

Implementation & Monitoring Plan for Ala Wai Canal 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 Ala Wai Canal Waste Load Allocation (WLA).

INTRODUCTION

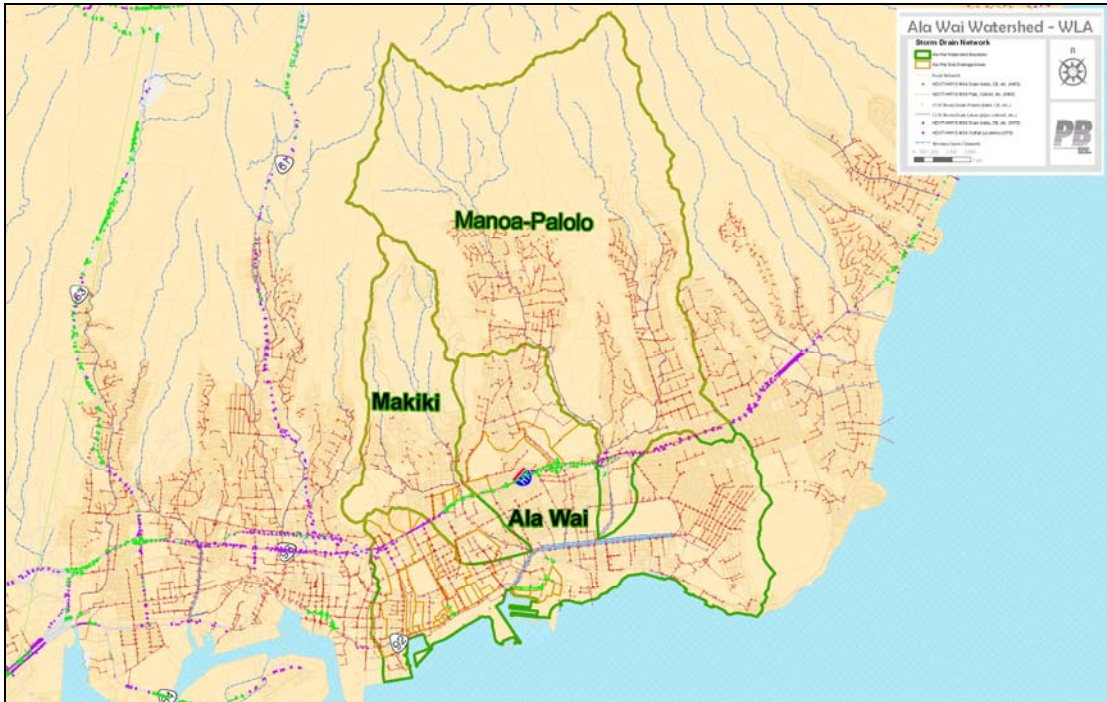
In conjunction with USEPA, Hawaii Department of Health (HDOH) developed and estimated the Total Maximum Daily Loads (TMDLs) for Ala Wai Canal in 1995 and updated in June 2002. These TMDLs established the maximum amount of pollutants that can enter Ala Wai Canal without violating the State Water Quality Standards. The revised TMDLs identified allowable nutrient loads by source category as well as estimated percent reductions from different source categories necessary in order to meet the TMDLs and State Water Quality Standards. Unlike the Waste Load Allocation (WLA) requirement for Kawa Stream, HDOH did not explicitly assign numerical WLA for Ala Wai Canal to HDOT Highways. Instead, the TMDL estimated "Urban Source Waste Load Allocation" and specified this load reduction to be implemented by the City and County of Honolulu (City) and Hawaii Department of Transportation, Highways Division (HDOT Highways) jointly. In the NPDES MS4 permit issued to HDOT Highways, HDOH required an implementation and monitoring plan for Ala Wai Canal be developed. 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 Ala Wai watershed. The WLA monitoring plan shall specify the water quality monitoring and activity tracking necessary to demonstrate HDOT's pollution reduction efforts.

ALA WAI CANAL WATERSHED

Ala Wai Canal is an artificial estuary constructed in the 1920s to drain the marshy areas around Waikiki. Three major tributaries, Manoa, Palolo, and Makiki, drain to the two mile long Canal. The Manoa and Palolo streams merge prior to flowing under the H-1 Freeway. The Canal flows into Mamala Bay. The Ala Wai Canal watershed is over 10,000 acres in total size. Land use in the watershed is divided between forested conservation lands (approximately 46%) located in the higher elevations of the watershed and urban land uses (approximately 53%) at lower elevations. The conservation lands are managed by the Hawaii Department of Land and Natural Resources. The urbanized areas of the watershed are within the City's jurisdiction. HDOT Highways has only two roadways in the Ala Wai watershed, H-1 Freeway and a portion of Ala Moana Boulevard (State Route 92). Each has approximate roadway surface areas of 92 acres and 29 acres respectively.

Ala Wai Canal water quality is impaired by nitrogen, phosphorous, sediments, pathogens, metals and pesticides. Nutrient loading, phosphorus loading in particular, is

associated with excessive sediment loading due to erosion from conservation lands, some urban areas, and streambanks (HDOH 2002).



Ala Wai Canal Watershed



H-1 Freeway within the Ala Wai Watershed

PROPOSED IMPLEMENTATION PLAN

HDOH Ala Wai TMDL report stated that “the City and HDOT storm water discharges may contribute significant sources of nutrients to the watershed, but insufficient information is available to distinguish among them.” HDOH considered these sources together as the urban land use category. TMDLs and WLA of Ala Wai Canal assigned to the City and HDOT are:

Pollutant	Estimated Load (kg/day)	Allocation (kg/day)	% Reduction needed
Total Nitrogen	6 - 26	6	65%
Total Phosphorus	6 - 10	4	50%

To meet the pollutant reduction 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 Ala Wai Canal Watershed (H-1 Freeway and the HDOT Highways portion of Ala Moana Boulevard). 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 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.



Storm Drain Inlet & Roadway Surface H-1 Freeway

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, 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. One area within the Ala Wai Canal Watershed has been identified: H-1 Freeway milepost 25.73 to 25.78.

3. Permanent BMP Installation – HDOT Highways roadways in the Ala Wai Canal watershed are located in a very urbanized and congested traffic environment. This environment presents a challenge to the installation of permanent BMPs as a storm water retrofit. Limited HDOT rights-of-way narrows the selection of BMPs to be structural type BMPs such as commercial hydrodynamic devices. These devices tend to be high maintenance in nature. Therefore, long term maintenance considerations should be evaluated during the design phase. HDOT Highways will evaluate the state roadway areas within the Ala Wai watershed to determine suitable locations for the installation of these BMPs.

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 Ala

Wai TMDL. 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 of the 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 Ala Wai watershed will be prepared and reported accordingly.
- 2. Erosion Control Program Activities** – Due to the budgetary limits, HDOT Highways prioritized the erosional areas identified in the islandwide assessment. The erosion area located in the Ala Wai watershed was not ranked high. The implementation of erosion control measures will depend on the availability of funds. At the times that HDOT implements the recommended erosion control BMPs for this site, the pollutant reduction will be estimated and reported accordingly.
- 3. Permanent BMP Program Activities** – Makiki Stream crosses beneath the H-1 Freeway in a closed box culvert west of the Punahou Street off-ramp and passes between the Shriner's Hospital and the Hawaii Jodo Mission. HDOT is evaluating the possibility of setting up a monitoring station at the Punahou Pumping station and another monitoring station at the nearby Makiki Stream as it outlets beneath the H-1 Freeway. Monitoring runoff at these two locations should yield representative water quality data of highway runoff, without any cross contamination from urban areas. Water quality monitoring at these locations will also provide valuable information for the design of permanent BMPs as described in the implementation section above.

HDOT will begin to monitor the Ala Wai Canal Watershed during the 2006-2007 winter to include two significant rainfall events at each site per raining season. Samples will be taken to analyze, at a minimum, total suspended solids, total nitrogen, and total phosphorous as these are the constituents of primary concern.



Potential Monitoring location @ Punahou Pumping Station



Potential Monitoring Location @ Makiki Stream

