



August 17, 2010

Santa Ana Watershed Project Authority
Attention: Mr. Mark Norton
11615 Sterling Avenue
Riverside, CA 92503

Subject: *Proposal for Preparation of Documentation for the 2008 Wasteload Allocation Model*

Dear Mr. Norton:

Per your request and the requests of Cindy Li and Hope Smythe of the Regional Board, I have prepared a cost estimate to prepare documentation for Wildermuth Environmental's (WEI) Wasteload Allocation Model (WLAM). The WLAM was used to evaluate the wasteload allocation for the Basin Plan in 2004 and, more recently, in the pending 2010 Basin Plan amendment. The WLAM was developed by WEI over the last 15 years. The N/TDS Task Force was presented with a similar proposal in the past and decided against preparing WLAM documentation to save money. Ms. Li and Ms. Smythe recently informed us that such documentation is necessary to satisfy peer review requirements, and they inquired about the cost for preparing such documentation.

Exhibit A outlines the proposed documentation/scope of work. We developed this outline based on the review of other surface and groundwater models. The scope of work to prepare the documentation is summarized below.

Scope of Work

Task 1 Prepare Draft Documentation. WEI will prepare draft documentation based on the outline in Exhibit A. WEI will post working sections of the documentation to a project website, making it widely available to stakeholders and the public. WEI will notify the Basin Monitoring Program Task Force (BMPTF) members by email when draft sections are posted. WEI will print 25 copies of the draft documentation and submit them to SAWPA for distribution to the BMPTF.

Task 2 Prepare Final Documentation. WEI is assuming that some BMPTF members will have questions and comments on the draft documentation. These questions and comments will be addressed at regularly scheduled BMPTF meetings during the course of this effort and will be responded to in writing. The written responses will be included in an appendix to the final documentation. WEI will print 25 copies of the final documentation and submit them to SAWPA for distribution to the BMPTF.

Deliverables

The anticipated deliverables for this work include:

- Draft WLAM documentation (25 printed copies plus pdf)

- Responses to comments received from the BMPTF
- Final WLAM documentation (25 copies plus pdf)
- Project website

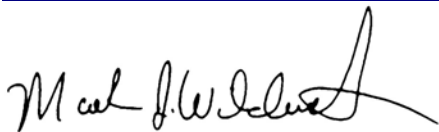
Fee and Schedule

Exhibit B is a work breakdown structure and fee estimate for this effort. The cost to prepare this documentation is about \$82,000. Task 1 will take about six weeks to complete. It will take about four weeks for the BMPTF to review the documentation and prepare comments. WEI will complete the final documentation upon receiving BMPTF comments. In total, it will take about four months to complete this work.

We appreciate the opportunity to serve the BMPTF, the Regional Board, and SAWPA on this important and timely initiative. Please call me if you have any questions.

Very truly yours,

Wildermuth Environmental, Inc.



Mark J. Wildermuth, PE
Chairman, Principal Engineer

Encl.

Exhibit A

Tentative Outline Preparation of Documentation for the 2008 Wasteload Allocation Model

Abstract
Table of Contents
List of Tables
List of Figures

Section 1 Introduction

History of WLAM
Purpose and Scope of WLAM
Purpose and Organization of This Document
Notice of User Responsibility

Section 2 Wasteload Allocation Model Organization

Processes Simulated
Historical Uses of the WLAM Since its Initial Development
Computational Sequence and Data Requirements
Simulation Time Step

Section 3 Runoff Module

Introduction
SCS Method
 Functional Description
 Implementation in the Runoff Module
Chemical Loading from the Land Surface
Land Surface Data Requirements
 Drainage Area
 Soil Type
 Land Use
 Impervious Area
Hydrologic Data Requirements
 Rainfall
 Evaporation
Curve Number Development
Antecedent Moisture Condition
Water Quality Data

Section 4 Router Module

Introduction
Node-Link Routing System
 Functional Description
 Implementation in the Router Module
River Routing
 Mathematical Representation
 Channel Types
 Infiltration and Evaporation in Channels
 Rising Groundwater

- Water Quality Processes Simulated
- Reservoir Routing
 - Mathematical Representation
 - Infiltration and Evaporation in Reservoirs
 - Water Quality Processes Simulated
- Facility Data Requirements
 - Stream Channel System Delineation
 - Channel Type and Geometry
 - Improved Channel
 - Natural Channel
 - Rating Curve-Defined Channel
 - Channel Diversions
 - Reservoirs
 - Elevation-Area-Volume Curves
 - Inlet Types
 - Uncontrolled Inflow
 - Controlled Inflow
 - Outlet Data
- Hydrologic Data Requirements
 - Runoff from the Runoff Module
 - Boundary Inflows Estimated without Runoff Module
 - Non-Tributary Inflows
 - Wastewater Treatment Plants
 - Trans Basin Diversions
 - Rising Groundwater
 - Dry Weather Flow

Section 5 Example Problems

- Problem 1: Santa Ana River between Seven Oaks Dam and E-Street
 - Questions Being Answered
 - Model Setup
 - Calibration
 - Results
- Problem 2: Stormwater Recharge in the Montclair Basins
 - Questions Being Answered
 - Model Setup
 - Results
- Problem 3: Calibration of Stormwater Discharge for Cucamonga and Chino Creeks
 - Questions Being Answered
 - Model Setup
 - Calibration
 - Results

Section 6 References

Appendix A User's Guide

- Installation
- Input Data File Conventions

Exhibit A
Tentative Outline
Documentation of the 2008 Wasteload Allocation Model

- Runoff Module Input Data Files
 - Main Input File
 - HSA/Land Use/Soil Type Polygon File
 - Rainfall Gage Weighting Data File
 - Land Use Related Data Files
 - Rainfall Data File
 - Evaporation Data File
- Router Module
 - Main Input File
 - Link Definition File
 - Node Definition File
 - Rating Curve Channel File
 - Boundary Inflow File
 - Point Load File
- Model Output Files
 - Daily Runoff Data
 - Daily Flow at Specified Locations
 - Monthly Flow at Specified Locations
 - Monthly Percolation from Specified Stream Reaches
 - Monthly Percolation from Specified Basins
- Model Execution
 - Order of Execution
 - Calibration
 - Prediction
 - Application of PEST

Appendix B FORTRAN Code (source code as a pdf file and an executable on CD)

Appendix C Example Problem Input and Output Files (text files on CD)

Appendix D BMPTF Comments and Responses

Appendix E PDF of WLAM Documentation (on CD)

Exhibit B – Work Breakdown Structure and Fee Estimate
Preparation of Documentation for the 2008 Wasteload Allocation Model

Description	Labor						Other Direct Charges			Total Project Costs	
	Principal III	Principal I & II	Staff	Total Labor			Reproduction	Total ODCs		Task	Task Total
				Person Days	Cost			Task	Task Total		
					Task	Task Total					
Task 1 Prepare Draft	5	20	20	45	\$62,400		\$1,250	\$1,250		\$63,650	
Task 2 Prepare Final	2	5	5	12	\$16,920		\$1,250	\$1,250		\$18,170	
Totals						<u>\$79,320</u>			<u>\$2,500</u>		<u>\$81,820</u>