution Prevention Plan

Tc or TOC: Time of concentration

VESCP: Virginia Erosion and Sediment Control Program

VRRM: Virginia Runoff Reduction Method

VSMA: Virginia Stormwater Management Act

VSMP: Virginia Stormwater Management Program

VPDES: Virginia Pollution Discharge Elimination System