

Developing Your Stormwater Pollution Prevention Plan

A Guide for Construction Sites

EPA-833-R-06-004
May 2007



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A Guide for Construction Sites

Who?

Construction site operators (generally, the person who has operational control over construction plans and/or the person who has day-to-day supervision and control of activities occurring at the construction site)

Where?

Construction sites required to comply with stormwater discharge requirements

What?

A guide to help you develop a good Stormwater Pollution Prevention Plan (SWPPP)

Why?

Stormwater runoff from construction sites can cause significant harm to our rivers, lakes, and coastal waters

A SWPPP is required (by your construction general permit) and will help you prevent stormwater pollution

A SWPPP is more than just a sediment and erosion control plan.

It describes all the construction site operator's activities to prevent stormwater contamination, control sedimentation and erosion, and comply with the requirements of the Clean Water Act

Purpose of this Guidance Document

This document provides guidance to construction site operators that need to prepare a SWPPP in order to receive NPDES permit coverage for their stormwater discharges. The Clean Water Act provisions, EPA regulations and EPA's Construction General Permit described in this document contain legally binding requirements. This document does not substitute for those provisions, regulations or permit, nor is it a regulation or permit itself. It also does not substitute for requirements under State law or construction general permits issued by States. It does not impose legally-binding requirements on EPA, States, or the regulated community, and may not apply to a particular situation based upon the circumstances. EPA and State decisionmakers retain the discretion to adopt approaches on a case-by-case basis that differ from this guidance where appropriate. Any decisions regarding a particular construction site will be made based on the applicable statutes, regulations and/or permit terms. Therefore, interested parties are free to raise questions and objections about the appropriateness of the application of this guidance to a particular situation, and EPA—or the applicable NPDES permitting authority—will consider whether or not the recommendations or interpretations in the guidance are appropriate in that situation based on the law and regulations.

This guidance document occasionally uses language describing mandatory requirements for construction site operators and those covered by a general permit for stormwater discharges from such sites. This language is generally intended to reflect requirements applicable where EPA is the NPDES permitting authority. Although requirements in jurisdictions where EPA is not the permitting authority may resemble these requirements, the reader should not assume that this guidance accurately describes those requirements. Rather, the reader should consult the applicable regulations and any applicable NPDES permit.

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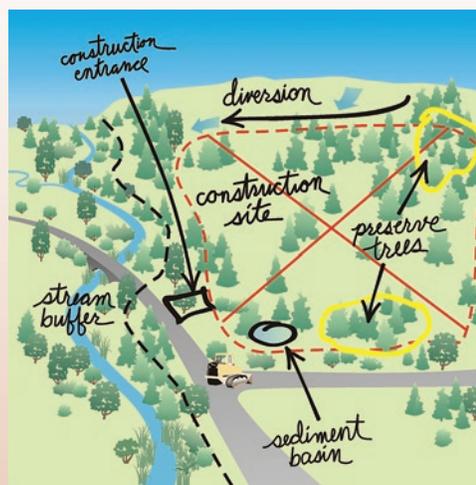
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What is a Stormwater Pollution Prevention Plan (SWPPP)?

A SWPPP may be called many things. Your state may use terms like:

- Construction Best Practices Plan
- Sediment and Stormwater Plan
- Erosion, Sediment, and Pollution Prevention Plan
- Construction Site Best Management Practices Plan
- Erosion Control Plan and Best Management Practices
- Best Management Practices Plan
- Erosion and Sediment Control Plan

Regardless of the title used in your state, these documents—and the stormwater permits that require them—tend to have many common elements. This guide is intended to help you develop a better SWPPP for your construction site.



Example sketch identifying various points to address in the SWPPP.

How to Use This Guide

- This guide was developed as a helpful reference guide for construction site operators across the country. We have tried to accommodate the wide range of knowledge and experience about stormwater pollution prevention that currently exists among operators—from novice to expert.
 - If you are relatively new to managing stormwater at a construction site, you will probably want to read this entire guide.
 - If you are very experienced and familiar with the requirements in your state, this guide may help you brush up on certain requirements or provide you with ideas to improve your SWPPP. You might want to review the table of contents and skip around. Be sure to take a look at the SWPPP template (Appendix A) to see if you can make improvements in the way you develop and maintain your SWPPP.
- This guide is written in a general format and can be used at most construction sites in any state, territory, or in Indian country. The document assumes that you will obtain discharge authorization under an appropriate National Pollutant Discharge Elimination System (NPDES) construction general permit and use both the permit and this guidance to assist in developing your SWPPP. In this guide, we make some references to the U.S. Environmental Protection Agency's Construction General Permit for illustrative purposes. **You should always consult your applicable NPDES permit for the exact requirements that apply to you.**
- Remember that you are developing your SWPPP for both your use and for review by the regulatory agencies responsible for overseeing your stormwater controls. As such, one of your goals in developing your SWPPP should be to present the information in a way that clearly demonstrates that it meets all the requirements of your NPDES permit.
- You can obtain an electronic copy of this guide (PDF format), the SWPPP template, and inspection form (in Microsoft Word) at www.epa.gov/npdes/swpppguide

Chapter 1: Introduction

► This chapter provides an orientation to this guide and its contents and describes why stormwater controls at construction sites are necessary.

A. Why Should You Use this Guide?

If you are responsible for erosion and sediment control and stormwater management at a permitted construction site, then this guide may be useful to you. This guide is designed to walk you through the steps for developing and implementing an effective stormwater pollution prevention plan (SWPPP). The basic outline of the guide is presented below:

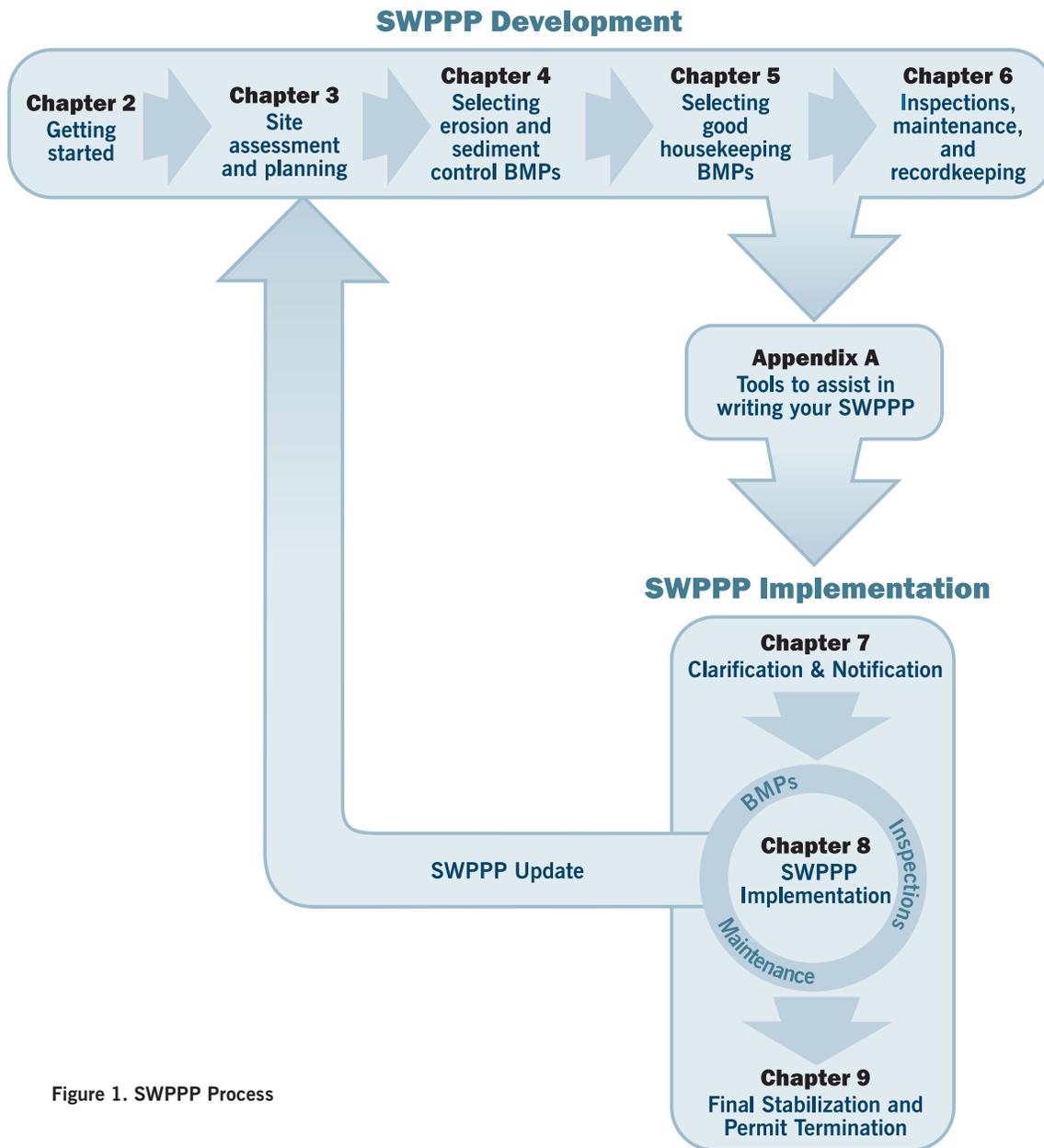


Figure 1. SWPPP Process

Take a Closer Look...

What is a SWPPP?

A SWPPP is a site-specific, written document that:

- Identifies potential sources of stormwater pollution at the construction site
- Describes practices to reduce pollutants in stormwater discharges from the construction site. Reduction of pollutants is often achieved by controlling the volume of stormwater runoff (e.g., taking steps to allow stormwater to infiltrate into the soil).
- Identifies procedures the operator will implement to comply with the terms and conditions of a construction general permit

What does this mean to me?

Failure to implement your SWPPP could result in significant fines from EPA or a state environmental agency. Therefore, it is important that you develop your SWPPP to address the specific conditions at your site, fully implement it, and keep it up-to-date to reflect changes at your site.

B. What Is Stormwater Runoff and What Are Its Impacts?

Stormwater runoff is rain or snowmelt that flows over land and does not percolate into the soil. Stormwater runoff occurs naturally, in small amounts, from almost any type of land surface, especially during larger storm events.

SWPPP Tip!

A SWPPP can have different names

A SWPPP may also be called a “construction best practices plan,” “sediment and stormwater plan,” “erosion, sedimentation, and pollution prevention plan,” or similar term. The SWPPP (or similarly named plan) is generally required to comply with EPA’s or the state’s stormwater construction general permit.

Impervious surfaces, such as buildings, homes, roads, sidewalks, and parking lots, can significantly alter the natural hydrology of the land by

increasing the volume, velocity, and temperature of runoff and by decreasing its infiltration capacity. Increasing the volume and velocity of stormwater runoff can cause severe stream bank erosion, flooding, and degrade the biological habitat of these streams. Reducing infiltration can lower ground water levels and affect drinking water supplies.

In addition, as stormwater runoff moves across surfaces, it picks up trash, debris, and pollutants such as sediment, oil and grease, pesticides and other toxics. Changes in ambient water temperature, sediment, and pollutants from stormwater runoff can be detrimental to aquatic life, wildlife, habitat, and human health. Soil exposed by construction activities is especially vulnerable to erosion. Runoff from an unstabilized construction site can result in the loss of approximately 35–45 tons of sediment per acre each year (ASCE and WFF, 1992). Even during a short period of time, construction sites can contribute more sediment to streams than would be deposited naturally over several

decades. Excess sediment can cloud the water reducing the amount of sunlight reaching aquatic plants, clog fish gills, smother aquatic habitat and spawning areas, and impede navigation in our waterways.

The primary stormwater pollutant at a construction site is sediment. To control erosion at a construction site, it is important to understand the different types of erosion that can occur. Erosion begins when raindrops break down the soil structure and dislodge soil particles. Runoff carrying the soil particles becomes sheet erosion which eventually forms smaller rills and larger gullies. The best way to stop erosion is to keep the soil in place through vegetation, erosion control blankets, or other methods that prevent the soil from becoming dislodged during rain events.

The erosion process is typically influenced by climate, topography, soils, and vegetative cover. Understanding how these factors influence erosion will help you select and design appropriate controls to minimize erosion from your construction site.

Typical erosion rates for land-based activities

(soil loss from various land areas, in tons per acre per year)

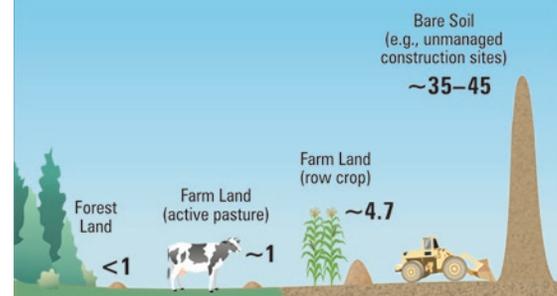


Figure 2. Typical erosion rates from land-based activities. (Dunne, T. and L. Leopold, 1978; NRCS, 2000; NRCS, 2006; ASCE and WEF, 1992)

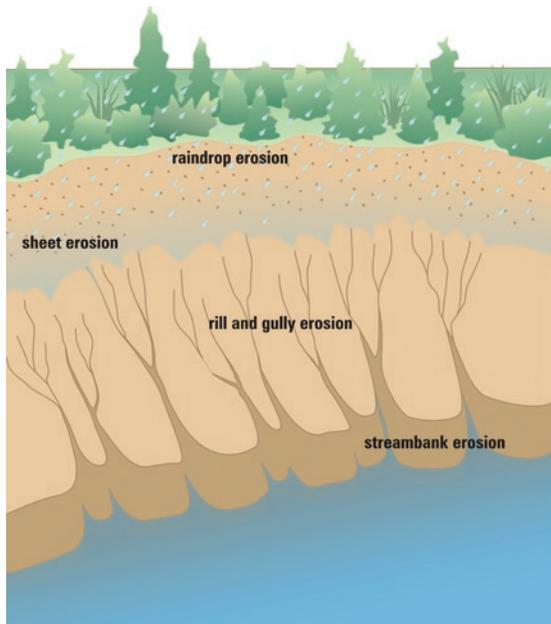


Figure 3. Types of erosion.

Raindrop erosion

Dislodging of soil particles by raindrops

Sheet erosion

The uniform removal of soil without the development of visible water channels

Rill erosion

Soil removal through the formation of concentrated runoff that creates many small channels

Gully erosion

The result of highly concentrated runoff that cuts down into the soil along the line of flow

Streambank erosion

Flowing water that erodes unstable streambanks

Climate. The frequency, intensity, and duration of rainfall are the principal factors influencing erosion from a construction site. Know the weather patterns in your area and, if possible, plan your soil disturbance activities for periods of historically lower rainfall.

Topography. The longer and steeper a slope, the greater the potential there is for erosion from that slope. Use practices such as diversions or fiber rolls to break up long slopes. Consider minimizing soil disturbance activities on steeper slopes.

Soils. Soil type can also impact erosion. Soil texture, structure, organic matter content, compaction, and permeability can all influence erosion rates.

Vegetative cover. Vegetative cover provides a number of critical benefits in preventing erosion—it absorbs the energy of raindrops, slows velocity of runoff, increases infiltration, and helps bind the soil. Soil erosion can be greatly reduced by maximizing vegetative cover at a construction site.

C. How Can Construction Site Operators Prevent Stormwater Pollution?

An effective SWPPP is the key! If sediment and erosion controls and good housekeeping practices are not followed, construction activity can result in the discharge of significant amounts of sediment and other pollutants. The term *Best Management Practices* or BMPs is often used to describe the controls and activities used to prevent stormwater pollution.

SWPPP Tip!

Erosion versus Sedimentation

Erosion is the process by which the land surface is worn away by the action of water or wind. Sedimentation is the movement and settling out of suspension of soil particles. It is usually easier and less expensive to prevent erosion than it is to control sediment from leaving a construction site.

BMPs can be divided into two categories—structural and non-structural BMPs. Structural BMPs include silt fences, sedimentation ponds, erosion control blankets, and temporary or permanent seeding, while non-structural BMPs include picking up trash and debris, sweeping up nearby sidewalks and streets, maintaining equipment, and training site staff on erosion and sediment control practices. In this document, the term “BMPs” is used broadly and includes both structural and non-structural controls and practices.

A SWPPP is more than just a sediment and erosion control plan. Most SWPPPs are written documents that describe the pollution prevention practices and activities that will be implemented on the site. It includes descriptions of the site and of each major phase of the planned activity, the roles and responsibilities of contractors and subcontractors, and the inspection schedules and logs. It is also a place to document changes and modifications to the construction plans and associated stormwater pollution prevention activities.

Appendix D: Resources List

The following are just a few of the many resources available to assist you in developing your SWPPP. The inclusion of these resources does not constitute an endorsement by EPA.

EPA Resources

EPA Stormwater Construction Website

<http://www.epa.gov/npdes/stormwater/construction>

- EPA's Construction General Permit (<http://www.epa.gov/npdes/stormwater/cgp>)
EPA's general permit that applies to all construction activity disturbing greater than one acre in the states and territories where EPA is the permitting authority.
- Construction SWPPP Guide, SWPPP Template and inspection form (www.epa.gov/npdes/swpppguide)
A downloadable copy of this guide, the SWPPP template and inspection form.
- Menu of BMPs (<http://www.epa.gov/npdes/stormwater/menuofbmps>)
Site containing over 40 construction BMP fact sheets. Also contains fact sheets on other stormwater program areas, and case studies organized by program area.

National Management Measures to Control Nonpoint Source Pollution from Urban Areas

<http://www.epa.gov/owow/nps/urbanmm/index.html>

Managing Your Environmental Responsibilities: A Planning Guide for Construction and Development

<http://www.epa.gov/compliance/resources/publications/assistance/sectors/constructmyer/index.html>

Expedited Settlement Offer Program for Stormwater (Construction)

<http://www.epa.gov/Compliance/resources/policies/civil/cwa/esoprogstormwater.pdf>

A supplemental program to ensure consistent EPA enforcement of stormwater requirements at construction sites for relatively minor violations.

Construction Industry Compliance Assistance

<http://www.cicacenter.org>

Plain language explanations of environmental rules for the construction industry. Links to stormwater permits and technical manuals for all 50 states.

Smart Growth and Low Impact Development Resources

Using Smart Growth Techniques as Stormwater Best Management Practices

http://www.epa.gov/livablecommunities/pdf/sg_stormwater_BMP.pdf

Stormwater Guidelines for Green, Dense Development

http://www.epa.gov/smartgrowth/pdf/Stormwater_Guidelines.pdf

Protecting Water Resources with Smart Growth

http://www.epa.gov/smartgrowth/pdf/waterresources_with_sg.pdf

Parking Spaces / Community Places: Finding the Balance Through Smart Growth Solutions

<http://www.epa.gov/smartgrowth/parking.htm>

EPA Nonpoint Source Low Impact Development site

<http://www.epa.gov/owow/nps/lid/>

Better Site Design: A Handbook for Changing Development Rules in Your Community

Available from <http://www.cwp.org>

State BMP/Guidance Manuals

Kentucky Erosion Prevention and Sediment Control Field Guide

<http://www.water.ky.gov/permitting/wastewaterpermitting/KPDES/storm/>

Easy to read field guide describing erosion and sediment control BMP selection, installation and maintenance.

Minnesota Stormwater Construction Inspection Guide

<http://www.pca.state.mn.us/publications/wq-strm2-10.pdf>

A manual designed to assist municipal construction inspectors in the procedures for conducting a compliance inspection at construction sites.

California Stormwater Quality Association's Construction Handbook

<http://www.cabmphandbooks.org/Construction.asp>

Delaware Erosion and Sediment Control Handbook

<http://www.dnrec.state.de.us/dnrec2000/Divisions/Soil/Stormwater/StormWater.htm>

Western Washington Stormwater Management Manual – Volume II – Construction Stormwater Pollution Prevention

<http://www.ecy.wa.gov/programs/wq/stormwater/manual.html>

Eastern Washington Stormwater Management Manual

<http://www.ecy.wa.gov/biblio/0410076.html>

A guidance document addressing stormwater design and management in more arid climates.

Certification Programs

Certified Professional in Erosion and Sediment Control

<http://www.cpesc.org>

Virginia Erosion and Sediment Control Certification Program

<http://www.dcr.virginia.gov/sw/estr&crt2.htm>

Florida Stormwater, Erosion and Sedimentation Control Inspector Certification

<http://www.dep.state.fl.us/water/nonpoint/erosion.htm>

Other Resources

International Erosion Control Association

<http://www.ieca.org>

A non-profit organization helping members solve the problems caused by erosion and its byproduct—sediment.

Erosion Control Magazine

<http://www.erosioncontrol.com>

A journal for erosion and sediment control professionals.

Designing for Effective Sediment & Erosion Control on Construction Sites by Jerald S. Fifield, PH.D., CPESC.

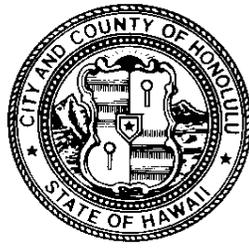
Available from Forester Press

<http://www.foresterpress.com>

Book describing proven and practical methods for minimizing erosion and sedimentation on construction sites.

Stormwater Permitting: A Guide for Builders and Developers by National Association of Home Builders (NAHB).

Available from NAHB <http://www.nahb.org>



BEST MANAGEMENT PRACTICES MANUAL
FOR
CONSTRUCTION SITES IN HONOLULU

Prepared by the

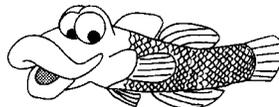
Department of Environmental Services
City and County of Honolulu

in cooperation with

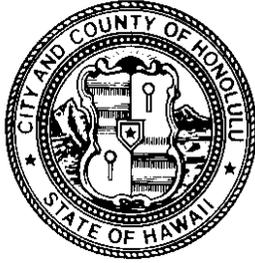
The General Contractors Association of Hawaii

May 1999

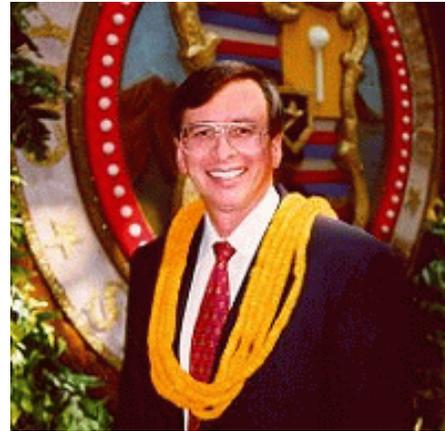
Help protect our waters ... for life!



**OFFICE OF THE MAYOR
CITY AND COUNTY OF HONOLULU**



MAYOR'S MESSAGE



The construction industry contributes greatly to our economy, growth and quality of life. It also has the potential to significantly impact our environment. Using best management practices (BMPs) at construction sites is the most effective way to prevent pollution and protect our environment.

Engineers, contractors and inspectors, who support this idea have all expressed the need for guidance in the planning, building and maintenance of effective pollution control measures. This *Best Management Practices Manual for Construction Sites in Honolulu*, prepared in cooperation with the General Contractors Association of Hawaii, provides a broad range of measures to control erosion and the discharge of sediment and other pollutants into our environment.

Each BMP fact sheet in the manual clearly defines objectives, identifies pollutants and lists implementation requirements. The fact sheets present the principles behind each measure, such as containment, filtration, or simply the need for good housekeeping practices, and give guidance for their effective application.

Please use the best management practices in this manual to keep pollutants out of our waterways. Together, with your kokua, we can meet our responsibilities as stewards entrusted to protect Oahu's streams and coastal waters.

A handwritten signature in black ink that reads "Jeremy Harris". The signature is fluid and cursive, with a large loop at the beginning.

JEREMY HARRIS, Mayor
City and County of Honolulu

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REFERENCES

“California Storm Water Best Management Practice Handbook, Construction Activity,” dated March 1993, by Camp Dresser & McKee, Larry Walker Associates, Uribe and Associates, and Resources Planning Associates for the California Storm Water Quality Task Force

“A Contractor’s Waste Management Guide: Best Management Practices and Tools for Job Site Recycling and Waste Reduction in Hawaii,” January 1999, State of Hawaii Department of Business, Economic Development and Tourism, Clean Hawaii Center

“Guidelines for the Design and Construction of Small Embankment Dams,” Report R88, June 1992, State of Hawaii Department of Land and Natural Resource, Division of Water and Land Development

“Guidelines for Safety Inspection of Dams,” Report R92, December 1992, State of Hawaii Department of Land and Natural Resource, Division of Water and Land Development

“Hawaii Occupational Safety and Health Standards”

“Minimizing Construction & Demolition Waste: A C&D Waste Management Guide,” February 1998, First Edition, State of Hawaii Department of Health, Office of Solid Waste Management

“Residential Construction Waste Management: A Builder’s Field Guide (How to Save Money and Landfill Space),” 1997, National Association of Home Builders Research Center

“Rules Relating to Soil Erosion Standards and Guidelines,” April 1999, City and County of Honolulu Department of Planning and Permitting

“Standard Specifications for Public Works Construction,” dated September 1986, Departments of Public Works, County of Kauai, City and County of Honolulu, County of Maui, County of Hawaii, of the State of Hawaii

“Storm Drainage Standards,” dated May 1988, Department of Public Works, City and County of Honolulu

“Planning and Design Manual for the Control and Erosion, Sediment, and Stormwater,” A Cooperative Effort by: USDA Natural Resources Conservation Service, Mississippi Department of Environmental Quality, and the Mississippi Soil & Water Conservation Commission.

ACRONYMS

BMPs	Best management practices
CA	Contractor Activity: BMPs in Chapter 1 of this manual are from Chapter 5 of the California Best Management Practice Handbook, and are referenced in this manner.
C&D	Construction & Demolition (C&D) Landfill, which for Honolulu at this time is the PVT Landfill in Nanakuli.
DBEDT	Department of Business, Economic Development & Tourism, State of Hawaii
DLNR	Department of Land and Natural Resources, State of Hawaii
DOH	Department of Health, State of Hawaii
DPP	Department of Planning and Permitting, City & County of Honolulu
ENV	Department of Environmental Services, City & County of Honolulu
EPA	United States Environmental Protection Agency
ESC	Erosion and Sedimentation Control: BMPs in Chapter 2 of this manual are from Chapter 5 of the California Best Management Practice Handbook and are referenced in this manner.
HEER	Hazard Evaluation & Emergency Response Office, Department of Health, State of Hawaii
MSW	Municipal Solid Waste (MSW) Landfill, which for Honolulu is the Waiamanalo Gulch Sanitary Landfill (Makakilo).
NAHB	National Association of Home Builders
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service, formerly the Soil Conservation Service.
POTW	Publicly owned treatment plant. For Honolulu, this could be the plants owned by the Federal Government, City of Honolulu, or the Hawaii Kai system.
SWPPP	Storm Water Pollution Prevention Plan
USEPA	United States Environmental Protection Agency

USEFUL PHONE NUMBERS

City and County of Honolulu

Grading Grubbing or Stockpiling Permits	523-4921 or 523-4164
Grading Plan Review/Approval Process	523-4968 or 523-4732
Effluent Discharge Permit to Storm Drains - Construction Dewatering	523-4968
Effluent Discharge Permits to Storm Drains - Hydrotesting, Well Drilling, Other	527-6106
Industrial Discharges to Sanitary Sewer System	527-6759
Environmental Concern Line	527-5091

Hawaii State Department of Health

NPDES Effluent Discharge Permits	586-4309
Construction and Demolition Waste	586-4220
Hazard Evaluation & Emergency Response Office	586-4249

Hawaii State Department of Land and Natural Resources

Stream Channel Alteration Permits	587-0249
Dam Safety	587-0227

Federal Agencies

National Resources Conservation Service	541-2600
U.S. Army Corps of Engineers (Permits)	438-9258
U.S. Coast Guard (to report spills of oil or hazardous materials)	522-8260
U.S. Environmental Protection Agency	541-2710