Performance Efficiency Evaluation of the Lockhart-Smith Regional Stormwater Facility (RSF)

Final Report

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Prepared for:

Seminole County, Florida

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TABLE OF CONTENTS

Section / Title			Page
LIST OF FIGURES			**LF-1**
LIST OF TABLES			**LT-1**
1.	**INTRODUCTION**		**1-1**
	1.1	Impaired Waters Designation	1-1
	1.2	Project Description	1-1
	1.3	System Design Criteria	1-5
	1.4	Work Efforts Performed by ERD	1-11
	1.5	Project Costs and Funding	1-11
2.	**FIELD AND LABORATORY ACTIVITIES**		**2-1**
	2.1	Field Instrumentation and Monitoring	2-1
		2.1.1 Western Inflow Channel - Site 1	2-2
		2.1.2 North Oregon Street Roadside Swale - Site 1A	2-4
		2.1.3 Bill Heard Chevrolet Detention Pond Inflow - Site 2	2-4
		2.1.4 Lockhart-Smith Canal Inflow - Site 3	2-6
		2.1.5 Detention Pond Inflow - Site 4	2-7
		2.1.6 Lockhart-Smith Outfall Canal - Site 5	2-8
		2.1.7 Hydrologic Instrumentation	2-10
		2.1.8 Monitoring Activities	2-10
	2.2	Field Measurements	2-10
	2.3	Laboratory Analyses	2-11
	2.4	Routine Data Analysis and Compilation	2-11
3.	**RESULTS**		**3-1**
	3.1	Site Hydrology	3-1
		3.1.1 Rainfall	3-1
		3.1.2 Water Level Elevations	3-5

TABLE OF CONTENTS -- CONTINUED

Section / Title			Page
3.	**RESULTS (Continued)**		
	3.1.3	Pond Inflows	3-6
		3.1.3.1 Western Channel Inflow - Site 1	3-6
		3.1.3.2 North Oregon Street Drainage Swale - Site 1A	3-9
		3.1.3.3 Bill Heard Pond Inflow - Site 2	3-10
		3.1.3.4 Lockhart-Smith Canal Inflow - Site 3	3-12
		3.1.3.5 Northwestern Dry Detention Pond Inflow - Site 4	3-14
	3.1.4	Lockhart-Smith Canal Outflow (Site 5)	3-16
	3.1.5	Evapotranspiration	3-17
	3.1.6	Hydrologic Budget	3-20
	3.1.7	Hydraulic Residence Time	3-20
3.2	Characteristics of Monitored Inputs and Outputs		3-23
	3.2.1	Physical-Chemical Field Measurements	3-24
		3.2.1.1 Temperature and pH	3-24
		3.2.1.2 Conductivity	3-24
		3.2.1.3 Dissolved Oxygen and ORP	3-26
		3.2.1.4 Comparison of Field Measurements	3-28
	3.2.2	Chemical Characteristics of Inputs and Outputs	3-30
		3.2.2.1 Western Inflow Channel - Site 1	3-30
		3.2.2.2 North Oregon Street Drainage Swale - Site 1A	3-31
		3.2.2.3 Bill Heard Detention Pond Inflow - Site 2	3-33
		3.2.2.4 Lockhart-Smith Canal Inflow - Site 3	3-34
		3.2.2.5 Northwest Dry Detention Pond Inflow - Site 4	3-35
		3.2.2.6 Lockhart-Smith Canal Outfall - Site 5	3-37
		3.2.2.7 Bulk Precipitation	3-38
	3.2.3	Comparison of Chemical Characteristics	3-39
		3.2.3.1 Variability Between Monitoring Sites	3-39
		3.2.3.2 Temporal Variability	3-45
3.3	System Performance Efficiency		3-52
	3.3.1	Concentration-Based Removals	3-52
	3.3.2	Mass Removal Efficiency	3-55
3.4	Discussion		3-58
3.5	Quality Assurance		3-61
4.	**SUMMARY**		**4-1**

TABLE OF CONTENTS -- CONTINUED

Appendices/Title

A. Selected Construction Plans for the Lockhart-Smith RSF Site

B. Field Measurements Collected at the Lockhart-Smith RSF Site from April 2010-March 2012

C. Chemical Characteristics of Inflow and Outflow Samples Collected at the Lockhart-Smith RSF

- C.1 Site 1
- C.2 Site 1A
- C.3 Site 2
- C.4 Site 3
- C.5 Site 4
- C.6 Site 5
- C.7 Bulk Precipitation Samples

D. Laboratory Quality Assurance Data

- D.1 Precision
- D.2 Accuracy
- D.3 Control Standard Recovery
- D.4 Continuing Calibration Verification
- D.5 Method Blanks

LIST OF FIGURES

Figure Number	Title	Page
1-1	General Location Map for the Lockhart-Smith RSF	1-2
1-2	Vicinity Map for the Lockhart-Smith RSF	1-2
1-3	Overview of Borrow Pit Site	1-3
1-4	General Drainage Patterns in the Lockhart-Smith RSF	1-4
1-5	Overview of Inputs and Outputs to the Lockhart-Smith RSF	1-8
1-6	Hydrologic Inflows in the Southern Portion of the Lockhart-Smith RSF	1-8
1-7	Hydrologic Inflows in Western Portions of the Lockhart-Smith RSF	1-9
1-8	Hydrologic Inflows and Outflows in the Northwestern Portion of the Lockhart-Smith RSF	1-10
1-9	Hydrologic Inflows in the Northeastern Portion of the Lockhart-Smith RSF	1-10
2-1	Monitoring Locations at the Lockhart-Smith RSF	2-2
2-2	Monitoring Equipment at Site 1	2-3
2-3	Monitoring Site 1A	2-5
2-4	Monitoring Equipment at Site 2	2-5
2-5	Monitoring Equipment at the Lockhart-Smith Canal - Site 3	2-6
2-6	Photographs of the Sump Area at Site 3	2-7
2-7	Monitoring Equipment at Site 4	2-8
2-8	Photographs of Monitoring Conducted at Site 5	2-9
3-1	Comparison of "Average" and Measured Rainfall in the Vicinity of the Lockhart-Smith RSF Site	3-3

LIST OF FIGURES -- CONTINUED

Figure Number	Title	Page
3-2	Comparison of Recorded Water Level Elevations for Significant Inflows and Outflows for the Lockhart-Smith RSF from April 2010-March 2012	3-5
3-3	Inflow Hydrographs for the Two 84-inch RCPs Discharging into the Western Inflow Channel	3-8
3-4	Inflow Hydrograph for the 30-inch RCP Roadside Swale	3-9
3-5	Inflow Hydrograph for the Three 54-inch RCPs Discharging into the Southern Side of the Lockhart-Smith RSF	3-11
3-6	Inflow Hydrograph for the Lockhart-Smith Canal	3-12
3-7	Inflow Hydrograph for the Northwestern Dry Detention Pond	3-15
3-8	Discharge Hydrograph for the Lockhart-Smith Canal Outfall	3-16
3-9	Comparison of Measured and "Average" Monthly Pan Evaporation at the Lockhart-Smith RSF Site	3-19
3-10	Measured Hydrologic Inputs and Losses to the Lockhart-Smith RSF from April 2010-March 2012	3-22
3-11	Field Measurements of Temperature and pH at Lockhart-Smith RSF Inflow and Outflow Monitoring Sites	3-25
3-12	Field Measurements of Conductivity at Lockhart-Smith RSF Inflow and Outflow Monitoring Sites	3-26
3-13	Field Measurements of Dissolved Oxygen and ORP at Lockhart-Smith Inflow and Outflow Monitoring Sites	3-27
3-14	Statistical Comparison of Field Measurements Collected at Inflow/Outflow Monitoring Sites at the Lockhart-Smith RSF from April 2010-March 2012	3-29
3-15	Statistical Comparison of Alkalinity, TSS, Turbidity, and Color Measured in Inflow/Outflow Samples Collected in the Lockhart-Smith RSF	3-42
3-16	Statistical Comparison of Nitrogen Species Measured in Inflow/Outflow Samples Collected in the Lockhart-Smith RSF	3-43

LIST OF FIGURES -- CONTINUED

Figure Number/Title		Page
3-17	Statistical Comparison of Phosphorus Species Measured in Inflow/Outflow Samples Collected in the Lockhart-Smith RSF	3-44
3-18	Concentrations of Alkalinity in Inflow/Outflow Samples Collected at the Lockhart-Smith RSF from April 2010-March 2012	3-45
3-19	Concentrations of Ammonia and NO_x in Inflow/Outflow Samples Collected at the Lockhart-Smith RSF from April 2010-March 2012	3-46
3-20	Concentrations of Particulate Nitrogen and Total Nitrogen in Inflow/Outflow Samples Collected at the Lockhart-Smith RSF from April 2010-March 2012	3-48
3-21	Concentrations of SRP and Dissolved Organic Phosphorus in Inflow/Outflow Samples Collected at the Lockhart-Smith RSF from April 2010-March 2012	3-49
3-22	Concentrations of Particulate Phosphorus and Total Phosphorus in Inflow/ Outflow Samples Collected at the Lockhart-Smith RSF from April 2010-March 2012	3-50
3-23	Concentrations of TSS and Color in Inflow/Outflow Samples Collected at the Lockhart-Smith RSF from April 2010-March 2012	3-51
3-24	Temporal Variability in Monthly Concentration-Based Removal Efficiencies for Total Nitrogen and Total Phosphorus at the Lockhart-Smith RSF from April 2010-March 2012	3-54
3-25	Temporal Variability in Mass Removal Efficiencies for Total Nitrogen and Total Phosphorus at the Lockhart-Smith RSF from April 2010-March 2012	3-57
3-26	Temporal Variability in Mass Load Reductions for Total Nitrogen and Total Phosphorus at the Lockhart-Smith RSF from April 2010-March 2012	3-59

LIST OF TABLES

Table Number/Title		Page
1-1	Existing Land Use and Coverages for the Tributary Area for the Lockhart-Smith RSF	1-5
1-2	Stage-Area-Storage Relationships for the Lockhart-Smith RSF	1-6
1-3	Pre- and Post-Construction Nutrient Mass Loadings for the Lockhart-Smith RSF	1-7
1-4	Funding Amounts and Sources for the Lockhart-Smith RSF	1-11
2-1	Analytical Methods and Detection Limits for Laboratory Analyses	2-11
3-1	Measured Daily Rainfall at the Lockhart-Smith RSF Site from April 1, 2010-March 31, 2012	3-2
3-2	Summary of Measured and "Average" Rainfall for the Lockhart-Smith RSF Site from April 2010-March 2012	3-4
3-3	Summary of Hydrologic Inputs to the Lockhart-Smith RSF Site from Direct Rainfall During the Period from April 2010-March 2012	3-4
3-4	Summary of Recorded Water Level Data for Significant Inflows and Outflows	3-6
3-5	Summary of Hydrologic Inputs to the Lockhart-Smith RSF Site from Site 1 During the Period from April 2010-March 2012	3-7
3-6	Summary of Hydrologic Inputs to the Lockhart-Smith RSF from Site 1A During the Period from April 2010-March 2012	3-10
3-7	Summary of Hydrologic Inputs to the Lockhart-Smith RSF Site from Site 2 During the Period from April 2010-March 2012	3-11
3-8	Summary of Hydrologic Inputs to the Lockhart-Smith RSF Site from Site 3 During the Period from April 2010-March 2012	3-13
3-9	Runoff Coefficient (C-Value) Calculations for the Lockhart-Smith Canal RSF Watershed	3-14

LIST OF TABLES -- CONTINUED

Table Number/Title		Page
3-10	Summary of Hydrologic Inputs to the Lockhart-Smith RSF Site from Site 4 During the Period from April 2010-March 2012	3-15
3-11	Summary of Hydrologic Inputs to the Lockhart-Smith RSF Site from Site 5 During the Period from April 2010-March 2012	3-17
3-12	Summary of Measured and "Average" Evaporation for the Lockhart-Smith RSF Site from April 2010-March 2012	3-18
3-13	Calculated Monthly Evapotranspiration Losses from the Lockhart-Smith RSF Site from April 2010-March 2012	3-19
3-14	Monthly Hydrologic Inputs and Losses for the Lockhart-Smith RSF Site from April 1, 2010-March 31, 2012	3-21
3-15	Hydraulic Residence Time Calculations for the Lockhart-Smith RSF	3-23
3-16	Summary of Sample Collection Performed at the Lockhart-Smith RSF Site from April 2010-March 2012	3-23
3-17	Characteristics of Inflow Samples Collected at the Western Inflow Channel (Site 1)	3-31
3-18	Characteristics of Inflow Samples Collected at the North Oregon Street Swale Inflow (Site 1A)	3-32
3-19	Characteristics of Inflow Samples Collected at the Bill Heard Detention Pond Inflow (Site 2)	3-33
3-20	Characteristics of Inflow Samples Collected at the Lockhart-Smith Canal Inflow (Site 3)	3-35
3-21	Characteristics of Inflow Samples Collected at the Northwest Dry Detention Pond Inflow (Site 4)	3-36
3-22	Characteristics of Lockhart-Smith Canal Discharge Samples (Site 5)	3-37
3-23	Characteristics of Bulk Precipitation Samples	3-39
3-24	Comparison of Mean Characteristics of Inputs and Outputs at the Lockhart-Smith RSF from April 2010-March 2012	3-40

LIST OF TABLES -- CONTINUED

Table Number/Title		Page
3-25	Calculated Changes in Concentrations for Inputs and Outputs at the Lockhart-Smith RSF	3-52
3-26	Calculated Mass Inputs and Outputs at the Lockhart-Smith RSF	3-56
3-27	Comparison of Annual Removals for the Lockhart-Smith RSF During the Initial and Final years of the Monitoring Program	3-60

SECTION 1

INTRODUCTION

This document provides a summary of work efforts conducted by Environmental Research & Design, Inc. (ERD) for Seminole County (County) to conduct a performance efficiency evaluation of the Lockhart-Smith Regional Stormwater Facility (RSF). This facility was constructed by the County, with cooperative funding from the Florida Department of Environmental Protection (FDEP) and the St. Johns River Water Management District (SJRWMD) to reduce pollutant loadings discharging from the Lockhart-Smith Canal into the Middle St. Johns River Basin. This facility is designed to reduce pollutant loadings from a watershed area of approximately 2,801 acres located east and south of the project site, much of which currently has no existing stormwater treatment facilities. The Lockhart-Smith RSF consists of an on-line shallow vegetated wetland system which intersects the canal and provides nutrient load reductions and volumetric water losses.

1.1 Impaired Waters Designation

Section 301(D) of the Clean Water Act requires states to submit lists of surface waterbodies that do not meet applicable water quality standards. These waterbodies are defined as "impaired waters" and total maximum daily loads (TMDLs) must be established for these waters on a prioritized schedule. The Lockhart-Smith Canal, also referred to as the Smith Canal (WIBID 2962) has been designated as an "impaired water" due to low dissolved oxygen concentrations thought to be caused by elevated nutrients, with phosphorus considered to be the causative pollutant. The Lockhart-Smith Canal is included on the Verified List of Impaired Waters for the Middle St. Johns River Basin that was adopted by secretarial order on May 19, 2009. A final TMDL report outlining the dissolved oxygen TMDL for the Lockhart-Smith Canal was issued by FDEP in September 2009. The Lockhart-Smith RSF was constructed to assist in reducing nutrient loadings within the Middle St. Johns River Basin and to improve the existing conditions of low dissolved oxygen.

1.2 Project Description

A general location map for the Lockhart-Smith RSF is given on Figure 1-1. The project site is located in northwest Seminole County. A vicinity map for the Lockhart-Smith RSF site is given on Figure 1-2. The Lockhart-Smith Canal system is approximately 6 miles in length, and discharges into the St. Johns River approximately 1.4 miles downstream of the outlet from Lake Monroe. The Smith Canal watershed includes portions of the cities of Sanford and Lake Mary and includes residential areas, commercial areas, agricultural, and sparse patches of wetlands and forested land.

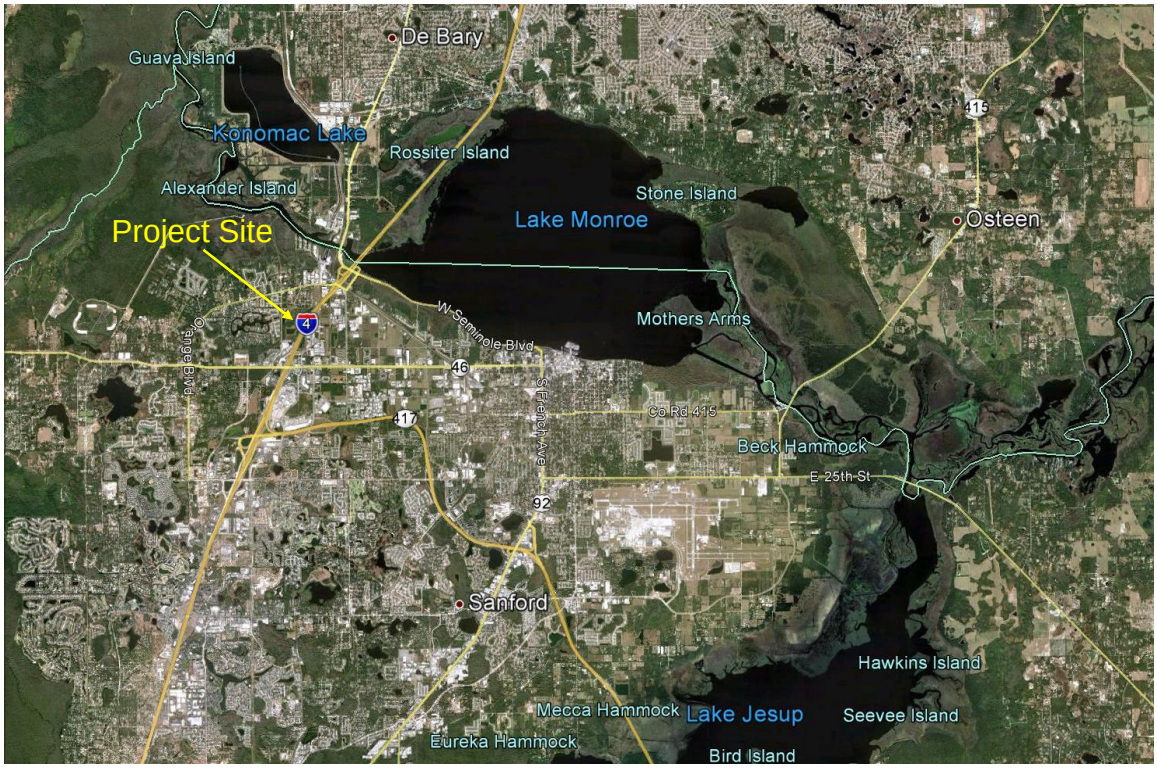


Figure 1-1. General Location Map for the Lockhart-Smith RSF.

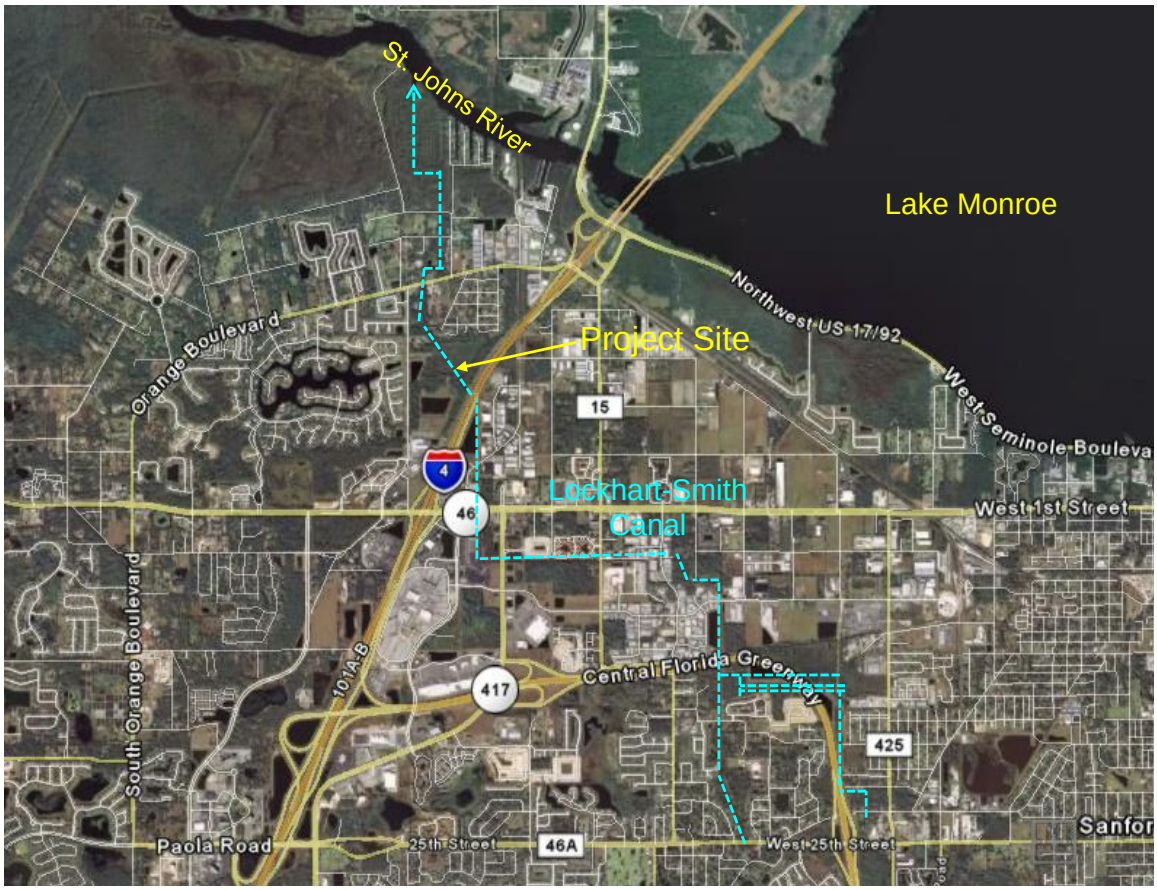


Figure 1-2. Vicinity Map for the Lockhart-Smith RSF.
(Lockhart-Smith Canal shown in **blue**)

The Lockhart-Smith Canal was constructed in 1929 and is typically characterized by well defined earthen channels with varying degrees of vegetated cover. In areas east of I-4, the Lockhart-Smith Canal is generally an open water channel, with moderate flow rates and heavily vegetated and/or tree-lined banks. In areas west of I-4, the slopes of the canal are generally steep, with both banks heavily vegetated and overgrown.

During the 1960s, a 39-acre borrow pit was constructed approximately 400 ft west of I-4 to provide fill for construction of the roadway. An overview of the borrow pit site is given on Figure 1-3. The Lockhart-Smith Canal bisects the borrow pit site in a southeast-northwest direction. A defined channel for the canal was maintained through the borrow pit site, although the site was subject to flooding during high elevation conditions within the canal.

Figure 1-3. Overview of Borrow Pit Site.

During 2004, a design was developed by Camp Dresser & McKee, Inc. (CDM) to convert the existing 39-acre borrow pit site into a regional wetland treatment system for the Lockhart-Smith Canal. The proposed improvements consisted of construction of two control structures, perimeter berms to provide for water containment and for maintenance purposes, as well as two internal finger berms to maximize the flow path within the treatment area. According to CDM (2004), the drainage basin area for the Lockhart-Smith Canal which drains to the borrow pit site is approximately 2,800 acres.

A summary of general drainage patterns for the Lockhart-Smith RSF is given on Figure 1-4. Inflow enters the treatment system on the southeast corner through the existing Lockhart-Smith Canal. A 1.2-acre open water sump area is provided to allow settling of larger particles. The inflow is then directed in a meandering path through the wetland area before discharging back into the Lockhart-Smith Canal on the northwest corner of the site. A significant additional inflow into the system also occurs along the west side of the treatment area from a residential community located west of North Oregon Street, as well as roadside drainage from the roadway itself. Three smaller inflows occur into the treatment system on the southwest and northern sides of the treatment area.

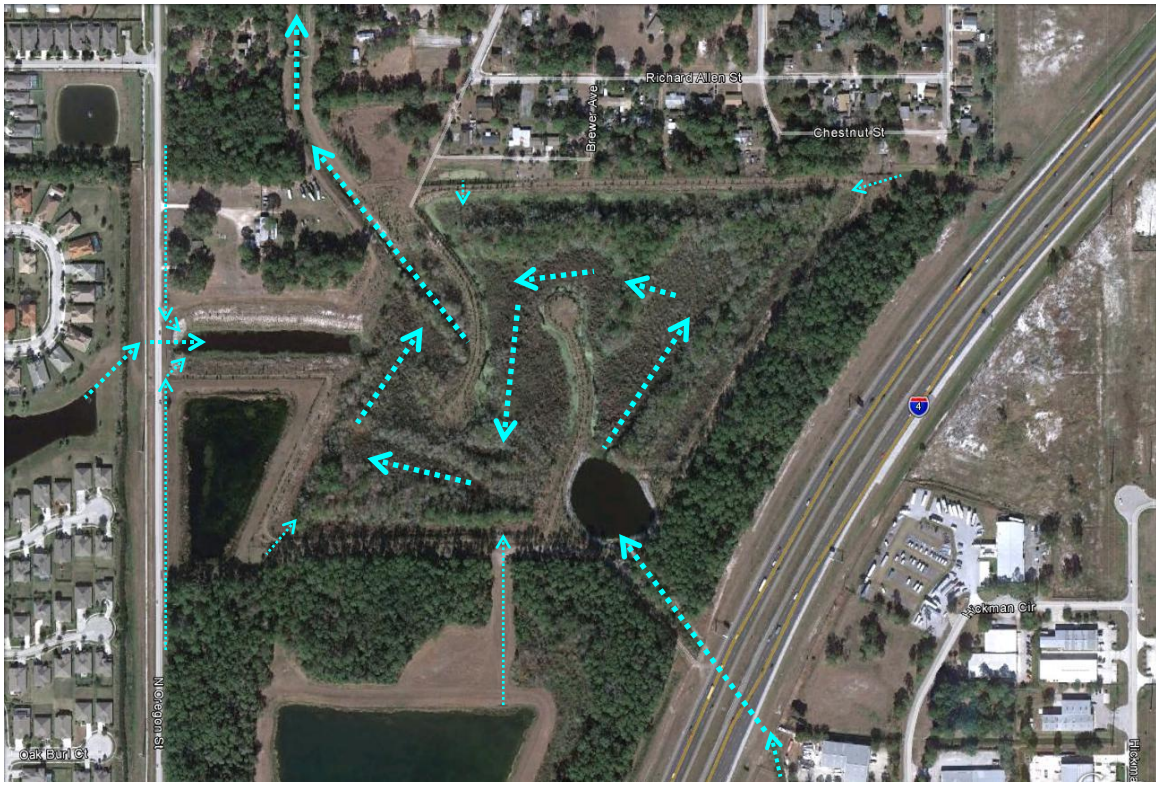


Figure 1-4. General Drainage Patterns in the Lockhart-Smith RSF.

According to CDM, the Lockhart-Smith Canal sub-basin (Basin 02-03) contains approximately 4,676 acres. The portion of the sub-basin which is tributary to the Lockhart-Smith RSF consists of approximately 2,800 acres. A summary of land use characteristics within portions of the Lockhart-Smith drainage basin which are tributary to the RSF site is given in Table 1-1 (CDM, 2004). According to the land use summary provided in Table 1-1, the dominant land use within the contributing drainage basin area is upland forest (17.6%), followed by shrub and brushland (17.0%), roads and highways (12.6%), agriculture (10.2%), medium-density residential (7.5%), commercial (6.0%), and low-density residential (5.6%). Each of the remaining listed land use categories occupies 5% or less of the total tributary area.

However, the Final TMDL Report for the Smith Canal developed by FDEP lists the total watershed area as 9,993 acres which includes areas both west and east of I-4. The FDEP basin area includes Sub-basins 02-03 and 02-08, while the CDM watershed only includes Sub-basin 02-03. Based on the Lockhart-Smith Canal watershed area defined by FDEP, the area contributing to the RSF site is approximately 6,500 acres.

TABLE 1-1

EXISTING LAND USE AND COVERAGES FOR THE TRIBUTARY AREA FOR THE LOCKHART-SMITH RSF (CDM, 2004)

FLUCCS CODE AND LAND USE DESCRIPTION		AREA (acres)	PERCENT COVERAGE (%)
110	Low-Density Residential	157.81	5.63
120	Medium-Density Residential	208.84	7.45
132	Mobile Home Units (high-density)	14.90	0.53
133	Multiple Dwelling Units (low-rise)	11.75	0.42
140	Commercial	168.49	6.01
143	Professional Services	2.04	0.07
148	Cemetery	8.07	0.29
150	Industrial	86.97	3.10
160	Extractive	7.42	0.26
171	Educational Facilities	10.89	0.39
172	Religious Facility	9.13	0.33
180	Recreational	38.28	1.37
200	Agriculture	285.02	10.17
320	Shrub and Brushland	476.77	17.02
400	Upland Forest	492.36	17.57
500	Waterbodies	121.83	4.35
600	Wetlands	295.47	10.55
800	Transportation	13.05	0.47
812	Railroad	24.19	0.86
814	Roads/Highways	351.66	12.55
830	Utility	16.69	0.60
	TOTAL:	**2801.61**	**100.00**

1.3 System Design Criteria

The design criteria for the treatment system is based upon an analysis of existing land uses and best management practices (BMPs) within the watershed by CDM. This analysis indicated that approximately 46% of the existing tributary area has stormwater management systems for water quality and hydrologic control. An additional 43% of the basin area is currently undeveloped with no existing BMPs, and 11% consists of previously developed areas with no current BMPs. Overall, approximately 54% of the entire tributary area was not served by BMPs. CDM decided that, for practical purposes, only 25% of the entire tributary area would be considered in the water quality calculations, consisting of an area of 700.4 acres. A set of construction drawings for the Lockhart-Smith RSF is given in Appendix A.

A summary of stage-area-storage relationships for the Lockhart-Smith RSF is given in Table 1-2. According to CDM, permanent pool volume is provided from the sump bottom at elevation 0 ft to 15.0 ft which represents the normal water level within the system. The corresponding permanent pool volume, including the volume of the sump area, is 58.7 ac-ft. Based on hydrologic modeling, CDM indicates that this volume provides an average of 7 days of residence time during wet season conditions. The treatment volume for the system, as defined by CDM, is the volume provided between elevations 15.0 ft and 16.5 ft, equivalent to approximately 39.0 ac-ft. The corresponding treatment volume provided over the 700.4 acre retrofit project area is approximately 0.7 inch or 1.1 inch over the impervious area.

TABLE 1-2

STAGE-AREA-STORAGE RELATIONSHIPS FOR THE LOCKHART-SMITH RSF

ELEVATION (ft)	POND AREA (acres)	INCREMENTAL VOLUME (ac-ft)	TOTAL VOLUME (ac-ft)
0.0 (Sump Bottom)	1.2	0.0	0.0
9.0	1.7	13.2	13.2
10.0 (Pond Bottom)	1.8	1.8	15.0
11.0	2.0	1.9	16.9
12.0	2.1	2.0	18.9
13.0	9.5	5.8	24.7
14.0	17.0	13.3	38.0
15.0 (NWL)	24.4	20.7	58.7
16.5 (Weir)	27.6	39.0	97.7
20.0	31.0	102.5	200.2
25.0 (TOB)	37.0	169.8	370.0

A tabular summary of modeled pre- and post-construction nutrient mass loadings for the Lockhart-Smith RSF (CDM, 2004) is given in Table 1-3. Mass loadings are divided into dry season and wet season conditions. Overall, the Lockhart-Smith RSF is expected to provide a 20% load reduction for total phosphorus, 37% load reduction of dissolved phosphorus, 10% load reduction for TKN, and 14% load reduction for NO_x.

TABLE 1-3

PRE- AND POST-CONSTRUCTION NUTRIENT MASS LOADINGS FOR THE LOCKHART-SMITH RSF (CDM, 2004)

NUTRIENT	EXISTING CONDITIONS (lb)			PROPOSED CONDITIONS (lb)			ANNUAL REDUCTION (lbs)	ANNUAL REDUCTION (%)
	Dry Season	Wet Season	Annual	Dry Season	Wet Season	Annual		
Total P	432	571	1,003	346	457	802	201	20
Diss. P	444	588	1,032	281	371	652	380	37
TKN	3,916	5,178	9,094	3,537	4,677	8,214	880	10
NO_x	764	1,010	1,774	655	866	1,521	253	14

An overview of inputs and outputs to the Lockhart-Smith RSF is given on Figure 1-5. The primary inflow into the system originates from the Lockhart-Smith Canal inflow which enters the system on the southeast corner. Additional inflows into the pond occur as a result of discharges from the Bill Heard Chevrolet detention pond which consists of three 54-inch RCPs. A small 18-inch RCP is located on the southwest corner of the RSF which provides drainage from a localized area. Another significant inflow occurs on the western side of the RSF which consists of two 84-inch RCPs that discharge from a pond system associated with a residential development west of North Oregon Street. In addition, roadside swale drainage along North Oregon Street also discharges into the 84-inch RCPs as well as directly into the western inflow channel. Two relatively minimal inflows also occur on the northern side of the RSF from newly constructed detention ponds which provide treatment for localized drainage. The primary outflow from the system occurs through the Lockhart-Smith outfall canal on the northwest corner of the RSF. A gabion weir was also constructed in the outflow canal to regulate water levels within the treatment area.

An aerial overview of hydrologic inflows in southern portions of the Lockhart-Smith RSF is given on Figure 1-6. The primary inflow consists of the Lockhart-Smith Canal. This inflow was monitored directly as part of this project. Periodic inflows into the RSF also occur from the Bill Heard wet detention pond through three 54-inch RCPs. These inflows were monitored directly as part of this project. An 18-inch RCP enters on the southwest side of the RSF, but this minimal inflow was not monitored as part of this project.

Hydrologic inputs in western portions of the Lockhart-Smith RSF are illustrated on Figure 1-7. Two 84-inch RCPs discharge from the existing lake system associated with the residential development located west of North Oregon Street. These inflows combine with runoff from the roadside swales on the west side of North Oregon Street and provide a significant inflow into the treatment area, although this inflow enters in relatively close proximity to the outflow for the system. Roadside swale drainage on the east side of North Oregon Street discharges into the pond through a 30-inch RCP (southern side) and a 24-inch RCP (northern side). Inflows through the two 84-inch RCPs were monitored directly as part of this project. In addition, inflows from the 30-inch RCP connected to the southern roadside swale system were also monitored.

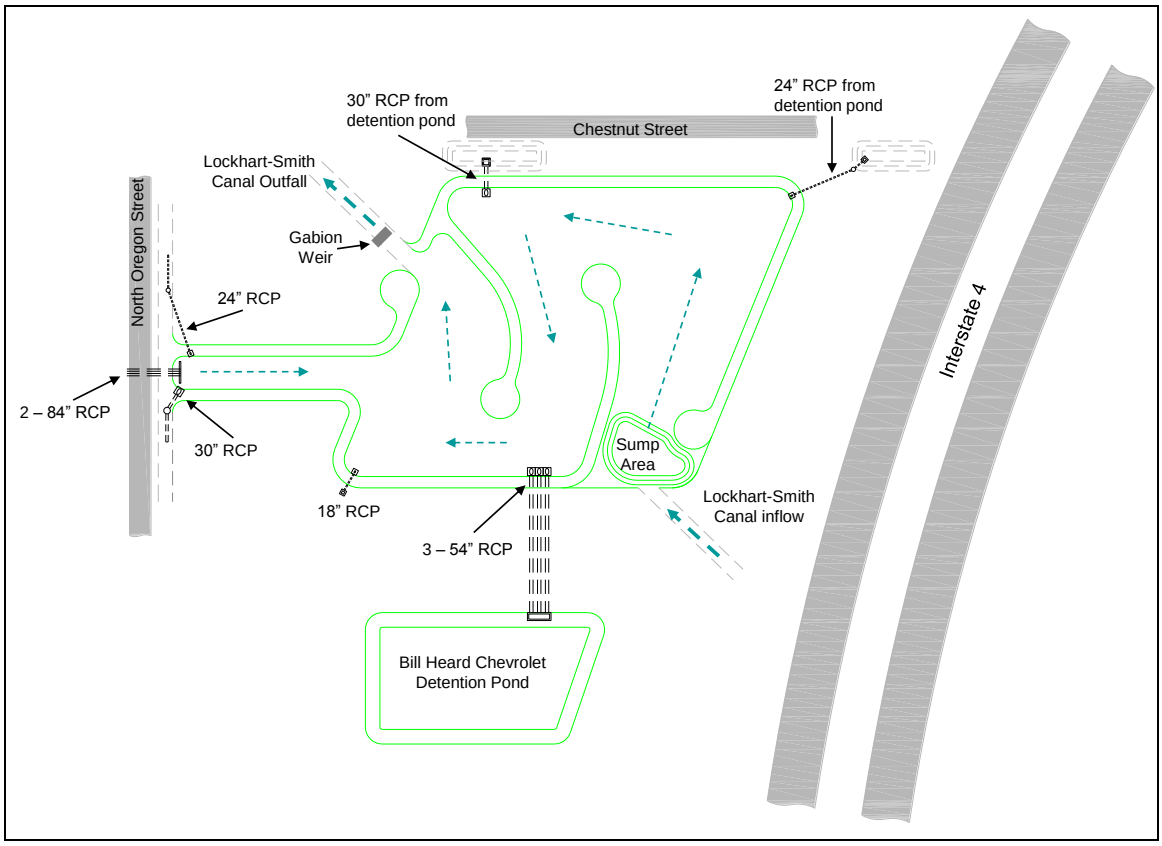


Figure 1-5. Overview of Inputs and Outputs to the Lockhart-Smith RSF.

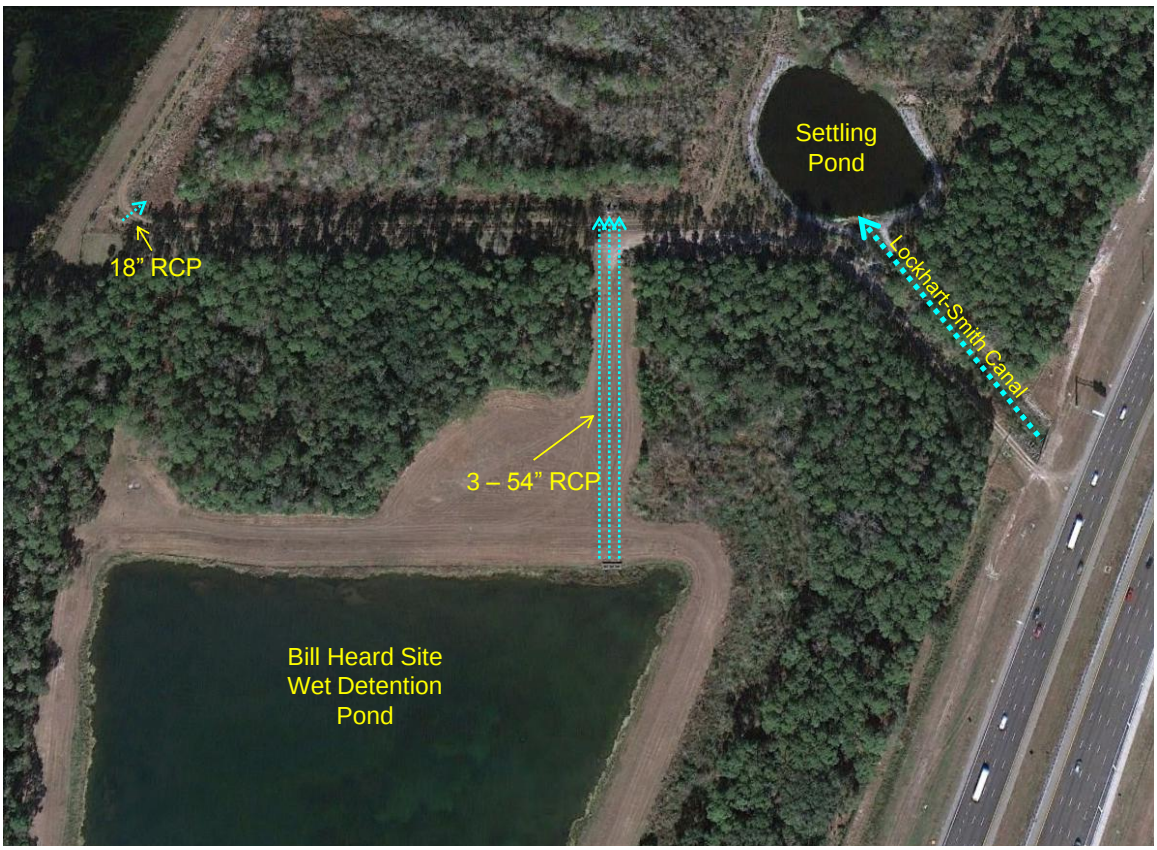


Figure 1-6. Hydrologic Inflows in the Southern Portion of the Lockhart-Smith RSF.

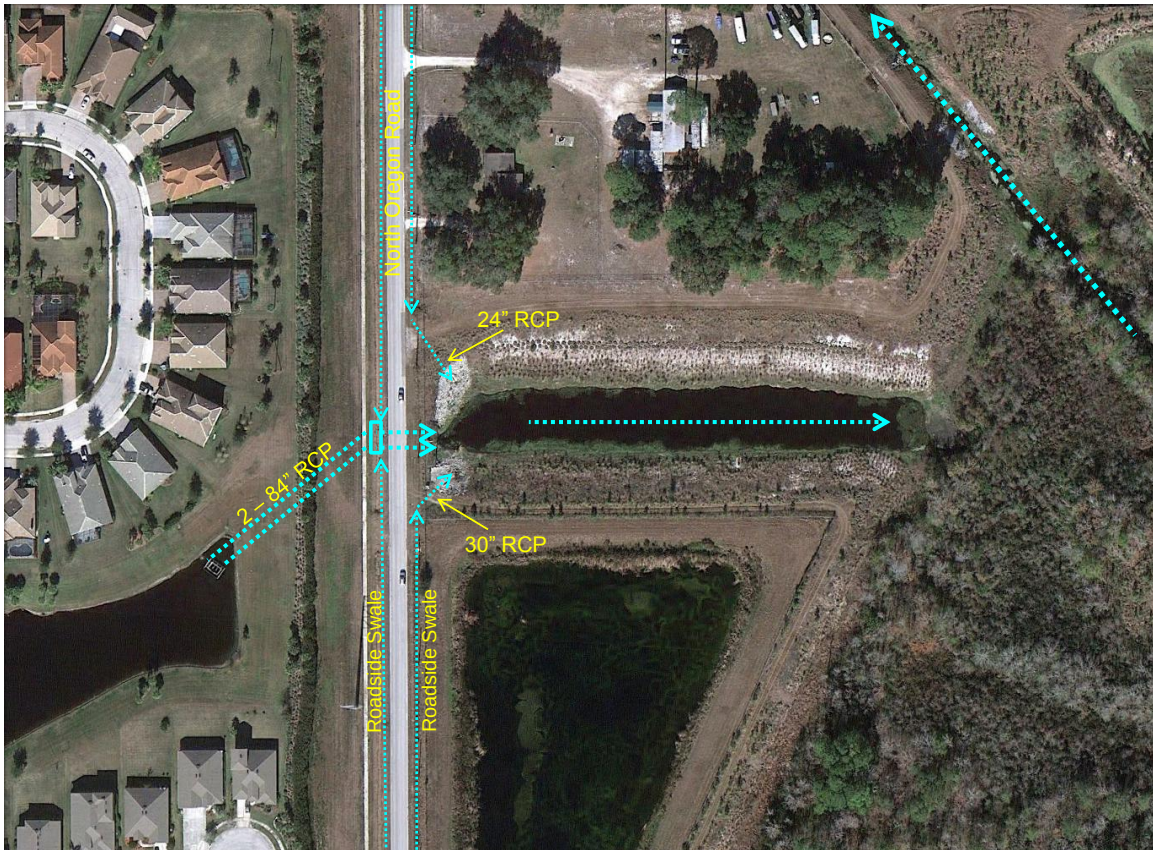


Figure 1-7. Hydrologic Inflows in Western Portions of the Lockhart-Smith RSF.

Hydrologic inflows and outflows in the northwestern portion of the Lockhart-Smith RSF are illustrated on Figure 1-8. The primary outflow for the system is the Lockhart-Smith Canal which was monitored directly as part of this project. A smaller 30-inch RCP discharges into the RSF from a detention with filtration pond which was recently constructed to provide treatment for roadway improvements in the Midway area. This inflow was monitored directly as part of this project.

Hydrologic inflows in the northeastern portion of the Lockhart-Smith RSF are indicated on Figure 1-9. A relatively minimal inflow occurs into the RSF from a 24-inch RCP which was connected to a detention with filtration pond that was constructed as a result of recent drainage improvements. This inflow was not monitored as part of this project.

Figure 1-8. Hydrologic Inflows and Outflows in the Northwestern Portion of the Lockhart-Smith RSF.

Figure 1-9. Hydrologic Inflows in the Northeastern Portion of the Lockhart-Smith RSF.

1.4 Work Efforts Performed by ERD

A Quality Assurance Project Plan (QAPP) was developed by ERD during March 2008 which provides details concerning the proposed field monitoring and laboratory analyses. The QAPP was reviewed and approved by FDEP. Monitoring equipment was installed at the Lockhart-Smith RSF site during March 2010. Routine monitoring was initiated on April 1, 2010 and was continued for a period of 24 months until April 4, 2012.

This report has been divided into four separate sections to summarize the work efforts conducted by ERD. Section 1 contains an introduction to the report, a description of the Lockhart-Smith RSF, and a brief summary of work efforts performed by ERD. Section 2 provides a detailed discussion of the methodologies used for field and laboratory evaluations. Section 3 includes a discussion of the hydrologic and water quality results, with a summary provided in Section 4. Appendices are attached which contain data and supporting documentation for the results and conclusions of this project.

1.5 Project Costs and Funding

Funding for the Lockhart-Smith RSF site was provided by Seminole County and FDEP. A summary of funding amounts and sources for the Lockhart-Smith RSF is given on Table 1-4. Seminole County contributed $1,738,755 for the project, which included the master basin engineering study, construction plan preparation and permitting, a portion of the construction costs, and project evaluation. A matching amount of $1,738,755 was contributed by FDEP, which included project construction, the BMP effectiveness monitoring, and project evaluation. In addition to the costs outlined above, Seminole County also provided $3,397,680 for land acquisition. Overall, the total cost for the project, including each of the items summarized in Table 1-1 plus land acquisition costs, is $6,875,190.

TABLE 1-4

FUNDING AMOUNTS AND SOURCES FOR THE LOCKHART-SMITH RSF

PROJECT FUNDING ACTIVITY	FDEP GRANT AMOUNT ($)	MATCHING CONTRIBUTION ($)	MATCH SOURCE
Task 0 - Master Basin Engineering	--	808,000	Seminole County
Task 0 - Construction Plan Preparation & Permitting	--	135,000	Seminole County
Task 1 - Construction	1,613,755	635,755	Seminole County
Task 2 - Effectiveness Evaluation	125,000	0	Seminole County
Task 3 - Project Evaluation	--	160,000	Seminole County
Total:	$ 1,738,755	$ 1,738,755	
Total Project Costs		$ 3,477,510	
Percentage Match:	50%	50%	
Land Acquisition	--	3,397,680	Seminole County
TOTAL COST:	**$ 6,875,190**		

SECTION 2

FIELD AND LABORATORY ACTIVITIES

Field and laboratory investigations were conducted by ERD over a 24-month period from April 2010-April 2012 to evaluate the effectiveness of the Lockhart-Smith RSF. Field monitoring was conducted at four significant inflows and the primary outflow for the RSF which included a continuous record of discharges at each of the monitoring sites. Laboratory analyses were conducted on collected samples for general parameters and nutrients to assist in identifying concentration-based and mass removal efficiencies. Specific details of monitoring efforts conducted at the Lockhart-Smith RSF are given in the following sections.

2.1 Field Instrumentation and Monitoring

A schematic of monitoring locations used to evaluate the performance efficiency of the Lockhart-Smith RSF is given on Figure 2-1. Inflows into the RSF were monitored at five separate locations, including the double 84-inch RCPs which enter on the west side of the RSF (Site 1), the 30-inch RCP which drains the southern roadside swale on the east side of North Oregon Street (Site 1A), the triple 54-inch RCPs which discharge into the RSF from the Bill Heard Chevrolet detention pond (Site 2), the Lockhart-Smith Canal inflow (Site 3), and the 30-inch RCP which discharges from the detention pond located on the northwest corner of the RSF site (Site 4). Discharges from the RSF were measured at the Lockhart-Smith Canal outfall (Site 5).

Three separate minor inflows into the RSF were not monitored, including the 24-inch RCP which drains the northern roadside swale on the east side of North Oregon Street, the 18-inch RCP which provides drainage for a small area adjacent to the southwest corner of the pond, and the 24-inch RCP from the detention pond located on the northeast corner of the pond.

In addition, water level recorders were installed near monitoring Sites 1, 3, and 5, as indicated on Figure 2-1, to provide a continuous record of water elevations in various parts of the RSF system. A rain gauge and pan evaporimeter were also installed adjacent to Site 1 to provide information on rainfall inputs and evaporation losses. Details of these monitoring locations are given in the following sections.

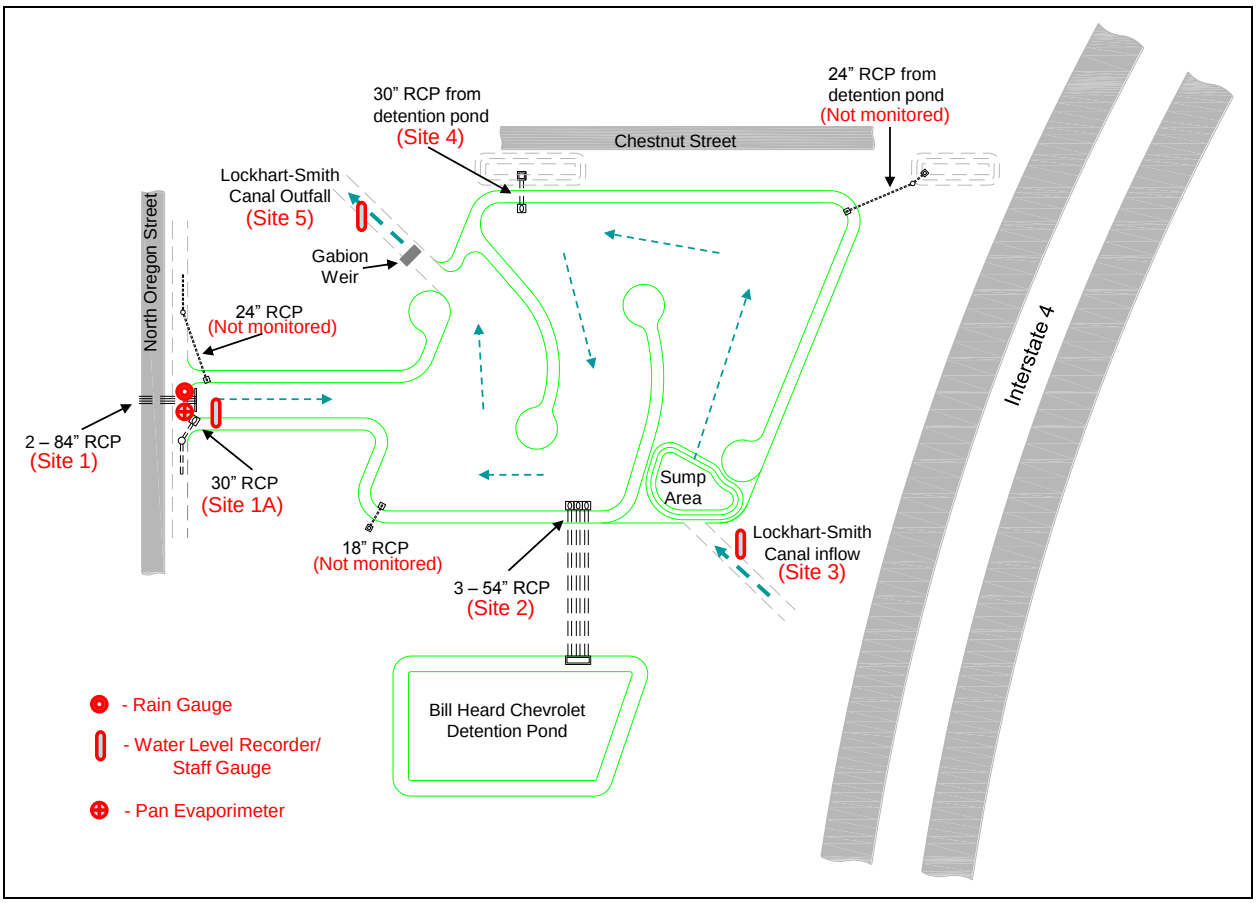
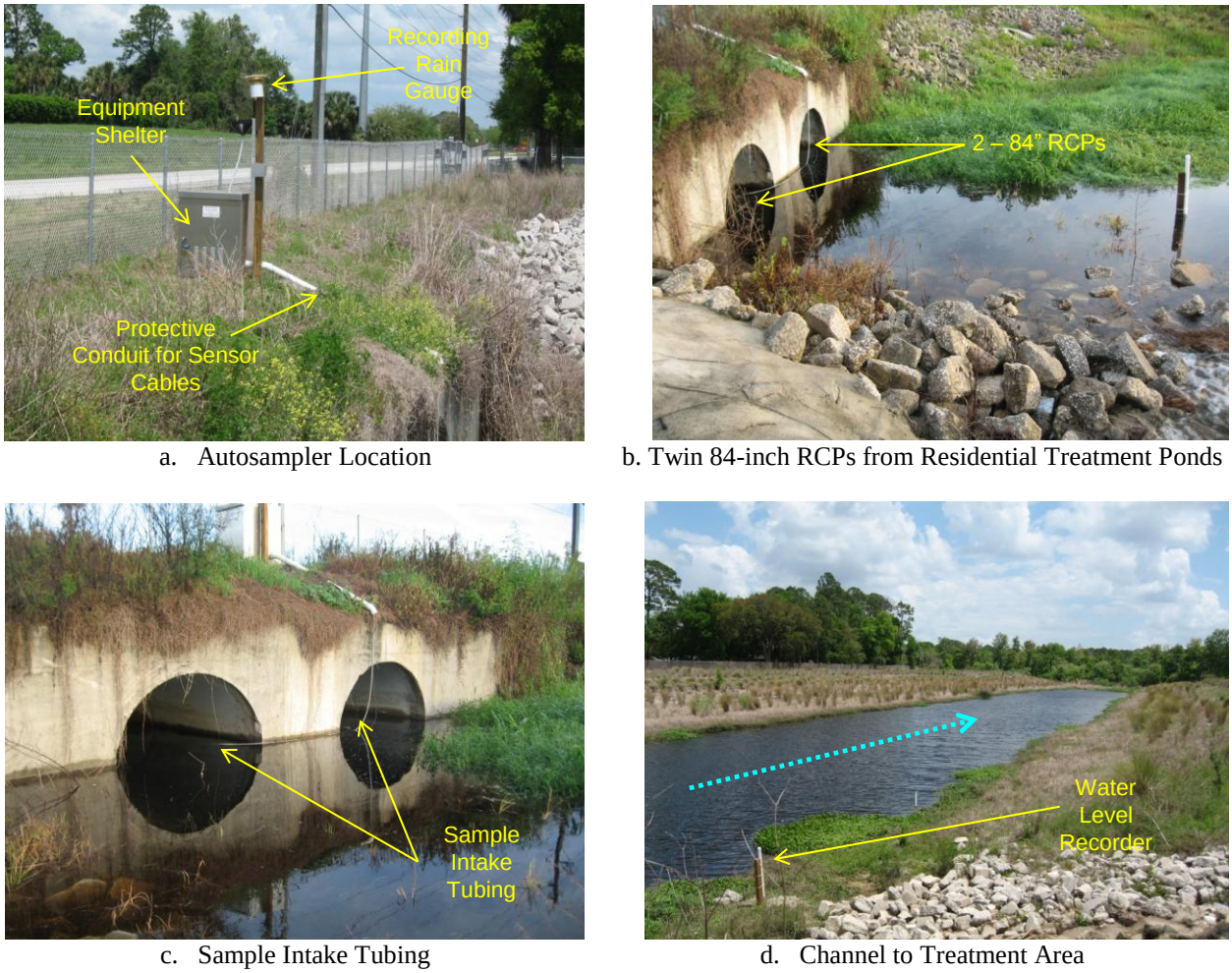


Figure 2-1. Monitoring Locations at the Lockhart-Smith RSF.

2.1.1 Western Inflow Channel - Site 1

Inflow into the western channel originates from the pond system for the residential community located west of North Oregon Street, as well as roadside drainage on the west side of North Oregon Street. Monitoring at this site was conducted at the headwall for the two 84-inch RCPs at the point of discharge into the canal which connects with the RSF. Photographs of monitoring equipment at Site 1 are given on Figure 2-2. A Sigma automatic sequential stormwater sampler with integral flow meter (Model 900MAX) was installed inside an insulated equipment shelter on the top of the headwall structure. Sensor cables and sample tubing were extended from the equipment shelter through a 3-inch PVC conduit to protect the sensor cables and sample tubing from mowing and other maintenance activities for the pond. The sample tubing was extended, using a "T", into each of the two 84-inch RCPs so that samples could be collected simultaneously from each of the two inflow pipes. The flow sensor was extended into the northern RCP, and the area-velocity (AV) flow probe was mounted to the bottom of the northern 84-inch RCP to prevent movement or vibration of the probe which may interfere with flow measurements.



a. Autosampler Location

b. Twin 84-inch RCPs from Residential Treatment Ponds

c. Sample Intake Tubing

d. Channel to Treatment Area

Figure 2-2. Monitoring Equipment at Site 1.

The autosampler provided a continuous measurement of inflows into the channel under both storm event and baseflow conditions, as well as collect flow-weighted samples of the inflow over a wide range of flow conditions. The internal flow meter within the autosampler was programmed to provide a continuous record of discharges into the pond, with measurements stored into internal memory at 10-minute intervals. The autosampler used at this site contained a single 20-liter polyethylene bottle and was programmed to collect samples in a flow-weighted mode, with 500-ml aliquots pumped into the collection bottle with every programmed increment of discharge. Since 120 VAC power was not available at the site, the automatic sampler was operated on 12 VDC batteries which were replaced on a periodic basis.

Discharge measurement at Site 1 were conducted using an area-velocity (AV) flow probe which provided simultaneous measurements of water depth and water velocity. The measured water depth was converted into a cross-sectional area based upon the geometry of the RCP and the depth of water. Discharge was then calculated using the Continuity Equation:

$$\boldsymbol{Q = V \times A}$$

where: Q = discharge in cubic feet per second (cfs)
A = cross-sectional area of the channel (square feet, ft^2)
V = flow velocity (feet per second, fps)

Field measurements recorded by the autosampler were verified manually by ERD during each weekly monitoring event by conducting manual measurements of discharge from both the northern and southern 84-inch RCPs.

2.1.2 North Oregon Street Roadside Swale - Site 1A

A supplemental monitoring site, designated as Site 1A, was established in the 30-inch RCP on the east side of North Oregon Street which introduces roadside swale drainage into the western inflow channel from areas south of the monitoring site. This site was included to evaluate the chemical characteristics of runoff entering the RSF from the roadside swale areas. Photographs of monitoring at Site 1A are given on Figure 2-3. Discharges at this site occurred as a result of both baseflow and storm event conditions. Monitoring was conducted manually during each of the weekly field visits to the RSF site. If discharge was occurring during a weekly site visit, the discharge of the inflow was measured, and a grab sample was collected for laboratory analyses. Inflows from this site enter the western inflow channel just downstream of the two 84-inch RCPs monitored at Site 1.

2.1.3 Bill Heard Chevrolet Detention Pond Inflow - Site 2

As discussed previously, inflows into the RSF also occur through three 54-inch RCPs which provide discharge from the large wet detention pond associated with the Bill Heard Chevrolet complex. Field monitoring at this site was conducted in the westernmost RCP which was used for collection of samples and measurement of discharge rates. Since each of the three 54-inch RCPs discharge from the same control structure, the chemical characteristics should be virtually identical. An aluminum equipment shelter was installed adjacent to the discharge point for the 54-inch RCPs. Sample collection tubing and flow probes were extended approximately 15 ft from the equipment shelter into the westernmost 54-inch RCP. Photographs of the monitoring equipment at Site 2 are given in Figure 2-4.

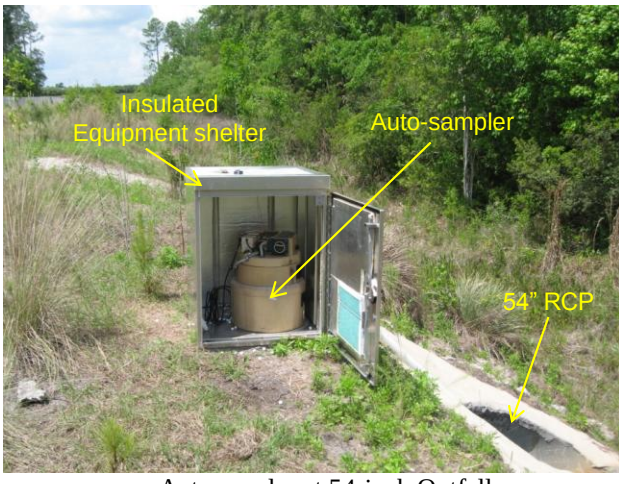
A Sigma automatic sequential stormwater sampler with integral flow meter (Model 900MAX) was installed inside the insulated aluminum equipment shelter. The flow probe and sample strainer were attached to a 4-inch x 36-inch x 0.5-inch thick steel plate which was attached to the bottom flow line of the stormsewer pipe. The integral flow meter in the stormwater sampler was programmed to provide a continuous record of discharges through the 54-inch RCP, with measurements stored into internal memory at 10-minute intervals. The automatic sampler contained a single 20-liter polyethylene bottle and was programmed to collect samples in a flow-weighted mode, with 500-ml aliquots pumped into the collection bottle with every programmed increment of discharge. Since 120 VAC power was not available at the site, the automatic sampler was operated on 12 VDC batteries which were replaced on a periodic basis. Discharge at this site was conducted using the Manning Equation based upon depth of flow within the 54-inch RCP and the pipe slope. Flow measurements recorded by the autosampler were verified manually by ERD during each weekly monitoring event by measuring the discharge at the outfall from the 54-inch RCP.

a. 30-inch RCP from Southern Roadside Swale

b. Low Flow (Baseflow) Conditions

c. Discharges from 30-inch RCP During Storm Conditions

Figure 2-3. Monitoring Site 1A.



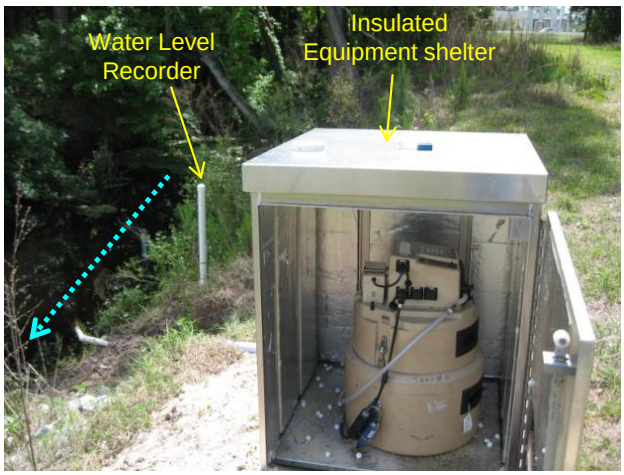
a. Autosampler at 54-inch Outfall

b. Flow Discharges into Wetland Treatment Area

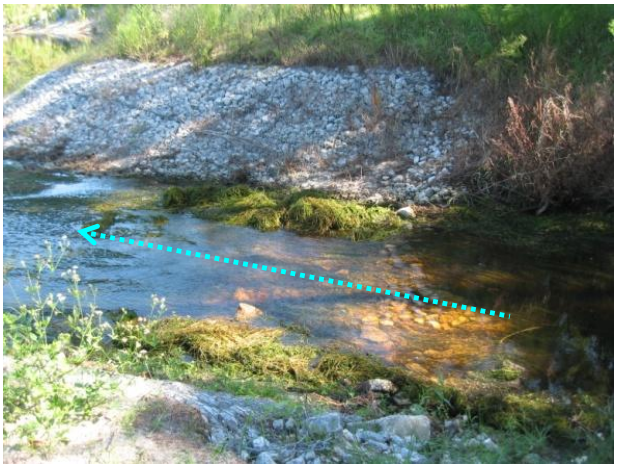
Figure 2-4. Monitoring Equipment at Site 2.

2.1.4 Lockhart-Smith Canal Inflow - Site 3

Inflows into the RSF from the Lockhart-Smith Canal were monitored on a continuous basis throughout the field monitoring program. As indicated on Figure 2-1, this site is designated as Site 3. An insulated equipment shelter was installed adjacent to the inflow channel, with sample tubing and flow probe wiring extended from the sampler into the adjacent channel. The sample tubing and flow probes were encased in a 3-inch PVC conduit which extended from the equipment shelter into the inflow channel to provide security for sample tubing and flow probes. The intake strainer and flow probe were mounted near the center of the channel on a 12-inch x 12-inch x 1-inch concrete pad. Photographs of monitoring equipment and site conditions at Site 3 are given in Figure 2-5.



a. Autosampler at Canal Inflow Monitoring Site



b. Flow Characteristics Under Baseflow Conditions

c. Flow Characteristics Under High Flow Conditions

d. Turbid Inflow Following Large Rain Event

Figure 2-5. Monitoring Equipment at the Lockhart-Smith Canal - Site 3.

The flow probe used at this site was an area-velocity (AV) probe which provided simultaneous measurements of water depth and water velocity, with discharge calculated using the Continuity Equation. Flow measurements recorded by the flow meter were verified manually by ERD during each weekly monitoring event by conducting manual measurements of discharge across the channel. Inflows through the Lockhart-Smith Canal initially enter the sump area where settling of larger particles is encouraged. Photographs of the sump area downstream from monitoring site 3 are given on Figure 2-6. The sump exhibited a wide range in water level elevations based upon whether low flow or high flow conditions were occurring at the time.

a. Sump Pond Under Low Flow Conditions

b. Sump Pond Under High Flow Conditions

Figure 2-6. Photographs of the Sump Area at Site 3.

2.1.5 Detention Pond Inflow - Site 4

As discussed previously, the RSF receives inflows from two separate dry detention ponds located on the northwest and northeast sides of the treatment area. Field monitoring was conducted in the larger of the two ponds which is located on the northwest corner of the treatment area. The detention pond receives inflow from a 30-inch RCP, with discharge into the RSF occurring through a 30-inch RCP connected to the outfall structure. The pond is equipped with a series of underdrains designed to provide water level control within the pond.

Photographs of monitoring equipment installed at Site 4 are given in Figure 2-7. An insulated aluminum equipment shelter was installed on top of the outfall structure and housed an automatic sampler to provide a continuous record of discharges from the pond and to collect flow-weighted composite samples on a continuous basis. A 3-inch PVC conduit was extended from the equipment shelter into the outfall structure to protect the sample tubing and flow probe wiring.

A Sigma automatic sequential stormwater sampler with integral flow meter (Model 900MAX) was installed inside the insulated aluminum equipment shelter. The flow probe and sample strainer were attached to the bottom of the 30-inch RCP outfall. The internal flow meter in the stormwater sampler was programmed to provide a continuous record of discharges through the 30-inch RCP, with measurements stored into internal memory at 10-minute intervals. The automatic sampler contained a single 20-liter polyethylene bottle and was programmed to collect samples in a flow-weighted mode, with 500-ml aliquots pumped into the collection bottle with every programmed increment of discharge. Since 120 VAC power was not available at this site, the automatic sampler was operated on 12 VDC batteries which were replaced on a periodic basis.

a. Overview of Pond, Inflow, and Outflow

b. Autosampler Mounted on Outfall Structure

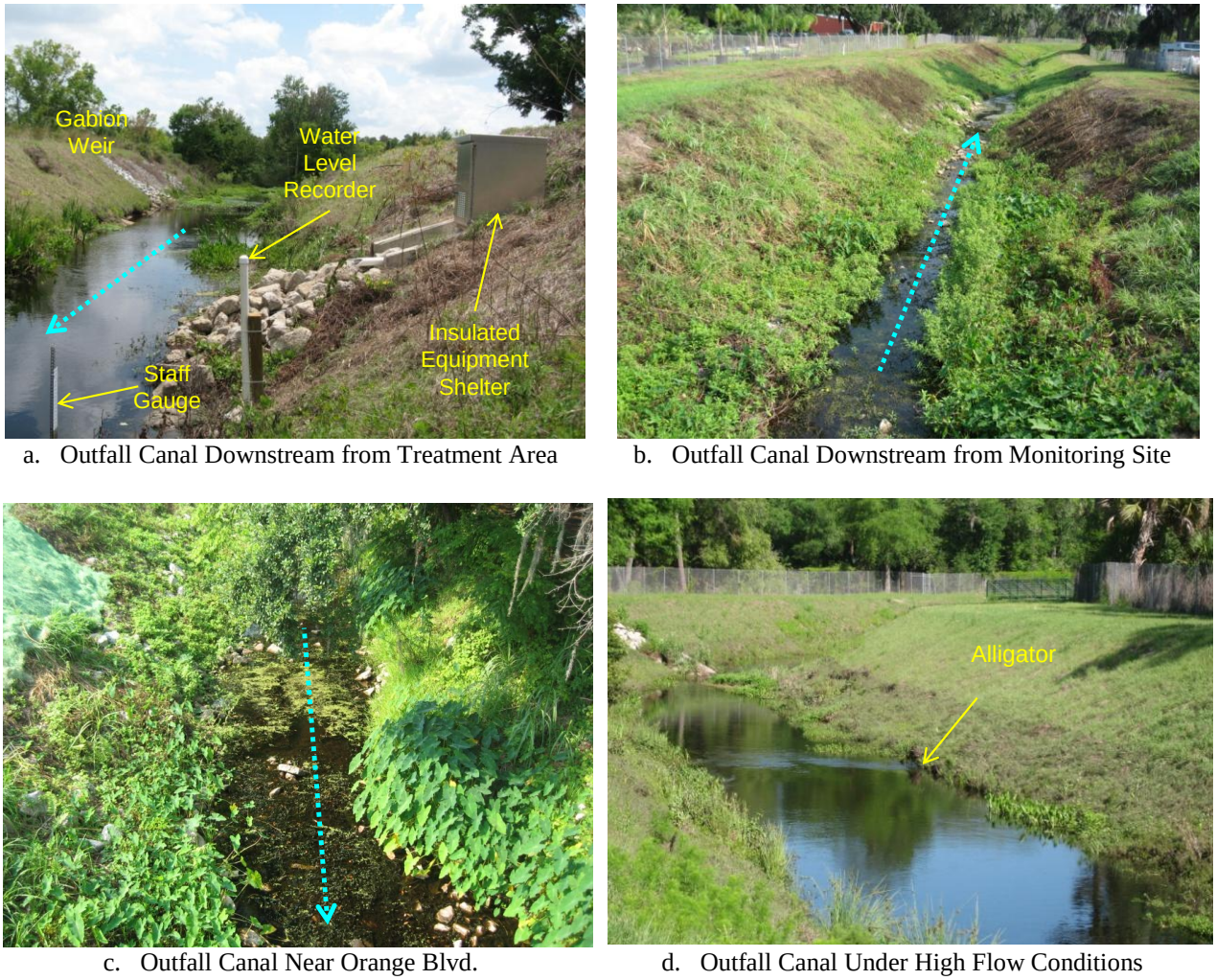
Figure 2-7. Monitoring Equipment at Site 4.

Discharge measurements at this site were conducted using the Manning Equation and a water level depth probe. The water level measured by the probe was converted into a discharge rate using the Manning Equation based upon the geometry and slope of the monitored RCP. Manual discharge measurements were conducted during each weekly site visit to verify the recorded discharge rates.

2.1.6 Lockhart-Smith Outfall Canal - Site 5

Discharges from the RSF were monitored in the Lockhart-Smith outfall canal approximately 250 ft downstream from the treatment area and 120 ft downstream from the gabion weir structure. Photographs of monitoring equipment and general conditions at Site 5 are given on Figure 2-8. An insulated aluminum equipment shelter was installed adjacent to the outflow canal, and sample tubing and flow probe wiring was extended from the shelter to the center of the channel. The sample tubing and wiring was extended from the equipment shelter through a 3-inch PVC conduit which provided protection from maintenance and mowing activities. The sample strainer and flow probe were mounted on a 12-inch x 12-inch x 2-inch thick concrete block which was embedded into the bottom of the discharge channel.

A Sigma automatic sequential stormwater sampler with integral flow meter (Model 900MAX) was installed inside the insulated aluminum equipment shelter. The internal flow meter in the stormwater sampler was programmed to provide a continuous record of discharges through the outfall canal, with measurements stored into internal memory at 10-minute intervals. The automatic sampler contained a single 20-liter polyethylene bottle and was programmed to collect samples in a flow-weighted mode, with 500-ml aliquots pumped into the collection bottle with every programmed increment of discharge. Since 120 VAC power was not available at the site, the automatic sampler was operated on 12 VDC batteries which were replaced on a periodic basis.



a. Outfall Canal Downstream from Treatment Area

b. Outfall Canal Downstream from Monitoring Site

c. Outfall Canal Near Orange Blvd.

d. Outfall Canal Under High Flow Conditions

Figure 2-8. Photographs of Monitoring Conducted at Site 5.

The flow probe installed at Site 5 consisted of an area-velocity (AV) probe which provided simultaneous measurements of water depth and flow velocity. The water depth was converted into a cross-sectional area based upon the geometry of the channel, and discharge was calculated using the Continuity Equation. Flow measurements recorded by the autosampler were verified by ERD during each weekly monitoring event by conducting a manual discharge measurement in the outfall canal. A water level recorder and staff gauge were also installed at this site to provide supplemental hydrologic information.

2.1.7 Hydrologic Instrumentation

In addition to the inflow and outflow monitoring sites discussed previously, hydrologic instrumentation was also installed at the site to provide information on rainfall, water levels, and evaporation during the field monitoring program. Locations of installed hydrologic instrumentation are indicated on Figure 2-1. The additional hydrologic equipment included a rain gauge, pan evaporimeter, and three sets of digital water level recorders and staff gauges.

Rainfall was monitored using a continuous rainfall recorder which was attached to a 4-inch x 4-inch wooden post near monitoring Site 1. The location of the rainfall recorder is indicated on Figures 2-1 and 2-2. The rainfall recorder (Texas Electronics Model 1014-C) produced a continuous record of all rainfall which occurred at the site, with a resolution of 0.01 inch. Rainfall data were stored inside a digital storage device (Hobo Event Rainfall Logger) which was also attached to the wooden post inside a waterproof enclosure. The rainfall record is used to provide information on general rainfall characteristics in the vicinity of the monitoring sites and to assist in completing the hydrologic budget for the pond.

In addition to the rainfall recorder, a Class A pan evaporimeter was also installed adjacent to monitoring Site 1. Measurements of water level within the evaporation pan were recorded on a continuous basis using a sensitive digital water level recorder. The recorded evaporation losses are corrected for measured rainfall and used to provide estimates of evaporation from the pond surface during the field monitoring program.

Digital water level recorders (Global Water Model WL16) and staff gauges were installed at each of the three locations indicated on Figure 2-1 to provide continuous measurements of water levels in the treatment area during the monitoring program. This information is used to assist in completing the hydrologic budget for the pond and to corroborate and verify elevations and corresponding discharge measurements recorded by the stormwater samplers.

2.1.8 Monitoring Activities

ERD field personnel visited each Lockhart-Smith RSF site at least once each week to retrieve collected stormwater, baseflow, and outflow samples and to download stored hydrologic data from the inflow and outflow automatic samplers as well as the additional hydrologic instrumentation. Readings of staff gauge levels were also conducted during each weekly visit. Data collected during each weekly visit were evaluated for quality control purposes and, if acceptable, compiled into a continuous data set for use in evaluating the hydrologic performance efficiency of the system.

2.2 Field Measurements

During each weekly monitoring visit, field measurements of pH, temperature, specific conductivity, dissolved oxygen, and oxidation-reduction potential (ORP) were conducted at each of the field monitoring sites using a Hydrolab Datasonde 4a water quality monitor. Field measurements were conducted at approximately mid-depth in the water column.

2.3 Laboratory Analyses

A summary of laboratory methods and MDLs for analyses conducted on water samples collected during this project is given in Table 2-1. All laboratory analyses were conducted in the ERD Laboratory which is NELAC-certified (No. E1031026). Details on field operations, laboratory procedures, and quality assurance methodologies are provided in the Quality Assurance Project Plan (QAPP), outlining the specific field and laboratory procedures to be conducted for this project, were submitted to and approved by FDEP prior to initiation of any field and laboratory activities.

TABLE 2-1

ANALYTICAL METHODS AND DETECTION LIMITS FOR LABORATORY ANALYSES

PARAMETER	METHOD OF ANALYSIS	METHOD DETECTION LIMITS (MDLs)[1]
pH	SM-21, Sec. 4500-H^+ B[2]	N/A
Conductivity	SM-21, Sec. 2510 B	0.2 μmho/cm
Alkalinity	SM-21, Sec. 2320 B	0.5 mg/l
Ammonia	SM-21, Sec. 4500-NH_3 G	0.005 mg/l
NO_x	SM-21, Sec. 4500-NO_3 F	0.005 mg/l
Total Nitrogen	SM-21, Sec. 4500-N C	0.01 mg/l
Ortho-P	SM-21, Sec. 4500-P F	0.001 mg/l
Total Phosphorus	SM-21, Sec. 4500-P B.5	0.001 mg/l
Turbidity	SM-21, Sec. 2130 B	0.3 NTU
Color	SM-21, Sec. 2120 C	1 Pt-Co Unit
TSS	SM-21, Sec. 2540 D	0.7 mg/l

1. MDLs are calculated based on the EPA method of determining detection limits
2. Standard Methods for the Examination of Water and Wastewater, 21st Ed., 2005.

2.4 Routine Data Analysis and Compilation

All data generated during this project, including hydrologic, hydraulic, and water quality information, were entered into a computerized database and double-checked for accuracy. Hydrologic and hydraulic information was tabulated and summarized on monthly intervals. This information is used to develop a hydrologic budget for the pond for use in evaluating system performance.

Data collected during this project were analyzed using a variety of statistical methods and software. Simple descriptive statistics were generated for runoff inflow, pond outflow, rainfall, and pond water levels to examine changes in water quality characteristics and system performance throughout the research period. The majority of these analyses were conducted using statistical procedures available in Excel.

Statistical procedures such as multiple regression or analysis of variance (ANOVA) were also conducted to examine predicted relationships between water quality characteristics and hydrologic or hydraulic factors, such as pond water elevation, antecedent dry period, cumulative event rainfall, and other variables. The majority of these analyses were conducted using the SAS (Statistical Analysis System) package.

Distribution patterns for the inflow, outflow, and bulk precipitation data sets were evaluated using both normal probability and log probability plots. These analyses indicated that the data most closely observe a log-normal distribution which is commonly observed with environmental data. As a result, statistical analyses were conducted using log transformations of each of the data sets. The data were then converted back to untransformed data at the completion of the statistical analyses.

SECTION 3

RESULTS

Field monitoring, sample collection, and laboratory analyses were conducted by ERD over a 24-month period from April 1, 2010-March 31, 2012 to evaluate the hydrologic and pollutant removal efficiencies of the Lockhart-Smith RSF. A discussion of the results of these efforts is given in the following sections.

3.1 Site Hydrology

3.1.1 Rainfall

A continuous record of rainfall characteristics was collected at the Lockhart-Smith RSF site from April 1, 2010-March 31, 2012 using a tipping bucket rainfall collector with a resolution of 0.01 inch and a digital data logging recorder. During the field monitoring program, information was collected for each monitored event which included event start time, event end time, event rainfall, event duration, average rainfall intensity, and antecedent dry period. However, due to the large amount of data which was generated, rainfall is summarized on a daily basis for the 24-month field monitoring program.

A tabular summary of measured daily rainfall at the Lockhart-Smith RSF site from April 1, 2010-March 31, 2012 is given on Table 3-1. A total of 83.79 inches of rainfall was recorded at the monitoring site during the 24-month field monitoring program. Measured daily rainfall amounts at the Lockhart-Smith RSF site ranged from 0.01-4.98 inches.

A comparison of measured and typical "average" rainfall in the vicinity of the Lockhart-Smith RSF site is given on Figure 3-1. Measured monthly rainfall presented in this figure is based upon the field measured rain events at the Lockhart-Smith RSF site provided on Table 3-1 and summarized on a monthly basis. "Average" rainfall conditions are based upon historical average monthly rainfall recorded at the Sanford Experimental Station (Site 087982) over the 30-year period from 1971-2000. The Sanford experimental Station is located at the City of Sanford Wastewater Treatment Facility located approximately 3.5 miles east of the Lockhart-Smith RSF site. Historical average annual rainfall at this site from 1971-2000 is 52.30 inches/year.

As seen on Figure 3-1, measured rainfall in the vicinity of the Lockhart-Smith RSF site was less than "normal" during 21 of the 24 months included in the field monitoring program. Higher than "normal" rainfall was observed at the Lockhart-Smith RSF site only during the months of January 2011, March 2011, and October 2011.

TABLE 3-1

MEASURED DAILY RAINFALL AT THE LOCKHART-SMITH RSF SITE FROM APRIL 1, 2010 - MARCH 31, 2012

DAY	2010									2011												2012		
	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1			0.24	0.99	0.25				0.01			0.66			0.28	0.41	0.91	0.04						
2			0.08	0.17	0.03			1.34									0.39							
3			0.70	2.56				0.11	0.01															0.17
4			0.51	0.36				0.66				0.38		0.02		0.08			4.98	0.02				0.25
5		0.25	0.01	0.64	0.64	0.09			0.03	0.48	0.08		0.82			0.07	0.01	0.04	0.03	0.01			0.04	
6		0.06		0.01		0.37				0.28	0.15			0.01				0.34		0.04			0.16	
7			0.43		0.76						0.28					1.79		0.19	1.01					
8					0.99	1.87			0.01							0.36	0.42		3.43					
9	0.18			0.14	0.11	0.39						0.42				0.07	0.78	0.19	0.98					0.01
10					0.02	0.02				0.27	0.07	0.39				0.10	1.11		0.05				0.79	0.67
11				0.12	0.37											0.03	0.23		0.02		0.25	0.11	0.01	0.40
12	0.03			0.05	0.04	0.61			0.04				0.10				0.04				0.13			
13				0.01	0.02											0.02					0.01		0.03	
14				0.96										0.33	0.13	0.01	0.09			0.02				
15			0.06	0.06										0.02		0.33	0.01	0.03		0.05				0.01
16		0.08	0.15		0.08			0.06		0.10							0.02							
17		1.34	0.03		0.02					1.55					0.26		0.09	0.01	0.03				0.16	
18	0.05	0.22	0.05						0.18			0.24			0.05		1.32	0.48	0.04			0.04		
19	0.06		1.57		0.03								0.01				0.01	0.02	0.06				0.02	
20	0.02		0.06		0.03					1.02								0.14						
21	0.49		0.48		0.87	0.06		0.01		0.59								0.12						0.06
22					0.95											0.87	0.03	1.53					0.48	
23				0.04	0.02	0.01			0.02						0.28		0.40	1.59						0.03
24				0.01	0.32	0.66									0.27	0.17	0.03							0.13
25	1.37	0.13			0.21				0.06	1.33			0.02		0.90		0.14	0.16			0.02			
26	0.24		0.01		0.01			0.11		0.03					0.02		0.08	0.05			0.02		0.27	
27					0.13	0.03		0.10					0.05	0.84	1.09	0.03					0.04	0.02	0.03	
28	0.01			0.10	0.03	0.74	0.02				0.04	1.32			0.18	0.11			0.10	0.08				
29		0.11		0.06	0.05			0.10							0.13	0.02	0.01	0.05	0.01	0.01				
30		0.03										0.32			1.40		0.72		0.04					
31		0.33										4.46				0.07			1.03					
Total	**2.45**	**2.55**	**4.38**	**6.28**	**5.98**	**4.85**	**0.02**	**2.49**	**0.36**	**5.65**	**0.62**	**8.19**	**1.00**	**1.22**	**4.99**	**4.54**	**6.84**	**4.98**	**11.81**	**0.23**	**0.47**	**0.17**	**1.99**	**1.73**

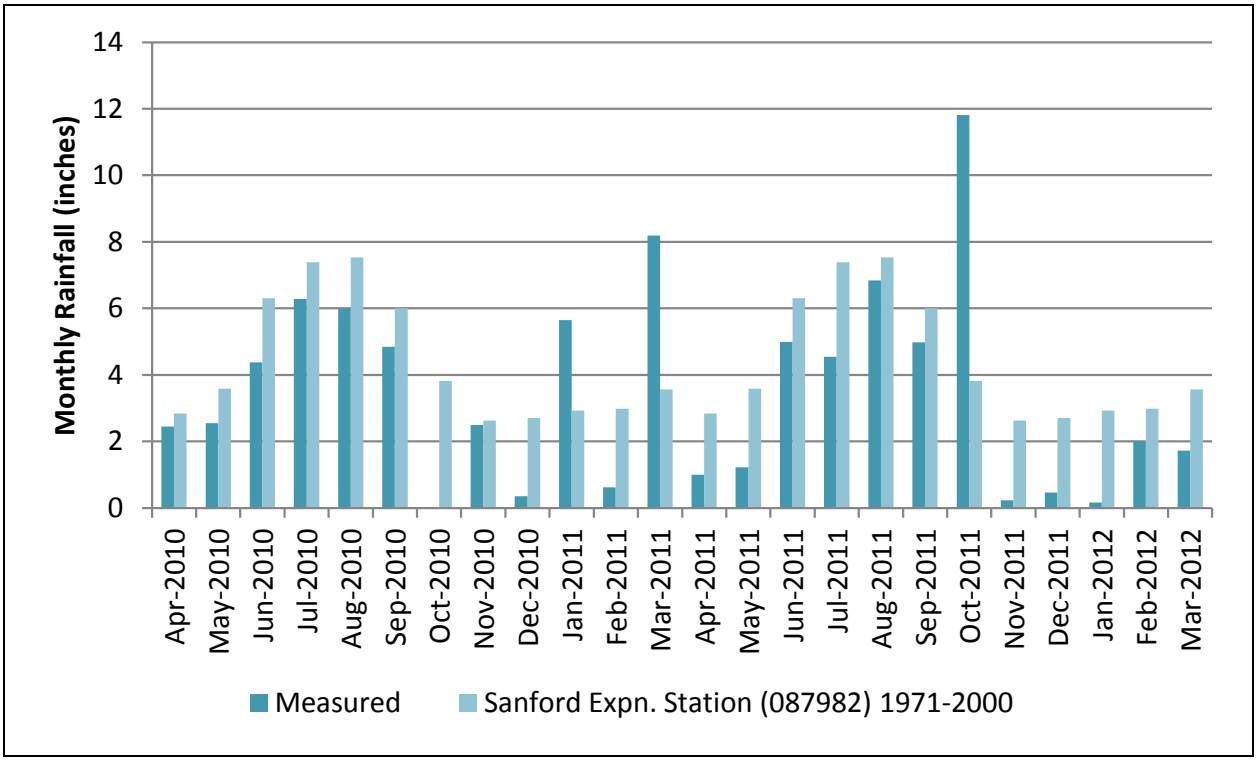


Figure 3-1. Comparison of "Average" and Measured Rainfall in the Vicinity of the Lockhart-Smith RSF Site.

A tabular comparison of measured and "average" rainfall for the Lockhart-Smith RSF site is given in Table 3-2. During the 24-month field monitoring program, a total of 83.79 inches of rainfall was recorded at the Lockhart-Smith RSF site. This value is approximately 20.81 inches less than the "normal" rainfall of 104.60 inches which would typically occur in the Sanford area during the field monitoring program. Overall, the measured rainfall at the Lockhart-Smith RSF site during the field monitoring program is approximately 20% less than the "normal" rainfall typically expected in the Sanford area during the 24-month monitoring program.

A summary of calculated hydrologic inputs to the Lockhart-Smith RSF from direct precipitation is given in Table 3-3. These inputs were calculated by multiplying the measured total monthly rainfall times the surface area of 24.4 acres for the treatment area at the normal water level of 15.0 ft, as summarized in Table 1-2. Calculated hydrologic inputs to the Lockhart-Smith RSF from direct precipitation range from a low of 0.04 ac-ft during October 2010 to a high of 24.0 ac-ft during October 2011, with an overall input of 170.4 ac-ft during the 24-month field monitoring program. The values summarized in Table 3-3 are utilized in a subsequent section to develop a hydrologic budget for the RSF.

TABLE 3-2

SUMMARY OF MEASURED AND "AVERAGE" RAINFALL FOR THE LOCKHART-SMITH RSF SITE FROM APRIL 2010 - MARCH 2012

YEAR	MONTH	MEAN MONTHLY RAINFALL[1] (inches)	MEASURED SITE RAINFALL[2] (inches)	YEAR	MONTH	MEAN MONTHLY RAINFALL[1] (inches)	MEASURED SITE RAINFALL[2] (inches)
2010	April	2.84	2.45	2011	April	2.84	1.00
	May	3.59	2.55		May	3.59	1.22
	June	6.31	4.38		June	6.31	4.99
	July	7.39	6.28		July	7.39	4.54
	August	7.53	5.98		August	7.53	6.84
	September	6.00	4.85		September	6.00	4.98
	October	3.82	0.02		October	3.82	11.81
	November	2.63	2.49		November	2.63	0.23
	December	2.71	0.36		December	2.71	0.47
2011	January	2.93	5.65	2012	January	2.93	0.17
	February	2.98	0.62		February	2.98	1.99
	March	3.57	8.19		March	3.57	1.73
					TOTAL:	**104.60**	**83.79**

1. Measured at the Sanford Experimental Station from 1971-2000
2. Measured at the Lockhart-Smith RSF site from April 2010-March 2012

TABLE 3-3

SUMMARY OF HYDROLOGIC INPUTS TO THE LOCKHART-SMITH RSF SITE FROM DIRECT RAINFALL DURING THE PERIOD FROM APRIL 2010 - MARCH 2012

YEAR	MONTH	MEASURED RAINFALL[1] (inches)	VOLUME (ac-ft)	YEAR	MONTH	MEASURED RAINFALL[1] (inches)	VOLUME (ac-ft)
2010	April	2.45	4.98	2011	April	1.00	2.03
	May	2.55	5.19		May	1.22	2.48
	June	4.38	8.90		June	4.99	10.1
	July	6.28	12.8		July	4.54	9.2
	August	5.98	12.2		August	6.84	13.9
	September	4.85	9.9		September	4.98	10.1
	October	0.02	0.04		October	11.81	24.0
	November	2.49	5.06		November	0.23	0.47
	December	0.36	0.73		December	0.47	0.96
2011	January	5.65	11.5	2012	January	0.17	0.35
	February	0.62	1.26		February	1.99	4.05
	March	8.19	16.7		March	1.73	3.52
					TOTAL:	**83.79**	**170.4**

1. Based on a treatment surface area of 28.1 acres

3.1.2 Water Level Elevations

Water surface elevations were monitored at three separate locations in the Lockhart-Smith RSF on a continuous basis from April 2010-March 2012 using a sensitive water level pressure transducer with a digital data logger. As discussed in Section 2, water level recorders were installed at monitoring Sites 1, 3, and 5 to evaluate pond responses to common rain events within the watershed and to assist in quantifying water inflows and outflows from the system.

A graphical summary of fluctuations in water levels at monitoring Sites 1, 3, and 5 from April 2010-March 2012 is given in Figure 3-2. Total daily rainfall is also summarized on this figure to illustrate relationships between water surface elevations and monitored rainfall events. In general, recorded water level elevations at the western inflow channel (Site 1) and the Lockhart-Smith inflow canal (Site 3) appear to be relatively similar during the field monitoring program. Recorded water level elevations at the outfall canal (Site 5) appear to be approximately 1 ft lower than the recorded inflow elevations.

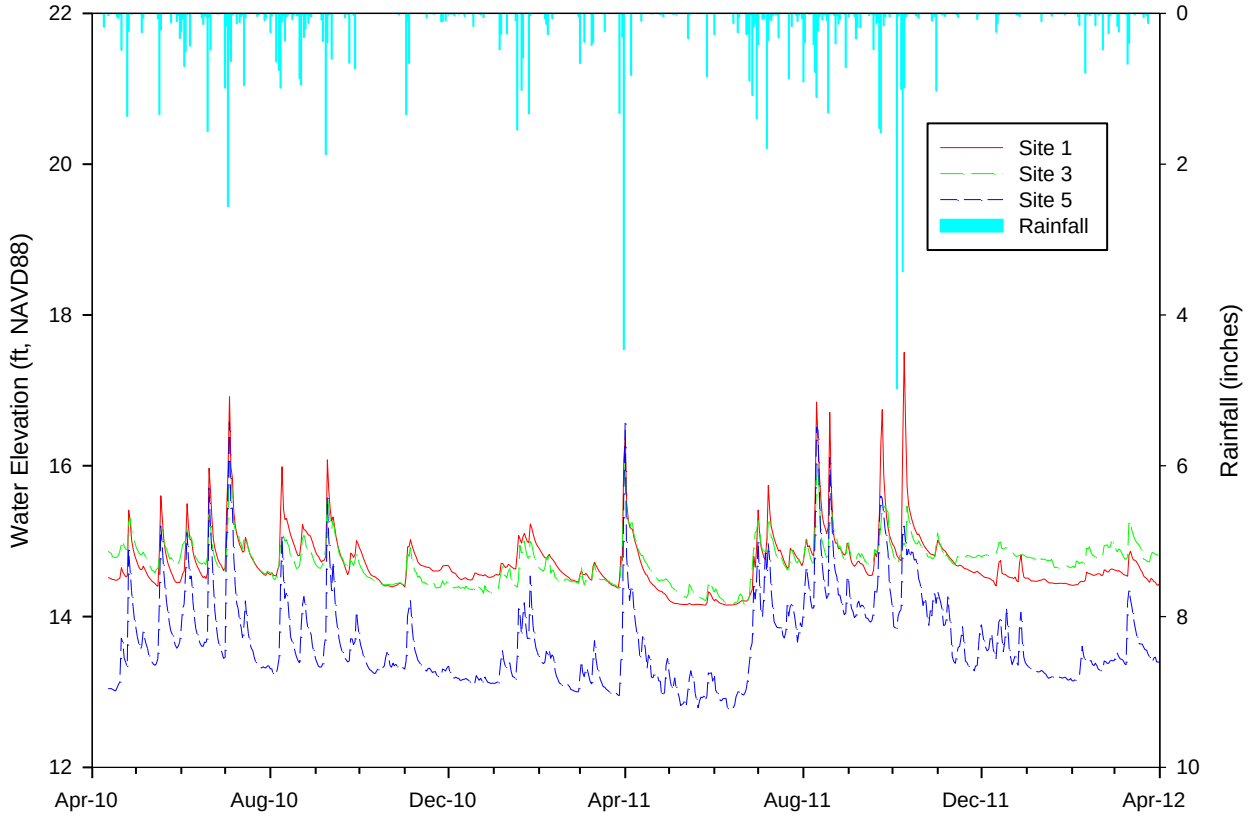


Figure 3-2. Comparison of Recorded Water Level Elevations for Significant Inflows and Outflows for the Lockhart-Smith RSF from April 2010-March 2012.

Measured minimum, maximum, and mean surface water elevations at Sites 1, 3, and 5 during the field monitoring program are summarized on Table 3-4. In general, recorded mean water elevations at Sites 1 and 3 appear to be virtually identical during the field monitoring program. The western inflow channel exhibited a maximum change in water elevation of approximately 2.78 ft during the field monitoring program, with a maximum water elevation change of 1.93 ft recorded at Site 3. In general, water level elevations recorded in the Lockhart-Smith outfall canal (Site 3) were lower in value throughout virtually all of the field monitoring program than elevations observed at Sites 1 or 3. The mean water surface elevation of 13.67 ft observed in the outfall canal is approximately 1.05 ft lower than water level elevations measured at Sites 1 or 3. During the field monitoring program, water level elevations at Site 5 exhibited a maximum change in elevation of 3.81 ft.

TABLE 3-4

SUMMARY OF RECORDED WATER LEVEL DATA FOR SIGNIFICANT INFLOWS AND OUTFLOWS

PARAMETER	WESTERN CHANNEL INFLOW (Site 1)	LOCKHART-SMITH CANAL INFLOW (Site 3)	LOCKHART-SMITH CANAL OUTFLOW (Site 5)
Minimum Elevation	14.15	14.13	12.77
Maximum Elevation	17.50	16.06	16.58
Mean Elevation	14.72	14.73	13.67
Maximum Change in Elevation	2.78	1.93	3.81

3.1.3 Pond Inflows

3.1.3.1 Western Channel Inflow - Site 1

A continuous inflow hydrograph was recorded at the 84-inch RCPs which discharge into the western inflow channel over the period from April 2010-March 2012. As discussed in Section 2, continuous discharge measurements were collected only in the northernmost RCP. Inflow hydrographs were estimated for the southern 84-inch RCP inflow based upon the ratio of the manual field measurements conducted at the north and south 84-inch RCPs during each of the weekly field visits. The recorded hydrograph for the northern RCP was multiplied by the ratio of measurements collected in the southern RCP to measurements collected in the northern RCP to provide an estimated inflow hydrograph for the southern RCP. In addition to the continuous inflow hydrograph, information was also generated for each of the two RCPs for total daily inflow volume and cumulative inflow volume for the period of record.

A graphical summary of the field monitored inflow hydrograph for the northern RCP and the simulated hydrograph for the southern 84-inch RCP at Site 1 is given in Figure 3-3. In general, inflows from both the northern and southern RCPs were typically less than approximately 2-3 cfs throughout a majority of the field monitoring program. Significant peaks in discharge rates, extending to values of approximately 6 cfs or greater, were observed on several occasions as a result of significant single events or cumulative multiple daily events. During periods of low rainfall, a relatively consistent baseflow was observed of approximately 0.5 cfs or less, reflecting the bleed-down of the pond system associated with the residential development west of North Oregon Street. In general, it appears that discharges through the southern 84-inch RCP appear to be somewhat less than measured in the northern RCP due to an accumulation of sand and silt in the southern RCP.

Estimates of monthly inflows into the western inflow channel from the two 84-inch RCPs were generated by integrating the inflow hydrographs summarized on Figure 3-3 on a monthly basis. A summary of monthly inflow volumes into the Lockhart-Smith RSF from the northern and southern 84-inch RCPs is given on Table 3-5. Monthly inflow volumes from the 84-inch RCPs ranged from a low of 0.40 ac-ft during May 2011 to a high of 184 ac-ft during August 2011. During the 24-month field monitoring program, Site 1 contributed approximately 1,597 ac-ft of water to the Lockhart-Smith RSF, with approximately two-thirds contributed by the northern 84-inch RCP and one-third contributed by the southern 84-inch RCP.

TABLE 3-5

SUMMARY OF HYDROLOGIC INPUTS TO THE LOCKHART-SMITH RSF SITE FROM SITE 1 DURING THE PERIOD FROM APRIL 2010 - MARCH 2012

YEAR	MONTH	MONTHLY INPUTS (ac-ft)			YEAR	MONTH	MONTHLY INPUTS (ac-ft)		
		Site 1-North	Site 1-South	Total			Site 1-North	Site 1-South	Total
2010	April	36.9	17.5	54.4	2011	April	44.6	29.9	74.5
	May	36.0	17.4	53.4		May	0.40	0.0	0.40
	June	57.7	33.3	91.0		June	5.83	3.6	9.43
	July	78.8	50.2	129		July	64.2	31.6	95.9
	August	71.4	33.8	105		August	107	77.0	184
	September	64.7	35.1	99.8		September	74.1	61.1	135
	October	22.8	2.45	25.2		October	75.3	46.0	121
	November	37.8	5.48	43.3		November	39.7	18.3	58.0
	December	23.8	0.08	23.9		December	24.6	14.6	39.1
2011	January	53.0	18.1	71.1	2012	January	16.6	4.87	21.5
	February	31.3	5.13	36.4		February	21.7	10.8	32.6
	March	30.8	9.6	40.4		March	32.1	19.5	51.6
						TOTAL:	**1,051**	**545**	**1,597**
						Percent of Total:	**66**	**34**	**100**

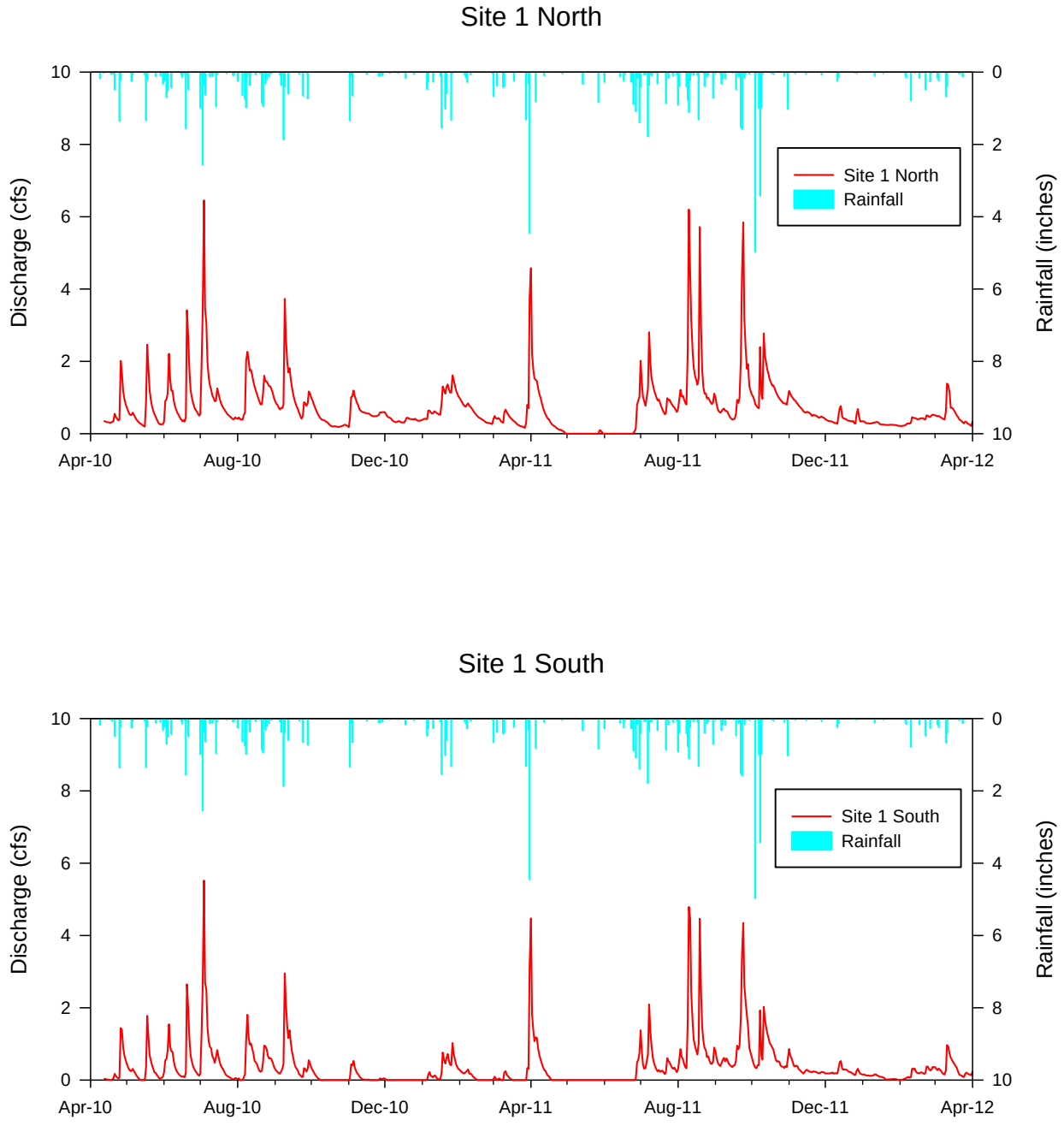


Figure 3-3. Inflow Hydrographs for the Two 84-inch RCPs Discharging into the Western Inflow Channel.

3.1.3.2 North Oregon Street Drainage Swale - Site 1A

As discussed in Section 2, supplemental field monitoring was conducted at the 30-inch RCP which discharges roadside swale drainage from the eastern side of North Oregon Street and south of the western inflow channel. No autosampler was installed at this site, so discharge measurements were collected manually during each weekly field visit to the Lockhart-Smith RSF. The weekly field measurements collected at this site were used to develop a simulated inflow hydrograph by scaling the inflow hydrographs measured at Site 1 based upon the ratio of manual field measurements collected at Site 1A to measurements collected at Site 1. This simulated hydrograph was used to estimate annual volumetric inputs from the roadside swale system.

A graphical summary of the simulated inflow hydrograph for the 30-inch RCP at Site 1A is given on Figure 3-4. In general, inflows into the Lockhart-Smith RSF from this site are typically less than approximately 1 cfs, with the exception of several inflows approaching 2-3 cfs during periods of significant rain events.

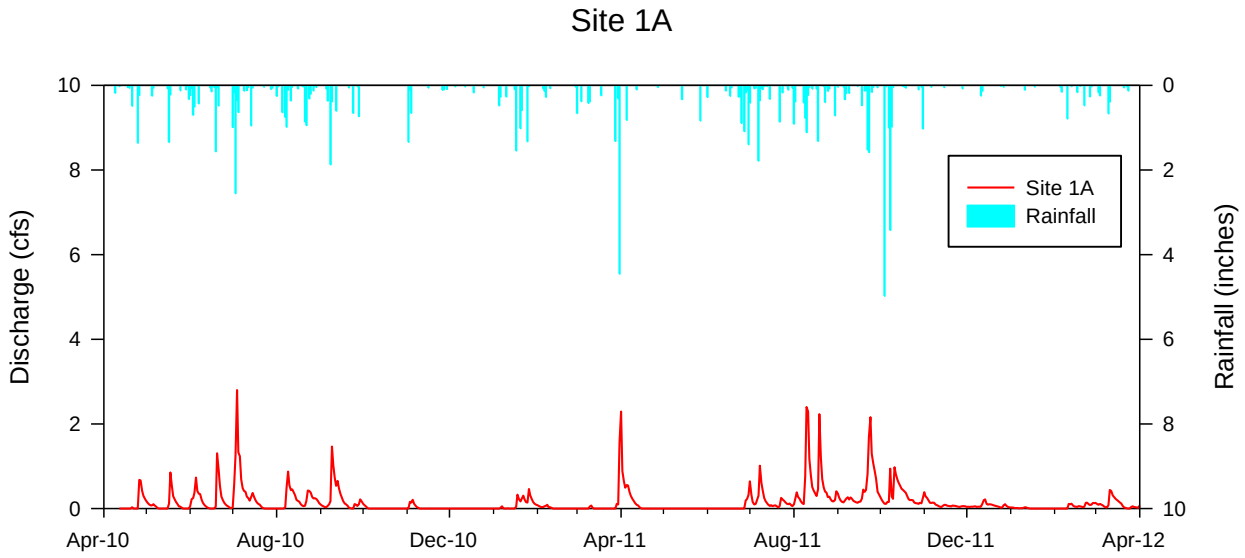


Figure 3-4. Inflow Hydrograph for the 30-inch RCP Roadside Swale.

A summary of estimated monthly inflow volumes to the western channel from the 30-inch RCP roadside swale inflow is given on Table 3-6. Estimated monthly inflows from this site are highly variable, ranging from 0.0 ac-ft during May 2011 to 36.0 ac-ft during August 2011. Overall, this site contributed approximately 223 ac-ft of runoff to the Lockhart-Smith RSF during the field monitoring program, approximately 14% of the volume contributed by the two 84-inch RCPs at Site 1.

TABLE 3-6

SUMMARY OF HYDROLOGIC INPUTS TO THE LOCKHART-SMITH RSF SITE FROM SITE 1A DURING THE PERIOD FROM APRIL 2010 - MARCH 2012

YEAR	MONTH	MONTHLY INPUTS (ac-ft)	YEAR	MONTH	MONTHLY INPUTS (ac-ft)
2010	April	7.25	2011	April	13.6
	May	6.24		May	0.00
	June	13.6		June	1.47
	July	22.7		July	12.4
	August	13.9		August	36.0
	September	14.4		September	28.3
	October	0.52		October	19.9
	November	1.46		November	5.87
	December	0.00		December	4.14
2011	January	6.41	2012	January	0.38
	February	1.03		February	3.06
	March	3.78		March	6.68
				TOTAL:	**223**

3.1.3.3 Bill Heard Pond Inflow - Site 2

As discussed in Section 2, field monitoring was conducted at the triple 54-inch RCPs which discharge from the wet detention pond associated with the Bill Heard complex located south of the Lockhart-Smith RSF. Flow monitoring and sample collection equipment were installed in the westernmost 54-inch RCP, and a continuous inflow hydrograph was recorded at this site over the period from April 2010-March 2012. Since the inverts of the three 54-inch RCPs were virtually identical, the inflow hydrograph measured at the westernmost RCP was multiplied by 3 to reflect inflows from the three 54-inch inflows. In addition to the continuous inflow hydrograph, information was also generated for total daily inflow volume and cumulative inflow volume over the period of record.

A graphical summary of the inflow hydrograph for the triple 54-inch RCPs at Site 2 is given on Figure 3-5. The combined inflows from the three 54-inch RCPs were typically less than approximately 1 cfs, with peaks extending to 1.5-2.0 cfs on several occasions as a result of significant single events or cumulative multiple daily events. During period of low rainfall, a relatively consistent baseflow was observed of approximately 0.5 cfs or less, reflecting the bleed-down of the wet detention pond.

A summary of estimated monthly inflows to the Lockhart-Smith RSF from the Bill Heard Chevrolet detention pond is given on Table 3-7. The values summarized in this table reflect the combined inflows from the three 54-inch RCPs. The values summarized in Table 3-7 were obtained by integrating the inflow hydrograph summarized on Figure 3-5 on a monthly basis. Estimated monthly inflows at Site 2 are highly variable, ranging from 0.0 ac-ft during May 2011 to 11.4 ac-ft during August 2011. Overall, inflows at this site contributed approximately 103 ac-ft of runoff to the Lockhart-Smith RSF during the field monitoring program.

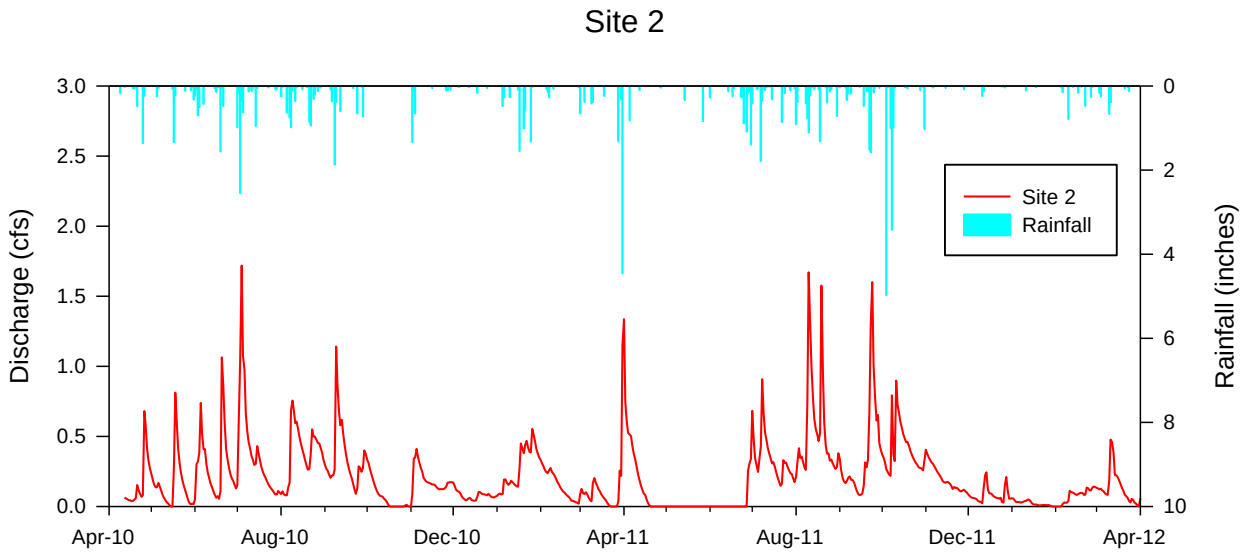


Figure 3-5. Inflow Hydrograph for the Three 54-inch RCPs Discharging into the Southern Side of the Lockhart-Smith RSF.

TABLE 3-7

SUMMARY OF HYDROLOGIC INPUTS TO THE LOCKHART-SMITH RSF SITE FROM SITE 2 DURING THE PERIOD FROM APRIL 2010 - MARCH 2012

YEAR	MONTH	MONTHLY INPUTS (ac-ft)	YEAR	MONTH	MONTHLY INPUTS (ac-ft)
2010	April	3.35	2011	April	4.36
	May	3.20		May	0.00
	June	6.02		June	0.60
	July	8.10		July	7.06
	August	7.89		August	11.4
	September	6.98		September	7.57
	October	1.46		October	8.42
	November	3.72		November	3.98
	December	1.62		December	1.71
2011	January	5.64	2012	January	0.47
	February	2.87		February	1.42
	March	2.39		March	2.77
				TOTAL:	**103**

3.1.3.4 Lockhart-Smith Canal Inflow - Site 3

A continuous inflow hydrograph was recorded at the Lockhart-Smith Canal inflow site over the period from April 2010-March 2012. A graphical summary of the field monitored inflow hydrograph for the Lockhart-Smith Canal inflow is given on Figure 3-6. Inflows monitored at this site were highly variable throughout the field monitoring program. In general, the majority of discharge rates were approximately 60 cfs or less, although inflow rates of approximately 100 cfs were observed on multiple occasions as a result of significant single events or cumulative daily events. During periods of low rainfall, a relatively consistent baseflow was observed of approximately 1-5 cfs or less, reflecting bleed-down of surface and groundwater from the contributing watershed area between events. Inflows at this site are substantially greater than inflows observed at monitoring Sites 1, 1A, or 2, indicating that the Lockhart-Smith Canal inflow is the dominant volumetric inflow into the system.

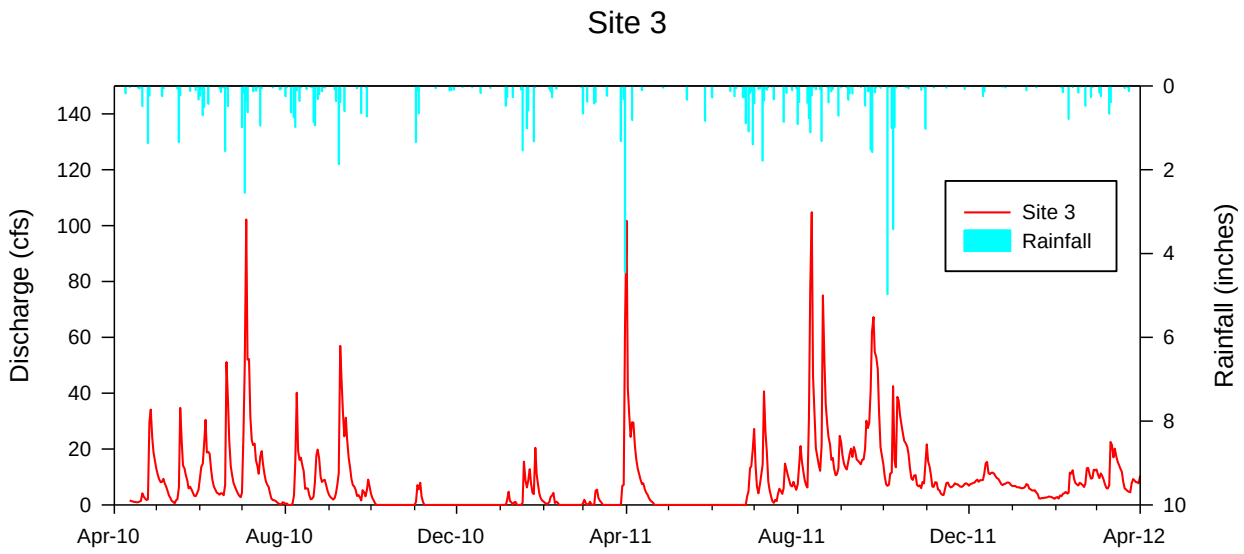


Figure 3-6. Inflow Hydrograph for the Lockhart-Smith Canal.

Estimates of monthly inputs into the Lockhart-Smith RSF from the inflow canal were generated by integrating the inflow hydrograph summarized on Figure 3-6 on a monthly basis. A tabular summary of estimated monthly inflow volumes into the Lockhart-Smith RSF from the inflow canal is given on Table 3-8. Monthly inflow volumes from the canal ranged from a low of 0 ac-ft during May 2011 to a high of 1,611 ac-ft during August 2011. During the 24-month field monitoring program, the inflow canal contributed approximately 12,468 ac-ft of water to the Lockhart-Smith RSF.

TABLE 3-8

SUMMARY OF HYDROLOGIC INPUTS TO THE LOCKHART-SMITH RSF SITE FROM SITE 3 DURING THE PERIOD FROM APRIL 2010 - MARCH 2012

YEAR	MONTH	MONTHLY INPUTS (ac-ft)	YEAR	MONTH	MONTHLY INPUTS (ac-ft)
2010	April	457	2011	April	721
	May	472		May	0.0
	June	744		June	108
	July	1,035		July	589
	August	547		August	1,611
	September	698		September	1,567
	October	16.4		October	984
	November	50.7		November	460
	December	0.0		December	567
2011	January	248	2012	January	285
	February	32.8		February	434
	March	195		March	646
				TOTAL:	**12,468**

A summary of runoff coefficient calculations for the Lockhart-Smith Canal watershed, based upon monitoring conducted at Site 3, is given in Table 3-9. As discussed in Section 1, the contributing watershed area to the Lockhart-Smith Canal RSF is assumed to be 2,801 acres by CDM in the design calculations for the project, while the FDEP TMDL document suggests a larger drainage basin area of approximately 6,500 acres. Using the basin area of 2,801 ac assumed by CDM, the 83.79 inches of rainfall which occurred during the 24-month field monitoring program would generate a rainfall volume of 19,558 ac-ft. The field measured inflow volume from the Lockhart-Smith Canal was approximately 12,468 ac-ft, which corresponds to a calculated C-value of 0.637. This value would be considered elevated if the inflow reflected runoff contributions only. However, since the inflows also include intercepted groundwater and baseflow, the calculated C-value of 0.637 is on the upper end of the range of values that would be expected for the land use, soil types, and groundwater table elevations present within the Lockhart-Smith Canal watershed.

TABLE 3-9

RUNOFF COEFFICIENT (C-VALUE) CALCULATIONS FOR THE LOCKHART-SMITH CANAL RSF WATERSHED

PARAMETER	VALUE
Basin Area	2,801 acres
Measured Rainfall[1]	83.79 inches
Rainfall Volume[2]	19,558 ac-ft
Discharged Volume[3]	12,468 ac-ft
Calculated C-value	0.637

1. Measured rainfall at the Lockhart-Smith RSF from April 2010-March 2012
2. Volume of rainfall over basin area
3. Measured hydrologic inputs through the Lockhart-Smith Canal from April 2010-March 2012

3.1.3.5 Northwestern Dry Detention Pond Inflow - Site 4

As discussed in Section 2, flow monitoring and sample collection was conducted at the larger of the two dry detention ponds which discharge into the northern side of the Lockhart-Smith RSF. A continuous inflow hydrograph was recorded at this site in the 30-inch RCP which discharges from the pond into the northwestern side of the RSF. A graphical summary of the field monitored inflow hydrograph at Site 4 is given on Figure 3-7. In general, discharges from the pond were extremely low in value throughout the majority of the 24-month field monitoring program and reflect primarily bleed-down from the pond underdrain system. Significant peaks in discharge rates, extending to values of approximately 1 cfs or greater, were observed on two occasions as a result of significant rain events. These events likely reflect rainfall amounts which caused water within the pond to discharge directly through the outfall structure. In general, it appears that discharges into the RSF from the northwestern dry detention pond are relatively insignificant compared with inflow hydrographs measured at the other monitoring sites.

Estimates of monthly inflows into the RSF from the northwestern dry detention pond were generated by integrating the inflow hydrographs summarized on Figure 3-7 on a monthly basis. A summary of monthly inflow volumes into the Lockhart-Smith RSF from Site 4 is given in Table 3-10. Monthly inflow volumes from the dry detention pond ranged from approximately 0 ac-ft, which occurred during multiple months of the field monitoring program, to a high of approximately 3.8 ac-ft during October 2011. During the 24-month field monitoring program, Site 4 contributed approximately 9.4 ac-ft of water to the Lockhart-Smith RSF. This value is minimal compared with monitored inflows at the remaining sites.

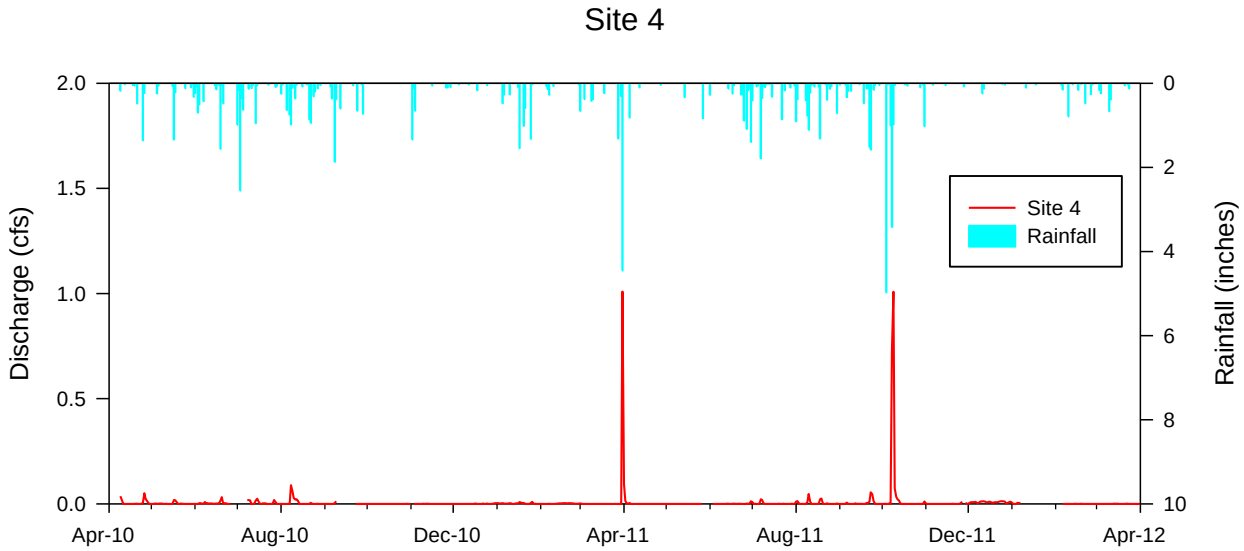


Figure 3-7. Inflow Hydrograph for the Northwestern Dry Detention Pond.

TABLE 3-10

SUMMARY OF HYDROLOGIC INPUTS TO THE LOCKHART-SMITH RSF SITE FROM SITE 4 DURING THE PERIOD FROM APRIL 2010 - MARCH 2012

YEAR	MONTH	MONTHLY INPUTS (ac-ft)	YEAR	MONTH	MONTHLY INPUTS (ac-ft)
2010	April	0.4	2011	April	0.2
	May	0.1		May	0.0
	June	0.2		June	0.0
	July	0.4		July	0.1
	August	0.5		August	0.3
	September	0.1		September	0.3
	October	0.0		October	3.8
	November	0.0		November	0.1
	December	0.0		December	0.5
2011	January	0.1	2012	January	0.2
	February	0.1		February	0.0
	March	2.0		March	0.0
				TOTAL:	**9.1**

3.1.4 Lockhart-Smith Canal Outflow (Site 5)

Discharges from the Lockhart-Smith RSF were monitored in the outfall canal on a continuous basis during the 24-month field monitoring program. A graphical summary of the field monitored discharge hydrographs in the outfall canal is given on Figure 3-8. Discharges from the Lockhart-Smith RSF occurred on virtually a continuous basis with the exception of a brief period during May 2011. Discharge rates in the outfall canal were typically less than 50 cfs, although significant peaks in discharge rates (extending to approximately 100-120 cfs) were observed on multiple occasions as a result of significant single events or cumulative multiple daily events. During periods of low rainfall, a relatively consistent baseflow was observed of approximately 1-5 cfs or less.

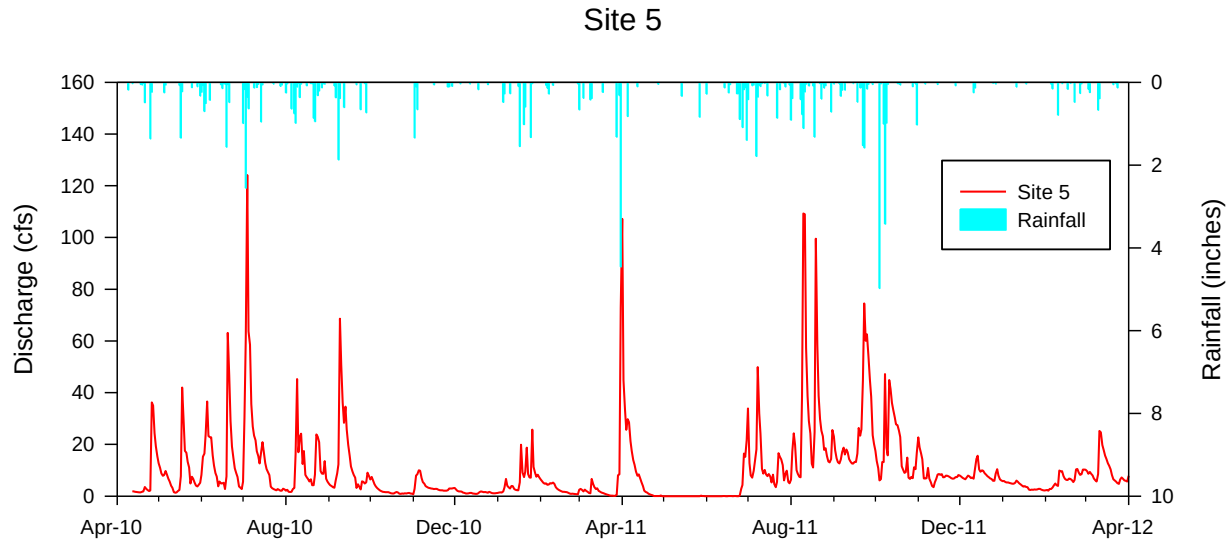


Figure 3-8. Discharge Hydrograph for the Lockhart-Smith Canal Outfall.

Estimates of monthly discharges from the Lockhart-Smith RSF were generated by integrating the discharge hydrograph summarized on Figure 3-8 on a monthly basis. A summary of monthly discharge volumes from the RSF is given on Table 3-11. Monthly discharge volumes range from a low of 0.6 ac-ft during May 2011 to a high of 1,883 ac-ft during August 2011. During the 24-month field monitoring program, approximately 14,444 ac-ft of water discharged from the RSF through the outfall canal.

TABLE 3-11

SUMMARY OF HYDROLOGIC INPUTS TO THE LOCKHART-SMITH RSF SITE FROM SITE 5 DURING THE PERIOD FROM APRIL 2010 - MARCH 2012

YEAR	MONTH	MONTHLY INPUTS (ac-ft)	YEAR	MONTH	MONTHLY INPUTS (ac-ft)
2010	April	495	2011	April	763
	May	552		May	0.6
	June	907		June	120
	July	1,232		July	776
	August	680		August	1,883
	September	824		September	1,540
	October	129		October	1,138
	November	228		November	512
	December	89.1		December	510
2011	January	411	2012	January	242
	February	164		February	372
	March	275		March	611
				TOTAL:	**14,444**

3.1.5 Evapotranspiration

As discussed in Section 2, a Class A pan evaporimeter was installed adjacent to the western inflow canal. Changes in water levels within the pan were recorded on a continuous basis and corrected for rainfall to obtain estimates of pan evaporation. Pan evaporation measurements are often multiplied by a standard conversion factor of 0.75 to obtain estimates of water surface evaporation rates. However, evapotranspiration from wetland areas is often assumed to be equivalent to the uncorrected pan evaporation measurements. Therefore, for purposes of this project, the measured pan evaporation rates at the Lockhart-Smith RSF site are assumed to reflect evapotranspiration losses within the wetland treatment area.

A tabular summary of field measured and "average" pan evaporation rates at the Lockhart-Smith RSF site are given in Table 3-12. The field measured values reflect the actual pan evaporation rates measured during the field monitoring program. The "average" pan evaporation rates are based upon National Weather Service (NWS) Bulletin No. 34 which provides estimates of evaporation rates in the Central Florida area. During the field monitoring program, measured pan evaporation at the Lockhart-Smith RSF site was approximately 144.78 inches which is approximately 1% less than the "average" pan evaporation of 146.30 inches which typically occurs in the Central Florida area.

TABLE 3-12

SUMMARY OF MEASURED AND "AVERAGE" EVAPORATION FOR THE LOCKHART-SMITH RSF SITE FROM APRIL 2010 - MARCH 2012

YEAR	MONTH	"AVERAGE" CENTRAL FLORIDA EVAPORATION (inches)	MEASURED PAN EVAPORATION (inches)	YEAR	MONTH	"AVERAGE" CENTRAL FLORIDA EVAPORATION (inches)	MEASURED PAN EVAPORATION (inches)
2010	April	7.66	5.18	2011	April	7.66	7.61
	May	8.53	7.46		May	8.53	8.25
	June	7.75	6.57		June	7.75	10.10
	July	7.74	6.44		July	7.74	6.79
	August	7.10	7.06		August	7.10	5.81
	September	6.23	7.89		September	6.23	10.18
	October	5.78	5.04		October	5.78	9.32
	November	4.51	3.55		November	4.51	3.33
	December	3.80	2.77		December	3.80	2.97
2011	January	3.66	4.81	2012	January	3.66	3.38
	February	4.39	3.00		February	4.39	3.44
	March	6.00	7.40		March	6.00	6.43
					TOTAL:	**146.30**	**144.78**

A graphical comparison of measured and "average" monthly pan evaporation in the vicinity of the Lockhart-Smith RSF site is given in Figure 3-9. In general, measured and "average" pan evaporation were relatively similar throughout much of the field monitoring program. Substantially higher than average pan evaporation rates were measured at the Lockhart-Smith RSF site during June, September and October 2011.

A summary of calculated monthly evapotranspiration losses from the Lockhart-Smith RSF site during the 24-month monitoring program from April 2010-March 2012 is given in Table 3-13. Evapotranspiration losses are calculated by multiplying the measured pan evaporation rates (summarized in Table 3-12) times the wetland treatment surface area of 24.4 acres at the normal water level of 15.0 ft (as summarized in Table 1-2). Evapotranspiration losses from the RSF ranged from a low of 5.63 ac-ft during December 2010 to a high of 20.7 ac-ft during September 2011. Overall, evapotranspiration losses from the RSF removed approximately 294 ac-ft of water during the field monitoring program.

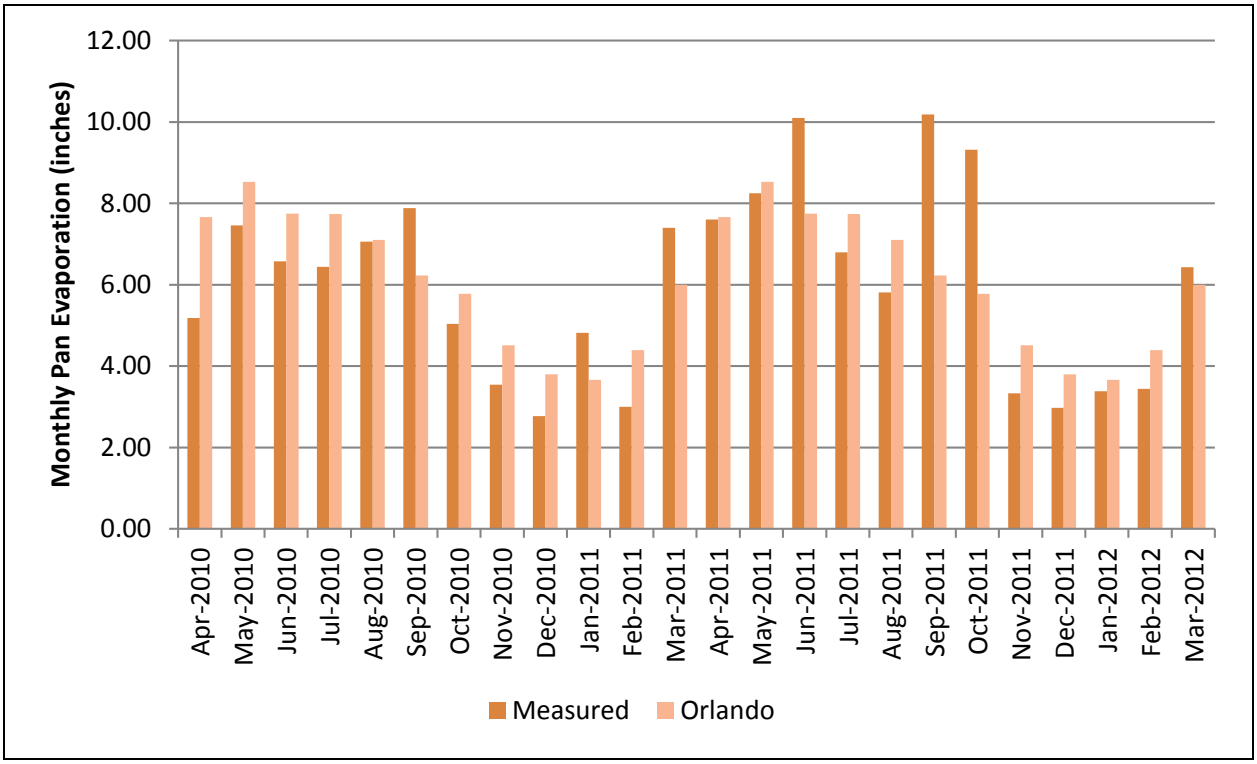


Figure 3-9. Comparison of Measured and "Average" Monthly Pan Evaporation at the Lockhart-Smith RSF Site.

TABLE 3-13

CALCULATED MONTHLY EVAPOTRANSPIRATION LOSSES FROM THE LOCKHART-SMITH RSF SITE FROM APRIL 2010 - MARCH 2012

YEAR	MONTH	MEASURED EVAPOTRANS-PIRATION (inches)	VOLUME LOSS (ac-ft)	YEAR	MONTH	MEASURED EVAPOTRANS-PIRATION (inches)	VOLUME LOSS (ac-ft)
2010	April	5.18	10.5	2011	April	7.61	15.5
	May	7.46	15.2		May	8.25	16.8
	June	6.57	13.4		June	10.10	20.5
	July	6.44	13.1		July	6.79	13.8
	August	7.06	14.4		August	5.81	11.8
	September	7.89	16.0		September	10.18	20.7
	October	5.04	10.2		October	9.32	19.0
	November	3.55	7.22		November	3.33	6.77
	December	2.77	5.63		December	2.97	6.04
2011	January	4.81	9.8	2012	January	3.38	6.87
	February	3.00	6.10		February	3.44	6.99
	March	7.40	15.0		March	6.43	13.1
					TOTAL:	**144.78**	**294**

3.1.6 Hydrologic Budget

A monthly hydrologic budget for the Lockhart-Smith RSF from April 2010-March 2012 is given on Table 3-14. Monitored inputs into the RSF include direct precipitation, inflow through the two 84-inch RCPs at Site 1, inflow from the North Oregon Street drainage swale, discharges from the Bill Heard Chevrolet detention pond, inflow from the Lockhart-Smith Canal, and discharges from the dry detention pond on the northwest corner of the RSF. Losses from the RSF are assumed to occur as a result of discharges through the outfall canal and evapotranspiration. The difference between the total hydrologic inputs and hydrologic losses is assumed to be a small additional unidentified input or loss. The unidentified inputs and losses reflect less than 0.3% of the total inputs and losses for the RSF, indicating an extremely good agreement between the monitored inputs and losses.

A graphical comparison of hydrologic inputs and losses for the Lockhart-Smith RSF is given on Figure 3-10. Approximately 84% of the hydrologic inputs to the Lockhart-Smith RSF over the period from April 2010-March 2012 originated from the Lockhart-Smith Canal. An additional 7% was contributed by the northern 84-inch RCP at Site 1, with 4% of the hydrologic inputs contributed by the southern 84-inch RCP. Relatively minimal hydrologic inputs resulted from direct precipitation, the swale drainage measured at Site 1A, and inflow from the Bill Heard wet detention pond.

Approximately 98% of the hydrologic losses during the field monitoring program occurred as a result of discharges through the Lockhart-Smith outfall canal. The remaining 2% of the hydrologic losses occurred as a result of evapotranspiration from the wetland area. Approximately 0.3% of the hydrologic losses occurred as a result of unidentified losses from the system.

3.1.7 Hydraulic Residence Time

An estimate of the mean hydraulic residence time within the Lockhart-Smith RSF was conducted by dividing the permanent pool storage volume of 58.7 ac-ft at the normal water level (summarized in Table 1-2) by the sum of the total hydrologic inputs during the 24-month (730-day) field monitoring program (summarized in Table 3-14). Based upon this analysis, the mean hydraulic residence time for the Lockhart-Smith RSF over the period from April 2010-March 2012 is approximately 2.9 days. This residence time is relatively short for wetland treatment areas which typically require somewhat longer residence times to achieve equilibrium water quality characteristics.

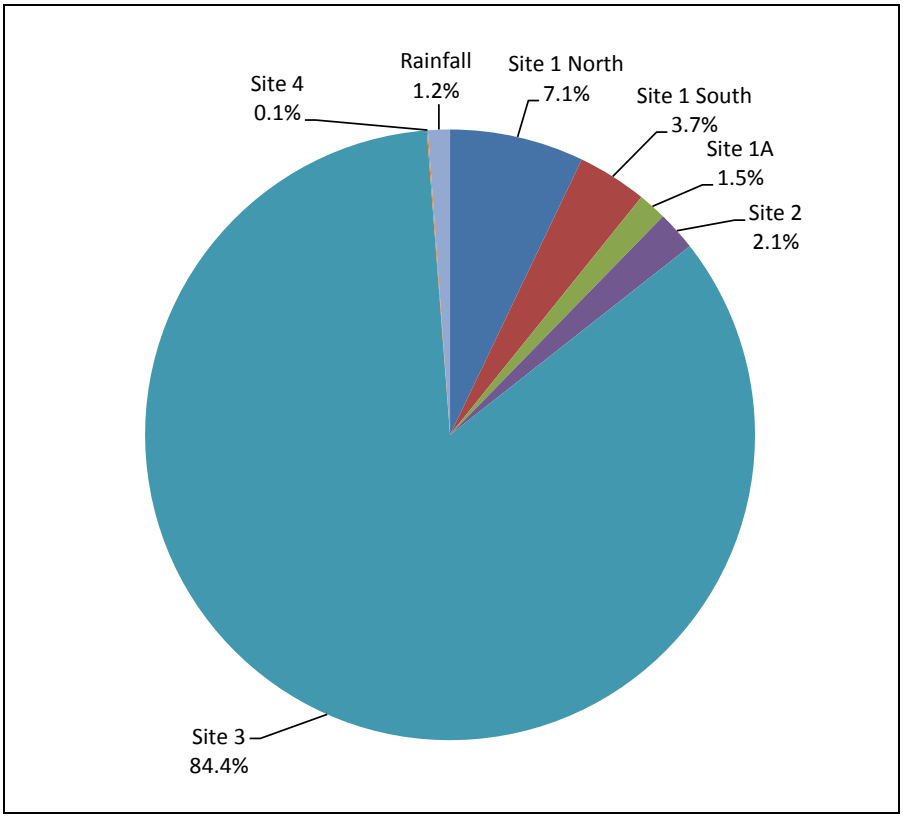
Hydraulic residence time calculations for the Lockhart-Smith RSF are given in Table 3-15. The calculated residence time of 2.9 days was measured during a period of substantially lower than normal rainfall, which suggests that the hydraulic residence time would be less than 2.9 days during normal rainfall conditions. The calculated residence time reflects a mean annual residence time which would increase during dry season conditions and decrease during wet season conditions.

TABLE 3-14

MONTHLY HYDROLOGIC INPUTS AND LOSSES FOR THE LOCKHART-SMITH RSF SITE FROM APRIL 1, 2010 - MARCH 31, 2012

YEAR	MONTH	HYDROLOGIC INPUTS (ac-ft)								HYDROLOGIC LOSSES (ac-ft)			
		Direct Precip.	Site 1-North	Site 1-South	Site 1A	Site 2	Site 3	Site 4	Total	Site 5-Outflow	Evapotrans-piration	Unidentified Inputs/ Losses	Total
2010	April	5.0	36.9	17.5	7.3	10.0	457	0.4	534	495	10.5	29	534
	May	5.2	36.0	17.4	6.2	9.6	472	0.1	547	542	15.2	-10	547
	June	8.9	57.7	33.3	13.6	18.0	744	0.2	876	907	13.4	-44	876
	July	12.8	78.8	50.2	22.7	24.3	1,035	0.4	1,224	1,232	13.1	-21	1,224
	August	12.2	71.4	33.8	13.9	23.7	547	0.5	702	680	14.4	7.9	702
	September	9.9	64.7	35.1	14.4	20.9	698	0.1	843	824	16.0	2.6	843
	October	0.0	22.8	2.5	0.5	4.4	16.4	0.0	47	129	10.2	-92.7	46.6
	November	5.1	37.8	5.5	1.5	11.2	50.7	0.0	112	228	7.2	-124	112
	December	0.7	23.8	0.1	0.0	4.9	0.0	0.0	30	89	5.6	-65.2	29.5
2011	January	11.5	53.0	18.1	6.4	16.9	248	0.1	354	411	9.8	-67.0	354
	February	1.3	31.3	5.1	1.0	8.6	32.8	0.1	80	164	6.1	-90.0	80
	March	16.7	30.8	9.6	3.8	7.2	195	2.0	265	275	15.0	-25.4	265
	April	2.0	44.6	29.9	13.6	13.1	721	0.2	825	763	15.5	46.4	825
	May	2.5	0.4	0.0	0.0	0.0	0.0	0.0	3	0.6	16.8	-14.5	2.9
	June	10.1	5.8	3.6	1.5	1.8	108	0.0	131	120	20.5	-9.3	131
	July	9.2	64.2	31.6	12.4	21.2	589	0.1	728	776	13.8	-62	728
	August	13.9	107.3	77.0	36.0	34.0	1,611	0.3	1,879	1,883	11.8	-16	1,879
	September	10.1	74.1	61.1	28.3	22.7	1,567	0.3	1,764	1,540	20.7	203	1,764
	October	24.0	75.3	46.0	19.9	25.3	984	3.8	1,178	1,138	19.0	21.5	1,178
	November	0.5	39.7	18.3	5.9	12.0	460	0.1	537	512	6.8	17.9	537
	December	1.0	24.6	14.6	4.1	5.1	567	0.5	616	510	6.0	100	616
2012	January	0.3	16.6	4.9	0.4	1.4	285	0.2	308	242	6.9	59.5	308
	February	4.0	21.7	10.8	3.1	4.3	434	0.0	478	372	7.0	99.1	478
	March	3.5	32.1	19.5	6.7	8.3	646	0.0	716	611	13.1	92.1	716
TOTAL:		**170**	**1,051**	**545**	**223**	**309**	**12,468**	**9**	**14,776**	**14,444**	**294**	**38.1**	**14,776**
Percent of Total (%):		**1**	**7**	**4**	**2**	**2**	**84**	**0**	**100**	**98**	**2**	**0.3**	**100**

Inputs



Losses

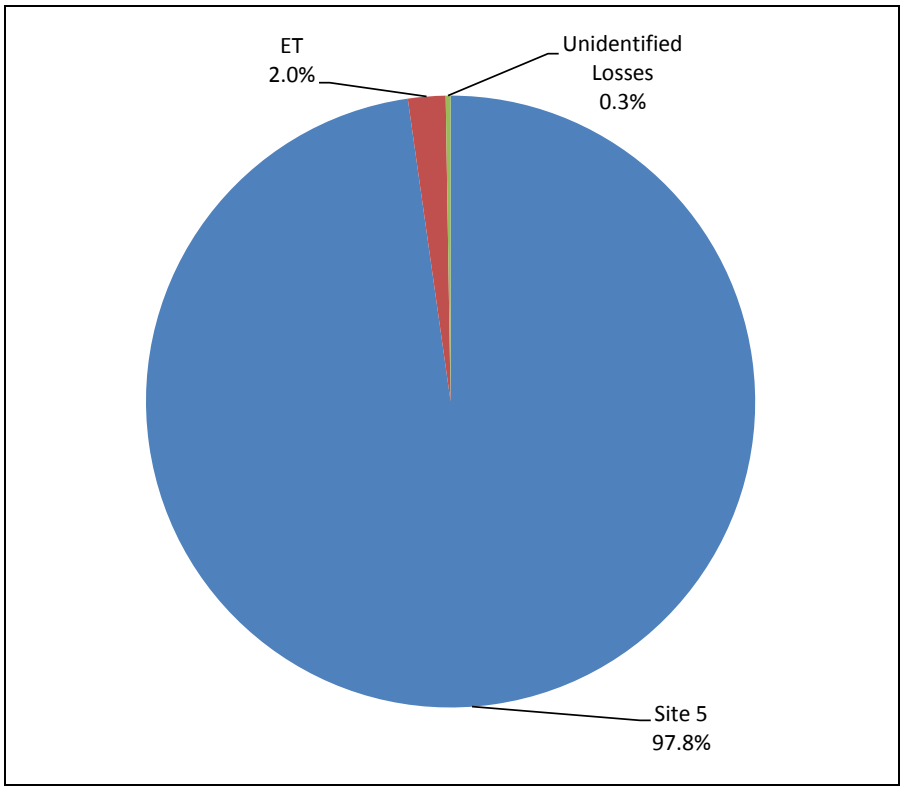


Figure 3-10. Measured Hydrologic Inputs and Losses to the Lockhart-Smith RSF from April 2010-March 2012.

TABLE 3-15

HYDRAULIC RESIDENCE TIME CALCULATIONS FOR THE LOCKHART-SMITH RSF

PARAMETER	VALUE
Hydrologic Inputs	14,776 ac-ft
Time Interval	730 days
Storage Volume	58.7 ac-ft
Residence Time	2.9 days

3.2 Characteristics of Monitored Inputs and Outputs

A summary of sample collection activities conducted at the Lockhart-Smith RSF site from April 2010-March 2012 is given in Table 3-16. Summaries are provided for both field measurements and samples collected for laboratory analyses. The most complete data sets were compiled at the primary inflows and outflows to the system which include Sites 1, 3, and 5, with 65-70 field measurements conducted at each site and 81-85 samples collected for laboratory analyses. A slightly lower number of field measurements and water samples was collected at the Bill Heard detention pond inflow (Site 2), with 50 sets of field measurements and 59 separate samples collected for laboratory analyses. The lowest number of field measurements and laboratory samples was collected at the North Oregon Street roadside swale (Site 1A) and the northwest detention pond inflow (Site 4), with 19 field measurements and 22 samples collected for lab analyses at each site. Overall, 291 sets of field measurements and 400 samples for laboratory analyses were collected during the 24-month field monitoring program.

TABLE 3-16

SUMMARY OF SAMPLE COLLECTION PERFORMED AT THE LOCKHART-SMITH RSF SITE FROM APRIL 2010-MARCH 2012

SITE	NUMBER OF SAMPLES COLLECTED	
	Field Measurements	Lab Analyses
Site 1: 84-inch RCPs	65	81
Site 1A: Roadside Swale	19	22
Site 2: Bill Heard Detention Pond	50	59
Site 3: Lockhart-Smith Canal Inflow	70	85
Site 4: Northwest Detention Pond	19	22
Site 5: Lockhart-Smith Canal Outfall	68	85
Bulk Precipitation	--	46
TOTAL:	**291**	**400**

3.2.1 Physical-Chemical Field Measurements

Field measurements of pH, temperature, specific conductivity, dissolved oxygen, and oxidation-reduction potential (ORP) were conducted at each of the inflow and outflow monitoring sites during each weekly site visit when measured discharge was observed at a given site. Field measurements were conducted at approximately mid-depth in the water column. A complete listing of field measurements collected at each of the inflow and outflow monitoring sites is given in Appendix B.

3.2.1.1 Temperature and pH

A graphical summary of field measurements of temperature and pH collected at inflow and outflow monitoring sites at the Lockhart-Smith RSF is given on Figure 3-11. In general, measured temperatures at the inflow and outflow monitoring sites appear to exhibit typical seasonal variability, with no significant differences in temperature measurements between the various sites. The only exception to this appears to be periodic temperature measurements conducted at the inflow at Site 1A which reflects the roadside swale drainage system. This swale system discharges runoff during rain events but provides for drawdown of groundwater elevations between rain events. Some of the lower temperatures measured at this site may be partially explained by the significance of groundwater at this site.

Measured pH values at the inflow and outflow monitoring sites exhibited a relatively high degree of variability, ranging from 6.6-8.4 during the 24-month monitoring program. No seasonal pattern is apparent in the measured pH values. However, pH measurements at Site 1 and Site 4, both of which primarily reflect discharges from stormwater management systems, appear to have slightly higher pH values than observed at the remaining sites. Measured pH values at the discharge for the treatment system at Site 5 often appear to be on the lower end of the measured range of pH values, suggesting that pH decreases during migration through the wetland system.

3.2.1.2 Conductivity

A graphical summary of field measurements of conductivity at the inflow and outflow monitoring sites is given on Figure 3-12. Field measured conductivity values were highly variable during the monitoring program, with the majority of the measured values ranging from approximately 100-500 μmho/cm. Consistently higher specific conductivity values appear to occur at Site 1 which reflects the discharge from the residential community west of North Oregon Street. Conductivity values measured at the Lockhart-Smith Canal inflow (Site 3) and outflow (Site 5) appear to trend very closely to one another throughout the field monitoring program. This behavior appears intuitive due to the significance of these sites as the primary inflows and outflows for the system.

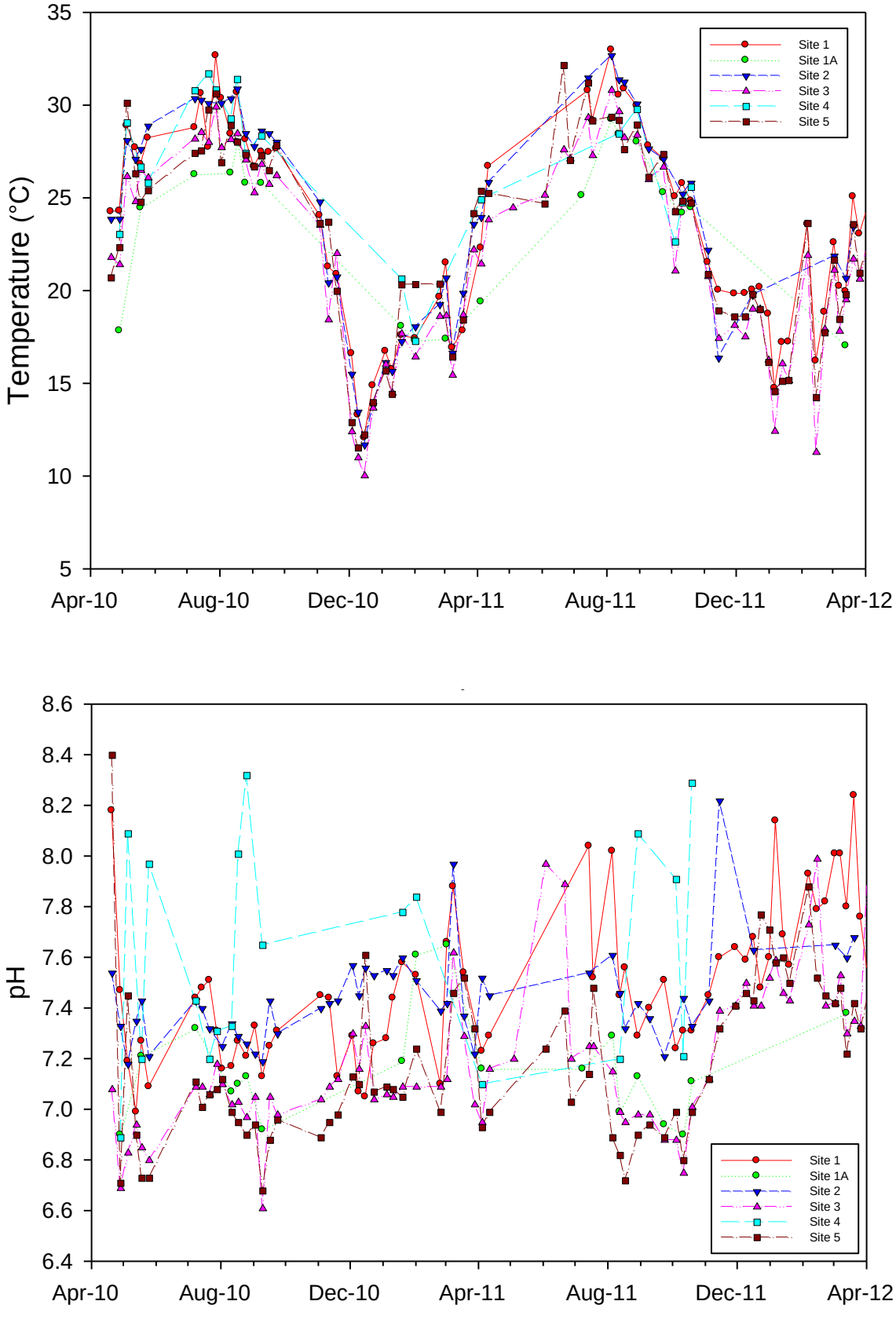


Figure 3-11. Field Measurements of Temperature and pH at Lockhart-Smith RSF Inflow and Outflow Monitoring Sites.

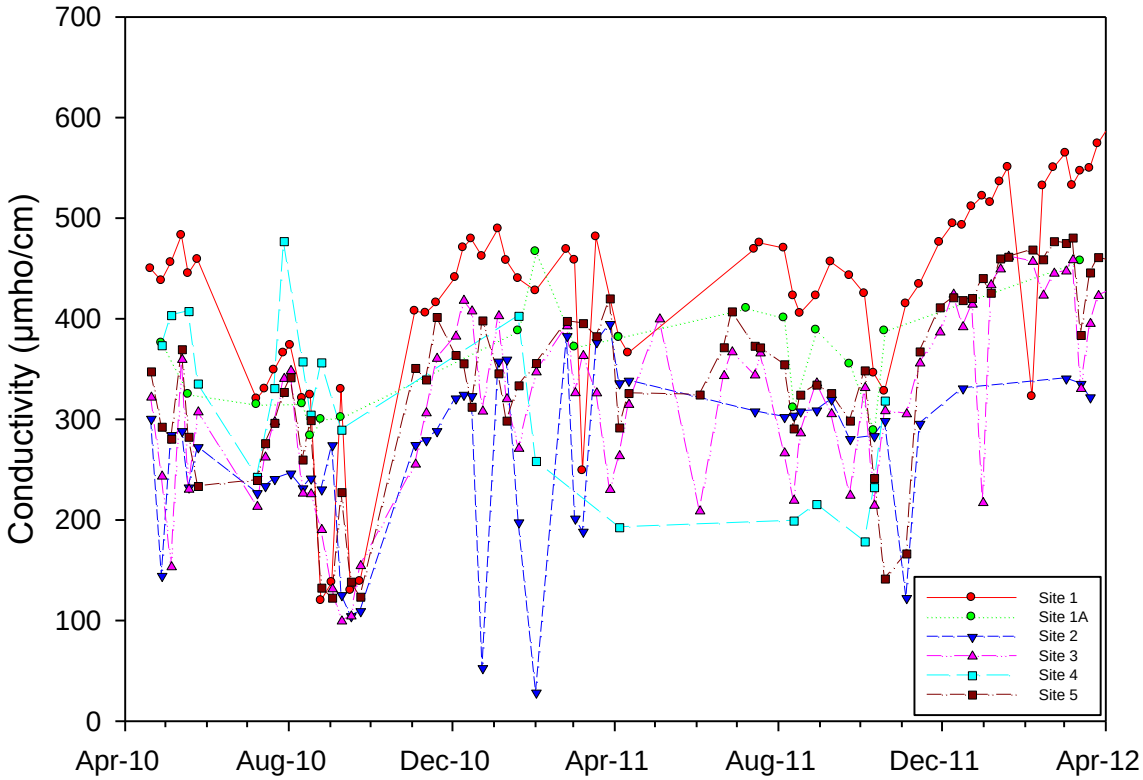


Figure 3-12. Field Measurements of Conductivity at Lockhart-Smith RSF Inflow and Outflow Monitoring Sites.

3.2.1.3 Dissolved Oxygen and ORP

A graphical summary of field measurements of dissolved oxygen and ORP at the Lockhart-Smith RSF inflow and outflow monitoring sites is given on Figure 3-13. In general, dissolved oxygen concentrations were highly variable throughout the field monitoring program, ranging from approximately 2-10 mg/l. A seasonal trend is apparent in dissolved oxygen concentrations, with lower dissolved oxygen concentrations during spring and summer conditions, and higher dissolved oxygen concentrations during fall and winter conditions. The lowest dissolved oxygen measurements appear to occur at Site 5 which reflects the discharge from the RSF. Approximately 63% (43 of 68 measurements) of the field measured dissolved oxygen concentrations in the Lockhart-Smith outfall canal were less than the applicable Class III surface water criterion of 5 mg/l for dissolved oxygen. Depressed concentrations of dissolved oxygen are common in discharges from wetland areas due to the oxygen demand created by the wetland soils and vegetation. Approximately 51% (36 of 70 measurements) of the measured dissolved oxygen concentrations in the Lockhart-Smith inflow canal were less than the applicable criterion of 5 mg/l.

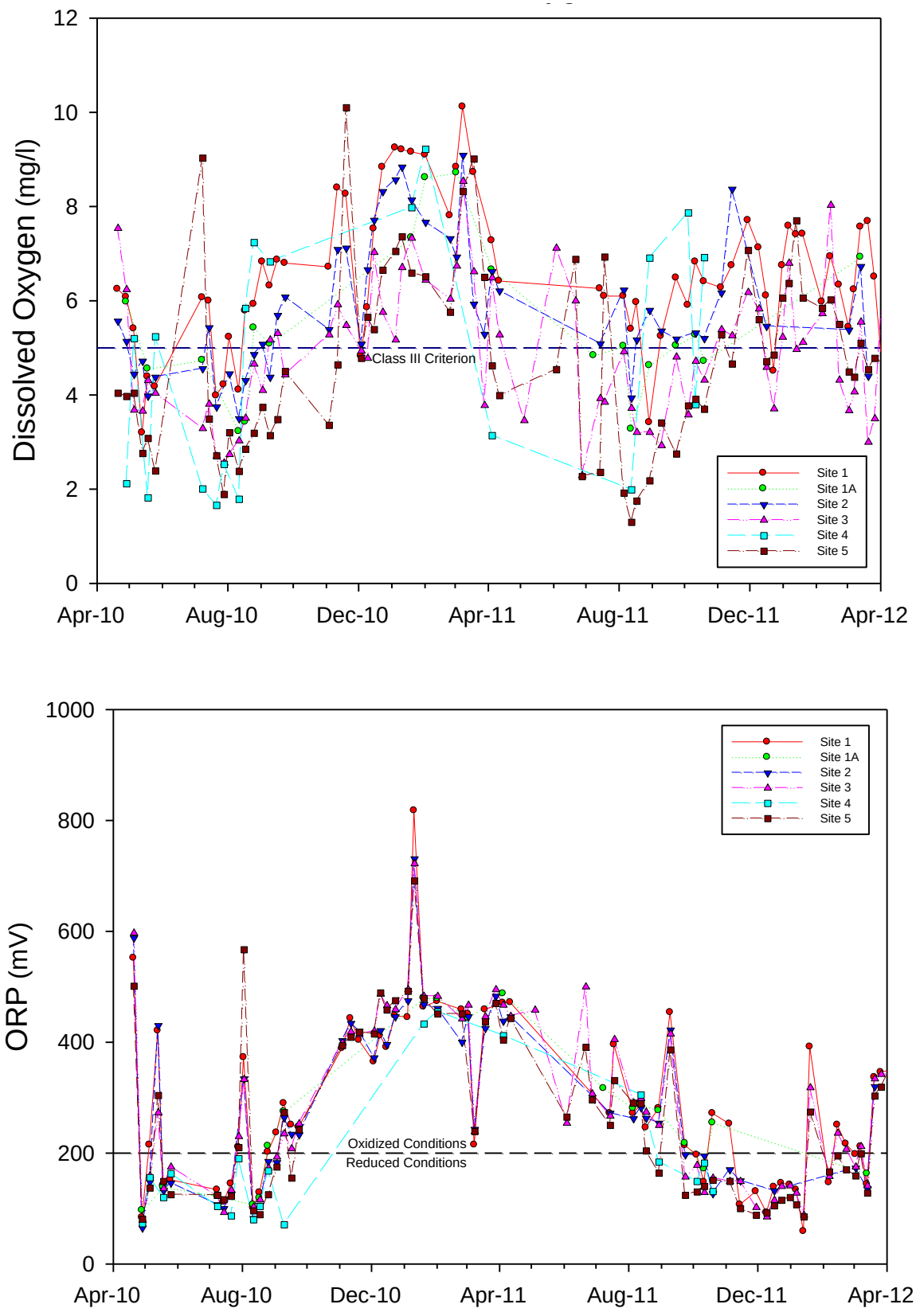


Figure 3-13. Field Measurements of Dissolved Oxygen and ORP at Lockhart-Smith RSF Inflow and Outflow Monitoring Sites.

Field measurements of ORP are provided at the bottom of Figure 3-13. In general, measured ORP values mimic the general patterns exhibited by dissolved oxygen, with reduced conditions at many of the inflow and outflow monitoring sites during spring and summer conditions and oxidized conditions observed during the remaining portions of the year. Conditions of reduced ORP are also commonly observed in wetland treatment areas.

3.2.1.4 Comparison of Field Measurements

Graphical comparisons of field measurements of pH, dissolved oxygen, ORP, and conductivity collected at inflow and outflow sites at the Lockhart-Smith RSF site from April 2010-March 2012 were developed in the form of Tukey box plots, also called "box and whisker plots". Statistical comparisons of the chemical characteristics of inflow and outflow samples collected at the Lockhart-Smith RSF site were developed for general parameters, nitrogen species, and phosphorus species in the form of Tukey box plots, also often called "box and whisker plots". The bottom line of the box portion of each plot represents the lower quartile, with 25% of the data points falling below this value. The upper line of the box represents the 75% upper quartile, with 25% of the data falling above this value. The **blue** horizontal line within the box represents the median value, with 50% of the data falling both above and below this value. The **red** horizontal line within the box represents the mean of the data points. The vertical lines, also known as "whiskers", represent the 5 and 95 percentiles for the data sets. Individual values which fall outside of the 5-95 percentile range, sometimes referred to as "outliers", are indicated as **red dots**.

A statistical comparison of field parameters measured in inflow and outflow samples at the Lockhart-Smith RSF site is given on Figure 3-14. In general, field measured pH values at the inflow and outflow monitoring sites appear to exhibit relatively similar values as well as similar degrees of variability in pH measurements. Measured pH values at Site 4, which provides inflow from the underdrain system for the dry detention pond, appear to be slightly greater than values measured at the remaining sites. Measured dissolved oxygen concentrations were highly variable between the inflow and outflow monitoring sites. In general, inflows at Sites 1, 1A, and 2 generally met the applicable Class III criterion of 5 mg/l for dissolved oxygen. However, dissolved oxygen measurements conducted at Sites 3, 4, and 5 suggest an approximately equal distribution between concentrations above and below the Class III criterion.

Measurements of oxidation-reduction potential (ORP) indicate that oxidized conditions were maintained at the inflow and outflow monitoring sites during the majority of the field monitoring program. However, reduced conditions, indicated by ORP values less than 200 mV, were observed at all of the monitored sites on at least several occasions. Field measured conductivity values appear to be relatively similar at each of the inflow and outflow monitoring sites, with the possible exception of Site 1 which generally exhibited a somewhat higher level of conductivity.

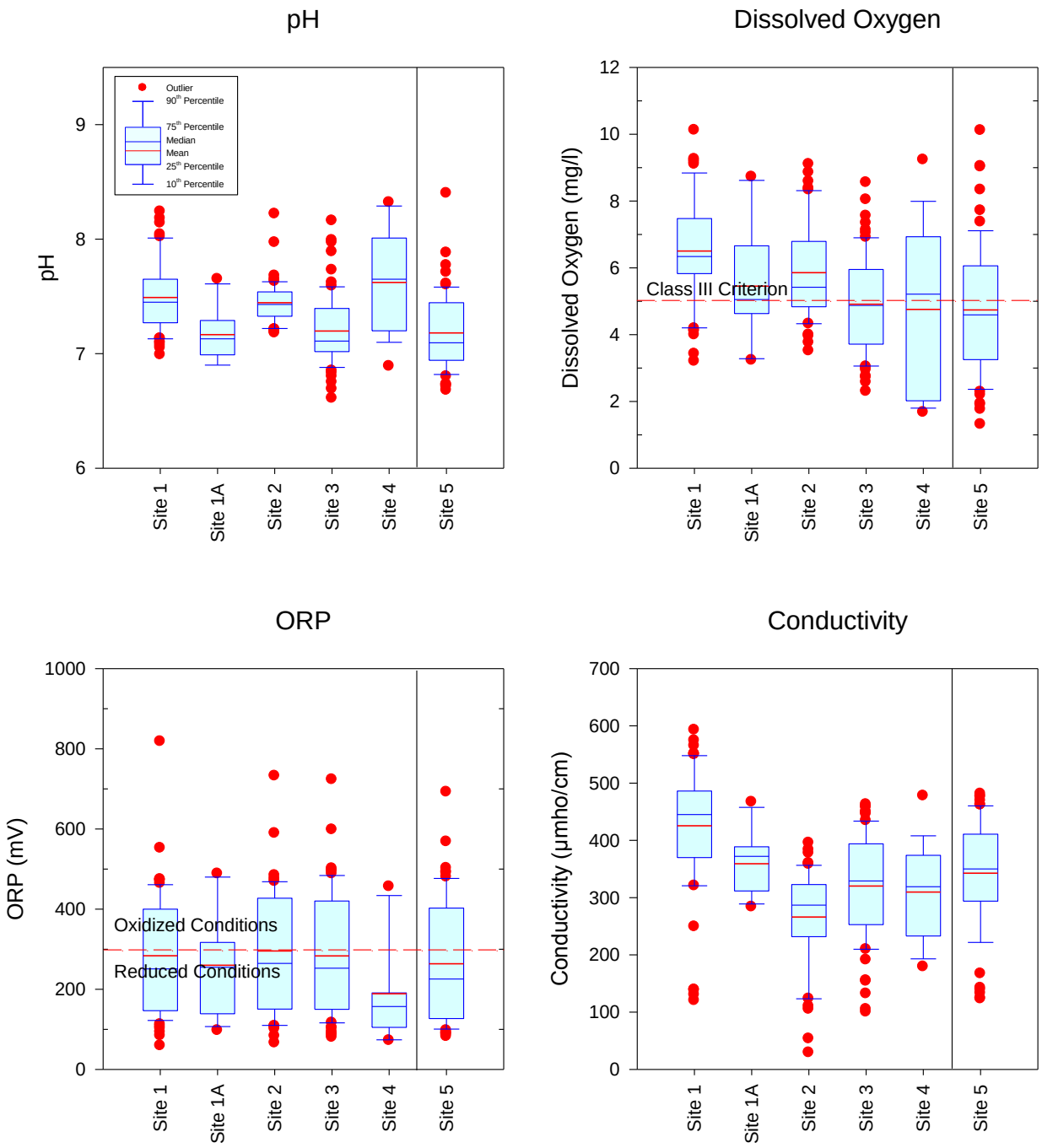


Figure 3-14. Statistical Comparison of Field Measurements Collected at Inflow/Outflow Monitoring Sites at the Lockhart-Smith RSF from April 2010-March 2012.

3.2.2 Chemical Characteristics of Inputs and Outputs

Collection of flow-weighted samples at significant inflows and outflows for the Lockhart-Smith RSF site was conducted from April 2010-March 2012. Monitored inflow locations include the western channel inflow (Site 1), North Oregon Street drainage swale (Site 1A), Bill Heard pond inflow (Site 2), Lockhart-Smith Canal inflow (Site 3), and the northwestern dry detention pond inflow (Site 4). Discharges from the Lockhart-Smith RSF were monitored at the Lockhart-Smith Canal outflow (Site 5). A complete listing of the chemical characteristics of samples collected at each of the inflow/outflow monitoring sites during the field monitoring program is given in Appendix C. A discussion of the chemical characteristics of inflows and outflows measured at each of the monitoring sites is given in the following sections.

3.2.2.1 Western Inflow Channel - Site 1

A summary of the chemical characteristics of samples collected from the two 84-inch RCPs which discharge into the western inflow channel (Site 1) from April 2010-March 2012 is given in Table 3-17. Information is provided for the minimum and maximum values measured for each parameter during the field monitoring program, along with a geometric mean value. A geometric mean value, also referred to as a log-normal mean value, is calculated for each parameter rather than an arithmetic mean since the data exhibit a log-normal distribution, and a log-normal mean or geometric mean provides a better measure of central tendency for the data.

In general, inflows into the western channel were approximately neutral in pH, with a mean pH value of 7.19. Inflows from the western channel were also relatively well buffered, with a mean alkalinity of 93 mg/l. Measured conductivity values at this site ranged from moderate to slightly elevated, with an overall mean of 421 μmho/cm.

Measured concentrations of nitrogen species were highly variable at the western inflow channel site, with several orders of magnitude difference between minimum and maximum measured values for most nitrogen species. However, in spite of the high degree of variability, measured concentrations for nitrogen species discharging into the western inflow channel were generally low to moderate in value, with extremely low mean concentrations for ammonia and NO_x. A relatively low mean particulate nitrogen concentration was also observed at this site, and likely reflects removals achieved within the residential pond system which forms the headwaters of the inflows at this site. The dominant nitrogen species at this site is dissolved organic nitrogen which comprises approximately 50% of the total nitrogen present. The overall mean total nitrogen concentration of 981 μg/l is approximately half of the total nitrogen concentrations commonly observed in urban runoff.

Similar to the trends observed for nitrogen species, measured concentrations for phosphorus species were highly variable but generally low in value on an average basis. The mean measured mean concentrations of 39 μg/l for SRP, 10 μg/l for dissolved organic phosphorus, and 43 μg/l for particulate phosphorus are substantially lower than concentrations for these parameters commonly observed in urban runoff. The mean total phosphorus concentration of 115 μg/l measured at this site is approximately half of the total phosphorus concentrations commonly observed in urban runoff. The low total phosphorus concentrations observed at this site likely reflect runoff treatment which occurs in the wet detention pond system for the residential development.

TABLE 3-17

CHARACTERISTICS OF INFLOW SAMPLES COLLECTED AT THE WESTERN INFLOW CHANNEL (SITE 1)

PARAMETER	UNITS	MINIMUM VALUE	MAXIMUM VALUE	GEOMETRIC MEAN
pH	s.u.	6.68	7.87	7.19
Alkalinity	mg/l	58	144	93
Conductivity	µmho/cm	265	590	421
Ammonia	µg/l	3	1678	49
NO_x-N	µg/l	3	531	88
Dissolved Organic N	µg/l	42	1388	490
Particulate N	µg/l	9	1470	162
Total N	µg/l	136	2664	981
SRP	µg/l	3	190	39
Dissolved Organic P	µg/l	1	76	10
Particulate P	µg/l	2	300	43
Total P	µg/l	38	384	115
Turbidity	NTU	0.6	78.6	6.6
Color	Pt-Co	11	222	116
TSS	mg/l	0.8	189.0	12.1

Highly variable concentrations were also observed for turbidity, color, and TSS at the western inflow site, although the mean concentrations for turbidity and TSS are relatively low in value. Measured color concentrations in the western inflow channel were highly variable, with a generally elevated mean value of 116 Pt-Co units.

3.2.2.2 North Oregon Street Drainage Swale - Site 1A

A summary of the chemical characteristics of inflows from the North Oregon Street swale site (Site 1A) collected from April 2010-March 2012 is given in Table 3-18. In general, inflows from the swale site were approximately neutral in pH, with an overall mean value of 7.16. Inflows from the swale system were also highly buffered, with an overall mean alkalinity value of 110 mg/l. The somewhat elevated alkalinity values measured at this site likely reflect the contribution of groundwater to the flows observed at the site. Measured conductivity values were moderate to slightly elevated, with the overall mean value of 363 µmho/cm reflecting a moderate conductivity value.

TABLE 3-18

CHARACTERISTICS OF INFLOW SAMPLES COLLECTED AT THE NORTH OREGON STREET SWALE INFLOW (SITE 1A)

PARAMETER	UNITS	MINIMUM VALUE	MAXIMUM VALUE	GEOMETRIC MEAN
pH	s.u.	6.80	7.66	7.16
Alkalinity	mg/l	65.8	178	110
Conductivity	µmho/cm	281	459	363
Ammonia	µg/l	20	83	37
NO_x-N	µg/l	1	52	7
Dissolved Organic N	µg/l	233	955	643
Particulate N	µg/l	23	1114	166
Total N	µg/l	563	1892	925
SRP	µg/l	7	121	38
Dissolved Organic P	µg/l	1	76	10
Particulate P	µg/l	3	164	16
Total P	µg/l	15	271	74
Turbidity	NTU	0.9	8.9	2.4
Color	Pt-Co	95	342	149
TSS	mg/l	0.6	30.0	2.2

In general, measured concentrations of nitrogen species in the North Oregon Street swale inflow appear to be similar to values measured in the western inflow channel. A high degree of variability was observed in measured concentrations of virtually all nitrogen species, with an order of magnitude or more difference between minimum and maximum values measured for many nitrogen species. However, the mean ammonia concentration of 37 µg/l and the mean NO_x concentration of 7 µg/l reflect extremely low values for these parameters. Low concentrations were also observed for particulate nitrogen which comprised less than 20% of the total nitrogen measured at this site. The dominant nitrogen species in the swale inflow appears to be dissolved organic nitrogen which was also the dominant nitrogen species in inflows through the western channel. Dissolved organic nitrogen comprises approximately 70% of the total nitrogen discharged from the swale system.

Measured concentrations of phosphorus species in the swale inflow were generally low in value, although a relatively high degree of variability was observed between minimum and maximum values for individual storm events. The observed mean concentrations for SRP, dissolved organic phosphorus, and particulate phosphorus at this site are substantially lower than concentrations commonly observed in urban runoff. The mean total phosphorus concentration of 74 µg/l is approximately one-fourth of concentrations commonly observed in urban runoff.

Measured concentrations of turbidity, color, and TSS were highly variable in samples collected from the swale system, with an order of magnitude difference between minimum and maximum values for turbidity and TSS. However, the mean measured concentrations for these parameters reflect extremely low concentrations, with a mean of only 2.4 NTU for turbidity and 2.2 mg/l for TSS. Inflows through the swale system were highly colored, with an overall mean of 149 Pt-Co units.

3.2.2.3 Bill Heard Detention Pond Inflow - Site 2

A summary of the chemical characteristics of samples collected from the Bill Heard detention pond inflow (Site 2) collected from April 2010-March 2012 is given in Table 3-19. Discharges from the wet detention pond were approximately neutral in pH and moderately to well buffered, with an overall mean alkalinity value of 92 mg/l. Measured conductivity values in the inflow samples exhibited a relatively low degree of variability, with an overall mean of 285 µmho/cm, reflecting a moderately low value.

TABLE 3-19

CHARACTERISTICS OF INFLOW SAMPLES COLLECTED AT THE BILL HEARD DETENTION POND INFLOW (SITE 2)

PARAMETER	UNITS	MINIMUM VALUE	MAXIMUM VALUE	GEOMETRIC MEAN
pH	s.u.	6.74	7.71	7.35
Alkalinity	mg/l	52.2	123	92
Conductivity	µmho/cm	208	389	285
Ammonia	µg/l	3	185	30
NO_x-N	µg/l	3	292	20
Dissolved Organic N	µg/l	83	794	287
Particulate N	µg/l	4	541	57
Total N	µg/l	136	1152	456
SRP	µg/l	1	39	2
Dissolved Organic P	µg/l	1	21	3
Particulate P	µg/l	1	37	5
Total P	µg/l	3	63	13
Turbidity	NTU	0.1	7.3	0.9
Color	Pt-Co	9	84	15
TSS	mg/l	0.4	35.2	1.5

Measured concentrations of nitrogen species were highly variable in the detention pond inflows, with 1-2 orders of magnitude difference between minimum and maximum values for many nitrogen species. However, overall, nitrogen species were relatively low in value, with extremely low concentrations measured for ammonia, NO_x, and particulate nitrogen. These observed low concentrations likely reflect removal of nitrogen within the pond system prior to discharge. The dominant nitrogen species in the detention pond inflow is dissolved organic nitrogen which comprises approximately 60% of the overall total nitrogen measured.

Measured concentrations of phosphorus species in the Bill Heard detention pond inflow were also highly variable, with 1-2 orders of magnitude difference between minimum and maximum values. However, in general, phosphorus concentrations in discharges from the wet detention pond were extremely low in value, with an overall total phosphorus of only 13 μg/l. This extremely low value reflects a substantial reduction in phosphorus concentrations which likely occurs within the wet detention pond.

Relatively low levels of turbidity, TSS, and color were observed in discharges from the wet detention pond, although a relatively high degree of variability was observed between minimum and maximum values. The mean turbidity value of 0.9 NTU and mean TSS concentration of 1.5 mg/l reflect extremely low concentrations.

3.2.2.4 Lockhart-Smith Canal Inflow - Site 3

A summary of the chemical characteristics of inflows from the Lockhart-Smith Canal (Site 2) from April 2010-March 2012 is given in Table 3-20. Inflows from the Lockhart-Smith Canal were found to be approximately neutral in pH and poorly to moderately well buffered, with an overall mean alkalinity of 88 mg/l. A relatively wide range of conductivity values was measured at this site, although the mean conductivity value of 301 μmho/cm reflects a moderate concentration.

Measured concentrations of nitrogen species were highly variable in the Lockhart-Smith Canal inflow, with 1-2 orders of magnitude difference between minimum and maximum values. In general, relatively low mean input concentrations were observed for ammonia, NOx, and particulate nitrogen, likely reflecting uptake and attenuation of nitrogen species in the extensive canal system upstream from the Lockhart-Smith site. The mean total nitrogen concentration of 747 μg/l reflects a moderately low concentration which is approximately one-third of total nitrogen concentrations commonly observed in urban runoff. Dissolved organic nitrogen is the dominant nitrogen species observed at the canal inflow, comprising approximately 45% of the total nitrogen measured at this site.

A high degree of variability was observed in measured phosphorus species in the Lockhart-Smith Canal inflow, with 1-2 orders of magnitude difference between minimum and maximum values for most phosphorus species. Inflows at this site were characterized by relatively low levels of dissolved organic phosphorus and particulate phosphorus, with a moderately elevated value for SRP. The overall mean total phosphorus concentration of 106 μg/l is approximately one-half to one-third of phosphorus concentrations commonly observed in urban runoff. Dissolved SRP comprised approximately 50% of the total phosphorus measured at this site.

TABLE 3-20

CHARACTERISTICS OF INFLOW SAMPLES COLLECTED AT THE LOCKHART-SMITH CANAL INFLOW (SITE 3)

PARAMETER	UNITS	MINIMUM VALUE	MAXIMUM VALUE	GEOMETRIC MEAN
pH	s.u.	6.74	7.82	7.25
Alkalinity	mg/l	47.4	136	88
Conductivity	µmho/cm	176	484	301
Ammonia	µg/l	3	479	36
NO_x-N	µg/l	3	523	103
Dissolved Organic N	µg/l	29	980	322
Particulate N	µg/l	10	2736	113
Total N	µg/l	229	3378	747
SRP	µg/l	11	130	53
Dissolved Organic P	µg/l	1	67	7
Particulate P	µg/l	1	556	27
Total P	µg/l	39	584	106
Turbidity	NTU	0.6	72.2	4.4
Color	Pt-Co	43	207	84
TSS	mg/l	0.6	217.0	4.9

Measured concentrations for turbidity, TSS, and color were relatively low in value in samples collected from the Lockhart-Smith Canal inflow, although a high degree of variability was observed between individual measured values.

3.2.2.5 Northwest Dry Detention Pond Inflow - Site 4

A summary of the chemical characteristics of inflows from the northwest dry detention pond (Site 4) from April 2010-March 2012 is given on Table 3-21. Inflows from the northwest dry detention pond were approximately neutral in pH and moderately to well buffered, with a mean alkalinity of 113 mg/l. Measured conductivity values at this site are typical of concentrations observed in detention pond discharges, with an overall mean of 292 µmho/cm.

Measured concentrations of nitrogen species were highly variable in the northwest dry detention pond inflow, with 1-2 orders of magnitude difference between minimum and maximum values for most nitrogen species. The mean ammonia concentration of 79 µg/l measured at this site reflects a relatively low value. Moderate mean concentrations were observed for NO_x (160 µg/l) and particulate nitrogen (167 µg/l). The dominant nitrogen species at this site is dissolved organic nitrogen which comprises approximately 45% of the total nitrogen measured at the site.

TABLE 3-21

CHARACTERISTICS OF INFLOW SAMPLES COLLECTED AT THE NORTHWEST DRY DETENTION POND INFLOW (SITE 4)

PARAMETER	UNITS	MINIMUM VALUE	MAXIMUM VALUE	GEOMETRIC MEAN
pH	s.u.	7.00	8.05	7.47
Alkalinity	mg/l	77.4	161	113
Conductivity	µmho/cm	155	482	292
Ammonia	µg/l	27	429	79
NO_x-N	µg/l	16	1036	160
Dissolved Organic N	µg/l	172	2131	552
Particulate N	µg/l	22	897	167
Total N	µg/l	574	2806	1216
SRP	µg/l	80	382	169
Dissolved Organic P	µg/l	4	65	36
Particulate P	µg/l	6	393	37
Total P	µg/l	131	834	255
Turbidity	NTU	0.4	19.5	2.1
Color	Pt-Co	25	144	88
TSS	mg/l	0.6	43.4	2.9

Measured concentrations of phosphorus species in the dry detention pond inflow were also highly variable, with 1-2 orders of magnitude difference between minimum and maximum values for most phosphorus species. Relatively low levels of dissolved organic phosphorus and particulate phosphorus were observed in discharges at this site, presumably due to the filtration effects of the underdrain system used for drawdown of the pond between storm events. However, the mean SRP concentration of 169 µg/l reflects an extremely high value and is typical of SRP concentrations commonly observed in discharges from underdrain systems. The overall mean total phosphorus concentration of 255 µg/l is similar to total phosphorus concentrations observed in raw residential runoff.

Relatively low levels of turbidity and TSS were observed in discharges from the dry detention pond system, although a relatively high degree of variability was observed in values measured for individual storm events. Measured color concentrations were also highly variable, with the mean color concentration of 88 Pt-Co units reflecting a relatively elevated value.

3.2.2.6 Lockhart-Smith Canal Outfall - Site 5

A summary of the chemical characteristics of samples collected at the discharge from the Lockhart-Smith RSF (Site 5) from April 2010-March 2012 is given on Table 3-22. Discharges from the treatment area were found to be approximately neutral in pH and moderately to well buffered, with an overall mean alkalinity of 93 mg/l. Measured conductivity values were also moderate, with an overall mean of 238 µmho/cm.

TABLE 3-22

CHARACTERISTICS OF LOCKHART-SMITH CANAL DISCHARGE SAMPLES (SITE 5)

PARAMETER	UNITS	MINIMUM VALUE	MAXIMUM VALUE	GEOMETRIC MEAN
pH	s.u.	6.58	7.84	7.31
Alkalinity	mg/l	60.8	132	93
Conductivity	µmho/cm	231	475	338
Ammonia	µg/l	3	339	30
NO_x-N	µg/l	3	317	48
Dissolved Organic N	µg/l	21	940	354
Particulate N	µg/l	5	973	166
Total N	µg/l	99	1989	694
SRP	µg/l	5	187	62
Dissolved Organic P	µg/l	1	56	7
Particulate P	µg/l	2	356	45
Total P	µg/l	44	452	135
Turbidity	NTU	0.8	38.7	5.5
Color	Pt-Co	21	180	86
TSS	mg/l	0.5	77.5	10.5

Measured concentrations of nitrogen species were highly variable in the discharge from the treatment area, with 1-2 orders of magnitude difference between minimum and maximum values. In general, low concentrations were observed for ammonia and NO_x, although a high degree of variability was observed between concentrations measured for individual events. More elevated concentrations were observed for dissolved organic nitrogen and particulate nitrogen. The overall mean total nitrogen concentration of 694 µg/l is approximately one-third of nitrogen concentrations commonly observed in urban runoff. The dominant nitrogen species measured in the canal outfall is dissolved organic nitrogen which comprised approximately 50% of the total nitrogen measured at this site.

Measured concentrations of phosphorus species in the outfall canal were highly variable, with 1-2 orders of magnitude difference between minimum and maximum values. However, in general, measured dissolved organic phosphorus concentrations were relatively low in value, with moderate concentrations observed for SRP (62 μg/l) and particulate phosphorus (45 μg/l). The overall mean total phosphorus concentration of 135 μg/l is approximately half of the concentration commonly observed in urban runoff.

Relatively low concentrations of turbidity and TSS were observed in discharges from the treatment system, although a high degree of variability was observed in measured concentrations between individual storm events. The overall mean color concentration of 86 Pt-Co units reflects a relatively elevated value for this parameter.

3.2.2.7 Bulk Precipitation

A total of 46 bulk precipitation samples was collected at the Lockhart-Smith RSF site during the 730-day field monitoring program from April 2010-March 2012. A complete listing of the characteristics of each of the monitored bulk precipitation samples is given in Appendix C.7.

A tabular summary of the characteristics of bulk precipitation samples is given in Table 3-23. Measured pH values in bulk precipitation range from 4.84-7.16, with an overall mean of 5.72 which is typical of pH values commonly observed in urban precipitation. Measured alkalinity values were also highly variable, although the mean alkalinity of 4.5 mg/l is consistent with values commonly observed in urban precipitation. Measured conductivity values were also extremely low, with an overall mean of 33 μmho/cm.

Measured nitrogen concentrations in bulk precipitation were highly variable, with 1-2 orders of magnitude difference between minimum and maximum values for most nitrogen species. The dominant nitrogen species in bulk precipitation was dissolved organic nitrogen, followed by NO_x and ammonia. In general, measured concentrations of ammonia and NO_x in bulk precipitation were low to moderate in value and typical of concentrations commonly observed in the Central Florida area. The overall total nitrogen concentration of 682 μg/l is also typical of nitrogen concentrations commonly observed in bulk precipitation in the Central Florida area.

Highly variable concentrations were observed for measured phosphorus species in bulk precipitation, with 1-2 orders of magnitude difference between minimum and maximum measured values. The dominant phosphorus species in bulk precipitation was SRP which comprised approximately 35% of the observed total phosphorus. The overall mean total phosphorus concentration of 49 μg/l is similar to values commonly observed in the Central Florida area.

A high degree of variability was observed in measured concentrations for turbidity, TSS, and color in bulk precipitation. However, the observed mean values for these parameters are relatively low in value and within the range of concentrations commonly observed in Central Florida bulk precipitation.

TABLE 3-23

CHARACTERISTICS OF BULK PRECIPITATION SAMPLES

PARAMETER	UNITS	MINIMUM VALUE	MAXIMUM VALUE	GEOMETRIC MEAN
pH	s.u.	4.84	7.16	5.72
Alkalinity	mg/l	0.6	70.4	4.5
Conductivity	µmho/cm	10	218	33
Ammonia	µg/l	3	453	100
NO_x-N	µg/l	7	586	133
Dissolved Organic N	µg/l	5	831	157
Particulate N	µg/l	5	1450	99
Total N	µg/l	184	2357	682
SRP	µg/l	1	776	17
Dissolved Organic P	µg/l	1	160	6
Particulate P	µg/l	1	183	13
Total P	µg/l	6	1034	49
Turbidity	NTU	0.3	9.3	1.4
Color	Pt-Co	1	38	7
TSS	mg/l	0.6	61.2	2.4

3.2.3 Comparison of Chemical Characteristics

3.2.3.1 Variability Between Monitoring Sites

A comparison of mean chemical characteristics of inflow and outflow samples collected at the Lockhart-Smith RSF site from April 2010-March 2012 is given on Table 3-24. The values summarized in this table reflect the log-normal or geometric mean value for each of the monitoring sites provided in previous sections. Mean pH values measured at the five inflow monitoring sites appear to be relatively similar, with mean values ranging from 7.16-7.47 compared with a mean outflow pH of 7.31. A lower pH value of 5.72 was observed for bulk precipitation. Mean alkalinity values for the inflows range from 88.2-113 mg/l, reflecting relatively well buffered conditions, compared with a mean outfall alkalinity of 93.5 mg/l. A low alkalinity value of 4.5 mg/l was observed in bulk precipitation. Mean conductivity values at the inflow sites ranged from 285-421 µmho/cm, compared with an outflow concentration of 338 µmho/cm. A much lower mean conductivity value of 33 µmho/cm was recorded in bulk precipitation.

TABLE 3-24

COMPARISON OF MEAN CHARACTERISTICS OF INPUTS AND OUTPUTS AT THE LOCKHART-SMITH RSF FROM APRIL 2010-MARCH 2012

PARAMETER	UNITS	MEAN INFLOW CONCENTRATIONS BY SOURCE						Mean Outflow Concentration
		Site 1	Site 1A	Site 2	Site 3	Site 4	Bulk Precipitation	
pH	s.u.	7.19	7.16	7.35	7.25	7.47	5.72	7.31
Alkalinity	mg/l	93.3	110	91.8	88.2	113	4.5	93.5
Conductivity	µmho/cm	421	363	285	301	292	33	338
Ammonia	µg/l	49	37	30	36	79	100	30
NO_x-N	µg/l	88	7	20	103	160	133	48
Dissolved Organic N	µg/l	490	643	287	322	552	157	354
Particulate N	µg/l	162	166	57	113	167	99	166
Total N	µg/l	981	925	456	747	1,216	682	694
SRP	µg/l	39	38	2	53	169	17	62
Dissolved Organic P	µg/l	10	10	3	7	36	6	7
Particulate P	µg/l	43	16	5	27	37	13	45
Total P	µg/l	115	74	13	106	255	49	135
Turbidity	NTU	6.6	2.4	0.9	4.4	2.1	1.4	5.5
Color	Pt-Co	116	149	15	84	88	7	86
TSS	mg/l	12.1	2.2	1.5	4.9	2.9	2.4	10.5

Low levels of ammonia and low to moderate levels of NO_x were observed at each of the inflow monitoring sites, including bulk precipitation. The mean ammonia concentration in the outflow is equal to or less than the mean concentrations measured for ammonia at any of the inflow sources, and the mean outflow NO_x concentration of 48 µg/l is lower than four of the six monitored inflows. A relatively high degree of variability is apparent in mean concentrations for dissolved organic nitrogen which ranged from 287-643 µg/l at the inflow monitoring sites, excluding bulk precipitation. A mean concentration of 354 µg/l was observed for dissolved organic nitrogen in the system outflow. In general, particulate nitrogen concentrations were low to moderate in value at the inflow monitoring sites, including bulk precipitation, with a mean outflow concentration similar to values measured in the inflows. Mean total nitrogen concentrations for the measured inflows were also highly variable, ranging from 456-1216 µg/l compared with an outflow concentration of 694 µg/l.

A relatively high degree of variability was also observed for measured concentrations of SRP, dissolved organic phosphorus, and particulate phosphorus for the inflow monitoring sites, with mean SRP concentrations ranging from 2-169 μg/l, mean dissolved organic phosphorus concentrations ranging from 3-36 μg/l, and mean particulate phosphorus concentrations ranging from 5-33 μg/l. Mean outflow concentrations appear to be relatively similar to concentrations measured at the Lockhart-Smith Canal inflow, with the exception of particulate phosphorus which increases in concentration during migration through the treatment area. Mean total phosphorus concentrations at the inflow sites are also highly variable, ranging from 213-255 μg/l, compared with an outflow concentration of 135 μg/l.

Relatively low levels of turbidity and TSS were observed at each of the inflow monitoring sites as well as in bulk precipitation, with mean concentrations for turbidity and TSS in the outflow slightly higher than measured in the inflow samples. Inflows into the Lockhart-Smith RSF also exhibited a wide range of color concentrations, ranging from 7-149 Pt-Co units, compared with an outflow concentration of 86 Pt-Co units.

A statistical comparison of alkalinity, TSS, turbidity, and color measurements in inflow and outflow samples is given on Figure 3-15. Measured alkalinity values appear to be relatively similar between the inflow and outflow sites, with slightly higher concentrations measured at Sites 1A and 4, both of which have significant groundwater components. Measured TSS concentrations appear to be relatively similar and low in value at monitoring Sites 1A, 2, 3, and 4. More elevated concentrations of TSS were observed at Site 1 and in the outfall canal at Site 5. A similar pattern is apparent for measured turbidity concentrations, with relatively low and similar concentrations observed at Sites 1A, 2, 3, and 4, and slightly higher values measured at Sites 1 and 5. A higher degree of variability is apparent in measured color concentrations between the monitoring sites, with low color measured in the wet detention pond at Site 2 and more elevated color concentrations observed at the remaining sites. Measured color concentrations appear to be virtually identical at Sites 3, 4, and 5.

A statistical comparison of nitrogen species at the inflow and outflow monitoring sites is given in Figure 3-16. Measured ammonia concentrations appear to be relatively low in value at each of the inflow and outflow monitoring sites, with a slightly higher concentration measured at Site 4. A higher degree of variability is apparent in measured NO_x concentrations, with low concentrations observed at Sites 1A, 2, and 5, and more elevated values measured at Sites 1, 3, and 4. Measured particulate nitrogen concentrations appear to be relatively similar between the inflow and outflow monitoring sites, with a slightly lower concentration observed at Site 2. Measured total nitrogen concentrations exhibit a high degree of variability, with the lowest concentrations measured at Sites 2, 3, and 5, and more elevated concentrations measured at Sites 1, 1A, and 4.

A statistical comparison of measured phosphorus species at the inflow and outflow monitoring sites is given on Figure 3-17. Low levels of SRP were observed at Site 2, with moderate levels observed at Sites 1, 1A, 3, and 5, and an elevated SRP concentration observed from the underdrain system at Site 4. A high degree of variability was observed in dissolved organic phosphorus concentrations between the inflow and outflow monitoring sites, although in general, the observed concentrations were generally low in value. Relatively low concentrations of dissolved organic phosphorus were observed at Sites 1, 1A, 2, 3, and 5, with more elevated values observed at Site 4. Relatively low levels of particulate phosphorus were observed at the inflow and outflow monitoring sites, particularly at Sites 1A and 2. Measured total phosphorus concentrations were highly variable between the inflow and outflow monitoring sites, with low levels of total phosphorus observed at Site 2, moderate levels observed at Sites 1, 1A, 3, and 5, and more elevated values observed at Site 4.

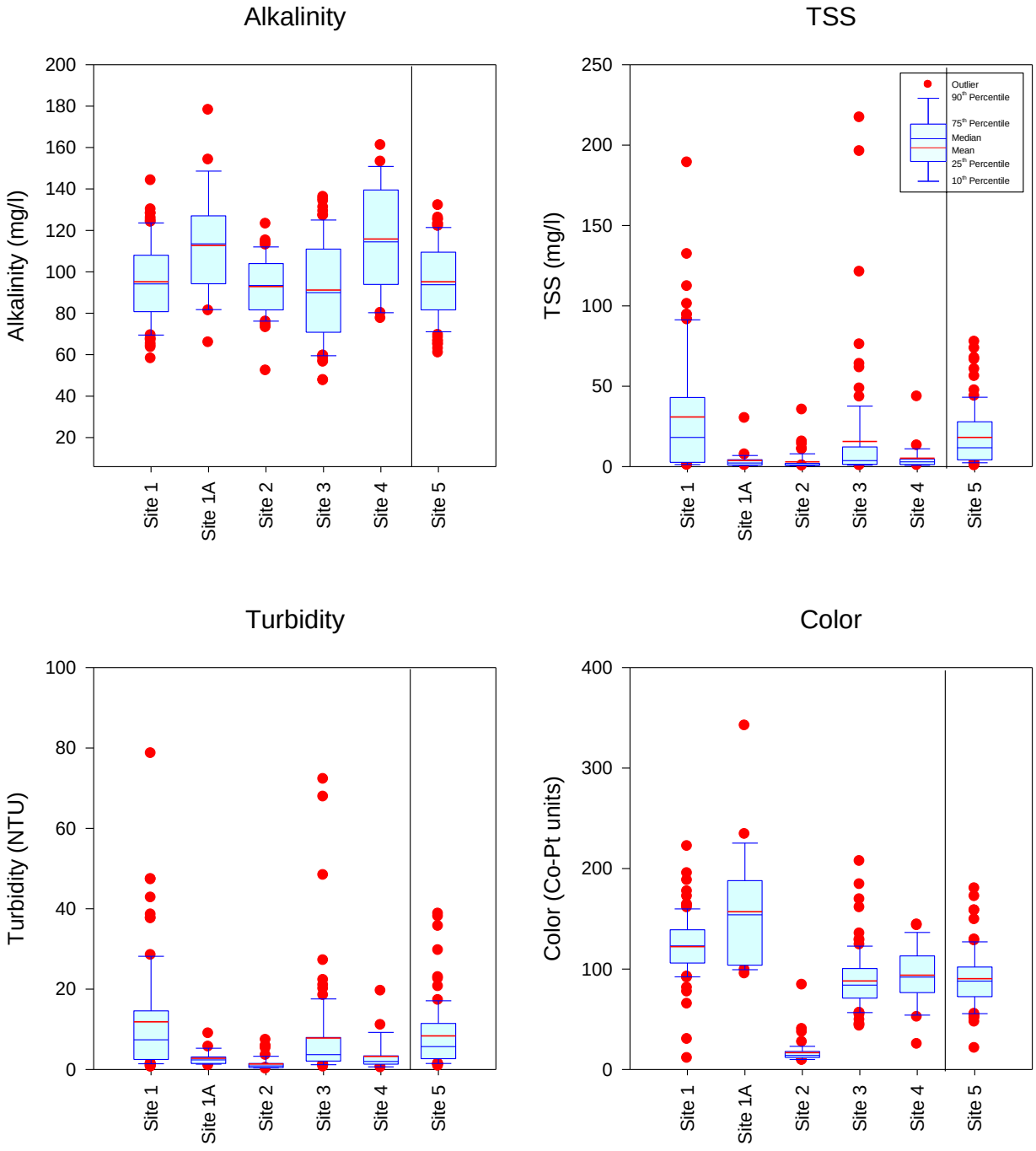


Figure 3-15. Statistical Comparison of Alkalinity, TSS, Turbidity, and Color Measured in Inflow/Outflow Samples Collected in the Lockhart-Smith RSF.

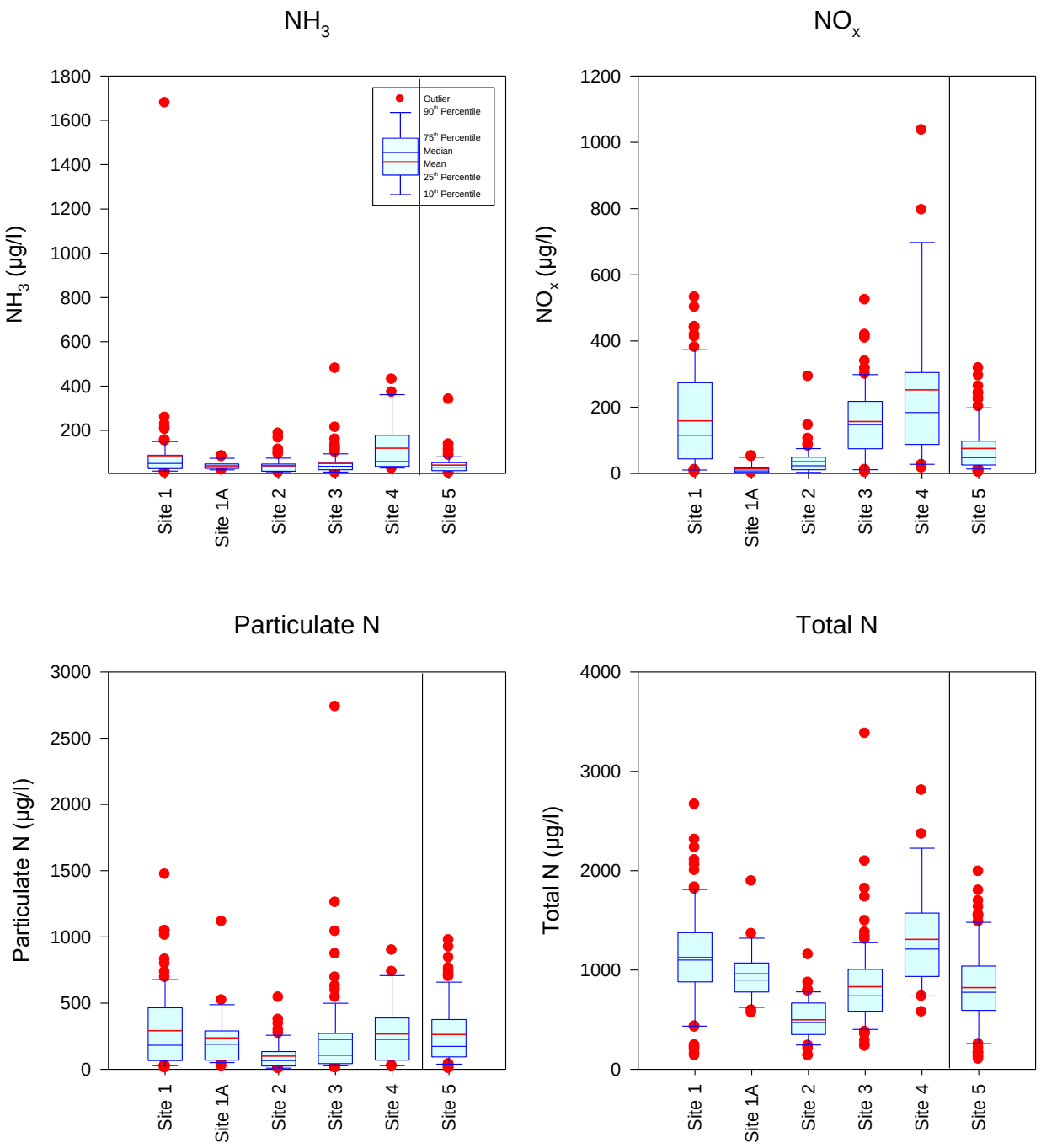


Figure 3-16. Statistical Comparison of Nitrogen Species Measured in Inflow/Outflow Samples Collected in the Lockhart-Smith RSF.

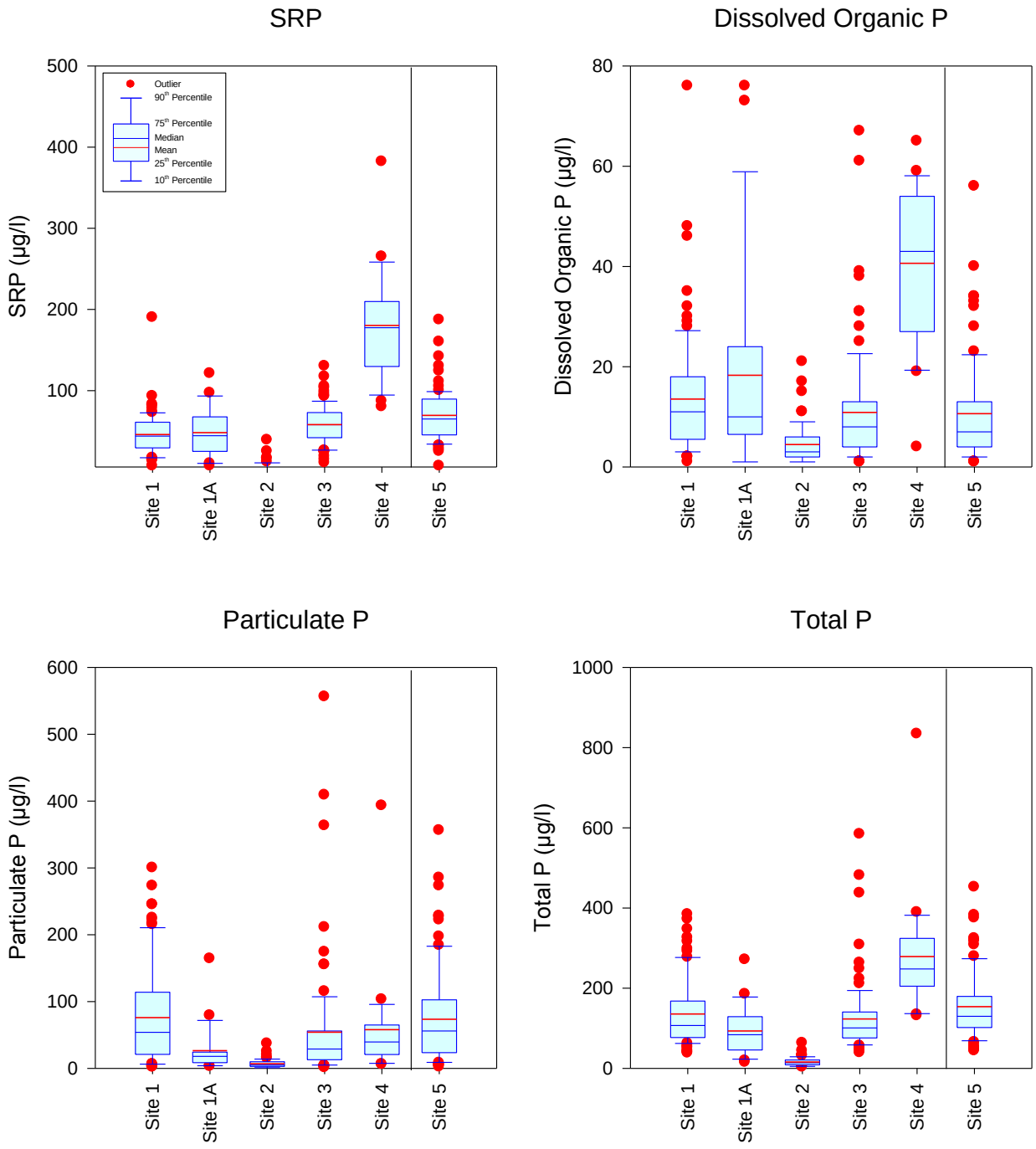


Figure 3-17. Statistical Comparison of Phosphorus Species Measured in Inflow/Outflow Samples Collected in the Lockhart-Smith RSF.

3.2.3.2 Temporal Variability

A graphical summary of temporal variability in alkalinity concentrations in inflow and outflow samples at the Lockhart-Smith RSF site is given in Figure 3-18. Measured alkalinity values were highly variable throughout the field monitoring program. However, a trend of lower alkalinity values is apparent at Sites 1 and 5, with more elevated alkalinity measurements observed at Sites 1A and 4.

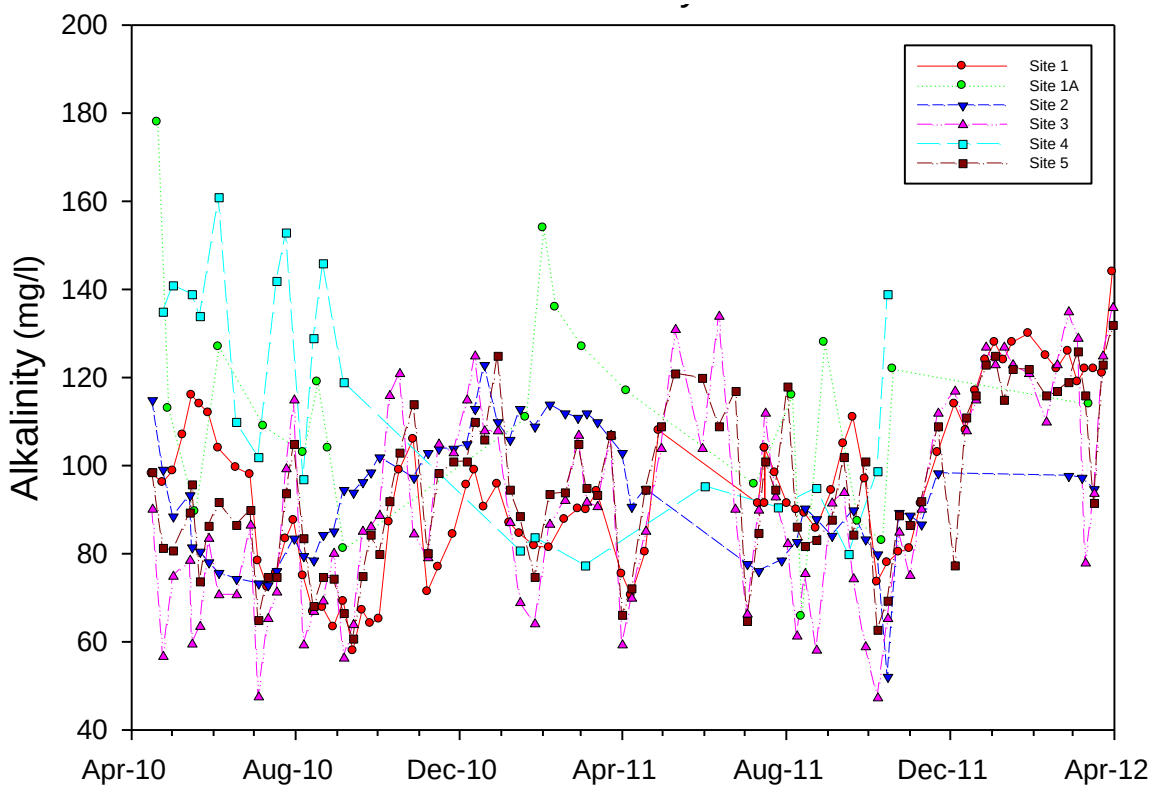


Figure 3-18. Concentrations of Alkalinity in Inflow/Outflow Samples Collected at the Lockhart-Smith RSF from April 2010-March 2012.

A graphical summary of temporal variability in measured concentrations of ammonia and NO_x in the inflow and outflow monitoring sites during the field monitoring program is given on Figure 3-19. In general, ammonia concentrations appear to be low in value at each of the monitored inflow and outflow sites, with a slight trend of higher ammonia concentrations measured at Site 4, reflecting discharges from the pond underdrain system. In contrast, measured NO_x concentrations were highly variable at the inflow and outflow monitoring sites, although a trend of somewhat lower NO_x concentrations is apparent at Sites 1A, 2, and 5, with more elevated NO_x concentrations observed at Sites 1 and 4.

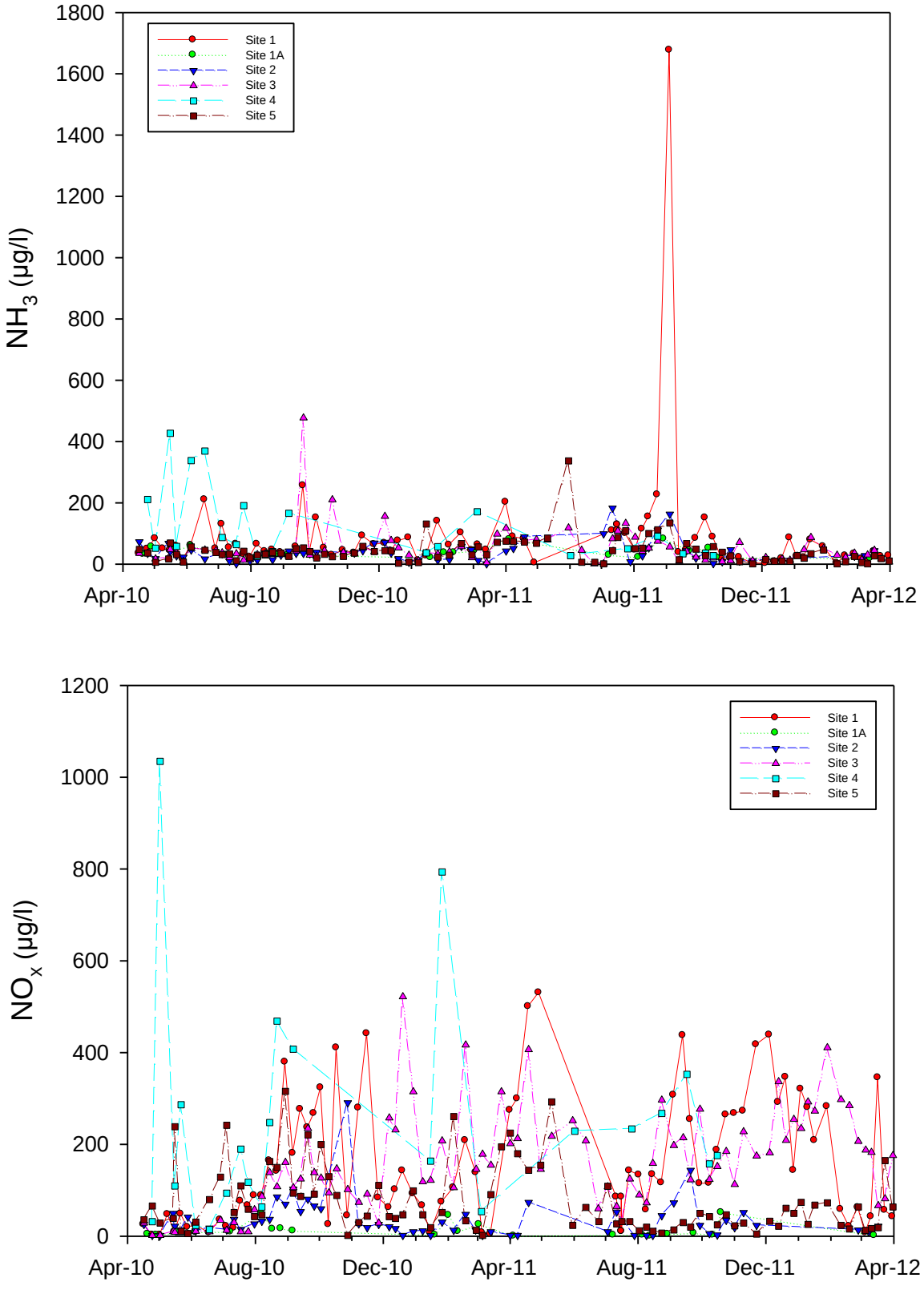


Figure 3-19. Concentrations of Ammonia and NO_x in Inflow/Outflow Samples Collected at the Lockhart-Smith RSF from April 2010-March 2012.

A graphical summary of temporal variability in measured concentrations of particulate nitrogen and total nitrogen at the inflow and outflow monitoring sites at the Lockhart-Smith RSF site is given on Figure 3-20. In general, measured particulate nitrogen concentrations were highly variable during the field monitoring program. A trend of somewhat lower concentrations for particulate nitrogen is apparent at Sites 2 and 5, with more elevated concentrations commonly observed at Sites 1 and 3. A high degree of variability is also apparent in measured total nitrogen concentrations at each of the inflow and outflow monitoring sites. A slight trend of lower total nitrogen concentrations is apparent at Sites 2 and 5, with more elevated concentrations commonly occurring at Sites 1 and 4.

A graphical summary of temporal variability in measured concentrations for SRP and dissolved organic phosphorus in inflow and outflow samples collected at the Lockhart-Smith RSF site is given in Figure 3-21. Measured concentrations of SRP were highly variable at each of the monitoring sites during the field monitoring program. A trend of substantially lower SRP concentrations is apparent at Site 2 which reflects the discharge from the Bill Heard wet detention pond. Substantially higher concentrations for SRP are apparent at Site 4 which reflects the discharge from the dry detention pond underdrain system. A large degree of variability is also apparent in measured concentrations of dissolved organic phosphorus. In general, samples collected at the wet detention pond inflow (Site 2) and the Lockhart-Smith inflow (Site 3) often have lower concentrations for this parameter. More elevated concentrations for this parameter were observed at Sites 1 and 4.

A graphical summary of temporal variability in particulate phosphorus and total phosphorus in inflow and outflow samples collected at the Lockhart-Smith RSF site is given in Figure 3-22. A high degree of variability was observed in measured particulate phosphorus concentrations during the field monitoring program. However, relatively consistent low levels of particulate phosphorus were observed in the wet detention pond inflow (Site 2) and in the swale inflow site (Site 1A). Measured concentrations of total phosphorus were also highly variable between the inflow and outflow monitoring sites. However, consistently lower levels of total phosphorus were observed in the discharge from the wet detention pond (Site 2) as well as the inflow at Site 1 which reflects discharges from the wet detention pond system associated with the residential development west of North Oregon Street. Consistently higher concentrations of total phosphorus were observed at Site 4 which reflects the discharge from the underdrain system for the dry detention pond.

A graphical summary of temporal variability in TSS and color in inflow and outflow samples collected at the Lockhart-Smith RSF site is given on Figure 3-23. Measured TSS concentrations were typically low in value at the majority of the monitoring sites throughout much of the field monitoring program. Consistently low levels of TSS were observed at the wet detention pond inflow (Site 2), the Lockhart-Smith Canal inflow (Site 3), and the dry detention underdrain inflow (Site 4). Consistently elevated levels of TSS were observed in the western channel inflow (Site 1). Measured color concentrations were also highly variable between the inflow and outflow monitoring sites. Consistently low levels of color were observed in the inflow from the Bill Heard wet detention pond (Site 2), with consistently higher color concentrations observed in the swale inflow measured at Site 1A. Measured color concentrations at the remaining sites appear to be relatively similar.

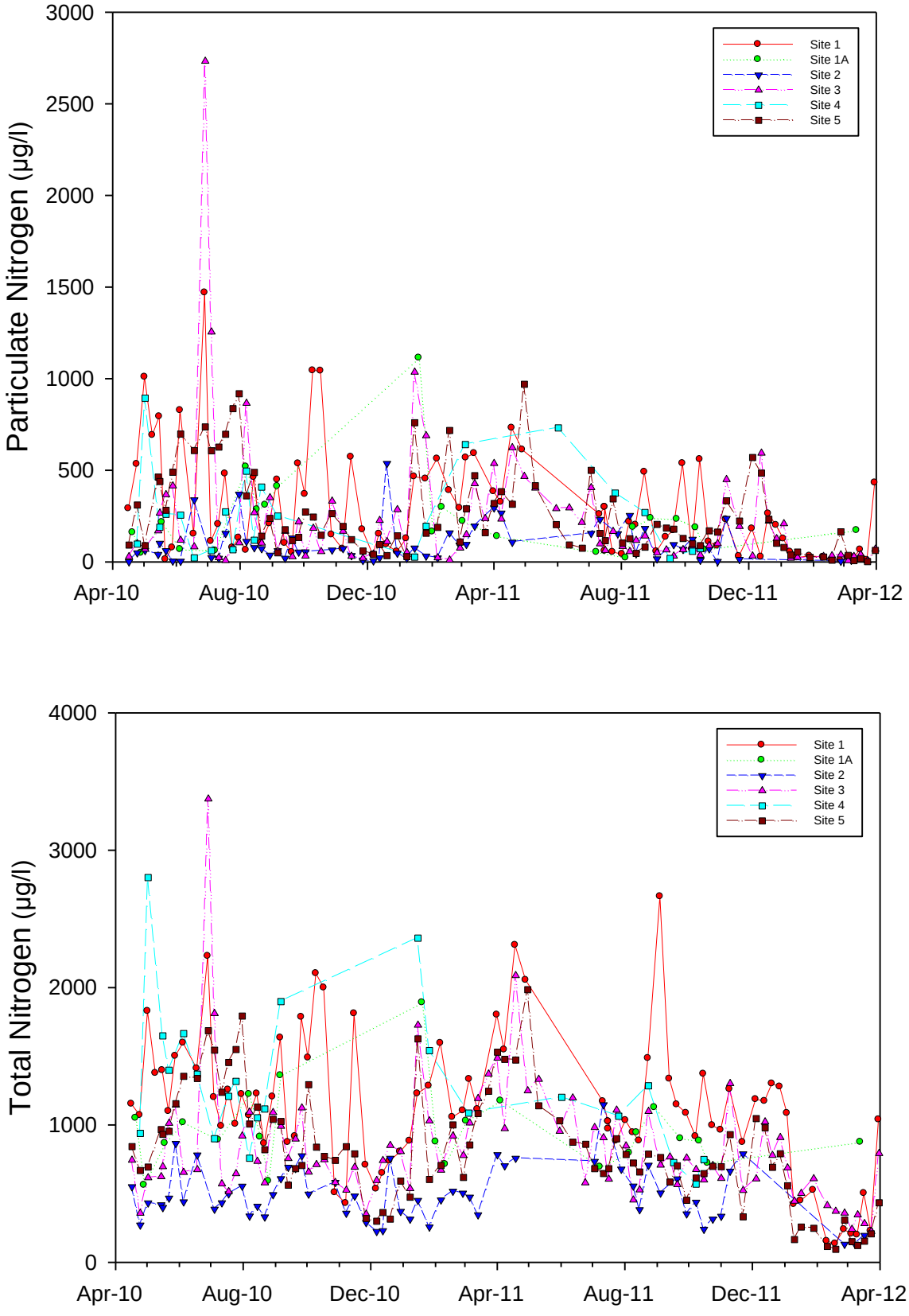


Figure 3-20. Concentrations of Particulate Nitrogen and Total Nitrogen in Inflow/Outflow Samples Collected at the Lockhart-Smith RSF from April 2010-March 2012.

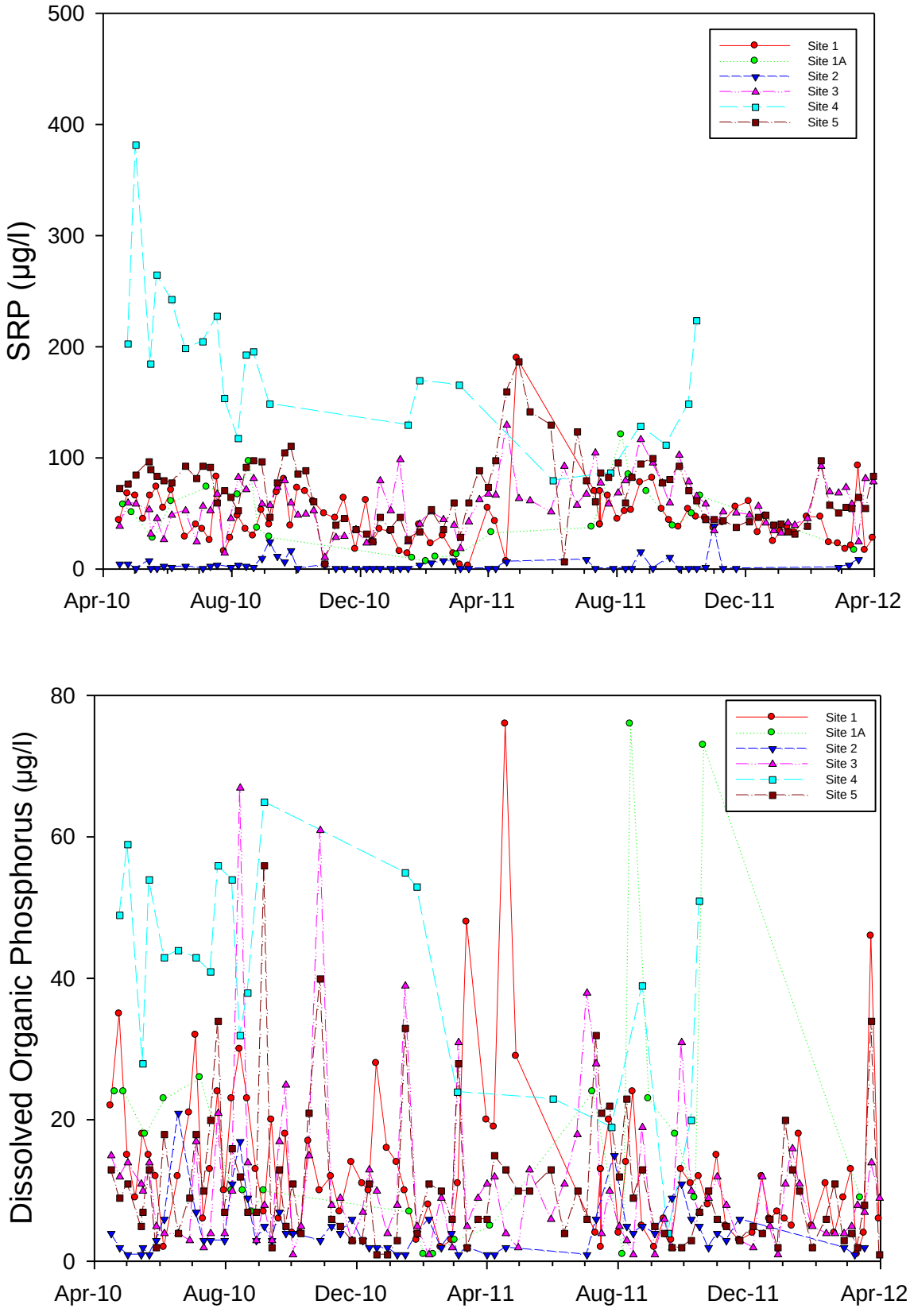
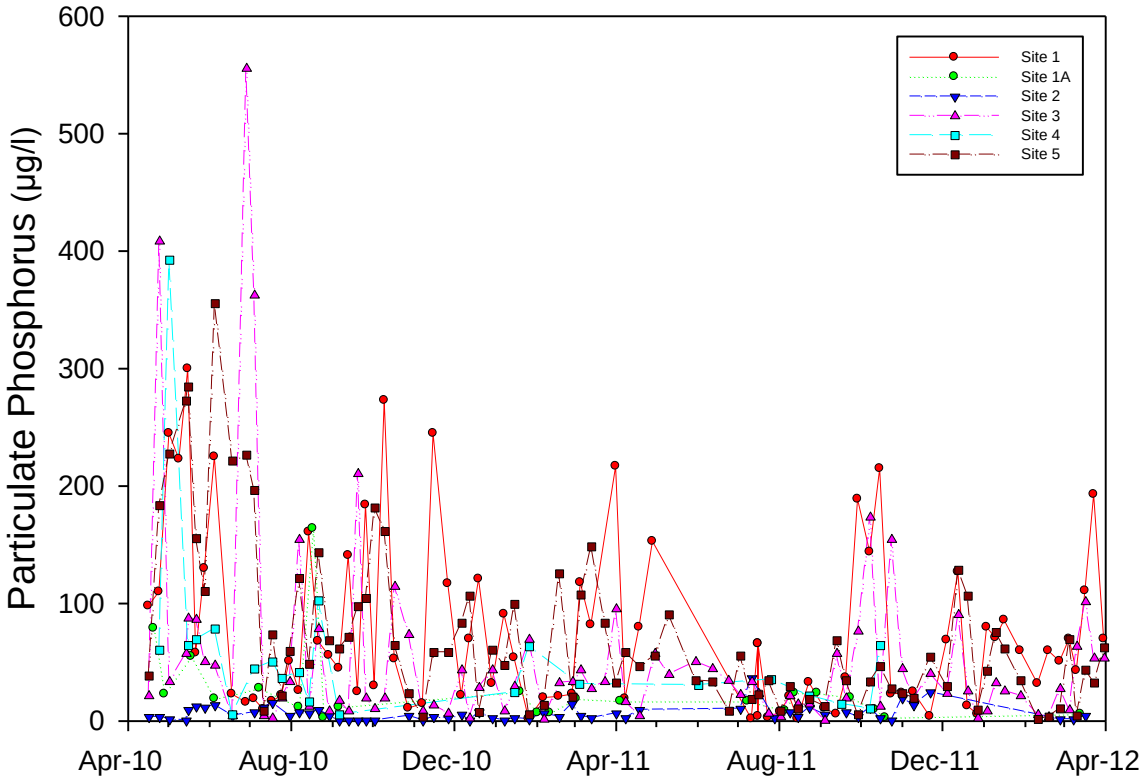


Figure 3-21. Concentrations of SRP and Dissolved Organic Phosphorus in Inflow/Outflow Samples Collected at the Lockhart-Smith RSF from April 2010-March 2012.



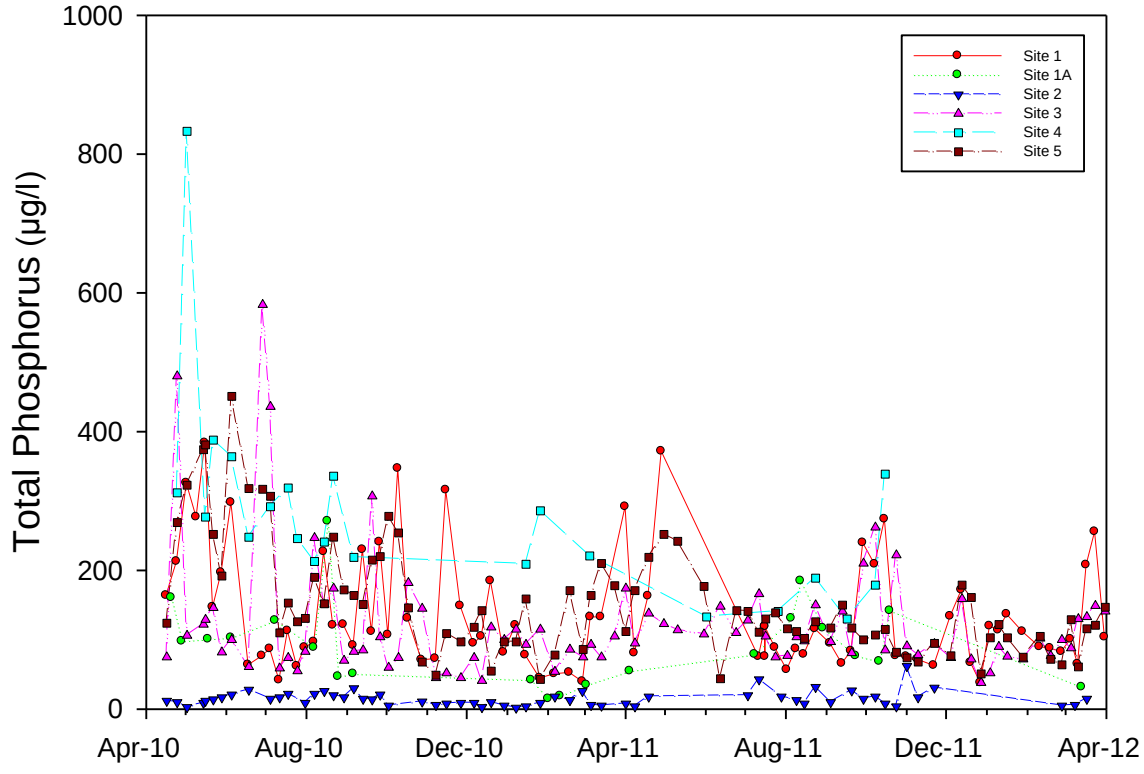


Figure 3-22. Concentrations of Particulate Phosphorus and Total Phosphorus in Inflow/ Outflow Samples Collected at the Lockhart-Smith RSF from April 2010-March 2012.

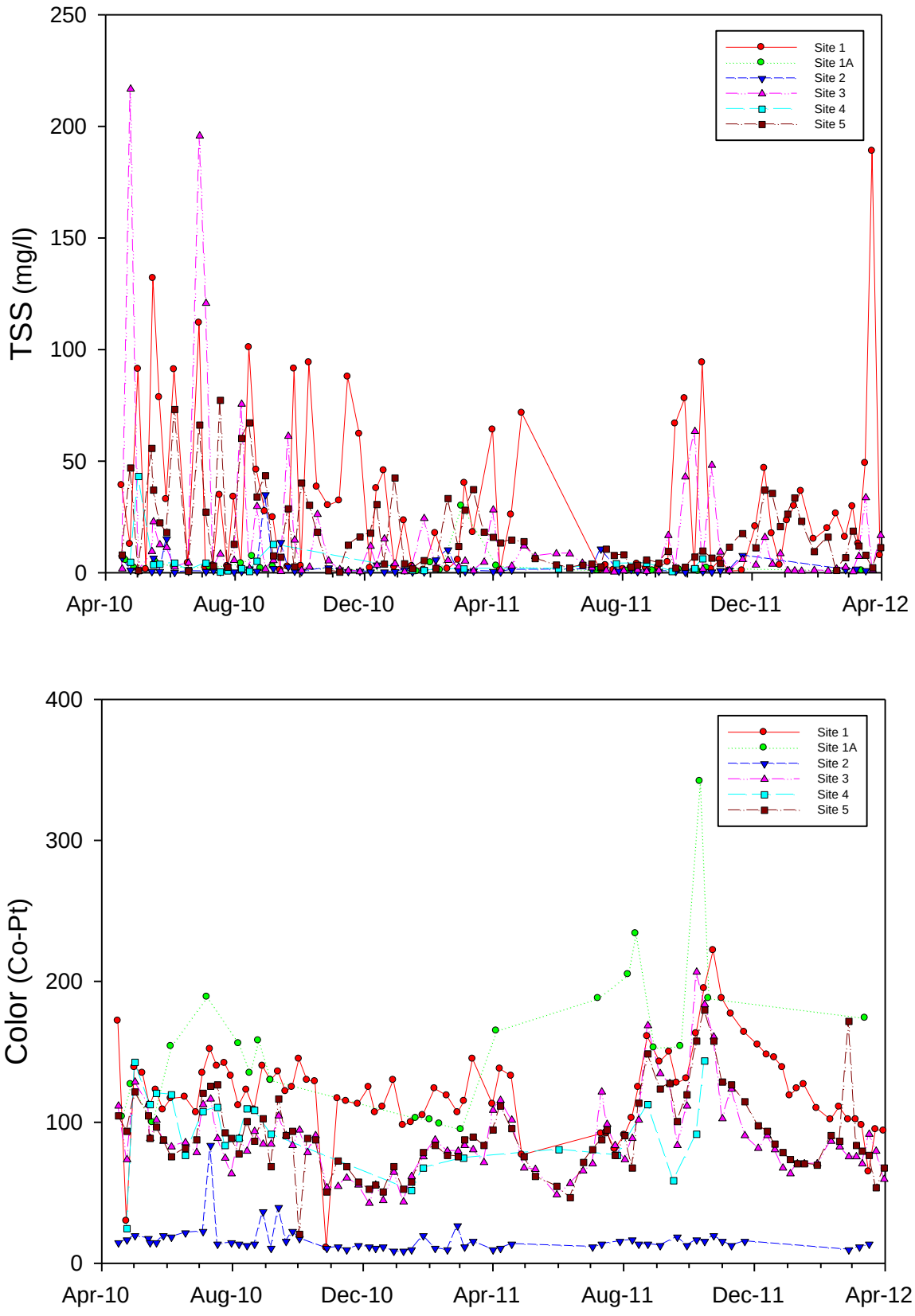


Figure 3-23. Concentrations of TSS and Color in Inflow/Outflow Samples Collected at the Lockhart-Smith RSF from April 2010-March 2012.

3.3 System Performance Efficiency

3.3.1 Concentration-Based Removals

A comparison of flow-weighted inflow and outflow concentrations for the Lockhart-Smith RSF during the field monitoring program is given in Table 3-25. The weighted inflow concentration was calculated as the flow-weighted average of the mean concentrations measured at each of the inflow monitoring sites, including bulk precipitation, with concentrations weighted based upon the relative inflow contribution from each source using the hydrologic input information summarized in Table 3-14. The mean outflow concentration reflects the mean value measured in the Lockhart-Smith outfall canal at Site 5. Concentration-based removal efficiencies are useful in reflecting physical, chemical, and biological mechanisms responsible for removing constituents within the treatment system.

Decreases in concentrations between the flow-weighted inputs and outputs were observed for ammonia (21% reduction), NO_x (51% reduction), total nitrogen (10% reduction) and dissolved organic phosphorus (2% reduction). Slight increases in outflow concentrations were observed for pH (1% increase), alkalinity (6% increase), conductivity (9% increase), and dissolved organic nitrogen (3% increase). More substantial increases between inflows and outflows were observed for particulate nitrogen (40% increase), SRP (23% increase), particulate phosphorus (62% increase), total phosphorus (30% increase), turbidity (22% increase), and TSS (91% increase). No change was observed in color concentrations between flow-weighted inflows and outflows.

TABLE 3-25

CALCULATED CHANGES IN CONCENTRATIONS FOR INPUTS AND OUTPUTS AT THE LOCKHART-SMITH RSF

PARAMETER	UNITS	WEIGHTED INPUT CONCENTRATION	MEAN OUTFLOW CONCENTRATION	CONCENTRATION CHANGE (%)
pH	s.u.	7.23	7.31	1
Alkalinity	mg/l	88.2	93.5	6
Conductivity	µmho/cm	312	338	9
Ammonia	µg/l	38	30	-21
NO_x-N	µg/l	98	48	-51
Dissolved Organic N	µg/l	343	354	3
Particulate N	µg/l	118	166	40
Total N	µg/l	769	694	-10
SRP	µg/l	50	62	23
Dissolved Organic P	µg/l	8	7	-2
Particulate P	µg/l	28	45	62
Total P	µg/l	104	135	30
Turbidity	NTU	4.5	5.5	22
Color	Pt-Co	86	86	0
TSS	mg/l	5.5	10.5	91

Based upon this analysis, the wetland treatment area appears capable of removing ammonia, NO_x, and total nitrogen, along with a small amount of dissolved organic phosphorus. However, increases in concentrations were observed for total phosphorus between the inflow and outflow concentrations. Total phosphorus concentrations in wetland treatment systems often reach equilibrium concentrations ranging from 100-150 mg/l, with the mean outflow concentration of 135 mg/l falling within this range. Many wetland systems discharge phosphorus concentrations in this range regardless of the incoming phosphorus concentrations. If the incoming phosphorus concentrations are elevated, then a substantial removal is likely to occur, but if the incoming phosphorus concentrations are relatively low in value, then an increase in total phosphorus often occurs as a result of nutrient dynamics within the wetland treatment area.

The concentration-based removal efficiencies summarized in Table 3-25 are based upon flow-weighted inflow and outflow concentrations during the entire 24-month field monitoring program. An additional analysis was conducted to evaluate input and output concentrations on a monthly basis to determine if seasonal or temporal variability in concentration-based removals may be present. Mean monthly concentrations were calculated for each of the evaluated parameters on a monthly basis for each of the five monitored inflow sites and the Lockhart-Smith discharge. The monthly concentrations were calculated as the average of concentrations measured during each monthly period at each site. If samples were not available during a monthly period for a given site, then the monthly concentration was estimated as the average of the mean concentration during the preceding and following monthly periods. This process generated mean monthly concentrations for each inflow site and each evaluated parameter throughout the 24-month field monitoring program. The mean monthly concentrations were then weighted using the measured monthly hydrologic inputs summarized on Table 3-14.

A graphical summary of temporal variability in monthly concentration-based removal efficiencies at the Lockhart-Smith RSF from April 2010-March 2012 is given on Figure 3-24. Concentration-based removals are provided for each of the evaluated species of nitrogen and phosphorus. On these figures, positive removals indicate a net decrease in concentration between the flow-weighted inputs and outputs on a monthly basis, while negative removal efficiencies indicate a concentration increase at the discharge from the RSF compared with the monthly flow-weighted inflow concentrations.

Large increases in concentrations occurred between the inflow and outflow for both NO_x and particulate nitrogen during the initial five months of the study period. However, beginning in August 2010, a consistent decrease in concentration for NO_x was observed between the inflow and outflow. Concentrations of ammonia exhibited a relatively consistent decrease between inflow and outflow concentrations, although concentration increases were observed during several monthly periods. In general, concentrations of particulate nitrogen exhibited a relatively consistent concentration increase. Overall, total nitrogen concentrations exhibited a concentration increase during the initial few months of the monitoring program, followed by a relatively consistent decrease in concentrations between inflow and outflow values for the remainder of the field monitoring program.

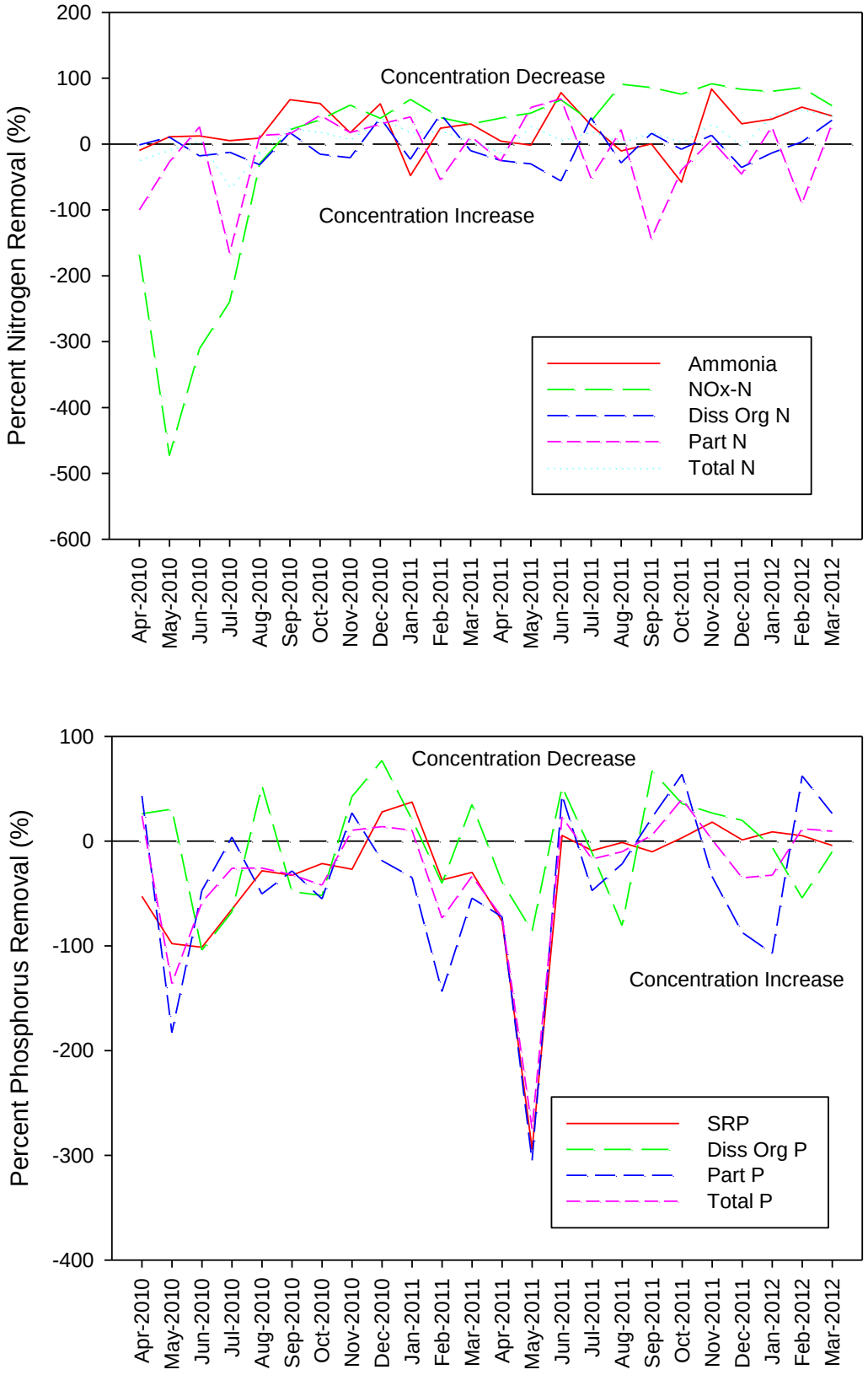


Figure 3-24. Temporal Variability in Monthly Concentration-Based Removal Efficiencies for Total Nitrogen and Total Phosphorus at the Lockhart-Smith RSF from April 2010-March 2012.

Concentration-based removal efficiencies for phosphorus species were highly variable throughout the entire field monitoring program. Significant increases in phosphorus concentrations were observed during winter and spring conditions, with overall total phosphorus concentration increases ranging from 150-300%. Relatively consistent increases in SRP were observed between inflow and outflow concentrations, with decreases in SRP concentrations observed during only 6 of the 24 months included in the field monitoring program. A similar pattern was observed for particulate phosphorus which generally exhibited a concentration increase between inflow and outflow values. Overall, concentration-based removals appear to occur for total phosphorus only during fall conditions.

3.3.2 Mass Removal Efficiency

Total mass loadings were calculated for each of the evaluated inputs and losses at the Lockhart-Smith RSF site over the 24-month monitoring program from April 2010-March 2012. Mass inputs were calculated by multiplying the mean concentrations for each input source (summarized in Table 3-24) times the measured hydrologic inputs (summarized in Table 3-14). Mass losses into the system are calculated for inflows at Sites 1, 1A, 2, 3, 4, and bulk precipitation. Mass losses are calculated for discharges through the outfall canal. Mass inputs and losses calculated in this manner include hydrologic impacts, such as evapotranspiration, which reduces the water volume that discharges from the system.

A summary of calculated mass inputs and outputs at the Lockhart-Smith RSF during the field monitoring program is given on Table 3-26. The largest mass loadings into the treatment area originate from Site 3 for each of the evaluated parameters. In general, mass inputs from Site 3 contribute 80-90% of the total mass loadings for each parameter. The second largest mass inputs into the system occur from the western inflow channel at Site 1, followed by inputs from the roadside swale system at Site 1A. Mass loadings from the wet detention pond inflow at Site 2 and bulk precipitation appear to be relatively similar for many parameters. A relatively minimal mass loading occurred from the dry detention pond underdrain at Site 4. Mass losses from the treatment area were calculated by multiplying the mean outfall concentrations (summarized in Table 3-24) times the total hydrologic outputs measured in the discharge canal.

During the 24-month field monitoring program, the Lockhart-Smith RSF produced a 23% reduction in mass loadings for ammonia, a 52% reduction for mass loadings for NO_x, and a 12% reduction in mass loadings for total nitrogen. The system also achieved a relatively small removal efficiency of approximately 4% for dissolved organic phosphorus. In contrast, relatively significant increases in loadings were observed for particulate nitrogen (87% increase), SRP (20% increase), particulate phosphorus (59% increase), total phosphorus (27% increase), and TSS (87% increase).

TABLE 3-26

CALCULATED MASS INPUTS AND OUTPUTS AT THE LOCKHART-SMITH RSF

PARAMETER	TOTAL MASS LOADING BY SOURCE (kg)						TOTAL MASS INPUTS (kg)	TOTAL MASS LOSSES (kg)	MASS REMOVAL (%)
	Site 1	Site 1A	Site 2	Site 3	Site 4	Bulk Precipitation			
Ammonia	96	10	11	551	0.9	21	691	531	23
NO_x-N	174	2.0	7.6	1,581	1.8	28	1,794	857	52
Diss. Org. N	965	177	109	4,952	6.2	33	6,243	6,298	-1
Particulate N	319	46	22	1,741	1.9	21	2,150	2,950	-37
Total N	1,931	255	174	11,493	14	143	14,009	12,367	12
SRP	77	10	1.0	818	1.9	3.6	911	1,096	-20
Diss. Org. P	19	2.8	1.3	112	0.4	1.3	137	131	4
Particulate P	84	4.5	1.8	412	0.4	2.8	506	802	-59
Total P	227	20	5.0	1,629	2.9	10.2	1,894	2,411	-27
TSS	23,891	607	567	74,908	32	512	100,516	187,749	-87

The estimated mass removal efficiencies summarized in Table 3-26 reflect the overall mass load reductions or increases during the 24-month monitoring program. However, to evaluate potential seasonal or temporal variability in mass removal efficiencies, removal efficiencies for total nitrogen and total phosphorus were evaluated on a monthly basis similar to the analysis previously described for concentration-based efficiencies. A graphical summary of temporal variability and mass removal efficiencies for total nitrogen and total phosphorus at the Lockhart-Smith RSF from April 2010-March 2012 is given on Figure 3-25. The values summarized in this figure reflect percent mass removal efficiencies based upon inflow and outflow mass loadings. In general, a net release of nitrogen was observed for the majority of the monitored nitrogen species during the initial 12 months of the field monitoring program. Substantial mass releases were observed for parameters such as NO_x, ammonia, dissolved organic nitrogen, particulate nitrogen, and total nitrogen. However, during the final 12 months of the field monitoring program, a net removal was observed for NO_x, ammonia, dissolved organic nitrogen, and total nitrogen. The only nitrogen species which appeared to exhibit a net export of mass within the system is particulate nitrogen.

The observed differences in mass removal efficiencies for nitrogen species between the initial and final 12-month monitoring periods suggests that the system may be reaching an equilibrium in terms of removal processes for nitrogen species. Construction of the RSF and flooding of the previously hydrologicly altered wetlands resulted in an alteration of the vegetative communities within the site. The observed mass releases of nitrogen during the initial 12-month monitoring program may reflect mass losses as this new equilibrium community becomes stabilized. The observed removal characteristics during the final 12 months of the field monitoring program may be more reflective of the anticipated long-term performance of the system.

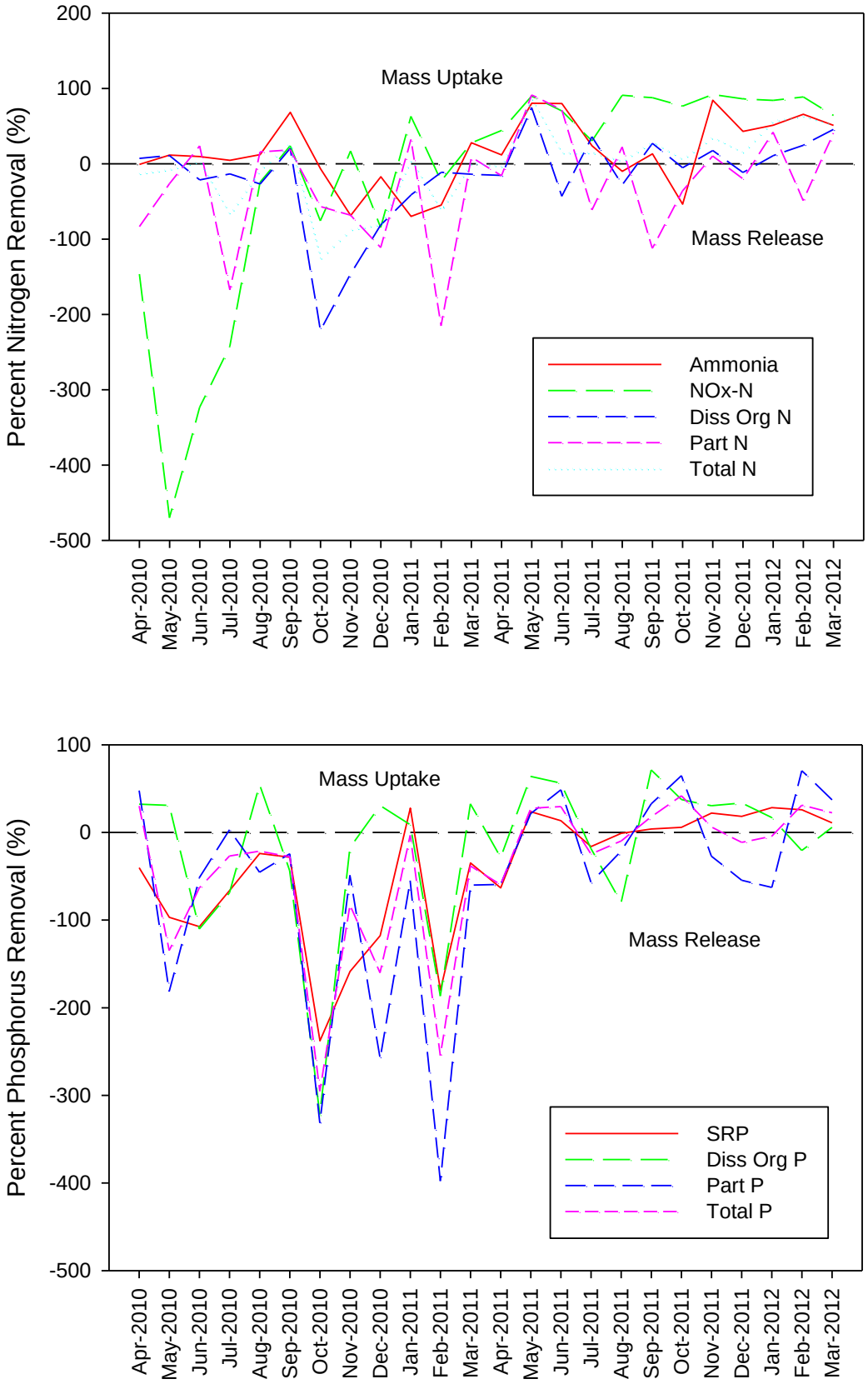


Figure 3-25. Temporal Variability in Mass Removal Efficiencies for Total Nitrogen and Total Phosphorus at the Lockhart-Smith RSF from April 2010-March 2012.

Temporal variability in mass removal efficiencies for total phosphorus are similar to the patterns observed for total nitrogen. Large releases of phosphorus occurred from the wetland area during the initial 12 months of the field monitoring program which resulted in an overall export of phosphorus when evaluated over the 24-month monitoring program. However, during the final 12 months of the field monitoring program, the RSF appears to be reaching a new equilibrium with respect to phosphorus dynamics. As discussed previously for total nitrogen, the wetland treatment area may be reaching a new equilibrium for phosphorus dynamics, and the removal efficiencies observed during the final 12 months may be more reflective of the long-term removal efficiencies for the system.

A graphical summary of temporal variability in mass load reductions for total nitrogen and total phosphorus is given in Figure 3-26. The values summarized in this figure reflect the actual mass which is either taken up or released rather than a percentage-based removal efficiency. In general, a net mass release occurred for total nitrogen during the initial 12 months of the field monitoring program, followed by a net uptake of nitrogen during the final 12 months. A similar pattern is also apparent for total phosphorus, with a large mass release occurring during the initial 12 moths and a significant uptake of phosphorus occurring during the final 12 months.

3.4 Discussion

The results of the field monitoring program conducted at the Lockhart-Smith RSF site indicate that during the 24-month field monitoring program the system provided a net mass load reduction only for ammonia, NO_x, total nitrogen, and dissolved organic phosphorus, with increases in mass loadings observed for the remaining parameters. However, when the observed removal efficiencies are evaluated on a monthly basis, the system appears to have exhibited a net release of nitrogen and phosphorus during the initial 12-month period, followed by a net uptake during the final 12-month period. Hydrologic alterations to the site as a result of construction of the Lockhart-Smith RSF provided for re-flooding of an area which had been previously drained. As a result, the temporal variability in removal efficiencies for nitrogen and phosphorus may simply reflect the ongoing changes in the vegetative and ecological communities within the site, with more equilibrium conditions occurring during the final 12 months of the monitoring program.

A comparison of calculated mass removal efficiencies for the Lockhart-Smith RSF during the initial and final 12-month periods is given in Table 3-27. Net positive removal efficiencies for ammonia were observed during each of the two years included in the monitoring program. However, during the initial 12-month monitoring program, a net mass release was observed for NO_x, dissolved organic nitrogen, particulate nitrogen, total nitrogen, SRP, dissolved organic phosphorus, particulate phosphorus, and total phosphorus. During the second monitoring year, a net mass release was observed only for particulate nitrogen and SRP, with mass uptake occurring for each of the remaining parameters. In terms of percentage removal efficiencies, a positive removal efficiency was observed only for ammonia during the initial 12-month period. However, removal efficiencies improved for each of the remaining parameters during the second year of the field monitoring program, with an overall net uptake of 16% for total nitrogen and 5% for total phosphorus. These data suggest that the treatment system may be reaching a new equilibrium which may be more reflective of removal efficiencies achieved during the second year of the field monitoring program.

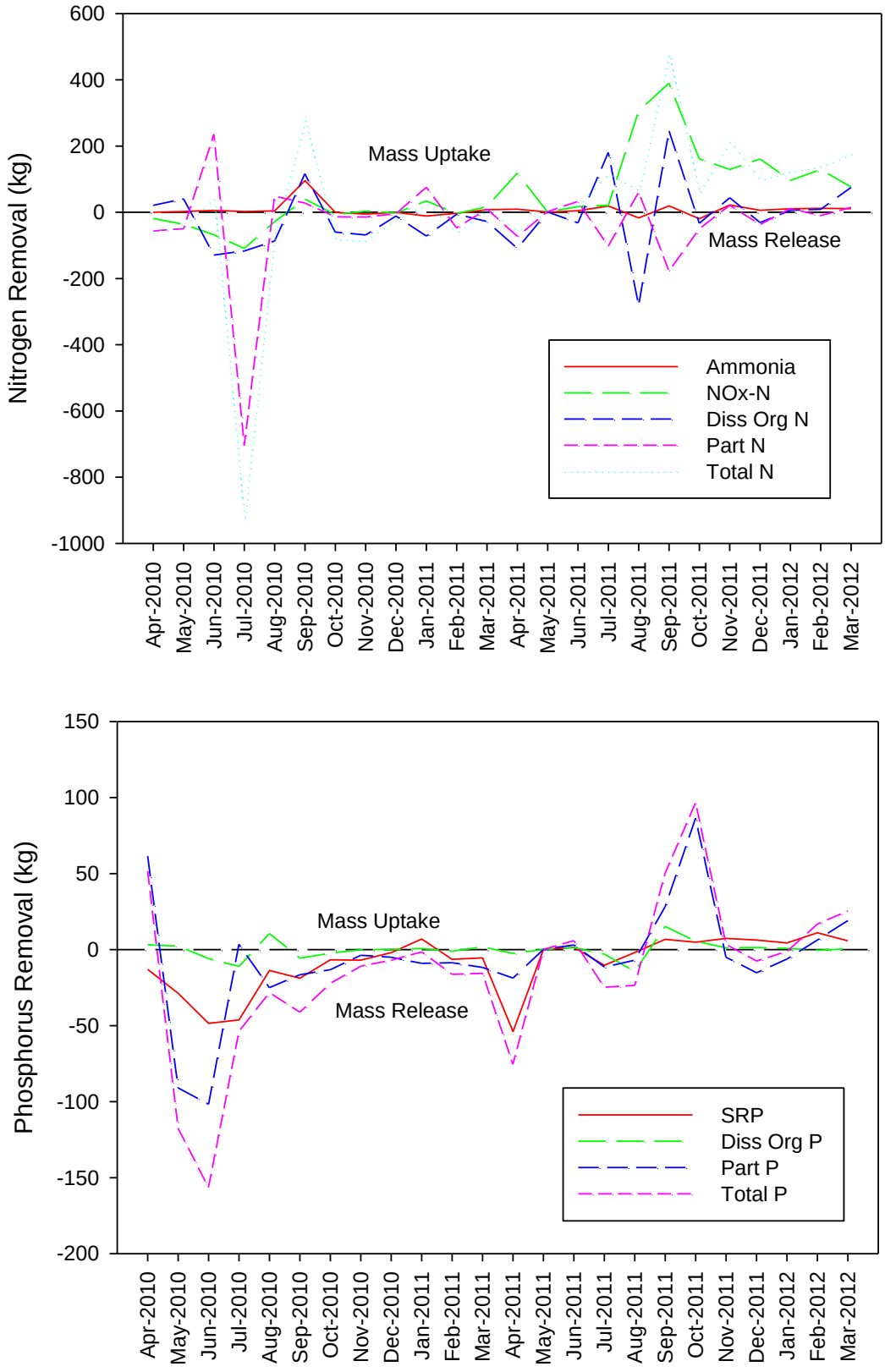


Figure 3-26. Temporal Variability in Mass Load Reductions for Total Nitrogen and Total Phosphorus at the Lockhart-Smith RSF from April 2010-March 2012.

TABLE 3-27

COMPARISON OF ANNUAL REMOVALS FOR THE LOCKHART-SMITH RSF DURING THE INITIAL AND FINAL YEARS OF THE MONITORING PROGRAM

PARAMETER	MASS REMOVAL (kg)		MASS REMOVAL (%)	
	Year 1	Year 2	Year 1	Year 2
Ammonia	97.2	76.9	25	12
NO_x	-182	1,605	-34	78
Diss. Organic N	-403	74.0	-11	2
Particulate N	-493	-309	-19	-18
Total N	-981	1,487	-14	16
SRP	-190	-184	-54	-2
Diss. Organic P	-8.1	4.9	-9	5
Particulate P	-221	78.9	-33	18
Total P	-419	65.3	-38	5

As indicated on Table 1-3, the pre- and post-construction nutrient estimates for the Lockhart-Smith RSF, prepared by CDM, predict a calculated annual load reduction of 91.2 kg (201 lb) for total phosphorus and 514 kg (1,033 lb) for total nitrogen. Based upon the information summarized in Table 3-27, the observed nitrogen load reduction of 1,487 kg achieved during the second year of the system operation substantially exceeds the predicted total nitrogen load reduction of 514 kg. However, the calculated mass load reduction of 65.3 kg for total phosphorus measured during the second year of the field monitoring program is approximately 28% less than the estimated phosphorus load reduction of 65.3 kg.

Although wetland treatment systems have been repeatedly shown to provide relatively good removal efficiencies for nitrogen species, phosphorus load reductions in wetland systems are highly variable. Unlike ponds or lakes where removal occurs primarily as a result of biological uptake, phosphorus concentrations in wetlands are regulated primarily by an equilibrium between phosphorus concentrations in the wetland soils and the overlying water column. In general, wetland systems typically achieve equilibrium total phosphorus concentrations of approximately 100 μg/l after several days of detention time within the wetlands. These values are often achieved regardless of the incoming phosphorus concentrations. For inflows exhibiting elevated phosphorus concentrations, removal efficiencies for phosphorus can be extremely high. However, if the input concentrations are equal to or less than 100 μg/l, then little or no removal efficiencies may be observed. As indicated on Table 3-25, the flow-weighted inflow total phosphorus concentration is approximately 104 μg/l which is near the equilibrium level for total phosphorus in wetland systems. If the inflow concentrations continue at this level, relatively little phosphorus load can be expected for the treatment facility. This concept is clearly illustrated in the information provided on Table 3-27 which shows a net uptake of dissolved organic phosphorus, particulate phosphorus, and total phosphorus during the second year, with a continued release of SRP from the wetland system.

3.5 Quality Assurance

Supplemental samples (such as equipment blanks and duplicate samples) were collected during the field monitoring program for quality assurance purposes. In addition, a number of supplemental laboratory analyses were performed to evaluate precision and accuracy of the collected data. Overall, more than 1000 additional laboratory analyses were conducted for quality assurance purposes. A summary of QA data collected as part of this project is given in Appendix D.

SECTION 4

SUMMARY

A field monitoring program was conducted by ERD from April 2010-March 2012 to evaluate the performance efficiencies of the Lockhart-Smith RSF. The Lockhart-Smith RSF site consists of a 24.4-acre wetland treatment area which was constructed from a pre-existing borrow pit area used to provide fill for construction for I-4. The wetland treatment area intersects the Lockhart-Smith Canal which provides inflows from a 2,800-acre watershed area located east of I-4. Land uses in the drainage basin include natural areas, wetlands, residential, commercial, industrial, and highway activities. Inflows from the Lockhart-Smith Canal initially discharge into a 1.2-acre sump where settling of larger particles is encouraged. After discharging from the sump area, the inflows meander through a vegetated wetland area before discharging through the outfall canal. Construction of the site was completed during 2008.

Automatic samplers with integral flow meters were installed at four significant inflows to the facility, as well as the outfall canal to provide a continuous record of hydrologic inputs and losses and to collect inflow and outflow samples in a flow-weighted mode. A recording rain gauge and evaporimeter were also installed at each monitoring sites. A digital water level recorder was installed at three separate locations to assist in evaluating changes in water surface elevations.

Continuous inflow and outflow hydrographs were recorded at the Lockhart-Smith RSF site at 10-minute intervals from April 2010-March 2012. During this time, approximately 84% of the hydrologic inputs into the system originated from the Lockhart-Smith Canal inflow, with relative minor inputs contributed by the remaining monitored inflow sources. Approximately 98% of the hydrologic inputs were discharged through the Lockhart-Smith outfall canal, with 2% of the inputs lost as a result of evapotranspiration within the wetland area. The mean hydraulic residence time within the Lockhart-Smith RSF during the field monitoring program was approximately 2.9 days which reflects an overall annual average value. Residence times can be expected to be substantially greater during dry periods and lower during wet season conditions.

Over the 24-month monitoring program, a total of 400 composite inflow and outflow samples was collected at the Lockhart-Smith RSF site. Physical-chemical field measurements of pH, temperature, specific conductivity, dissolved oxygen, dissolved oxygen saturation, and ORP were conducted at each of the inflow and outflow monitoring sites during each weekly field visit. In addition, manual field measurements of discharge rates were conducted at each of the four inflows and one outflow for use in calibration and verification of discharge measurements collected by the flow monitoring equipment.

During the field monitoring program, the Lockhart-Smith RSF site resulted in a 10% decrease in concentrations of total nitrogen based upon a comparison of flow-weighted input and outflow concentrations. This reduction occurred primarily as a result of decreases in concentrations of ammonia and NO_x. In contrast, the Lockhart-Smith RSF site resulted in a 30% increase in total phosphorus concentrations between the inflows and outflows, provided primarily as a result of significant increase in SRP. Concentration increases were also observed for turbidity and TSS. Removal efficiencies calculated using mass inputs and outputs indicated a net load reduction for ammonia (23%), NO_x (52%), total nitrogen (12%), and dissolved organic phosphorus (4%), with increases in mass loadings during migration through the Lockhart-Smith RSF for the remaining parameters.

Additional analyses were conducted to evaluate monthly based removal efficiencies during the 24-month monitoring program. The data suggests that large release of both nitrogen and phosphorus occurred within the treatment area during the initial 12 months of the monitoring program. However, net uptake occurred for species of both nitrogen and phosphorus during the second year of the field monitoring program, suggesting that the system is reaching a new equilibrium, and long-term removal efficiencies may be more appropriately predicted by the removals which occurred during the second year of the field monitoring program.

Based upon the 24-month field monitoring program, the Lockhart-Smith RSF site retains substantially more total nitrogen mass than predicted in the design phase evaluation for the project. However, the observed removal for total phosphorus is less than what was actually predicted. The reduced capacity for phosphorus removal is likely related to the relatively low input concentrations from the evaluated inflows. Phosphorus concentrations in wetland treatment areas are often determined by the equilibrium between the sediments and water column.

APPENDICES

APPENDIX A

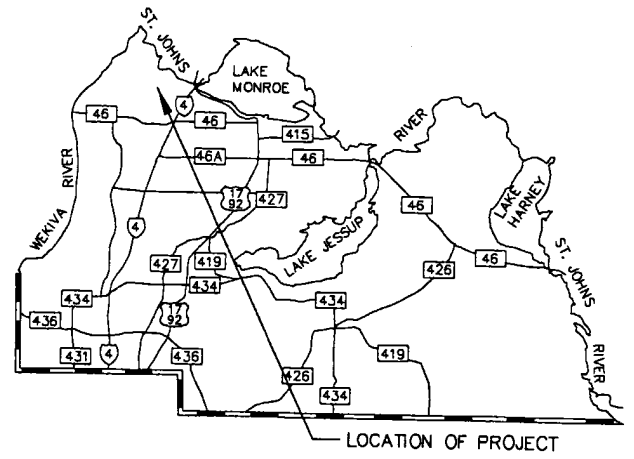
SELECTED CONSTRUCTION PLANS FOR THE LOCKHART-SMITH RSF SITE

JOB FILE #
6116-39972

THIS CONTRACT PLAN SET INCLUDES:

REGRADING PLANS
EROSION CONTROL MEASURES

SEMINOLE COUNTY
PUBLIC WORKS DEPARTMENT
STORMWATER DIVISION



PUBLIC WORKS DIRECTOR
W. Gary Johnson, P.E.

STORMWATER MANAGER
Mark Flomerfelt. P.E.

INDEX OF PLANS

SHEET NO.	SHEET DESCRIPTION
1	COVER SHEET
2	GENERAL NOTES
3	TYPICAL SECTIONS
4–6	EXISTING CONDITIONS PLAN
7	KEY PLAN
8–16	POND PLANS
17–19	POND CROSS SECTIONS
20	EROSION CONTROL PLAN
21–22	DRAINAGE STRUCTURES
23	EROSION CONTROL DETAILS
24–25	DRAINAGE DETAILS
26	SPT & AUGER BORING PROFILES

LOCKHART-SMITH REGIONAL STORMWATER FACILITY

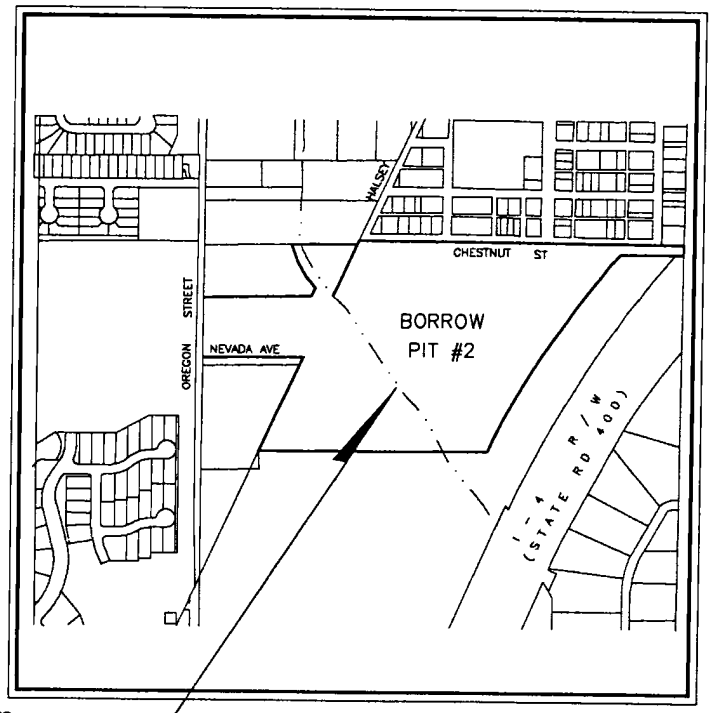
THESE PLANS HAVE BEEN PREPARED IN ACCORDANCE WITH AND ARE GOVERNED BY THE STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION DESIGN STANDARDS (BOOKLET DATED JANUARY 2002)

PRELIMINARY
NOT FOR CONSTRUCTION

PERMIT SUBMITTAL

January, 2004

LENGTH OF PROJECT						
			SIDE STREETS		TOTAL	
	LIN.FT.	MILES	LIN.FT.	MILES	LIN.FT.	MILES
DITCH REGRADING	–	–	—	—	–	–
	—	—	—	—	—	—
NET LENGTH OF PROJECT	–	–	—	—	–	–
EXCEPTIONS	–	–	—	—	–	–
GROSS LENGTH OF PROJECT	–	–	—	—	–	–



LOCATION MAP
SECTION 20, TOWNSHIP 19 S, RANGE 31 E

92278-1

RECEIVED
JAN 30 2004
PDS
ALTAMONTE SVC. CTR.

GOVERNING SPECIFICATIONS: STATE OF FLORIDA, DEPARTMENT OF TRANSPORTATION, STANDARD SPECIFICATIONS, DATED 2000 AND SUPPLEMENTS THERETO IF NOTED IN THE SPECIAL TECHNICAL PROVISIONS FOR THIS PROJECT.

ATTENTION IS DIRECTED TO THE FACT THAT THESE PLANS MAY HAVE BEEN CHANGED IN SIZE BY REPRODUCTION. THIS MUST BE CONSIDERED WHEN OBTAINING SCALED DATA.

PREPARED BY: CAMP DRESSER & MCKEE INC.
2301 MAITLAND CENTER PARKWAY, SUITE 300
MAITLAND, FLORIDA 32751
PHONE: (407) 660-2552
FAX: (407) 875-1157
FL COA NO: EB-0000020

PLANS APPROVED BY _____
Mario F. Chavez, P.E. # 50713 DATE JAN 30 2004

CONSTRUCTION COMPLETION DATE _____

FIELD VERIFIED BY _____

REVISIONS		
BY	DATE	DESCRIPTION

P:\6116\39972\30p\general\ gcavr0g1 10/14/03 13:42:03 20:31:49 RussellJR

GENERAL NOTES

SHEET No. 2

1. ALL ELEVATIONS ARE REFERRED TO NATIONAL GEODETIC VERTICAL DATUM OF 1929.
2. LOCATIONS, ELEVATIONS, AND DIMENSIONS OF EXISTING UTILITIES, STRUCTURES, AND OTHER FEATURES ARE SHOWN ACCORDING TO THE BEST INFORMATION AVAILABLE AT THE TIME OF PREPARATION OF THESE PLANS, BUT DO NOT PURPORT TO BE ABSOLUTELY CORRECT. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL VERIFY AND AGREE TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL EXISTING UTILITIES, STRUCTURES, AND OTHER FEATURES AFFECTING HIS WORK.
3. CONTRACTOR SHALL VERIFY ALL UTILITIES AND NOTIFY THE SEMINOLE COUNTY ENVIRONMENTAL SERVICES DEPARTMENT, 72 HOURS PRIOR TO DIGGING IN ANY PORTION OF THE SITE.
4. PUBLIC LAND CORNERS OR COUNTY MONUMENTS WITHIN THE LIMITS OF CONSTRUCTION ARE TO BE PROTECTED. IF A CORNER MONUMENT IS IN DANGER OF BEING DESTROYED OR DISTURBED AND HAS NOT BEEN PROPERLY REFERENCED, THE CONTRACTOR SHALL NOTIFY THE SEMINOLE COUNTY SURVEYOR WITHOUT DELAY, BY TELEPHONE. CONTACT MR. STEVE WESSELS AT SEMINOLE COUNTY ENGINEERING DIVISION, 520 WEST LAKE MARY BOULEVARD, SUITE 200, SANFORD, FLORIDA 32773. TELEPHONE (407)665-5656.
5. ALL SURVEY CORNERS INDICATED ON THE PLANS SHALL BE REFERENCED AND CERTIFIED BY A REGISTERED PROFESSIONAL LAND SURVEYOR PRIOR TO COMMENCEMENT OF CONSTRUCTION. ALL CORNERS DESTROYED OR OBLITERATED BY CONSTRUCTION SHALL BE RESET AND SO CERTIFIED BY THE LAND SURVEYOR PRIOR TO THE COMPLETION OF THE PROJECT. CERTIFIED SKETCHES SHALL BE SUBMITTED TO:
   SEMINOLE COUNTY ENGINEERING DIVISION
   SURVEY SECTION
   520 W. LAKE MARY BOULEVARD, SUITE 200
   SANFORD, FLORIDA 32773
   (407) 665-5656
6. TOPOGRAPHIC SURVEY WAS PERFORMED BY: SOUTHEASTERN SURVEYING AND MAPPING CORP. 324 N. ORLANDO AVENUE MAITLAND, FLORIDA 32751-4702 PHONE: 407-647-8898
7. THE CONTRACTOR SHALL CONTACT THE ENGINEER'S OFFICE IMMEDIATELY UPON FINDING ANY CONFLICTS DURING CONSTRUCTION ON ANY IMPROVEMENTS SHOWN ON THE DRAWINGS.
8. EROSION CONTROL AND SEDIMENTATION CONTROL DEVICES SHALL BE IN PLACE PRIOR TO BEGINNING ANY DEMOLITION OR CONSTRUCTION. THEY SHALL BE INSTALLED TO THE LIMITS SHOWN IN THE DRAWING, AS REQUIRED IN THE SPECIFICATIONS AND IN ACCORDANCE WITH ALL REGULATORY AGENCY REQUIREMENTS (SEE EROSION CONTROL NOTES).
9. EXISTING DRAINAGE STRUCTURES WITHIN CONSTRUCTION LIMITS SHALL BE REMOVED UNLESS OTHERWISE NOTED.
10. ALL STATIONING AND OFFSET REFERS TO CONSTRUCTION BASELINE UNLESS OTHERWISE NOTED ON PLANS.
11. EXISTING UTILITIES AND FACILITIES SHOWN ON THE DRAWINGS WERE LOCATED FROM THE UTILITY OWNER'S RECORDS OF UNDERGROUND FACILITIES. GUARANTEE IS NOT MADE THAT ALL EXISTING FACILITIES ARE SHOWN NOR THAT THOSE FACILITIES SHOWN ARE ENTIRELY ACCURATE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION EXISTING UTILITIES.
12. THE CONTRACTOR SHALL, BY REPAIR OR REPLACEMENT, RETURN TO EQUAL OR BETTER CONDITION ALL PAVEMENT, SIDEWALK, LAWNS, UTILITIES AND OTHER ITEMS DAMAGED BY THIS CONSTRUCTION ACTIVITY.
13. DURING CONSTRUCTION OF THE STORMWATER IMPROVEMENTS, THE CONTRACTOR IS RESPONSIBLE FOR REMOVAL, PROTECTION, AND REPLACEMENT OF ITEMS ON PRIVATE PROPERTY AND PUBLIC RIGHTS OF WAY SUCH AS SPRINKLERS, FENCES, SOD, SHRUBS, TREES, SURVEYING MARKERS, ETC.
14. PRIOR TO EXCAVATING IN THE VICINITY OF A GAS LINE, THE CONTRACTOR SHALL NOTIFY THE GAS UTILITY OWNER IN ACCORDANCE WITH THE REQUIREMENTS OF FLORIDA STATUTES, PROTECTION OF UNDERGROUND PIPELINES F.S. 553.851 CH 77-143.
15. ALL CONSTRUCTION SHALL CONFORM TO SEMINOLE COUNTY STANDARDS AND SPECIFICATIONS AND TO THE FLORIDA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, MOST RECENT EDITIONS.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LOCATION AND PROTECTION OF ALL UTILITIES THAT MAY EXIST, ABOVE OR BELOW GROUND.
17. ALL BRUSH, STRIPPINGS OR UNSUITABLE MATERIAL SHALL BE DISPOSED OF OFF-SITE AT THE CONTRACTOR'S EXPENSE.
18. A DE-WATERING PERMIT IS REQUIRED BY THE ST. JOHNS RIVER WATER MANAGEMENT DISTRICT PRIOR TO ANY PUMPING, ETC. AND SHALL BE OBTAINED BY THE CONTRACTOR.
19. MEASURES SHALL BE TAKEN BY THE CONTRACTOR TO ENSURE THAT ADEQUATE EROSION AND SEDIMENT CONTROL ARE MAINTAINED AT ALL TIMES DURING THE PROJECT (SEE EROSION CONTROL NOTES).
20. ALL PRIVATE AND PUBLIC PROPERTY AFFECTED BY THIS WORK SHALL BE RESTORED TO A CONDITION EQUAL TO OR BETTER THAN THE CONDITION EXISTING PRIOR TO COMMENCING CONSTRUCTION UNLESS SPECIFICALLY EXEMPTED BY THE PLANS. COSTS TO BE INCIDENTAL TO OTHER CONSTRUCTION AND NO EXTRA COMPENSATION TO BE ALLOWED.
21. INSTALLATION OF ALL STORM SEWERS, INLETS, MANHOLES, AND APPURTENANCES SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE APPLICABLE SECTIONS OF THE FLORIDA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS, OR AS INDICATED ON THE DRAWINGS.
22. THE LIMITS OF CONSTRUCTION SHOWN ON THE PLANS SHALL BE STRICTLY OBSERVED BY THE CONTRACTOR. ALL INGRESS, EGRESS AND TRAFFIC PATTERNS ON THE SITE SHALL BE WITHIN THE LIMITS OF CONSTRUCTION SHOWN ON THE DRAWINGS.
23. NO REPRESENTATION IS MADE REGARDING BALANCED EARTHWORK. ANY EXCESS MATERIAL, OR MATERIAL NOT SUITABLE FOR USE AS BACKFILL, SHALL BE PLACED IN PERMANENT DESIGNATED STOCKPILE AREA, AND STABILIZED IN ACCORDANCE WITH FDOT SECTION 120-5.
24. IN AREAS REQUIRING FILL MATERIAL, THE CONTRACTOR WILL STRIP OR OTHERWISE REMOVE ALL VEGETATION SUCH AS BRUSH, HEAVY SODS, HEAVY GROWTH OF GRASS, DECAYED VEGETABLE MATTER, RUBBISH AND ANY OTHER DELETERIOUS MATERIAL BEFORE EMBANKMENT IS STARTED. IMMEDIATELY PRIOR TO THE PLACING OF FILL MATERIALS, THE ENTIRE AREA UPON WHICH FILL IS TO BE PLACED, SHALL BE SCARIFIED.
25. STATION OFFSETS SHOWN ON PLANS ARE FROM CENTERLINE TO CENTERLINE OF STRUCTURE.
26. ALL REINFORCED CONCRETE PIPE (RCP) SHALL BE MINIMUM CLASS III.
27. WATER AND SEWER CROSSING(S):
   A. WHERE WATER MAINS MUST PASS OVER STORM, SANITARY AND/OR EFFLUENT REUSE LINES AND A MINIMUM CLEARANCE OF 18" CANNOT BE MAINTAINED, THE WATER MAIN SHALL BE CONSTRUCTED OF MECHANICAL JOINT DUCTILE IRON PIPE 10' EQUIDISTANT EACH SIDE OF THE CROSSING AND PROVIDE A 6" MINIMUM CLEARANCE BETWEEN THE WATER MAIN AND THE OTHER UTILITY.
   B. A HORIZONTAL SEPARATION OF 10' MUST BE MAINTAINED BETWEEN POTABLE WATER LINES AND NON-POTABLE LINES. WHEN THIS IS NOT POSSIBLE, REPLACE PVC WITH MECHANICAL JOINT DUCTILE IRON PIPE AND LAY IN SEPARATE TRENCH. IN CASE OF RESTRICTED ACCESS REUSE WATER, A 5' MINIMUM HORIZONTAL SEPARATION IS ACCEPTABLE.
28. ABSOLUTELY NO WORK WILL BE ALLOWED WITHIN ANY CONSERVATION AREA, BUFFER AREA, MITIGATION AREA, OR DESIGNATED WETLAND AREA UNLESS SO SPECIFICALLY DESCRIBED BY THE PLANS AND GRANTED BY REASON OF PERMIT FROM THE GOVERNMENTAL ENTITY HAVING JURISDICTION OVER SAID AREA.
29. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DEMOLITION OF THE EXISTING STRUCTURES SUCH AS, WOOD/METAL FRAME DWELLINGS, BARNS, MOBILE HOMES, TANKS OR ANY ABOVE OR BELOW GROUND STRUCTURES.
30. THE CONTRACTOR SHALL TAKE ALL THE NECESSARY PRECAUTIONS AND OBTAIN PERMITS FOR THE DEMOLITION (INCLUDING LEAD PAINT AND ASBESTOS REMOVAL).
31. ALL COMPONENTS FOR THE COST OF REMOVAL AND DISPOSAL OF HAZARDOUS MATERIALS OR WASTE SHALL BE INCLUDED IN THE COST OF REMOVAL OF EXISTING STRUCTURES (PAY ITEM 110-3) AND NO EXTRA COMPENSATION SHALL BE ALLOWED.
32. ALL PETROLEUM CONTAMINATED SOIL SHALL BE REMOVED, TRANSPORTED AND DISPOSED OF AT A PERMITTED FACILITY BY THE CONTRACTOR. SOILS REMOVED FROM THIS REC AREA SHALL NOT BE USED AS FILL MATERIAL.
33. ALL COMPENSATION FOR THE COST OF REMOVAL AND DISPOSAL OF PETROLEUM CONTAMINATED SOIL SHALL BE INCLUDED IN THE COST OF REMOVAL AND DISPOSAL OF CONTAMINATED SOIL (PAY ITEM 120-300) AND NO EXTRA COMPENSATION SHALL BE ALLOWED.

GEOTECHNICAL RECOMMENDATIONS

1. OVER-EXCAVATION SHALL BE PERFORMED AS NECESSARY TO REMOVE A-8 AND PLASTIC MATERIALS IN THE PROPOSED WINGWALL/HEADWALL FOUNDATION AREAS AS DIRECTED BY THE ENGINEER. DEWATER TO THE BOTTOM OF THE DEMUCKED EXCAVATION. BACKFILL WITH A-3 (AASHTO M-145) SAND. THE SOIL BELOW BOX/PIPE CULVERT CROSSINGS AND THE WINGWALL/HEADWALL FOUNDATIONS SHALL BE COMPACTED IN ACCORDANCE WITH SECTION 455-3L. TO ACHIEVE THE COMPACTION REQUIREMENTS, IT MAY BE NECESSARY TO OVER-EXCAVATE EXISTING SOIL AT THE PROPOSED BOX/PIPE CULVERT CROSSINGS AND WINGWALL/HEADWALL FOUNDATIONS AT LEAST 12 INCHES AND 24 INCHES, RESPECTIVELY AND BACKFILL WITH A-3 SAND WHICH HAS A MOISTURE CONTENT AT OR BELOW OPTIMUM. ALL BOX/PIPE CULVERT CROSSINGS JOINTS (TOP & SIDES) AND WINGWALL/BOX/PIPE CULVERT CROSSINGS JOINTS SHALL BE COVERED WITH FILTER FABRIC (2-FOOT MINIMUM WIDTH) MEETING THE REQUIREMENTS OF INDEX 199, TYPE D-3 WITH MAXIMUM A.O.S. OF 0.22 mm AND MINIMUM PERMITIVITY OF 0.2 sec^{-1}.
2. THE CONTRACTOR SHALL ANTICIPATE THAT DEWATERING WILL BE REQUIRED TO FACILITATE BOX/PIPE CULVERT CROSSINGS AND WINGWALL/HEADWALL CONSTRUCTION. ALL FOUNDATIONS SHALL BE CONSTRUCTED IN THE DRY. THE CONTRACTOR SHALL USE EXTENSIVE WELL POINTS, SUMPS, DEEP WELLS AND/OR OTHER NECESSARY DEWATERING METHODS AS REQUIRED TO DEWATER FOUNDATION EXCAVATIONS IN ACCORDANCE WITH SECTIONS 455-28 AND 455-29.2. THE COST OF DEWATERING SHALL BE CONSIDERED INCIDENTAL AND NO EXTRA COMPENSATION SHALL BE ALLOWED.
3. ALL GRASS, ROOTS, VEGETATION, TOPSOIL, ORGANIC MATTER, AND OTHER DELETERIOUS MATERIALS WITHIN THE BERM "FOOTPRINT" SHOULD BE STRIPPED AND GRUBBED. EXPECT CLEARING AND GRUBBING TO DEPTHS OF AT LEAST 12 INCHES. DEEPER CLEARING AND GRUBBING DEPTHS MAY BE ENCOUNTERED IN MORE HEAVILY VEGETATED AREAS, OR WHERE MAJOR ROOT SYSTEMS ARE ENCOUNTERED. THE ACTUAL DEPTH(S) OF STRIPPING AND GRUBBING MUST BE DETERMINED BY VISUAL AND JUDGMENT DURING THE EARTHWORK OPERATION.
4. PROOF-ROLL THE CLEARED SURFACE TO LOCATE ANY UNFORESEEN SOFT AREAS OR UNSUITABLE SURFACE OR NEAR-SURFACE SOILS, TO INCREASE THE DENSITY ANY LOOSE TO MEDIUM DENSE FINE SAND SOILS WITHIN THE TOP 2 TO 3 FEET, AND TO PREPARE THE EXISTING SURFACE FOR THE ADDITION OF THE FILL SOILS (AS REQUIRED). PROOF-ROLLING OF THE BERM SUBGRADE AREAS SHOULD BE OBSERVED BY A GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE AND CONSIST OF AT LEAST 10 PASSES OF A SELF-PROPELLED COMPACTOR CAPABLE OF ACHIEVING THE REQUIRED DENSITIES. AREAS OF THE SITE NEAR ANY EXISTING STRUCTURES MAY HAVE TO BE COMPACTED STATICALLY OR WITH LESS VIBRATORY FORCE TO PREVENT DAMAGE TO THE EXISTING STRUCTURES. EACH PASS SHOULD OVERLAP THE PRECEDING PASS BY 30 PERCENT TO ACHIEVE COMPLETE COVERAGE. IN AREAS THAT CONTINUE TO "YIELD", ALL DELETERIOUS MATERIALS SHOULD BE REMOVED AND REPLACED WITH CLEAN, COMPACTED SAND BACKFILL. THE PROOF-ROLLING SHOULD OCCUR AFTER CUTTING AND BEFORE FILLING.
5. A DENSITY EQUIVALENT TO 95 PERCENT OF THE MODIFIED PROCTOR (AASHTO T-180) MAXIMUM DRY DENSITY VALUE FOR A DEPTH OF 2 FEET IN THE BERM AREAS MUST BE ACHIEVED BENEATH THE STRIPPED AND GRUBBED GROUND SURFACE. ADDITIONAL PASSES AND/OR OVER EXCAVATION AND RECOMPACTION MAY BE REQUIRED IF THESE MINIMUM DENSITY REQUIREMENTS ARE NOT ACHIEVED. THE SOIL MOISTURE SHOULD BE ADJUSTED AS NECESSARY DURING COMPACTION.
6. CARE SHOULD BE EXERCISED TO AVOID DAMAGING ANY NEIGHBORING STRUCTURES WHILE THE COMPACTION OPERATION IS UNDERWAY. PRIOR TO COMMENCING COMPACTION, OWNERS OF ADJACENT STRUCTURES SHOULD BE NOTIFIED AND THE EXISTING CONDITION (I.E. CRACKS) OF THE STRUCTURE DOCUMENTED WITH PHOTOGRAPHS AND SURVEY (IF NECESSARY). COMPACTION SHOULD CEASE IF DEEMED DETRIMENTAL TO ADJACENT STRUCTURES AND GEOTECHNICAL PROFESSIONAL ASSOCIATES, INC. SHOULD BE NOTIFIED IMMEDIATELY.
7. BERM SUBGRADES SHOULD BE TESTED FOR COMPACTION AT A FREQUENCY OF NOT LESS THAN ONE TEST PER 200 LINEAL FEET OF BERM, PER FOOT OF IMPROVEMENT DEPTH. THE BERM MATERIAL SHOULD ALSO BE TESTED FOR PERMEABILITY EVERY 500 FEET OR CHANGE IN FILL MATERIAL AND/OR COMPACTION PROCEDURE.
8. ALL BERM FILL SHOULD BE PLACED IN LEVEL LIFTS NOT TO EXCEED 12 INCHES IN UNCOMPACTED THICKNESS. IF HAND-HELD COMPACTION EQUIPMENT IS USED, THE LIFT THICKNESS SHOULD BE REDUCED TO NOT MORE THAN 6 INCHES.
9. EACH LIFT SHOULD BE COMPACTED TO AT LEAST 95 PERCENT OF THE MODIFIED PROCTOR (AASHTO T-180) MAXIMUM DRY DENSITY VALUE. THE FILLING AND COMPACTION OPERATIONS SHOULD CONTINUE IN LIFTS UNTIL THE DESIRED ELEVATION(S) IS ACHIEVED.
10. CLAYEY SOILS MAY REQUIRE STATIC COMPACTION TECHNIQUES, PNEUMATIC RUBBER TIRE COMPACTORS, AND/OR SHEEPSFOOT ROLLER COMPACTORS.
11. ALL FILL MATERIAL SHOULD BE FREE OF ORGANIC MATERIALS, SUCH AS ROOTS AND VEGETATION. BERM FILL SOIL WHEN COMPACTED SHOULD HAVE A PERMEABILITY OF LESS THAN 0.1 FEET/DAY. THE TYPE OF FILL MATERIAL AND THE MEANS AND METHODS OF PLACING AND COMPACTING THE FILL IS THE CONTRACTOR'S RESPONSIBILITY. SOIL WITH A PERCENT FINES (-200) OF 12 TO 15% OR GREATER WILL BE NECESSARY TO MEET THIS PERMEABILITY REQUIREMENT. SILTY TO CLAYEY FINE SANDS WILL MOST LIKELY NEED TO BE USED AS BERM FILL MATERIAL. PROPER COMPACTION EQUIPMENT AND METHODOLOGY WILL BE IMPORTANT TO BE ABLE TO COMPACT THESE SOILS TO THE NECESSARY DENSITIES.
12. FILL MATERIAL FOR THE WETLAND RESTORATION AREA PERIMETER BERM BETWEEN ELDER POND STATIONS 31+50 AND 37+56 SHALL BE FREE OF ORGANIC MATERIALS AND CONSIST OF CLAYEY SANDS (A-2-6 OR A-2-7) AND WHEN COMPACTED SHOULD HAVE A HYDRAULIC CONDUCTIVITY OF LESS THAN 0.1 FEET PER DAY.
13. THE CONTRACTOR SHALL REFER TO SUBSURFACE SOIL EXPLORATION AND GEOTECHNICAL EVALUATION REPORT (DATED JANUARY 21, 2003).
14. THE CONTRACTOR SHALL PREPARE A SMALL TEST STRIP OF THE PERIMETER BERM PRIOR TO CONSTRUCTION SO THAT THE CONTRACTOR'S EQUIPMENT, FILL SOIL MATERIAL AND PLACEMENT TECHNIQUES CAN BE EVALUATED AND THE COMPACTED FILL MATERIAL CAN BE TESTED FOR IN-PLACE DENSITY AND PERMEABILITY.

EROSION CONTROL

IT IS THE CONTRACTORS RESPONSIBILITY TO IMPLEMENT THE EROSION AND TURBIDITY CONTROLS AS SHOWN ON THE EROSION AND TURBIDITY CONTROL PLAN. IT IS ALSO THE CONTRACTORS RESPONSIBILITY TO ENSURE THESE CONTROLS ARE PROPERLY INSTALLED, MAINTAINED AND FUNCTIONING PROPERLY TO PREVENT TURBID OR POLLUTED WATER FROM LEAVING THE PROJECT SITE. THE CONTRACTOR WILL ADJUST THE EROSION AND TURBIDITY CONTROLS SHOWN ON THE EROSION AND TURBIDITY CONTROL PLAN AND ADD ADDITIONAL CONTROL MEASURES, AS REQUIRED TO ENSURE THE SITE MEETS ALL FEDERAL, STATE AND LOCAL EROSION AND TURBIDITY CONTROL REQUIREMENTS. THE FOLLOWING BEST MANAGEMENT PRACTICES WILL BE IMPLEMENTED BY THE CONTRACTOR AS REQUIRED BY THE EROSION AND TURBIDITY CONTROL PLAN AND AS REQUIRED BY THE REGULATORY AGENCIES.

1. SEDIMENT BASINS AND TRAPS, PERIMETER DITCHES, SEDIMENT BARRIERS AND OTHER MEASURES INTENDED TO TRAP SEDIMENT SHALL BE CONSTRUCTED AS A FIRST STEP BEFORE ANY LAND-DISTURBING TAKES PLACE TO MEET THE EROSION AND TURBIDITY REQUIREMENTS IMPOSED ON THE PROJECT.
2. ALL SEDIMENT CONTROL MEASURES ARE TO BE ADJUSTED TO MEET FIELD CONDITIONS AT THE TIME OF CONSTRUCTION AND BE CONSTRUCTED PRIOR TO ANY GRADING OR DISTURBANCE OF EXISTING SURFACE MATERIAL ON BALANCE OF SITE. PERIMETER SEDIMENT BARRIERS SHALL BE CONSTRUCTED TO PREVENT SEDIMENT OR TRASH FROM FLOWING OR FLOATING ON TO ADJACENT PROPERTIES.
3. DURING CONSTRUCTION OF THE PROJECT. SOIL STOCK PILES SHALL BE STABILIZED OR PROTECTED WITH SEDIMENT TRAPPING MEASURES. THE CONTRACTOR IS RESPONSIBLE FOR THE TEMPORARY PROTECTIONS AND PERMANENT STABILIZATION OF ALL SOIL STOCKPILES ON SITE AS WELL AS SOIL INTENTIONALLY TRANSPORTED FROM THE PROJECT SITE.
4. AFTER ANY SIGNIFICANT RAINFALL SEDIMENT CONTROL STRUCTURES WILL BE INSPECTED FOR INTEGRITY. ANY DAMAGED DEVICES SHALL BE REPAIRED IMMEDIATELY.
5. CONCENTRATED RUNOFF SHALL NOT FLOW DOWN CUT OR FILL SLOPES UNLESS CONTAINED WITHIN AN ADEQUATE TEMPORARY OR PERMANENT CHANNEL, FLUME OR SLOPE DRAIN STRUCTURE.
6. WHENEVER WATER SEEPS FROM A SLOPE FACE ADEQUATE DRAINAGE OR OTHER PROTECTION SHALL BE PROVIDED.
7. SEDIMENT WILL BE PREVENTED FROM ENTERING ANY STORM DRAIN SYSTEM, DITCH, OR CHANNEL. ALL STORM SEWER INLETS THAT ARE MADE OPERABLE DURING CONSTRUCTION SHALL BE PROTECTED SO THAT SEDIMENT-LADEN WATER CANNOT ENTER THE CONVEYANCE SYSTEM WITHOUT FIRST BEING FILTERED OR OTHERWISE TREATED TO REMOVE SEDIMENT.
8. BEFORE TEMPORARY OR NEWLY CONSTRUCTED STORMWATER CONVEYANCE CHANNELS ARE MADE OPERATIONAL ADEQUATE OUTLET PROTECTION AND ANY REQUIRED TEMPORARY OR PERMANENT CHANNEL LINING SHALL BE INSTALLED IN BOTH THE CONVEYANCE CHANNEL AND RECEIVING CHANNEL.
9. WHEN WORK IN A LIVE WATERCOURSE IS PERFORMED, PRECAUTIONS SHALL BE TAKEN TO MINIMIZE ENRICHMENT, CONTROL SEDIMENT TRANSPORT AND STABILIZE THE WORK AREA TO THE GREATEST EXTENT POSSIBLE DURING CONSTRUCTION. NONERODIBLE MATERIAL SHALL BE USED FOR THE CONSTRUCTION OF CAUSEWAYS AND COFFERDAMS. EARTHEN FILL MAY BE USED FOR THESE STRUCTURES IF ARMORED BY NONERODIBLE COVER MATERIALS.
10. STOCKPILING MATERIAL: NO EXCAVATED MATERIAL SHALL BE STOCKPILED IN SUCH A MANNER AS TO DIRECT RUNOFF DIRECTLY OFF THE PROJECT SITE INTO ANY ADJACENT WATER BODY OR STORM WATER COLLECTION FACILITY.
11. EXPOSED AREA LIMITATION: THE SURFACE AREA OF OPEN, RAW ERODIBLE SOIL EXPOSED BY CLEARING AND GRUBBING OPERATIONS OR EXCAVATION AND FILLING OPERATIONS SHALL NOT EXCEED 5 ACRES. IF THE TOTAL AREA TO BE CLEARED IS EQUAL TO, OR EXCEEDS FIVE (5) ACRES, THEN THE CONTRACTOR WILL BE RESPONSIBLE FOR PREPARING A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) IN ACCORDANCE WITH EPA'S NPDES REGULATIONS. THE CONTRACTOR WILL BE RESPONSIBLE FOR SUBMITTING A NOTICE ON INTENT (NOI) TO EPA FORTY-EIGHT (48) HOURS PRIOR TO COMMENCING CONSTRUCTION.
12. TEMPORARY SEEDING: AREAS OPENED BY CONSTRUCTION OPERATIONS AND THAT ARE NOT ANTICIPATED TO BE RE-EXCAVATED OR DRESSED AND RECEIVE FINAL GRASSING TREATMENT WITHIN 30 DAYS SHALL BE SEEDED WITH A QUICK GROWING GRASS SPECIES WHICH WILL PROVIDE AN EARLY COVER DURING THE SEASON IN WHICH IT IS PLANTED AND WILL NOT LATER COMPETE WITH THE PERMANENT GRASSING.
13. TEMPORARY SEEDING AND MULCHING: SLOPES STEEPER THAN 6:1 THAT FALL WITHIN THE CATEGORY ESTABLISHED IN PARAGRAPH 12 ABOVE LOOSE MEASURE OF MULCH MATERIAL CUT INTO THE SOIL OF THE SEEDED AREA ADEQUATE TO PREVENT MOVEMENT OF SEED AND MULCH.
14. TEMPORARY GRASSING: THE SEEDED OR SEEDED AND MULCHED AREA(S) SHALL BE ROLLED AND WATERED OR HYDROMULCHED OR OTHER SUITABLE METHODS IF REQUIRED TO ASSURE OPTIMUM GROWING CONDITIONS FOR THE ESTABLISHMENT OF A GOOD GRASS COVER. TEMPORARY GRASSING SHALL BE THE SAME MIX & AMOUNT REQUIRED FOR PERMANENT GRASSING IN THE CONTRACT SPECIFICATIONS.
15. TEMPORARY REGRASSING : IF, AFTER 14 DAYS FROM SEEDING, THE TEMPORARY GRASSED AREAS HAVE NOT ATTAINED A MINIMUM OF 75 PERCENT GOOD GRASS COVER, THE AREA WILL BE REWORKED AND ADDITIONAL SEED APPLIED SUFFICIENT TO ESTABLISH THE DESIRED VEGETATIVE COVER.
16. MAINTENANCE: ALL FEATURES OF THE PROJECT DESIGNED AND CONSTRUCTED TO PREVENT EROSION AND SEDIMENT SHALL BE MAINTAINED DURING THE LIFE OF THE CONSTRUCTION SO AS TO FUNCTION AS THEY WERE ORIGINALLY DESIGNED AND CONSTRUCTED.
17. PERMANENT EROSION CONTROL: THE EROSION CONTROL FACILITIES OF THE PROJECT SHOULD BE DESIGNED TO MINIMIZE THE IMPACT ON THE OFF SITE FACILITIES.
18. PERMANENT SEEDING: ALL AREAS WHICH HAVE BEEN DISTURBED BY CONSTRUCTION WILL, AS A MINIMUM, BE SEEDED. THE SEEDING MIX MUST PROVIDE BOTH LONG-TERM VEGETATION AND RAPID GROWTH SEASONAL VEGETATION. SLOPES STEEPER THAN 4:1 SHALL BE SEEDED AND MULCHED OR SODDED.
19. ALL SLOPES STEEPER THAN 3:1 SHALL BE SODDED.

UTILITY OWNERS & CONTACTS

1. THE CONTRACTOR SHALL NOTIFY THE APPROPRIATE UTILITY COMPANY FORTY-EIGHT (48) HOURS IN ADVANCE OF ANY EXCAVATION INVOLVING ITS UTILITIES SO THAT A COMPANY REPRESENTATIVE CAN BE PRESENT. THE LOCATION OF THE UTILITIES SHOWN IN THE PLANS ARE APPROXIMATE ONLY. THE EXACT LOCATION SHALL BE DETERMINED BY THE CONTRACTOR DURING CONSTRUCTION.

   UTILITY OWNERS:

   SEMINOLE COUNTY ENVIRONMENTAL SERVICES
   PATTI LEVITI (WATER & WASTEWATER)
   407-665-2132

   BELLSOUTH
   JIM FARRELL
   407-273-5084

   FLORIDA POWER & LIGHT
   CHARLES JOHNSON
   407-328-1922

   TIME WARNER COMMUNICATIONS
   MARVIN USRY
   407-532-8509

   FLORIDA GAS TRANSMISSION CO.
   JOE SANCHEZ
   407-838-7171

   A.T.&T.
   RICHARD KALETA
   407-294-3005

   FLORIDA PUBLIC UTILITIES-GAS
   DAN SCRIBBEN
   407-322-5733

2. THE CONTRACTOR SHALL USE THE SERVICES OF SUNSHINE-ONE CALL UTILITY LOCATOR A MINIMUM OF 48 HOURS PRIOR TO THE COMMENCEMENT OF WORK. (SUNSHINE-ONE CALL 1 (800) 423-4770)

MAINTENANCE OF TRAFFIC

1. ACCESS FOR LOCAL TRAFFIC WITH DESTINATIONS WITHIN THE PROJECT LIMITS SHALL BE MAINTAINED. IF DURING CONSTRUCTION ACCESS FOR LOCAL TRAFFIC IS CHANGED, THEN THE CONTRACTOR SHALL NOTIFY THE OWNER A MINIMUM OF THREE (3) WORKING DAYS IN ADVANCE. IF DURING CONSTRUCTION ROAD CLOSURES ARE REQUIRED, THEN THE CONTRACTOR SHALL NOTIFY SEMINOLE COUNTY A MINIMUM OF FIVE (5) WORKING DAYS IN ADVANCE.
2. PRIOR TO COMMENCING WORK, THE CONTRACTOR SHALL FURNISH, ERECT AND MAINTAIN ALL BARRICADES, WARNING SIGNS, AND MARKINGS FOR HAZARDS AND THE CONTROL OF TRAFFIC, IN REASONABLE CONFORMITY WITH THE U.S. DEPARTMENT OF TRANSPORTATION MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, OR AS DIRECTED BY SEMINOLE COUNTY, SUCH AS TO EFFECTIVELY PREVENT ACCIDENTS IN ALL PLACES WHERE THE WORK CAUSES OBSTRUCTION TO THE NORMAL TRAFFIC OR CONSTITUTES IN ANY WAY A HAZARD TO THE PUBLIC.
3. MAINTENANCE OF TRAFFIC PLANS (MOT), ARE REQUIRED TO BE SUBMITTED BY THE CONTRACTOR. THESE PLANS SHOULD BE SUBMITTED AND APPROVED BY THE SEMINOLE COUNTY TRAFFIC ENGINEER, STEVEN DOUGLAS (407-665-5690), AT LEAST 14 DAYS PRIOR TO MOBILIZATION.

92278-1

RECEIVED
JAN 3 0 2004
PDS
ALTAMONTE SVC. CTR.

Mario F. Chavez, P.E. # 507.. Date JAN 3 0 2004

PRELIMINARY
NOT FOR CONSTRUCTION

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: B. WILLIAMS
DRAWN BY: J. RUSSELL
SHEET CHK'D BY: J. WITTIG
CROSS CHK'D BY: B. WILLIAMS
APPROVED BY: M. CHAVEZ
DATE: JANUARY 2004

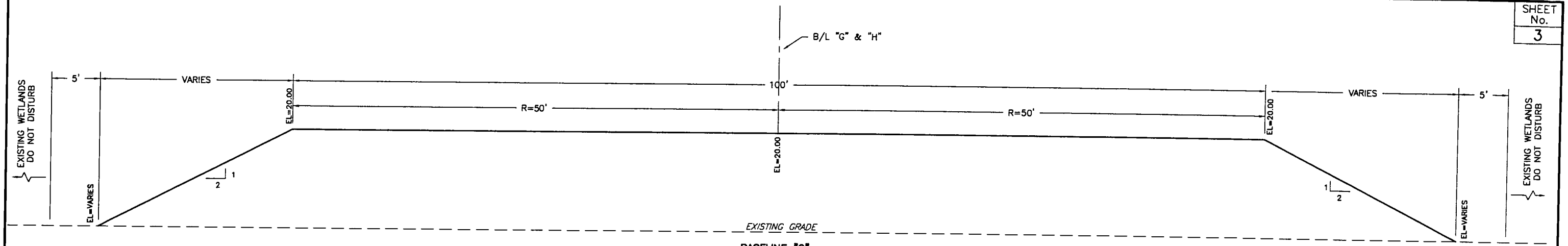
CDM Camp Dresser & McKee Inc.
2301 Maitland Center Parkway
Suite 300
Maitland, Florida 32751
Tel: 407 660-2552
Fax: 407 875-1161
Fl COA No. EB-0000020

SEMINOLE COUNTY
FLORIDA

LOCKHART-SMITH REGIONAL STORMWATER FACILITY

GENERAL NOTES

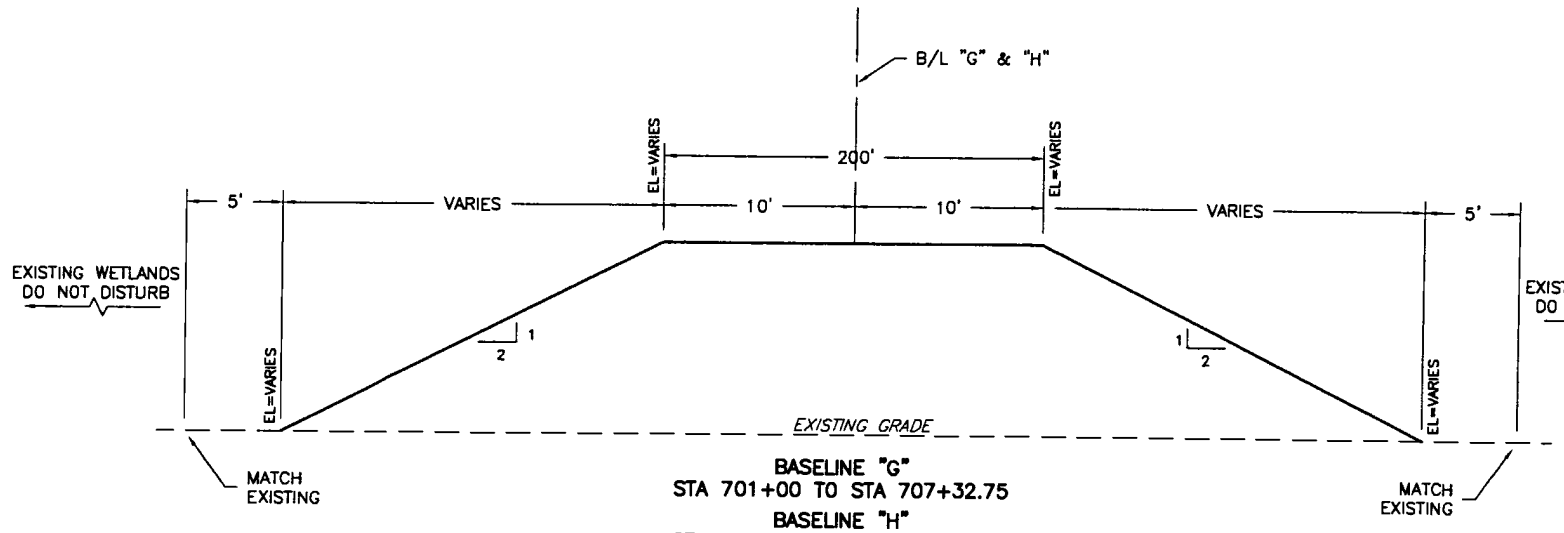
P:\8118\39972\30p\general\ gennot02 10/14/03 08:01:06 5:40:33 RussellJR



BASELINE "G"
STA 700+00
BASELINE "H"
STA 807+68.74

TYPICAL SECTION

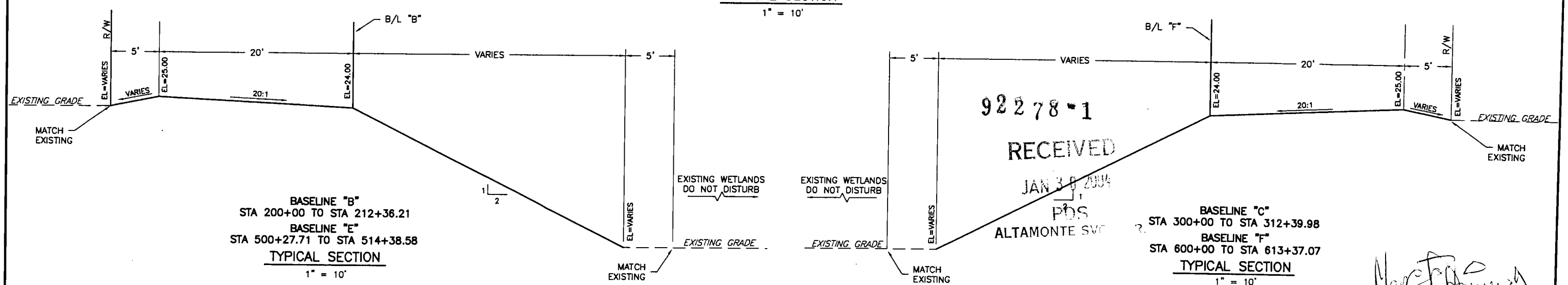
1" = 10'



BASELINE "G"
STA 701+00 TO STA 707+32.75
BASELINE "H"
STA 802+00 TO STA 807+68.74

TYPICAL SECTION

1" = 10'



BASELINE "B"
STA 200+00 TO STA 212+36.21
BASELINE "E"
STA 500+27.71 TO STA 514+38.58

TYPICAL SECTION

1" = 10'

92278-1

RECEIVED
JAN 30 2004
PDS
ALTAMONTE SVC

BASELINE "C"
STA 300+00 TO STA 312+39.98
BASELINE "F"
STA 600+00 TO STA 613+37.07

TYPICAL SECTION

1" = 10'

Marlo F. Chavez, P.E. # 50713 Date JAN 30 2004

PRELIMINARY NOT FOR CONSTRUCTION

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: B. WILLIAMS
DRAWN BY: J. RUSSELL
SHEET CHK'D BY: J. WITTIG
CROSS CHK'D BY: B. WILLIAMS
APPROVED BY: M. CHAVEZ
DATE: JANUARY 2004

CDM Camp Dresser & McKee Inc.
2301 Maitland Center Parkway
Suite 300
Maitland, Florida 32751
Tel. 407 660-2552
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Fl COA No. EB-0000020

SEMINOLE COUNTY
FLORIDA

LOCKHART-SMITH REGIONAL STORMWATER FACILITY

TYPICAL SECTIONS

LEGEND & ABBREVIATIONS

↓	= GUY WIRE
⌖	= COMBINATION POLE
⊡	= FLAT GRATE INLET
CMP	= CORRUGATED METAL PIPE
—OHL—	= OVERHEAD UTILITY LINE
INV	= INVERT
—BCL—	= BURIED CABLE TV LINE
RCP	= REINFORCED CONCRETE PIPE
R/W	= RIGHT OF WAY
— GL —	= BURIED GAS LINE
— BTL —	= BURIED TELEPHONE LINE
P.I. STA.	= POINT OF INTERSECTION STATION
NO.	= NUMBER
#	= NUMBER
E	= EAST
RT.	= RIGHT
N	= NORTH
LT.	= LEFT
S	= SOUTH
Δ	= DELTA
W	= WEST
R	= RADIUS
TWP	= TOWNSHIP
L	= ARC LENGTH
RNG	= RANGE
CB	= CHORD BEARING
SEC	= SECTION
C	= CHORD
I.D.	= IDENTIFICATION NUMBER
SSMC	= SOUTHEASTERN SURVEYING AND MAPPING CORP.

SOUTHEASTERN SURVEYING & MAPPING CORP.
524 North Orlando Avenue
Maitland, Florida 32751-4702
(407)647-3850 fax:(407)647-1887
email: semmo@mail.com

Rev:12/17/01 MR	ADJUSTED CHESTNUT STREET		
Sheet of	Drawing No. 46534003	Date: Oct. 4, 2000	

NOTE:
SEE SHEET 5 FOR SURVEYOR'S NOTES & LEGAL DESCRIPTION.

N

25 0 100
Feet

MAP OF SANFORD FARMS
PLAT BOOK 1 PAGE 127 – 128 1/2
LOT 3

BOOKERTOWN
PLAT BOOK 4 PAGES 98 & 99

B/L "A" STA. 119+82.82=
STA. 15+31.33 LOCKHART-SMITH CANAL

B/L "A" CURVE DATA
Δ=10°08'47"
R=1000.00'
L=177.09'
Tan=88.78'
P.C. STA. 117+53.98
P.T. STA. 119+31.07

HALSEY AVENUE
40' RIGHT OF WAY PER PLAT BOOK 4 PAGES 9 & 10

CHESTNUT STREET
36' RIGHT OF WAY
PLAT BOOK 4, PAGES 9 & 10

BREWER AVENUE

B/L "B"
STA. 212+51.96
25.00' LT.

B/L "B" STA. 212+63.92

SET 5/8" IRON ROD WITH CAP SSMC LB 2108
N 1632917.187
E 546332.329

RETENTION POND

N89°24'06"E 1878.56' (CALCULATED TOTAL)
N89°18'23"E 1878.70' (TOTAL PER DESCRIPTION)

B/L "E"
STA. 500+00.00

B/L "H"
STA. 707+32.75

N 89°24'06" E 1867.89'

B/L "B" STA. 212+36.21
B/L "E" STA. 500+27.71

BASELINE "E"

B/L "B" STA. 211+53.68
B/L "G" STA. 707+04.76

B/L "B" STA. 211+53.68
B/L "H" STA. 707+04.76

B/L "G" CURVE DATA
Δ=63°15'56"
R=360.00
L=397.51
Tan=221.76
P.T. STA. 705+06.96
P.C. STA.701+09.45

B/L "A" STA. 114+99.86
B/L "B" STA. 210+06.82

B/L "G"

BORROW PIT
1,527,889 SQUARE FEET ±
OR 35.08 ACRES ±

BLOCK 2
LOT 2

BASELINE "A"

B/L "A" STA. 19+76.64 53.17 RT.
B/L "B" STA. 19+66.22 38.61 LT.

SET 5/8" IRON ROD WITH CAP SSMC LB2108
N 1633380.720
E 547547.747
FOUND 1/2" IRON ROD NO ID 0.6' S & 2.4' E

1 STORY MASONRY DWELLING

N89°43'50"E 671.66'

20.00' INGRESS / EGRESS EASEMENT PER OFFICIAL RECORDS BOOK 1718, PAGE 1675

SET 5/8" IRON ROD WITH CAP SSMC LB2108
N 1633363.877
E 548219.404

END BASELINE 3
STA. 2+38+38.91

OREGON STREET

WOOD FRAME SHED
CONCRETE FOUNDATION

METAL SHED

LOT 1, BLOCK 2
199,641 SQUARE FEET ±
OR 4.58 ACRES ±

WEST LINE OF THE SE 1/4 OF SECTION 20, TOWNSHIP 19 SOUTH, RANGE 31 EAST

BLOCK 2
LOT 1

B/L "D"
P.I. STA. 11+20.08

BASELINE "D"

148.00' DRAINAGE EASEMENT PER OFFICIAL RECORDS BOOK 2070, PAGES 1513-1518

N 90°00'00" E 688.00'

DITCH

SET 5/8" IRON ROD WITH CAP SSMC LB2108

B/L "B" STA. 206+74.37
B/L "D" STA. 408+08.08

B/L "A"
P.I. STA. 111+39.66

N 57°25'21" E 401+00
120.00'

SET 5/8" IRON ROD WITH CAP SSMC LB2108
N 1633204.388
E 547540.563

NORTHWEST CORNER OF THE SE 1/4 OF SECTION 20, TOWNSHIP 19 SOUTH, RANGE 31 EAST
FOUND 5/8" IRON ROD NO I.D.

B/L "D"
STA. 10+00.00

S89°43'50"W 515.50'

NEVADA AVENUE
30' RIGHT OF WAY PER PLAT

N 1633206.817
E 548694.085

B/L "D" STA. 12+25.40 58.61 RT.

B/L "B" STA. 205+95.08 37.20 LT.

N89°43'50"E 2640.00' (TOTAL)

B/L "A" STA. 110+95.50
B/L "H" STA. 701+98.04

B/L "H" CURVE DATA
Δ=45°05'01"
R=490.00
L=385.56
Tan=203.38
P.C. STA. 802+66.95
P.T. STA. 806+52.51

92278-1

B/L "H"
P.I. STA. 807+68.74

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MAP OF SANFORD FARMS
PLAT BOOK 1 PAGE 127 – 128 1/2
LOT 7A
BLOCK 20

WEST LINE OF THE SE 1/4 OF SECTION 20, TOWNSHIP 19 SOUTH, RANGE 31 EAST

BASELINE OF SURVEY PER SEMINOLE COUNTY PUBLIC WORKS DEPARTMENT RIGHT OF WAY AND TOPOGRAPHIC SURVEY PREPARED BY BOWER-SINGLETON & ASSOC., DATED 8-11-00.

CENTERLINE OF SWALE (SEE NOTE 9)

BASELINE "B"

BASELINE "A"

BASELINE OF SURVEY PER SEMINOLE COUNTY PUBLIC WORKS DEPARTMENT RIGHT OF WAY AND TOPOGRAPHIC SURVEY PREPARED BY BOWER-SINGLETON & ASSOC., DATED 8-11-00.

MATCHLINE SEE SHEET 6

MATCHLINE SEE SHEET 5

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY:
DRAWN BY:
SHEET CHK'D BY:
CROSS CHK'D BY:
APPROVED BY:
DATE: JANUARY 2004

CDM Camp Dresser & McKee Inc.
2301 Maitland Center Parkway
Suite 300
Maitland, Florida 32751
Tel: 407 660-2552
Fax: 407 875-1161
FI COA No. EB-0000020

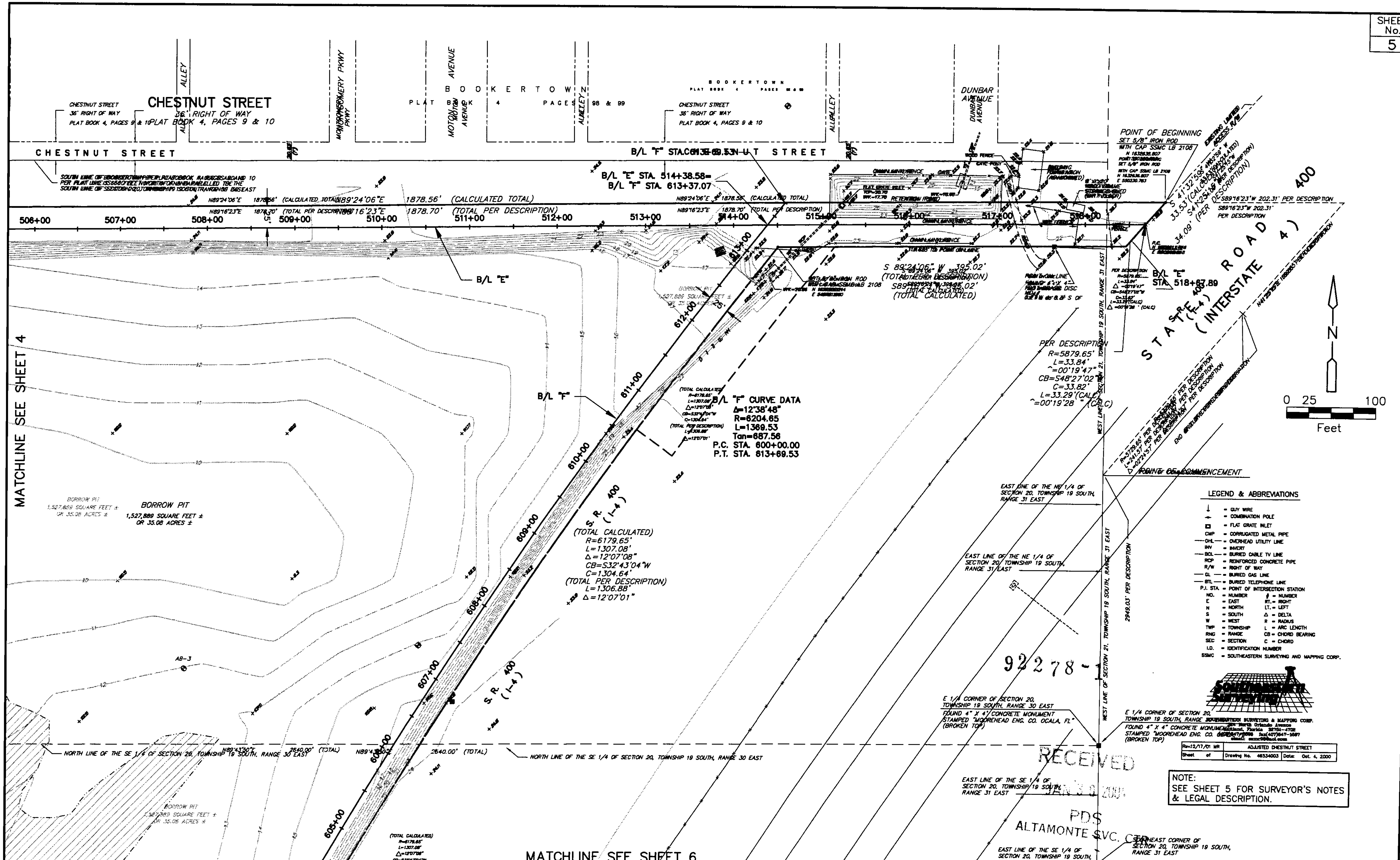
SEMINOLE COUNTY
FLORIDA

LOCKHART-SMITH REGIONAL STORMWATER FACILITY

EXISTING SITE CONDITIONS

PRELIMINARY
NOT FOR CONSTRUCTION

P:\81181\39972\30p\general\ RussellR 10/14/03 08:01:06 ppmw0p4


CHESTNUT STREET
36' RIGHT OF WAY
PLAT BOOK 4, PAGES 9 & 10
BOOKERTOWN
PLAT BOOK 4 PAGES 98 & 99
DUNBAR AVENUE
MOTON AVENUE
MONTGOMERY PKWY
ALLEY
POINT OF BEGINNING
SET 5/8" IRON ROD
WITH CAP SSMC LB 2108
B/L "E" STA. 514+38.58=
B/L "F" STA. 613+37.07
N89°24'06"E 1878.56' (CALCULATED TOTAL)
N89°16'23"E 1878.70' (TOTAL PER DESCRIPTION)
S89°16'23"W 202.31' PER DESCRIPTION
B/L "E"
B/L "E" STA. 518+67.89
B/L "F"
S 89°24'06" W 395.02'
(TOTAL PER DESCRIPTION)
(TOTAL CALCULATED)
STATE ROAD 400 (I-4) (INTERSTATE 4)
PER DESCRIPTION
R=5879.65'
L=33.84'
CB=S48°27'02"
C=33.82'
L=33.29'(CALC)
B/L "F" CURVE DATA
Δ=12°38'48"
R=6204.65
L=1369.53
Tan=687.56
P.C. STA. 600+00.00
P.T. STA. 613+69.53
S. R. 400 (I-4)
(TOTAL CALCULATED)
R=6179.65'
L=1307.08'
Δ=12°07'08"
CB=S32°43'04"W
C=1304.64'
(TOTAL PER DESCRIPTION)
L=1306.88'
Δ=12°07'01"
BORROW PIT
1,527,889 SQUARE FEET ±
OR 35.08 ACRES ±
MATCHLINE SEE SHEET 4
MATCHLINE SEE SHEET 6
NORTH LINE OF THE SE 1/4 OF SECTION 20, TOWNSHIP 19 SOUTH, RANGE 30 EAST
2640.00' (TOTAL)
POINT OF COMMENCEMENT
WEST LINE OF SECTION 21, TOWNSHIP 19 SOUTH, RANGE 31 EAST
2949.03' PER DESCRIPTION
EAST LINE OF THE NE 1/4 OF SECTION 20, TOWNSHIP 19 SOUTH, RANGE 31 EAST
EAST LINE OF THE SE 1/4 OF SECTION 20, TOWNSHIP 19 SOUTH, RANGE 31 EAST
E 1/4 CORNER OF SECTION 20, TOWNSHIP 19 SOUTH, RANGE 30 EAST
FOUND 4" X 4" CONCRETE MONUMENT
STAMPED "MOOREHEAD ENG. CO. OCALA, FL"
(BROKEN TOP)
SOUTHEAST CORNER OF SECTION 20, TOWNSHIP 19 SOUTH, RANGE 31 EAST
0 25 100
Feet
LEGEND & ABBREVIATIONS
GUY WIRE
COMBINATION POLE
FLAT GRATE INLET
CMP = CORRUGATED METAL PIPE
OHL = OVERHEAD UTILITY LINE
INV = INVERT
BCL = BURIED CABLE TV LINE
RCP = REINFORCED CONCRETE PIPE
R/W = RIGHT OF WAY
GL = BURIED GAS LINE
BTL = BURIED TELEPHONE LINE
P.I. STA. = POINT OF INTERSECTION STATION
NO. = NUMBER
E = EAST
N = NORTH
S = SOUTH
W = WEST
TWP = TOWNSHIP
RNG = RANGE
SEC = SECTION
I.D. = IDENTIFICATION NUMBER
SSMC = SOUTHEASTERN SURVEYING AND MAPPING CORP.
# = NUMBER
RT. = RIGHT
LT. = LEFT
Δ = DELTA
R = RADIUS
L = ARC LENGTH
CB = CHORD BEARING
C = CHORD
ADJUSTED CHESTNUT STREET
Date: Oct. 4, 2000
92278-1
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ALTAMONTE SVC. CTR.

NOTE:
SEE SHEET 5 FOR SURVEYOR'S NOTES & LEGAL DESCRIPTION.

SHEET No. 5

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY:
DRAWN BY:
SHEET CHK'D BY:
CROSS CHK'D BY:
APPROVED BY:
DATE: JANUARY 2004

CDM Camp Dresser & McKee Inc.
2301 Maitland Center Parkway
Suite 300
Maitland, Florida 32751
Tel: 407 660-2552
Fax: 407 875-1161
Fl COA No. EB-0000020

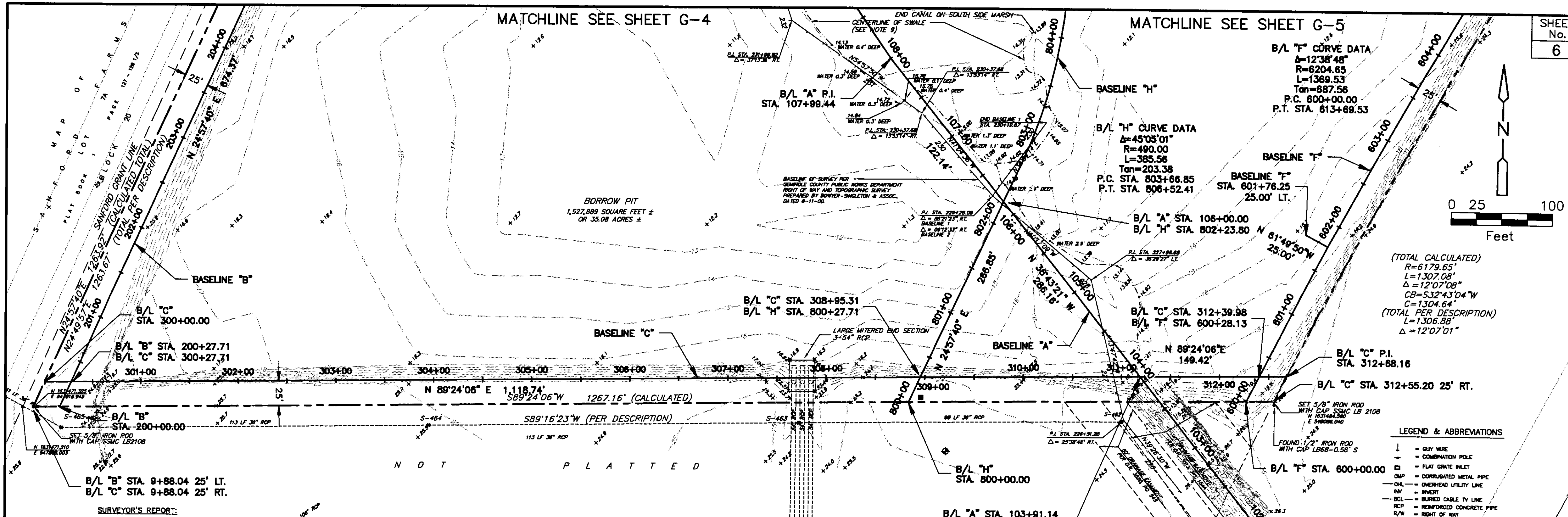
SEMINOLE COUNTY
FLORIDA

LOCKHART-SMITH REGIONAL STORMWATER FACILITY

EXISTING SITE CONDITIONS

PRELIMINARY
NOT FOR CONSTRUCTION

P:\6116\39972\30p\general\ 10/14/03 08:01:06 5:40:33



LEGEND & ABBREVIATIONS

	= GUY WIRE
	= COMBINATION POLE
	= FLAT GRATE INLET
CMP	= CORRUGATED METAL PIPE
—OHL—	= OVERHEAD UTILITY LINE
INV	= INVERT
—BCL—	= BURIED CABLE TV LINE
RCP	= REINFORCED CONCRETE PIPE
R/W	= RIGHT OF WAY
—GL—	= BURIED GAS LINE
—BTL—	= BURIED TELEPHONE LINE
P.I. STA.	= POINT OF INTERSECTION STATION
NO.	= NUMBER
E	= EAST
N	= NORTH
S	= SOUTH
W	= WEST
TWP	= TOWNSHIP
RNG	= RANGE
SEC	= SECTION
I.D.	= IDENTIFICATION NUMBER
SSMC	= SOUTHEASTERN SURVEYING AND MAPPING CORP.
#	= NUMBER
RT.	= RIGHT
LT.	= LEFT
Δ	= DELTA
R	= RADIUS
L	= ARC LENGTH
CB	= CHORD BEARING
C	= CHORD

SOUTHEASTERN SURVEYING & MAPPING CORP.
384 North Orlando Avenue
Maitland, Florida 32751-4702
(407)647-6866 fax(407)647-1667

Rev12/17/01 MR	ADJUSTED CHESTNUT STREET	
Sheet of	Drawing No. 48534003	Date: Oct. 4, 2000

SURVEYOR'S REPORT:

1. Utility locations if shown hereon are based on field location of markings by Utility Company representatives, surface features and construction plans furnished to the surveyor. Additional sub-surface utilities may exist that have not been field located.
2. Easements or rights of way that appear on recorded plans or that have been furnished to the surveyor by others have been incorporated into this drawing with appropriate notation. Other easements may be discovered by a search of the Public Records.
3. Measurement methods used for this survey meet MINIMUM TECHNICAL STANDARDS FOR LAND SURVEYING CH. 61G17-6 requirements.
4. Not valid without the signature and raised seal of a Florida licensed surveyor and mapper.
5. Features shown by symbol as indicated in the legend are not to scale.
6. Bearings shown hereon are based on the North line of the SE 1/4 of Section 20, Township 19 South, Range 31 East, Seminole County, Florida, being North 89°43'50" East.
7. Vertical information shown hereon refers to Seminole County Benchmark designation 189-6-901, being a Found PK Nail & Disk in a 4" x 4" Concrete Monument 2'± east of the east edge of pavement of Oregon Avenue at ground level, 0.35 miles ± south of Orange Boulevard across from the north end of a large open field, also 30' ± south of a double power pole #TNL 47 and SNL 47A, 30.6' southwest of the southwest corner post of a 6' chain link fence around a deep ditch. Elevation=26.420
8. The electronic image of this map contains horizontal positions for all features shown relative to an assumed datum.
9. The elevations and the water depths shown along the centerline of swale were taken from Seminole County Public Works Department Right of Way and Topographic Survey prepared by Bowyer-Singleton & Assoc., dated 8-11-00.
10. Unless shown, only those visible features in the immediate vicinity of the above described parcel boundary have been located.
11. The following comments are in regards to Ownership and Encumberance Report No. 00.05717, prepared by Fidelity Title and and Guarantee Company, dated September 7, 2000. The numbers in our comments correspond to the numbering system used in the "Encumberances" section of said Report.

Item:	Comment:
1.	As shown hereon to the best of our knowledge and belief.
2.	As shown hereon to the best of our knowledge and belief.
3.	Southeastern Surveying & Mapping Corp. did not examine or address this item.
4.	Does not affect Lot 1, Block 2, MAP OF SANFORD FARMS per Plat Book 1, Pages 127-128 1/2 of the Public Records of Seminole County, Florida.
5.	Southeastern Surveying & Mapping Corp. did not examine or address this item.
6.	Southeastern Surveying & Mapping Corp. did not examine or address this item.
7.	As shown hereon to the best of our knowledge and belief.

12. The bearings and coordinates shown hereon are based on the Florida State Coordinate System, East Zone, 1983 North American Datum, 1990 Adjustment, as established from NGS Control Points I-4 71 A15 and I-4 71 A14.

LEGAL DESCRIPTION

Lot 1, Block 2, MAP OF SANFORD FARMS as recorded in Plat Book 1, Pages 127 – 128 1/3 of the Public Records of Seminole County, Florida and a portion of Section 20, Township 19 South, Range 31 East, Seminole County, Florida,described as follows:

A parcel of land sometimes referred to as "Borrow Pit No. 2" lying in the South five–eighths (S 5/8) of the East one–half (E 1/2) of aforesaid Section 20, and described as follows:

Commence at a point on the East line of Section 20, Township 19 South, Range 30 East, 2949.03 feet Northeasterly from the Southeast corner of said Section 20; said point being on a curve having a radius of 5729.65 feet and being concave Southeasterly; thence from a tangent bearing of N 39°00'23" East, run 241.57 feet along said curve through a central angle of 02°24'57" to the end of said curve; thence North 41°25'15" East 169.85 feet; thence South 89°16'23" West 202.31 feet to the Point of Beginning; thence run South 41°25'15" West 34.09 feet to the beginning of a curve having a radius of 5879.65 feet, and being concave Southeasterly, thence run Southwesterly 33.29 feet along said curve, through a central angle of 00°19'28"; thence South 89°16'23" West 395.02 feet to a point on a curve having a radius of 6179.65 feet, and being concave Southeasterly, thence from a tangent bearing of South 38°39'12" West, 1306.88 feet along said curve through a central angle of 12°07'01"; thence run South 89°16'23" West 1267.16 feet; thence run North 24°49'57" East 1263.67 feet; thence run North 89°16'23" East 1878.70 feet to the Point of Beginning. CONTAINING 1,727,530 square feet or 39.66 acres more or less.

92278-1

RECEIVED
JAN 30 2004
PDS
ALTAMONTE SVC. CTR.

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY:
DRAWN BY:
SHEET CHK'D BY:
CROSS CHK'D BY:
APPROVED BY:
DATE: JANUARY 2004

CDM Camp Dresser & McKee Inc.
2301 Maitland Center Parkway
Suite 300
Maitland, Florida 32751
Tel: 407 660-2552
Fax: 407 875-1161
Fl COA No. EB-0000020

SEMINOLE COUNTY
FLORIDA

LOCKHART-SMITH REGIONAL STORMWATER FACILITY

EXISTING SITE CONDITIONS

PRELIMINARY
NOT FOR CONSTRUCTION

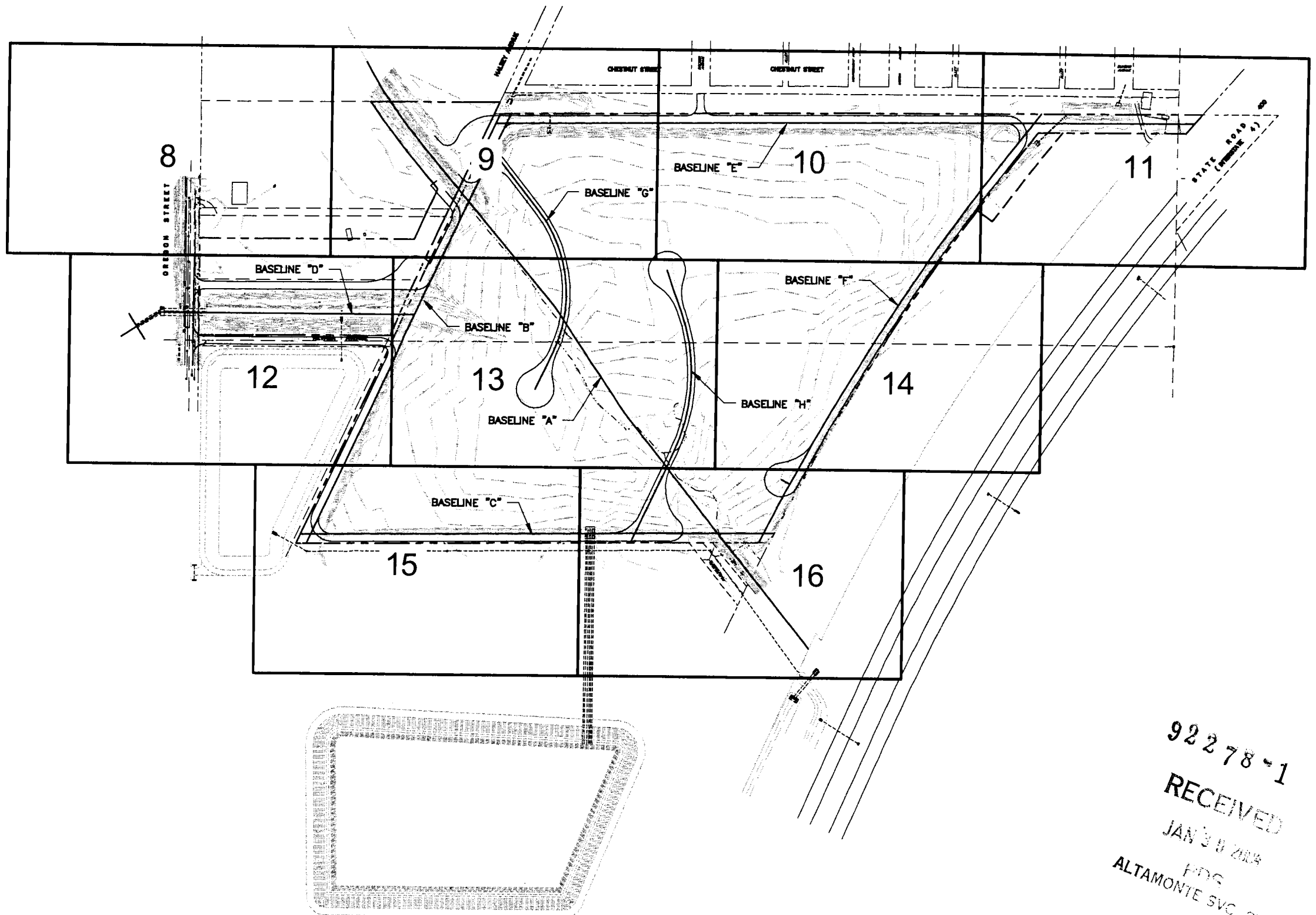
SHEET No. 6

P:\6116\39972\30p\general\ ggrey0g6 10/14/03 08:01:06 5:40:33 RussellR

SHEET No. 7

N

75 300
Feet



92278-1

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JAN 30 2004
FDC
ALTAMONTE SVC. CTR.

Mario F. Chavez, P.E. # 50734 Date JAN 30 2004

PRELIMINARY NOT FOR CONSTRUCTION

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: B. WILLIAMS
DRAWN BY: J. RUSSELL
SHEET CHK'D BY: J. WITTIG
CROSS CHK'D BY: B. WILLIAMS
APPROVED BY: M. CHAVEZ
DATE: JANUARY 2004

CDM Camp Dresser & McKee Inc.
2301 Maitland Center Parkway
Suite 300
Maitland, Florida 32751
Tel: 407 660-2552
Fax: 407 875-1161
Fl.COA No. EB 0000020

SEMINOLE COUNTY
FLORIDA

LOCKHART-SMITH REGIONAL STORMWATER FACILITY

KEY MAP

P:\0116\138972\Jobs\general\ gpmap0g07 10/14/03 08:01:06 5:40:33 RussellR

SHEET No. 8

MAP OF
SANFORD FARMS
PLAT BOOK 1 PAGE 127 - 128 1/2
LOT 3

N

0 15 60
Feet

OREGON STREET

SET 5/8" IRON ROD
WITH CAP SSMC LB2108
N 1632360.720
E 547547.747
FOUND 1/2" IRON ROD
NO #-0.6' S & 2.4' E

INV.=22.93 30" CMP
INV.=23.94 30" CMP

1 STORY MASONRY DWELLING
58.5'
41.2'

DIRT DRIVE
86.0'

9.57'

N89°43'50"E 671.66'

20.00' INGRESS / EGRESS EASEMENT PER OFFICIAL RECORDS BOOK 1718, PAGE 1675

ASPHALT PAVING

R/W

WEST LINE OF THE SE 1/4
OF SECTION 20, TOWNSHIP 19 SOUTH,
RANGE 31 EAST

ALTAMONTE LOT 1, BLOCK 23

199,641 SQUARE FEET ±
OR 4.58 ACRES ±

MATCH LINE SEE SHEET 9

MATCH LINE SEE SHEET 12

RECEIVED
JAN 30 2004

KEY PLAN

8 10 11
12 13 14
15 16

Mario F. Chavez Date
P.E. # 50 JAN 30 2004

PRELIMINARY
NOT FOR CONSTRUCTION

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: B. WILLIAMS
DRAWN BY: J. RUSSELL
SHEET CHK'D BY: J. WITTIG
CROSS CHK'D BY: B. WILLIAMS
APPROVED BY: M. CHAVEZ
DATE: JANUARY 2004

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Tel: 407 660-2552
Fax: 407 875-1161
FI COA No EB-0000020

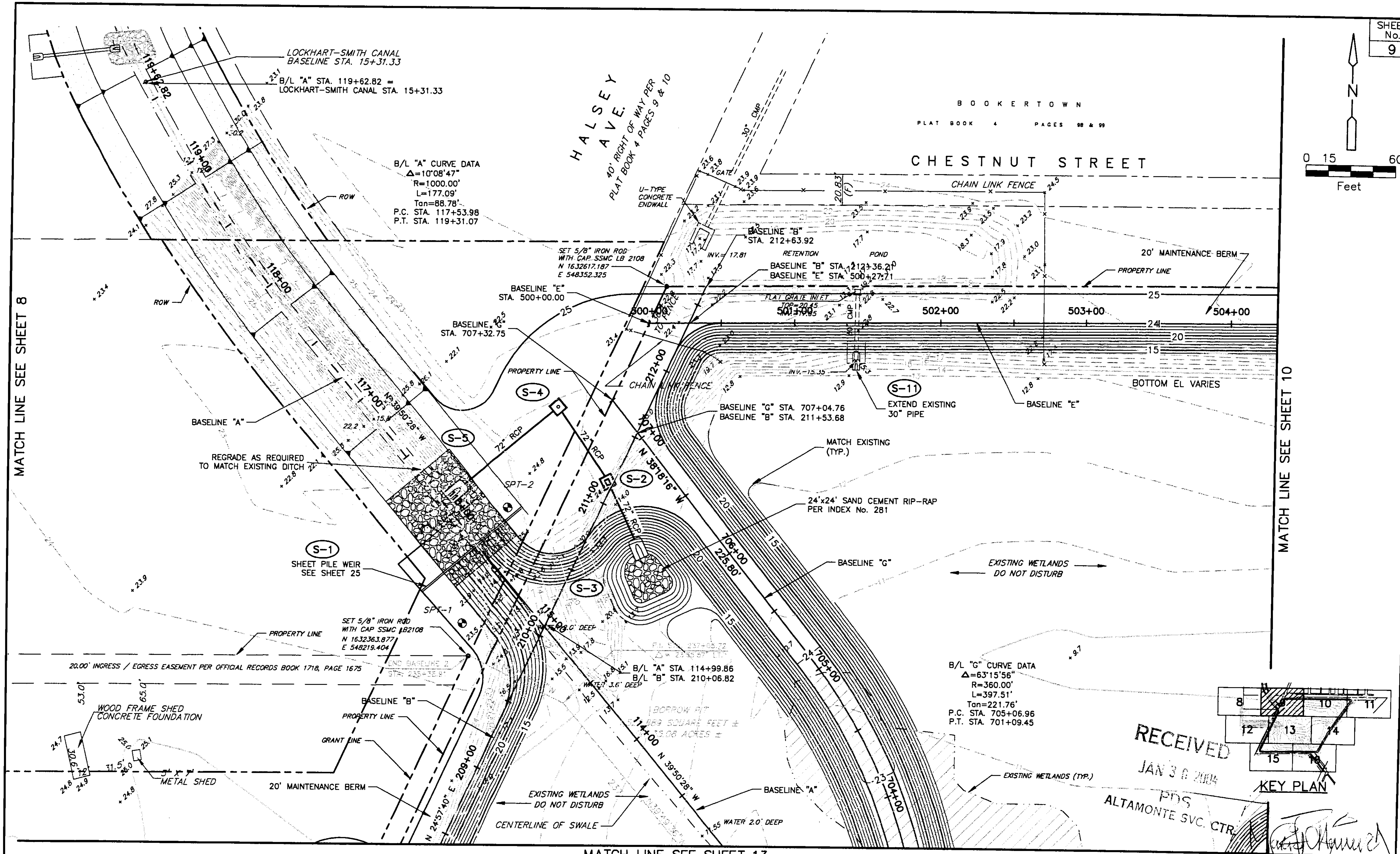
SEMINOLE COUNTY
FLORIDA

LOCKHART-SMITH REGIONAL
STORMWATER FACILITY

92276-1

POND PLAN

P:\9116\92276\dgn\general\ cpierce08 10/14/03 08:01:06 5:40:33 RussellR


SHEET No. 9
LOCKHART-SMITH CANAL BASELINE STA. 15+31.33
B/L "A" STA. 119+62.82 = LOCKHART-SMITH CANAL STA. 15+31.33
HALSEY AVE.
40' RIGHT OF WAY PER PLAT BOOK 4 PAGES 9 & 10
BOOKERTOWN
PLAT BOOK 4 PAGES 98 & 99
CHESTNUT STREET
CHAIN LINK FENCE
B/L "A" CURVE DATA
Δ=10°08'47"
R=1000.00'
L=177.09'
Tan=88.78'
P.C. STA. 117+53.98
P.T. STA. 119+31.07
U-TYPE CONCRETE ENDWALL
BASELINE "B" STA. 212+63.92
RETENTION POND
BASELINE "B" STA. 212+36.21
BASELINE "E" STA. 500+27.71
20' MAINTENANCE BERM
PROPERTY LINE
SET 5/8" IRON ROD WITH CAP SSMC LB 2108 N 1632617.187 E 548352.325
BASELINE "E" STA. 500+00.00
FLAT GRATE INLET
BASELINE "G" STA. 707+32.75
PROPERTY LINE
CHAIN LINK FENCE
BOTTOM EL VARIES
EXTEND EXISTING 30" PIPE
BASELINE "E"
BASELINE "G" STA. 707+04.76
BASELINE "B" STA. 211+53.68
MATCH EXISTING (TYP.)
BASELINE "A"
REGRADE AS REQUIRED TO MATCH EXISTING DITCH
72" RCP
N 38°18'16" W
24"x24" SAND CEMENT RIP-RAP PER INDEX No. 281
SHEET PILE WEIR SEE SHEET 25
BASELINE "G"
EXISTING WETLANDS DO NOT DISTURB
SET 5/8" IRON ROD WITH CAP SSMC LB2108 N 1632363.877 E 548219.404
PROPERTY LINE
20.00' INGRESS / EGRESS EASEMENT PER OFFICIAL RECORDS BOOK 1718, PAGE 1675
B/L "A" STA. 114+99.86
B/L "B" STA. 210+06.82
BORROW PIT
B/L "G" CURVE DATA
Δ=63°15'56"
R=360.00'
L=397.51'
Tan=221.76'
P.C. STA. 705+06.96
P.T. STA. 701+09.45
WOOD FRAME SHED CONCRETE FOUNDATION
BASELINE "B"
PROPERTY LINE
GRANT LINE
METAL SHED
20' MAINTENANCE BERM
EXISTING WETLANDS DO NOT DISTURB
CENTERLINE OF SWALE
BASELINE "A"
N 39°50'28" W
N 24°57'40" E
WATER 2.0' DEEP
EXISTING WETLANDS (TYP.)
MATCH LINE SEE SHEET 8
MATCH LINE SEE SHEET 10
MATCH LINE SEE SHEET 13
KEY PLAN
RECEIVED JAN 30 2004 PDS ALTAMONTE SVC. CTR.
Feet
0 15 60

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: B. WILLIAMS
DRAWN BY: J. RUSSELL
SHEET CHK'D BY: J. WITTIG
CROSS CHK'D BY: B. WILLIAMS
APPROVED BY: M. CHAVEZ
DATE: JANUARY 2004

CDM Camp Dresser & McKee Inc.
2301 Maitland Center Parkway, Suite 300, Maitland, Florida 32751
Tel. 407 660-2552
Fax 407 875-1161
Fl COA No. EB-0000020

SEMINOLE COUNTY
FLORIDA

LOCKHART-SMITH REGIONAL STORMWATER FACILITY

92278-1

POND PLAN

Mario F. Chavez Date
P.E. # 50... JAN 30 2004

PRELIMINARY NOT FOR CONSTRUCTION

SHEET No. 10

BREWER AVENUE

CHESTNUT STREET
36' RIGHT OF WAY
PLAT BOOK 4, PAGES 9 & 10

ALLEY

MONTGOMERY PKWY

MOTON AVENUE

ALLEY

N

0 15 60
Feet

CHESTNUT STREET

20.83' (F)

20.83' (F)

R/W 20' R/W
50'

R25' (TYP.)

SOUTH LINE OF BOOKERTOWN PER PLAT BOOK 4, PAGES 9 AND 10 PER PLAT LINE IS 660 FEET NORTH OF AND PARALLEL TO THE SOUTH LINE OF SECTION 20, TOWNSHIP 19 SOUTH, RANGE 30 EAST

N89°24'06"E 1878.56' (CALCULATED TOTAL)
N89°16'23"E 1878.70' (TOTAL PER DESCRIPTION)

PROPERTY LINE

20' MAINTENANCE BERM

BASELINE "E"

505+00 506+00 507+00 N 89°24'06" E 508+00 509+00 510+00 511+00 512+00 513+00

25' 20'

24 20 15

BOTTOM EL. VARIES

MATCH EXISTING

MATCH LINE SEE SHEET 11

MATCH LINE SEE SHEET 9

EXISTING WETLANDS
DO NOT DISTURB

MATCH EXISTING

BASELINE "F"

611+00 610+00 609+00

BASELINE "F" CURVE DATA
Δ=12°38'48"
R=6204.65
L=1369.53
Tan=687.56
P.C. STA. 600+00.00
P.T. STA. 613+69.53

MAINTENANCE BERM

ROW

S.R. 400 (I-4)

BORROW PIT
1,507,889 SQUARE FEET ±
OR 35.08 ACRES ±

AB-2

KEY PLAN

92278-1

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PDS
ALTAMONTE SVC. CTR.

MATCH LINE SEE SHEET 14

Mario R. Chavez, P.E. Date
P.E. #50718 JAN 30 2004

PRELIMINARY NOT FOR CONSTRUCTION

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: B. WILLIAMS
DRAWN BY: J. RUSSELL
SHEET CHK'D BY: J. WITTIG
CROSS CHK'D BY: B. WILLIAMS
APPROVED BY: M. CHAVEZ
DATE: JANUARY 2004

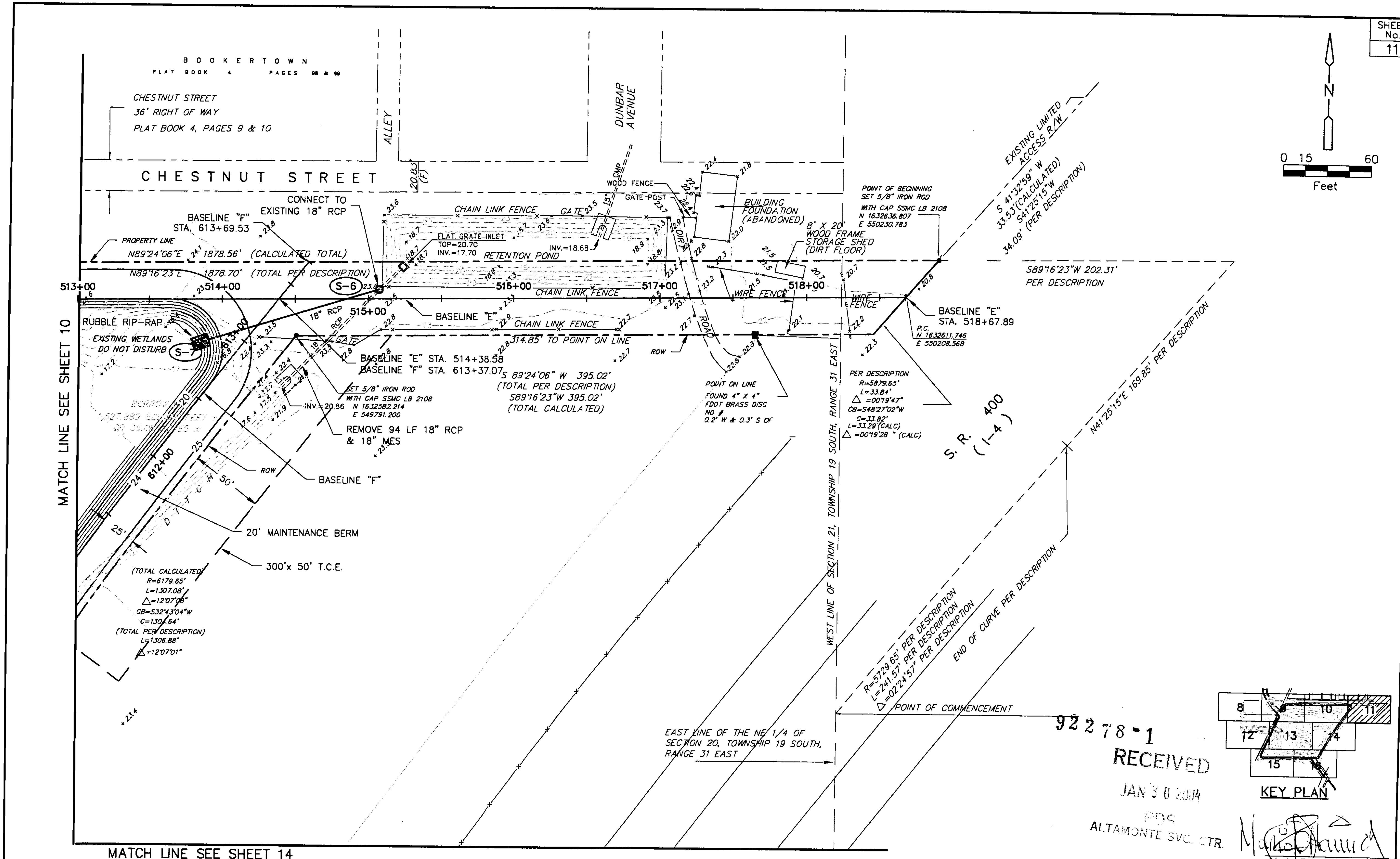
CDM Camp Dresser & McKee Inc.
2301 Maitland Center Parkway
Suite 300
Maitland, Florida 32751
Tel: 407 660-2552
Fax: 407 875-1161
FI COA No. EB-0000020

SEMINOLE COUNTY
FLORIDA

LOCKHART-SMITH REGIONAL STORMWATER FACILITY

POND PLAN

P:\8118\39972\Job\general\ cplan10 10/14/03 08:01:06 5:40:33 RussellJR



SHEET No. 11
N
0 15 60
Feet
BOOKERTOWN
PLAT BOOK 4 PAGES 98 & 99
CHESTNUT STREET
36' RIGHT OF WAY
PLAT BOOK 4, PAGES 9 & 10
CHESTNUT STREET
ALLEY
DUNBAR AVENUE
CONNECT TO EXISTING 18" RCP
BASELINE "F" STA. 613+69.53
PROPERTY LINE
N89°24'06"E 1878.56' (CALCULATED TOTAL)
N89°16'23"E 1878.70' (TOTAL PER DESCRIPTION)
CHAIN LINK FENCE
GATE
WOOD FENCE
GATE POST
FLAT GRATE INLET TOP=20.70 INV.=17.70
INV.=18.68
RETENTION POND
BUILDING FOUNDATION (ABANDONED)
8' X 20' WOOD FRAME STORAGE SHED (DIRT FLOOR)
DIRT ROAD
POINT OF BEGINNING SET 5/8" IRON ROD WITH CAP SSMC LB 2108 N 1632636.807 E 550230.783
EXISTING LIMITED ACCESS R/W
S 41°32'59" W 33.53'(CALCULATED)
S41°25'15"W 34.09' (PER DESCRIPTION)
S89°16'23"W 202.31' PER DESCRIPTION
513+00
514+00
515+00
516+00
517+00
518+00
S-6
S-7
18" RCP
BASELINE "E"
WIRE FENCE
BASELINE "E" STA. 518+67.89
P.C. N 1632611.746 E 550208.568
RUBBLE RIP-RAP
EXISTING WETLANDS DO NOT DISTURB
314.85' TO POINT ON LINE
BASELINE "E" STA. 514+38.58
BASELINE "F" STA. 613+37.07
S 89°24'06" W 395.02' (TOTAL PER DESCRIPTION)
S89°16'23"W 395.02' (TOTAL CALCULATED)
SET 5/8" IRON ROD WITH CAP SSMC LB 2108 N 1632582.214 E 549791.200
INV.=20.86
REMOVE 94 LF 18" RCP & 18" MES
ROW
POINT ON LINE FOUND 4" X 4" FDOT BRASS DISC NO # 0.2' W & 0.3' S OF
PER DESCRIPTION R=5879.65' L=33.84' Δ =00°19'47" CB=S48°27'02"W C=33.82' L=33.29'(CALC) Δ =00°19'28" (CALC)
S. R. 400 (I-4)
N41°25'15"E 169.85' PER DESCRIPTION
BORROW
612+00
613+00
ROW
BASELINE "F"
DITCH
50'
25'
20' MAINTENANCE BERM
300'x 50' T.C.E.
(TOTAL CALCULATED) R=6179.65' L=1307.08' Δ=12°07'08" CB=S32°43'04"W C=1304.64'
(TOTAL PER DESCRIPTION) L=1306.88' Δ=12°07'01"
WEST LINE OF SECTION 21, TOWNSHIP 19 SOUTH, RANGE 31 EAST
R=5729.65' PER DESCRIPTION
L=241.57' PER DESCRIPTION
Δ=02°24'57" PER DESCRIPTION
END OF CURVE PER DESCRIPTION
POINT OF COMMENCEMENT
EAST LINE OF THE NE 1/4 OF SECTION 20, TOWNSHIP 19 SOUTH, RANGE 31 EAST
MATCH LINE SEE SHEET 10
MATCH LINE SEE SHEET 14
KEY PLAN
8 10 11 12 13 14 15 16

92278-1

RECEIVED
JAN 30 2004
PDS
ALTAMONTE SVC. CTR.

Mario F. Chavez, Date
P.E. # 50718 JAN 30 2004

PRELIMINARY
NOT FOR CONSTRUCTION

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: B. WILLIAMS
DRAWN BY: J. RUSSELL
SHEET CHK'D BY: J. WITTIG
CROSS CHK'D BY: B. WILLIAMS
APPROVED BY: M. CHAVEZ
DATE: JANUARY 2004

CDM Camp Dresser & McKee Inc.
2301 Maitland Center Parkway
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Fax: 407 875-1161
Fl COA No. EB-0000020

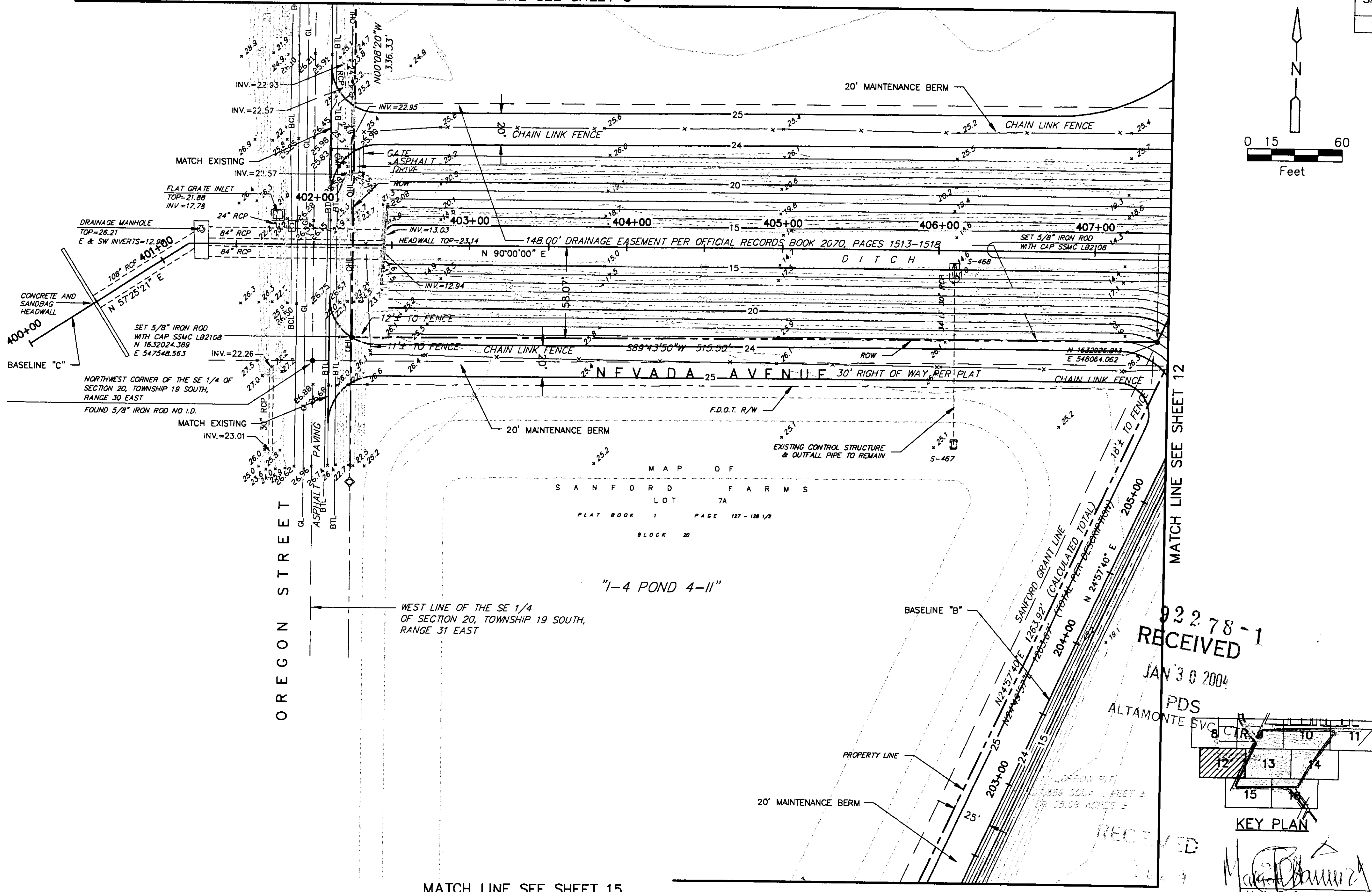
SEMINOLE COUNTY
FLORIDA

LOCKHART-SMITH REGIONAL
STORMWATER FACILITY

POND PLAN

P:\6118\38972\30p\genera\ cplan11 10/14/03 08:01:06 5:40:33 RussellR

SHEET No. 12



MATCH LINE SEE SHEET 8
MATCH LINE SEE SHEET 12
MATCH LINE SEE SHEET 15
N
0 15 60
Feet
20' MAINTENANCE BERM
CHAIN LINK FENCE
148.00' DRAINAGE EASEMENT PER OFFICIAL RECORDS BOOK 2070, PAGES 1513–1518
D I T C H
N 90°00'00" E
402+00
403+00
404+00
405+00
406+00
407+00
401+00
400+00
SET 5/8" IRON ROD WITH CAP SSMC LB2108
N 1632024.389
E 547548.563
BASELINE "C"
CONCRETE AND SANDBAG HEADWALL
N 57°25'21" E
108" RCP
DRAINAGE MANHOLE
TOP=26.21
E & SW INVERTS=12.90
FLAT GRATE INLET
TOP=21.88
INV.=17.78
24" RCP
84" RCP
MATCH EXISTING
INV.=22.93
INV.=22.57
INV.=22.95
INV.=13.03
HEADWALL TOP=23.14
INV.=12.94
INV.=22.26
INV.=23.01
GATE
ASPHALT DRIVE
N00°08'20"W
336.33'
12'± TO FENCE
11'± TO FENCE
58.07'
S89°43'50"W 515.50'
N E V A D A A V E N U E
30' RIGHT OF WAY PER PLAT
ROW
N 1632026.813
E 548064.062
F.D.O.T. R/W
EXISTING CONTROL STRUCTURE & OUTFALL PIPE TO REMAIN
S-468
S-467
NORTHWEST CORNER OF THE SE 1/4 OF SECTION 20, TOWNSHIP 19 SOUTH, RANGE 30 EAST
FOUND 5/8" IRON ROD NO I.D.
ASPHALT PAVING
O R E G O N S T R E E T
WEST LINE OF THE SE 1/4 OF SECTION 20, TOWNSHIP 19 SOUTH, RANGE 31 EAST
M A P O F
S A N F O R D F A R M S
LOT 7A
PLAT BOOK 1 PAGE 127 – 128 1/2
BLOCK 20
"I–4 POND 4–II"
BASELINE "B"
SANFORD GRANT LINE
1263.92' (CALCULATED TOTAL)
N24°57'40"E
N 24°57'40" E
18'± TO FENCE
203+00
204+00
205+00
25'
PROPERTY LINE
KEY PLAN
92278-1
RECEIVED
JAN 3 0 2004
PDS
ALTAMONTE SVC CTR

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: B. WILLIAMS
DRAWN BY: J. RUSSELL
SHEET CHK'D BY: J. WITTIG
CROSS CHK'D BY: B. WILLIAMS
APPROVED BY: M. CHAVEZ
DATE: JANUARY 2004

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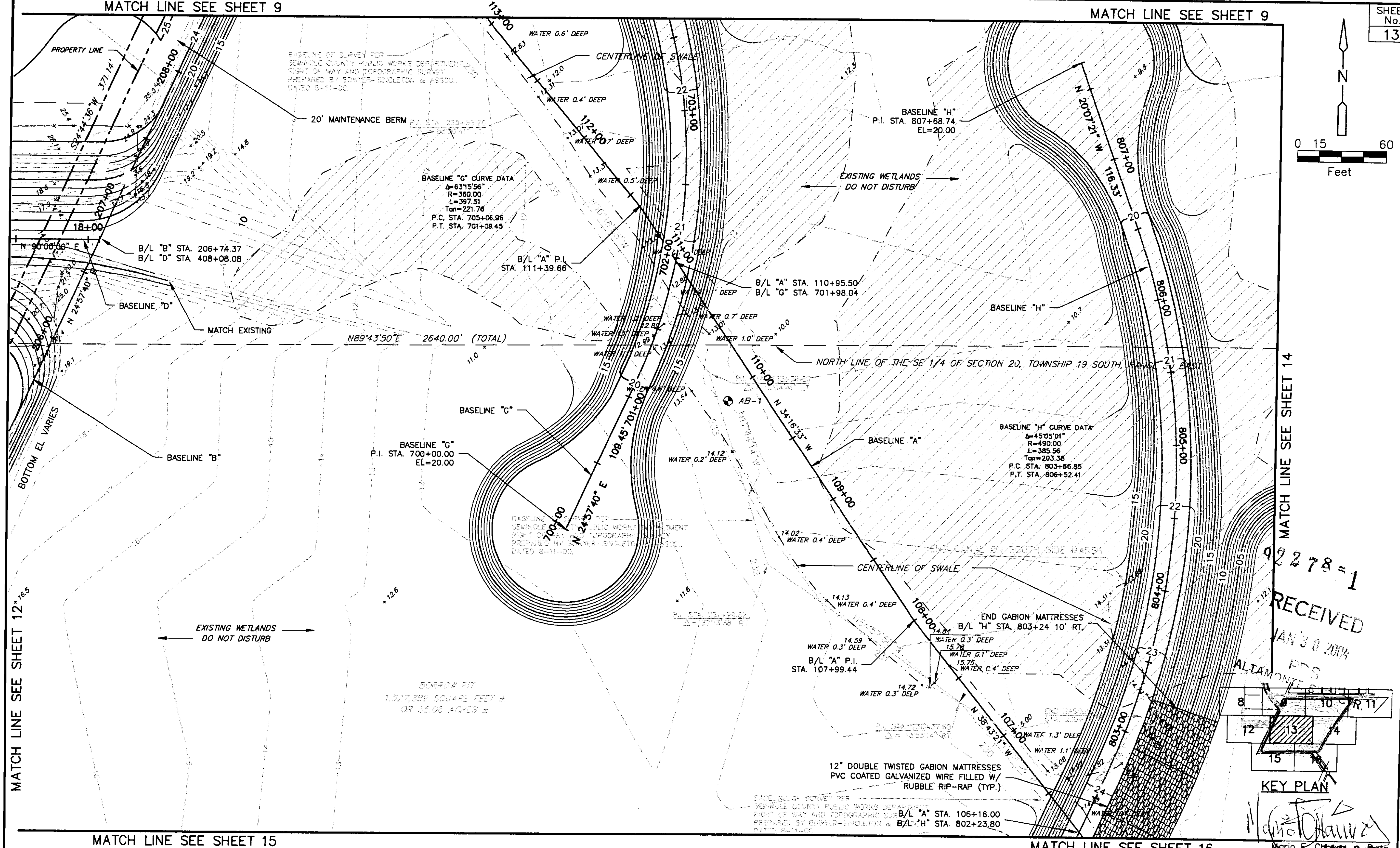
SEMINOLE COUNTY
FLORIDA

LOCKHART-SMITH REGIONAL STORMWATER FACILITY

POND PLAN

Mario F. Chavez Date
P.E. # 507 JAN 3 0 2004

PRELIMINARY
NOT FOR CONSTRUCTION



RECEIVED JAN 3 0 2004

Mario F. Chavez P.E. # 507.. Date JAN 3 0 2004

PRELIMINARY NOT FOR CONSTRUCTION

SHEET No. 13

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: B. WILLIAMS
DRAWN BY: J. RUSSELL
SHEET CHK'D BY: J. WITTIG
CROSS CHK'D BY: B. WILLIAMS
APPROVED BY: M. CHAVEZ
DATE: JANUARY 2004

CDM Camp Dresser & McKee Inc.
2301 Maitland Center Parkway
Suite 300
Maitland, Florida 32751
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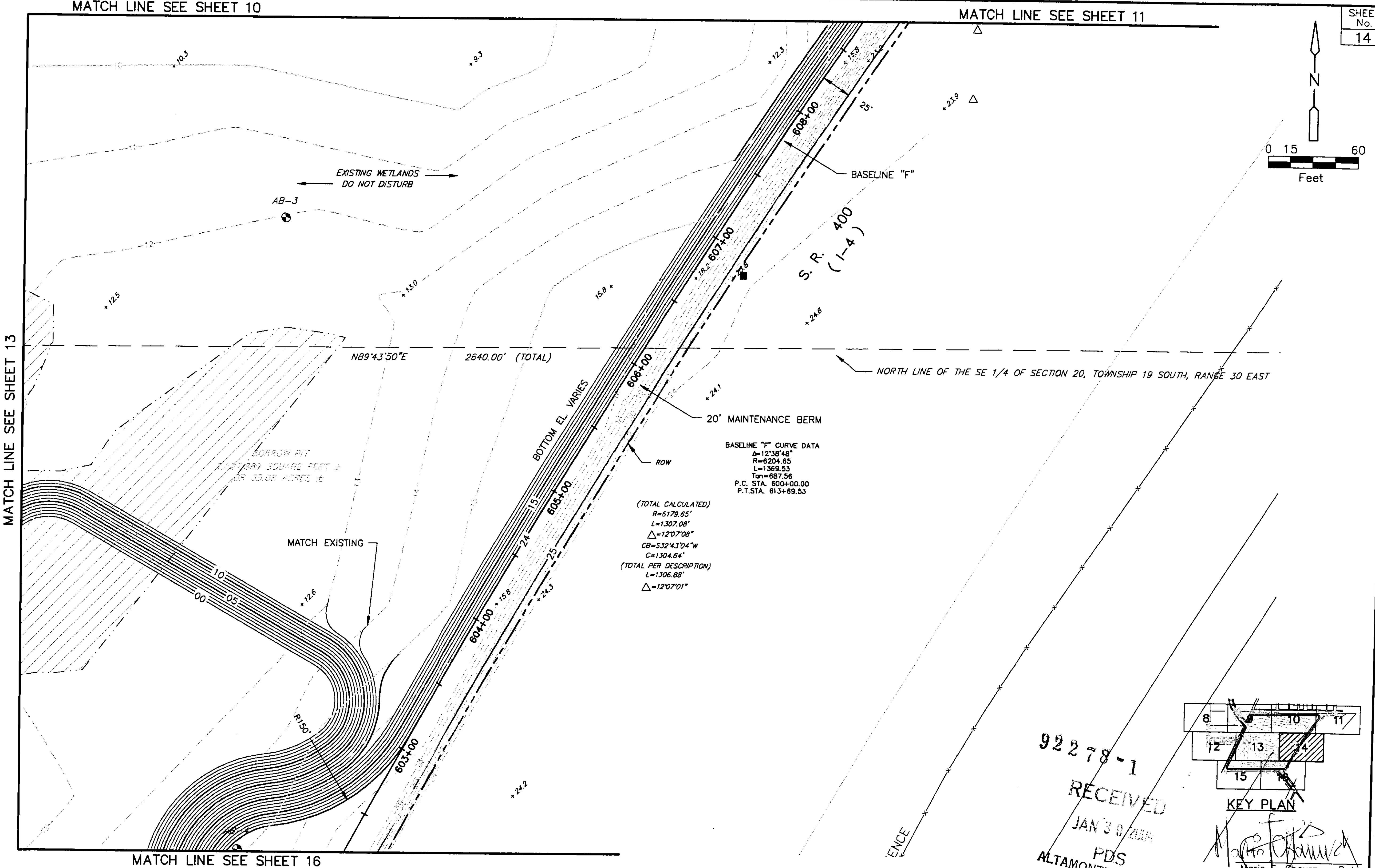
Fl COA No. EB 0000020

SEMINOLE COUNTY
FLORIDA

LOCKHART-SMITH REGIONAL STORMWATER FACILITY

POND PLAN

P:\6118\39972\30p\general\ cplan13 10/14/03 08:01:06 5:40:33 RussellJR



REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: B. WILLIAMS
DRAWN BY: J. RUSSELL
SHEET CHK'D BY: J. WITTIG
CROSS CHK'D BY: B. WILLIAMS
APPROVED BY: M. CHAVEZ
DATE: JANUARY 2004

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Fl COA No. EB-0000020

SEMINOLE COUNTY
FLORIDA

LOCKHART-SMITH REGIONAL STORMWATER FACILITY

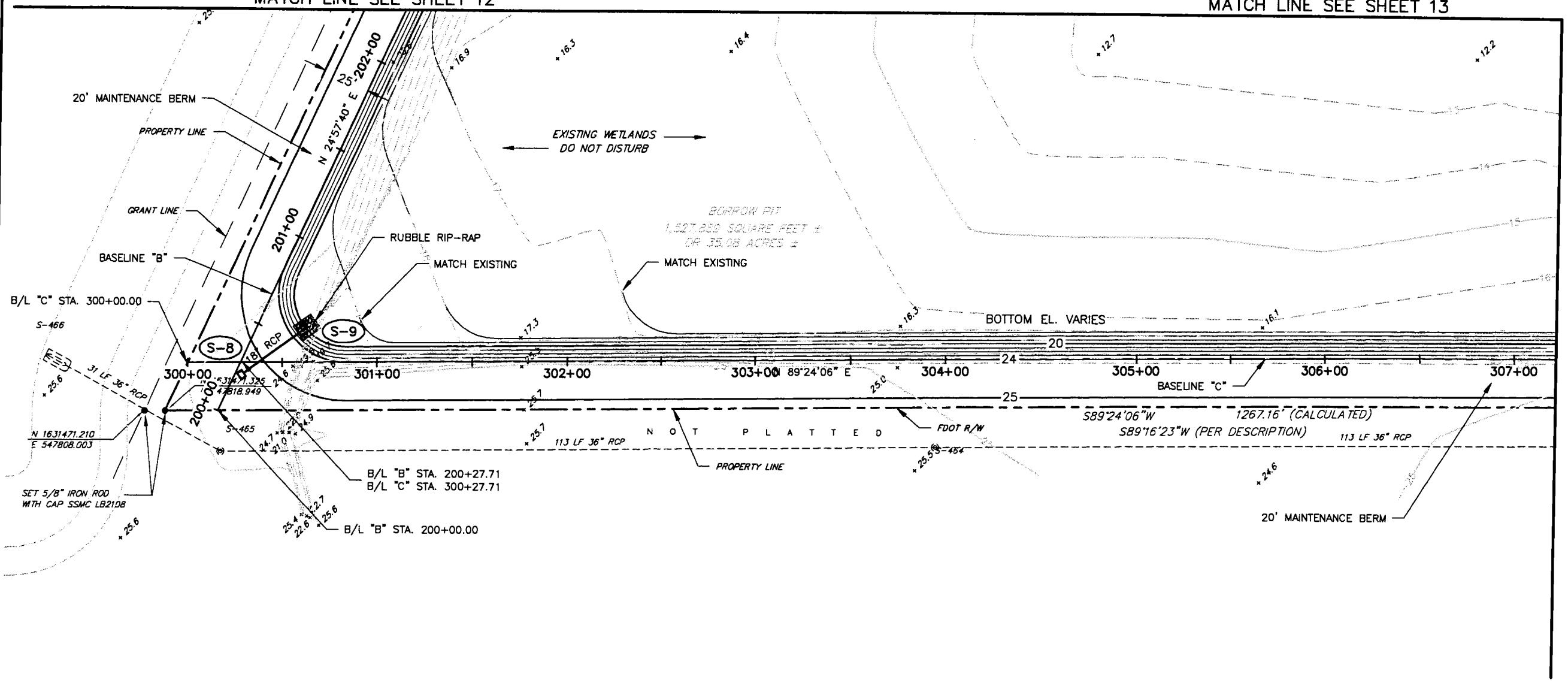
POND PLAN

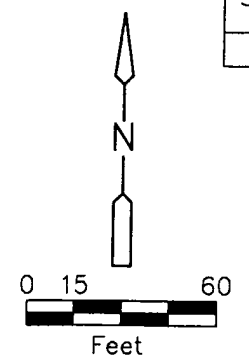
PRELIMINARY
NOT FOR CONSTRUCTION

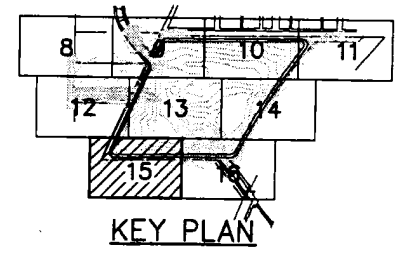
MATCH LINE SEE SHEET 12

MATCH LINE SEE SHEET 13

MATCH LINE SEE SHEET 15







KEY PLAN

92278-1

RECEIVED
JAN 30 2004
ALTAMONTE SVC. CTR.

Mario F. Chavez, P.E. # 50... Date JAN 30 2004

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: B. WILLIAMS
DRAWN BY: J. RUSSELL
SHEET CHK'D BY: J. WITTIG
CROSS CHK'D BY: B. WILLIAMS
APPROVED BY: M. CHAVEZ
DATE: JANUARY 2004

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Fax: 407 875-1161
FI COA No. EB-0000020

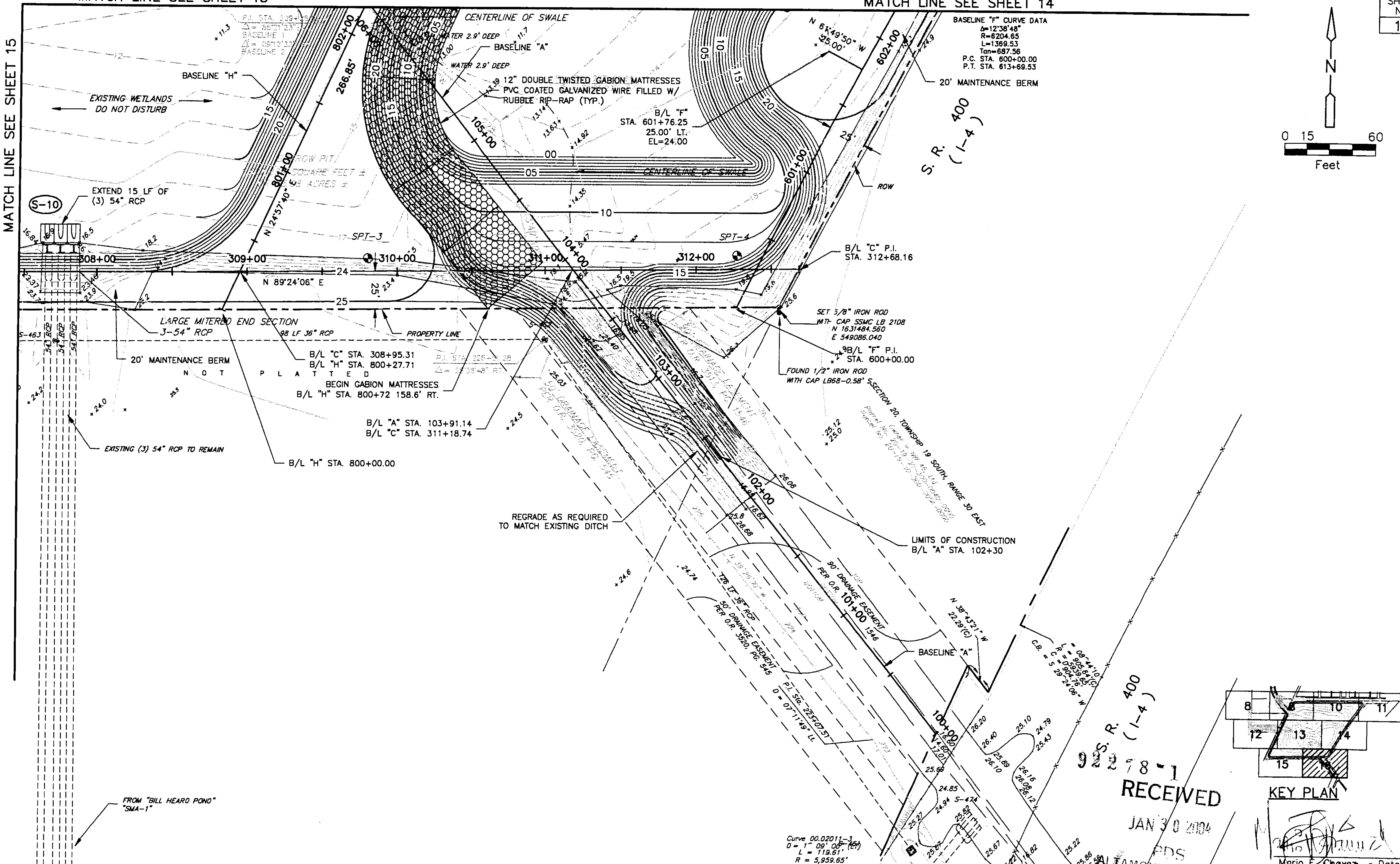
SEMINOLE COUNTY
FLORIDA

LOCKHART-SMITH REGIONAL
STORMWATER FACILITY

POND PLAN

PRELIMINARY
NOT FOR CONSTRUCTION

P:\1811R\39972\30p\general\ colon15 10/14/03 09:01:06 5.4D.33 RussellR



92278-1
RECEIVED
JAN 30 2004
PDS
ALTAMONTE SPG CTR.

Mario E. Chavez Date
P.E. # JAN 30 2004

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: B. WILLIAMS
DRAWN BY: J. RUSSELL
SHEET CHK'D BY: J. WITTIG
CROSS CHK'D BY: B. WILLIAMS
APPROVED BY: M. CHAVEZ
DATE: JANUARY 2004

CDM Camp Dresser & McKee Inc.
2301 Maitland Center Parkway
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SEMINOLE COUNTY
FLORIDA

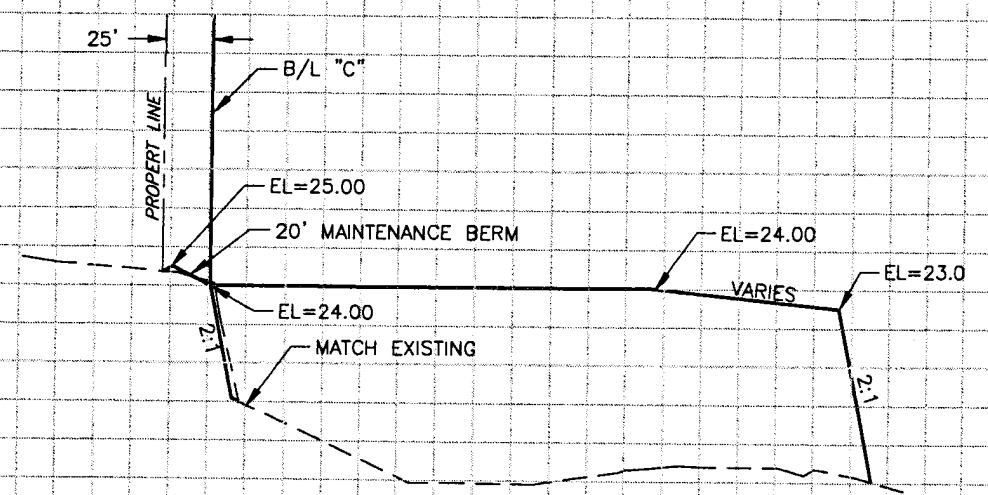
LOCKHART-SMITH REGIONAL STORMWATER FACILITY

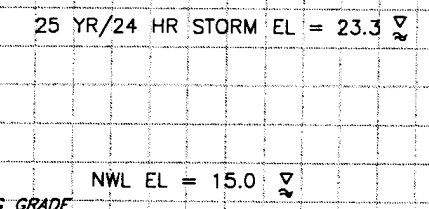
POND PLAN

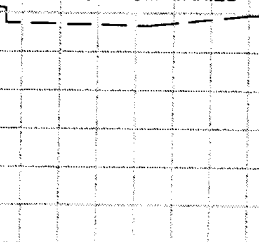
PRELIMINARY NOT FOR CONSTRUCTION

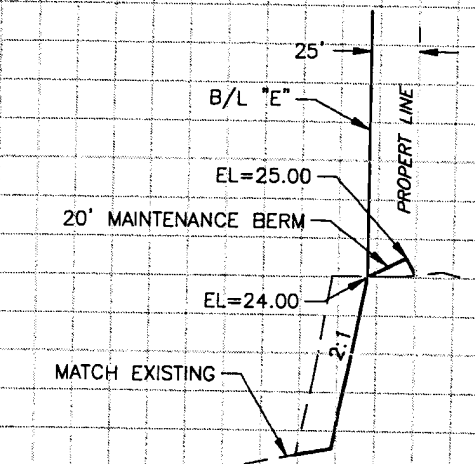
SHEET No. 16

P:\6118\39972\30p\general\ cplan16 10/14/03 08:01:06 5:40:33 RussellJR

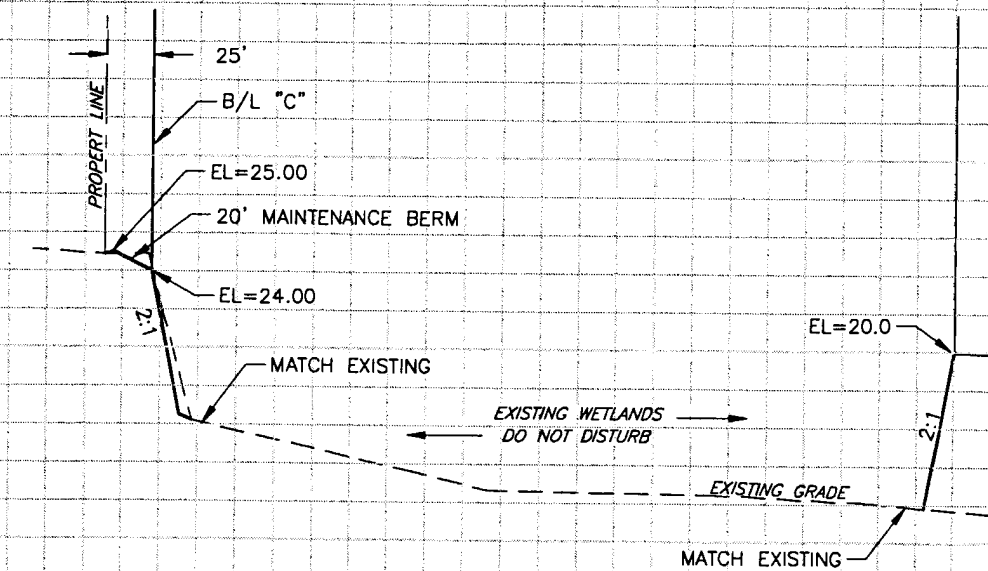


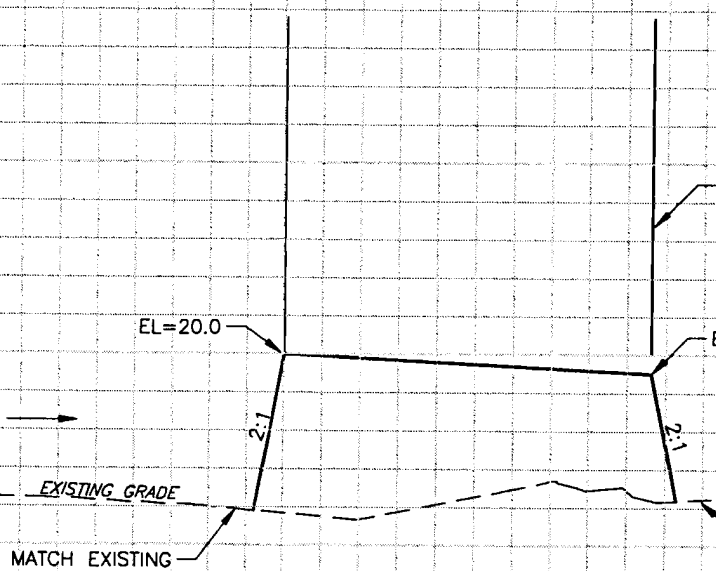


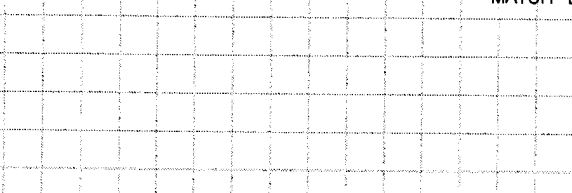


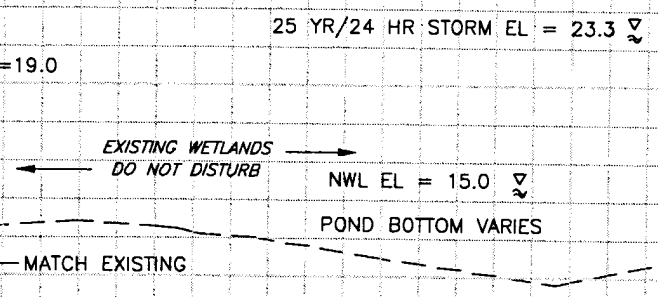


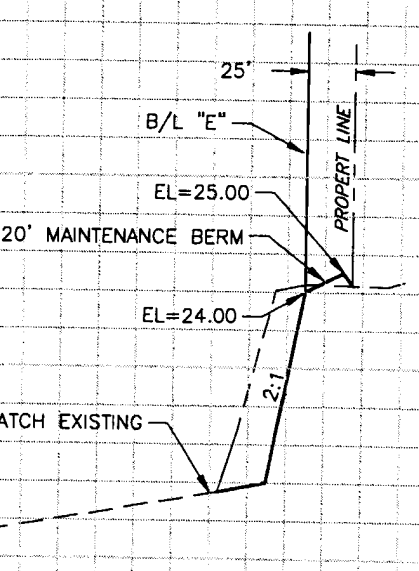
B/L "C" STA. 308+86
B/L "E" STA. 508+86











B/L "C" STA. 304+46
B/L "E" STA. 504+46

9227871

RECEIVED
JAN 30 2004
PDS
ALTAMONTE SVC. CTR.

SCALE: 1" = 100' HORIZ.
1" = 10' VERT.

Mario E. Chavez Date
P.E. # 50780 JAN 30 2004

PRELIMINARY NOT FOR CONSTRUCTION

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: B. WILLIAMS
DRAWN BY: J. RUSSELL
SHEET CHK'D BY: J. WITTIG
CROSS CHK'D BY: B. WILLIAMS
APPROVED BY: M. CHAVEZ
DATE: JANUARY 2004

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Fax: 407 875-1161
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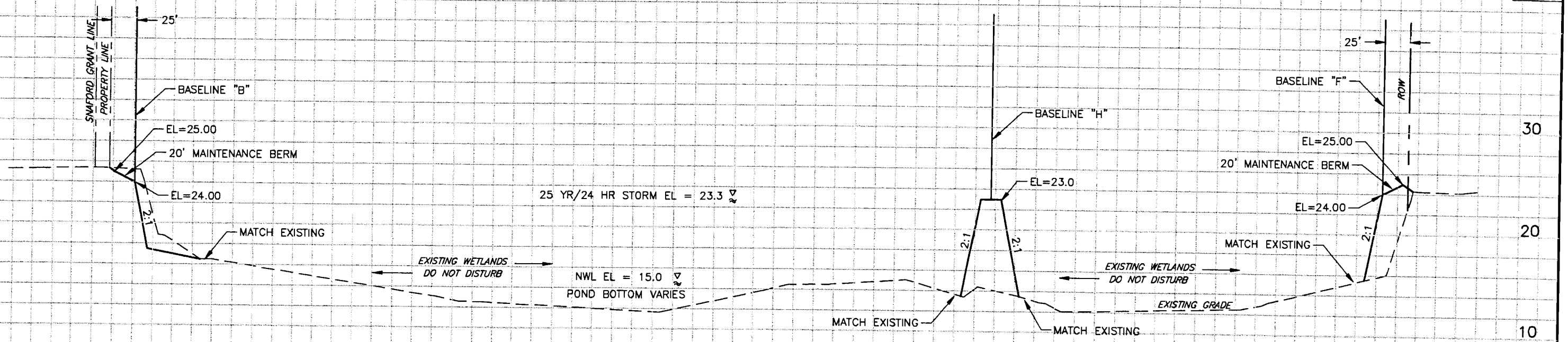
SEMINOLE COUNTY
FLORIDA

LOCKHART-SMITH REGIONAL
STORMWATER FACILITY

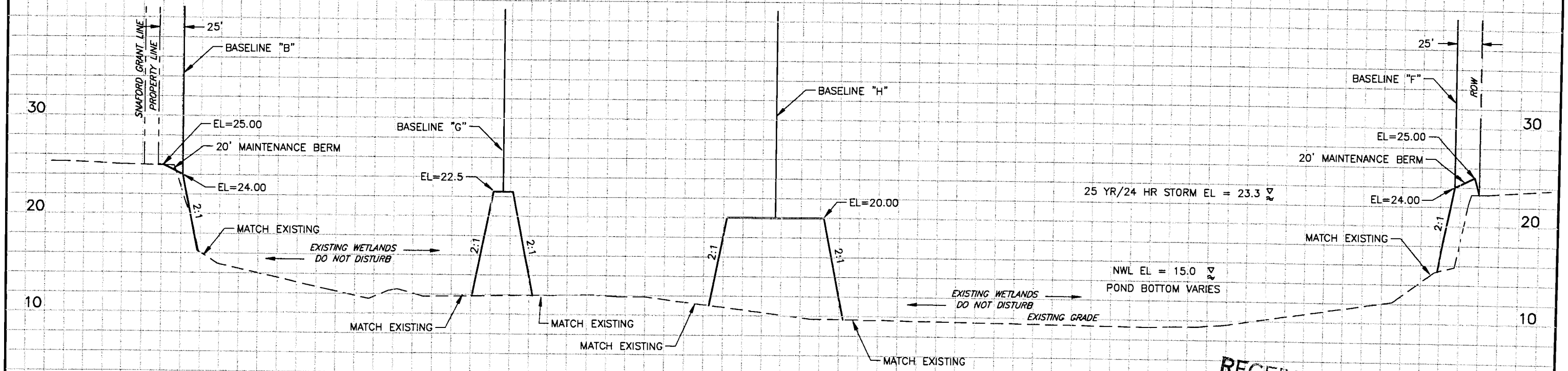
POND CROSS SECTIONS

P:\0118\39972\30p\civil\ RussellR 10/14/03 08:01:06 5:40:33 sht#17

SHEET No. 18



B/L "B" STA. 208+20
B/L "F" STA. 608+66



B/L "B" STA. 203+77
B/L "F" STA. 603+89

RECEIVED
JAN 30 2004
PDS
ALTAMONTE SVC. CTR.
92 22 75 - 1

SCALE: 1" = 100' HORIZ.
1" = 10' VERT.

Mario F. Chavez, P.E. # 50[illegible] Date JAN 30 2004

PRELIMINARY NOT FOR CONSTRUCTION

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: B. WILLIAMS
DRAWN BY: J. RUSSELL
SHEET CHK'D BY: J. WITTIG
CROSS CHK'D BY: B. WILLIAMS
APPROVED BY: M. CHAVEZ
DATE: JANUARY 2004

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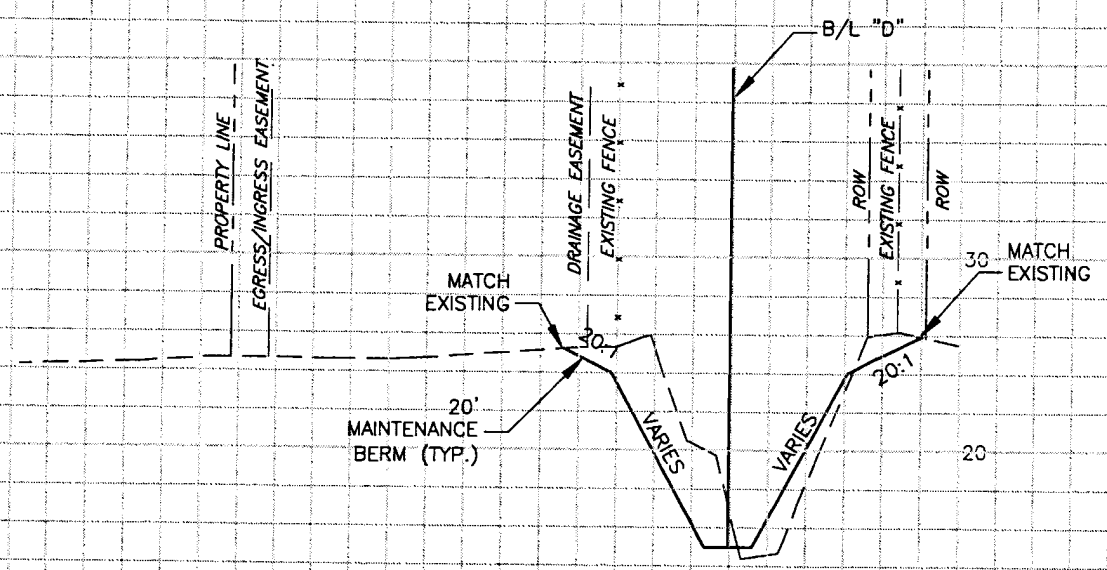
SEMINOLE COUNTY
FLORIDA

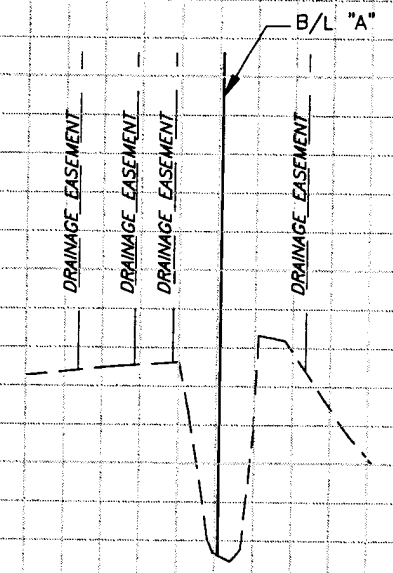
LOCKHART-SMITH REGIONAL
STORMWATER FACILITY

POND CROSS SECTIONS

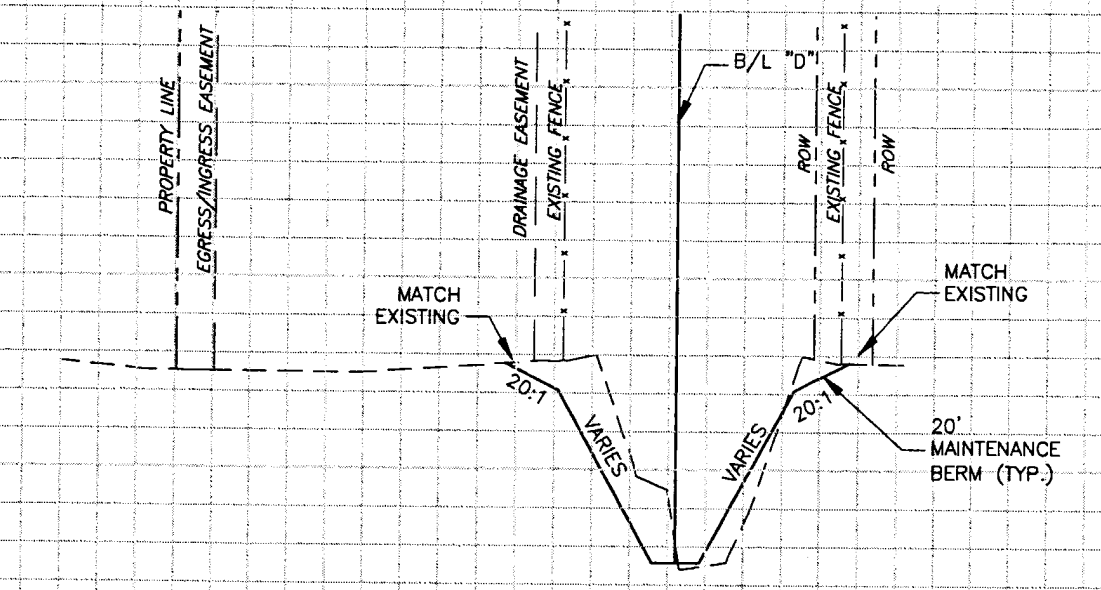
P:\6118\39972\30p\civil\ cpdss10 10/14/03 09:01:06 RussellR 5:40:33



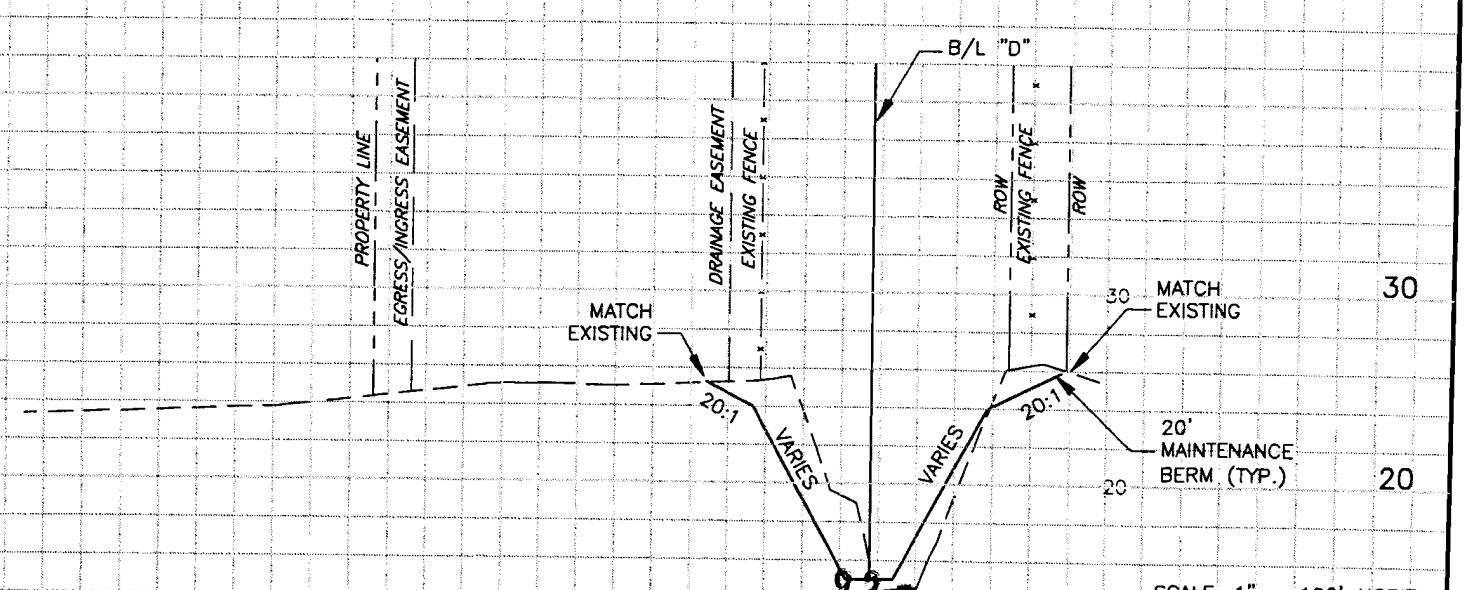
B/L "D" STA. 405+25



B/L 'A" STA. 103+04



B/L "D" STA. 403+75



B/L "C" STA. 16+75

SCALE: 1" = 100' HORIZ.
1" = 10' VERT.

92273-1

RECEIVED
JAN 30 2004
PDS
ALTAMONTE SVC. CTR.

Mario E. Flores Date
P.E. # 58[illegible] 1-30-2004

PRELIMINARY NOT FOR CONSTRUCTION

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: B. WILLIAMS
DRAWN BY: J. RUSSELL
SHEET CHK'D BY: J. WITTIG
CROSS CHK'D BY: B. WILLIAMS
APPROVED BY: M. CHAVEZ
DATE: JANUARY 2004

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SEMINOLE COUNTY
FLORIDA

LOCKHART-SMITH REGIONAL STORMWATER FACILITY

POND CROSS SECTIONS

F:\6116\39972\30s\civil\ RussellR 5-0:33 10/14/03 09:01:09 cpdx19

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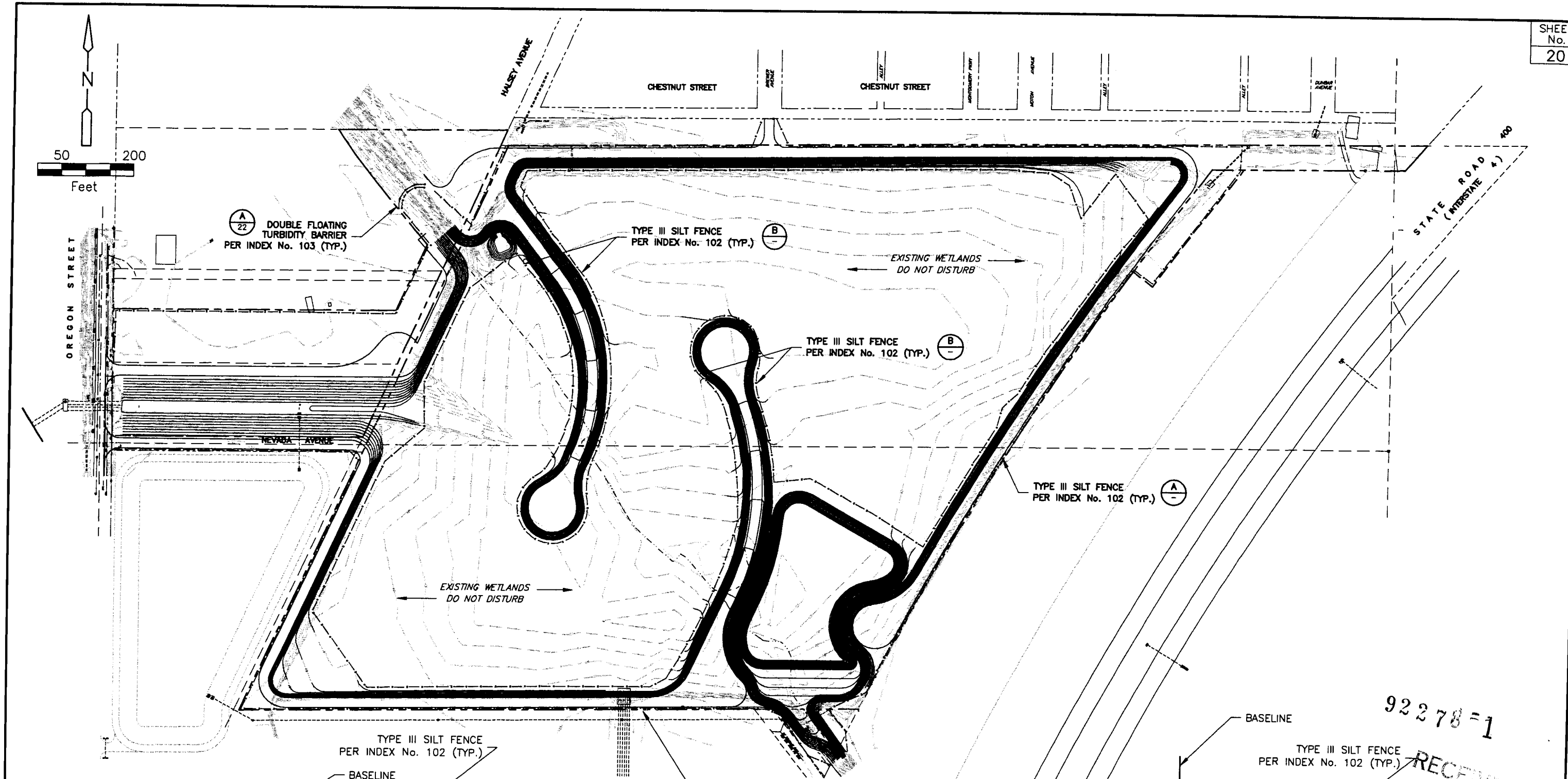
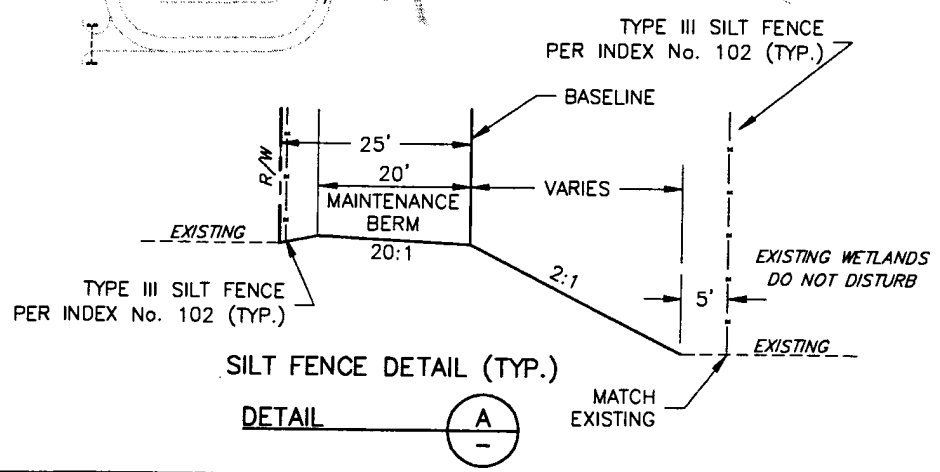
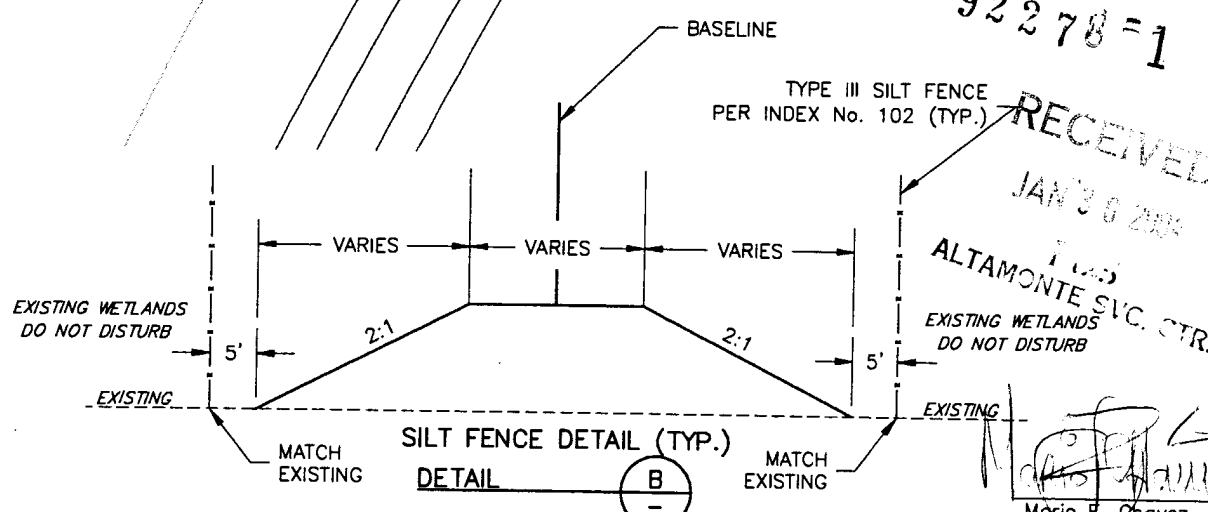




SILT FENCE DETAIL (TYP.)

DETAIL A/-



SILT FENCE DETAIL (TYP.)

DETAIL B/-

92278-1

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Mario P. Chavez, P.E. # 50[illegible] Date JAN 30 2004

PRELIMINARY NOT FOR CONSTRUCTION

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: B. WILLIAMS
DRAWN BY: J. RUSSELL
SHEET CHK'D BY: J. WITTIG
CROSS CHK'D BY: B. WILLIAMS
APPROVED BY: M. CHAVEZ
DATE: JANUARY 2004

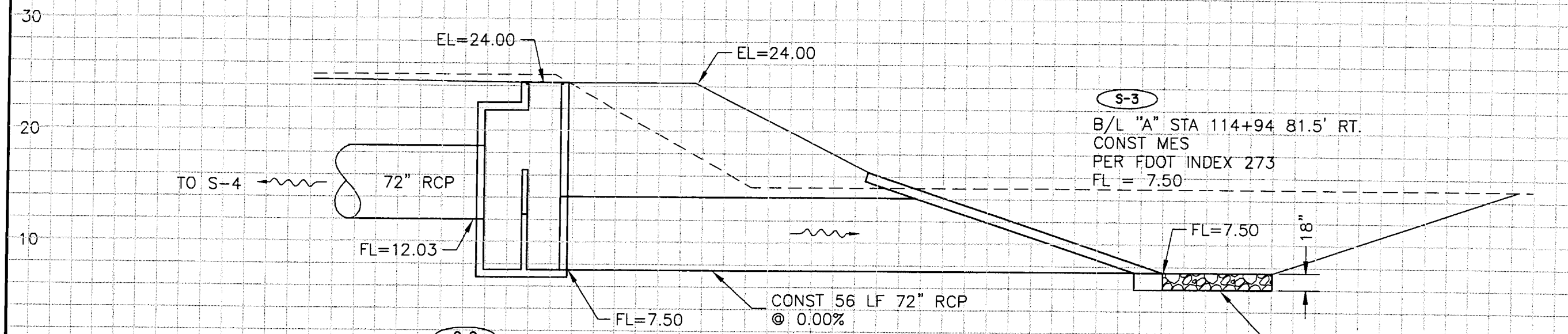
CDM Camp Dresser & McKee Inc.
2301 Maitland Center Parkway
Suite 300
Maitland, Florida 32751
Tel: 407 660-2552
Fax: 407 875-1161
FI COA No. EB-0000020

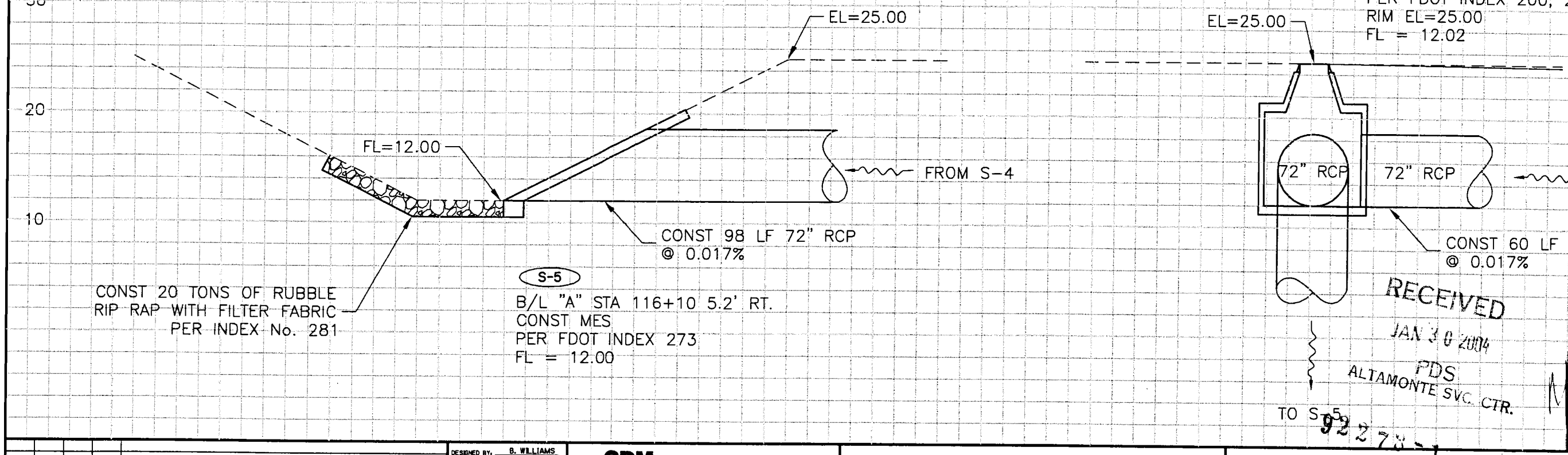
SEMINOLE COUNTY
FLORIDA

LOCKHART-SMITH REGIONAL STORMWATER FACILITY

EROSION CONTROL PLAN

P:\8118\39972\Dgn\general\ RussellR 5:40:33 10/14/03 08:01:06 gpmpDg20





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92273-1

SCALE: 1" = 10'
VERT & HORIZ

Mario F. Chavez, P.E. # 56 — Date JAN 30 2004

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REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: B. WILLIAMS
DRAWN BY: J. RUSSELL
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CROSS CHK'D BY: B. WILLIAMS
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DATE: JANUARY 2004

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SEMINOLE COUNTY
FLORIDA

LOCKHART-SMITH REGIONAL
STORMWATER FACILITY

DRAINAGE
STRUCTURES

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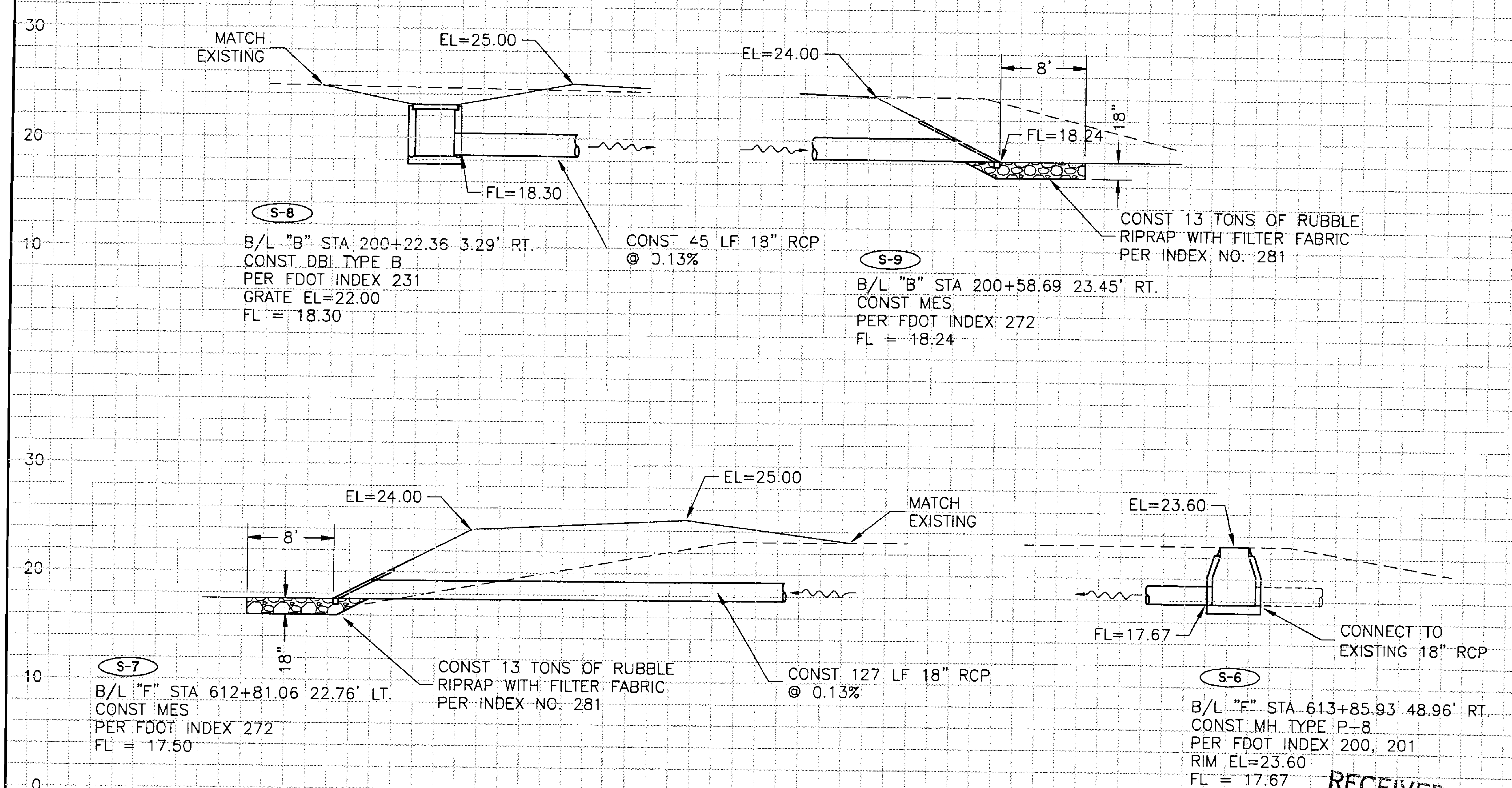
SHEET No. 22



SCALE: 1" = 10'
VERT & HORIZ

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ALTAMONTE SVC. CTR.

Mario P. Chavez P.E. # 50... JAN 3 0 2004 Date

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NOT FOR CONSTRUCTION

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REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: B. WILLIAMS
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DATE: JANUARY 2004

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SEMINOLE COUNTY
FLORIDA

LOCKHART-SMITH REGIONAL
STORMWATER FACILITY

DRAINAGE
STRUCTURES

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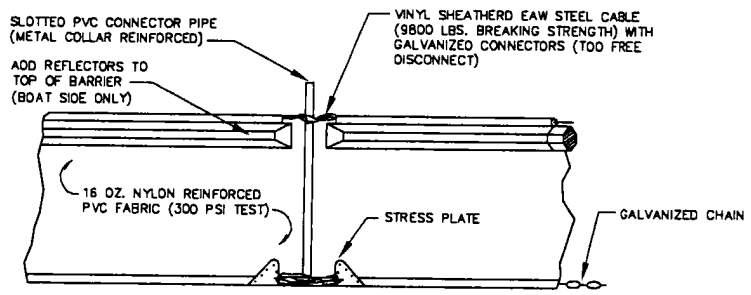
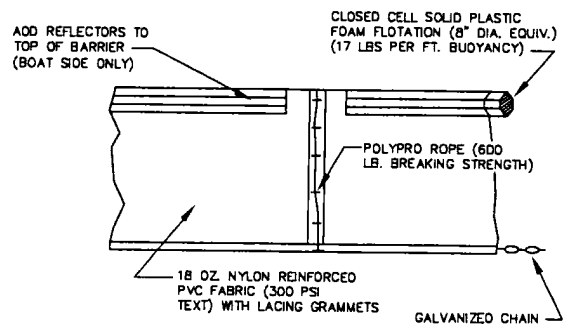
NOTES:
1. TURBIDITY BARRIERS ARE TO BE USED IN ALL PERMANENT BODIES OF WATER REGARDLESS OF DEPTH.
2. NUMBER AND SPACING OF ANCHORS DEPENDENT ON CURRENT VELOCITIES.
3. DEPLOYMENT OF BARRIER AROUND PILE LOCATIONS MAY VARY TO ACCOMODATE CONSTRUCTION OPERATIONS.
4. NAVIGATION MAY REQUIRE SEGMENTING BARRIER DURING CONSTRUCTION OPERATIONS.
5. THE ABOVE APPLICATIONS INDICATE TYPE I FLOATING TURBIDITY BARRIER SINCE ANCHORS ARE SHOWN, HOWEVER, IF CONDITIONS WARRANT, TYPE II FLOATING TURBIDITY BARRIER MAY BE USED.
6. USE REO REFLECTIVE TAPE ON FLOATING BARRIERS ONLY.



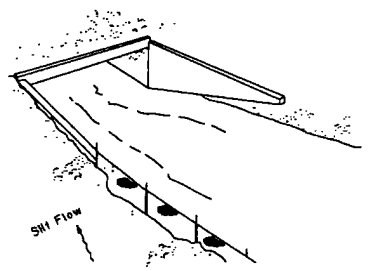
TYPE I



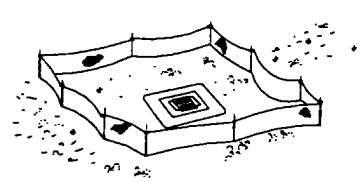
TYPE II
(F.D.O.T. INDEX No. 103)

FLOATING TURBIDITY BARRIER

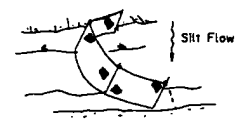
DETAIL A
NTS



Type III Silt Fence



Type III Silt Fence Protection Around Ditch Bottom Inlets.

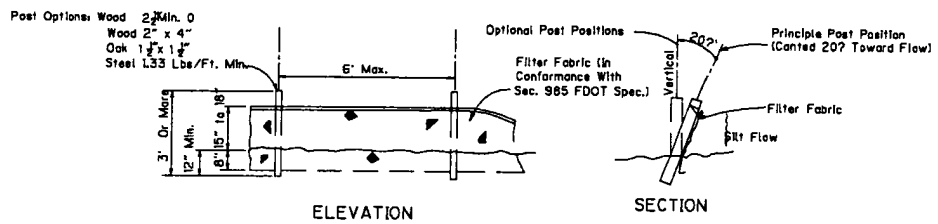


Note: Spacing for Type --- Fence to be in accordance with Chart -, Sheet 1 of 3 and ditch installations at drainage structures Sheet 2 of 3.

Type III Silt Fence

Do not deploy in a manner that silt fences will act as a dam across permanent flowing watercourses. Silt fences are to be used at upland locations and turbidity barriers used at permanent bodies of water.

SILT FENCE APPLICATIONS



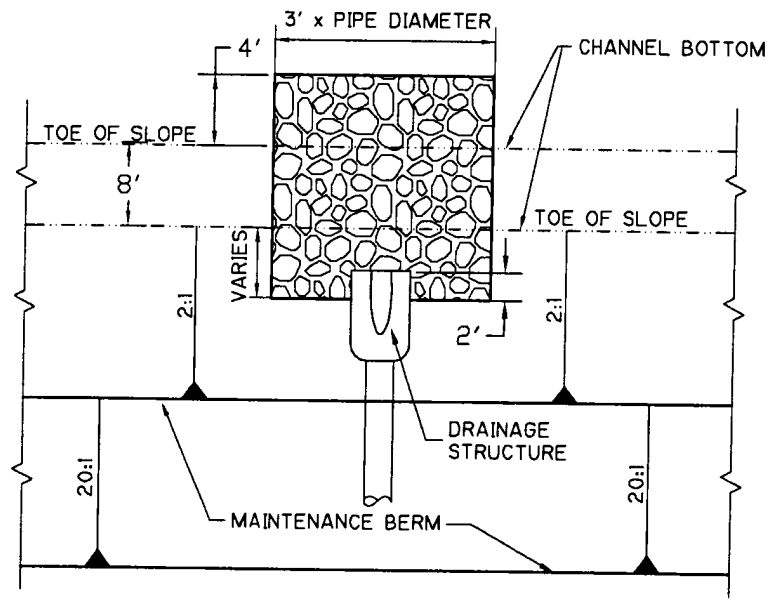
ELEVATION SECTION

Note: Silt Fence to be paid for under the contract unit price for Staked Silt Fence (LF).

TYPE III SILT FENCE
(F.D.O.T. INDEX No. 102)

SILT FENCE DETAIL

DETAIL C
NTS



OUTLET PROTECTION DETAIL

DETAIL B
NTS

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Mario F. Chavez, P.E. # 56[illegible] Date JAN 30 2004

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REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: B. WILLIAMS
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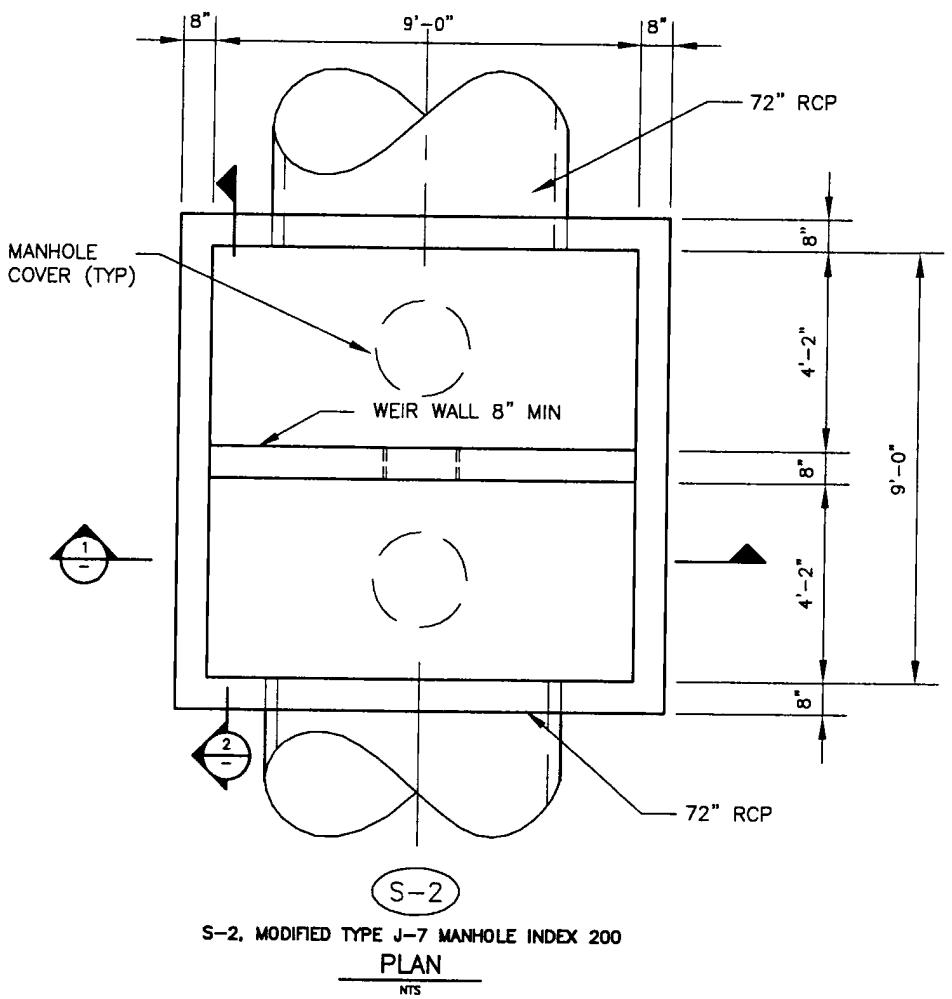
SEMINOLE COUNTY
FLORIDA

LOCKHART-SMITH REGIONAL STORMWATER FACILITY

EROSION CONTROL DETAILS

P:\0118\38972\30y\general\ model23 10/14/03 08:01:06 5:40:33 RussellR

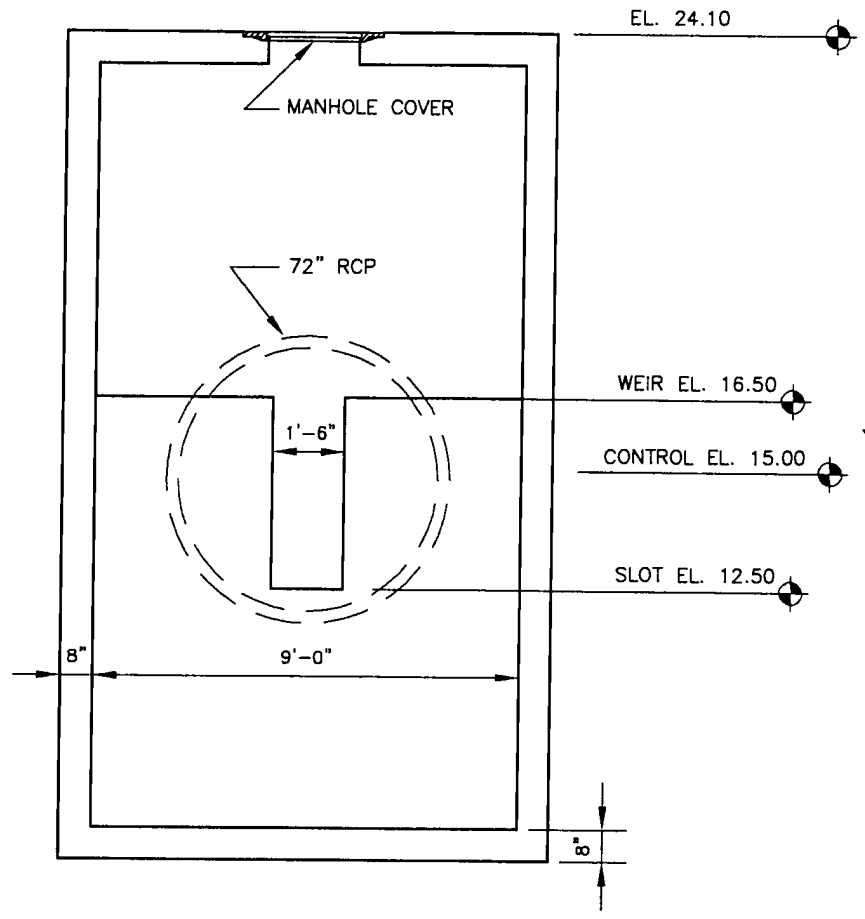


S-2

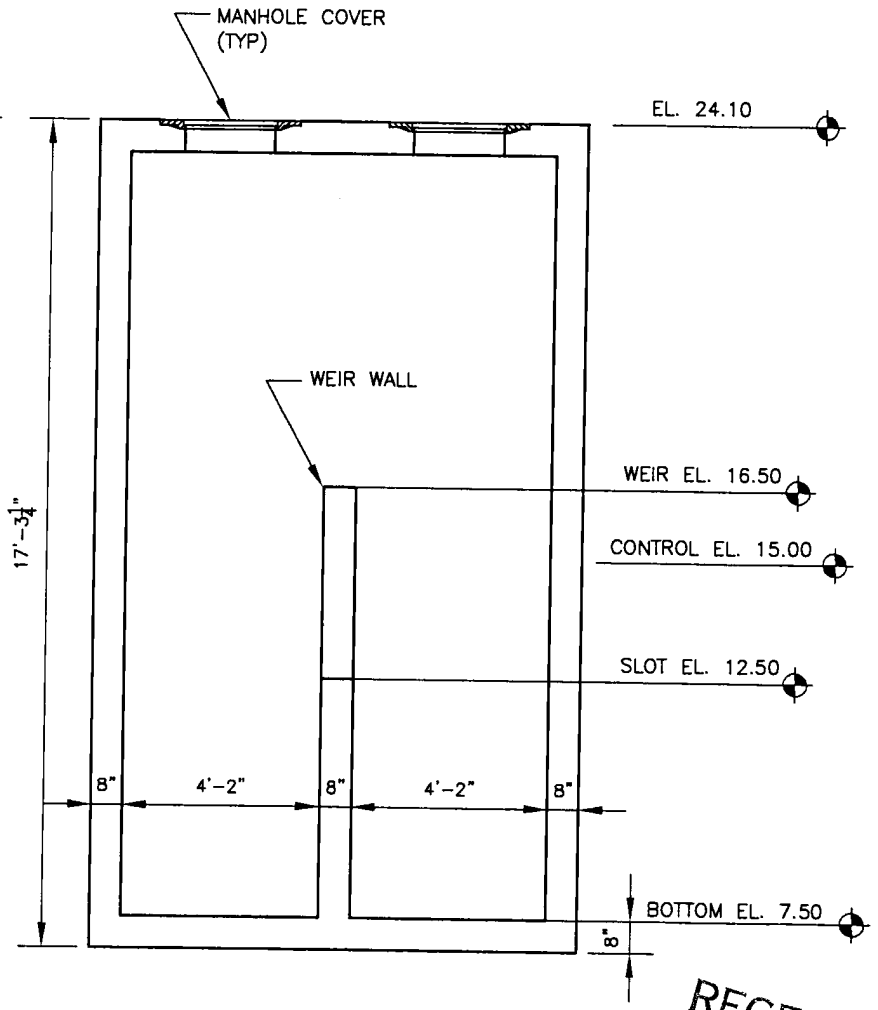
S-2, MODIFIED TYPE J-7 MANHOLE INDEX 200

PLAN

NTS



SECTION 1 / - NTS



SECTION 2 / - NTS

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Mario F. Chavez, P.E. # 50[illegible] Date JAN 30 2004

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REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: B. WILLIAMS
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SHEET CHK'D BY: J. WITTIG
CROSS CHK'D BY: B. WILLIAMS
APPROVED BY: M. CHAVEZ
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SEMINOLE COUNTY
FLORIDA

LOCKHART-SMITH REGIONAL STORMWATER FACILITY

DRAINAGE DETAILS

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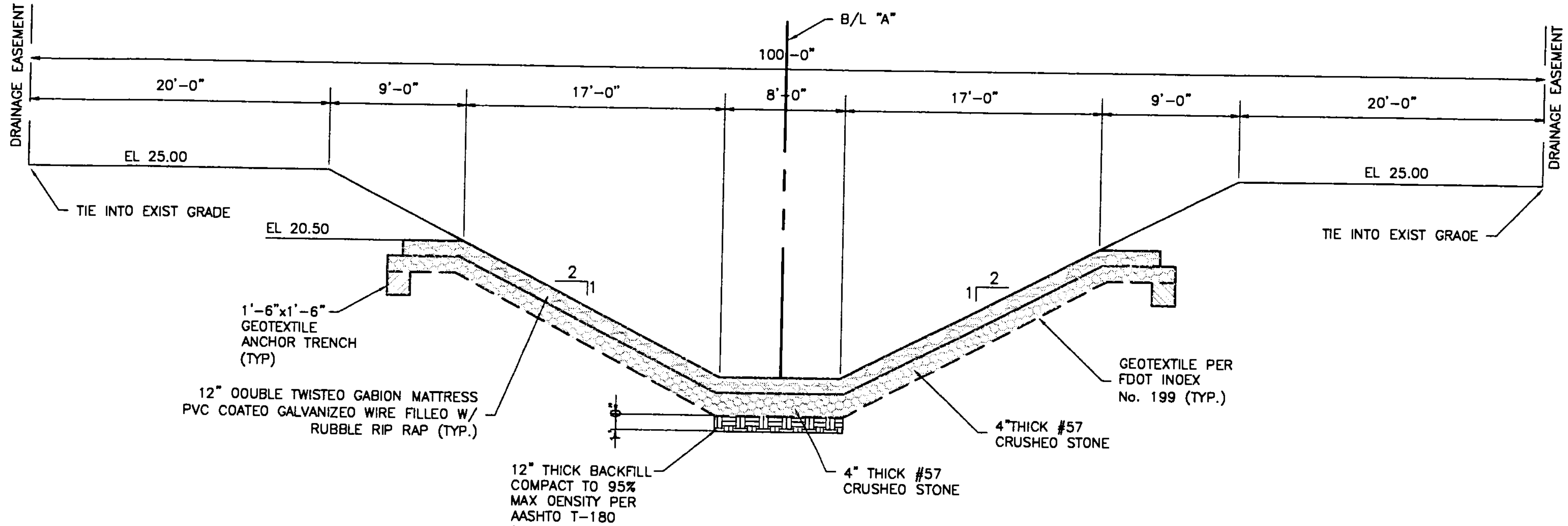
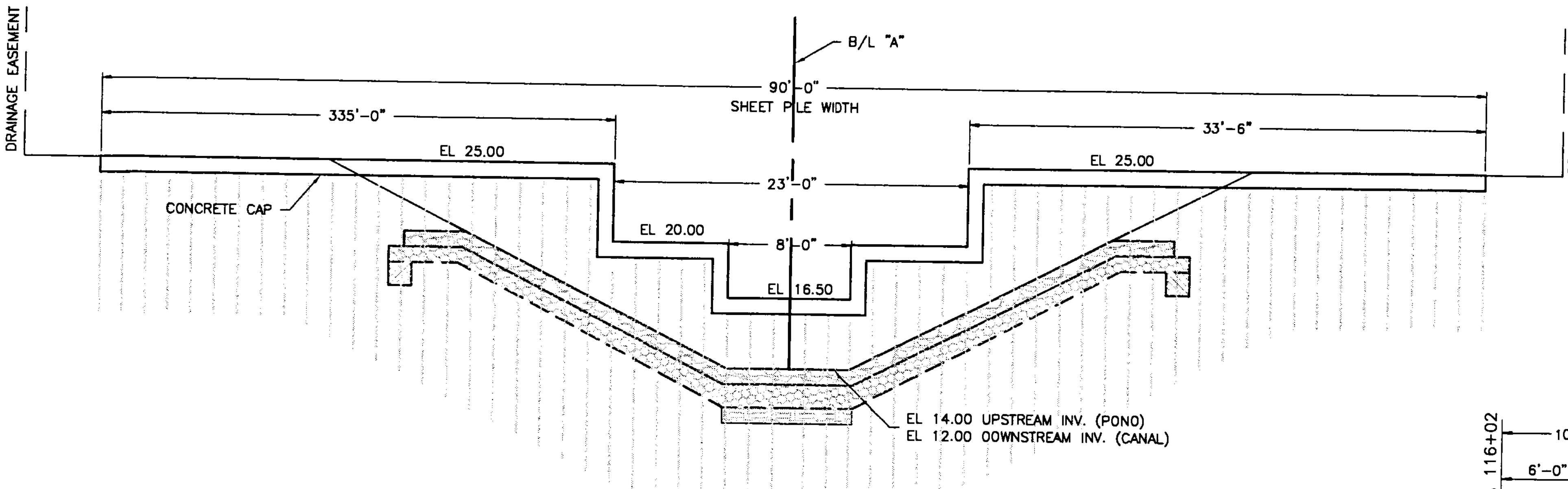
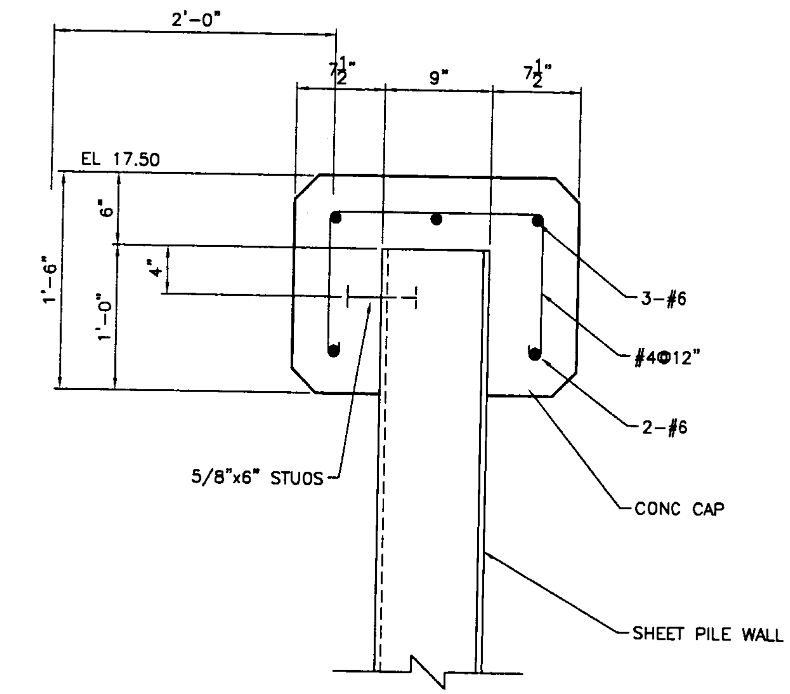


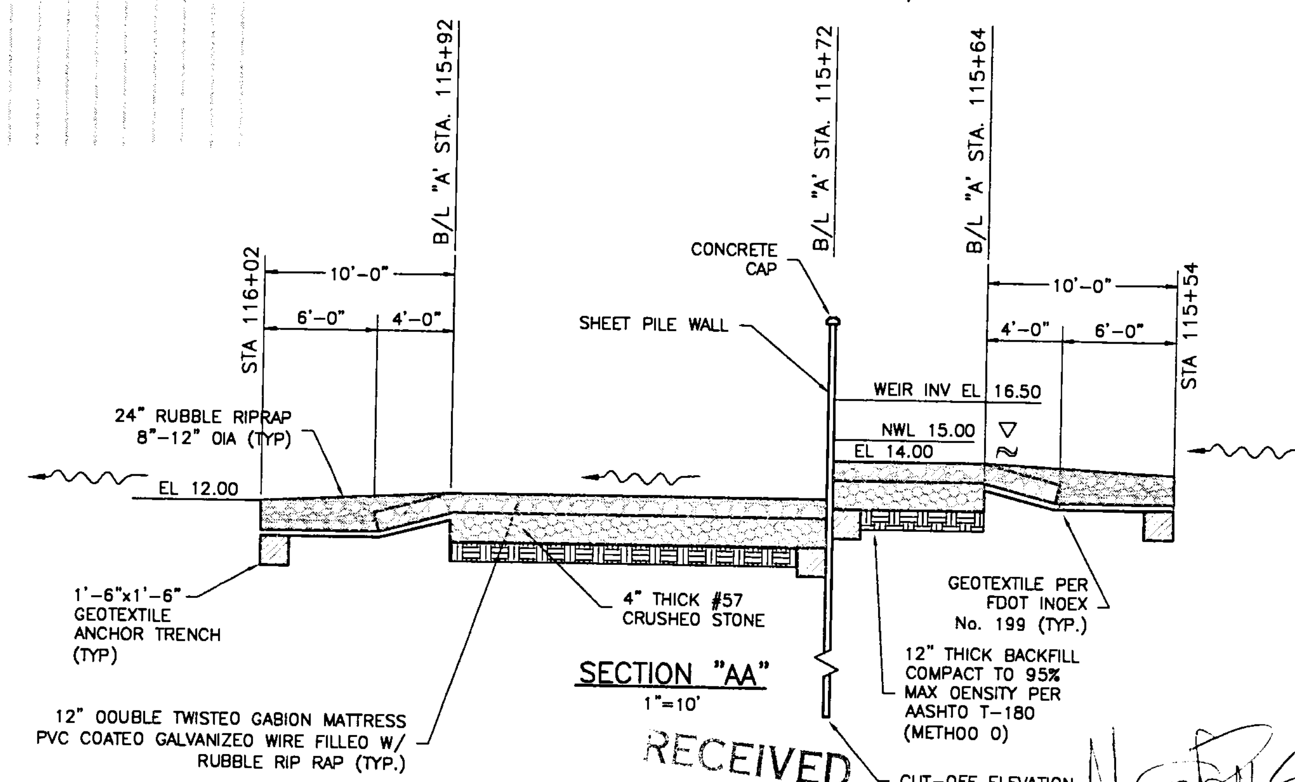
SHEET PILE WEIR
1"=10'



S-1
SHEET PILE WEIR
1"=10'



SHEET PILE WALL CAP DETAIL
3/4" = 1'



SECTION "AA"
1"=10'

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ALTAMONTE SVC. CTR.
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Mario E. Chavez, P.E. # 507[illegible] Date JAN 3 0 2004

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REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: B. WILLIAMS
DRAWN BY: J. RUSSELL
SHEET CHK'D BY: J. WITTIG
CROSS CHK'D BY: B. WILLIAMS
APPROVED BY: M. CHAVEZ
DATE: JANUARY 2004

CDM Camp Dresser & McKee Inc.
2301 Maitland Center Parkway
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Tel: 407 660-2552
Fax: 407 875-1161
Fl COA No. EB-0000020

SEMINOLE COUNTY
FLORIDA

LOCKHART-SMITH REGIONAL STORMWATER FACILITY

DRAINAGE DETAILS

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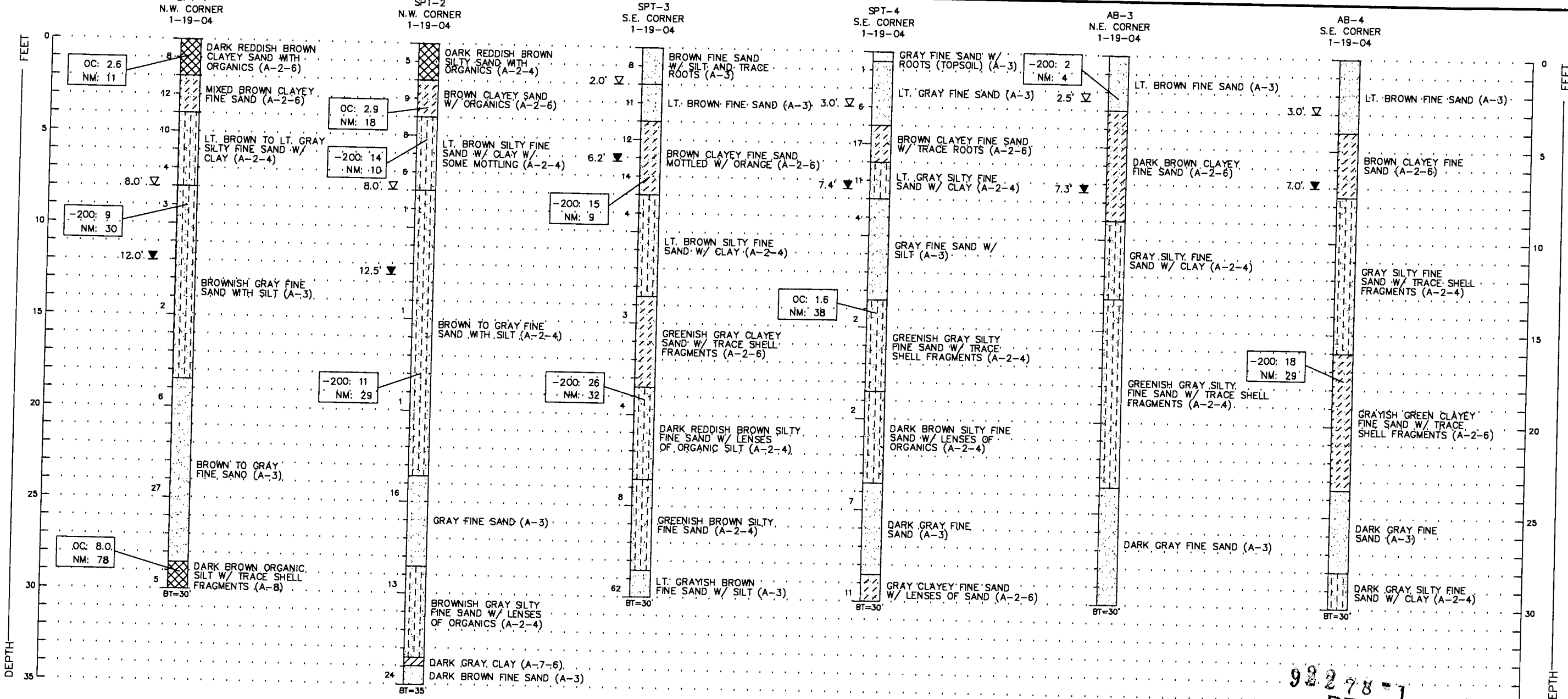

LEGEND

- FINE SAND TO FINE SAND WITH SILT (A-3)
- SILTY SAND TO SILTY SAND W/ CLAY (A-2-4)
- ORGANIC MUCK TO SANDY PEAT (A-8)
- CLAY (A-7-6)
- CLAYEY FINE SAND (A-2-6)

STANDARD PENETRATION TEST DATA:
SPOON I.D.= 1.5"
SPOON O.D.= 2.0"
HAMMER DROP= 30"
HAMMER WEIGHT= 140 lbs.
HAMMER TYPE: SAFETY
DRILL RIG: MUD BUG

ENGINEERING CLASSIFICATION

I COHESIONLESS SOILS

DESCRIPTION	BLOW COUNT "N"
VERY LOOSE	0 TO 4
LOOSE	4 TO 10
MEDIUM DENSE	10 TO 30
DENSE	30 TO 50
VERY DENSE	>50

II COHESIVE SOILS

DESCRIPTION	UNCONFINED COMPRESSIVE STRENGTH, QU, TSF	BLOW COUNT "N"
VERY SOFT	<1/4	0 TO 2
SOFT	1/4 to 1/2	2 TO 4
FIRM	1/2 to 1	4 TO 8
STIFF	1 to 2	8 TO 15
VERY STIFF	2 to 4	15 TO 30
HARD	>4	>30

ENGINEER OF RECORD:
BRENDAN S. O'BRIEN, P.E.
FL/REG. NO. 52047
GEOTECHNICAL PROFESSIONAL ASSOC., INC.
5780 HOFFNER AVENUE, SUITE 403
ORLANDO, FL 32822

GPA

N	STANDARD PENETRATION TEST (SPT) N-VALUE (BLOWS PER FOOT)
B.T.	BORING TERMINATION DEPTH IN FEET
▼	GROUNDWATER LEVEL MEASURED ON DATE DRILLED
▽	ESTIMATED HIGH SEASON GROUNDWATER TABLE
-200	PERCENT FINES (PERCENT PASSING NO. 200 SIEVE)
NM	NATURAL MOISTURE CONTENT (IN PERCENT)
OC	ORGANIC CONTENT (IN PERCENT)
(A-3), (A-2-4) (A-2-6), (A-8) (A-7-6)	AASHTO SOIL CLASSIFICATION SYSTEM

WHILE THE BORINGS ARE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT THEIR RESPECTIVE LOCATIONS AND FOR THEIR RESPECTIVE VERTICAL REACHES, LOCAL VARIATIONS CHARACTERISTIC OF THE SUBSURFACE MATERIALS OF THE REGION ARE ANTICIPATED AND MAY BE ENCOUNTERED. THE BORING LOGS AND RELATED INFORMATION ARE BASED ON THE DRILLER'S LOGS AND VISUAL EXAMINATION OF SELECTED SAMPLES IN THE LABORATORY. THE DELINEATION BETWEEN SOIL TYPES SHOWN ON THE LOGS IS APPROXIMATE AND THE DESCRIPTION REPRESENTS OUR INTERPRETATION OF SUBSURFACE CONDITIONS AT THE DESIGNATED BORING LOCATIONS ON THE PARTICULAR DATE DRILLED. SUBSURFACE VARIATIONS BETWEEN BORINGS SHOULD BE ANTICIPATED AS INDICATED IN SECTION 2-4 OF THE STANDARD SPECIFICATIONS.

GROUNDWATER ELEVATIONS SHOWN ON THE BORING LOGS REPRESENT GROUNDWATER SURFACES ENCOUNTERED ON THE DATES SHOWN. FLUCTUATIONS IN WATER TABLE LEVELS SHOULD BE ANTICIPATED THROUGHOUT THE YEAR.

SPT AND AUGER BORING PROFILES

92278-1
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JAN 30 2004
PDS
ALTAMONTE SPRINGS

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY:
DRAWN BY:
SHEET CHK'D BY:
CROSS CHK'D BY:
APPROVED BY:
DATE: JANUARY 2004

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FLORIDA

LOCKHART-SMITH REGIONAL STORMWATER FACILITY

SPT AND AUGER BORING PROFILE

PRELIMINARY NOT FOR CONSTRUCTION

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APPENDIX B

FIELD MEASUREMENTS COLLECTED AT THE LOCKHART-SMITH RSF SITE FROM APRIL 2010-MARCH 2012

Field Measurements Collected at the Lockhart-Smith Site from April 2010 - April 2012

	Date	Time	Temp	pH	SpCond	Diss. O_2		ORP
	MMDDYY	HHMMSS	(°C)	(s.u.)	(µmho/cm)	(mg/l)	(% Sat.)	(mV)
Site 1	4/20/10	7:21	24.27	8.18	450	6.3	75	552
Site 1	4/28/10	6:27	24.30	7.47	438	6.1	73	84
Site 1	5/5/10	5:59	28.90	7.19	456	5.4	70	215
Site 1	5/13/10	6:46	27.72	6.99	483	3.2	41	421
Site 1	5/18/10	7:08	26.82	7.27	445	4.4	55	142
Site 1	5/25/10	6:48	28.24	7.09	459	4.2	54	152
Site 1	7/8/10	9:40	28.80	7.44	321	6.1	79	134
Site 1	7/14/10	8:29	30.64	7.48	330	6.0	80	112
Site 1	7/21/10	8:20	27.74	7.51	349	4.0	51	145
Site 1	7/28/10	10:34	32.68	7.31	366	4.2	58	211
Site 1	8/2/10	9:03	30.38	7.16	374	5.2	70	373
Site 1	8/11/10	9:02	28.46	7.17	321	4.1	53	102
Site 1	8/17/10	8:43	30.70	7.27	324	5.8	78	129
Site 1	8/25/10	0:00	28.16	7.21	120	5.9	76	202
Site 1	9/2/10	0:00	26.69	7.33	138	6.8	85	237
Site 1	9/9/10	0:00	27.49	7.13	330	6.3	80	290
Site 1	9/16/10	0:00	27.47	7.25	130	6.9	87	251
Site 1	9/23/10	0:00	27.66	7.31	139	6.8	86	247
Site 1	11/3/10	10:12	24.06	7.45	408	6.7	80	389
Site 1	11/11/10	10:25	21.29	7.44	406	8.4	95	443
Site 1	11/19/10	11:58	20.89	7.13	416	8.3	93	404
Site 1	12/3/10	9:54	16.62	7.29	441	4.8	50	365
Site 1	12/9/10	10:29	13.31	7.07	471	5.9	56	412
Site 1	12/15/10	12:34	12.08	7.05	480	7.5	70	391
Site 1	12/23/10	11:52	14.89	7.26	462	8.8	88	448
Site 1	1/4/11	11:05	16.74	7.28	489	9.3	95	445
Site 1	1/10/11	10:30	15.76	7.44	458	9.2	93	818
Site 1	1/19/11	12:11	17.60	7.58	440	9.2	96	464
Site 1	2/1/11	11:46	17.43	7.53	428	9.1	95	474
Site 1	2/24/11	10:06	19.66	7.10	469	7.8	86	459
Site 1	3/2/11	10:33	21.51	7.66	458	8.8	100	451
Site 1	3/8/11	0:00	16.93	7.88	249	10.1	105	215
Site 1	3/18/11	8:48	17.85	7.54	482	8.7	92	459
Site 1	4/4/11	9:27	22.31	7.23	382	7.3	84	471
Site 1	4/11/11	9:17	26.72	7.29	366	6.4	80	472
Site 1	7/14/11	10:29	30.80	8.04	469	6.3	84	272
Site 1	7/18/11	9:54	29.19	7.52	476	6.1	80	396
Site 1	8/5/11	11:19	32.99	8.02	470	6.1	85	272
Site 1	8/12/11	10:27	30.55	7.45	423	5.4	72	287
Site 1	8/17/11	8:54	30.89	7.56	405	6.0	80	246
Site 1	8/29/11	10:28	29.98	7.29	423	3.4	45	281
Site 1	9/9/11	8:22	27.82	7.40	457	5.3	67	454
Site 1	9/23/11	0:00	27.14	7.51	443	6.5	82	214
Site 1	10/4/11	0:00	25.08	7.24	425	5.9	72	197
Site 1	10/11/11	0:00	25.79	7.31	346	6.8	84	148

Field Measurements Collected at the Lockhart-Smith Site from April 2010 - April 2012

	Date	Time	Temp	pH	SpCond	Diss. O_2		ORP
	MMDDYY	HHMMSS	(°C)	(s.u.)	(µmho/cm)	(mg/l)	(% Sat.)	(mV)
Site 1	10/19/11	0:00	24.85	7.31	328	6.4	77	272
Site 1	11/4/11	0:00	21.54	7.45	415	6.3	71	253
Site 1	11/14/11	9:18	20.04	7.60	434	6.8	74	107
Site 1	11/29/11	8:32	19.84	7.64	476	7.7	85	131
Site 1	12/9/11	11:30	19.86	7.59	495	7.1	78	93
Site 1	12/16/11	9:14	20.05	7.68	493	6.1	67	139
Site 1	12/23/11	8:03	20.19	7.48	512	4.5	50	146
Site 1	12/31/11	8:04	18.75	7.60	522	6.8	73	143
Site 1	1/6/12	10:00	14.75	8.14	516	7.6	75	134
Site 1	1/13/12	9:20	17.22	7.69	536	7.4	77	59
Site 1	1/19/12	9:34	17.25	7.57	551	7.4	77	392
Site 1	2/6/12	11:48	23.59	7.93	323	6.0	71	147
Site 1	2/14/12	8:28	16.22	7.79	532	6.9	71	251
Site 1	2/22/12	8:05	18.85	7.82	550	6.3	68	217
Site 1	3/2/12	7:59	22.60	8.01	565	5.4	63	198
Site 1	3/7/12	8:33	20.25	8.01	533	6.2	69	212
Site 1	3/13/12	7:30	19.96	7.80	547	7.6	83	144
Site 1	3/20/12	10:25	25.08	8.24	550	7.7	93	337
Site 1	3/26/12	9:03	23.07	7.76	574	6.5	76	346
Site 1	4/4/12	8:21	24.76	7.46	593	4.1	50	350
	Minimum Value:		**12.08**	**6.99**	**120**	**3.2**	**41**	**59**
	Maximum Value:		**32.99**	**8.24**	**593**	**10.1**	**105**	**818**
	Median Value:		**24.06**	**7.45**	**445**	**6.3**	**77**	**251**
	Geometric Mean:		**22.77**	**7.48**	**407**	**6.3**	**74**	**247**

Field Measurements Collected at the Lockhart-Smith Site from April 2010 - April 2012

	Date	Time	Temp	pH	SpCond	Diss. O_2		ORP
	MMDDYY	HHMMSS	(°C)	(s.u.)	(µmho/cm)	(mg/l)	(% Sat.)	(mV)
Site 1A	4/28/10	6:21	17.85	6.90	376	6.0	63	97
Site 1A	5/18/10	7:10	24.48	7.21	325	4.6	55	139
Site 1A	7/8/10	9:44	26.27	7.32	315	4.7	59	123
Site 1A	8/11/10	8:59	26.35	7.07	316	3.2	40	107
Site 1A	8/17/10	8:46	28.01	7.10	284	3.4	44	119
Site 1A	8/25/10	0:00	25.81	7.13	300	5.4	67	213
Site 1A	9/9/10	0:00	25.80	6.92	302	5.1	63	275
Site 1A	1/19/11	11:57	18.09	7.19	388	7.3	78	480
Site 1A	2/1/11	11:44	17.31	7.61	467	8.6	90	479
Site 1A	3/2/11	12:01	17.40	7.65	372	8.7	91	444
Site 1A	4/4/11	9:18	19.41	7.16	382	6.7	73	488
Site 1A	7/8/11	8:11	25.14	7.16	410	4.8	59	317
Site 1A	8/5/11	11:22	29.25	7.29	401	5.0	66	281
Site 1A	8/12/11	10:33	28.44	6.99	312	3.3	42	288
Site 1A	8/29/11	10:31	28.03	7.13	389	4.6	59	277
Site 1A	9/23/11	0:00	25.30	6.94	355	5.1	62	218
Site 1A	10/11/11	0:00	24.20	6.90	289	5.3	63	172
Site 1A	10/19/11	0:00	24.49	7.11	388	4.7	57	255
Site 1A	3/13/12	7:19	17.04	7.38	458	6.9	71	163
	Minimum Value:		**17.04**	**6.90**	**284**	**3.2**	**40**	**97**
	Maximum Value:		**29.25**	**7.65**	**467**	**8.7**	**91**	**488**
	Median Value:		**25.14**	**7.13**	**372**	**5.1**	**63**	**255**
	Geometric Mean:		**23.22**	**7.16**	**355**	**5.2**	**62**	**229**

Field Measurements Collected at the Lockhart-Smith Site from April 2010 - April 2012

	Date	Time	Temp	pH	SpCond	Diss. O_2		ORP
	MMDDYY	HHMMSS	(°C)	(s.u.)	(µmho/cm)	(mg/l)	(% Sat.)	(mV)
Site 2	4/20/10	7:50	23.88	7.54	301	5.6	66	589
Site 2	4/28/10	6:59	23.89	7.33	145	5.2	61	66
Site 2	5/5/10	6:24	28.12	7.18	285	4.5	57	149
Site 2	5/13/10	6:43	27.11	7.35	289	4.7	60	431
Site 2	5/18/10	7:42	27.64	7.43	233	4.0	51	133
Site 2	5/25/10	7:03	28.90	7.21	273	4.4	57	147
Site 2	7/8/10	10:16	30.38	7.43	227	4.6	61	108
Site 2	7/14/10	8:56	30.29	7.40	234	5.4	72	101
Site 2	7/21/10	8:50	30.12	7.32	241	3.8	50	127
Site 2	8/2/10	9:27	30.13	7.25	247	4.5	59	335
Site 2	8/11/10	9:40	30.37	7.34	232	3.5	47	83
Site 2	8/17/10	9:13	30.90	7.29	242	4.3	58	107
Site 2	8/25/10	0:00	28.50	7.26	231	4.9	63	186
Site 2	9/2/10	0:00	27.80	7.22	275	5.1	65	184
Site 2	9/9/10	0:00	28.63	7.19	126	4.4	57	265
Site 2	9/16/10	0:00	28.49	7.43	105	5.7	74	235
Site 2	9/23/10	0:00	28.03	7.30	110	6.1	78	234
Site 2	11/3/10	10:35	24.81	7.40	275	5.4	65	404
Site 2	11/11/10	11:04	20.45	7.42	280	7.1	79	435
Site 2	11/19/10	12:44	20.77	7.43	289	7.1	80	421
Site 2	12/3/10	10:11	15.52	7.57	322	5.1	51	373
Site 2	12/9/10	10:52	13.48	7.45	325	6.7	64	422
Site 2	12/15/10	12:48	11.71	7.56	324	7.7	71	397
Site 2	12/23/10	11:17	13.83	7.53	53	8.3	81	447
Site 2	1/4/11	11:24	16.15	7.55	358	8.6	87	476
Site 2	1/10/11	10:48	15.68	7.53	360	8.9	89	732
Site 2	1/19/11	12:27	17.28	7.60	198	8.2	85	469
Site 2	2/1/11	12:15	18.08	7.51	29	7.7	81	462
Site 2	2/24/11	10:32	19.28	7.39	383	7.3	80	401
Site 2	3/2/11	11:22	20.72	7.42	202	6.9	77	447
Site 2	3/8/11	0:00	16.66	7.97	189	9.1	94	244
Site 2	3/18/11	8:58	19.89	7.37	378	5.9	65	426
Site 2	3/28/11	9:12	23.61	7.22	396	5.3	63	484
Site 2	4/4/11	10:39	23.98	7.52	337	6.6	79	439
Site 2	4/11/11	9:27	25.86	7.45	339	6.2	77	447
Site 2	7/14/11	10:46	31.49	7.54	309	5.1	69	273
Site 2	8/5/11	11:34	32.70	7.61	303	6.2	86	263
Site 2	8/12/11	10:50	31.40	7.46	304	4.0	54	283
Site 2	8/17/11	9:08	31.27	7.32	309	5.2	70	264
Site 2	8/29/11	10:44	30.09	7.42	310	5.8	77	255
Site 2	9/9/11	8:36	27.67	7.36	320	5.4	68	423

Field Measurements Collected at the Lockhart-Smith Site from April 2010 - April 2012

	Date	Time	Temp	pH	SpCond	Diss. O_2		ORP
	MMDDYY	HHMMSS	(°C)	(s.u.)	(µmho/cm)	(mg/l)	(% Sat.)	(mV)
Site 2	9/23/11	0:00	27.12	7.21	281	5.2	65	198
Site 2	10/11/11	0:00	25.23	7.44	284	5.3	65	196
Site 2	10/19/11	0:00	25.82	7.33	299	5.2	64	128
Site 2	11/4/11	0:00	22.21	7.43	123	6.2	71	171
Site 2	11/14/11	8:37	16.39	8.22	296	8.4	86	151
Site 2	12/16/11	9:27	19.79	7.63	331	5.5	60	133
Site 2	3/2/12	8:18	21.89	7.65	341	5.4	62	174
Site 2	3/13/12	7:40	20.69	7.60	336	6.7	75	137
Site 2	3/20/12	11:06	23.47	7.68	323	4.4	52	321
	Minimum Value:		**11.71**	**7.18**	**29**	**3.5**	**47**	**66**
	Maximum Value:		**32.70**	**8.22**	**396**	**9.1**	**94**	**732**
	Median Value:		**25.02**	**7.43**	**287**	**5.4**	**66**	**265**
	Geometric Mean:		**23.43**	**7.44**	**245**	**5.7**	**68**	**255**

Field Measurements Collected at the Lockhart-Smith Site from April 2010 - April 2012

	Date	Time	Temp	pH	SpCond	Diss. O_2		ORP
	MMDDYY	HHMMSS	(°C)	(s.u.)	(µmho/cm)	(mg/l)	(% Sat.)	(mV)
Site 3	4/20/10	8:10	21.82	7.08	323	7.6	86	598
Site 3	4/28/10	7:23	21.43	6.69	244	6.3	71	80
Site 3	5/5/10	7:00	26.18	6.83	154	3.7	46	160
Site 3	5/13/10	8:22	24.83	6.94	360	3.7	44	274
Site 3	5/18/10	8:18	26.52	6.85	231	4.3	54	137
Site 3	5/25/10	7:36	26.11	6.80	308	4.1	50	176
Site 3	7/8/10	11:05	28.20	7.09	214	3.3	42	123
Site 3	7/14/10	9:08	28.56	7.09	263	3.8	49	94
Site 3	7/21/10	9:28	28.02	7.06	298	2.7	35	134
Site 3	7/28/10	11:09	29.93	7.18	341	2.6	34	231
Site 3	8/2/10	9:50	27.74	7.10	349	2.8	35	334
Site 3	8/11/10	9:28	28.18	7.02	227	3.0	39	104
Site 3	8/17/10	9:39	28.49	7.03	227	3.5	45	117
Site 3	8/25/10	0:00	27.08	6.97	191	4.7	59	174
Site 3	9/2/10	0:00	25.31	7.05	132	4.1	50	194
Site 3	9/9/10	0:00	26.84	6.61	100	5.2	65	236
Site 3	9/16/10	0:00	25.76	7.05	105	5.3	65	209
Site 3	9/23/10	0:00	26.23	6.98	155	4.4	55	254
Site 3	11/3/10	11:05	23.55	7.04	256	5.3	62	400
Site 3	11/11/10	11:31	18.46	7.09	307	5.9	63	420
Site 3	11/19/10	12:28	22.03	7.12	361	5.5	63	415
Site 3	12/3/10	10:42	12.42	7.30	383	5.0	46	421
Site 3	12/9/10	11:15	11.02	7.16	419	4.8	44	488
Site 3	12/15/10	13:09	10.05	7.33	408	7.0	63	467
Site 3	12/23/10	10:58	13.70	7.04	309	5.8	56	460
Site 3	1/4/11	11:49	16.05	7.06	404	5.2	53	496
Site 3	1/10/11	11:14	14.51	7.05	321	6.7	66	723
Site 3	1/19/11	12:51	17.70	7.09	272	7.3	77	484
Site 3	2/1/11	12:02	16.46	7.09	348	6.5	67	484
Site 3	2/24/11	10:57	18.64	7.09	393	6.1	65	443
Site 3	3/2/11	11:04	18.68	7.12	327	6.8	72	468
Site 3	3/8/11	0:00	15.47	7.62	364	8.6	86	240
Site 3	3/18/11	9:20	18.72	7.29	327	6.6	71	447
Site 3	3/28/11	9:03	22.23	7.02	231	3.8	44	496
Site 3	4/4/11	10:12	21.47	6.95	264	6.5	74	468
Site 3	4/11/11	9:48	23.85	7.16	315	5.3	63	448
Site 3	5/4/11	11:01	24.50	7.20	400	3.5	42	459
Site 3	6/3/11	9:55	25.18	7.97	209	7.1	87	255
Site 3	6/21/11	8:57	27.63	7.89	344	6.0	76	501
Site 3	6/27/11	9:12	27.13	7.20	368	2.3	29	308
Site 3	7/14/11	11:03	29.36	7.25	345	3.9	52	268
Site 3	7/18/11	10:21	27.31	7.25	367	3.9	49	406
Site 3	8/5/11	11:57	30.83	7.15	267	4.9	66	292
Site 3	8/12/11	11:06	29.68	6.99	220	3.7	49	300
Site 3	8/17/11	9:29	28.28	6.95	287	3.2	41	275

Field Measurements Collected at the Lockhart-Smith Site from April 2010 - April 2012

	Date	Time	Temp	pH	SpCond	Diss. O_2		ORP
	MMDDYY	HHMMSS	(°C)	(s.u.)	(µmho/cm)	(mg/l)	(% Sat.)	(mV)
Site 3	8/29/11	10:57	28.41	6.98	337	3.2	42	251
Site 3	9/9/11	8:57	26.02	6.98	306	2.9	36	416
Site 3	9/23/11	0:00	26.69	6.88	225	4.8	60	158
Site 3	10/4/11	0:00	21.09	6.88	332	3.6	40	179
Site 3	10/11/11	0:00	24.84	6.75	215	4.7	57	130
Site 3	10/19/11	0:00	24.74	7.01	309	4.3	52	156
Site 3	11/4/11	0:00	20.79	7.12	306	5.4	60	150
Site 3	11/14/11	8:53	17.45	7.39	357	5.3	55	150
Site 3	11/29/11	9:05	18.16	7.41	387	6.2	66	103
Site 3	12/9/11	11:41	17.54	7.50	425	5.8	61	86
Site 3	12/16/11	9:59	19.04	7.41	393	4.6	50	116
Site 3	12/23/11	8:21	19.03	7.41	415	3.7	40	141
Site 3	12/31/11	8:14	16.28	7.52	218	5.2	53	142
Site 3	1/6/12	10:16	12.45	7.59	434	6.8	64	129
Site 3	1/13/12	9:36	16.09	7.46	450	5.0	51	89
Site 3	1/19/12	9:48	15.18	7.43	463	5.1	51	319
Site 3	2/6/12	12:14	21.93	7.73	458	5.7	66	159
Site 3	2/14/12	8:49	11.31	7.99	424	8.0	74	237
Site 3	2/22/12	8:31	17.94	7.41	446	4.3	46	208
Site 3	3/2/12	8:41	21.13	7.42	448	3.7	42	176
Site 3	3/7/12	8:52	17.84	7.53	459	4.1	43	213
Site 3	3/13/12	8:09	19.54	7.30	331	5.6	61	142
Site 3	3/20/12	10:54	21.73	7.35	396	3.0	34	335
Site 3	3/26/12	9:23	20.65	7.33	424	3.5	39	343
Site 3	4/4/12	8:29	22.87	8.16	429	6.9	81	342
	Minimum Value:		**10.05**	**6.61**	**100**	**2.3**	**29**	**80**
	Maximum Value:		**30.83**	**8.16**	**463**	**8.6**	**87**	**723**
	Median Value:		**21.98**	**7.11**	**329**	**4.9**	**54**	**253**
	Geometric Mean:		**21.29**	**7.19**	**305**	**4.7**	**54**	**244**

Field Measurements Collected at the Lockhart-Smith Site from April 2010 - April 2012

	Date	Time	Temp	pH	SpCond	Diss. O_2		ORP
	MMDDYY	HHMMSS	(°C)	(s.u.)	(µmho/cm)	(mg/l)	(% Sat.)	(mV)
Site 4	4/28/10	8:48	23.06	6.89	374	2.1	25	74
Site 4	5/5/10	7:59	29.08	8.09	404	5.2	68	157
Site 4	5/18/10	8:58	26.69	7.20	408	1.8	23	121
Site 4	5/25/10	8:05	25.83	7.97	336	5.3	65	164
Site 4	7/8/10	11:29	30.81	7.43	243	2.0	27	105
Site 4	7/21/10	10:53	31.72	7.20	331	1.7	23	88
Site 4	7/28/10	9:07	30.85	7.31	478	2.5	34	191
Site 4	8/11/10	10:33	29.29	7.33	358	1.8	24	81
Site 4	8/17/10	10:13	31.42	8.01	305	5.9	79	105
Site 4	8/25/10	0:00	27.44	8.32	357	7.3	92	169
Site 4	9/9/10	0:00	28.37	7.65	290	6.8	88	72
Site 4	1/19/11	13:54	20.66	7.78	403	8.0	89	434
Site 4	2/1/11	12:58	17.30	7.84	259	9.2	96	456
Site 4	4/4/11	11:39	24.93	7.10	193	3.2	38	413
Site 4	8/12/11	9:08	28.47	7.20	200	2.0	26	306
Site 4	8/29/11	11:31	29.80	8.09	216	6.9	91	185
Site 4	10/4/11	0:00	22.66	7.91	179	7.9	91	150
Site 4	10/11/11	0:00	24.77	7.21	233	3.8	46	183
Site 4	10/19/11	0:00	25.61	8.29	319	6.9	85	132
	Minimum Value:		**17.30**	**6.89**	**179**	**1.7**	**23**	**72**
	Maximum Value:		**31.72**	**8.32**	**478**	**9.2**	**96**	**456**
	Median Value:		**27.44**	**7.65**	**319**	**5.2**	**65**	**157**
	Geometric Mean:		**26.48**	**7.61**	**298**	**4.0**	**50**	**159**

Field Measurements Collected at the Lockhart-Smith Site from April 2010 - April 2012

	Date	Time	Temp	pH	SpCond	Diss. O_2		ORP
	MMDDYY	HHMMSS	(°C)	(s.u.)	(µmho/cm)	(mg/l)	(% Sat.)	(mV)
Site 5	4/20/10	6:15	20.72	8.40	348	4.1	45	502
Site 5	4/28/10	8:09	22.35	6.71	293	4.0	46	82
Site 5	5/5/10	7:24	30.13	7.45	281	4.1	54	138
Site 5	5/13/10	7:30	26.33	6.90	370	2.8	34	305
Site 5	5/18/10	5:51	24.79	6.73	283	3.1	37	150
Site 5	5/25/10	6:03	25.42	6.73	234	2.4	29	126
Site 5	7/8/10	8:46	27.43	7.11	240	9.0	114	125
Site 5	7/14/10	7:56	27.57	7.01	277	3.5	44	117
Site 5	7/21/10	10:29	29.77	7.06	297	2.7	36	123
Site 5	7/28/10	9:31	30.63	7.08	328	1.9	25	211
Site 5	8/2/10	8:20	26.93	7.12	342	3.2	40	568
Site 5	8/11/10	10:14	28.93	6.99	260	2.4	31	97
Site 5	8/17/10	8:01	28.04	6.95	300	2.9	37	90
Site 5	8/25/10	0:00	27.35	6.90	133	3.2	40	126
Site 5	9/2/10	0:00	26.70	6.94	123	3.8	47	176
Site 5	9/9/10	0:00	27.29	6.68	228	3.2	40	274
Site 5	9/16/10	0:00	26.50	6.88	139	3.5	43	156
Site 5	9/23/10	0:00	27.85	6.96	124	4.5	57	243
Site 5	11/3/10	11:40	23.65	6.89	351	3.4	40	395
Site 5	11/11/10	12:12	23.72	6.95	340	4.7	55	410
Site 5	11/19/10	13:21	20.00	6.98	402	10.1	111	419
Site 5	12/3/10	11:11	12.92	7.13	364	4.8	45	416
Site 5	12/9/10	11:48	11.55	7.10	356	5.7	52	490
Site 5	12/15/10	13:32	12.25	7.61	313	5.4	51	459
Site 5	12/23/10	10:31	13.99	7.07	399	6.7	65	476
Site 5	1/4/11	12:29	15.70	7.09	346	7.1	71	493
Site 5	1/10/11	11:37	14.44	7.08	299	7.4	72	692
Site 5	1/19/11	13:29	20.34	7.05	334	6.6	73	480
Site 5	2/1/11	12:36	20.36	7.24	356	6.5	72	452
Site 5	2/24/11	11:27	20.38	6.99	398	5.8	64	452
Site 5	3/8/11	0:00	16.45	7.46	396	8.3	85	240
Site 5	3/18/11	9:42	18.45	7.52	383	9.0	96	438
Site 5	3/28/11	9:49	24.18	7.32	421	6.5	78	471
Site 5	4/4/11	11:06	25.38	6.93	292	4.6	57	405
Site 5	4/11/11	10:17	25.27	6.99	327	4.0	49	444
Site 5	6/3/11	9:59	24.70	7.24	325	4.6	55	266
Site 5	6/21/11	11:00	32.17	7.39	372	6.9	95	392
Site 5	6/27/11	9:31	27.05	7.03	408	2.3	29	297
Site 5	7/14/11	11:36	31.22	7.14	373	2.4	32	251
Site 5	7/18/11	10:46	29.18	7.48	372	6.9	91	332
Site 5	8/5/11	10:37	29.38	6.89	355	1.9	25	291
Site 5	8/12/11	9:32	29.21	6.82	291	1.3	17	290
Site 5	8/17/11	8:23	27.63	6.72	325	1.8	22	205
Site 5	8/29/11	11:17	28.96	6.90	335	2.2	28	165
Site 5	9/9/11	9:29	26.14	6.94	327	3.4	42	387

Field Measurements Collected at the Lockhart-Smith Site from April 2010 - April 2012

	Date	Time	Temp	pH	SpCond	Diss. O_2		ORP
	MMDDYY	HHMMSS	(°C)	(s.u.)	(µmho/cm)	(mg/l)	(% Sat.)	(mV)
Site 5	9/23/11	0:00	27.37	6.89	299	2.8	35	125
Site 5	10/4/11	0:00	24.28	6.99	349	3.8	45	131
Site 5	10/11/11	0:00	24.85	6.80	242	3.9	47	141
Site 5	10/19/11	0:00	24.74	6.99	142	3.7	45	152
Site 5	11/4/11	0:00	20.90	7.12	167	5.3	59	150
Site 5	11/14/11	9:32	18.94	7.32	368	4.7	50	101
Site 5	11/29/11	9:44	18.61	7.41	412	7.1	76	89
Site 5	12/9/11	12:09	18.61	7.46	422	5.6	60	93
Site 5	12/16/11	10:25	19.82	7.43	419	4.7	52	106
Site 5	12/23/11	8:43	19.01	7.77	421	4.9	53	116
Site 5	12/31/11	8:34	16.16	7.71	441	6.1	62	121
Site 5	1/6/12	11:07	14.58	7.58	426	6.4	63	108
Site 5	1/13/12	10:06	15.14	7.60	460	7.7	77	86
Site 5	1/19/12	10:42	15.18	7.50	462	6.1	61	275
Site 5	2/6/12	12:43	23.65	7.88	469	5.9	69	167
Site 5	2/14/12	9:22	14.26	7.52	459	6.0	59	196
Site 5	2/22/12	8:55	17.76	7.45	477	5.5	58	171
Site 5	3/2/12	9:06	21.68	7.42	476	4.5	51	160
Site 5	3/7/12	9:15	18.48	7.48	481	4.4	47	200
Site 5	3/13/12	8:42	19.81	7.22	384	5.1	56	129
Site 5	3/20/12	11:25	23.59	7.42	446	4.6	54	304
Site 5	3/26/12	9:43	20.97	7.32	462	4.8	54	320
Site 5	4/4/12	8:55	22.66	7.48	458	4.7	54	355
	Minimum Value:		**11.55**	**6.68**	**123**	**1.3**	**17**	**82**
	Maximum Value:		**32.17**	**8.40**	**481**	**10.1**	**114**	**692**
	Median Value:		**23.69**	**7.10**	**350**	**4.6**	**52**	**226**
	Geometric Mean:		**22.13**	**7.17**	**327**	**4.3**	**50**	**223**

APPENDIX C

CHEMICAL CHARACTERISTICS OF INFLOW AND OUTFLOW SAMPLES COLLECTED AT THE LOCKHART-SMITH RSF

C.1 Site 1
C.2 Site 1A
C.3 Site 2
C.4 Site 3
C.5 Site 4
C.6 Site 5
C.7 Bulk Precipitation Samples

C.1 Site 1

Chemical Characteristics of Inflow Samples Collected at Lockhart-Smith Site 1

Date Collected	pH (s.u.)	Alkalinity (mg/l)	Cond (µmho/cm)	Ammonia (µg/l)	NO_x-N (µg/l)	Diss Org N (µg/l)	Part N (µg/l)	Total N (µg/l)	SRP (µg/l)	Diss Org P (µg/l)	Part P (µg/l)	Total P (µg/l)	Turbidity (NTU)	Color (Pt-Co)	TSS (mg/l)
4/12/10 - 4/20/10	6.98	98.2	415	36	26	800	292	1,154	44	22	98	164	13.6	172	39.2
4/20/10 - 4/28/10	7.05	96.2	413	50	3	485	534	1,072	68	35	110	213	8.9	30	12.8
4/28/10 - 5/5/10	6.85	98.8	378	84	3	732	1,010	1,829	66	15	245	326	20.5	139	91.3
5/5/10 - 5/13/10	7.42	107	441	51	48	587	692	1,378	45	9	223	277	3.2	135	1.5
5/13/10 - 5/18/10	7.18	116	418	45	10	549	794	1,398	66	18	300	384	47.3	112	132
5/18/10 - 5/25/10	7.31	114	427	60	49	977	14	1,100	74	15	58	147	6.9	123	78.6
5/25/10 - 5/31/10	7.32	112	444	16	20	1,388	78	1,502	55	12	130	197	10.8	109	32.9
5/31/10 - 6/09/10	6.92	104	434	62	25	683	828	1,598	71	2	225	298	28.4	117	91.1
6/9/10 - 6/26/10	7.08	99.6	399	211	8	1,039	153	1,411	29	12	23	64	4.2	118	4.3
6/26/10 - 6/30/10	6.95	98.0	401	51	36	673	1,470	2,230	40	21	16	77	42.7	107	112
6/30/10 - 7/8/10	6.78	78.4	395	131	22	936	113	1,202	36	32	19	87	2.4	135	2.4
7/08 - 7/14/10	6.70	72.4	306	54	18	714	206	992	26	6	10	42	2.4	152	3.2
7/14/10 - 7/21/10	6.92	75.6	329	66	77	632	482	1,257	83	13	17	113	3.0	140	34.8
7/21/10 - 7/28/10	6.97	83.4	344	33	67	829	78	1,007	16	24	22	62	1.5	142	2.9
7/28/10 - 8/2/10	7.13	87.6	373	24	89	979	132	1,224	28	10	51	89	18.1	133	34.0
8/2/10 - 8/11/10	6.95	75.0	345	66	89	850	65	1,070	48	23	26	97	1.9	112	2.4
8/11/10 - 8/17/10	6.68	66.8	378	42	165	558	463	1,228	36	30	161	227	2.8	123	101
8/17/10 - 8/25/10	6.90	67.8	325	47	142	573	103	865	30	23	68	121	19.8	109	46.1
8/25/10 - 9/2/10	6.71	63.4	332	39	380	577	210	1,206	53	13	56	122	12.1	140	27.5
9/2/10 - 9/9/10	6.94	69.2	350	26	181	979	449	1,635	40	7	45	92	11.7	130	24.8
9/9/10 - 9/16/10	7.05	58.0	325	57	277	438	103	875	69	20	141	230	0.8	136	1.2
9/16/10 - 9/23/10	7.16	67.2	349	257	237	370	53	917	81	6	25	112	3.1	122	2.7
9/23/10 - 9/28/10	6.96	64.2	350	39	268	942	537	1,786	39	18	184	241	38.5	125	91.4
9/28/10 - 10/6/10	7.29	65.2	336	152	324	644	370	1,490	73	4	30	107	1.8	145	3.0
10/6/10 - 10/13/10	7.39	87.2	389	53	26	980	1,045	2,104	70	4	273	347	47.2	130	94.2
10/13/10 - 10/21/10	7.33	99.0	424	30	411	516	1,043	2,000	61	17	53	131	14.2	129	38.5
10/21/10 - 11/3/10	6.94	106	461	46	45	269	149	509	50	10	11	71	12.1	11	30.2
11/3/10 - 11/11/10	7.45	71.4	379	37	280	42	71	430	46	12	15	73	11.9	117	32.3
11/11/10 - 11/19/10	7.43	77.0	441	93	442	704	573	1,812	64	7	245	316	37.5	115	87.8
11/19/10 - 12/3/10	6.85	84.4	383	65	84	383	177	709	18	14	117	149	27.2	113	62.2
12/3/10 - 12/9/10	7.21	95.6	446	69	63	364	39	535	62	11	22	95	3.0	125	2.1
12/9/10 - 12/15/10	7.44	99.0	477	44	102	351	153	650	25	10	70	105	14.5	107	37.8
12/15/10 - 12/23/10	7.28	90.6	334	77	143	423	96	739	36	28	121	185	18.3	111	45.8
12/23/10 - 1/4/11	7.33	95.8	441	87	93	569	56	805	34	16	32	82	3.3	130	2.6
1/4/11 - 1/10/11	7.21	87.0	386	12	67	677	128	884	16	14	91	121	6.4	98	23.4
1/10/11 - 1/19/11	7.37	84.6	400	28	8	727	466	1,229	14	10	54	78	2.0	100	2.9
1/19/11 - 2/1/11	7.21	81.8	398	141	75	615	454	1,285	40	3	2	45	1.1	105	1.3
2/1/11 - 2/10/11	7.04	81.4	434	63	106	864	563	1,596	23	8	20	51	6.4	124	17.7
2/10/11 - 2/24/11	7.14	87.8	460	103	209	354	391	1,057	30	2	21	53	1.4	119	1.7
2/24/11 - 3/2/11	7.09	90.2	455	46	139	626	294	1,105	14	3	23	40	3.7	107	5.7
3/2/11 - 3/8/11	7.50	90.0	441	64	8	693	569	1,334	4	11	118	133	18.6	115	40.2
3/8/11 - 3/18/11	7.11	94.2	410	47	5	469	593	1,114	3	48	82	133	9.9	145	18.1
3/28/11 - 4/4/11	7.12	75.4	401	203	275	939	385	1,802	55	20	217	292	14.7	113	64.1

Chemical Characteristics of Inflow Samples Collected at Lockhart-Smith Site 1

Date Collected	pH (s.u.)	Alkalinity (mg/l)	Cond (µmho/cm)	Ammonia (µg/l)	NO_x-N (µg/l)	Diss Org N (µg/l)	Part N (µg/l)	Total N (µg/l)	SRP (µg/l)	Diss Org P (µg/l)	Part P (µg/l)	Total P (µg/l)	Turbidity (NTU)	Color (Pt-Co)	TSS (mg/l)
4/4/11 - 4/11/11	6.84	70.6	393	90	300	831	327	1,548	43	19	19	81	2.3	138	1.0
4/11/11 - 4/25/11	7.31	80.4	373	83	501	994	732	2,310	7	76	80	163	7.4	133	26.0
4/25/11 - 5/1/11	7.08	108	502	5	531	906	613	2,055	190	29	153	372	37.6	77	71.6
7/8/11 - 7/14/11	6.97	91.4	449	110	86	716	260	1,172	70	4	2	76	0.6	92	1.3
7/14/11 - 7/18/11	7.45	104	464	129	11	586	300	1,026	40	13	66	119	3.7	93	3.3
7/8/11 - 7/14/11	6.97	91.4	449	110	86	716	60	972	70	2	4	76	0.6	92	1.3
7/14/11 - 7/18/11	7.45	104	464	129	11	586	300	1,026	40	13	66	119	3.7	93	3.3
7/18/11 - 7/29/11	7.23	98.4	461	101	143	587	54	885	66	20	3	89	4.9	81	1.2
7/29/11 - 8/5/11	7.10	91.4	462	47	134	810	43	1,034	45	4	8	57	0.9	91	1.6
8/5/11 - 8/12/11	7.04	90.0	430	115	58	554	219	946	52	14	21	87	1.8	103	2.1
8/12/11 - 8/17/11	7.12	89.2	449	155	135	394	202	886	53	24	2	79	2.2	125	4.0
8/17/11 - 8/29/11	7.08	85.8	407	227	117	651	491	1,486	78	5	33	116	1.4	161	2.0
8/29/11 - 9/9/11	6.91	94.4	431	1,678	308	621	57	2,664	82	2	11	95	1.2	143	2.6
9/9/11 - 9/16/11	7.42	105	443	39	438	723	136	1,336	54	6	6	66	2.7	150	4.7
9/16/11 - 9/23/11	7.42	111.0	490	46	255	676	172	1,149	44	3	37	84	18.0	128	66.8
9/23/11 - 10/4/11	6.90	97.0	422	85	115	349	538	1,087	38	13	189	240	25.8	131	78.1
10/4/11 - 10/11/11	6.92	73.6	338	152	116	580	69	917	54	11	144	209	2.0	163	1.0
10/11/11 - 10/19/11	7.06	78.0	265	89	188	535	560	1,372	47	12	215	274	25.9	195	94.2
10/19 - 10/28/11	7.15	80.4	377	17	265	604	111	997	46	8	23	77	1.9	222	1.6
10/28/11 - 11/4/11	7.41	81.2	376	20	268	588	88	964	37	15	24	76	5.5	188	5.9
11/4/11 - 11/14/11	7.19	91.4	332	23	273	733	232	1,261	42	5	25	72	2.6	177	0.8
11/14/11 - 11/29/11	7.46	103	457	4	418	422	31	875	56	3	4	63	1.6	164	1.0
11/29/11 - 12/9/11	7.61	114	428	3	439	563	182	1,187	61	4	69	134	11.5	155	20.7
12/9/11 - 12/16/11	7.51	108	458	9	292	845	28	1,174	33	12	127	172	18.0	148	46.9
12/16/11 - 12/23/11	7.73	117	472	19	347	671	264	1,301	48	6	13	67	13.3	146	17.6
12/23/11 - 12/31/11	7.25	124	499	87	144	847	201	1,279	25	7	6	38	5.0	139	3.4
12/31/11 - 1/6/12	7.87	128	540	26	321	612	127	1,086	34	6	80	120	12.4	119	23.4
1/6/12 - 1/13/12	7.58	124	486	22	281	65	55	423	38	5	71	114	11.7	124	29.9
1/13/12 - 1/19/12	7.27	128	590	80	209	136	24	449	33	18	86	137	14.3	127	36.6
1/19/12 - 2/6/12	7.78	130	525	58	283	152	33	526	47	5	60	112	9.8	110	15.1
2/6/12 - 2/14/12	7.79	125	533	4	59	65	27	155	47	11	32	90	10.4	102	19.9
2/14/12 - 2/22/12	7.47	122	510	28	22	74	12	136	24	4	60	88	10.0	111	26.5
2/22/12 - 3/2/12	7.56	126	531	34	63	134	9	240	23	9	51	83	6.7	102	16.0
3/2/12 - 3/7/12	7.23	119	546	17	8	157	26	208	18	13	70	101	12.9	102	29.7
3/7/12 - 3/13/12	7.24	122	547	8	43	125	25	201	21	1	43	65	7.5	98	13.0
3/13/12 - 3/20/12	7.44	122	572	42	346	48	67	503	93	4	111	208	18.1	65	49.1
3/20/12 - 3/26/12	7.14	121	549	26	57	135	10	228	17	46	193	256	78.6	95	189
3/26/12 - 4/4/12	7.25	144	544	28	43	536	433	1,040	28	6	70	104	5.6	94	7.8
Minimum Value:	**6.68**	**58.0**	**265**	**3**	**3**	**42**	**9**	**136**	**3**	**1**	**2**	**38**	**0.6**	**11**	**0.8**
Maximum Value:	**7.87**	**144**	**590**	**1,678**	**531**	**1,388**	**1,470**	**2,664**	**190**	**76**	**300**	**384**	**78.6**	**222**	**189**
Median Value:	**7.18**	**94.2**	**428**	**51**	**115**	**604**	**182**	**1,100**	**44**	**11**	**54**	**107**	**7.4**	**123**	**18.1**
Gemoetric Mean:	**7.19**	**93.3**	**421**	**49**	**88**	**490**	**162**	**981**	**39**	**10**	**43**	**115**	**6.6**	**116**	**12.1**

C.2 Site 1A

Chemical Characteristics of Inflow Samples Collected at Lockhart-Smith Site 1A

Date Collected	pH (s.u.)	Alkalinity (mg/l)	Cond (µmho/cm)	Ammonia (µg/l)	NO_x-N (µg/l)	Diss Org N (µg/l)	Part N (µg/l)	Total N (µg/l)	SRP (µg/l)	Diss Org P (µg/l)	Part P (µg/l)	Total P (µg/l)	Turbidity (NTU)	Color (Pt-Co)	TSS (mg/l)
4/20/10	7.36	178	452	33	5	852	161	1,051	58	24	79	161	5.6	104	5.6
4/28/10	7.18	113	337	57	3	454	49	563	51	24	23	98	1.9	127	2.2
5/18/10	7.14	89.6	299	45	8	598	217	868	28	18	55	101	4.2	100	4.9
05/31/10-06/09/10	7.32	127	382	60	9	881	69	1,019	61	23	19	103	2.9	154	2.8
7/8/10	7.19	109	313	30	10	791	62	893	74	26	28	128	3.1	189	2.5
8/2/10 - 8/11/10	6.94	103	317	23	50	631	520	1,224	67	10	12	89	1.8	156	4.2
8/17/10	6.97	119	348	33	16	579	286	914	97	10	164	271	2.5	135	7.4
8/25/10	7.13	104	299	31	17	233	311	592	37	7	3	47	1.3	158	2.0
9/2/10 - 9/9/10	6.80	81.2	322	31	12	905	413	1,361	29	10	12	51	1.9	130	2.8
1/19/11	7.27	111	413	22	3	753	1,114	1,892	10	7	25	42	1.4	103	0.6
2/1/11	7.66	154	437	38	46	629	165	878	7	1	7	15	3.0	102	4.6
2/10/11	7.36	136	424	38	11	365	300	714	11	1	7	19	2.6	99	1.2
3/2/11	7.36	127	448	44	26	737	223	1,030	13	3	19	35	8.9	95	30.0
4/4/11	7.15	117	339	81	1	955	140	1,177	33	5	17	55	3.2	165	3.1
7/8/11	7.02	95.8	415	30	3	608	54	695	38	24	17	79	4.6	188	1.1
8/5/11	7.36	116	375	23	3	748	23	797	121	1	9	131	0.9	205	0.7
8/12/11	6.97	65.8	314	47	1	708	190	946	85	76	24	185	1.5	234	0.9
8/29/11	7.31	128	378	83	5	802	239	1,129	70	23	24	117	1.4	153	1.0
9/23/11	6.98	87.4	345	44	7	617	234	902	39	18	20	77	3.0	154	1.5
10/11/11	6.97	83.0	281	53	3	641	188	885	50	9	10	69	1.5	342	0.7
10/19/11	6.98	122	377	22	52	581	68	723	66	73	3	142	2.3	188	2.2
3/13/12	7.19	114	459	20	2	681	173	876	17	9	6	32	1.5	174	1.0
Minimum Value:	**6.80**	**65.8**	**281**	**20**	**1**	**233**	**23**	**563**	**7**	**1**	**3**	**15**	**0.9**	**95**	**0.6**
Maximum Value:	**7.66**	**178**	**459**	**83**	**52**	**955**	**1114**	**1892**	**121**	**76**	**164**	**271**	**8.9**	**342**	**30.0**
Median Value:	**7.17**	**114**	**362**	**36**	**8**	**661**	**189**	**898**	**45**	**10**	**18**	**84**	**2.4**	**154**	**2.2**
Gemoetric Mean:	**7.16**	**110**	**363**	**37**	**7**	**643**	**166**	**925**	**38**	**10**	**16**	**74**	**2.4**	**149**	**2.2**

C.3 Site 2

Chemical Characteristics of Inflow Samples Collected at Lockhart-Smith Site 2

Date Collected	pH (s.u.)	Alkalinity (mg/l)	Cond (µmho/cm)	Ammonia (µg/l)	NO_x-N (µg/l)	Diss Org N (µg/l)	Part N (µg/l)	Total N (µg/l)	SRP (µg/l)	Diss Org P (µg/l)	Part P (µg/l)	Total P (µg/l)	Turbidity (NTU)	Color (Pt-Co)	TSS (mg/l)
7/20/11 - 8/5/11	7.25	78.6	297	10	3	513	157	683	1	15	3	19	0.7	16	1.0
8/5/11 - 8/12/11	7.23	82.8	310	29	3	271	257	560	1	5	8	14	0.6	17	1.7
8/12/11 - 8/17/11	7.24	90.4	312	55	3	282	48	388	1	4	4	9	0.7	14	0.7
8/17/11 - 8/29/11	7.54	88.0	311	113	46	366	186	711	16	5	12	33	0.7	14	0.9
8/29/11 - 9/9/11	6.98	84.2	294	165	74	250	20	509	1	4	6	11	0.5	13	0.9
9/16/11 - 9/23/11	7.58	90.0	310	46	145	323	98	612	11	9	8	28	0.9	19	0.9
9/23/11 - 10/4/11	7.14	83.4	305	21	25	239	72	357	1	11	4	16	0.4	13	0.5
10/4/11 - 10/11/11	7.14	80.0	279	34	7	274	127	442	1	6	12	19	1.3	17	2.4
10/11/11 - 10/19/11	7.18	52.2	208	4	4	224	13	245	1	5	3	9	0.5	16	0.8
10/19 - 10/28/11	7.53	89.4	306	10	36	198	75	319	2	2	1	5	0.4	20	0.6
10/28/11 - 11/4/11	7.36	88.8	311	49	20	265	6	340	39	4	20	63	5.2	16	1.2
11/4/11 - 11/14/11	7.51	86.8	238	12	53	362	241	668	1	3	14	18	0.6	13	1.4
11/14/11 - 11/29/11	7.36	98.4	307	13	25	739	17	794	1	6	25	32	5.7	16	8.0
2/22/12 - 3/2/12	7.38	97.8	338	28	15	86	7	136	2	2	2	6	1.5	10	1.6
3/2/12 - 3/13/12	7.40	97.4	339	30	11	83	13	137	4	1	2	7	1.7	12	1.9
3/13/12 - 3/20/12	7.55	94.8	340	46	23	106	26	201	9	2	5	16	1.1	14	1.2
Minimum Value:	**6.74**	**52.2**	**208**	**3**	**3**	**83**	**4**	**136**	**1**	**1**	**1**	**3**	**0.1**	**9**	**0.4**
Maximum Value:	**7.71**	**123**	**389**	**185**	**292**	**794**	**541**	**1,152**	**39**	**21**	**37**	**63**	**7.3**	**84**	**35.2**
Median Value:	**7.36**	**93.4**	**293**	**37**	**23**	**313**	**66**	**472**	**2**	**3**	**5**	**14**	**0.9**	**14**	**1.0**
Gemoetric Mean:	**7.35**	**91.8**	**285**	**30**	**20**	**287**	**57**	**456**	**2**	**3**	**5**	**13**	**0.9**	**15**	**1.5**

C.4 Site 3

Chemical Characteristics of Inflow Samples Collected at Lockhart-Smith Site 3

Date Collected	pH (s.u.)	Alkalinity (mg/l)	Cond (µmho/cm)	Ammonia (µg/l)	NO_x-N (µg/l)	Diss Org N (µg/l)	Part N (µg/l)	Total N (µg/l)	SRP (µg/l)	Diss Org P (µg/l)	Part P (µg/l)	Total P (µg/l)	Turbidity (NTU)	Color (Pt-Co)	TSS (mg/l)
4/12/10 - 4/20/10	7.36	90.2	311	37	30	649	32	748	39	15	22	76	3.4	112	2.0
4/20/10 - 4/28/10	6.74	56.8	176	38	3	218	103	362	60	12	409	481	67.8	74	217
4/28/10 - 5/5/10	7.11	75.0	226	19	3	525	73	620	59	14	34	107	1.7	129	0.9
5/15 - 5/13/10	7.43	78.6	268	22	11	422	173	628	54	11	58	123	5.5	113	9.8
5/13/10 - 5/18/10	7.00	59.6	196	50	10	371	270	701	32	10	88	130	10.5	89	23.1
5/18/10 - 5/25/10	6.93	63.6	231	38	9	600	370	1,017	46	14	87	147	7.1	102	12.8
5/25/10 - 5/31/10	7.24	83.6	284	11	6	714	418	1,149	27	5	51	83	11.9	87	11.6
05/31/10-06/09/10	6.91	70.8	235	53	12	472	122	659	49	4	48	101	0.9	83	2.8
6/9/10 - 6/26/10	6.96	70.8	234	48	11	534	86	679	53	4	5	62	2.2	86	4.6
6/26/10 - 6/30/10	7.25	86.6	289	46	36	560	2,736	3,378	25	3	556	584	72.2	79	196
6/30/10 - 7/8/10	6.79	47.6	205	39	14	505	1,258	1,816	57	17	363	437	48.3	113	121
7/08/10 - 7/14/10	6.77	65.4	221	23	31	495	27	576	53	2	5	60	3.6	117	2.5
7/14/10 - 7/21/10	6.97	71.4	230	36	11	461	11	519	68	4	3	75	7.5	89	8.6
7/21/10 - 7/28/10	7.39	99.4	322	15	11	547	77	650	15	21	20	56	1.2	75	2.9
7/28/10 - 8/2/10	7.26	115	352	17	59	740	108	924	46	4	34	84	2.0	64	5.8
8/2/10 - 8/11/10	6.82	59.4	215	33	88	108	869	1,098	83	10	155	248	16.0	89	75.8
8/11/10 - 8/17/10	7.04	67.0	201	36	140	292	272	740	72	67	13	152	1.3	80	2.1
8/17/10 - 8/25/10	6.99	69.4	229	34	109	334	106	583	82	14	79	175	14.4	94	30.0
8/25/10 - 9/2/10	7.21	80.2	263	33	162	546	354	1,095	59	3	9	71	1.2	85	1.8
9/2/10 - 9/9/10	6.86	56.4	196	26	107	801	61	995	58	8	18	84	1.0	85	5.7
9/9/10 - 9/16/10	6.99	64.0	222	45	126	418	171	760	74	3	9	86	1.4	105	0.8
9/16/10 - 9/23/10	7.14	85.2	265	479	236	155	32	902	80	17	211	308	27.1	91	61.4
9/23/10 - 9/28/10	7.14	86.2	274	31	140	736	222	1,129	60	25	20	105	9.4	84	14.9
9/28/10 - 10/6/10	7.01	88.8	274	27	128	471	35	661	49	1	11	61	0.6	95	1.3
10/6/10 - 10/13/10	7.10	116	363	46	96	387	187	716	50	5	20	75	3.7	79	2.8
10/13/10 - 10/21/10	7.30	121	388	212	148	332	60	752	53	15	115	183	14.3	91	26.4
10/21/10 - 11/3/10	6.89	84.6	307	40	103	108	335	586	11	61	74	146	3.1	54	5.6
11/3/10 - 11/11/10	7.16	79.2	290	36	75	248	171	530	29	8	9	46	1.1	55	1.7
11/11/10 - 11/19/10	7.55	105	374	55	93	515	34	697	30	9	14	53	2.1	61	1.2
11/19/10 - 12/3/10	7.51	103	318	42	30	259	24	355	36	3	7	46	1.1	56	0.7
12/3/10 - 12/9/10	7.34	115	390	158	259	137	46	600	24	7	44	75	20.0	43	12.1
12/9/10 - 12/15/10	7.52	125	421	79	233	204	230	746	26	13	3	42	3.8	56	3.6
12/15/10 - 12/23/10	7.55	108	280	55	523	163	114	855	80	10	29	119	8.4	45	15.4
12/23/10 - 1/4/11	7.33	108	367	31	316	175	289	811	53	4	44	101	2.2	65	4.3
1/4/11 - 1/10/11	7.42	87.2	281	13	120	353	55	541	99	8	9	116	1.5	44	0.7
1/10/11 - 1/19/11	7.19	69.0	274	38	123	531	1,039	1,731	25	39	30	94	3.8	62	3.0
1/19/11 - 2/1/11	7.06	64.2	247	35	209	98	692	1,034	41	5	70	116	18.4	76	24.6
2/1/11 - 2/10/11	7.18	86.8	334	42	107	500	26	675	52	1	2	55	4.1	88	2.7
2/10/11 - 2/24/11	7.39	92.2	360	59	418	433	14	924	45	9	33	87	5.7	80	5.8
2/24/11 - 3/2/11	7.53	107	392	23	147	533	79	782	40	2	34	76	3.5	80	2.9
3/2/11 - 3/8/11	7.41	91.8	346	56	180	631	152	1,019	19	31	44	94	6.0	84	5.5
3/8/11 - 3/18/11	7.23	90.8	319	7	156	604	430	1,197	43	5	28	76	1.9	81	1.1
3/18/11 - 3/28/11	7.32	107	349	100	316	719	240	1,375	63	9	34	106	3.0	72	5.0
3/28/11 - 4/4/11	6.89	59.4	252	119	203	628	541	1,491	68	11	96	175	12.1	109	28.4
4/4/11 - 4/11/11	6.96	70.0	265	76	214	451	237	978	67	12	17	96	1.6	116	1.4

Chemical Characteristics of Inflow Samples Collected at Lockhart-Smith Site 3

Date Collected	pH (s.u.)	Alkalinity (mg/l)	Cond (µmho/cm)	Ammonia (µg/l)	NO_x-N (µg/l)	Diss Org N (µg/l)	Part N (µg/l)	Total N (µg/l)	SRP (µg/l)	Diss Org P (µg/l)	Part P (µg/l)	Total P (µg/l)	Turbidity (NTU)	Color (Pt-Co)	TSS (mg/l)
4/11/11 - 4/25/11	7.73	85.2	260	77	408	980	627	2,092	130	4	5	139	2.7	102	3.2
4/25/11 - 5/4/11	7.54	104	371	82	147	554	470	1,253	64	2	58	124	7.1	68	12.3
5/4/11 - 5/16/11	7.74	131	407	81	219	631	406	1,337	62	13	40	115	3.0	67	7.6
5/26/11 - 6/3/11	7.50	104	358	120	253	291	294	958	52	6	51	109	2.3	49	8.8
6/3/11 - 6/20/11	7.70	134	331	47	209	647	298	1,201	93	11	45	149	5.3	57	8.7
6/20/11 - 6/27/11	7.38	90.2	314	3	61	300	219	583	58	18	35	111	5.2	66	4.6
6/27/11 - 7/8/11	6.91	66.4	245	3	109	465	409	986	68	38	23	129	6.1	71	2.4
7/8/11 - 7/14/11	7.24	90.0	309	85	66	659	102	912	105	28	34	167	3.2	122	2.2
7/14/11 - 7/18/11	7.31	112	372	110	31	403	66	610	78	4	24	106	2.1	99	1.2
7/18/11 - 7/29/11	7.43	93.0	332	135	126	682	170	1,113	59	10	7	76	2.7	84	0.6
7/29/11 - 8/5/11	7.32	82.4	282	90	91	583	88	852	69	5	4	78	1.7	74	1.2
8/5/11 - 8/12/11	6.87	61.4	204	44	74	280	60	458	80	3	22	105	3.7	89	2.2
8/12/11 - 8/17/11	6.97	75.6	252	54	160	197	121	532	83	1	15	99	1.9	102	1.4
8/17/11 - 8/29/11	6.86	58.2	200	77	298	583	145	1,103	117	19	15	151	1.1	169	0.9
8/29/11 - 9/9/11	7.12	91.6	298	58	199	402	53	712	96	1	1	98	1.2	135	1.2
9/9/11 - 9/16/11	7.63	94.0	306	11	216	476	69	772	78	6	58	142	4.0	128	17.0
9/16/11 - 9/23/11	7.25	74.4	256	43	124	368	35	570	60	2	20	82	5.2	84	2.1
9/23/11 - 10/4/11	7.09	59.0	199	25	278	391	70	764	103	31	77	211	17.0	112	43.2
10/4/11 - 10/11/11	6.76	47.4	198	15	125	452	88	680	79	10	174	263	22.2	207	63.6
10/11/11 - 10/19/11	6.82	65.4	240	22	153	389	40	604	66	7	13	86	1.8	184	1.9
10/19 - 10/28/11	7.56	85.0	314	10	186	421	92	709	59	9	155	223	20.9	161	48.4
10/28/11 - 11/4/11	7.35	75.2	248	13	114	385	103	615	35	12	45	92	10.0	103	9.5
11/4/11 - 11/14/11	7.38	90.2	221	73	229	551	453	1,306	52	8	19	79	2.6	124	1.2
11/14/11 - 11/29/11	7.38	112	369	13	176	142	197	528	51	3	41	95	6.2	91	6.2
11/29/11 - 12/9/11	7.29	117	409	24	183	369	36	612	49	2	24	75	3.6	82	3.7
12/9/11 - 12/16/11	7.77	108	350	10	338	82	597	1,027	57	12	91	160	10.2	91	16.1
12/16/11 - 12/23/11	7.35	115	405	19	210	328	226	783	42	5	26	73	6.2	81	4.1
12/23/11 - 12/31/11	7.46	127	437	15	256	512	130	913	35	1	3	39	6.3	68	8.8
12/31/11 - 1/6/12	7.32	123	459	28	236	216	212	692	33	11	9	53	3.7	64	1.2
1/6/12 - 1/13/12	7.36	127	468	49	294	83	24	450	42	16	33	91	3.7	71	1.1
1/13/12 - 1/19/12	7.25	123	484	89	274	115	28	506	40	11	26	77	3.3	71	1.0
1/19/12 - 2/6/12	7.69	121	438	53	412	128	20	613	46	5	22	73	1.8	71	1.3
2/6/12 - 2/14/12	7.75	110	432	31	299	55	33	418	93	4	6	103	4.4	87	1.0
2/14/12 - 2/22/12	7.53	123	435	24	286	29	37	376	70	4	4	78	3.3	83	2.0
2/22/12 - 3/2/12	7.32	135	441	38	208	75	42	363	69	4	28	101	4.2	76	2.7
3/2/12 - 3/7/12	7.33	129	460	16	189	30	10	245	74	5	10	89	4.4	76	0.7
3/7/12 - 3/13/12	7.38	78.0	310	32	184	101	33	350	59	8	64	131	6.5	71	7.6
3/13/12 - 3/20/12	7.76	93.8	352	47	68	128	43	286	25	7	102	134	12.1	92	33.9
3/20/12 - 3/26/12	7.42	125	422	19	83	117	10	229	82	14	54	150	2.3	80	1.4
3/26/12 - 4/4/12	7.82	136	412	9	177	538	73	797	79	9	54	142	10.0	60	17.0
Minimum Value:	**6.74**	**47.4**	**176**	**3**	**3**	**29**	**10**	**229**	**11**	**1**	**1**	**39**	**0.6**	**43**	**0.6**
Maximum Value:	**7.82**	**136**	**484**	**479**	**523**	**980**	**2736**	**3378**	**130**	**67**	**556**	**584**	**72.2**	**207**	**217**
Median Value:	**7.30**	**90.0**	**307**	**38**	**147**	**418**	**106**	**740**	**58**	**8**	**29**	**101**	**3.7**	**84**	**3.7**
Gemoetric Mean:	**7.25**	**88.2**	**301**	**36**	**103**	**322**	**113**	**747**	**53**	**7**	**27**	**106**	**4.4**	**84**	**4.9**

C.5 Site 4

Chemical Characteristics of Inflow Samples Collected at Lockhart-Smith Site 4

Date Collected	pH (s.u.)	Alkalinity (mg/l)	Cond (µmho/cm)	Ammonia (µg/l)	NO_x-N (µg/l)	Diss Org N (µg/l)	Part N (µg/l)	Total N (µg/l)	SRP (µg/l)	Diss Org P (µg/l)	Part P (µg/l)	Total P (µg/l)	Turbidity (NTU)	Color (Pt-Co)	TSS (mg/l)
4/20/10 - 4/28/10	7.22	135	352	213	33	597	101	944	203	49	61	313	2.4	25	5.0
4/28/10 - 5/5/10	7.93	141	339	54	1,036	819	897	2,806	382	59	393	834	19.5	143	43.4
5/13/10 - 5/18/10	7.32	139	363	429	111	920	193	1,653	185	28	65	278	3.4	113	3.8
5/18/10-5/25/10	7.97	134	321	60	288	791	264	1,403	265	54	70	389	1.9	121	4.1
5/31/10 - 6/09/10	7.42	161	389	340	25	1,046	259	1,670	243	43	79	365	1.6	120	4.6
6/9/10 - 6/26/10	7.38	110	267	371	16	961	26	1,374	199	44	6	249	1.1	77	1.3
6/30/10 - 7/8/10	7.22	102	352	89	95	656	65	905	205	43	45	293	1.7	108	4.6
7/14/10 - 7/21/10	7.32	142	339	66	191	679	277	1,213	228	41	51	320	0.4	111	0.6
7/21/10 - 7/28/10	7.00	153	482	193	119	940	70	1,322	154	56	37	247	1.1	84	1.1
8/2/10 - 8/11/10	7.22	97	228	27	65	172	499	763	118	54	42	214	2.1	89	2.1
8/11/10 - 8/17/10	7.88	129	400	32	249	654	122	1,057	193	32	17	242	0.6	110	0.8
8/17/10 - 8/25/10	8.05	146	374	43	470	196	412	1,121	196	38	103	337	11.0	109	5.4
9/2/10 - 9/9/10	7.32	119	296	168	409	1,072	254	1,903	149	65	6	220	5.1	92	13.0
1/10/11 - 1/19/11	7.44	81	383	39	165	2,131	30	2,365	130	55	25	210	2.1	52	1.3
1/19/11 - 2/1/11	7.73	84	246	59	795	494	198	1,546	170	53	64	287	1.4	68	1.3
2/1/11 - 4/4/11	7.10	77	203	173	55	219	644	1,091	166	24	32	222	2.1	75	2.0
4/25/11 - 7/8/11	7.13	95	243	30	230	211	735	1,206	80	23	31	134	1.9	81	2.0
7/8/11 - 8/12/11	7.14	91	201	52	235	402	379	1,068	87	19	36	142	2.1	77	4.3
8/17/11 - 8/29/11	7.61	95	219	93	269	655	273	1,290	129	39	22	190	3.4	113	4.5
8/29/11 - 10/4/11	7.65	80	155	36	354	319	22	731	112	4	15	131	0.8	59	0.8
10/4/11 - 10/11/11	7.29	99	208	38	159	315	62	574	149	20	11	180	1.7	92	2.1
10/11/11 - 10/19/11	8.05	139	314	30	177	469	77	753	224	51	65	340	3.8	144	6.5
Minimum Value:	**7.00**	**77.4**	**155**	**27**	**16**	**172**	**22**	**574**	**80**	**4**	**6**	**131**	**0.4**	**25**	**0.6**
Maximum Value:	**8.05**	**161**	**482**	**429**	**1,036**	**2,131**	**897**	**2,806**	**382**	**65**	**393**	**834**	**19.5**	**144**	**43.4**
Median Value:	**7.35**	**115**	**318**	**60**	**184**	**655**	**226**	**1,210**	**178**	**43**	**40**	**248**	**2.0**	**92**	**3.0**
Gemoetric Mean:	**7.47**	**113**	**292**	**79**	**160**	**552**	**167**	**1,216**	**169**	**36**	**37**	**255**	**2.1**	**88**	**2.9**

C.6 Site 5

Chemical Characteristics of Inflow Samples Collected at Lockhart-Smith Site 5

Date Collected	pH (s.u.)	Alkalinity (mg/l)	Cond (µmho/cm)	Ammonia (µg/l)	NO_x-N (µg/l)	Diss Org N (µg/l)	Part N (µg/l)	Total N (µg/l)	SRP (µg/l)	Diss Org P (µg/l)	Part P (µg/l)	Total P (µg/l)	Turbidity (NTU)	Color (Pt-Co)	TSS (mg/l)
4/12/10 - 4/20/10	7.16	98.6	336	50	37	665	95	847	73	13	39	125	5.7	105	8.2
4/20/10 - 4/28/10	7.16	81.4	278	38	67	254	314	673	77	9	184	270	20.6	94	47.2
4/28/10 - 5/5/10	7.07	80.8	254	8	30	568	92	698	85	11	228	324	1.3	122	1.2
5/15/10 - 05/13/10	7.35	89.4	313	19	40	446	466	971	97	5	273	375	22.5	105	56.0
5/13/10 - 5/18/10	7.38	95.8	296	71	240	183	442	936	90	7	285	382	15.3	89	37.3
5/18/10 - 5/25/10	7.02	73.8	279	33	12	628	285	958	84	13	156	253	9.7	97	22.6
5/25/10 - 5/31/10	7.29	86.4	297	9	7	650	493	1,159	80	2	111	193	4.9	88	18.3
5/31/10 - 6/09/10	7.06	91.8	300	58	32	567	701	1,358	78	18	356	452	35.6	76	73.4
6/9/10 - 6/26/10	7.19	86.6	313	47	81	604	611	1,343	93	4	222	319	1.3	82	0.9
6/26/10 - 6/30/10	7.36	90.0	326	40	130	781	740	1,691	82	9	227	318	38.7	88	66.4
6/30/10 - 7/8/10	7.14	65.0	280	33	243	663	610	1,549	93	18	197	308	9.9	121	27.4
7/08/10 - 7/14/10	6.89	74.8	261	35	53	524	630	1,242	92	10	9	111	2.7	126	3.3
7/14/10 - 7/21/10	7.36	74.8	265	13	111	635	700	1,459	60	20	74	154	38.0	127	77.5
7/21/10 - 7/28/10	6.86	93.8	339	44	60	610	840	1,554	71	34	22	127	1.5	93	2.7
7/28/10 - 8/2/10	7.10	105	340	23	44	809	921	1,797	65	7	60	132	5.3	89	13.0
8/2/10 - 8/11/10	7.27	83.6	282	31	48	568	364	1,011	53	16	122	191	15.2	78	60.4
8/11/10 - 8/17/10	7.03	68.2	316	34	164	444	492	1,134	92	12	49	153	29.6	101	67.4
8/17/10 - 8/25/10	7.15	74.8	272	40	151	489	144	824	98	7	144	249	15.7	87	34.2
8/25/10 - 9/2/10	7.06	74.4	279	38	317	449	241	1,045	97	7	69	173	16.7	103	43.7
9/2/10 - 9/9/10	6.92	66.6	252	27	95	855	53	1,030	47	56	62	165	4.0	69	7.8
9/9/10 - 9/16/10	7.16	60.8	239	52	88	247	179	566	78	2	72	152	2.0	117	7.2
9/16/10 - 9/23/10	7.36	75.0	259	55	222	289	120	686	105	13	98	216	12.2	91	28.9
9/23/10 - 9/28/10	7.10	84.4	303	43	93	436	137	709	111	5	105	221	1.3	94	2.9
9/28/10 - 10/6/10	7.22	80.0	302	22	201	799	276	1,298	86	11	182	279	15.4	21	40.4
10/6/10 - 10/13/10	7.33	92.0	328	34	131	430	248	843	89	4	162	255	15.4	89	30.5
10/13/10 - 10/21/10	7.53	103	351	26	90	510	149	775	61	21	65	147	9.0	88	18.4
10/21/10 - 11/3/10	7.31	114	388	27	3	450	267	747	5	40	24	69	1.2	51	1.1
11/3/10 - 11/11/10	7.35	80.2	323	38	31	580	197	846	40	6	4	50	1.0	73	0.5
11/11/10 - 11/19/10	7.43	98.4	370	60	45	564	125	794	46	5	59	110	0.8	69	12.6
11/19/10 - 12/3/10	7.38	101	341	43	112	105	63	323	36	3	59	98	6.2	58	16.3
12/3/10 - 12/9/10	7.25	101	351	46	44	170	44	304	32	3	84	119	12.9	53	18.0
12/9/10 - 12/15/10	7.42	110	375	45	40	184	98	367	25	11	107	143	8.8	56	30.8
12/15/10 - 12/23/10	7.54	106	310	5	48	228	38	319	47	1	8	56	2.1	51	4.1
12/23/10 - 1/4/11	7.80	125	366	9	100	341	146	596	36	1	61	98	6.1	69	42.7
1/4/11 - 1/10/11	7.51	94.6	326	7	48	391	32	478	47	3	48	98	2.2	53	4.3
1/10/11 - 1/19/11	7.47	88.6	343	133	20	715	763	1,631	27	33	100	160	1.5	58	2.0
1/19/11 - 2/1/11	7.46	74.8	318	25	53	370	160	608	34	4	6	44	2.4	79	5.7
2/1/11 - 2/10/11	7.16	93.6	354	31	262	224	192	709	54	11	14	79	1.6	84	2.2
2/10/11 - 2/24/11	7.33	94.0	376	69	35	180	721	1,005	36	10	126	172	14.0	77	33.5

Chemical Characteristics of Inflow Samples Collected at Lockhart-Smith Site 5

Date Collected	pH (s.u.)	Alkalinity (mg/l)	Cond (µmho/cm)	Ammonia (µg/l)	NO_x-N (µg/l)	Diss Org N (µg/l)	Part N (µg/l)	Total N (µg/l)	SRP (µg/l)	Diss Org P (µg/l)	Part P (µg/l)	Total P (µg/l)	Turbidity (NTU)	Color (Pt-Co)	TSS (mg/l)
2/24/11 - 3/2/11	7.28	105	399	32	14	464	112	622	60	6	21	87	4.6	76	12.0
3/2/11 - 3/8/11	7.70	95.0	356	58	3	505	293	859	29	28	108	165	13.3	88	28.3
3/8/11 - 3/18/11	7.37	93.4	369	32	92	490	474	1,088	60	2	149	211	22.9	90	37.5
3/18/11 - 3/28/11	7.40	107	376	73	196	818	163	1,250	89	6	84	179	7.7	84	18.4
3/28/11 - 4/4/11	7.13	66.2	297	77	226	909	322	1,534	74	6	33	113	10.1	95	16.1
4/4/11 - 4/11/11	6.99	72.2	265	76	181	838	387	1,482	98	15	59	172	3.7	112	13.6
4/11/11 - 4/25/11	7.34	94.6	366	74	145	940	318	1,477	160	13	47	220	6.2	96	14.9
4/25/11 - 5/4/11	7.38	109	401	70	156	790	973	1,989	187	10	56	253	6.9	76	14.2
5/4/11 - 5/16/11	7.35	121	368	87	294	344	419	1,144	142	10	91	243	2.9	62	6.6
5/26/11 - 6/3/11	7.20	120	392	339	25	464	207	1,035	130	13	35	178	3.5	55	3.7
6/3/11 - 6/20/11	7.59	109	376	8	64	711	96	879	7	4	34	45	2.7	47	2.4
6/21/11 - 6/27/11	7.33	117	413	8	33	745	78	864	124	10	9	143	3.2	72	3.6
6/27/11 - 7/8/11	6.95	64.8	263	3	110	70	503	686	80	6	56	142	3.1	81	4.2
7/8/11 - 7/14/11	7.27	84.8	332	46	28	418	159	651	61	32	19	112	1.5	88	2.9
7/14/11 - 7/18/11	7.39	101	360	89	33	445	119	686	87	21	23	131	4.7	95	10.8
7/18/11 - 7/29/11	7.38	94.6	376	111	33	413	347	904	83	22	35	140	2.9	77	8.0
7/29/11 - 8/5/11	7.34	118	327	52	13	618	106	789	96	12	9	117	4.6	91	8.3
8/5/11 - 8/12/11	7.43	86.2	307	54	21	522	130	727	60	23	30	113	1.8	68	2.8
8/12/11 - 8/17/11	7.08	81.8	319	102	12	498	50	662	83	9	11	103	2.7	114	3.6
8/17/11 - 8/29/11	7.07	83.2	281	114	8	586	84	792	95	13	19	127	2.4	149	6.0
8/29/11 - 9/9/11	7.02	87.8	428	136	15	409	208	768	100	5	13	118	1.5	124	4.6
9/9/11 - 9/16/11	7.49	102	330	16	31	354	188	589	78	4	69	151	5.2	128	9.8
9/16/11 - 9/23/11	6.58	84.4	294	69	21	435	182	707	81	2	35	118	3.0	101	2.3
9/23/11 - 10/4/11	7.05	101.0	320	51	51	223	131	456	93	2	6	101	1.2	120	2.7
10/4/11 - 10/11/11	7.04	62.8	235	30	44	442	102	618	71	3	34	108	3.2	158	7.3
10/11/11 - 10/19/11	7.04	69.4	261	59	26	473	92	650	62	7	47	116	4.1	180	10.0
10/19/11 - 10/28/11	7.41	88.8	334	41	48	441	173	703	45	10	28	83	4.0	158	6.8
10/28/11 - 11/4/11	7.10	86.6	332	29	24	482	166	701	45	6	24	75	3.4	129	4.4
11/4/11 - 11/14/11	7.39	92.0	231	10	30	557	337	934	44	5	20	69	6.7	127	11.7
11/14/11 - 11/29/11	7.67	109	355	3	6	101	226	336	38	3	55	96	8.2	115	17.8
11/29/11 - 12/9/11	7.55	77.4	332	17	34	427	573	1,051	43	5	30	78	6.3	98	11.4
12/9/11 - 12/16/11	7.40	111	398	11	23	461	488	983	47	4	129	180	17.0	94	37.3
12/16/11 - 12/23/11	7.38	116	414	12	62	386	236	696	49	6	107	162	17.2	85	35.8
12/23/11 - 12/31/11	7.54	123	427	11	51	628	105	795	40	2	10	52	10.2	79	20.9
12/31/11 - 1/6/12	7.61	125	462	30	75	375	82	562	41	20	43	104	15.5	74	26.5
1/6/12 - 1/13/12	7.45	115	441	21	27	81	41	170	34	13	76	123	13.5	71	33.8
1/13/12 - 1/19/12	7.49	122	460	36	69	99	57	261	32	10	62	104	10.7	71	23.3
1/19/12 - 2/6/12	7.83	122	449	48	74	102	28	252	39	2	35	76	5.9	70	9.7

Chemical Characteristics of Inflow Samples Collected at Lockhart-Smith Site 5

Date Collected	pH (s.u.)	Alkalinity (mg/l)	Cond (µmho/cm)	Ammonia (µg/l)	NO_x-N (µg/l)	Diss Org N (µg/l)	Part N (µg/l)	Total N (µg/l)	SRP (µg/l)	Diss Org P (µg/l)	Part P (µg/l)	Total P (µg/l)	Turbidity (NTU)	Color (Pt-Co)	TSS (mg/l)
2/6/12 - 2/14/12	7.56	116	475	3	25	62	30	120	98	6	2	106	8.7	91	16.2
2/14/12 - 2/22/12	7.72	117	444	10	17	59	13	99	58	11	4	73	1.9	87	1.3
2/22/12 - 3/2/12	7.55	119	454	27	65	52	168	312	51	3	11	65	7.6	172	7.0
3/2/12 - 3/7/12	7.84	126	473	7	14	95	39	155	56	4	70	130	8.4	84	18.9
3/7/12 - 3/13/12	7.42	116	444	3	18	96	10	127	55	2	5	62	7.4	80	12.2
3/13/12 - 3/20/12	7.69	92	426	29	20	88	21	158	65	8	44	117	5.2	77	8.1
3/20/12 - 3/26/12	7.33	123	449	20	166	21	5	212	55	34	33	122	2.2	54	2.5
3/26/12 - 4/4/12	7.42	132	438	12	65	295	66	438	84	1	63	148	8.5	68	11.5
Minimum Value:	**6.58**	**60.8**	**231**	**3**	**3**	**21**	**5**	**99**	**5**	**1**	**2**	**44**	**0.8**	**21**	**0.5**
Maximum Value:	**7.84**	**132**	**475**	**339**	**317**	**940**	**973**	**1,989**	**187**	**56**	**356**	**452**	**38.7**	**180**	**77.5**
Median Value:	**7.35**	**93.8**	**334**	**34**	**48**	**446**	**173**	**775**	**65**	**7**	**56**	**130**	**5.7**	**88**	**11.7**
Gemoetric Mean:	**7.31**	**93.5**	**338**	**30**	**48**	**354**	**166**	**694**	**62**	**7**	**45**	**135**	**5.5**	**86**	**10.5**

C.7 Bulk Precipitation Samples

Chemical Characteristics of Bulk Precipitation Samples Collected at the Lockhart-Smith RSF

Date Collected	pH (s.u.)	Alkalinity (mg/l)	Cond (µmho/cm)	Ammonia (µg/l)	NO_x-N (µg/l)	Diss Org N (µg/l)	Part N (µg/l)	Total N (µg/l)	SRP (µg/l)	Diss Org P (µg/l)	Part P (µg/l)	Total P (µg/l)	Turbidity (NTU)	Color (Pt-Co)	TSS (mg/l)
04/18/10-04/19/10	5.78	4.2	48	133	547	495	7	1,182	8	3	20	31	3.0	7	10.0
04/20/10-04/28/10	5.34	2.4	10	169	183	71	69	492	1	1	7	9	2.1	3	6.0
5/13/10 - 5/18/10	5.38	4.4	12	114	164	84	17	379	1	1	4	6	2.0	4	1.2
05/31/10-06/09/10	4.87	1.2	10	73	17	190	38	318	2	2	2	6	0.5	1	1.3
6/9 - 6/26/10	5.30	2.4	218	33	12	277	59	381	1	16	13	30	1.5	1	1.9
6/30 - 7/8/10	4.84	0.6	13	22	12	169	33	236	16	2	1	19	0.9	12	3.3
07/14/10-07/21/10	5.67	3.2	22	110	374	217	29	730	4	4	10	18	1.6	1	2.2
7/28/10 - 8/2/10	6.60	43.0	151	399	281	831	846	2,357	58	32	40	130	9.1	17	25.5
8/2/10 - 8/11/10	5.07	2.0	18	18	59	466	131	674	1	13	3	17	0.8	4	1.4
8/11/10 - 8/17/10	5.55	2.2	12	453	148	348	283	1,232	49	4	92	145	1.2	7	2.3
8/17/10 - 8/25/10	5.45	2.2	14	48	157	433	39	677	21	2	19	42	0.3	28	61.2
8/25/10 - 9/2/10	5.91	3.2	34	428	240	566	106	1,340	94	9	74	177	1.3	36	6.3
9/2/10 - 9/9/10	5.73	4.2	30	279	130	769	146	1,324	37	4	30	71	0.7	11	1.0
9/16/10 - 9/23/10	6.65	5.8	43	70	167	615	102	954	21	1	6	28	0.8	8	2.0
9/28/10 - 10/6/10	5.82	4.2	23	173	145	160	36	514	20	11	9	40	0.6	8	1.1
10/6/10 - 11/3/10	5.52	4.2	34	90	348	130	69	637	20	20	19	59	1.0	6	7.0
11/3/10 - 11/11/10	5.71	3.0	34	143	151	177	87	558	6	1	7	14	1.6	3	4.9
11/11/10 - 12/3/10	5.97	4.4	67	110	586	221	228	1,145	11	2	72	85	9.3	6	51.5
12/3/10 - 12/23/10	6.99	70.4	19	235	466	233	871	1,805	691	160	183	1,034	6.7	35	7.0
12/23/10 - 1/10/11	6.56	15.8	65	231	463	165	1,450	2,309	776	143	68	987	3.9	16	6.0
1/10/11 - 1/19/11	5.81	5.8	17	27	299	437	1,141	1,904	227	55	82	364	1.2	10	2.6
1/19/11 - 2/1/11	5.51	4.2	27	67	39	182	186	474	267	42	53	362	1.4	9	4.8
2/1/11 - 2/10/11	5.64	3.0	54	247	533	502	186	1,468	409	144	115	668	7.0	10	5.0
3/2/11	5.81	6.8	50	357	355	647	217	1,576	220	19	45	284	2.8	8	4.0
3/2/11 - 3/8/11	6.81	25.4	133	406	10	213	80	709	159	34	23	216	2.1	15	2.5
3/8/11 - 3/18/11	6.63	20.8	129	81	213	5	358	657	149	45	12	206	1.5	21	1.4
3/18/11 - 4/4/11	5.34	1.8	25	173	193	172	51	589	2	2	17	21	1.9	3	0.9
4/4/11 - 4/11/11	5.14	1.2	20	125	113	95	133	466	6	3	12	21	0.7	5	2.2
5/26/11 - 6/3/11	6.74	43.8	146	229	308	235	749	1,521	29	3	9	41	1.5	7	1.2
6/3/11 - 6/20/11	6.05	14.6	133	166	120	103	631	1,020	24	3	12	39	3.7	38	2.0
6/21/11 - 6/27/11	5.73	4.2	30	35	322	27	253	637	11	9	8	28	0.7	4	0.9
4/25/11 - 7/8/11	5.55	1.8	17	3	7	256	11	277	6	1	9	16	0.7	1	1.3
7/8/11 - 7/14/11	5.37	3.8	25	76	168	16	493	753	3	3	15	21	2.1	29	1.2
7/29/11	5.76	2.8	28	136	54	240	187	617	42	2	34	78	0.4	7	1.5
7/29/11 - 8/5/11	5.34	1.6	22	5	204	163	41	413	7	1	18	26	0.7	9	0.8
8/5/11 - 8/12/11	5.43	4.4	16	53	76	78	51	258	3	1	6	10	0.7	5	0.6
8/17/11 - 8/29/11	5.26	4.6	22	169	8	139	39	355	17	2	7	26	0.5	6	0.6
8/29/11 - 9/9/11	5.47	4.0	17	161	271	327	11	770	17	34	16	67	1.1	10	1.2
9/9/11 - 9/23/11	5.04	2.0	16	69	90	59	48	266	14	13	1	28	0.4	5	1.2
9/23/11 - 10/4/11	5.62	6.2	21	71	264	90	180	605	2	10	1	13	0.3	4	0.8
10/4/11 - 10/11/11	5.41	3.2	37	67	44	68	5	184	13	6	4	23	0.5	7	1.9

Chemical Characteristics of Bulk Precipitation Samples Collected at the Lockhart-Smith RSF

Date Collected	pH (s.u.)	Alkalinity (mg/l)	Cond (µmho/cm)	Ammonia (µg/l)	NO_x-N (µg/l)	Diss Org N (µg/l)	Part N (µg/l)	Total N (µg/l)	SRP (µg/l)	Diss Org P (µg/l)	Part P (µg/l)	Total P (µg/l)	Turbidity (NTU)	Color (Pt-Co)	TSS (mg/l)
10/11/11 - 11/4/11	5.58	3.8	43	348	157	359	294	1,158	99	3	15	117	1.8	10	2.0
11/4/11 - 12/16/11	5.79	3.6	99	210	317	257	336	1,120	5	2	19	26	1.4	19	2.0
12/16/11 - 2/14/12	5.62	2.4	39	283	349	18	22	672	77	58	6	141	5.4	12	1.7
2/14/12 - 3/2/12	5.87	3.4	48	28	385	29	38	480	1	1	9	11	0.9	7	0.8
3/7/12 - 3/13/12	7.16	28.0	90	34	100	11	46	191	17	5	5	27	3.9	6	3.0
Minimum Value:	**4.84**	**0.6**	**10**	**3**	**7**	**5**	**5**	**184**	**1**	**1**	**1**	**6**	**0.3**	**1**	**0.6**
Maximum Value:	**7.16**	**70.4**	**218**	**453**	**586**	**831**	**1,450**	**2,357**	**776**	**160**	**183**	**1,034**	**9.3**	**38**	**61.2**
Median Value:	**5.63**	**3.9**	**29**	**120**	**168**	**186**	**95**	**665**	**17**	**4**	**13**	**31**	**1.4**	**7**	**2.0**
Gemoetric Mean:	**5.72**	**4.5**	**33**	**99**	**133**	**157**	**99**	**681**	**17**	**6**	**13**	**49**	**1.4**	**7**	**2.4**

APPENDIX D

LABORATORY QUALITY ASSURANCE DATA

D.1 Precision
D.2 Accuracy
D.3 Control Standard Recovery
D.4 Continuing Calibration Verification
D.5 Method Blanks

D.1 Precision

Sample Duplicate Recovery

FOR LOCKHART-SMITH COLLECTED FROM

April 2010 to April 2012

PARAMETER	UNITS	SAMPLE ID	SAMPLE DESCRIPTION	DATE COLLECTED	DATE RECEIVED	DATE ANALYZED	REPEAT 1	REPEAT 2	MEAN	s	% RELATIVE STD. DEVIATION (RSD)	ACCEPTANCE RANGE (% RSD)
pH	s.u.	10-1387	Rain	5/31 - 6/9/10	6/9/10	06/11/10	4.87	4.86	4.87	0.01	0.15	0 - 0.9
pH	s.u.	10-1278	Site #5	5/25 - 5/31/10	5/31/10	06/04/10	7.29	7.31	7.30	0.01	0.19	0 - 0.9
pH	s.u.	10-2290	Rain Blank	09/02/10	9/2/10	09/07/10	5.76	5.72	5.74	0.03	0.49	0 - 0.9
pH	s.u.	10-2284	Rain	8/25 – 9/2/10	9/2/10	09/07/10	5.91	5.90	5.91	0.01	0.12	0 - 0.9
pH	s.u.	10-1393	Rain Blank	06/09/10	6/9/10	06/11/10	5.71	5.72	5.72	0.01	0.12	0 - 0.9
pH	s.u.	10-2412	Site #5	9/9 – 9/16/10	9/16/10	09/20/10	7.16	7.19	7.18	0.02	0.30	0 - 0.9
pH	s.u.	10-2338	Rain	9/2 – 9/9/10	9/9/10	09/10/10	5.61	5.59	5.60	0.01	0.25	0 - 0.9
pH	s.u.	10-1490	Site #2	6/9 - 6/26/10	6/26/10	06/29/10	5.30	5.28	5.29	0.01	0.27	0 - 0.9
pH	s.u.	10-0852	Rain Blank	04/08/10	4/8/10	04/13/10	5.49	5.50	5.50	0.01	0.13	0 - 0.9
pH	s.u.	10-1071	Rain Blank	05/05/10	5/5/10	05/07/10	5.56	5.57	5.57	0.01	0.13	0 - 0.9
pH	s.u.	10-2769	Site #5	10/13 – 10/21/10	10/21/10	10/26/10	7.53	7.51	7.52	0.01	0.19	0 - 0.9
pH	s.u.	10-1600	Site #5	6/26 - 6/30/10	6/30/10	07/06/10	7.36	7.37	7.37	0.01	0.10	0 - 0.9
pH	s.u.	10-0972	Rain	4/20 - 4/28/10	4/28/10	04/30/10	5.34	5.36	5.35	0.01	0.26	0 - 0.9
pH	s.u.	10-1915	Rain	7/28 - 8/2/10	8/2/10	08/04/10	6.60	6.63	6.62	0.02	0.32	0 - 0.9
pH	s.u.	10-2543	Site #5	9/16 – 9/23/10	9/23/10	10/04/10	7.36	7.35	7.36	0.01	0.10	0 - 0.9
pH	s.u.	10-2334	Site #2	9/2 – 9/9/10	9/9/10	09/10/10	7.19	7.22	7.21	0.02	0.29	0 - 0.9
pH	s.u.	10-1219	Site #2	5/18 - 5/25/10	5/25/10	05/27/10	7.22	7.25	7.24	0.02	0.29	0 - 0.9
pH	s.u.	10-2183	Rain	8/17 - 8/25/10	8/25/10	08/30/10	5.45	5.45	5.45	0.00	0.00	0 - 0.9
pH	s.u.	10-1222	Site #5	5/18 - 5/25/10	5/25/10	05/27/10	7.02	7.00	7.01	0.01	0.20	0 - 0.9
pH	s.u.	10-1486	Site #2	6/9 - 6/26/10	6/26/10	06/29/10	7.36	7.35	7.36	0.01	0.10	0 - 0.9
pH	s.u.	10-1133	Site #5	5/5 - 5/13/10	5/13/10	05/17/10	7.35	7.37	7.36	0.01	0.19	0 - 0.9
pH	s.u.	10-2699	Site #5	10/6 – 10/13/10	10/13/10	10/14/10	7.33	7.30	7.32	0.02	0.29	0 - 0.9
pH	s.u.	10-2659	Rain Blank	10/06/10	10/6/10	10/07/10	5.65	5.63	5.64	0.01	0.25	0 - 0.9
pH	s.u.	10-0908	Rain	4/18 - 4/19/10	4/19/10	04/26/10	5.78	5.80	5.79	0.01	0.24	0 - 0.9
pH	s.u.	10-1681	Rain	6/30 - 7/8/10	7/8/10	07/12/10	4.84	4.85	4.85	0.01	0.13	0 - 0.9
pH	s.u.	10-2071	Rain	8/11 - 8/17/10	8/17/10	08/24/10	5.55	5.56	5.56	0.01	0.13	0 - 0.9
pH	s.u.	10-2179	Site #2	8/17 -8/25/10	8/25/10	08/30/10	7.21	7.23	7.22	0.01	0.20	0 - 0.9
pH	s.u.	10-2648	Site #1	9/28 – 10/6/10	10/6/10	10/07/10	7.29	7.27	7.28	0.01	0.19	0 - 0.9
pH	s.u.	10-3307	Site #5	12/3 - 12/9/10	12/9/10	12/13/10	7.25	7.25	7.25	0.00	0.00	0 - 0.9
pH	s.u.	10-3331	Site #5	12/9 - 12/15/10	12/15/10	12/21/10	7.42	7.40	7.41	0.01	0.19	0 - 0.9
pH	s.u.	11-0020	Rain Blank	01/04/11	1/6/11	01/06/11	4.87	4.86	4.87	0.01	0.15	0 - 0.9
pH	s.u.	11-0054	Rain	01/10/11	1/11/11	01/11/11	7.29	7.31	7.30	0.01	0.19	0 - 0.9
pH	s.u.	11-0209	Site #3	01/19/11	1/27/11	02/06/11	5.76	5.72	5.74	0.03	0.49	0 - 0.9
pH	s.u.	11-0377	Site #1	02/01/11	2/3/11	02/06/11	5.91	5.90	5.91	0.01	0.12	0 - 0.9
pH	s.u.	11-0387	Site #4 Blank	02/01/11	2/3/11	02/15/11	5.71	5.72	5.72	0.01	0.12	0 - 0.9
pH	s.u.	11-0798	Site #1	02/24/11	2/28/11	03/01/11	7.16	7.19	7.18	0.02	0.30	0 - 0.9
pH	s.u.	11-0802	Site #5 F.D.	02/24/11	2/28/11	03/07/11	5.61	5.59	5.60	0.01	0.25	0 - 0.9

Sample Duplicate Recovery

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April 2010 to April 2012

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pH	s.u.	11-0907	Rain	03/02/11	3/4/11	03/15/11	5.30	5.28	5.29	0.01	0.27	0 - 0.9
pH	s.u.	11-0913	Rain Blank	03/02/11	3/4/11	03/18/11	5.49	5.50	5.50	0.01	0.13	0 - 0.9
pH	s.u.	11-0988	Rain	03/08/11	3/9/11	04/11/11	5.56	5.57	5.57	0.01	0.13	0 - 0.9
pH	s.u.	11-1168	Site #2	03/18/11	3/21/11	05/09/11	7.53	7.51	7.52	0.01	0.19	0 - 0.9
pH	s.u.	11-1465	Site #5	04/04/11	4/7/11	06/08/11	7.36	7.37	7.37	0.01	0.10	0 - 0.9
pH	s.u.	11-1904	Rain Blank	05/04/11	5/5/11	07/12/11	5.34	5.36	5.35	0.01	0.26	0 - 0.9
pH	s.u.	11-2301	Rain Blank	06/03/11	6/6/11	07/18/11	6.60	6.63	6.62	0.02	0.32	0 - 0.9
pH	s.u.	11-2655	Rain	06/27/11	7/6/11	08/01/11	7.36	7.35	7.36	0.01	0.10	0 - 0.9
pH	s.u.	11-2821	Rain	07/08/11	7/12/11	08/09/11	7.19	7.22	7.21	0.02	0.29	0 - 0.9
pH	s.u.	11-2925	Site #5	07/18/11	7/21/11	08/16/11	7.22	7.25	7.24	0.02	0.29	0 - 0.9
pH	s.u.	11-3152	Rain	07/29/11	8/5/11	8/16/11	5.45	5.45	5.45	0.00	0.00	0 - 0.9
pH	s.u.	11-3255	Rain	08/05/11	8/12/11	08/09/11	7.02	7.00	7.01	0.01	0.20	0 - 0.9
pH	s.u.	11-3345	Rain	08/12/11	8/16/11	09/13/11	7.36	7.35	7.36	0.01	0.10	0 - 0.9
pH	s.u.	11-3744	Rain Blank	09/09/11	9/12/11	09/20/11	7.35	7.37	7.36	0.01	0.19	0 - 0.9
pH	s.u.	11-3916	Rain	09/23/11	9/26/11	09/26/11	7.33	7.30	7.32	0.02	0.29	0 - 0.9
pH	s.u.	11-4048	Rain	10/04/11	10/7/11	10/9/11	5.65	5.63	5.64	0.01	0.25	0 - 0.9
pH	s.u.	11-4312	Site #5	10/28/11	101/31/11	10/12/11	5.78	5.80	5.79	0.01	0.24	0 - 0.9
pH	s.u.	11-4407	Rain Blank	11/04/11	11/7/11	10/12/11	4.84	4.85	4.85	0.01	0.13	0 - 0.9
pH	s.u.	11-4623	Site #5	11/29/11	12/1/11	11/1/11	5.55	5.56	5.56	0.01	0.13	0 - 0.9
pH	s.u.	11-4720	Rain Blank	12/09/11	12/12/11	11/10/11	7.21	7.23	7.22	0.01	0.20	0 - 0.9
pH	s.u.	11-4820	Rain	12/16/11	12/19/11	11/16/11	7.29	7.27	7.28	0.01	0.19	0 - 0.9
pH	s.u.	11-4938	Site #5	12/23/11	12/27/11	12/04/11	7.25	7.25	7.25	0.00	0.00	0 - 0.9
pH	s.u.	12-0043	Rain Blank	01/06/12	1/6/12	01/10/12	5.59	5.61	5.60	0.01	0.25	0 - 0.9
pH	s.u.	12-0121	Site #5	1/6 - 1/13/12	1/13/12	01/15/12	7.45	7.48	7.47	0.02	0.28	0 - 0.9
pH	s.u.	12-0362	Site #3 Blank	02/06/12	2/6/12	02/07/12	5.64	5.67	5.66	0.02	0.38	0 - 0.9
pH	s.u.	12-0365	Rain Blank	02/06/12	2/6/12	02/07/12	5.62	5.61	5.62	0.01	0.13	0 - 0.9
pH	s.u.	12-0462	Rain	12/16 - 2/14/12	2/14/12	02/15/12	5.62	5.65	5.64	0.02	0.38	0 - 0.9
pH	s.u.	12-0602	Site #5	2/14 - 2/22/12	2/22/12	02/27/12	7.72	7.76	7.74	0.03	0.37	0 - 0.9
pH	s.u.	12-0688	Rain	03/02/12	3/2/12	03/05/12	5.87	5.85	5.86	0.01	0.24	0 - 0.9
pH	s.u.	12-0694	Rain Blank	03/02/12	3/2/12	03/05/12	5.60	5.61	5.61	0.01	0.13	0 - 0.9
pH	s.u.	12-0876	Site #1	3/13 - 3/20/12	3/20/12	03/21/12	7.44	7.48	7.46	0.03	0.38	0 - 0.9
pH	s.u.	12-0879	Site #5	3/13 - 3/20/12	3/20/12	03/21/12	7.69	7.67	7.68	0.01	0.18	0 - 0.9

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Alkalinity	mg/l	10-2338	Rain	9/2 – 9/9/10	9/9/10	09/10/10	4.0	4.0	4.0	0.0	0.0	0 - 2.8
Alkalinity	mg/l	10-2334	Site #2	9/2 – 9/9/10	9/9/10	09/10/10	92.2	92.8	92.5	0.4	0.5	0 - 2.8
Alkalinity	mg/l	10-1219	Site #2	5/18 - 5/25/10	5/25/10	05/27/10	80.6	80.0	80.3	0.4	0.5	0 - 2.8
Alkalinity	mg/l	10-1133	Site #5	5/5 - 5/13/10	5/13/10	05/17/10	89.4	88.8	89.1	0.4	0.5	0 - 2.8
Alkalinity	mg/l	10-2648	Site #1	9/28 – 10/6/10	10/6/10	10/07/10	65.2	65.8	65.5	0.4	0.6	0 - 2.8
Alkalinity	mg/l	10-2699	Site #5	10/6 – 10/13/10	10/13/10	10/14/10	92.0	91.4	91.7	0.4	0.5	0 - 2.8
Alkalinity	mg/l	10-2990	Rain Blank	09/02/10	9/2/10	09/07/10	0.4	0.4	0.4	0.0	0.0	0 - 2.8
Alkalinity	mg/l	10-0908	Rain	4/18 - 4/19/10	4/19/10	04/26/10	4.2	4.2	4.2	0.0	0.0	0 - 2.8
Alkalinity	mg/l	10-2412	Site #5	9/9 – 9/16/10	9/16/10	09/20/10	60.8	61.0	60.9	0.1	0.2	0 - 2.8
Alkalinity	mg/l	10-2769	Site #5	10/13 – 10/21/10	10/21/10	10/26/10	103.0	103.0	103.0	0.0	0.0	0 - 2.8
Alkalinity	mg/l	10-2659	Rain Blank	10/06/10	10/6/10	10/07/10	0.4	0.4	0.4	0.0	0.0	0 - 2.8
Alkalinity	mg/l	10-2884	Rain	8/25 – 9/2/10	9/2/10	09/07/10	3.2	3.1	3.2	0.1	2.2	0 - 2.8
Alkalinity	mg/l	10-2543	Site #5	9/16 – 9/23/10	9/23/10	10/04/10	75.0	75.8	75.4	0.6	0.8	0 - 2.8
Alkalinity	mg/l	10-2183	Rain	8/17 - 8/25/10	8/25/10	08/30/10	2.2	2.2	2.2	0.0	0.0	0 - 2.8
Alkalinity	mg/l	10-2179	Site #2	8/17 - 8/25/10	8/25/10	08/30/10	84.4	84.0	84.2	0.3	0.3	0 - 2.8
Alkalinity	mg/l	10-2071	Rain	8/11 - 8/17/10	8/17/10	08/24/10	2.2	2.2	2.2	0.0	0.0	0 - 2.8
Alkalinity	mg/l	10-0972	Rain	4/20 - 4/28/10	4/28/10	04/30/10	2.4	2.4	2.4	0.0	0.0	0 - 2.8
Alkalinity	mg/l	10-0852	Rain Blank	04/08/10	4/8/10	04/13/10	0.6	0.6	0.6	0.0	0.0	0 - 2.8
Alkalinity	mg/l	10-1071	Rain Blank	05/05/10	5/5/10	05/07/10	0.6	0.6	0.6	0.0	0.0	0 - 2.8
Alkalinity	mg/l	10-1681	Rain	6/30 - 7/8/10	7/8/10	07/12/10	0.6	0.6	0.6	0.0	0.0	0 - 2.8
Alkalinity	mg/l	10-1387	Rain	5/31 - 6/9/10	6/9/10	06/11/10	1.2	1.2	1.2	0.0	0.0	0 - 2.8
Alkalinity	mg/l	10-1278	Site #5	5/25 - 5/31/10	5/31/10	06/04/10	86.4	87.0	86.7	0.4	0.5	0 - 2.8
Alkalinity	mg/l	10-1222	Site #5	5/18 - 5/25/10	5/25/10	05/27/10	73.8	74.6	74.2	0.6	0.8	0 - 2.8
Alkalinity	mg/l	10-1600	Site #5	6/26 - 6/30/10	6/30/10	07/06/10	90.0	89.4	89.7	0.4	0.5	0 - 2.8
Alkalinity	mg/l	10-1490	Rain	6/9 - 6/26/10	6/26/10	06/29/10	2.4	2.4	2.4	0.0	0.0	0 - 2.8
Alkalinity	mg/l	10-1393	Rain Blank	06/09/10	6/9/10	06/11/10	0.6	0.6	0.6	0.0	0.0	0 - 2.8
Alkalinity	mg/l	10-1915	Rain	7/28 - 8/2/10	8/2/10	08/04/10	43.0	43.6	43.3	0.4	1.0	0 - 2.8
Alkalinity	mg/l	10-1486	Site #2	6/9 - 6/26/10	6/26/10	06/29/10	74.4	73.8	74.1	0.4	0.6	0 - 2.8
Alkalinity	mg/l	10-3307	Site #5	12/3 - 12/9/10	12/9/10	12/13/10	101.0	100.0	100.5	0.7	0.7	0 - 2.8
Alkalinity	mg/l	10-3331	Site #5	12/9 - 12/15/10	12/15/10	12/21/10	110.0	110.0	110.0	0.0	0.0	0 - 2.8
Alkalinity	mg/l	11-0907	Rain	2/10 - 3/2/11	3/2/11	03/04/11	6.8	6.6	6.7	0.1	2.1	0 - 2.8
Alkalinity	mg/l	11-0988	Rain	3/2 - 3/8/11	3/8/11	03/09/11	25.4	24.6	25.0	0.6	2.3	0 - 2.8
Alkalinity	mg/l	11-2655	Rain	6/21 - 6/27/11	6/27/11	07/06/11	4.2	4.2	4.2	0.0	0.0	0 - 2.8
Alkalinity	mg/l	11-2821	Rain	6/27 - 7/8/11	7/8/11	07/12/11	1.8	1.8	1.8	0.0	0.0	0 - 2.8
Alkalinity	mg/l	11-3152	Rain	7/14 - 7/29/11	7/29/11	08/05/11	2.8	2.8	2.8	0.0	0.0	0 - 2.8
Alkalinity	mg/l	11-3255	Rain	7/29 - 8/5/11	8/5/11	08/12/11	1.6	1.6	1.6	0.0	0.0	0 - 2.8
Alkalinity	mg/l	11-3345	Rain	8/5 - 8/12/11	8/12/11	08/16/11	4.4	4.4	4.4	0.0	0.0	0 - 2.8

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Alkalinity	mg/l	11-0054	Rain	12/23 - 1/10/11	1/10/11	01/11/11	15.8	15.1	15.4	0.4	2.8	0 - 2.8
Alkalinity	mg/l	11-0021	Rain Blank	01/04/11	1/4/11	01/06/11	0.6	0.6	0.6	0.0	0.0	0 - 2.8
Alkalinity	mg/l	11-0913	Rain Blank	03/02/11	3/2/11	03/04/11	0.6	0.6	0.6	0.0	0.0	0 - 2.8
Alkalinity	mg/l	11-1904	Rain Blank	05/04/11	5/4/11	05/05/11	0.4	0.4	0.4	0.0	0.0	0 - 2.8
Alkalinity	mg/l	11-2301	Rain Blank	06/03/11	6/3/11	06/06/11	0.6	0.6	0.6	0.0	0.0	0 - 2.8
Alkalinity	mg/l	11-3744	Rain Blank	09/09/11	9/9/11	09/12/11	0.4	0.4	0.4	0.0	0.0	0 - 2.8
Alkalinity	mg/l	11-0377	Site #1	1/19 - 2/1/11	2/1/11	02/03/11	81.8	81.2	81.5	0.4	0.5	0 - 2.8
Alkalinity	mg/l	11-0798	Site #1	2/10 - 2/24/11	2/24/11	02/28/11	87.8	87.6	87.7	0.1	0.2	0 - 2.8
Alkalinity	mg/l	11-1168	Site #2	3/8 - 3/18/11	3/18/11	03/21/11	110.0	109.0	109.5	0.7	0.6	0 - 2.8
Alkalinity	mg/l	11-0209	Site #3	1/10 - 1/19/10	1/19/11	01/27/11	69.0	70.2	69.6	0.8	1.2	0 - 2.8
Alkalinity	mg/l	11-0387	Site #4 Blank	02/01/11	2/1/11	02/03/11	0.6	0.6	0.6	0.0	0.0	0 - 2.8
Alkalinity	mg/l	11-2925	Site #5	7/14 - 7/18/11	7/18/11	07/21/11	101.0	100.0	100.5	0.7	0.7	0 - 2.8
Alkalinity	mg/l	11-1465	Site #5	3/28 - 4/4/11	4/4/11	04/07/11	66.2	65.4	65.8	0.6	0.9	0 - 2.8
Alkalinity	mg/l	11-0802	Site #5 F.D.	2/10 - 2/24/11	2/24/11	02/28/11	93.2	93.8	93.5	0.4	0.5	0 - 2.8
Alkalinity	mg/l	11-3916	Rain	9/9 - 9/23/11	9/23/11	09/26/11	2.0	2.0	2.0	0.0	0.0	0 - 2.8
Alkalinity	mg/l	11-4048	Rain	9/23 - 10/4/11	10/4/11	10/07/11	6.2	6.0	6.1	0.1	2.3	0 - 2.8
Alkalinity	mg/l	11-4321	Site #5	10/19 - 10/28/11	10/28/11	10/31/11	88.8	88.0	88.4	0.6	0.6	0 - 2.8
Alkalinity	mg/l	11-4407	Rain Blank	11/04/11	11/4/11	11/07/11	0.6	0.6	0.6	0.0	0.0	0 - 2.8
Alkalinity	mg/l	11-4623	Site #5	11/14 - 11/29/11	11/29/11	12/01/11	109.0	109.0	109.0	0.0	0.0	0 - 2.8
Alkalinity	mg/l	11-4720	Rain Blank	12/09/11	12/9/11	12/12/11	0.6	0.6	0.6	0.0	0.0	0 - 2.8
Alkalinity	mg/l	11-4820	Rain	11/4 - 12/16/11	12/16/11	12/19/11	3.6	3.6	3.6	0.0	0.0	0 - 2.8
Alkalinity	mg/l	11-4938	Site #5	12/16 - 12/23/11	12/23/11	12/27/11	116.0	117.0	116.5	0.7	0.6	0 - 2.8
Alkalinity	mg/l	12-0043	Rain Blank	01/06/12	1/6/12	01/10/12	0.4	0.4	0.4	0.0	0.0	0 - 2.8
Alkalinity	mg/l	12-0121	Site #5	1/6 - 1/13/12	1/13/12	01/15/12	115.0	115.0	115.0	0.0	0.0	0 - 2.8
Alkalinity	mg/l	12-0362	Site #3 Blank	02/06/12	2/6/12	02/07/12	0.6	0.6	0.6	0.0	0.0	0 - 2.8
Alkalinity	mg/l	12-0365	Rain Blank	02/06/12	2/6/12	02/07/12	0.6	0.6	0.6	0.0	0.0	0 - 2.8
Alkalinity	mg/l	12-0462	Rain	12/16 - 2/14/12	2/14/12	02/15/12	2.4	2.4	2.4	0.0	0.0	0 - 2.8
Alkalinity	mg/l	12-0602	Site #5	2/14 - 2/22/12	2/22/12	02/27/12	117.0	117.0	117.0	0.0	0.0	0 - 2.8
Alkalinity	mg/l	12-0688	Rain	03/02/12	3/2/12	03/05/12	3.4	3.4	3.4	0.0	0.0	0 - 2.8
Alkalinity	mg/l	12-0694	Rain Blank	03/02/12	3/2/12	03/05/12	0.6	0.6	0.6	0.0	0.0	0 - 2.8
Alkalinity	mg/l	12-0876	Site #1	3/13 - 3/20/12	3/20/12	03/21/12	122.0	123.0	122.5	0.7	0.6	0 - 2.8
Alkalinity	mg/l	12-0879	Site #5	3/13 - 3/20/12	3/20/12	03/21/12	91.6	90.4	91.0	0.8	0.9	0 - 2.8

Sample Duplicate Recovery

FOR LOCKHART-SMITH COLLECTED FROM

April 2010 to April 2012

PARAMETER	UNITS	SAMPLE ID	SAMPLE DESCRIPTION	DATE COLLECTED	DATE RECEIVED	DATE ANALYZED	REPEAT 1	REPEAT 2	MEAN	s	% RELATIVE STD. DEVIATION (RSD)	ACCEPTANCE RANGE (% RSD)
Spec. Cond.	µmho/cm	10-1486	Site #2	6/9 - 6/26/10	6/26/10	07/07/10	232	234	233	1.4	0.6	0 - 2.8
Spec. Cond.	µmho/cm	10-1600	Site #5	6/26 - 6/30/10	6/30/10	07/07/10	326	324	325	1.4	0.4	0 - 2.8
Spec. Cond.	µmho/cm	10-1679	Site #4	6/30 - 7/8/10	7/8/10	07/15/10	352	352	352	0.0	0.0	0 - 2.8
Spec. Cond.	µmho/cm	10-1758	Site #5	7/8 - 7/14/10	7/14/10	07/15/10	261	259	260	1.4	0.5	0 - 2.8
Spec. Cond.	µmho/cm	10-1898	Site #5	7/21 - 7/28/10	7/28/10	08/02/10	339	338	339	0.7	0.2	0 - 2.8
Spec. Cond.	µmho/cm	10-1919	Site #4 Blank	08/02/10	8/2/10	08/13/10	2.2	2	2	0.0	0.0	0 - 2.8
Spec. Cond.	µmho/cm	10-2068	Site #3	8/11 - 8/17/10	8/17/10	08/27/10	201	205	203	2.8	1.4	0 - 2.8
Spec. Cond.	µmho/cm	10-2290	Rain Blank	09/02/10	9/2/10	09/21/10	2.2	2	2	0.0	0.0	0 - 2.8
Spec. Cond.	µmho/cm	10-2335	Site #3	9/2 - 9/9/10	9/9/10	10/08/10	196	194	195	1.4	0.7	0 - 2.8
Spec. Cond.	µmho/cm	10-2411	Site #3	9/9 - 9/16/10	9/16/10	10/08/10	222	223	223	0.7	0.3	0 - 2.8
Spec. Cond.	µmho/cm	10-2541	Site #2	9/16 - 9/23/10	9/23/10	10/14/10	267	263	265	2.8	1.1	0 - 2.8
Spec. Cond.	µmho/cm	10-2575	Site #2	9/23 - 9/28/10	9/28/10	10/14/10	255	255	255	0.0	0.0	0 - 2.8
Spec. Cond.	µmho/cm	10-2659	Rain Blank	10/06/10	10/6/10	10/14/10	2.2	2	2	0.0	0.0	0 - 2.8
Spec. Cond.	µmho/cm	10-2989	Rain Blank	11/03/10	11/3/10	11/30/10	2.14	2	2	0.0	2.0	0 - 2.8
Spec. Cond.	µmho/cm	10-3048	Site #5	11/3 - 11/11/10	11/11/10	11/30/10	323	321	322	1.4	0.4	0 - 2.8
Spec. Cond.	µmho/cm	10-3259	Rain	11/11 - 11/23/10	11/23/10	12/27/10	67.3	67	67	0.1	0.1	0 - 2.8
Spec. Cond.	µmho/cm	10-1687	Rain Blank	07/08/10	7/8/10	07/15/10	2.1	2	2	0.0	0.0	0 - 2.8
Spec. Cond.	µmho/cm	10-1810	Rain	7/14 - 7/21/10	7/21/10	08/02/10	21.6	22	22	0.4	1.9	0 - 2.8
Spec. Cond.	µmho/cm	10-1921	Rain Blank	08/02/10	8/2/10	08/13/10	2.2	2	2	0.0	0.0	0 - 2.8
Spec. Cond.	µmho/cm	10-2007	Rain	8/2 - 8/11/10	8/11/10	08/13/10	18.3	19	19	0.4	1.9	0 - 2.8
Spec. Cond.	µmho/cm	10-2071	Rain	8/11 - 8/17/10	8/17/10	08/27/10	11.6	12	12	0.0	0.0	0 - 2.8
Spec. Cond.	µmho/cm	10-2183	Rain	8/17- 8/25/10	8/25/10	09/21/10	14.3	15	14	0.2	1.5	0 - 2.8
Spec. Cond.	µmho/cm	10-2287	Site #3 Blank	09/02/10	9/2/10	09/21/10	2.1	2	2	0.0	0.0	0 - 2.8
Spec. Cond.	µmho/cm	10-2338	Rain	9/2 - 9/9/10	9/9/10	10/08/10	30.1	30	30	0.4	1.2	0 - 2.8
Spec. Cond.	µmho/cm	10-2412	Site #5	9/9 - 9/16/10	9/16/10	10/08/10	239	235	237	2.8	1.2	0 - 2.8
Spec. Cond.	µmho/cm	10-2543	Site #5	9/16 - 9/23/10	9/23/10	10/14/10	259	265	262	4.2	1.6	0 - 2.8
Spec. Cond.	µmho/cm	10-2577	Site #5	9/23 - 9/28/10	9/28/10	10/14/10	303	295	299	5.7	1.9	0 - 2.8
Spec. Cond.	µmho/cm	10-2582	Rain	9/16 - 9/23/10	9/23/10	10/14/10	42.7	43	43	0.1	0.3	0 - 2.8
Spec. Cond.	µmho/cm	10-2654	Site #1 Blank	10/06/10	10/6/10	10/14/10	2	2	2	0.0	0.0	0 - 2.8
Spec. Cond.	µmho/cm	10-2699	Site #5	10/6 - 10/13/10	10/13/10	11/03/10	328	332	330	2.8	0.9	0 - 2.8
Spec. Cond.	µmho/cm	10-2769	Site #5	10/13 - 10/21/10	10/21/10	11/16/10	351	356	354	3.5	1.0	0 - 2.8
Spec. Cond.	µmho/cm	10-3094	Site #5	11/8 - 11/19/10	11/19/10	11/30/10	370	375	373	3.5	0.9	0 - 2.8
Spec. Cond.	µmho/cm	11-0012	Site #1	12/23 - 1/4/11	1/4/11	01/24/11	441	439	440	1.4	0.3	0 - 2.8

Sample Duplicate Recovery

FOR LOCKHART-SMITH COLLECTED FROM

April 2010 to April 2012

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Spec. Cond.	µmho/cm	11-0054	Rain	12/23 - 1/10/11	1/10/11	01/24/11	65	65	65	0.1	0.1	0 - 2.8
Spec. Cond.	µmho/cm	11-0383	Rain	1/19 - 2/1/11	2/1/11	02/17/11	27	27	27	0.1	0.3	0 - 2.8
Spec. Cond.	µmho/cm	11-0907	Rain	2/10 - 3/2/11	3/2/11	03/24/11	50	50	50	0.1	0.1	0 - 2.8
Spec. Cond.	µmho/cm	11-0984	Site #1	3/2 - 3/8/11	3/8/11	03/24/11	441	436	439	3.5	0.8	0 - 2.8
Spec. Cond.	µmho/cm	11-1469	Site #3 Blank	04/04/11	4/4/11	04/28/11	2	2	2	0.0	0.0	0 - 2.8
Spec. Cond.	µmho/cm	11-1579	Site #2	4/4 - 4/11/11	4/11/11	04/28/11	351	348	350	2.1	0.6	0 - 2.8
Spec. Cond.	µmho/cm	11-2295	Rain	4/11-6/3/11	6/3/11	06/29/11	146	144	145	1.4	1.0	0 - 2.8
Spec. Cond.	µmho/cm	11-2821	Rain	6/27-7/8/11	7/8/11	07/25/11	17	17	17	0.0	0.0	0 - 2.8
Spec. Cond.	µmho/cm	11-2893	Site #3 F.D.	7/8-7/14/11	7/14/11	07/25/11	299	297	298	1.4	0.5	0 - 2.8
Spec. Cond.	µmho/cm	11-3253	Site #3 F.D.	7/29 - 8/5/11	8/5/11	08/26/11	282	283	283	0.7	0.3	0 - 2.8
Spec. Cond.	µmho/cm	11-3344	Site #5	8/5 - 8/12/11	8/12/11	08/30/11	307	311	309	2.8	0.9	0 - 2.8
Spec. Cond.	µmho/cm	11-3569	1A	08/29/11	8/29/11	09/15/11	378	374	376	2.8	0.8	0 - 2.8
Spec. Cond.	µmho/cm	11-3738	Rain	8/29 - 9/9/11	9/9/11	09/28/11	17	18	18	0.1	0.8	0 - 2.8
Spec. Cond.	µmho/cm	11-3914	Site #3	9/16 - 9/23/11	9/23/11	09/28/11	256	254	255	1.4	0.6	0 - 2.8
Spec. Cond.	µmho/cm	11-3916	Rain	09/27/11	9/27/11	09/28/11	16	16	16	0.1	0.9	0 - 2.8
Spec. Cond.	µmho/cm	11-4048	Rain	9/23 - 10/4/11	10/4/11	10/26/11	21	21	21	0.1	0.7	0 - 2.8
Spec. Cond.	µmho/cm	11-4134	Site #4	10/4 - 10/11/11	10/11/11	10/26/11	208	204	206	2.8	1.4	0 - 2.8
Spec. Cond.	µmho/cm	11-4206	Site #3 F.D.	10/11 - 10/19/11	10/19/11	11/09/11	238	235	237	2.1	0.9	0 - 2.8
Spec. Cond.	µmho/cm	11-4401	Rain	11/1 - 11/4/11	11/4/11	11/15/11	43	43	43	0.4	0.8	0 - 2.8
Spec. Cond.	µmho/cm	11-4461	Site #5	11/4 - 11/14/11	11/14/11	11/15/11	231	228	230	2.1	0.9	0 - 2.8
Spec. Cond.	µmho/cm	11-4816	Site #1	12/9 - 12/16/11	12/16/11	01/13/12	458	456	457	1.4	0.3	0 - 2.8
Spec. Cond.	µmho/cm	11-4982	Site #5	12/23 - 12/31/11	12/31/11	01/13/12	427	427	427	0.0	0.0	0 - 2.8
Spec. Cond.	µmho/cm	11-0021	Rain Blank	01/04/11	1/4/11	01/24/11	2	2	2	0.0	0.0	0 - 2.8
Spec. Cond.	µmho/cm	11-0213	Rain	1/10 - 1/19/11	1/19/11	02/07/11	17	16	17	0.4	2.5	0 - 2.8
Spec. Cond.	µmho/cm	11-0495	Rain	2/1 - 2/10/11	2/10/11	03/01/11	54	55	54	0.4	0.8	0 - 2.8
Spec. Cond.	µmho/cm	11-1463	Site #3	3/28 - 4/4/11	4/4/11	04/28/11	252	260	256	5.7	2.2	0 - 2.8
Spec. Cond.	µmho/cm	12-0043	Rain Blank	01/06/12	1/6/12	01/25/12	2	2	2	0.0	0.0	0 - 2.8
Spec. Cond.	µmho/cm	12-0358	Site #3	1/19 - 2/6/12	2/6/12	02/08/12	438	442	440	2.8	0.6	0 - 2.8
Spec. Cond.	µmho/cm	12-0602	Site #5	2/14 - 2/22/12	2/22/12	03/06/12	444	442	443	1.4	0.3	0 - 2.8
Spec. Cond.	µmho/cm	12-0692	Site #4 Blank	03/02/12	3/2/12	04/02/12	2	2	2	0.0	0.0	0 - 2.8
Spec. Cond.	µmho/cm	12-0121	Site #5	1/6 - 1/13/12	1/13/12	01/25/12	441	435	438	4.2	1.0	0 - 2.8
Spec. Cond.	µmho/cm	12-0196	Site #5	1/13 - 1/19/12	1/19/12	01/25/12	460	468	464	5.7	1.2	0 - 2.8
Spec. Cond.	µmho/cm	12-0364	Site #5 Blank	02/06/12	2/6/12	02/08/12	2	2	2	0.0	0.0	0 - 2.8

Sample Duplicate Recovery

FOR LOCKHART-SMITH COLLECTED FROM

April 2010 to April 2012

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Turbidity	NTU	10-0852	Rain Blank	04/08/10	4/8/10	04/09/10	0.3	0.3	0.3	0.0	0.0	0 - 3.7
Turbidity	NTU	10-0972	Rain	4/20 - 4/28/10	4/28/10	04/28/10	2.1	2.1	2.1	0.0	0.0	0 - 3.7
Turbidity	NTU	10-1071	Rain Blank	05/05/10	5/5/10	05/06/10	0.4	0.4	0.4	0.0	0.0	0 - 3.7
Turbidity	NTU	10-1133	Site #5	5/5 - 5/13/10	5/13/10	05/14/10	22.5	22.8	22.7	0.2	0.9	0 - 3.7
Turbidity	NTU	10-1222	Site #5	5/18 - 5/25/10	5/25/10	05/26/10	9.1	8.9	9.0	0.1	1.6	0 - 3.7
Turbidity	NTU	10-1278	Site #5	5/25 - 5/31/10	5/31/10	06/03/10	4.9	4.7	4.8	0.1	2.9	0 - 3.7
Turbidity	NTU	10-1388	Rain	5/31 - 6/9/10	6/9/10	06/10/10	0.5	0.5	0.5	0.0	0.0	0 - 3.7
Turbidity	NTU	10-1394	Rain Blank	06/09/10	6/9/10	06/10/10	0.0	0.0	0.0	0.0	0.0	0 - 3.7
Turbidity	NTU	10-1488	Site #4	6/9 - 6/26/10	6/26/10	06/28/10	1.1	1.1	1.1	0.0	0.0	0 - 3.7
Turbidity	NTU	10-1490	Rain	6/9 - 6/26/10	6/26/10	06/28/10	1.5	1.4	1.5	0.0	2.4	0 - 3.7
Turbidity	NTU	10-1681	Rain	6/30 - 7/8/10	7/8/10	07/09/10	0.9	0.9	0.9	0.0	0.0	0 - 3.7
Turbidity	NTU	10-1687	Rain Equipment Blank	07/08/10	7/8/10	07/09/10	0.3	0.3	0.3	0.0	0.0	0 - 3.7
Turbidity	NTU	10-1915	Rain	7/28 - 8/2/10	8/2/10	08/03/10	9.1	9.0	9.1	0.1	0.8	0 - 3.7
Turbidity	NTU	10-2007	Rain	8/2 - 8/11/10	8/11/10	08/12/10	0.8	0.8	0.8	0.0	0.0	0 - 3.7
Turbidity	NTU	10-2071	Rain	8/11 - 8/17/10	8/17/10	08/18/10	1.2	1.2	1.2	0.0	0.0	0 - 3.7
Turbidity	NTU	10-2290	Rain Blank	09/02/10	9/2/10	09/03/10	0.2	0.2	0.2	0.0	0.0	0 - 3.7
Turbidity	NTU	10-2338	Rain	9/2 - 9/9/10	9/9/10	09/10/10	0.7	0.7	0.7	0.0	0.0	0 - 3.7
Turbidity	NTU	10-2582	Rain	9/16 - 9/23/10	9/23/10	09/29/10	0.8	0.8	0.8	0.0	0.0	0 - 3.7
Turbidity	NTU	10-2659	Rain	10/06/10	10/6/10	10/08/10	0.0	0.0	0.0	0.0	0.0	0 - 3.7
Turbidity	NTU	10-2699	Site #5	10/6 - 10/13/10	10/13/10	10/13/10	15.4	15.3	15.4	0.1	0.5	0 - 3.7
Turbidity	NTU	10-2989	Rain Blank	11/03/10	11/3/10	11/05/10	0.2	0.2	0.2	0.0	0.0	0 - 3.7
Turbidity	NTU	10-3094	Site #5	11/11 - 11/19/10	11/19/10	11/20/10	0.8	0.8	0.8	0.0	0.0	0 - 3.7
Turbidity	NTU	10-3259	Rain	11/1 - 12/3/10	12/3/10	12/04/10	9.3	9.1	9.2	0.1	1.5	0 - 3.7
Turbidity	NTU	10-3307	Site #5	12/3 - 12/9/10	12/9/10	12/10/10	12.9	12.7	12.8	0.1	1.1	0 - 3.7
Turbidity	NTU	10-3310	Rain	12/09/10	12/9/10	12/10/10	0.2	0.2	0.2	0.0	0.0	0 - 3.7
Turbidity	NTU	10-3331	Site #5	12/9 - 12/15/10	12/15/10	12/17/10	8.8	8.7	8.8	0.1	0.8	0 - 3.7
Turbidity	NTU	10-3410	Rain	12/3 - 12/23/10	12/23/10	12/24/10	6.7	6.6	6.7	0.1	1.1	0 - 3.7
Turbidity	NTU	11-0021	Rain Blank	01/04/11	1/4/11	01/05/11	0.4	0.4	0.4	0.0	0.0	0 - 3.7
Turbidity	NTU	11-0054	Rain	12/31 - 1/10/11	1/10/11	01/10/11	3.9	4.0	4.0	0.1	1.8	0 - 3.7
Turbidity	NTU	11-0377	Site #1	1/19 - 2/1/11	2/1/11	02/02/11	1.1	1.1	1.1	0.0	0.0	0 - 3.7
Turbidity	NTU	11-0389	Rain Blank	1/19 - 2/1/11	2/1/11	02/02/11	0.1	0.1	0.1	0.0	0.0	0 - 3.7
Turbidity	NTU	11-0802	Site #5 F.D.	2/10 - 2/24/11	2/24/11	02/25/11	15.9	15.7	15.8	0.1	0.9	0 - 3.7
Turbidity	NTU	11-0913	Rain Blank	03/02/11	3/2/11	03/01/11	0.6	0.6	0.6	0.0	0.0	0 - 3.7
Turbidity	NTU	11-0988	Rain	3/2 - 3/8/11	3/8/11	03/09/11	2.1	2.1	2.1	0.0	0.0	0 - 3.7

Sample Duplicate Recovery

FOR LOCKHART-SMITH COLLECTED FROM

April 2010 to April 2012

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Turbidity	NTU	11-1171	Rain	3/8 - 3/18/11	3/18/11	03/18/11	1.5	1.5	1.5	0.0	0.0	0 - 3.7
Turbidity	NTU	11-1466	Rain	3/18 - 4/14/11	4/14/11	04/06/11	1.9	2.0	2.0	0.1	3.6	0 - 3.7
Turbidity	NTU	11-2821	Rain	6/27-7/8/11	7/8/11	07/08/11	0.7	0.7	0.7	0.0	0.0	0 - 3.7
Turbidity	NTU	11-2827	Rain Blank	07/08/11	7/8/11	07/08/11	0.3	0.3	0.3	0.0	0.0	0 - 3.7
Turbidity	NTU	11-2925	Site #5	7/14-7/18/11	7/18/11	07/19/11	4.7	4.6	4.7	0.1	1.5	0 - 3.7
Turbidity	NTU	11-3152	Rain	7/14-7/29/11	7/29/11	07/31/11	0.4	0.4	0.4	0.0	0.0	0 - 3.7
Turbidity	NTU	11-3255	Rain	7/29 - 8/5/11	8/5/11	08/05/11	0.7	0.7	0.7	0.0	0.0	0 - 3.7
Turbidity	NTU	11-3261	Rain Blank	08/05/11	8/5/11	08/05/11	0.2	0.2	0.2	0.0	0.0	0 - 3.7
Turbidity	NTU	11-3345	Rain	8/5 - 8/12/11	8/12/11	08/12/11	0.7	0.7	0.7	0.0	0.0	0 - 3.7
Turbidity	NTU	11-3737	Site #5	8/29 - 9/9/11	9/9/11	09/09/11	1.5	1.5	1.5	0.0	0.0	0 - 3.7
Turbidity	NTU	11-3744	Rain Blank	09/09/11	9/9/11	09/09/11	0.2	0.2	0.2	0.0	0.0	0 - 3.7
Turbidity	NTU	11-3817	Site #5	9/9 - 9/16/11	9/16/11	09/16/11	5.2	5.0	5.1	0.1	2.8	0 - 3.7
Turbidity	NTU	11-3916	Rain	9/9 - 9/23/11	9/23/11	09/25/11	0.4	0.4	0.4	0.0	0.0	0 - 3.7
Turbidity	NTU	11-4048	Rain	9/23 - 10/4/11	10/4/11	10/04/11	0.3	0.3	0.3	0.0	0.0	0 - 3.7
Turbidity	NTU	11-4054	Rain Blank	10/04/11	10/4/11	10/04/11	0.1	0.1	0.1	0.0	0.0	0 - 3.7
Turbidity	NTU	11-4131	Site #2	10/4 - 10/11/11	10/11/11	10/12/11	1.3	1.3	1.3	0.0	0.0	0 - 3.7
Turbidity	NTU	11-4136	Rain	10/4 - 10/11/11	10/11/11	10/12/11	0.5	0.5	0.5	0.0	0.0	0 - 3.7
Turbidity	NTU	11-4208	Site #5	10/11 - 10/19/11	10/19/11	10/20/11	4.1	4.3	4.2	0.1	3.4	0 - 3.7
Turbidity	NTU	11-4407	Rain Blank	11/04/11	11/4/11	11/04/11	0.2	0.2	0.2	0.0	0.0	0 - 3.7
Turbidity	NTU	11-4623	Site #5	11/14 - 11/29/11	11/29/11	11/30/11	8.2	8.5	8.4	0.2	2.5	0 - 3.7
Turbidity	NTU	11-4720	Rain Blank	12/09/11	12/9/11	12/09/11	0.3	0.3	0.3	0.0	0.0	0 - 3.7
Turbidity	NTU	11-4816	Site #1	12/9 - 12/16/11	12/16/11	12/17/11	18.0	17.8	17.9	0.1	0.8	0 - 3.7
Turbidity	NTU	11-4820	Rain	12/9 - 12/16/11	12/16/11	12/17/11	1.4	1.4	1.4	0.0	0.0	0 - 3.7
Turbidity	NTU	11-4938	Site #5	12/16 - 12/23/11	12/23/11	12/23/11	17.2	17.4	17.3	0.1	0.8	0 - 3.7
Turbidity	NTU	11-4982	Site #5	12/23 - 12/31/11	12/31/11	12/31/11	10.2	10.4	10.3	0.1	1.4	0 - 3.7
Turbidity	NTU	11-4623	Site #5	11/14 - 11/29/11	11/29/11	12/28/11	355.0	356.0	355.5	0.7	0.2	0 - 3.7
Turbidity	NTU	11-4714	Site #5	11/29 - 12/9/11	12/9/11	12/28/11	332.0	328.0	330.0	2.8	0.9	0 - 3.7
Turbidity	NTU	12-0043	Rain Blank	01/06/12	1/6/12	01/08/12	0.1	0.1	0.1	0.0	0.0	0 - 3.7
Turbidity	NTU	12-0121	Site #5	1/6 - 1/13/12	1/13/12	01/13/12	13.5	13.2	13.4	0.2	1.6	0 - 3.7
Turbidity	NTU	12-0602	Site #5	2/14 - 2/22/12	2/22/12	02/22/12	1.9	2.1	2.0	0.1	3.6	0 - 3.7
Turbidity	NTU	12-0688	Rain	2/14 - 3/2/12	3/2/12	03/02/12	0.9	1.0	0.9	0.0	0.1	0 - 3.7
Turbidity	NTU	12-0694	Rain Blank	03/02/12	3/2/12	03/02/12	0.2	0.2	0.2	0.0	0.0	0 - 3.7
Turbidity	NTU	12-0785	1A	03/13/12	3/13/12	03/15/12	1.5	1.4	1.5	0.0	2.0	0 - 3.7
Turbidity	NTU	12-1046	Site #5	3/26 - 4/4/12	4/4/12	04/05/12	8.5	8.8	8.7	0.2	2.5	0 - 3.7

Sample Duplicate Recovery

FOR LOCKHART-SMITH COLLECTED FROM

April 2010 to April 2012

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TSS	mg/l	10-0852	Rain Blank	04/08/10	4/8/10	04/09/10	0.4	0.4	0.4	0.0	0.0	0 - 13
TSS	mg/l	10-0972	Rain	4/20 - 4/28/10	4/28/10	04/28/10	6.0	5.0	5.5	0.7	12.9	0 - 13
TSS	mg/l	10-1070	Site #5 Blank	05/05/10	5/5/10	05/06/10	0.5	0.5	0.5	0.0	0.0	0 - 13
TSS	mg/l	10-1133	Site #5	5/5 - 5/13/10	5/13/10	05/14/10	56.0	58.5	57.3	1.8	3.1	0 - 13
TSS	mg/l	10-1384	Site #3	5/31 - 6/9/10	6/9/10	06/10/10	2.8	3.2	3.0	0.3	9.4	0 - 13
TSS	mg/l	10-1393	Rain Blank	06/09/10	6/9/10	06/10/10	0.2	0.2	0.2	0.0	0.0	0 - 13
TSS	mg/l	10-1490	Rain	6/9 - 6/26/10	6/26/10	06/28/10	1.9	1.7	1.8	0.1	7.9	0 - 13
TSS	mg/l	10-1598	Site #1	6/26 - 6/30/10	6/30/10	07/01/10	112.0	111.0	111.5	0.7	0.6	0 - 13
TSS	mg/l	10-1681	Rain	6/30 - 7/8/10	7/8/10	07/09/10	3.3	3.9	3.6	0.4	11.8	0 - 13
TSS	mg/l	10-1687	Rain Blank	07/08/10	7/8/10	07/09/10	0.3	0.3	0.3	0.0	0.0	0 - 13
TSS	mg/l	10-1758	Site #5	7/8 - 7/14/10	7/14/10	07/15/10	3.3	3.7	3.5	0.3	8.1	0 - 13
TSS	mg/l	10-1810	Rain	7/14 - 7/21/10	7/21/10	07/23/10	2.2	2.4	2.3	0.1	6.1	0 - 13
TSS	mg/l	10-1919	Site #4 Blank	08/02/10	8/2/10	08/06/10	0.4	0.4	0.4	0.0	0.0	0 - 13
TSS	mg/l	10-2007	Rain	8/2 - 8/11/10	8/11/10	08/12/10	1.4	1.3	1.4	0.1	5.2	0 - 13
TSS	mg/l	10-2290	Rain Blank	09/02/10	9/2/10	09/06/10	0.4	0.4	0.4	0.0	0.0	0 - 13
TSS	mg/l	10-2412	Site #5	9/9 - 9/16/10	9/16/10	09/21/10	7.2	6.8	7.0	0.3	4.0	0 - 13
TSS	mg/l	10-2543	Site #5	9/16 - 9/23/10	9/23/10	09/28/10	28.9	28.5	28.7	0.3	1.0	0 - 13
TSS	mg/l	10-2582	Rain	9/16 - 9/23/10	9/23/10	09/28/10	2.0	2.4	2.2	0.3	12.9	0 - 13
TSS	mg/l	10-2657	Site #4 Blank	10/06/10	10/6/10	10/11/10	0.4	0.4	0.4	0.0	0.0	0 - 13
TSS	mg/l	10-2989	Rain Blank	11/03/10	11/3/10	11/10/10	0.4	0.4	0.4	0.0	0.0	0 - 13
TSS	mg/l	10-3259	Rain	11/11 - 12/3/10	12/3/10	12/06/10	51.5	50.0	50.8	1.1	2.1	0 - 13
TSS	mg/l	10-3307	Site #5	12/3 - 12/9/10	12/9/10	12/13/10	18.0	20.9	19.5	2.1	10.5	0 - 13
TSS	mg/l	10-3331	Site #5	12/9 - 12/15/10	12/15/10	12/20/10	30.8	32.3	31.6	1.1	3.4	0 - 13
TSS	mg/l	10-3410	Rain	12/3 - 12/23/10	12/23/10	12/27/10	7.0	6.0	6.5	0.7	10.9	0 - 13
TSS	mg/l	11-0021	Rain Blank	01/04/11	1/4/11	01/06/11	0.3	0.3	0.3	0.0	0.0	0 - 13
TSS	mg/l	11-0053	Site #5	1/4 - 1/10/11	1/10/11	01/11/11	4.3	5.0	4.7	0.5	10.6	0 - 13
TSS	mg/l	11-0377	Site #1	1/19 - 2/1/11	2/1/11	02/06/11	1.3	1.4	1.4	0.1	5.2	0 - 13
TSS	mg/l	11-0389	Rain Blank	02/01/11	2/1/11	02/06/11	0.2	0.2	0.2	0.0	0.0	0 - 13
TSS	mg/l	11-0495	Rain	2/1 - 2/10/11	2/10/11	02/15/11	5.0	4.2	4.6	0.6	12.3	0 - 13
TSS	mg/l	11-0802	Site #5 F.D.	2/10 - 2/24/11	2/24/11	03/01/11	38.8	38.0	38.4	0.6	1.5	0 - 13
TSS	mg/l	11-0911	Site #4 Blank	03/02/11	3/2/11	03/07/11	0.4	0.4	0.4	0.0	0.0	0 - 13
TSS	mg/l	11-0988	Rain	3/2 - 3/8/11	3/8/11	03/15/11	2.5	3.0	2.8	0.4	12.9	0 - 13
TSS	mg/l	11-1171	Rain	3/8 - 3/18/11	3/18/11	03/18/11	1.4	1.4	1.4	0.0	0.0	0 - 13

Sample Duplicate Recovery

FOR LOCKHART-SMITH COLLECTED FROM

April 2010 to April 2012

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TSS	mg/l	11-1466	Rain	3/18 - 4/4/11	4/4/11	04/11/11	0.9	1.0	1.0	0.1	7.4	0 - 13
TSS	mg/l	11-1898	Site #5	4/25 - 5/4/11	5/4/11	05/09/11	14.2	15.0	14.6	0.6	3.9	0 - 13
TSS	mg/l	11-2301	Rain Dup	06/03/11	6/3/11	06/08/11	0.3	0.3	0.3	0.0	0.0	0 - 13
TSS	mg/l	11-2824	Site #3 Blank	07/08/11	7/8/11	07/12/11	0.2	0.2	0.2	0.0	0.0	0 - 13
TSS	mg/l	11-2891	7/8 - 7/14/11	07/18/11	7/18/11	07/18/11	10.9	9.9	10.4	0.7	6.8	0 - 13
TSS	mg/l	11-3152	Rain	7/14 - 7/29/11	7/29/11	08/01/11	1.5	1.6	1.6	0.1	4.6	0 - 13
TSS	mg/l	11-3258	Site #3 Blank	08/05/11	8/5/11	08/09/11	0.3	0.3	0.3	0.0	0.0	0 - 13
TSS	mg/l	11-3340	1A	08/12/11	8/12/11	08/16/11	0.9	1.0	1.0	0.1	7.4	0 - 13
TSS	mg/l	11-3345	Rain	8/5 - 8/12/11	8/12/11	08/16/11	0.6	0.6	0.6	0.0	0.0	0 - 13
TSS	mg/l	11-3258	Site #3 Blank	08/05/11	8/5/11	08/09/11	0.3	0.3	0.3	0.0	0.0	0 - 13
TSS	mg/l	11-3735	Site #2	09/08/11	9/8/11	09/13/11	0.9	1.0	1.0	0.1	7.4	0 - 13
TSS	mg/l	11-3817	Site #5	9/9 - 9/16/11	9/16/11	09/20/11	9.8	10.5	10.2	0.5	4.9	0 - 13
TSS	mg/l	11-3916	Rain	9/9 - 9/23/11	9/23/11	09/26/11	1.2	1.0	1.1	0.1	12.9	0 - 13
TSS	mg/l	11-4046	Site #4	8/29 - 10/4/11	10/4/11	10/09/11	0.8	0.9	0.9	0.1	8.3	0 - 13
TSS	mg/l	11-4130	1A	10/11/11	10/11/11	10/12/11	0.7	0.8	0.8	0.1	9.4	0 - 13
TSS	mg/l	11-4136	Rain	10/4 - 10/11/11	10/11/11	10/12/11	1.9	1.7	1.8	0.1	7.9	0 - 13
TSS	mg/l	11-4321	Site #5	10/19 - 10/28/11	10/28/11	11/01/11	6.8	7.5	7.2	0.5	6.9	0 - 13
TSS	mg/l	11-4404	Site #3 Blank	11/04/11	11/4/11	11/10/11	0.4	0.4	0.4	0.0	0.0	0 - 13
TSS	mg/l	11-4461	Site #5	11/4 - 11/14/11	11/14/11	11/16/11	11.7	12.5	12.1	0.6	4.7	0 - 13
TSS	mg/l	11-4623	Site #5	11/14 - 11/29/11	11/29/11	12/04/11	17.8	17.4	17.6	0.3	1.6	0 - 13
TSS	mg/l	12-0039	Site #2 Blank	01/06/12	1/6/12	01/11/12	0.2	0.2	0.2	0.0	0.0	0 - 13
TSS	mg/l	12-0358	Site #3	1/19 - 2/6/12	2/6/12	02/09/12	1.3	1.5	1.4	0.1	7.5	0 - 13
TSS	mg/l	12-0462	Rain	12/16 - 2/14/12	2/14/12	02/15/12	1.7	1.5	1.6	0.1	8.8	0 - 13
TSS	mg/l	12-0602	Site #5	2/14 - 2/22/12	2/22/12	02/22/12	1.3	1.6	1.4	0.1	9.8	0 - 13
TSS	mg/l	12-0692	Site #4 Blank	03/02/12	3/2/12	03/08/12	0.2	0.2	0.2	0.0	0.0	0 - 13
TSS	mg/l	12-0741	Site #5	3/2 - 3/7/12	3/7/12	03/08/12	18.9	17.3	18.1	1.1	6.3	0 - 13
TSS	mg/l	12-0786	Site #2	03/15/12	3/15/12	03/20/12	1.9	2.0	2.0	0.1	3.6	0 - 13
TSS	mg/l	12-0947	Site #3	3/20 - 3/26/12	3/26/12	03/28/12	1.4	1.8	1.6	0.2	13.3	0 - 13
TSS	mg/l	12-1046	Site #5	3/26 - 4/4/12	4/4/12	04/05/12	11.5	14.0	12.7	1.7	13.3	0 - 13

Sample Duplicate Recovery

FOR LOCKHART-SMITH COLLECTED FROM

April 2010 to April 2012

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SRP	µg/l	10-0902F	Site #1	04/12/10-04/20/10	4/20/10	04/21/10	44	48	46	2.1	4.6	0-5.6
SRP	µg/l	10-0972F	Rain	04/20/10-04/28/10	4/28/10	04/30/10	0	0	0	0.0	0.0	0-5.6
SRP	µg/l	10-1071F	Rain Equipment Blank	40303	5/5/10	05/05/10	0	0	0	0.0	0.0	0-5.6
SRP	µg/l	10-1133F	Site #5	05/15 - 05/13/10	5/13/10	05/13/10	97	99	98	1.4	1.4	0-5.6
SRP	µg/l	10-1220F	Site #3	05/18/10-05/25/10	5/25/10	05/26/10	46	46	46	0.0	0.0	0-5.6
SRP	µg/l	10-1222F	Site #5	05/18/10-05/25/10	5/25/10	05/26/10	84	84	84	0.0	0.0	0-5.6
SRP	µg/l	10-1278F	Site #5	05/25/10-05/31/10	6/1/10	06/03/10	80	83	82	2.1	2.6	0-5.6
SRP	µg/l	10-1389F	Site #2 Sampler Blank	06/09/10	6/9/10	06/11/10	1	0	0	0.0	1.4	0-5.6
SRP	µg/l	10-1487F	Site #3	6/9 - 6/26/10	6/26/10	06/28/10	62	64	63	1.4	2.2	0-5.6
SRP	µg/l	10-1490F	Rain	6/9 - 6/26/10	6/26/10	06/28/10	0	0	0	0.0	0.0	0-5.6
SRP	µg/l	10-1683F	Site #2 Sampler Blank	07/08/10	7/8/10	07/09/10	0	0	0	0.0	0.0	0-5.6
SRP	µg/l	10-1687F	Rain Equipment Blank	07/08/10	7/8/10	07/09/10	0	0	0	0.0	0.0	0-5.6
SRP	µg/l	10-1913F	Site # 3 FD	7/28/10 - 8/2/10	8/2/11	08/04/10	47	48	48	0.7	1.5	0-5.6
SRP	µg/l	10-2007F	Rain	8/2/10 - 8/11/10	8/11/10	08/11/10	1	1	1	0.0	0.0	0-5.6
SRP	µg/l	10-2071F	Rain	8/11/10 - 8/17/10	8/17/10	08/18/10	49	48	49	0.7	1.5	0-5.6
SRP	µg/l	10-2289F	Site # 5 Sampler Blank	09/02/10	9/2/10	09/08/10	0	0	0	0.0	0.0	0-5.6
SRP	µg/l	10-2582F	Rain	9/16/10 - 9/23/10	9/28/10	09/29/10	21	20	21	0.7	3.4	0-5.6
SRP	µg/l	10-2651F	Site # 3 FD	9/28/10 - 10/6/10	10/7/10	10/08/10	50	51	51	0.7	1.4	0-5.6
SRP	µg/l	10-2699F	Site # 5	10/6/10 - 10/13/10	10/13/10	10/15/10	89	90	90	0.7	0.8	0-5.6
SRP	µg/l	10-3046F	Site #2	11/3/10 - 11/11/10	11/11/10	11/21/10	1	1	1	0.0	0.0	0-5.6
SRP	µg/l	10-2987F	Site # 4 Sampler Blank	11/03/10	11/4/10	11/21/10	0	0	0	0.0	0.0	0-5.6
SRP	µg/l	10-3259F	Rain	11/11/10 - 12/3/10	12/3/10	12/09/10	1	1	1	0.0	0.0	0-5.6
SRP	µg/l	10-3406F	Site #1	12/15/10 - 12/23/10	12/23/10	12/29/10	36	34	35	1.4	4.0	0-5.6
SRP	µg/l	11-0020F	Site # 5 Sampler Blank	01/04/11	1/4/11	01/05/11	0	0	0	0.0	0.0	0-5.6
SRP	µg/l	11-0209F	Site # 3	1/10/11 - 1/19/11	1/19/11	01/27/11	25	25	25	0.0	0.0	0-5.6
SRP	µg/l	11-0383F	Rain	1/19/11 - 2/1/11	2/1/11	02/08/11	267	280	274	9.2	3.4	0-5.6
SRP	µg/l	11-0493F	Site # 3	2/1/11 - 2/10/11	2/10/11	02/14/11	52	53	53	0.7	1.3	0-5.6
SRP	µg/l	11-0902F	Site # 1	03/02/11	3/2/11	03/09/11	14	15	15	0.7	4.9	0-5.6
SRP	µg/l	11-0912F	Site # 5 Sampler Blank	03/02/11	3/2/11	03/09/11	0	0	0	0.0	0.0	0-5.6
SRP	µg/l	11-0987F	Site # 5	3/2/11 - 3/8/11	3/8/11	03/15/11	29	29	29	0.0	0.0	0-5.6

Sample Duplicate Recovery

FOR LOCKHART-SMITH COLLECTED FROM

April 2010 to April 2012

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SRP	µg/l	11-1171F	Rain	3/8/11 - 3/18/11	3/18/11	03/25/11	149	151	150	1.4	0.9	0-5.6
SRP	µg/l	11-1339F	Site # 5	3/18/11 - 3/28/11	3/28/11	04/11/11	86	85	86	0.7	0.8	0-5.6
SRP	µg/l	11-1462F	Site # 2	3/28/11 - 4/4/11	4/4/11	04/12/11	1	1	1	0.0	0.0	0-5.6
SRP	µg/l	11-1901F	Site # 3 Sampler Blank	05/04/11	5/4/11	05/06/11	0	0	0	0.0	0.0	0-5.6
SRP	µg/l	11-2297F	Site # 2 Sampler Blank	06/03/11	6/3/11	06/07/11	0	0	0	0.0	0.0	0-5.6
SRP	µg/l	11-2818F	Site #3	4/25/11 - 7/8/11	7/8/11	07/11/11	68	67	68	0.7	1.0	0-5.6
SRP	µg/l	11-3151F	Site # 5	07/29/11	7/29/11	08/10/11	83	85	84	0.8	0.9	0-5.6
SRP	µg/l	11-3258F	Site # 3 Sampler Blank	08/05/11	8/5/11	08/18/11	0	0	0	0.0	0.0	0-5.6
SRP	µg/l	11-3343F	Site # 4	7/8/11 - 8/12/11	8/12/11	08/22/11	87	88	88	0.7	0.8	0-5.6
SRP	µg/l	11-3570F	Site # 2	8/17/11 - 8/29/11	8/29/11	08/30/11	16	17	17	0.7	4.3	0-5.6
SRP	µg/l	11-4044F	Site # 3	9/23/11 - 10/4/11	10/4/11	10/05/11	103	101	102	1.4	1.4	0-5.6
SRP	µg/l	11-4054F	Rain Equipment Blank	10/04/11	10/4/11	10/05/11	0	0	0	0.0	0.0	0-5.6
SRP	µg/l	11-4135F	Site # 5	10/4/11 - 10/11/11	10/11/11	10/12/11	71	68	70	2.1	3.1	0-5.6
SRP	µg/l	11-4321F	Site #5	10/19 - 10/28/11	10/28/11	10/31/11	45	42	44	2.1	4.9	0-5.6
SRP	µg/l	11-4406F	Site # 5 Sampler Blank	11/04/11	11/4/11	11/09/11	0	0	0	0.0	0.0	0-5.6
SRP	µg/l	11-4460F	Site # 3 F.D.	11/4/11 - 11/14/11	11/14/11	11/16/11	54	55	55	0.7	1.3	0-5.6
SRP	µg/l	11-4623F	Site # 5	11/14/11 - 11/29/11	11/29/11	11/29/11	38	40	39	1.4	3.6	0-5.6
SRP	µg/l	11-4938F	Site # 5	12/23/11	12/23/11	12/23/11	49	49	49	0.0	0.0	0-5.6
SRP	µg/l	11-4982F	Site # 5	12/31/11	12/31/11	12/31/11	40	42	41	1.4	3.4	0-5.6
SRP	µg/l	12-0358F	Site # 3	1/19/12 - 2/6/12	2/6/12	02/08/12	46	50	48	2.1	4.4	0-5.6
SRP	µg/l	12-0462F	Rain	12/16/11 - 2/14/12	2/15/12	02/16/12	77	71	74	3.9	5.2	0-5.6
SRP	µg/l	12-0689F	Site # 1 Sampler Blank	03/02/12	3/2/12	03/02/12	0	0	0	0.0	0.0	0-5.6
SRP	µg/l	12-0694F	Rain Equipment Blank	03/02/12	3/2/12	03/02/12	0	0	0	0.0	0.0	0-5.6
SRP	µg/l	12-0741F	Site # 5	3/2/12 - 3/7/12	3/7/12	03/07/12	56	57	57	0.7	1.3	0-5.6

Sample Duplicate Recovery

FOR LOCKHART-SMITH COLLECTED FROM

April 2010 to April 2012

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NOX-N	µg/l	10-0902F	Site #1	04/12/10-04/20/10	4/20/10	04/21/10	263	262	263	0.7	0.3	0-4.7
NOX-N	µg/l	10-0972F	Rain	04/20/10-04/28/10	4/28/10	04/30/10	183	194	189	7.8	4.1	0-4.7
NOX-N	µg/l	10-1071F	Rain Equipment Blank	05/05/10	5/5/10	05/05/10	0	0	0	0.0	0.0	0-4.7
NOX-N	µg/l	10-1133F	Site #5	05/15 - 05/13/10	5/13/10	05/13/10	40	43	41	1.4	3.4	0-4.7
NOX-N	µg/l	10-1220F	Site #3	05/18/10-05/25/10	5/25/10	05/26/10	6	5	5	0.0	0.1	0-4.7
NOX-N	µg/l	10-1222F	Site #5	05/18/10-05/25/10	5/25/10	05/26/10	12	11	11	0.4	3.1	0-4.7
NOX-N	µg/l	10-1278F	Site #5	05/25/10-05/31/10	6/1/10	06/03/10	7	8	8	0.4	4.7	0-4.7
NOX-N	µg/l	10-1389F	Site #2 Sampler Blank	06/09/10	6/9/10	06/11/10	0	0	0	0.0	0.0	0-4.7
NOX-N	µg/l	10-1487F	Site #3	6/9 - 6/26/10	6/26/10	06/28/10	11	10	10	0.0	0.1	0-4.7
NOX-N	µg/l	10-1490F	Rain	6/9 - 6/26/10	6/26/10	06/28/10	12	13	13	0.4	2.8	0-4.7
NOX-N	µg/l	10-1683F	Site #2 Sampler Blank	07/08/10	7/8/10	07/09/10	0	0	0	0.0	0.0	0-4.7
NOX-N	µg/l	10-1687F	Rain Equipment Blank	07/08/10	7/8/10	07/09/10	0	0	0	0.0	0.0	0-4.7
NOX-N	µg/l	10-1913F	Site # 3 FD	7/28/10 - 8/2/10	8/2/10	08/04/10	60	62	61	1.4	2.3	0-4.7
NOX-N	µg/l	10-2007F	Rain	8/2/10 - 8/11/10	8/11/10	08/11/10	59	62	60	1.4	2.4	0-4.7
NOX-N	µg/l	10-2071F	Rain	8/11/10 - 8/17/10	8/17/10	08/18/10	148	148	148	0.0	0.0	0-4.7
NOX-N	µg/l	10-2289F	Site # 5 Sampler Blank	09/02/10	9/2/10	09/08/10	0	0	0	0.0	0.0	0-4.7
NOX-N	µg/l	10-2582F	Rain	9/16/10 - 9/23/10	9/28/10	09/29/10	167	169	168	1.4	0.8	0-4.7
NOX-N	µg/l	10-2651F	Site # 3 FD	9/28/10 - 10/6/10	10/7/10	10/08/10	125	126	126	0.7	0.6	0-4.7
NOX-N	µg/l	10-2699F	Site # 5	10/6/10 - 10/13/10	10/13/10	10/15/10	131	138	135	4.9	3.7	0-4.7
NOX-N	µg/l	10-3046F	Site #2	11/3/10 - 11/11/10	11/11/10	11/21/10	28	26	27	1.1	4.0	0-4.7
NOX-N	µg/l	10-2987F	Site # 4 Sampler Blank	11/03/10	11/4/10	11/21/10	0	0	0	0.0	0.0	0-4.7
NOX-N	µg/l	10-3259F	Rain	11/11/10 - 12/3/10	12/3/10	12/09/10	586	562	574	17.0	3.0	0-4.7
NOX-N	µg/l	10-3406F	Site #1	12/15/10 - 12/23/10	12/23/10	12/29/10	143	145	144	1.4	1.0	0-4.7
NOX-N	µg/l	11-0020F	Site # 5 Sampler Blank	01/04/11	1/4/11	01/05/11	0	0	0	0.0	0.0	0-4.7
NOX-N	µg/l	11-0209F	Site # 3	1/10/11 - 1/19/11	1/19/11	01/27/11	123	122	123	0.7	0.6	0-4.7
NOX-N	µg/l	11-0383F	Rain	1/19/11 - 2/1/11	2/1/11	02/08/11	39	40	40	0.7	1.8	0-4.7
NOX-N	µg/l	11-0493F	Site # 3	2/1/11 - 2/10/11	2/10/11	02/14/11	107	107	107	0.0	0.0	0-4.7
NOX-N	µg/l	11-0902F	Site # 1	03/02/11	3/2/11	03/09/11	139	139	139	0.0	0.0	0-4.7
NOX-N	µg/l	11-0912F	Site # 5 Sampler Blank	03/02/11	3/2/11	03/09/11	0	0	0	0.0	0.0	0-4.7
NOX-N	µg/l	11-0987F	Site # 5	3/2/11 - 3/8/11	3/8/11	03/15/11	0	0	0	0.0	0.0	0-4.7
NOX-N	µg/l	11-1171F	Rain	3/8/11 - 3/18/11	3/18/11	03/25/11	213	217	215	2.8	1.3	0-4.7

Sample Duplicate Recovery

FOR LOCKHART-SMITH COLLECTED FROM

April 2010 to April 2012

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NOX-N	µg/l	11-1339F	Site # 5	3/18/11 - 3/28/11	3/28/11	04/11/11	196	191	194	3.5	1.8	0-4.7
NOX-N	µg/l	11-1462F	Site # 2	3/28/11 - 4/4/11	4/4/11	04/12/11	0	0	0	0.0	0.0	0-4.7
NOX-N	µg/l	11-1901F	Site # 3 Sampler Blank	05/04/11	5/4/11	05/06/11	0	0	0	0.0	0.0	0-4.7
NOX-N	µg/l	11-2297F	Site # 2 Sampler Blank	06/03/11	6/3/11	06/07/11	0	0	0	0.0	0.0	0-4.7
NOX-N	µg/l	11-2818F	Site #3	4/25/11 - 7/8/11	7/8/11	07/11/11	109	108	109	0.7	0.7	0-4.7
NOX-N	µg/l	11-3151F	Site # 5	07/29/11	7/29/11	08/10/11	33	36	34	1.4	4.1	0-4.7
NOX-N	µg/l	11-3258F	Site # 3 Sampler Blank	08/05/11	8/5/11	08/18/11	0	0	0	0.0	0.0	0-4.7
NOX-N	µg/l	11-3343F	Site # 4	7/8/11 - 8/12/11	8/12/11	08/22/11	35	35	35	0.0	0.0	0-4.7
NOX-N	µg/l	11-3570F	Site # 2	8/17/11 - 8/29/11	8/29/11	08/30/11	46	43	44	1.8	4.0	0-4.7
NOX-N	µg/l	11-4044F	Site # 3	9/23/11 - 10/4/11	10/4/11	10/05/11	278	269	274	6.4	2.3	0-4.7
NOX-N	µg/l	11-4054F	Rain Equipment Blank	10/04/11	10/4/11	10/05/11	0	0	0	0.0	0.0	0-4.7
NOX-N	µg/l	11-4135F	Site # 5	10/4/11 - 10/11/11	10/11/11	10/12/11	44	41	42	1.4	3.3	0-5.6
NOX-N	µg/l	11-4321F	Site #5	10/19 - 10/28/11	10/28/11	10/31/11	48	52	50	2.1	4.3	0-4.7
NOX-N	µg/l	11-4406F	Site # 5 Sampler Blank	11/04/11	11/4/11	11/09/11	0	0	0	0.0	0.0	0-4.7
NOX-N	µg/l	11-4460F	Site # 3 F.D.	11/4/11 - 11/14/11	11/14/11	11/16/11	228	231	230	2.1	0.9	0-4.7
NOX-N	µg/l	11-4623F	Site # 5	11/14/11 - 11/29/11	11/29/11	11/29/11	6	7	6	0.0	0.1	0-4.7
NOX-N	µg/l	11-4938F	Site # 5	12/23/11	12/23/11	12/23/11	62	59	61	2.1	3.5	0-4.7
NOX-N	µg/l	11-4982F	Site # 5	12/31/11	12/31/11	12/31/11	51	48	49	1.8	3.6	0-4.7
NOX-N	µg/l	12-0358F	Site # 3	1/19/12 - 2/6/12	2/6/12	02/08/12	412	411	412	0.7	0.2	0-4.7
NOX-N	µg/l	12-0462F	Rain	12/16/11 - 2/14/12	2/15/12	02/16/12	349	348	349	0.7	0.2	0-4.7
NOX-N	µg/l	12-0741F	Site # 5	3/2/12 - 3/7/12	3/7/12	03/07/12	14	13	13	0.4	2.7	0-4.7

Sample Duplicate Recovery

FOR LOCKHART-SMITH COLLECTED FROM

April 2010 to April 2012

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Ammonia	µg/l	10-0902P	Site #1	04/12/10-04/20/10	4/20/10	04/29/10	36	36	36	0.0	0.0	0-12.7
Ammonia	µg/l	10-0972P	Rain	04/20/10-04/28/10	4/28/10	04/30/10	169	170	170	0.7	0.4	0-12.7
Ammonia	µg/l	10-1061P	Site #1	05/05/10	5/5/10	05/12/10	84	81	83	2.1	2.6	0-12.7
Ammonia	µg/l	10-1070P	Site #5 Sampler Blank	05/05/10	5/5/10	05/12/10	0	0	0	0.0	0.0	0-12.7
Ammonia	µg/l	10-1161P	Site #3 Field Dup	5/13/10 - 5/18/10	5/18/10	06/02/10	41	45	43	2.8	6.6	0-12.7
Ammonia	µg/l	10-1278P	Site #5	05/25/10-05/31/10	6/1/10	06/02/10	9	10	9	0.4	3.8	0-12.7
Ammonia	µg/l	10-1390P	Site #3 Sampler Blank	06/09/10	6/9/10	06/29/10	0	0	0	0.0	0.0	0-12.7
Ammonia	µg/l	10-1675P	Site #1A	07/08/10	7/8/10	07/15/10	30	30	30	0.0	0.0	0-12.7
Ammonia	µg/l	10-1685P	Site #4 Sampler Blank	07/08/10	7/8/10	07/15/10	0	0	0	0.0	0.0	0-12.7
Ammonia	µg/l	10-2183P	Rain	8/17/10 - 8/25/10	8/25/10	09/28/10	48	52	50	2.8	5.7	0-12.7
Ammonia	µg/l	10-2289P	Site # 5 Sampler Blank	09/02/10	9/2/10	09/29/10	0	0	0	0.0	0.0	0-12.7
Ammonia	µg/l	10-2290P	Rain Equipment Blank	09/02/10	9/2/10	09/29/10	0	0	0	0.0	0.0	0-12.7
Ammonia	µg/l	10-2334P	Site #2	9/2/10 - 9/9/10	9/9/10	09/29/10	45	41	43	2.8	6.6	0-12.7
Ammonia	µg/l	10-2655P	Site # 2 Sampler Blank	10/06/10	10/7/10	12/08/10	0	0	0	0.0	0.0	0-12.7
Ammonia	µg/l	10-2659P	Rain Equipment Blank	10/06/10	10/7/10	12/08/10	0	0	0	0.0	0.0	0-12.7
Ammonia	µg/l	10-2768P	Site # 3	10/13/10 - 10/21/10	10/21/10	12/14/10	212	228	220	11.3	5.1	0-12.7
Ammonia	µg/l	10-2988P	Site # 5 Sampler Blank	11/03/10	11/4/10	12/17/10	0	0	0	0.0	0.0	0-12.7
Ammonia	µg/l	10-3308P	Site # 1 Sampler Blank	12/09/10	12/9/10	12/21/10	0	0	0	0.0	0.0	0-12.7
Ammonia	µg/l	10-3331P	Site #5	12/9/10 - 12/15/10	12/15/10	12/21/10	45	46	46	0.7	1.6	0-12.7
Ammonia	µg/l	10-3410P	Rain	12/3/10 - 12/23/10	12/23/10	01/09/11	9682	9676	9679	4.2	0.0	0-12.7
Ammonia	µg/l	11-0020P	Site # 5 Sampler Blank	01/04/11	1/4/11	02/04/11	0	0	0	0.0	0.0	0-12.7
Ammonia	µg/l	11-0213P	Rain	1/10/11 - 1/19/11	1/19/11	03/07/11	393	393	393	0.0	0.0	0-12.7
Ammonia	µg/l	11-0389P	Rain Equipment Blank	02/01/11	2/1/11	05/03/11	0	0	0	0.0	0.0	0-12.7
Ammonia	µg/l	11-0495P	Rain	2/1/11 - 2/10/11	2/10/11	05/03/11	247	243	245	2.8	1.2	0-12.7
Ammonia	µg/l	11-0903P	Site # 1A	03/02/11	3/2/11	05/04/11	44	44	44	0.0	0.0	0-12.7
Ammonia	µg/l	11-0913P	Rain Equipment Blank	03/02/11	3/2/11	05/04/11	0	0	0	0.0	0.0	0-12.7
Ammonia	µg/l	11-0800P	Site #3	2/10/11 - 2/24/11	2/24/11	05/04/11	59	53	56	3.5	6.3	0-12.7
Ammonia	µg/l	11-1469P	Site # 3 Sampler Blank	04/04/11	4/4/11	06/08/11	0	0	0	0.0	0.0	0-12.7
Ammonia	µg/l	11-1472P	Rain Equipment Blank	04/04/11	4/4/11	06/08/11	0	0	0	0.0	0.0	0-12.7
Ammonia	µg/l	11-1902P	Site # 4 Sampler Blank	05/04/11	5/4/11	06/15/11	0	0	0	0.0	0.0	0-12.7

Sample Duplicate Recovery

FOR LOCKHART-SMITH COLLECTED FROM

April 2010 to April 2012

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Ammonia	µg/l	11-2654P	Site # 5	6/21/11 - 6/27/11	6/27/11	06/28/11	8	7	7	0.0	0.1	0-12.7
Ammonia	µg/l	11-2821P	Rain	4/25/11 - 7/8/11	7/8/11	07/13/11	0	0	0	0.0	0.0	0-12.7
Ammonia	µg/l	11-3258P	Site # 3 Sampler Blank	08/05/11	8/5/11	08/31/11	0	0	0	0.0	0.0	0-12.7
Ammonia	µg/l	11-3343P	Site # 4	7/8/11 - 8/12/11	8/12/11	08/31/11	52	52	52	0.0	0.0	0-12.7
Ammonia	µg/l	11-3403P	Site # 5	8/12/11 - 8/17/11	8/17/11	09/01/11	102	95	98	4.6	4.7	0-12.7
Ammonia	µg/l	11-3570P	Site # 2	8/17/11 - 8/29/11	8/29/11	09/15/11	113	116	115	2.1	1.9	0-12.7
Ammonia	µg/l	11-3740P	Site # 2 Sampler Blank	09/09/11	9/9/11	09/20/11	0	0	0	0.0	0.0	0-12.7
Ammonia	µg/l	11-4053P	Site # 5 Sampler Blank	10/04/11	10/4/11	10/14/11	0	0	0	0.0	0.0	0-12.7
Ammonia	µg/l	11-4043P	Site # 2	9/23/11 - 10/4/11	10/4/11	10/14/11	21	19	20	0.7	3.6	0-12.7
Ammonia	µg/l	11-4208P	Site # 5	10/11/11 - 10/19/11	10/19/11	11/02/11	59	53	56	3.5	6.3	0-12.7
Ammonia	µg/l	11-4134P	Site # 4	10/4/11 - 10/11/11	10/11/11	11/02/11	38	34	36	2.1	5.9	0-12.7
Ammonia	µg/l	11-4404P	Site # 3 Sampler Blank	11/04/11	11/4/11	11/16/11	0	0	0	0.0	0.0	0-12.7
Ammonia	µg/l	11-4712P	Site # 1	11/29/11 - 12/9/11	12/9/11	12/15/11	0	0	0	0.0	0.0	0-12.7
Ammonia	µg/l	11-4816P	Site # 1	12/9/11 - 12/16/11	12/16/11	12/20/11	9	8	8	0.4	4.3	0-12.7
Ammonia	µg/l	11-4938P	Site # 5	12/23/11	12/23/11	12/29/11	12	11	11	0.0	0.1	0-12.7
Ammonia	µg/l	11-4982P	Site # 5	12/31/11	12/31/11	01/17/12	11	11	11	0.0	0.0	0-12.7
Ammonia	µg/l	12-0119P	Site # 1	1/6/12 - 1/13/12	1/13/12	01/18/12	22	23	22	0.0	0.0	0-12.7
Ammonia	µg/l	12-0360P	Site # 1 Sampler Blank	02/06/12	2/6/12	02/15/12	0	0	0	0.0	0.0	0-12.7
Ammonia	µg/l	12-0689P	Site # 1 Sampler Blank	03/02/12	3/2/12	03/05/12	0	0	0	0.0	0.0	0-12.7
Ammonia	µg/l	12-1044P	Site # 1	3/26/12 - 4/4/12	4/4/12	04/06/12	28	25	26	1.4	5.4	0-12.7

Sample Duplicate Recovery

FOR LOCKHART-SMITH COLLECTED FROM

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Total N	µg/l	10-2655P	Site # 2 Sampler Blank	10/06/10	10/6/10	12/28/10	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	10-2657P	Site # 4 Sampler Blank	10/06/10	10/6/10	12/28/10	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	10-2698P	Site # 3	10/6/10 - 10/13/10	10/13/10	12/28/10	670	684	677	9.9	1.5	0-7.4
Total N	µg/l	10-0851P	Site # 5 Sampler Blank	4/8/2010	4/8/10	04/26/10	185	173	179	8.5	4.7	0-7.4
Total N	µg/l	10-0902FP	Site #1	04/12/10-04/20/10	4/20/10	04/27/10	1063	1027	1045	25.5	2.4	0-7.4
Total N	µg/l	10-0968FP	Site #2	04/20/10-04/28/10	4/28/10	05/06/10	183	190	187	4.9	2.7	0-7.4
Total N	µg/l	10-1070P	Site #5 Sampler Blank	05/05/10	5/5/10	05/12/10	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	10-1069FP	Site #4 Sampler Blank	05/05/10	5/5/10	05/20/10	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	10-1132P	Site #3	05/15 - 05/13/10	5/13/10	05/26/10	606	593	600	9.2	1.5	0-7.4
Total N	µg/l	10-1158FP	Site #1A	05/18/10	5/18/10	06/01/10	606	590	598	11.3	1.9	0-7.4
Total N	µg/l	10-1222P	Site #5	05/18/10-05/25/10	5/25/10	06/04/10	925	914	920	7.8	0.8	0-7.4
Total N	µg/l	10-1276P	Site #2	05/25/10-05/31/10	6/1/10	06/07/10	537	555	546	12.7	2.3	0-7.4
Total N	µg/l	10-1389P	Site #2 Sampler Blank	06/09/10	6/9/10	06/23/10	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	10-1386FP	Site #5	05/31/10-06/09/10	6/9/10	06/23/10	599	591	595	5.7	1.0	0-7.4
Total N	µg/l	)-1386FP RED	Site #5	05/31/10-06/09/10	6/9/10	07/07/10	648	584	616	45.3	7.3	0-7.4
Total N	µg/l	0-1389P RED	Site #2 Sampler Blank	6/9/2010	6/9/10	07/07/10	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	10-1683P	Site #2 Sampler Blank	7/8/2010	7/8/10	07/22/10	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	10-1679FP	Site #4	6/30 - 7/8/10	7/8/10	07/22/10	751	714	733	26.2	3.6	0-7.4
Total N	µg/l	10-1758P	Site #5	7/08 - 7/14/10	7/14/10	07/26/10	640	675	658	24.7	3.8	0-7.4
Total N	µg/l	10-1808FP	Site # 4	07/14/10-07/21/10	7/21/10	08/02/10	870	861	866	6.4	0.7	0-7.4
Total N	µg/l	10-1919P	Site # 4 Sampler Blank	08/02/10	8/2/10	08/11/10	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	10-1917FP	Site # 2 Sampler Blank	08/02/10	8/2/10	08/16/10	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	10-2065FP	Site #1	8/11/10 - 8/17/10	8/17/10	09/10/10	723	702	713	14.8	2.1	0-7.4
Total N	µg/l	10-2182P	Site #5	8/17/10 - 8/25/10	8/25/10	10/12/10	254	282	268	19.8	7.4	0-7.4
Total N	µg/l	10-2287P	Site # 3 Sampler Blank	09/02/10	9/2/10	12/02/10	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	10-2286FP	Site # 2 Sampler Blank	09/02/10	9/2/10	12/02/10	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	10-2332FP	Site #1	9/2/10 - 9/9/10	9/9/10	12/06/10	1362	1414	1388	36.8	2.6	0-7.4
Total N	µg/l	10-2541P	Site # 2	9/16/10 - 9/23/10	9/23/10	12/22/10	117	112	115	3.5	3.1	0-7.4
Total N	µg/l	10-2575P	Site # 2	9/23/10 - 9/28/10	9/28/10	12/27/10	687	730	709	30.4	4.3	0-7.4
Total N	µg/l	10-2986p	Site # 3 Sampler Blank	11/03/10	11/4/10	01/18/11	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	10-2985fp	Site # 2 Sampler Blank	11/03/10	11/4/10	01/18/11	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	10-2989fp	Rain Equipment Blank	11/03/10	11/4/10	01/18/11	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	10-3049fp	Rain	11/3/10 - 11/11/10	11/11/10	02/08/11	28	26	27	1.4	5.2	0-7.4
Total N	µg/l	10-3094p	Site #5	11/11/10 - 11/19/10	11/19/10	02/17/11	734	728	731	4.2	0.6	0-7.4
Total N	µg/l	10-2410p	Site #2	9/9/10 - 9/16/10	9/16/10	03/23/11	660	681	671	14.8	2.2	0-7.4
Total N	µg/l	10-3259fp	South Pond - Middle F.D.	02/11/10	2/11/10	02/22/10	2135	2167	2151	22.6	1.1	0-7.4
Total N	µg/l	10-3313p	Site # 1	02/03/10-02/11/10	2/12/10	02/22/10	996	938	967	41.0	4.2	0-7.4
Total N	µg/l	10-3313fp	Site # 5	02/11/10	2/12/10	02/22/10	2503	2333	2418	120.2	5.0	0-7.4

Sample Duplicate Recovery

FOR LOCKHART-SMITH COLLECTED FROM

April 2010 to April 2012

PARAMETER	UNITS	SAMPLE ID	SAMPLE DESCRIPTION	DATE COLLECTED	DATE RECEIVED	DATE ANALYZED	REPEAT 1	REPEAT 2	MEAN	s	% RELATIVE STD. DEVIATION (RSD)	ACCEPTANCE RANGE (% RSD)
Total N	µg/l	10-3409p	South Pond - Middle F.D.	01/19/10	1/19/10	03/05/10	1991	2004	1998	9.2	0.5	0-7.4
Total N	µg/l	10-3410fp	South Pond - Top	01/19/10	1/19/10	03/05/10	1949	1926	1938	16.3	0.8	0-7.4
Total N	µg/l	11-0017p	Site # 2 Sampler Blank	01/04/11	1/4/11	06/14/11	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	11-0017fp	Site # 2 Sampler Blank	01/04/11	1/4/11	06/14/11	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	11-0052fp	Site # 3	1/4/11 - 1/10/11	1/10/11	06/14/11	473	483	478	7.1	1.5	0-7.4
Total N	µg/l	11-0211p	Site # 4	1/10/11 - 1/19/11	1/19/11	08/22/11	3776	4013	3895	167.6	4.3	0-7.4
Total N	µg/l	11-0213fp	Rain	1/10/11 - 1/19/11	1/19/11	08/22/11	1877	1992	1935	81.3	4.2	0-7.4
Total N	µg/l	11-0378p	Site #1A	02/01/11	2/1/11	09/07/11	840	826	833	9.9	1.2	0-7.4
Total N	µg/l	11-0388p	Site #5 Sampler Blank	02/01/11	2/1/11	09/07/11	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	11-0385fp	Site #2 Sampler Blank	02/01/11	2/1/11	09/07/11	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	11-0493fp	Site # 3	2/1/11 - 2/10/11	2/10/11	09/27/11	607	613	610	4.2	0.7	0-7.4
Total N	µg/l	11-0800fp	Site #3	2/10/11 - 2/24/11	2/24/11	09/27/11	851	913	882	43.8	5.0	0-7.4
Total N	µg/l	11-0909p	Site # 2 Sampler Blank	03/02/11	3/2/11	09/27/11	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	11-0907fp	Rain	03/02/11	3/2/11	09/27/11	1002	976	989	18.4	1.9	0-7.4
Total N	µg/l	11-0987p	Site # 5	3/2/11 - 3/8/11	3/8/11	09/27/11	798	806	802	5.7	0.7	0-7.4
Total N	µg/l	11-1170p	Site # 5	3/8/11 - 3/18/11	3/18/11	09/27/11	1056	1101	1079	31.8	3.0	0-7.4
Total N	µg/l	11-1171fp	Rain	3/8/11 - 3/18/11	3/18/11	09/27/11	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	11-1465p	Site # 5	3/28/11 - 4/4/11	4/4/11	10/05/11	1457	1545	1501	62.2	4.1	0-7.4
Total N	µg/l	11-1462fp	Site # 2	3/28/11 - 4/4/11	4/4/11	10/05/11	442	422	432	14.1	3.3	0-7.4
Total N	µg/l	11-1472fp	Rain Equipment Blank	04/04/11	4/4/11	10/05/11	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	11-1582fp	Rain	4/4/11 - 4/11/11	4/11/11	10/05/11	208	196	202	8.5	4.2	0-7.4
Total N	µg/l	11-1898p	Site # 5	4/25/11 - 5/4/11	5/4/11	10/05/11	1919	1997	1958	55.2	2.8	0-7.4
Total N	µg/l	11-1900fp	Site # 2 Sampler Blank	05/04/11	5/4/11	10/05/11	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	11-1904fp	Rain Equipment Blank	05/04/11	5/4/11	10/05/11	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	11-2001fp	Site # 5	5/4/11 - 5/16/11	5/16/11	10/18/11	638	596	617	29.7	4.8	0-7.4
Total N	µg/l	11-2297p	Site # 2 Sampler Blank	06/03/11	6/3/11	11/01/11	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	11-2298fp	Site # 3 Sampler Blank	06/03/11	6/3/11	11/01/11	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	11-2532fp	Site # 5	6/3/11 - 6/20/11	6/21/11	11/01/11	775	763	769	8.5	1.1	0-7.4
Total N	µg/l	11-2824p	Site #3 Sampler Blank	07/08/11	7/8/11	11/15/11	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	11-2821p	Rain	4/25/11 - 7/8/11	7/8/11	11/15/11	274	291	283	11.7	4.1	0-7.4
Total N	µg/l	11-2827fp	Rain Equipment Blank	07/08/11	7/8/11	11/15/11	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	11-2893p	Site # 3 F.D.	7/8/11 - 7/14/11	7/14/11	12/07/11	598	632	615	24.0	3.9	0-7.4
Total N	µg/l	11-2924p	Site # 3	7/14/11 - 7/18/11	7/18/11	12/13/11	500	554	527	38.2	7.2	0-7.4
Total N	µg/l	11-3149fp	Site # 1	07/29/11	7/29/11	12/19/11	730	712	721	12.7	1.8	0-7.4
Total N	µg/l	11-3152fp	Rain	07/29/11	7/29/11	12/19/11	293	310	302	12.0	4.0	0-7.4
Total N	µg/l	11-3258p	Site # 3 Sampler Blank	08/05/11	8/5/11	12/21/11	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	11-3255fp	Rain	7/29/11 - 8/5/11	8/5/11	12/21/11	367	370	369	2.1	0.6	0-7.4

Sample Duplicate Recovery

FOR LOCKHART-SMITH COLLECTED FROM

April 2010 to April 2012

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Total N	µg/l	11-3342p	Site # 3	8/5/11 - 8/12/11	8/12/11	12/28/11	414	445	429	21.3	5.0	0-7.4
Total N	µg/l	11-3345fp	Rain	8/5/11 - 8/12/11	8/12/11	12/28/11	205	215	210	7.1	3.4	0-7.4
Total N	µg/l	11-3575p	Rain	8/17/11 - 8/29/11	8/29/11	01/11/12	186	180	183	3.5	1.9	0-7.4
Total N	µg/l	11-3743p	Site # 5 Sampler Blank	09/09/11	9/9/11	01/12/12	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	11-3742fp	Site # 4 Sampler Blank	09/09/11	9/9/11	01/12/12	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	11-3816fp	Site # 3	9/9/11 - 9/16/11	9/16/11	01/12/12	761	771	766	7.1	0.9	0-7.4
Total N	µg/l	11-3817fp	Site # 5	9/9/11 - 9/16/11	9/16/11	01/12/12	385	397	391	8.5	2.2	0-7.4
Total N	µg/l	11-3914fp	Site # 3	9/16/11 - 9/23/11	9/23/11	01/16/12	492	485	489	4.9	1.0	0-7.4
Total N	µg/l	11-4043p	Site # 2	9/23/11 - 10/4/11	10/4/11	01/20/12	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	11-4053p	Site # 5 Sampler Blank	10/04/11	10/4/11	01/20/12	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	11-4050fp	Site # 2 Sampler Blank	10/04/11	10/4/11	01/20/12	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	11-4054fp	Rain Equipment Blank	10/04/11	10/4/11	01/20/12	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	11-4133p	Site # 3 F.D.	10/4/11 - 10/11/11	10/11/11	01/24/12	772	763	768	6.4	0.8	0-7.4
Total N	µg/l	11-4135fp	Site # 5	10/4/11 - 10/11/11	10/11/11	01/24/12	486	480	483	4.2	0.9	0-7.4
Total N	µg/l	11-4205p	Site # 3	10/11/11 - 10/19/11	10/19/11	01/27/12	582	594	588	8.5	1.4	0-7.4
Total N	µg/l	11-4208fp	Site # 5	10/11/11 - 10/19/11	10/19/11	01/27/12	499	486	493	9.2	1.9	0-7.4
Total N	µg/l	11-4406p	Site # 5 Sampler Blank	11/04/11	11/4/11	02/08/12	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	11-4405fp	Site # 4 Sampler Blank	11/04/11	11/4/11	02/08/12	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	11-4460p	Site # 3 F.D.	11/4/11 - 11/14/11	11/14/15	02/08/12	1258	1311	1285	37.5	2.9	0-7.4
Total N	µg/l	11-4621fp	Site # 1	11/14/11 - 11/29/11	11/29/11	02/16/12	871	862	867	6.4	0.7	0-7.4
Total N	µg/l	11-4623fp	Site # 5	11/14/11 - 11/29/11	11/29/11	02/16/12	107	105	106	0.7	0.7	0-7.4
Total N	µg/l	11-4712fp	Site # 1	11/29/11 - 12/9/11	12/9/11	02/27/12	1002	990	996	8.5	0.9	0-7.4
Total N	µg/l	11-4817fp	Site # 2	11/14/11 - 12/16/11	12/16/11	02/29/12	320	328	324	5.0	1.5	0-7.4
Total N	µg/l	11-4937p	Site # 3	12/23/11	12/23/11	03/04/12	764	768	766	2.8	0.4	0-7.4
Total N	µg/l	11-4982fp	Site # 5	12/31/11	12/31/11	03/13/12	679	667	673	8.5	1.3	0-7.4
Total N	µg/l	12-0042p	Site # 5 Sampler Blank	01/06/12	1/6/12	03/14/12	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	12-0043fp	Rain Equipment Blank	01/06/12	1/6/12	03/14/12	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	12-0362p	Site # 3 Sampler Blank	02/06/12	2/6/12	03/19/12	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	12-0363fp	Site # 4 Sampler Blank	02/06/12	2/6/12	03/19/12	0	0	0	0.0	0.0	0-7.4
Total N	µg/l	12-0459p	Site # 1	2/6/12 - 2/14/12	2/14/12	03/25/12	151	142	147	6.4	4.3	0-7.4
Total N	µg/l	12-0687p	Site # 5	2/22/12 - 3/2/12	3/2/12	03/27/12	117	115	116	1.4	1.2	0-7.4
Total N	µg/l	12-0685fp	Site # 3	2/22/12 - 3/2/12	3/2/12	03/27/12	312	306	309	4.2	1.4	0-7.4
Total N	µg/l	12-0741p	Site # 5	3/2/12 - 3/7/12	3/7/12	03/27/12	148	154	151	4.2	2.8	0-7.4
Total N	µg/l	12-0784fp	Site # 1	3/7/12 - 3/13/12	3/13/12	03/27/12	168	154	161	9.2	5.7	0-7.4
Total N	µg/l	12-0789fp	Rain	3/7/12 - 3/13/12	3/13/12	03/27/12	90	88	89	1.4	1.6	0-7.4
Total N	µg/l	12-0876p	Site # 1	3/13/12 - 3/20/12	3/20/12	04/02/12	461	477	469	11.3	2.4	0-7.4
Total N	µg/l	12-0948p	Site # 5	3/20/12 - 3/26/12	3/26/12	04/02/12	147	153	150	4.2	2.8	0-7.4

Sample Duplicate Recovery

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Total P	µg/l	10-2655P	Site # 2 Sampler Blank	10/06/10	10/6/10	12/28/10	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	10-2657P	Site # 4 Sampler Blank	10/06/10	10/6/10	12/28/10	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	10-2698P	Site # 3	10/6/10 - 10/13/10	10/13/10	12/28/10	75	78	76	1.5	1.9	0-6.6
Total P	µg/l	10-2769FP	Site # 5	10/13/10 - 10/21/10	10/21/10	12/28/10	52	49	51	2.4	4.7	0-6.6
Total P	µg/l	10-0851P	Site # 5 Sampler Blank	04/08/10	4/8/10	04/26/10	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	10-0902FP	Site #1	04/12/10-04/20/10	4/20/10	04/27/10	66	69	68	2.1	3.1	0-6.6
Total P	µg/l	10-0968FP	Site #2	04/20/10-04/28/10	4/28/10	05/06/10	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	10-1070P	Site #5 Sampler Blank	05/05/10	5/5/10	05/12/10	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	10-1069FP	Site #4 Sampler Blank	05/05/10	5/5/10	05/20/10	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	10-1132P	Site #3	05/15 - 05/13/10	5/13/10	05/26/10	123	114	119	6.4	5.4	0-6.6
Total P	µg/l	10-1158FP	Site #1A	05/18/10	5/18/10	06/01/10	46	46	46	0.0	0.0	0-6.6
Total P	µg/l	10-1222P	Site #5	05/18/10-05/25/10	5/25/10	06/04/10	253	248	251	3.5	1.4	0-6.6
Total P	µg/l	10-1276P	Site #2	05/25/10-05/31/10	6/1/10	06/07/10	18	19	19	0.7	3.8	0-6.6
Total P	µg/l	10-1389P	Site #2 Sampler Blank	06/09/10	6/9/10	06/23/10	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	10-1386FP	Site #5	05/31/10-06/09/10	6/9/10	06/23/10	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	10-1485P	Site #1	6/9 - 6/26/10	6/26/10	07/02/10	64	60	62	2.8	4.6	0-6.6
Total P	µg/l	10-1489FP	Site #5	6/9 - 6/26/10	6/26/10	07/02/10	78	76	77	1.4	1.8	0-6.6
Total P	µg/l	10-1386FP	Site #5	05/31/10-06/09/10	6/9/10	07/07/10	15	17	16	0.7	4.5	0-6.6
Total P	µg/l	10-1389P	Site #2 Sampler Blank	06/09/10	6/9/10	07/07/10	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	10-1683P	Site #2 Sampler Blank	07/08/10	7/8/10	07/22/10	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	10-1679FP	Site #4	6/30 - 7/8/10	7/8/10	07/22/10	248	250	249	1.4	0.6	0-6.6
Total P	µg/l	10-1758P	Site #5	7/08 - 7/14/10	7/14/10	07/26/10	101	106	104	3.5	3.4	0-6.6
Total P	µg/l	10-1808FP	Site # 4	07/14/10-07/21/10	7/21/10	08/02/10	107	117	112	7.1	6.3	0-6.6
Total P	µg/l	10-1919P	Site # 4 Sampler Blank	08/02/10	8/2/10	08/11/10	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	10-1917FP	Site # 2 Sampler Blank	08/02/10	8/2/10	08/16/10	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	10-2001FP	Site #1	8/2/10 - 8/11/10	8/11/10	08/17/10	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	10-2065FP	Site #1	8/11/10 - 8/17/10	8/17/10	09/10/10	66	62	64	2.8	4.4	0-6.6
Total P	µg/l	10-2182P	Site #5	8/17/10 - 8/25/10	8/25/10	10/12/10	249	241	245	5.7	2.3	0-6.6
Total P	µg/l	10-2287P	Site # 3 Sampler Blank	09/02/10	9/2/10	12/02/10	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	10-2286FP	Site # 2 Sampler Blank	09/02/10	9/2/10	12/02/10	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	10-2332FP	Site #1	9/2/10 - 9/9/10	9/9/10	12/06/10	27	28	28	0.7	2.6	0-6.6
Total P	µg/l	10-2541P	Site # 2	9/16/10 - 9/23/10	9/23/10	12/22/10	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	10-2575P	Site # 2	9/23/10 - 9/28/10	9/28/10	12/27/10	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	10-2986p	Site # 3 Sampler Blank	11/03/10	11/4/10	01/18/11	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	10-2985fp	Site # 2 Sampler Blank	11/03/10	11/4/10	01/18/11	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	10-2989fp	Rain Equipment Blank	11/03/10	11/4/10	01/18/11	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	10-3049p	Rain	11/3/10 - 11/11/10	11/11/10	02/08/11	14	15	15	0.7	4.9	0-6.6
Total P	µg/l	10-3049fp	Rain	11/3/10 - 11/11/10	11/11/10	02/08/11	4	4	4	0.0	0.0	0-6.6
Total P	µg/l	10-3094p	Site #5	11/11/10 - 11/19/10	11/19/10	02/17/11	110	110	110	0.0	0.0	0-6.6

Sample Duplicate Recovery

FOR LOCKHART-SMITH COLLECTED FROM

April 2010 to April 2012

PARAMETER	UNITS	SAMPLE ID	SAMPLE DESCRIPTION	DATE COLLECTED	DATE RECEIVED	DATE ANALYZED	REPEAT 1	REPEAT 2	MEAN	s	% RELATIVE STD. DEVIATION (RSD)	ACCEPTANCE RANGE (% RSD)
Total P	µg/l	10-2410p	Site #2	9/9/10 - 9/16/10	9/16/10	03/23/11	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	10-3259fp	Rain	11/11/10 - 12/3/10	12/3/10	05/02/11	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	10-3313p	Rain Equipment Blank	12/09/10	12/9/10	05/03/11	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	10-3313fp	Rain Equipment Blank	12/09/10	12/9/10	05/03/11	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	10-3409p	Site #5	12/15/10 - 12/23/10	12/23/10	05/10/11	56	58	57	0.8	1.4	0-6.6
Total P	µg/l	10-3410fp	Rain	12/3/10 - 12/23/10	12/23/10	05/10/11	2292	2301	2297	6.4	0.3	0-6.6
Total P	µg/l	11-0017p	Site # 2 Sampler Blank	01/04/11	1/4/11	06/14/11	5	5	5	0.0	0.0	0-6.6
Total P	µg/l	11-0017fp	Site # 2 Sampler Blank	01/04/11	1/4/11	06/14/11	4	4	4	0.0	0.0	0-6.6
Total P	µg/l	11-0052fp	Site # 3	1/4/11 - 1/10/11	1/10/11	06/14/11	47	49	48	1.4	2.9	0-6.6
Total P	µg/l	11-0211p	Site # 4	1/10/11 - 1/19/11	1/19/11	08/22/11	110	105	108	3.5	3.3	0-6.6
Total P	µg/l	11-0213fp	Rain	1/10/11 - 1/19/11	1/19/11	08/22/11	282	303	293	14.8	5.1	0-6.6
Total P	µg/l	11-0378p	Site #1A	02/01/11	2/1/11	09/07/11	15	14	15	0.7	4.7	0-6.6
Total P	µg/l	11-0388p	Site #5 Sampler Blank	02/01/11	2/1/11	09/07/11	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	11-0385fp	Site #2 Sampler Blank	02/01/11	2/1/11	09/07/11	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	11-0493fp	Site # 3	2/1/11 - 2/10/11	2/10/11	09/27/11	41	44	43	1.8	4.3	0-6.6
Total P	µg/l	11-0800fp	Site #3	2/10/11 - 2/24/11	2/24/11	09/27/11	44	46	45	0.8	1.7	0-6.6
Total P	µg/l	11-0909p	Site # 2 Sampler Blank	03/02/11	3/2/11	09/27/11	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	11-0907fp	Rain	03/02/11	3/2/11	09/27/11	201	200	201	0.7	0.4	0-6.6
Total P	µg/l	11-0987p	Site # 5	3/2/11 - 3/8/11	3/8/11	09/27/11	165	168	166	1.5	0.9	0-6.6
Total P	µg/l	11-1170p	Site # 5	3/8/11 - 3/18/11	3/18/11	09/27/11	211	212	212	0.7	0.3	0-6.6
Total P	µg/l	11-1171fp	Rain	3/8/11 - 3/18/11	3/18/11	09/27/11	104	103	104	0.7	0.7	0-6.6
Total P	µg/l	11-1465p	Site # 5	3/28/11 - 4/4/11	4/4/11	10/05/11	113	119	116	3.6	3.1	0-6.6
Total P	µg/l	11-1462fp	Site # 2	3/28/11 - 4/4/11	4/4/11	10/05/11	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	11-1472fp	Rain Equipment Blank	04/04/11	4/4/11	10/05/11	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	11-1582fp	Rain	4/4/11 - 4/11/11	4/11/11	10/05/11	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	11-1898p	Site # 5	4/25/11 - 5/4/11	5/4/11	10/05/11	253	260	257	4.9	1.9	0-6.6
Total P	µg/l	11-1900fp	Site # 2 Sampler Blank	05/04/11	5/4/11	10/05/11	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	11-1904fp	Rain Equipment Blank	05/04/11	5/4/11	10/05/11	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	11-2001fp	Site # 5	5/4/11 - 5/16/11	5/16/11	10/18/11	142	139	141	2.1	1.5	0-6.6
Total P	µg/l	11-2297p	Site # 2 Sampler Blank	06/03/11	6/3/11	11/01/11	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	11-2298fp	Site # 3 Sampler Blank	06/03/11	6/3/11	11/01/11	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	11-2532fp	Site # 5	6/3/11 - 6/20/11	6/21/11	11/01/11	11	10	10	0.1	0.7	0-6.6
Total P	µg/l	11-2824p	Site #3 Sampler Blank	07/08/11	7/8/11	11/15/11	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	11-2821fp	Rain	4/25/11 - 7/8/11	7/8/11	11/15/11	5	4	4	0.1	1.6	0-6.6
Total P	µg/l	11-2827fp	Rain Equipment Blank	07/08/11	7/8/11	11/15/11	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	11-2893p	Site # 3 F.D.	7/8/11 - 7/14/11	7/14/11	12/07/11	169	168	168	0.1	0.0	0-6.6
Total P	µg/l	11-2924p	Site # 3	7/14/11 - 7/18/11	7/18/11	12/13/11	106	107	106	0.1	0.1	0-6.6
Total P	µg/l	11-3149fp	Site # 1	07/29/11	7/29/11	12/19/11	86	86	86	0.0	0.0	0-6.6
Total P	µg/l	11-3152fp	Rain	07/29/11	7/29/11	12/19/11	44	41	42	1.5	3.5	0-6.6

Sample Duplicate Recovery

FOR LOCKHART-SMITH COLLECTED FROM

April 2010 to April 2012

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Total P	µg/l	11-3258p	Site # 3 Sampler Blank	08/05/11	8/5/11	12/21/11	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	11-3255fp	Rain	7/29/11 - 8/5/11	8/5/11	12/21/11	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	11-3342p	Site # 3	8/5/11 - 8/12/11	8/12/11	12/28/11	105	103	104	0.8	0.7	0-6.6
Total P	µg/l	11-3345fp	Rain	8/5/11 - 8/12/11	8/12/11	12/28/11	4	5	4	0.1	1.6	0-6.6
Total P	µg/l	11-3575p	Rain	8/17/11 - 8/29/11	8/29/11	01/11/12	22	22	22	0.0	0.0	0-6.6
Total P	µg/l	11-3743p	Site # 5 Sampler Blank	09/09/11	9/9/11	01/12/12	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	11-3742fp	Site # 4 Sampler Blank	09/09/11	9/9/11	01/12/12	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	11-3816fp	Site # 3	9/9/11 - 9/16/11	9/16/11	01/12/12	77	82	79	2.8	3.6	0-6.6
Total P	µg/l	11-3817fp	Site # 5	9/9/11 - 9/16/11	9/16/11	01/12/12	82	82	82	0.0	0.0	0-6.6
Total P	µg/l	11-3914fp	Site # 3	9/16/11 - 9/23/11	9/23/11	01/16/12	59	60	59	0.0	0.0	0-6.6
Total P	µg/l	11-4043p	Site # 2	9/23/11 - 10/4/11	10/4/11	01/20/12	10	12	11	0.7	6.5	0-6.6
Total P	µg/l	11-4053p	Site # 5 Sampler Blank	10/04/11	10/4/11	01/20/12	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	11-4050fp	Site # 2 Sampler Blank	10/04/11	10/4/11	01/20/12	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	11-4054fp	Rain Equipment Blank	10/04/11	10/4/11	01/20/12	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	11-4133p	Site # 3 F.D.	10/4/11 - 10/11/11	10/11/11	01/24/12	346	338	342	5.0	1.4	0-6.6
Total P	µg/l	11-4135fp	Site # 5	10/4/11 - 10/11/11	10/11/11	01/24/12	69	71	70	0.7	1.0	0-6.6
Total P	µg/l	11-4205p	Site # 3	10/11/11 - 10/19/11	10/19/11	01/27/12	86	84	85	0.7	0.8	0-6.6
Total P	µg/l	11-4208fp	Site # 5	10/11/11 - 10/19/11	10/19/11	01/27/12	69	67	68	0.7	1.1	0-6.6
Total P	µg/l	11-4319p	Site #2	10/19 - 10/28/11	10/28/11	02/03/12	1	1	1	0.0	0.0	0-6.6
Total P	µg/l	11-4406p	Site # 5 Sampler Blank	11/04/11	11/4/11	02/08/12	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	11-4405fp	Site # 4 Sampler Blank	11/04/11	11/4/11	02/08/12	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	11-4621fp	Site # 1	11/14/11 - 11/29/11	11/29/11	02/16/12	59	59	59	0.0	0.0	0-6.6
Total P	µg/l	11-4623fp	Site # 5	11/14/11 - 11/29/11	11/29/11	02/16/12	41	43	42	0.7	1.7	0-6.6
Total P	µg/l	11-4712fp	Site # 1	11/29/11 - 12/9/11	12/9/11	02/27/12	65	59	62	3.5	5.7	0-6.6
Total P	µg/l	11-4817fp	Site # 2	11/14/11 - 12/16/11	12/16/11	02/29/12	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	11-4937p	Site # 3	12/23/11	12/23/11	03/04/12	73	69	71	2.8	4.0	0-6.6
Total P	µg/l	11-4982fp	Site # 5	12/31/11	12/31/11	03/13/12	42	39	40	1.4	3.5	0-6.6
Total P	µg/l	12-0042p	Site # 5 Sampler Blank	01/06/12	1/6/12	03/14/12	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	12-0043fp	Rain Equipment Blank	01/06/12	1/6/12	03/14/12	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	12-0362p	Site # 3 Sampler Blank	02/06/12	2/6/12	03/19/12	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	12-0363fp	Site # 4 Sampler Blank	02/06/12	2/6/12	03/19/12	0	0	0	0.0	0.0	0-6.6
Total P	µg/l	12-0459p	Site # 1	2/6/12 - 2/14/12	2/14/12	03/25/12	90	91	90	0.0	0.0	0-6.6
Total P	µg/l	12-0687p	Site # 5	2/22/12 - 3/2/12	3/2/12	03/27/12	65	67	66	1.4	2.1	0-6.6
Total P	µg/l	12-0685fp	Site # 3	2/22/12 - 3/2/12	3/2/12	03/27/12	79	82	81	2.1	2.6	0-6.6
Total P	µg/l	12-0741p	Site # 5	3/2/12 - 3/7/12	3/7/12	03/27/12	130	138	134	5.0	3.7	0-6.6
Total P	µg/l	12-0784fp	Site # 1	3/7/12 - 3/13/12	3/13/12	03/27/12	22	23	22	0.0	0.0	0-6.6
Total P	µg/l	12-0789fp	Rain	3/7/12 - 3/13/12	3/13/12	03/27/12	12	14	13	0.7	5.5	0-6.6
Total P	µg/l	12-0876p	Site # 1	3/13/12 - 3/20/12	3/20/12	04/02/12	208	214	211	3.5	1.7	0-6.6
Total P	µg/l	12-0948p	Site # 5	3/20/12 - 3/26/12	3/26/12	04/02/12	122	123	122	0.0	0.0	0-6.6

Sample Duplicate Recovery

FOR LOCKHART-SMITH COLLECTED FROM

April 2010 to April 2012

PARAMETER	UNITS	SAMPLE ID	SAMPLE DESCRIPTION	DATE COLLECTED	DATE RECEIVED	DATE ANALYZED	REPEAT 1	REPEAT 2	MEAN	s	% RELATIVE STD. DEVIATION (RSD)	ACCEPTANCE RANGE (% RSD)
Color	PCU	10-0852F	Rain Blank	04/08/10	4/8/10	04/08/10	0	0	0	0.0	0.0	0-7
Color	PCU	10-0972F	Rain	04/20/10	4/20/10	04/28/10	3	2	2	0.1	2.9	0-7
Color	PCU	10-1061F	Site #1	04/28/10-05/05/10	5/5/10	05/06/10	139	139	139	0.0	0.0	0-7
Color	PCU	10-1071F	Rain Blank	05/05/10	5/5/10	05/06/10	0	0	0	0.0	0.0	0-7
Color	PCU	10-1133F	Site #5	05/05/10-05/13/10	5/13/10	05/13/10	105	107	106	1.4	1.3	0-7
Color	PCU	10-1385F	Site #4	05/31/10-06/09/10	6/9/10	06/10/10	120	117	119	2.1	1.8	0-7
Color	PCU	10-1393F	Rain Blank	06/09/10	6/9/10	06/10/10	0	0	0	0.0	0.0	0-7
Color	PCU	10-1487F	Site #3	06/09-06/26/10	6/26/10	06/28/10	86	87	87	0.7	0.8	0-7
Color	PCU	10-1490F	Rain	06/09-06/26/10	6/26/10	06/28/10	1	1	1	0.0	0.0	0-7
Color	PCU	10-1683F	Site #2 SB	07/08/10	7/8/10	07/09/10	0	0	0	0.0	0.0	0-7
Color	PCU	10-1687F	Rain Equip. Blank	07/08/10	7/8/10	07/09/10	0	0	0	0.0	0.0	0-7
Color	PCU	10-1807F	Site #3	07/14-07/21/10	7/21/10	07/21/10	89	90	90	0.7	0.8	0-7
Color	PCU	10-1919F	Site #4 SB	08/02/10	8/2/10	08/02/10	0	0	0	0.0	0.0	0-7
Color	PCU	10-2007F	Rain	08/08-08/11/10	8/11/10	08/12/10	4	4	4	0.0	0.0	0-7
Color	PCU	10-2071F	Rain	08/11-08/17/10	8/17/10	08/17/10	7	7	7	0.0	0.0	0-7
Color	PCU	10-2179F	Site #2	08/17-08/25/10	8/25/10	08/25/10	14	14	14	0.0	0.0	0-7
Color	PCU	10-2289F	Site #5 SB	09/02/10	9/2/10	09/02/10	0	0	0	0.0	0.0	0-7
Color	PCU	10-2290F	Rain Equip. Blank	09/02/10	9/2/10	09/02/10	0	0	0	0.0	0.0	0-7
Color	PCU	10-2411F	Site #3	09/09-09/16/10	9/16/10	09/17/10	105	105	105	0.0	0.0	0-7
Color	PCU	10-2651F	Site #3	09/28-10/06/10	10/6/10	10/07/10	95	92	94	2.1	2.3	0-7
Color	PCU	11-0021F	Rain Equip. Blank	01/04/11	1/4/11	01/06/11	0	0	0	0.0	0.0	0-7
Color	PCU	11-0054F	Rain	12/23/10-01/10/11	1/10/11	01/10/11	16	16	16	0.0	0.0	0-7
Color	PCU	11-0207F	Site #1A	01/19/11	1/19/11	01/20/11	103	103	103	0.0	0.0	0-7
Color	PCU	11-0386F	Site #3 SB	02/01/11	2/1/11	02/02/11	0	0	0	0.0	0.0	0-7
Color	PCU	11-0389F	Rain Equip. Blank	02/01/11	2/1/11	02/02/11	0	0	0	0.0	0.0	0-7
Color	PCU	11-0802F	Site #5 F.D.	02/10-02/24/11	2/24/11	02/24/11	78	78	78	0.0	0.0	0-7
Color	PCU	11-0905F	Site #3	02/24-03/02/11	3/2/11	03/02/11	80	80	80	0.0	0.0	0-7
Color	PCU	11-0913F	Rain Equip. Blank	03/02/11	3/2/11	03/02/11	0	0	0	0.0	0.0	0-7
Color	PCU	11-1167F	Site #1	03/08-03/18/11	3/18/11	03/19/11	145	145	145	0.0	0.0	0-7
Color	PCU	11-1171F	Rain	03/08-03/18/11	3/18/11	03/19/11	21	21	21	0.0	0.0	0-7
Color	PCU	11-1339F	Site #5	03/18-03/28/11	3/28/11	03/29/11	84	84	84	0.0	0.0	0-7
Color	PCU	11-1469F	Site #3 SB	04/04/11	4/4/11	04/06/11	0	0	0	0.0	0.0	0-7
Color	PCU	11-1904F	Rain Equip. Blank	05/04/11	5/4/11	05/05/11	0	0	0	0.0	0.0	0-7
Color	PCU	11-2301F	Rain Equip. Blank	06/03/11	6/3/11	06/04/11	0	0	0	0.0	0.0	0-7
Color	PCU	11-2816F	Site #1A	07/08/11	7/8/11	07/08/11	188	188	188	0.0	**0.0**	0-7
Color	PCU	11-2827F	Rain Equip. Blank	07/08/11	7/8/11	07/08/11	0	0	0	0.0	**0.0**	0-7
Color	PCU	11-2923F	Site #1	07/14-07/18/11	7/18/11	07/18/11	93	93	93	0.0	**0.0**	0-7
Color	PCU	11-2925F	Site #5	07/14-07/18/11	7/18/11	07/18/11	95	95	95	0.0	**0.0**	0-7

Sample Duplicate Recovery

FOR LOCKHART-SMITH COLLECTED FROM

April 2010 to April 2012

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Color	PCU	11-3151F	Site #5	07/18-07/29/11	7/29/11	07/31/11	77	77	77	0.0	**0.0**	0-7
Color	PCU	11-3152F	Rain	07/14-07/29/11	7/29/11	07/31/11	7	7	7	0.0	**0.0**	0-7
Color	PCU	11-3258F	Site #3 SB	08/05/11	8/5/11	08/08/11	0	0	0	0.0	**0.0**	0-7
Color	PCU	11-3345F	Rain	08/05-08/12/11	8/12/11	08/12/11	5	5	5	0.0	**0.0**	0-7
Color	PCU	11-3403F	Site #5	08/12-08/17/11	8/17/11	08/18/11	114	114	114	0.0	**0.0**	0-7
Color	PCU	11-3743F	Site #5 SB	09/09/11	9/9/11	09/11/11	0	0	0	0.0	**0.0**	0-7
Color	PCU	11-3744F	Rain Equip. Blank	09/09/11	9/9/11	09/11/11	0	0	0	0.0	**0.0**	0-7
Color	PCU	11-3817F	Site #5	09/09-09/16/11	9/16/11	09/16/11	128	128	128	0.0	**0.0**	0-7
Color	PCU	11-3916F	Rain	09/09-09/23/11	9/23/11	09/23/11	5	5	5	0.0	**0.0**	0-7
Color	PCU	11-4048F	Rain	09/23-10/04/11	10/4/11	10/05/11	4	4	4	0.0	**0.0**	0-7
Color	PCU	11-4054F	Rain Equip. Blank	10/04/11	10/4/11	10/05/11	0	0	0	0.0	**0.0**	0-7
Color	PCU	11-4131F	Site #2	10/04-10/11/11	10/11/11	10/12/11	17	18	18	0.7	**4.0**	0-7
Color	PCU	11-4203F	Site #1A	10/19/11	10/19/11	10/19/11	188	184	186	2.8	**1.5**	0-7
Color	PCU	11-4208F	Site #5	10/11-10/19/11	10/19/11	10/19/11	180	180	180	0.0	**0.0**	0-7
Color	PCU	11-4321F	Site #5	10/19-10/28/11	10/28/11	10/28/11	158	158	158	0.0	**0.0**	0-7
Color	PCU	11-4404F	Site #3 SB	11/04/11	11/4/11	11/04/11	0	0	0	0.0	**0.0**	0-7
Color	PCU	11-4407F	Rain Equip. Blank	11/04/11	11/4/11	11/04/11	0	0	0	0.0	**0.0**	0-7
Color	PCU	11-4623F	Site #5	11/14-11/29/11	11/29/11	12/01/11	115	111	113	2.8	**2.5**	0-7
Color	PCU	11-4720F	Rain Equip. Blank	12/09/11	12/9/11	12/10/11	0	0	0	0.0	**0.0**	0-7
Color	PCU	11-4820F	Rain	11/04-12/16/11	12/16/11	12/16/11	19	19	19	0.0	**0.0**	0-7
Color	PCU	11-4938F	Site #5	12/16-12/23/11	12/23/11	12/24/11	85	85	85	0.0	**0.0**	0-7
Color	PCU	11-4982F	Site #5	12/23-12/31/11	12/31/11	12/31/11	79	79	79	0.0	**0.0**	0-7
Color	PCU	12-0043F	Rain Equip. Blank	01/06/12	1/6/12	01/08/12	0	0	0	0.0	**0.0**	0-7
Color	PCU	12-0121F	Site #5	01/06-01/13/12	1/13/12	01/14/12	71	71	71	0.0	**0.0**	0-7
Color	PCU	12-0360F	Site #1 SB	02/06/12	2/6/12	02/08/12	0	0	0	0.0	**0.0**	0-7
Color	PCU	12-0462F	Rain	12/16-02/14/12	2/14/12	02/15/12	12	12	12	0.0	**0.0**	0-7
Color	PCU	12-0692F	Site #4 SB	03/02/12	3/2/12	03/02/12	0	0	0	0.0	**0.0**	0-7
Color	PCU	12-0694F	Rain Equip. Blank	03/02/12	3/2/12	03/02/12	0	0	0	0.0	**0.0**	0-7
Color	PCU	12-0741F	Site #5	03/02-03/07/12	3/7/12	03/08/12	84	84	84	0.0	**0.0**	0-7
Color	PCU	12-0785F	Site #1A	03/13/12	3/13/12	03/14/12	174	174	174	0.0	**0.0**	0-7
Color	PCU	12-1045F	Site #3	03/26-04/04/12	4/4/12	04/05/12	60	60	60	0.0	**0.0**	0-7
Color	PCU	12-1046F	Site #5	03/26-04/04/12	4/4/12	04/05/12	68	68	68	0.0	**0.0**	0-7

D.2 Accuracy

Matrix Spike Recovery Study
Lockhart-Smith Samples Collected from:
April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE ID	SAMPLE DESCRIPTION	DATE COLLECTED	DATE RECEIVED	DATE ANALYZED	INITIAL CONC.	INITIAL VOLUME (ml)	SPIKE CONC.	SPIKE VOLUME ADDED (ml)	Dilution Factor	THEOR. CONC.	ACTUAL CONC.	PERCENT RECOVERY	ACCEPTANCE RANGE
Alkalinity	mg/l	10-0852	Rain Blank	04/08/10	04/08/10	04/13/10	0.6	50	1000	0.2	1	4.6	4.4	96%	91-105
Alkalinity	mg/l	10-0972	Rain	4/20 - 4/28/10	04/28/10	04/30/10	2.4	50	1000	0.2	1	6.4	6.6	103%	91-105
Alkalinity	mg/l	10-1219	Site #2	5/18 - 5/25/10	05/25/10	05/27/10	80.6	50	1000	0.2	1	84.6	85.0	100%	91-105
Alkalinity	mg/l	10-1393	Rain Blank	06/09/10	06/09/10	06/11/10	0.6	50	1000	0.2	1	4.6	4.8	104%	91-105
Alkalinity	mg/l	10-1490	Rain	6/9 - 6/26/10	06/26/10	06/29/10	2.4	50	1000	0.2	1	6.4	6.6	103%	91-105
Alkalinity	mg/l	10-1915	Rain	7/28 - 8/2/10	08/02/10	08/04/10	43	50	1000	0.4	1	51.0	51.6	101%	91-105
Alkalinity	mg/l	10-2183	Rain	8/17 - 8/25/10	08/25/10	08/30/10	2.2	50	1000	0.4	1	10.2	10.4	102%	91-105
Alkalinity	mg/l	10-2290	Rain Blank	09/02/10	09/02/10	09/07/10	0.4	50	1000	0.4	1	8.4	8.8	105%	91-105
Alkalinity	mg/l	10-2338	Rain	9/2 - 9/9/10	09/09/10	09/10/10	4	50	1000	0.4	1	12.0	11.6	97%	91-105
Alkalinity	mg/l	10-2412	Site #5	9/9 - 9/16/10	09/16/10	09/20/10	60.8	50	1000	0.4	1	68.8	67.8	99%	91-105
Alkalinity	mg/l	10-2659	Rain Blank	10/06/10	10/06/10	10/07/10	0.4	50	1000	0.6	1	12.4	12.8	103%	91-105
Alkalinity	mg/l	10-2699	Site #5	10/6 - 10/13/10	10/13/10	10/14/10	92	50	1000	0.6	1	104.0	105.0	101%	91-105
Alkalinity	mg/l	10-2769	Site #5	10/13 - 10/21/10	10/21/10	10/26/10	103	50	1000	0.6	1	115.0	116.0	101%	91-105
Alkalinity	mg/l	10-3331	Site #5	12/9- 12/15/10	12/15/10	12/21/10	110	50	1000	0.6	1	122.0	120.0	98%	91-105
Alkalinity	mg/l	11-0021	Rain Blank	01/04/11	01/04/11	01/06/11	0.6	50	1000	0.3	1	6.6	6.8	103%	91-105
Alkalinity	mg/l	11-0054	Rain	12/23 - 1/10/11	01/10/11	01/11/11	15.8	50	1000	0.3	1	21.8	22.2	102%	91-105
Alkalinity	mg/l	11-0387	Site 4 Blank	02/01/11	02/01/11	02/03/11	0.6	50	1000	0.3	1	6.6	6.8	103%	91-105
Alkalinity	mg/l	11-0802	Site 5 F.D.	2/10 - 2/24/11	02/24/11	02/28/11	93.2	50	1000	0.2	1	97.2	101.0	104%	91-105
Alkalinity	mg/l	11-0913	Rain Blank	03/02/11	03/02/11	03/04/11	0.6	50	1000	0.3	1	6.6	7.0	105%	91-105
Alkalinity	mg/l	11-0988	Rain	3/2 - 3/8/11	03/08/11	03/09/11	25.4	50	1000	0.3	1	31.4	30.2	96%	91-105
Alkalinity	mg/l	11-1168	Site #2	3/8 - 3/18/11	03/18/11	03/21/11	110	50	1000	0.3	1	116.0	116.0	100%	91-105
Alkalinity	mg/l	11-1904	Rain	05/04/11	05/04/11	05/05/11	0.4	50	1000	0.5	1	10.4	10.2	98%	91-105
Alkalinity	mg/l	11-2301	Rain Blank	06/03/11	06/03/11	06/06/11	0.6	50	1000	0.5	1	10.6	11.0	104%	91-105
Alkalinity	mg/l	11-2925	Site #5	7/14 - 7/18/11	07/18/11	07/21/11	101	50	1000	0.4	1	109.0	108.0	99%	91-105
Alkalinity	mg/l	11-3345	Rain	8/5 - 8/12/11	08/12/11	08/16/11	4.4	50	1000	0.4	1	12.4	12.0	97%	91-105
Alkalinity	mg/l	11-3744	Rain Blank	09/09/11	09/09/11	09/12/11	0.4	50	1000	0.4	1	8.4	8.6	102%	91-105
Alkalinity	mg/l	11-4321	Site #5	10/19 - 10/28/11	10/28/11	10/31/11	88.8	50	1000	0.6	1	100.8	101.0	100%	91-105
Alkalinity	mg/l	11-4407	Rain Blank	11/04/11	11/04/11	11/07/11	0.6	50	1000	0.6	1	12.6	13.2	105%	91-105
Alkalinity	mg/l	11-4720	Rain Blank	12/09/11	12/09/11	12/12/11	0.6	50	1000	0.6	1	12.6	13.2	105%	91-105
Alkalinity	mg/l	11-4820	Rain	11/4 - 12/16/11	12/16/11	12/19/11	3.6	50	1000	0.6	1	15.6	16.0	103%	91-105
Alkalinity	mg/l	11-4938	Site #5	12/16 - 12/23/11	12/23/11	12/27/11	116	50	1000	0.6	1	128.0	129.0	101%	91-105
Alkalinity	mg/l	12-0043	Rain Blank	01/06/12	01/06/12	01/10/12	0.4	50	1000	0.5	1	10.4	10.8	104%	91-105
Alkalinity	mg/l	12-0121	Site #5	1/6 - 1/13/12	01/13/12	01/15/12	115	50	1000	0.5	1	125.0	126.0	101%	91-105
Alkalinity	mg/l	12-0362	Site #3 Blank	02/06/12	02/06/12	02/07/12	0.6	50	1000	0.5	1	10.6	10.8	102%	91-105
Alkalinity	mg/l	12-0462	Rain	2/16 - 2/14/12	02/14/12	02/15/12	2.4	50	1000	0.5	1	12.4	13.0	104%	91-105
Alkalinity	mg/l	12-0602	Site #5	2/14 - 2/22/12	02/22/12	02/27/12	117	50	1000	0.5	1	127.0	128.0	101%	91-105
Alkalinity	mg/l	12-0688	Rain	03/02/12	03/02/12	03/05/12	3.4	50	1000	0.5	1	13.4	13.8	103%	91-105
Alkalinity	mg/l	12-0879	Site #5	3/13 - 3/20/12	03/20/12	03/21/12	91.6	50	1000	0.5	1	101.6	102.0	100%	91-105

Matrix Spike Recovery Study

Lockhart-Smith Samples Collected from:

April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE ID	SAMPLE DESCRIPTION	DATE COLLECTED	DATE RECEIVED	DATE ANALYZED	INITIAL CONC.	INITIAL VOLUME (ml)	SPIKE CONC.	SPIKE VOLUME ADDED (ml)	Dilution Factor	THEOR. CONC.	ACTUAL CONC.	PERCENT RECOVERY	ACCEPTANCE RANGE
Turbidity	NTU	10-0852	Rain Blank	04/08/10	04/08/10	04/09/10	0.3	50	4000	0.125	1	10.3	10.4	101%	86.4 - 106.8
Turbidity	NTU	10-0972	Rain	4/20 - 4/28/10	04/28/12	04/28/10	2.1	50	4000	0.125	1	12.1	12.4	102%	86.4 - 106.8
Turbidity	NTU	10-1071	Rain Blank	05/05/10	05/05/10	05/06/10	0.4	50	4000	0.125	1	10.4	10.4	100%	86.4 - 106.8
Turbidity	NTU	10-1222	Site #5	5/18 - 5/25/10	05/25/10	05/26/10	9.1	50	4000	0.125	1	19.1	18.4	96%	86.4 - 106.8
Turbidity	NTU	10-1394	Rain Blank	06/09/10	06/09/10	06/10/10	0	50	4000	0.125	1	10.0	9.3	93%	86.4 - 106.8
Turbidity	NTU	10-1490	Rain	6/9 - 6/26/10	06/26/10	06/28/10	1.3	50	4000	0.125	1	11.3	11.0	97%	86.4 - 106.8
Turbidity	NTU	10-1687	Rain Equipment Blank	07/08/10	07/08/10	07/09/10	0.3	50	4000	0.5	1	40.3	39.3	98%	86.4 - 106.8
Turbidity	NTU	10-2007	Rain	8/2 - 8/11/10	08/11/10	08/12/10	0.8	25	1000	0.25	1	10.8	10.8	100%	86.4 - 106.8
Turbidity	NTU	10-2071	Rain	8/11 - 8/17/10	08/17/10	08/18/10	1.2	25	1000	0.25	1	11.2	11.7	104%	86.4 - 106.8
Turbidity	NTU	10-2290	Rain Blank	09/02/10	09/02/10	09/03/10	0.2	25	1000	0.25	1	10.2	10.2	100%	86.4 - 106.8
Turbidity	NTU	10-2338	Rain	9/2 - 9/9/10	09/09/10	09/10/10	0.7	25	1000	0.25	1	10.7	9.9	93%	86.4 - 106.8
Turbidity	NTU	10-2582	Rain	9/16 - 9/23/10	09/23/10	09/29/10	0.8	25	1000	0.25	1	10.8	10.7	99%	86.4 - 106.8
Turbidity	NTU	10-3094	Site #5	11/11 - 11/19/10	11/19/10	11/20/10	0.8	25	1000	0.25	1	10.8	10.7	99%	86.4 - 106.8
Turbidity	NTU	10-3259	Rain	11/1 - 12/3/10	12/03/10	12/04/10	9.3	25	1000	0.25	1	19.3	19.3	100%	86.4 - 106.8
Turbidity	NTU	10-3313	Rain Blank	12/09/10	12/09/10	12/10/10	0.2	25	1000	0.25	1	10.2	9.9	97%	86.4 - 106.8
Turbidity	NTU	10-3331	Site #5	12/9 - 12/15/10	12/15/10	12/17/10	8.8	25	1000	0.25	1	18.8	17.7	94%	86.4 - 106.8
Turbidity	NTU	10-3410	Rain	12/3 - 12/23/10	12/23/10	12/24/10	6.7	25	1000	0.25	1	16.7	16.2	97%	86.4 - 106.8
Turbidity	NTU	11-0021	Rain Blank	01/04/11	01/04/11	01/05/11	0.4	50	4000	0.25	1	20.4	19.2	101%	86.4 - 106.8
Turbidity	NTU	11-0054	Rain	12/31 - 1/10/11	01/10/11	01/10/11	3.9	50	4000	0.25	1	23.9	22.7	102%	86.4 - 106.8
Turbidity	NTU	11-0389	Rain Blank	02/01/11	02/01/11	02/02/11	0.1	50	4000	0.25	1	20.1	20.0	99%	86.4 - 106.8
Turbidity	NTU	11-0802	Site #5 F.D.	2/10 - 2/24/11	02/24/11	02/25/11	15.9	50	4000	0.25	1	35.9	35.1	98%	86.4 - 106.8
Turbidity	NTU	11-0913	Rain Blank	03/02/11	03/02/11	03/01/11	0.6	50	4000	0.25	1	20.6	19.2	98%	86.4 - 106.8
Turbidity	NTU	11-0988	Rain	3/2 - 3/8/11	03/08/11	03/09/11	2.1	50	4000	0.25	1	22.1	21.4	96%	86.4 - 106.8
Turbidity	NTU	11-2821	Rain	07/08/11	07/08/11	07/08/11	0.7	50	4000	0.25	1	20.7	19.0	101%	86.4 - 106.8
Turbidity	NTU	11-2925	Site #5	7/14 - 7/18/11	07/18/11	07/19/11	4.7	50	4000	0.25	1	24.7	24.2	97%	86.4 - 106.8
Turbidity	NTU	11-3152	Rain	7/14 - 7/29/11	07/29/11	07/31/11	0.4	50	4000	0.25	1	20.4	19.6	105%	86.4 - 106.8
Turbidity	NTU	11-3261	Rain Blank	08/05/11	08/05/11	08/05/11	0.2	50	4000	0.25	1	20.2	19.4	99%	86.4 - 106.8
Turbidity	NTU	11-3345	Rain	8/5 - 8/12/11	08/12/11	08/12/11	0.7	50	4000	0.25	1	20.7	19.5	100%	86.4 - 106.8
Turbidity	NTU	11-3744	Rain Blank	09/09/11	09/09/11	09/09/11	0.2	50	4000	0.25	1	20.2	19.3	99%	86.4 - 106.8
Turbidity	NTU	11-3916	Rain	9/9 - 9/23/11	09/23/11	09/25/11	0.4	50	4000	0.25	1	20.4	19.0	101%	86.4 - 106.8
Turbidity	NTU	11-4048	Rain	9/23 - 10/4/11	10/04/11	10/04/11	0.3	50	4000	0.5	1	40.3	38.7	94%	86.4 - 106.8
Turbidity	NTU	11-4136	Rain	10/4 - 10/11/11	10/11/11	10/12/11	0.5	50	4000	0.5	1	40.5	39.0	101%	86.4 - 106.8
Turbidity	NTU	11-4208	Site #5	10/11 - 10/19/11	10/19/11	10/20/11	4.1	50	4000	0.5	1	44.1	45.6	101%	86.4 - 106.8
Turbidity	NTU	11-4623	Site #5	11/14 - 11/29/11	11/29/11	11/30/11	8.2	50	4000	0.5	1	48.2	48.9	102%	86.4 - 106.8
Turbidity	NTU	11-4720	Rain Blank	12/09/11	12/09/11	12/09/11	0.3	50	4000	0.5	1	40.3	42.0	99%	86.4 - 106.8
Turbidity	NTU	11-4820	Rain	12/9 - 12/16/11	12/16/11	12/17/11	1.4	50	4000	0.5	1	41.4	42.5	98%	86.4 - 106.8
Turbidity	NTU	11-4938	Site #5	12/16 - 12/23/11	12/23/11	12/23/11	17.2	50	4000	0.5	1	57.2	53.3	98%	86.4 - 106.8
Turbidity	NTU	11-4979	Site #5	12/23 - 12/31/11	12/31/11	12/31/11	10.2	50	4000	0.5	1	50.2	49.7	96%	86.4 - 106.8
Turbidity	NTU	12-0043	Rain	01/06/12	01/06/12	01/08/12	0.1	50	4000	0.125	1	10.1	10.0	99%	86.4 - 106.8
Turbidity	NTU	12-0121	Site #5	1/6 - 1/13/12	01/13/12	01/13/12	13.5	50	4000	0.125	1	23.5	22.2	94%	86.4 - 106.8
Turbidity	NTU	12-0602	Site #5	2/14 - 2/22/12	02/22/12	02/22/12	1.9	50	4000	0.125	1	11.9	11.0	92%	86.4 - 106.8
Turbidity	NTU	12-0688	Rain	2/14 - 3/2/12	03/02/12	03/02/12	0.9	50	4000	0.125	1	10.9	10.6	97%	86.4 - 106.8
Turbidity	NTU	12-1046	Site #5	3/26 - 4/4/12	04/04/12	04/05/12	8.5	50	4000	0.25	1	28.5	27.8	98%	86.4 - 106.8

Matrix Spike Recovery Study
Lockhart-Smith Samples Collected from:
April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE ID	SAMPLE DESCRIPTION	DATE COLLECTED	DATE RECEIVED	DATE ANALYZED	INITIAL CONC.	INITIAL VOLUME (ml)	SPIKE CONC.	SPIKE VOLUME ADDED (ml)	Dilution Factor	THEOR. CONC.	ACTUAL CONC.	PERCENT RECOVERY	ACCEPTANCE RANGE
SRP	µg/l	10-0902F	Site #1	04/12/10-04/20/10	04/20/10	04/21/10	44	10	20000	0.100	1	244	260	107%	90-110
SRP	µg/l	10-1071F	Rain Equipment Blank	05/05/10	05/05/10	05/05/10	0	10	20000	0.200	1	400	423	106%	90-110
SRP	µg/l	10-1133F	Site #5	05/15 - 05/13/10	05/13/10	05/13/10	97	10	20000	0.250	1	597	563	94%	90-110
SRP	µg/l	10-1220F	Site #3	05/18/10-05/25/10	05/25/10	05/26/10	46	10	20000	0.200	1	446	468	105%	90-110
SRP	µg/l	10-1490F	Rain	6/9 - 6/26/10	06/26/10	06/28/10	0	10	20000	0.100	1	200	210	105%	90-110
SRP	µg/l	10-1687F	Rain Equipment Blank	07/08/10	07/08/10	07/09/10	0	10	20000	0.040	1	80	81	101%	90-110
SRP	µg/l	10-2007F	Rain	8/2/10 - 8/11/10	08/11/06	08/11/06	1	10	20000	0.100	1	201	214	106%	90-110
SRP	µg/l	10-2007F	Rain	8/2/10 - 8/11/10	08/11/06	08/11/10	1	10	20000	0.100	1	201	213	106%	90-110
SRP	µg/l	10-2071F	Rain	8/11/10 - 8/17/10	08/17/10	08/18/10	49	10	20000	0.100	1	249	267	107%	90-110
SRP	µg/l	10-2289F	Site # 5 Sampler Blank	09/02/10	09/02/10	09/08/10	0	10	20000	0.100	1	200	219	110%	90-110
SRP	µg/l	10-2582F	Rain	9/16/10 - 9/23/10	09/28/10	09/29/10	21	10	20000	0.100	1	221	215	97%	90-110
SRP	µg/l	10-2651F	Site # 3 FD	9/28/10 - 10/6/10	10/07/10	10/08/10	50	10	20000	0.150	1	350	379	108%	90-110
SRP	µg/l	10-2699F	Site # 5	10/6/10 - 10/13/10	10/13/10	10/15/10	89	10	20000	0.150	1	389	404	104%	90-110
SRP	µg/l	10-3406F	Site #1	12/15/10 - 12/23/10	12/23/10	12/29/10	36	10	20000	0.150	1	336	364	108%	90-110
SRP	µg/l	11-0020F	Site # 5 Sampler Blank	01/04/11	01/04/11	01/05/11	0	10	20000	0.200	1	400	435	109%	90-110
SRP	µg/l	11-0383F	Rain	1/19/11 - 2/1/11	02/01/11	02/08/11	267	10	20000	0.150	1	567	579	102%	90-110
SRP	µg/l	11-0912F	Site # 5 Sampler Blank	03/02/11	03/02/11	03/09/11	0	10	20000	0.100	1	200	218	109%	90-110
SRP	µg/l	11-1171F	Rain	3/8/11 - 3/18/11	03/18/11	03/25/11	149	10	20000	0.100	1	349	337	97%	90-110
SRP	µg/l	11-1339F	Site # 5	3/18/11 - 3/28/11	03/28/11	04/11/11	86	10	20000	0.050	1	186	201	108%	90-110
SRP	µg/l	11-1462F	Site # 2	3/28/11 - 4/4/11	04/04/11	04/12/11	1	10	20000	0.050	1	101	111	110%	90-110
SRP	µg/l	11-2297F	Site # 2 Sampler Blank	06/03/11	06/03/11	06/07/11	0	10	20000	0.050	1	100	100	100%	90-110
SRP	µg/l	11-3151F	Site # 5	07/29/11	07/29/11	08/10/11	83	10	10000	0.250	1	333	344	103%	90-110
SRP	µg/l	11-3258F	Site # 3 Sampler Blank	08/05/11	08/05/11	08/18/11	0	10	10000	0.250	1	250	268	107%	90-110
SRP	µg/l	11-3343F	Site # 4	7/8/11 - 8/12/11	08/12/11	08/22/11	87	10	10000	0.250	1	337	341	101%	90-110
SRP	µg/l	11-4054F	Rain Equipment Blank	10/04/11	10/04/11	10/05/11	0	10	10000	0.100	1	100	92	92%	90-110
SRP	µg/l	11-4135F	Site # 5	10/4/11 - 10/11/11	10/11/11	10/12/11	71	10	10000	0.150	1	221	229	104%	90-110
SRP	µg/l	11-4321F	Site #5	10/19 - 10/28/11	10/28/11	10/31/11	45	10	10000	0.150	1	195	207	106%	90-110
SRP	µg/l	11-4623F	Site # 5	11/14/11 - 11/29/11	11/29/11	11/29/11	38	10	10000	0.150	1	188	202	107%	90-110
SRP	µg/l	11-4938F	Site # 5	12/23/11	12/23/11	12/23/11	49	10	10000	0.150	1	199	196	98%	90-110
SRP	µg/l	11-4982F	Site # 5	12/31/11	12/31/11	12/31/11	40	10	10000	0.150	1	190	188	99%	90-110
SRP	µg/l	12-0358F	Site # 3	1/19/12 - 2/6/12	02/06/12	02/08/12	46	10	10000	0.200	1	246	264	107%	90-110
SRP	µg/l	12-0462F	Rain	12/16/11 - 2/14/12	02/15/12	02/16/12	77	10	20000	0.200	1	477	456	96%	90-110
SRP	µg/l	12-0689F	Site # 1 Sampler Blank	03/02/12	03/02/12	03/02/12	0	10	10000	0.200	1	200	210	105%	90-110
SRP	µg/l	12-0694F	Rain Equipment Blank	03/02/12	03/02/12	03/02/12	0	10	10000	0.200	1	200	210	105%	90-110
SRP	µg/l	12-0741F	Site # 5	3/2/12 - 3/7/12	03/07/12	03/07/12	56	10	10000	0.200	1	256	271	106%	90-110

Matrix Spike Recovery Study
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PARAMETERS	UNITS	SAMPLE ID	SAMPLE DESCRIPTION	DATE COLLECTED	DATE RECEIVED	DATE ANALYZED	INITIAL CONC.	INITIAL VOLUME (ml)	SPIKE CONC.	SPIKE VOLUME ADDED (ml)	Dilution Factor	THEOR. CONC.	ACTUAL CONC.	PERCENT RECOVERY	ACCEPTANCE RANGE
NOX-N	µg/l	10-0902F	Site #1	04/12/10-04/20/10	04/20/10	04/21/10	263	10	11300	0.200	1	489	492	101%	89 - 110
NOX-N	µg/l	10-1071F	Rain Equipment Blank	05/05/10	05/05/10	05/05/10	0	10	11300	0.400	1	452	455	101%	89 - 110
NOX-N	µg/l	10-1133F	Site #5	05/15 - 05/13/10	05/13/10	05/13/10	40	10	11300	0.400	1	492	463	94%	89 - 110
NOX-N	µg/l	10-1220F	Site #3	05/18/10-05/25/10	05/25/10	05/26/10	6	10	11300	0.400	1	458	470	103%	89 - 110
NOX-N	µg/l	10-1490F	Rain	6/9 - 6/26/10	06/26/10	06/28/10	12	10	11300	0.200	1	238	233	98%	89 - 110
NOX-N	µg/l	10-1687F	Rain Equipment Blank	07/08/10	07/08/10	07/09/10	0	10	11300	0.071	1	80	82	102%	89 - 110
NOX-N	µg/l	10-2007F	Rain	8/2/10 - 8/11/10	08/11/10	08/11/10	59	10	22600	0.100	1	285	274	96%	89 - 110
NOX-N	µg/l	10-2007F	Rain	8/2/10 - 8/11/10	08/11/10	08/11/10	59	10	22600	0.100	1	285	275	96%	89 - 110
NOX-N	µg/l	10-2071F	Rain	8/11/10 - 8/17/10	08/17/10	08/18/10	148	10	22600	0.100	1	374	392	105%	89 - 110
NOX-N	µg/l	10-2289F	Site # 5 Sampler Blank	09/02/10	09/02/10	09/08/10	0	10	22600	0.100	1	224	234	104%	89 - 110
NOX-N	µg/l	10-2582F	Rain	9/16/10 - 9/23/10	09/28/10	09/29/10	167	10	22600	0.1	1	393	430	109%	89 - 110
NOX-N	µg/l	10-2651F	Site # 3 FD	9/28/10 - 10/6/10	10/07/10	10/08/10	125	10	22600	0.15	1	464	472	102%	89 - 110
NOX-N	µg/l	10-2699F	Site # 5	10/6/10 - 10/13/10	10/13/10	10/15/10	131	10	22600	0.15	1	470	442	94.0%	89 - 110
NOX-N	µg/l	10-3406F	Site #1	12/15/10 - 12/23/10	12/23/10	12/29/10	143	10	22600	0.15	1	482	501	103.9%	89 - 110
NOX-N	µg/l	11-0020F	Site # 5 Sampler Blank	01/04/11	01/04/11	01/05/11	0	10	11300	0.4	1	452	476	103%	89 - 110
NOX-N	µg/l	11-0383F	Rain	1/19/11 - 2/1/11	02/01/11	02/08/11	39	10	10000	0.5	1	539	525	94%	89 - 110
NOX-N	µg/l	11-0912F	Site # 5 Sampler Blank	03/02/11	03/02/11	03/09/11	0	10	10000	0.2	1	200	195	91.6%	89 - 110
NOX-N	µg/l	11-1171F	Rain	3/8/11 - 3/18/11	03/18/11	03/25/11	213	10	10000	0.125	1	338	320	95.3%	89 - 110
NOX-N	µg/l	11-1339F	Site # 5	3/18/11 - 3/28/11	03/28/11	04/11/11	196	10	10000	0.1	1	296	305	97%	89 - 110
NOX-N	µg/l	11-1462F	Site # 2	3/28/11 - 4/4/11	04/04/11	04/12/11	0	10	10000	0.1	1	100	100	106%	89 - 110
NOX-N	µg/l	11-2297F	Site # 2 Sampler Blank	06/03/11	06/03/11	06/07/11	0	10	100000	0.1	1	1,000	1,054	110%	89 - 110
NOX-N	µg/l	11-3151F	Site # 5	07/29/11	07/29/11	08/10/11	33	10	100000	0.25	1	2,533	2,640	102%	89 - 110
NOX-N	µg/l	11-3258F	Site # 3 Sampler Blank	08/05/11	08/05/11	08/18/11	0	10	100000	0.25	1	2,500	2,678	100%	89 - 110
NOX-N	µg/l	11-3343F	Site # 4	7/8/11 - 8/12/11	08/12/11	08/22/11	35	10	100000	0.25	1	2,535	2,539	106%	89 - 110
NOX-N	µg/l	11-4054F	Rain Equipment Blank	10/04/11	10/04/11	10/05/11	0	10	10000	0.2	1	200	180	103%	89 - 110
NOX-N	µg/l	11-4135F	Site # 5	10/4/11 - 10/11/11	10/11/11	10/12/11	44	10	10000	0.150	1	194	199	100%	89 - 110
NOX-N	µg/l	11-4321F	Site #5	10/19 - 10/28/11	10/28/11	10/31/11	48	10	10000	0.150	1	198	201	101%	89 - 110
NOX-N	µg/l	11-4623F	Site # 5	11/14/11 - 11/29/11	11/29/11	11/29/11	6	10	10000	0.150	1	156	158	100%	89 - 110
NOX-N	µg/l	11-4938F	Site # 5	12/23/11	12/23/11	12/23/11	62	10	10000	0.150	1	212	191	91%	89 - 110
NOX-N	µg/l	11-4982F	Site # 5	12/31/11	12/31/11	12/31/11	51	10	11300	0.100	1	164	168	102%	89 - 110
NOX-N	µg/l	12-0358F	Site # 3	1/19/12 - 2/6/12	02/06/12	02/08/12	412	10	10000	0.200	1	612	597	98%	89 - 110
NOX-N	µg/l	12-0462F	Rain	12/16/11 - 2/14/12	02/15/12	02/16/12	349	10	10000	0.200	1	549	553	101%	89 - 110
NOX-N	µg/l	12-0741F	Site # 5	3/2/12 - 3/7/12	03/07/12	03/07/12	14	10	10000	0.200	1	214	205	96%	89 - 110

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Total N	µg/l	10-1070P	Site #5	05/18/10-05/25/10	05/25/10	06/04/10	0	5	226000	0.050	1	2,260	2,300	102%	90-110
Total N	µg/l	10-1222P	Site #2	05/25/10-05/31/10	06/01/10	06/07/10	925	5	226000	0.050	1	3,465	3,565	109%	90-110
Total N	µg/l	10-1276P	Site #5	05/31/10-06/09/10	06/09/10	06/23/10	537	5	226000	0.075	1	3,927	3,537	90%	90-110
Total N	µg/l	10-1386FP	Site #5	05/18/10-05/25/10	05/25/10	06/24/10	599	5	226000	0.100	1	5,119	5,396	105%	90-110
Total N	µg/l	10-1222P	Site #2	05/25/10-05/31/10	06/01/10	06/24/10	925	5	226000	0.050	1	3,185	3,435	108%	90-110
Total N	µg/l	10-1276P	Site #5	6/9 - 6/26/10	06/26/10	07/02/10	537	5	226000	0.050	1	2,797	3,048	109%	90-110
Total N	µg/l	10-1489FP	Site #5	05/31/10-06/09/10	06/09/10	07/07/10	966	5	226000	0.100	1	5,486	5,370	98%	90-110
Total N	µg/l	10-1386FP	Site #4	06/30/10 - 07/08/10	07/08/10	07/22/10	648	5	226000	0.100	1	5,168	5,206	101%	90-110
Total N	µg/l	10-1679FP	Site #4	6/30 - 7/8/10	07/08/10	07/22/10	751	5	226000	0.125	1	6,401	6,051	95%	90-110
Total N	µg/l	10-1679P	Site # 4 Sampler Blank	08/02/10	08/02/10	08/11/10	751	5	226000	0.110	1	5,723	6,051	106%	90-110
Total N	µg/l	10-1919P	Site # 2 Sampler Blank	09/02/10	09/02/10	12/02/10	0	5	11300	0.125	1	283	281	99%	90-110
Total N	µg/l	10-2286FP	Site #1	9/2/10 - 9/9/10	09/09/10	12/06/10	0	5	22600	0.200	1	904	885	98%	90-110
Total N	µg/l	10-2332FP	Site # 2 Sampler Blank	10/06/10	10/06/10	12/28/10	1362	5	22600	0.250	1	2,492	2,474	99%	90-110
Total N	µg/l	10-2655P	Site # 3	10/6/10 - 10/13/10	10/13/10	12/28/10	0	5	22600	0.250	1	1,130	1,085	96%	90-110
Total N	µg/l	10-2698P	Site # 5	10/13/10 - 10/21/10	10/21/10	12/28/10	670	5	22600	0.200	1	1,574	1,655	105%	90-110
Total N	µg/l	10-2769FP	Site # 2 Sampler Blank	11/03/10	11/04/10	01/18/11	551	5	22600	0.200	1	1,455	1,441	99%	90-110
Total N	µg/l	10-2985fp	Rain Equipment Blank	11/03/10	11/04/10	01/18/11	0	5	22600	0.250	1	1,130	1,165	103%	90-110
Total N	µg/l	10-2989fp	Rain	11/3/10 - 11/11/10	11/11/10	02/08/11	0	5	22600	0.250	1	1,130	1,184	105%	90-110
Total N	µg/l	10-3049p	Rain	11/3/10 - 11/11/10	11/11/10	02/08/11	115	5	22600	0.250	1	1,245	1,223	98%	90-110
Total N	µg/l	10-3259fp	Rain	11/11/10 - 12/3/10	12/03/10	05/02/11	807	5	10000	0.125	1	1,057	1,008	95%	90-110
Total N	µg/l	10-3409p	Site #5	12/15/10 - 12/23/10	12/23/10	05/10/11	314	5	10000	0.075	1	464	481	95%	90-110
Total N	µg/l	10-3410fp	Rain	12/3/10 - 12/23/10	12/23/10	05/10/11	2792	5	10000	0.075	1	2,942	3,001	96%	90-110
Total N	µg/l	11-0213fp	Rain	1/10/11 - 1/19/11	01/19/11	08/22/11	1877	5	100000	0.30	1	7,877	7,640	97%	90-110
Total N	µg/l	11-0378p	Site #1A	02/01/11	02/01/11	09/07/11	840	5	10000	0.25	1	1,340	1,311	95%	90-110
Total N	µg/l	11-0385fp	Site #2 Sampler Blank	02/01/11	02/01/11	09/07/11	0	5	10000	0.25	1	500	500	104%	90-110
Total N	µg/l	11-0800fp	Site #3	2/10/11 - 2/24/11	02/24/11	09/27/11	851	5	10000	0.25	1	1,351	1,276	102%	90-110
Total N	µg/l	11-0907fp	Rain	03/02/11	03/02/11	09/27/11	1002	5	10000	0.25	1	1,502	1,421	103%	90-110
Total N	µg/l	11-1170p	Site # 5	3/8/11 - 3/18/11	03/18/11	09/27/11	1056	5	10000	0.25	1	1,556	1,565	97.0%	90-110
Total N	µg/l	11-1171fp	Rain	3/8/11 - 3/18/11	03/18/11	09/27/11	0	5	10000	0.23	1	450	450	97.8%	90-110
Total N	µg/l	11-1462fp	Site # 2	3/28/11 - 4/4/11	04/04/11	10/05/11	442	5	10000	0.25	1	942	941	100%	90-110
Total N	µg/l	11-1582fp	Rain	4/4/11 - 4/11/11	04/11/11	10/05/11	208	5	10000	0.25	1	708	655	94%	90-110
Total N	µg/l	11-1900fp	Site # 2 Sampler Blank	05/04/11	05/04/11	10/05/11	0	5	10000	0.25	1	500	535	95%	90-110
Total N	µg/l	11-1904fp	Rain Equipment Blank	05/04/11	05/04/11	10/05/11	0	5	10000	0.25	1	500	513	101%	90-110
Total N	µg/l	11-2001fp	Site # 5	5/4/11 - 5/16/11	05/16/11	10/18/11	638	5	10000	0.15	1	938	925	100%	90-110
Total N	µg/l	11-2297p	Site # 2 Sampler Blank	06/03/11	06/03/11	11/01/11	0	5	10000	0.15	1	300	322	100%	90-110
Total N	µg/l	11-2821p	Rain	4/25/11 - 7/8/11	07/08/11	11/15/11	274	5	10000	0.15	1	574	598	93%	90-110

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Total N	µg/l	11-2827fp	Rain Equipment Blank	07/08/11	07/08/11	11/15/11	0	5	10000	0.15	1	300	301	107%	90-110
Total N	µg/l	11-2893p	Site # 3 F.D.	7/8/11 - 7/14/11	07/14/11	12/07/11	598	5	10000	0.15	1	898	943	103%	90-110
Total N	µg/l	11-3149fp	Site # 1	07/29/11	07/29/11	12/19/11	730	5	10000	0.15	1	1,030	980	99%	90-110
Total N	µg/l	11-3152fp	Rain	07/29/11	07/29/11	12/19/11	293	5	10000	0.15	1	593	593	107%	90-110
Total N	µg/l	11-3255fp	Rain	7/29/11 - 8/5/11	08/05/11	12/21/11	367	5	10000	0.15	1	667	653	104%	90-110
Total N	µg/l	11-3345fp	Rain	8/5/11 - 8/12/11	08/12/11	12/28/11	205	5	10000	0.15	1	505	491	100%	90-110
Total N	µg/l	11-3742fp	Site # 4 Sampler Blank	09/09/11	09/09/11	01/12/12	0	5	10000	0.20	1	400	407	105%	90-110
Total N	µg/l	11-3816fp	Site # 3	9/9/11 - 9/16/11	09/16/11	01/12/12	761	5	10000	0.20	1	1,161	1,172	95%	90-110
Total N	µg/l	11-3817fp	Site # 5	9/9/11 - 9/16/11	09/16/11	01/12/12	385	5	10000	0.20	1	785	770	100.0%	90-110
Total N	µg/l	11-4053p	Site # 5 Sampler Blank	10/04/11	10/04/11	01/20/12	0	5	10000	0.20	1	400	384	96.0%	90-110
Total N	µg/l	11-4054fp	Rain Equipment Blank	10/04/11	10/04/11	01/20/12	0	5	10000	0.20	1	400	400	100.0%	90-110
Total N	µg/l	11-4135fp	Site # 5	10/4/11 - 10/11/11	10/11/11	01/24/12	486	5	10000	0.20	1	886	904	102.0%	90-110
Total N	µg/l	11-4205p	Site # 3	10/11/11 - 10/19/11	10/19/11	01/27/12	582	5	10000	0.20	1	982	939	95.6%	90-110
Total N	µg/l	11-4319p	Site #2	10/19 - 10/28/11	10/28/11	02/03/12	309	5	10000	0.20	1	709	774	109.1%	90-110
Total N	µg/l	11-4405fp	Site # 4 Sampler Blank	11/04/11	11/04/11	02/08/12	0	5	10000	0.20	1	400	424	106.0%	90-110
Total N	µg/l	11-4621fp	Site # 1	11/14/11 - 11/29/11	11/29/11	02/16/12	871	5	10000	0.20	1	1,271	1,229	96.7%	90-110
Total N	µg/l	11-4623fp	Site # 5	11/14/11 - 11/29/11	11/29/11	02/16/12	107	5	10000	0.20	1	507	515	101.7%	90-110
Total N	µg/l	11-4817fp	Site # 2	11/14/11 - 12/16/11	12/16/11	02/29/12	320	5	10000	0.20	1	720	715	99.2%	90-110
Total N	µg/l	11-4982fp	Site # 5	12/31/11	12/31/11	03/13/12	679	5	10000	0.20	1	1,079	1,105	102.4%	90-110
Total N	µg/l	12-0042p	Site # 5 Sampler Blank	01/06/12	01/06/12	03/14/12	0	5	10000	0.20	1	400	408	102.0%	90-110
Total N	µg/l	12-0362p	Site # 3 Sampler Blank	02/06/12	02/06/12	03/19/12	0	5	10000	0.20	1	400	426	106.5%	90-110
Total N	µg/l	12-0459p	Site # 1	2/6/12 - 2/14/12	02/14/12	03/25/12	151	5	10000	0.20	1	551	526	95.5%	90-110
Total N	µg/l	12-0685fp	Site # 3	2/22/12 - 3/2/12	03/02/12	03/27/12	312	5	10000	0.20	1	712	688	96.6%	90-110
Total N	µg/l	12-0784fp	Site # 1	3/7/12 - 3/13/12	03/13/12	03/27/12	168	5	10000	0.20	1	568	559	98.5%	90-110
Total N	µg/l	12-0789fp	Rain	3/7/12 - 3/13/12	03/13/12	03/27/12	90	5	10000	0.20	1	490	472	96.3%	90-110
Total N	µg/l	12-0948p	Site # 5	3/20/12 - 3/26/12	03/26/12	04/02/12	147	5	10000	0.20	1	547	536	98.0%	90-110

Matrix Spike Recovery Study
Lockhart-Smith Samples Collected from:
April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE ID	SAMPLE DESCRIPTION	DATE COLLECTED	DATE RECEIVED	DATE ANALYZED	INITIAL CONC.	INITIAL VOLUME (ml)	SPIKE CONC.	SPIKE VOLUME ADDED (ml)	Dilution Factor	THEOR. CONC.	ACTUAL CONC.	PERCENT RECOVERY	ACCEPTANCE RANGE
Total P	µg/l	10-1070P	Site #5 Sampler Blank	05/05/10	05/05/10	05/12/10	0	5	50000	0.025	1	250	260	104%	90-110
Total P	µg/l	10-1222P	Site #5	05/18/10-05/25/10	05/25/10	06/04/10	253	5	50000	0.100	1	1,253	1,324	106%	90-110
Total P	µg/l	10-1276P	Site #2	05/25/10-05/31/10	06/01/10	06/07/10	18	5	50000	0.100	1	1,018	1,099	108%	90-110
Total P	µg/l	10-1386FP	Site #5	05/31/10-06/09/10	06/09/10	06/23/10	38	5	50000	0.050	1	538	579	108%	90-110
Total P	µg/l	0-1276P RED	Site #2	05/25/10-05/31/10	06/01/10	06/24/10	18	5	50000	0.100	1	1,018	1,057	104%	90-110
Total P	µg/l	10-1489FP	Site #5	6/9 - 6/26/10	06/26/10	07/02/10	78	5	50000	0.050	1	578	571	99%	90-110
Total P	µg/l	-1386FP RED	Site #5	05/31/10-06/09/10	06/09/10	07/07/10	78	5	50000	0.050	1	578	636	110%	90-110
Total P	µg/l	10-1679FP	Site #4	06/30/10 - 07/08/10	07/08/10	07/22/10	248	5	50000	0.070	1	948	914	96%	90-110
Total P	µg/l	10-1919P	Site # 4 Sampler Blank	08/02/10	08/02/10	08/11/10	0	5	50000	0.010	1	100	101	101%	90-110
Total P	µg/l	10-2286FP	Site # 2 Sampler Blank	09/02/10	09/02/10	12/02/10	0	5	20000	0.125	1	500	523	105%	90-110
Total P	µg/l	10-2332FP	Site #1	9/2/10 - 9/9/10	09/09/10	12/06/10	27	5	20000	0.125	1	527	511	97%	90-110
Total P	µg/l	10-2655P	Site # 2 Sampler Blank	10/06/10	10/06/10	12/28/10	0	5	20000	0.150	1	600	586	98%	90-110
Total P	µg/l	10-2698P	Site # 3	10/6/10 - 10/13/10	10/13/10	12/28/10	75	5	20000	0.150	1	675	740	110%	90-110
Total P	µg/l	10-2769FP	Site # 5	10/13/10 - 10/21/10	10/21/10	12/28/10	52	5	20000	0.150	1	652	688	106%	90-110
Total P	µg/l	10-2985fp	Site # 2 Sampler Blank	11/03/10	11/04/10	01/18/11	0	5	20000	0.225	1	900	906	101%	90-110
Total P	µg/l	10-2989fp	Rain Equipment Blank	11/03/10	11/04/10	01/18/11	0	5	20000	0.2	1	800	771	96%	90-110
Total P	µg/l	10-3049p	Rain	11/3/10 - 11/11/10	11/11/10	02/08/11	14	5	20000	0.2	1	814	779	96%	90-110
Total P	µg/l	10-3049fp	Rain	11/3/10 - 11/11/10	11/11/10	02/08/11	4	5	20000	0.2	1	804	771	96%	90-110
Total P	µg/l	10-3313p	Rain Equipment Blank	12/09/10	12/09/10	05/03/11	0	5	10000	0.075	1	150	159	106%	90-110
Total P	µg/l	10-3313fp	Rain Equipment Blank	12/09/10	12/09/10	05/03/11	0	5	10000	0.100	1	200	197	98%	90-110
Total P	µg/l	10-3409p	Site #5	12/15/10 - 12/23/10	12/23/10	05/10/11	56	5	10000	0.100	1	256	256	100%	90-110
Total P	µg/l	10-3410fp	Rain	12/3/10 - 12/23/10	12/23/10	05/10/11	2292	5	10000	0.075	1	2,442	2,433	100%	90-110
Total P	µg/l	11-0017fp	Site # 2 Sampler Blank	01/04/11	01/04/11	06/14/11	0	5	10000	0.200	1	400	426	106%	90-110
Total P	µg/l	11-0213fp	Rain	1/10/11 - 1/19/11	01/19/11	08/22/11	282	5	10000	0.300	1	882	885	100%	90-110
Total P	µg/l	11-0378p	Site #1A	02/01/11	02/01/11	09/07/11	15	5	10000	0.200	1	415	421	101%	90-110
Total P	µg/l	11-0385fp	Site #2 Sampler Blank	02/01/11	02/01/11	09/07/11	0	5	10000	0.225	1	450	454	101%	90-110
Total P	µg/l	11-0800fp	Site #3	2/10/11 - 2/24/11	02/24/11	09/27/11	44	5	10000	0.25	1	544	576	105.8%	90-110
Total P	µg/l	11-0907fp	Rain	03/02/11	03/02/11	09/27/11	201	5	10000	0.25	1	701	731	104.3%	90-110
Total P	µg/l	11-1170p	Site # 5	3/8/11 - 3/18/11	03/18/11	09/27/11	211	5	10000	0.25	1	711	750	105.5%	90-110
Total P	µg/l	11-1171fp	Rain	3/8/11 - 3/18/11	03/18/11	09/27/11	104	5	10000	0.25	1	604	631	104%	90-110
Total P	µg/l	11-1462fp	Site # 2	3/28/11 - 4/4/11	04/04/11	10/05/11	0	5	10000	0.25	1	500	524	104.8%	90-110
Total P	µg/l	11-1582fp	Rain	4/4/11 - 4/11/11	04/11/11	10/05/11	0	5	10000	0.25	1	500	517	103%	90-110
Total P	µg/l	11-1900fp	Site # 2 Sampler Blank	05/04/11	05/04/11	10/05/11	0	5	10000	0.25	1	500	524	105%	90-110
Total P	µg/l	11-1904fp	Rain Equipment Blank	05/04/11	05/04/11	10/05/11	0	5	10000	0.25	1	500	528	106%	90-110
Total P	µg/l	11-2001fp	Site # 5	5/4/11 - 5/16/11	05/16/11	10/18/11	142	5	10000	0.15	1	442	464	105%	90-110

Matrix Spike Recovery Study
Lockhart-Smith Samples Collected from:
April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE ID	SAMPLE DESCRIPTION	DATE COLLECTED	DATE RECEIVED	DATE ANALYZED	INITIAL CONC.	INITIAL VOLUME (ml)	SPIKE CONC.	SPIKE VOLUME ADDED (ml)	Dilution Factor	THEOR. CONC.	ACTUAL CONC.	PERCENT RECOVERY	ACCEPTANCE RANGE
Total P	µg/l	11-2297p	Site # 2 Sampler Blank	06/03/11	06/03/11	11/01/11	0	5	10000	0.15	1	300	299	100%	90-110
Total P	µg/l	11-2821p	Rain	4/25/11 - 7/8/11	07/08/11	11/15/11	5	5	10000	0.15	1	305	304	100%	90-110
Total P	µg/l	11-2827fp	Rain Equipment Blank	07/08/11	07/08/11	11/15/11	0	5	10000	0.15	1	300	312	104.0%	90-110
Total P	µg/l	11-2893p	Site # 3 F.D.	7/8/11 - 7/14/11	07/14/11	12/07/11	169	5	10000	0.15	1	469	478	102.0%	90-110
Total P	µg/l	11-3149fp	Site # 1	07/29/11	07/29/11	12/19/11	86	5	10000	0.15	1	386	403	104%	90-110
Total P	µg/l	11-3152fp	Rain	07/29/11	07/29/11	12/19/11	44	5	10000	0.15	1	344	355	103.3%	90-110
Total P	µg/l	11-3255fp	Rain	7/29/11 - 8/5/11	08/05/11	12/21/11	0	5	10000	0.15	1	300	311	104%	90-110
Total P	µg/l	11-3345fp	Rain	8/5/11 - 8/12/11	08/12/11	12/28/11	4	5	10000	0.15	1	304	301	98.9%	90-110
Total P	µg/l	11-3742fp	Site # 4 Sampler Blank	09/09/11	09/09/11	01/12/12	0	5	10000	0.20	1	400	392	98.0%	90-110
Total P	µg/l	11-3816fp	Site # 3	9/9/11 - 9/16/11	09/16/11	01/12/12	77	5	10000	0.20	1	477	490	102.6%	90-110
Total P	µg/l	11-3817fp	Site # 5	9/9/11 - 9/16/11	09/16/11	01/12/12	82	5	10000	0.20	1	482	493	102.3%	90-110
Total P	µg/l	11-4053p	Site # 5 Sampler Blank	10/04/11	10/04/11	01/20/12	0	5	10000	0.20	1	400	399	99.7%	90-110
Total P	µg/l	11-4054fp	Rain Equipment Blank	10/04/11	10/04/11	01/20/12	0	5	10000	0.20	1	400	397	99%	90-110
Total P	µg/l	11-4135fp	Site # 5	10/4/11 - 10/11/11	10/11/11	01/24/12	69	5	10000	0.20	1	469	502	106.9%	90-110
Total P	µg/l	11-4205p	Site # 3	10/11/11 - 10/19/11	10/19/11	01/27/12	86	5	10000	0.2	1	486	516	106%	90-110
Total P	µg/l	11-4319p	Site #2	10/19 - 10/28/11	10/28/11	02/03/12	1	5	10000	0.2	1	401	411	102%	90-110
Total P	µg/l	11-4405fp	Site # 4 Sampler Blank	11/04/11	11/04/11	02/08/12	0	5	10000	0.20	1	400	414	103.5%	90-110
Total P	µg/l	11-4621fp	Site # 1	11/14/11 - 11/29/11	11/29/11	02/16/12	59	5	10000	0.20	1	459	469	102%	90-110
Total P	µg/l	11-4623fp	Site # 5	11/14/11 - 11/29/11	11/29/11	02/16/12	41	5	10000	0.20	1	441	471	106.7%	90-110
Total P	µg/l	11-4817fp	Site # 2	11/14/11 - 12/16/11	12/16/11	02/29/12	0	5	10000	0.2	1	400	407	102%	90-110
Total P	µg/l	11-4982fp	Site # 5	12/31/11	12/31/11	03/13/12	42	5	10000	0.2	1	442	478	108%	90-110
Total P	µg/l	12-0042p	Site # 5 Sampler Blank	01/06/12	01/06/12	03/14/12	0	5	10000	0.2	1	400	390	97%	90-110
Total P	µg/l	12-0362p	Site # 3 Sampler Blank	02/06/12	02/06/12	03/19/12	0	5	10000	0.20	1	400	391	97.7%	90-110
Total P	µg/l	12-0459p	Site # 1	2/6/12 - 2/14/12	02/14/12	03/25/12	90	5	10000	0.20	1	490	527	107%	90-110
Total P	µg/l	12-0685fp	Site # 3	2/22/12 - 3/2/12	03/02/12	03/27/12	79	5	10000	0.20	1	479	492	102.7%	90-110
Total P	µg/l	12-0784fp	Site # 1	3/7/12 - 3/13/12	03/13/12	03/27/12	22	5	10000	0.2	1	422	424	100%	90-110
Total P	µg/l	12-0789fp	Rain	3/7/12 - 3/13/12	03/13/12	03/27/12	12	5	10000	0.2	1	412	397	96%	90-110
Total P	µg/l	12-0948p	Site # 5	3/20/12 - 3/26/12	03/26/12	04/02/12	122	5	10000	0.2	1	522	559	107%	90-110

Matrix Spike Recovery Study
Lockhart-Smith Samples Collected from:
April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE ID	SAMPLE DESCRIPTION	DATE COLLECTED	DATE RECEIVED	DATE ANALYZED	INITIAL CONC.	INITIAL VOLUME (ml)	SPIKE CONC.	SPIKE VOLUME ADDED (ml)	Dilution Factor	THEOR. CONC.	ACTUAL CONC.	PERCENT RECOVERY	ACCEPTANCE RANGE
Ammonia	µg/l	10-0972P	Rain	04/20/10-04/28/10	04/28/10	04/30/10	169	10	10000	1.000	1	1,069	1,036	97%	80-120
Ammonia	µg/l	10-1070P	Site #5 Sampler Blank	05/05/10	05/05/10	05/12/10	0	10	10000	1.000	1	1,000	946	92%	80-120
Ammonia	µg/l	10-1278P	Site #5	05/25/10-05/31/10	06/01/10	06/02/10	9	10	10000	0.400	1	409	439	107%	80-120
Ammonia	µg/l	10-1675P	Site #1A	07/08/10	07/08/10	07/15/10	30	8	10000	0.100	1	155	150	97%	80-120
Ammonia	µg/l	10-2289P	Site # 5 Sampler Blank	09/02/10	09/02/10	09/29/10	0	10	10000	1.000	1	1,000	1,028	103%	80-120
Ammonia	µg/l	10-2659P	Rain Equipment Blank	10/06/10	10/07/10	12/08/10	0	10	10000	0.400	1	400	432	100%	80-120
Ammonia	µg/l	10-2768P	Site # 3	10/13/10 - 10/21/10	10/21/10	12/14/10	212	10	10000	0.100	1	312	303	97%	80-120
Ammonia	µg/l	10-3308P	Site # 1 Sampler Blank	12/09/10	12/09/10	12/21/10	0	10	10000	0.150	1	150	161	107%	80-120
Ammonia	µg/l	10-3331P	Site #5	12/9/10 - 12/15/10	12/15/10	12/21/10	45	10	10000	0.125	1	170	170	100%	80-120
Ammonia	µg/l	11-0020P	Site # 5 Sampler Blank	01/04/11	01/04/11	02/04/11	0	10	10000	0.200	1	200	190	95%	80-120
Ammonia	µg/l	11-0389P	Rain Equipment Blank	02/01/11	02/01/11	05/03/11	0	10	10000	0.100	1	100	95	95%	80-120
Ammonia	µg/l	11-0495P	Rain	2/1/11 - 2/10/11	02/10/11	05/03/11	247	10	10000	0.050	1	297	285	96.0%	80-120
Ammonia	µg/l	11-0913P	Rain Equipment Blank	03/02/11	03/02/11	05/04/11	0	10	10000	0.150	1	150	144	96.0%	80-120
Ammonia	µg/l	11-3740P	Site # 2 Sampler Blank	09/09/11	09/09/11	09/20/11	0	10	10000	1.000	1	1,000	950	95%	80-120
Ammonia	µg/l	11-4043P	Site # 2	9/23/11 - 10/4/11	10/04/11	10/14/11	21	10	10000	1.750	1	1,750	1,747	99.8%	80-120
Ammonia	µg/l	11-4208P	Site # 5	10/11/11 - 10/19/11	10/19/11	11/02/11	59	10	10000	1.250	1	1,271	1,190	93.6%	80-120
Ammonia	µg/l	11-4134P	Site # 4	10/4/11 - 10/11/11	10/11/11	11/02/11	38	10	10000	1.250	1	1,309	1,324	101%	80-120
Ammonia	µg/l	11-4938P	Site # 5	12/23/11	12/23/11	12/29/11	12	10	10000	1.250	1	1,288	1,187	92.2%	80-120
Ammonia	µg/l	11-4982P	Site # 5	12/31/11	12/31/11	01/17/12	11	10	10000	1.250	1	1,262	1,220	97%	80-120
Ammonia	µg/l	12-1044P	Site # 1	3/26/12 - 4/4/12	04/04/12	04/06/12	28	10	10000	0.200	1	211	193	91.5%	80-120

D.3 Control Standard Recovery

Laboratory Control Standard Recovery

FOR LOCKHART-SMITH COLLECTED FROM

April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE DESCRIPTION	DATE PREPPED	DATE ANALYZED	THEOR. CONC.	ACTUAL CONC.	% RECOVERY	ACCEPTANCE RANGE (%)
Alkalinity	mg/l	LCS	04/13/10	04/13/10	6.8	6.6	97%	93.4 - 104
Alkalinity	mg/l	LCS	04/26/10	04/26/10	6.8	6.6	97%	93.4 - 104
Alkalinity	mg/l	LCS	04/30/10	04/30/10	6.6	6.6	100%	93.4 - 104
Alkalinity	mg/l	LCS	05/07/10	05/07/10	6.6	6.4	97%	93.4 - 104
Alkalinity	mg/l	LCS	05/17/10	05/17/10	6.6	6.6	100%	93.4 - 104
Alkalinity	mg/l	LCS	05/27/10	05/27/10	6.6	6.8	103%	93.4 - 104
Alkalinity	mg/l	LCS	05/27/10	05/27/10	6.4	6.6	103%	93.4 - 104
Alkalinity	mg/l	LCS	06/04/10	06/04/10	6.8	7.0	103%	93.4 - 104
Alkalinity	mg/l	LCS	06/11/10	06/11/10	6.4	6.2	97%	93.4 - 104
Alkalinity	mg/l	LCS	06/11/10	06/11/10	6.4	6.2	97%	93.4 - 104
Alkalinity	mg/l	LCS	06/29/10	06/29/10	6.4	6.6	103%	93.4 - 104
Alkalinity	mg/l	LCS	06/29/10	06/29/10	6.4	6.2	97%	93.4 - 104
Alkalinity	mg/l	LCS	07/06/10	07/06/10	4.8	4.6	96%	93.4 - 104
Alkalinity	mg/l	LCS	07/12/10	07/12/10	4.4	4.4	100%	93.4 - 104
Alkalinity	mg/l	LCS	08/04/10	08/04/10	4.6	4.4	96%	93.4 - 104
Alkalinity	mg/l	LCS	08/24/10	08/24/10	4.6	4.4	96%	93.4 - 104
Alkalinity	mg/l	LCS	08/30/10	08/30/10	4.6	4.8	104%	93.4 - 104
Alkalinity	mg/l	LCS	08/30/10	08/30/10	4.6	4.6	100%	93.4 - 104
Alkalinity	mg/l	LCS	09/07/10	09/07/10	4.8	4.6	96%	93.4 - 104
Alkalinity	mg/l	LCS	09/07/10	09/07/10	4.6	4.4	96%	93.4 - 104
Alkalinity	mg/l	LCS	09/10/10	09/10/10	4.6	4.4	96%	93.4 - 104
Alkalinity	mg/l	LCS	09/20/10	09/20/10	4.4	4.6	105%	93.4 - 104
Alkalinity	mg/l	LCS	10/04/10	10/04/10	8.6	8.2	104%	93.4 - 104
Alkalinity	mg/l	LCS	10/07/10	10/07/10	8.4	8.2	97%	93.4 - 104
Alkalinity	mg/l	LCS	10/07/10	10/07/10	8.6	8.8	96%	93.4 - 104
Alkalinity	mg/l	LCS	10/14/10	10/14/10	8.4	8.2	98%	93.4 - 104
Alkalinity	mg/l	LCS	10/26/10	10/26/10	8.4	8.4	102%	93.4 - 104
Alkalinity	mg/l	LCS	12/13/10	12/13/10	8.4	8.6	98%	93.4 - 104
Alkalinity	mg/l	LCS	12/21/10	12/21/10	8.6	8.8	100%	93.4 - 104
Alkalinity	mg/l	LCS	01/06/11	01/06/11	6.6	6.6	100%	93.4 - 104
Alkalinity	mg/l	LCS	01/11/11	01/11/11	6.6	6.6	100%	93.4 - 104
Alkalinity	mg/l	LCS	01/27/11	01/27/11	6.6	6.6	100%	93.4 - 104
Alkalinity	mg/l	LCS	02/03/11	02/03/11	6.6	6.4	97%	93.4 - 104
Alkalinity	mg/l	LCS	02/03/11	02/03/11	6.8	6.8	100%	93.4 - 104
Alkalinity	mg/l	LCS	02/28/11	02/28/11	6.6	6.4	97%	93.4 - 104
Alkalinity	mg/l	LCS	02/28/11	02/28/11	6.8	6.8	100%	93.4 - 104
Alkalinity	mg/l	LCS	03/04/11	03/04/11	6.6	6.6	100%	93.4 - 104
Alkalinity	mg/l	LCS	03/04/11	03/04/11	6.6	6.6	100%	93.4 - 104
Alkalinity	mg/l	LCS	03/09/11	03/09/11	6.8	7.0	103%	93.4 - 104
Alkalinity	mg/l	LCS	03/21/11	03/21/11	6.8	6.8	100%	93.4 - 104
Alkalinity	mg/l	LCS	04/07/11	04/07/11	6.6	6.4	97%	93.4 - 104

Laboratory Control Standard Recovery

FOR LOCKHART-SMITH COLLECTED FROM

April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE DESCRIPTION	DATE PREPPED	DATE ANALYZED	THEOR. CONC.	ACTUAL CONC.	% RECOVERY	ACCEPTANCE RANGE (%)
Alkalinity	mg/l	LCS	05/05/11	05/05/11	6.4	6.2	97%	93.4 - 104
Alkalinity	mg/l	LCS	06/06/11	06/06/11	12.4	12.6	102%	93.4 - 104
Alkalinity	mg/l	LCS	07/06/11	07/06/11	12.6	12.2	97%	93.4 - 104
Alkalinity	mg/l	LCS	07/12/11	07/12/11	12.4	12.6	102%	93.4 - 104
Alkalinity	mg/l	LCS	07/21/11	07/21/11	12.8	12.6	98%	93.4 - 104
Alkalinity	mg/l	LCS	08/05/11	08/05/11	12.6	12.6	100%	93.4 - 104
Alkalinity	mg/l	LCS	08/12/11	08/12/11	12.6	12.4	98%	93.4 - 104
Alkalinity	mg/l	LCS	08/16/11	08/16/11	12.6	12.8	102%	93.4 - 104
Alkalinity	mg/l	LCS	09/12/11	09/12/11	12.8	12.6	98%	93.4 - 104
Alkalinity	mg/l	LCS	09/26/11	09/26/11	12.8	12.6	98%	93.4 - 104
Alkalinity	mg/l	LCS	10/07/11	10/07/11	10.6	11.0	104%	93.4 - 104
Alkalinity	mg/l	LCS	10/31/11	10/31/11	10.4	10.0	96%	93.4 - 104
Alkalinity	mg/l	LCS	11/07/11	11/07/11	10.4	10.0	96%	93.4 - 104
Alkalinity	mg/l	LCS	12/01/11	12/01/11	10.4	10.4	100%	93.4 - 104
Alkalinity	mg/l	LCS	12/12/11	12/12/11	10.6	10.2	96%	93.4 - 104
Alkalinity	mg/l	LCS	12/19/11	12/19/11	10.4	10.0	96%	93.4 - 104
Alkalinity	mg/l	LCS	12/27/11	12/27/11	10.6	10.4	98%	93.4 - 104
Alkalinity	mg/l	LCS	01/10/12	01/10/12	10.4	10.8	104%	93.4 - 104
Alkalinity	mg/l	LCS	01/15/12	01/15/12	10.6	10.8	102%	93.4 - 104
Alkalinity	mg/l	LCS	02/07/12	02/07/12	10.4	9.8	95%	93.4 - 104
Alkalinity	mg/l	LCS	02/07/12	02/07/12	10.6	11.0	104%	93.4 - 104
Alkalinity	mg/l	LCS	02/15/12	02/15/12	10.4	10.6	102%	93.4 - 104
Alkalinity	mg/l	LCS	02/27/12	02/27/12	10.6	10.8	102%	93.4 - 104
Alkalinity	mg/l	LCS	03/05/12	03/05/12	10.4	10.0	96%	93.4 - 104
Alkalinity	mg/l	LCS	03/05/12	03/05/12	10.4	10.8	104%	93.4 - 104
Alkalinity	mg/l	LCS	03/21/12	03/21/12	10.6	10.4	98%	93.4 - 104
Alkalinity	mg/l	LCS	03/21/12	03/21/12	10.6	10.2	96%	93.4 - 104

Laboratory Control Standard Recovery

FOR LOCKHART-SMITH COLLECTED FROM

April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE DESCRIPTION	DATE PREPPED	DATE ANALYZED	THEOR. CONC.	ACTUAL CONC.	% RECOVERY	ACCEPTANCE RANGE (%)
Turbidity	NTU	LCS	04/09/10	04/09/10	20.0	19.6	98%	87.6 - 106.8
Turbidity	NTU	LCS	04/28/10	04/28/10	20.0	19.6	98%	87.6 - 106.8
Turbidity	NTU	LCS	05/06/10	05/06/10	20.0	19.9	100%	87.6 - 106.8
Turbidity	NTU	LCS	05/14/10	05/14/10	20.1	19.8	99%	87.6 - 106.8
Turbidity	NTU	LCS	05/26/10	05/26/10	20.1	19.3	96%	87.6 - 106.8
Turbidity	NTU	LCS	06/03/10	06/03/10	20.0	19.7	99%	87.6 - 106.8
Turbidity	NTU	LCS	06/10/10	06/10/10	20.0	20.3	102%	87.6 - 106.8
Turbidity	NTU	LCS	06/10/10	06/10/10	20.0	20.2	101%	87.6 - 106.8
Turbidity	NTU	LCS	06/28/10	06/28/10	20.0	20.2	101%	87.6 - 106.8
Turbidity	NTU	LCS	06/28/10	06/28/10	20.1	20.1	100%	87.6 - 106.8
Turbidity	NTU	LCS	07/09/10	07/09/10	10.0	9.4	94%	87.6 - 106.8
Turbidity	NTU	LCS	07/09/10	07/09/10	10.0	9.1	91%	87.6 - 106.8
Turbidity	NTU	LCS	08/03/10	08/03/10	10.3	10.5	102%	87.6 - 106.8
Turbidity	NTU	LCS	08/12/10	08/12/10	10.4	10.4	100%	87.6 - 106.8
Turbidity	NTU	LCS	08/18/10	08/18/10	10.1	10.6	105%	87.6 - 106.8
Turbidity	NTU	LCS	09/03/10	09/03/10	10.1	9.8	97%	87.6 - 106.8
Turbidity	NTU	LCS	09/10/10	09/10/10	10.1	10.0	99%	87.6 - 106.8
Turbidity	NTU	LCS	09/29/10	09/29/10	10.1	10.0	99%	87.6 - 106.8
Turbidity	NTU	LCS	10/08/10	10/08/10	40.3	38.8	96%	87.6 - 106.8
Turbidity	NTU	LCS	10/13/10	10/13/10	40.3	38.8	96%	87.6 - 106.8
Turbidity	NTU	LCS	11/05/10	11/05/10	40.3	39.7	99%	87.6 - 106.8
Turbidity	NTU	LCS	11/20/10	11/20/10	40.5	40.2	99%	87.6 - 106.8
Turbidity	NTU	LCS	12/04/10	12/04/10	40.5	38.8	96%	87.6 - 106.8
Turbidity	NTU	LCS	12/10/10	12/10/10	40.2	40.4	100%	87.6 - 106.8
Turbidity	NTU	LCS	12/10/10	12/10/10	40.1	40.7	101%	87.6 - 106.8
Turbidity	NTU	LCS	12/17/10	12/17/10	40.4	40.4	100%	87.6 - 106.8
Turbidity	NTU	LCS	12/24/10	12/24/10	40.4	40.4	100%	87.6 - 106.8
Turbidity	NTU	LCS	01/05/11	01/05/11	20.3	18.9	93%	87.6 - 106.8
Turbidity	NTU	LCS	01/10/11	01/10/11	20.2	19.2	95%	87.6 - 106.8
Turbidity	NTU	LCS	02/02/11	02/02/11	20.2	19.9	99%	87.6 - 106.8
Turbidity	NTU	LCS	02/02/11	02/02/11	20.2	19.3	96%	87.6 - 106.8
Turbidity	NTU	LCS	02/25/11	02/25/11	20.0	19.7	99%	87.6 - 106.8
Turbidity	NTU	LCS	03/01/11	03/01/11	20.0	19.6	98%	87.6 - 106.8
Turbidity	NTU	LCS	03/09/11	03/09/11	20.3	19.1	94%	87.6 - 106.8
Turbidity	NTU	LCS	03/18/11	03/18/11	20.2	19.1	95%	87.6 - 106.8
Turbidity	NTU	LCS	04/06/11	04/06/11	20.3	18.8	93%	87.6 - 106.8
Turbidity	NTU	LCS	07/08/11	07/08/11	40.0	37.7	94%	87.6 - 106.8
Turbidity	NTU	LCS	07/08/11	07/08/11	40.3	37.7	94%	87.6 - 106.8
Turbidity	NTU	LCS	07/19/11	07/19/11	40.2	37.3	93%	87.6 - 106.8
Turbidity	NTU	LCS	07/31/11	07/31/11	40.4	37.0	92%	87.6 - 106.8
Turbidity	NTU	LCS	08/05/11	08/05/11	40.3	36.6	91%	87.6 - 106.8

Laboratory Control Standard Recovery

FOR LOCKHART-SMITH COLLECTED FROM

April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE DESCRIPTION	DATE PREPPED	DATE ANALYZED	THEOR. CONC.	ACTUAL CONC.	% RECOVERY	ACCEPTANCE RANGE (%)
Turbidity	NTU	LCS	08/05/11	08/05/11	40.2	39.0	97%	87.6 - 106.8
Turbidity	NTU	LCS	08/12/11	08/12/11	40.1	36.9	92%	87.6 - 106.8
Turbidity	NTU	LCS	09/09/11	09/09/11	40.2	39.3	98%	87.6 - 106.8
Turbidity	NTU	LCS	09/09/11	09/09/11	40.1	39.6	99%	87.6 - 106.8
Turbidity	NTU	LCS	09/16/11	09/16/11	40.3	38.0	94%	87.6 - 106.8
Turbidity	NTU	LCS	09/25/11	09/25/11	40.3	38.8	96%	87.6 - 106.8
Turbidity	NTU	LCS	10/04/11	10/04/11	20.2	19.3	96%	87.6 - 106.8
Turbidity	NTU	LCS	10/04/11	10/04/11	20.2	19.6	97%	87.6 - 106.8
Turbidity	NTU	LCS	10/12/11	10/12/11	20.1	19.1	95%	87.6 - 106.8
Turbidity	NTU	LCS	10/12/11	10/12/11	20.1	19.1	95%	87.6 - 106.8
Turbidity	NTU	LCS	10/20/11	10/20/11	20.2	19.1	95%	87.6 - 106.8
Turbidity	NTU	LCS	11/04/11	11/04/11	20.1	19.2	96%	87.6 - 106.8
Turbidity	NTU	LCS	11/30/11	11/30/11	20.2	19.3	96%	87.6 - 106.8
Turbidity	NTU	LCS	12/09/11	12/09/11	20.2	19.5	97%	87.6 - 106.8
Turbidity	NTU	LCS	12/17/11	12/17/11	20.4	20.0	98%	87.6 - 106.8
Turbidity	NTU	LCS	12/17/11	12/17/11	20.4	19.6	96%	87.6 - 106.8
Turbidity	NTU	LCS	12/23/11	12/23/11	20.2	19.4	96%	87.6 - 106.8
Turbidity	NTU	LCS	12/28/11	12/28/11	20.1	19.0	95%	87.6 - 106.8
Turbidity	NTU	LCS	12/28/11	12/28/11	20.1	18.9	94%	87.6 - 106.8
Turbidity	NTU	LCS	12/31/11	12/31/11	20.1	18.9	94%	87.6 - 106.8
Turbidity	NTU	LCS	01/08/12	01/08/12	10.2	9.6	94%	87.6 - 106.8
Turbidity	NTU	LCS	01/13/12	01/13/12	10.2	9.5	93%	87.6 - 106.8
Turbidity	NTU	LCS	02/22/12	02/22/12	10.3	9.6	93%	87.6 - 106.8
Turbidity	NTU	LCS	03/02/12	03/02/12	10.3	9.7	94%	87.6 - 106.8
Turbidity	NTU	LCS	03/02/12	03/02/12	10.2	10.2	100%	87.6 - 106.8
Turbidity	NTU	LCS	03/15/12	03/15/12	10.2	9.4	92%	87.6 - 106.8
Turbidity	NTU	LCS	04/05/12	04/05/12	10.3	9.5	92%	87.6 - 106.8

Laboratory Control Standard Recovery

FOR LOCKHART-SMITH COLLECTED FROM

April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE DESCRIPTION	DATE PREPPED	DATE ANALYZED	THEOR. CONC.	ACTUAL CONC.	% RECOVERY	ACCEPTANCE RANGE (%)
TSS	mg/l	LCS	04/09/10	04/09/10	36.3	36.8	101%	89-113
TSS	mg/l	LCS	04/28/10	04/28/10	33.9	30.8	91%	89-113
TSS	mg/l	LCS	05/06/10	05/06/10	33.3	36.0	108%	89-113
TSS	mg/l	LCS	05/14/10	05/14/10	36.2	37.9	105%	89-113
TSS	mg/l	LCS	06/10/10	06/10/10	32.5	33.8	104%	89-113
TSS	mg/l	LCS	06/10/10	06/10/10	32.2	34.5	107%	89-113
TSS	mg/l	LCS	06/28/10	06/28/10	35.1	37.8	108%	89-113
TSS	mg/l	LCS	07/01/10	07/01/10	33.7	35.4	105%	89-113
TSS	mg/l	LCS	07/09/10	07/09/10	33.7	34.8	103%	89-113
TSS	mg/l	LCS	07/09/10	07/09/10	36.0	36.0	100%	89-113
TSS	mg/l	LCS	07/15/10	07/15/10	34.3	35.3	103%	89-113
TSS	mg/l	LCS	07/23/10	07/23/10	35.3	35.3	100%	89-113
TSS	mg/l	LCS	08/06/10	08/06/10	31.9	33.3	104%	89-113
TSS	mg/l	LCS	08/12/10	08/12/10	34.1	33.5	98%	89-113
TSS	mg/l	LCS	09/06/10	09/06/10	37.2	38.4	103%	89-113
TSS	mg/l	LCS	09/21/10	09/21/10	36.2	35.7	99%	89-113
TSS	mg/l	LCS	09/28/10	09/28/10	33.6	35.5	106%	89-113
TSS	mg/l	LCS	09/28/10	09/28/10	37.1	37.1	100%	89-113
TSS	mg/l	LCS	10/11/10	10/11/10	36.2	38.8	107%	89-113
TSS	mg/l	LCS	11/10/10	11/10/10	30.7	32.4	106%	89-113
TSS	mg/l	LCS	12/06/10	12/06/10	30.6	32.7	107%	89-113
TSS	mg/l	LCS	12/13/10	12/13/10	27.8	28.3	102%	89-113
TSS	mg/l	LCS	12/20/10	12/20/10	30.7	29.7	97%	89-113
TSS	mg/l	LCS	12/27/10	12/27/10	26.8	27.8	104%	89-113
TSS	mg/l	LCS	01/06/11	01/06/11	25.8	23.4	91%	89-113
TSS	mg/l	LCS	01/11/11	01/11/11	26.0	25.2	97%	89-113
TSS	mg/l	LCS	02/06/11	02/06/11	69.6	63.1	91%	89-113
TSS	mg/l	LCS	02/06/11	02/06/11	59.3	55.6	94%	89-113
TSS	mg/l	LCS	02/15/11	02/15/11	61.3	64.9	106%	89-113
TSS	mg/l	LCS	03/01/11	03/01/11	61.6	58.2	94%	89-113
TSS	mg/l	LCS	03/07/11	03/07/11	63.2	56.5	89%	89-113
TSS	mg/l	LCS	03/15/11	03/15/11	63.4	58.3	92%	89-113
TSS	mg/l	LCS	03/18/11	03/18/11	60.7	60.1	99%	89-113
TSS	mg/l	LCS	04/11/11	04/11/11	58.5	62.2	106%	89-113
TSS	mg/l	LCS	05/09/11	05/09/11	58.5	52.5	90%	89-113
TSS	mg/l	LCS	06/08/11	06/08/11	68.5	62.7	92%	89-113
TSS	mg/l	LCS	07/12/11	07/12/11	68.5	65.1	95%	89-113
TSS	mg/l	LCS	07/18/11	07/18/11	61.1	62.4	102%	89-113
TSS	mg/l	LCS	08/01/11	08/01/11	68.3	63.0	92%	89-113
TSS	mg/l	LCS	08/09/11	08/09/11	70.0	66.0	94%	89-113

Laboratory Control Standard Recovery

FOR LOCKHART-SMITH COLLECTED FROM

April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE DESCRIPTION	DATE PREPPED	DATE ANALYZED	THEOR. CONC.	ACTUAL CONC.	% RECOVERY	ACCEPTANCE RANGE (%)
TSS	mg/l	LCS	08/16/11	08/16/11	61.6	59.5	97%	89-113
TSS	mg/l	LCS	08/16/11	08/16/11	58.7	62.9	107%	89-113
TSS	mg/l	LCS	08/09/11	08/09/11	65.3	62.3	95%	89-113
TSS	mg/l	LCS	09/13/11	09/13/11	68.7	63.7	93%	89-113
TSS	mg/l	LCS	09/20/11	09/20/11	61.0	64.0	105%	89-113
TSS	mg/l	LCS	09/26/11	09/26/11	57.6	63.3	110%	89-113
TSS	mg/l	LCS	10/09/11	10/09/11	54.4	53.4	98%	89-113
TSS	mg/l	LCS	10/12/11	10/12/11	68.9	69.3	101%	89-113
TSS	mg/l	LCS	10/12/11	10/12/11	55.5	60.4	109%	89-113
TSS	mg/l	LCS	11/01/11	11/01/11	60.3	58.9	98%	89-113
TSS	mg/l	LCS	11/10/11	11/10/11	65.7	60.4	92%	89-113
TSS	mg/l	LCS	11/16/11	11/16/11	60.3	59.1	98%	89-113
TSS	mg/l	LCS	12/04/11	12/04/11	54.5	59.6	109%	89-113
TSS	mg/l	LCS	01/11/12	01/11/12	62.5	67.5	108%	89-113
TSS	mg/l	LCS	02/09/12	02/09/12	64.0	62.0	97%	89-113
TSS	mg/l	LCS	02/15/12	02/15/12	65.3	62.3	95%	89-113
TSS	mg/l	LCS	02/22/12	02/22/12	64.3	66.7	104%	89-113
TSS	mg/l	LCS	03/08/12	03/08/12	64.3	59.3	92%	89-113
TSS	mg/l	LCS	03/08/12	03/08/12	62.4	68.1	109%	89-113
TSS	mg/l	LCS	03/20/12	03/20/12	64.7	61.4	95%	89-113
TSS	mg/l	LCS	03/28/12	03/28/12	63.2	67.3	106%	89-113
TSS	mg/l	LCS	04/05/12	04/05/12	61.8	61.8	100%	89-113

Laboratory Control Standard Recovery

FOR LOCKHART-SMITH COLLECTED FROM

April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE DESCRIPTION	DATE PREPPED	DATE ANALYZED	THEOR. CONC.	ACTUAL CONC.	% RECOVERY	ACCEPTANCE RANGE (%)
SRP	µg/l	LCS	04/21/10	04/21/10	200	212	106%	90-110
SRP	µg/l	LCS	04/30/10	04/30/10	200	217	109%	90-110
SRP	µg/l	LCS	05/05/10	05/05/10	200	206	103%	90-110
SRP	µg/l	LCS	05/13/10	05/13/10	200	217	109%	90-110
SRP	µg/l	LCS	05/26/10	05/26/10	200	203	102%	90-110
SRP	µg/l	LCS	05/26/10	05/26/10	200	212	106%	90-110
SRP	µg/l	LCS	06/03/10	06/03/10	200	200	100%	90-110
SRP	µg/l	LCS	06/11/10	06/11/10	200	215	108%	90-110
SRP	µg/l	LCS	06/28/10	06/28/10	200	206	103%	90-110
SRP	µg/l	LCS	06/28/10	06/28/10	200	219	110%	90-110
SRP	µg/l	LCS	07/09/10	07/09/10	220	219	100%	90-110
SRP	µg/l	LCS	07/09/10	07/09/10	220	221	100%	90-110
SRP	µg/l	LCS	08/04/10	08/04/10	220	225	102%	90-110
SRP	µg/l	LCS	08/11/10	08/11/10	220	229	104%	90-110
SRP	µg/l	LCS	08/18/10	08/18/10	220	225	102%	90-110
SRP	µg/l	LCS	09/08/10	09/08/10	220	215	98%	90-110
SRP	µg/l	LCS	09/29/10	09/29/10	220	229	104%	90-110
SRP	µg/l	LCS	10/08/10	10/08/10	330	346	105%	90-110
SRP	µg/l	LCS	10/15/10	10/15/10	330	325	98%	90-110
SRP	µg/l	LCS	11/21/10	11/21/10	330	341	103%	90-110
SRP	µg/l	LCS	11/21/10	11/21/10	330	337	102%	90-110
SRP	µg/l	LCS	12/09/10	12/09/10	330	326	99%	90-110
SRP	µg/l	LCS	12/29/10	12/29/10	330	333	101%	90-110
SRP	µg/l	LCS	01/05/11	01/05/11	220	223	101%	90-110
SRP	µg/l	LCS	01/27/11	01/27/11	220	230	105%	90-110
SRP	µg/l	LCS	02/08/11	02/08/11	220	211	96%	90-110
SRP	µg/l	LCS	02/14/11	02/14/11	220	230	105%	90-110
SRP	µg/l	LCS	03/09/11	03/09/11	220	231	105%	90-110
SRP	µg/l	LCS	03/09/11	03/09/11	220	201	91%	90-110
SRP	µg/l	LCS	03/15/11	03/15/11	220	222	101%	90-110
SRP	µg/l	LCS	03/25/11	03/25/11	220	230	105%	90-110
SRP	µg/l	LCS	04/11/11	04/11/11	220	230	105%	90-110
SRP	µg/l	LCS	04/12/11	04/12/11	100	99	99%	90-110
SRP	µg/l	LCS	05/06/11	05/06/11	100	99	99%	90-110
SRP	µg/l	LCS	06/07/11	06/07/11	100	104	104%	90-110
SRP	µg/l	LCS	07/11/11	07/11/11	100	104	104%	90-110
SRP	µg/l	LCS	08/10/11	08/10/11	250	238	95%	90-110
SRP	µg/l	LCS	08/18/11	08/18/11	250	243	97%	90-110
SRP	µg/l	LCS	08/22/11	08/22/11	250	242	97%	90-110
SRP	µg/l	LCS	08/30/11	08/30/11	250	263	105%	90-110
SRP	µg/l	LCS	10/05/11	10/05/11	150	158	105%	90-110
SRP	µg/l	LCS	10/05/11	10/05/11	150	144	96%	90-110
SRP	µg/l	LCS	10/12/11	10/12/11	150	163	109%	90-110
SRP	µg/l	LCS	10/31/11	10/31/11	150	144	96%	90-110
SRP	µg/l	LCS	11/09/11	11/09/11	150	151	101%	90-110
SRP	µg/l	LCS	11/16/11	11/16/11	150	157	105%	90-110
SRP	µg/l	LCS	11/29/11	11/29/11	150	160	107%	90-110
SRP	µg/l	LCS	12/23/11	12/23/11	150	156	104%	90-110
SRP	µg/l	LCS	12/31/11	12/31/11	150	163	109%	90-110
SRP	µg/l	LCS	02/08/12	02/08/12	200	203	102%	90-110
SRP	µg/l	LCS	02/16/12	02/16/12	200	206	103%	90-110
SRP	µg/l	LCS	03/02/12	03/02/12	200	211	106%	90-110
SRP	µg/l	LCS	03/02/12	03/02/12	200	212	106%	90-110
SRP	µg/l	LCS	03/07/12	03/07/12	200	206	103%	90-110

Laboratory Control Standard Recovery

FOR LOCKHART-SMITH COLLECTED FROM

April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE DESCRIPTION	DATE PREPPED	DATE ANALYZED	THEOR. CONC.	ACTUAL CONC.	% RECOVERY	ACCEPTANCE RANGE (%)
NOX-N	µg/l	LCS	04/21/10	04/21/10	452	457	101%	90-110
NOX-N	µg/l	LCS	04/30/10	04/30/10	452	414	92%	90-110
NOX-N	µg/l	LCS	05/05/10	05/05/10	452	452	100%	90-110
NOX-N	µg/l	LCS	05/13/10	05/13/10	452	462	102%	90-110
NOX-N	µg/l	LCS	05/26/10	05/26/10	452	454	100%	90-110
NOX-N	µg/l	LCS	05/26/10	05/26/10	452	427	94%	90-110
NOX-N	µg/l	LCS	06/03/10	06/03/10	452	418	92%	90-110
NOX-N	µg/l	LCS	06/11/10	06/11/10	452	448	99%	90-110
NOX-N	µg/l	LCS	06/28/10	06/28/10	452	456	101%	90-110
NOX-N	µg/l	LCS	06/28/10	06/28/10	452	445	98%	90-110
NOX-N	µg/l	LCS	07/09/10	07/09/10	249	251	101%	90-110
NOX-N	µg/l	LCS	07/09/10	07/09/10	249	245	99%	90-110
NOX-N	µg/l	LCS	08/04/10	08/04/10	249	269	108%	90-110
NOX-N	µg/l	LCS	08/11/10	08/11/10	249	272	109%	90-110
NOX-N	µg/l	LCS	08/18/10	08/18/10	249	261	105%	90-110
NOX-N	µg/l	LCS	09/08/10	09/08/10	249	271	109%	90-110
NOX-N	µg/l	LCS	09/29/10	09/29/10	249	257	103%	90-110
NOX-N	µg/l	LCS	10/08/10	10/08/10	373	376	101%	90-110
NOX-N	µg/l	LCS	10/15/10	10/15/10	373	339	91%	90-110
NOX-N	µg/l	LCS	11/21/10	11/21/10	373	365	98%	90-110
NOX-N	µg/l	LCS	11/21/10	11/21/10	373	361	97%	90-110
NOX-N	µg/l	LCS	12/09/10	12/09/10	373	344	92%	90-110
NOX-N	µg/l	LCS	12/29/10	12/29/10	373	340	91%	90-110
NOX-N	µg/l	LCS	01/05/11	01/05/11	200	201	101%	90-110
NOX-N	µg/l	LCS	01/27/11	01/27/11	200	199	100%	90-110
NOX-N	µg/l	LCS	02/08/11	02/08/11	200	202	101%	90-110
NOX-N	µg/l	LCS	02/14/11	02/14/11	200	200	100%	90-110
NOX-N	µg/l	LCS	03/09/11	03/09/11	200	200	100%	90-110
NOX-N	µg/l	LCS	03/09/11	03/09/11	200	201	101%	90-110
NOX-N	µg/l	LCS	03/15/11	03/15/11	200	202	101%	90-110
NOX-N	µg/l	LCS	03/25/11	03/25/11	200	202	101%	90-110
NOX-N	µg/l	LCS	04/11/11	04/11/11	100	101	101%	90-110
NOX-N	µg/l	LCS	04/12/11	04/12/11	100	103	103%	90-110
NOX-N	µg/l	LCS	05/06/11	05/06/11	100	105	105%	90-110
NOX-N	µg/l	LCS	06/07/11	06/07/11	100	105	105%	90-110
NOX-N	µg/l	LCS	07/11/11	07/11/11	1,000	1,040	104%	90-110
NOX-N	µg/l	LCS	08/10/11	08/10/11	1,000	978	98%	90-110
NOX-N	µg/l	LCS	08/18/11	08/18/11	1,000	995	100%	90-110
NOX-N	µg/l	LCS	08/22/11	08/22/11	1,000	1,053	105%	90-110
NOX-N	µg/l	LCS	08/30/11	08/30/11	1,000	1,088	109%	90-110
NOX-N	µg/l	LCS	10/05/11	10/05/11	150	146	97%	90-110
NOX-N	µg/l	LCS	10/05/11	10/05/11	150	138	92%	90-110
NOX-N	µg/l	LCS	10/12/11	10/12/11	150	139	93%	90-110
NOX-N	µg/l	LCS	10/31/11	10/31/11	150	144	96%	90-110
NOX-N	µg/l	LCS	11/09/11	11/09/11	150	146	97%	90-110
NOX-N	µg/l	LCS	11/16/11	11/16/11	150	148	99%	90-110
NOX-N	µg/l	LCS	11/29/11	11/29/11	150	148	99%	90-110
NOX-N	µg/l	LCS	12/23/11	12/23/11	150	152	101%	90-110
NOX-N	µg/l	LCS	12/31/11	12/31/11	150	138	92%	90-110
NOX-N	µg/l	LCS	02/08/12	02/08/12	100	98	98%	90-110
NOX-N	µg/l	LCS	02/16/12	02/16/12	100	97	97%	90-110
NOX-N	µg/l	LCS	03/07/12	03/07/12	100	97	97%	90-110

Laboratory Control Standard Recovery

FOR LOCKHART-SMITH COLLECTED FROM

April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE DESCRIPTION	DATE PREPPED	DATE ANALYZED	THEOR. CONC.	ACTUAL CONC.	% RECOVERY	ACCEPTANCE RANGE (%)
Ammonia	µg/l	LCS	04/29/10	04/29/10	1,000	930	93%	90-110
Ammonia	µg/l	LCS	04/30/10	04/30/10	1,000	904	90%	90-110
Ammonia	µg/l	LCS	05/12/10	05/12/10	1,000	908	91%	90-110
Ammonia	µg/l	LCS	05/12/10	05/12/10	1,000	912	91%	90-110
Ammonia	µg/l	LCS	06/02/10	06/02/10	1,000	920	92%	90-110
Ammonia	µg/l	LCS	06/02/10	06/02/10	1,000	932	93%	90-110
Ammonia	µg/l	LCS	06/29/10	06/29/10	1,000	937	94%	90-110
Ammonia	µg/l	LCS	07/15/10	07/15/10	400	377	94%	90-110
Ammonia	µg/l	LCS	07/15/10	07/15/10	400	397	99%	90-110
Ammonia	µg/l	LCS	09/28/10	09/28/10	400	357	89%	90-110
Ammonia	µg/l	LCS	09/29/10	09/29/10	400	372	93%	90-110
Ammonia	µg/l	LCS	09/29/10	09/29/10	400	377	94%	90-110
Ammonia	µg/l	LCS	09/29/10	09/29/10	400	367	92%	90-110
Ammonia	µg/l	LCS	12/08/10	12/08/10	150	159	106%	90-110
Ammonia	µg/l	LCS	12/08/10	12/08/10	150	156	104%	90-110
Ammonia	µg/l	LCS	12/14/10	12/14/10	150	156	104%	90-110
Ammonia	µg/l	LCS	12/17/10	12/17/10	150	155	103%	90-110
Ammonia	µg/l	LCS	12/21/10	12/21/10	150	153	102%	90-110
Ammonia	µg/l	LCS	12/21/10	12/21/10	150	155	103%	90-110
Ammonia	µg/l	LCS	01/09/11	01/09/11	1,000	975	98%	90-110
Ammonia	µg/l	LCS	02/04/11	02/04/11	1,000	964	96%	90-110
Ammonia	µg/l	LCS	03/07/11	03/07/11	1,000	955	96%	90-110
Ammonia	µg/l	LCS	05/03/11	05/03/11	2,055	2,242	109%	90-110
Ammonia	µg/l	LCS	05/03/11	05/03/11	2,055	2,243	109%	90-110
Ammonia	µg/l	LCS	05/04/11	05/04/11	2,055	2,255	110%	90-110
Ammonia	µg/l	LCS	05/04/11	05/04/11	2,055	2,213	108%	90-110
Ammonia	µg/l	LCS	05/04/11	05/04/11	2,055	2,202	107%	90-110
Ammonia	µg/l	LCS	06/08/11	06/08/11	2,055	2,211	108%	90-110
Ammonia	µg/l	LCS	06/08/11	06/08/11	2,055	2,209	107%	90-110
Ammonia	µg/l	LCS	06/15/11	06/15/11	2,055	2,171	106%	90-110
Ammonia	µg/l	LCS	06/28/11	06/28/11	2,055	2,208	107%	90-110
Ammonia	µg/l	LCS	07/13/11	07/13/11	2,055	2,124	103%	90-110
Ammonia	µg/l	LCS	08/31/11	08/31/11	2,055	2,079	101%	90-110
Ammonia	µg/l	LCS	08/31/11	08/31/11	2,055	2,076	101%	90-110
Ammonia	µg/l	LCS	09/01/11	09/01/11	2,055	2,076	101%	90-110
Ammonia	µg/l	LCS	09/15/11	09/15/11	2,055	2,108	103%	90-110
Ammonia	µg/l	LCS	09/20/11	09/20/11	2,055	2,049	100%	90-110
Ammonia	µg/l	LCS	10/14/11	10/14/11	1,233	1,279	104%	90-110
Ammonia	µg/l	LCS	10/14/11	10/14/11	1,233	1,296	105%	90-110
Ammonia	µg/l	LCS	11/02/11	11/02/11	1,233	1,284	104%	90-110
Ammonia	µg/l	LCS	11/02/11	11/02/11	1,233	1,265	103%	90-110
Ammonia	µg/l	LCS	11/16/11	11/16/11	1,233	1,323	107%	90-110
Ammonia	µg/l	LCS	12/15/11	12/15/11	1,233	1,276	103%	90-110
Ammonia	µg/l	LCS	12/20/11	12/20/11	1,233	1,311	106%	90-110
Ammonia	µg/l	LCS	12/29/11	12/29/11	1,233	1,304	106%	90-110
Ammonia	µg/l	LCS	01/17/12	01/17/12	200	218	109%	90-110
Ammonia	µg/l	LCS	01/18/12	01/18/12	200	214	107%	90-110
Ammonia	µg/l	LCS	02/15/12	02/15/12	200	194	97%	90-110
Ammonia	µg/l	LCS	03/05/12	03/05/12	200	215	108%	90-110
Ammonia	µg/l	LCS	04/06/12	04/06/12	200	208	104%	90-110

Laboratory Control Standard Recovery

FOR LOCKHART-SMITH COLLECTED FROM

April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE DESCRIPTION	DATE PREPPED	DATE ANALYZED	THEOR. CONC.	ACTUAL CONC.	% RECOVERY	ACCEPTANCE RANGE (%)
Total N	µg/l	LCS	12/28/10	12/28/10	200	215	108%	90-110
Total N	µg/l	LCS	12/28/10	12/28/10	3,390	3,580	106%	90-110
Total N	µg/l	LCS	12/28/10	12/28/10	3,390	3,588	106%	90-110
Total N	µg/l	LCS	12/28/10	12/28/10	3,390	3,464	102%	90-110
Total N	µg/l	LCS	04/26/10	04/26/10	2,260	2,252	100%	90-110
Total N	µg/l	LCS	04/27/10	04/27/10	2,260	2,342	104%	90-110
Total N	µg/l	LCS	05/06/10	05/06/10	2,260	2,150	95%	90-110
Total N	µg/l	LCS	05/12/10	05/12/10	2,260	2,432	108%	90-110
Total N	µg/l	LCS	05/20/10	05/20/10	2,260	2,384	105%	90-110
Total N	µg/l	LCS	05/26/10	05/26/10	2,260	2,306	102%	90-110
Total N	µg/l	LCS	06/01/10	06/01/10	2,260	2,417	107%	90-110
Total N	µg/l	LCS	06/04/10	06/04/10	1,582	1,495	95%	90-110
Total N	µg/l	LCS	06/07/10	06/07/10	1,582	1,595	101%	90-110
Total N	µg/l	LCS	06/23/10	06/23/10	1,582	1,507	95%	90-110
Total N	µg/l	LCS	06/23/10	06/23/10	1,582	1,471	93%	90-110
Total N	µg/l	LCS	07/02/10	07/02/10	4,520	4,556	101%	90-110
Total N	µg/l	LCS	07/07/10	07/07/10	4,520	4,829	107%	90-110
Total N	µg/l	LCS	07/07/10	07/07/10	4,520	4,617	102%	90-110
Total N	µg/l	LCS	07/22/10	07/22/10	4,520	4,559	101%	90-110
Total N	µg/l	LCS	07/22/10	07/22/10	4,520	4,683	104%	90-110
Total N	µg/l	LCS	07/26/10	07/26/10	4,520	4,700	104%	90-110
Total N	µg/l	LCS	08/02/10	08/02/10	4,520	4,704	104%	90-110
Total N	µg/l	LCS	08/11/10	08/11/10	4,520	4,582	101%	90-110
Total N	µg/l	LCS	08/16/10	08/16/10	4,520	4,346	96%	90-110
Total N	µg/l	LCS	08/17/10	08/17/10	4,520	4,620	102%	90-110
Total N	µg/l	LCS	09/10/10	09/10/10	4,520	4,477	99%	90-110
Total N	µg/l	LCS	10/12/10	10/12/10	2,260	2,286	101%	90-110
Total N	µg/l	LCS	12/02/10	12/02/10	1,808	1,926	107%	90-110
Total N	µg/l	LCS	12/02/10	12/02/10	4,520	4,172	92%	90-110
Total N	µg/l	LCS	12/06/10	12/06/10	3,164	3,194	101%	90-110
Total N	µg/l	LCS	12/22/10	12/22/10	3,164	3,367	106%	90-110
Total N	µg/l	LCS	12/27/10	12/27/10	5,424	5,595	103%	90-110
Total N	µg/l	LCS	01/18/11	01/18/11	3,164	3,011	95%	90-110
Total N	µg/l	LCS	01/18/11	01/18/11	3,164	2,999	95%	90-110
Total N	µg/l	LCS	01/18/11	01/18/11	3,164	3,186	101%	90-110
Total N	µg/l	LCS	02/08/11	02/08/11	3,164	2,991	95%	90-110
Total N	µg/l	LCS	02/08/11	02/08/11	3,164	2,993	95%	90-110
Total N	µg/l	LCS	02/17/11	02/17/11	3,164	2,913	92%	90-110
Total N	µg/l	LCS	03/23/11	03/23/11	3,164	2,956	93%	90-110
Total N	µg/l	LCS	02/22/10	02/22/10	3,164	3,089	98%	90-110
Total N	µg/l	LCS	02/22/10	02/22/10	3,164	2,944	93%	90-110
Total N	µg/l	LCS	02/22/10	02/22/10	3,164	3,327	105%	90-110
Total N	µg/l	LCS	03/05/10	03/05/10	3,164	3,018	95%	90-110
Total N	µg/l	LCS	03/05/10	03/05/10	3,164	2,991	95%	90-110
Total N	µg/l	LCS	06/14/11	06/14/11	2,712	2,791	103%	90-110
Total N	µg/l	LCS	06/14/11	06/14/11	2,712	2,937	108%	90-110
Total N	µg/l	LCS	06/14/11	06/14/11	2,712	2,900	107%	90-110
Total N	µg/l	LCS	08/22/11	08/22/11	3,164	3,194	101%	90-110

Laboratory Control Standard Recovery

FOR LOCKHART-SMITH COLLECTED FROM

April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE DESCRIPTION	DATE PREPPED	DATE ANALYZED	THEOR. CONC.	ACTUAL CONC.	% RECOVERY	ACCEPTANCE RANGE (%)
Total N	µg/l	LCS	08/22/11	08/22/11	3,164	3,219	102%	90-110
Total N	µg/l	LCS	09/07/11	09/07/11	3,164	3,210	101%	90-110
Total N	µg/l	LCS	09/07/11	09/07/11	3,164	3,084	97%	90-110
Total N	µg/l	LCS	09/07/11	09/07/11	3,164	3,138	99%	90-110
Total N	µg/l	LCS	09/27/11	09/27/11	3,164	3,077	97%	90-110
Total N	µg/l	LCS	09/27/11	09/27/11	3,164	3,153	100%	90-110
Total N	µg/l	LCS	09/27/11	09/27/11	3,164	3,172	100%	90-110
Total N	µg/l	LCS	09/27/11	09/27/11	3,164	3,410	108%	90-110
Total N	µg/l	LCS	09/27/11	09/27/11	3,164	3,399	107%	90-110
Total N	µg/l	LCS	09/27/11	09/27/11	3,164	3,109	98%	90-110
Total N	µg/l	LCS	09/27/11	09/27/11	3,164	3,096	98%	90-110
Total N	µg/l	LCS	10/05/11	10/05/11	3,164	3,329	105%	90-110
Total N	µg/l	LCS	10/05/11	10/05/11	3,164	2,963	94%	90-110
Total N	µg/l	LCS	10/05/11	10/05/11	3,164	3,138	99%	90-110
Total N	µg/l	LCS	10/05/11	10/05/11	3,164	3,098	98%	90-110
Total N	µg/l	LCS	10/05/11	10/05/11	3,164	3,219	102%	90-110
Total N	µg/l	LCS	10/05/11	10/05/11	3,164	3,033	96%	90-110
Total N	µg/l	LCS	10/05/11	10/05/11	3,164	3,137	99%	90-110
Total N	µg/l	LCS	10/18/11	10/18/11	3,164	3,081	97%	90-110
Total N	µg/l	LCS	11/01/11	11/01/11	3,164	3,093	98%	90-110
Total N	µg/l	LCS	11/01/11	11/01/11	3,164	3,007	95%	90-110
Total N	µg/l	LCS	11/01/11	11/01/11	3,164	3,082	97%	90-110
Total N	µg/l	LCS	11/15/11	11/15/11	3,164	3,100	98%	90-110
Total N	µg/l	LCS	11/15/11	11/15/11	3,164	3,153	100%	90-110
Total N	µg/l	LCS	11/15/11	11/15/11	3,164	3,011	95%	90-110
Total N	µg/l	LCS	12/07/11	12/07/11	3,164	3,048	96%	90-110
Total N	µg/l	LCS	12/13/11	12/13/11	3,164	3,099	98%	90-110
Total N	µg/l	LCS	12/19/11	12/19/11	3,164	2,987	94%	90-110
Total N	µg/l	LCS	12/19/11	12/19/11	3,164	2,976	94%	90-110
Total N	µg/l	LCS	12/21/11	12/21/11	3,164	3,039	96%	90-110
Total N	µg/l	LCS	12/21/11	12/21/11	3,164	3,035	96%	90-110
Total N	µg/l	LCS	12/28/11	12/28/11	3,164	3,010	95%	90-110
Total N	µg/l	LCS	12/28/11	12/28/11	3,164	2,983	94%	90-110
Total N	µg/l	LCS	01/11/12	01/11/12	2,500	2,565	103%	90-110
Total N	µg/l	LCS	01/12/12	01/12/12	2,500	2,642	106%	90-110
Total N	µg/l	LCS	01/12/12	01/12/12	2,500	2,617	105%	90-110
Total N	µg/l	LCS	01/12/12	01/12/12	2,500	2,468	99%	90-110

Laboratory Control Standard Recovery

FOR LOCKHART-SMITH COLLECTED FROM

April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE DESCRIPTION	DATE PREPPED	DATE ANALYZED	THEOR. CONC.	ACTUAL CONC.	% RECOVERY	ACCEPTANCE RANGE (%)
Total N	µg/l	LCS	01/12/12	01/12/12	2,500	2,588	104%	90-110
Total N	µg/l	LCS	01/16/12	01/16/12	2,500	2,445	98%	90-110
Total N	µg/l	LCS	01/20/12	01/20/12	2,500	2,604	104%	90-110
Total N	µg/l	LCS	01/20/12	01/20/12	2,500	2,578	103%	90-110
Total N	µg/l	LCS	01/20/12	01/20/12	2,500	2,486	99%	90-110
Total N	µg/l	LCS	01/20/12	01/20/12	2,500	2,590	104%	90-110
Total N	µg/l	LCS	01/24/12	01/24/12	2,500	2,543	102%	90-110
Total N	µg/l	LCS	01/24/12	01/24/12	2,500	2,548	102%	90-110
Total N	µg/l	LCS	01/27/12	01/27/12	2,500	2,498	100%	90-110
Total N	µg/l	LCS	01/27/12	01/27/12	2,500	2,581	103%	90-110
Total N	µg/l	LCS	02/03/12	02/03/12	2,500	2,621	105%	90-110
Total N	µg/l	LCS	02/08/12	02/08/12	2,500	2,636	105%	90-110
Total N	µg/l	LCS	02/08/12	02/08/12	2,500	2,614	105%	90-110
Total N	µg/l	LCS	02/08/12	02/08/12	2,500	2,583	103%	90-110
Total N	µg/l	LCS	02/16/12	02/16/12	2,500	2,525	101%	90-110
Total N	µg/l	LCS	02/16/12	02/16/12	2,500	2,466	99%	90-110
Total N	µg/l	LCS	02/27/12	02/27/12	2,500	2,551	102%	90-110
Total N	µg/l	LCS	02/29/12	02/29/12	2,500	2,498	100%	90-110
Total N	µg/l	LCS	03/04/12	03/04/12	2,500	2,469	99%	90-110
Total N	µg/l	LCS	03/13/12	03/13/12	2,500	2,501	100%	90-110
Total N	µg/l	LCS	03/14/12	03/14/12	2,500	2,520	101%	90-110
Total N	µg/l	LCS	03/14/12	03/14/12	2,500	2,418	97%	90-110
Total N	µg/l	LCS	03/19/12	03/19/12	2,500	2,456	98%	90-110
Total N	µg/l	LCS	03/19/12	03/19/12	2,500	2,433	97%	90-110
Total N	µg/l	LCS	03/25/12	03/25/12	2,500	2,342	94%	90-110
Total N	µg/l	LCS	03/27/12	03/27/12	2,500	2,500	100%	90-110
Total N	µg/l	LCS	03/27/12	03/27/12	2,500	2,422	97%	90-110
Total N	µg/l	LCS	03/27/12	03/27/12	2,500	2,489	100%	90-110
Total N	µg/l	LCS	03/27/12	03/27/12	2,500	2,378	95%	90-110
Total N	µg/l	LCS	03/27/12	03/27/12	2,500	2,495	100%	90-110
Total N	µg/l	LCS	04/02/12	04/02/12	3,000	3,035	101%	90-110
Total N	µg/l	LCS	04/02/12	04/02/12	3,000	3,116	104%	90-110

Laboratory Control Standard Recovery

FOR LOCKHART-SMITH COLLECTED FROM

April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE DESCRIPTION	DATE PREPPED	DATE ANALYZED	THEOR. CONC.	ACTUAL CONC.	% RECOVERY	ACCEPTANCE RANGE (%)
Total P	µg/l	LCS	12/28/10	12/28/10	1,000	1,074	107%	90-110
Total P	µg/l	LCS	12/28/10	12/28/10	1,000	1,083	108%	90-110
Total P	µg/l	LCS	12/28/10	12/28/10	1,000	1,086	109%	90-110
Total P	µg/l	LCS	12/28/10	12/28/10	1,000	1,068	107%	90-110
Total P	µg/l	LCS	04/26/10	04/26/10	1,000	1,094	109%	90-110
Total P	µg/l	LCS	05/06/10	05/06/10	1,000	1,075	108%	90-110
Total P	µg/l	LCS	05/12/10	05/12/10	1,000	970	97%	90-110
Total P	µg/l	LCS	05/20/10	05/20/10	1,000	1,004	100%	90-110
Total P	µg/l	LCS	05/26/10	05/26/10	1,000	1,063	106%	90-110
Total P	µg/l	LCS	06/01/10	06/01/10	1,000	1,079	108%	90-110
Total P	µg/l	LCS	06/04/10	06/04/10	1,000	1,005	101%	90-110
Total P	µg/l	LCS	06/07/10	06/07/10	1,000	1,043	104%	90-110
Total P	µg/l	LCS	06/23/10	06/23/10	1,000	1,055	106%	90-110
Total P	µg/l	LCS	06/23/10	06/23/10	1,000	1,057	106%	90-110
Total P	µg/l	LCS	07/02/10	07/02/10	500	547	109%	90-110
Total P	µg/l	LCS	07/02/10	07/02/10	500	548	110%	90-110
Total P	µg/l	LCS	07/07/10	07/07/10	500	526	105%	90-110
Total P	µg/l	LCS	07/07/10	07/07/10	500	541	108%	90-110
Total P	µg/l	LCS	07/22/10	07/22/10	500	535	107%	90-110
Total P	µg/l	LCS	07/22/10	07/22/10	500	524	105%	90-110
Total P	µg/l	LCS	07/26/10	07/26/10	500	496	99%	90-110
Total P	µg/l	LCS	08/02/10	08/02/10	500	546	109%	90-110
Total P	µg/l	LCS	08/11/10	08/11/10	500	500	100%	90-110
Total P	µg/l	LCS	08/16/10	08/16/10	500	507	101%	90-110
Total P	µg/l	LCS	08/17/10	08/17/10	500	515	103%	90-110
Total P	µg/l	LCS	09/10/10	09/10/10	500	506	101%	90-110
Total P	µg/l	LCS	10/12/10	10/12/10	500	506	101%	90-110
Total P	µg/l	LCS	12/02/10	12/02/10	300	303	101%	90-110
Total P	µg/l	LCS	12/02/10	12/02/10	300	304	101%	90-110
Total P	µg/l	LCS	12/06/10	12/06/10	300	312	104%	90-110
Total P	µg/l	LCS	12/22/10	12/22/10	300	304	101%	90-110
Total P	µg/l	LCS	12/27/10	12/27/10	300	299	100%	90-110
Total P	µg/l	LCS	01/18/11	01/18/11	350	347	99%	90-110
Total P	µg/l	LCS	01/18/11	01/18/11	350	372	106%	90-110
Total P	µg/l	LCS	01/18/11	01/18/11	350	359	103%	90-110
Total P	µg/l	LCS	02/08/11	02/08/11	350	386	110%	90-110
Total P	µg/l	LCS	02/08/11	02/08/11	350	363	104%	90-110
Total P	µg/l	LCS	02/17/11	02/17/11	350	364	104%	90-110
Total P	µg/l	LCS	03/23/11	03/23/11	350	377	108%	90-110

Laboratory Control Standard Recovery

FOR LOCKHART-SMITH COLLECTED FROM

April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE DESCRIPTION	DATE PREPPED	DATE ANALYZED	THEOR. CONC.	ACTUAL CONC.	% RECOVERY	ACCEPTANCE RANGE (%)
Total P	µg/l	LCS	05/02/11	05/02/11	150	145	97%	90-110
Total P	µg/l	LCS	05/03/11	05/03/11	150	152	101%	90-110
Total P	µg/l	LCS	05/03/11	05/03/11	150	135	90%	90-110
Total P	µg/l	LCS	05/10/11	05/10/11	150	152	101%	90-110
Total P	µg/l	LCS	05/10/11	05/10/11	150	145	97%	90-110
Total P	µg/l	LCS	06/14/11	06/14/11	150	143	95%	90-110
Total P	µg/l	LCS	06/14/11	06/14/11	150	144	96%	90-110
Total P	µg/l	LCS	06/14/11	06/14/11	150	146	97%	90-110
Total P	µg/l	LCS	08/22/11	08/22/11	300	292	97%	90-110
Total P	µg/l	LCS	08/22/11	08/22/11	300	271	90%	90-110
Total P	µg/l	LCS	09/07/11	09/07/11	300	286	95%	90-110
Total P	µg/l	LCS	09/07/11	09/07/11	300	286	95%	90-110
Total P	µg/l	LCS	09/07/11	09/07/11	300	307	102%	90-110
Total P	µg/l	LCS	09/27/11	09/27/11	300	289	96%	90-110
Total P	µg/l	LCS	09/27/11	09/27/11	300	307	102%	90-110
Total P	µg/l	LCS	09/27/11	09/27/11	300	317	106%	90-110
Total P	µg/l	LCS	09/27/11	09/27/11	300	291	97%	90-110
Total P	µg/l	LCS	09/27/11	09/27/11	300	283	94%	90-110
Total P	µg/l	LCS	09/27/11	09/27/11	300	297	99%	90-110
Total P	µg/l	LCS	09/27/11	09/27/11	300	275	92%	90-110
Total P	µg/l	LCS	10/05/11	10/05/11	300	302	101%	90-110
Total P	µg/l	LCS	10/05/11	10/05/11	300	301	100%	90-110
Total P	µg/l	LCS	10/05/11	10/05/11	300	316	105%	90-110
Total P	µg/l	LCS	10/05/11	10/05/11	300	312	104%	90-110
Total P	µg/l	LCS	10/05/11	10/05/11	300	305	102%	90-110
Total P	µg/l	LCS	10/05/11	10/05/11	300	300	100%	90-110
Total P	µg/l	LCS	10/05/11	10/05/11	300	298	99%	90-110
Total P	µg/l	LCS	10/18/11	10/18/11	300	292	97%	90-110
Total P	µg/l	LCS	11/01/11	11/01/11	300	304	101%	90-110
Total P	µg/l	LCS	11/01/11	11/01/11	300	292	97%	90-110
Total P	µg/l	LCS	11/01/11	11/01/11	300	287	96%	90-110
Total P	µg/l	LCS	11/15/11	11/15/11	300	285	95%	90-110
Total P	µg/l	LCS	11/15/11	11/15/11	300	269	90%	90-110
Total P	µg/l	LCS	11/15/11	11/15/11	300	296	99%	90-110
Total P	µg/l	LCS	12/07/11	12/07/11	300	301	100%	90-110
Total P	µg/l	LCS	12/13/11	12/13/11	300	294	98%	90-110
Total P	µg/l	LCS	12/19/11	12/19/11	300	286	95%	90-110
Total P	µg/l	LCS	12/19/11	12/19/11	300	299	100%	90-110
Total P	µg/l	LCS	12/21/11	12/21/11	300	306	102%	90-110

Laboratory Control Standard Recovery

FOR LOCKHART-SMITH COLLECTED FROM

April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE DESCRIPTION	DATE PREPPED	DATE ANALYZED	THEOR. CONC.	ACTUAL CONC.	% RECOVERY	ACCEPTANCE RANGE (%)
Total P	µg/l	LCS	12/21/11	12/21/11	300	303	101%	90-110
Total P	µg/l	LCS	12/28/11	12/28/11	300	302	101%	90-110
Total P	µg/l	LCS	12/28/11	12/28/11	300	307	102%	90-110
Total P	µg/l	LCS	01/11/12	01/11/12	250	225	90%	90-110
Total P	µg/l	LCS	01/12/12	01/12/12	250	253	101%	90-110
Total P	µg/l	LCS	01/12/12	01/12/12	250	237	95%	90-110
Total P	µg/l	LCS	01/12/12	01/12/12	250	229	92%	90-110
Total P	µg/l	LCS	01/12/12	01/12/12	250	253	101%	90-110
Total P	µg/l	LCS	01/16/12	01/16/12	250	241	96%	90-110
Total P	µg/l	LCS	01/20/12	01/20/12	250	251	100%	90-110
Total P	µg/l	LCS	01/20/12	01/20/12	250	239	96%	90-110
Total P	µg/l	LCS	01/20/12	01/20/12	250	256	102%	90-110
Total P	µg/l	LCS	01/24/12	01/24/12	250	250	100%	90-110
Total P	µg/l	LCS	01/24/12	01/24/12	250	253	101%	90-110
Total P	µg/l	LCS	01/27/12	01/27/12	250	253	101%	90-110
Total P	µg/l	LCS	01/27/12	01/27/12	250	252	101%	90-110
Total P	µg/l	LCS	02/03/12	02/03/12	250	256	102%	90-110
Total P	µg/l	LCS	02/08/12	02/08/12	250	256	102%	90-110
Total P	µg/l	LCS	02/08/12	02/08/12	250	264	106%	90-110
Total P	µg/l	LCS	02/08/12	02/08/12	250	250	100%	90-110
Total P	µg/l	LCS	02/16/12	02/16/12	250	257	103%	90-110
Total P	µg/l	LCS	02/16/12	02/16/12	250	252	101%	90-110
Total P	µg/l	LCS	02/27/12	02/27/12	250	231	92%	90-110
Total P	µg/l	LCS	02/29/12	02/29/12	250	257	103%	90-110
Total P	µg/l	LCS	03/04/12	03/04/12	250	252	101%	90-110
Total P	µg/l	LCS	03/13/12	03/13/12	250	256	102%	90-110
Total P	µg/l	LCS	03/14/12	03/14/12	250	252	101%	90-110
Total P	µg/l	LCS	03/14/12	03/14/12	250	249	100%	90-110
Total P	µg/l	LCS	03/19/12	03/19/12	250	259	104%	90-110
Total P	µg/l	LCS	03/19/12	03/19/12	250	250	100%	90-110
Total P	µg/l	LCS	03/25/12	03/25/12	250	257	103%	90-110
Total P	µg/l	LCS	03/27/12	03/27/12	250	256	102%	90-110
Total P	µg/l	LCS	03/27/12	03/27/12	250	258	103%	90-110
Total P	µg/l	LCS	03/27/12	03/27/12	250	227	91%	90-110
Total P	µg/l	LCS	03/27/12	03/27/12	250	272	109%	90-110
Total P	µg/l	LCS	03/27/12	03/27/12	250	255	102%	90-110
Total P	µg/l	LCS	04/02/12	04/02/12	300	284	95%	90-110
Total P	µg/l	LCS	04/02/12	04/02/12	300	294	98%	90-110

Laboratory Control Standard Recovery

FOR LOCKHART-SMITH COLLECTED FROM

April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE DESCRIPTION	DATE PREPPED	DATE ANALYZED	THEOR. CONC.	ACTUAL CONC.	% RECOVERY	ACCEPTANCE RANGE (%)
Color	PCU	LCS	04/08/10	04/08/10	20	20	100%	85-115
Color	PCU	LCS	04/28/10	04/28/10	20	20	100%	85-115
Color	PCU	LCS	05/06/10	05/06/10	20	20	100%	85-115
Color	PCU	LCS	05/06/10	05/06/10	20	20	100%	85-115
Color	PCU	LCS	05/13/10	05/13/10	20	20	100%	85-115
Color	PCU	LCS	06/10/10	06/10/10	20	20	100%	85-115
Color	PCU	LCS	06/10/10	06/10/10	20	20	100%	85-115
Color	PCU	LCS	06/28/10	06/28/10	20	20	100%	85-115
Color	PCU	LCS	06/28/10	06/28/10	20	20	100%	85-115
Color	PCU	LCS	07/09/10	07/09/10	15	15	100%	85-115
Color	PCU	LCS	07/09/10	07/09/10	15	15	100%	85-115
Color	PCU	LCS	07/21/10	07/21/10	15	15	100%	85-115
Color	PCU	LCS	08/02/10	08/02/10	15	15	100%	85-115
Color	PCU	LCS	08/12/10	08/12/10	15	15	100%	85-115
Color	PCU	LCS	08/17/10	08/17/10	15	15	100%	85-115
Color	PCU	LCS	08/25/10	08/25/10	15	15	100%	85-115
Color	PCU	LCS	09/02/10	09/02/10	15	15	100%	85-115
Color	PCU	LCS	09/02/10	09/02/10	15	15	100%	85-115
Color	PCU	LCS	09/17/10	09/17/10	15	15	100%	85-115
Color	PCU	LCS	10/07/10	10/07/10	30	32	107%	85-115
Color	PCU	LCS	01/06/11	01/06/11	20	21	105%	85-115
Color	PCU	LCS	01/10/11	01/10/11	20	21	105%	85-115
Color	PCU	LCS	01/20/11	01/20/11	20	21	105%	85-115
Color	PCU	LCS	02/02/11	02/02/11	20	21	105%	85-115
Color	PCU	LCS	02/02/11	02/02/11	20	21	105%	85-115
Color	PCU	LCS	02/24/11	02/24/11	20	21	105%	85-115
Color	PCU	LCS	03/02/11	03/02/11	20	21	105%	85-115
Color	PCU	LCS	03/02/11	03/02/11	20	21	105%	85-115
Color	PCU	LCS	03/19/11	03/19/11	20	21	105%	85-115
Color	PCU	LCS	03/19/11	03/19/11	20	21	105%	85-115
Color	PCU	LCS	03/29/11	03/29/11	20	21	105%	85-115
Color	PCU	LCS	04/06/11	04/06/11	40	41	103%	85-115
Color	PCU	LCS	05/05/11	05/05/11	40	41	103%	85-115
Color	PCU	LCS	06/04/11	06/04/11	40	41	103%	85-115
Color	PCU	LCS	07/08/11	07/08/11	30	32	107%	85-115
Color	PCU	LCS	07/08/11	07/08/11	30	32	107%	85-115

Laboratory Control Standard Recovery

FOR LOCKHART-SMITH COLLECTED FROM

April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE DESCRIPTION	DATE PREPPED	DATE ANALYZED	THEOR. CONC.	ACTUAL CONC.	% RECOVERY	ACCEPTANCE RANGE (%)
Color	PCU	LCS	07/18/11	07/18/11	30	32	107%	85-115
Color	PCU	LCS	07/18/11	07/18/11	30	32	107%	85-115
Color	PCU	LCS	07/31/11	07/31/11	30	32	107%	85-115
Color	PCU	LCS	07/31/11	07/31/11	30	32	107%	85-115
Color	PCU	LCS	08/08/11	08/08/11	30	32	107%	85-115
Color	PCU	LCS	08/12/11	08/12/11	30	32	107%	85-115
Color	PCU	LCS	08/18/11	08/18/11	30	32	107%	85-115
Color	PCU	LCS	09/11/11	09/11/11	30	32	107%	85-115
Color	PCU	LCS	09/11/11	09/11/11	30	32	107%	85-115
Color	PCU	LCS	09/16/11	09/16/11	30	32	107%	85-115
Color	PCU	LCS	09/23/11	09/23/11	30	32	107%	85-115
Color	PCU	LCS	10/05/11	10/05/11	15	16	107%	85-115
Color	PCU	LCS	10/05/11	10/05/11	15	16	107%	85-115
Color	PCU	LCS	10/12/11	10/12/11	15	16	107%	85-115
Color	PCU	LCS	10/19/11	10/19/11	15	16	107%	85-115
Color	PCU	LCS	10/19/11	10/19/11	15	16	107%	85-115
Color	PCU	LCS	10/28/11	10/28/11	15	16	107%	85-115
Color	PCU	LCS	11/04/11	11/04/11	15	16	107%	85-115
Color	PCU	LCS	11/04/11	11/04/11	15	15	100%	85-115
Color	PCU	LCS	12/01/11	12/01/11	15	15	100%	85-115
Color	PCU	LCS	12/10/11	12/10/11	15	15	100%	85-115
Color	PCU	LCS	12/16/11	12/16/11	15	16	107%	85-115
Color	PCU	LCS	12/24/11	12/24/11	15	16	107%	85-115
Color	PCU	LCS	12/31/11	12/31/11	15	16	107%	85-115
Color	PCU	LCS	01/08/12	01/08/12	20	21	105%	85-115
Color	PCU	LCS	01/14/12	01/14/12	20	21	105%	85-115
Color	PCU	LCS	02/08/12	02/08/12	20	21	105%	85-115
Color	PCU	LCS	02/15/12	02/15/12	20	21	105%	85-115
Color	PCU	LCS	03/02/12	03/02/12	20	21	105%	85-115
Color	PCU	LCS	03/02/12	03/02/12	20	21	105%	85-115
Color	PCU	LCS	03/08/12	03/08/12	20	21	105%	85-115
Color	PCU	LCS	03/14/12	03/14/12	20	21	105%	85-115
Color	PCU	LCS	04/05/12	04/05/12	30	32	107%	85-115
Color	PCU	LCS	04/05/12	04/05/12	30	32	107%	85-115

D.4 Continuing Calibration Verification

Continuing Calbration Verification Recovery

for Lockhart-Smith from:

April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE DESCRIPTION	DATE PREPPED	DATE ANALYZED	THEOR. CONC.	ACTUAL CONC.	% RECOVERY	ACCEPTANCE RANGE (%)
Alkalinity	mg/l	CCV	04/13/10	04/13/10	6.6	6.8	103%	95.6 - 105
Alkalinity	mg/l	CCV	04/26/10	04/26/10	6.4	6.2	97%	95.6 - 105
Alkalinity	mg/l	CCV	04/30/10	04/30/10	6.4	6.2	97%	95.6 - 105
Alkalinity	mg/l	CCV	05/07/10	05/07/10	6.2	6.0	97%	95.6 - 105
Alkalinity	mg/l	CCV	05/17/10	05/17/10	6.6	6.6	100%	95.6 - 105
Alkalinity	mg/l	CCV	05/27/10	05/27/10	6.4	6.6	103%	95.6 - 105
Alkalinity	mg/l	CCV	05/27/10	05/27/10	6.4	6.4	100%	95.6 - 105
Alkalinity	mg/l	CCV	06/04/10	06/04/10	6.2	6.0	97%	95.6 - 105
Alkalinity	mg/l	CCV	06/11/10	06/11/10	6.4	6.2	97%	95.6 - 105
Alkalinity	mg/l	CCV	06/11/10	06/11/10	6.6	6.4	97%	95.6 - 105
Alkalinity	mg/l	CCV	06/29/10	06/29/10	6.6	6.6	100%	95.6 - 105
Alkalinity	mg/l	CCV	06/29/10	06/29/10	6.6	6.4	97%	95.6 - 105
Alkalinity	mg/l	CCV	07/06/10	07/06/10	6.2	6.2	100%	95.6 - 105
Alkalinity	mg/l	CCV	07/12/10	07/12/10	6.8	6.6	97%	95.6 - 105
Alkalinity	mg/l	CCV	08/04/10	08/04/10	6.2	6.4	103%	95.6 - 105
Alkalinity	mg/l	CCV	08/24/10	08/24/10	6.6	6.4	97%	95.6 - 105
Alkalinity	mg/l	CCV	08/30/10	08/30/10	6.6	6.4	97%	95.6 - 105
Alkalinity	mg/l	CCV	08/30/10	08/30/10	8.6	8.8	102%	95.6 - 105
Alkalinity	mg/l	CCV	09/07/10	09/07/10	8.8	8.8	100%	95.6 - 105
Alkalinity	mg/l	CCV	09/07/10	09/07/10	8.6	8.4	98%	95.6 - 105
Alkalinity	mg/l	CCV	09/10/10	09/10/10	8.6	8.8	102%	95.6 - 105
Alkalinity	mg/l	CCV	09/20/10	09/20/10	8.4	8.6	102%	95.6 - 105
Alkalinity	mg/l	CCV	10/04/10	10/04/10	8.8	8.8	100%	95.6 - 105
Alkalinity	mg/l	CCV	10/07/10	10/07/10	8.6	8.8	102%	95.6 - 105
Alkalinity	mg/l	CCV	10/07/10	10/07/10	8.6	8.8	102%	95.6 - 105
Alkalinity	mg/l	CCV	10/14/10	10/14/10	8.8	9.0	102%	95.6 - 105
Alkalinity	mg/l	CCV	10/26/10	10/26/10	8.6	8.4	98%	95.6 - 105
Alkalinity	mg/l	CCV	12/13/10	12/13/10	8.8	8.8	100%	95.6 - 105
Alkalinity	mg/l	CCV	12/21/10	12/21/10	8.8	9.0	102%	95.6 - 105
Alkalinity	mg/l	CCV	01/06/11	01/06/11	12.6	13.0	103%	95.6 - 105
Alkalinity	mg/l	CCV	01/11/11	01/11/11	12.6	13.0	103%	95.6 - 105
Alkalinity	mg/l	CCV	01/27/11	01/27/11	12.6	12.6	100%	95.6 - 105
Alkalinity	mg/l	CCV	02/03/11	02/03/11	12.6	13.0	103%	95.6 - 105
Alkalinity	mg/l	CCV	02/03/11	02/03/11	12.6	13.0	103%	95.6 - 105
Alkalinity	mg/l	CCV	02/28/11	02/28/11	12.6	12.8	102%	95.6 - 105
Alkalinity	mg/l	CCV	02/28/11	02/28/11	12.4	12.8	103%	95.6 - 105
Alkalinity	mg/l	CCV	03/04/11	03/04/11	12.4	12.8	103%	95.6 - 105

Continuing Calbration Verification Recovery

for Lockhart-Smith from:

April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE DESCRIPTION	DATE PREPPED	DATE ANALYZED	THEOR. CONC.	ACTUAL CONC.	% RECOVERY	ACCEPTANCE RANGE (%)
Alkalinity	mg/l	CCV	03/04/11	03/04/11	12.6	12.2	97%	95.6 - 105
Alkalinity	mg/l	CCV	03/09/11	03/09/11	12.4	12.8	103%	95.6 - 105
Alkalinity	mg/l	CCV	03/21/11	03/21/11	12.4	12.8	103%	95.6 - 105
Alkalinity	mg/l	CCV	04/07/11	04/07/11	12.4	12.8	103%	95.6 - 105
Alkalinity	mg/l	CCV	05/05/11	05/05/11	12.6	12.4	98%	95.6 - 105
Alkalinity	mg/l	CCV	06/06/11	06/06/11	12.6	13.0	103%	95.6 - 105
Alkalinity	mg/l	CCV	07/06/11	07/06/11	12.4	12.6	102%	95.6 - 105
Alkalinity	mg/l	CCV	07/12/11	07/12/11	12.6	12.8	102%	95.6 - 105
Alkalinity	mg/l	CCV	07/21/11	07/21/11	12.4	12.6	102%	95.6 - 105
Alkalinity	mg/l	CCV	08/05/11	08/05/11	12.6	13.0	103%	95.6 - 105
Alkalinity	mg/l	CCV	08/12/11	08/12/11	12.4	12.8	103%	95.6 - 105
Alkalinity	mg/l	CCV	08/16/11	08/16/11	12.6	12.2	97%	95.6 - 105
Alkalinity	mg/l	CCV	09/12/11	09/12/11	12.6	12.6	100%	95.6 - 105
Alkalinity	mg/l	CCV	09/26/11	09/26/11	12.6	12.4	98%	95.6 - 105
Alkalinity	mg/l	CCV	10/07/11	10/07/11	12.6	12.4	98%	95.6 - 105
Alkalinity	mg/l	CCV	10/31/11	10/31/11	12.6	12.4	98%	95.6 - 105
Alkalinity	mg/l	CCV	11/07/11	11/07/11	12.6	12.4	98%	95.6 - 105
Alkalinity	mg/l	CCV	12/01/11	12/01/11	12.6	12.8	102%	95.6 - 105
Alkalinity	mg/l	CCV	12/12/11	12/12/11	12.6	12.6	100%	95.6 - 105
Alkalinity	mg/l	CCV	12/19/11	12/19/11	12.6	12.6	100%	95.6 - 105
Alkalinity	mg/l	CCV	12/27/11	12/27/11	12.4	12.8	103%	95.6 - 105
Alkalinity	mg/l	CCV	01/10/12	01/10/12	8.6	8.2	95%	95.6 - 105
Alkalinity	mg/l	CCV	01/15/12	01/15/12	8.6	8.6	100%	95.6 - 105
Alkalinity	mg/l	CCV	02/07/12	02/07/12	8.4	8.6	102%	95.6 - 105
Alkalinity	mg/l	CCV	02/07/12	02/07/12	8.6	8.2	95%	95.6 - 105
Alkalinity	mg/l	CCV	02/15/12	02/15/12	8.6	9.0	104%	95.6 - 105
Alkalinity	mg/l	CCV	02/27/12	02/27/12	8.6	8.2	95%	95.6 - 105
Alkalinity	mg/l	CCV	03/05/12	03/05/12	8.4	8.8	104%	95.6 - 105
Alkalinity	mg/l	CCV	03/05/12	03/05/12	8.4	8.8	104%	95.6 - 105
Alkalinity	mg/l	CCV	03/21/12	03/21/12	8.6	8.4	98%	95.6 - 105
Alkalinity	mg/l	CCV	03/21/12	03/21/12	8.4	8.2	98%	95.6 - 105

Continuing Calbration Verification Recovery

for Lockhart-Smith from:

April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE DESCRIPTION	DATE PREPPED	DATE ANALYZED	THEOR. CONC.	ACTUAL CONC.	% RECOVERY	ACCEPTANCE RANGE (%)
Turbidity	NTU	CCV	04/09/10	04/09/10	40.2	38.6	96%	87.6 - 106.8
Turbidity	NTU	CCV	04/28/10	04/28/10	40.0	38.6	97%	87.6 - 106.8
Turbidity	NTU	CCV	05/06/10	05/06/10	40.4	39.9	99%	87.6 - 106.8
Turbidity	NTU	CCV	05/14/10	05/14/10	40.3	39.1	97%	87.6 - 106.8
Turbidity	NTU	CCV	05/26/10	05/26/10	40.0	39.6	99%	87.6 - 106.8
Turbidity	NTU	CCV	06/03/10	06/03/10	40.3	40.2	100%	87.6 - 106.8
Turbidity	NTU	CCV	06/10/10	06/10/10	40.2	39.9	99%	87.6 - 106.8
Turbidity	NTU	CCV	06/10/10	06/10/10	40.0	38.8	97%	87.6 - 106.8
Turbidity	NTU	CCV	06/28/10	06/28/10	40.0	38.8	97%	87.6 - 106.8
Turbidity	NTU	CCV	06/28/10	06/28/10	40.0	40.6	102%	87.6 - 106.8
Turbidity	NTU	CCV	07/09/10	07/09/10	40.0	38.6	97%	87.6 - 106.8
Turbidity	NTU	CCV	07/09/10	07/09/10	40.3	38.0	94%	87.6 - 106.8
Turbidity	NTU	CCV	08/03/10	08/03/10	40.0	40.4	101%	87.6 - 106.8
Turbidity	NTU	CCV	08/12/10	08/12/10	40.1	39.4	98%	87.6 - 106.8
Turbidity	NTU	CCV	08/18/10	08/18/10	40.1	41.0	102%	87.6 - 106.8
Turbidity	NTU	CCV	09/03/10	09/03/10	40.1	39.8	99%	87.6 - 106.8
Turbidity	NTU	CCV	09/10/10	09/10/10	40.4	39.1	97%	87.6 - 106.8
Turbidity	NTU	CCV	09/29/10	09/29/10	40.4	38.1	94%	87.6 - 106.8
Turbidity	NTU	CCV	10/08/10	10/08/10	40.1	38.9	97%	87.6 - 106.8
Turbidity	NTU	CCV	10/13/10	10/13/10	40.2	39.5	98%	87.6 - 106.8
Turbidity	NTU	CCV	11/05/10	11/05/10	40.3	38.6	96%	87.6 - 106.8
Turbidity	NTU	CCV	11/20/10	11/20/10	40.2	38.2	95%	87.6 - 106.8
Turbidity	NTU	CCV	12/04/10	12/04/10	40.2	39.8	99%	87.6 - 106.8
Turbidity	NTU	CCV	12/10/10	12/10/10	40.6	37.1	91%	87.6 - 106.8
Turbidity	NTU	CCV	12/10/10	12/10/10	40.2	38.4	96%	87.6 - 106.8
Turbidity	NTU	CCV	12/17/10	12/17/10	40.2	38.2	95%	87.6 - 106.8
Turbidity	NTU	CCV	12/24/10	12/24/10	40.1	38.1	95%	87.6 - 106.8
Turbidity	NTU	CCV	01/05/11	01/05/11	20.4	18.7	92%	87.6 - 106.8
Turbidity	NTU	CCV	01/10/11	01/10/11	20.4	19.3	95%	87.6 - 106.8
Turbidity	NTU	CCV	02/02/11	02/02/11	20.1	18.9	94%	87.6 - 106.8
Turbidity	NTU	CCV	02/02/11	02/02/11	20.1	18.9	94%	87.6 - 106.8
Turbidity	NTU	CCV	02/25/11	02/25/11	20.1	19.2	96%	87.6 - 106.8
Turbidity	NTU	CCV	03/01/11	03/01/11	20.2	19.1	95%	87.6 - 106.8
Turbidity	NTU	CCV	03/09/11	03/09/11	20.2	19.3	96%	87.6 - 106.8
Turbidity	NTU	CCV	03/18/11	03/18/11	20.2	19.4	96%	87.6 - 106.8

Continuing Calbration Verification Recovery

for Lockhart-Smith from:

April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE DESCRIPTION	DATE PREPPED	DATE ANALYZED	THEOR. CONC.	ACTUAL CONC.	% RECOVERY	ACCEPTANCE RANGE (%)
Turbidity	NTU	CCV	04/06/11	04/06/11	20.1	20.1	100%	87.6 - 106.8
Turbidity	NTU	CCV	07/08/11	07/08/11	20.0	18.7	94%	87.6 - 106.8
Turbidity	NTU	CCV	07/08/11	07/08/11	20.0	18.8	94%	87.6 - 106.8
Turbidity	NTU	CCV	07/19/11	07/19/11	20.3	19.1	94%	87.6 - 106.8
Turbidity	NTU	CCV	07/31/11	07/31/11	20.3	18.9	93%	87.6 - 106.8
Turbidity	NTU	CCV	08/05/11	08/05/11	20.2	18.9	94%	87.6 - 106.8
Turbidity	NTU	CCV	08/05/11	08/05/11	20.2	19.2	95%	87.6 - 106.8
Turbidity	NTU	CCV	08/12/11	08/12/11	20.1	19.4	97%	87.6 - 106.8
Turbidity	NTU	CCV	09/09/11	09/09/11	20.1	19.0	95%	87.6 - 106.8
Turbidity	NTU	CCV	09/09/11	09/09/11	20.2	19.3	96%	87.6 - 106.8
Turbidity	NTU	CCV	09/16/11	09/16/11	20.2	19.0	94%	87.6 - 106.8
Turbidity	NTU	CCV	09/25/11	09/25/11	20.1	19.0	95%	87.6 - 106.8
Turbidity	NTU	CCV	10/04/11	10/04/11	20.1	18.7	93%	87.6 - 106.8
Turbidity	NTU	CCV	10/04/11	10/04/11	20.1	18.5	92%	87.6 - 106.8
Turbidity	NTU	CCV	10/12/11	10/12/11	20.1	18.9	94%	87.6 - 106.8
Turbidity	NTU	CCV	10/12/11	10/12/11	20.2	18.4	91%	87.6 - 106.8
Turbidity	NTU	CCV	10/20/11	10/20/11	20.1	18.7	93%	87.6 - 106.8
Turbidity	NTU	CCV	11/04/11	11/04/11	20.2	18.9	94%	87.6 - 106.8
Turbidity	NTU	CCV	11/30/11	11/30/11	20.2	18.8	93%	87.6 - 106.8
Turbidity	NTU	CCV	12/09/11	12/09/11	20.2	18.4	91%	87.6 - 106.8
Turbidity	NTU	CCV	12/17/11	12/17/11	20.2	18.9	94%	87.6 - 106.8
Turbidity	NTU	CCV	12/17/11	12/17/11	20.1	18.6	93%	87.6 - 106.8
Turbidity	NTU	CCV	12/23/11	12/23/11	20.0	18.1	91%	87.6 - 106.8
Turbidity	NTU	CCV	12/28/11	12/28/11	20.0	18.5	93%	87.6 - 106.8
Turbidity	NTU	CCV	12/28/11	12/28/11	20.1	18.9	94%	87.6 - 106.8
Turbidity	NTU	CCV	12/31/11	12/31/11	20.1	18.5	92%	87.6 - 106.8
Turbidity	NTU	CCV	01/08/12	01/08/12	10.1	10.0	99%	87.6 - 106.8
Turbidity	NTU	CCV	01/13/12	01/13/12	10.2	9.6	94%	87.6 - 106.8
Turbidity	NTU	CCV	02/22/12	02/22/12	10.3	9.8	95%	87.6 - 106.8
Turbidity	NTU	CCV	03/02/12	03/02/12	10.3	9.7	94%	87.6 - 106.8
Turbidity	NTU	CCV	03/02/12	03/02/12	10.2	9.5	93%	87.6 - 106.8
Turbidity	NTU	CCV	03/15/12	03/15/12	10.4	9.7	93%	87.6 - 106.8
Turbidity	NTU	CCV	04/05/12	04/05/12	10.4	9.6	92%	87.6 - 106.8

Continuing Calbration Verification Recovery

for Lockhart-Smith from:

April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE DESCRIPTION	DATE PREPPED	DATE ANALYZED	THEOR. CONC.	ACTUAL CONC.	% RECOVERY	ACCEPTANCE RANGE (%)
SRP	µg/l	CCV	04/21/10	04/21/10	100	92	92%	90-110
SRP	µg/l	CCV	05/05/10	05/05/10	100	107	107%	90-110
SRP	µg/l	CCV	05/13/10	05/13/10	100	95	95%	90-110
SRP	µg/l	CCV	05/26/10	05/26/10	100	99	99%	90-110
SRP	µg/l	CCV	05/26/10	05/26/10	100	102	102%	90-110
SRP	µg/l	CCV	06/03/10	06/03/10	100	94	94%	90-110
SRP	µg/l	CCV	06/11/10	06/11/10	100	100	100%	90-110
SRP	µg/l	CCV	06/28/10	06/28/10	100	99	99%	90-110
SRP	µg/l	CCV	06/28/10	06/28/10	100	102	102%	90-110
SRP	µg/l	CCV	07/09/10	07/09/10	100	98	98%	90-110
SRP	µg/l	CCV	07/09/10	07/09/10	100	109	109%	90-110
SRP	µg/l	CCV	08/04/10	08/04/10	100	100	100%	90-110
SRP	µg/l	CCV	08/11/10	08/11/10	100	100	100%	90-110
SRP	µg/l	CCV	08/18/10	08/18/10	100	103	103%	90-110
SRP	µg/l	CCV	09/08/10	09/08/10	100	106	106%	90-110
SRP	µg/l	CCV	09/29/10	09/29/10	100	100	100%	90-110
SRP	µg/l	CCV	10/08/10	10/08/10	100	107	107%	90-110
SRP	µg/l	CCV	10/15/10	10/15/10	100	96	96%	90-110
SRP	µg/l	CCV	11/21/10	11/21/10	100	99	99%	90-110
SRP	µg/l	CCV	11/21/10	11/21/10	100	103	103%	90-110
SRP	µg/l	CCV	12/09/10	12/09/10	100	97	97%	90-110
SRP	µg/l	CCV	12/29/10	12/29/10	100	105	105%	90-110
SRP	µg/l	CCV	01/05/11	01/05/11	100	105	105%	90-110
SRP	µg/l	CCV	01/27/11	01/27/11	100	107	107%	90-110
SRP	µg/l	CCV	02/08/11	02/08/11	100	107	107%	90-110
SRP	µg/l	CCV	02/14/11	02/14/11	100	106	106%	90-110
SRP	µg/l	CCV	03/09/11	03/09/11	120	120	100%	90-110
SRP	µg/l	CCV	03/09/11	03/09/11	120	128	107%	90-110
SRP	µg/l	CCV	03/15/11	03/15/11	120	120	100%	90-110
SRP	µg/l	CCV	03/25/11	03/25/11	120	128	107%	90-110
SRP	µg/l	CCV	04/11/11	04/11/11	120	111	93%	90-110
SRP	µg/l	CCV	04/12/11	04/12/11	120	118	98%	90-110
SRP	µg/l	CCV	05/06/11	05/06/11	100	102	102%	90-110
SRP	µg/l	CCV	06/07/11	06/07/11	100	101	101%	90-110
SRP	µg/l	CCV	07/11/11	07/11/11	100	106	106%	90-110
SRP	µg/l	CCV	08/10/11	08/10/11	100	105	105%	90-110
SRP	µg/l	CCV	08/18/11	08/18/11	100	105	105%	90-110
SRP	µg/l	CCV	08/22/11	08/22/11	100	103	103%	90-110
SRP	µg/l	CCV	08/30/11	08/30/11	100	105	105%	90-110
SRP	µg/l	CCV	10/05/11	10/05/11	100	102	102%	90-110
SRP	µg/l	CCV	10/05/11	10/05/11	100	109	109%	90-110
SRP	µg/l	CCV	10/12/11	10/12/11	100	106	106%	90-110

Continuing Calbration Verification Recovery

for Lockhart-Smith from:

April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE DESCRIPTION	DATE PREPPED	DATE ANALYZED	THEOR. CONC.	ACTUAL CONC.	% RECOVERY	ACCEPTANCE RANGE (%)
SRP	µg/l	CCV	10/31/11	10/31/11	100	101	101%	90-110
SRP	µg/l	CCV	11/09/11	11/09/11	100	106	106%	90-110
SRP	µg/l	CCV	11/16/11	11/16/11	100	106	106%	90-110
SRP	µg/l	CCV	11/29/11	11/29/11	100	102	102%	90-110
SRP	µg/l	CCV	12/23/11	12/23/11	100	105	105%	90-110
SRP	µg/l	CCV	12/31/11	12/31/11	100	109	109%	90-110
SRP	µg/l	CCV	02/08/12	02/08/12	100	106	106%	90-110
SRP	µg/l	CCV	02/16/12	02/16/12	100	97	97%	90-110
SRP	µg/l	CCV	03/02/12	03/02/12	100	101	101%	90-110
SRP	µg/l	CCV	03/02/12	03/02/12	100	97	97%	90-110
SRP	µg/l	CCV	03/07/12	03/07/12	100	98	98%	90-110

Continuing Calbration Verification Recovery

for Lockhart-Smith from:

April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE DESCRIPTION	DATE PREPPED	DATE ANALYZED	THEOR. CONC.	ACTUAL CONC.	% RECOVERY	ACCEPTANCE RANGE (%)
NOX-N	µg/l	CCV	04/21/10	04/21/10	2,000	1,927	96%	90-110
NOX-N	µg/l	CCV	04/30/10	04/30/10	2,000	2,032	102%	90-110
NOX-N	µg/l	CCV	05/05/10	05/05/10	2,000	1,898	95%	90-110
NOX-N	µg/l	CCV	05/13/10	05/13/10	2,000	2,051	103%	90-110
NOX-N	µg/l	CCV	05/26/10	05/26/10	2,000	2,061	103%	90-110
NOX-N	µg/l	CCV	05/26/10	05/26/10	2,000	1,986	99%	90-110
NOX-N	µg/l	CCV	06/03/10	06/03/10	2,000	1,976	99%	90-110
NOX-N	µg/l	CCV	06/11/10	06/11/10	2,000	1,961	98%	90-110
NOX-N	µg/l	CCV	06/28/10	06/28/10	2,000	1,988	99%	90-110
NOX-N	µg/l	CCV	06/28/10	06/28/10	2,000	1,943	97%	90-110
NOX-N	µg/l	CCV	07/09/10	07/09/10	2,000	1,955	98%	90-110
NOX-N	µg/l	CCV	07/09/10	07/09/10	2,000	1,944	97%	90-110
NOX-N	µg/l	CCV	08/04/10	08/04/10	2,000	1,956	98%	90-110
NOX-N	µg/l	CCV	08/11/10	08/11/10	2,000	1,968	98%	90-110
NOX-N	µg/l	CCV	08/18/10	08/18/10	2,000	1,937	97%	90-110
NOX-N	µg/l	CCV	09/08/10	09/08/10	2,000	1,957	98%	90-110
NOX-N	µg/l	CCV	09/29/10	09/29/10	2,000	1,953	98%	90-110
NOX-N	µg/l	CCV	10/08/10	10/08/10	2,000	1,924	96%	90-110
NOX-N	µg/l	CCV	10/15/10	10/15/10	2,000	1,975	99%	90-110
NOX-N	µg/l	CCV	11/21/10	11/21/10	2,000	2,001	100%	90-110
NOX-N	µg/l	CCV	11/21/10	11/21/10	2,000	1,970	99%	90-110
NOX-N	µg/l	CCV	12/09/10	12/09/10	2,000	2,044	102%	90-110
NOX-N	µg/l	CCV	12/29/10	12/29/10	2,000	1,986	99%	90-110
NOX-N	µg/l	CCV	01/05/11	01/05/11	2,000	1,986	99%	90-110
NOX-N	µg/l	CCV	01/27/11	01/27/11	2,000	1,958	98%	90-110
NOX-N	µg/l	CCV	02/08/11	02/08/11	2,000	1,946	97%	90-110
NOX-N	µg/l	CCV	02/14/11	02/14/11	2,000	1,911	96%	90-110
NOX-N	µg/l	CCV	03/09/11	03/09/11	2,000	1,925	96%	90-110
NOX-N	µg/l	CCV	03/09/11	03/09/11	2,000	1,866	93%	90-110
NOX-N	µg/l	CCV	03/15/11	03/15/11	2,000	1,814	91%	90-110
NOX-N	µg/l	CCV	03/25/11	03/25/11	2,000	1,815	91%	90-110
NOX-N	µg/l	CCV	04/11/11	04/11/11	2,000	1,945	97%	90-110
NOX-N	µg/l	CCV	04/12/11	04/12/11	2,000	1,960	98%	90-110
NOX-N	µg/l	CCV	05/06/11	05/06/11	2,000	1,890	95%	90-110
NOX-N	µg/l	CCV	06/07/11	06/07/11	2,000	1,850	93%	90-110
NOX-N	µg/l	CCV	07/11/11	07/11/11	2,000	1,854	93%	90-110
NOX-N	µg/l	CCV	08/10/11	08/10/11	2,000	1,914	96%	90-110
NOX-N	µg/l	CCV	08/18/11	08/18/11	2,000	1,980	99%	90-110
NOX-N	µg/l	CCV	08/22/11	08/22/11	2,000	1,996	100%	90-110

Continuing Calbration Verification Recovery

for Lockhart-Smith from:

April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE DESCRIPTION	DATE PREPPED	DATE ANALYZED	THEOR. CONC.	ACTUAL CONC.	% RECOVERY	ACCEPTANCE RANGE (%)
NOX-N	µg/l	CCV	08/30/11	08/30/11	2,000	1,970	99%	90-110
NOX-N	µg/l	CCV	10/05/11	10/05/11	2,000	1,925	96%	90-110
NOX-N	µg/l	CCV	10/05/11	10/05/11	2,000	1,825	91%	90-110
NOX-N	µg/l	CCV	10/12/11	10/12/11	2,000	2,073	104%	90-110
NOX-N	µg/l	CCV	10/31/11	10/31/11	2,000	1,979	99%	90-110
NOX-N	µg/l	CCV	11/09/11	11/09/11	2,000	1,967	98%	90-110
NOX-N	µg/l	CCV	11/16/11	11/16/11	2,000	1,889	94%	90-110
NOX-N	µg/l	CCV	11/29/11	11/29/11	2,000	1,942	97%	90-110
NOX-N	µg/l	CCV	12/23/11	12/23/11	2,000	1,942	97%	90-110
NOX-N	µg/l	CCV	12/31/11	12/31/11	1,000	1,036	103.6%	90-110
NOX-N	µg/l	CCV	02/08/12	02/08/12	1,000	1,030	103.0%	90-110
NOX-N	µg/l	CCV	02/16/12	02/16/12	1,000	1,021	102.1%	90-110
NOX-N	µg/l	CCV	03/07/12	03/07/12	1,000	1,026	102.6%	90-110

Continuing Calbration Verification Recovery

for Lockhart-Smith from:

April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE DESCRIPTION	DATE PREPPED	DATE ANALYZED	THEOR. CONC.	ACTUAL CONC.	% RECOVERY	ACCEPTANCE RANGE (%)
Ammonia	µg/l	CCV	04/29/10	04/29/10	1,000	1,063	106%	90-110
Ammonia	µg/l	CCV	04/30/10	04/30/10	1,000	1,048	105%	90-110
Ammonia	µg/l	CCV	05/12/10	05/12/10	1,000	1,052	105%	90-110
Ammonia	µg/l	CCV	05/12/10	05/12/10	1,000	969	97%	90-110
Ammonia	µg/l	CCV	06/02/10	06/02/10	1,000	1,061	106%	90-110
Ammonia	µg/l	CCV	06/02/10	06/02/10	1,000	949	95%	90-110
Ammonia	µg/l	CCV	06/29/10	06/29/10	1,000	950	95%	90-110
Ammonia	µg/l	CCV	07/15/10	07/15/10	1,000	953	95%	90-110
Ammonia	µg/l	CCV	07/15/10	07/15/10	1,000	976	98%	90-110
Ammonia	µg/l	CCV	09/28/10	09/28/10	1,000	965	97%	90-110
Ammonia	µg/l	CCV	09/29/10	09/29/10	1,000	950	95%	90-110
Ammonia	µg/l	CCV	09/29/10	09/29/10	1,000	963	96%	90-110
Ammonia	µg/l	CCV	09/29/10	09/29/10	1,000	988	99%	90-110
Ammonia	µg/l	CCV	12/08/10	12/08/10	1,000	970	97%	90-110
Ammonia	µg/l	CCV	12/08/10	12/08/10	1,000	947	95%	90-110
Ammonia	µg/l	CCV	12/14/10	12/14/10	1,000	966	97%	90-110
Ammonia	µg/l	CCV	12/17/10	12/17/10	1,000	966	97%	90-110
Ammonia	µg/l	CCV	12/21/10	12/21/10	1,000	968	97%	90-110
Ammonia	µg/l	CCV	12/21/10	12/21/10	1,000	950	95%	90-110
Ammonia	µg/l	CCV	01/09/11	01/09/11	1,000	970	97%	90-110
Ammonia	µg/l	CCV	02/04/11	02/04/11	1,000	958	96%	90-110
Ammonia	µg/l	CCV	03/07/11	03/07/11	1,000	990	99%	90-110
Ammonia	µg/l	CCV	05/03/11	05/03/11	1,000	963	96%	90-110
Ammonia	µg/l	CCV	05/03/11	05/03/11	1,000	986	99%	90-110
Ammonia	µg/l	CCV	05/04/11	05/04/11	1,000	1,004	100%	90-110
Ammonia	µg/l	CCV	05/04/11	05/04/11	1,000	998	100%	90-110
Ammonia	µg/l	CCV	05/04/11	05/04/11	1,000	1,046	105%	90-110
Ammonia	µg/l	CCV	06/08/11	06/08/11	1,000	1,031	103%	90-110
Ammonia	µg/l	CCV	06/08/11	06/08/11	1,000	1,025	103%	90-110
Ammonia	µg/l	CCV	06/15/11	06/15/11	1,000	1,023	102%	90-110
Ammonia	µg/l	CCV	06/28/11	06/28/11	1,000	1,016	102%	90-110
Ammonia	µg/l	CCV	07/13/11	07/13/11	1,000	1,017	102%	90-110
Ammonia	µg/l	CCV	08/31/11	08/31/11	1,000	1,003	100%	90-110
Ammonia	µg/l	CCV	08/31/11	08/31/11	1,000	996	100%	90-110
Ammonia	µg/l	CCV	09/01/11	09/01/11	1,000	1,000	100%	90-110
Ammonia	µg/l	CCV	09/15/11	09/15/11	1,000	993	99%	90-110

Continuing Calbration Verification Recovery

for Lockhart-Smith from:

April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE DESCRIPTION	DATE PREPPED	DATE ANALYZED	THEOR. CONC.	ACTUAL CONC.	% RECOVERY	ACCEPTANCE RANGE (%)
Ammonia	µg/l	CCV	09/20/11	09/20/11	1,000	1,026	103%	90-110
Ammonia	µg/l	CCV	10/14/11	10/14/11	1,000	1,028	103%	90-110
Ammonia	µg/l	CCV	10/14/11	10/14/11	1,000	1,035	104%	90-110
Ammonia	µg/l	CCV	11/02/11	11/02/11	1,000	1,093	109%	90-110
Ammonia	µg/l	CCV	11/02/11	11/02/11	1,000	1,025	103%	90-110
Ammonia	µg/l	CCV	11/16/11	11/16/11	1,000	994	99%	90-110
Ammonia	µg/l	CCV	12/15/11	12/15/11	1,000	1,065	107%	90-110
Ammonia	µg/l	CCV	12/20/11	12/20/11	1,000	1,002	100%	90-110
Ammonia	µg/l	CCV	12/29/11	12/29/11	1,000	1,018	102%	90-110
Ammonia	µg/l	CCV	01/17/12	01/17/12	100	98	98%	90-110
Ammonia	µg/l	CCV	01/18/12	01/18/12	100	106	106%	90-110
Ammonia	µg/l	CCV	02/15/12	02/15/12	100	101	101%	90-110
Ammonia	µg/l	CCV	03/05/12	03/05/12	100	104	104%	90-110
Ammonia	µg/l	CCV	04/06/12	04/06/12	100	104	104%	90-110

Continuing Calbration Verification Recovery

for Lockhart-Smith from:

April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE DESCRIPTION	DATE PREPPED	DATE ANALYZED	THEOR. CONC.	ACTUAL CONC.	% RECOVERY	ACCEPTANCE RANGE (%)
Total N	µg/l	CCV	12/28/10	12/28/10	2,000	1,982	99%	90-110
Total N	µg/l	CCV	12/28/10	12/28/10	1,250	1,190	95%	90-110
Total N	µg/l	CCV	12/28/10	12/28/10	2,000	2,118	106%	90-110
Total N	µg/l	CCV	12/28/10	12/28/10	2,000	2,204	110%	90-110
Total N	µg/l	CCV	04/26/10	04/26/10	2,000	2,097	105%	90-110
Total N	µg/l	CCV	04/27/10	04/27/10	2,000	2,010	101%	90-110
Total N	µg/l	CCV	05/06/10	05/06/10	2,000	2,015	101%	90-110
Total N	µg/l	CCV	05/12/10	05/12/10	2,000	2,026	101%	90-110
Total N	µg/l	CCV	05/20/10	05/20/10	2,000	2,049	102%	90-110
Total N	µg/l	CCV	05/26/10	05/26/10	2,000	2,064	103%	90-110
Total N	µg/l	CCV	06/01/10	06/01/10	2,000	1,926	96%	90-110
Total N	µg/l	CCV	06/04/10	06/04/10	2,000	1,973	99%	90-110
Total N	µg/l	CCV	06/07/10	06/07/10	2,000	1,849	92%	90-110
Total N	µg/l	CCV	06/23/10	06/23/10	2,000	2,081	104%	90-110
Total N	µg/l	CCV	06/23/10	06/23/10	2,000	1,801	90%	90-110
Total N	µg/l	CCV	07/02/10	07/02/10	2,000	2,069	103%	90-110
Total N	µg/l	CCV	07/07/10	07/07/10	2,000	2,003	100%	90-110
Total N	µg/l	CCV	07/07/10	07/07/10	2,000	2,016	101%	90-110
Total N	µg/l	CCV	07/22/10	07/22/10	2,000	2,026	101%	90-110
Total N	µg/l	CCV	07/22/10	07/22/10	1,500	1,421	95%	90-110
Total N	µg/l	CCV	07/26/10	07/26/10	1,500	1,433	96%	90-110
Total N	µg/l	CCV	08/02/10	08/02/10	1,500	1,456	97%	90-110
Total N	µg/l	CCV	08/11/10	08/11/10	1,500	1,600	107%	90-110
Total N	µg/l	CCV	08/16/10	08/16/10	1,500	1,495	100%	90-110
Total N	µg/l	CCV	08/17/10	08/17/10	1,500	1,442	96%	90-110
Total N	µg/l	CCV	09/10/10	09/10/10	2,000	2,087	104%	90-110
Total N	µg/l	CCV	10/12/10	10/12/10	2,000	2,122	106%	90-110
Total N	µg/l	CCV	12/02/10	12/02/10	2,000	1,907	95%	90-110
Total N	µg/l	CCV	12/02/10	12/02/10	2,000	1,951	98%	90-110
Total N	µg/l	CCV	12/06/10	12/06/10	2,000	1,998	100%	90-110
Total N	µg/l	CCV	12/22/10	12/22/10	2,000	2,071	104%	90-110
Total N	µg/l	CCV	12/27/10	12/27/10	2,000	2,050	103%	90-110
Total N	µg/l	CCV	01/18/11	01/18/11	2,000	2,019	101%	90-110
Total N	µg/l	CCV	01/18/11	01/18/11	2,000	1,905	95%	90-110
Total N	µg/l	CCV	01/18/11	01/18/11	2,000	1,888	94%	90-110
Total N	µg/l	CCV	02/08/11	02/08/11	2,000	2,096	105%	90-110
Total N	µg/l	CCV	02/08/11	02/08/11	2,000	2,152	108%	90-110
Total N	µg/l	CCV	02/17/11	02/17/11	2,000	2,121	106%	90-110
Total N	µg/l	CCV	03/23/11	03/23/11	2,000	1,930	97%	90-110
Total N	µg/l	CCV	02/22/10	02/22/10	2,000	2,052	103%	90-110
Total N	µg/l	CCV	02/22/10	02/22/10	2,000	2,033	102%	90-110
Total N	µg/l	CCV	02/22/10	02/22/10	2,000	1,973	99%	90-110
Total N	µg/l	CCV	03/05/10	03/05/10	2,000	1,908	95%	90-110
Total N	µg/l	CCV	03/05/10	03/05/10	2,000	1,919	96%	90-110
Total N	µg/l	CCV	06/14/11	06/14/11	2,000	1,926	96%	90-110
Total N	µg/l	CCV	06/14/11	06/14/11	2,000	1,907	95%	90-110
Total N	µg/l	CCV	06/14/11	06/14/11	2,000	1,927	96%	90-110

Continuing Calbration Verification Recovery

for Lockhart-Smith from:

April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE DESCRIPTION	DATE PREPPED	DATE ANALYZED	THEOR. CONC.	ACTUAL CONC.	% RECOVERY	ACCEPTANCE RANGE (%)
Total N	µg/l	CCV	08/22/11	08/22/11	2,000	2,013	101%	90-110
Total N	µg/l	CCV	08/22/11	08/22/11	2,000	1,934	97%	90-110
Total N	µg/l	CCV	09/07/11	09/07/11	2,000	2,074	104%	90-110
Total N	µg/l	CCV	09/07/11	09/07/11	2,000	2,097	105%	90-110
Total N	µg/l	CCV	09/07/11	09/07/11	2,000	2,073	104%	90-110
Total N	µg/l	CCV	09/27/11	09/27/11	2,000	2,048	102%	90-110
Total N	µg/l	CCV	09/27/11	09/27/11	2,000	1,903	95%	90-110
Total N	µg/l	CCV	09/27/11	09/27/11	2,000	1,905	95%	90-110
Total N	µg/l	CCV	09/27/11	09/27/11	2,000	2,052	103%	90-110
Total N	µg/l	CCV	09/27/11	09/27/11	2,000	1,829	91%	90-110
Total N	µg/l	CCV	09/27/11	09/27/11	2,000	1,892	95%	90-110
Total N	µg/l	CCV	09/27/11	09/27/11	2,000	1,892	95%	90-110
Total N	µg/l	CCV	10/05/11	10/05/11	2,000	1,933	97%	90-110
Total N	µg/l	CCV	10/05/11	10/05/11	2,000	2,037	102%	90-110
Total N	µg/l	CCV	10/05/11	10/05/11	2,000	1,930	97%	90-110
Total N	µg/l	CCV	10/05/11	10/05/11	2,000	2,034	102%	90-110
Total N	µg/l	CCV	10/05/11	10/05/11	2,000	1,934	97%	90-110
Total N	µg/l	CCV	10/05/11	10/05/11	2,000	2,118	106%	90-110
Total N	µg/l	CCV	10/05/11	10/05/11	2,000	2,020	101%	90-110
Total N	µg/l	CCV	10/18/11	10/18/11	2,000	1,912	96%	90-110
Total N	µg/l	CCV	11/01/11	11/01/11	2,000	1,942	97%	90-110
Total N	µg/l	CCV	11/01/11	11/01/11	2,000	1,926	96%	90-110
Total N	µg/l	CCV	11/01/11	11/01/11	2,000	1,924	96%	90-110
Total N	µg/l	CCV	11/15/11	11/15/11	2,000	1,925	96%	90-110
Total N	µg/l	CCV	11/15/11	11/15/11	2,000	1,933	97%	90-110
Total N	µg/l	CCV	11/15/11	11/15/11	2,000	1,836	92%	90-110
Total N	µg/l	CCV	12/07/11	12/07/11	2,000	1,856	93%	90-110
Total N	µg/l	CCV	12/13/11	12/13/11	2,000	2,022	101%	90-110
Total N	µg/l	CCV	12/19/11	12/19/11	2,000	2,011	101%	90-110
Total N	µg/l	CCV	12/19/11	12/19/11	2,000	2,098	105%	90-110
Total N	µg/l	CCV	12/21/11	12/21/11	2,000	2,094	105%	90-110
Total N	µg/l	CCV	12/21/11	12/21/11	2,000	2,091	105%	90-110
Total N	µg/l	CCV	12/28/11	12/28/11	2,000	2,050	103%	90-110
Total N	µg/l	CCV	12/28/11	12/28/11	2,000	2,099	105%	90-110
Total N	µg/l	CCV	01/11/12	01/11/12	2,000	2,179	109%	90-110
Total N	µg/l	CCV	01/12/12	01/12/12	2,000	2,127	106%	90-110
Total N	µg/l	CCV	01/12/12	01/12/12	2,000	2,107	105%	90-110
Total N	µg/l	CCV	01/12/12	01/12/12	2,000	2,174	109%	90-110
Total N	µg/l	CCV	01/12/12	01/12/12	2,000	2,020	101%	90-110
Total N	µg/l	CCV	01/16/12	01/16/12	2,000	2,166	108%	90-110
Total N	µg/l	CCV	01/20/12	01/20/12	2,000	2,089	104%	90-110
Total N	µg/l	CCV	01/20/12	01/20/12	2,000	2,108	105%	90-110
Total N	µg/l	CCV	01/20/12	01/20/12	2,000	2,084	104%	90-110
Total N	µg/l	CCV	01/20/12	01/20/12	2,000	2,142	107%	90-110
Total N	µg/l	CCV	01/24/12	01/24/12	2,000	1,998	100%	90-110
Total N	µg/l	CCV	01/24/12	01/24/12	2,000	2,110	106%	90-110
Total N	µg/l	CCV	01/27/12	01/27/12	2,000	2,109	105%	90-110

Continuing Calbration Verification Recovery

for Lockhart-Smith from:

April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE DESCRIPTION	DATE PREPPED	DATE ANALYZED	THEOR. CONC.	ACTUAL CONC.	% RECOVERY	ACCEPTANCE RANGE (%)
Total N	µg/l	CCV	01/27/12	01/27/12	2,000	2,166	108%	90-110
Total N	µg/l	CCV	02/03/12	02/03/12	2,000	2,178	109%	90-110
Total N	µg/l	CCV	02/08/12	02/08/12	2,000	2,039	102%	90-110
Total N	µg/l	CCV	02/08/12	02/08/12	2,000	2,180	109%	90-110
Total N	µg/l	CCV	02/08/12	02/08/12	2,000	2,059	103%	90-110
Total N	µg/l	CCV	02/16/12	02/16/12	2,000	2,172	109%	90-110
Total N	µg/l	CCV	02/16/12	02/16/12	2,000	2,112	106%	90-110
Total N	µg/l	CCV	02/27/12	02/27/12	2,000	2,114	106%	90-110
Total N	µg/l	CCV	02/29/12	02/29/12	2,000	2,055	103%	90-110
Total N	µg/l	CCV	03/04/12	03/04/12	2,000	2,085	104%	90-110
Total N	µg/l	CCV	03/13/12	03/13/12	2,000	2,073	104%	90-110
Total N	µg/l	CCV	03/14/12	03/14/12	2,000	2,136	107%	90-110
Total N	µg/l	CCV	03/14/12	03/14/12	2,000	2,074	104%	90-110
Total N	µg/l	CCV	03/19/12	03/19/12	2,000	2,190	110%	90-110
Total N	µg/l	CCV	03/19/12	03/19/12	2,000	2,030	102%	90-110
Total N	µg/l	CCV	03/25/12	03/25/12	2,000	2,098	105%	90-110
Total N	µg/l	CCV	03/27/12	03/27/12	2,000	2,061	103%	90-110
Total N	µg/l	CCV	03/27/12	03/27/12	2,000	2,029	101%	90-110
Total N	µg/l	CCV	03/27/12	03/27/12	2,000	2,068	103%	90-110
Total N	µg/l	CCV	03/27/12	03/27/12	2,000	2,023	101%	90-110
Total N	µg/l	CCV	03/27/12	03/27/12	2,000	2,110	106%	90-110
Total N	µg/l	CCV	04/02/12	04/02/12	2,000	2,037	102%	90-110
Total N	µg/l	CCV	04/02/12	04/02/12	2,000	2,061	103%	90-110

Continuing Calbration Verification Recovery

for Lockhart-Smith from:

April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE DESCRIPTION	DATE PREPPED	DATE ANALYZED	THEOR. CONC.	ACTUAL CONC.	% RECOVERY	ACCEPTANCE RANGE (%)
Total P	µg/l	CCV	12/28/10	12/28/10	200	201	101%	90-110
Total P	µg/l	CCV	12/28/10	12/28/10	200	193	97%	90-110
Total P	µg/l	CCV	12/28/10	12/28/10	200	198	99%	90-110
Total P	µg/l	CCV	12/28/10	12/28/10	200	202	101%	90-110
Total P	µg/l	CCV	04/26/10	04/26/10	200	204	102%	90-110
Total P	µg/l	CCV	04/27/10	04/27/10	200	195	98%	90-110
Total P	µg/l	CCV	05/06/10	05/06/10	200	201	101%	90-110
Total P	µg/l	CCV	05/12/10	05/12/10	200	191	96%	90-110
Total P	µg/l	CCV	05/20/10	05/20/10	200	199	100%	90-110
Total P	µg/l	CCV	05/26/10	05/26/10	200	195	98%	90-110
Total P	µg/l	CCV	06/01/10	06/01/10	200	187	94%	90-110
Total P	µg/l	CCV	06/04/10	06/04/10	200	196	98%	90-110
Total P	µg/l	CCV	06/07/10	06/07/10	200	186	93%	90-110
Total P	µg/l	CCV	06/23/10	06/23/10	200	207	104%	90-110
Total P	µg/l	CCV	06/23/10	06/23/10	200	188	94%	90-110
Total P	µg/l	CCV	07/02/10	07/02/10	200	195	98%	90-110
Total P	µg/l	CCV	07/02/10	07/02/10	200	204	102%	90-110
Total P	µg/l	CCV	07/07/10	07/07/10	200	196	98%	90-110
Total P	µg/l	CCV	07/07/10	07/07/10	200	210	105%	90-110
Total P	µg/l	CCV	07/22/10	07/22/10	200	184	92%	90-110
Total P	µg/l	CCV	07/22/10	07/22/10	200	205	103%	90-110
Total P	µg/l	CCV	07/26/10	07/26/10	200	208	104%	90-110
Total P	µg/l	CCV	08/02/10	08/02/10	200	207	104%	90-110
Total P	µg/l	CCV	08/16/10	08/16/10	200	198	99%	90-110
Total P	µg/l	CCV	08/17/10	08/17/10	200	193	97%	90-110
Total P	µg/l	CCV	09/10/10	09/10/10	200	199	100%	90-110
Total P	µg/l	CCV	10/12/10	10/12/10	200	198	99%	90-110
Total P	µg/l	CCV	12/02/10	12/02/10	200	198	99%	90-110
Total P	µg/l	CCV	12/02/10	12/02/10	200	198	99%	90-110
Total P	µg/l	CCV	12/06/10	12/06/10	200	219	110%	90-110
Total P	µg/l	CCV	12/22/10	12/22/10	200	214	107%	90-110
Total P	µg/l	CCV	12/27/10	12/27/10	200	209	105%	90-110
Total P	µg/l	CCV	01/18/11	01/18/11	200	207	104%	90-110
Total P	µg/l	CCV	01/18/11	01/18/11	200	193	97%	90-110
Total P	µg/l	CCV	01/18/11	01/18/11	200	199	100%	90-110
Total P	µg/l	CCV	02/08/11	02/08/11	200	198	99%	90-110
Total P	µg/l	CCV	02/08/11	02/08/11	200	198	99%	90-110
Total P	µg/l	CCV	02/17/11	02/17/11	200	198	99%	90-110
Total P	µg/l	CCV	03/23/11	03/23/11	200	219	110%	90-110
Total P	µg/l	CCV	05/02/11	05/02/11	200	214	107%	90-110
Total P	µg/l	CCV	05/03/11	05/03/11	200	209	105%	90-110
Total P	µg/l	CCV	05/03/11	05/03/11	200	207	104%	90-110
Total P	µg/l	CCV	05/10/11	05/10/11	200	197	99%	90-110
Total P	µg/l	CCV	05/10/11	05/10/11	200	196	98%	90-110
Total P	µg/l	CCV	06/14/11	06/14/11	200	189	95%	90-110
Total P	µg/l	CCV	06/14/11	06/14/11	200	190	95%	90-110
Total P	µg/l	CCV	06/14/11	06/14/11	200	201	101%	90-110

Continuing Calbration Verification Recovery

for Lockhart-Smith from:

April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE DESCRIPTION	DATE PREPPED	DATE ANALYZED	THEOR. CONC.	ACTUAL CONC.	% RECOVERY	ACCEPTANCE RANGE (%)
Total P	µg/l	CCV	08/22/11	08/22/11	200	205	103%	90-110
Total P	µg/l	CCV	08/22/11	08/22/11	200	211	106%	90-110
Total P	µg/l	CCV	09/07/11	09/07/11	200	207	104%	90-110
Total P	µg/l	CCV	09/07/11	09/07/11	200	206	103%	90-110
Total P	µg/l	CCV	09/07/11	09/07/11	200	208	104%	90-110
Total P	µg/l	CCV	09/27/11	09/27/11	200	208	104%	90-110
Total P	µg/l	CCV	09/27/11	09/27/11	200	204	102%	90-110
Total P	µg/l	CCV	09/27/11	09/27/11	200	215	108%	90-110
Total P	µg/l	CCV	09/27/11	09/27/11	200	207	104%	90-110
Total P	µg/l	CCV	09/27/11	09/27/11	200	199	100%	90-110
Total P	µg/l	CCV	09/27/11	09/27/11	200	206	103%	90-110
Total P	µg/l	CCV	09/27/11	09/27/11	200	198	99%	90-110
Total P	µg/l	CCV	10/05/11	10/05/11	200	198	99%	90-110
Total P	µg/l	CCV	10/05/11	10/05/11	200	199	100%	90-110
Total P	µg/l	CCV	10/05/11	10/05/11	200	194	97%	90-110
Total P	µg/l	CCV	10/05/11	10/05/11	200	205	103%	90-110
Total P	µg/l	CCV	10/05/11	10/05/11	200	191	96%	90-110
Total P	µg/l	CCV	10/05/11	10/05/11	200	199	100%	90-110
Total P	µg/l	CCV	10/05/11	10/05/11	200	198	99%	90-110
Total P	µg/l	CCV	10/18/11	10/18/11	200	197	99%	90-110
Total P	µg/l	CCV	11/01/11	11/01/11	200	199	100%	90-110
Total P	µg/l	CCV	11/01/11	11/01/11	200	201	101%	90-110
Total P	µg/l	CCV	11/01/11	11/01/11	200	212	106%	90-110
Total P	µg/l	CCV	11/15/11	11/15/11	200	213	107%	90-110
Total P	µg/l	CCV	11/15/11	11/15/11	200	211	106%	90-110
Total P	µg/l	CCV	11/15/11	11/15/11	200	207	104%	90-110
Total P	µg/l	CCV	12/07/11	12/07/11	200	207	104%	90-110
Total P	µg/l	CCV	12/13/11	12/13/11	200	212	106%	90-110
Total P	µg/l	CCV	12/19/11	12/19/11	200	185	93%	90-110
Total P	µg/l	CCV	12/19/11	12/19/11	200	194	97%	90-110
Total P	µg/l	CCV	12/21/11	12/21/11	200	212	106%	90-110
Total P	µg/l	CCV	12/21/11	12/21/11	200	194	97%	90-110
Total P	µg/l	CCV	12/28/11	12/28/11	200	199	100%	90-110
Total P	µg/l	CCV	12/28/11	12/28/11	200	197	99%	90-110
Total P	µg/l	CCV	01/11/12	01/11/12	250	235	94%	90-110
Total P	µg/l	CCV	01/12/12	01/12/12	250	236	94%	90-110
Total P	µg/l	CCV	01/12/12	01/12/12	250	237	95%	90-110
Total P	µg/l	CCV	01/12/12	01/12/12	250	242	97%	90-110
Total P	µg/l	CCV	01/12/12	01/12/12	250	229	92%	90-110
Total P	µg/l	CCV	01/16/12	01/16/12	250	241	96%	90-110
Total P	µg/l	CCV	01/20/12	01/20/12	250	236	94%	90-110
Total P	µg/l	CCV	01/20/12	01/20/12	250	246	98%	90-110
Total P	µg/l	CCV	01/20/12	01/20/12	250	240	96%	90-110
Total P	µg/l	CCV	01/20/12	01/20/12	250	247	99%	90-110
Total P	µg/l	CCV	01/24/12	01/24/12	250	234	94%	90-110
Total P	µg/l	CCV	01/24/12	01/24/12	250	247	99%	90-110

Continuing Calbration Verification Recovery

for Lockhart-Smith from:

April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE DESCRIPTION	DATE PREPPED	DATE ANALYZED	THEOR. CONC.	ACTUAL CONC.	% RECOVERY	ACCEPTANCE RANGE (%)
Total P	µg/l	CCV	01/27/12	01/27/12	250	242	97%	90-110
Total P	µg/l	CCV	01/27/12	01/27/12	250	242	97%	90-110
Total P	µg/l	CCV	02/03/12	02/03/12	250	239	96%	90-110
Total P	µg/l	CCV	02/08/12	02/08/12	250	238	95%	90-110
Total P	µg/l	CCV	02/16/12	02/16/12	250	239	96%	90-110
Total P	µg/l	CCV	02/16/12	02/16/12	250	253	101%	90-110
Total P	µg/l	CCV	02/27/12	02/27/12	250	265	106%	90-110
Total P	µg/l	CCV	02/29/12	02/29/12	250	250	100%	90-110
Total P	µg/l	CCV	03/04/12	03/04/12	250	250	100%	90-110
Total P	µg/l	CCV	03/13/12	03/13/12	250	253	101%	90-110
Total P	µg/l	CCV	03/14/12	03/14/12	250	246	98%	90-110
Total P	µg/l	CCV	03/14/12	03/14/12	250	247	99%	90-110
Total P	µg/l	CCV	03/19/12	03/19/12	250	236	94%	90-110
Total P	µg/l	CCV	03/19/12	03/19/12	250	236	94%	90-110
Total P	µg/l	CCV	03/25/12	03/25/12	250	254	102%	90-110
Total P	µg/l	CCV	03/27/12	03/27/12	250	244	98%	90-110
Total P	µg/l	CCV	03/27/12	03/27/12	250	246	98%	90-110
Total P	µg/l	CCV	03/27/12	03/27/12	250	248	99%	90-110
Total P	µg/l	CCV	03/27/12	03/27/12	250	250	100%	90-110
Total P	µg/l	CCV	03/27/12	03/27/12	250	239	96%	90-110
Total P	µg/l	CCV	04/02/12	04/02/12	250	245	98%	90-110
Total P	µg/l	CCV	04/02/12	04/02/12	250	244	98%	90-110

Continuing Calbration Verification Recovery

for Lockhart-Smith from:

April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE DESCRIPTION	DATE PREPPED	DATE ANALYZED	THEOR. CONC.	ACTUAL CONC.	% RECOVERY	ACCEPTANCE RANGE (%)
Color	PCU	CCV	04/08/10	04/08/10	30	30	100%	85-115
Color	PCU	CCV	04/28/10	04/28/10	30	30	100%	85-115
Color	PCU	CCV	05/06/10	05/06/10	30	30	100%	85-115
Color	PCU	CCV	05/06/10	05/06/10	30	29	97%	85-115
Color	PCU	CCV	05/13/10	05/13/10	30	29	97%	85-115
Color	PCU	CCV	06/10/10	06/10/10	30	29	97%	85-115
Color	PCU	CCV	06/10/10	06/10/10	30	29	97%	85-115
Color	PCU	CCV	06/28/10	06/28/10	30	30	100%	85-115
Color	PCU	CCV	06/28/10	06/28/10	30	30	100%	85-115
Color	PCU	CCV	07/09/10	07/09/10	30	30	100%	85-115
Color	PCU	CCV	07/09/10	07/09/10	30	30	100%	85-115
Color	PCU	CCV	07/21/10	07/21/10	30	30	100%	85-115
Color	PCU	CCV	08/02/10	08/02/10	30	30	100%	85-115
Color	PCU	CCV	08/12/10	08/12/10	30	30	100%	85-115
Color	PCU	CCV	08/17/10	08/17/10	30	30	100%	85-115
Color	PCU	CCV	08/25/10	08/25/10	30	30	100%	85-115
Color	PCU	CCV	09/02/10	09/02/10	30	30	100%	85-115
Color	PCU	CCV	09/02/10	09/02/10	30	30	100%	85-115
Color	PCU	CCV	09/17/10	09/17/10	30	30	100%	85-115
Color	PCU	CCV	10/07/10	10/07/10	30	30	100%	85-115
Color	PCU	CCV	01/06/11	01/06/11	15	15	100%	85-115
Color	PCU	CCV	01/10/11	01/10/11	15	15	100%	85-115
Color	PCU	CCV	01/20/11	01/20/11	15	15	100%	85-115
Color	PCU	CCV	02/02/11	02/02/11	15	15	100%	85-115
Color	PCU	CCV	02/02/11	02/02/11	15	15	100%	85-115
Color	PCU	CCV	02/24/11	02/24/11	15	15	100%	85-115
Color	PCU	CCV	03/02/11	03/02/11	15	15	100%	85-115
Color	PCU	CCV	03/02/11	03/02/11	15	15	100%	85-115
Color	PCU	CCV	03/19/11	03/19/11	15	15	100%	85-115
Color	PCU	CCV	03/19/11	03/19/11	15	15	100%	85-115
Color	PCU	CCV	03/29/11	03/29/11	15	15	100%	85-115
Color	PCU	CCV	04/06/11	04/06/11	15	15	100%	85-115
Color	PCU	CCV	05/05/11	05/05/11	15	15	100%	85-115
Color	PCU	CCV	06/04/11	06/04/11	15	15	100%	85-115
Color	PCU	CCV	07/08/11	07/08/11	15	15	100%	85-115
Color	PCU	CCV	07/08/11	07/08/11	15	15	100%	85-115
Color	PCU	CCV	07/18/11	07/18/11	15	15	100%	85-115
Color	PCU	CCV	07/18/11	07/18/11	15	15	100%	85-115
Color	PCU	CCV	07/31/11	07/31/11	15	15	100%	85-115
Color	PCU	CCV	07/31/11	07/31/11	15	15	100%	85-115
Color	PCU	CCV	08/08/11	08/08/11	15	15	100%	85-115
Color	PCU	CCV	08/12/11	08/12/11	15	15	100%	85-115

Continuing Calbration Verification Recovery

for Lockhart-Smith from:

April 2010 to April 2012

PARAMETERS	UNITS	SAMPLE DESCRIPTION	DATE PREPPED	DATE ANALYZED	THEOR. CONC.	ACTUAL CONC.	% RECOVERY	ACCEPTANCE RANGE (%)
Color	PCU	CCV	08/18/11	08/18/11	15	15	100%	85-115
Color	PCU	CCV	09/11/11	09/11/11	15	15	100%	85-115
Color	PCU	CCV	09/11/11	09/11/11	15	15	100%	85-115
Color	PCU	CCV	09/16/11	09/16/11	15	15	100%	85-115
Color	PCU	CCV	09/23/11	09/23/11	15	15	100%	85-115
Color	PCU	CCV	10/05/11	10/05/11	15	15	100%	85-115
Color	PCU	CCV	10/05/11	10/05/11	15	15	100%	85-115
Color	PCU	CCV	10/12/11	10/12/11	15	15	100%	85-115
Color	PCU	CCV	10/19/11	10/19/11	15	15	100%	85-115
Color	PCU	CCV	10/19/11	10/19/11	15	15	100%	85-115
Color	PCU	CCV	10/28/11	10/28/11	15	15	100%	85-115
Color	PCU	CCV	11/04/11	11/04/11	15	15	100%	85-115
Color	PCU	CCV	11/04/11	11/04/11	15	15	100%	85-115
Color	PCU	CCV	12/01/11	12/01/11	15	15	100%	85-115
Color	PCU	CCV	12/10/11	12/10/11	15	15	100%	85-115
Color	PCU	CCV	12/16/11	12/16/11	15	15	100%	85-115
Color	PCU	CCV	12/24/11	12/24/11	15	16	107%	85-115
Color	PCU	CCV	12/31/11	12/31/11	15	16	107%	85-115
Color	PCU	CCV	01/08/12	01/08/12	20	20	100%	85-115
Color	PCU	CCV	01/14/12	01/14/12	20	20	100%	85-115
Color	PCU	CCV	02/08/12	02/08/12	20	20	100%	85-115
Color	PCU	CCV	02/15/12	02/15/12	20	20	100%	85-115
Color	PCU	CCV	03/02/12	03/02/12	20	20	100%	85-115
Color	PCU	CCV	03/02/12	03/02/12	20	20	100%	85-115
Color	PCU	CCV	03/08/12	03/08/12	20	20	100%	85-115
Color	PCU	CCV	03/14/12	03/14/12	20	20	100%	85-115
Color	PCU	CCV	04/05/12	04/05/12	20	20	100%	85-115
Color	PCU	CCV	04/05/12	04/05/12	20	20	100%	85-115

D.5 Method Blanks

Method Blank Recovery

for Lockhart-Smirh from

April 2010 to April 2012

pH	s.u.	Method Blank	06/11/10	06/11/10	5.74	5.00-6.00
pH	s.u.	Method Blank	06/04/10	06/04/10	5.79	5.00-6.00
pH	s.u.	Method Blank	09/07/10	09/07/10	5.82	5.00-6.00
pH	s.u.	Method Blank	09/07/10	09/07/10	5.74	5.00-6.00
pH	s.u.	Method Blank	06/11/10	06/11/10	5.82	5.00-6.00
pH	s.u.	Method Blank	09/20/10	09/20/10	5.81	5.00-6.00
pH	s.u.	Method Blank	09/10/10	09/10/10	5.79	5.00-6.00
pH	s.u.	Method Blank	06/29/10	06/29/10	5.74	5.00-6.00
pH	s.u.	Method Blank	04/13/10	04/13/10	5.72	5.00-6.00
pH	s.u.	Method Blank	05/07/10	05/07/10	5.72	5.00-6.00
pH	s.u.	Method Blank	10/26/10	10/26/10	5.70	5.00-6.00
pH	s.u.	Method Blank	07/06/10	07/06/10	5.59	5.00-6.00
pH	s.u.	Method Blank	04/30/10	04/30/10	5.69	5.00-6.00
pH	s.u.	Method Blank	08/04/10	08/04/10	5.72	5.00-6.00
pH	s.u.	Method Blank	10/04/10	10/04/10	5.82	5.00-6.00
pH	s.u.	Method Blank	09/10/10	09/10/10	5.70	5.00-6.00
pH	s.u.	Method Blank	05/27/10	05/27/10	5.68	5.00-6.00
pH	s.u.	Method Blank	08/30/10	08/30/10	5.64	5.00-6.00
pH	s.u.	Method Blank	05/27/10	05/27/10	5.71	5.00-6.00
pH	s.u.	Method Blank	06/29/10	06/29/10	5.74	5.00-6.00
pH	s.u.	Method Blank	05/17/10	05/17/10	5.68	5.00-6.00
pH	s.u.	Method Blank	10/14/10	10/14/10	5.73	5.00-6.00
pH	s.u.	Method Blank	10/07/10	10/07/10	5.74	5.00-6.00
pH	s.u.	Method Blank	04/26/10	04/26/10	5.84	5.00-6.00
pH	s.u.	Method Blank	07/12/10	07/12/10	5.73	5.00-6.00
pH	s.u.	Method Blank	08/24/10	08/24/10	5.82	5.00-6.00
pH	s.u.	Method Blank	08/30/10	08/30/10	5.63	5.00-6.00
pH	s.u.	Method Blank	10/07/10	10/07/10	5.65	5.00-6.00
pH	s.u.	Method Blank	12/13/10	12/13/10	5.82	5.00-6.00
pH	s.u.	Method Blank	12/21/10	12/21/10	5.73	5.00-6.00
pH	s.u.	Method Blank	01/06/11	01/06/11	5.83	5.00-6.00
pH	s.u.	Method Blank	01/11/11	01/11/11	5.84	5.00-6.00
pH	s.u.	Method Blank	02/06/11	02/06/11	5.69	5.00-6.00
pH	s.u.	Method Blank	02/06/11	02/06/11	5.59	5.00-6.00
pH	s.u.	Method Blank	02/15/11	02/15/11	5.70	5.00-6.00
pH	s.u.	Method Blank	03/01/11	03/01/11	5.74	5.00-6.00
pH	s.u.	Method Blank	03/07/11	03/07/11	5.70	5.00-6.00
pH	s.u.	Method Blank	03/15/11	03/15/11	5.82	5.00-6.00
pH	s.u.	Method Blank	03/18/11	03/18/11	5.74	5.00-6.00
pH	s.u.	Method Blank	04/11/11	04/11/11	5.72	5.00-6.00

Method Blank Recovery

for Lockhart-Smirh from

April 2010 to April 2012

pH	s.u.	Method Blank	05/09/11	05/09/11	5.85	5.00-6.00
pH	s.u.	Method Blank	06/08/11	06/08/11	5.74	5.00-6.00
pH	s.u.	Method Blank	07/12/11	07/12/11	5.69	5.00-6.00
pH	s.u.	Method Blank	07/18/11	07/18/11	5.69	5.00-6.00
pH	s.u.	Method Blank	08/01/11	08/01/11	5.74	5.00-6.00
pH	s.u.	Method Blank	08/09/11	08/09/11	5.81	5.00-6.00
pH	s.u.	Method Blank	08/16/11	08/16/11	5.78	5.00-6.00
pH	s.u.	Method Blank	8/16/11	8/16/11	5.83	5.00-6.00
pH	s.u.	Method Blank	08/09/11	08/09/11	5.80	5.00-6.00
pH	s.u.	Method Blank	09/13/11	09/13/11	5.79	5.00-6.00
pH	s.u.	Method Blank	09/20/11	09/20/11	5.82	5.00-6.00
pH	s.u.	Method Blank	09/26/11	09/26/11	5.79	5.00-6.00
pH	s.u.	Method Blank	10/9/11	10/9/11	5.71	5.00-6.00
pH	s.u.	Method Blank	10/12/11	10/12/11	5.75	5.00-6.00
pH	s.u.	Method Blank	10/12/11	10/12/11	5.74	5.00-6.00
pH	s.u.	Method Blank	11/1/11	11/1/11	5.82	5.00-6.00
pH	s.u.	Method Blank	11/10/11	11/10/11	5.69	5.00-6.00
pH	s.u.	Method Blank	11/16/11	11/16/11	5.79	5.00-6.00
pH	s.u.	Method Blank	12/04/11	12/04/11	5.70	5.00-6.00
pH	s.u.	Method Blank	01/10/12	01/10/12	5.75	5.00-6.00
pH	s.u.	Method Blank	01/15/12	01/15/12	5.89	5.00-6.00
pH	s.u.	Method Blank	02/07/12	02/07/12	5.98	5.00-6.00
pH	s.u.	Method Blank	02/07/12	02/07/12	5.86	5.00-6.00
pH	s.u.	Method Blank	02/15/12	02/15/12	5.89	5.00-6.00
pH	s.u.	Method Blank	02/27/12	02/27/12	5.79	5.00-6.00
pH	s.u.	Method Blank	03/05/12	03/05/12	5.78	5.00-6.00
pH	s.u.	Method Blank	03/05/12	03/05/12	5.74	5.00-6.00
pH	s.u.	Method Blank	03/21/12	03/21/12	5.79	5.00-6.00
pH	s.u.	Method Blank	03/21/12	03/21/12	5.81	5.00-6.00

Method Blank Recovery

for Lockhart-Smirh from

April 2010 to April 2012

Alkalinity	mg/l	Method Blank	09/10/10	09/10/10	<0.5	<0.5
Alkalinity	mg/l	Method Blank	09/10/10	09/10/10	<0.5	<0.5
Alkalinity	mg/l	Method Blank	05/27/10	05/27/10	<0.5	<0.5
Alkalinity	mg/l	Method Blank	05/17/10	05/17/10	<0.5	<0.5
Alkalinity	mg/l	Method Blank	10/07/10	10/07/10	<0.5	<0.5
Alkalinity	mg/l	Method Blank	10/14/10	10/14/10	<0.5	<0.5
Alkalinity	mg/l	Method Blank	09/07/10	09/07/10	<0.5	<0.5
Alkalinity	mg/l	Method Blank	04/26/10	04/26/10	<0.5	<0.5
Alkalinity	mg/l	Method Blank	09/20/10	09/20/10	<0.5	<0.5
Alkalinity	mg/l	Method Blank	10/26/10	10/26/10	<0.5	<0.5
Alkalinity	mg/l	Method Blank	10/07/10	10/07/10	<0.5	<0.5
Alkalinity	mg/l	Method Blank	09/07/10	09/07/10	<0.5	<0.5
Alkalinity	mg/l	Method Blank	10/04/10	10/04/10	<0.5	<0.5
Alkalinity	mg/l	Method Blank	08/30/10	08/30/10	<0.5	<0.5
Alkalinity	mg/l	Method Blank	08/30/10	08/30/10	<0.5	<0.5
Alkalinity	mg/l	Method Blank	08/24/10	08/24/10	<0.5	<0.5
Alkalinity	mg/l	Method Blank	04/30/10	04/30/10	<0.5	<0.5
Alkalinity	mg/l	Method Blank	04/13/10	04/13/10	<0.5	<0.5
Alkalinity	mg/l	Method Blank	05/07/10	05/07/10	<0.5	<0.5
Alkalinity	mg/l	Method Blank	07/12/10	07/12/10	<0.5	<0.5
Alkalinity	mg/l	Method Blank	06/11/10	06/11/10	<0.5	<0.5
Alkalinity	mg/l	Method Blank	06/04/10	06/04/10	<0.5	<0.5
Alkalinity	mg/l	Method Blank	05/27/10	05/27/10	<0.5	<0.5
Alkalinity	mg/l	Method Blank	07/06/10	07/06/10	<0.5	<0.5
Alkalinity	mg/l	Method Blank	06/29/10	06/29/10	<0.5	<0.5
Alkalinity	mg/l	Method Blank	06/11/10	06/11/10	<0.5	<0.5
Alkalinity	mg/l	Method Blank	08/04/10	08/04/10	<0.5	<0.5
Alkalinity	mg/l	Method Blank	06/29/10	06/29/10	<0.5	<0.5
Alkalinity	mg/l	Method Blank	12/13/10	12/13/10	<0.5	<0.5
Alkalinity	mg/l	Method Blank	12/21/10	12/21/10	<0.5	<0.5
Alkalinity	mg/l	Method Blank	03/04/11	03/04/11	<0.5	<0.5
Alkalinity	mg/l	Method Blank	03/09/11	03/09/11	<0.5	<0.5
Alkalinity	mg/l	Method Blank	07/06/11	07/06/11	<0.5	<0.5
Alkalinity	mg/l	Method Blank	07/12/11	07/12/11	<0.5	<0.5
Alkalinity	mg/l	Method Blank	08/05/11	08/05/11	<0.5	<0.5
Alkalinity	mg/l	Method Blank	08/12/11	08/12/11	<0.5	<0.5
Alkalinity	mg/l	Method Blank	08/16/11	08/16/11	<0.5	<0.5

Method Blank Recovery

for Lockhart-Smirh from

April 2010 to April 2012

Alkalinity	mg/l	Method Blank	01/11/11	01/11/11	<0.5	<0.5
Alkalinity	mg/l	Method Blank	01/06/11	01/06/11	<0.5	<0.5
Alkalinity	mg/l	Method Blank	03/04/11	03/04/11	<0.5	<0.5
Alkalinity	mg/l	Method Blank	05/05/11	05/05/11	<0.5	<0.5
Alkalinity	mg/l	Method Blank	06/06/11	06/06/11	<0.5	<0.5
Alkalinity	mg/l	Method Blank	09/12/11	09/12/11	<0.5	<0.5
Alkalinity	mg/l	Method Blank	02/03/11	02/03/11	<0.5	<0.5
Alkalinity	mg/l	Method Blank	02/28/11	02/28/11	<0.5	<0.5
Alkalinity	mg/l	Method Blank	03/21/11	03/21/11	<0.5	<0.5
Alkalinity	mg/l	Method Blank	01/27/11	01/27/11	<0.5	<0.5
Alkalinity	mg/l	Method Blank	02/03/11	02/03/11	<0.5	<0.5
Alkalinity	mg/l	Method Blank	07/21/11	07/21/11	<0.5	<0.5
Alkalinity	mg/l	Method Blank	04/07/11	04/07/11	<0.5	<0.5
Alkalinity	mg/l	Method Blank	02/28/11	02/28/11	<0.5	<0.5
Alkalinity	mg/l	Method Blank	09/26/11	09/26/11	<0.5	<0.5
Alkalinity	mg/l	Method Blank	10/07/11	10/07/11	<0.5	<0.5
Alkalinity	mg/l	Method Blank	10/31/11	10/31/11	<0.5	<0.5
Alkalinity	mg/l	Method Blank	11/07/11	11/07/11	<0.5	<0.5
Alkalinity	mg/l	Method Blank	12/01/11	12/01/11	<0.5	<0.5
Alkalinity	mg/l	Method Blank	12/12/11	12/12/11	<0.5	<0.5
Alkalinity	mg/l	Method Blank	12/19/11	12/19/11	<0.5	<0.5
Alkalinity	mg/l	Method Blank	12/27/11	12/27/11	<0.5	<0.5
Alkalinity	mg/l	Method Blank	01/10/12	01/10/12	<0.5	<0.5
Alkalinity	mg/l	Method Blank	01/15/12	01/15/12	<0.5	<0.5
Alkalinity	mg/l	Method Blank	02/07/12	02/07/12	<0.5	<0.5
Alkalinity	mg/l	Method Blank	02/07/12	02/07/12	<0.5	<0.5
Alkalinity	mg/l	Method Blank	02/15/12	02/15/12	<0.5	<0.5
Alkalinity	mg/l	Method Blank	02/27/12	02/27/12	<0.5	<0.5
Alkalinity	mg/l	Method Blank	03/05/12	03/05/12	<0.5	<0.5
Alkalinity	mg/l	Method Blank	03/05/12	03/05/12	<0.5	<0.5
Alkalinity	mg/l	Method Blank	03/21/12	03/21/12	<0.5	<0.5
Alkalinity	mg/l	Method Blank	03/21/12	03/21/12	<0.5	<0.5

Method Blank Recovery

for Lockhart-Smirh from

April 2010 to April 2012

Spec. Cond.	µmho/cm	Method Blank	07/07/10	07/07/10	<0.2	<0.2
Spec. Cond.	µmho/cm	Method Blank	07/07/10	07/07/10	<0.2	<0.2
Spec. Cond.	µmho/cm	Method Blank	07/15/10	07/15/10	<0.2	<0.2
Spec. Cond.	µmho/cm	Method Blank	07/15/10	07/15/10	<0.2	<0.2
Spec. Cond.	µmho/cm	Method Blank	08/02/10	08/02/10	<0.2	<0.2
Spec. Cond.	µmho/cm	Method Blank	08/13/10	08/13/10	<0.2	<0.2
Spec. Cond.	µmho/cm	Method Blank	08/27/10	08/27/10	<0.2	<0.2
Spec. Cond.	µmho/cm	Method Blank	09/21/10	09/21/10	<0.2	<0.2
Spec. Cond.	µmho/cm	Method Blank	10/08/10	10/08/10	<0.2	<0.2
Spec. Cond.	µmho/cm	Method Blank	10/08/10	10/08/10	<0.2	<0.2
Spec. Cond.	µmho/cm	Method Blank	10/14/10	10/14/10	<0.2	<0.2
Spec. Cond.	µmho/cm	Method Blank	10/14/10	10/14/10	<0.2	<0.2
Spec. Cond.	µmho/cm	Method Blank	10/14/10	10/14/10	<0.2	<0.2
Spec. Cond.	µmho/cm	Method Blank	11/30/10	11/30/10	<0.2	<0.2
Spec. Cond.	µmho/cm	Method Blank	11/30/10	11/30/10	<0.2	<0.2
Spec. Cond.	µmho/cm	Method Blank	12/27/10	12/27/10	<0.2	<0.2
Spec. Cond.	µmho/cm	Method Blank	07/15/10	07/15/10	<0.2	<0.2
Spec. Cond.	µmho/cm	Method Blank	08/02/10	08/02/10	<0.2	<0.2
Spec. Cond.	µmho/cm	Method Blank	08/13/10	08/13/10	<0.2	<0.2
Spec. Cond.	µmho/cm	Method Blank	08/13/10	08/13/10	<0.2	<0.2
Spec. Cond.	µmho/cm	Method Blank	08/27/10	08/27/10	<0.2	<0.2
Spec. Cond.	µmho/cm	Method Blank	09/21/10	09/21/10	<0.2	<0.2
Spec. Cond.	µmho/cm	Method Blank	09/21/10	09/21/10	<0.2	<0.2
Spec. Cond.	µmho/cm	Method Blank	10/08/10	10/08/10	<0.2	<0.2
Spec. Cond.	µmho/cm	Method Blank	10/08/10	10/08/10	<0.2	<0.2
Spec. Cond.	µmho/cm	Method Blank	10/14/10	10/14/10	<0.2	<0.2
Spec. Cond.	µmho/cm	Method Blank	10/14/10	10/14/10	<0.2	<0.2
Spec. Cond.	µmho/cm	Method Blank	10/14/10	10/14/10	<0.2	<0.2
Spec. Cond.	µmho/cm	Method Blank	10/14/10	10/14/10	<0.2	<0.2
Spec. Cond.	µmho/cm	Method Blank	11/03/10	11/03/10	<0.2	<0.2
Spec. Cond.	µmho/cm	Method Blank	11/16/10	11/16/10	<0.2	<0.2
Spec. Cond.	µmho/cm	Method Blank	11/30/10	11/30/10	<3	<3
Spec. Cond.	µmho/cm	Method Blank	01/24/11	01/24/11	<3	<3
Spec. Cond.	µmho/cm	Method Blank	01/24/11	01/24/11	<3	<3
Spec. Cond.	µmho/cm	Method Blank	02/17/11	02/17/11	<3	<3

Method Blank Recovery

for Lockhart-Smirh from

April 2010 to April 2012

Spec. Cond.	µmho/cm	Method Blank	03/24/11	03/24/11	<3	<3
Spec. Cond.	µmho/cm	Method Blank	03/24/11	03/24/11	<3	<3
Spec. Cond.	µmho/cm	Method Blank	04/28/11	04/28/11	<3	<3
Spec. Cond.	µmho/cm	Method Blank	04/28/11	04/28/11	<3	<3
Spec. Cond.	µmho/cm	Method Blank	06/29/11	06/29/11	<3	<3
Spec. Cond.	µmho/cm	Method Blank	07/25/11	07/25/11	<3	<3
Spec. Cond.	µmho/cm	Method Blank	07/25/11	07/25/11	<3	<3
Spec. Cond.	µmho/cm	Method Blank	08/26/11	08/26/11	<3	<3
Spec. Cond.	µmho/cm	Method Blank	08/30/11	08/30/11	<3	<3
Spec. Cond.	µmho/cm	Method Blank	09/15/11	09/15/11	<3	<3
Spec. Cond.	µmho/cm	Method Blank	09/28/11	09/28/11	<3	<3
Spec. Cond.	µmho/cm	Method Blank	09/28/11	09/28/11	<3	<3
Spec. Cond.	µmho/cm	Method Blank	09/28/11	09/28/11	<3	<3
Spec. Cond.	µmho/cm	Method Blank	10/26/11	10/26/11	<3	<3
Spec. Cond.	µmho/cm	Method Blank	10/26/11	10/26/11	<3	<3
Spec. Cond.	µmho/cm	Method Blank	11/09/11	11/09/11	<3	<3
Spec. Cond.	µmho/cm	Method Blank	11/15/11	11/15/11	<3	<3
Spec. Cond.	µmho/cm	Method Blank	11/15/11	11/15/11	<3	<3
Spec. Cond.	µmho/cm	Method Blank	01/13/12	01/13/12	<3	<3
Spec. Cond.	µmho/cm	Method Blank	01/13/12	01/13/12	<3	<3
Spec. Cond.	µmho/cm	Method Blank	01/24/11	01/24/11	<3	<3
Spec. Cond.	µmho/cm	Method Blank	02/07/11	02/07/11	<3	<3
Spec. Cond.	µmho/cm	Method Blank	03/01/11	03/01/11	<3	<3
Spec. Cond.	µmho/cm	Method Blank	04/28/11	04/28/11	<3	<3
Spec. Cond.	µmho/cm	Method Blank	01/25/12	01/25/12	<3	<3
Spec. Cond.	µmho/cm	Method Blank	02/08/12	02/08/12	<3	<3
Spec. Cond.	µmho/cm	Method Blank	03/06/12	03/06/12	<3	<3
Spec. Cond.	µmho/cm	Method Blank	04/02/12	04/02/12	<3	<3
Spec. Cond.	µmho/cm	Method Blank	01/25/12	01/25/12	<3	<3
Spec. Cond.	µmho/cm	Method Blank	01/25/12	01/25/12	<3	<3
Spec. Cond.	µmho/cm	Method Blank	02/08/12	02/08/12	<3	<3

Method Blank Recovery

for Lockhart-Smirh from

April 2010 to April 2012

Turbidity	NTU	Method Blank	04/09/10	04/09/10	<0.2	<0.2
Turbidity	NTU	Method Blank	04/28/10	04/28/10	<0.2	<0.2
Turbidity	NTU	Method Blank	05/06/10	05/06/10	<0.2	<0.2
Turbidity	NTU	Method Blank	05/14/10	05/14/10	<0.2	<0.2
Turbidity	NTU	Method Blank	05/26/10	05/26/10	<0.2	<0.2
Turbidity	NTU	Method Blank	06/03/10	06/03/10	<0.2	<0.2
Turbidity	NTU	Method Blank	06/10/10	06/10/10	<0.2	<0.2
Turbidity	NTU	Method Blank	06/10/10	06/10/10	<0.2	<0.2
Turbidity	NTU	Method Blank	06/28/10	06/28/10	<0.2	<0.2
Turbidity	NTU	Method Blank	06/28/10	06/28/10	<0.2	<0.2
Turbidity	NTU	Method Blank	07/09/10	07/09/10	<0.2	<0.2
Turbidity	NTU	Method Blank	07/09/10	07/09/10	<0.2	<0.2
Turbidity	NTU	Method Blank	08/03/10	08/03/10	<0.2	<0.2
Turbidity	NTU	Method Blank	08/12/10	08/12/10	<0.2	<0.2
Turbidity	NTU	Method Blank	08/18/10	08/18/10	<0.2	<0.2
Turbidity	NTU	Method Blank	09/03/10	09/03/10	<0.2	<0.2
Turbidity	NTU	Method Blank	09/10/10	09/10/10	<0.2	<0.2
Turbidity	NTU	Method Blank	09/29/10	09/29/10	<0.2	<0.2
Turbidity	NTU	Method Blank	10/08/10	10/08/10	<0.2	<0.2
Turbidity	NTU	Method Blank	10/13/10	10/13/10	<0.2	<0.2
Turbidity	NTU	Method Blank	11/05/10	11/05/10	<0.2	<0.2
Turbidity	NTU	Method Blank	11/20/10	11/20/10	<0.2	<0.2
Turbidity	NTU	Method Blank	12/04/10	12/04/10	<0.2	<0.2
Turbidity	NTU	Method Blank	12/10/10	12/10/10	<0.2	<0.2
Turbidity	NTU	Method Blank	12/10/10	12/10/10	<0.2	<0.2
Turbidity	NTU	Method Blank	12/17/10	12/17/10	<0.2	<0.2
Turbidity	NTU	Method Blank	12/24/10	12/24/10	<0.2	<0.2
Turbidity	NTU	Method Blank	01/05/11	01/05/11	<0.2	<0.2
Turbidity	NTU	Method Blank	01/10/11	01/10/11	<0.2	<0.2
Turbidity	NTU	Method Blank	02/02/11	02/02/11	<0.2	<0.2
Turbidity	NTU	Method Blank	02/02/11	02/02/11	<0.2	<0.2
Turbidity	NTU	Method Blank	02/25/11	02/25/11	<0.2	<0.2

Method Blank Recovery

for Lockhart-Smirh from

April 2010 to April 2012

Turbidity	NTU	Method Blank	03/01/11	03/01/11	<0.2	<0.2
Turbidity	NTU	Method Blank	03/09/11	03/09/11	<0.2	<0.2
Turbidity	NTU	Method Blank	03/18/11	03/18/11	<0.2	<0.2
Turbidity	NTU	Method Blank	04/06/11	04/06/11	<0.2	<0.2
Turbidity	NTU	Method Blank	07/08/11	07/08/11	<0.2	<0.2
Turbidity	NTU	Method Blank	07/08/11	07/08/11	<0.2	<0.2
Turbidity	NTU	Method Blank	07/19/11	07/19/11	<0.2	<0.2
Turbidity	NTU	Method Blank	07/31/11	07/31/11	<0.2	<0.2
Turbidity	NTU	Method Blank	08/05/11	08/05/11	<0.2	<0.2
Turbidity	NTU	Method Blank	08/05/11	08/05/11	<0.2	<0.2
Turbidity	NTU	Method Blank	08/12/11	08/12/11	<0.2	<0.2
Turbidity	NTU	Method Blank	09/09/11	09/09/11	<0.2	<0.2
Turbidity	NTU	Method Blank	09/09/11	09/09/11	<0.2	<0.2
Turbidity	NTU	Method Blank	09/16/11	09/16/11	<0.2	<0.2
Turbidity	NTU	Method Blank	09/25/11	09/25/11	<0.2	<0.2
Turbidity	NTU	Method Blank	10/04/11	10/04/11	<0.2	<0.2
Turbidity	NTU	Method Blank	10/04/11	10/04/11	<0.2	<0.2
Turbidity	NTU	Method Blank	10/12/11	10/12/11	<0.2	<0.2
Turbidity	NTU	Method Blank	10/12/11	10/12/11	<0.2	<0.2
Turbidity	NTU	Method Blank	10/20/11	10/20/11	<0.2	<0.2
Turbidity	NTU	Method Blank	11/04/11	11/04/11	<0.2	<0.2
Turbidity	NTU	Method Blank	11/30/11	11/30/11	<0.2	<0.2
Turbidity	NTU	Method Blank	12/09/11	12/09/11	<0.2	<0.2
Turbidity	NTU	Method Blank	12/17/11	12/17/11	<0.2	<0.2
Turbidity	NTU	Method Blank	12/17/11	12/17/11	<0.2	<0.2
Turbidity	NTU	Method Blank	12/23/11	12/23/11	<0.2	<0.2
Turbidity	NTU	Method Blank	12/31/11	12/31/11	<0.2	<0.2
Turbidity	NTU	Method Blank	12/28/11	12/28/11	<0.2	<0.2
Turbidity	NTU	Method Blank	12/28/11	12/28/11	<0.2	<0.2
Turbidity	NTU	Method Blank	01/08/12	01/08/12	<0.2	<0.2
Turbidity	NTU	Method Blank	01/13/12	01/13/12	<0.2	<0.2
Turbidity	NTU	Method Blank	02/22/12	02/22/12	<0.2	<0.2
Turbidity	NTU	Method Blank	03/02/12	03/02/12	<0.2	<0.2
Turbidity	NTU	Method Blank	03/02/12	03/02/12	<0.2	<0.2
Turbidity	NTU	Method Blank	03/15/12	03/15/12	<0.2	<0.2
Turbidity	NTU	Method Blank	04/05/12	04/05/12	<0.7	<0.7

Method Blank Recovery

for Lockhart-Smirh from

April 2010 to April 2012

TSS	mg/l	Method Blank	04/09/10	04/09/10	<0.7	<0.7
TSS	mg/l	Method Blank	04/28/10	04/28/10	<0.7	<0.7
TSS	mg/l	Method Blank	05/06/10	05/06/10	<0.7	<0.7
TSS	mg/l	Method Blank	05/14/10	05/14/10	<0.7	<0.7
TSS	mg/l	Method Blank	06/10/10	06/10/10	<0.7	<0.7
TSS	mg/l	Method Blank	06/10/10	06/10/10	<0.7	<0.7
TSS	mg/l	Method Blank	06/28/10	06/28/10	<0.7	<0.7
TSS	mg/l	Method Blank	07/01/10	07/01/10	<0.7	<0.7
TSS	mg/l	Method Blank	07/09/10	07/09/10	<0.7	<0.7
TSS	mg/l	Method Blank	07/09/10	07/09/10	<0.7	<0.7
TSS	mg/l	Method Blank	07/15/10	07/15/10	<0.7	<0.7
TSS	mg/l	Method Blank	07/23/10	07/23/10	<0.7	<0.7
TSS	mg/l	Method Blank	08/06/10	08/06/10	<0.7	<0.7
TSS	mg/l	Method Blank	08/12/10	08/12/10	<0.7	<0.7
TSS	mg/l	Method Blank	09/06/10	09/06/10	<0.7	<0.7
TSS	mg/l	Method Blank	09/21/10	09/21/10	<0.7	<0.7
TSS	mg/l	Method Blank	09/28/10	09/28/10	<0.7	<0.7
TSS	mg/l	Method Blank	09/28/10	09/28/10	<0.7	<0.7
TSS	mg/l	Method Blank	10/11/10	10/11/10	<0.7	<0.7
TSS	mg/l	Method Blank	11/10/10	11/10/10	<0.7	<0.7
TSS	mg/l	Method Blank	12/06/10	12/06/10	<0.7	<0.7
TSS	mg/l	Method Blank	12/13/10	12/13/10	<0.7	<0.7
TSS	mg/l	Method Blank	12/20/10	12/20/10	<0.7	<0.7
TSS	mg/l	Method Blank	12/27/10	12/27/10	<0.7	<0.7
TSS	mg/l	Method Blank	01/06/11	01/06/11	<0.7	<0.7
TSS	mg/l	Method Blank	01/11/11	01/11/11	<0.7	<0.7
TSS	mg/l	Method Blank	02/06/11	02/06/11	<0.7	<0.7
TSS	mg/l	Method Blank	02/06/11	02/06/11	<0.7	<0.7
TSS	mg/l	Method Blank	02/15/11	02/15/11	<0.7	<0.7
TSS	mg/l	Method Blank	03/01/11	03/01/11	<0.7	<0.7
TSS	mg/l	Method Blank	03/07/11	03/07/11	<0.7	<0.7
TSS	mg/l	Method Blank	03/15/11	03/15/11	<0.7	<0.7

Method Blank Recovery

for Lockhart-Smirh from

April 2010 to April 2012

TSS	mg/l	Method Blank	03/18/11	03/18/11	<0.7	<0.7
TSS	mg/l	Method Blank	04/11/11	04/11/11	<0.7	<0.7
TSS	mg/l	Method Blank	05/09/11	05/09/11	<0.7	<0.7
TSS	mg/l	Method Blank	06/08/11	06/08/11	<0.7	<0.7
TSS	mg/l	Method Blank	07/12/11	07/12/11	<0.7	<0.7
TSS	mg/l	Method Blank	07/18/11	07/18/11	<0.7	<0.7
TSS	mg/l	Method Blank	08/01/11	08/01/11	<0.7	<0.7
TSS	mg/l	Method Blank	08/09/11	08/09/11	<0.7	<0.7
TSS	mg/l	Method Blank	08/16/11	08/16/11	<0.7	<0.7
TSS	mg/l	Method Blank	08/16/11	08/16/11	<0.7	<0.7
TSS	mg/l	Method Blank	08/09/11	08/09/11	<0.7	<0.7
TSS	mg/l	Method Blank	09/13/11	09/13/11	<0.7	<0.7
TSS	mg/l	Method Blank	09/20/11	09/20/11	<0.7	<0.7
TSS	mg/l	Method Blank	09/26/11	09/26/11	<0.7	<0.7
TSS	mg/l	Method Blank	10/09/11	10/09/11	<0.7	<0.7
TSS	mg/l	Method Blank	10/12/11	10/12/11	<0.7	<0.7
TSS	mg/l	Method Blank	10/12/11	10/12/11	<0.7	<0.7
TSS	mg/l	Method Blank	11/01/11	11/01/11	<0.7	<0.7
TSS	mg/l	Method Blank	11/10/11	11/10/11	<0.7	<0.7
TSS	mg/l	Method Blank	11/16/11	11/16/11	<0.7	<0.7
TSS	mg/l	Method Blank	12/04/11	12/04/11	<0.7	<0.7
TSS	mg/l	Method Blank	01/11/12	01/11/12	<0.7	<0.7
TSS	mg/l	Method Blank	02/09/12	02/09/12	<0.7	<0.7
TSS	mg/l	Method Blank	02/15/12	02/15/12	<0.7	<0.7
TSS	mg/l	Method Blank	02/22/12	02/22/12	<0.7	<0.7
TSS	mg/l	Method Blank	03/08/12	03/08/12	<0.7	<0.7
TSS	mg/l	Method Blank	03/08/12	03/08/12	<0.7	<0.7
TSS	mg/l	Method Blank	03/20/12	03/20/12	<0.7	<0.7
TSS	mg/l	Method Blank	03/28/12	03/28/12	<0.7	<0.7
TSS	mg/l	Method Blank	04/05/12	04/05/12	<0.7	<0.7

Method Blank Recovery

for Lockhart-Smirh from

April 2010 to April 2012

SRP	µg/l	Method Blank	04/21/10	04/21/10	<1	<1
SRP	µg/l	Method Blank	04/30/10	04/30/10	<1	<1
SRP	µg/l	Method Blank	05/05/10	05/05/10	<1	<1
SRP	µg/l	Method Blank	05/13/10	05/13/10	<1	<1
SRP	µg/l	Method Blank	05/26/10	05/26/10	<1	<1
SRP	µg/l	Method Blank	05/26/10	05/26/10	<1	<1
SRP	µg/l	Method Blank	06/03/10	06/03/10	<1	<1
SRP	µg/l	Method Blank	06/11/10	06/11/10	<1	<1
SRP	µg/l	Method Blank	06/28/10	06/28/10	<1	<1
SRP	µg/l	Method Blank	06/28/10	06/28/10	<1	<1
SRP	µg/l	Method Blank	07/09/10	07/09/10	<1	<1
SRP	µg/l	Method Blank	07/09/10	07/09/10	<1	<1
SRP	µg/l	Method Blank	08/04/10	08/04/10	<1	<1
SRP	µg/l	Method Blank	08/11/10	08/11/10	<1	<1
SRP	µg/l	Method Blank	08/18/10	08/18/10	<1	<1
SRP	µg/l	Method Blank	09/08/10	09/08/10	<1	<1
SRP	µg/l	Method Blank	09/29/10	09/29/10	<1	<1
SRP	µg/l	Method Blank	10/08/10	10/08/10	<1	<1
SRP	µg/l	Method Blank	10/15/10	10/15/10	<1	<1
SRP	µg/l	Method Blank	11/21/10	11/21/10	<1	<1
SRP	µg/l	Method Blank	11/21/10	11/21/10	<1	<1
SRP	µg/l	Method Blank	12/09/10	12/09/10	<1	<1
SRP	µg/l	Method Blank	12/29/10	12/29/10	<1	<1
SRP	µg/l	Method Blank	01/05/11	01/05/11	<1	<1
SRP	µg/l	Method Blank	01/27/11	01/27/11	<1	<1
SRP	µg/l	Method Blank	02/08/11	02/08/11	<1	<1
SRP	µg/l	Method Blank	02/14/11	02/14/11	<1	<1
SRP	µg/l	Method Blank	03/09/11	03/09/11	<1	<1
SRP	µg/l	Method Blank	03/09/11	03/09/11	<1	<1
SRP	µg/l	Method Blank	03/15/11	03/15/11	<1	<1
SRP	µg/l	Method Blank	03/25/11	03/25/11	<1	<1
SRP	µg/l	Method Blank	04/11/11	04/11/11	<1	<1
SRP	µg/l	Method Blank	04/12/11	04/12/11	<1	<1
SRP	µg/l	Method Blank	05/06/11	05/06/11	<1	<1
SRP	µg/l	Method Blank	06/07/11	06/07/11	<1	<1
SRP	µg/l	Method Blank	07/11/11	07/11/11	<1	<1
SRP	µg/l	Method Blank	08/10/11	08/10/11	<1	<1
SRP	µg/l	Method Blank	08/18/11	08/18/11	<1	<1
SRP	µg/l	Method Blank	08/22/11	08/22/11	<1	<1
SRP	µg/l	Method Blank	08/30/11	08/30/11	<1	<1
SRP	µg/l	Method Blank	10/05/11	10/05/11	<1	<1
SRP	µg/l	Method Blank	10/05/11	10/05/11	<1	<1
SRP	µg/l	Method Blank	10/12/11	10/12/11	<1	<1
SRP	µg/l	Method Blank	10/31/11	10/31/11	<1	<1
SRP	µg/l	Method Blank	11/09/11	11/09/11	<1	<1
SRP	µg/l	Method Blank	11/16/11	11/16/11	<1	<1
SRP	µg/l	Method Blank	11/29/11	11/29/11	<1	<1
SRP	µg/l	Method Blank	12/23/11	12/23/11	<1	<1
SRP	µg/l	Method Blank	12/31/11	12/31/11	<1	<1
SRP	µg/l	Method Blank	02/08/12	02/08/12	<1	<1
SRP	µg/l	Method Blank	02/16/12	02/16/12	<1	<1
SRP	µg/l	Method Blank	03/02/12	03/02/12	<1	<1
SRP	µg/l	Method Blank	03/02/12	03/02/12	<1	<1
SRP	µg/l	Method Blank	03/07/12	03/07/12	<1	<1

Method Blank Recovery

for Lockhart-Smirh from

April 2010 to April 2012

NOX-N	µg/l	Method Blank	04/21/10	04/21/10	<1	<1
NOX-N	µg/l	Method Blank	04/30/10	04/30/10	<1	<1
NOX-N	µg/l	Method Blank	05/05/10	05/05/10	<1	<1
NOX-N	µg/l	Method Blank	05/13/10	05/13/10	<1	<1
NOX-N	µg/l	Method Blank	05/26/10	05/26/10	<1	<1
NOX-N	µg/l	Method Blank	05/26/10	05/26/10	<1	<1
NOX-N	µg/l	Method Blank	06/03/10	06/03/10	<1	<1
NOX-N	µg/l	Method Blank	06/11/10	06/11/10	<1	<1
NOX-N	µg/l	Method Blank	06/28/10	06/28/10	<1	<1
NOX-N	µg/l	Method Blank	06/28/10	06/28/10	<1	<1
NOX-N	µg/l	Method Blank	07/09/10	07/09/10	<1	<1
NOX-N	µg/l	Method Blank	07/09/10	07/09/10	<1	<1
NOX-N	µg/l	Method Blank	08/04/10	08/04/10	<1	<1
NOX-N	µg/l	Method Blank	08/11/10	08/11/10	<1	<1
NOX-N	µg/l	Method Blank	08/18/10	08/18/10	<1	<1
NOX-N	µg/l	Method Blank	09/08/10	09/08/10	<1	<1
NOX-N	µg/l	Method Blank	09/29/10	09/29/10	<1	<1
NOX-N	µg/l	Method Blank	10/08/10	10/08/10	<1	<1
NOX-N	µg/l	Method Blank	10/15/10	10/15/10	<1	<1
NOX-N	µg/l	Method Blank	11/21/10	11/21/10	<1	<1
NOX-N	µg/l	Method Blank	11/21/10	11/21/10	<1	<1
NOX-N	µg/l	Method Blank	12/09/10	12/09/10	<1	<1
NOX-N	µg/l	Method Blank	12/29/10	12/29/10	<1	<1
NOX-N	µg/l	Method Blank	01/05/11	01/05/11	<1	<1
NOX-N	µg/l	Method Blank	01/27/11	01/27/11	<1	<1
NOX-N	µg/l	Method Blank	02/08/11	02/08/11	<1	<1
NOX-N	µg/l	Method Blank	02/14/11	02/14/11	<1	<1
NOX-N	µg/l	Method Blank	03/09/11	03/09/11	<1	<1
NOX-N	µg/l	Method Blank	03/09/11	03/09/11	<1	<1
NOX-N	µg/l	Method Blank	03/15/11	03/15/11	<1	<1
NOX-N	µg/l	Method Blank	03/25/11	03/25/11	<1	<1
NOX-N	µg/l	Method Blank	04/11/11	04/11/11	<1	<1
NOX-N	µg/l	Method Blank	04/12/11	04/12/11	<1	<1
NOX-N	µg/l	Method Blank	05/06/11	05/06/11	<1	<1
NOX-N	µg/l	Method Blank	06/07/11	06/07/11	<1	<1
NOX-N	µg/l	Method Blank	07/11/11	07/11/11	<1	<1
NOX-N	µg/l	Method Blank	08/10/11	08/10/11	<1	<1
NOX-N	µg/l	Method Blank	08/18/11	08/18/11	<1	<1
NOX-N	µg/l	Method Blank	08/22/11	08/22/11	<1	<1
NOX-N	µg/l	Method Blank	08/30/11	08/30/11	<1	<1
NOX-N	µg/l	Method Blank	10/05/11	10/05/11	<1	<1
NOX-N	µg/l	Method Blank	10/05/11	10/05/11	<1	<1
NOX-N	µg/l	Method Blank	10/12/11	10/12/11	<1	<1
NOX-N	µg/l	Method Blank	10/31/11	10/31/11	<1	<1
NOX-N	µg/l	Method Blank	11/09/11	11/09/11	<1	<1
NOX-N	µg/l	Method Blank	11/16/11	11/16/11	<1	<1
NOX-N	µg/l	Method Blank	11/29/11	11/29/11	<1	<1
NOX-N	µg/l	Method Blank	12/23/11	12/23/11	<1	<1
NOX-N	µg/l	Method Blank	12/31/11	12/31/11	<1	<1
NOX-N	µg/l	Method Blank	02/08/12	02/08/12	<1	<1
NOX-N	µg/l	Method Blank	02/16/12	02/16/12	<1	<1
NOX-N	µg/l	Method Blank	03/07/12	03/07/12	<1	<1

Method Blank Recovery

for Lockhart-Smirh from

April 2010 to April 2012

Ammonia	µg/l	Method Blank	04/29/10	04/29/10	<1	<1
Ammonia	µg/l	Method Blank	04/30/10	04/30/10	<1	<1
Ammonia	µg/l	Method Blank	05/12/10	05/12/10	<1	<1
Ammonia	µg/l	Method Blank	05/12/10	05/12/10	<1	<1
Ammonia	µg/l	Method Blank	06/02/10	06/02/10	<1	<1
Ammonia	µg/l	Method Blank	06/02/10	06/02/10	<1	<1
Ammonia	µg/l	Method Blank	06/29/10	06/29/10	<1	<1
Ammonia	µg/l	Method Blank	07/15/10	07/15/10	<1	<1
Ammonia	µg/l	Method Blank	07/15/10	07/15/10	<1	<1
Ammonia	µg/l	Method Blank	09/28/10	09/28/10	<1	<1
Ammonia	µg/l	Method Blank	09/29/10	09/29/10	<1	<1
Ammonia	µg/l	Method Blank	09/29/10	09/29/10	<1	<1
Ammonia	µg/l	Method Blank	09/29/10	09/29/10	<1	<1
Ammonia	µg/l	Method Blank	12/08/10	12/08/10	<1	<1
Ammonia	µg/l	Method Blank	12/08/10	12/08/10	<1	<1
Ammonia	µg/l	Method Blank	12/14/10	12/14/10	<1	<1
Ammonia	µg/l	Method Blank	12/17/10	12/17/10	<1	<1
Ammonia	µg/l	Method Blank	12/21/10	12/21/10	<1	<1
Ammonia	µg/l	Method Blank	12/21/10	12/21/10	<1	<1
Ammonia	µg/l	Method Blank	01/09/11	01/09/11	<1	<1
Ammonia	µg/l	Method Blank	02/04/11	02/04/11	<1	<1
Ammonia	µg/l	Method Blank	03/07/11	03/07/11	<1	<1
Ammonia	µg/l	Method Blank	05/03/11	05/03/11	<1	<1
Ammonia	µg/l	Method Blank	05/03/11	05/03/11	<1	<1
Ammonia	µg/l	Method Blank	05/04/11	05/04/11	<1	<1
Ammonia	µg/l	Method Blank	05/04/11	05/04/11	<1	<1
Ammonia	µg/l	Method Blank	05/04/11	05/04/11	<1	<1
Ammonia	µg/l	Method Blank	06/08/11	06/08/11	<1	<1
Ammonia	µg/l	Method Blank	06/08/11	06/08/11	<1	<1
Ammonia	µg/l	Method Blank	06/15/11	06/15/11	<1	<1
Ammonia	µg/l	Method Blank	06/28/11	06/28/11	<1	<1
Ammonia	µg/l	Method Blank	07/13/11	07/13/11	<1	<1
Ammonia	µg/l	Method Blank	08/31/11	08/31/11	<1	<1
Ammonia	µg/l	Method Blank	08/31/11	08/31/11	<1	<1
Ammonia	µg/l	Method Blank	09/01/11	09/01/11	<1	<1
Ammonia	µg/l	Method Blank	09/15/11	09/15/11	<1	<1
Ammonia	µg/l	Method Blank	09/20/11	09/20/11	<1	<1
Ammonia	µg/l	Method Blank	10/14/11	10/14/11	<1	<1
Ammonia	µg/l	Method Blank	10/14/11	10/14/11	<1	<1
Ammonia	µg/l	Method Blank	11/02/11	11/02/11	<1	<1
Ammonia	µg/l	Method Blank	11/02/11	11/02/11	<1	<1
Ammonia	µg/l	Method Blank	11/16/11	11/16/11	<1	<1
Ammonia	µg/l	Method Blank	12/15/11	12/15/11	<1	<1
Ammonia	µg/l	Method Blank	12/20/11	12/20/11	<1	<1
Ammonia	µg/l	Method Blank	12/29/11	12/29/11	<1	<1
Ammonia	µg/l	Method Blank	01/17/12	01/17/12	<1	<1
Ammonia	µg/l	Method Blank	01/18/12	01/18/12	<1	<1
Ammonia	µg/l	Method Blank	02/15/12	02/15/12	<1	<1
Ammonia	µg/l	Method Blank	03/05/12	03/05/12	<1	<1
Ammonia	µg/l	Method Blank	04/06/12	04/06/12	<1	<1

Method Blank Recovery

for Lockhart-Smirh from

April 2010 to April 2012

Total N	µg/l	Method Blank	12/28/10	12/28/10	<1	<1
Total N	µg/l	Method Blank	12/28/10	12/28/10	<1	<1
Total N	µg/l	Method Blank	12/28/10	12/28/10	<1	<1
Total N	µg/l	Method Blank	12/28/10	12/28/10	<1	<1
Total N	µg/l	Method Blank	04/26/10	04/26/10	<1	<1
Total N	µg/l	Method Blank	04/27/10	04/27/10	<1	<1
Total N	µg/l	Method Blank	05/06/10	05/06/10	<1	<1
Total N	µg/l	Method Blank	05/12/10	05/12/10	<1	<1
Total N	µg/l	Method Blank	05/20/10	05/20/10	<1	<1
Total N	µg/l	Method Blank	05/26/10	05/26/10	<1	<1
Total N	µg/l	Method Blank	06/01/10	06/01/10	<1	<1
Total N	µg/l	Method Blank	06/04/10	06/04/10	<1	<1
Total N	µg/l	Method Blank	06/07/10	06/07/10	<1	<1
Total N	µg/l	Method Blank	06/23/10	06/23/10	<1	<1
Total N	µg/l	Method Blank	06/23/10	06/23/10	<1	<1
Total N	µg/l	Method Blank	07/02/10	07/02/10	<1	<1
Total N	µg/l	Method Blank	07/07/10	07/07/10	<1	<1
Total N	µg/l	Method Blank	07/07/10	07/07/10	<1	<1
Total N	µg/l	Method Blank	07/22/10	07/22/10	<1	<1
Total N	µg/l	Method Blank	07/22/10	07/22/10	<1	<1
Total N	µg/l	Method Blank	07/26/10	07/26/10	<1	<1
Total N	µg/l	Method Blank	08/02/10	08/02/10	<1	<1
Total N	µg/l	Method Blank	08/11/10	08/11/10	<1	<1
Total N	µg/l	Method Blank	08/16/10	08/16/10	<1	<1
Total N	µg/l	Method Blank	08/17/10	08/17/10	<1	<1
Total N	µg/l	Method Blank	09/10/10	09/10/10	<1	<1
Total N	µg/l	Method Blank	10/12/10	10/12/10	<1	<1
Total N	µg/l	Method Blank	12/02/10	12/02/10	<1	<1
Total N	µg/l	Method Blank	12/02/10	12/02/10	<1	<1
Total N	µg/l	Method Blank	12/06/10	12/06/10	<1	<1
Total N	µg/l	Method Blank	12/22/10	12/22/10	<1	<1
Total N	µg/l	Method Blank	12/27/10	12/27/10	<1	<1
Total N	µg/l	Method Blank	01/18/11	01/18/11	<1	<1
Total N	µg/l	Method Blank	01/18/11	01/18/11	<1	<1
Total N	µg/l	Method Blank	01/18/11	01/18/11	<1	<1
Total N	µg/l	Method Blank	02/08/11	02/08/11	<1	<1
Total N	µg/l	Method Blank	02/08/11	02/08/11	<1	<1
Total N	µg/l	Method Blank	02/17/11	02/17/11	<1	<1
Total N	µg/l	Method Blank	03/23/11	03/23/11	<1	<1
Total N	µg/l	Method Blank	02/22/10	02/22/10	<1	<1

Method Blank Recovery

for Lockhart-Smirh from

April 2010 to April 2012

Total N	µg/l	Method Blank	02/22/10	02/22/10	<1	<1
Total N	µg/l	Method Blank	02/22/10	02/22/10	<1	<1
Total N	µg/l	Method Blank	03/05/10	03/05/10	<1	<1
Total N	µg/l	Method Blank	03/05/10	03/05/10	<1	<1
Total N	µg/l	Method Blank	06/14/11	06/14/11	<1	<1
Total N	µg/l	Method Blank	06/14/11	06/14/11	<1	<1
Total N	µg/l	Method Blank	06/14/11	06/14/11	<1	<1
Total N	µg/l	Method Blank	08/22/11	08/22/11	<1	<1
Total N	µg/l	Method Blank	08/22/11	08/22/11	<1	<1
Total N	µg/l	Method Blank	09/07/11	09/07/11	<1	<1
Total N	µg/l	Method Blank	09/07/11	09/07/11	<1	<1
Total N	µg/l	Method Blank	09/07/11	09/07/11	<1	<1
Total N	µg/l	Method Blank	09/27/11	09/27/11	<1	<1
Total N	µg/l	Method Blank	09/27/11	09/27/11	<1	<1
Total N	µg/l	Method Blank	09/27/11	09/27/11	<1	<1
Total N	µg/l	Method Blank	09/27/11	09/27/11	<1	<1
Total N	µg/l	Method Blank	09/27/11	09/27/11	<1	<1
Total N	µg/l	Method Blank	09/27/11	09/27/11	<1	<1
Total N	µg/l	Method Blank	09/27/11	09/27/11	<1	<1
Total N	µg/l	Method Blank	10/05/11	10/05/11	<1	<1
Total N	µg/l	Method Blank	10/05/11	10/05/11	<1	<1
Total N	µg/l	Method Blank	10/05/11	10/05/11	<1	<1
Total N	µg/l	Method Blank	10/05/11	10/05/11	<1	<1
Total N	µg/l	Method Blank	10/05/11	10/05/11	<1	<1
Total N	µg/l	Method Blank	10/05/11	10/05/11	<1	<1
Total N	µg/l	Method Blank	10/05/11	10/05/11	<1	<1
Total N	µg/l	Method Blank	10/18/11	10/18/11	<1	<1
Total N	µg/l	Method Blank	11/01/11	11/01/11	<1	<1
Total N	µg/l	Method Blank	11/01/11	11/01/11	<1	<1
Total N	µg/l	Method Blank	11/01/11	11/01/11	<1	<1
Total N	µg/l	Method Blank	11/15/11	11/15/11	<1	<1
Total N	µg/l	Method Blank	11/15/11	11/15/11	<1	<1
Total N	µg/l	Method Blank	11/15/11	11/15/11	<1	<1
Total N	µg/l	Method Blank	12/07/11	12/07/11	<1	<1
Total N	µg/l	Method Blank	12/13/11	12/13/11	<1	<1
Total N	µg/l	Method Blank	12/19/11	12/19/11	<1	<1
Total N	µg/l	Method Blank	12/19/11	12/19/11	<1	<1
Total N	µg/l	Method Blank	12/21/11	12/21/11	<1	<1

Method Blank Recovery

for Lockhart-Smirh from

April 2010 to April 2012

Total N	µg/l	Method Blank	12/21/11	12/21/11	<1	<1
Total N	µg/l	Method Blank	12/28/11	12/28/11	<1	<1
Total N	µg/l	Method Blank	12/28/11	12/28/11	<1	<1
Total N	µg/l	Method Blank	01/11/12	01/11/12	<1	<1
Total N	µg/l	Method Blank	01/12/12	01/12/12	<1	<1
Total N	µg/l	Method Blank	01/12/12	01/12/12	<1	<1
Total N	µg/l	Method Blank	01/12/12	01/12/12	<1	<1
Total N	µg/l	Method Blank	01/12/12	01/12/12	<1	<1
Total N	µg/l	Method Blank	01/16/12	01/16/12	<1	<1
Total N	µg/l	Method Blank	01/20/12	01/20/12	<1	<1
Total N	µg/l	Method Blank	01/20/12	01/20/12	<1	<1
Total N	µg/l	Method Blank	01/20/12	01/20/12	<1	<1
Total N	µg/l	Method Blank	01/20/12	01/20/12	<1	<1
Total N	µg/l	Method Blank	01/24/12	01/24/12	<1	<1
Total N	µg/l	Method Blank	01/24/12	01/24/12	<1	<1
Total N	µg/l	Method Blank	01/27/12	01/27/12	<1	<1
Total N	µg/l	Method Blank	01/27/12	01/27/12	<1	<1
Total N	µg/l	Method Blank	02/03/12	02/03/12	<1	<1
Total N	µg/l	Method Blank	02/08/12	02/08/12	<1	<1
Total N	µg/l	Method Blank	02/08/12	02/08/12	<1	<1
Total N	µg/l	Method Blank	02/08/12	02/08/12	<1	<1
Total N	µg/l	Method Blank	02/16/12	02/16/12	<1	<1
Total N	µg/l	Method Blank	02/16/12	02/16/12	<1	<1
Total N	µg/l	Method Blank	02/27/12	02/27/12	<1	<1
Total N	µg/l	Method Blank	02/29/12	02/29/12	<1	<1
Total N	µg/l	Method Blank	03/04/12	03/04/12	<1	<1
Total N	µg/l	Method Blank	03/13/12	03/13/12	<1	<1
Total N	µg/l	Method Blank	03/14/12	03/14/12	<1	<1
Total N	µg/l	Method Blank	03/14/12	03/14/12	<1	<1
Total N	µg/l	Method Blank	03/19/12	03/19/12	<1	<1
Total N	µg/l	Method Blank	03/19/12	03/19/12	<1	<1
Total N	µg/l	Method Blank	03/25/12	03/25/12	<1	<1
Total N	µg/l	Method Blank	03/27/12	03/27/12	<1	<1
Total N	µg/l	Method Blank	03/27/12	03/27/12	<1	<1
Total N	µg/l	Method Blank	03/27/12	03/27/12	<1	<1
Total N	µg/l	Method Blank	03/27/12	03/27/12	<1	<1
Total N	µg/l	Method Blank	03/27/12	03/27/12	<1	<1
Total N	µg/l	Method Blank	04/02/12	04/02/12	<1	<1
Total N	µg/l	Method Blank	04/02/12	04/02/12	<1	<1

Method Blank Recovery

for Lockhart-Smirh from

April 2010 to April 2012

Total P	µg/l	Method Blank	12/28/10	12/28/10	<1	<1
Total P	µg/l	Method Blank	12/28/10	12/28/10	<1	<1
Total P	µg/l	Method Blank	12/28/10	12/28/10	<1	<1
Total P	µg/l	Method Blank	12/28/10	12/28/10	<1	<1
Total P	µg/l	Method Blank	04/26/10	04/26/10	<1	<1
Total P	µg/l	Method Blank	04/27/10	04/27/10	<1	<1
Total P	µg/l	Method Blank	05/06/10	05/06/10	<1	<1
Total P	µg/l	Method Blank	05/12/10	05/12/10	<1	<1
Total P	µg/l	Method Blank	05/20/10	05/20/10	<1	<1
Total P	µg/l	Method Blank	05/26/10	05/26/10	<1	<1
Total P	µg/l	Method Blank	06/01/10	06/01/10	<1	<1
Total P	µg/l	Method Blank	06/04/10	06/04/10	<1	<1
Total P	µg/l	Method Blank	06/07/10	06/07/10	<1	<1
Total P	µg/l	Method Blank	06/23/10	06/23/10	<1	<1
Total P	µg/l	Method Blank	06/23/10	06/23/10	<1	<1
Total P	µg/l	Method Blank	07/02/10	07/02/10	<1	<1
Total P	µg/l	Method Blank	07/02/10	07/02/10	<1	<1
Total P	µg/l	Method Blank	07/07/10	07/07/10	<1	<1
Total P	µg/l	Method Blank	07/07/10	07/07/10	<1	<1
Total P	µg/l	Method Blank	07/22/10	07/22/10	<1	<1
Total P	µg/l	Method Blank	07/22/10	07/22/10	<1	<1
Total P	µg/l	Method Blank	07/26/10	07/26/10	<1	<1
Total P	µg/l	Method Blank	08/02/10	08/02/10	<1	<1
Total P	µg/l	Method Blank	08/11/10	08/11/10	<1	<1
Total P	µg/l	Method Blank	08/16/10	08/16/10	<1	<1
Total P	µg/l	Method Blank	08/17/10	08/17/10	<1	<1
Total P	µg/l	Method Blank	09/10/10	09/10/10	<1	<1
Total P	µg/l	Method Blank	10/12/10	10/12/10	<1	<1
Total P	µg/l	Method Blank	12/02/10	12/02/10	<1	<1
Total P	µg/l	Method Blank	12/02/10	12/02/10	<1	<1
Total P	µg/l	Method Blank	12/06/10	12/06/10	<1	<1
Total P	µg/l	Method Blank	12/22/10	12/22/10	<1	<1
Total P	µg/l	Method Blank	12/27/10	12/27/10	<1	<1
Total P	µg/l	Method Blank	01/18/11	01/18/11	<1	<1
Total P	µg/l	Method Blank	01/18/11	01/18/11	<1	<1
Total P	µg/l	Method Blank	01/18/11	01/18/11	<1	<1
Total P	µg/l	Method Blank	02/08/11	02/08/11	<1	<1
Total P	µg/l	Method Blank	02/08/11	02/08/11	<1	<1

Method Blank Recovery
for Lockhart-Smirh from
April 2010 to April 2012

Total P	µg/l	Method Blank	02/17/11	02/17/11	<1	<1
Total P	µg/l	Method Blank	03/23/11	03/23/11	<1	<1
Total P	µg/l	Method Blank	05/02/11	05/02/11	<1	<1
Total P	µg/l	Method Blank	05/03/11	05/03/11	<1	<1
Total P	µg/l	Method Blank	05/03/11	05/03/11	<1	<1
Total P	µg/l	Method Blank	05/10/11	05/10/11	<1	<1
Total P	µg/l	Method Blank	05/10/11	05/10/11	<1	<1
Total P	µg/l	Method Blank	06/14/11	06/14/11	<1	<1
Total P	µg/l	Method Blank	06/14/11	06/14/11	<1	<1
Total P	µg/l	Method Blank	06/14/11	06/14/11	<1	<1
Total P	µg/l	Method Blank	08/22/11	08/22/11	<1	<1
Total P	µg/l	Method Blank	08/22/11	08/22/11	<1	<1
Total P	µg/l	Method Blank	09/07/11	09/07/11	<1	<1
Total P	µg/l	Method Blank	09/07/11	09/07/11	<1	<1
Total P	µg/l	Method Blank	09/07/11	09/07/11	<1	<1
Total P	µg/l	Method Blank	09/27/11	09/27/11	<1	<1
Total P	µg/l	Method Blank	09/27/11	09/27/11	<1	<1
Total P	µg/l	Method Blank	09/27/11	09/27/11	<1	<1
Total P	µg/l	Method Blank	09/27/11	09/27/11	<1	<1
Total P	µg/l	Method Blank	09/27/11	09/27/11	<1	<1
Total P	µg/l	Method Blank	09/27/11	09/27/11	<1	<1
Total P	µg/l	Method Blank	09/27/11	09/27/11	<1	<1
Total P	µg/l	Method Blank	10/05/11	10/05/11	<1	<1
Total P	µg/l	Method Blank	10/05/11	10/05/11	<1	<1
Total P	µg/l	Method Blank	10/05/11	10/05/11	<1	<1
Total P	µg/l	Method Blank	10/05/11	10/05/11	<1	<1
Total P	µg/l	Method Blank	10/05/11	10/05/11	<1	<1
Total P	µg/l	Method Blank	10/05/11	10/05/11	<1	<1
Total P	µg/l	Method Blank	10/05/11	10/05/11	<1	<1
Total P	µg/l	Method Blank	10/18/11	10/18/11	<1	<1
Total P	µg/l	Method Blank	11/01/11	11/01/11	<1	<1
Total P	µg/l	Method Blank	11/01/11	11/01/11	<1	<1
Total P	µg/l	Method Blank	11/01/11	11/01/11	<1	<1
Total P	µg/l	Method Blank	11/15/11	11/15/11	<1	<1
Total P	µg/l	Method Blank	11/15/11	11/15/11	<1	<1
Total P	µg/l	Method Blank	11/15/11	11/15/11	<1	<1
Total P	µg/l	Method Blank	12/07/11	12/07/11	<1	<1
Total P	µg/l	Method Blank	12/13/11	12/13/11	<1	<1
Total P	µg/l	Method Blank	12/19/11	12/19/11	<1	<1
Total P	µg/l	Method Blank	12/19/11	12/19/11	<1	<1
Total P	µg/l	Method Blank	12/21/11	12/21/11	<1	<1
Total P	µg/l	Method Blank	12/21/11	12/21/11	<1	<1

Method Blank Recovery

for Lockhart-Smirh from

April 2010 to April 2012

Total P	µg/l	Method Blank	12/28/11	12/28/11	<1	<1
Total P	µg/l	Method Blank	12/28/11	12/28/11	<1	<1
Total P	µg/l	Method Blank	01/11/12	01/11/12	<1	<1
Total P	µg/l	Method Blank	01/12/12	01/12/12	<1	<1
Total P	µg/l	Method Blank	01/12/12	01/12/12	<1	<1
Total P	µg/l	Method Blank	01/12/12	01/12/12	<1	<1
Total P	µg/l	Method Blank	01/12/12	01/12/12	<1	<1
Total P	µg/l	Method Blank	01/16/12	01/16/12	<1	<1
Total P	µg/l	Method Blank	01/20/12	01/20/12	<1	<1
Total P	µg/l	Method Blank	01/20/12	01/20/12	<1	<1
Total P	µg/l	Method Blank	01/20/12	01/20/12	<1	<1
Total P	µg/l	Method Blank	01/20/12	01/20/12	<1	<1
Total P	µg/l	Method Blank	01/24/12	01/24/12	<1	<1
Total P	µg/l	Method Blank	01/24/12	01/24/12	<1	<1
Total P	µg/l	Method Blank	01/27/12	01/27/12	<1	<1
Total P	µg/l	Method Blank	01/27/12	01/27/12	<1	<1
Total P	µg/l	Method Blank	02/03/12	02/03/12	<1	<1
Total P	µg/l	Method Blank	02/08/12	02/08/12	<1	<1
Total P	µg/l	Method Blank	02/08/12	02/08/12	<1	<1
Total P	µg/l	Method Blank	02/08/12	02/08/12	<1	<1
Total P	µg/l	Method Blank	02/16/12	02/16/12	<1	<1
Total P	µg/l	Method Blank	02/16/12	02/16/12	<1	<1
Total P	µg/l	Method Blank	02/27/12	02/27/12	<1	<1
Total P	µg/l	Method Blank	02/29/12	02/29/12	<1	<1
Total P	µg/l	Method Blank	03/04/12	03/04/12	<1	<1
Total P	µg/l	Method Blank	03/13/12	03/13/12	<1	<1
Total P	µg/l	Method Blank	03/14/12	03/14/12	<1	<1
Total P	µg/l	Method Blank	03/14/12	03/14/12	<1	<1
Total P	µg/l	Method Blank	03/19/12	03/19/12	<1	<1
Total P	µg/l	Method Blank	03/19/12	03/19/12	<1	<1
Total P	µg/l	Method Blank	03/25/12	03/25/12	<1	<1
Total P	µg/l	Method Blank	03/27/12	03/27/12	<1	<1
Total P	µg/l	Method Blank	03/27/12	03/27/12	<1	<1
Total P	µg/l	Method Blank	03/27/12	03/27/12	<1	<1
Total P	µg/l	Method Blank	03/27/12	03/27/12	<1	<1
Total P	µg/l	Method Blank	03/27/12	03/27/12	<1	<1
Total P	µg/l	Method Blank	04/02/12	04/02/12	<1	<1
Total P	µg/l	Method Blank	04/02/12	04/02/12	<1	<1

Method Blank Recovery

for Lockhart-Smirh from

April 2010 to April 2012

Color	PCU	Method Blank	04/08/10	04/08/10	<1	<1
Color	PCU	Method Blank	04/28/10	04/28/10	<1	<1
Color	PCU	Method Blank	05/06/10	05/06/10	<1	<1
Color	PCU	Method Blank	05/06/10	05/06/10	<1	<1
Color	PCU	Method Blank	05/13/10	05/13/10	<1	<1
Color	PCU	Method Blank	06/10/10	06/10/10	<1	<1
Color	PCU	Method Blank	06/10/10	06/10/10	<1	<1
Color	PCU	Method Blank	06/28/10	06/28/10	<1	<1
Color	PCU	Method Blank	06/28/10	06/28/10	<1	<1
Color	PCU	Method Blank	07/09/10	07/09/10	<1	<1
Color	PCU	Method Blank	07/09/10	07/09/10	<1	<1
Color	PCU	Method Blank	07/21/10	07/21/10	<1	<1
Color	PCU	Method Blank	08/02/10	08/02/10	<1	<1
Color	PCU	Method Blank	08/12/10	08/12/10	<1	<1
Color	PCU	Method Blank	08/17/10	08/17/10	<1	<1
Color	PCU	Method Blank	08/25/10	08/25/10	<1	<1
Color	PCU	Method Blank	09/02/10	09/02/10	<1	<1
Color	PCU	Method Blank	09/02/10	09/02/10	<1	<1
Color	PCU	Method Blank	09/17/10	09/17/10	<1	<1
Color	PCU	Method Blank	10/07/10	10/07/10	<1	<1
Color	PCU	Method Blank	01/06/11	01/06/11	<1	<1
Color	PCU	Method Blank	01/10/11	01/10/11	<1	<1
Color	PCU	Method Blank	01/20/11	01/20/11	<1	<1
Color	PCU	Method Blank	02/02/11	02/02/11	<1	<1
Color	PCU	Method Blank	02/02/11	02/02/11	<1	<1
Color	PCU	Method Blank	02/24/11	02/24/11	<1	<1
Color	PCU	Method Blank	03/02/11	03/02/11	<1	<1
Color	PCU	Method Blank	03/02/11	03/02/11	<1	<1
Color	PCU	Method Blank	03/19/11	03/19/11	<1	<1
Color	PCU	Method Blank	03/19/11	03/19/11	<1	<1
Color	PCU	Method Blank	03/29/11	03/29/11	<1	<1
Color	PCU	Method Blank	04/06/11	04/06/11	<1	<1
Color	PCU	Method Blank	05/05/11	05/05/11	<1	<1
Color	PCU	Method Blank	06/04/11	06/04/11	<1	<1
Color	PCU	Method Blank	07/08/11	07/08/11	<1	<1

Method Blank Recovery

for Lockhart-Smirh from

April 2010 to April 2012

Color	PCU	Method Blank	07/08/11	07/08/11	<1	<1
Color	PCU	Method Blank	07/18/11	07/18/11	<1	<1
Color	PCU	Method Blank	07/18/11	07/18/11	<1	<1
Color	PCU	Method Blank	07/31/11	07/31/11	<1	<1
Color	PCU	Method Blank	07/31/11	07/31/11	<1	<1
Color	PCU	Method Blank	08/08/11	08/08/11	<1	<1
Color	PCU	Method Blank	08/12/11	08/12/11	<1	<1
Color	PCU	Method Blank	08/18/11	08/18/11	<1	<1
Color	PCU	Method Blank	09/11/11	09/11/11	<1	<1
Color	PCU	Method Blank	09/11/11	09/11/11	<1	<1
Color	PCU	Method Blank	09/16/11	09/16/11	<1	<1
Color	PCU	Method Blank	09/23/11	09/23/11	<1	<1
Color	PCU	Method Blank	10/05/11	10/05/11	<1	<1
Color	PCU	Method Blank	10/05/11	10/05/11	<1	<1
Color	PCU	Method Blank	10/12/11	10/12/11	<1	<1
Color	PCU	Method Blank	10/19/11	10/19/11	<1	<1
Color	PCU	Method Blank	10/19/11	10/19/11	<1	<1
Color	PCU	Method Blank	10/28/11	10/28/11	<1	<1
Color	PCU	Method Blank	11/04/11	11/04/11	<1	<1
Color	PCU	Method Blank	11/04/11	11/04/11	<1	<1
Color	PCU	Method Blank	12/01/11	12/01/11	<1	<1
Color	PCU	Method Blank	12/10/11	12/10/11	<1	<1
Color	PCU	Method Blank	12/16/11	12/16/11	<1	<1
Color	PCU	Method Blank	12/24/11	12/24/11	<1	<1
Color	PCU	Method Blank	12/31/11	12/31/11	<1	<1
Color	PCU	Method Blank	01/08/12	01/08/12	<1	<1
Color	PCU	Method Blank	01/14/12	01/14/12	<1	<1
Color	PCU	Method Blank	02/08/12	02/08/12	<1	<1
Color	PCU	Method Blank	02/15/12	02/15/12	<1	<1
Color	PCU	Method Blank	03/02/12	03/02/12	<1	<1
Color	PCU	Method Blank	03/02/12	03/02/12	<1	<1
Color	PCU	Method Blank	03/08/12	03/08/12	<1	<1
Color	PCU	Method Blank	03/14/12	03/14/12	<1	<1
Color	PCU	Method Blank	04/05/12	04/05/12	<1	<1
Color	PCU	Method Blank	04/05/12	04/05/12	<1	<1