



DEPARTMENT OF
ECOLOGY
State of Washington

**Addendum to
Quality Assurance Project Plan**

**Des Moines, Massey, and McSorley Creeks
Copper and Zinc Water Quality Assessment**

December 2010

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Publication Information

Addendum

This addendum is an addition to an original Quality Assurance Project Plan. The addendum is not a correction (errata) to the original plan.

This addendum is available on the Department of Ecology's website at www.ecy.wa.gov/biblio/0803119Addendum1.html

Ecology's Activity Tracker Code for this study is 09-195.

Original Publication

Quality Assurance Project Plan: Des Moines, Massey, and McSorley Creeks Copper and Zinc Water Quality Assessment

Publication No. 08-03-119

The Quality Assurance Project Plan is available on the Department of Ecology's website at www.ecy.wa.gov/biblio/0803119.html

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DEPARTMENT OF ECOLOGY
Environmental Assessment Program

October 27, 2010

TO: Chris Coffin, Water Quality Program
Dave Garland, Unit Supervisor, Water Quality Program
Kevin Fitzpatrick, Section Manager, Water Quality Program

THROUGH: Dale Norton, Unit Supervisor, Environmental Assessment Program
Will Kendra, Section Manager, Environmental Assessment Program

FROM: Randy Coots, Environmental Assessment Program

**SUBJECT: Addendum to Quality Assurance Project Plan for: Des Moines, Massey,
and McSorley Creeks Copper and Zinc Water Quality Assessment**

Activity Tracker Code: 09-195
Publication No: 08-03-119-Addendum1

Over the last ten years Des Moines, Massey, and McSorley Creek drainages have had a number of stormwater management improvements. No evaluation has been conducted to determine if these changes have been effective in meeting water quality standards for toxic metals currently on the 303(d) list. In order to verify these streams are meeting standards, an additional two more storm event samples are needed.

This addendum to the original Quality Assurance Project Plan (QAPP) describes changes to the stormwater sampling plan to meet requirements for a 303(d) evaluation. All sampling and laboratory procedures, quality control, and data quality objectives will adhere to protocols presented in the original QAPP. This addendum presents information on changes in sampling sites, the sample initiation trigger, analytical cost, and the project schedule.

cc: Robert F. Cusimano, Section Manager for Project Study Area
Chuck Springer, Stream Hydrology Unit, EAP
Stuart Magoon, Director, Manchester Environmental Laboratory
Bill Kammin, Ecology Quality Assurance Officer

Background and Purpose

Many changes in stormwater management and restoration efforts to improve fish habitat have occurred in Des Moines, Massey, and McSorley Creek watersheds in the recent past. They have not been evaluated in the last ten years. This Addendum documents changes in the sampling program to meet study objectives for these creeks originally described in *Quality Assurance Project Plan: Des Moines, Massey, and McSorley Creeks Copper and Zinc Water Quality Assessment*, located at www.ecy.wa.gov/pubs/0803119.pdf.

Historical data from these streams have shown the critical period for copper and zinc loading is during wash-off from storm events. The study was designed to verify the critical period for copper and zinc loading and generate data during this period for comparison to water quality standards and the 303(d) list.

Both dry season (baseflow) and storm event samplings were planned. The dry season sampling was completed in October 2008. The storm event sampling has been more difficult because the trigger to initiate sampling was too restrictive. Over two wet seasons only one set of stormwater samples was collected. By easing requirements to initiate storm sampling, additional samples will be collected, allowing for an assessment of current critical conditions for the 303(d) listed toxic metals.

Sampling Sites

The project plan called for three sample sites in each of the three study streams. Des Moines Creek, the largest of the three drainages, has headwaters potentially impacted by SeaTac International Airport and will continue to be sampled at the three original sites. These sites are at: (1) Des Moines Creek Park; (2) just below the Des Moines Wastewater Treatment Plant; and (3) just south of the Tye Golf Course below 200th Street.

Sample sites in Massey and McSorley Creeks will be reduced from three to one each, located at the original downstream sites. The Massey Creek site is just below the South 230th Street Bridge; the McSorley Creek site is just above the marine influence adjacent to the parking lot in Saltwater State Park.

Despite this reduction in sample sites from nine to five per storm event, study objectives to evaluate violations of water quality standards in the study streams should still be met. The downstream sites integrate water quality of the whole stream. These sample locations are shown below in Figure 1 and coordinates are presented in Table 1.

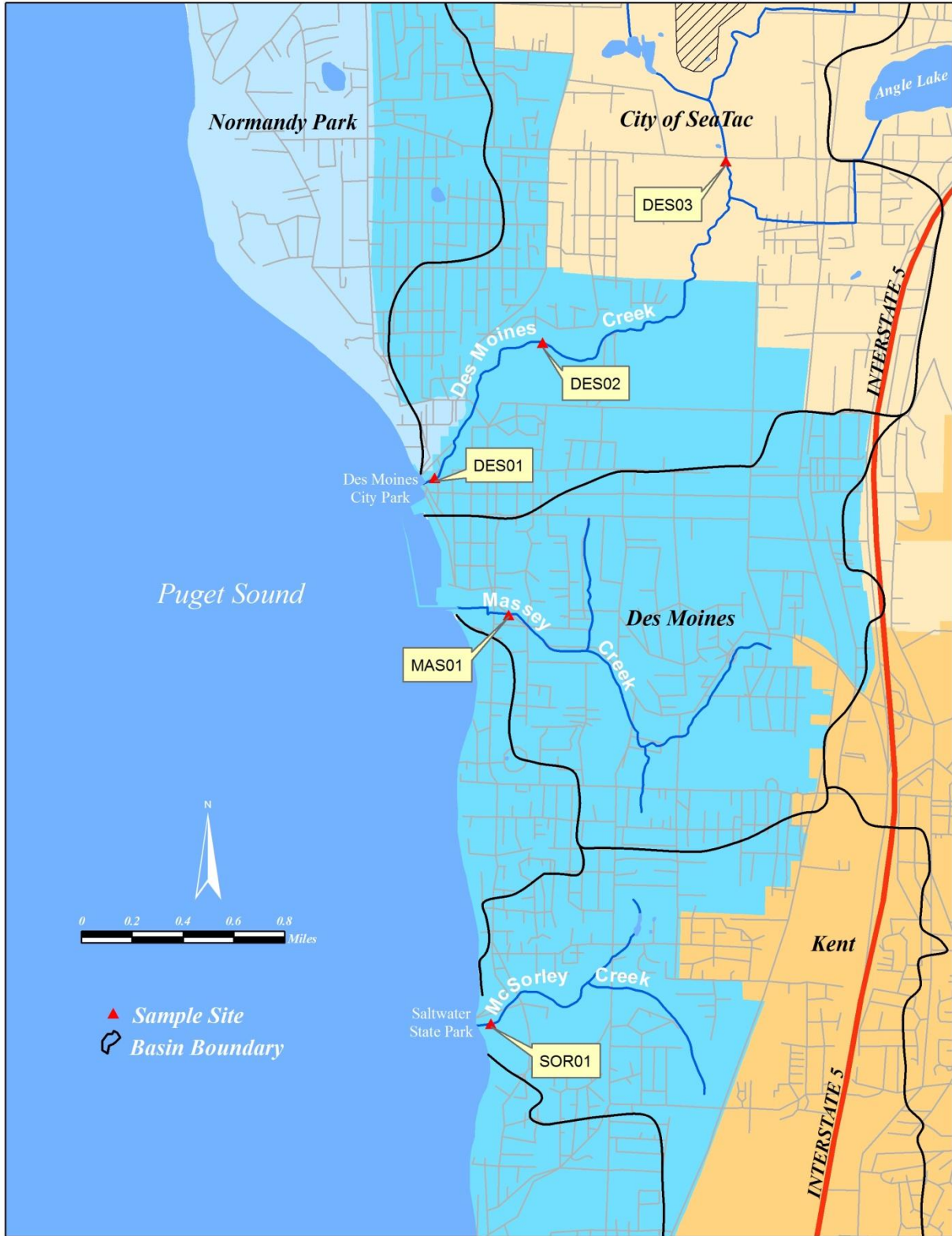


Figure 1. Study area and sample sites for Des Moines, Massey, and McSorley Creek basins copper and zinc study.

Table 1. Latitude and longitude of sampling sites.

Stream/Sample Site ID	Latitude	Longitude	Description
Des Moines Creek			
DES01	47.40584	-122.32764	In Des Moines City Park
DES02	47.41178	-122.32032	Just below Des Moines Wastewater Treatment Plant
DES03	47.42259	-122.30538	At the 200 th Street crossing south of the Tye Golf Course
Massey Creek			
MAS01	47.39601	-122.32166	Just below the 230 th Street crossing
McSorley Creek			
SOR01	47.37294	-122.32343	In Saltwater State Park

Datum: NAD83

Sampling Initiation

Two additional storm events will be sampled to assess water quality changes in study streams from stormwater management actions. If water quality violations are not found, the 303(d) listings for copper and zinc may be changed from category 5 (violates water quality standards) to category 1 (meets water quality standards). Currently all three streams are 303(d) listed under category 5 for copper, while Des Moines and Massey Creeks are also listed for zinc.

The trigger to initiate storm event sampling was too restrictive so some requirements will be relaxed. No antecedent dry period or predicted 0.20 inch minimum storm event will be required prior to sampling. Samples will be collected when run-off is occurring, on a rising limb of the hydrograph. The gage at Des Moines Creek Park will be used to verify that the creek's stage height is increasing.

When a significant rain event is predicted for the Des Moines area, field staff will be deployed to collect storm samples. Following arrival at the Des Moines Creek Park site, a gage height will be recorded. Run-off will be verified by a stage increase on the staff gage of at least 0.05 feet. For each storm event two samples will be collected per site. About an hour will pass between the first and the second samples. This will allow time to sample other sites.

Sample Number and Analytical Cost

A summary of the sample numbers and laboratory costs are presented below in Table 2. The original estimated total laboratory cost for the study was \$24,902, with \$5,240 dedicated to the dry season samples. The total laboratory cost for the proposed additional sampling is estimated at \$6,516. With these proposed changes the new estimated total laboratory cost for the study will be \$18,310.

All analyses will be conducted by MEL. The cost estimates reflect a 50% discount for analyses conducted by MEL.

Table 2. Summary of sample numbers and analytical cost.

Analysis	Sites	Samples Per Event	QA Samples	Storm Events	Total Storm Event Samples	Cost Per Sample	Subtotal
Diss and TR Cu and Zn ¹	5	2	5 ²	2	30	\$182	\$5460
Hardness	5	2	2	2	24	\$22	\$528
Turbidity	5	2	2	2	24	\$11	\$264
TSS	5	2	2	2	24	\$11	\$264
Grand Total							\$6,516
1 = \$58 X 2 (TR + Diss) analysis + \$30 prep + \$27 filter + \$9 preservative = \$182 per metals sample.							

1 = Metals cost estimates are for 1 total recoverable Cu and Zn and 1 dissolved Cu and Zn analysis per sample.

2 = QA samples include 1 standard reference material (SRM), 1 matrix spike/matrix spike duplicate (MS/MSD), 1 analytical duplicate, 1 filter blank, and 1 field replicate per event.

Diss = Dissolved

TR = Total recoverable

Cu = Copper

Zn = Zinc

TSS = Total suspended solids

Project Organization and Schedule

The following individuals listed in Table 3 are involved in this project. All are employees of the Washington State Department of Ecology. Table 4 shows the proposed schedule for completing field and laboratory work, data entry into EIM, and the report.

Table 3. Organization of project staff and responsibilities.

Staff (all are EAP except client)	Title	Responsibilities
Randy Coots Toxics Study Unit Statewide Coordination Section (360) 407-6690	Project Manager/Principal Investigator	Wrote the QAPP, oversees field sampling and transportation of samples to the laboratory, conducts QA review of data, analyzes and interprets data, enters data into EIM, and writes the draft report and final report.
Chuck Springer Watershed Technical Support Unit (360) 407-6997	Hydrologist	Develops discharge rating curves for Massey and McSorley Creeks and provides discharge information to the project lead for sample collection periods
Dale Norton Toxics Study Unit Statewide Coordination Section (360) 407-6765	Unit Supervisor for the Project Manager	Provided internal review of the QAPP, approves the budget, and approved the final QAPP.
Will Kendra Statewide Coordination Section EAP (360) 407-6698	Section Manager for the Project Manager	Reviewed the project scope and budget, tracked progress, reviewed the draft QAPP, and approved the final QAPP.
Sinang Lee Water Quality Program Northwest Regional Office (425) 649-7110	Original EAP Client	Clarified scope of the project, provided internal review of the QAPP, and approved the final QAPP.
Chris Coffin Water Quality Program Northwest Regional Office (425) 649-7110	Replaced Sinang Lee as EAP Client	Clarifies scope of the project, provides internal review of the draft and approves the final report.
Stuart Magoon Manchester Environmental Laboratory (360) 871-8801	Director	Approved the final QAPP.
William R. Kammin (360) 407-6964	Ecology Quality Assurance Officer	Reviewed the draft QAPP and approved the final QAPP.

EAP: Environmental Assessment Program
 EIM: Environmental Information Management system
 QAPP: Quality Assurance Project Plan

Table 4. Revised Schedule for completing field and laboratory work, data entry into EIM, and reports.

Field and laboratory work	
Field work completed	January 2011
Laboratory analyses completed	February 2011
Environmental Information System (EIM) system	
EIM data engineer	Michael Friese
EIM user study ID	RCOO0009
EIM study name	Des Moines, Massey, and McSorley Creeks Copper and Zinc Water Quality Assessment
Data due in EIM	April 2011
Final report	
Author lead	Randy Coots
Schedule	
Draft due to supervisor	May 2011
Draft due to client/peer reviewer	June 2011
Final report due on web	August 2011