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## Program Evaluation Report

### Marine Corps Base Hawaii (MCBH) Kaneohe Bay Storm Water Management Program (Permit No. HI 1121423)

#### Executive Summary

Tetra Tech, Inc., with assistance from the Hawaii Department of Health (DOH), conducted a program evaluation of the Marine Corps Base Hawaii (MCBH) Kaneohe Bay's Municipal Storm Water Management Program (the program) in August 2003. The purpose of the program evaluation was to review the permittees' storm water management plan developed to comply with National Pollutant Discharge Elimination System (NPDES) permit (HI 1121423) and recommend areas for program improvement. A secondary goal was to assess the permittee's overall capability in complying with the permit.

This program evaluation report identifies recommendations for improved implementation of the permittee's storm water management program.

The following recommendations were considered the most significant:

- MCBH should consider combining the information in their SWPCP with the NPDES Phase II SWMP.
- MCBH should consider how it plans to demonstrate the effectiveness of the storm water program.
- MCBH should provide more specific design criteria on the type of BMPs construction operators should implement at construction sites.
- MCBH should include runoff reduction techniques such as low impact development principles in new development designs and consider requiring new developments to label storm drain inlets.
- MCBH should develop a set, or manual, of activity-specific BMPs for the Emergency Services Department.
- MCBH should apply the same requirements to commercial tenants as are currently applied to industrial areas.
- MCBH needs to determine what constitutes an illicit discharge and publicize this to staff and Base personnel.
- MCBH should coordinate with the City of Honolulu's storm water education program when educating residents and tenants on base.

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## **1.0 Introduction**

### **1.1 Program Evaluation Purpose**

Tetra Tech, Inc., with assistance from the Hawaii Department of Health (DOH), conducted a program evaluation of the Marine Corps Base Hawaii (MCBH) Kaneohe Bay's Municipal Storm Water Management Program (the program) in August 2003. The purpose of the program evaluation was to review the permittees' storm water management plan developed to comply with National Pollutant Discharge Elimination System (NPDES) permit (HI 1121423) and recommend areas for program improvement. A secondary goal was to assess the permittee's overall capability in complying with the permit.

40 CFR 122.41(i) and Standard Conditions Section 13 of the Base's NPDES permit no. HI 1121423 provide the authority to conduct the program evaluation.

### **1.2 Permit History**

The City was issued an NPDES permit to discharge storm water runoff and certain non-storm water discharges identified in the permit from MCBH's existing municipal separate storm sewer system (MS4) outfalls into Kailua Bay, Kaneohe Bay and Nuupia Ponds on the Island of Oahu. The NPDES storm water permit was issued on December 31, 2002, became effective on January 30, 2003, and is scheduled to expire on January 31, 2007. The current permit, the second storm water permit issued to the MCBH, requires MCBH to implement a storm water pollution control plan (SWPCP), storm water monitoring plan, and storm water management plan (SWMP).

### **1.3 Logistics and Program Evaluation Preparation**

Before initiating the on-site program evaluation, Tetra Tech, Inc., reviewed the following program materials:

- NPDES Permit No. HI 1121423
- MCBH NPDES Phase II Storm Water Management Plan (April 2003)

On August 15, 2003, Tetra Tech, Inc., with assistance from DOH, conducted the program evaluation. Upon completion of the evaluation, the evaluation teams held an exit interview to discuss the preliminary findings. During the exit interview, the attendees were informed that the findings were to be considered preliminary pending further review by DOH and EPA.

### **1.4 Program Areas Evaluated**

The following program areas were evaluated:

- Program management and reporting, including the permittees' effectiveness assessment.
- Construction and Post-Construction Runoff Control.
- System Maintenance.
- Tenant and Facility Activities.
- Illicit Discharge and Spill Response Programs.
- Public Education/Public Participation.

## 1.5 Program Areas Not Evaluated

The following areas were not evaluated in detail as part of this program evaluation:

- Wet-weather monitoring program and monitoring program details (e.g., sample locations, types, frequency, parameters).
- Other NPDES permits issued to MCBH (e.g., industrial or construction NPDES storm water permits).
- Legal authority.
- Inspection reports, plan review reports, and other relevant files. The program evaluation team did not conduct a detailed file review to verify that all elements of the Program were being implemented as described. Instead, the team relied on its observations and on statements from the permittees' representatives to assess overall compliance with permit requirements. A detailed file review of specific program areas could be included in a subsequent evaluation.

## 2.0 Program Evaluation Results

This program evaluation report assesses the permittee's capability to comply with the NPDES permit and provides recommendations for improved program implementation. The most significant recommendations identified during the evaluation are noted in the Executive Summary and are described in text boxes in the following subsections.

### 2.1 Evaluation of Program Management, Reporting and Effectiveness

#### Recommendations:

- *MCBH should consider combining the information in their SWPCP with the NPDES Phase II SWMP.*

Under the previous NPDES permit, MCBH developed a SWPCP to primarily address the storm water Phase I industrial activities occurring on the base. This SWPCP was most recently updated in April 2001. The storm water management plan was developed to address Phase II practices that are not included in the Phase I SWPCP.

MCBH should consider combining these two separate plans into a single document that will guide all storm water activities at the base. This combined plan could be written after MCBH gains more experience with implementing the Phase II requirements. When revised, the combined SWMP should specifically address the following issues:

- Program management and coordination, including roles and responsibilities of individuals and departments
- Storm water management program activities, including both industrial and Phase II minimum measures
- Measurable goals for specific storm water activities
- Training and education

- Monitoring and program effectiveness

The SWMP should be written for MCBH employees and in a style that staff can easily implement it. To ensure ownership and implementability, the BMPs should ideally be developed by the individual facilities and/or departments. Specific storm water responsibilities should also be included.

- *MCBH should consider how it plans to demonstrate the effectiveness of the storm water program.*

As MCBH implements its storm water program, it should also consider how it would demonstrate the effectiveness of the program. MCBH has developed measurable goals for BMPs described in the Phase II plan, however some of these goals do not ~~provide~~ describe the amount or quantity against which performance can be measured. For example, BMP PE-2 describes an “Environmental SOP” class that includes storm water pollution prevention information. The measurable goal is to “provide Base staff with information regarding storm water pollution prevention and applicable BMPs.” MCBH should develop measurable goals with a targeted quantity, such as “provide all participants in the Environmental SOP class with at least X hours of instruction on storm water pollution prevention techniques” or “ensure that X percentage of the Base population receives annual storm water awareness training.” Additional information on developing measurable goals can be found in EPA’s Measurable Goals Guidance available at <http://cfpub.epa.gov/npdes/stormwater/measurablegoals/index.cfm>

Effectiveness of the program can also be measured in other ways, beyond just tracking BMPs and water quality monitoring. For example, public awareness surveys, the number of complaints received or the number of illicit discharges investigated are other ways to gauge the effectiveness of the program. MCBH should consider developing direct and indirect measurable goals for its combined SWMP. Direct measures focus on characterizing the water quality of discharges from the MS4 or receiving water impacts. Indirect measures are based on the assumption that specific program activities are effective in decreasing storm water pollution and ultimately protecting water quality. These measurable goals should be linked to programmatic, social, or environmental indicators, such as those listed in the 1996 Center for Watershed Protection report *Environmental Indicators to Assess Stormwater Control Programs and Practices*.

- *MCBH should follow an End-of-Year reporting format that clearly describes their implementation status and compliance with permit requirements.*  
Part C.3 of the NPDES permit specifies the required components in the End-of-Year Report, which include significant achievements, areas of concern, proposed changes, and the status and effectiveness of all control measures. In order to provide more detail and consistency in these End-of-Year reports, MCBH should develop a clear and concise report format. The format should include sufficient information to allow DOH, EPA and others to easily assess the MCBH’s compliance with their NPDES permit. The following information should be included in the report for each major activity:

- Requirements: Describe what MCBH was required to do (describe permit requirements or other commitments).
- Past Year Activities: Describe activities for the past year, including where practicable, the quantity of activities accomplished. Include an explanation as to why MCBH either did or did not meet its commitments for this reporting period.
- Future Activities: Describe planned activities, including, where practicable, the quantity of activities planned for the next reporting period, and an explanation if future activities are different from past year activities.

The End-of-Year reports should be directly linked to the measurable goals developed in the combined SWMP. MCBH could review the City of Honolulu’s End-of-Year report as an example.

**2.2 Evaluation of Construction and Post-Construction Runoff Control**

Recommendations:

- *MCBH should provide more specific design criteria on the type of BMPs construction operators should implement at construction sites.*

MCBH requires erosion and sediment control plans at construction sites but leaves the design and specifications of BMPs to each construction operator. This can result in inconsistent or inappropriate application of BMPs. For example, at the construction of a new Bachelor Enlisted Quarters (BEQ) a stabilized construction entrance was built with smaller stone than is normally recommended. Larger stone (usually 3 – 6 inches in diameter) is recommended in order to reduce tracking of sediment into the roadway. Smaller stone can also be more easily picked up by mud on the tires and carried into the roadway. Several examples of BMP manuals that include standards for construction BMPs are described below.

The City and County of Honolulu has developed “minimum BMP checklists” for large and small construction projects. The City recommends that very small construction projects (less than 7,500 square feet) follow the minimum BMP checklist, but requires larger construction projects to submit plans that include the minimum BMPs and additional site-specific controls. Some basic design criteria are provided on the BMP checklists. Information on these minimum BMP checklists is contained in the City and County of Honolulu’s *Rules Relating to Soil Erosion Standards and Guidelines* (April 1999).

Additional resources for the design of construction site BMPs are available from the State of California. The California Stormwater Quality Association has published several storm water BMP manuals, including one on construction BMPs (see <http://www.cabmphandbooks.org/Construction.asp> for an electronic copy). In addition, the San Francisco Regional Water Quality Control Board has developed a *Field Manual for Erosion and Sediment Control* (an order form for this field manual is available from [http://www.swrcb.ca.gov/stormwtr/docs/reg2training\\_products03.pdf](http://www.swrcb.ca.gov/stormwtr/docs/reg2training_products03.pdf)).

- *MCBH should include runoff reduction techniques such as low impact development principles in new development designs and consider requiring new developments to label storm drain inlets.*

Addressing the minimization of storm water pollutants during the design of new developments is the most cost-effective approach to storm water quality management. Retrofitting existing projects with storm water quality controls is costly and can pose design and logistics problems. Although MCBH does not have a significant number of construction projects, the few large projects built on the base, such as a new 42-acre family housing quarters project, should be designed to minimize the discharge of storm water pollutants to the maximum extent practicable.

Options to reduce storm water pollutants in new developments include the minimization of impervious surfaces, directing storm water runoff to pervious areas, and minimizing the exposure of potential pollution sources. These techniques, also referred to as low impact development, have been found to be cost-effective solutions for storm water. Additional information on low impact development can be found at:

- Low Impact Development Center (<http://www.lowimpactdevelopment.org/>)
- EPA’s Low Impact Development Page (<http://www.epa.gov/owow/nps/lid/>)
- Stormwater Center (<http://www.stormwatercenter.net>)

The City of Honolulu had recently incorporated low impact development techniques at a development in Kapolei that could be used as examples.

Another cost-effective option would be to require all new developments to label or stencil storm drain inlets during construction. The base already has a goal in the Phase II plan to “complete stenciling in housing area by permit expiration date.” Requiring new developments to label inlets will reduce the total number of inlets that eventually must be stenciled.

- *MCBH will need to develop procedures to document implementation of the construction site storm water program.*

The NPDES permit in Part C.1.b.vi requires MCBH to develop procedures or criteria to address specific needs, including:

- Procedures for site inspections by the Permittee (Part C.1.b.iv(2))
- Criteria to guide the construction of structural facilities designed to limit storm water pollution (Part C.1.b.iv(3)), and
- Procedures for the receipt and consideration of public inquiries, concerns, and information submitted regarding local construction activities (Part C.1.b.iv(5)).

These procedures do not need to be overly complex, but should be written in a manner and in sufficient detail to provide direct guidance to Base staff responsible for implementing the program. The procedures should explain to DOH how MCBH would implement each of these requirements. ~~[JK Need more detail here about how they are complying now and what more is needed—records, forms, etc.]~~ MCBH plan review and inspection staff, although knowledgeable about storm water requirements.



did not have written procedures or standards to follow. In addition, staff described EPA's 1992 Construction storm water guidance as their primary reference. The Base's construction site storm water program's procedures should be updated and documented to ensure consistent application of controls and requirements.

### 2.3 Evaluation of System Maintenance

#### Recommendations:

- *MCBH should develop a set, or manual, of activity-specific BMPs for the Emergency Services Department.*

This department employs approximately 22 staff that performs Base-wide minor maintenance tasks. It was stated that Emergency Services conducts all maintenance activities that take less than 16 hours to complete. More significant tasks are contracted out. MCBH should develop a formalized set of maintenance BMPs for routine and emergency in-house activities conducted by Emergency Services. The need for activity specific BMPs was evident at the lateral replacement and concrete boring jobs described below in Section 2.5. Activity specific BMPs should be organized as a manual and be created in a format that facilitates its use by field staff (i.e., field friendly). It should be distributed to all field staff and should complement the overall goals of the SWMP. Importantly, personnel from Emergency Services should participate in the BMP development process so as to ensure ownership and implementability. Developing a more specific and easily distributed maintenance manual will benefit MCBH by maintaining a level of consistency among field staff activities.

For example, the Sacramento County Department of Transportation's Maintenance and Operations Division created a handbook that provides detailed BMPs for both routine and emergency activities. Topics covered include roadside ditch digging, pothole patching, storm patrol, saw cutting, street marking removal, painting, post installation, roadside herbicide application, roadside mowing, tree trimming/removal, roadside vegetation and hedge trimming, vegetation truck watering, street sweeping, yard maintenance, disposal of bituminous waste and open containers, storage of materials in the yard, disposition of hazardous materials, and washing of county vehicles and equipment. The BMP handbook is comprehensive and formalizes the approved maintenance and operation activities for Division staff.

- *MCBH should expand and accelerate its inlet stenciling program.* BMP PI-1, storm drain stenciling, includes a measurable goal to "complete stenciling in housing area by permit expiration date." MCBH should extend its storm drain stenciling program beyond just the housing area to also include commercial and industrial areas of the Base. Commercial and industrial areas have an equal, if not greater, potential to contaminate storm water. Additionally, MCBH had previously used off Base volunteers (i.e., Boy Scouts) to stencil the inlets but this program had been discontinued. Only a very limited number of inlets were observed to be stenciled during the evaluation and Base personnel did not have a finalized plan

regarding stenciling. MCBH is recommended to develop and initiate an accelerated plan to stencil all inlets ~~prior~~ as soon as possible. The 2007 compliance date appears unnecessarily extended.

- *Additional BMPs were needed at the Base fueling area.*  
The Base fueling area appeared to have been recently upgraded and secondary containment was present around the entire fuel island. However, the valve within secondary containment had been left open and it was stated that opening the valve to release rainwater was standard practice. This practice appeared counterproductive to the design of the facility and should be remedied immediately. Additionally, there were no spill containment materials present at the fuel island. It was stated that spill kits were kept at the fuel manager's adjacent office. The office is located behind a fence that is locked in the evening yet the fuel island remains open. Spill kits should be placed at the island where they would be most accessible in the event of a spill.
- *Street sweeping could be improved in the vicinity of shops.*  
The overall cleanliness of Base streets, gutters, and roadside ditches was exceptional, as litter was essentially non-existent. The Base had several street sweepers with established routes. However, it appeared that additional sweeping was needed in the vicinity of the carpenter and paint shops and Emergency Services Department equipments storage areas. Road debris was present in the drainage pathways and saw dust and litter was present. It was unclear whether these areas could be accessed by a sweeper, or if manual clean up was required. Nonetheless, additional cleaning was needed in these areas.

## 2.4 Evaluation of Tenant and Facility Activities

### Recommendations:

- *MCBH should apply the same requirements to commercial tenants as are currently applied to industrial areas.*

The existing SWPCP provides BMPs and operational requirements for identified industrial areas on the Base. Examples of such areas include the landfill, fueling areas, maintenance shops, etc. However, MCBH did not include on-Base commercial tenants such as the Firestone auto repair facility, McDonalds restaurant, etc. These commercial tenants should be included in the SWPCP, or in the combined SWMP, and procedures should be put in place to ensure that appropriate BMPs are installed and maintained. These commercial tenants have significant potential to discharge polluted storm water to the MS4 and should be addressed no differently than the industrial areas listed in the SWPCP.

Information on storm water BMPs that can be used for commercial tenants can be found in a number of references, including:

- EPA's Menu of BMPs (<http://cfpub.epa.gov/npdes/stormwater/menuofbmps/menu.cfm>)
- California Stormwater Quality Association's Industrial and Commercial BMP Handbook (<http://www.cabmphandbooks.org/Industrial.asp>)

- BMP brochures for commercial sources ~~are~~ available from the City of Los Angeles (<http://www.lastormwater.org/Pages/publctns.htm>)

## 2.5 Evaluation of Illicit Discharge and Spill Response Programs

### Recommendations:

- *MCBH needs to determine what constitutes an illicit discharge and publicize this to staff and Base personnel.*

Active non-storm water discharges were observed during the evaluation and included the discharge of cooling/cutting water from a concrete boring operation and street washing as part of a lateral replacement/repair job. In one instance the cooling/cutting was discharging directly into the storm drain inlet and at the other dirt was being washed into the excavated area. In both instances, Base personnel did not immediately recognize the discharges as prohibited illicit discharges and require their immediate termination. Rather, it appeared that subjective determinations were made regarding the significance of the discharge and their relative threat to water quality.

While the discharge of cutting/cooling water to the storm drain clearly constitutes a violation of the permit, the discharge of dirt into the excavated area is less definitive. Nonetheless, the parties involved with the activities did not appear to be knowledgeable of the permit, prohibited discharges, or that their actions could constitute a violation. MCBH needs to establish clear policies on what constitutes a prohibited discharge and then develop guidelines and BMPs for Base personnel to follow. For consistency and to reduce the risk of future identified permit violations, Base environmental staff should not be making subjective determinations regarding whether a discharge is authorized or prohibited. Once such a determination has been made, MCBH should publicize this policy(s) to Base personnel and residents.

## 2.6 Evaluation of Public Education/Public Participation

### Recommendations:

- *MCBH should coordinate with the City of Honolulu's storm water education program when educating residents and tenants on base.*

The City of Honolulu has developed an extensive storm water public outreach program, including television and radio PSAs, storm drain stenciling, and various brochures. Copies of many of these materials are available at <http://www.cleanwaterhonolulu.com>. Many base residents are probably already familiar with the messages conveyed by the City's program.

MCBH should leverage the City's storm water education program by building onto and supplementing their program for the base's specific needs. For example, the base could use the same storm drain stenciling message or brochures on proper disposal of used cooking oil and grease for the base's commercial tenants.