

Draft

# ACTION PLAN FOR RETROFITTING STRUCTURAL BEST MANAGEMENT PRACTICES

Storm Water Management Plan

Marine Corps Base Hawaii

NPDES Permit No. HI 000007

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## List of Acronyms and Abbreviations

BMP	Best Management Practice
CFR	Code of Federal Regulations
CWA	Clean Water Act
DOH	State of Hawaii Department of Health
ECE	Environmental Compliance Evaluation
EDOP	Effective Date of Permit
ENV	Marine Corps Base Hawaii Environmental Department
EPA	United States Environmental Protection Agency
GIS	Geographic Information Systems
ID	Identification
INRMP	Integrated Natural Resources Management Plan
JBPHH	Joint Base Pearl Harbor-Hickam
MCB Hawaii	Marine Corps Base Hawaii
MCDC	Mokapu Central Drainage Channel
MS4	Municipal Separate Storm Sewer System
MS4 Permit	Marine Corps Base Hawaii's NPDES Permit No. HI S000007
MSL	Mean Sea Level
NAVFAC	Naval Facilities Engineering Command
NPDES	National Pollutant Discharge Elimination System
SWMP	Storm Water Management Plan
TBD	To Be Determined
U.S.	United States

# 1 Introduction

As of the effective date, October 15, 2014, the Marine Corps Base Hawaii (MCB Hawaii) is required to comply with the conditions of the National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit No. HIS000007 (referred to hereinafter as the “MS4 Permit”). The MS4 Permit includes authorized storm water and specified non-storm water discharges into Kaneohe Bay, Nuupia Ponds, Kailua Bay, and the Mokapu Central Drainage Channel. Per the MS4 Permit, Part D.1.f.(1).(iv), MCB Hawaii is required to provide an Action Plan for Retrofitting Structural Best Management Practices (BMPs). The MS4 Permit states:

*Pollution Prevention/Good Housekeeping, Part D.1.f.(1).(iv)*

*“Action Plan for Retrofitting Structural BMPs – The Permittee shall provide the DOH with an Action Plan for Retrofitting Structural BMPs within one (1) year from the effective date of this permit, which shall identify retrofits to be implemented, and include an explanation of the basis for their selection and an implementation schedule. The implementation schedule shall cover a five (5) year period and be updated annually to include additional retrofit projects with water quality protection measures. The annual updates to the implementation schedule shall be included in the Annual Report with a description of the projects status. The Action Plan may include, but not be limited to projects in compliance with any TMDL implementation and monitoring plan.”*

The purpose of the Action Plan for Retrofitting Structural BMPs is to reduce storm water pollution by designing and constructing or installing appropriate and cost-effective structural BMPs (retrofits) in strategic locations and structures within the existing MS4.

## 2 Structural Best Management Practices (BMPs)

Structural BMPs are engineered systems designed to control or store runoff or remove pollutants from storm water runoff via a chemical or physically based treatment system. These systems improve storm water runoff water quality by addressing issues of erosion and trash. Examples include:

- Stabilization of Erodible Surfaces
- Detention/Infiltration Basins
- Retention Basins
- Sand Filters
- Infiltration Trenches
- Porous/Permeable Pavement
- Vegetated Swales
- Vegetated Buffers/Biofilters
- Bio-retention Cells
- Storm Water Inlet Water Quality Inserts
- Vortex Separation/Continuous Deflection Systems

### 3 Summary of Recent Improvement Projects

#### 3.1 Prioritization of Improvement Projects

Various studies and surveys at MCB Hawaii have been conducted to identify improvement projects at MCB Hawaii, many of which have direct or indirect impacts on improving storm water runoff water quality. Prioritization of potential improvement projects include the following factors:

- Most immediate threat to public safety or potential to cause property damage;
- Level of onsite usage;
- Proximity to and potential impact on the ocean or receiving water; and
- Potential to route pollutants into receiving waters.

#### 3.2 Documented Areas of Concern

##### 3.2.1 MCB Hawaii Landfill

Erosion within the landfill is confined within the boundaries of the parcel. In addition to storm water pollution concerns, erosion at the landfill is monitored with respect to regulatory agency rules regarding minimum and maintained fill and cover depths to prevent exposure of buried trash.

The main areas of concern are located along the access roads. The 2004 *Landfill and Northeast Crater Catchment Erosion Assessment Report and Recommendations* identified the following issues associated with erosion and sediment transport:

- At the main entrance, runoff from the roadway flows onto the shoulder of Middaugh Road.
- At the secondary access road (dump truck wash zone), runoff flows down the roadway and across Middaugh Road toward the ocean.
- Suspended solids may be transported offsite via spillway pipes.
- Dust control issues associated with vehicles and equipment entering, leaving, and working on the site.

##### 3.2.2 Ulupau Crater

The Ulupau Crater Catchment area includes approximately 155 acres, ranging in elevation from 638 feet mean sea level (msl) to sea level. Naturally formed gullies and cliffs, in addition to manmade features like military training berms, have the potential to contribute eroded sediment into the MS4 and receiving waters.

### 3.3 Summary of Recent Retrofit Projects

Various erosion assessment and recommendation studies have been conducted at MCB Hawaii, resulting in BMP projects that have had a direct impact on improving storm water runoff quality. The following list shows examples of retrofit improvement projects that have been implemented as a result of those studies:

<b>BMP Retrofit Project</b>	<b>Issue Addressed by Corrective Action</b>	
	<b>Erosion</b>	<b>Trash</b>
Southeast Ulupau Crater Shoreline: An unlined dirt ditch was lined with HDPE for runoff velocity dissipation.	X	
Southeast Ulupau Crater Shoreline: Stabilization of eroding slopes along southern shoreline cliffs with waddles.	X	
Southeast Ulupau Crater Shoreline: Drainage improvements at Weapons Range Parking Lot.	X	
North-facing Ulupau Crater Slopes: An unlined dirt ditch was lined with HDPE for runoff velocity dissipation.	X	
North-facing Ulupau Crater Slopes: The eroding slopes along the north-facing side of Ulupau Crater cliffs were stabilized with waddles.	X	
Sustain Weapons Range: Improvements to access road, drainage improvements, installation of erosion BMPs.	X	
Mokapu Central Drainage Channel (MCDC): Drainage improvement project. Three acres of weed-choked land along the west bank were replaced with a meandering, re-sloped corridor to increase flood storage capacity.	X	
MCDC: Sediment basin installed on the west side of MCDC, north of the footbridge near Seldon St.	X	
MCDC: Trash collector installed at inlet to sediment basin.	X	X
Drainage channel located along Daly Road at Uli Street: Channel lined with HDPE for runoff velocity dissipation.	X	
HDPE Drainage channel located along Daly Road at Uli Street: Two (2) concrete trash/sediment collectors installed at the two discharge points into the channel.		X
Drainage channel located along Daly Road at Middaugh Street: Channel lined with HDPE for runoff velocity dissipation.	X	
Golf course drainage channel perpendicular to Manning Street: Channel regraded with flattened slopes to allow for maintenance access.	X	X
Nuupia Ponds (wetlands): Sediment trap and retention basin installed upstream of discharge outlet into Nuupia Ponds	X	

## 4 Proposed Actions

MCB Hawaii's plan for retrofitting structural BMPs will continue to build on the improvements that have been implemented throughout the property.

### 4.1 Base-wide Survey

The initial step in the BMP retrofit process will be a base-wide survey to document:

1. Locations of existing structural BMPs.
2. Maintenance requirements for existing structural BMPs (including proprietary product information).
3. Areas with observed or potential storm water pollution issues.

### 4.2 Geographic Information System (GIS) Database

In conjunction with the preliminary base-wide survey, the MCB Hawaii Facilities Department's GIS database will be updated to create an inventory of structural BMPs. This database will be used to identify the maintenance and inspection requirements.

### 4.3 Assessment of Areas of Concern

Using the information gathered in the preliminary base-wide survey, the areas identified with potential storm water pollution issues will be prioritized by the MCB Hawaii Environmental Department (ENV) using the following steps:

- ENV will investigate whether the issue can be resolved through simple, cost-effective non-structural BMPs, such as increased awareness and education, or improved good housekeeping techniques.
- If the issue requires additional assessment for the design of a structural BMP, the site will be prioritized based on:
  - Most immediate threat to public safety or potential to cause property damage;
  - Level of onsite usage;
  - Proximity to and potential impact on the ocean or receiving water; and
  - Potential to route pollutants into receiving waters.
- If a permanent solution for a high priority hot spot cannot be constructed within 18 months of the effective date of permit (EDOP), the site will be addressed with temporary BMP controls, such as silt fences, bio-filter socks, geotextiles etc., and a work order request should be generated for increased frequency of maintenance at the site.

#### 4.4 Evaluation of Existing and Installed BMP Structures

Following preliminary investigations and installation, structural BMP inspections will commence at an inspection frequency based on the outcome of previous inspections. If there are no reported high priority concerns after two consecutive rainfall events, a site will be downgraded to a reduced inspection frequency:

- Low priority sites shall be inspected at least once every five years.
- Medium priority sites shall be inspected at least annually.
- High priority sites shall be inspected at least semiannually.

Training will be provided to designers, contractors, and maintenance staff on optimizing use of BMPs, and to ensure the use of appropriate BMPs during all stages of the implementation of temporary and permanent BMPs.

All applicable documents and field manuals, provided with MCB Hawaii's Storm Water Management Plan (SWMP) update, will be used to guide implementation, inspection, and maintenance of new and existing structural BMPs.

Annual status reports will be used to evaluate and revise the Action Plan for Retrofitting Structural BMPs, as required by the MS4 permit.

## 5 Proposed Implementation Schedule

Based on the outcome of preliminary surveys and the number of high priority sites identified, if any, the following implementation schedule is proposed. The implementation year is the year in which the proposed retrofit project is scheduled to be completed; however, this schedule is subject to change due to funding availability, permitting delays, or other unforeseen circumstances. Changes to the implementation schedule will be provided in the Annual Report.

**Table 1: Implementation Schedule**

<i>Task</i>	<i>Year 1</i>	<i>Year 2</i>	<i>Year 3</i>	<i>Year 4</i>	<i>Year 5</i>
Conduct Base-wide Preliminary Inventory Survey	X				
Develop GIS Database and Tracking Database for Structural BMPs	X				
Develop a Prioritized Ranking of Hot Spots and Other Potential Retrofit Opportunities, if any	X				
Develop Maintenance and Field Inspection Plan		X			
Implementation of Temporary BMPs at High Priority Sites, as needed	X	X	X	X	X
Implementation of Maintenance and Field Inspection Plan		X	X	X	X
Design and Appropriation of Funding for Permanent BMPs:					
Priority #1		X			
Priority #2			X		
Priority #3				X	
Implementation of Permanent BMPs:					
Priority #1			X		
Priority #2				X	
Priority #3					X
Update Internal Database for Tracking of Maintenance and Inspections, as needed		X	X	X	X
Update GIS Database	X	X	X	X	X
BMP Retrofit Program Status Updates (in Annual Report) – Evaluation		X	X	X	X

## 6 References

1. *Final Marine Corps Base Hawaii Integrated Natural Resources Management Plan (INRMP), Update 2012-2016* (2011). Prepared for MCB Hawaii, by the Environmental Compliance and Protection Department MCB Hawaii and Sustainable Resources Group Int'l Inc. November 2011.
2. *Erosion Assessment with Recommendations: Outer Slopes and Southeast Shoreline, Ulupau Crater, Marine Corps Base Hawaii* (2007). Prepared for the ENV, by Sustainable Resource Group Int'l Inc. May 2007.
3. *Landfill and Northeast Crater Catchment Erosion Assessment Report with Recommendations* (2004). Prepared for the ENV, by Sustainable Resource Group Int'l Inc. June 2004.