

Implementation & Monitoring Plan for Kawa Stream Waste Load Allocation

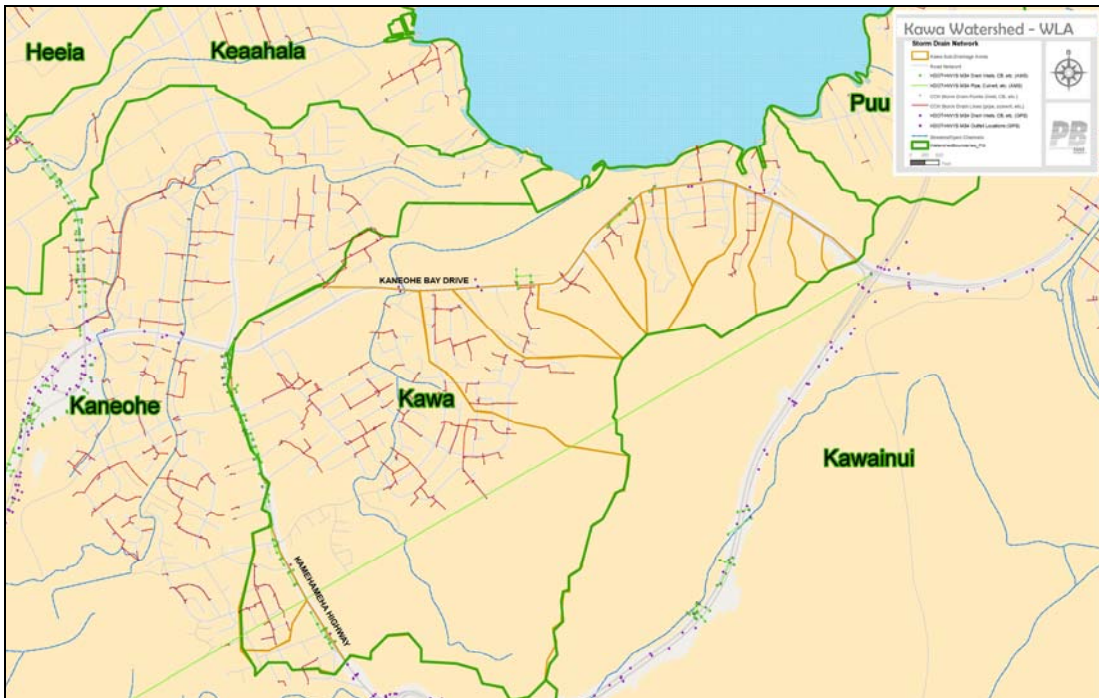
Under the requirements of the MS4 NPDES Permit issued to the Hawaii Department of Transportation, Highways Division (HDOT Highways) effective March 31, 2006, Part E.2., HDOT Highways is required to submit an implementation and monitoring plan for the Kawa Stream Waste Load Allocation (WLA).

INTRODUCTION

In conjunction with USEPA, Hawaii Department of Health (HDOH) developed the waste load reduction goal based on the Total Maximum Daily Loads (TMDL) established for Kawa Stream and included the Waste Load Allocation (WLA) assigned to Hawaii Department of Transportation, Highways Division (HDOT Highways) in the Oahu MS4 NPDES permit. The permit stipulated that HDOT Highways work jointly with the City and County of Honolulu (City) to develop an implementation and monitoring plan for the Kawa Stream watershed. The WLA Implementation Plan shall identify specific HDOT Highways activities meant to reduce total nitrogen and total phosphorus discharges in the Kawa Stream Watershed as necessary to comply with the WLAs. The WLA monitoring plan shall specify the water quality monitoring and activity tracking necessary to demonstrate efforts to comply with the urban source WLAs assigned to HDOT Highways. The objectives of the Kawa WLA monitoring program are to provide further understanding and to better assess HDOT Highways Oahu MS4's relative contribution to nutrient loads and other water quality waste loads specifically to the Kawa Stream Watershed. The Kawa Stream monitoring plan is also designed to help evaluate the effectiveness of the WLA implementation.

KAWA WATERSHED WLA

The Kawa Stream TMDL was approved by the EPA in 2002 and revised by HDOH in 2005. The HDOT WLA was calculated assuming an area-proportionate loading with the area calculated as the 1.25 mile length for Kaneohe Bay Drive, and the 1.1 mile length for Kamehameha Highway resulting in a total of 15.63 acres out of the total watershed area of 1000 acres. With various assumptions for runoff, evaporation, and infiltration the HDOT is calculated to be responsible for 1.36 million cubic feet (mcf) of runoff out of the total 26 mcf of runoff from the entire watershed. This volume of HDOT runoff is calculated to carry 7,284 pounds (3,311 kg) of sediment, 117 pounds (53 kg) of total nitrogen, and 20 pounds (9 kg) of total phosphorous annually. To meet State Water Quality Standards these loads must be annually decreased by 2,807 pounds (1,276 kg) sediment, 77 pounds (35 kg) total nitrogen, and 11 pounds (5 kg) of total phosphorous.



Kawa Stream Watershed

PROPOSED IMPLEMENTATION PLAN

The HDOH TMDL implementation plan (HDOH, 2002) proposed five major strategies to achieve pollutant load reduction goals in the Kawa Stream Watershed. One of the strategies was to “Reduce nutrients and sediments in the watershed runoff”. HDOH requires through the issuance of the MS4 NPDES Permit that HDOT Highways work jointly with the City to identify and implement specific activities targeted at reducing these pollutants as necessary to comply with the given WLA. To meet this goal, HDOT Highways is proposing herein to implement the following major best management practices:

- 1. Debris Control Program** - HDOT Highways has implemented a street sweeping program for state highways in the Kawa Stream Watershed (Kaneohe Bay Drive and Kamehameha Highway). Debris and sediment which has built up along the roadways, shoulders, medians, curbs and gutters is being collected periodically. HDOT Highways will also implement a drain cleaning program which aims to remove debris and sediment from the state highway MS4 system located in the Kawa Stream Watershed such as 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. Based on the accumulation rates resulting from current street sweeping and storm drain cleaning program, the frequency of sweeping and cleaning operations will be re-evaluated to determine if frequencies need to be adjusted.



Debris accumulated along roadway curb and storm drain inlet

2. Erosion Control BMPs Program – HDOT Highways has completed an island-wide comprehensive assessment of erosional areas. The assessment identified eroded areas within HDOT 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, gulying, 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 Kawa Stream Watershed have been identified. These are:

- a. Kamehameha Highway from milepost 41.35 to 41.43
- b. Kaneohe Bay Drive from milepost 0.9 to 1.0

3. Permanent BMP Installation – HDOT Highways is conducting the Kawa Stream watershed reconnaissance in order to evaluate suitable locations for installing 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 and proprietary or custom designed hydrodynamic water quality devices. One potential location being evaluated for a hydrodynamic BMP is located on the south side of Kaneohe Bay Drive as it passes over Kawa Stream. A single HDOT storm drain outfall accumulates the roadway runoff from about one-half mile of the highway and from inflows from Castle High School and the shopping center (see photos).



Potential structural BMP & monitoring location



Potential conversion to grassed swale

PROPOSED MONITORING PLAN

HDOT Highways has committed to developing a WLA monitoring plan that will include the water quality monitoring and pollutant reduction tracking necessary to demonstrate the results of efforts made to comply with the urban source WLAs assigned to HDOT Highways. Consistent with the implementation plan proposed above, HDOT Highways intends to execute the monitoring plan as follows:

- 1. Debris Control Program Activities** – HDOT Highways will track by inspection and service contractors' reports on street sweeping and drain

cleaning activities. A database contains the records of actual debris removed from the debris removal activities. HDOT Highways 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 data in its SSWMP reports. In these reports, a summary of actual pollutant reduction specific to the WLA for the Kawa Stream Watershed will be prepared and reported accordingly.

2. Erosion Control Program Activities – Due to budgeting limitations, HDOT Highways has prioritized the erosion areas identified in the island-wide assessment. Two erosion areas located in the Kawa 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 BMPs for these two sites, pollutant reductions will be estimated and reported.

3. Permanent BMP Program Activities – Water quality sampling will be conducted in the location described in the implementation section above. The site will be monitored during the 2006-2007 winter to include two significant rainfall events at each site an ISCO automatic sampler will be installed at the location described above for approximately 2 months (November - December 2006). The Kawa monitoring station 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 the installation of any samplers, a field survey will be completed to map the contributing areas to each drain. Analyses of water quality samples from Kawa should show the true load from the highway system as differentiated from pollutant loads from surrounding land uses. Results of the Kawa Stream sample analyses will also help in evaluating the installation of a permanent physical BMP and its specific configuration. Monitoring this site will enable estimated of the loads captured by a structural BMP.