

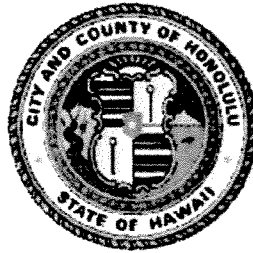
APPENDIX D.1

Storm Drain Inspection Plan



E Mālama I Ka Wai Ola

Protect our waters...
FOR LIFE



**CITY AND COUNTY OF HONOLULU
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
STORM DRAIN INSPECTION PLAN**

NPDES MS4 PERMIT NO. HI S000002

as required by the

**State of Hawaii
Department of Health**

**PREPARED BY
DEPARTMENT OF ENVIRONMENTAL SERVICES AND
DEPARTMENT OF FACILITY MAINTENANCE**

SEPTEMBER 2006

City and County of Honolulu
NPDES MS4 Permit No. HI S000002

CERTIFICATION

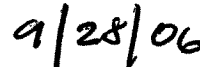
City and County of Honolulu
Department of Environmental Services
Storm Drain Inspection Plan
NPDES MS4 Permit No. HI S000002

“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”



Dr. Eric S. Takamura, P.E., Director
Department of Environmental Services

for



Date

City and Count of Honolulu
NPDES MS4 Permit No. HI S000002

Table of Contents

<u>Sections</u>	<u>Page</u>
A. BACKGROUND	4
B. OBJECTIVES	4
C. STRATEGY	4

City and County of Honolulu
NPDES MS4 Permit No. HI S000002

A. BACKGROUND

The City and County of Honolulu received approval from the State Department of Health (DOH) on their National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit on March 31, 2006. The City's NPDES MS4 permit covers all discharges of storm water runoff and certain non-storm water discharges to the MS4. As part of the permit [Part D.1.f.(1)(e)], states that "the Permittee shall submit to DOH within 180 days of the effective date of this permit a priority-based schedule for inspecting and maintaining storm drain lines, manholes, and inlets/catch basins. At a minimum, all inlets/catch basins will be inspected at least twice during the permit term. Inlets/catch basins requiring minimal maintenance after two (2) inspections can then be inspected on an as-needed basis."

As a result, the City and County of Honolulu's Department of Environmental Services (ENV) – Storm Water Quality Branch (SWQ) worked with the Department of Facilities Maintenance (DFM) in developing the storm drain inspection plan as outlined in the following document.

B. OBJECTIVES

1. Develop a feasible inspection plan that utilizes the available resources and provides the best means of protecting the receiving waters from potential flooding hazards and water quality degradation.
2. Establish procedures for scheduling maintenance of identified areas based on field inspections.

C. STRATEGY

We believe that inspecting all inlets/catch basins at least twice during the permit term may not best utilize the limited financial and staff resources. There are about 38,000 catch basins (CBs) and inlets based on current GIS data, not including drain structures constructed after 1996. It is estimated that compliance with the foregoing condition requiring two inspections for each catch basin and inlet by October 31, 2008, would cost over \$5 million. Limited resources should be used toward inspecting problematic areas and cleaning out the catch basins and inlets that have significant amounts of accumulated debris and trash.

It can be reasonably stated that at steep or moderately steep areas, the CBs and drain pipe possess self-cleaning capacity, i.e. flow velocities more than 3 feet per second. As a result, the drain structures at these areas would be generally clean or with minimal debris accumulation, especially subsequent to heavy rains. We believe that most of resources should be used in the inspection of flat areas and problematic areas, such as in the

City and Count of Honolulu
NPDES MS4 Permit No. HI S000002

vicinity of fast food restaurants, areas of recurring blockages, submerged areas, or outlets where the flow slows down and debris tends to accumulate. The strategic planning and scheduling for drain cleaning should be carried out based on drain inspection results. In order to best utilize available resources and comply with the permit requirement, "the discharge of pollutants from the Permittee's MS4 shall be reduced to the Maximum Extent Practicable (MEP)," we are planning to invest over \$100,000 conducting pilot testing through **March 31, 2007**, the due date for the Storm Water Management Plan (SWMP). Based on the findings, we would then propose an inspection plan for the remainder of the permit term.

The pilot testing plan would proceed on the basis that we would sample representative areas with steep and moderate slopes (St. Louis Heights, Alewa Heights, Makakilo, Manoa, Pearl City, etc.), as well as flat areas (Downtown, McCully, Waikiki, etc.). We would also identify potential problematic areas in the system where changes in slope or land use (near fast food restaurants, etc.) would point to accumulation of sediment and trash. The following is a list of the priorities for the pilot testing through March 31, 2007:

- Priority 1 - problematic areas as reported by DFM (blockages, next to fast food restaurants, etc.)
- Priority 2 - outfalls, submerged lines, and where slopes change from supercritical to subcritical flow
- Priority 3 - CBs that will generally flow subcritical (slopes < 1 percent, velocity < than 3 ft/sec)
- Priority 4 - CBs with self-cleaning velocities (slopes > 1 percent)

The selection of one (1) percent slope is based on the concept of self-cleaning velocity, as stated in the California Department of Transportation (Caltrans) Highway Design Manual Topic 838 – Storm Drains. A self-cleaning velocity of one meter per second, which is equivalent to three feet per second, is introduced. Using Manning equation, for an 18-inch pipe, the self-cleaning velocity is achieved with a longitudinal slope for both full and half full flow of less than one (1) percent.

Storm drain inspection planning and scheduling for FY 2008 & FY 2009 will be set up based on the pilot testing results and incorporated into the SWMP to be submitted to DOH by March 31, 2007.

All inspection results will be recorded in inspection forms and a Microsoft Access database system, which will eventually be integrated into the City's GIS system. Coordination has been done with the City Department of Planning and Permitting (DPP) to facilitate the data transition.

The inspection results will be submitted to DFM to be used as a guide for drain system cleaning planning and scheduling.