

Implementation & Monitoring Plan for Waimanalo Stream Waste Load Allocation

Under the requirements of the MS4 NPDES Permit issued to the Hawaii Department of Transportation, Highways Division (HDOT Highways) effective March 31, 2006, Part E.2., HDOT Highways is required to submit an implementation and monitoring plan for the Waimanalo Stream Waste Load Allocation (WLA).

INTRODUCTION

In conjunction with USEPA, Hawaii Department of Health (HDOH) developed and estimated the Total Maximum Daily Loads (TMDL) for Waimanalo Stream in March 2001. These TMDLs established the maximum amount of pollutants that can enter Waimanalo Stream without violating the State Water Quality Standards. Unlike Kawa Stream, HDOH did not explicitly assign the Waste Load Allocation (WLA) to the Hawaii Department of Transportation, Highways Division (HDOT Highways). Instead, the HDOT's TMDL suggests some specific management measurements (BMPs) that could be implemented by HDOT and the City and County of Honolulu (City). In the HDOT MS4 NPDES permit, HDOH stipulated that HDOT Highways work jointly with the City to develop an implementation and monitoring plan for the Waimanalo Stream watershed. The WLA Implementation Plan should identify specific HDOT Highways activities meant to reduce total nitrogen and total phosphorus discharges from the urban source of the Waimanalo watershed. The WLA monitoring plan shall specify the water quality monitoring and activity tracking necessary to demonstrate HDOT's pollution reduction efforts.

WAIMANALO WATERSHED

Waimanalo Stream is a highly altered waterway. It is about 3.42 miles in length, and is located in the Koolaupoko District on the windward side of the Oahu. Waimanalo TMDLs were calculated for only the perennial freshwater portions of Waimanalo Stream because this is the only portion of the stream that is included on the Hawaii's 1988 List of Impaired Waterbodies (HDOH, March 2001).

The Waimanalo Stream watershed is about 1.33 square miles (3,952 acres) in total area. Primary land uses in the watershed include forested conservation area, small agricultural operation, residential, a golf course, and Bellows Air Force Station. According to HDOH, Waimanalo watershed has a proportionately high number of farm and household animals to residents, as compared to other watersheds on Oahu. Both animal wastes and inorganic chemical fertilizers contribute to the excess nutrient loads. Waimanalo Stream is impaired primarily due to sediments and nutrients.

There are HDOT Highways storm drains located on or along Kalaniana'ole Highway as a divided 4-lane highway entering Waimanalo from Kailua. From the point where the highway narrows to two-lanes and bridges over Waimanalo Stream, the road has a

gravel shoulder with minimal drainage control in a small drainage ditch (mauka) or sheet flows to adjacent properties (makai).



Waimanalo Watershed



Roadways within the Waimanalo Watershed

PROPOSED IMPLEMENTATION PLAN

The Waimanalo watershed has many problems, including poor water quality, limited aquatic habitat, and altered flow regimes (HDOH Waimanalo TMDL, 2001). In lieu of specifically assigning waste load allocation, HDOH's Waimanalo Stream TMDL identified to "Reduce nutrient and sediments in urban runoff, especially from roads and

roadsides” to be one of the key high priorities for pollutant reduction. HDOH designated HDOT Highways and the City as the two major participants to meet this goal. Accordingly, a joint effort between the HDOT and the City has been initiated to implement the following major best management practices:

1. Debris Control Program - HDOT Highways has implemented a street sweeping program for Kalanianaʻole Highway, a divided 4-lane highway connecting Waimanalo to Kailua. HDOT periodically collects debris and sediment which has built up along the roadways, shoulders, medians, curbs and gutters. HDOT Highways has also implemented a drain cleaning program which aims to remove debris and sediment from the HDOT Highways MS4 system located in the Waimanalo Watershed including catch basins, gutters, open ditches, trenches and storm drain inlets. Much of the total nitrogen and total phosphorus in the urban runoff are attached to the sediment and wooden debris. Removing the debris through street sweeping and drain cleaning activities will aid HDOT in achieving the pollutant reduction goals. Similarly, the City will implement their debris control programs for its streets, storm drains, and streams.

Based on the accumulation rates resulting from current street sweeping and storm drain cleaning program, the frequency of sweeping and cleaning operations will be reevaluated to determine if frequencies need to be adjusted.



Storm Drain along Kalanianaʻole Highway

2. Erosion Control BMPs Program – HDOT Highways has completed an island-wide comprehensive assessment of erosion areas. The assessment identified eroded areas within HDOT Highways rights-of-way that are in need of permanent erosion control. HDOT’s assessment effort focuses on identifying erosion areas that have potential water quality impacts. These include areas that show evidence of rilling, gullying, or areas that potentially have significant sediment transport. Through prioritization and cost effectiveness analyses, HDOT will implement to the extent possible the installation of permanent erosion control measures. Two areas within the Waimanalo Watershed have been identified. These are:

- a. Kalanianaʻole Highway milepost 3.41 to 3.44
- b. Kalanianaʻole Highway milepost 2.35 to 2.48

3. Permanent BMP Installation – HDOT Highways is conducting the Waimanalo Stream watershed reconnaissance to evaluate suitable locations for the installation of permanent BMP devices. Criteria to be used for site selection include, but are not limited to: Size of the MS4 storm drain outfalls; drainage area and its imperviousness to the outfalls; distance between the outfall and the receiving stream; accessibility; and potential community reaction. Types of BMPs to be considered are grassed swales, bio-retention, or proprietary or custom designed hydrodynamic water quality devices. One potential location being evaluated for bio-retention or grassed bioswale is located on the mauka side of Kalanianaʻole Highway near the Olomana Golf Course entrance. An area in front of the HDOT storm drain culvert may allow for the installation of this BMP to reduce nutrient from the nearby animal farm.



Potential BMP and monitoring location

PROPOSED MONITORING PLAN

HDOT Highways and the City have committed to developing a WLA monitoring plan that will include the water quality monitoring and pollutant reduction tracking necessary to demonstrate efforts to meet the urban source pollutant reduction goal set by the Waimanalo TMDL. Consistent with the implementation plan proposed above, HDOT Highways and the City intend to execute the monitoring plan as follows:

- 1. Debris Control Program Activities** – HDOT Highways and the City will track respective program activities by inspection and service contractors' reports, the street sweeping and drain cleaning activities. A database contains the records of actual debris removed. HDOT Highways and the City will use these databases to estimate the reduction of pollutants, such as total suspended solids, total nitrogen, and total phosphorous. HDOT Highways will compile and document the results in HDOT's SSWMP reports. In these reports, a summary of actual pollutant reduction specific to the Waimanalo watershed will be prepared and reported accordingly.

- 2. Erosion Control Program Activities** – Due to budgetary limitations, HDOT Highways prioritized the erosional areas identified in the islandwide assessment. Two erosion areas located in the Waimanalo watershed were not ranked very high. The implementation of erosion control measures will depend on the availability of funds. At the time that HDOT implements the recommended erosion control BMPs for these two sites, pollutant reduction will be estimated and reported accordingly.

- 3. Permanent BMP Program Activities** – Waimanalo Stream will be monitored during the 2006-2007 winter to include two significant rainfall events at each site. A minimum of two ISCO automatic samplers will be installed at locations to be determined for approximately 2 months (January – February 2007). Waimanalo monitoring stations will collect water samples from the highway runoff and the samples will be tested for total suspended solids, total nitrogen, and total phosphorous. These are the constituents of primary concern in most TMDL HDOH studies. Prior to installation of any samplers, a field survey will be completed to select specific drains to monitor and to map the contributing areas to each drain.