



**Dutch Slough Restoration Area
Surface Water Quality Monitoring Report
September 2012 to August 2013**

Report and Appendices

Prepared by:

**HydroFocus, Inc.
2827 Spafford Street
Davis, California 95618**

530-759-2484

April 11, 2014

Dutch Slough Restoration Area Surface Water Quality Monitoring Report September 2012 to August 2013

Contents

1.0 INTRODUCTION	5
2.0 MONITORING ACTIVITIES	6
2.1 Flow and Discharge Measurements	6
2.2 Water Sample Collection and Analysis	7
3.0 RESULTS AND DISCUSSION	11
3.1 Marsh Creek Flow.....	11
3.2 Drain Discharge	12
3.3 Analytical Results	14
3.3.1 Marsh Creek	15
3.3.2 Drain water	16
3.3.3 Methyl Mercury	23
3.3.4 Dissolved Organic Carbon.....	23
3.3.5 Pesticides and Herbicides	24
3.4 Loads	25
4.0 SUMMARY AND CONCLUSIONS.....	28

List of Tables:

Table 1.	Field Parameters and Analytes for Marsh Creek
Table 2.	Drain-water Field Parameters and Constituents
Table 3.	Field Parameters and Analytical Methods
Table 4.	Marsh Creek Flow and Uncertainty
Table 5.	Parcel Drainage Discharge
Table 6.	Marsh Creek Sampling Results
Table 7.	Drainage Ditch Sampling Results
Table 8.	Bifenthrin Lethal Concentrations in Aquatic Organisms
Table 9.	Calculated Drain Loads
Table 10.	Calculated Marsh Creek Loads

List of Figures:

- Figure 1. Dutch Slough Project Area Location
- Figure 2. Baseline Sampling Locations and Significant Features, Dutch Slough Project Area
- Figure 3. Precipitation Measured at Ironhouse Sanitary District, Oakley, CA, and Marsh Creek Flow, September 2012 through August 2013
- Figure 4. Estimated Drain Flow from Emerson, Gilbert and Burroughs parcels
- Figure 5. Methyl Mercury Concentrations in Marsh Creek and Drain-water Samples
- Figure 6. Dissolved Organic Carbon Concentrations in Marsh Creek and Drain-water Samples
- Figure 7. Estimated Dissolved Organic Carbon and Methyl Mercury Loads from Emerson, Gilbert and Burroughs parcels

List of Appendices:

- Appendix A: Marsh Creek Flow
- Appendix B: Pump Efficiency Tests and Estimated Drain Discharge
- Appendix C: Water Quality Results
- Appendix D: Laboratory Analytical Reports
- Appendix E: Quality Assurance and Control Assessment
- Appendix F: Field Sheets and Chain of Custody Forms

Dutch Slough Restoration Area Surface Water Quality Monitoring Report

1.0 INTRODUCTION

This report presents and summarizes data collected in the Dutch Slough restoration area which includes Emerson, Gilbert, and Burroughs parcels (Figure 1). We also present data for Marsh Creek.

The Dutch Slough Restoration Project proposes to convert parts of the Emerson, Burroughs, and Gilbert parcels to tidal habitat and managed wetlands. In the near term, a large area on the Emerson Parcel will be converted to tidal open water habitat and marsh and part of the Gilbert Parcel will become a managed wetland for habitat, subsidence reversal and carbon sequestration. The nearby Burroughs Parcel will be managed as upland habitat similar to current conditions during the short term but is slated for eventual restoration to tidal habitat.

The Department of Water Resources plans to divert Marsh Creek onto the Emerson Parcel, providing seasonal freshwater flows to cue out-migrating salmon into the restored marsh. A new Marsh Creek distributary channel would be constructed through the Emerson marsh, with low riparian berms or “natural levees” along the channel banks.

Project surface water quality concerns are related primarily to potential effects of the Dutch Slough Project on adjacent channels and influence of Marsh Creek on the Emerson Marsh. From a drinking water perspective, dissolved organic carbon (DOC) and associated disinfection byproducts (DBPs) represent a concern for Contra Costa Water District at the nearby Rock Slough intakes. Entrainment of increased DOC concentrations in drinking water diversion is possible if DOC is transported from the restoration site to the drinking water intake at Rock Slough when water is being diverted.

Methyl mercury (MeHg) is a potential threat to delta fisheries and there is concern that the restored Dutch Slough project may contribute to MeHg in adjacent channels. Marsh Creek water quality concerns include MeHg and other constituents associated with urban and agricultural activities.

Current site activities likely contribute water-quality constituents of concern to Dutch Slough, Emerson Slough, and Little Dutch Slough. Specifically, DOC, MeHg, and salt in drain water are discharged primarily through networks of subsurface drainage ditches to main drains and pump stations where drainage water is discharged to adjacent channels. Drainage pumps on the three parcels regularly discharge drainage water to adjacent sloughs.

Water quality monitoring will include one year of baseline and subsequent project data collection and analysis. Results of baseline water quality monitoring will

1) guide development of wetland land- and water-management practices to minimize export of water-quality constituents of concern from the Dutch Slough Project, 2) determine the viability of diverting Marsh Creek onto the Emerson Parcel and 3) be used to guide future monitoring for and implementation of future Delta restoration projects.

This report summarizes September 2012 through August 2013 monitoring results. HydroFocus performed data collection and analyses in accordance with HydroFocus' "Draft Wetlands Quality Assurance Project Plan for the Dutch Slough Project".¹ This report:

- Describes preparatory, sampling, data collection and laboratory analytical activities;
- Presents a scaled map showing relevant structures, features and sampling locations (Figure 2);
- Reports Marsh Creek flow measurements (Appendix A) and presents estimated drainage discharge rates for the three parcels (Appendix B);
- Provides analytical results for all samples and summary data tables (Tables 6 and 7), graphs (Figures 5 and 6), and analytical reports (Appendix D);
- Presents historical water-quality data tables (Appendix C).

2.0 MONITORING ACTIVITIES

HydroFocus, Inc. personnel collected samples and measured flow in Marsh Creek at site MC-5 (Figure 2). We also collected samples from the main drains near the pump stations on Emerson, Gilbert, and Burroughs parcels. Figure 2 shows sampling and measurement locations.

2.1 Flow and Discharge Measurements

HydroFocus measured Marsh Creek flow monthly at site MC-5 (Figure 2) using a Marsh-McBirney Flo-Mate 2000 portable flowmeter. Each month at the same cross location, we measured velocity and depth of flow at approximately 20 locations on a transect across the Creek perpendicular to the direction of flow. We used these measurements to calculate Marsh Creek discharge in cubic feet per second.

We estimated outflow from the drainage ditches using electrical power records and pump test results. We obtained power records from Pacific Gas and Electric

¹ Draft Wetlands Quality Assurance Project Plan for the Dutch Slough Project Version 1.4 December 12, 2011. Prepared by Steven Deverel, Ph.D., P.G., submitted to the United States Environmental Protection Agency. Approved on January 18, 2012.

and utilized results from pump-efficiency tests² performed on the discharge pumps (Appendix B) in 2012. The pump tests provided a value for kilowatt-hour per acre-feet (kwh/AF). Therefore, we divided the monthly power consumption by kilowatt-hour/acre-feet to obtain monthly flow estimates in acre-feet (AF). These flow estimates were used to estimate monthly loads of constituents of concern from the three parcels which can be compared with measured loads after project implementation. The Emerson pump station drains all of the Emerson Parcel north of the Contra Costa Canal, the Gilbert pump station drains all of the Gilbert Parcel north of the Contra Costa Canal, and the Burroughs pump station drains the portion of Burroughs Parcel north of the east-west trending road and drainage ditch about ½ mile north of Cypress Road.

2.2 Water Sample Collection and Analysis

On September 24, October 24, November 27, and December 18, 2012 and January 28, February 25, April 1, April 29, May 20, June 24, July 29, and August 26, 2013, HydroFocus personnel collected surface water samples from Marsh Creek and the three main drains on Emerson, Gilbert, and Burroughs parcels (Figure 2). At all sites, we measured field parameters (pH, electrical conductivity, temperature, dissolved oxygen, oxidation-reduction potential, and turbidity) using a YSI Model 650 multimeter or a YSI Model 556 multimeter³. The YSI Model 650 multimeter was calibrated for turbidity in the office on the day prior to sampling, and all other probes were calibrated in the field, at least twice a day. Field sheets (Appendix F) contain all calibration information by site.

At Marsh Creek, we collected both a grab and depth-integrated composite sample for the September 2012 and October 2012 sampling. Because there was no significant difference between the analytical results for the depth-integrated and grab samples, we subsequently collected only grab samples from Marsh Creek. Prior to sampling, we triple rinsed all bottles with sample water. We collected unfiltered grab samples directly from the Creek into sample bottles and a churn splitter⁴. We used a peristaltic pump, clean, dedicated tubing, and a 0.45 µm filter to collect filtered samples from the churn splitter. For the depth-integrated sample, we collected unfiltered pesticide and herbicide samples using a US DH-48⁵

² Pump tests were conducted by Power Services, Inc., 6301 Beardon Lane, CA 95357 on November 19, 2012.

³ On October 24, 2012 the YSI Model 650 multimeter would not calibrate pH or ORP, so we used the YSI Model 556 multimeter to measure these two parameters.

⁴ The churn splitter consists of a Polyethylene 14 liter bucket with a disc churn attached to a central handle. During sampling, the disc churn is moved up and down while sample water dispenses through a front spigot enabling a sub-sample to be collected from the main sample. The churn ensures representative unfiltered sub-samples are collected from the sampling site and contain equally distributed suspended sediments. See <http://water.usgs.gov/fisp/products/4111001.html> for more information.

⁵ The US DH-48 is a hand-held depth integrating stream sampler designed to sample water and sediment at the same velocity as the stream flow, which ensures a representative sample is collected. A pint bottle attaches to the sampler. An intake nozzle on the front of the sampler allows water and sediment to flow into the pint bottle, while an air exhaust port allows air to

stream sampler with a glass bottle. At five to six locations along the stream cross section, we collected the water into clean⁶, triple-rinsed 4L amber glass bottles. We then filled the sample bottles from the amber bottles. We collected the rest of the samples using the US DH-48 stream sampler with a plastic bottle at five to six locations along the stream cross section and poured the samples into a churn splitter⁷. We then filled the unfiltered sample bottles from the churn splitter pour spout and used a peristaltic pump, clean, dedicated tubing, and a 0.45 µm filter to collect filtered samples. Finally, we collected methyl and total mercury samples directly from the Creek using a swing sampler⁸ with a triple-rinsed bottle attached.

At the main drains on Emerson, Gilbert and Burroughs parcels, we used a dipper to collect samples. Water from the dipper was placed into the churn splitter. We then collected unfiltered samples directly from the pour spout into the triple-rinsed bottles. We filtered samples for DOC and trihalomethane formation potential (THMFP) using a peristaltic pump, dedicated, clean tubing, and a 0.45 µm filter. Filtered samples were collected in amber glass bottles.

We acidified samples collected for major cations (calcium, magnesium, sodium, and potassium), ammonia, total Kjeldahl nitrogen, and total phosphorous analyses in the field and stored all samples on ice. We sent the mercury samples overnight to Moss Landing Marine Laboratory and replicate samples to Frontier GeoSciences, transported samples to McCampbell Analytical Laboratory in Antioch on the day of sampling, and sent samples to Weck Laboratories the following day using standard chain-of-custody protocol.

Appendix F contains field sampling logs which document measured field parameters and samples collected at each site and chain of custody forms.

Table 1 lists field parameters and constituents determined in Marsh Creek samples. Table 2 shows field parameters and constituents determined in drain-water samples.

escape the sample bottle as it fills. See <http://water.usgs.gov/fisp/products/4101002.html> for more information.

⁶ See Field Sampling Equipment Decontamination Procedures, Section 7.2 in United States Environmental Protection Agency (1994) Sampling Equipment Decontamination. SOP#: 2006

⁷ The churn splitter consists of a Polyethylene 14 liter bucket with a disc churn attached to a central handle. During sampling, the disc churn is moved up and down while sample water dispenses through a front spigot enabling a sub-sample to be collected from the main sample. The churn ensures representative unfiltered sub-samples are collected from the sampling site and contain equally distributed suspended sediments. See <http://water.usgs.gov/fisp/products/4111001.html> for more information.

⁸ The swing sampler consists of an extendable fiberglass pole with a sample bottle resting ledge. Sample bottles are held in place with a bungee cord.

Table 1. Field Parameters and Analytes for Marsh Creek.				
<i>Constituent</i>	<i>Units</i>	<i>Type of Sample</i>	<i>Filtering</i>	<i>Preservation</i>
pH	pH units	Grab	Yes	
Total Dissolved Solids	mg/L ^a	Grab	Yes	
Electrical Conductivity	µmhos/cm ^b	Grab	Yes	
Mercury				
Methyl Mercury	ng/L ^c	Grab	No	
Total Mercury	ng/L	Grab	No	
Methyl Mercury (split sample)	ng/L	Grab	No	
Standard cations				
Calcium	mg/L	Grab	Yes	HNO ₃ ^d
Magnesium	mg/L	Grab	Yes	HNO ₃
Sodium	mg/L	Grab	Yes	HNO ₃
Potassium	mg/L	Grab	Yes	HNO ₃
Standard anions				
Chloride	mg/L	Grab	Yes	
Sulfate	mg/L	Grab	Yes	
Ortho-phosphate as P	mg/L	Grab	Yes	
Alkalinity				
Bicarbonate alkalinity	mg/L	Grab	No	
Carbonate alkalinity	mg/L	Grab	No	
Hydroxide alkalinity	mg/L	Grab	No	
Total alkalinity	mg/L	Grab	No	
Nitrogen				
Ammonia	mg/L	Grab	Yes	H ₂ SO ₄ ^e
Nitrate as Nitrogen	mg/L	Grab	Yes	
Total Kjeldahl	mg/L	Grab	Yes	H ₂ SO ₄
Dissolved Organic Carbon	mg/L	Grab	Yes	
Total Phosphorous	mg/L	Grab	No	H ₂ SO ₄
Coliform				
Total	MPN/100ml ^f	Grab	No	Na ₂ S ₂ O ₃ ^g
E. Coli	MPN/100ml	Grab	No	Na ₂ S ₂ O ₃
Pesticides				
Chlorinated and/or PCBs	µg/L ^h	Grab	No	
Organophosphorus	µg/L	Grab	No	
Pyrethroid	ng/L	Grab	No	
Chlorinated Herbicides	µg/L	Grab	No	

- a) Milligrams/liter, which is equal to one part per million
- b) Micromhos/centimeter, which is the unit of measurement for conductivity
- c) Nanograms/liter, which is equal to one part per trillion
- d) Nitric acid
- e) Sulfuric acid
- f) Most probable number of cells in 100 mL of sample
- g) Sodium thiosulfate
- h) Micrograms/liter, which is equal to one part per billion

Table 2. Drain-water Field Parameters and Constituents.

<i>Constituent</i>	<i>Units</i>	<i>Type of Sample</i>	<i>Filtration</i>	<i>Preservation</i>
pH	pH units	Grab	No	
Electrical Conductivity	$\mu\text{mhos}/\text{cm}^a$	Grab	No	
Methyl Mercury	ng/L^b	Grab	No	
Total Organic Carbon	mg/L^c	Grab	No	H_3PO_4^d
Dissolved Organic Carbon	mg/L	Grab	Yes	
Trihalomethane Formation Potential	$\mu\text{g}/\text{L}^e$	Grab	Yes	

a) Micromhos/centimeter, which is the unit of measurement for conductivity

b) Nanograms/liter, which is equal to one part per trillion

c) Milligrams/liter, which is equal to one part per million

d) Phosphoric acid

e) Micrograms/liter, which is equal to one part per billion

Table 3 lists the meters and methods used to analyze water samples.

Table 3. Field Parameters and Analytical Methods.

<i>Parameter/Constituent</i>	<i>Meter/Laboratory Method</i>
pH	YSI Model 650 MDS meter
Electrical Conductivity	YSI Model 650 MDS meter
Dissolved Oxygen	YSI Model 650 MDS meter optical probe
Oxidation/Reduction Potential (ORP)	YSI Model 650 MDS meter
Turbidity	YSI Model 650 MDS meter optical probe
Total Dissolved Solids	EPA Standard Method SM 2540C
Mercury	
Methyl	EPA modified Method 1630
Total	EPA modified Method 1631E
Standard cations ^a	EPA Standard Method 200.7
Standard anions ^b	EPA Standard Method 300.1
Alkalinity	EPA Standard Method SM 2320B
Nitrogen	
Ammonia	EPA Standard Method 350.1
Nitrate plus nitrite as nitrogen	EPA Standard Method 300.1
Total Kjeldahl as nitrogen	EPA Standard Method 351.2
Total Organic Carbon	EPA Standard Method SM 5310C
Dissolved Organic Carbon	EPA Standard Method SM 5310C
Total Phosphorous as P	EPA Standard Method 365.1
Coliform	EPA Standard Method SM 9223B
Pesticides	
Chlorinated and/or PCBs	EPA Standard Method 8081A
Organophosphorus	EPA Standard Method 8141A
Pyrethroid	GC/MS NCI-SIM
Chlorinated Herbicides	EPA Standard Method 8151A
Trihalomethane Formation Potential	EPA Standard Method 524.2

a) Standard cations include calcium, magnesium, sodium and potassium.

b) Standard anions include chloride, sulfate, and ortho-phosphate as P.

3.0 RESULTS AND DISCUSSION

3.1 Marsh Creek Flow

Table 4 and Figure 3 show monthly Marsh Creek flow measurements and uncertainty. Figure 3 also shows hourly precipitation measured at the Ironhouse Sanitary District in Oakley⁹ for September 2012 through August 2013. We assessed measurement uncertainty using U.S. Geological Survey methodology by calculating component uncertainties in depth, width, and velocity¹⁰. See Appendix A for all Marsh Creek flow measurements, calculations, and cross section diagrams.

Table 4. Marsh Creek Flow and Uncertainty					
Date	MC-5 flow (cfs ^a)	Change		Estimated Measurement Uncertainty	
		(cfs)	(%)	(cfs)	(%)
8/23/2012	8.3	--	--	0.73	8.76
9/24/2012	5.6	-2.71	-32.6	0.28	4.97
10/24/2012	8.1	+2.45	+43.7	0.36	4.47
11/27/2012	3.4	-4.69	-58.2	0.16	4.73
12/18/2012	10.2	+6.83	+202.7	0.46	4.53
1/28/2013	8.0	-2.24	-22.0	0.34	4.25
2/25/2013	8.1	+0.18	+2.3	0.35	4.29
4/1/2013	14.9	+6.8	+83.2	0.64	4.27
4/29/2013	5.9	-9.05	-60.7	0.29	4.92
5/20/2013	4.2	-1.64	-28.0	0.22	5.29
6/24/2013	2.9	-1.36	-32.3	0.14	5.07
7/29/2013	5.0	+2.17	+76.1	0.25	4.91
8/26/2013	5.1	+0.09	+1.8	0.24	4.77

a) Cubic feet per second

Marsh Creek flow varied significantly throughout the year. Flow in August, September and November 2012 were the result of agricultural and urban irrigation runoff and the influx of treated wastewater at the Brentwood Wastewater Treatment Plant located about 2.3 miles upstream of our measurement location (Figure 1). There was minimal rainfall prior to the November 27th measurement. Greater flow measured on December 18 occurred after about 0.4 inch of rain on December 15 through 17. Low flow measured during January and February was associated with low rainfall during these months. About 0.25 inch of rain fell during March 31 prior to the April 1 flow of 14.9 cfs. Lower flows during April – August

⁹ Data downloaded for Station "ISD" measured at Ironhouse Sanitary District from Department of Water Resources (DWR) California Data Exchange Center (CDEC). Data modified to hourly when higher resolution data were reported during storms. Available online at http://cdec.water.ca.gov/cgi-progs/stationInfo?station_id=ISD

¹⁰ Sauer, VB and Meyer RW (1992) Determination of error in individual discharge measurements. U.S. Geological Survey Open-File Report 92-144.

were reflective of dry conditions when flow in Marsh Creek was due primarily to runoff and wastewater treatment discharge.

3.2 Drain Discharge

We used the monthly reported drainage-pump electrical power usage to estimate the discharge from the main drains for the parcels. Appendix B contains the pump test results and drainage discharge estimates. Table 5 and Figure 4 show the monthly discharge estimates in acre-feet during the stated interval. Figure 4 shows that monthly drain flow from Emerson and Gilbert were generally similar. Maximum flow occurred in December due to relatively high rainfall (Figure 3). Relatively high flow also occurred during April when there was greater rainfall relative to January, February and March. At the Burroughs pump station, drain flow generally followed a similar pattern until April. In May and July, higher flows were estimated, which were likely due to irrigation.

Table 5. Parcel Drainage Discharge.					
Pump Station	Acres Drained	Beginning Date	Ending Date	Kwh ^a	Drainage Discharge (AF) ^b
Emerson ^c	464.9	8/31/2012	10/1/2012	3,872	53
		10/2/2012	10/30/2012	2,089	29
		10/31/2012	12/3/2012	2,534	61
		12/3/2012	12/31/2012	4,543	109
		1/3/2013	1/31/2013	2,111	51
		2/1/2013	3/4/2013	1,685	41
		3/5/2013	4/2/2013	2,235	54
		4/3/2013	5/2/2013	3,537	85
		5/1/2013	5/2/2013	203	2.8
		5/3/2013	6/3/2013	4,578	63
		6/4/2013	7/2/2013	3,550	49
		7/3/2013	8/1/2013	4,008	55
		8/2/2013	9/2/2013	4,849	67
Gilbert	275.1	8/31/2012	10/1/2012	889	24
		9/30/2012	10/31/2012	826	23
		10/31/2012	12/3/2012	1,079	29
		12/3/2012	12/31/2012	2,875	78
		1/3/2013	1/31/2013	808	22
		2/1/2013	3/4/2013	360	10
		3/5/2013	4/2/2013	307	8.4
		4/3/2013	5/2/2013	1,512	41
		5/3/2013	6/3/2013	1,563	43
		6/4/2013	7/2/2013	1,344	37
		7/3/2013	8/1/2013	1,228	34
		8/2/2013	9/2/2013	1,316	36
Burroughs	319.9	9/6/2012	10/4/2012	5,062	119
		10/5/2012	11/5/2012	2,982	70
		11/6/2006	12/5/2012	3,282	77
		12/6/2012	12/31/2012	5,147	121
		1/6/2013	2/6/2013	2,812	66
		2/7/2013	3/8/2013	1,913	45
		3/9/2013	4/5/2013	3,297	78
		4/6/2013	4/30/2013	5,903	139
		5/8/2013	6/6/2013	6,827	161
		6/7/2013	7/8/2013	0	0
		7/9/2013	7/31/2013	10,167	239
		8/1/2013	8/8/2013	3,536	83
		8/9/2013	9/6/2013	4,899	115

a) PG&E reported "Usage" in kilowatt-hours

b) Total acre-feet from the beginning to ending date

c) There are two pumps located at the Emerson drain site. Per the farmer Brent Gilbert, the smaller pump is used in the summer and the larger pump is used in the winter. We assumed this division is consistent with the summer and winter rates reported by PG&E.

3.3 Analytical Results

Tables 6 and 7 show analytical results for all twelve sampling events for Marsh Creek and the parcel main drains and available Federal and State benchmarks listed below. We compared these State and Federal criteria to the measured concentrations. We recognize that not all criteria are directly applicable. For example, the sampled waters are not used for drinking water and drinking water MCLs are for comparative purposes only.

- The United States EPA recommended Aquatic Life Criteria contain two categories: acute and chronic exposure for freshwater¹¹. These criteria provide benchmarks for protection of aquatic life in surface waters.
- The EPA recommended Human Health Criteria provides standards for the protection of human health in surface waters¹².
- The EPA Office of Pesticides established surface-water pesticide Aquatic Life Benchmarks for both fish and invertebrates¹³. The EPA developed these benchmarks for baseline risk assessments and they represent concentrations which will not harm fish or invertebrates.
- The United States EPA established Ambient Water Quality Criteria Recommendations for rivers and streams by ecoregion¹⁴. Marsh Creek and surrounding properties fall into Ecoregion I, subregion 7.
- The United States EPA and the State of California established Maximum Contaminant Levels (MCL) for drinking water¹⁵.
- The California Environmental Protection Agency Office of Environmental Health Hazard Assessment established California Public Health Goals for drinking water¹⁶.

¹¹ EPA National Recommended Water Quality Criteria available online at <http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm>

¹² ibid

¹³ EPA Office of Pesticide Programs' Aquatic Life Benchmarks available online at http://www.epa.gov/oppefed1/ecorisk_ders/aquatic_life_benchmark.htm

¹⁴ EPA Ambient Water Quality Criteria Recommendations for Rivers and Streams, Ecoregion I available online at <http://www2.epa.gov/sites/production/files/documents/rivers1.pdf>

¹⁵ EPA National Primary Drinking Water Regulations available online at <http://water.epa.gov/drink/contaminants/upload/mcl-2.pdf>; California Maximum Contaminant Levels for Drinking Water available online at <http://www.cdph.ca.gov/certlic/drinkingwater/Documents/DWdocuments/EPAandCDPH-11-28-2008.pdf>

¹⁶ California EPA Office of Environmental Health Hazard Assessment Public Health Goals available online at <http://oehha.ca.gov/water/phg/allphgs.html>

The following sections summarize provide details about key water-quality concerns. Appendix C contains all historical sampling results.

3.3.1 Marsh Creek

The following constituent concentrations exceeded criteria listed above in one or more samples:

- **Coliform Bacteria.** The determination of most probably numbers (MPN) includes all coliform organisms, not just those found in the human intestinal tract. This determination is used as an indicator of the potential for microbial contamination. The MPN of coliform bacteria in grab samples for all months were higher than the chronic aquatic life criterion and the MCL. Values were highest during the October 2012 sampling event. The MPN values varied greatly between sampling events, but were generally lowest in January and February 2013 and greatest in August 2012 and October 2013. Even though coliform levels were higher than the MCL during September 2012 through August 2013, the observed levels are consistent with other values reported for the San Joaquin River Basin. For example, TetraTech¹⁷ showed levels as high as 10,000 to 25,000 MPN/100 mL in the San Joaquin River Basin. CVRWQCB staff stated that coliform bacteria levels will not pose a threat to the proposed restored marsh after re-routing Marsh Creek¹⁸.
- **Total dissolved solids (TDS)** exceeded both the EPA human health criteria and the MCL for all samples from all sampling dates.
- **Chloride** concentrations exceeded the MCL and the chronic aquatic life criterion in the samples collected during September and November 2012 and January, April, May, June, and July 2013.
- **Total phosphorous** exceeded the ambient water quality criteria recommendations for rivers and streams for all sampling events.
- **The pyrethroid insecticide Bifenthrin** concentration exceeded the US EPA chronic aquatic life benchmark for invertebrates in the samples collected in September, October, and December 2012 and January, April, and May 2013. CVRWQCB staff stated that pyrethroid levels are similar to those found throughout the Delta and should therefore not impede the

¹⁷ TetraTech, 2007, Conceptual model for pathogens and pathogen indicators in the Central Valley and Sacramento-San Joaquin Delta, Prepared for the US EPA and Central Valley Drinking Water Policy Workgroup, Lafayette, CA
http://www.waterboards.ca.gov/rwqcb5/water_issues/drinking_water_policy/concept_path_indicators

¹⁸ Tessa Fojut and Trevor Cleak at the CVRWQCB were consulted on August 14, 2013. These CVRWQCB staff stated that the monitored coliform levels would not pose any threat to the restored marsh.

proposed restored marsh after re-routing Marsh Creek¹⁹. Table 8 in section 3.3.5 below compares the Bifenthrin concentrations to the lethal concentration values for aquatic organisms.

3.3.2 Drain water

The following constituent concentrations exceeded water quality criteria in one or more samples:

- **Methyl mercury** concentrations exceeded the Central Valley Regional Water Quality Control Board TMDL water-quality objective in all samples. These values ranged from two to twenty-four times the objective.
- **Total organic carbon (TOC)** exceeded the Delta Water Quality Objective²⁰ of 3 mg/L for all sampling events. TOC concentrations generally were an order of magnitude greater than this objective.
- **Trihalomethane formation potential** exceeded the EPA recommended MCL for all drain-water samples for all dates.

¹⁹ Tessa Fojut and Trevor Cleak at the CVRWQCB were consulted on August 14, 2013. These CVRWQCB staff stated that the pyrethroid levels are similar to those found throughout the Delta and are also not of particular ecological concern.

²⁰ The Delta Water Quality Objective for TOC was established by CALFED and documentation is available online at http://www.calwater.ca.gov/content/Documents/Draft_Final.pdf

TABLE 6
MARSH CREEK SAMPLING RESULTS

Site ID	Sample Date	Temperature °C	pH	EC µS/cm	Dissolved Oxygen mg/L	ORP mV	Turbidity NTU	Total Dissolved Solids mg/L	Total Coliform MPN/100 mL	Calcium mg/L	Magnesium mg/L	Potassium mg/L	Sodium mg/L	Chloride mg/L	Sulfate mg/L
Acute Aquatic Life Criteria ¹														860	
Chronic Aquatic Life Criteria ¹			6.5 - 9						126					230	
Ambient WQ Criteria Recommendations ²							5.2								
Human Health Criteria ³			5 - 9					250							
Maximum Contaminant Level ⁴			6.5 - 8.5	900				500	100					250	250
<i>Depth Integrated</i>															
MC-5	9/24/2012	19.95	7.76	1,863	7.32	-48.7	2.6	1,020	41,000	70	34	24	270	320	160
MC-5	10/24/2012	15.50	7.14	1,035	6.13	94.0	7.9	625	200,000	49	21	14	120	180	140
<i>Grab</i>															
MC-5	9/24/2012	19.95	7.76	1,863	7.32	-48.7	2.6	1,070	39,000	68	34	24	270	320	150
MC-5	10/24/2012	15.50	7.14	1,035	6.13	94.0	7.9	651	130,000	51	21	14	130	180	140
MC-5 duplicate	10/24/2012	15.50	7.14	1,035	6.13	94.0	7.9	623	120,000	50	21	15	120	180	140
MC-5	11/27/2012	15.32	7.58	1,965	8.57	95.9	3.1	1,100	17,000	71	39	25	270	330	180
MC-5	12/18/2012	11.21	7.08	1,428	9.57	144.4	9.2	909	16,000	82	35	10.0	180	170	270
MC-5 duplicate	12/18/2012	11.21	7.08	1,428	9.57	144.4	9.2	861	10,000	82	34	9.9	170	170	270
MC-5	1/28/2013	11.53	7.32	1,895	10.70	70.5	0.9	1,120	1,700	82	39	17	220	280	250
MC-5	2/25/2013	11.52	8.08	1,372	10.72	231.6	2.6	801	1,000	62	28	14	160	220	150
MC-5 duplicate	2/25/2013	11.52	8.08	1,372	10.72	231.6	2.6	798	1,300	60	27	14	170	220	150
MC-5	4/1/2013	17.34	7.47	987	6.70	193.4	6.6	556	41,000	60	23	9.8	110	110	160
MC-5	4/29/2013	20.83	8.32	1,613	8.33	140.1	3.6	940	8,700	88	39	20	220	260	190
MC-5 duplicate	4/29/2013	20.83	8.32	1,613	8.33	140.1	3.6	931	10,000	79	35	20	230	260	190
MC-5	5/20/2013	19.82	8.05	1,629	8.77	131.1	3.3	912	29,000	110	45	16	210	260	230
MC-5	6/24/2013	20.24	7.89	1,628	7.44	68.6	2.1	945	36,000	78	36	18	220	250	190
MC-5 duplicate	6/24/2013	20.24	7.89	1,628	7.44	68.6	2.1	945	29,000	78	36	18.0	220	250	190
MC-5	7/29/2013	20.85	7.99	1,682	7.69	44.5	0.6	970	39,000	82	36	17	210	260	170
MC-5	8/26/2013	20.92	7.60	1,871	6.56	62.1	0.0	1,060	69,000	79	39	20	260	340	200
MC-5 duplicate	8/26/2013	20.92	7.60	1,871	6.56	62.1	0.0	1,020	100,000	76	39	20.0	250	340	200

ND denotes "not detected".

Numbers in gray background exceed the Chronic Aquatic Life Criteria.

Numbers in yellow background exceed the EPA Ambient Water Quality Criteria Recommendations for Rivers and Streams.

Numbers in orange background exceed the Human Health Criteria.

Numbers in **bold** font exceed the Maximum Contaminant Level.

1 EPA Aquatic Life Criteria available at: <http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm#alttable>

2 EPA Ambient Water Quality Criteria Recommendations for Rivers and Streams, Ecoregion I available at: <http://www2.epa.gov/sites/production/files/documents/rivers1.pdf>

3 EPA Human Health Criteria available at: <http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm#hhtable>

4 EPA Maximum Contaminant Level available at: <http://water.epa.gov/drink/contaminants/upload/mcl-2.pdf> ; California Maximum Contaminant Level available at: <http://www.cdph.ca.gov/certlic/drinkingwater/Documents/DWdocuments/EPAandCDPH-11-28-2008.p>

TABLE 6 (continued)
MARSH CREEK SAMPLING RESULTS

Site ID	Sample Date	Ortho-Phosphate as P mg/L	Total Phosphorous mg/L	Methyl Mercury ng/L	Methyl Mercury (split) ng/L	Total Mercury ng/L	Total Kjeldahl Nitrogen mg/L	Ammonia as N mg/L	Nitrate as N mg/L	Nitrite as N mg/L	Dissolved Organic Carbon mg/L	Total Alkalinity as CaCO ₃ mg CaCO ₃ /L	Bicarbonate mg/L	Carbonate mg/L	Hydroxide mg/L
Acute Aquatic Life Criteria ¹				1400	1400	1400		2.9							
Chronic Aquatic Life Criteria ¹				770	770	770		0.26				20 ^a			
Ambient WQ Criteria Recommendations ²			0.077												
Human Health Criteria ³									10						
CVRWQCB TMDL ⁴				0.06	0.06										
California Public Health Goals ⁵						1200			10	1					
Maximum Contaminant Level ⁶						2000			10	1					
<i>Depth Integrated</i>															
MC-5	9/24/2012	3.4	3.9	NA	NA	1.37	0.85	0.12	8.7	NA	7.4	181	221	ND	ND
MC-5	10/24/2012	0.80	1.0	NA	NA	NA	0.94	0.13	3.1	NA	9.0	107	131	ND	ND
<i>Grab</i>															
MC-5	9/24/2012	3.5	3.6	0.027*	ND	1.21	0.90	0.084	8.7	NA	7.5	179	218	ND	ND
MC-5 duplicate	9/24/2012	NA	NA	0.043	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MC-5	10/24/2012	0.82	1.0	0.082	0.1	3.6	0.91	0.13	3.1	NA	9.2	111	135	ND	ND
MC-5 duplicate	10/24/2012	0.82	1.0	0.076	NA	3.4	0.90	0.13	3.1	NA	9.3	108	132	ND	ND
MC-5	11/27/2012	1.8	1.8	0.029	ND	1.46	0.75	0.065	9.8	ND	3.7	180	220	ND	ND
MC-5 duplicate	11/27/2012	NA	NA	0.035	NA	1.50	NA	NA	NA	NA	NA	NA	NA	NA	NA
MC-5	12/18/2012	0.67	0.85	0.063	0.079	4.39	0.46	ND	3.5	NA	4.5	165	201	ND	ND
MC-5 duplicate	12/18/2012	0.68	0.84	0.072	NA	4.34	0.54	ND	3.5	NA	4.7	160	195	ND	ND
MC-5	1/28/2013	1.7	2.2	0.045	ND	1.78	0.33	ND	8.3	NA	3.7	207	253	ND	ND
MC-5 duplicate	1/28/2013	NA	NA	0.051	NA	1.79	NA	NA	NA	NA	NA	NA	NA	NA	NA
MC-5	2/25/2013	1.40	1.6	0.032	ND	1.28	0.30	ND	5.0	NA	3.4	145	177	ND	ND
MC-5 duplicate	2/25/2013	1.40	1.6	0.020*	NA	1.33	0.26	ND	5.0	NA	3.8	143	174	ND	ND
MC-5	4/1/2013	0.71	0.63	0.122	0.186	4.50	0.50	0.1	2.1	NA	8.1	121	148	ND	ND
MC-5 duplicate	4/1/2013	NA	NA	0.130	NA	4.44	NA	NA	NA	NA	NA	NA	NA	NA	NA
MC-5	4/29/2013	2.00	2.2	0.029*	ND	1.64	0.57	0.12	8.0	NA	3.7	184	224	ND	ND
MC-5 duplicate	4/29/2013	2.00	2.2	0.033	NA	1.64	0.65	0.18	8.0	NA	3.9	183	223	ND	ND
MC-5	5/20/2013	1.60	2.5	0.043	ND	1.32	0.95	0.12	7.0	NA	3.2	184	224	ND	ND
MC-5 duplicate	5/20/2013	NA	NA	0.026*	NA	1.33	NA	NA	NA	NA	NA	NA	NA	NA	NA
MC-5	6/24/2013	2.50	2.5	0.030*	0.056	0.881	0.76	0.11	7.8	NA	2.5	184	224	ND	ND
MC-5 duplicate	6/24/2013	2.50	2.5	0.041	NA	0.883	1.10	0.19	7.8	NA	2.4	187	228	ND	ND
MC-5	7/29/2013	1.90	1.8	0.033	ND	0.927	0.63	ND	6.6	NA	3.6	188	229	ND	ND
MC-5 duplicate	7/29/2013	NA	NA	0.028*	NA	0.786	NA	NA	NA	NA	NA	NA	NA	NA	NA
MC-5	8/26/2013	1.60	1.7	ND	ND	0.614	0.68	0.12	7.0	NA	3.7	185	226	ND	ND
MC-5 duplicate	8/26/2013	1.60	1.9	ND	NA	0.598	0.59	0.15	7.0	NA	3.8	190	232	ND	ND

ND denotes "not detected".

NA denotes "not analyzed".

* signifies the sample was detected, but not quantifiable since less than the Reporting Limit.

^a minimum value.

Numbers in gray background exceed the EPA Chronic Aquatic Life Criteria.

Numbers in yellow background exceed the EPA Ambient Water Quality Criteria Recommendations for Rivers and Streams.

Numbers in green background exceed the CVRWQCB TMDL water quality objective

Numbers in **bold** font exceed the Maximum Contaminant Level.

1 EPA Aquatic Life Criteria available at: <http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm#alttable>

2 EPA Ambient Water Quality Criteria Recommendations for Rivers and Streams, Ecoregion I available at: <http://www2.epa.gov/sites/production/files/documents/rivers1.pdf>

3 EPA Human Health Criteria available at: <http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm#httable>

4 Central Valley Regional Water Quality Control Board TMDL available at: http://www.swrcb.ca.gov/rwqcb5/water_issues/tmdl/central_valley_projects/delta_hg/april_2010_hg_tmdl_hearing/apr2010_bpa_staffrpt_final.pdf

5 California Public Health Goals available at: <http://www.oehha.ca.gov/water/phg/allphgs.html>

6 California Maximum Contaminant Level available at: <http://www.cdph.ca.gov/certic/drinkingwater/Documents/DWdocuments/EPAandCDPH-11-28-2008.pdf>

TABLE 6 (continued)
MARSH CREEK SAMPLING RESULTS

Site ID		Sample Date	Chlorinated Pesticides and/or PCBs																		
			4,4'-DDD µg/L	4,4'-DDE µg/L	4,4'-DDT µg/L	Aldrin µg/L	alpha-BHC µg/L	beta-BHC µg/L	Chlordane (tech) µg/L	delta-BHC µg/L	Dieldrin µg/L	Endosulfan I µg/L	Endosulfan II µg/L	Endosulfan sulfate µg/L	Endrin µg/L	Endrin aldehyde µg/L	gamma-BHC (Lindane) µg/L	Heptachlor µg/L	Heptachlor epoxide µg/L	Methoxychlor µg/L	Toxaphene µg/L
Acute Aquatic Life Criteria ¹	Freshwater				1.1	3			2.4		0.24	0.22	0		0.086		0.95	0.52	0.52		0.73
Acute Aquatic Life Benchmark ²	Fish											0.05		1.9			0.85			7.5	
	Invertebrates											0.30		150			0.5			0.7	
Chronic Aquatic Life Criteria ¹	Freshwater				0.001				0.0043		0.056	0.056	0.056		0.036			0.0038	0.0038	0.03	0.0002
Chronic Aquatic Life Benchmark ²	Fish											0.11					2.9				
	Invertebrates											0.01					54				
Human Health Criteria ³	Water		0.00031	0.00022	0.00022	5E-06	0.0049	0.017	0.00081		5.4E-05	89	89	89	0.06	0.3	2	0.000079	0.000039		0.00028
	Water + Organism		0.00031	0.00022	0.00022	4.9E-05	0.0026	0.0091	0.0008		5.2E-05	62	62	62	0.059	0.29	1	0.000079	0.000039	100	0.00028
California Public Health Goals ⁴									0.03						1.8		0.032	0.008	0.006	0.09	0.03
Maximum Contaminant Level ⁵									0.1						2		0.2	0.01	0.0	30	3
Depth Integrated																					
MC-5	9/24/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5	10/24/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Grab																					
MC-5	9/24/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5	10/24/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5 duplicate	10/24/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5	11/27/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5	12/18/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5 duplicate	12/18/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5	1/28/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5	2/25/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5 duplicate	2/25/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5	4/1/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5	4/29/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5 duplicate	4/29/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5	5/20/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5	6/24/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5 duplicate	6/24/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5	7/29/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5	8/26/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5 duplicate	8/26/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

ND denotes "not detected".

1 EPA Aquatic Life Criteria available at: <http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm#alttable>

2 EPA Office of Pesticide Programs' Aquatic Life Benchmarks available at: http://www.epa.gov/oppefed1/ecorisk_ders/aquatic_life_benchmark.htm

3 EPA Human Health Criteria available at: <http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm#hhtable>

4 California Public Health Goals available at: <http://www.oehha.ca.gov/water/phg/allphgs.html>

5 California Maximum Contaminant Level available at: <http://www.cdph.ca.gov/certificdrinkingwater/Documents/DWdocuments/EPAandCDPH-11-28-2008.pdf>

TABLE 6 (continued)
MARSH CREEK SAMPLING RESULTS

Site ID	Sample Date	Chlorinated Herbicides																
		2,4,5-T µg/L	2,4,5-TP (Silvex) µg/L	2,4-D µg/L	2,4-DB µg/L	3,5- Dichlorobenzoic Acid µg/L	4- Nitrophenol µg/L	Acifluorfen µg/L	Bentazoa µg/L	Dalapon µg/L	DCPA µg/L	Dicamba µg/L	Dichloroprop µg/L	Dinoseb µg/L	MCPA µg/L	MCP µg/L	Pentachloro- phenol µg/L	Picloram µg/L
Acute Aquatic Life Criteria ¹	Freshwater																19	
Acute Aquatic Life Benchmark ²	Fish			12,075	1,000			8,500	> 50,000		15,000	14,000					47.5	6,500
	Invertebrates			12,500	7,500			14,050	>50,000		13,500	17,300				>45,500	25	34,150
Chronic Aquatic Life Criteria ¹	Freshwater																15	
Chronic Aquatic Life Benchmark ²	Fish			14,200				<1,500									550	
	Invertebrates			16,050												50,800		11,800
Human Health Criteria ³	Water																3	
	Water + Organism																0.27	
California Public Health Goals ⁴			25	20					200	790				14			0.3	500
Maximum Contaminant Level ⁵			50	70					18	200				7			1	500
Depth Integrated																		
MC-5	9/24/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5	10/24/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Grab																		
MC-5	9/24/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5	10/24/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5 duplicate	10/24/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5	11/27/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5	12/18/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5 duplicate	12/18/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5	1/28/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5	2/25/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5 duplicate	2/25/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5	4/1/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5	4/29/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5 duplicate	4/29/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5	5/20/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5	6/24/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5 duplicate	6/24/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5	7/29/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5	8/26/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5 duplicate	8/26/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

ND denotes "not detected".

1 EPA Aquatic Life Criteria available at: <http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm#alttable>

2 EPA Office of Pesticide Programs' Aquatic Life Benchmarks available at: http://www.epa.gov/oppefed1/ecorisk_ders/aquatic_life_benchmark.htm

3 EPA Human Health Criteria available at: <http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm#hhtable>

4 California Public Health Goals available at: <http://www.oehha.ca.gov/water/phg/allphgs.html>

5 California Maximum Contaminant Level available at: <http://www.cdph.ca.gov/certlic/drinkingwater/Documents/DWdocuments/EPAandCDPH-11-28-2008.pdf>

TABLE 6 (continued)
MARSH CREEK SAMPLING RESULTS

Site ID		Sample Date	Pyrethriod Pesticides														
			Allenthrin ng/L	Bifenthrin ng/L	Cyfluthrin ng/L	Cypermethrin ng/L	Deltamethrin/ Tralomethrin ng/L	Dichloran ng/L	Esfenvalerate ng/L	Fenpropathrin (Danitol) ng/L	Fenvalerate ng/L	L-Cyhalothrin ng/L	Pendimethali n ng/L	Permethrin ng/L	Prallethrin ng/L	Sumithrin ng/L	Tefluthrin ng/L
Acute Aquatic Life Criteria ¹	Freshwater																
	Fish			75	34	195	290		35	1,100		105	69,000	395	6,000	7,900	
Benchmark ²	Invertebrates			800	12.5	210	55		25	265		3.5	140,000	10	3,100	2,200	
Chronic Aquatic Life Criteria ¹	Freshwater																
	Fish			40	10	140	17		35	91		31	6,300	51.5	3,000	1,100	
Benchmark ²	Invertebrates			1.3	7	69	4.1		17	64		2	14,500	1.4	325	470	
Human Health Criteria ³	Water																
	Water + Organism																
Depth Integrated																	
MC-5		9/24/2012	ND	10	ND	ND	ND	7.7	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5		10/24/2012	ND	11	ND	ND	ND	ND	ND	ND	ND	ND	6.1	ND	ND	ND	ND
Grab																	
MC-5		9/24/2012	ND	12	ND	ND	ND	8.6	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5		10/24/2012	ND	15	ND	ND	ND	ND	ND	ND	ND	ND	6.7	ND	ND	ND	ND
MC-5 duplicate		10/24/2012	ND	18	ND	ND	ND	ND	ND	ND	ND	ND	7.6	ND	ND	ND	ND
MC-5		11/27/2012	ND	ND	ND	ND	ND	6.3	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5		12/18/2012	ND	33	ND	ND	ND	6.2	ND	ND	ND	ND	100	ND	ND	ND	ND
MC-5 duplicate		12/18/2012	ND	39	ND	ND	ND	6.7	ND	ND	ND	ND	110	ND	ND	ND	ND
MC-5		1/28/2013	ND	3.5	ND	ND	ND	8.1	ND	ND	ND	ND	9.9	ND	ND	ND	ND
MC-5		2/25/2013	ND	ND	ND	ND	ND	3.2	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5 duplicate		2/25/2013	ND	ND	ND	ND	ND	2.5	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5		4/1/2013	ND	4.5	ND	ND	ND	ND	ND	ND	ND	ND	24	ND	ND	ND	ND
MC-5		4/29/2013	ND	ND	ND	ND	ND	2.7	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5 duplicate		4/29/2013	ND	ND	ND	ND	ND	2.5	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5		5/20/2013	ND	4.6	ND	ND	ND	3.0	ND	ND	ND	ND	ND	ND	ND	57	ND
MC-5		6/24/2013	ND	ND	ND	ND	ND	3.9	ND	ND	ND	ND	2.1	ND	ND	ND	ND
MC-5 duplicate		6/24/2013	ND	ND	ND	ND	ND	4.1	ND	ND	ND	ND	2.0	ND	ND	ND	ND
MC-5		7/29/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5		8/26/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11	ND
MC-5 duplicate		8/26/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	14	ND

ND denotes "not detected".

Numbers in gray background exceed the Chronic Aquatic Life Benchmarks.

1 EPA Aquatic Life Criteria available at: <http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm#altable>

2 EPA Office of Pesticide Programs' Aquatic Life Benchmarks available at: http://www.epa.gov/oppefed1/ecorisk_ders/aquatic_life_benchmark.htm

3 EPA Human Health Criteria available at: <http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm#hhtable>

TABLE 6 (continued)
MARSH CREEK SAMPLING RESULTS

Site ID		Sample Date	Organophosphorus Pesticides																								
			Axinphos methyl (Guthion) µg/L	Bolstar µg/L	Chlorpyrifos µg/L	Coumaphos µg/L	Demeton-o µg/L	Demeton-s µg/L	Diazinon µg/L	Dichlorvos µg/L	Dimethoate µg/L	Disulfoton µg/L	Ethoprop µg/L	Ethyl parathion µg/L	Fensulfothion µg/L	Fenthion µg/L	Malathion µg/L	Merphos µg/L	Methyl parathion µg/L	Mevinphos µg/L	Naled µg/L	Phorate µg/L	Ronnel µg/L	Stirophos µg/L	Thionazin µg/L	Tokuthion (Prothiofos) µg/L	Trichloronate µg/L
Acute Aquatic Life Criteria ¹	Freshwater								0.17																		
	Fish				0.9	140			< 0.55	79.5	3,100	19.5	150			415	16.4		925		46	1.18					
Benchmark ²	Invertebrates				0.05	0.037			0.17	0.035	21.5	1.95	22			2.6	0.3		0.49			0.3					
Chronic Aquatic Life Criteria ¹	Freshwater		0.01				0.01	0.01	0.17								0.1										
Chronic Aquatic Life	Fish				0.57	11.7			0.11	5.2	430	4	24			7.5	8.6		<10		2.9	0.34					
Benchmark ²	Invertebrates				0.04	0.037			3,700	0.0058	0.5	0.01	0.8			0.013	0.035		0.25		0.045	0.21					
Human Health Criteria ³	Water																										
	Water + Organism																										
Depth Integrated																											
MC-5		9/24/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5		10/24/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Grab																											
MC-5		9/24/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5		10/24/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5 duplicate		10/24/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5		11/27/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5		12/18/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5 duplicate		12/18/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5		1/28/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5		2/25/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5 duplicate		2/25/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5		4/1/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5		4/29/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5 duplicate		4/29/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5		5/20/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5		6/24/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5 duplicate		6/24/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5		7/29/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5		8/26/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MC-5 duplicate		8/26/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

ND denotes "not detected".

1 EPA Aquatic Life Criteria available at: <http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm#altable>

2 EPA Office of Pesticide Programs' Aquatic Life Benchmarks available at: http://www.epa.gov/oppefed1/ecorisk_ders/aquatic_life_benchmark.htm

3 EPA Human Health Criteria available at: <http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm#hhtable>

TABLE 7
DRAIN WATER SAMPLING RESULTS

Site ID	Sample Date	Temperature °C	pH	EC µS/cm	Dissolved Oxygen mg/L	ORP mV	Turbidity NTU	Methyl Mercury ng/L	TOC mg/L	DOC mg/L	Trihalomethane Formation Potential µg/L
Acute Aquatic Life Criteria ¹											
Chronic Aquatic Life Criteria ¹			6.5 - 9								
Human Health Criteria ²			5 - 9								
CVRWQCB TMDL ³								0.06			
Delta Water Quality Objective ⁴									3		
Maximum Contaminant Level ⁵			6.5-8.5	900							80
<i>Emerson</i>											
Emerson	9/24/2012	19.18	7.25	2,145	3.55	-106.0	5.6	0.114	24	23	NA
Emerson	10/1/2012	17.02	7.27	2,648	2.45	-31.0	10.0	NA	NA	15	1,100
Emerson	10/24/2012	14.74	7.71	2,809	6.74	51.7	42.3	0.205	23	23	NA
Emerson	11/27/2012	10.18	7.25	2,641	6.69	38.9	21.2	0.091	17	16	1,300
Emerson	12/18/2012	10.32	7.22	3,787	5.66	-2.4	107.5	0.643	38	35	1,400
Emerson	1/28/2013	10.35	7.54	3,409	8.78	-0.6	48.1	0.229	13	39	1,700
Emerson	2/25/2013	8.69	7.24	2,885	7.70	112.6	51.3	0.115	26	26	1,300
Emerson	4/1/2013	15.98	7.33	2,275	2.91	192.4	13.2	0.163	27	31	1,700
Emerson	4/29/2013	24.15	7.41	3,172	6.14	181.4	15.0	0.156	24	25	1,900
Emerson	5/20/2013	21.53	7.46	2,933	3.13	66.7	30.6	0.090	16	15	1,200
Emerson	6/24/2013	19.11	7.37	1,988	2.50	20.4	8.8	0.181	11	10	1,500
Emerson	7/29/2013	21.14	7.46	1,595	2.58	-6.7	13.4	0.197	23	24	1,300
Emerson	8/26/2013	21.30	7.69	2,480	2.09	-31.0	2.0	0.255	29	31	1,700
<i>Gilbert</i>											
Gilbert	9/24/2012	19.01	7.51	2,295	3.50	-103.7	3.8	0.904	25	23	NA
Gilbert	10/1/2012	18.63	7.64	2,055	2.43	-51.0	10.3	NA	NA	19	1,400
Gilbert	10/24/2012	14.32	7.45	2,331	2.26	51.6	6.1	1.110	23	23	NA
Gilbert	11/27/2012	10.91	7.16	1,915	3.59	65.6	7.2	0.583	25	25	1,800
Gilbert	12/18/2012	9.13	7.46	3,038	5.37	13.6	11.9	0.343	30	28	1,500
Gilbert	1/28/2013	9.88	7.11	2,773	8.77	10.4	9.2	0.281	19	17	1,200
Gilbert	2/25/2013	9.16	8.07	2,678	9.97	230.7	14.3	0.193	18	18	1,500
Gilbert	4/1/2013	21.32	7.92	2,240	4.33	206.9	9.7	0.306	31	33	1,800
Gilbert	4/29/2013	23.71	7.65	1,485	6.05	122.3	13.8	0.976	19	19	1,500
Gilbert	5/20/2013	22.98	7.35	1,042	3.64	162.5	5.0	0.730	24	23	1,500
Gilbert	6/24/2013	18.64	7.21	1,117	2.93	158.7	8.8	0.554	20	19	1,600
Gilbert	7/29/2013	20.95	8.03	1,497	10.07	37.8	11.7	0.285	20	19	1,500
Gilbert	8/26/2013	22.25	7.67	2,058	8.81	55.1	9.6	0.350	19	19	1,600
<i>Burroughs</i>											
Burroughs	9/24/2012	22.29	7.77	2,342	4.54	-96.8	20.5	0.298	21	21	NA
Burroughs	10/1/2012	17.94	7.71	2,208	1.04	-41.2	4.0	NA	NA	12	1,000
Burroughs	10/24/2012	14.19	7.05	1,009	3.02	108.9	4.8	0.242	13	12	NA
Burroughs	11/27/2012	9.98	7.46	1,888	2.53	-59.8	21.0	0.278	18	18	1,300
Burroughs	12/18/2012	9.26	7.10	1,883	4.15	28.9	2.4	0.320	29	28	1,400
Burroughs	1/28/2013	11.08	7.92	2,559	11.18	-47.9	27.0	0.190	32	13	1,000
Burroughs	2/25/2013	13.95	7.84	1,897	12.93	183.2	12.0	0.191	12	12	1,000
Burroughs	4/1/2013	17.74	7.47	1,440	7.08	147.7	6.4	0.421	15	14	1,300
Burroughs	4/29/2013	26.23	7.82	2,215	7.33	116.0	6.6	0.339	11	11	910
Burroughs	5/20/2013	24.46	8.00	1,575	9.42	82.6	5.3	0.287	10	9	810
Burroughs	6/24/2013	19.80	7.08	836	1.42	113.8	3.3	1.460	15	13	1,400
Burroughs	7/29/2013	20.88	7.86	2,018	7.47	18.0	4.2	0.455	17	17	1,100
Burroughs	8/26/2013	20.94	7.61	1,907	17.90	1.6	5.5	0.411	11	11	990

NA denotes "not analyzed".

Numbers in green background exceed the CVRWQCB TMDL water quality objective.

Numbers in blue background exceed the Delta Water Quality Objective.

Numbers in **bold** font exceed the Maximum Contaminant Level.

1 EPA Aquatic Life Criteria available at: <http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm#alttable>

2 EPA Human Health Criteria available at: <http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm#hhtable>

3 Central Valley Regional Water Quality Control Board TMDL available at: http://www.swrcb.ca.gov/rwqcb5/water_issues/tmdl/central_valley_projects/delta_hg/april_2010_hg_tmdl_hearing/apr2010_bpa_staffrpt_final.pdf

4 Delta Water Quality Objective available at: http://www.calwater.ca.gov/content/Documents/Draft_Final.pdf

5 California Maximum Contaminant Level available at: <http://www.cdph.ca.gov/certic/drinkingwater/Documents/DWdocuments/EPAandCDPH-11-28-2008.pdf>

3.3.3 Methyl Mercury

In 2010, the Central Valley Regional Water Quality Control Board proposed an implementation plan to reduce MeHg concentrations in Delta channels²¹. Available data indicate that achieving an annual average MeHg concentration of 0.06 ng/L²² in ambient Delta waters should enable attainment of proposed fish tissue concentration objectives. Figure 5 shows the temporal variability in MeHg concentrations for the Marsh Creek and drain-water samples.

From September 2012 through August 2013, the average MeHg concentration was 0.058 ng/L²³ in Marsh Creek samples. Values ranged from below the reporting limit to 0.186 ng/L. Marsh Creek MeHg concentrations were highest in the April 1, 2013 samples which also corresponded to the largest measured flow shown in Figure 3. Methyl mercury concentrations were consistently higher in the drain-water samples relative to Marsh Creek samples (Figure 5) and nearby San Joaquin River samples where previously reported concentrations ranged from 0.05 – 0.25 ng/L²⁴.

Drain-water MeHg sample concentrations averaged 0.203, 0.551, and 0.408 ng/L for Emerson, Gilbert, and Burroughs, respectively. Among the three parcels MeHg concentrations were highest in samples collected from the Burroughs drain. In the Emerson main drain, MeHg concentrations were highest during December 2012 when drain flow was large due to precipitation (Figures 3 and 4). In the Gilbert drain, MeHg concentrations were highest during October 2012. Methyl mercury concentrations in samples collected from the Burroughs main drain, were highest during the June 2013 sampling event which corresponded to the lowest estimated drain flow.

3.3.4 Dissolved Organic Carbon

Entrainment of increased DOC concentrations in drinking water diversions is possible if DOC is exported from the restoration site to the CCWD drinking water intake at Rock Slough. The objective of baseline sampling is to determine DOC concentrations and loads for comparison with project conditions. Figure 6 shows that DOC concentrations in Marsh Creek were low relative to drain-water samples and generally decreased from September 2012 through August 2013. The highest DOC concentration was observed in October 2012. A relatively large concentration was measured on the April 1, 2013 following precipitation.

²¹ Wood M, Morris P, Cooke J, Louis S (2010). Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins for the Control of Methylmercury and Total Mercury in the Sacramento-San Joaquin Delta Estuary, Staff Report. Sacramento: Central Valley Regional Water Quality Control Board. Available online at http://www.swrcb.ca.gov/rwqcb5/water_issues/tmdl/central_valley_projects/delta_hg/april_2010_hg_tmdl_hearing/apr2010_bpa_staffrpt_final.pdf

²² Nanograms/liter, which is equal to 1 part per trillion.

²³ The calculation of average value uses half the detection limit for non-detect values.

²⁴ Deverel and others, 2013, Annual Progress Report for Twitchell Rice Project, 2011.

Among the parcels, the highest DOC concentrations were measured in the Emerson drain-water samples (the average concentration was 24 mg/L). This is likely due to the large area of organic and highly organic mineral soils there. Dissolved organic carbon concentrations in the Emerson drain-water samples generally increased from September 2012 through January 2013 and then decreased from February through June 2013. Concentrations then increased from June through August 2013.

Slightly lower concentrations were measured in Gilbert drain-water samples (the average concentration was 22 mg/L) where there are also organic soils. Dissolved organic carbon concentrations in the Gilbert drain-water samples generally increased between September and December 2012. Similar to Emerson, peak concentrations were measured in drain-water samples collected during April 1, 2013 soon after precipitation.

Dissolved organic carbon concentrations in the Burroughs drain-water samples were the lowest of the three parcels (the average was 14 mg/L). Organic soils are generally absent on Burroughs. Concentrations increased between October and December 2012, decreased from January to May 2013, and increased between May and July 2013 when the highest drain flow was estimated.

3.3.5 Pesticides and Herbicides

During September 2012 through August 2013, four pesticides were detected in Marsh Creek samples, Bifenthrin, Dichloran, Pendimethalin, and Sumithrin. Bifenthrin, Dichloran, Pendimethalin, and Sumithrin are pyrethroid pesticides. Bifenthrin is permitted for ant control and has been historically used in Contra Costa County for crops and for landscape maintenance and structural pest control²⁵. Dichloran is a pre- and post-harvest fungicide. There is no historical application record of this pesticide in Contra Costa County. Pendimethalin is an herbicide which in Contra Costa County has historically been applied to crops, landscapes, and right-of-ways²⁶. Sumithrin, also known as d-phenothrin, is an insecticide and has been historically applied for landscape maintenance and structural pest control²⁷.

Marsh Creek concentrations of Bifenthrin ranged from less than detect to 36 ng/L (average of duplicate samples) measured in December 2012. The September, October, and December 2012 and January, April 1, and May 2013 Bifenthrin concentrations exceeded the chronic aquatic life benchmark (1.3 ng/L) for invertebrates established by the EPA. In addition to the EPA benchmark value, Table 8 lists lethal concentrations for various aquatic organisms. The detected

²⁵ Department of Pesticide Regulation. 2011 Annual Pesticide Use Report Indexed by Chemical. Contra Costa County. Available online at <http://www.cdpr.ca.gov/docs/pur/purmain.htm>

²⁶ *ibid*

²⁷ *ibid*

Bifenthrin concentration values are less than the lethal concentration for all species, except bees, opossum shrimp and insects (mosquitos and mudge). CVRWQCB staff²⁸ stated that the pyrethroid levels are similar to those found throughout the Delta, and are also not of particular ecological concern. Re-routing Marsh Creek through the restored marsh will not increase levels of pyrethroids, but instead may decrease levels in waterways due to an accumulation in marsh sediments.

Table 8. Bifenthrin Lethal Concentrations in Aquatic Organisms	
Organism	Lethal Concentration (ng/L^a)
<i>Daphnia magna</i>	LC ₅₀ ^b = 320 ^c
<i>Ceriodaphnia dubia</i>	LC ₅₀ = 70 ^c
Bees	LC ₅₀ = 15 to 100 ^d
Copepods	LD ^e = 90 ^c
Cladocerans	LD = 39,000 ^c
Opossum Shrimp	LC ₅₀ = 4 ^f
Grass Shrimp	LC ₅₀ = 150 ^f
Insects (Mosquito, Mudge)	LC ₅₀ = 1.6 to 651,000 ^f
Trout	LC ₅₀ = 150 ^f
Bluegill	LC ₅₀ = 340 ^f

a) Nanograms/liter

b) LC₅₀ is the concentration lethal to 50% of organisms

c) Value from Fecko A (1999) Environmental Fate of Bifenthrin. Available online at: <http://www.cdpr.ca.gov/docs/emon/pubs/fatememo/bifentn.pdf>

d) Value from National Pesticide Information Center, Bifenthrin Technical Fact Sheet. Available online at: <http://npic.orst.edu/factsheets/biftech.pdf>

e) LD is the lethal dose

f) Value from U.S. Environmental Protection Agency ECOTOX database. Available online at: <http://cfpub.epa.gov/ecotox/>

3.4 Loads

We used the monthly main drain discharge estimates (Table 5) to calculate drain-water loads from the Emerson, Gilbert and Burroughs parcels. Table 9 shows the MeHg, DOC, total dissolved solids (TDS), and THMFP loads. Figure 7 shows the temporal variability in MeHg and DOC loads for the three parcels. We used the measured Marsh Creek flow estimates (see Table 4) to calculate Marsh Creek loads. Table 10 shows the MeHg, DOC, and TDS loads.

²⁸ Tessa Fojut and Trevor Cleak were consulted on August 14, 2013 by the Department of Water Resources and HydroFocus

Table 9. Calculated Drain Loads.							
Pump Station	Begin Date	End Date	Drain Discharge (AF) ^a	MeHg Load (µg/ac) ^b	DOC Load (kg/ac) ^c	TDS Load (kg/ac) ^c	THMFP Load (g/ac) ^d
Emerson	8/31/2012	10/1/2012	53	16.1	2.7	217.6	155.8
	10/2/2012	10/30/2012	29	15.7	1.5	138.6	NC
	10/31/2012	12/2/2012	61	14.7	2.6	275.5	210.6
	12/3/2012	12/31/2012	109	186.8	10.2	717.3	406.7
	1/3/2013	1/31/2013	51	30.9	5.3	299.1	229.5
	2/1/2013	3/4/2013	41	12.4	2.8	200.8	140.0
	3/5/2013	4/2/2013	54	23.3	4.4	207.8	242.9
	4/3/2013	4/30/2013	85	35.3	5.7	465.1	429.7
	5/1/2013	5/2/2013	2.8	1.2	0.2	15.3	14.1
	5/3/2013	6/3/2013	63	15.1	2.5	317.5	201.0
	6/4/2013	7/2/2013	49	23.5	1.3	163.9	194.8
	7/3/2013	8/1/2013	55	28.9	3.5	146.3	190.6
	8/2/2013	9/2/2013	67	45.2	5.5	282.4	301.5
Gilbert	8/31/2012	10/1/2012	24	98.2	2.3	150.7	152.0
	10/2/2012	10/30/2012	23	112.0	2.1	141.2	NC
	10/31/2012	12/2/2012	29	76.9	3.3	159.9	237.4
	12/3/2012	12/31/2012	78	120.5	9.8	691.1	527.1
	1/3/2013	1/31/2013	22	27.8	1.7	176.7	118.6
	2/1/2013	3/4/2013	10	8.5	0.8	75.9	66.0
	3/5/2013	4/2/2013	8.4	11.5	1.2	53.7	67.5
	4/3/2013	5/2/2013	41	180.4	3.5	170.8	277.3
	5/3/2013	6/3/2013	43	139.4	4.4	119.7	286.5
	6/4/2013	7/2/2013	37	91.0	3.1	111.2	262.8
	7/3/2013	8/1/2013	33	42.8	2.9	139.9	225.2
	8/2/2013	9/2/2013	36	56.3	3.1	210.5	257.3
Burroughs	9/6/2012	10/4/2012	119	137.0	5.5	668.6	459.7
	10/5/2012	11/5/2012	70	65.5	3.3	163.7	NC
	11/6/2006	12/5/2012	77	82.9	5.4	356.1	387.5
	12/6/2012	12/31/2012	121	149.6	13.1	556.8	654.4
	1/6/2013	2/6/2013	66	48.5	3.3	420.1	255.4
	2/7/2013	3/8/2013	45	33.2	2.1	208.6	173.7
	3/9/2013	4/5/2013	78	126.1	4.5	267.6	389.3
	4/6/2013	4/30/2013	139	181.7	5.9	758.1	487.9
	5/8/2013	6/6/2013	161	177.9	5.7	610.4	502.2
	6/7/2013	7/8/2013	0	0	0	0	0
	7/9/2013	7/31/2013	239	420.1	15.7	1,184	1,016
	8/1/2013	8/8/2013	83	146.1	5.5	411.6	353.3
	8/9/2013	9/6/2013	115	182.9	4.9	537.2	440.5

NC: Not calculated

a) Total acre-feet from the beginning to ending date

b) Micrograms/acre

c) Kilograms/acre

d) grams/acre

The values in Table 9 and Figure 7 are generally consistent with loads reported for MeHg, DOC and THMFP for other Delta islands.²⁹ At the Emerson drain, MeHg, DOC, and TDS loads were highest during December 2012, whereas trihalomethane formation potential loads were highest during April 2013. At the Gilbert drain, DOC, TDS, and trihalomethane formation potential loads were highest during December 2012, whereas MeHg loads were highest during April 2013. At the Burroughs drain, MeHg, DOC, TDS, and trihalomethane formation potential loads were all highest during July 2013. The large loads measured in December and July are inconsistent with data collected on Twitchell Island where loads were at a maximum during late winter and early spring.³⁰ The difference is likely due to high relatively high precipitation during the fall of 2012 and substantially lower than average rainfall during the winter and early spring 2013. The large DOC loads measured in April after precipitation at the Emerson and Gilbert drains are more consistent with trends observed on Twitchell Island³¹ and likely the result of flushing of DOC from soils by precipitation.

Table 10. Calculated Marsh Creek Loads				
Sample Date	Marsh Creek Flow (cfs) ^a	MeHg Load (ng/s) ^b	DOC Load (g/s) ^c	TDS Load (g/s) ^c
9/24/2012	5.6	5.56	1.18	166.0
10/24/2012	8.1	19.6	2.09	144.5
11/27/2012	3.4	3.05	0.35	105.0
12/18/2012	10.2	20.6	1.33	255.6
1/28/2013	8.0	10.8	0.83	252.4
2/25/2013	8.1	5.99	0.83	184.3
4/1/2013	14.9	61.6	3.42	234.7
4/29/2013	5.9	5.14	0.63	155.0
5/20/2013	4.2	4.11	0.38	108.7
6/24/2013	2.9	3.42	0.20	76.3
7/29/2013	5.0	4.34	0.51	137.9
8/26/2013	5.1	2.03	0.54	150.5

a) Cubic feet per second measured at MC-5 site (see Table 4)

b) Nanograms/second

c) Grams/second

Table 10 shows that Marsh Creek methyl mercury and DOC loads were highest during the April 1st sampling event, and TDS loads were highest during the December sampling event.

²⁹ Deverel SJ, Leighton DA, Finlay MR (2007) Processes Affecting Agricultural Drainwater Quality and Organic Carbon Loads in California's Sacramento-San Joaquin Delta. *San Francisco Estuary and Watershed Science* 5(2): Article 2;

Heim, W. A., Deverel, S., Ingrum, T., Piekarski, W., & Stephenson, M. (2009). Assessment of Methylmercury Contributions from Sacramento-San Joaquin Delta Farmed Islands. Report submitted to Chris Foe and the Central Valley Regional Water Quality Control Board.

³⁰ *ibid*

³¹ *ibid*

Appendix D contains all laboratory analytical reports used to prepare this report. Appendix E discusses the quality assurance and control assessment of the laboratory analytical results.

4.0 SUMMARY AND CONCLUSIONS

Baseline water quality monitoring for the Dutch Slough Project will 1) guide development of wetland land- and water-management practices to minimize export of water-quality constituents of concern from the Dutch Slough Project, 2) determine the viability of diverting Marsh Creek onto the Emerson Parcel and 3) be used to guide future monitoring for and implementation of future Delta restoration projects. During September 2012 through August 2013, HydroFocus collected monthly drain-water samples on the Emerson, Gilbert and Burroughs parcels and Marsh Creek water samples.

As per the QAPP approved by EPA, drain-water samples were analyzed for dissolved organic carbon, trihalomethane formation potential and methyl mercury. Field parameters (pH, electrical conductivity, temperature, turbidity, oxidation-reduction potential and dissolved oxygen) were measured at each of the three parcel main drains where samples were collected. Drain flow was estimated using PG&E records and pump test results. The primary objective of these data collection efforts is to estimate constituent concentrations and loads for baseline conditions for comparison with Dutch Slough restoration conditions.

Samples collected from Marsh Creek were analyzed for pesticides, major ions and cations, methyl mercury, coliform bacteria, dissolved organic carbon, and field parameters listed in the previous paragraph. The primary objective of the Marsh Creek sampling is to provide information for planning of rerouting of Marsh Creek onto the Emerson Parcel. We also measured flow during sampling events in Marsh Creek. The following bullets summarize the September 2012 to August 2013 monitoring results.

- Marsh Creek flow ranged from 2.9 to 14.9 cubic feet per second. Maximum flow was measured on April 1, 2013 immediately after a precipitation event; the lowest flow was measured on June 24, 2013.
- Monthly drain discharge for the Emerson, Gilbert and Burroughs parcels was estimated from electrical consumption records and using pump test results. Values ranged from 0 to 239 acre feet. The highest discharge occurred during December 2012 at the Emerson and Gilbert drains and during July at the Burroughs drain.

Constituent concentrations in water quality samples were compared with EPA Aquatic Life Criteria and Aquatic Life Benchmarks, California EPA Public Health Goals and Maximum Contaminant Levels and Central Valley Regional Water Quality Board objectives for methyl mercury.

- In Marsh Creek samples:
 - Coliform bacteria levels exceeded the chronic aquatic life criterion but counts are consistent with other reported values for the San Joaquin River basin and will not be detrimental to rerouting of Marsh Creek onto the Emerson Parcel.
 - Chloride concentrations in samples from eight of the 12 sampling events exceeded the chronic aquatic life criterion;
 - Total phosphorous exceeded the ambient water quality criterion recommendations for all sampling events and;
 - Pyrethroid pesticide Bifenthrin concentrations exceeded the US EPA chronic aquatic life criteria for invertebrates in the samples from 6 of the 12 sampling events. However, the concentration was lower than most EPA documented LC₅₀ levels for invertebrates. Pyrethroids are prevalent throughout much of the Delta at similar or higher levels than those determined in Marsh Creek and do not represent an obstacle for diversion of the creek onto the Emerson Parcel.
- In drain-water samples collected on Emerson, Gilbert and Burroughs:
 - Methyl mercury concentrations exceeded the Central Valley Regional Water Quality Control Board water-quality objective for all samples.
 - Total organic carbon exceeded the Delta Water Quality Objective for all samples.

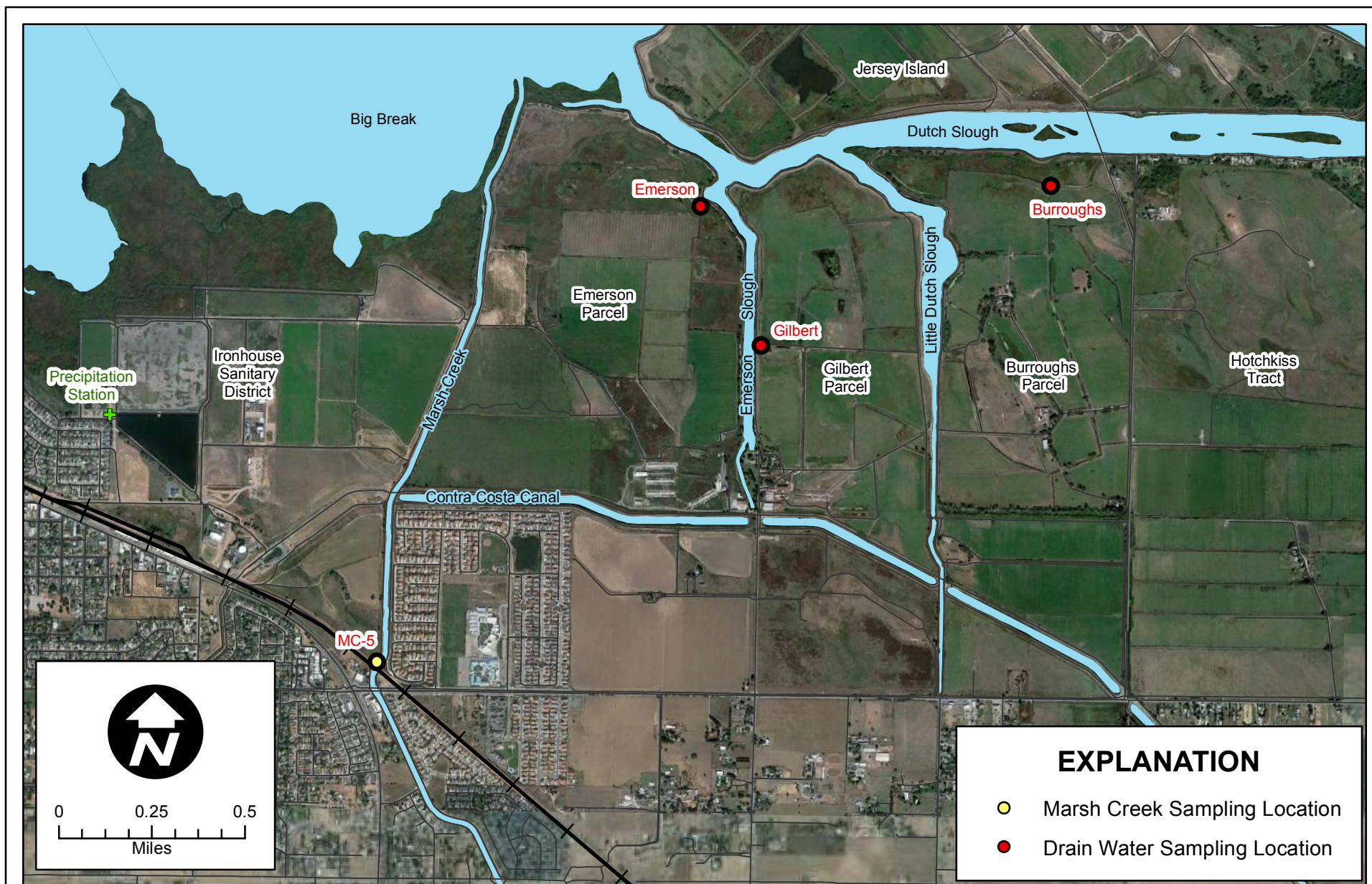
Concentrations of organic carbon and methyl mercury were consistent with those measured on other farmed Delta islands.

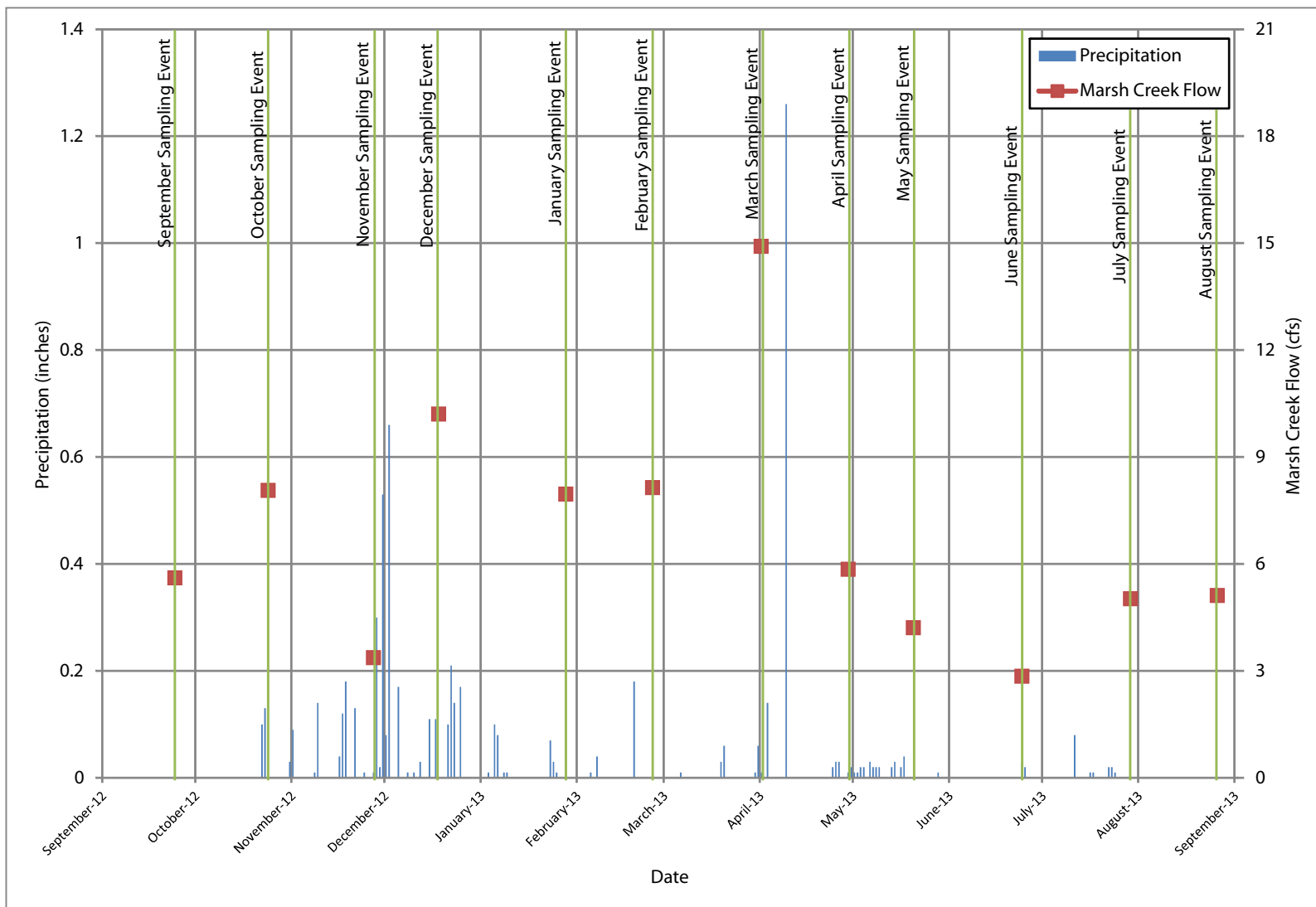
- Estimated monthly drain loads on Emerson, Gilbert and Burroughs were as follows:
 - Methyl mercury loads ranged from 0 to 420 micrograms/acre and averaged 35 micrograms/acre at the Emerson drain, 80 micrograms/acre at the Gilbert drain, and 134 micrograms/acre at the Burroughs drain;
 - Dissolved organic carbon loads ranged from 0 to 15.7 kilograms/acre and averaged 3.7 kilograms/acre at the Emerson drain, 3.2 kilograms/acre at the Gilbert drain, and 5.8 kilograms/acre at the Burroughs drain;
 - Trihalomethane formation potential loads ranged from 0 to 1,016 grams/acre and averaged 210 grams/acre at the Emerson drain, 208 grams/acre at the Gilbert drain, and 403 grams/acre at the Burroughs drain.

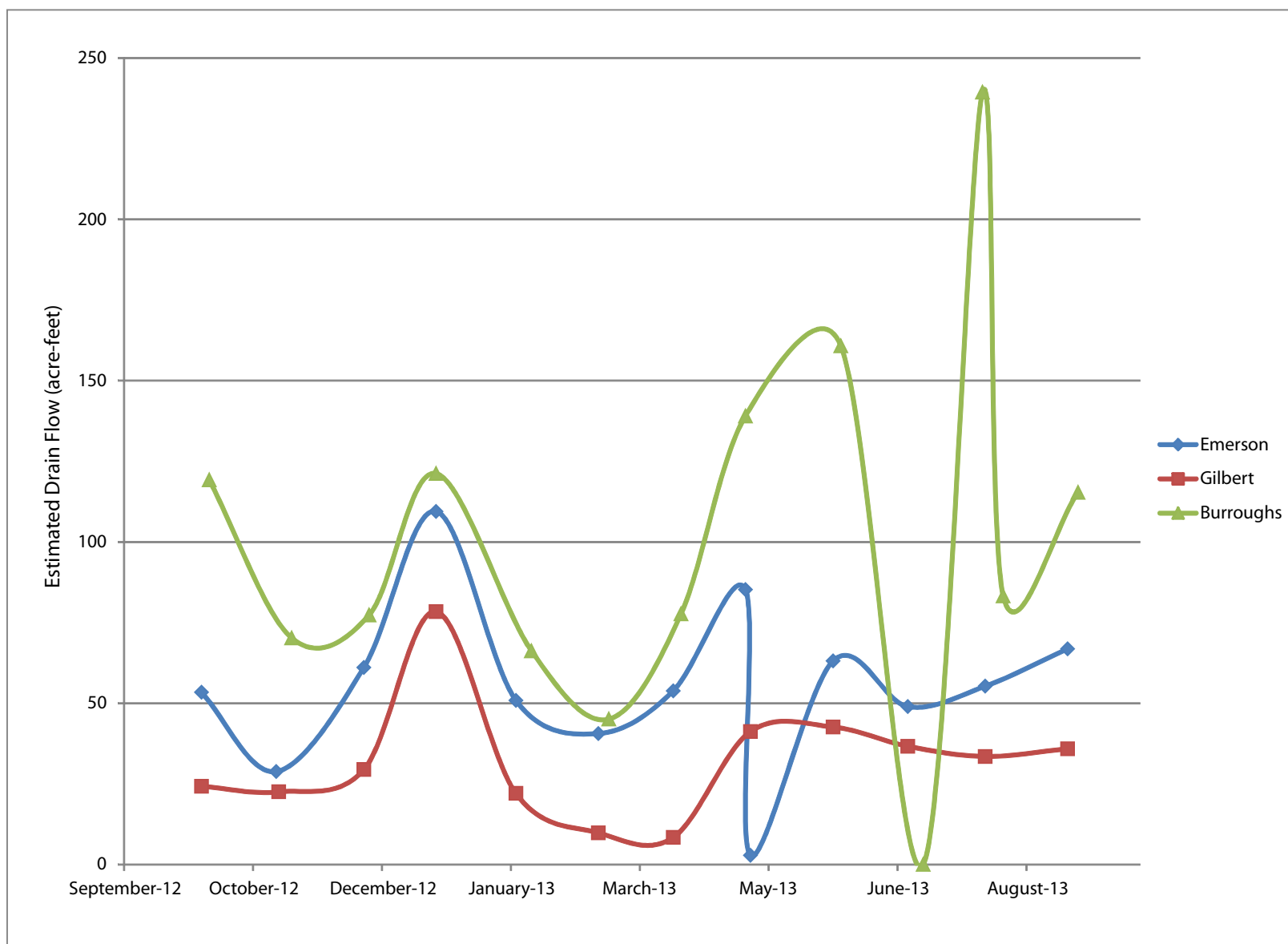
These loads are within the range of values reported for other farmed Delta islands.

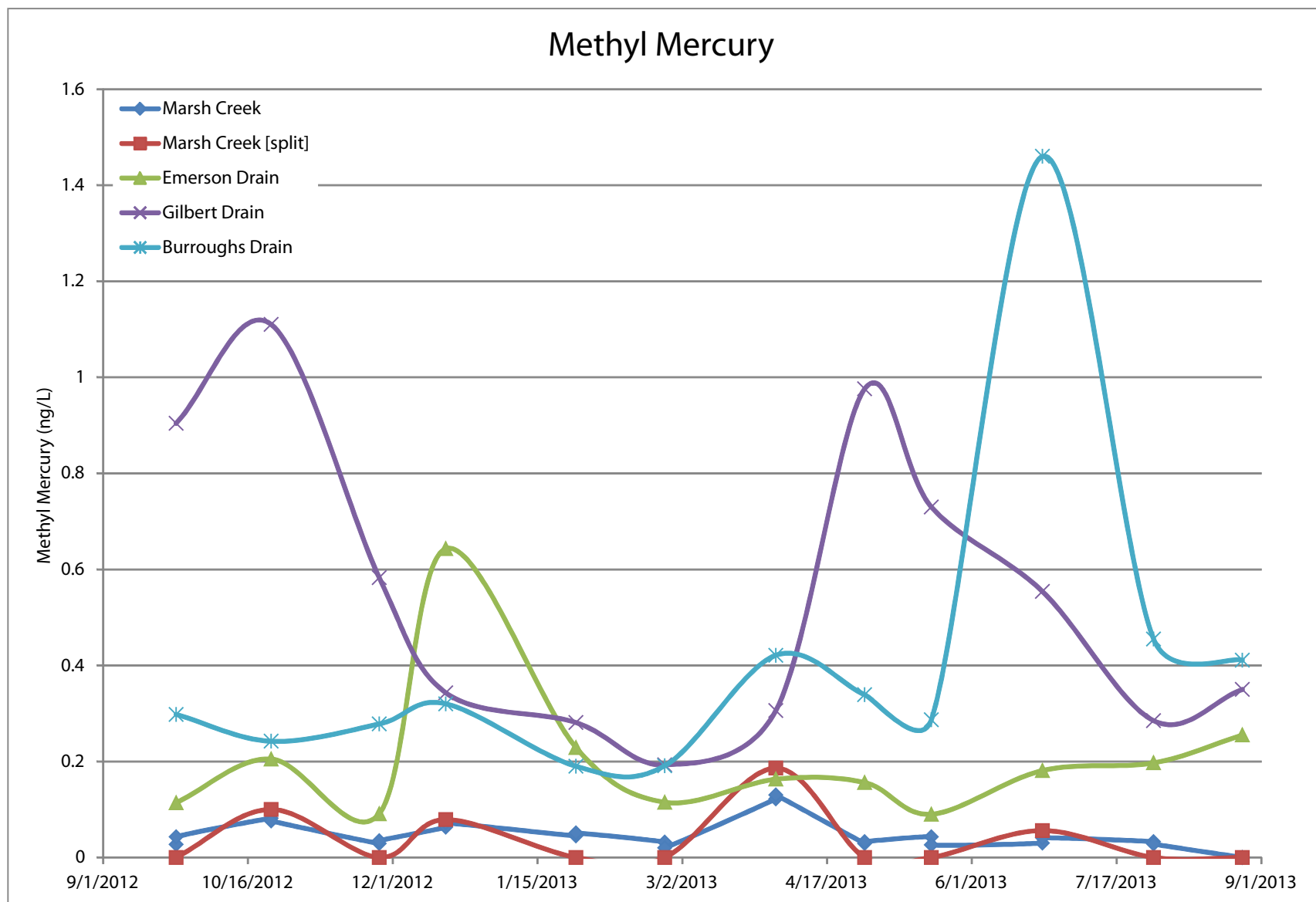
- Estimated monthly Marsh Creek loads were as follows:
 - Methyl mercury loads ranged from 2.0 to 61.6 nanograms/second. The lowest MeHg load was measured in August 2013 and the highest MeHg load was measured on April 1, 2013;
 - Dissolved organic carbon loads ranged from 0.20 to 3.4 grams/second and. The lowest DOC load was measured in June 2013 and the highest DOC load was measured on April 1, 2013;
 - Total dissolved solids loads ranged from 76 to 256 grams/second. The lowest TDS load was measured in June 2013 and the highest TDS load was measured in December 2012.

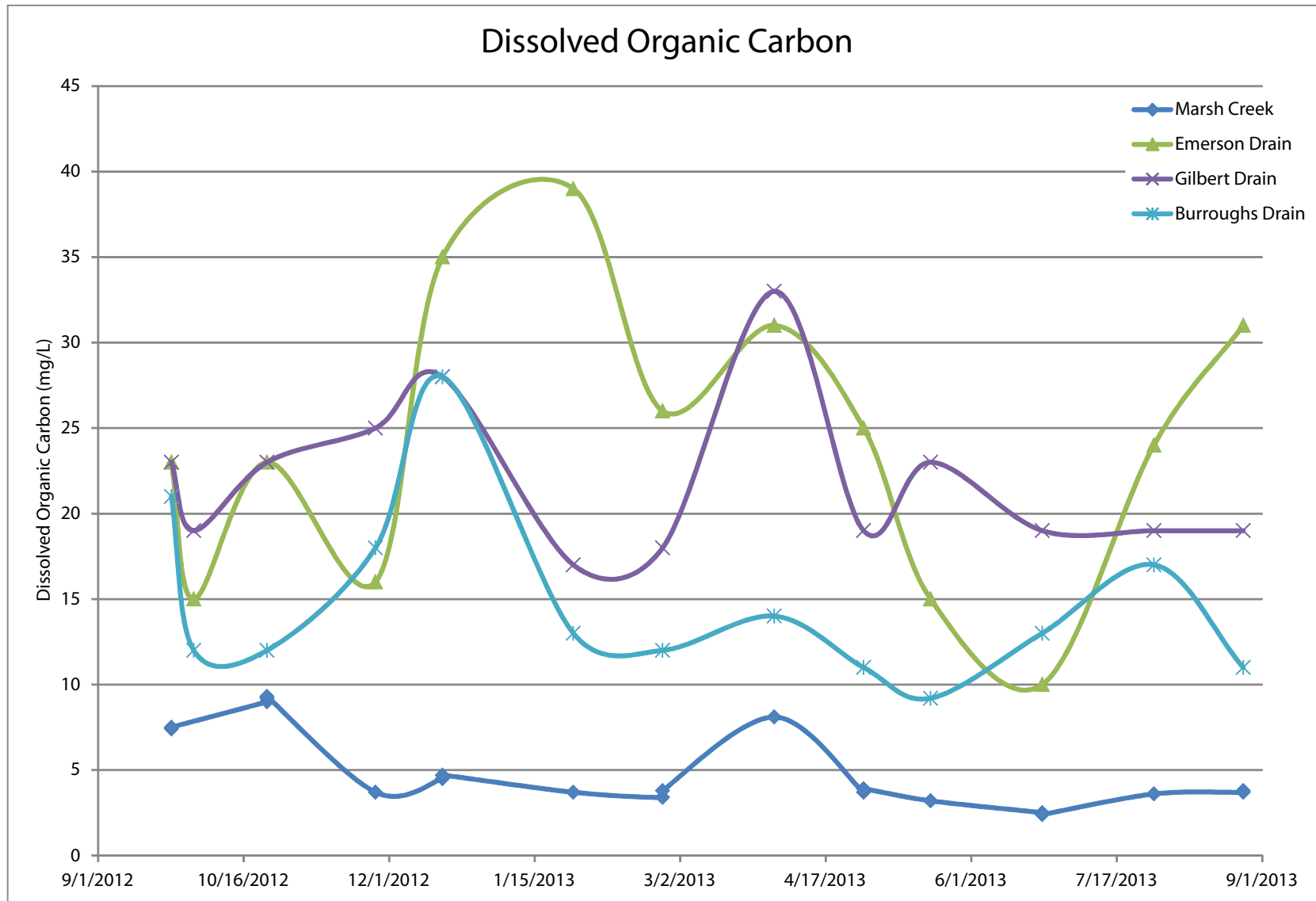


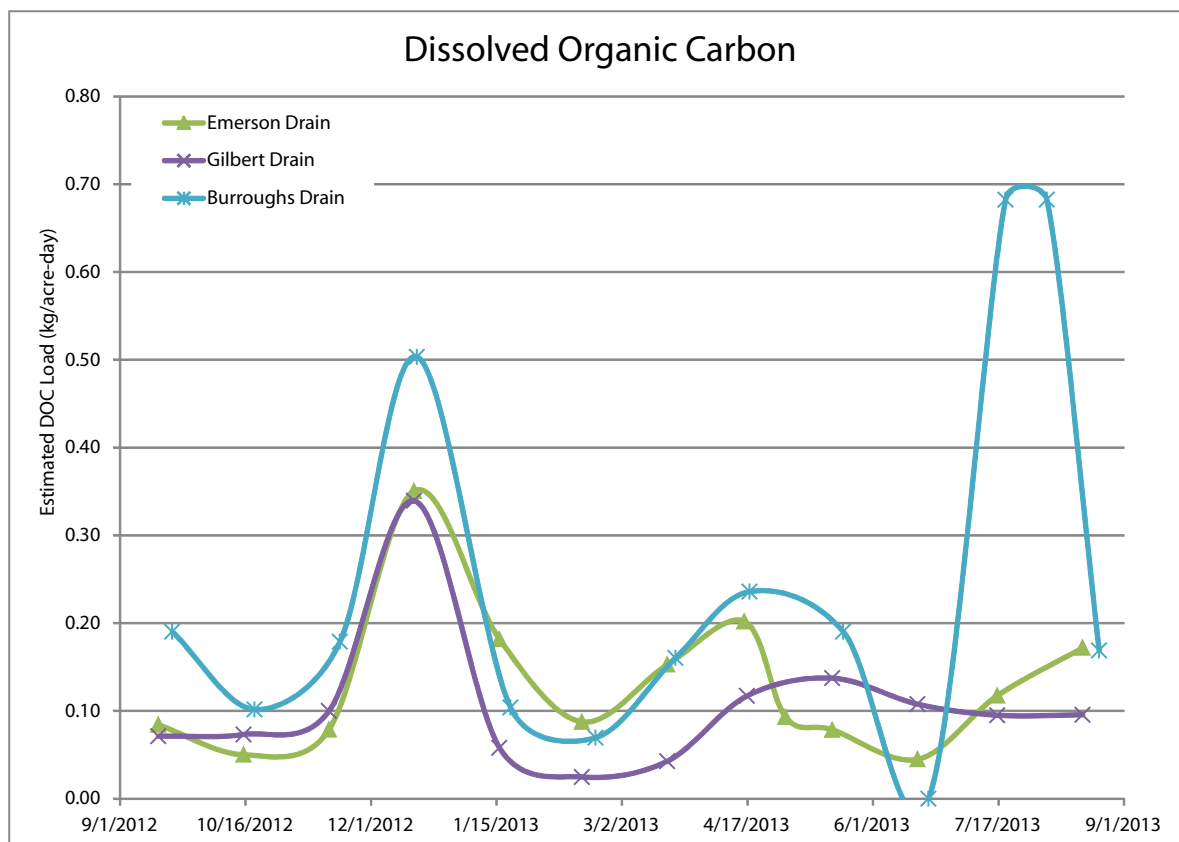
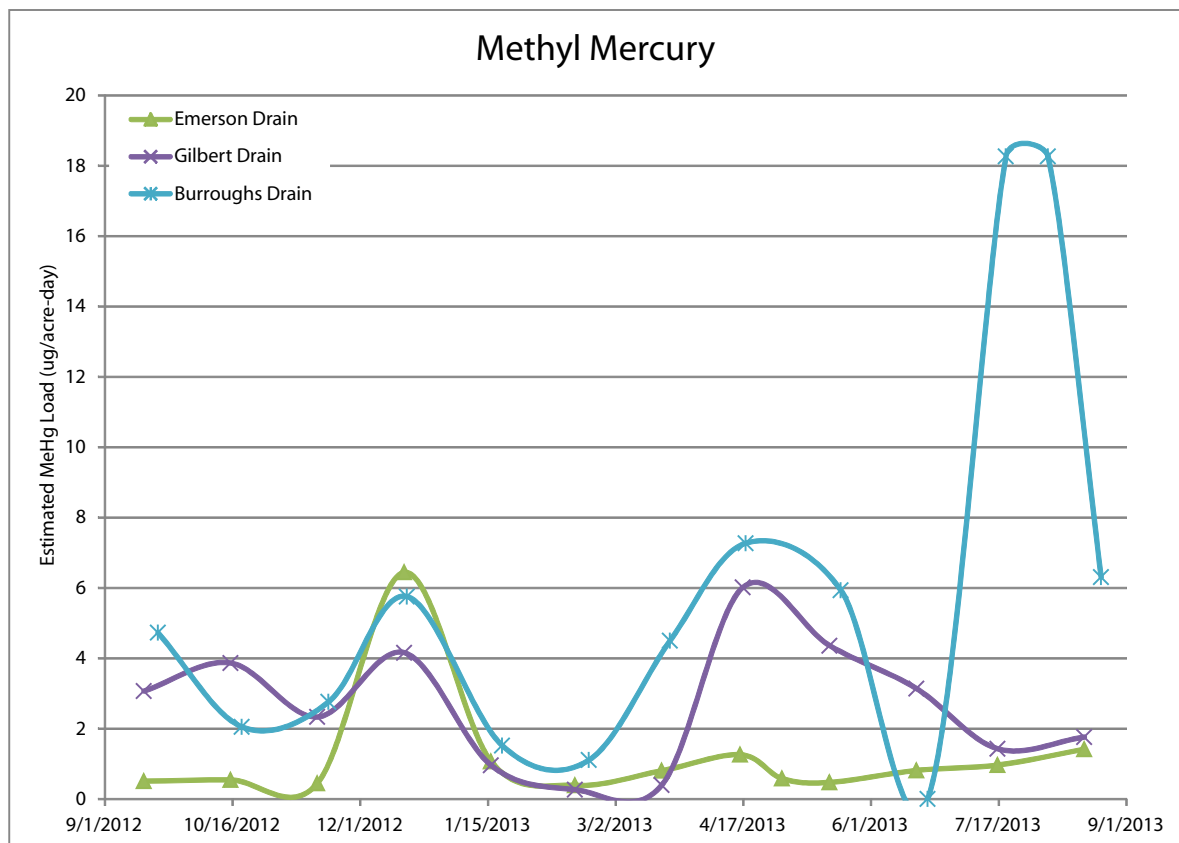












Appendix A. Marsh Creek Flow Rates

Streamflow Calculations for August 23, 2012

Station:	Marsh Creek, Station MC-5, RR Crossing/ISD						
Date:	8/23/2012	Start time:	End time:				
Observer:	Leighton, HydroFocus						
Flow conditions:	Stable, rocky bed						
Weather:	Sunny, warm						
Water quality:	clear						

	Distance (ft)	Width (ft)	Depth (ft)	Velocity (ft/s)	Area (ft2)	Horiz. angle factor for velocity (decimal)	Flow (cfs)
west	0.00	1.67	0.00	0.00	0.000	1.00	0.000
	3.33	2.67	0.52	1.05	1.386	1.00	1.455
	5.33	2.00	0.48	0.80	0.960	1.00	0.768
	7.33	2.00	0.75	0.84	1.500	1.00	1.260
	9.33	2.15	0.50	1.79	1.075	1.00	1.924
east	11.63	2.88	0.75	1.35	2.156	1.00	2.911
	15.08	1.73	0.00	0.00	0.000	1.00	0.000
Total:	0	15.08			7.08		8.32
Average:			0.47	1.18			

MEASUREMENT UNCERTAINTY

Reference: Sauer, V.B. and R.W. Meyer. 1992. Determination of error in individual discharge measurements. Open-File Report 92-144. USGS, Norcross, GA

Substrate

soft	5
uneven	10

DEPTH (Sd)

Enter substrate type 'stable', 'soft' or 'uneven': **uneven** 6.83

PULSATION (St)

Average point measurement duration (sec): **30** 6.40

VELOCITY (Si)

Assume pygmy meter with standard rating 1.71

VERTICAL METHOD (Ss)

Enter 1 if 0.6D, enter 2 if 0.2+0.8D: **1**
Ss= 4.71

NUMBER OF POINTS ACROSS SECTION (Sv)

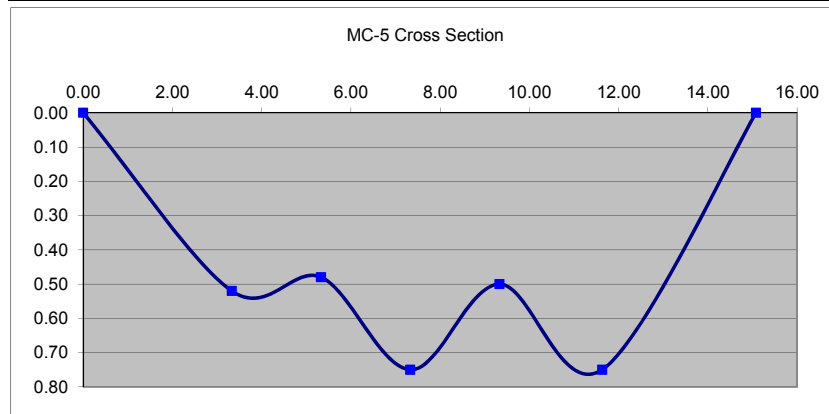
Sv= 5.77

HORIZONTAL OBLIQUE FLOW (Sh)

Sh= 0.00 Assumed small for vertical-axis meters

OVERALL FLOW MEASUREMENT UNCERTAINTY

% 8.76
cfs 0.73



Streamflow Calculations for September 24, 2012

Station:	Marsh Creek, Station MC-5, RR Crossing/ISD					
Date:	9/24/2012	Start time:	12:15	End time:		
Observer:	Leighton, HydroFocus					
Flow conditions:	Stable, rocky bed USGS station reported 0.38 cfs at this time					
Weather:	Sunny, warm					
Water quality:	clear					
	Distance (ft)	Width (ft)	Depth (ft)	Velocity (ft/s)	Area (ft2)	Flow (cfs)
RB	0.00	0.42	0.00	0.00	0.000	1.00
	0.83	0.75	0.30	0.00	0.225	1.00
	1.50	0.67	0.40	0.12	0.268	1.00
	2.17	0.67	0.50	0.51	0.333	1.00
	2.83	0.67	0.48	0.54	0.319	1.00
	3.50	0.67	0.52	0.86	0.348	1.00
	4.17	0.63	0.55	1.26	0.344	1.00
	4.75	0.67	0.60	1.36	0.399	1.00
	5.50	0.92	0.60	0.48	0.549	1.00
	6.58	0.92	0.50	1.40	0.458	1.00
	7.33	0.92	0.50	1.36	0.460	1.00
	8.42	0.92	0.50	1.35	0.460	1.00
	9.17	0.26	0.50	1.15	0.128	0.98
	8.93	0.63	0.50	1.24	0.313	0.94
	10.42	1.12	0.48	1.22	0.538	1.00
	11.17	0.88	0.50	0.77	0.438	0.94
	12.17	0.92	0.60	0.33	0.549	0.94
LB	13.00	0.75	0.60	0.16	0.450	0.94
	13.67	0.71	0.70	0.19	0.497	0.94
	14.42	0.75	0.48	0.00	0.360	1.00
	15.17	0.38	0.00	0.00	0.000	1.00
Total:	0	15.17			7.43	5.61
Average:			0.49	0.75		

MEASUREMENT UNCERTAINTY

Reference: Sauer, V.B. and R.W. Meyer. 1992. Determination of error in individual discharge measurements. Open-File Report 92-144. USGS, Norcross, GA

Substrate

soft	5
uneven	10

DEPTH (Sd)

Enter substrate type 'stable', 'soft' or 'uneven': **uneven** 6.69

PULSATION (St)

Average point measurement duration (sec): **30** 6.40

VELOCITY (Si)

Assume pygmy meter with standard rating 1.96

VERTICAL METHOD (Ss)

Enter 1 if 0.6D, enter 2 if 0.2+0.8D: **1**
Ss= 3.28

NUMBER OF POINTS ACROSS SECTION (Sv)

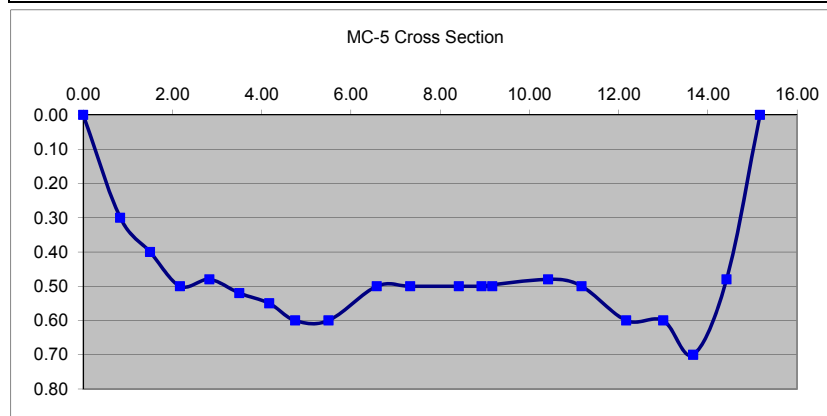
Sv= 2.20

HORIZONTAL OBLIQUE FLOW (Sh)

Sh= 0.00 Assumed small for vertical-axis meters

OVERALL FLOW MEASUREMENT UNCERTAINTY

% 4.97
cfs 0.28



Streamflow Calculations for October 24, 2012

Station:	Marsh Creek, Station MC-5, RR Crossing/ISD					
Date:	10/24/2012	Start time:	11:27	End time:	11:50	
Observer:	Leighton, Hart; HydroFocus					
Flow conditions:	Stable, rocky bed; stage declining after storm peak USGS station reported 5.9 cfs at this time					
Weather:	Cool, partly cloudy					
Water quality:	mostly clear					

	Distance (ft)	Width (ft)	Depth (ft)	Velocity (ft/s)	Area (ft ²)	Horiz. angle factor for velocity (decimal)	Flow (cfs)
RB	0.00	0.21	0.00	0.00	0.000	1.00	0.000
	0.42	0.42	0.30	0.00	0.125	1.00	0.000
	0.83	0.58	0.52	0.01	0.302	1.00	0.003
	1.58	0.63	0.52	0.29	0.325	1.00	0.094
	2.08	0.59	0.72	0.42	0.421	1.00	0.177
	2.75	0.59	0.72	1.25	0.421	1.00	0.527
	3.25	0.46	0.70	1.35	0.322	1.00	0.435
	3.67	0.42	0.80	1.19	0.332	1.00	0.395
	4.08	0.54	0.72	1.72	0.389	1.00	0.669
	4.75	0.67	0.45	1.76	0.302	1.00	0.531
	5.42	0.54	0.70	1.55	0.378	1.00	0.586
	5.83	0.42	0.70	1.93	0.291	1.00	0.561
	6.25	0.42	0.58	1.91	0.244	1.00	0.465
	6.67	0.42	0.58	1.86	0.241	1.00	0.448
	7.08	0.46	0.65	1.71	0.296	1.00	0.506
	7.58	0.50	0.58	1.71	0.290	1.00	0.496
	8.08	0.42	0.62	1.29	0.260	1.00	0.336
	8.42	0.42	0.55	1.55	0.231	1.00	0.358
	8.92	0.46	0.55	0.70	0.250	0.98	0.173
	9.33	0.42	0.40	1.70	0.166	0.94	0.265
	9.75	0.42	0.45	1.48	0.189	1.00	0.280
	10.17	0.42	0.35	1.36	0.145	1.00	0.198
	10.58	0.42	0.50	1.06	0.208	1.00	0.220
	11.00	0.46	0.50	0.65	0.230	1.00	0.150
	11.50	0.54	0.40	0.86	0.216	1.00	0.186
	12.08	0.29	0.00	0.00	0.000	1.00	0.000
Total:	0	12.08			6.57		8.06
Average:			0.54	1.23			

MEASUREMENT UNCERTAINTY

Reference: Sauer, V.B. and R.W. Meyer. 1992. Determination of error in individual discharge measurements. Open-File Report 92-144. USGS, Norcross, GA

Substrate

soft	5
uneven	10

DEPTH (Sd)

Enter substrate type 'stable', 'soft' or 'uneven': **uneven** 6.38

PULSATION (St)

Average point measurement duration (sec): **30** 6.40

VELOCITY (Si)

Assume pygmy meter with standard rating 1.69

VERTICAL METHOD (Ss)

Enter 1 if 0.6D, enter 2 if 0.2+0.8D: **1**
Ss= 3.11

NUMBER OF POINTS ACROSS SECTION (Sv)

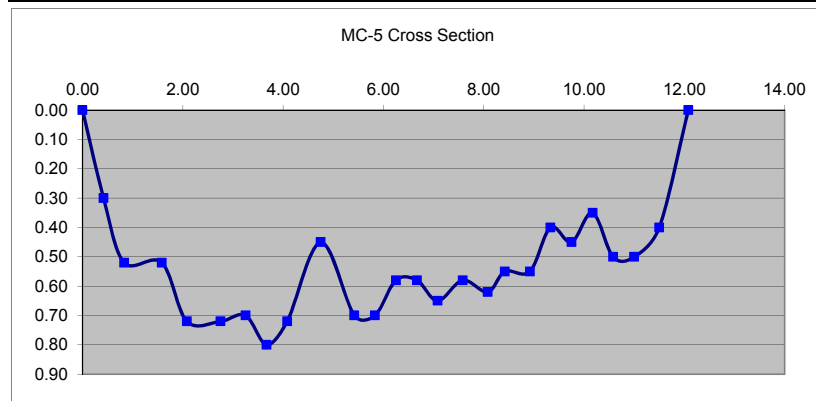
Sv= 1.82

HORIZONTAL OBLIQUE FLOW (Sh)

Sh= 0.00 Assumed small for vertical-axis meters

OVERALL FLOW MEASUREMENT UNCERTAINTY

% 4.47
cfs 0.36



Streamflow Calculations for November 27, 2012

Station:	Marsh Creek, Station MC-5, RR Crossing/ISD					
Date:	11/27/2012	Start time:	11:22	End time:	11:53	
Observer:	Leighton, Hart; HydroFocus					
Flow conditions:	Stable, rocky bed; low flow USGS station reported 0.5 cfs at this time					
Weather:	Cool, partly cloudy					
Water quality:	mostly clear					

	Distance (ft)	Width (ft)	Depth (ft)	Velocity (ft/s)	Area (ft ²)	Horiz. angle factor for velocity (decimal)	Flow (cfs)
RB	0.00	0.21	0.00	0.00	0.000	1.00	0.000
	0.42	0.50	0.15	0.00	0.075	1.00	0.000
	1.00	0.54	0.15	0.17	0.081	1.00	0.014
	1.50	0.46	0.40	0.28	0.184	1.00	0.052
	1.92	0.54	0.40	0.54	0.216	1.00	0.117
	2.58	0.58	0.55	0.36	0.319	1.00	0.115
	3.08	0.46	0.80	0.60	0.368	1.00	0.221
	3.50	0.42	0.72	0.52	0.302	1.00	0.157
	3.92	0.46	0.50	0.80	0.230	1.00	0.184
	4.42	0.54	0.50	0.92	0.270	1.00	0.248
	5.00	0.67	0.45	0.84	0.299	1.00	0.251
	5.75	0.67	0.43	0.93	0.286	1.00	0.266
	6.33	0.50	0.40	0.95	0.200	1.00	0.190
	6.75	0.46	0.42	0.94	0.193	1.00	0.182
	7.25	0.50	0.41	0.87	0.205	0.98	0.176
	7.75	0.59	0.42	1.09	0.246	1.00	0.268
	8.42	0.59	0.40	0.65	0.234	1.00	0.152
	8.92	0.46	0.38	0.50	0.173	0.98	0.085
	9.33	0.42	0.23	1.17	0.095	0.94	0.105
	9.75	0.50	0.30	0.56	0.150	0.94	0.079
	10.33	0.54	0.30	1.25	0.162	0.98	0.199
	10.83	0.63	0.26	0.66	0.163	1.00	0.107
	11.58	0.59	0.45	0.30	0.263	1.00	0.079
	12.00	0.38	0.42	0.79	0.158	1.00	0.124
	12.33	0.17	0.00	0.00	0.000	1.00	0.000
Total:	0	12.33			4.87		3.37
Average:			0.40	0.69			

MEASUREMENT UNCERTAINTY

Reference: Sauer, V.B. and R.W. Meyer. 1992. Determination of error in individual discharge measurements. Open-File Report 92-144. USGS, Norcross, GA

Substrate

soft	5
uneven	10

DEPTH (Sd)

Enter substrate type 'stable', 'soft' or 'uneven': **uneven** 7.39

PULSATION (St)

Average point measurement duration (sec): **30** 6.40

VELOCITY (Si)

Assume pygmy meter with standard rating 2.01

VERTICAL METHOD (Ss)

Enter 1 if 0.6D, enter 2 if 0.2+0.8D: **1**
Ss= 3.14

NUMBER OF POINTS ACROSS SECTION (Sv)

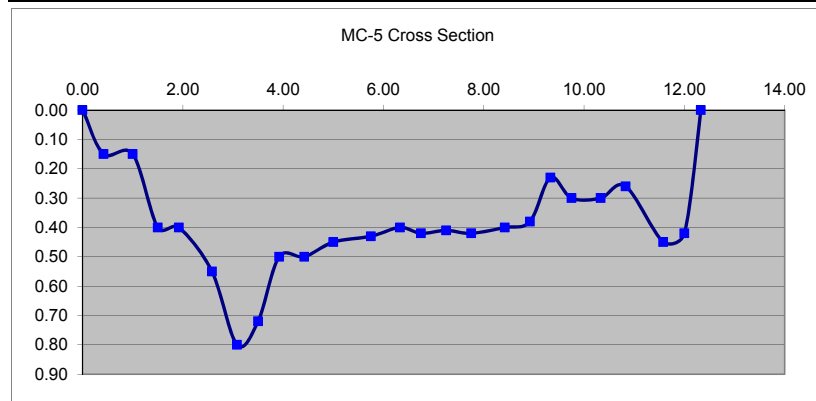
Sv= 1.88

HORIZONTAL OBLIQUE FLOW (Sh)

Sh= 0.00 Assumed small for vertical-axis meters

OVERALL FLOW MEASUREMENT UNCERTAINTY

% 4.73
cfs 0.16



Streamflow Calculations for December 18, 2012

Station:	Marsh Creek, Station MC-5, RR Crossing/ISD					
Date:	12/18/2012	Start time:	11:13	End time:	11:40	
Observer:	Leighton, Hart; HydroFocus					
Flow conditions:	Stable, rocky bed; USGS station reported 4.20 cfs at this time					
Weather:	Cool, sunny, breezy					
Water quality:	somewhat cloudy, murky					

	Distance (ft)	Width (ft)	Depth (ft)	Velocity (ft/s)	Area (ft ²)	Horiz. angle factor for velocity (decimal)	Flow (cfs)
RB	0.00	0.38	0.00	0.00	0.000	1.00	0.000
	0.75	0.59	0.35	0.00	0.205	1.00	0.000
	1.17	0.50	0.38	0.35	0.190	1.00	0.067
	1.75	0.62	0.45	0.37	0.281	1.00	0.104
	2.42	0.63	0.68	0.84	0.425	1.00	0.357
	3.00	0.63	0.75	1.08	0.469	1.00	0.506
	3.67	0.63	1.05	1.34	0.656	1.00	0.879
	4.25	0.58	1.00	1.13	0.583	1.00	0.659
	4.83	0.75	0.75	1.55	0.563	1.00	0.872
	5.75	0.88	0.65	1.65	0.569	1.00	0.938
	6.58	0.67	0.65	1.81	0.433	1.00	0.784
	7.08	0.50	0.68	1.79	0.340	1.00	0.609
	7.58	0.46	0.75	1.63	0.344	1.00	0.560
	8.00	0.46	0.78	1.30	0.358	1.00	0.465
	8.50	0.63	0.72	1.71	0.450	1.00	0.770
	9.25	0.63	0.60	1.08	0.375	0.98	0.399
	9.75	0.67	0.55	0.98	0.367	0.98	0.354
	10.58	0.75	0.52	1.05	0.390	0.98	0.403
	11.25	0.79	0.45	1.90	0.356	1.00	0.677
	12.17	0.75	0.60	0.74	0.450	1.00	0.333
	12.75	0.58	0.55	0.97	0.321	1.00	0.311
	13.33	0.54	0.40	0.63	0.217	1.00	0.137
	13.83	0.58	0.45	0.05	0.263	1.00	0.013
	14.50	0.67	0.40	0.02	0.267	1.00	0.005
LB	15.17	0.33	0.00	0.00	0.000	1.00	0.000
Total:	0	15.17			8.87		10.20
Average:			0.58	1.15			

MEASUREMENT UNCERTAINTY

Reference: Sauer, V.B. and R.W. Meyer. 1992. Determination of error in individual discharge measurements. Open-File Report 92-144. USGS, Norcross, GA

Substrate

soft	5
uneven	10

DEPTH (Sd)

Enter substrate type 'stable', 'soft' or 'uneven': **uneven** 6.18

PULSATION (St)

Average point measurement duration (sec): **30** 6.40

VELOCITY (Si)

Assume pygmy meter with standard rating 1.73

VERTICAL METHOD (Ss)

Enter 1 if 0.6D, enter 2 if 0.2+0.8D: **1**
Ss= 3.14

NUMBER OF POINTS ACROSS SECTION (Sv)

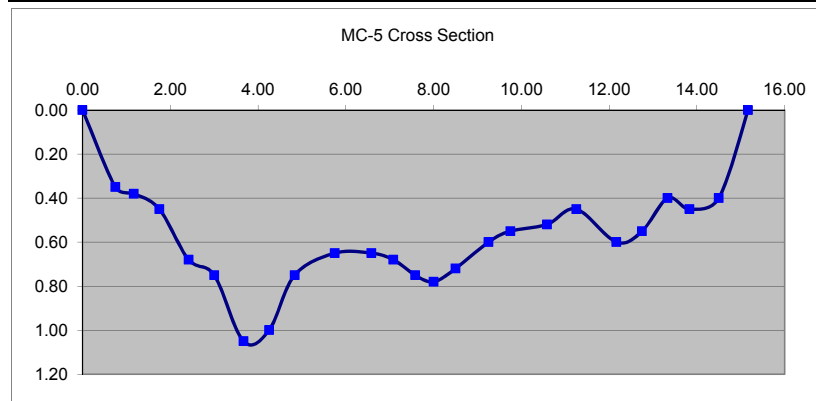
Sv= 1.88

HORIZONTAL OBLIQUE FLOW (Sh)

Sh= 0.00 Assumed small for vertical-axis meters

OVERALL FLOW MEASUREMENT UNCERTAINTY

% 4.53
cfs 0.46



Streamflow Calculations for January 28, 2013

Station:	Marsh Creek, Station MC-5, RR Crossing/ISD					
Date:	1/28/2013	Start time:	11:00	End time:	11:30	
Observer:	Leighton, Hart, Ingram; HydroFocus					
Flow conditions:	Stable, rocky bed, much algae growth in last month; USGS station reported 2.50 cfs at this time					
Weather:	Cool, sunny					
Water quality:	clear					
	Distance (ft)	Width (ft)	Depth (ft)	Velocity (ft/s)	Area (ft ²)	Flow (cfs)
RB	0.00	0.25	0.00	0.00	0.000	0.000
	0.50	0.50	0.30	0.03	0.150	0.005
	1.00	0.46	0.35	0.20	0.160	0.032
	1.42	0.46	0.45	0.02	0.206	0.004
	1.92	0.63	0.38	0.25	0.238	0.059
	2.67	0.58	0.51	0.65	0.298	0.193
	3.08	0.46	0.56	1.14	0.257	0.293
	3.58	0.46	0.40	1.60	0.183	0.293
	4.00	0.50	0.70	1.55	0.350	0.543
	4.58	0.58	0.43	1.88	0.251	0.472
	5.17	0.54	0.60	1.70	0.325	0.544
	5.67	0.50	0.55	1.53	0.275	0.421
	6.17	0.50	0.57	0.89	0.285	0.254
	6.67	0.54	0.63	1.19	0.341	0.406
	7.25	0.54	0.65	0.35	0.352	0.123
	7.75	0.67	0.67	1.20	0.447	0.528
	8.58	0.88	0.55	1.56	0.481	0.739
	9.50	0.67	0.25	1.45	0.167	0.227
	9.92	0.54	0.35	1.45	0.190	0.258
	10.58	0.63	0.40	1.04	0.250	0.236
	11.17	0.58	0.52	0.98	0.303	0.269
	11.75	0.67	0.45	0.88	0.300	0.202
	12.50	0.75	0.45	1.55	0.338	0.401
	13.25	0.63	0.40	0.73	0.250	0.158
	13.75	0.54	0.68	1.22	0.368	0.422
	14.33	0.58	0.45	1.08	0.263	0.279
	14.92	0.67	0.43	0.79	0.287	0.223
	15.67	0.63	0.40	0.11	0.250	0.028
	16.17	0.50	0.40	0.65	0.200	0.130
	16.67	0.50	0.40	0.22	0.200	0.044
LB	17.17	0.67	0.35	0.76	0.233	0.177
	18.00	0.42	0.00	0.00	0.000	0.000
Total:	0	18.00			8.20	7.96
Average:			0.46	0.97		

MEASUREMENT UNCERTAINTY

Reference: Sauer, V.B. and R.W. Meyer. 1992. Determination of error in individual discharge measurements. Open-File Report 92-144. USGS, Norcross, GA

Substrate

soft	5
uneven	10

DEPTH (Sd)

Enter substrate type 'stable', 'soft'
or 'uneven':

uneven 6.92

PULSATION (St)

Average point measurement
duration (sec):

30 6.40

VELOCITY (Si)

Assume pygmy meter with
standard rating

1.82

VERTICAL METHOD (Ss)

Enter 1 if 0.6D, enter 2 if 0.2+0.8D:

1
Ss= 2.96

NUMBER OF POINTS ACROSS SECTION (Sv)

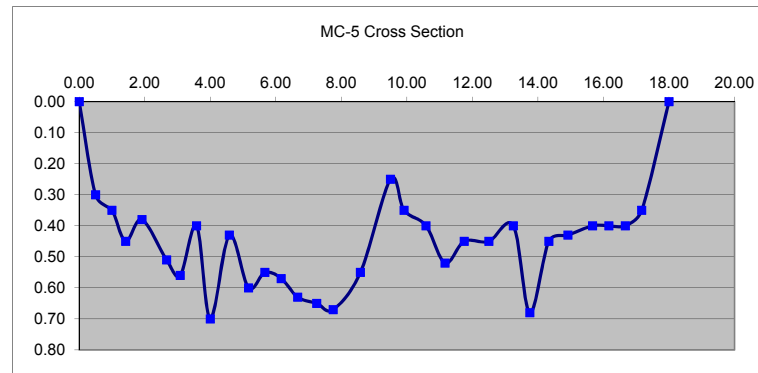
Sv= 1.52

HORIZONTAL OBLIQUE FLOW (Sh)

Sh= 0.00 Assumed small for vertical-axis meters (

OVERALL FLOW MEASUREMENT UNCERTAINTY

% 4.25
cfs 0.34



Streamflow Calculations for February 25, 2013

Station:	Marsh Creek, Station MC-5, RR Crossing/ISD					
Date:	2/25/2013	Start time:	11:30	End time:	12:00	
Observer:	Hart, Ingram; HydroFocus					
Flow conditions:	Stable, rocky bed, algae growth					
	USGS station reported 2.70 cfs at this time					
Weather:	Sunny, warm					
Water quality:	clear					
	Distance (ft)	Width (ft)	Depth (ft)	Velocity (ft/s)	Area (ft ²)	Flow (cfs)
RB	0.00	0.38	0.00	0.00	0.000	0.000
	0.75	0.75	0.40	0.08	0.300	0.024
	1.50	0.67	0.50	0.34	0.333	0.113
	2.08	0.54	0.40	0.94	0.217	0.204
	2.58	0.46	0.50	0.60	0.229	0.138
	3.00	0.54	0.50	1.13	0.271	0.306
	3.67	0.54	0.45	1.40	0.244	0.341
	4.08	0.50	0.65	1.18	0.325	0.384
	4.67	0.58	0.32	1.68	0.187	0.309
	5.25	0.63	0.55	1.59	0.344	0.538
	5.92	0.67	0.53	1.31	0.353	0.435
	6.58	0.63	0.60	1.12	0.375	0.414
	7.17	0.54	0.65	0.51	0.352	0.180
	7.67	0.54	0.62	1.43	0.336	0.480
	8.25	0.67	0.50	1.68	0.333	0.560
	9.00	0.71	0.30	1.56	0.213	0.287
	9.67	0.67	0.30	1.82	0.200	0.315
	10.33	0.63	0.45	1.49	0.281	0.363
	10.92	0.63	0.50	0.83	0.313	0.255
	11.58	0.63	0.55	1.38	0.344	0.411
	12.17	0.63	0.40	1.21	0.250	0.232
	12.83	0.58	0.35	2.13	0.204	0.377
	13.33	0.54	0.45	0.98	0.244	0.207
	13.92	0.67	0.55	1.51	0.367	0.479
	14.67	0.58	0.50	1.47	0.292	0.371
	15.08	0.50	0.35	1.04	0.175	0.158
	15.67	0.54	0.40	0.48	0.217	0.098
	16.17	0.50	0.38	0.19	0.190	0.036
	16.67	0.54	0.40	0.30	0.217	0.064
	17.25	0.71	0.30	0.30	0.213	0.064
LB	18.08	0.42	0.00	0.00	0.000	0.000
Total:	0	18.08			7.92	8.14
Average:			0.44	1.03		

MEASUREMENT UNCERTAINTY

Reference: Sauer, V.B. and R.W. Meyer. 1992. Determination of error in individual discharge measurements. Open-File Report 92-144. USGS, Norcross, GA

Substrate

soft	5
uneven	10

DEPTH (Sd)

Enter substrate type 'stable', 'soft'

or 'uneven': **uneven** 7.05

PULSATION (St)

Average point measurement

duration (sec): **30** 6.40

VELOCITY (Si)

Assume pygmy meter with standard rating 1.78

VERTICAL METHOD (Ss)

Enter 1 if 0.6D, enter 2 if 0.2+0.8D: **1**
Ss= 2.98

NUMBER OF POINTS ACROSS SECTION (Sv)

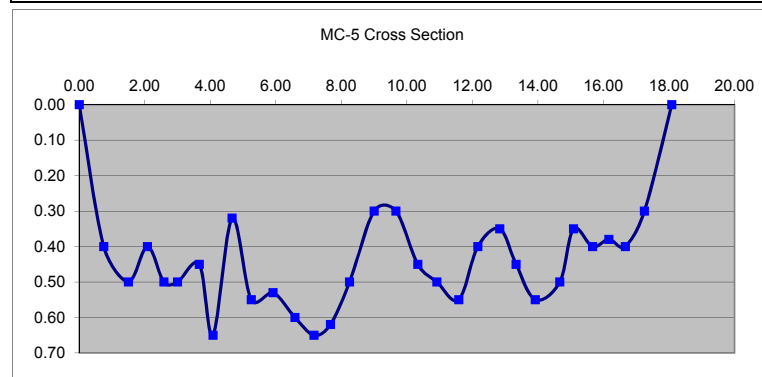
Sv= 1.56

HORIZONTAL OBLIQUE FLOW (Sh)

Sh= 0.00 Assumed small for vertical-axis meters

OVERALL FLOW MEASUREMENT UNCERTAINTY

% 4.29
cfs 0.35



Streamflow Calculations for April 1, 2013

Station:		Marsh Creek, Station MC-5, RR Crossing/ISD					
Date:		4/1/2013		Start time:	10:50	End time:	11:15
Observer:		Hart, Ingram; HydroFocus					
Flow conditions:		Rocky bed, relatively high flow, some algae; USGS station reported 4.20 cfs at this time					
Weather:		Partly cloudy					
Water quality:		clear					
	Distance (ft)	Width (ft)	Depth (ft)	Velocity (ft/s)	Area (ft2)	Horiz. angle factor for velocity (decimal)	Flow (cfs)
RB	0.00	0.58	0.00	0.00	0.000	1.00	0.000
	1.17	0.92	0.42	0.75	0.385	1.00	0.289
	1.83	0.58	0.35	1.31	0.204	1.00	0.267
	2.33	0.54	0.40	0.59	0.217	1.00	0.128
	2.92	0.58	0.60	1.23	0.350	1.00	0.431
	3.50	0.54	0.60	1.15	0.325	0.98	0.368
	4.00	0.46	0.60	0.82	0.275	1.00	0.226
	4.42	0.54	0.60	1.68	0.325	0.98	0.538
	5.08	0.63	0.65	2.38	0.406	0.98	0.952
	5.67	0.58	0.65	1.81	0.379	0.98	0.676
	6.25	0.63	0.62	1.75	0.388	1.00	0.678
	6.92	0.79	0.70	2.24	0.554	1.00	1.241
	7.83	0.75	0.60	2.66	0.450	0.94	1.125
	8.42	0.54	0.60	2.76	0.325	0.98	0.883
	8.92	0.58	0.50	2.03	0.292	0.98	0.583
	9.58	0.67	0.55	0.54	0.367	1.00	0.198
	10.25	0.63	0.50	2.12	0.313	1.00	0.663
	10.83	0.71	0.60	0.92	0.425	1.00	0.391
	11.67	0.67	0.40	2.13	0.267	1.00	0.568
	12.17	0.54	0.25	2.35	0.135	1.00	0.318
	12.75	0.63	0.55	2.34	0.344	0.98	0.792
	13.42	0.58	0.65	1.46	0.379	1.00	0.554
	13.92	0.63	0.65	2.36	0.406	0.98	0.944
	14.67	0.67	0.60	1.97	0.400	1.00	0.788
	15.25	0.54	0.55	0.47	0.298	1.00	0.140
	15.75	0.50	0.55	1.29	0.275	1.00	0.355
	16.25	0.67	0.45	0.99	0.300	1.00	0.297
	17.08	1.25	0.45	0.92	0.563	1.00	0.518
LB	18.75	0.83	0.00	0.00	0.000	1.00	0.000
Total:	0	18.75			9.35		14.91
Average:			0.50	1.60			

MEASUREMENT UNCERTAINTY

Reference: Sauer, V.B. and R.W. Meyer. 1992. Determination of error in individual discharge measurements. Open-File Report 92-144. USGS, Norcross, GA

Substrate

soft	5
uneven	10

DEPTH (Sd)

Enter substrate type 'stable', 'soft' or 'uneven': **uneven** 6.64

PULSATION (St)

Average point measurement duration (sec): **30** 6.40

VELOCITY (Si)

Assume pygmy meter with standard rating 1.56

VERTICAL METHOD (Ss)

Enter 1 if 0.6D, enter 2 if 0.2+0.8D: **1**
Ss= 3.03

NUMBER OF POINTS ACROSS SECTION (Sv)

Sv= 1.65

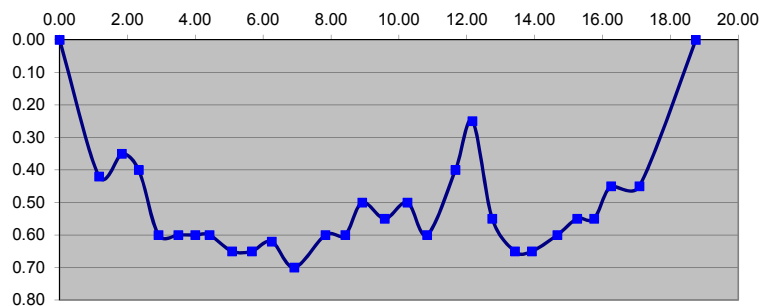
HORIZONTAL OBLIQUE FLOW (Sh)

Sh= 0.00 Assumed small for vertical-axis meters

OVERALL FLOW MEASUREMENT UNCERTAINTY

% 4.27
cfs 0.64

MC-5 Cross Section



Streamflow Calculations for April 29, 2013

Station:	Marsh Creek, Station MC-5, RR Crossing/ISD						
Date:	4/29/2013	Start time:	11:15	End time:	11:30		
Observer:	Hart, Ingram; HydroFocus & Burgis; Friends of Marsh Creek						
Flow conditions:	Rocky bed, low flow, some algae; USGS station reported 0.76 cfs at this time						
Weather:	Hot, sunny						
Water quality:	clear						
	Distance (ft)	Width (ft)	Depth (ft)	Velocity (ft/s)	Area (ft2)	Horiz. angle factor for velocity (decimal)	Flow (cfs)
RB	0.00	0.88	0.00	0.00	0.000	1.00	0.000
	1.75	1.42	0.21	0.34	0.298	1.00	0.101
	2.83	1.13	0.25	1.04	0.281	1.00	0.293
	4.00	0.79	0.25	0.69	0.198	1.00	0.137
	4.42	0.63	0.40	0.82	0.250	0.87	0.178
	5.25	0.67	0.30	1.87	0.200	0.98	0.368
	5.75	0.54	0.45	1.37	0.244	1.00	0.334
	6.33	0.63	0.35	1.42	0.219	1.00	0.311
	7.00	0.92	0.50	1.22	0.458	1.00	0.559
	8.17	0.92	0.48	1.55	0.440	1.00	0.682
	8.83	0.67	0.38	1.17	0.253	1.00	0.296
	9.50	0.79	0.30	0.76	0.238	1.00	0.181
	10.42	1.08	0.43	0.46	0.466	1.00	0.214
	11.67	1.21	0.30	0.71	0.363	1.00	0.257
	12.83	0.88	0.30	1.73	0.263	0.94	0.427
	13.42	0.63	0.48	1.27	0.300	0.98	0.375
	14.08	0.71	0.45	1.38	0.319	0.98	0.433
	14.83	0.75	0.50	0.07	0.375	1.00	0.026
	15.58	0.67	0.40	1.14	0.267	1.00	0.304
	16.17	0.67	0.35	1.08	0.233	1.00	0.252
LB	16.92	0.67	0.20	0.90	0.133	1.00	0.120
	17.50	0.29	0.00	0.00	0.000	1.00	0.000
Total:	0	17.50			5.80		5.85
Average:			0.33	1.01			

MEASUREMENT UNCERTAINTY

Reference: Sauer, V.B. and R.W. Meyer. 1992. Determination of error in individual discharge measurements. Open-File Report 92-144. USGS, Norcross, GA

Substrate

soft	5
uneven	10

DEPTH (Sd)

Enter substrate type 'stable', 'soft' or 'uneven': **uneven** 8.02

PULSATION (St)

Average point measurement duration (sec): **30** 6.40

VELOCITY (Si)

Assume pygmy meter with standard rating 1.80

VERTICAL METHOD (Ss)

Enter 1 if 0.6D, enter 2 if 0.2+0.8D: **1**
Ss= 3.24

NUMBER OF POINTS ACROSS SECTION (Sv)

Sv= 2.11

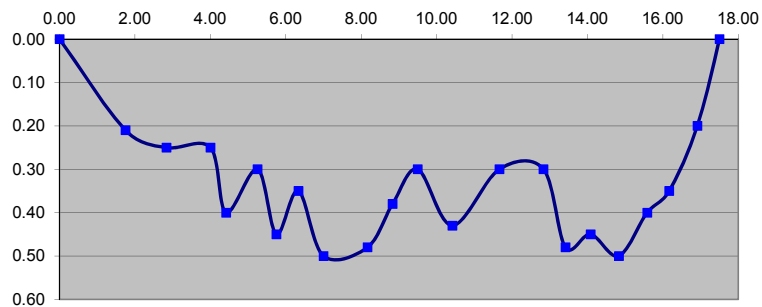
HORIZONTAL OBLIQUE FLOW (Sh)

Sh= 0.00 Assumed small for vertical-axis meters

OVERALL FLOW MEASUREMENT UNCERTAINTY

% 4.92
cfs 0.29

MC-5 Cross Section



Streamflow Calculations for May 20, 2013

Station:	Marsh Creek, Station MC-5, RR Crossing/ISD						
Date:	5/20/2013	Start time:	11:16	End time:	11:30		
Observer:	Hart, Ingram; HydroFocus						
Flow conditions:	Rocky bed, low flow; USGS station reported 0.47 cfs at this time						
Weather:	Sunny, warm						
Water quality:	clear						

	Distance (ft)	Width (ft)	Depth (ft)	Velocity (ft/s)	Area (ft ²)	Horiz. angle factor for velocity (decimal)	Flow (cfs)
RB	0.00	0.46	0.00	0.00	0.000	1.00	0.000
	0.92	0.96	0.25	0.10	0.240	1.00	0.024
	1.92	0.79	0.20	0.07	0.158	1.00	0.011
	2.50	0.67	0.30	0.57	0.200	1.00	0.114
	3.25	0.83	0.20	0.32	0.167	1.00	0.053
	4.17	0.83	0.35	1.93	0.292	1.00	0.563
	4.92	0.75	0.40	1.41	0.300	1.00	0.423
	5.67	0.75	0.35	1.25	0.263	1.00	0.328
	6.42	0.79	0.40	0.49	0.317	1.00	0.155
	7.25	1.33	0.35	0.96	0.467	1.00	0.448
	9.08	1.25	0.30	0.13	0.375	1.00	0.049
	9.75	0.63	0.28	1.09	0.175	1.00	0.191
	10.33	0.63	0.25	1.30	0.156	1.00	0.203
	11.00	0.79	0.20	0.86	0.158	1.00	0.136
	11.92	0.83	0.20	0.93	0.167	1.00	0.155
LB	12.67	0.79	0.30	1.32	0.238	1.00	0.314
	13.50	0.88	0.28	1.78	0.245	1.00	0.436
	14.42	0.75	0.40	2.02	0.300	1.00	0.606
	15.00	0.29	0.00	0.00	0.000	1.00	0.000
	Total:	0	15.00			4.22	
Average:			0.28	1.00			

MEASUREMENT UNCERTAINTY

Reference: Sauer, V.B. and R.W. Meyer. 1992. Determination of error in individual discharge measurements. Open-File Report 92-144. USGS, Norcross, GA

Substrate

soft	5
uneven	10

DEPTH (Sd)

Enter substrate type 'stable', 'soft'
or 'uneven': **uneven** 8.67

PULSATION (St)

Average point measurement
duration (sec): **30** 6.40

VELOCITY (Si)

Assume pygmy meter with
standard rating 1.80

VERTICAL METHOD (Ss)

Enter 1 if 0.6D, enter 2 if 0.2+0.8D: **1**
Ss= 3.37

NUMBER OF POINTS ACROSS SECTION (Sv)

Sv= 2.40

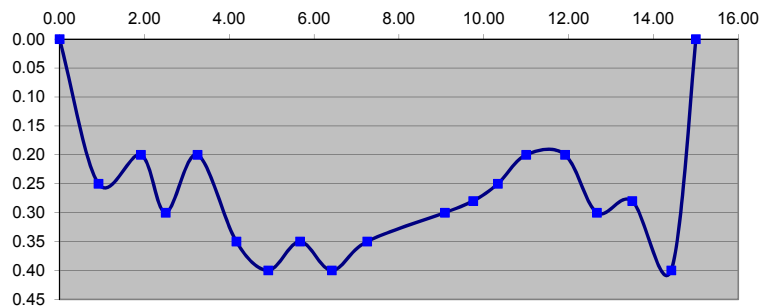
HORIZONTAL OBLIQUE FLOW (Sh)

Sh= 0.00 Assumed small for vertical-axis meters

OVERALL FLOW MEASUREMENT UNCERTAINTY

% 5.29
cfs 0.22

MC-5 Cross Section



Streamflow Calculations for June 24, 2013

Station:	Marsh Creek, Station MC-5, RR Crossing/ISD						
Date:	6/24/2013	Start time:	11:20	End time:	11:35		
Observer:	Hart, Ingram; HydroFocus						
Flow conditions:	Rocky bed, low flow; USGS station reported 1.8 cfs at this time						
Weather:	Cloudy, sprinkling intermittently						
Water quality:	Clear						
						Horiz. angle factor for velocity (decimal)	
	Distance (ft)	Width (ft)	Depth (ft)	Velocity (ft/s)	Area (ft2)		Flow (cfs)
RB	0.00	0.21	0.00	0.00	0.000	1.00	0.000
	0.42	0.67	0.20	0.40	0.133	1.00	0.053
	1.33	0.71	0.25	0.98	0.177	1.00	0.174
	1.83	0.79	0.20	0.73	0.158	1.00	0.116
	2.92	0.71	0.25	1.05	0.177	1.00	0.186
	3.25	0.42	0.35	1.36	0.146	1.00	0.198
	3.75	0.63	0.30	1.38	0.188	1.00	0.259
	4.50	0.67	0.35	1.29	0.233	1.00	0.301
	5.08	0.54	0.20	0.74	0.108	1.00	0.080
	5.58	0.63	0.30	1.17	0.188	1.00	0.219
	6.33	0.96	0.18	0.42	0.173	1.00	0.072
	7.50	1.04	0.15	0.38	0.156	1.00	0.059
	8.42	0.75	0.20	0.43	0.150	1.00	0.065
	9.00	0.54	0.35	1.39	0.190	1.00	0.264
	9.50	0.50	0.25	0.17	0.125	1.00	0.021
	10.00	0.67	0.25	0.89	0.167	1.00	0.148
	10.83	0.79	0.20	0.42	0.158	1.00	0.067
	11.58	0.67	0.20	1.32	0.133	1.00	0.176
LB	12.17	0.75	0.20	0.36	0.150	1.00	0.054
	13.08	0.79	0.30	1.04	0.238	1.00	0.247
	13.75	0.46	0.40	0.48	0.183	1.00	0.088
	14.00	0.13	0.00	0.00	0.000	1.00	0.000
Total:	0	14.00			3.33		2.85
Average:			0.24	0.85			

MEASUREMENT UNCERTAINTY

Reference: Sauer, V.B. and R.W. Meyer. 1992. Determination of error in individual discharge measurements. Open-File Report 92-144. USGS, Norcross, GA

Substrate

soft	5
uneven	10

DEPTH (Sd)

Enter substrate type 'stable', 'soft' or 'uneven': **uneven** 9.38

PULSATION (St)

Average point measurement duration (sec): **30** 6.40

VELOCITY (Si)

Assume pygmy meter with standard rating 1.89

VERTICAL METHOD (Ss)

Enter 1 if 0.6D, enter 2 if 0.2+0.8D: **1**
Ss= 3.24

NUMBER OF POINTS ACROSS SECTION (Sv)

Sv= 2.11

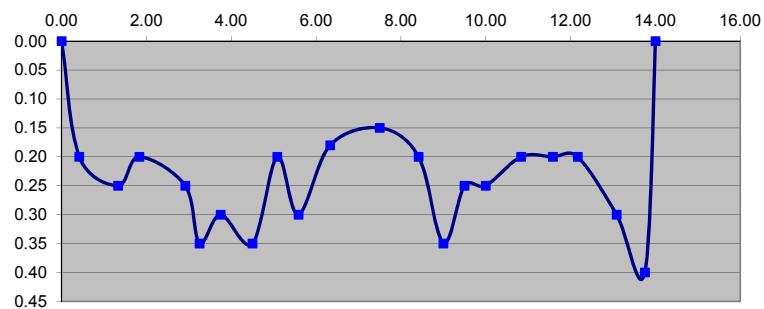
HORIZONTAL OBLIQUE FLOW (Sh)

Sh= 0.00 Assumed small for vertical-axis meters

OVERALL FLOW MEASUREMENT UNCERTAINTY

% 5.07
cfs 0.14

MC-5 Cross Section



Streamflow Calculations for July 29, 2013

Station:	Marsh Creek, Station MC-5, RR Crossing/ISD						
Date:	7/29/2013	Start time:	11:20	End time:	11:35		
Observer:	Hart, Ingram; HydroFocus						
Flow conditions:	Rocky bed, moderate flow, banks very vegetated; USGS station reported 1.0 cfs at this time						
Weather:	Sunny, warm, breezy						
Water quality:	Clear						

	Distance (ft)	Width (ft)	Depth (ft)	Velocity (ft/s)	Area (ft2)	Horiz. angle factor for velocity (decimal)	Flow (cfs)
RB	0.00	0.25	0.00	0.00	0.000	1.00	0.000
	0.50	0.54	0.25	0.70	0.135	1.00	0.095
	1.08	0.54	0.30	0.08	0.163	1.00	0.013
	1.58	0.58	0.30	0.17	0.175	1.00	0.030
	2.25	0.67	0.33	1.28	0.220	1.00	0.282
	2.92	0.75	0.30	0.04	0.225	1.00	0.009
	3.75	0.79	0.25	0.54	0.198	1.00	0.107
	4.50	0.79	0.25	2.60	0.198	1.00	0.515
	5.33	0.63	0.30	1.49	0.188	1.00	0.279
	5.75	0.46	0.33	0.33	0.151	1.00	0.050
	6.25	0.67	0.30	1.10	0.200	1.00	0.220
	7.08	0.71	0.50	1.45	0.354	1.00	0.514
	7.67	0.75	0.45	0.48	0.338	0.98	0.160
	8.58	1.04	0.35	2.08	0.365	1.00	0.758
	9.75	1.08	0.20	2.04	0.217	1.00	0.442
	10.75	0.75	0.35	2.19	0.263	1.00	0.575
	11.25	0.50	0.30	0.70	0.150	1.00	0.105
	11.75	0.54	0.30	0.70	0.163	1.00	0.114
LB	12.33	0.63	0.40	0.31	0.250	1.00	0.078
	13.00	0.58	0.40	0.51	0.233	1.00	0.119
	13.50	0.63	0.60	1.49	0.375	1.00	0.559
	14.25	0.38	0.00	0.00	0.000	1.00	0.000
	Total:	0	14.25			4.56	
Average:			0.32	1.10			

MEASUREMENT UNCERTAINTY

Reference: Sauer, V.B. and R.W. Meyer. 1992. Determination of error in individual discharge measurements. Open-File Report 92-144. USGS, Norcross, GA

Substrate

soft	5
uneven	10

DEPTH (Sd)

Enter substrate type 'stable', 'soft' or 'uneven': **uneven** 8.16

PULSATION (St)

Average point measurement duration (sec): **30** 6.40

VELOCITY (Si)

Assume pygmy meter with standard rating 1.75

VERTICAL METHOD (Ss)

Enter 1 if 0.6D, enter 2 if 0.2+0.8D: **1**
Ss= 3.24

NUMBER OF POINTS ACROSS SECTION (Sv)

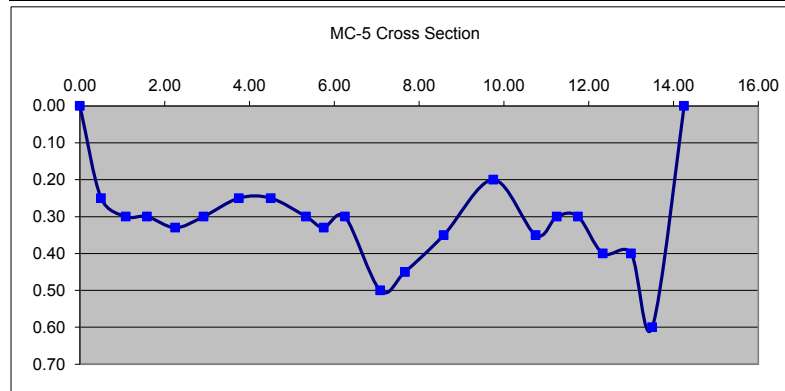
Sv= 2.11

HORIZONTAL OBLIQUE FLOW (Sh)

Sh= 0.00 Assumed small for vertical-axis meters

OVERALL FLOW MEASUREMENT UNCERTAINTY

% 4.91
cfs 0.25



Streamflow Calculations for August 26, 2013

Station:	Marsh Creek, Station MC-5, RR Crossing/ISD						
Date:	8/26/2013	Start time:	11:15	End time:	11:30		
Observer:	Lucero, Ingram; HydroFocus						
Flow conditions:	Rocky bed, moderate flow, banks very vegetated; USGS station reported 0.42 cfs at this time						
Weather:	Sunny, warm, windy						
Water quality:	Clear						
	Distance (ft)	Width (ft)	Depth (ft)	Velocity (ft/s)	Area (ft2)	Horiz. angle factor for velocity (decimal)	Flow (cfs)
RB	0.00	0.54	0.00	0.00	0.000	1.00	0.000
	1.08	0.92	0.20	0.07	0.183	1.00	0.013
	1.83	0.75	0.40	0.02	0.300	1.00	0.006
	2.58	0.75	0.30	0.13	0.225	1.00	0.029
	3.33	0.71	0.30	0.33	0.213	1.00	0.070
	4.00	0.54	0.32	0.21	0.173	1.00	0.036
	4.42	0.42	0.32	0.18	0.133	1.00	0.024
	4.83	0.58	0.35	1.30	0.204	0.94	0.249
	5.58	0.75	0.35	0.41	0.263	1.00	0.108
	6.33	0.71	0.35	2.81	0.248	1.00	0.697
	7.00	0.63	0.35	0.95	0.219	1.00	0.208
	7.58	0.50	0.40	1.88	0.200	1.00	0.376
	8.00	0.71	0.30	1.15	0.213	0.98	0.241
	9.00	0.83	0.35	1.39	0.292	1.00	0.405
	9.67	0.58	0.40	1.63	0.233	1.00	0.380
	10.17	0.54	0.40	1.25	0.217	1.00	0.271
	10.75	0.63	0.35	0.72	0.219	1.00	0.158
	11.42	0.63	0.30	0.35	0.188	1.00	0.066
	12.00	0.63	0.30	1.35	0.188	1.00	0.253
	12.67	1.42	0.30	1.98	0.425	0.98	0.829
	13.42	1.29	0.40	1.13	0.517	0.98	0.575
LB	14.08	0.33	0.40	0.46	0.133	1.00	0.061
	14.83	0.38	0.40	0.35	0.150	1.00	0.053
	15.25	0.21	0.00	0.00	0.000	1.00	0.000
Total:	0	15.96			5.13		5.11
Average:			0.32	0.99			

MEASUREMENT UNCERTAINTY

Reference: Sauer, V.B. and R.W. Meyer. 1992. Determination of error in individual discharge measurements. Open-File Report 92-144. USGS, Norcross, GA

Substrate

soft	5
uneven	10

DEPTH (Sd)

Enter substrate type 'stable', 'soft'
or 'uneven': **uneven** 8.13

PULSATION (St)

Average point measurement
duration (sec): **30** 6.40

VELOCITY (Si)

Assume pygmy meter with
standard rating 1.80

VERTICAL METHOD (Ss)

Enter 1 if 0.6D, enter 2 if 0.2+0.8D: **1**
Ss= 3.17

NUMBER OF POINTS ACROSS SECTION (Sv)

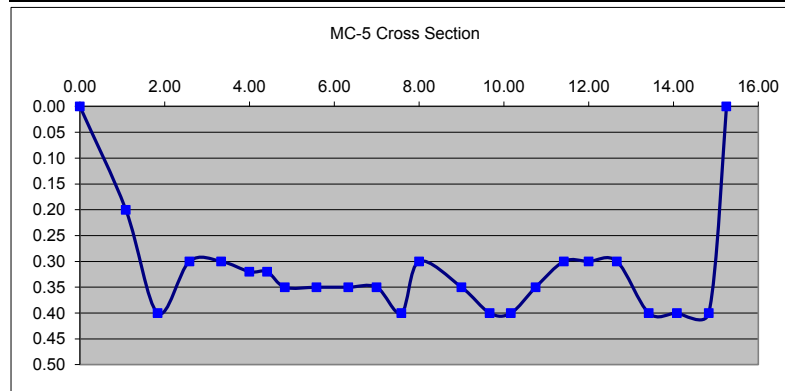
Sv= 1.95

HORIZONTAL OBLIQUE FLOW (Sh)

Sh= 0.00 Assumed small for vertical-axis meters

OVERALL FLOW MEASUREMENT UNCERTAINTY

% 4.77
cfs 0.24



Appendix B: Pump Efficiency Tests and Estimated Drain Discharge.

CONFIDENTIAL/PROPRIETARY INFORMATION

DAVID LEIGHTON
HYDROFOCUS, INC.
P O BOX 2401
DAVIS, CA 956172401

Monday, November 26, 2012

SUBJECT: PUMPING COST ANALYSIS
HP: 30.0 Plant: EMERSON MIDDLE
PUMP TEST REFERENCE NUMBER: 5782

The following Pumping Cost Analysis is presented as an aid to your cost accounting. This analysis is an estimate prepared from operating criteria supplied from the pump test performed 11/19/2012 and information provided by you during the pump test.

It is recommended and assumed that:

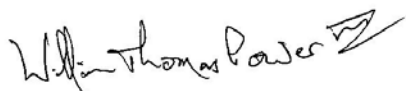
1. Overall plant efficiency can be improved to: 62.0%
2. Water requirements will be the same as for the past year.
3. All operating conditions (annual hours of operation, head above, and water pumping level) will remain the same as they were at the time of the pump test.

	EXISTING PLANT EFFICIENCY	IMPROVED PLANT EFFICIENCY	SAVINGS
kWh/AF	72.6	30.0	42.6
Estimated Total kWh	0	0	0
Average Cost per kWh:	\$0.24		
Average Cost per hour:	\$4.71	\$1.95	\$2.76
Cost Per Acre Ft.:	\$17.42	\$7.21	\$10.21
Estimated Acre Ft. Per Year :	0.0	0.0	
Overall Plant Efficiency:	25.7%	62.0%	
Estimated Total Annual Cost:	\$0.00	\$0.00	\$0.00

It is sincerely hoped that this information will prove helpful to you, and that your concerns over maintaining optimum pumping efficiency will be continued.

If you have any questions, please contact Bill Power at (209) 527-2908.

Regards,



William Thomas Power III

Enclosures

Power Services, Inc.

Agricultural and Domestic Pump Test Report

Plant Location: Emerson Middle

GPS Coordinates: Lat 38 N 00.586 Long 121 W 40.824

Test Date: 11/19/2012 **Tester:** Bill Power

CUSTOMER INFORMATION		POWER COMPANY DATA		EQUIPMENT DATA	
HydroFocus, Inc. P O Box 2401 Davis, CA 956172401 David Leighton Phone: (530) 759-2484 Fax: (503) 756-2687 Cell:		PG & E Meter #: 1005693517 Rate Schedule: AG1B Average Cost: 0.24 State Well #: 005782		HP: 30 Make: General Electric Serial Number: 60172840 Voltage: 460 Amps: 36.5 Pump Type: Mix Flow Pump Make: Prime	
HYDRAULIC DATA		FLOW DATA			
Standing Level	0.0 ft	Run Number: 1 Of 1			
Recovered Level	0.0 ft	Measured Flow 1466 gpm			
Pumping Water Level	7.1 ft	Customer Flow 0 gpm			
Drawdown	0.0 ft	2.1 m g/day			
Discharge Pressure	4.8 psi	Flow Velocity 3.985			
Discharge Level	11.1 ft				
Total Lift	18.2 ft	Acre Feet per 24 Hr: 6.5			
Well Yield	0.0 gpm/ft	Cubic Feet per Second (CFS): 3.3			
Water Source	Canal				
POWER DATA					
Horsepower Input to Motor: 26.25		Percent of Rated Motor Load (%):		80.8	
Brake Horsepower: 24.25		Kilowatt Hours per Acre Foot:		72.54	
Kilowatt Input to Motor: 19.58		Cost to Pump an Acre Foot:		\$17.41	
Energy Cost (\$/Hours) \$4.71		Overall Plant Efficiency (%):		25.65	
Name Plate RPM: 1755		Water Horsepower:		6.73	
Measured RPM: 0		Bowl Efficiency:		27.76	
REMARKS					
All results are based on conditions during the time of the test. If these conditions vary from the normal operation of your pump, the results shown may not describe the pump's normal performance.					
Overall efficiency of this plant is considered to be very low assuming this run represents plant's normal operating condition.					
This pump has an adequate test section.					
This pump did not have a flow meter.					
HPI measured with direct read KWI.					
Based on information obtained at the time the test was performed, this test represents the pumps standard operating conditions.					
Power Hydrodynamics, Inc 209 527-2908 / 800 808-9283					

CONFIDENTIAL/PROPRIETARY INFORMATION

DAVID LEIGHTON
HYDROFOCUS, INC.
P O BOX 2401
DAVIS, CA 956172401

Monday, November 26, 2012

SUBJECT: PUMPING COST ANALYSIS
HP: 40.0 Plant: EMERSON EAST
PUMP TEST REFERENCE NUMBER: 5780

The following Pumping Cost Analysis is presented as an aid to your cost accounting. This analysis is an estimate prepared from operating criteria supplied from the pump test performed 11/19/2012 and information provided by you during the pump test.

It is recommended and assumed that:

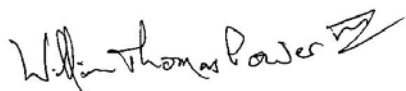
1. Overall plant efficiency can be improved to: 62.0%
2. Water requirements will be the same as for the past year.
3. All operating conditions (annual hours of operation, head above, and water pumping level) will remain the same as they were at the time of the pump test.

	EXISTING PLANT EFFICIENCY	IMPROVED PLANT EFFICIENCY	SAVINGS
kWh / AF	41.5	35.3	6.3
Estimated Total kWh	0	0	0
Average Cost per kWh:	\$0.24		
Average Cost per hour:	\$5.20	\$4.41	\$0.78
Cost Per Acre Ft.:	\$9.97	\$8.47	\$1.50
Estimated Acre Ft. Per Year :	0.0	0.0	
Overall Plant Efficiency:	52.7%	62.0%	
Estimated Total Annual Cost:	\$0.00	\$0.00	\$0.00

It is sincerely hoped that this information will prove helpful to you, and that your concerns over maintaining optimum pumping efficiency will be continued.

If you have any questions, please contact Bill Power at (209) 527-2908.

Regards,



William Thomas Power III

Enclosures

Power Services, Inc.

Agricultural and Domestic Pump Test Report

Plant Location: Emerson East

GPS Coordinates: Lat 38 N 00.586 Long 121 W 40.824

Test Date: 11/19/2012 **Tester:** Bill Power

CUSTOMER INFORMATION		POWER COMPANY DATA		EQUIPMENT DATA	
HydroFocus, Inc. P O Box 2401 Davis, CA 956172401 David Leighton Phone: (530) 759-2484 Fax: (503) 756-2687 Cell:		PG & E Meter #: 1005693517 Rate Schedule: AG1B Average Cost: 0.24 State Well #: 005780		HP: 40 Make: General Electric Serial Number: 60088565 Voltage: 460 Amps: 48.5 Pump Type: Mix Flow Pump Make: Prime	
HYDRAULIC DATA		FLOW DATA			
Standing Level	0.0 ft	Run Number: 1 Of 1			
Recovered Level	0.0 ft	Measured Flow 2828 gpm			
Pumping Water Level	10.5 ft	Customer Flow 0 gpm			
Drawdown	0.0 ft	4.1 m g/day			
Discharge Pressure	4.7 psi	Flow Velocity 7.618			
Discharge Level	10.9 ft				
Total Lift	21.4 ft	Acre Feet per 24 Hr: 12.5			
Well Yield	0.0 gpm/ft	Cubic Feet per Second (CFS): 6.3			
Water Source	Canal				
POWER DATA					
Horsepower Input to Motor: 28.97		Percent of Rated Motor Load (%):		67.4	
Brake Horsepower: 26.94		Kilowatt Hours per Acre Foot:		41.50	
Kilowatt Input to Motor: 21.61		Cost to Pump an Acre Foot:		\$9.96	
Energy Cost (\$/Hours) \$5.19		Overall Plant Efficiency (%):		52.65	
Name Plate RPM: 1775		Water Horsepower:		15.25	
Measured RPM: 0		Bowl Efficiency:		56.61	
REMARKS					
All results are based on conditions during the time of the test. If these conditions vary from the normal operation of your pump, the results shown may not describe the pump's normal performance.					
Overall efficiency of this plant is considered to be fair assuming this run represents plant's normal operating condition.					
This pump has an adequate test section.					
This pump did not have a flow meter.					
HPI measured with direct read KWI.					
Based on information obtained at the time the test was performed, this test represents the pumps standard operating conditions.					
Power Hydrodynamics, Inc 209 527-2908 / 800 808-9283					

CONFIDENTIAL/PROPRIETARY INFORMATION

DAVID LEIGHTON
HYDROFOCUS, INC.
P O BOX 2401
DAVIS, CA 956172401

Monday, November 26, 2012

SUBJECT: PUMPING COST ANALYSIS
HP: 10.0 Plant: GILBERT
PUMP TEST REFERENCE NUMBER: 5783

The following Pumping Cost Analysis is presented as an aid to your cost accounting. This analysis is an estimate prepared from operating criteria supplied from the pump test performed 11/19/2012 and information provided by you during the pump test.

It is recommended and assumed that:

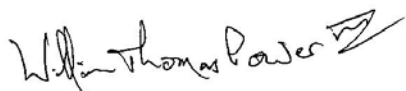
1. Overall plant efficiency can be improved to: 58.0%
2. Water requirements will be the same as for the past year.
3. All operating conditions (annual hours of operation, head above, and water pumping level) will remain the same as they were at the time of the pump test.

	EXISTING PLANT EFFICIENCY	IMPROVED PLANT EFFICIENCY	SAVINGS
kWh/AF	36.7	19.2	17.5
Estimated Total kWh	0	0	0
Average Cost per kWh:	\$0.32		
Average Cost per hour:	\$2.59	\$1.36	\$1.23
Cost Per Acre Ft.:	\$11.75	\$6.15	\$5.59
Estimated Acre Ft. Per Year :	0.0	0.0	
Overall Plant Efficiency:	30.4%	58.0%	
Estimated Total Annual Cost:	\$0.00	\$0.00	\$0.00

It is sincerely hoped that this information will prove helpful to you, and that your concerns over maintaining optimum pumping efficiency will be continued.

If you have any questions, please contact Bill Power at (209) 527-2908.

Regards,



William Thomas Power III

Enclosures

Power Services, Inc.

Agricultural and Domestic Pump Test Report

Plant Location: Gilbert

GPS Coordinates: Lat 38 N 00.260 Long 121 W 40.643

Test Date: 11/19/2012 **Tester:** Bill Power

CUSTOMER INFORMATION		POWER COMPANY DATA		EQUIPMENT DATA	
HydroFocus, Inc. P O Box 2401 Davis, CA 956172401 David Leighton Phone: (530) 759-2484 Fax: (503) 756-2687 Cell:		PG & E Meter #: 1005370774 Rate Schedule: AG1A Average Cost: 0.32 State Well #: 005783		HP: 10 Make: General Electric Serial Number: DS263 Voltage: 230 Amps: 26.8 Pump Type: Propeller Pump Make: Berkeley	
HYDRAULIC DATA		FLOW DATA			
Standing Level	0.0 ft	Run Number: 1 Of 1			
Recovered Level	0.0 ft	Measured Flow 1195 gpm			
Pumping Water Level	3.5 ft	Customer Flow 0 gpm			
Drawdown	0.0 ft	1.7 m g/day			
Discharge Pressure	3.2 psi	Flow Velocity 4.376			
Discharge Level	7.4 ft				
Total Lift	10.9 ft	Acre Feet per 24 Hr: 5.3			
Well Yield	0.0 gpm/ft	Cubic Feet per Second (CFS): 2.7			
Water Source	Canal				
POWER DATA					
Horsepower Input to Motor:	10.82	Percent of Rated Motor Load (%):		92.0	
Brake Horsepower:	9.20	Kilowatt Hours per Acre Foot:		36.68	
Kilowatt Input to Motor:	8.07	Cost to Pump an Acre Foot:		\$11.74	
Energy Cost (\$/Hours)	\$2.59	Overall Plant Efficiency (%):		30.38	
Name Plate RPM:	1740	Water Horsepower:		3.29	
Measured RPM:	0	Bowl Efficiency:		35.75	
REMARKS					
All results are based on conditions during the time of the test. If these conditions vary from the normal operation of your pump, the results shown may not describe the pump's normal performance.					
Overall efficiency of this plant is considered to be very low assuming this run represents plant's normal operating condition.					
This pump has an adequate test section.					
This pump did not have a flow meter.					
HPI measured with direct read KWI.					
Based on information obtained at the time the test was performed, this test represents the pumps standard operating conditions.					
Power Hydrodynamics, Inc 209 527-2908 / 800 808-9283					

CONFIDENTIAL/PROPRIETARY INFORMATION

DAVID LEIGHTON
HYDROFOCUS, INC.
P O BOX 2401
DAVIS, CA 956172401

Thursday, November 29, 2012

SUBJECT: PUMPING COST ANALYSIS
HP: 20.0 Plant: BURROUGHS
PUMP TEST REFERENCE NUMBER: 5779

The following Pumping Cost Analysis is presented as an aid to your cost accounting. This analysis is an estimate prepared from operating criteria supplied from the pump test performed 11/19/2012 and information provided by you during the pump test.

It is recommended and assumed that:

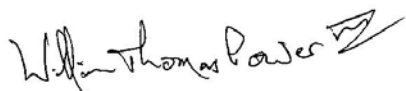
1. Overall plant efficiency can be improved to: 61.0%
2. Water requirements will be the same as for the past year.
3. All operating conditions (annual hours of operation, head above, and water pumping level) will remain the same as they were at the time of the pump test.

	EXISTING PLANT EFFICIENCY	IMPROVED PLANT EFFICIENCY	SAVINGS
kWh / AF	42.5	32.2	10.3
Estimated Total kWh	0	0	0
Average Cost per kWh:	\$0.23		
Average Cost per hour:	\$2.75	\$2.08	\$0.67
Cost Per Acre Ft.:	\$9.77	\$7.40	\$2.37
Estimated Acre Ft. Per Year :	0.0	0.0	
Overall Plant Efficiency:	46.2%	61.0%	
Estimated Total Annual Cost:	\$0.00	\$0.00	\$0.00

It is sincerely hoped that this information will prove helpful to you, and that your concerns over maintaining optimum pumping efficiency will be continued.

If you have any questions, please contact Bill Power at (209) 527-2908.

Regards,



William Thomas Power III

Enclosures

Power Services, Inc.

Agricultural and Domestic Pump Test Report

Plant Location: Burroughs

GPS Coordinates: Lat 38 N 00.641 Long 121 W 39.790

Test Date: 11/19/2012 **Tester:** Bill Power

CUSTOMER INFORMATION		POWER COMPANY DATA		EQUIPMENT DATA	
HydroFocus, Inc. P O Box 2401 Davis, CA 956172401 David Leighton Phone: (530) 759-2484 Fax: (503) 756-2687 Cell:		PG & E Meter #: P99282 Rate Schedule: AG4A Average Cost: 0.23 State Well #: 005779		HP: 20 Make: General Electric Serial Number: UFP1932 Voltage: 230 Amps: 50 Pump Type: Vertical Turbine Booster Pump Make: Prime	
HYDRAULIC DATA		FLOW DATA			
Standing Level	0.0 ft	Run Number: 1 Of 1			
Recovered Level	0.0 ft	Measured Flow 1526 gpm			
Pumping Water Level	6.0 ft	Customer Flow 0 gpm			
Drawdown	0.0 ft	2.2 m g/day			
Discharge Pressure	5.7 psi	Flow Velocity 2.679			
Discharge Level	13.2 ft	Acre Feet per 24 Hr: 6.8			
Total Lift	19.2 ft	Cubic Feet per Second (CFS): 3.4			
Well Yield	0.0 gpm/ft				
Water Source	Canal				
POWER DATA					
Horsepower Input to Motor:	15.99	Percent of Rated Motor Load (%):	70.8		
Brake Horsepower:	14.15	Kilowatt Hours per Acre Foot:	42.46		
Kilowatt Input to Motor:	11.93	Cost to Pump an Acre Foot:	\$9.77		
Energy Cost (\$/Hours)	\$2.75	Overall Plant Efficiency (%):	46.19		
Name Plate RPM:	1750	Water Horsepower:	7.39		
Measured RPM:	0	Bowl Efficiency:	52.19		
REMARKS					
All results are based on conditions during the time of the test. If these conditions vary from the normal operation of your pump, the results shown may not describe the pump's normal performance.					
Overall efficiency of this plant is considered to be low assuming this run represents plant's normal operating condition.					
This pump has an adequate test section.					
This pump did not have a flow meter.					
The air vent is undersized. It should be 1/4 of the pipe diameter or 4 inches. It should also have a continuous release air vent. Pipe had air in top 1/4.					
Power Hydrodynamics, Inc 209 527-2908 / 800 808-9283					

Emerson	Pump	HP	Kwh/AF
Service ID 8466177821	Middle	30	72.54
Meter 1005693517	East	40	41.5

Data provided by Pamela Forbus, RD 2137

Begin Date	End Date	Days	Kwh	Kwh/AF	AF	AF/day	Season	Pump
8/31/2012	10/1/2012	32	3,872	72.54	53	1.7	Summer	Middle
10/2/2012	10/30/2012	29	2,089	72.54	29	1.0	Summer	Middle
10/31/2012	12/2/2012	33	2,534	41.5	61	1.9	Winter	East
12/3/2012	12/31/2012	29	4,543	41.5	109	3.8	Winter	East
1/3/2013	1/31/2013	29	2,111	41.5	51	1.8	Winter	East
2/1/2013	3/4/2013	32	1,685	41.5	41	1.3	Winter	East
3/5/2013	4/2/2013	29	2,235	41.5	54	1.9	Winter	East
4/3/2013	4/30/2013	28	3,537	41.5	85	3.0	Winter	East
5/1/2013	5/2/2013	2	203	72.54	3	1.4	Summer	Middle
5/3/2013	6/3/2013	32	4,578	72.54	63	2.0	Summer	Middle
6/4/2013	7/2/2013	29	3,551	72.54	49	1.7	Summer	Middle
7/3/2013	8/1/2013	30	4,008	72.54	55	1.8	Summer	Middle
8/2/2013	9/2/2013	32	4,848	72.54	67	2.1	Summer	Middle

Brent Gilbert (farmer) said he uses the smaller pump (middle) in the summer when electric rates are higher and the larger pump (east) in the winter. The PGE bill identifies if the rates for the month are summer or winter rates. Based on that information, the pump was assigned for the calculations above.

Gilbert

Service ID 8466177171

Meter 1005370774

Data provided by Pamela Forbus, RD 2137

Begin Date	End Date	Days	Kwh	Kwh/AF	AF	AF/day
8/31/2012	10/1/2012	32	889	36.68	24	0.8
10/2/2012	10/30/2012	29	826	36.68	23	0.8
10/31/2012	12/2/2012	33	1,079	36.68	29	0.9
12/3/2012	12/31/2012	29	2,875	36.68	78	2.7
1/3/2013	1/31/2013	29	808	36.68	22	0.8
2/1/2013	3/4/2013	32	360	36.68	10	0.3
3/5/2013	4/2/2013	29	307	36.68	8	0.3
4/3/2013	5/2/2013	30	1,512	36.68	41	1.4
5/3/2013	6/3/2013	32	1,563	36.68	43	1.3
6/4/2013	7/2/2013	29	1,344	36.68	37	1.3
7/3/2013	8/1/2013	30	1,228	36.68	33	1.1
8/2/2013	9/2/2013	32	1,316	36.68	36	1.1

Pump Station #1 (Burroughs)

Service ID 9397615020

Meter P99282

Data provided by Angelia Tant, Reclamation Dist. 799

Begin Date	End Date	Days	Kwh	Kwh/AF	AF	AF/day
9/6/2012	10/4/2012	29	5,062	42.46	119	4.1
10/5/2012	11/5/2012	32	2,982	42.46	70	2.2
11/6/2012	12/5/2012	30	3,282	42.46	77	2.6
12/6/2012	12/31/2012	26	5,147	42.46	121	4.7
1/6/2013	2/6/2013	32	2,812	42.46	66	2.1
2/7/2013	3/8/2013	30	1,913	42.46	45	1.5
3/9/2013	4/5/2013	28	3,297	42.46	78	2.8
4/6/2013	4/30/2013	25	5,903	42.46	139	5.6
5/8/2013	6/6/2013	30	6,827	42.46	161	5.4
6/7/2013	7/8/2013	32	0	42.46	0	0.0
7/9/2013	7/31/2013	23	10,167	42.46	239	10.4
8/1/2013	8/8/2013	8	3,536	42.46	83	10.4
8/9/2013	9/6/2013	29	4,899	42.46	115	4.0

Appendix C. Historical Water Quality Data

Marsh Creek																															
Date Sampled	Temperature (°C)	EC (uS/cm)	EC Lab (uS/cm)	Dissolved Oxygen (mg/L)	pH	pH Lab	ORP (mV)	Turbidity (NTU)	Total Dissolved Solids (mg/L)	Fecal Coliform (MPN/100 mL)	Total Coliform (MPN/100 mL)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Ortho-Phosphate as P (mg/L)	Total Phosphorous (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Ammonia as N (mg/L)	Nitrate as N (mg/L)	Nitrite as N (mg/L)	Dissolved Organic Carbon (mg/L)	Methyl Mercury (ng/L)	Methyl Mercury [split sample] (ng/L)	Total Mercury (ng/L)	Alkalinity as CaCO ₃ (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Hydroxide (mg/L)
9/24/2012	19.95	1,863	1,750	7.32	7.76	7.99	-48.7	2.6	1,020	300	41,000	70	34	24	270	320	160	3.4	3.9	0.85	0.12	8.7	NA	7.4	0.027*	ND	1.37	181	221	ND	ND
9/24/2012	19.95	1,863	1,760	7.32	7.76	8.06	-48.7	2.6	1,070	50	39,000	68	34	24	270	320	150	3.5	3.6	0.90	0.08	8.7	NA	7.5	0.043	NA	1.21	179	218	ND	ND
10/24/2012	15.50	1,035	874	6.13	7.14	7.54	94.0	7.9	625	15,000	200,000	49	21	14	120	180	140	0.80	1.0	0.94	0.13	3.1	NA	9.0	NA	NA	107	131	ND	ND	ND
10/24/2012	15.50	1,035	891	6.13	7.14	7.47	94.0	7.9	651	14,000	130,000	51	21	14	130	180	140	0.82	1.0	0.91	0.13	3.1	NA	9.2	0.082	0.10	3.60	111	135	ND	ND
10/24/2012	15.50	1,035	900	6.13	7.14	7.48	94.0	7.9	623	9,900	120,000	50	21	15	120	180	140	0.82	1.0	0.90	0.13	3.1	NA	9.3	0.076	NA	3.40	108	132	ND	ND
11/27/2012	15.32	1,965	1,640	8.57	7.58	7.82	95.9	3.1	1,100	130	17,000	71	39	25	270	330	180	1.8	1.8	0.75	0.07	9.8	ND	3.7	0.029	ND	1.46	180	220	ND	ND
11/27/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.035	NA	1.50	NA	NA	NA	NA
12/18/2012	11.21	1,428	843	9.57	7.08	7.91	144.4	9.2	909	500	16,000	82	35	10	180	170	270	0.67	0.85	0.46	ND	3.5	NA	4.5	0.063	0.079	4.39	165	201	ND	ND
12/18/2012	11.21	1,428	827	9.57	7.08	7.89	144.4	9.2	861	420	10,000	82	34	10	170	170	270	0.68	0.84	0.54	ND	3.5	NA	4.7	0.072	NA	4.34	160	195	ND	ND
1/28/2013	11.53	1,895	1,430	10.70	7.32	8.05	70.5	0.90	1,120	49	1,700	82	39	17	220	280	250	1.7	2.2	0.33	ND	8.3	NA	3.7	0.045	ND	1.78	207	253	ND	ND
1/28/2013	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.051	NA	1.79	NA	NA	NA	NA
2/25/2013	11.52	1,372	1,310	10.72	8.08	7.75	231.6	2.6	801	32	1,000	62	28	14	160	220	150	1.4	1.6	0.30	ND	5.0	NA	3.4	0.032	ND	1.28	145	177	ND	ND
2/25/2013	11.52	1,372	1,290	10.72	8.08	7.86	231.6	2.6	798	23	1,300	60	27	14	170	220	150	1.4	1.6	0.26	ND	5.0	NA	3.8	0.020*	NA	1.33	143	174	ND	ND
4/1/2013	17.34	987	917	6.70	7.47	7.66	193.4	6.6	556	8,900	41,000	60	23	10	110	110	160	0.71	0.63	0.50	0.10	2.1	NA	8.1	0.122	0.186	4.50	121	148	ND	ND
4/1/2013	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.130	NA	4.44	NA	NA	NA	NA
4/29/2013	20.83	1,613	1,550	8.33	8.32	8.36	140.1	3.6	940	130	8,700	88	39	20	220	260	190	2.0	2.2	0.57	0.12	8.0	NA	3.7	0.029*	ND	1.64	184	224	ND	ND
4/29/2013	20.83	1,613	1,520	8.33	8.32	8.47	140.1	3.6	931	160	10,000	79	35	20	230	260	190	2.0	2.2	0.65	0.18	8.0	NA	3.9	0.033	NA	1.64	183	223	ND	ND
5/20/2013	19.82	1,629	1,490	8.77	8.05	8.34	131.1	3.3	912	100	29,000	110	45	16	210	260	230	1.6	2.5	0.95	0.12	7.0	NA	3.2	0.043	ND	1.32	184	224	ND	ND
5/20/2013	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.026*	NA	1.33	NA	NA	NA	NA
6/24/2013	20.24	1,628	1,480	7.44	7.89	8.06	68.6	2.1	945	200	36,000	78	36	18	220	250	190	2.5	2.5	0.76	0.11	7.8	NA	2.5	0.030*	0.056	0.881	184	224	ND	ND
6/24/2013	20.24	1,628	1,490	7.44	7.89	7.97	68.6	2.1	945	200	29,000	78	36	18	220	250	190	2.5	2.5	1.1	0.19	7.8	NA	2.4	0.041	NA	0.883	187	228	ND	ND
7/29/2013	20.85	1,682	1,510	7.69	7.99	8.20	44.5	0.6	970	100	39,000	82	36	17	210	260	170	1.9	1.8	0.6	ND	6.6	NA	3.6	0.033	ND	0.927	188	229	ND	ND
7/29/2013	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.028*	NA	0.786	NA	NA	NA	NA
8/26/2013	20.92	1,871	1,650	6.56	7.60	7.96	62.1	0.0	1,060	32	69,000	79	39	20	260	340	200	1.6	1.7	0.7	0.12	7.0	NA	3.7	ND	ND	0.614	185	226	ND	ND
8/26/2013	20.92	1,871	1,630	6.56	7.60	8.14	62.1	0.0	1,020	40	100,000	76	39	20	250	340	200	1.6	1.9	0.59	0.15	7.0	NA	3.8	ND	NA	0.598	190	232	ND	ND

ND is "not detected".
NA is "not analyzed".
* signifies the sample was detected, but not quantifiable since less than the Reporting Limit

Marsh Creek (continued)																													
Date Sampled	2,4,5-T (ug/L)	2,4,5-TP (Silvex) (ug/L)	2,4-D (ug/L)	2,4-DB (ug/L)	3,5- Dichlorobenzoic Acid (ug/L)	4-Nitrophenol (ug/L)	4,4'-DDD (ug/L)	4,4'-DDE (ug/L)	4,4'-DDT (ug/L)	Acifluorfen (ug/L)	Aldrin (ug/L)	Allethrin (ng/L)	alpha-BHC (ug/L)	Azinphos methyl (Guthion) (ug/L)	Bentazon (ug/L)	beta-BHC (ug/L)	Bifenthrin (ng/L)	Bolstar (ug/L)	Chlordane (tech) (ug/L)	Chlorpyrifos (ug/L)	Coumaphos (ug/L)	Cyfluthrin (ng/L)	Cypermethrin (ng/L)	Dalapon (ug/L)	DCPA (ug/L)	delta-BHC (ug/L)	Deltamethrin/ Tralomethrin (ng/L)	Demeton-o (ug/L)	Demeton-s (ug/L)
9/24/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
9/24/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
10/24/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
10/24/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
10/24/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
11/27/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
12/18/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	33	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
12/18/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	39	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1/28/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2/25/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2/25/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4/1/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4/29/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4/29/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5/20/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
6/24/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
6/24/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
7/29/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/26/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/26/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

ND is "not detected".

Marsh Creek (continued)																														
Date Sampled	Diazinon (ug/L)	Dicambra (ug/L)	Dichloran (ng/L)	Dichloroprop (ug/L)	Dichlorvos (ug/L)	Dieldrin (ug/L)	Dimethoate (ug/L)	Dinoseb (ug/L)	Disulfoton (ug/L)	Endosulfan I (ug/L)	Endosulfan II (ug/L)	Endosulfan sulfate (ug/L)	Endrin (ug/L)	Endrin aldehyde (ug/L)	Esfenvalerate (ng/L)	Ethoprop (ug/L)	Ethyl parathion (ug/L)	Fenpropathrin (Danitol) (ng/L)	Fensulfothion (ug/L)	Fenthion (ug/L)	Fenvalerate (ng/L)	gamma- BHC (Lindane) (ug/L)	Heptachlor (ug/L)	Heptachlor epoxide (ug/L)	L-Cyhalothrin (ng/L)	Malathion (ug/L)	MCPA (ug/L)	MCPP (ug/L)	Merphos (ug/L)	
9/24/2012	ND	ND	7.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
9/24/2012	ND	ND	8.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
10/24/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
10/24/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
10/24/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
11/27/2012	ND	ND	6.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
12/18/2012	ND	ND	6.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
12/18/2012	ND	ND	6.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1/28/2013	ND	ND	8.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2/25/2013	ND	ND	3.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2/25/2013	ND	ND	2.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4/1/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4/29/2013	ND	ND	2.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4/29/2013	ND	ND	2.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5/20/2013	ND	ND	3.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
6/24/2013	ND	ND	3.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
6/24/2013	ND	ND	4.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
7/29/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/26/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/26/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

ND is "not detected".

Marsh Creek (continued)																	
Date Sampled	Methoxychlor (ug/L)	Methyl parathion (ug/L)	Mevinphos (ug/L)	Naled (ug/L)	Pendimethalin (ng/L)	Pentachloro- phenol (ug/L)	Permethrin (ng/L)	Phorate (ug/L)	Picloram (ug/L)	Prallethrin (ng/L)	Ronnel (ug/L)	Sumithrin (ng/L)	Tefluthrin (ng/L)	Thionazin (ug/L)	Tokuthion (Prothiofos) (ug/L)	Toxaphene (ug/L)	Trichloronate (ug/L)
9/24/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
9/24/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
10/24/2012	ND	ND	ND	ND	6.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
10/24/2012	ND	ND	ND	ND	6.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
10/24/2012	ND	ND	ND	ND	7.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
11/27/2012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
12/18/2012	ND	ND	ND	ND	100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
12/18/2012	ND	ND	ND	ND	110	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1/28/2013	ND	ND	ND	ND	9.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2/25/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2/25/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4/1/2013	ND	ND	ND	ND	24	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4/29/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4/29/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
5/20/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	57	ND	ND	ND	ND	ND
6/24/2013	ND	ND	ND	ND	2.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
6/24/2013	ND	ND	ND	ND	2.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
7/29/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/26/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11	ND	ND	ND	ND	ND
8/26/2013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	14	ND	ND	ND	ND	ND

ND is "not detected".

Emerson												
Date Sampled	Temperature (°C)	EC (uS/cm)	EC Lab (uS/cm)	Dissolved Oxygen (mg/L)	pH	pH Lab	ORP (mV)	Turbidity (NTU)	DOC (mg/L)	TOC (mg/L)	Methyl Mercury (ng/L)	Trihalomethane Formation Potential (ug/L)
9/24/2012	19.18	2,145	2,090	3.55	7.25	7.65	-106.0	5.6	23.0	24.0	0.114	NA
10/1/2012	17.02	2,648	NA	2.45	7.27	NA	-31.0	10.0	15.0	NA	NA	1,100
10/24/2012	14.74	2,809	2,440	6.74	7.71	7.87	51.7	42.3	23.0	23.0	0.205	NA
11/27/2012	10.18	2,641	2,750	6.69	7.25	7.45	38.9	21.2	16.0	17.0	0.091	1,300
12/18/2012	10.32	3,787	3,160	5.66	7.22	7.54	-2.4	107.5	35.0	38.0	0.643	1,400
1/28/2013	10.35	3,409	1,850	8.78	7.54	7.44	-0.60	48.1	39.0	13.0	0.229	1,700
2/25/2013	8.69	2,885	3,590	7.70	7.24	7.50	112.6	51.3	26.0	26.0	0.115	1,300
4/1/2013	15.98	2,275	2,020	2.91	7.33	7.54	192.4	13.2	31.0	27.0	0.163	1,700
4/29/2013	24.15	3,172	2,350	6.14	7.41	7.62	181.4	15.0	25.0	24.0	0.156	1,900
5/20/2013	21.53	2,933	2,670	3.13	7.46	7.81	66.7	30.6	15.0	16.0	0.090	1,200
6/24/2013	19.11	1,988	1,720	2.50	7.37	7.58	20.4	8.8	10.0	11.0	0.181	1,500
7/29/2013	21.14	1,595	1,430	2.58	7.46	7.59	-6.7	13.4	24.0	23.0	0.197	1,300
8/26/2013	21.30	2,480	2,640	2.09	7.69	7.60	-31.0	2.0	31.0	29.0	0.255	1,700

ND is "not detected".

NA is "not analyzed".

Gilbert												
Date Sampled	Temperature (°C)	EC (uS/cm)	EC Lab (uS/cm)	Dissolved Oxygen (mg/L)	pH	pH Lab	ORP (mV)	Turbidity (NTU)	DOC (mg/L)	TOC (mg/L)	Methyl Mercury (ng/L)	Trihalomethane Formation Potential (ug/L)
9/24/2012	19.01	2,295	2,310	3.50	7.51	7.80	-103.7	3.8	23.0	25.0	0.904	NA
10/1/2012	18.63	2,055	NA	2.43	7.64	NA	-51.0	10.3	19.0	NA	NA	1,400
10/24/2012	14.32	2,331	2,020	2.26	7.45	7.56	51.6	6.1	23.0	23.0	1.11	NA
11/27/2012	10.91	1,915	1,900	3.59	7.16	7.42	65.6	7.2	25.0	25.0	0.583	1,800
12/18/2012	9.13	3,038	2,370	5.37	7.46	7.83	13.6	11.9	28.0	30.0	0.343	1,500
1/28/2013	9.88	2,773	1,810	8.77	7.11	7.78	10.4	9.2	17.0	19.0	0.281	1,200
2/25/2013	9.16	2,678	2,880	9.97	8.07	8.31	230.7	14.3	18.0	18.0	0.193	1,500
4/1/2013	21.32	2,240	2,050	4.33	7.92	8.02	206.9	9.7	33.0	31.0	0.306	1,800
4/29/2013	23.71	1,485	1,420	6.05	7.65	7.83	122.3	13.8	19.0	19.0	0.976	1,500
5/20/2013	22.98	1,042	966	3.64	7.35	7.63	162.5	5.0	23.0	24.0	0.730	1,500
6/24/2013	18.64	1,117	1,030	2.93	7.21	7.57	158.7	8.8	19.0	20.0	0.554	1,600
7/29/2013	20.95	1,497	1,350	10.07	8.03	8.13	37.8	11.7	19.0	20.0	0.285	1,500
8/26/2013	22.25	2,058	1,770	8.81	7.67	7.96	55.1	9.6	19.0	19.0	0.350	1,600

ND is "not detected".

NA is "not analyzed".

Burroughs												
Date Sampled	Temperature (°C)	EC (uS/cm)	EC Lab (uS/cm)	Dissolved Oxygen (mg/L)	pH	pH Lab	ORP (mV)	Turbidity (NTU)	DOC (mg/L)	TOC (mg/L)	Methyl Mercury (ng/L)	Trihalomethane Formation Potential (ug/L)
9/24/2012	22.29	2,342	2,260	4.54	7.77	8.06	-96.8	20.5	21.0	21.0	0.298	NA
10/1/2012	17.94	2,208	NA	1.04	7.71	NA	-41.2	4.0	12.0	NA	NA	1,000
10/24/2012	14.19	1,009	930	3.02	7.05	7.33	108.9	4.8	12.0	13.0	0.242	NA
11/27/2012	9.98	1,888	711	2.53	7.46	7.34	-59.8	21.0	18.0	18.0	0.278	1,300
12/18/2012	9.26	1,883	1,550	4.15	7.10	7.62	28.9	2.4	28.0	29.0	0.320	1,400
1/28/2013	11.08	2,559	1,770	11.2	7.92	8.05	-47.9	27.0	13.0	32.0	0.190	1,000
2/25/2013	13.95	1,897	1,820	12.93	7.84	7.88	183.2	12.0	12.0	12.0	0.191	1,000
4/1/2013	17.74	1,440	1,650	7.08	7.47	7.75	147.7	6.4	14.0	15.0	0.421	1,300
4/29/2013	26.23	2,215	2,130	7.33	7.82	7.99	116.0	6.6	11.0	11.0	0.339	910
5/20/2013	24.46	1,575	1,380	9.42	8.00	8.03	82.6	5.3	9.2	10.0	0.287	810
6/24/2013	19.80	836	785	1.42	7.08	7.34	113.8	3.3	13.0	15.0	1.46	1,400
7/29/2013	20.88	2,018	1,700	7.47	7.86	7.83	18.0	4.2	17.0	17.0	0.455	1,100
8/26/2013	20.94	1,907	1,470	17.90	7.61	7.72	1.6	5.5	11.0	11.0	0.411	990

ND is "not detected".

NA is "not analyzed".

Appendix D: Laboratory Analytical Reports



Analytical Report

HydroFocus, Inc. P.O. Box 2401 Davis, CA 95617	Client Project ID: #5586; Dutch Slough SW	Date Sampled: 07/29/13
		Date Received: 07/29/13
	Client Contact: Christina Hart	Date Reported: 08/07/13
	Client P.O.:	Date Completed: 08/07/13

WorkOrder: 1307907

August 07, 2013

Dear Christina:

Enclosed within are:

- 1) The results of the **6** analyzed samples from your project: **#5586; Dutch Slough SW**,
- 2) QC data for the above samples, and
- 3) A copy of the chain of custody.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits.

If you have any questions or concerns, please feel free to give me a call. Thank you for choosing McC Campbell Analytical Laboratories for your analytical needs.

Best regards,

Angela Rydelius
Laboratory Manager
McC Campbell Analytical, Inc.

The analytical results relate only to the items tested.

McC Campbell Analytical, Inc.



1534 Willow Pass Rd
Pittsburg, CA 94565-1701
(925) 252-9262

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

WorkOrder: 1307907

ClientCode: HYFD

☐ WaterTrax ☐ WriteOn ☐ EDF ☒ Excel ☐ EQulS ☒ Email ☐ HardCopy ☐ ThirdParty ☐ J-flag

Report to:

Christina Hart
HydroFocus, Inc.
P.O. Box 2401
Davis, CA 95617
(530) 756-2840 FAX: (530) 756-2687

Email: chart@hydrofocus.com
cc:
PO:
ProjectNo: #5586; Dutch Slough SW

Bill to:

Teresa Deverel
HydroFocus, Inc.
P.O. Box 2401
Davis, CA 95617

Requested TAT:

5 days

Date Received: 07/29/2013

Date Printed: 07/30/2013

Lab ID	Client ID	Matrix	Collection Date	Hold	Requested Tests (See legend below)											
					1	2	3	4	5	6	7	8	9	10	11	12
1307907-001	MC-5A	Water	7/29/2013 10:10	☐	G	B	C	E	A	A	F	A	C	D		
1307907-002	MC-5C	Water	7/29/2013 10:30	☐	G	B	C	E	A	A	F	A	C	D		
1307907-003	Emerson	Water	7/29/2013 12:40	☐					A	A						
1307907-004	Gilbert	Water	7/29/2013 13:25	☐					A	A						
1307907-005	Burroughs	Water	7/29/2013 14:20	☐					A	A						
1307907-006	Trip Blank	Water	7/29/2013	☐	G	B	C	E	A	A	F	A	C	D		

Test Legend:

1	300_1_W	2	Alka(spe)_W	3	AMMONIA_W	4	METALSMS DISS	5	PH_W
6	SC_W	7	TCEC-Enum_W	8	TDS_W	9	TKN_W	10	TotalP_W
11		12							

Prepared by: Jena Alfaro

Comments: Spoke to Tim re: pos TC/EC in -001 - 07/30/13, Angela R.

NOTE: Soil samples are discarded 60 days after results are reported unless other arrangements are made (Water samples are 30 days).
Hazardous samples will be returned to client or disposed of at client expense.



Sample Receipt Checklist

Client Name: **HydroFocus, Inc.**

Date and Time Received: **7/29/2013 4:14:57 PM**

Project Name: **#5586; Dutch Slough SW**

Login Reviewed by: **Jena Alfaro**

WorkOrder N°: **1307907**

Matrix: Water

Carrier: Client Drop-In

Chain of Custody (COC) Information

Chain of custody present?	Yes ☒	No ☐
Chain of custody signed when relinquished and received?	Yes ☒	No ☐
Chain of custody agrees with sample labels?	Yes ☒	No ☐
Sample IDs noted by Client on COC?	Yes ☒	No ☐
Date and Time of collection noted by Client on COC?	Yes ☒	No ☐
Sampler's name noted on COC?	Yes ☒	No ☐

Sample Receipt Information

Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	NA ☒
Shipping container/cooler in good condition?	Yes ☒	No ☐	
Samples in proper containers/bottles?	Yes ☒	No ☐	
Sample containers intact?	Yes ☒	No ☐	
Sufficient sample volume for indicated test?	Yes ☒	No ☐	

Sample Preservation and Hold Time (HT) Information

All samples received within holding time?	Yes ☒	No ☐	
Container/Temp Blank temperature	Cooler Temp: 3.2°C		NA ☐
Water - VOA vials have zero headspace / no bubbles?	Yes ☐	No ☐	No VOA vials submitted ☒
Sample labels checked for correct preservation?	Yes ☒	No ☐	
Metal - pH acceptable upon receipt (pH<2)?	Yes ☐	No ☒	NA ☐
Samples Received on Ice?	Yes ☒	No ☐	

(Ice Type: WET ICE)

* NOTE: If the "No" box is checked, see comments below.

Comments: Trip Blank Metal preserved in house.

	McC Campbell Analytical, Inc. <i>"When Quality Counts"</i>	1534 Willow Pass Road, Pittsburg, CA 94565-1701 Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269 http://www.mcccampbell.com / E-mail: main@mcccampbell.com			
HydroFocus, Inc. P.O. Box 2401 Davis, CA 95617	Client Project ID: #5586; Dutch Slough SW	Date Sampled: 07/29/13			
	Client Contact: Christina Hart	Date Received: 07/29/13			
	Client P.O.:	Date Extracted: 07/30/13-07/31/13			
	Date Analyzed: 07/30/13-07/31/13				
Inorganic Anions by IC*					
Extraction Method: E300.1 Analytical Method: E300.1 Work Order: 1307907					
Lab ID	1307907-001G	1307907-002G	1307907-006G	Reporting Limit for DF = 1	
Client ID	MC-5A	MC-5C	Trip Blank		
Matrix	W	W	W		
DF	1	1	1		
S				W	
Compound	Concentration			ug/kg	mg/L
Chloride	260	ND	ND	NA	0.1
Nitrate as N	6.6	ND	ND	NA	0.1
Nitrate as NO ₃ ⁻	29	ND	ND	NA	0.45
ortho-Phosphate as P	1.9	ND	ND	NA	0.1
Sulfate	170	ND	ND	NA	0.1
Surrogate Recoveries (%)					
%SS:	114	112	113		
Comments					
* water samples are reported in mg/L, soil/sludge/solid samples in mg/kg, wipe samples in mg/wipe, product/oil/non-aqueous liquid samples in mg/L. * [Nitrate as NO ₃ ⁻] = 4.4268 x [Nitrate as N] # means surrogate diluted out of range or surrogate coelutes with another peak; N/A means surrogate not applicable to this analysis; %SS = Percent Recovery of Surrogate Standard; DF = Dilution Factor					



McC Campbell Analytical, Inc.

"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

HydroFocus, Inc. P.O. Box 2401 Davis, CA 95617	Client Project ID: #5586; Dutch Slough SW	Date Sampled: 07/29/13
		Date Received: 07/29/13
	Client Contact: Christina Hart	Date Extracted: 08/02/13
	Client P.O.:	Date Analyzed: 08/02/13

Ammonia as N*

Analytical Method: E350.1

Work Order: 1307907

Lab ID	Client ID	Matrix	Total Ammonia as N	DF	Comments
1307907-001C	MC-5A	W	ND	1	
1307907-002C	MC-5C	W	ND	1	
1307907-006C	Trip Blank	W	ND	1	

Reporting Limit for DF = 1; ND means not detected at or above the reporting limit	W	0.1 mg/L	
	S	NA	

*water/product/oil/non-aqueous liquid samples and all TCLP / STLC / DISTLC / SPLP extracts are reported in mg/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, filter samples in µg/filter.

DF = Dilution Factor



1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
<http://www.mccampbell.com> / E-mail: main@mccampbell.com

HydroFocus, Inc. P.O. Box 2401 Davis, CA 95617	Client Project ID: #5586; Dutch Slough SW	Date Sampled: 07/29/13
		Date Received: 07/29/13
	Client Contact: Christina Hart	Date Extracted: 07/30/13
	Client P.O.:	Date Analyzed: 07/30/13

Extraction method: SM2320B

Analytical methods: SM2320B

Work Order: 1307907

[illegible]

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	1.0	1.0	1.0	1.0	mg CaCO ₃ /L
	S	NA	NA	NA	NA	mg/Kg

*water samples are reported in mg calcium carbonate/L. Hydroxide, Carbonate & Bicarbonate alkalinity measure @ end-point of pH = 8.3 & 4.5 per SM2320B.

DF = Dilution Factor

CDPH ELAP 1644 ♦ NELAP 12283CA

HN	Analyst's Initial
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	25
26	26
27	27
28	28
29	29
30	30
31	31
32	32
33	33
34	34
35	35
36	36
37	37
38	38
39	39
40	40
41	41
42	42
43	43
44	44
45	45
46	46
47	47
48	48
49	49
50	50
51	51
52	52
53	53
54	54
55	55
56	56
57	57
58	58
59	59
60	60
61	61
62	62
63	63
64	64
65	65
66	66
67	67
68	68
69	69
70	70
71	71
72	72
73	73
74	74
75	75
76	76
77	77
78	78
79	79
80	80
81	81
82	82
83	83
84	84
85	85
86	86
87	87
88	88
89	89
90	90
91	91
92	92
93	93
94	94
95	95
96	96
97	97
98	98
99	99
100	100

AR Angela Rydelius, Lab Manager



1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
<http://www.mccampbell.com> / E-mail: main@mccampbell.com

Metals*			
Extraction method:	E200.8	Analytical methods:	E200.8
		Work Order:	1307907

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	DISS.	100	20	50	100	µg/L
	S	TOTAL	NA	NA	NA	NA	NA

*water samples are reported in µg/L, product/oil/non-aqueous liquid samples and all TCLP / STLC / DISTLC / SPLP extracts are reported in mg/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, filter samples in µg/filter.

means surrogate diluted out of range; ND means not detected above the reporting limit/method detection limit; N/A means not applicable to this sample or instrument;
%SS = Percent Recovery of Surrogate Standard; DF = Dilution Factor

TOTAL = Hot acid digestion of a representative sample aliquot.

TRM = Total recoverable metals is the "direct analysis" of a sample aliquot taken from its acid-preserved container.

DISS = Dissolved metals by direct analysis of 0.45 μm filtered and acidified sample.

CDPH ELAP 1644 ♦ NELAP 12283CA

PR Analyst's Initial

AR Angela Rydelius, Lab Manager



McC Campbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

HydroFocus, Inc. P.O. Box 2401 Davis, CA 95617	Client Project ID: #5586; Dutch Slough SW	Date Sampled: 07/29/13
	Client Contact: Christina Hart	Date Received: 07/29/13
	Client P.O.:	Date Extracted: 07/29/13
		Date Analyzed: 07/29/13

pH*

Analytical Method: SM4500H+B

Work Order: 1307907

Lab ID	Client ID	Matrix	pH	DF	Comments
1307907-001A	MC-5A	W	8.20 @ 22.7°C	1	
1307907-002A	MC-5C	W	6.35 @ 22.7°C	1	
1307907-003A	Emerson	W	7.59 @ 22.7°C	1	
1307907-004A	Gilbert	W	8.13 @ 22.3°C	1	
1307907-005A	Burroughs	W	7.83 @ 22.7°C	1	
1307907-006A	Trip Blank	W	6.20 @ 23.3°C	1	

Method Accuracy and Reporting Units	W	±0.05, pH units @ °C	
	S	NA	

* According the formal method, this is "field test" with a 15 minute Hold Time. However, as this is unrealistically short for commercial environmental analysis, MAI has designated a 24 hour hold time for aqueous samples.

DF = Dilution Factor



HydroFocus, Inc. P.O. Box 2401 Davis, CA 95617	Client Project ID: #5586; Dutch Slough SW	Date Sampled: 07/29/13
		Date Received: 07/29/13
	Client Contact: Christina Hart	Date Extracted: 07/30/13
	Client P.O.:	Date Analyzed: 07/30/13

Specific Conductivity*

Analytical Method: SM2510B

Work Order: 1307907

Lab ID	Client ID	Matrix	Specific Conductivity	DF	Comments
1307907-001A	MC-5A	W	1510 @ 23.6°C	1	
1307907-002A	MC-5C	W	ND @ 23.8°C	1	
1307907-003A	Emerson	W	1430 @ 23.4°C	1	
1307907-004A	Gilbert	W	1350 @ 23.5°C	1	
1307907-005A	Burroughs	W	1700 @ 23.5°C	1	
1307907-006A	Trip Blank	W	ND @ 23.5°C	1	

Reporting Limit for DF = 1; ND means not detected at or above the reporting limit	W	10 µmhos/cm @ 25°C	
	S	NA	

DF = Dilution Factor



HydroFocus, Inc.
P.O. Box 2401
Davis, CA 95617

Client P.O.:

Date Analyzed: 07/30/13

Work Order: 1307907

Reporting Limit & Reporting Units	W	1.0 MPN/100ml	
	S	NA	

Page 11 of 23



McC Campbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

HydroFocus, Inc. P.O. Box 2401 Davis, CA 95617	Client Project ID: #5586; Dutch Slough SW	Date Sampled: 07/29/13
		Date Received: 07/29/13
	Client Contact: Christina Hart	Date Extracted: 07/31/13
	Client P.O.:	Date Analyzed: 08/01/13

Total Dissolved Solids*

Analytical Method: SM2540C

Work Order: 1307907

Lab ID	Client ID	Matrix	Total Dissolved Solids	DF	Comments
1307907-001A	MC-5A	W	970	1	
1307907-002A	MC-5C	W	ND	1	
1307907-006A	Trip Blank	W	ND	1	

Reporting Limit for DF = 1; ND means not detected at or above the reporting limit	W	10 mg/L	
	S	NA	

* water samples reported in mg/L.

DF = Dilution Factor



McC Campbell Analytical, Inc.

"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

HydroFocus, Inc. P.O. Box 2401 Davis, CA 95617	Client Project ID: #5586; Dutch Slough SW	Date Sampled: 07/29/13
		Date Received: 07/29/13
	Client Contact: Christina Hart	Date Extracted: 08/05/13
	Client P.O.:	Date Analyzed: 08/06/13

Total Phosphorous as P*

Analytical Method: E365.1

Work Order: 1307907

Lab ID	Client ID	Matrix	Total Phosphorous as P	DF	Comments
1307907-001D	MC-5A	W	1.8	2	
1307907-002D	MC-5C	W	ND	1	
1307907-006D	Trip Blank	W	ND	1	

Reporting Limit for DF = 1; ND means not detected at or above the reporting limit	W	0.04 mg/L	
	S	NA	

*water/product/oil/non-aqueous liquid samples and all TCLP / STLC / DISTLC / SPLP extracts are reported in mg/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, filter samples in µg/filter.

DF = Dilution Factor



QC SUMMARY REPORT FOR E300.1

W.O. Sample Matrix: Water

QC Matrix: Water

BatchID: 79917

WorkOrder: 1307907

EPA Method: E300.1

Extraction: E300.1

Spiked Sample ID: 1307905-001a

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	Acceptance Criteria (%)		
	mg/L	mg/L	% Rec.	% Rec.	% RPD	% Rec.	MS / MSD	RPD	LCS
Chloride	1600	1	NR	NR	NR	92.5	N/A	N/A	85 - 115
Nitrate as N	0.27	1	91.8	91.5	0.251	91.5	85 - 115	15	85 - 115
Nitrate as NO ₃ ⁻	1.2	4.4	92.4	92.1	0.251	92.1	85 - 115	15	85 - 115
ortho-Phosphate as P	ND	1	85.6	87.6	2.33	101	85 - 115	15	85 - 115
Sulfate	260	1	NR	NR	NR	98.6	N/A	N/A	85 - 115
%SS:	103	0.10	110	114	3.77	114	90 - 115	10	90 - 115

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:
NONE

BATCH 79917 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
1307907-001G	07/29/13 10:10 AM	07/30/13	07/30/13 3:32 AM	1307907-001G	07/29/13 10:10 AM	07/30/13	07/30/13 11:35 AM
1307907-001G	07/29/13 10:10 AM	07/31/13	07/31/13 2:29 PM	1307907-002G	07/29/13 10:30 AM	07/30/13	07/30/13 4:16 AM
1307907-006G	07/29/13	07/30/13	07/30/13 4:59 AM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = $100 * (MS - Sample) / (Amount Spiked)$; RPD = $100 * (MS - MSD) / ((MS + MSD) / 2)$.

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not applicable to this method.

surrogate diluted out of range or surrogate coelutes with another peak.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.



QC SUMMARY REPORT FOR E351.2

W.O. Sample Matrix: Water

QC Matrix: Water

BatchID: 80077

WorkOrder: 1307907

EPA Method: E351.2

Extraction: E351.2

Spiked Sample ID: 1307907-001C

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	Acceptance Criteria (%)		
	mg/L	mg/L	% Rec.	% Rec.	% RPD	% Rec.	MS / MSD	RPD	LCS
TKN as N	0.63	12	91.3	89.7	1.65	94.3	80 - 120	20	90 - 110

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:
NONE

BATCH 80077 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
1307907-001C	07/29/13 10:10 AM	08/02/13	08/03/13 2:39 PM	1307907-002C	07/29/13 10:30 AM	08/02/13	08/03/13 2:51 PM
1307907-006C	07/29/13	08/02/13	08/03/13 2:54 PM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = $100 * (MS - Sample) / (Amount\ Spiked)$; RPD = $100 * (MS - MSD) / ((MS + MSD) / 2)$.

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.



QC SUMMARY REPORT FOR E350.1

W.O. Sample Matrix: Water

QC Matrix: Water

BatchID: 80115

WorkOrder: 1307907

EPA Method: E350.1

Extraction: E350.1

Spiked Sample ID: 1307905-001D

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	Acceptance Criteria (%)		
	mg/L	mg/L	% Rec.	% Rec.	% RPD	% Rec.	MS / MSD	RPD	LCS
Total Ammonia as N	0.11	4	95.7	99.4	3.70	91.7	80 - 120	20	90 - 110

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:
NONE

BATCH 80115 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
1307907-001C	07/29/13 10:10 AM	08/02/13	08/02/13 8:59 PM	1307907-002C	07/29/13 10:30 AM	08/02/13	08/02/13 9:02 PM
1307907-006C	07/29/13	08/02/13	08/02/13 9:28 PM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = $100 * (MS - Sample) / (Amount Spiked)$; RPD = $100 * (MS - MSD) / ((MS + MSD) / 2)$.

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not applicable to this method.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.



QC SUMMARY REPORT FOR WET CHEMISTRY TESTS

Test Method: SM2320B (Alkalinity)

Matrix: W

WorkOrder: 1307907

Method Name: SM2320B			Units: mg CaCO ₃ /L			BatchID: 79949
Lab ID	Sample	DF	Dup / Ser. Dil.	DF	% RPD	Acceptance Criteria (%)
1307907-001B	188	1	189	1	0.356	<20
1307907-002B	ND	1	ND	1	N/A	<20
1307907-006B	ND	1	ND	1	N/A	<20

BATCH 79949 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
1307907-001B	07/29/13 10:10 AM	07/30/13	07/30/13 10:00 AM	1307907-002B	07/29/13 10:30 AM	07/30/13	07/30/13 10:07 AM
1307907-006B	07/29/13	07/30/13	07/30/13 10:10 AM				

Test Method: SM4500H+B (pH)

Matrix: W

WorkOrder: 1307907

Method Name: SM4500H+B			Units: $\pm$, pH units @ °C			BatchID: 79935
Lab ID	Sample	DF	Dup / Ser. Dil.	DF	Precision	Acceptance Criteria
1307907-001A	8.20 @ 22.7°C	1	8.20 @ 22.8°C	1	0	0.05
1307907-002A	6.35 @ 22.7°C	1	6.31 @ 22.7°C	1	0.04	0.05
1307907-003A	7.59 @ 22.7°C	1	7.61 @ 22.8°C	1	0.02	0.05
1307907-004A	8.13 @ 22.3°C	1	8.12 @ 22.4°C	1	0.01	0.05
1307907-005A	7.83 @ 22.7°C	1	7.83 @ 22.7°C	1	0	0.05
1307907-006A	6.20 @ 23.3°C	1	6.19 @ 23.4°C	1	0.01	0.05

BATCH 79935 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
1307907-001A	07/29/13 10:10 AM	07/29/13	07/29/13 8:45 PM	1307907-002A	07/29/13 10:30 AM	07/29/13	07/29/13 8:51 PM
1307907-003A	07/29/13 12:40 PM	07/29/13	07/29/13 8:57 PM	1307907-004A	07/29/13 1:25 PM	07/29/13	07/29/13 9:03 PM
1307907-005A	07/29/13 2:20 PM	07/29/13	07/29/13 9:09 PM	1307907-006A	07/29/13	07/29/13	07/29/13 9:15 PM

Dup = Duplicate; Ser. Dil. = Serial Dilution; MS = Matrix Spike; RD = Relative Difference; RPD = Relative Percent Deviation.

Precision = Absolute Value (Sample - Duplicate)

RPD = $100 * (\text{Sample} - \text{Duplicate}) / [(\text{Sample} + \text{Duplicate}) / 2]$

%RPD is calculated using results of up to 10 significant figures, however the reported results are rounded to 2 or 3 significant figures. Therefore there may be a slight discrepancy between the %RPD displayed above and %RPD calculated using the reported results. MAI considers %RPD based upon more significant figures to be more accurate.



QC SUMMARY REPORT FOR WET CHEMISTRY TESTS

Test Method: SM2510B (Specific Conductivity)

Matrix: W

WorkOrder: 1307907

Method Name: SM2510B			Units: μ mhos/cm @ 25°C			BatchID: 79956
Lab ID	Sample	DF	Dup / Ser. Dil.	DF	% RPD	Acceptance Criteria (%)
1307907-001A	1510 @ 23.6°C	1	1520 @ 23.6°C	1	0.397	<2
1307907-002A	ND @ 23.8°C	1	ND @ 23.8°C	1	N/A	<2
1307907-003A	1430 @ 23.4°C	1	1430 @ 23.4°C	1	0.14	<2
1307907-004A	1350 @ 23.5°C	1	1350 @ 23.5°C	1	0.0739	<2
1307907-005A	1700 @ 23.5°C	1	1700 @ 23.5°C	1	0.412	<2
1307907-006A	ND @ 23.5°C	1	ND @ 23.5°C	1	N/A	<2

BATCH 79956 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
1307907-001A	07/29/13 10:10 AM	07/30/13	07/30/13 5:05 PM	1307907-002A	07/29/13 10:30 AM	07/30/13	07/30/13 5:15 PM
1307907-003A	07/29/13 12:40 PM	07/30/13	07/30/13 5:25 PM	1307907-004A	07/29/13 1:25 PM	07/30/13	07/30/13 5:35 PM
1307907-005A	07/29/13 2:20 PM	07/30/13	07/30/13 5:45 PM	1307907-006A	07/29/13	07/30/13	07/30/13 5:55 PM

Dup = Duplicate; SD = Serial Dilution; MS = Matrix Spike; RD = Relative Difference; RPD = Relative Percent Deviation.

Precision = Absolute Value (Sample - Duplicate)

$RPD = 100 * (\text{Sample} - \text{Duplicate}) / [(\text{Sample} + \text{Duplicate}) / 2]$

%RPD is calculated using results of up to 10 significant figures, however the reported results are rounded to 2 or 3 significant figures. Therefore there may be a slight discrepancy between the %RPD displayed above and %RPD calculated using the reported results. MAI considers %RPD based upon more significant figures to be more accurate.



QC SUMMARY REPORT FOR E200.8

W.O. Sample Matrix: Water

QC Matrix: Water

BatchID: 79916

WorkOrder: 1307907

EPA Method: E200.8		Extraction: E200.8					Spiked Sample ID: 1307905-004B		
Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	Acceptance Criteria (%)		
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	MS / MSD	RPD	LCS
Calcium	N/A	5000	N/A	N/A	N/A	92.9	N/A	N/A	85 - 115
Magnesium	N/A	500	N/A	N/A	N/A	94.2	N/A	N/A	85 - 115
Potassium	N/A	500	N/A	N/A	N/A	87.9	N/A	N/A	85 - 115
Sodium	N/A	5000	N/A	N/A	N/A	90.6	N/A	N/A	85 - 115
%SS:	99	750	NR	NR	NR	94	N/A	N/A	70 - 130
All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions: NONE									

BATCH 79916 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
1307907-001E	07/29/13 10:10 AM	07/29/13	07/30/13 3:03 AM	1307907-002E	07/29/13 10:30 AM	07/29/13	07/30/13 11:17 PM
1307907-006E	07/29/13	07/29/13	08/02/13 11:15 PM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = $100 * (MS - Sample) / (Amount Spiked)$; RPD = $100 * (MS - MSD) / ((MS + MSD) / 2)$.

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not applicable to this method.

NR = matrix interference and/or analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.



McC Campbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mcccampbell.com / E-mail: main@mcccampbell.com

QC SUMMARY REPORT FOR WET CHEMISTRY TESTS

Test Method: SM9223B (Total Coliform & E. Coli)

Matrix: W

WorkOrder: 1307907

Method Name: SM9223B							BatchID: 79903	
Lab ID	Analyte	Reporting Units	Sample	DF	Dup	DF	% RPD	Acceptance Criteria (%)
1307907-001F	E Coli	MPN/100ml	100	100	100	100	0	<70
	Total Coliform	MPN/100ml	39,000	100	42,000	100	7.04	<70
1307907-002F	E Coli	MPN/100ml	ND	1	ND	1	N/A	<70
	Total Coliform	MPN/100ml	ND	1	ND	1	N/A	<70
1307907-006F	E Coli	MPN/100ml	ND	1	ND	1	N/A	<70
	Total Coliform	MPN/100ml	ND	1	ND	1	N/A	<70

BATCH 79903 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
1307907-001F	07/29/13 10:10 AM	07/29/13	07/30/13 5:03 PM	1307907-002F	07/29/13 10:30 AM	07/29/13	07/30/13 5:09 PM
1307907-006F	07/29/13	07/29/13	07/30/13 5:15 PM				

% RPD = $\text{abs}(\text{Sample} - \text{Dup}) / ((\text{Sample} + \text{Dup}) / 2) * 100$

N/A = Not Applicable

NR = %RPD may fall outside of laboratory acceptance criteria due to sample inconsistency between two containers.

CDPH ELAP 1644 ♦ NELAP 12283CA

 QA/QC Officer



QC SUMMARY REPORT FOR WET CHEMISTRY TESTS

Test Method: SM2540C (TDS)

Matrix: W

WorkOrder: 1307907

Method Name: SM2540C			Units: mg/L		BatchID: 80031	
Lab ID	Sample	DF	Dup / Ser. Dil.	DF	% RPD	Acceptance Criteria (%)
1307907-001A	970	1	928	2	4.43	<20
1307907-002A	ND	1	ND	1	N/A	<20
1307907-006A	ND	1	ND	1	N/A	<20

BATCH 80031 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
1307907-001A	07/29/13 10:10 AM	07/31/13	08/01/13 2:55 PM	1307907-002A	07/29/13 10:30 AM	07/31/13	08/01/13 3:05 PM
1307907-006A	07/29/13	07/31/13	08/01/13 3:15 PM				

Dup = Duplicate; Ser. Dil. = Serial Dilution; MS = Matrix Spike; RD = Relative Difference; RPD = Relative Percent Deviation.

Precision = Absolute Value (Sample - Duplicate)

$RPD = 100 * (\text{Sample} - \text{Duplicate}) / [(\text{Sample} + \text{Duplicate}) / 2]$

%RPD is calculated using results of up to 10 significant figures, however the reported results are rounded to 2 or 3 significant figures. Therefore there may be a slight discrepancy between the %RPD displayed above and %RPD calculated using the reported results. MAI considers %RPD based upon more significant figures to be more accurate.



QC SUMMARY REPORT FOR E365.1

W.O. Sample Matrix: Water

QC Matrix: Water

BatchID: 79976

WorkOrder: 1307907

EPA Method: E365.1

Extraction: E365.1

Spiked Sample ID: 1307905-001D

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	Acceptance Criteria (%)		
	mg/L	mg/L	% Rec.	% Rec.	% RPD	% Rec.	MS / MSD	RPD	LCS
Total Phosphorous as P	0.094	0.80	101	94.4	5.69	96.5	80 - 120	20	90 - 110

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:
NONE

BATCH 79976 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
1307907-001D	07/29/13 10:10 AM	08/05/13	08/06/13 5:02 PM	1307907-002D	07/29/13 10:30 AM	08/05/13	08/06/13 5:05 PM
1307907-006D	07/29/13	08/05/13	08/06/13 5:35 PM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = $100 * (MS - Sample) / (Amount\ Spiked)$; RPD = $100 * (MS - MSD) / ((MS + MSD) / 2)$.

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

26 August 2013

Christina Hart
Hydro Focus, Inc
2827 Spafford St., Suite A
Davis, CA 95618
RE: Dutch Slough SW

Enclosed are the analytical results for samples received by Eurofins Frontier Global Sciences. All quality control measurements are within established control limits and there were no analytical difficulties encountered with the exception of those listed in the case narrative section of this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Liz Siska
Project Manager



Frontier Global Sciences

11720 North Creek Parkway North, Suite 400
Bothell, WA 98011
Phone: 425-686-1996
www.frontiergs.com

ANALYTICAL REPORT FOR SAMPLES

Laboratory: Eurofins Frontier Global Sciences, Inc.

SDG:

Client: Hydro Focus, Inc

Project: Dutch Slough SW

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B-131 850 MC-5A	1307577-01	Water	29-Jul-13 09:20	30-Jul-13 09:45
B-131 854 MC-5C	1307577-02	Water	29-Jul-13 09:23	30-Jul-13 09:45

Eurofins Frontier Global Sciences

The results in this report only apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Liz Siska, Project Manager

Page 1 of 11
1307577 Final Report
08/26/2013

CASE NARRATIVE

SAMPLE RECEIPT

Samples were received at Eurofins Frontier Global Sciences (EFGS) on July 30th, 2013. The samples were received intact, at -0.4 degrees Celsius.

SAMPLE PREPARATION AND ANALYSIS

Samples were prepared and analyzed for total mercury in accordance with modified EPA 1630/FGS 70.

ANALYTICAL ISSUES

Liquid spikes were prepared for every preparation as a measure of accuracy. All liquid spikes and certified reference material (if applicable) were within the control limits.

As an additional measure of the accuracy of the methods used and to check for matrix interference, matrix spikes (MS) and matrix spike duplicates (MSD) were digested and analyzed. All of the matrix spike recoveries were within the control limits.

A reasonable measure of the precision of the analytical methods is the relative percent difference (RPD) between a matrix spike recovery and a matrix spike duplicate recovery and between laboratory control sample recovery and laboratory control sample duplicate recoveries. All of the relative percent differences were within the control limits.

Eurofins Frontier Global Sciences

The results in this report only apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Liz Siska, Project Manager



Frontier Global Sciences

11720 North Creek Parkway North, Suite 400
Bothell, WA 98011
Phone: 425-686-1996
www.frontiergs.com

CHAIN OF CUSTODY FORMS

EFGS Work Order: 1307577

Sample Receipt Checklist

Eurofins Frontier Global Sciences

Client: Hydrobicus Date & Time Received: 7-30-13 9:45 Date Logged In: 7-30-13 Date Labeled: 7-30-13
Project: _____ Received By: OB Logged By: OB Labeled By: AD
of Coolers Received: 1 Samples Arrived By: ✓ Shipping Service _____ Courier _____ Hand _____ Other (Specify: _____)
Tracking/Airbill #: 13 A13 9A3 01 A819 5143 Coolant: ☐ None/Ambient ☒ Loose Ice ☐ Gel Ice ☐ Dry Ice
Coolant Required: Y Temp Blank Used: Y for Cooler(s): _____

Cooler Information:	Y/N/NA	Comments
The coolers do not appear to be tampered with:	<u>Y</u>	
Custody Seals are present and intact:	<u>Y</u>	
Custody seals signed by:	<u>Y</u>	

TID: 11943150 CF: -1.5C		Date/time: 7.30.13 9.45 By: OB	
Cooler 1: 1 °C	w/ CF: -1.5 °C	Cooler 4: °C	w/ CF: °C
Cooler 2: °C	w/ CF: °C	Cooler 5: °C	w/ CF: °C
Cooler 3: °C	w/ CF: °C	Cooler 6: °C	w/ CF: °C

Chain of Custody:	Y/N/NA	Comments
Sample ID/Description:	<u>Y</u>	
Date and time of collection:	<u>Y</u>	
Sampled by:	<u>Y</u>	
Preservation type:	<u>NA</u>	
Requested analyses:	<u>Y</u>	
Required signatures:	<u>Y</u>	
Internal COC required:	<u>Y</u>	

Sample Condition/Integrity:	Y/N/NA	Comments
Sample containers intact/present:	<u>Y</u>	
Sample labels are present and legible:	<u>Y</u>	
Sample ID on container/bag matches COC:	<u>Y</u>	
Correct sample containers used:	<u>Y</u>	
Samples received within holding times:	<u>Y</u>	
Sample volume sufficient for requested analyses:	<u>Y</u>	
Correct preservative used for requested analyses:	<u>NA</u>	
pH of preserved samples verified and recorded:	<u>NA</u>	

Anomalies/Non-conformances (attach additional pages if needed):

Discussion/Resolution: _____ Client Contacted: _____ Date/Time: _____ Method: _____

EFGS Sample Receipt Checklist Revision 3; 03/15/2013

Eurofins Frontier Global Sciences

The results in this report only apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Liz Siska

Liz Siska, Project Manager

Page 3 of 11
1307577 Final Report
08/26/2013



Frontier Global Sciences

11720 North Creek Parkway North, Suite 400
Bothell, WA 98011
Phone: 425-686-1996
www.frontiergs.com

CHAIN OF CUSTODY FORMS

1307577

Chain of Custody Record & Laboratory Analysis Request:
Air, Water, Sediments, Plant and Animal Tissue,
Hydrocarbon & Other Samples

11720 Northcreek Pkwy N, Suite 400
Bothell, WA 98011
Phone: 425-686-1996
Fax: 425-686-3096
info@FrontierGS.com
http://www.FrontierGS.com



Frontier Global Sciences

Page 1 of 1

Client: HydroFocus, Inc.		Contact: Christina Hart								Analyses Requested		FGS PM:	
Address: 2827 Spafford St. Davis, CA 95618		Phone: (530)759-2484 Fax: (530)756-2687										Date:	
Project Name: Dutch Slough SW		E-mail: chart@hydrofocus.com										TAT (business days) <u>20</u> (std)	
Report To: HydroFocus, Inc.		Contract/PO: 5586										15 10 5 4 3 2 24 hrs.	
Address: 2827 Spafford St. Davis, CA 95618		Invoice To: Teresa Deverel										(For TAT < 10 days, contact PM.	
Phone: (530)759-2484 Fax: (530)756-2687		Address: P.O. Box 2401 Davis, CA 95617										Saturday delivery? ☐ Y ☐ N	
E-mail: chart@hydrofocus.com		Phone: (530)759-2484 Fax: (530)756-2687										(If yes, please contact PM)	
		E-mail: tdeverel@hydrofocus.com										EDD ☐ Y ☐ N	
												QA ☐ Standard ☐ High	
No.	Engraved Bottle ID	Sample ID	# of Bottles	Matrix	Date & Time	Sampled By	Field Filtered (Y/N)	Field Preserved: HNO ₃ HCl BrCl Other (%)	Methyl Mercury				Comments
1	B-131850	MC-SA	1	FW	7/29/13 9:20	TH	N	N	X				Please ship cooler back with 2 sample bottles for next month. Thanks!
2	B-131854	MC-SC	1	FW	7/29/13 9:23	CH	N	N	X				
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
For Laboratory Use Only		Matrix Codes:		Relinquished By:		Received By:		Received By:					
COC Seal: <u>10</u>		Comments:		Name: Christina Hart		Name: <u>OB</u>		Name:					
Cooler Temp:				Organization: HydroFocus		Organization: <u>EFGS</u>		Organization:					
Carrier: <u>VPS</u>				Date & Time: <u>7/29/13</u>		Date & Time: <u>7:30:13</u>		Date & Time:					
VTSR: <u>9.45</u>				Tracking number: <u>12 413 943 01 4819 5143</u>									
# of Coolers: <u>1</u>													
Sample Disposal:													
☐ Return (shipping fees may apply)													
☐ Standard Disposal - 30 Days after report													
☐ Retain for _____ weeks after report (storage fees may apply)													

Eurofins Frontier Global Sciences

The results in this report only apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Liz Siska

Liz Siska, Project Manager

Page 4 of 11
1307577 Final Report
08/26/2013

Methyl Mercury Analytical Results

Lab ID	Sample Name	Result	MDL	MRL	Units	Batch	Prepared	Sequence	Analyzed	Method	Notes
1307577-01	B-131 850 MC-5A	ND	-	0.050	ng/L	F308148	08/19/13	3H20010	08/20/13	1630 Mod/FGS	U
1307577-02	B-131 854 MC-5C	ND	-	0.050	ng/L	F308148	08/19/13	3H20010	08/20/13	1630 Mod/FGS	U

Eurofins Frontier Global Sciences

The results in this report only apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Liz Siska, Project Manager

MATRIX DUPLICATES/TRIPPLICATES**SOURCE: 1308173-01RE1****Matrix:** Water**Sequence:** 3H20010**Batch:** F308148**Lab Number:** F308148-DUP1**Preparation:** EFGS-013 Methyl Hg Distillation for Water

Analyte	Sample Concentration ng/L	Duplicate Concentration ng/L	MRL	% RPD	RPD Limit	Method	Notes
Methyl Mercury	0.121	0.108	0.050	11.4	35	1630 Mod/FGS-	



MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 1307318-01RE1

Matrix: Water

Sequence: 3H20010

Batch: F308148

Lab Number: F308148-MS/MSD1

Preparation: EFGS-013 Methyl Hg Distillation for Water

Analyte	Sample Concentration (ng/L)	Spike Added (ng/L)	MS Concentration (ng/L)	MS % Recovery	Recovery Limits	Method	Notes
Methyl Mercury	ND	1.0020	1.180	118	65 - 130	1630 Mod/FGS	

Analyte	Spike Added (ng/L)	MSD Concentration (ng/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Methyl Mercury	1.0020	1.087	108	8.23	65 - 130	35	1630 Mod/FGS	

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 1307319-01RE1

Matrix: Water

Sequence: 3H20010

Batch: F308148

Lab Number: F308148-MS/MSD2

Preparation: EFGS-013 Methyl Hg Distillation for Water

Analyte	Sample Concentration (ng/L)	Spike Added (ng/L)	MS Concentration (ng/L)	MS % Recovery	Recovery Limits	Method	Notes
Methyl Mercury	1.003	1.0020	1.861	85.6	65 - 130	1630 Mod/FGS	

Analyte	Spike Added (ng/L)	MSD Concentration (ng/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Methyl Mercury	1.0020	1.898	89.3	1.98	65 - 130	35	1630 Mod/FGS	

LABORATORY CONTROL SAMPLE/ LABORATORY CONTROL SAMPLE DUPLICATE

RECOVERY AND RPD

Matrix: Water

Sequence: 3H20010

Batch: F308148

Lab Number: F308148-BS/BSD1

Preparation: EFGS-013 Methyl Hg Distillation for Water

LCS Source: Blank Spike

Analyte	Spike Added (ng/L)	LCS Concentration (ng/L)	LCS % Recovery	Recovery Limits	Method	Notes
Methyl Mercury	1.0020	0.978	97.6	70 - 130	1630 Mod/FGS	

Analyte	Spike Added (ng/L)	LCSD Concentration (ng/L)	LCSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Methyl Mercury	1.0020	1.087	108	10.5	70 - 130	25	1630 Mod/FGS	

PREPARATION BLANKS

Matrix: WaterSequence: 3H20010Instrument: Hg-07Preparation: EFGS-013 Methyl Hg Distillation for Water

Lab Sample ID	Analyte	Found	MDL	MRL	Units	Batch	Method	Notes
F308148-BLK1	Methyl Mercury	0.002	0.026	0.050	ng/L	F308148	1630 Mod/FGS	U
F308148-BLK2	Methyl Mercury	0.000	0.026	0.050	ng/L	F308148	1630 Mod/FGS	U
F308148-BLK3	Methyl Mercury	0.000	0.026	0.050	ng/L	F308148	1630 Mod/FGS	U

Eurofins Frontier Global Sciences

The results in this report only apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Liz Siska, Project Manager

Notes and Definitions

U	Analyte was not detected and is reported as less than the LOD or as defined by the client. The LOD has been adjusted for any dilution or concentration of the sample.
DET	Analyte Detected
MRL	Minimum Reporting Limit
ND	Analyte Not Detected at or above the reporting limit
wet	Sample results reported on a wet weight basis
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
RSD	Relative Standard Deviation

Eurofins Frontier Global Sciences

The results in this report only apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Liz Siska, Project Manager



CERTIFICATE OF ANALYSIS

Client: Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Attention: Steven Deverel

Phone: (530) 759-2484

Fax: (530) 756-2687

Work Order(s): 3G31051

Report Date: 09/17/13 11:42

Received Date: 07/31/13 10:15

Turn Around: Normal

Client Project: 5586-Dutch Slough Surface water

NELAP #04229CA ELAP#1132 NEVADA #CA211 HAWAII LACSD #10143

The results in this report apply to the samples analyzed in accordance with the Chain of Custody document. Weck Laboratories, Inc. certifies that the test results meet all NELAC requirements unless noted in the case narrative. This analytical report is confidential and is only intended for the use of Weck Laboratories, Inc. and its client. This report contains the Chain of Custody document, which is an integral part of it, and can only be reproduced in full with the authorization of Weck Laboratories, Inc.

Dear Steven Deverel :

Enclosed are the results of analyses for samples received 07/31/13 10:15 with the Chain of Custody document. The samples were received in good condition, at 2.3 °C and on ice. All analysis met the method criteria except as noted below or in the report with data qualifiers.

Case Narrative:

Pyrethroid analysis was originally done on 9/4/13 had suspect hits for Sumithrin in sample 3G31051-02 MC-5C (15 ng/l) and 3G31051-06 Trip Blank (17 ng/l). Sample 3G31051-02 MC-5C second bottle was extracted and analyzed on 9/12/13 past holding time. Second extract result is ND. Trip Blank could not be extracted and analyzed a second time because only one bottle was sampled.

Reviewed by:

Kim G Tu
Project Manager





Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 07/31/13 10:15
Date Reported: 09/17/13 11:42

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Sampled by:	Sample Comments	Lab ID	Matrix	Date Sampled
MC-5A	Christina Hart, Tim		3G31051-01	Water	07/29/13 10:10
MC-5C	Christina Hart, Tim		3G31051-02	Water	07/29/13 10:30
Emerson	Christina Hart, Tim		3G31051-03	Water	07/29/13 12:40
Gilbert	Christina Hart, Tim		3G31051-04	Water	07/29/13 13:25
Burroughs	Christina Hart, Tim		3G31051-05	Water	07/29/13 14:20
Trip Blank	Christina Hart, Tim		3G31051-06	Water	07/29/13 00:00

ANALYSES

Chlorinated Herbicides

Chlorinated Pesticides and/or PCBs

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods

Organophosphorus Pesticides by EPA Method 8141A

Pyrethroid Pesticides by GC/MS SIM

Volatile Organic Compounds by EPA Method 524.2



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 07/31/13 10:15
Date Reported: 09/17/13 11:42

3G31051-01 MC-5A
Sampled: 07/29/13 10:10 Sampled By: Christina Hart, Tim Ingrum Matrix: Water

Chlorinated Herbicides

Method: EPA 8151A		Batch: W3H0016		Prepared: 08/01/13 09:12		Analyst: WEC	
Analyte		Result	MRL	Units	Dil	Analyzed	Qualifier
2,4,5-T		ND	0.25	ug/l	1	08/14/13 17:25	
2,4,5-TP (Silvex)		ND	0.25	ug/l	1	08/14/13 17:25	
2,4-D		ND	0.50	ug/l	1	08/14/13 17:25	
2,4-DB		ND	2.5	ug/l	1	08/14/13 17:25	
3,5-Dichlorobenzoic acid		ND	1.2	ug/l	1	08/14/13 17:25	
4-Nitrophenol		ND	1.2	ug/l	1	08/14/13 17:25	
Acifluorfen		ND	0.50	ug/l	1	08/14/13 17:25	
Bentazon		ND	2.5	ug/l	1	08/14/13 17:25	
Dalapon		ND	0.50	ug/l	1	08/14/13 17:25	
DCPA		ND	0.25	ug/l	1	08/14/13 17:25	
Dicamba		ND	0.75	ug/l	1	08/14/13 17:25	
Dichloroprop		ND	1.0	ug/l	1	08/14/13 17:25	
Dinoseb		ND	0.50	ug/l	1	08/14/13 17:25	
MCPA		ND	100	ug/l	1	08/14/13 17:25	
MCPP		ND	100	ug/l	1	08/14/13 17:25	
Pentachlorophenol		ND	0.25	ug/l	1	08/14/13 17:25	
Picloram		ND	0.75	ug/l	1	08/14/13 17:25	
Surr: 2,4-DCAA	86 %	Conc:36.4	56-156	%			

Chlorinated Pesticides and/or PCBs

Method: EPA 8081A	Batch: W3H0014	Prepared: 08/01/13 09:08				Analyst: bma
Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
2,4'-DDD	ND	0.050	ug/l	1	08/10/13 12:26	
2,4'-DDE	ND	0.050	ug/l	1	08/10/13 12:26	
2,4'-DDT	ND	0.050	ug/l	1	08/10/13 12:26	
4,4'-DDD	ND	0.050	ug/l	1	08/10/13 12:26	
4,4'-DDE	ND	0.050	ug/l	1	08/10/13 12:26	
4,4'-DDT	ND	0.050	ug/l	1	08/10/13 12:26	
Aldrin	ND	0.050	ug/l	1	08/10/13 12:26	
alpha-BHC	ND	0.050	ug/l	1	08/10/13 12:26	
alpha-Chlordane	ND	0.050	ug/l	1	08/10/13 12:26	
beta-BHC	ND	0.050	ug/l	1	08/10/13 12:26	
Chlordane (tech)	ND	0.50	ug/l	1	08/10/13 12:26	
cis-Nonachlor	ND	0.050	ug/l	1	08/10/13 12:26	
delta-BHC	ND	0.050	ug/l	1	08/10/13 12:26	
Dieldrin	ND	0.050	ug/l	1	08/10/13 12:26	
Endosulfan I	ND	0.050	ug/l	1	08/10/13 12:26	
Endosulfan II	ND	0.050	ug/l	1	08/10/13 12:26	
Endosulfan sulfate	ND	0.050	ug/l	1	08/10/13 12:26	
Endrin	ND	0.050	ug/l	1	08/10/13 12:26	



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 07/31/13 10:15
Date Reported: 09/17/13 11:42

3G31051-01 MC-5A
Sampled: 07/29/13 10:10 Sampled By: Christina Hart, Tim Ingrum Matrix: Water

Chlorinated Pesticides and/or PCBs

Method: EPA 8081A		Batch: W3H0014		Prepared: 08/01/13 09:08		Analyst: bma	
Analyte	Result		MRL	Units	Dil	Analyzed	Qualifier
Endrin aldehyde	ND		0.050	ug/l	1	08/10/13 12:26	
Endrin ketone	ND		0.050	ug/l	1	08/10/13 12:26	
gamma-BHC (Lindane)	ND		0.050	ug/l	1	08/10/13 12:26	
gamma-Chlordane	ND		0.050	ug/l	1	08/10/13 12:26	
Heptachlor	ND		0.050	ug/l	1	08/10/13 12:26	
Heptachlor epoxide	ND		0.050	ug/l	1	08/10/13 12:26	
Kepone	ND		0.25	ug/l	1	08/10/13 12:26	
Methoxychlor	ND		0.050	ug/l	1	08/10/13 12:26	
Mirex	ND		0.050	ug/l	1	08/10/13 12:26	
Oxychlordane	ND		0.050	ug/l	1	08/10/13 12:26	
Toxaphene	ND		2.0	ug/l	1	08/10/13 12:26	
trans-Nonachlor	ND		0.050	ug/l	1	08/10/13 12:26	
Surr: Decachlorobiphenyl	67 %	Conc:0.352	0.1-123	%			
Surr: Tetrachloro-meta-xylene	73 %	Conc:0.387	10-137	%			

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods

Method: SM 5310C		Batch: W3H0072		Prepared: 08/02/13 08:44		Analyst: jlp	
Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier	
Dissolved Organic Carbon	3.6	1.0	mg/l	2	08/02/13 13:23		

Organophosphorus Pesticides by EPA Method 8141A

Method: EPA 8141A		Batch: W3H0095		Prepared: 08/03/13 13:04		Analyst: jch
Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Azinphos methyl (Guthion)	ND	0.10	ug/l	1	08/12/13 23:28	
Bolstar	ND	0.10	ug/l	1	08/12/13 23:28	
Chlorpyrifos	ND	0.10	ug/l	1	08/12/13 23:28	
Coumaphos	ND	0.10	ug/l	1	08/12/13 23:28	
Demeton-o	ND	0.10	ug/l	1	08/12/13 23:28	
Demeton-s	ND	0.10	ug/l	1	08/12/13 23:28	
Diazinon	ND	0.10	ug/l	1	08/12/13 23:28	
Dichlorvos	ND	0.10	ug/l	1	08/12/13 23:28	
Dimethoate	ND	0.25	ug/l	1	08/12/13 23:28	
Disulfoton	ND	0.10	ug/l	1	08/12/13 23:28	
Ethoprop	ND	0.10	ug/l	1	08/12/13 23:28	
Ethyl parathion	ND	0.25	ug/l	1	08/12/13 23:28	
Fensulfothion	ND	0.10	ug/l	1	08/12/13 23:28	
Fenthion	ND	0.10	ug/l	1	08/12/13 23:28	
Malathion	ND	0.25	ug/l	1	08/12/13 23:28	
Merphos	ND	0.10	ug/l	1	08/12/13 23:28	
Methyl parathion	ND	0.10	ug/l	1	08/12/13 23:28	



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 07/31/13 10:15
Date Reported: 09/17/13 11:42

3G31051-01 MC-5A
Sampled: 07/29/13 10:10 Sampled By: Christina Hart, Tim Ingram Matrix: Water

Organophosphorus Pesticides by EPA Method 8141A

Method: EPA 8141A		Batch: W3H0095		Prepared: 08/03/13 13:04		Analyst: jch		
Analyte		Result		MRL	Units	Dil	Analyzed	Qualifier
Mevinphos		ND		0.10	ug/l	1	08/12/13 23:28	
Naled		ND		0.10	ug/l	1	08/12/13 23:28	
Phorate		ND		0.10	ug/l	1	08/12/13 23:28	
Ronnel		ND		0.10	ug/l	1	08/12/13 23:28	
Stirophos		ND		0.10	ug/l	1	08/12/13 23:28	
Thionazin		ND		0.25	ug/l	1	08/12/13 23:28	
Tokuthion (Prothiofos)		ND		0.10	ug/l	1	08/12/13 23:28	
Total Demeton, -o and -s		ND		0.20	ug/l	1	08/12/13 23:28	
Total Parathion, ethyl & methyl		ND		0.35	ug/l	1	08/12/13 23:28	
Trichloronate		ND		0.10	ug/l	1	08/12/13 23:28	
Surr: Triphenyl phosphate	80 %	Conc:0.800	10-181		%			

Pyrethroid Pesticides by GC/MS SIM

Method: GC/MS NCI-SIM	Batch: W3H0252	Prepared: 08/07/13 09:13				Analyst: css
Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Allethrin	ND	2.0	ng/l	1	09/04/13 22:53	
Bifenthrin	ND	2.0	ng/l	1	09/04/13 22:53	
Cyfluthrin	ND	2.0	ng/l	1	09/04/13 22:53	
Cypermethrin	ND	2.0	ng/l	1	09/04/13 22:53	
Deltamethrin/Tralomethrin	ND	2.0	ng/l	1	09/04/13 22:53	
Dichloran	ND	2.0	ng/l	1	09/04/13 22:53	
Fenpropathrin (Danitol)	ND	2.0	ng/l	1	09/04/13 22:53	
Fenvalerate/Esfenvalerate	ND	2.0	ng/l	1	09/04/13 22:53	
L-Cyhalothrin	ND	2.0	ng/l	1	09/04/13 22:53	
Pendimethalin	ND	2.0	ng/l	1	09/04/13 22:53	
Permethrin	ND	5.0	ng/l	1	09/04/13 22:53	
Prallethrin	ND	2.0	ng/l	1	09/04/13 22:53	
Sumithrin	ND	10	ng/l	1	09/04/13 22:53	
Tefluthrin	ND	2.0	ng/l	1	09/04/13 22:53	



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 07/31/13 10:15
Date Reported: 09/17/13 11:42

3G31051-02 MC-5C
Sampled: 07/29/13 10:30 Sampled By: Christina Hart, Tim Ingram Matrix: Water

Chlorinated Herbicides

Method: EPA 8151A		Batch: W3H0016		Prepared: 08/01/13 09:12		Analyst: WEC
Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
2,4,5-T	ND	0.25	ug/l	1	08/14/13 17:44	
2,4,5-TP (Silvex)	ND	0.25	ug/l	1	08/14/13 17:44	
2,4-D	ND	0.50	ug/l	1	08/14/13 17:44	
2,4-DB	ND	2.5	ug/l	1	08/14/13 17:44	
3,5-Dichlorobenzoic acid	ND	1.2	ug/l	1	08/14/13 17:44	
4-Nitrophenol	ND	1.2	ug/l	1	08/14/13 17:44	
Acifluorfen	ND	0.50	ug/l	1	08/14/13 17:44	
Bentazon	ND	2.5	ug/l	1	08/14/13 17:44	
Dalapon	ND	0.50	ug/l	1	08/14/13 17:44	
DCPA	ND	0.25	ug/l	1	08/14/13 17:44	
Dicamba	ND	0.75	ug/l	1	08/14/13 17:44	
Dichloroprop	ND	1.0	ug/l	1	08/14/13 17:44	
Dinoseb	ND	0.50	ug/l	1	08/14/13 17:44	
MCPA	ND	100	ug/l	1	08/14/13 17:44	
MCPP	ND	100	ug/l	1	08/14/13 17:44	
Pentachlorophenol	ND	0.25	ug/l	1	08/14/13 17:44	
Picloram	ND	0.75	ug/l	1	08/14/13 17:44	
Surr: 2,4-DCAA	94 %	Conc:39.7	56-156	%		

Chlorinated Pesticides and/or PCBs

Method: EPA 8081A	Batch: W3H0014	Prepared: 08/01/13 09:08				Analyst: bma
Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
2,4'-DDD	ND	0.050	ug/l	1	08/10/13 12:54	
2,4'-DDE	ND	0.050	ug/l	1	08/10/13 12:54	
2,4'-DDT	ND	0.050	ug/l	1	08/10/13 12:54	
4,4'-DDD	ND	0.050	ug/l	1	08/10/13 12:54	
4,4'-DDE	ND	0.050	ug/l	1	08/10/13 12:54	
4,4'-DDT	ND	0.050	ug/l	1	08/10/13 12:54	
Aldrin	ND	0.050	ug/l	1	08/10/13 12:54	
alpha-BHC	ND	0.050	ug/l	1	08/10/13 12:54	
alpha-Chlordane	ND	0.050	ug/l	1	08/10/13 12:54	
beta-BHC	ND	0.050	ug/l	1	08/10/13 12:54	
Chlordane (tech)	ND	0.50	ug/l	1	08/10/13 12:54	
cis-Nonachlor	ND	0.050	ug/l	1	08/10/13 12:54	
delta-BHC	ND	0.050	ug/l	1	08/10/13 12:54	
Dieldrin	ND	0.050	ug/l	1	08/10/13 12:54	
Endosulfan I	ND	0.050	ug/l	1	08/10/13 12:54	
Endosulfan II	ND	0.050	ug/l	1	08/10/13 12:54	
Endosulfan sulfate	ND	0.050	ug/l	1	08/10/13 12:54	
Endrin	ND	0.050	ug/l	1	08/10/13 12:54	



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 07/31/13 10:15
Date Reported: 09/17/13 11:42

3G31051-02 MC-5C
Sampled: 07/29/13 10:30 Sampled By: Christina Hart, Tim Ingrum Matrix: Water

Chlorinated Pesticides and/or PCBs

Method: EPA 8081A		Batch: W3H0014		Prepared: 08/01/13 09:08		Analyst: bma	
Analyte	Result		MRL	Units	Dil	Analyzed	Qualifier
Endrin aldehyde	ND		0.050	ug/l	1	08/10/13 12:54	
Endrin ketone	ND		0.050	ug/l	1	08/10/13 12:54	
gamma-BHC (Lindane)	ND		0.050	ug/l	1	08/10/13 12:54	
gamma-Chlordane	ND		0.050	ug/l	1	08/10/13 12:54	
Heptachlor	ND		0.050	ug/l	1	08/10/13 12:54	
Heptachlor epoxide	ND		0.050	ug/l	1	08/10/13 12:54	
Kepone	ND		0.25	ug/l	1	08/10/13 12:54	
Methoxychlor	ND		0.050	ug/l	1	08/10/13 12:54	
Mirex	ND		0.050	ug/l	1	08/10/13 12:54	
Oxychlordane	ND		0.050	ug/l	1	08/10/13 12:54	
Toxaphene	ND		2.0	ug/l	1	08/10/13 12:54	
trans-Nonachlor	ND		0.050	ug/l	1	08/10/13 12:54	
Surr: Decachlorobiphenyl	57 %	Conc:0.300	0.1-123	%			
Surr: Tetrachloro-meta-xylene	78 %	Conc:0.412	10-137	%			

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods

Method: SM 5310C		Batch: W3H0072		Prepared: 08/02/13 08:44		Analyst: jlp	
Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier	
Dissolved Organic Carbon	ND	0.50	mg/l	1	08/02/13 13:23		

Organophosphorus Pesticides by EPA Method 8141A

Method: EPA 8141A	Batch: W3H0095	Prepared: 08/03/13 13:04			Analyst: jch	
Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Azinphos methyl (Guthion)	ND	0.10	ug/l	1	08/12/13 23:59	
Bolstar	ND	0.10	ug/l	1	08/12/13 23:59	
Chlorpyrifos	ND	0.10	ug/l	1	08/12/13 23:59	
Coumaphos	ND	0.10	ug/l	1	08/12/13 23:59	
Demeton-o	ND	0.10	ug/l	1	08/12/13 23:59	
Demeton-s	ND	0.10	ug/l	1	08/12/13 23:59	
Diazinon	ND	0.10	ug/l	1	08/12/13 23:59	
Dichlorvos	ND	0.10	ug/l	1	08/12/13 23:59	
Dimethoate	ND	0.25	ug/l	1	08/12/13 23:59	
Disulfoton	ND	0.10	ug/l	1	08/12/13 23:59	
Ethoprop	ND	0.10	ug/l	1	08/12/13 23:59	
Ethyl parathion	ND	0.25	ug/l	1	08/12/13 23:59	
Fensulfothion	ND	0.10	ug/l	1	08/12/13 23:59	
Fenthion	ND	0.10	ug/l	1	08/12/13 23:59	
Malathion	ND	0.25	ug/l	1	08/12/13 23:59	
Merphos	ND	0.10	ug/l	1	08/12/13 23:59	
Methyl parathion	ND	0.10	ug/l	1	08/12/13 23:59	



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 07/31/13 10:15
Date Reported: 09/17/13 11:42

3G31051-02 MC-5C
Sampled: 07/29/13 10:30 **Sampled By:** Christina Hart, Tim Ingram **Matrix:** Water

Organophosphorus Pesticides by EPA Method 8141A

Method: EPA 8141A		Batch: W3H0095		Prepared: 08/03/13 13:04		Analyst: jch		
Analyte		Result		MRL	Units	Dil	Analyzed	Qualifier
Mevinphos		ND		0.10	ug/l	1	08/12/13 23:59	
Naled		ND		0.10	ug/l	1	08/12/13 23:59	
Phorate		ND		0.10	ug/l	1	08/12/13 23:59	
Ronnel		ND		0.10	ug/l	1	08/12/13 23:59	
Stirophos		ND		0.10	ug/l	1	08/12/13 23:59	
Thionazin		ND		0.25	ug/l	1	08/12/13 23:59	
Tokuthion (Prothiofos)		ND		0.10	ug/l	1	08/12/13 23:59	
Total Demeton, -o and -s		ND		0.20	ug/l	1	08/12/13 23:59	
Total Parathion, ethyl & methyl		ND		0.35	ug/l	1	08/12/13 23:59	
Trichloronate		ND		0.10	ug/l	1	08/12/13 23:59	
Surr: Triphenyl phosphate	95 %	Conc:0.952	10-181		%			

Pyrethroid Pesticides by GC/MS SIM

Method: GC/MS NCI-SIM		Batch: W3H0252		Prepared: 08/07/13 09:13		Analyst: css	
Analyte	Result		MRL	Units	Dil	Analyzed	Qualifier
Allethrin	ND		2.0	ng/l	1	09/04/13 23:16	
Bifenthrin	ND		2.0	ng/l	1	09/04/13 23:16	
Cyfluthrin	ND		2.0	ng/l	1	09/04/13 23:16	
Cypermethrin	ND		2.0	ng/l	1	09/04/13 23:16	
Deltamethrin/Tralomethrin	ND		2.0	ng/l	1	09/04/13 23:16	
Dichloran	ND		2.0	ng/l	1	09/04/13 23:16	
Fenpropathrin (Danitol)	ND		2.0	ng/l	1	09/04/13 23:16	
Fenvalerate/Esfenvalerate	ND		2.0	ng/l	1	09/04/13 23:16	
L-Cyhalothrin	ND		2.0	ng/l	1	09/04/13 23:16	
Pendimethalin	ND		2.0	ng/l	1	09/04/13 23:16	
Permethrin	ND		5.0	ng/l	1	09/04/13 23:16	
Prallethrin	ND		2.0	ng/l	1	09/04/13 23:16	
Sumithrin	15		10	ng/l	1	09/04/13 23:16	CN-1
Tefluthrin	ND		2.0	ng/l	1	09/04/13 23:16	
Surr: Perylene-d12	104 %	Conc: 261	70-130	%			
Surr: Triphenyl phosphate	60 %	Conc: 149	70-130	%			S-11



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 07/31/13 10:15
Date Reported: 09/17/13 11:42

3G31051-02RE1

MC-5C

Sampled: 07/29/13 10:30

Sampled By: Christina Hart, Tim Ingram

Matrix: Water

Pyrethroid Pesticides by GC/MS SIM

Method: GC/MS NCI-SIM

Batch: W3I0281

Prepared: 09/09/13 08:22

Analyst: css

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Sumithrin	ND	10	ng/l	1	09/12/13 00:16	CN-1, O-13
Surr: Perylene-d12	101 %	Conc:282	70-130	%		O-13
Surr: Triphenyl phosphate	62 %	Conc:172	70-130	%		O-13, S-11



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 07/31/13 10:15
Date Reported: 09/17/13 11:42

3G31051-03 Emerson
Sampled: 07/29/13 12:40 **Sampled By:** Christina Hart, Tim Ingrum **Matrix:** Water

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods

Method: SM 5310C Batch: W3H0018 Prepared: 08/01/13 09:32 Analyst: jlp

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
---------	--------	-----	-------	-----	----------	-----------

Total Organic Carbon (TOC)	23	3.0	mg/l	10	08/01/13 10:51	
-----------------------------------	-----------	-----	------	----	----------------	--

Method: SM 5310C Batch: W3H0072 Prepared: 08/02/13 08:44 Analyst: jlp

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
---------	--------	-----	-------	-----	----------	-----------

Dissolved Organic Carbon	24	5.0	mg/l	10	08/02/13 13:23	
---------------------------------	-----------	-----	------	----	----------------	--

Volatile Organic Compounds by EPA Method 524.2

Method: SM 5710B/EPA524.2 Batch: W3H0545 Prepared: 08/12/13 10:25 Analyst: mdt

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
---------	--------	-----	-------	-----	----------	-----------

Bromodichloromethane, FP	300	25	ug/l	50	08/12/13 23:52	
---------------------------------	------------	----	------	----	----------------	--

Bromoform, FP	2.1	0.50	ug/l	1	08/12/13 23:52	
----------------------	------------	------	------	---	----------------	--

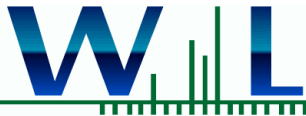
Chloroform, FP	900	25	ug/l	50	08/12/13 23:52	
-----------------------	------------	----	------	----	----------------	--

Dibromochloromethane, FP	68	25	ug/l	50	08/12/13 23:52	
---------------------------------	-----------	----	------	----	----------------	--

THM Formation Potential	1300	2.0	ug/l	1	08/12/13 23:52	
--------------------------------	-------------	-----	------	---	----------------	--

<i>Surr: 1,2-Dichlorobenzene-d4</i>	91 %	Conc:9.09	70-130	%		
-------------------------------------	------	-----------	--------	---	--	--

<i>Surr: 4-Bromofluorobenzene</i>	96 %	Conc:9.65	70-130	%		
-----------------------------------	------	-----------	--------	---	--	--



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 07/31/13 10:15
Date Reported: 09/17/13 11:42

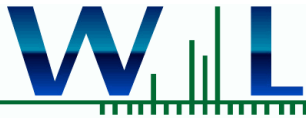
3G31051-04 Gilbert**Sampled:** 07/29/13 13:25**Sampled By:** Christina Hart, Tim Ingrum**Matrix:** Water**Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods**

Method: SM 5310C	Batch: W3H0018	Prepared: 08/01/13 09:32	Analyst: jlp			
Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Total Organic Carbon (TOC)	20	3.0	mg/l	10	08/01/13 10:51	

Method: SM 5310C	Batch: W3H0072	Prepared: 08/02/13 08:44	Analyst: jlp			
Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Dissolved Organic Carbon	19	5.0	mg/l	10	08/02/13 13:23	

Volatile Organic Compounds by EPA Method 524.2

Method: SM 5710B/EPA524.2	Batch: W3H0589	Prepared: 08/13/13 10:39	Analyst: mdt			
Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Bromodichloromethane, FP	310	25	ug/l	50	08/13/13 22:11	
Bromoform, FP	1.7	0.50	ug/l	1	08/13/13 22:11	
Chloroform, FP	1100	25	ug/l	50	08/13/13 22:11	
Dibromochloromethane, FP	66	25	ug/l	50	08/13/13 22:11	
THM Formation Potential	1500	2.0	ug/l	1	08/13/13 22:11	
<i>Surr: 1,2-Dichlorobenzene-d4</i>	90 %	Conc:8.99	70-130	%		
<i>Surr: 4-Bromofluorobenzene</i>	94 %	Conc:9.38	70-130	%		



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 07/31/13 10:15
Date Reported: 09/17/13 11:42

3G31051-05 Burroughs

Sampled: 07/29/13 14:20

Sampled By: Christina Hart, Tim Ingrum

Matrix: Water

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods

Method: SM 5310C	Batch: W3H0018	Prepared: 08/01/13 09:32	Analyst: jlp			
Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Total Organic Carbon (TOC)	17	3.0	mg/l	10	08/01/13 10:51	

Method: SM 5310C	Batch: W3H0072	Prepared: 08/02/13 08:44	Analyst: jlp			
Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Dissolved Organic Carbon	17	5.0	mg/l	10	08/02/13 13:23	

Volatile Organic Compounds by EPA Method 524.2

Method: SM 5710B/EPA524.2	Batch: W3H0589	Prepared: 08/13/13 10:39	Analyst: mdt			
Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Bromodichloromethane, FP	310	25	ug/l	50	08/13/13 22:41	
Bromoform, FP	6.3	0.50	ug/l	1	08/13/13 22:41	
Chloroform, FP	710	25	ug/l	50	08/13/13 22:41	
Dibromochloromethane, FP	110	25	ug/l	50	08/13/13 22:41	
THM Formation Potential	1100	2.0	ug/l	1	08/13/13 22:41	
<i>Surr: 1,2-Dichlorobenzene-d4</i>	88 %	Conc:8.85	70-130	%		
<i>Surr: 4-Bromofluorobenzene</i>	93 %	Conc:9.26	70-130	%		



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 07/31/13 10:15
Date Reported: 09/17/13 11:42

3G31051-06 Trip Blank

Sampled: 07/29/13 00:00

Sampled By: Christina Hart, Tim Ingrum

Matrix: Water

Chlorinated Herbicides

Method: EPA 8151A

Batch: W3H0016

Prepared: 08/01/13 09:12

Analyst: WEC

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
2,4,5-T	ND	0.25	ug/l	1	08/14/13 18:04	
2,4,5-TP (Silvex)	ND	0.25	ug/l	1	08/14/13 18:04	
2,4-D	ND	0.50	ug/l	1	08/14/13 18:04	
2,4-DB	ND	2.5	ug/l	1	08/14/13 18:04	
3,5-Dichlorobenzoic acid	ND	1.2	ug/l	1	08/14/13 18:04	
4-Nitrophenol	ND	1.2	ug/l	1	08/14/13 18:04	
Acifluorfen	ND	0.50	ug/l	1	08/14/13 18:04	
Bentazon	ND	2.5	ug/l	1	08/14/13 18:04	
Dalapon	ND	0.50	ug/l	1	08/14/13 18:04	
DCPA	ND	0.25	ug/l	1	08/14/13 18:04	
Dicamba	ND	0.75	ug/l	1	08/14/13 18:04	
Dichloroprop	ND	1.0	ug/l	1	08/14/13 18:04	
Dinoseb	ND	0.50	ug/l	1	08/14/13 18:04	
MCPA	ND	100	ug/l	1	08/14/13 18:04	
MCPP	ND	100	ug/l	1	08/14/13 18:04	
Pentachlorophenol	ND	0.25	ug/l	1	08/14/13 18:04	
Picloram	ND	0.75	ug/l	1	08/14/13 18:04	
Surr: 2,4-DCAA	111 %	Conc:44.6	56-156	%		

Chlorinated Pesticides and/or PCBs

Method: EPA 8081A

Batch: W3H0014

Prepared: 08/01/13 09:08

Analyst: bma

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
2,4'-DDD	ND	0.050	ug/l	1	08/10/13 13:22	
2,4'-DDE	ND	0.050	ug/l	1	08/10/13 13:22	
2,4'-DDT	ND	0.050	ug/l	1	08/10/13 13:22	
4,4'-DDD	ND	0.050	ug/l	1	08/10/13 13:22	
4,4'-DDE	ND	0.050	ug/l	1	08/10/13 13:22	
4,4'-DDT	ND	0.050	ug/l	1	08/10/13 13:22	
Aldrin	ND	0.050	ug/l	1	08/10/13 13:22	
alpha-BHC	ND	0.050	ug/l	1	08/10/13 13:22	
alpha-Chlordane	ND	0.050	ug/l	1	08/10/13 13:22	
beta-BHC	ND	0.050	ug/l	1	08/10/13 13:22	
Chlordane (tech)	ND	0.50	ug/l	1	08/10/13 13:22	
cis-Nonachlor	ND	0.050	ug/l	1	08/10/13 13:22	
delta-BHC	ND	0.050	ug/l	1	08/10/13 13:22	
Dieldrin	ND	0.050	ug/l	1	08/10/13 13:22	
Endosulfan I	ND	0.050	ug/l	1	08/10/13 13:22	
Endosulfan II	ND	0.050	ug/l	1	08/10/13 13:22	
Endosulfan sulfate	ND	0.050	ug/l	1	08/10/13 13:22	
Endrin	ND	0.050	ug/l	1	08/10/13 13:22	



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 07/31/13 10:15
Date Reported: 09/17/13 11:42

3G31051-06 Trip Blank

Sampled: 07/29/13 00:00

Sampled By: Christina Hart, Tim Ingrum

Matrix: Water

Chlorinated Pesticides and/or PCBs

Method: EPA 8081A

Batch: W3H0014

Prepared: 08/01/13 09:08

Analyst: bma

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Endrin aldehyde	ND	0.050	ug/l	1	08/10/13 13:22	
Endrin ketone	ND	0.050	ug/l	1	08/10/13 13:22	
gamma-BHC (Lindane)	ND	0.050	ug/l	1	08/10/13 13:22	
gamma-Chlordane	ND	0.050	ug/l	1	08/10/13 13:22	
Heptachlor	ND	0.050	ug/l	1	08/10/13 13:22	
Heptachlor epoxide	ND	0.050	ug/l	1	08/10/13 13:22	
Kepone	ND	0.25	ug/l	1	08/10/13 13:22	
Methoxychlor	ND	0.050	ug/l	1	08/10/13 13:22	
Mirex	ND	0.050	ug/l	1	08/10/13 13:22	
Oxychlordane	ND	0.050	ug/l	1	08/10/13 13:22	
Toxaphene	ND	2.0	ug/l	1	08/10/13 13:22	
trans-Nonachlor	ND	0.050	ug/l	1	08/10/13 13:22	
Surr: Decachlorobiphenyl	58 %	Conc:0.289	0.1-123	%		
Surr: Tetrachloro-meta-xylene	77 %	Conc:0.387	10-137	%		

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods

Method: SM 5310C

Batch: W3H0018

Prepared: 08/01/13 09:32

Analyst: jlp

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Total Organic Carbon (TOC)	ND	0.30	mg/l	1	08/01/13 10:51	

Method: SM 5310C

Batch: W3H0072

Prepared: 08/02/13 08:44

Analyst: jlp

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Dissolved Organic Carbon	ND	0.50	mg/l	1	08/02/13 13:23	

Organophosphorus Pesticides by EPA Method 8141A

Method: EPA 8141A

Batch: W3H0095

Prepared: 08/03/13 13:04

Analyst: jch

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Azinphos methyl (Guthion)	ND	0.10	ug/l	1	08/13/13 00:29	
Bolstar	ND	0.10	ug/l	1	08/13/13 00:29	
Chlorpyrifos	ND	0.10	ug/l	1	08/13/13 00:29	
Coumaphos	ND	0.10	ug/l	1	08/13/13 00:29	
Demeton-o	ND	0.10	ug/l	1	08/13/13 00:29	
Demeton-s	ND	0.10	ug/l	1	08/13/13 00:29	
Diazinon	ND	0.10	ug/l	1	08/13/13 00:29	
Dichlorvos	ND	0.10	ug/l	1	08/13/13 00:29	
Dimethoate	ND	0.25	ug/l	1	08/13/13 00:29	
Disulfoton	ND	0.10	ug/l	1	08/13/13 00:29	
Ethoprop	ND	0.10	ug/l	1	08/13/13 00:29	
Ethyl parathion	ND	0.25	ug/l	1	08/13/13 00:29	
Fensulfothion	ND	0.10	ug/l	1	08/13/13 00:29	



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 07/31/13 10:15
Date Reported: 09/17/13 11:42

3G31051-06 Trip Blank

Sampled: 07/29/13 00:00

Sampled By: Christina Hart, Tim Ingrum

Matrix: Water

Organophosphorus Pesticides by EPA Method 8141A

Method: EPA 8141A

Batch: W3H0095

Prepared: 08/03/13 13:04

Analyst: jch

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Fenthion	ND	0.10	ug/l	1	08/13/13 00:29	
Malathion	ND	0.25	ug/l	1	08/13/13 00:29	
Merphos	ND	0.10	ug/l	1	08/13/13 00:29	
Methyl parathion	ND	0.10	ug/l	1	08/13/13 00:29	
Mevinphos	ND	0.10	ug/l	1	08/13/13 00:29	
Naled	ND	0.10	ug/l	1	08/13/13 00:29	
Phorate	ND	0.10	ug/l	1	08/13/13 00:29	
Ronnel	ND	0.10	ug/l	1	08/13/13 00:29	
Stirophos	ND	0.10	ug/l	1	08/13/13 00:29	
Thionazin	ND	0.25	ug/l	1	08/13/13 00:29	
Tokuthion (Prothiofos)	ND	0.10	ug/l	1	08/13/13 00:29	
Total Demeton, -o and -s	ND	0.20	ug/l	1	08/13/13 00:29	
Total Parathion, ethyl & methyl	ND	0.35	ug/l	1	08/13/13 00:29	
Trichloronate	ND	0.10	ug/l	1	08/13/13 00:29	
Surr: Triphenyl phosphate	79 %	Conc:0.785	10-181	%		

Pyrethroid Pesticides by GC/MS SIM

Method: GC/MS NCI-SIM

Batch: W3H0252

Prepared: 08/07/13 09:13

Analyst: css

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Allethrin	ND	2.0	ng/l	1	09/04/13 23:40	
Bifenthrin	ND	2.0	ng/l	1	09/04/13 23:40	
Cyfluthrin	ND	2.0	ng/l	1	09/04/13 23:40	
Cypermethrin	ND	2.0	ng/l	1	09/04/13 23:40	
Deltamethrin/Tralomethrin	ND	2.0	ng/l	1	09/04/13 23:40	
Dichloran	ND	2.0	ng/l	1	09/04/13 23:40	
Fenpropathrin (Danitol)	ND	2.0	ng/l	1	09/04/13 23:40	
Fenvalerate/Esfenvalerate	ND	2.0	ng/l	1	09/04/13 23:40	
L-Cyhalothrin	ND	2.0	ng/l	1	09/04/13 23:40	
Pendimethalin	ND	2.0	ng/l	1	09/04/13 23:40	
Permethrin	ND	5.0	ng/l	1	09/04/13 23:40	
Prallethrin	ND	2.0	ng/l	1	09/04/13 23:40	
Sumithrin	17	10	ng/l	1	09/04/13 23:40	
Tefluthrin	ND	2.0	ng/l	1	09/04/13 23:40	
Surr: Perylene-d12	88 %	Conc:219	70-130	%		
Surr: Triphenyl phosphate	51 %	Conc:127	70-130	%		

S-11

Volatile Organic Compounds by EPA Method 524.2

Method: SM 5710B/EPA524.2

Batch: W3H0589

Prepared: 08/13/13 10:39

Analyst: mdt

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Bromodichloromethane, FP	ND	0.50	ug/l	1	08/13/13 21:41	



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 07/31/13 10:15
Date Reported: 09/17/13 11:42

3G31051-06 Trip Blank

Sampled: 07/29/13 00:00

Sampled By: Christina Hart, Tim Ingram

Matrix: Water

Volatile Organic Compounds by EPA Method 524.2

Method: SM 5710B/EPA524.2

Batch: W3H0589

Prepared: 08/13/13 10:39

Analyst: mdt

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Bromoform, FP	ND	0.50	ug/l	1	08/13/13 21:41	
Chloroform, FP	6.4	0.50	ug/l	1	08/13/13 21:41	
Dibromochloromethane, FP	ND	0.50	ug/l	1	08/13/13 21:41	
THM Formation Potential	6.4	2.0	ug/l	1	08/13/13 21:41	
<i>Surr: 1,2-Dichlorobenzene-d4</i>	88 %	Conc:8.78	70-130	%		
<i>Surr: 4-Bromofluorobenzene</i>	96 %	Conc:9.62	70-130	%		



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 07/31/13 10:15
Date Reported: 09/17/13 11:42

QUALITY CONTROL SECTION



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 07/31/13 10:15
Date Reported: 09/17/13 11:42

Chlorinated Pesticides and/or PCBs - Quality Control

Batch W3H0014 - EPA 8081A

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
Blank (W3H0014-BLK1)			Analyzed: 08/10/13 09:10							
2,4'-DDD	ND	0.050	ug/l							
2,4'-DDE	ND	0.050	ug/l							
2,4'-DDT	ND	0.050	ug/l							
4,4'-DDD	ND	0.050	ug/l							
4,4'-DDE	ND	0.050	ug/l							
4,4'-DDT	ND	0.050	ug/l							
Aldrin	ND	0.050	ug/l							
alpha-BHC	ND	0.050	ug/l							
alpha-Chlordane	ND	0.050	ug/l							
beta-BHC	ND	0.050	ug/l							
Chlordane (tech)	ND	0.50	ug/l							
cis-Nonachlor	ND	0.050	ug/l							
delta-BHC	ND	0.050	ug/l							
Dieldrin	ND	0.050	ug/l							
Endosulfan I	ND	0.050	ug/l							
Endosulfan II	ND	0.050	ug/l							
Endosulfan sulfate	ND	0.050	ug/l							
Endrin	ND	0.050	ug/l							
Endrin aldehyde	ND	0.050	ug/l							
Endrin ketone	ND	0.050	ug/l							
gamma-BHC (Lindane)	ND	0.050	ug/l							
gamma-Chlordane	ND	0.050	ug/l							
Heptachlor	ND	0.050	ug/l							
Heptachlor epoxide	ND	0.050	ug/l							
Kepone	ND	0.25	ug/l							
Methoxychlor	ND	0.050	ug/l							
Mirex	ND	0.050	ug/l							
Oxychlordane	ND	0.050	ug/l							
Toxaphene	ND	2.0	ug/l							
trans-Nonachlor	ND	0.050	ug/l							
Surr: Decachlorobiphenyl	0.365		ug/l	0.500		73	0.1-123			
Surr: Tetrachloro-meta-xylene	0.403		ug/l	0.500		81	10-137			
LCS (W3H0014-BS1)			Analyzed: 08/10/13 09:38							
4,4'-DDD	0.429	0.050	ug/l	0.500		86	59-143			
4,4'-DDE	0.443	0.050	ug/l	0.500		89	63-126			
4,4'-DDT	0.536	0.050	ug/l	0.500		107	43-165			
Aldrin	0.401	0.050	ug/l	0.500		80	54-116			
alpha-BHC	0.421	0.050	ug/l	0.500		84	70-121			
beta-BHC	0.445	0.050	ug/l	0.500		89	71-126			
delta-BHC	0.481	0.050	ug/l	0.500		96	72-129			
Dieldrin	0.451	0.050	ug/l	0.500		90	70-130			
Endosulfan I	0.417	0.050	ug/l	0.500		83	48-113			
Endosulfan II	0.433	0.050	ug/l	0.500		87	58-118			
Endosulfan sulfate	0.457	0.050	ug/l	0.500		91	68-142			



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 07/31/13 10:15
Date Reported: 09/17/13 11:42

Chlorinated Pesticides and/or PCBs - Quality Control

Batch W3H0014 - EPA 8081A

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
LCS (W3H0014-BS1) Analyzed: 08/10/13 09:38										
Endrin	0.475	0.050	ug/l	0.500		95	53-150			
Endrin aldehyde	0.558	0.050	ug/l	0.500		112	56-147			
gamma-BHC (Lindane)	0.453	0.050	ug/l	0.500		91	71-123			
Heptachlor	0.468	0.050	ug/l	0.500		94	58-138			
Heptachlor epoxide	0.440	0.050	ug/l	0.500		88	71-127			
Methoxychlor	0.488	0.050	ug/l	0.500		98	49-158			
Surr: Decachlorobiphenyl	0.372		ug/l	0.500		74	0.1-123			
Surr: Tetrachloro-meta-xylene	0.391		ug/l	0.500		78	10-137			

LCS Dup (W3H0014-BSD1)

Analyzed: 08/10/13 10:06

4,4'-DDD	0.431	0.050	ug/l	0.500		86	59-143	0.5	25	
4,4'-DDE	0.444	0.050	ug/l	0.500		89	63-126	0.2	25	
4,4'-DDT	0.542	0.050	ug/l	0.500		108	43-165	1	25	
Aldrin	0.397	0.050	ug/l	0.500		79	54-116	1	25	
alpha-BHC	0.416	0.050	ug/l	0.500		83	70-121	1	25	
beta-BHC	0.451	0.050	ug/l	0.500		90	71-126	1	25	
delta-BHC	0.480	0.050	ug/l	0.500		96	72-129	0.3	25	
Dieldrin	0.447	0.050	ug/l	0.500		89	70-130	0.8	25	
Endosulfan I	0.413	0.050	ug/l	0.500		83	48-113	1	25	
Endosulfan II	0.430	0.050	ug/l	0.500		86	58-118	0.6	25	
Endosulfan sulfate	0.455	0.050	ug/l	0.500		91	68-142	0.3	25	
Endrin	0.474	0.050	ug/l	0.500		95	53-150	0.3	25	
Endrin aldehyde	0.578	0.050	ug/l	0.500		116	56-147	4	25	
gamma-BHC (Lindane)	0.448	0.050	ug/l	0.500		90	71-123	1	25	
Heptachlor	0.468	0.050	ug/l	0.500		94	58-138	0.1	25	
Heptachlor epoxide	0.438	0.050	ug/l	0.500		88	71-127	0.6	25	
Methoxychlor	0.484	0.050	ug/l	0.500		97	49-158	0.9	25	
Surr: Decachlorobiphenyl	0.368		ug/l	0.500		74	0.1-123			
Surr: Tetrachloro-meta-xylene	0.387		ug/l	0.500		77	10-137			

Batch W3H0016 - EPA 8151A

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
Blank (W3H0016-BLK1) Analyzed: 08/14/13 16:27										
2,4,5-T	ND	0.25	ug/l							
2,4,5-TP (Silvex)	ND	0.25	ug/l							
2,4-D	ND	0.50	ug/l							
2,4-DB	ND	2.5	ug/l							
3,5-Dichlorobenzoic acid	ND	1.2	ug/l							
4-Nitrophenol	ND	1.2	ug/l							
Acifluorfen	ND	0.50	ug/l							
Bentazon	ND	2.5	ug/l							
Dalapon	ND	0.50	ug/l							
DCPA	ND	0.25	ug/l							
Dicamba	ND	0.75	ug/l							



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 07/31/13 10:15
Date Reported: 09/17/13 11:42

Chlorinated Herbicides - Quality Control

Batch W3H0016 - EPA 8151A

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
Blank (W3H0016-BLK1)				Analyzed: 08/14/13 16:27						
Dichloroprop	ND	1.0	ug/l							
Dinoseb	ND	0.50	ug/l							
MCPA	ND	100	ug/l							
MCPP	ND	100	ug/l							
Pentachlorophenol	ND	0.25	ug/l							
Picloram	ND	0.75	ug/l							
Surr: 2,4-DCAA	49.2		ug/l	40.0		123	56-156			
LCS (W3H0016-BS1)				Analyzed: 08/14/13 16:47						
2,4,5-T	2.59	0.25	ug/l	2.50		104	39-151			
2,4,5-TP (Silvex)	2.49	0.25	ug/l	2.50		100	46-142			
2,4-D	4.36	0.50	ug/l	5.00		87	56-164			
2,4-DB	18.0	2.5	ug/l	10.0		180	27-161			Q-08
3,5-Dichlorobenzoic acid	4.31	1.2	ug/l	5.00		86	54-154			
4-Nitrophenol	7.34	1.2	ug/l	10.0		73	3-105			
Acifluorfen	1.48	0.50	ug/l	2.50		59	39-134			
Bentazon	7.81	2.5	ug/l	10.0		78	44-139			
Dalapon	3.28	0.50	ug/l	5.00		66	40-139			
DCPA	1.73	0.25	ug/l	2.50		69	34-135			
Dicamba	4.41	0.75	ug/l	5.00		88	46-140			
Dichloroprop	5.59	1.0	ug/l	5.00		112	43-158			
Dinoseb	3.01	0.50	ug/l	2.50		120	42-146			
MCPA	454	100	ug/l	500		91	28-144			
MCPP	378	100	ug/l	500		76	31-153			
Pentachlorophenol	2.43	0.25	ug/l	2.50		97	37-136			
Picloram	1.93	0.75	ug/l	2.50		77	35-138			
Surr: 2,4-DCAA	31.4		ug/l	40.0		78	56-156			
LCS Dup (W3H0016-BSD1)				Analyzed: 08/14/13 17:06						
2,4,5-T	2.54	0.25	ug/l	2.50		102	39-151	2	25	
2,4,5-TP (Silvex)	2.67	0.25	ug/l	2.50		107	46-142	7	25	
2,4-D	4.80	0.50	ug/l	5.00		96	56-164	10	25	
2,4-DB	16.2	2.5	ug/l	10.0		162	27-161	11	25	Q-08
3,5-Dichlorobenzoic acid	5.88	1.2	ug/l	5.00		118	54-154	31	25	Q-12
4-Nitrophenol	7.40	1.2	ug/l	10.0		74	3-105	0.9	25	
Acifluorfen	1.71	0.50	ug/l	2.50		68	39-134	14	25	
Bentazon	9.13	2.5	ug/l	10.0		91	44-139	16	25	
Dalapon	4.56	0.50	ug/l	5.00		91	40-139	33	25	Q-12
DCPA	2.18	0.25	ug/l	2.50		87	34-135	23	25	
Dicamba	5.40	0.75	ug/l	5.00		108	46-140	20	25	
Dichloroprop	6.18	1.0	ug/l	5.00		124	43-158	10	25	
Dinoseb	2.84	0.50	ug/l	2.50		114	42-146	6	25	
MCPA	525	100	ug/l	500		105	28-144	14	25	
MCPP	511	100	ug/l	500		102	31-153	30	25	Q-12
Pentachlorophenol	3.12	0.25	ug/l	2.50		125	37-136	25	25	
Picloram	2.21	0.75	ug/l	2.50		88	35-138	13	25	



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 07/31/13 10:15
Date Reported: 09/17/13 11:42

Chlorinated Herbicides - Quality Control

Batch W3H0016 - EPA 8151A

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
LCS Dup (W3H0016-BSD1)				Analyzed: 08/14/13 17:06						
Surr: 2,4-DCAA	35.9		ug/l	40.0		90	56-156			

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods - Quality Control

Batch W3H0018 - SM 5310C

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
Blank (W3H0018-BLK1)				Analyzed: 08/01/13 10:51						
Total Organic Carbon (TOC)	ND	0.30	mg/l							
LCS (W3H0018-BS1)				Analyzed: 08/01/13 10:51						
Total Organic Carbon (TOC)	5.24	0.30	mg/l	5.00		105	85-115			
Matrix Spike (W3H0018-MS1)				Source: 3G29027-04 Analyzed: 08/01/13 10:51						
Total Organic Carbon (TOC)	5.42	0.30	mg/l	5.00	0.105	106	77-114			
Matrix Spike Dup (W3H0018-MSD1)				Source: 3G29027-04 Analyzed: 08/01/13 10:51						
Total Organic Carbon (TOC)	5.29	0.30	mg/l	5.00	0.105	104	77-114	2	10	

Batch W3H0072 - SM 5310C

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
Blank (W3H0072-BLK1)				Analyzed: 08/02/13 13:23						
Dissolved Organic Carbon	ND	0.50	mg/l							
LCS (W3H0072-BS1)				Analyzed: 08/02/13 13:23						
Dissolved Organic Carbon	5.22	0.50	mg/l	5.00		104	80-120			
LCS Dup (W3H0072-BSD1)				Analyzed: 08/02/13 13:23						
Dissolved Organic Carbon	5.25	0.50	mg/l	5.00		105	80-120	0.5	20	

Organophosphorus Pesticides by EPA Method 8141A - Quality Control

Batch W3H0095 - EPA 8141A

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
Blank (W3H0095-BLK1)				Analyzed: 08/12/13 20:56						
Azinphos methyl (Guthion)	ND	0.10	ug/l							
Bolstar	ND	0.10	ug/l							
Chlorpyrifos	ND	0.10	ug/l							
Coumaphos	ND	0.10	ug/l							
Demeton-o	ND	0.10	ug/l							
Demeton-s	ND	0.10	ug/l							
Diazinon	ND	0.10	ug/l							
Dichlorvos	ND	0.10	ug/l							
Dimethoate	ND	0.25	ug/l							
Disulfoton	ND	0.10	ug/l							



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 07/31/13 10:15
Date Reported: 09/17/13 11:42

Organophosphorus Pesticides by EPA Method 8141A - Quality Control

Batch W3H0095 - EPA 8141A

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
Blank (W3H0095-BLK1)				Analyzed: 08/12/13 20:56						
Ethoprop	ND	0.10	ug/l							
Ethyl parathion	ND	0.25	ug/l							
Fensulfothion	ND	0.10	ug/l							
Fenthion	ND	0.10	ug/l							
Malathion	ND	0.25	ug/l							
Merphos	ND	0.10	ug/l							
Methyl parathion	ND	0.10	ug/l							
Mevinphos	ND	0.10	ug/l							
Naled	ND	0.10	ug/l							
Phorate	ND	0.10	ug/l							
Ronnel	ND	0.10	ug/l							
Stirophos	ND	0.10	ug/l							
Thionazin	ND	0.25	ug/l							
Tokuthion (Prothiofos)	ND	0.10	ug/l							
Total Demeton, -o and -s	ND	0.20	ug/l							
Total Parathion, ethyl & methyl	ND	0.35	ug/l							
Trichloronate	ND	0.10	ug/l							
Surr: Triphenyl phosphate	0.790		ug/l	1.00		79	10-181			
LCS (W3H0095-BS1)				Analyzed: 08/12/13 21:26						
Azinphos methyl (Guthion)	0.550	0.10	ug/l	1.00		55	12-167			
Bolstar	0.769	0.10	ug/l	1.00		77	36-146			
Chlorpyrifos	0.757	0.10	ug/l	1.00		76	35-149			
Coumaphos	0.384	0.10	ug/l	1.00		38	24-171			
Demeton-o	0.612	0.10	ug/l	1.00		61	22-117			
Demeton-s	0.747	0.10	ug/l	1.00		75	35-137			
Diazinon	0.899	0.10	ug/l	1.00		90	37-145			
Dichlorvos	0.989	0.10	ug/l	1.00		99	31-169			
Disulfoton	0.868	0.10	ug/l	1.00		87	39-140			
Ethoprop	1.00	0.10	ug/l	1.00		100	40-153			
Fensulfothion	0.757	0.10	ug/l	1.00		76	24-178			
Fenthion	0.812	0.10	ug/l	1.00		81	37-147			
Merphos	0.654	0.10	ug/l	1.00		65	25-159			
Methyl parathion	0.704	0.10	ug/l	1.00		70	29-160			
Mevinphos	0.844	0.10	ug/l	1.00		84	31-146			
Naled	0.683	0.10	ug/l	1.00		68	0.1-142			
Phorate	0.968	0.10	ug/l	1.00		97	43-146			
Ronnel	0.725	0.10	ug/l	1.00		73	30-156			
Stirophos	0.878	0.10	ug/l	1.00		88	31-166			
Tokuthion (Prothiofos)	0.793	0.10	ug/l	1.00		79	36-144			
Trichloronate	0.894	0.10	ug/l	1.00		89	38-148			
Surr: Triphenyl phosphate	0.848		ug/l	1.00		85	10-181			
LCS Dup (W3H0095-BSD1)				Analyzed: 08/12/13 21:57						
Azinphos methyl (Guthion)	0.566	0.10	ug/l	1.00		57	12-167	3	25	
Bolstar	0.714	0.10	ug/l	1.00		71	36-146	7	25	



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 07/31/13 10:15
Date Reported: 09/17/13 11:42

Organophosphorus Pesticides by EPA Method 8141A - Quality Control

Batch W3H0095 - EPA 8141A

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
LCS Dup (W3H0095-BSD1)		Analyzed: 08/12/13 21:57								
Chlorpyrifos	0.762	0.10	ug/l	1.00		76	35-149	0.7	25	
Coumaphos	0.393	0.10	ug/l	1.00		39	24-171	2	25	
Demeton-o	0.748	0.10	ug/l	1.00		75	22-117	20	25	
Demeton-s	0.763	0.10	ug/l	1.00		76	35-137	2	25	
Diazinon	0.859	0.10	ug/l	1.00		86	37-145	5	25	
Dichlorvos	0.979	0.10	ug/l	1.00		98	31-169	0.9	25	
Disulfoton	0.864	0.10	ug/l	1.00		86	39-140	0.5	25	
Ethoprop	0.976	0.10	ug/l	1.00		98	40-153	3	25	
Fensulfothion	0.717	0.10	ug/l	1.00		72	24-178	5	25	
Fenthion	0.800	0.10	ug/l	1.00		80	37-147	1	25	
Merphos	0.617	0.10	ug/l	1.00		62	25-159	6	25	
Methyl parathion	0.718	0.10	ug/l	1.00		72	29-160	2	25	
Mevinphos	0.910	0.10	ug/l	1.00		91	31-146	8	25	
Naled	0.709	0.10	ug/l	1.00		71	0.1-142	4	25	
Phorate	1.01	0.10	ug/l	1.00		101	43-146	5	25	
Ronnel	0.735	0.10	ug/l	1.00		74	30-156	1	25	
Stirophos	0.885	0.10	ug/l	1.00		88	31-166	0.7	25	
Tokuthion (Prothiofos)	0.752	0.10	ug/l	1.00		75	36-144	5	25	
Trichloronate	0.847	0.10	ug/l	1.00		85	38-148	5	25	
Surr: Triphenyl phosphate	0.737		ug/l	1.00		74	10-181			

Pyrethroid Pesticides by GC/MS SIM - Quality Control

Batch W3H0252 - GC/MS NCI-SIM

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
Blank (W3H0252-BLK1)		Analyzed: 09/04/13 20:32								
Allethrin	ND	2.0	ng/l							
Bifenthrin	ND	2.0	ng/l							
Cyfluthrin	ND	2.0	ng/l							
Cypermethrin	ND	2.0	ng/l							
Deltamethrin/Tralomethrin	ND	2.0	ng/l							
Dichloran	ND	2.0	ng/l							
Fenpropathrin (Danitol)	ND	2.0	ng/l							
Fenvalerate/Esfenvalerate	ND	2.0	ng/l							
L-Cyhalothrin	ND	2.0	ng/l							
Pendimethalin	ND	2.0	ng/l							
Permethrin	ND	5.0	ng/l							
Prallethrin	ND	2.0	ng/l							
Sumithrin	ND	10	ng/l							
Tefluthrin	ND	2.0	ng/l							
Surr: Perylene-d12	212		ng/l	250		85	70-130			
Surr: Triphenyl phosphate	184		ng/l	250		74	70-130			



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 07/31/13 10:15
Date Reported: 09/17/13 11:42

Pyrethroid Pesticides by GC/MS SIM - Quality Control

Batch W3H0252 - GC/MS NCI-SIM

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
LCS (W3H0252-BS1)						Analyzed: 09/05/13 09:39				
Allethrin	38.6	2.0	ng/l	50.0		77	48-156			
Bifenthrin	42.4	2.0	ng/l	50.0		85	25-191			
Cyfluthrin	38.4	2.0	ng/l	50.0		77	37-169			
Cypermethrin	38.2	2.0	ng/l	50.0		76	29-178			
Deltamethrin/Tralomethrin	73.9	2.0	ng/l	50.0		148	50-150			
Dichloran	65.5	2.0	ng/l	50.0		131	53-164			
Fenpropathrin (Danitol)	46.3	2.0	ng/l	50.0		93	50-150			
Fenvalerate/Esfenvalerate	40.7	2.0	ng/l	50.0		81	31-178			
L-Cyhalothrin	57.4	2.0	ng/l	50.0		115	38-182			
Pendimethalin	57.7	2.0	ng/l	50.0		115	52-145			
Permethrin	46.3	5.0	ng/l	50.0		93	59-148			
Prallethrin	33.9	2.0	ng/l	50.0		68	54-148			
Sumithrin	60.6	10	ng/l	50.0		121	56-146			
Tefluthrin	42.2	2.0	ng/l	50.0		84	38-195			
Surr: Perylene-d12	252		ng/l	250		101	70-130			
Surr: Triphenyl phosphate	194		ng/l	250		77	70-130			

LCS Dup (W3H0252-BSD1)

Analyzed: 09/05/13 10:00

Allethrin	32.2	2.0	ng/l	50.0		64	48-156	18	30	
Bifenthrin	45.7	2.0	ng/l	50.0		91	25-191	8	30	
Cyfluthrin	39.7	2.0	ng/l	50.0		79	37-169	4	30	
Cypermethrin	31.1	2.0	ng/l	50.0		62	29-178	20	30	
Deltamethrin/Tralomethrin	71.0	2.0	ng/l	50.0		142	50-150	4	30	
Dichloran	60.5	2.0	ng/l	50.0		121	53-164	8	30	
Fenpropathrin (Danitol)	48.3	2.0	ng/l	50.0		97	50-150	4	30	
Fenvalerate/Esfenvalerate	35.7	2.0	ng/l	50.0		71	31-178	13	30	
L-Cyhalothrin	59.2	2.0	ng/l	50.0		118	38-182	3	30	
Pendimethalin	62.8	2.0	ng/l	50.0		126	52-145	8	30	
Permethrin	42.9	5.0	ng/l	50.0		86	59-148	8	30	
Prallethrin	37.7	2.0	ng/l	50.0		75	54-148	11	30	
Sumithrin	58.3	10	ng/l	50.0		117	56-146	4	30	
Tefluthrin	42.8	2.0	ng/l	50.0		86	38-195	1	30	
Surr: Perylene-d12	194		ng/l	250		78	70-130			
Surr: Triphenyl phosphate	145		ng/l	250		58	70-130			

S-11

Batch W3I0281 - GC/MS NCI-SIM

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
Blank (W3I0281-BLK1)						Analyzed: 09/12/13 11:19				
Allethrin	ND	2.0	ng/l							
Bifenthrin	ND	2.0	ng/l							
Cyfluthrin	ND	2.0	ng/l							
Cypermethrin	ND	2.0	ng/l							
Deltamethrin/Tralomethrin	ND	2.0	ng/l							
Dichloran	ND	2.0	ng/l							



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 07/31/13 10:15
Date Reported: 09/17/13 11:42

Pyrethroid Pesticides by GC/MS SIM - Quality Control

Batch W3I0281 - GC/MS NCI-SIM

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
Blank (W3I0281-BLK1)				Analyzed: 09/12/13 11:19						
Fenpropathrin (Danitol)	ND	2.0	ng/l							
Fenvalerate/Esfenvalerate	ND	2.0	ng/l							
L-Cyhalothrin	ND	2.0	ng/l							
Pendimethalin	ND	2.0	ng/l							
Permethrin	ND	5.0	ng/l							
Prallethrin	ND	2.0	ng/l							
Sumithrin	ND	10	ng/l							
Tefluthrin	ND	2.0	ng/l							
Surr: Perylene-d12	194		ng/l	250		78	70-130			
Surr: Triphenyl phosphate	148		ng/l	250		59	70-130			S-11
LCS (W3I0281-BS1)				Analyzed: 09/11/13 22:43						
Allethrin	32.0	2.0	ng/l	50.0		64	48-156			
Bifenthrin	39.8	2.0	ng/l	50.0		80	25-191			
Cyfluthrin	32.4	2.0	ng/l	50.0		65	37-169			
Cypermethrin	35.6	2.0	ng/l	50.0		71	29-178			
Deltamethrin/Tralomethrin	70.2	2.0	ng/l	50.0		140	50-150			
Dichloran	55.3	2.0	ng/l	50.0		111	53-164			
Fenpropathrin (Danitol)	42.2	2.0	ng/l	50.0		84	50-150			
Fenvalerate/Esfenvalerate	42.8	2.0	ng/l	50.0		86	31-178			
L-Cyhalothrin	55.2	2.0	ng/l	50.0		110	38-182			
Pendimethalin	47.3	2.0	ng/l	50.0		95	52-145			
Permethrin	45.0	5.0	ng/l	50.0		90	59-148			
Prallethrin	41.8	2.0	ng/l	50.0		84	54-148			
Sumithrin	35.8	10	ng/l	50.0		72	56-146			
Tefluthrin	55.9	2.0	ng/l	50.0		112	38-195			
Surr: Perylene-d12	207		ng/l	250		83	70-130			
Surr: Triphenyl phosphate	154		ng/l	250		62	70-130			S-11
LCS Dup (W3I0281-BSD1)				Analyzed: 09/11/13 23:06						
Allethrin	28.7	2.0	ng/l	50.0		57	48-156	11	30	
Bifenthrin	40.4	2.0	ng/l	50.0		81	25-191	1	30	
Cyfluthrin	33.9	2.0	ng/l	50.0		68	37-169	5	30	
Cypermethrin	37.1	2.0	ng/l	50.0		74	29-178	4	30	
Deltamethrin/Tralomethrin	73.7	2.0	ng/l	50.0		147	50-150	5	30	
Dichloran	60.5	2.0	ng/l	50.0		121	53-164	9	30	
Fenpropathrin (Danitol)	44.3	2.0	ng/l	50.0		89	50-150	5	30	
Fenvalerate/Esfenvalerate	43.2	2.0	ng/l	50.0		86	31-178	0.9	30	
L-Cyhalothrin	53.1	2.0	ng/l	50.0		106	38-182	4	30	
Pendimethalin	51.1	2.0	ng/l	50.0		102	52-145	8	30	
Permethrin	45.4	5.0	ng/l	50.0		91	59-148	0.7	30	
Prallethrin	52.9	2.0	ng/l	50.0		106	54-148	23	30	
Sumithrin	61.9	10	ng/l	50.0		124	56-146	54	30	Q-12
Tefluthrin	54.6	2.0	ng/l	50.0		109	38-195	2	30	
Surr: Perylene-d12	201		ng/l	250		80	70-130			
Surr: Triphenyl phosphate	159		ng/l	250		63	70-130			S-11



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 07/31/13 10:15
Date Reported: 09/17/13 11:42

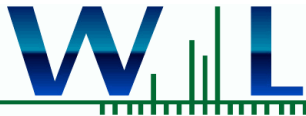
Volatile Organic Compounds by EPA Method 524.2 - Quality Control

Batch W3H0545 - SM 5710B/EPA524.2

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
Blank (W3H0545-BLK1)				Analyzed: 08/12/13 14:25						
Bromodichloromethane, FP	ND	0.50	ug/l							
Bromoform, FP	ND	0.50	ug/l							
Chloroform, FP	ND	0.50	ug/l							
Dibromochloromethane, FP	ND	0.50	ug/l							
THM Formation Potential	ND	2.0	ug/l							
Surr: 1,2-Dichlorobenzene-d4	9.19		ug/l	10.0		92	70-130			
Surr: 4-Bromofluorobenzene	9.55		ug/l	10.0		96	70-130			
LCS (W3H0545-BS1)				Analyzed: 08/12/13 12:56						
Bromodichloromethane, FP	6.12	0.50	ug/l	5.00		122	70-130			
Bromoform, FP	6.02	0.50	ug/l	5.00		120	70-130			
Chloroform, FP	6.34	0.50	ug/l	5.00		127	70-130			
Dibromochloromethane, FP	5.93	0.50	ug/l	5.00		119	70-130			
THM Formation Potential	24.4	2.0	ug/l	20.0		122	70-130			
Surr: 1,2-Dichlorobenzene-d4	10.9		ug/l	10.0		109	70-130			
Surr: 4-Bromofluorobenzene	10.6		ug/l	10.0		106	70-130			
LCS Dup (W3H0545-BSD1)				Analyzed: 08/12/13 13:25						
Bromodichloromethane, FP	6.13	0.50	ug/l	5.00		123	70-130	0.2	30	
Bromoform, FP	5.95	0.50	ug/l	5.00		119	70-130	1	30	
Chloroform, FP	6.26	0.50	ug/l	5.00		125	70-130	1	30	
Dibromochloromethane, FP	6.26	0.50	ug/l	5.00		125	70-130	5	30	
THM Formation Potential	24.6	2.0	ug/l	20.0		123	70-130	0.7	200	
Surr: 1,2-Dichlorobenzene-d4	11.1		ug/l	10.0		111	70-130			
Surr: 4-Bromofluorobenzene	10.6		ug/l	10.0		106	70-130			

Batch W3H0589 - SM 5710B/EPA524.2

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
Blank (W3H0589-BLK1)				Analyzed: 08/13/13 14:43						
Bromodichloromethane, FP	ND	0.50	ug/l							
Bromoform, FP	ND	0.50	ug/l							
Chloroform, FP	ND	0.50	ug/l							
Dibromochloromethane, FP	ND	0.50	ug/l							
THM Formation Potential	ND	2.0	ug/l							
Surr: 1,2-Dichlorobenzene-d4	9.37		ug/l	10.0		94	70-130			
Surr: 4-Bromofluorobenzene	9.67		ug/l	10.0		97	70-130			
LCS (W3H0589-BS1)				Analyzed: 08/13/13 13:13						
Bromodichloromethane, FP	6.00	0.50	ug/l	5.00		120	70-130			
Bromoform, FP	5.75	0.50	ug/l	5.00		115	70-130			
Chloroform, FP	6.22	0.50	ug/l	5.00		124	70-130			
Dibromochloromethane, FP	6.40	0.50	ug/l	5.00		128	70-130			
THM Formation Potential	24.4	2.0	ug/l	20.0		122	70-130			
Surr: 1,2-Dichlorobenzene-d4	11.0		ug/l	10.0		110	70-130			
Surr: 4-Bromofluorobenzene	10.6		ug/l	10.0		106	70-130			
LCS Dup (W3H0589-BSD1)				Analyzed: 08/13/13 13:43						



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 07/31/13 10:15
Date Reported: 09/17/13 11:42

Volatile Organic Compounds by EPA Method 524.2 - Quality Control

Batch W3H0589 - SM 5710B/EPA524.2

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
LCS Dup (W3H0589-BSD1)		Analyzed: 08/13/13 13:43								
Bromodichloromethane, FP	5.96	0.50	ug/l	5.00		119	70-130	0.7	30	
Bromoform, FP	5.65	0.50	ug/l	5.00		113	70-130	2	30	
Chloroform, FP	6.24	0.50	ug/l	5.00		125	70-130	0.3	30	
Dibromochloromethane, FP	6.35	0.50	ug/l	5.00		127	70-130	0.8	30	
THM Formation Potential	24.2	2.0	ug/l	20.0		121	70-130	0.7	200	
Surr: 1,2-Dichlorobenzene-d4	11.1		ug/l	10.0		111	70-130			
Surr: 4-Bromofluorobenzene	10.9		ug/l	10.0		109	70-130			



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 07/31/13 10:15
Date Reported: 09/17/13 11:42

Notes and Definitions

S-11	Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.
Q-12	The RPD result exceeded the QC control limits; however, both percent recoveries were acceptable. Sample results for the QC batch were accepted based on the percent recoveries and/or other acceptable QC data.
Q-08	High bias in the QC sample does not affect sample result since analyte was not detected or below the reporting limit.
O-13	The sample was originally analyzed within hold time. However, the re-analysis was performed due to possible carry over and/or cross contamination after the recommended holding time had expired.
CN-1	See case narrative for an explanation of results.
ND	NOT DETECTED at or above the Reporting Limit. If J-value reported, then NOT DETECTED at or above the Method Detection Limit (MDL)
NR	Not Reportable
Dil	Dilution
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
% Rec	Percent Recovery
Sub	Subcontracted analysis, original report available upon request
MDL	Method Detection Limit
MDA	Minimum Detectable Activity
MRL	Method Reporting Limit

Any remaining sample(s) will be disposed of one month from the final report date unless other arrangements are made in advance.

An Absence of Total Coliform meets the drinking water standards as established by the California Department of Health Services.

The Reporting Limit (RL) is referenced as the Laboratory's Practical Quantitation Limit (PQL) or the Detection Limit for Reporting Purposes (DLR).

All samples collected by Weck Laboratories have been sampled in accordance to laboratory SOP Number MIS002.

Marine Pollution Studies Laboratories
Moss Landing Marine Laboratories
7544 Sandholdt Road
Moss Landing, CA 95039

Project Manager: **Wes Heim**
Phone: **(831) 771-4459**
Fax: **(831) 633-0805**
Email: wheim@mlml.calstate.edu



Mercury Results

Project Name: Dutch Slough July 2013
Project Number: 341
Analyst: Adam Newman

Report #: Hg13-035w

Report Date: 8/12/2013

Lab Number	Station Name	Sample Type	Date Collected	Date Received	Batch Number	Hg ng/L	Flag
2013-2729	MC-5A	Raw	7/29/2013	7/30/2013	t130812a	0.927	
2013-2730	MC-5B	Raw	7/29/2013	7/30/2013	t130812a	0.786	
2013-2731	MC-5C	Raw	7/29/2013	7/30/2013	t130812a	<MDL	
						MDL	0.200
						RL	0.200

Method: modified EPA 1631E

Marine Pollution Studies Laboratories
Moss Landing Marine Laboratories
7544 Sandholdt Road
Moss Landing, CA 95039



Project Manager: Wes Heim
Phone: 831-771-4459
Fax: 831-663-0805
e-mail: wheim@mlml.calstate.edu

Project Name: Dutch Slough July 2013
Parameter: Mercury
Report Number: Hg 13-035w

Project Number: 341
Matrix: Water
Report Date: 8/12/2013

QA/QC SUMMARY

SAMPLE CUSTODY

Three water samples were collected July 29, 2013 and were received in good condition on July 30, 2013. Cooler temperature was 4.6°C, which is inside the optimal temperature range of 4±2°C. The samples were acidified to a final concentration of 0.5% v/v bromine monochloride (BrCl).

QA/QC DATA QUALITY OBJECTIVES (DQO)

<u>Analyte</u>	<u>Reference Method</u>	<u>Range of Recovery</u>	<u>Relative Precision</u>	<u>Detection Limit</u>
Hg	EPA 1631E M	±25%	±25%	0.200 ng/L

METHOD

Samples were analyzed using Modified EPA 1631, Revision E: Mercury in Water by Oxidation, Purge and Trap, and Cold Vapor Atomic Fluorescence Spectrometry.

HOLDING TIME

Samples were analyzed August 12, 2013. All samples were analyzed within the EPA holding time of 90 days from collection.

CALIBRATION CURVE

A calibration curve, covering the range of 0.50 – 100 ng/L Hg, was performed for each batch.

CALIBRATION VERIFICATION

Initial Calibration Verification (ICV) and all Continuing Calibration Verification (CCV) were within DQO of $\pm 20\%$ for each batch.

DETECTION LIMIT

All detection limits listed in the table above were achieved.

METHOD BLANKS

Three method blanks were analyzed with each batch of samples. All blanks were below detection limits, and samples are blank corrected with the average blank value per batch.

REPLICATES

One pair of analytical duplicates selected at random was analyzed with each batch of samples. All RPDs met the DQO of $\pm 25\%$.

MATRIX SPIKES

One matrix spike/matrix spike duplicate (MS/MSD) pair was analyzed with each batch of samples. All recoveries and RPDs met the DQO of $\pm 25\%$.

CERTIFIED REFERENCE MATERIAL

One CRM NIST-1641d was analyzed with each batch of samples. All recoveries met the DQO of $\pm 25\%$.

REFERENCES

US Environmental Protection Agency Method 1631. 2002. Mercury in Water by Oxidation, Purge and Trap, and Cold Vapor Atomic Fluorescence Spectrometry, Revision E. US Environmental Protection Agency, Washington, DC.

Modifications to EPA 1631E

Marine Pollution Studies Laboratories**Moss Landing Marine Laboratories**

7544 Sandholdt Road
Moss Landing, CA 95039

Project Manager: **Autumn Bonnema**
Phone: **831-771-4165**
Fax: **831-633-0805**
Email: bonnema@mlml.calstate.edu

**Mercury Results**

Project Name: Dutch Slough July - August 2013
Project Number: 341
Analyst: Amy Byington

Report #: sMMHg 13-032w

Report Date: 9/10/2013

Lab Number	Station Name	Sample Type	Date Collected	Date Received	Batch Number	MMHg ng/L	Flag
2013-2734	MC-5C	raw	7/29/2013	7/30/2013	s082813	0.018	DNQ
2013-2733	MC-5B	raw	7/29/2013	7/30/2013	s082813	0.028	DNQ
2013-2737	Burroughs Parcel	raw	7/29/2013	7/30/2013	s082813	0.455	
2013-2735	Emerson Parcel	raw	7/29/2013	7/30/2013	s082813	0.197	
2013-2732	MC 5A	raw	7/29/2013	7/30/2013	s082813	0.033	
2013-2736	Gilbert Parcel	raw	7/29/2013	7/30/2013	s082813	0.285	
2013-3117	MC-5A	raw	8/26/2013	8/27/2013	s090413	<MDL	
2013-3121	Gilbert Parcel	raw	8/26/2013	8/27/2013	s090413	0.350	
2013-3120	Emerson Parcel	raw	8/26/2013	8/27/2013	s090413	0.255	
2013-3122	Burroughs Parcel	raw	8/26/2013	8/27/2013	s090413	0.411	
2013-3118	MC-5B	raw	8/26/2013	8/27/2013	s090413	<MDL	
2013-3119	MC-5C	raw	8/26/2013	8/27/2013	s090413	<MDL	
						MDL	0.011
						RL	0.031

Method: modified EPA 1630

DNQ = sample detected, but not quantifiable, less than RL

Marine Pollution Studies Laboratories
Moss Landing Marine Laboratories
7544 Sandholdt Road
Moss Landing, CA 95039



Project Manager: Autumn Bonnema
Phone: 831-771-4175
Fax: 831-633-0805
e-mail: bonnema@mlml.calstate.edu

Project Name:	Dutch Slough July – Aug 2013	Project Number:	341
Parameter:	Monomethylmercury	Matrix:	Water
Report Number:	sMMHg 13-032w	Report Date:	9/10/2013

QA/QC SUMMARY

SAMPLE CUSTODY

Six samples were collected on July 29, 2013 and received in good condition on July 30, 2013. Cooler temperature was 4.6°C, which is within the optimal temperature range of 4±2°C. Upon receipt, the samples were acidified to a final concentration of 0.5% v/v hydrochloric acid (HCl). The samples were kept at 4°C until analysis.

Six samples were collected on August 26, 2013 and received in good condition on August 27, 2013. Cooler temperature was 4.2°C, which is within the optimal temperature range of 4±2°C. Upon receipt, the samples were acidified to a final concentration of 0.5% v/v hydrochloric acid (HCl). The samples were kept at 4°C until analysis.

QA/QC DATA QUALITY OBJECTIVES (DQO)

<u>Analyte</u>	<u>Reference Method</u>	<u>Range of Recovery</u>	<u>Relative Precision</u>	<u>Detection Limit</u>
MMHg	EPA 1630 M	±30%	±25%	0.011 ng/L

METHOD

Samples were analyzed using Modified EPA 1630: Methyl Mercury in Water by Distillation, Aqueous Ethylation, Purge and Trap, and Cold Vapor Atomic Fluorescence Spectrometer.

HOLDING TIME

Samples were analyzed August 28 and September 4, 2013. All samples were analyzed within the EPA holding time of six months from collection.

CALIBRATION CURVE

Calibration curves, covering the range of 0.02 – 4.0 ng/L MMHg were performed for each batch.

CALIBRATION VERIFICATION

Initial Calibration Verification (ICV) and all Continuing Calibration Verification (CCV) were within DQO of $\pm 20\%$.

DETECTION LIMIT

All detection limits listed in the table above were achieved.

METHOD BLANKS

Three method blanks were analyzed with each batch of samples. A low level blank was detected in s082813 but was less than the RL and are considered not quantifiable. The average method blank value for each batch was less than 0.045 ng/L, which is within EPA specifications. Sample results are not blank corrected.

REPLICATES

One pair of analytical duplicates, selected at random, was analyzed with the batch of samples. All RPDs met the DQO of $\pm 25\%$, except in batch s082813. The replicate sample concentrations were below 10x the MDL and are therefore exempt from meeting the DQO.

MATRIX SPIKES

One matrix spike/matrix spike duplicate (MS/MSD) pair was analyzed with the batch of samples. All recoveries and RPDs met the DQO of $\pm 30\%$ and $\pm 25\%$.

CERTIFIED REFERENCE MATERIAL

Because no CRM for methylmercury in water is available, a second 1.0 parts per million (ppm) MMHg standard was used as a second source, and analyzed with the water samples to assess accuracy. The recoveries meet the DQO of $\pm 20\%$.

REFERENCES

US Environmental Protection Agency Method 1630. 1998. Methyl Mercury in Water by Distillation, Aqueous Ethylation, Purge and Trap, and Cold Vapor Atomic Fluorescence Spectrometer. US Environmental Protection Agency, Washington, DC.

Modifications to EPA 1630.



McC Campbell Analytical, Inc.

"When Quality Counts"

Analytical Report

WorkOrder: 1308873

Report Created for: HydroFocus, Inc.
P.O. Box 2401
Davis, CA 95617

Project Contact: Christina Hart
Project Name: #5586; Dutch Slough SW
Project P.O.:

Project Received: 08/26/2013

Analytical Report reviewed & approved for release on 09/04/2013 by:

Question about
your data?

[Click here to email
McC Campbell](#)

Angela Rydelius,
Laboratory Manager

The report shall not be reproduced except in full, without the written approval of the laboratory. The analytical results relate only to the items tested. Results reported conform to the most current NELAP standards, where applicable, unless otherwise stated in the case narrative.





Glossary of Terms & Qualifier Definitions

Client: HydroFocus, Inc.
Project: #5586; Dutch Slough SW
WorkOrder: 1308873

Glossary Abbreviation

Description

DF	Dilution Factor
LCS	Laboratory Control Sample
MB	Method Blank
MB % Rec	% Recovery of Surrogate in Method Blank, if applicable
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ND	Not detected at or above the indicated MDL or RL
NR	Analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix; or sample diluted due to high matrix or analyte content.
RL	Reporting Limit
RPD	Relative Percent Deviation
SPK Val	Spike Value
SPKRef Val	Spike Reference Value

Analytical Qualifier

H	samples were analyzed out of holding time
S	spike recovery outside accepted recovery limits



Analytical Report

Client: HydroFocus, Inc.
Project: #5586; Dutch Slough SW
Date Received: 8/26/13 16:20
Date Prepared: 8/27/13

WorkOrder: 1308873
Extraction Method E300.1
Analytical Method: E300.1
Unit: mg/L

Inorganic Anions by IC

Client ID	Lab ID	Matrix/ExtType	Date Collected	Instrument	Batch ID
MC-5A	1308873-001C	Water	08/26/2013 10:00	IC1	81026

Analytes	Result	RL	DF	Date Analyzed
Chloride	340	10	100	08/27/2013 11:12
Nitrate as N	7.0	0.50	5	08/27/2013 10:37
Nitrate as NO ₃ ⁻	31	2.2	5	08/27/2013 10:37
ortho-Phosphate as P	1.6	0.10	1	08/27/2013 05:07
Sulfate	200	10	100	08/27/2013 11:12
Surrogates	REC (%)	Limits		
Formate	101	90-115		08/27/2013 05:07

MC-5B	1308873-002C	Water	08/26/2013 10:10	IC1	81026
-------	--------------	-------	------------------	-----	-------

Analytes	Result	RL	DF	Date Analyzed
Chloride	340	10	100	08/27/2013 12:22
Nitrate as N	7.0	0.50	5	08/27/2013 11:47
Nitrate as NO ₃ ⁻	31	2.2	5	08/27/2013 11:47
ortho-Phosphate as P	1.6	0.10	1	08/27/2013 06:51
Sulfate	200	10	100	08/27/2013 12:22
Surrogates	REC (%)	Limits		
Formate	103	90-115		08/27/2013 06:51

MC-5C	1308873-003C	Water	08/26/2013 10:35	IC1	81026
-------	--------------	-------	------------------	-----	-------

Analytes	Result	RL	DF	Date Analyzed
Chloride	ND	0.10	1	08/27/2013 19:26
Nitrate as N	ND	0.10	1	08/27/2013 19:26
Nitrate as NO ₃ ⁻	ND	0.45	1	08/27/2013 19:26
ortho-Phosphate as P	ND	0.10	1	08/27/2013 19:26
Sulfate	ND	0.10	1	08/27/2013 19:26
Surrogates	REC (%)	Limits		
Formate	102	90-115		08/27/2013 19:26



Analytical Report

Client: HydroFocus, Inc.
Project: #5586; Dutch Slough SW
Date Received: 8/26/13 16:20
Date Prepared: 9/3/13

WorkOrder: 1308873
Extraction Method E350.1
Analytical Method: E350.1
Unit: mg/L

Ammonia as N

Client ID	Lab ID	Matrix/ExtType	Date Collected	Instrument	Batch ID
MC-5A	1308873-001F	Water/TOTAL	08/26/2013 10:00	SKALAR	81257

<u>Analytes</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
Total Ammonia as N	0.12	0.10	1	09/03/2013 16:25

MC-5B	1308873-002F	Water/TOTAL	08/26/2013 10:10	SKALAR	81257
-------	--------------	-------------	------------------	--------	-------

<u>Analytes</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
Total Ammonia as N	0.15	0.10	1	09/03/2013 16:36

MC-5C	1308873-003F	Water/TOTAL	08/26/2013 10:35	SKALAR	81257
-------	--------------	-------------	------------------	--------	-------

<u>Analytes</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
Total Ammonia as N	ND	0.10	1	09/03/2013 16:40



Analytical Report

Client: HydroFocus, Inc.
Project: #5586; Dutch Slough SW
Date Received: 8/26/13 16:20
Date Prepared: 8/29/13

WorkOrder: 1308873
Extraction Method SM2320B
Analytical Method: SM2320B
Unit: mg CaCO₃/L

Total & Speciated Alkalinity as Calcium Carbonate

Client ID	Lab ID	Matrix/ExtType	Date Collected	Instrument	Batch ID
MC-5A	1308873-001E	Water	08/26/2013 10:00	Titrimo	81148

Analytes	Result	RL	DF	Date Analyzed
Total*	185	1.00	1	08/29/2013 10:01
Carbonate*	ND	1.00	1	08/29/2013 10:01
Bicarbonate*	185	1.00	1	08/29/2013 10:01
Hydroxide*	ND	1.00	1	08/29/2013 10:01

MC-5B	1308873-002E	Water	08/26/2013 10:10	Titrimo	81148
-------	--------------	-------	------------------	---------	-------

Analytes	Result	RL	DF	Date Analyzed
Total*	190	1.00	1	08/29/2013 10:11
Carbonate*	ND	1.00	1	08/29/2013 10:11
Bicarbonate*	190	1.00	1	08/29/2013 10:11
Hydroxide*	ND	1.00	1	08/29/2013 10:11

MC-5C	1308873-003E	Water	08/26/2013 10:35	Titrimo	81148
-------	--------------	-------	------------------	---------	-------

Analytes	Result	RL	DF	Date Analyzed
Total*	ND	1.00	1	08/29/2013 13:08
Carbonate*	ND	1.00	1	08/29/2013 13:08
Bicarbonate*	ND	1.00	1	08/29/2013 13:08
Hydroxide*	ND	1.00	1	08/29/2013 13:08



Analytical Report

Client: HydroFocus, Inc.
Project: #5586; Dutch Slough SW
Date Received: 8/26/13 16:20
Date Prepared: 8/26/13

WorkOrder: 1308873
Extraction Method E200.8
Analytical Method: E200.8
Unit: µg/L

Metals

Client ID	Lab ID	Matrix/ExtType	Date Collected	Instrument	Batch ID
MC-5A	1308873-001B	Water/DISS.	08/26/2013 10:00	ICP-MS1	80984

Analytes	Result	RL	DF	Date Analyzed
Calcium	79,000	5000	50	08/31/2013 03:44
Magnesium	39,000	1000	50	08/31/2013 03:44
Potassium	20,000	2500	50	08/31/2013 03:44
Sodium	260,000	5000	50	08/31/2013 03:44

MC-5B	1308873-002B	Water/DISS.	08/26/2013 10:10	ICP-MS1	80984
-------	--------------	-------------	------------------	---------	-------

Analytes	Result	RL	DF	Date Analyzed
Calcium	76,000	5000	50	08/31/2013 03:50
Magnesium	39,000	1000	50	08/31/2013 03:50
Potassium	20,000	2500	50	08/31/2013 03:50
Sodium	250,000	5000	50	08/31/2013 03:50

MC-5C	1308873-003B	Water/DISS.	08/26/2013 10:35	ICP-MS1	80984
-------	--------------	-------------	------------------	---------	-------

Analytes	Result	RL	DF	Date Analyzed
Calcium	ND	100	1	08/31/2013 03:56
Magnesium	ND	20	1	08/31/2013 03:56
Potassium	ND	50	1	08/31/2013 03:56
Sodium	ND	100	1	08/31/2013 03:56



Analytical Report

Client: HydroFocus, Inc.
Project: #5586; Dutch Slough SW
Date Received: 8/26/13 16:20
Date Prepared: 8/26/13

WorkOrder: 1308873
Extraction Method SM4500H+B
Analytical Method: SM4500H+B
Unit: $\pm$, pH units @ °C

pH

Client ID	Lab ID	Matrix/ExtType	Date Collected	Instrument	Batch ID
MC-5A	1308873-001D	Water	08/26/2013 10:00	WetChem	81055

<u>Analytes</u>	<u>Result</u>	<u>Qualifiers</u>	<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
pH	7.96 @ 22.8°C	H	0.0500	1	08/26/2013 21:18

MC-5B	1308873-002D	Water	08/26/2013 10:10	WetChem	81055
-------	--------------	-------	------------------	---------	-------

<u>Analytes</u>	<u>Result</u>	<u>Qualifiers</u>	<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
pH	8.14 @ 22.4°C	H	0.0500	1	08/26/2013 21:24

MC-5C	1308873-003D	Water	08/26/2013 10:35	WetChem	81055
-------	--------------	-------	------------------	---------	-------

<u>Analytes</u>	<u>Result</u>	<u>Qualifiers</u>	<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
pH	6.43 @ 23.3°C	H	0.0500	1	08/26/2013 21:30

Emerson	1308873-004A	Water	08/26/2013 12:35	WetChem	81055
---------	--------------	-------	------------------	---------	-------

<u>Analytes</u>	<u>Result</u>	<u>Qualifiers</u>	<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
pH	7.60 @ 23.3°C	H	0.0500	1	08/26/2013 21:36

Gilbert	1308873-005A	Water	08/26/2013 13:10	WetChem	81055
---------	--------------	-------	------------------	---------	-------

<u>Analytes</u>	<u>Result</u>	<u>Qualifiers</u>	<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
pH	7.96 @ 23.2°C	H	0.0500	1	08/26/2013 21:42

(Cont.)



Analytical Report

Client: HydroFocus, Inc.
Project: #5586; Dutch Slough SW
Date Received: 8/26/13 16:20
Date Prepared: 8/26/13

WorkOrder: 1308873
Extraction Method SM4500H+B
Analytical Method: SM4500H+B
Unit: $\pm$, pH units @ °C

pH

Client ID	Lab ID	Matrix/ExtType	Date Collected	Instrument	Batch ID
Burroughs	1308873-006A	Water	08/26/2013 13:55	WetChem	81055
<u>Analytes</u>	<u>Result</u>	<u>Qualifiers</u>	<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
pH	7.72 @ 23.6°C	H	0.0500	1	08/26/2013 21:48



Analytical Report

Client: HydroFocus, Inc.
Project: #5586; Dutch Slough SW
Date Received: 8/26/13 16:20
Date Prepared: 8/27/13

WorkOrder: 1308873
Extraction Method SM2510B
Analytical Method: SM2510B
Unit: $\mu\text{mhos/cm}$ @ 25°C

Specific Conductivity

Client ID	Lab ID	Matrix/ExtType	Date Collected	Instrument	Batch ID
MC-5A	1308873-001D	Water	08/26/2013 10:00	WetChem	81059

<u>Analytes</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
Specific Conductivity	1650 @ 25.0°C	10.0	1	08/27/2013 14:10

MC-5B	1308873-002D	Water	08/26/2013 10:10	WetChem	81059
-------	--------------	-------	------------------	---------	-------

<u>Analytes</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
Specific Conductivity	1630 @ 23.7°C	10.0	1	08/27/2013 14:20

MC-5C	1308873-003D	Water	08/26/2013 10:35	WetChem	81059
-------	--------------	-------	------------------	---------	-------

<u>Analytes</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
Specific Conductivity	ND @ 23.7°C	10.0	1	08/27/2013 14:30

Emerson	1308873-004A	Water	08/26/2013 12:35	WetChem	81059
---------	--------------	-------	------------------	---------	-------

<u>Analytes</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
Specific Conductivity	2640 @ 25.0°C	10.0	1	08/27/2013 13:00

Gilbert	1308873-005A	Water	08/26/2013 13:10	WetChem	81059
---------	--------------	-------	------------------	---------	-------

<u>Analytes</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
Specific Conductivity	1770 @ 23.9°C	10.0	1	08/27/2013 14:40

(Cont.)



Analytical Report

Client: HydroFocus, Inc. **WorkOrder:** 1308873
Project: #5586; Dutch Slough SW **Extraction Method** SM2510B
Date Received: 8/26/13 16:20 **Analytical Method:** SM2510B
Date Prepared: 8/27/13 **Unit:** $\mu\text{mhos/cm}$ @ 25°C

Specific Conductivity

Client ID	Lab ID	Matrix/ExtType	Date Collected	Instrument	Batch ID
Burroughs	1308873-006A	Water	08/26/2013 13:55	WetChem	81059
<u>Analytes</u>	<u>Result</u>		<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
Specific Conductivity	1470 @ 23.8°C		10.0	1	08/27/2013 14:50

HydroFocus, Inc.

P.O. Box 2401

Davis, CA 95617

Client Project ID: #5586; Dutch
Slough SW

Client Contact: Christina Hart

Client P.O.:

Date Sampled: 08/26/13

Date Received: 08/26/13

Date Extracted: 08/26/13

Date Analyzed: 08/27/13

Total Coliform / E. Coli, Enumeration

Analytical Method: SM9223B

Work Order: 1308873

[illegible]

Reporting Limit & Reporting Units	W	1.0 MPN/100ml	
	S	NA	

DF = Dilution Factor

CDPH ELAP 1644 ♦ NELAP 12283CA

AB Analyst's Initial

 Angela Rydelius, Lab Manager



Analytical Report

Client: HydroFocus, Inc.
Project: #5586; Dutch Slough SW
Date Received: 8/26/13 16:20
Date Prepared: 8/29/13

WorkOrder: 1308873
Extraction Method SM2540C
Analytical Method: SM2540C
Unit: mg/L

Total Dissolved Solids

Client ID	Lab ID	Matrix/ExtType	Date Collected	Instrument	Batch ID
MC-5A	1308873-001D	Water	08/26/2013 10:00	WetChem	81212
<u>Analytes</u>	<u>Result</u>		<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
Total Dissolved Solids	1060		10.0	1	08/30/2013 17:00

MC-5B	1308873-002D	Water	08/26/2013 10:10	WetChem	81212
<u>Analytes</u>	<u>Result</u>		<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
Total Dissolved Solids	1020		10.0	1	08/30/2013 17:10

MC-5C	1308873-003D	Water	08/26/2013 10:35	WetChem	81212
<u>Analytes</u>	<u>Result</u>		<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
Total Dissolved Solids	ND		10.0	1	08/30/2013 17:20



Analytical Report

Client: HydroFocus, Inc.
Project: #5586; Dutch Slough SW
Date Received: 8/26/13 16:20
Date Prepared: 8/30/13

WorkOrder: 1308873
Extraction Method E351.2
Analytical Method: E351.2
Unit: mg/L

Total Kjeldahl Nitrogen

Client ID	Lab ID	Matrix/ExtType	Date Collected	Instrument	Batch ID
MC-5A	1308873-001F	Water/TOTAL	08/26/2013 10:00	SKALAR	81207

<u>Analytes</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
TKN as N	0.68	0.30	1	09/03/2013 18:31

MC-5B	1308873-002F	Water/TOTAL	08/26/2013 10:10	SKALAR	81207
-------	--------------	-------------	------------------	--------	-------

<u>Analytes</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
TKN as N	0.59	0.30	1	09/03/2013 18:43

MC-5C	1308873-003F	Water/TOTAL	08/26/2013 10:35	SKALAR	81207
-------	--------------	-------------	------------------	--------	-------

<u>Analytes</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
TKN as N	ND	0.30	1	09/03/2013 18:46



Analytical Report

Client: HydroFocus, Inc.
Project: #5586; Dutch Slough SW
Date Received: 8/26/13 16:20
Date Prepared: 8/29/13-8/30/13

WorkOrder: 1308873
Extraction Method E365.1
Analytical Method: E365.1
Unit: mg/L

Total Phosphorous as P

Client ID	Lab ID	Matrix/ExtType	Date Collected	Instrument	Batch ID
MC-5A	1308873-001G	Water/TOTAL	08/26/2013 10:00	SKALAR	81103
<u>Analytes</u>	<u>Result</u>		<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
Total Phosphorous as P	1.7		0.080	2	09/03/2013 14:08

MC-5B	1308873-002G	Water/TOTAL	08/26/2013 10:10	SKALAR	81103
<u>Analytes</u>	<u>Result</u>		<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
Total Phosphorous as P	1.9		0.040	1	08/30/2013 15:23

MC-5C	1308873-003G	Water/TOTAL	08/26/2013 10:35	SKALAR	81103
<u>Analytes</u>	<u>Result</u>		<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
Total Phosphorous as P	ND		0.040	1	08/30/2013 15:27



Quality Control Report

Client:	HydroFocus, Inc.	WorkOrder:	1308873
Date Prepared:	8/26/13	BatchID:	81026
Date Analyzed:	8/27/13	Extraction Method	E300.1
Instrument:	IC1	Analytical Method:	E300.1
Matrix:	Water	Unit:	mg/L
Project:	#5586; Dutch Slough SW	Sample ID:	MB/LCS-81026 1308873-001CMS/MSD

QC SUMMARY REPORT FOR E300.1

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Chloride	ND	0.9442	0.10	1	-	94.4	85-115
Nitrate as N	ND	0.9161	0.10	1	-	91.6	85-115
Nitrate as NO ₃ ⁻	ND	4.056	0.45	4.4	-	92.2	85-115
ortho-Phosphate as P	ND	0.9496	0.10	1	-	95	85-115
Sulfate	ND	0.9916	0.10	1	-	99.2	85-115
Surrogate Recovery							
Formate	0.104	0.1052		0.10	104	105	90-115

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	%RPD	RPD Limit
Chloride	109.8	109.5	1	340	NR	NR	85-115	NR	15
Nitrate as N	9.49	9.455	1	7.0	NR	NR	85-115	NR	15
Nitrate as NO ₃ ⁻	42.01	41.86	4.4	31	NR	NR	85-115	NR	15
ortho-Phosphate as P	2.646	2.567	1	1.6	103	95.2	85-115	3.02	15
Sulfate	166.6	166.5	1	200	NR	NR	85-115	NR	15
Surrogate Recovery									
Formate	0.1014	0.09774	0.10	101	101	98	90-115	3.64	10



Quality Control Report

Client:	HydroFocus, Inc.	WorkOrder:	1308873
Date Prepared:	8/28/13	BatchID:	81103
Date Analyzed:	8/30/13	Extraction Method	E365.1
Instrument:	SKALAR	Analytical Method:	E365.1
Matrix:	Water	Unit:	mg/L
Project:	#5586; Dutch Slough SW	Sample ID:	MB/LCS-81103 1308873-001GMS/MSD

QC SUMMARY REPORT FOR E365.1

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Total Phosphorous as P	ND	0.7705	0.040	0.80	-	96.3	90-110

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	%RPD	RPD Limit
Total Phosphorous as P	2.556	2.437	0.80	1.7	105	90	80-120	4.79	20

(Cont.)



Quality Control Report

Client:	HydroFocus, Inc.	WorkOrder:	1308873
Date Prepared:	8/30/13	BatchID:	81207
Date Analyzed:	9/3/13	Extraction Method	E351.2
Instrument:	SKALAR	Analytical Method:	E351.2
Matrix:	Water	Unit:	mg/L
Project:	#5586; Dutch Slough SW	Sample ID:	MB/LCS-81207 1308873-001FMS/MSD

QC SUMMARY REPORT FOR E351.2

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
TKN as N	ND	12.42	0.30	12	-	102	90-110

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	%RPD	RPD Limit
TKN as N	12.4	12.23	12	0.68	97.7	96.3	80-120	1.38	20

(Cont.)



Quality Control Report

Client: HydroFocus, Inc.

Date Prepared: 9/3/13

Date Analyzed: 9/3/13

Instrument: SKALAR

Matrix: Water

Project: #5586; Dutch Slough SW

WorkOrder: 1308873

BatchID: 81257

Extraction Method: E350.1

Analytical Method: E350.1

Unit: mg/L

Sample ID: MB/LCS-81257
1308873-001FMS/MSD

QC SUMMARY REPORT FOR E350.1

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Total Ammonia as N	ND	4.06	0.10	4	-	100	90-110

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	%RPD	RPD Limit
Total Ammonia as N	3.985	3.834	4	0.12	96.6	92.8	80-120	3.88	20



Quality Control Report

Client:	HydroFocus, Inc.	WorkOrder:	1308873
Date Prepared:	8/29/13	BatchID:	81148
Date Analyzed:	8/29/13	Extraction Method	SM2320B
Instrument:	Titrimo	Analytical Method:	SM2320B
Matrix:	Water	Unit:	mg CaCO ₃ /L
Project:	#5586; Dutch Slough SW	Test Method:	SM2320B (Alkalinity)

QC SUMMARY REPORT FOR SM2320B

SampleID	Sample Result	Sample DF	Dup / Serial Dilution Result	Dup / Serial Dilution DF	% RPD	Acceptance Criteria (%)
1308873-001E	185	1	185	1	0	<20
1308873-002E	190	1	185	1	2.95	<20
1308873-003E	ND	1	ND	1	N/A	<20

Client:	HydroFocus, Inc.	WorkOrder:	1308873
Date Prepared:	8/30/13	BatchID:	81212
Date Analyzed:	8/30/13	Extraction Method	SM2540C
Instrument:	WetChem	Analytical Method:	SM2540C
Matrix:	Water	Unit:	mg/L
Project:	#5586; Dutch Slough SW	Test Method:	SM2540C (TDS)

QC SUMMARY REPORT FOR SM2540C

SampleID	Sample Result	Sample DF	Dup / Serial Dilution Result	Dup / Serial Dilution DF	% RPD	Acceptance Criteria (%)
1308873-001D	1060	1	1060	2	0.189	<20
1308873-002D	1020	1	986	2	3.78	<20
1308873-003D	ND	1	ND<20.0	2	N/A	<20



Quality Control Report

Client: HydroFocus, Inc.

Date Prepared: 8/26/13

Date Analyzed: 8/27/13

Instrument: ICP-MS1

Matrix: Water

Project: #5586; Dutch Slough SW

WorkOrder: 1308873

BatchID: 80984

Extraction Method: E200.8

Analytical Method: E200.8

Unit: µg/L

Sample ID: MB/LCS-80984
1308861-001AMS/MSD

QC SUMMARY REPORT FOR E200.8

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Calcium	ND	4464	100	5000	-	89.3	85-115
Magnesium	ND	473.7	20	500	-	92.3	85-115
Potassium	ND	472.3	50	500	-	94.5	85-115
Sodium	ND	4270	100	5000	-	85.4	85-115

Surrogate Recovery

Tb 350.917	658.5	734.1		750	88	98	70-130
------------	-------	-------	--	-----	----	----	--------

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	%RPD	RPD Limit
Calcium	46090	46050	5000	42,000	NR	NR	70-130	NR	20
Magnesium	9040	9018	500	8700	NR	NR	70-130	NR	20
Potassium	1325	1316	500	870	91.9	90.1	70-130	0.682	20
Sodium	10910	10720	5000	6600	87.1	83.3	70-130	1.76	20

Surrogate Recovery

Tb 350.917	753	736.6	750	97	100	98	70-130	2.20	20
------------	-----	-------	-----	----	-----	----	--------	------	----



Quality Control Report

Client: HydroFocus, Inc.
Date Prepared: 8/26/13 - 8/27/13
Date Analyzed: 8/26/13 - 8/27/13
Instrument: WetChem
Matrix: Water
Project: #5586; Dutch Slough SW

WorkOrder: 1308873
BatchID: 81055
Extraction Method: SM4500H+B
Analytical Method: SM4500H+B
Unit: $\pm$, pH units @ $^{\circ}\text{C}$
Test Method: SM4500H+B (pH)

QC SUMMARY REPORT FOR SM4500H+B

SampleID	Sample Result	Sample DF	Dup / Serial Dilution Result	Dup / Serial Dilution DF	Precision	Acceptance Criteria
1308873-001D	7.96 @ 22.8 $^{\circ}\text{C}$	1	7.95 @ 22.9 $^{\circ}\text{C}$	1	0.01	0.05
1308873-002D	8.14 @ 22.4 $^{\circ}\text{C}$	1	8.13 @ 22.5 $^{\circ}\text{C}$	1	0.01	0.05
1308873-003D	6.43 @ 23.3 $^{\circ}\text{C}$	1	6.41 @ 23.3 $^{\circ}\text{C}$	1	0.02	0.05
1308873-004A	7.60 @ 23.3 $^{\circ}\text{C}$	1	7.61 @ 23.3 $^{\circ}\text{C}$	1	0.01	0.05
1308873-005A	7.96 @ 23.2 $^{\circ}\text{C}$	1	7.97 @ 23.3 $^{\circ}\text{C}$	1	0.01	0.05
1308873-006A	7.72 @ 23.6 $^{\circ}\text{C}$	1	7.71 @ 23.7 $^{\circ}\text{C}$	1	0.01	0.05

Client: HydroFocus, Inc.
Date Prepared: 8/27/13
Date Analyzed: 8/27/13
Instrument: WetChem
Matrix: Water
Project: #5586; Dutch Slough SW

WorkOrder: 1308873
BatchID: 81059
Extraction Method: SM2510B
Analytical Method: SM2510B
Unit: $\mu\text{mhos/cm}$ @ 25 $^{\circ}\text{C}$
Test Method: SM2510B (Specific Conductivity)

QC SUMMARY REPORT FOR SM2510B

SampleID	Sample Result	Sample DF	Dup / Serial Dilution Result	Dup / Serial Dilution DF	% RPD	Acceptance Criteria (%)
1308873-001D	1650 @ 25.0 $^{\circ}\text{C}$	1	1640 @ 25.0 $^{\circ}\text{C}$	1	0.0608	<2
1308873-002D	1630 @ 23.7 $^{\circ}\text{C}$	1	1630 @ 25.0 $^{\circ}\text{C}$	1	0.245	<2
1308873-003D	ND @ 23.7 $^{\circ}\text{C}$	1	ND @ 23.7 $^{\circ}\text{C}$	1	N/A	<2
1308873-004A	2640 @ 25.0 $^{\circ}\text{C}$	1	2640 @ 25.0 $^{\circ}\text{C}$	1	0.0759	<2
1308873-005A	1770 @ 23.9 $^{\circ}\text{C}$	1	1770 @ 23.9 $^{\circ}\text{C}$	1	0.282	<2
1308873-006A	1470 @ 23.8 $^{\circ}\text{C}$	1	1470 @ 23.8 $^{\circ}\text{C}$	1	0.204	<2



Quality Control Report

Client:	HydroFocus, Inc.	WorkOrder:	1308873
Date Prepared:	8/26/13	BatchID:	80993
Date Analyzed:	8/27/13	Extraction Method:	SM9223B
Instrument:	MICROBIOLOGY	Analytical Method:	SM9223B
Matrix:	Water	Test Method:	SM9223B (Total Coliform & E. Coli)
Project:	#5586; Dutch Slough SW		

QC SUMMARY REPORT FOR SM9223B

Lab ID	Analyte	Reporting Units	Sample Result	Sample DF	Dup / Serial Dilution Result	Dup / Serial Dilution DF	% RPD	Acceptance Criteria (%)
1308873-001A	E Coli	MPN/100ml	32	1	34	1	7.61	<70
	Total Coliform	MPN/100ml	69,000	100	58,000	100	16.9	<70
1308873-002A	E Coli	MPN/100ml	40	1	36	1	10.6	<70
	Total Coliform	MPN/100ml	100,000	100	110,000	100	6.8	<70
1308873-003A	Total Coliform	MPN/100ml	ND	1	ND	1	N/A	<70
	E Coli	MPN/100ml	ND	1	ND	1	N/A	<70



CHAIN-OF-CUSTODY RECORD

WorkOrder: 1308873

ClientCode: HYFD

☐ WaterTrax☐ WriteOn☐ EDF☒ Excel☐ EQUIS☒ Email☐ HardCopy☐ ThirdParty☐ J-flag

Report to:

 Christina Hart
 HydroFocus, Inc.
 P.O. Box 2401
 Davis, CA 95617
 (530) 756-2840

FAX: (530) 756-2687

Email: chart@hydrofocus.com

cc:

PO:

ProjectNo: #5586; Dutch Slough SW

Bill to:

 Teresa Deverel
 HydroFocus, Inc.
 P.O. Box 2401
 Davis, CA 95617

Requested TAT:

5 days

Date Received: 08/26/2013

Date Printed: 08/27/2013

Lab ID	Client ID	Matrix	Collection Date	Hold	Requested Tests (See legend below)											
					1	2	3	4	5	6	7	8	9	10	11	12
1308873-001	MC-5A	Water	8/26/2013 10:00	☐	C	E	F	B	D	D	A	D	F	G		
1308873-002	MC-5B	Water	8/26/2013 10:10	☐	C	E	F	B	D	D	A	D	F	G		
1308873-003	MC-5C	Water	8/26/2013 10:35	☐	C	E	F	B	D	D	A	D	F	G		
1308873-004	Emerson	Water	8/26/2013 12:35	☐					A	A						
1308873-005	Gilbert	Water	8/26/2013 13:10	☐					A	A						
1308873-006	Burroughs	Water	8/26/2013 13:55	☐					A	A						

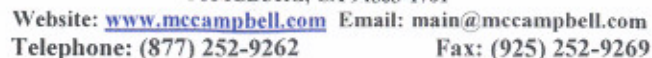
Test Legend:

1	300_1_W	2	Alka(spe)_W	3	AMMONIA_W	4	METALSMS DISS	5	PH_W
6	SC_W	7	TCEC-Enum_W	8	TDS_W	9	TKN_W	10	TotalP_W
11		12							

Prepared by: Maria Venegas

Comments:

NOTE: Soil samples are discarded 60 days after results are reported unless other arrangements are made (Water samples are 30 days).
 Hazardous samples will be returned to client or disposed of at client expense.



☐ RUSH ☐ 24 HR ☐ 48 HR ☐ 72 HR ☒ 5 DAY

GeoTracker EDF ☐ PDF ☐ Excel ☒ Write On (DW) ☐
☐ Check if sample is effluent and "J" flag is required

Report To: Christina Lucero	Bill To: Teresa Deverel
Company: HydroFocus	P.O. Box 2401
P.O. Box 2401	Davis, CA 95617
Davis, CA 95617	E-Mail: chart@hydrofocus.com
Tele: 530-759-2484	Fax: 530-756-2687
Project #: 5586	Project Name: Dutch Slough SW
Project Location: Dutch Slough	
Sampler Signature: <i>Christina Lucero</i>	

Analysis Request

Other

Comments

TDS samples filtered in the field.

Metals samples filtered and preserved with HNO₃. Alkali metals analysis to include: Ca, Mg, Na, K

Ammonia/TKN samples filtered and preserved with H₂SO₄.

Total Phosphorous as P preserved with H₂SO₄.



Sample Receipt Checklist

Client Name: **HydroFocus, Inc.**

Date and Time Received: **8/26/2013 4:20:04 PM**

Project Name: **#5586; Dutch Slough SW**

LogIn Reviewed by: **Maria Venegas**

WorkOrder N°: **1308873**

Matrix: Water

Carrier: Client Drop-In

Chain of Custody (COC) Information

Chain of custody present?	Yes ☒	No ☐
Chain of custody signed when relinquished and received?	Yes ☒	No ☐
Chain of custody agrees with sample labels?	Yes ☒	No ☐
Sample IDs noted by Client on COC?	Yes ☒	No ☐
Date and Time of collection noted by Client on COC?	Yes ☒	No ☐
Sampler's name noted on COC?	Yes ☒	No ☐

Sample Receipt Information

Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	NA ☒
Shipping container/cooler in good condition?	Yes ☒	No ☐	
Samples in proper containers/bottles?	Yes ☒	No ☐	
Sample containers intact?	Yes ☒	No ☐	
Sufficient sample volume for indicated test?	Yes ☒	No ☐	

Sample Preservation and Hold Time (HT) Information

All samples received within holding time?	Yes ☒	No ☐	
Container/Temp Blank temperature	Cooler Temp: 3.8°C		NA ☐
Water - VOA vials have zero headspace / no bubbles?	Yes ☐	No ☐	No VOA vials submitted ☒
Sample labels checked for correct preservation?	Yes ☒	No ☐	
Metal - pH acceptable upon receipt (pH<2)?	Yes ☒	No ☐	NA ☐
Samples Received on Ice?	Yes ☒	No ☐	

(Ice Type: WET ICE)

* NOTE: If the "No" box is checked, see comments below.

Comments:



Frontier Global Sciences

11720 Northcreek Pkwy N, Suite 400
Bothell, WA 98011
425.686.1996 Phone
425.686.3096 Fax

24 September 2013

Christina Hart
Hydro Focus, Inc
2827 Spafford St., Suite A
Davis, CA 95618
RE: Dutch Slough SW

Enclosed are the analytical results for samples received by Eurofins Frontier Global Sciences. All quality control measurements are within established control limits and there were no analytical difficulties encountered with the exception of those listed in the case narrative section of this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Amy Goodall". The signature is written in a cursive, flowing style.

Amy Goodall
Project Manager



Frontier Global Sciences

11720 Northcreek Pkwy N, Suite 400
Bothell, WA 98011
425.686.1996 Phone
425.686.3096 Fax

Hydro Focus, Inc
2827 Spafford St., Suite A
Davis CA, 95618

Project: Dutch Slough SW
Project Number: 1
Project Manager: Christina Hart

Reported:
24-Sep-13 11:43

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MC-5A	1308558-01	Water	26-Aug-13 09:20	27-Aug-13 09:32
MC-5C	1308558-02	Water	26-Aug-13 10:35	27-Aug-13 09:32

SAMPLE RECEIPT

Samples were received at Eurofins Frontier Global Sciences (EFGS) on 8/27/2013 9:32:00 AM . The samples were received intact, on-ice within a sealed cooler at 0.4 degrees Celsius.

SAMPLE PREPARATION AND ANALYSIS

Samples were prepared and analyzed for methyl mercury by cold vapor gas chromatography atomic fluorescence spectrometry (CV-GC-AFS) in accordance with EPA 1630 (EFGS-070).

ANALYTICAL AND QUALITY CONTROL ISSUES

Method blanks were prepared for every preparation to assess possible blank contribution from the sample preparation procedure. The method blanks were carried through the entire analytical procedure. All blanks fell within the established acceptance criteria with the exception of any items narrated above or flagged and described in the notes and definitions section of the report.

Liquid spikes, certified reference material (CRM) or a quality control samples (QCS) were prepared for every preparation as a measure of accuracy. All liquid spikes, CRMs and/or QCS samples fell within the established acceptance criteria with the exception of any items narrated above or flagged and described in the notes and definitions section of the report.

As an additional measure of the accuracy of the methods used and to check for matrix interference, matrix spikes (MS) and matrix spike duplicates (MSD) were digested and analyzed. All of the matrix spike recoveries fell within the established acceptance criteria with the exception of any items flagged and described in the notes and definitions section of the report.

A reasonable measure of the precision of the analytical methods is the relative percent difference (RPD) between a matrix spike recovery and a matrix spike duplicate recovery and between laboratory control sample recovery and laboratory control sample duplicate recoveries. All of the relative percent differences established acceptance criteria with the exception of any items flagged and described in the notes and definitions section of the report.

Eurofins Frontier Global Sciences, Inc.

The results in this report only apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Amy Goodall, Project Manager

Page 1 of 6
1308558 Final Report
09/24/2013

1308558



Frontier Global Sciences

Chain of Custody Record & Laboratory Analysis Request:
Air, Water, Sediments, Plant and Animal Tissue,
Hydrocarbon & Other Samples

11720 Northcreek Pkwy N, Suite 400
Bothell, WA 98011
Phone: 425-686-1996
Fax: 425-686-3096
info@FrontierGS.com
http://www.FrontierGS.com

Page 1 of 1

Client: HydroFocus, Inc.		Contact: Christina Lucero		Analyses Requested		FGS PM:	
Address: 2827 Spafford St. Davis, CA 95618		Phone: (530)759-2484 Fax: (530)756-2687		Date:		TAT (business days) 20 (std)	
Project Name: Dutch Slough SW		E-mail: chart@hydrofocus.com		15 10 5 4 3 2 24 hrs.		(For TAT < 10 days, contact PM. Surcharges apply for expedited TAT)	
Report To: HydroFocus, Inc.		Contract/PO: 5586		Saturday delivery? ☐ Y ☐ N		(If yes, please contact PM)	
Address: 2827 Spafford St. Davis, CA 95618		Invoice To: Teresa Deverel		Field Preserved:		EDD ☐ Y ☐ N	
Phone: (530)759-2484 Fax: (530)756-2687		Address: P.O. Box 2401 Davis, CA 95617		Field Filtered (Y/N)		QA ☐ Standard ☐ High	
E-mail: chart@hydrofocus.com		Phone: (530)759-2484 Fax: (530)756-2687		Sampled By		Comments	
E-mail: tdeverel@hydrofocus.com		E-mail: tdeverel@hydrofocus.com					
No.	Engraved Bottle ID	Sample ID	# of Bottles	Matrix	Date & Time		
1	B-131665	MC-5A	1	FW	8/24/13 9:20	N	X
2	B-131691	MC-5C	1	PW	8/24/13 10:35	N	X
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							

For Laboratory Use Only		Relinquished By:		Received By:	
COC Seal: N/A	Comments:	Christina Lucero		Christina Lucero	
Cooler Temp: 0.4		Name: Christina Lucero		Name: Christina Lucero	
Carrier: UPS		Organization: HydroFocus		Organization: HydroFocus	
VTSR: 0925		Date & Time: 8/24/13 14:15		Date & Time: 8/27/13 09:32	
# of Coolers:		Tracking number: 1Z439430118158310			

By signing, you declare that you agree with FGS' terms and conditions, and that you authorize FGS to perform the specified analyses.

Customer Approval: Christina Lucero Date: 8/24/13

Sample Disposal:
☐ Return (shipping fees may apply)
☐ Standard Disposal - 30 Days after report
☐ Retain for ___ weeks after report (storage fees may apply)

Sample Receipt Checklist

Client: Hydrofocus Date & Time Received: 8/27/13 0932 Date Logged In: 8/27/13 Date Labeled: 8/27/13
 Project: _____ Received By: OR Logged By: OR Labeled By: _____
 # of Coolers Received: 1 Samples Arrived By: ✓ Shipping Service _____ Courier _____ Hand _____ Other (Specify: _____)
 Tracking/Airbill #: 1Z 413 9A3 01 1815 8310 Coolant: ☐ None/Ambient ☒ Loose Ice ☐ Gel Ice ☐ Dry Ice
 Coolant Required: Y/N Temp Blank Used: Y/N for Cooler(s): _____

Cooler Information:		Y/N/NA	Comments
The coolers do not appear to be tampered with:		<u>Y</u>	
Custody Seals are present and intact:		<u>NA</u>	
Custody seals signed by:		<u>NA</u>	

Chain of Custody:		Y/N/NA	Comments
Sample ID/Description:		<u>Y</u>	
Date and time of collection:		<u>Y</u>	
Sampled by:		<u>Y</u>	
Preservation type:		<u>N/A</u>	
Requested analyses:		<u>Y</u>	
Required signatures:		<u>Y</u>	
Internal COC required:		<u>2</u>	

Anomalies/Non-conformances (attach additional pages if needed):

Sample Condition/Integrity:	Y/N/NA	Comments
Sample containers intact/present:		
Sample labels are present and legible:		
Sample ID on container/bag matches COC:		
Correct sample containers used:		
Samples received within holding times:		
Sample volume sufficient for requested analyses:		
Correct preservative used for requested analyses:		
pH of preserved samples verified and recorded:		

Discussion/Resolution: _____ Client Contacted: _____ Date/Time: _____ Method: _____



Frontier Global Sciences

11720 Northcreek Pkwy N, Suite 400
Bothell, WA 98011
425.686.1996 Phone
425.686.3096 Fax

Hydro Focus, Inc
2827 Spafford St., Suite A
Davis CA, 95618

Project: Dutch Slough SW
Project Number: 1
Project Manager: Christina Hart

Reported:
24-Sep-13 11:43

Methyl Mercury

Sample Name	Lab Number	Result	Detection Limit	Reporting Limit	Units	Dilution	Batch	Prepared	Sequence	Analyzed	Method	Notes
-------------	------------	--------	-----------------	-----------------	-------	----------	-------	----------	----------	----------	--------	-------

Sample Preparation: EFGS-013 Methyl Hg Distillation for Water

MC-5C	1308558-02	ND	-	0.050	ng/L	1.25	F309016	04-Sep-13	3I09011	06-Sep-13	EPA 1630 Mod/FGS-070	U
MC-5A	1308558-01	ND	-	0.050	ng/L	1.25	F309016	04-Sep-13	3I09011	06-Sep-13	EPA 1630 Mod/FGS-070	U

Eurofins Frontier Global Sciences, Inc.

The results in this report only apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Amy Goodall, Project Manager

Page 4 of 6
1308558 Final Report
09/24/2013



Frontier Global Sciences

11720 Northcreek Pkwy N, Suite 400
Bothell, WA 98011
425.686.1996 Phone
425.686.3096 Fax

Hydro Focus, Inc
2827 Spafford St., Suite A
Davis CA, 95618

Project: Dutch Slough SW
Project Number: 1
Project Manager: Christina Hart

Reported:
24-Sep-13 11:43

Quality Control Data

Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch F309016 - EFGS-013 Methyl Hg Distillation for Water											
Blank (F309016-BLK1)					Prepared: 04-Sep-13 Analyzed: 06-Sep-13						
Methyl Mercury	ND	-	0.050	ng/L							U
Blank (F309016-BLK2)					Prepared: 04-Sep-13 Analyzed: 06-Sep-13						
Methyl Mercury	ND	-	0.050	ng/L							U
Blank (F309016-BLK3)					Prepared: 04-Sep-13 Analyzed: 06-Sep-13						
Methyl Mercury	ND	-	0.050	ng/L							U
LCS (F309016-BS1)					Prepared: 04-Sep-13 Analyzed: 06-Sep-13						
Methyl Mercury	1.099	-	0.050	ng/L	1.0020		110	70-130			
LCS Dup (F309016-BSD1)					Prepared: 04-Sep-13 Analyzed: 06-Sep-13						
Methyl Mercury	0.943	-	0.050	ng/L	1.0020		94.1	70-130	15.3	25	
Duplicate (F309016-DUP1)					Source: 1308438-01 Prepared: 04-Sep-13 Analyzed: 06-Sep-13						
Methyl Mercury	0.046	-	0.050	ng/L		0.054			16.7	35	U
Matrix Spike (F309016-MS1)					Source: 1308587-01 Prepared: 04-Sep-13 Analyzed: 06-Sep-13						
Methyl Mercury	1.247	-	0.050	ng/L	1.0020	ND	124	65-130			
Matrix Spike (F309016-MS2)					Source: 1308588-01 Prepared: 04-Sep-13 Analyzed: 06-Sep-13						
Methyl Mercury	1.249	-	0.050	ng/L	1.0020	1.055	19.3	65-130			QM-02
Matrix Spike Dup (F309016-MSD1)					Source: 1308587-01 Prepared: 04-Sep-13 Analyzed: 06-Sep-13						
Methyl Mercury	1.118	-	0.050	ng/L	1.0020	ND	112	65-130	10.9	35	
Matrix Spike Dup (F309016-MSD2)					Source: 1308588-01 Prepared: 04-Sep-13 Analyzed: 06-Sep-13						
Methyl Mercury	2.298	-	0.050	ng/L	1.0020	1.055	124	65-130	59.2	35	QR-04

Eurofins Frontier Global Sciences, Inc.

Amy Goodall, Project Manager

The results in this report only apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Page 5 of 6
1308558 Final Report
09/24/2013



Frontier Global Sciences

11720 Northcreek Pkwy N, Suite 400
Bothell, WA 98011
425.686.1996 Phone
425.686.3096 Fax

Hydro Focus, Inc
2827 Spafford St., Suite A
Davis CA, 95618

Project: Dutch Slough SW
Project Number: 1
Project Manager: Christina Hart

Reported:
24-Sep-13 11:43

Notes and Definitions

- U Analyte was not detected and is reported as less than the LOD or as defined by the client. The LOD has been adjusted for any dilution or concentration of the sample.
- QR-04 RPD and/or RSD value exceeded control limit. Sample concentrations less than 5 times the reporting limit and the difference between the QC values was less than 1 time the reporting limit.
- QM-02 The MS and/or MSD recoveries outside acceptance limits, due to spike concentration less than 1 times the sample concentration. The batch was accepted based on LCS and LCSD recoveries within control limits and, when analysis permits, acceptable AS/ASD.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference

Eurofins Frontier Global Sciences, Inc.

The results in this report only apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Amy Goodall, Project Manager

Page 6 of 6
1308558 Final Report
09/24/2013



CERTIFICATE OF ANALYSIS

Client: Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Report Date: 09/23/13 15:27

Received Date: 08/28/13 09:20

Turn Around: Normal

Client Project: 5586-Dutch Slough Surface water

Attention: Christina Hart

Phone: (530) 759-2484

Fax: (530) 756-2687

Work Order(s): 3H28014

NELAP #04229CA ELAP#1132 NEVADA #CA211 HAWAII LACSD #10143

The results in this report apply to the samples analyzed in accordance with the Chain of Custody document. Weck Laboratories, Inc. certifies that the test results meet all NELAC requirements unless noted in the case narrative. This analytical report is confidential and is only intended for the use of Weck Laboratories, Inc. and its client. This report contains the Chain of Custody document, which is an integral part of it, and can only be reproduced in full with the authorization of Weck Laboratories, Inc.

Dear Christina Hart :

Enclosed are the results of analyses for samples received 08/28/13 09:20 with the Chain of Custody document. The samples were received in good condition, at 2.3 °C and on ice. All analysis met the method criteria except as noted below or in the report with data qualifiers.

Case Narrative:

Reviewed by:

Kim G Tu
Project Manager





Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 08/28/13 09:20
Date Reported: 09/23/13 15:27

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Sampled by:	Sample Comments	Lab ID	Matrix	Date Sampled
MC-5A	Christina Lucero, T		3H28014-01	Water	08/26/13 10:00
MC-5B	Christina Lucero, T		3H28014-02	Water	08/26/13 10:10
MC-5C	Christina Lucero, T		3H28014-03	Water	08/26/13 10:35
Emerson	Christina Lucero, T		3H28014-04	Water	08/26/13 12:35
Gilbert	Christina Lucero, T		3H28014-05	Water	08/26/13 13:10
Burroughs	Christina Lucero, T		3H28014-06	Water	08/26/13 13:55

ANALYSES

Chlorinated Herbicides

Chlorinated Pesticides and/or PCBs

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods

Organophosphorus Pesticides by EPA Method 8141A

Pyrethroid Pesticides by GC/MS SIM

Volatile Organic Compounds by EPA Method 524.2



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 08/28/13 09:20
Date Reported: 09/23/13 15:27

3H28014-01 MC-5A
Sampled: 08/26/13 10:00 Sampled By: Christina Lucero, Tim Ingram Matrix: Water

Chlorinated Herbicides

Method: EPA 8151A		Batch: W3H1379		Prepared: 08/29/13 08:24		Analyst: bma
Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
2,4,5-T	ND	0.25	ug/l	1	09/05/13 17:26	
2,4,5-TP (Silvex)	ND	0.25	ug/l	1	09/05/13 17:26	
2,4-D	ND	0.50	ug/l	1	09/05/13 17:26	
2,4-DB	ND	2.5	ug/l	1	09/05/13 17:26	
3,5-Dichlorobenzoic acid	ND	1.2	ug/l	1	09/05/13 17:26	
4-Nitrophenol	ND	1.2	ug/l	1	09/05/13 17:26	
Acifluorfen	ND	0.50	ug/l	1	09/05/13 17:26	
Bentazon	ND	2.5	ug/l	1	09/05/13 17:26	
Dalapon	ND	0.50	ug/l	1	09/05/13 17:26	
DCPA	ND	0.25	ug/l	1	09/05/13 17:26	
Dicamba	ND	0.75	ug/l	1	09/05/13 17:26	
Dichloroprop	ND	1.0	ug/l	1	09/05/13 17:26	
Dinoseb	ND	0.50	ug/l	1	09/05/13 17:26	
MCPA	ND	100	ug/l	1	09/05/13 17:26	
MCPP	ND	100	ug/l	1	09/05/13 17:26	
Pentachlorophenol	ND	0.25	ug/l	1	09/05/13 17:26	
Picloram	ND	0.75	ug/l	1	09/05/13 17:26	
Surr: 2,4-DCAA	92 %	Conc:19.5	56-156	%		

Chlorinated Pesticides and/or PCBs

Method: EPA 8081A	Batch: W3H1377	Prepared: 08/29/13 08:17				Analyst: rhr
Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
2,4'-DDD	ND	0.050	ug/l	1	09/09/13 16:29	
2,4'-DDE	ND	0.050	ug/l	1	09/09/13 16:29	
2,4'-DDT	ND	0.050	ug/l	1	09/09/13 16:29	
4,4'-DDD	ND	0.050	ug/l	1	09/09/13 16:29	
4,4'-DDE	ND	0.050	ug/l	1	09/09/13 16:29	
4,4'-DDT	ND	0.050	ug/l	1	09/09/13 16:29	
Aldrin	ND	0.050	ug/l	1	09/09/13 16:29	
alpha-BHC	ND	0.050	ug/l	1	09/09/13 16:29	
alpha-Chlordane	ND	0.050	ug/l	1	09/09/13 16:29	
beta-BHC	ND	0.050	ug/l	1	09/09/13 16:29	
Chlordane (tech)	ND	0.50	ug/l	1	09/09/13 16:29	
cis-Nonachlor	ND	0.050	ug/l	1	09/09/13 16:29	
delta-BHC	ND	0.050	ug/l	1	09/09/13 16:29	
Dieldrin	ND	0.050	ug/l	1	09/09/13 16:29	
Endosulfan I	ND	0.050	ug/l	1	09/09/13 16:29	
Endosulfan II	ND	0.050	ug/l	1	09/09/13 16:29	
Endosulfan sulfate	ND	0.050	ug/l	1	09/09/13 16:29	
Endrin	ND	0.050	ug/l	1	09/09/13 16:29	



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 08/28/13 09:20
Date Reported: 09/23/13 15:27

3H28014-01 MC-5A
Sampled: 08/26/13 10:00 Sampled By: Christina Lucero, Tim Ingram Matrix: Water

Chlorinated Pesticides and/or PCBs

Method: EPA 8081A	Batch: W3H1377		Prepared: 08/29/13 08:17			Analyst: rhr	
Analyte	Result		MRL	Units	Dil	Analyzed	Qualifier
Endrin aldehyde	ND		0.050	ug/l	1	09/09/13 16:29	
Endrin ketone	ND		0.050	ug/l	1	09/09/13 16:29	
gamma-BHC (Lindane)	ND		0.050	ug/l	1	09/09/13 16:29	
gamma-Chlordane	ND		0.050	ug/l	1	09/09/13 16:29	
Heptachlor	ND		0.050	ug/l	1	09/09/13 16:29	
Heptachlor epoxide	ND		0.050	ug/l	1	09/09/13 16:29	
Kepone	ND		0.25	ug/l	1	09/09/13 16:29	
Methoxychlor	ND		0.050	ug/l	1	09/09/13 16:29	
Mirex	ND		0.050	ug/l	1	09/09/13 16:29	
Oxychlordane	ND		0.050	ug/l	1	09/09/13 16:29	
Toxaphene	ND		2.0	ug/l	1	09/09/13 16:29	
trans-Nonachlor	ND		0.050	ug/l	1	09/09/13 16:29	
Surr: Decachlorobiphenyl	92 %	Conc:0.485	0.1-123	%			
Surr: Tetrachloro-meta-xylene	77 %	Conc:0.406	10-137	%			

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods

Method: SM 5310C		Batch: W3I0795		Prepared: 09/18/13 11:35		Analyst: jlp	
Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier	
Dissolved Organic Carbon	3.7	0.50	mg/l	1	09/18/13 12:00		

Organophosphorus Pesticides by EPA Method 8141A

Method: EPA 8141A		Batch: W3H1378		Prepared: 08/29/13 08:19		Analyst: jch	
Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier	
Azinphos methyl (Guthion)	ND	0.10	ug/l	1	09/18/13 18:26		
Bolstar	ND	0.10	ug/l	1	09/18/13 18:26		
Chlorpyrifos	ND	0.10	ug/l	1	09/18/13 18:26		
Coumaphos	ND	0.10	ug/l	1	09/18/13 18:26		
Demeton-o	ND	0.10	ug/l	1	09/18/13 18:26		
Demeton-s	ND	0.10	ug/l	1	09/18/13 18:26		
Diazinon	ND	0.10	ug/l	1	09/18/13 18:26		
Dichlorvos	ND	0.10	ug/l	1	09/18/13 18:26		
Dimethoate	ND	0.25	ug/l	1	09/18/13 18:26		
Disulfoton	ND	0.10	ug/l	1	09/18/13 18:26		
Ethoprop	ND	0.10	ug/l	1	09/18/13 18:26		
Ethyl parathion	ND	0.25	ug/l	1	09/18/13 18:26		
Fensulfothion	ND	0.10	ug/l	1	09/18/13 18:26		
Fenthion	ND	0.10	ug/l	1	09/18/13 18:26		
Malathion	ND	0.25	ug/l	1	09/18/13 18:26		
Merphos	ND	0.10	ug/l	1	09/18/13 18:26		
Methyl parathion	ND	0.10	ug/l	1	09/18/13 18:26		



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 08/28/13 09:20
Date Reported: 09/23/13 15:27

3H28014-01 MC-5A
Sampled: 08/26/13 10:00 **Sampled By:** Christina Lucero, Tim Ingrum **Matrix:** Water

Organophosphorus Pesticides by EPA Method 8141A

Method: EPA 8141A		Batch: W3H1378		Prepared: 08/29/13 08:19			Analyst: jch	
Analyte	Result		MRL	Units	Dil	Analyzed		Qualifier
Mevinphos	ND		0.10	ug/l	1	09/18/13 18:26		
Naled	ND		0.10	ug/l	1	09/18/13 18:26		
Phorate	ND		0.10	ug/l	1	09/18/13 18:26		
Ronnel	ND		0.10	ug/l	1	09/18/13 18:26		
Stirophos	ND		0.10	ug/l	1	09/18/13 18:26		
Thionazin	ND		0.25	ug/l	1	09/18/13 18:26		
Tokuthion (Prothiofos)	ND		0.10	ug/l	1	09/18/13 18:26		
Total Demeton, -o and -s	ND		0.20	ug/l	1	09/18/13 18:26		
Total Parathion, ethyl & methyl	ND		0.35	ug/l	1	09/18/13 18:26		
Trichloronate	ND		0.10	ug/l	1	09/18/13 18:26		
Surr: Triphenyl phosphate	102 %	Conc: 1.02	10-181	%				

Pyrethroid Pesticides by GC/MS SIM

Method: GC/MS NCI-SIM		Batch: W3I0177		Prepared: 09/06/13 08:44		Analyst: css	
Analyte		Result	MRL	Units	Dil	Analyzed	Qualifier
Allethrin		ND	2.0	ng/l	1	09/12/13 21:27	
Bifenthrin		ND	2.0	ng/l	1	09/12/13 21:27	
Cyfluthrin		ND	2.0	ng/l	1	09/12/13 21:27	
Cypermethrin		ND	2.0	ng/l	1	09/12/13 21:27	
Deltamethrin/Tralomethrin		ND	2.0	ng/l	1	09/12/13 21:27	
Dichloran		ND	2.0	ng/l	1	09/12/13 21:27	
Fenpropathrin (Danitol)		ND	2.0	ng/l	1	09/12/13 21:27	
Fenvalerate/Esfenvalerate		ND	2.0	ng/l	1	09/12/13 21:27	
L-Cyhalothrin		ND	2.0	ng/l	1	09/12/13 21:27	
Pendimethalin		ND	2.0	ng/l	1	09/12/13 21:27	
Permethrin		ND	5.0	ng/l	1	09/12/13 21:27	
Prallethrin		ND	2.0	ng/l	1	09/12/13 21:27	
Sumithrin		11	10	ng/l	1	09/12/13 21:27	
Tefluthrin		ND	2.0	ng/l	1	09/12/13 21:27	
Surr: Perylene-d12	89 %	Conc:234	70-130	%			
Surr: Triphenyl phosphate	67 %	Conc:176	70-130	%			S-11

S-11



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 08/28/13 09:20
Date Reported: 09/23/13 15:27

3H28014-02 MC-5B
Sampled: 08/26/13 10:10 Sampled By: Christina Lucero, Tim Ingram Matrix: Water

Chlorinated Herbicides

Method: EPA 8151A		Batch: W3H1379		Prepared: 08/29/13 08:24		Analyst: bma	
Analyte		Result	MRL	Units	Dil	Analyzed	Qualifier
2,4,5-T		ND	0.25	ug/l	1	09/05/13 17:54	
2,4,5-TP (Silvex)		ND	0.25	ug/l	1	09/05/13 17:54	
2,4-D		ND	0.50	ug/l	1	09/05/13 17:54	
2,4-DB		ND	2.5	ug/l	1	09/05/13 17:54	
3,5-Dichlorobenzoic acid		ND	1.2	ug/l	1	09/05/13 17:54	
4-Nitrophenol		ND	1.2	ug/l	1	09/05/13 17:54	
Acifluorfen		ND	0.50	ug/l	1	09/05/13 17:54	
Bentazon		ND	2.5	ug/l	1	09/05/13 17:54	
Dalapon		ND	0.50	ug/l	1	09/05/13 17:54	
DCPA		ND	0.25	ug/l	1	09/05/13 17:54	
Dicamba		ND	0.75	ug/l	1	09/05/13 17:54	
Dichloroprop		ND	1.0	ug/l	1	09/05/13 17:54	
Dinoseb		ND	0.50	ug/l	1	09/05/13 17:54	
MCPA		ND	100	ug/l	1	09/05/13 17:54	
MCPP		ND	100	ug/l	1	09/05/13 17:54	
Pentachlorophenol		ND	0.25	ug/l	1	09/05/13 17:54	
Picloram		ND	0.75	ug/l	1	09/05/13 17:54	
Surr: 2,4-DCAA		100 %	Conc:21.0	56-156	%		

Chlorinated Pesticides and/or PCBs

Method: EPA 8081A	Batch: W3H1377	Prepared: 08/29/13 08:17				Analyst: rhr
Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
2,4'-DDD	ND	0.050	ug/l	1	09/09/13 16:57	
2,4'-DDE	ND	0.050	ug/l	1	09/09/13 16:57	
2,4'-DDT	ND	0.050	ug/l	1	09/09/13 16:57	
4,4'-DDD	ND	0.050	ug/l	1	09/09/13 16:57	
4,4'-DDE	ND	0.050	ug/l	1	09/09/13 16:57	
4,4'-DDT	ND	0.050	ug/l	1	09/09/13 16:57	
Aldrin	ND	0.050	ug/l	1	09/09/13 16:57	
alpha-BHC	ND	0.050	ug/l	1	09/09/13 16:57	
alpha-Chlordane	ND	0.050	ug/l	1	09/09/13 16:57	
beta-BHC	ND	0.050	ug/l	1	09/09/13 16:57	
Chlordane (tech)	ND	0.50	ug/l	1	09/09/13 16:57	
cis-Nonachlor	ND	0.050	ug/l	1	09/09/13 16:57	
delta-BHC	ND	0.050	ug/l	1	09/09/13 16:57	
Dieldrin	ND	0.050	ug/l	1	09/09/13 16:57	
Endosulfan I	ND	0.050	ug/l	1	09/09/13 16:57	
Endosulfan II	ND	0.050	ug/l	1	09/09/13 16:57	
Endosulfan sulfate	ND	0.050	ug/l	1	09/09/13 16:57	
Endrin	ND	0.050	ug/l	1	09/09/13 16:57	



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 08/28/13 09:20
Date Reported: 09/23/13 15:27

3H28014-02 MC-5B
Sampled: 08/26/13 10:10 Sampled By: Christina Lucero, Tim Ingram Matrix: Water

Chlorinated Pesticides and/or PCBs

Method: EPA 8081A		Batch: W3H1377		Prepared: 08/29/13 08:17		Analyst: rhr
Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Endrin aldehyde	ND	0.050	ug/l	1	09/09/13 16:57	
Endrin ketone	ND	0.050	ug/l	1	09/09/13 16:57	
gamma-BHC (Lindane)	ND	0.050	ug/l	1	09/09/13 16:57	
gamma-Chlordane	ND	0.050	ug/l	1	09/09/13 16:57	
Heptachlor	ND	0.050	ug/l	1	09/09/13 16:57	
Heptachlor epoxide	ND	0.050	ug/l	1	09/09/13 16:57	
Kepone	ND	0.25	ug/l	1	09/09/13 16:57	
Methoxychlor	ND	0.050	ug/l	1	09/09/13 16:57	
Mirex	ND	0.050	ug/l	1	09/09/13 16:57	
Oxychlordane	ND	0.050	ug/l	1	09/09/13 16:57	
Toxaphene	ND	2.0	ug/l	1	09/09/13 16:57	
trans-Nonachlor	ND	0.050	ug/l	1	09/09/13 16:57	
Surr: Decachlorobiphenyl	97 %	Conc:0.485	0.1-123	%		
Surr: Tetrachloro-meta-xylene	84 %	Conc:0.418	10-137	%		

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods

Method: SM 5310C		Batch: W3I0795		Prepared: 09/18/13 11:35		Analyst: jlp	
Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier	
Dissolved Organic Carbon	3.8	0.50	mg/l	1	09/18/13 12:00		

Organophosphorus Pesticides by EPA Method 8141A

Method: EPA 8141A		Batch: W3H1378		Prepared: 08/29/13 08:19		Analyst: jch
Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Azinphos methyl (Guthion)	ND	0.10	ug/l	1	09/18/13 18:56	
Bolstar	ND	0.10	ug/l	1	09/18/13 18:56	
Chlorpyrifos	ND	0.10	ug/l	1	09/18/13 18:56	
Coumaphos	ND	0.10	ug/l	1	09/18/13 18:56	
Demeton-o	ND	0.10	ug/l	1	09/18/13 18:56	
Demeton-s	ND	0.10	ug/l	1	09/18/13 18:56	
Diazinon	ND	0.10	ug/l	1	09/18/13 18:56	
Dichlorvos	ND	0.10	ug/l	1	09/18/13 18:56	
Dimethoate	ND	0.25	ug/l	1	09/18/13 18:56	
Disulfoton	ND	0.10	ug/l	1	09/18/13 18:56	
Ethoprop	ND	0.10	ug/l	1	09/18/13 18:56	
Ethyl parathion	ND	0.25	ug/l	1	09/18/13 18:56	
Fensulfothion	ND	0.10	ug/l	1	09/18/13 18:56	
Fenthion	ND	0.10	ug/l	1	09/18/13 18:56	
Malathion	ND	0.25	ug/l	1	09/18/13 18:56	
Merphos	ND	0.10	ug/l	1	09/18/13 18:56	
Methyl parathion	ND	0.10	ug/l	1	09/18/13 18:56	



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 08/28/13 09:20
Date Reported: 09/23/13 15:27

3H28014-02 MC-5B
Sampled: 08/26/13 10:10 **Sampled By:** Christina Lucero, Tim Ingrum **Matrix:** Water

Organophosphorus Pesticides by EPA Method 8141A

Method: EPA 8141A		Batch: W3H1378		Prepared: 08/29/13 08:19		Analyst: jch		
Analyte		Result		MRL	Units	Dil	Analyzed	Qualifier
Mevinphos		ND		0.10	ug/l	1	09/18/13 18:56	
Naled		ND		0.10	ug/l	1	09/18/13 18:56	
Phorate		ND		0.10	ug/l	1	09/18/13 18:56	
Ronnel		ND		0.10	ug/l	1	09/18/13 18:56	
Stirophos		ND		0.10	ug/l	1	09/18/13 18:56	
Thionazin		ND		0.25	ug/l	1	09/18/13 18:56	
Tokuthion (Prothiofos)		ND		0.10	ug/l	1	09/18/13 18:56	
Total Demeton, -o and -s		ND		0.20	ug/l	1	09/18/13 18:56	
Total Parathion, ethyl & methyl		ND		0.35	ug/l	1	09/18/13 18:56	
Trichloronate		ND		0.10	ug/l	1	09/18/13 18:56	
Surr: Triphenyl phosphate	108 %	Conc: 1.08		10-181	%			

Pyrethroid Pesticides by GC/MS SIM

Method: GC/MS NCI-SIM		Batch: W3I0177		Prepared: 09/06/13 08:44		Analyst: css	
Analyte	Result		MRL	Units	Dil	Analyzed	Qualifier
Allethrin	ND		2.0	ng/l	1	09/12/13 21:50	
Bifenthrin	ND		2.0	ng/l	1	09/12/13 21:50	
Cyfluthrin	ND		2.0	ng/l	1	09/12/13 21:50	
Cypermethrin	ND		2.0	ng/l	1	09/12/13 21:50	
Deltamethrin/Tralomethrin	ND		2.0	ng/l	1	09/12/13 21:50	
Dichloran	ND		2.0	ng/l	1	09/12/13 21:50	
Fenpropathrin (Danitol)	ND		2.0	ng/l	1	09/12/13 21:50	
Fenvalerate/Esfenvalerate	ND		2.0	ng/l	1	09/12/13 21:50	
L-Cyhalothrin	ND		2.0	ng/l	1	09/12/13 21:50	
Pendimethalin	ND		2.0	ng/l	1	09/12/13 21:50	
Permethrin	ND		5.0	ng/l	1	09/12/13 21:50	
Prallethrin	ND		2.0	ng/l	1	09/12/13 21:50	
Sumithrin	14		10	ng/l	1	09/12/13 21:50	
Tefluthrin	ND		2.0	ng/l	1	09/12/13 21:50	
Surr: Perylene-d12	103 %	Conc:257	70-130	%			
Surr: Triphenyl phosphate	81 %	Conc:202	70-130	%			



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 08/28/13 09:20
Date Reported: 09/23/13 15:27

3H28014-03 MC-5C
Sampled: 08/26/13 10:35 Sampled By: Christina Lucero, Tim Ingram Matrix: Water

Chlorinated Herbicides

Method: EPA 8151A		Batch: W3H1379		Prepared: 08/29/13 08:24		Analyst: bma
Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
2,4,5-T	ND	0.25	ug/l	1	09/05/13 18:23	
2,4,5-TP (Silvex)	ND	0.25	ug/l	1	09/05/13 18:23	
2,4-D	ND	0.50	ug/l	1	09/05/13 18:23	
2,4-DB	ND	2.5	ug/l	1	09/05/13 18:23	
3,5-Dichlorobenzoic acid	ND	1.2	ug/l	1	09/05/13 18:23	
4-Nitrophenol	ND	1.2	ug/l	1	09/05/13 18:23	
Acifluorfen	ND	0.50	ug/l	1	09/05/13 18:23	
Bentazon	ND	2.5	ug/l	1	09/05/13 18:23	
Dalapon	ND	0.50	ug/l	1	09/05/13 18:23	
DCPA	ND	0.25	ug/l	1	09/05/13 18:23	
Dicamba	ND	0.75	ug/l	1	09/05/13 18:23	
Dichloroprop	ND	1.0	ug/l	1	09/05/13 18:23	
Dinoseb	ND	0.50	ug/l	1	09/05/13 18:23	
MCPA	ND	100	ug/l	1	09/05/13 18:23	
MCPP	ND	100	ug/l	1	09/05/13 18:23	
Pentachlorophenol	ND	0.25	ug/l	1	09/05/13 18:23	
Picloram	ND	0.75	ug/l	1	09/05/13 18:23	
Surr: 2,4-DCAA	94 %	Conc:18.7	56-156	%		

Chlorinated Pesticides and/or PCBs

Method: EPA 8081A	Batch: W3H1377	Prepared: 08/29/13 08:17				Analyst: rhr
Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
2,4'-DDD	ND	0.050	ug/l	1	09/09/13 17:25	
2,4'-DDE	ND	0.050	ug/l	1	09/09/13 17:25	
2,4'-DDT	ND	0.050	ug/l	1	09/09/13 17:25	
4,4'-DDD	ND	0.050	ug/l	1	09/09/13 17:25	
4,4'-DDE	ND	0.050	ug/l	1	09/09/13 17:25	
4,4'-DDT	ND	0.050	ug/l	1	09/09/13 17:25	
Aldrin	ND	0.050	ug/l	1	09/09/13 17:25	
alpha-BHC	ND	0.050	ug/l	1	09/09/13 17:25	
alpha-Chlordane	ND	0.050	ug/l	1	09/09/13 17:25	
beta-BHC	ND	0.050	ug/l	1	09/09/13 17:25	
Chlordane (tech)	ND	0.50	ug/l	1	09/09/13 17:25	
cis-Nonachlor	ND	0.050	ug/l	1	09/09/13 17:25	
delta-BHC	ND	0.050	ug/l	1	09/09/13 17:25	
Dieldrin	ND	0.050	ug/l	1	09/09/13 17:25	
Endosulfan I	ND	0.050	ug/l	1	09/09/13 17:25	
Endosulfan II	ND	0.050	ug/l	1	09/09/13 17:25	
Endosulfan sulfate	ND	0.050	ug/l	1	09/09/13 17:25	
Endrin	ND	0.050	ug/l	1	09/09/13 17:25	



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 08/28/13 09:20
Date Reported: 09/23/13 15:27

3H28014-03 MC-5C
Sampled: 08/26/13 10:35 Sampled By: Christina Lucero, Tim Ingram Matrix: Water

Chlorinated Pesticides and/or PCBs

Method: EPA 8081A		Batch: W3H1377		Prepared: 08/29/13 08:17		Analyst: rhr	
Analyte		Result	MRL	Units	Dil	Analyzed	Qualifier
Endrin aldehyde		ND	0.050	ug/l	1	09/09/13 17:25	
Endrin ketone		ND	0.050	ug/l	1	09/09/13 17:25	
gamma-BHC (Lindane)		ND	0.050	ug/l	1	09/09/13 17:25	
gamma-Chlordane		ND	0.050	ug/l	1	09/09/13 17:25	
Heptachlor		ND	0.050	ug/l	1	09/09/13 17:25	
Heptachlor epoxide		ND	0.050	ug/l	1	09/09/13 17:25	
Kepone		ND	0.25	ug/l	1	09/09/13 17:25	
Methoxychlor		ND	0.050	ug/l	1	09/09/13 17:25	
Mirex		ND	0.050	ug/l	1	09/09/13 17:25	
Oxychlordane		ND	0.050	ug/l	1	09/09/13 17:25	
Toxaphene		ND	2.0	ug/l	1	09/09/13 17:25	
trans-Nonachlor		ND	0.050	ug/l	1	09/09/13 17:25	
Surr: Decachlorobiphenyl	93 %	Conc:0.466	0.1-123	%			
Surr: Tetrachloro-meta-xylene	87 %	Conc:0.434	10-137	%			

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods

Method: SM 5310C		Batch: W3I0795		Prepared: 09/18/13 11:35		Analyst: jlp
Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Dissolved Organic Carbon	ND	0.50	mg/l	1	09/18/13 12:00	

Organophosphorus Pesticides by EPA Method 8141A

Method: EPA 8141A	Batch: W3H1378	Prepared: 08/29/13 08:19			Analyst: jch	
Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Azinphos methyl (Guthion)	ND	0.10	ug/l	1	09/18/13 19:26	
Bolstar	ND	0.10	ug/l	1	09/18/13 19:26	
Chlorpyrifos	ND	0.10	ug/l	1	09/18/13 19:26	
Coumaphos	ND	0.10	ug/l	1	09/18/13 19:26	
Demeton-o	ND	0.10	ug/l	1	09/18/13 19:26	
Demeton-s	ND	0.10	ug/l	1	09/18/13 19:26	
Diazinon	ND	0.10	ug/l	1	09/18/13 19:26	
Dichlorvos	ND	0.10	ug/l	1	09/18/13 19:26	
Dimethoate	ND	0.25	ug/l	1	09/18/13 19:26	
Disulfoton	ND	0.10	ug/l	1	09/18/13 19:26	
Ethoprop	ND	0.10	ug/l	1	09/18/13 19:26	
Ethyl parathion	ND	0.25	ug/l	1	09/18/13 19:26	
Fensulfothion	ND	0.10	ug/l	1	09/18/13 19:26	
Fenthion	ND	0.10	ug/l	1	09/18/13 19:26	
Malathion	ND	0.25	ug/l	1	09/18/13 19:26	
Merphos	ND	0.10	ug/l	1	09/18/13 19:26	
Methyl parathion	ND	0.10	ug/l	1	09/18/13 19:26	



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 08/28/13 09:20
Date Reported: 09/23/13 15:27

3H28014-03 MC-5C
Sampled: 08/26/13 10:35 Sampled By: Christina Lucero, Tim Ingrum Matrix: Water

Organophosphorus Pesticides by EPA Method 8141A

Method: EPA 8141A		Batch: W3H1378		Prepared: 08/29/13 08:19		Analyst: jch		
Analyte		Result		MRL	Units	Dil	Analyzed	Qualifier
Mevinphos		ND		0.10	ug/l	1	09/18/13 19:26	
Naled		ND		0.10	ug/l	1	09/18/13 19:26	
Phorate		ND		0.10	ug/l	1	09/18/13 19:26	
Ronnel		ND		0.10	ug/l	1	09/18/13 19:26	
Stirophos		ND		0.10	ug/l	1	09/18/13 19:26	
Thionazin		ND		0.25	ug/l	1	09/18/13 19:26	
Tokuthion (Prothiofos)		ND		0.10	ug/l	1	09/18/13 19:26	
Total Demeton, -o and -s		ND		0.20	ug/l	1	09/18/13 19:26	
Total Parathion, ethyl & methyl		ND		0.35	ug/l	1	09/18/13 19:26	
Trichloronate		ND		0.10	ug/l	1	09/18/13 19:26	
Surr: Triphenyl phosphate		100 %	Conc: 1.00	10-181	%			

Pyrethroid Pesticides by GC/MS SIM

Method: GC/MS NCI-SIM		Batch: W3I0177		Prepared: 09/06/13 08:44		Analyst: css	
Analyte	Result		MRL	Units	Dil	Analyzed	Qualifier
Allethrin	ND		2.0	ng/l	1	09/12/13 22:13	
Bifenthrin	ND		2.0	ng/l	1	09/12/13 22:13	
Cyfluthrin	ND		2.0	ng/l	1	09/12/13 22:13	
Cypermethrin	ND		2.0	ng/l	1	09/12/13 22:13	
Deltamethrin/Tralomethrin	ND		2.0	ng/l	1	09/12/13 22:13	
Dichloran	ND		2.0	ng/l	1	09/12/13 22:13	
Fenpropathrin (Danitol)	ND		2.0	ng/l	1	09/12/13 22:13	
Fenvalerate/Esfenvalerate	ND		2.0	ng/l	1	09/12/13 22:13	
L-Cyhalothrin	ND		2.0	ng/l	1	09/12/13 22:13	
Pendimethalin	ND		2.0	ng/l	1	09/12/13 22:13	
Permethrin	ND		5.0	ng/l	1	09/12/13 22:13	
Prallethrin	ND		2.0	ng/l	1	09/12/13 22:13	
Sumithrin	11		10	ng/l	1	09/12/13 22:13	
Tefluthrin	ND		2.0	ng/l	1	09/12/13 22:13	
Surr: Perylene-d12	95 %	Conc:239	70-130	%			
Surr: Triphenyl phosphate	54 %	Conc:135	70-130	%			S-11

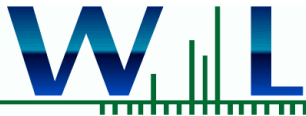
S-11



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 08/28/13 09:20
Date Reported: 09/23/13 15:27

3H28014-04		Emerson				
Sampled: 08/26/13 12:35	Sampled By: Christina Lucero, Tim Ingram			Matrix: Water		
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: SM 5310C	Batch: W3I0794		Prepared: 09/18/13 11:28			Analyst: jlp
Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Total Organic Carbon (TOC)	29	3.0	mg/l	10	09/18/13 16:11	
Method: SM 5310C	Batch: W3I0795		Prepared: 09/18/13 11:35			Analyst: jlp
Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Dissolved Organic Carbon	31	5.0	mg/l	10	09/18/13 12:00	
Volatile Organic Compounds by EPA Method 524.2						
Method: SM 5710B/EPA524.2	Batch: W3I0292		Prepared: 09/09/13 09:11			Analyst: hmc
Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Bromodichloromethane, FP	470	12	ug/l	25	09/09/13 16:33	
Bromoform, FP	7.8	0.50	ug/l	1	09/09/13 16:33	
Chloroform, FP	1100	12	ug/l	25	09/09/13 16:33	
Dibromochloromethane, FP	130	12	ug/l	25	09/09/13 16:33	
THM Formation Potential	1700	2.0	ug/l	1	09/09/13 16:33	
Surr: 1,2-Dichlorobenzene-d4	73 %	Conc:7.28	70-130	%		
Surr: 4-Bromofluorobenzene	76 %	Conc:7.55	70-130	%		



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 08/28/13 09:20
Date Reported: 09/23/13 15:27

3H28014-05		Gilbert				
Sampled: 08/26/13 13:10		Sampled By: Christina Lucero, Tim Ingrum				Matrix: Water
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: SM 5310C		Batch: W3I0794		Prepared: 09/18/13 11:28		Analyst: jlp
Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Total Organic Carbon (TOC)	19	3.0	mg/l	10	09/18/13 16:11	
Method: SM 5310C		Batch: W3I0795		Prepared: 09/18/13 11:35		Analyst: jlp
Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Dissolved Organic Carbon	19	5.0	mg/l	10	09/18/13 12:00	
Volatile Organic Compounds by EPA Method 524.2						
Method: SM 5710B/EPA524.2		Batch: W3I0292		Prepared: 09/09/13 09:11		Analyst: hmc
Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Bromodichloromethane, FP	450	12	ug/l	25	09/09/13 17:33	
Bromoform, FP	9.2	0.50	ug/l	1	09/09/13 17:33	
Chloroform, FP	970	12	ug/l	25	09/09/13 17:33	
Dibromochloromethane, FP	180	12	ug/l	25	09/09/13 17:33	
THM Formation Potential	1600	2.0	ug/l	1	09/09/13 17:33	
Surr: 1,2-Dichlorobenzene-d4	81 %	Conc:8.12	70-130	%		
Surr: 4-Bromofluorobenzene	84 %	Conc:8.42	70-130	%		



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 08/28/13 09:20
Date Reported: 09/23/13 15:27

3H28014-06 Burroughs

Sampled: 08/26/13 13:55

Sampled By: Christina Lucero, Tim Ingram

Matrix: Water

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods

Method: SM 5310C		Batch: W3I0794		Prepared: 09/18/13 11:28		Analyst: jlp	
Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier	
Total Organic Carbon (TOC)	11	3.0	mg/l	10	09/18/13 16:11		

Method: SM 5310C		Batch: W3I0795		Prepared: 09/18/13 11:35		Analyst: jlp	
Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier	
Dissolved Organic Carbon	11	5.0	mg/l	10	09/18/13 12:00		

Volatile Organic Compounds by EPA Method 524.2

Method: SM 5710B/EPA524.2		Batch: W3I0292		Prepared: 09/09/13 09:11		Analyst: hmc	
Analyte	Result		MRL	Units	Dil	Analyzed	Qualifier
Bromodichloromethane, FP	290		12	ug/l	25	09/09/13 16:03	
Bromoform, FP	6.9		0.50	ug/l	1	09/09/13 16:03	
Chloroform, FP	590		12	ug/l	25	09/09/13 16:03	
Dibromochloromethane, FP	100		12	ug/l	25	09/09/13 16:03	
THM Formation Potential	990		2.0	ug/l	1	09/09/13 16:03	
Surr: 1,2-Dichlorobenzene-d4	79 %	Conc:7.88	70-130	%			
Surr: 4-Bromofluorobenzene	84 %	Conc:8.42	70-130	%			



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 08/28/13 09:20
Date Reported: 09/23/13 15:27

QUALITY CONTROL SECTION



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 08/28/13 09:20
Date Reported: 09/23/13 15:27

Chlorinated Pesticides and/or PCBs - Quality Control

Batch W3H1377 - EPA 8081A

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
Blank (W3H1377-BLK1)			Analyzed: 09/09/13 15:05							
2,4'-DDD	ND	0.050	ug/l							
2,4'-DDE	ND	0.050	ug/l							
2,4'-DDT	ND	0.050	ug/l							
4,4'-DDD	ND	0.050	ug/l							
4,4'-DDE	ND	0.050	ug/l							
4,4'-DDT	ND	0.050	ug/l							
Aldrin	ND	0.050	ug/l							
alpha-BHC	ND	0.050	ug/l							
alpha-Chlordane	ND	0.050	ug/l							
beta-BHC	ND	0.050	ug/l							
Chlordane (tech)	ND	0.50	ug/l							
cis-Nonachlor	ND	0.050	ug/l							
delta-BHC	ND	0.050	ug/l							
Dieldrin	ND	0.050	ug/l							
Endosulfan I	ND	0.050	ug/l							
Endosulfan II	ND	0.050	ug/l							
Endosulfan sulfate	ND	0.050	ug/l							
Endrin	ND	0.050	ug/l							
Endrin aldehyde	ND	0.050	ug/l							
Endrin ketone	ND	0.050	ug/l							
gamma-BHC (Lindane)	ND	0.050	ug/l							
gamma-Chlordane	ND	0.050	ug/l							
Heptachlor	ND	0.050	ug/l							
Heptachlor epoxide	ND	0.050	ug/l							
Kepone	ND	0.25	ug/l							
Methoxychlor	ND	0.050	ug/l							
Mirex	ND	0.050	ug/l							
Oxychlordane	ND	0.050	ug/l							
Toxaphene	ND	2.0	ug/l							
trans-Nonachlor	ND	0.050	ug/l							
Surr: Decachlorobiphenyl	0.460		ug/l	0.500		92	0.1-123			
Surr: Tetrachloro-meta-xylene	0.410		ug/l	0.500		82	10-137			
LCS (W3H1377-BS1)			Analyzed: 09/09/13 15:33							
4,4'-DDD	0.441	0.050	ug/l	0.500		88	59-143			
4,4'-DDE	0.473	0.050	ug/l	0.500		95	63-126			
4,4'-DDT	0.559	0.050	ug/l	0.500		112	43-165			
Aldrin	0.427	0.050	ug/l	0.500		85	54-116			
alpha-BHC	0.469	0.050	ug/l	0.500		94	70-121			
beta-BHC	0.473	0.050	ug/l	0.500		95	71-126			
delta-BHC	0.496	0.050	ug/l	0.500		99	72-129			
Dieldrin	0.439	0.050	ug/l	0.500		88	70-130			
Endosulfan I	0.397	0.050	ug/l	0.500		79	48-113			
Endosulfan II	0.426	0.050	ug/l	0.500		85	58-118			
Endosulfan sulfate	0.601	0.050	ug/l	0.500		120	68-142			



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 08/28/13 09:20
Date Reported: 09/23/13 15:27

Chlorinated Pesticides and/or PCBs - Quality Control

Batch W3H1377 - EPA 8081A

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
LCS (W3H1377-BS1)		Analyzed: 09/09/13 15:33								
Endrin	0.463	0.050	ug/l	0.500		93	53-150			
Endrin aldehyde	0.485	0.050	ug/l	0.500		97	56-147			
gamma-BHC (Lindane)	0.479	0.050	ug/l	0.500		96	71-123			
Heptachlor	0.484	0.050	ug/l	0.500		97	58-138			
Heptachlor epoxide	0.458	0.050	ug/l	0.500		92	71-127			
Methoxychlor	0.563	0.050	ug/l	0.500		113	49-158			
Surr: Decachlorobiphenyl	0.467		ug/l	0.500		93	0.1-123			
Surr: Tetrachloro-meta-xylene	0.413		ug/l	0.500		83	10-137			

LCS Dup (W3H1377-BSD1)

Analyzed: 09/09/13 16:01

4,4'-DDD	0.440	0.050	ug/l	0.500		88	59-143	0.2	25	
4,4'-DDE	0.465	0.050	ug/l	0.500		93	63-126	2	25	
4,4'-DDT	0.551	0.050	ug/l	0.500		110	43-165	1	25	
Aldrin	0.425	0.050	ug/l	0.500		85	54-116	0.5	25	
alpha-BHC	0.465	0.050	ug/l	0.500		93	70-121	1	25	
beta-BHC	0.470	0.050	ug/l	0.500		94	71-126	0.7	25	
delta-BHC	0.492	0.050	ug/l	0.500		98	72-129	0.8	25	
Dieldrin	0.437	0.050	ug/l	0.500		87	70-130	0.4	25	
Endosulfan I	0.391	0.050	ug/l	0.500		78	48-113	2	25	
Endosulfan II	0.419	0.050	ug/l	0.500		84	58-118	2	25	
Endosulfan sulfate	0.622	0.050	ug/l	0.500		124	68-142	3	25	
Endrin	0.455	0.050	ug/l	0.500		91	53-150	2	25	
Endrin aldehyde	0.484	0.050	ug/l	0.500		97	56-147	0.3	25	
gamma-BHC (Lindane)	0.474	0.050	ug/l	0.500		95	71-123	0.9	25	
Heptachlor	0.489	0.050	ug/l	0.500		98	58-138	1	25	
Heptachlor epoxide	0.454	0.050	ug/l	0.500		91	71-127	0.9	25	
Methoxychlor	0.576	0.050	ug/l	0.500		115	49-158	2	25	
Surr: Decachlorobiphenyl	0.464		ug/l	0.500		93	0.1-123			
Surr: Tetrachloro-meta-xylene	0.418		ug/l	0.500		84	10-137			

Batch W3H1379 - EPA 8151A

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
Blank (W3H1379-BLK1)		Analyzed: 09/05/13 15:59								
2,4,5-T	ND	0.25	ug/l							
2,4,5-TP (Silvex)	ND	0.25	ug/l							
2,4-D	ND	0.50	ug/l							
2,4-DB	ND	2.5	ug/l							
3,5-Dichlorobenzoic acid	ND	1.2	ug/l							
4-Nitrophenol	ND	1.2	ug/l							
Acifluorfen	ND	0.50	ug/l							
Bentazon	ND	2.5	ug/l							
Dalapon	ND	0.50	ug/l							
DCPA	ND	0.25	ug/l							
Dicamba	ND	0.75	ug/l							



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 08/28/13 09:20
Date Reported: 09/23/13 15:27

Chlorinated Herbicides - Quality Control

Batch W3H1379 - EPA 8151A

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
Blank (W3H1379-BLK1)			Analyzed: 09/05/13 15:59							
Dichloroprop	ND	1.0	ug/l							
Dinoseb	ND	0.50	ug/l							
MCPA	ND	100	ug/l							
MCPP	ND	100	ug/l							
Pentachlorophenol	ND	0.25	ug/l							
Picloram	ND	0.75	ug/l							
Surr: 2,4-DCAA	14.9		ug/l	20.0		74	56-156			
LCS (W3H1379-BS1)			Analyzed: 09/05/13 16:28							
2,4,5-T	1.41	0.25	ug/l	2.50		56	39-151			
2,4,5-TP (Silvex)	1.48	0.25	ug/l	2.50		59	46-142			
2,4-D	3.65	0.50	ug/l	5.00		73	56-164			
2,4-DB	5.53	2.5	ug/l	10.0		55	27-161			
3,5-Dichlorobenzoic acid	4.94	1.2	ug/l	5.00		99	54-154			
4-Nitrophenol	7.19	1.2	ug/l	10.0		72	3-105			
Acifluorfen	1.92	0.50	ug/l	2.50		77	39-134			
Bentazon	4.70	2.5	ug/l	10.0		47	44-139			
Dalapon	6.79	0.50	ug/l	5.00		136	40-139			
DCPA	1.41	0.25	ug/l	2.50		57	34-135			
Dicamba	3.91	0.75	ug/l	5.00		78	46-140			
Dichloroprop	3.11	1.0	ug/l	5.00		62	43-158			
Dinoseb	1.51	0.50	ug/l	2.50		61	42-146			
MCPA	327	100	ug/l	500		65	28-144			
MCPP	289	100	ug/l	500		58	31-153			
Pentachlorophenol	1.51	0.25	ug/l	2.50		60	37-136			
Picloram	1.47	0.75	ug/l	2.50		59	35-138			
Surr: 2,4-DCAA	14.1		ug/l	20.0		71	56-156			
LCS Dup (W3H1379-BSD1)			Analyzed: 09/05/13 16:57							
2,4,5-T	2.14	0.25	ug/l	2.50		86	39-151	41	200	
2,4,5-TP (Silvex)	2.21	0.25	ug/l	2.50		88	46-142	39	200	
2,4-D	6.45	0.50	ug/l	5.00		129	56-164	55	200	
2,4-DB	8.71	2.5	ug/l	10.0		87	27-161	45	200	
3,5-Dichlorobenzoic acid	5.31	1.2	ug/l	5.00		106	54-154	7	200	
4-Nitrophenol	7.46	1.2	ug/l	10.0		75	3-105	4	200	
Acifluorfen	2.14	0.50	ug/l	2.50		86	39-134	11	200	
Bentazon	6.73	2.5	ug/l	10.0		67	44-139	36	200	
Dalapon	6.21	0.50	ug/l	5.00		124	40-139	9	200	
DCPA	1.97	0.25	ug/l	2.50		79	34-135	33	200	
Dicamba	4.92	0.75	ug/l	5.00		98	46-140	23	200	
Dichloroprop	5.03	1.0	ug/l	5.00		101	43-158	47	200	
Dinoseb	2.34	0.50	ug/l	2.50		94	42-146	43	200	
MCPA	452	100	ug/l	500		90	28-144	32	200	
MCPP	518	100	ug/l	500		104	31-153	57	200	
Pentachlorophenol	1.88	0.25	ug/l	2.50		75	37-136	22	200	
Picloram	1.77	0.75	ug/l	2.50		71	35-138	18	200	



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 08/28/13 09:20
Date Reported: 09/23/13 15:27

Chlorinated Herbicides - Quality Control

Batch W3H1379 - EPA 8151A

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
LCS Dup (W3H1379-BSD1)				Analyzed: 09/05/13 16:57						
Surr: 2,4-DCAA	17.5		ug/l	20.0		88	56-156			

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods - Quality Control

Batch W3I0794 - SM 5310C

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
Blank (W3I0794-BLK1)				Analyzed: 09/18/13 16:11						
Total Organic Carbon (TOC)	ND	0.30	mg/l							
LCS (W3I0794-BS1)				Analyzed: 09/18/13 16:11						
Total Organic Carbon (TOC)	4.79	0.30	mg/l	5.00		96	85-115			
Matrix Spike (W3I0794-MS1)				Source: 3I10037-02 Analyzed: 09/18/13 16:11						
Total Organic Carbon (TOC)	6.15	0.30	mg/l	5.00	1.01	103	77-114			
Matrix Spike Dup (W3I0794-MSD1)				Source: 3I10037-02 Analyzed: 09/18/13 16:11						
Total Organic Carbon (TOC)	6.29	0.30	mg/l	5.00	1.01	106	77-114	2	10	

Batch W3I0795 - SM 5310C

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
Blank (W3I0795-BLK1)				Analyzed: 09/18/13 12:00						
Dissolved Organic Carbon	ND	0.50	mg/l							
LCS (W3I0795-BS1)				Analyzed: 09/18/13 12:00						
Dissolved Organic Carbon	5.20	0.50	mg/l	5.00		104	85-115			
LCS Dup (W3I0795-BSD1)				Analyzed: 09/18/13 12:00						
Dissolved Organic Carbon	5.25	0.50	mg/l	5.00		105	85-115	1	20	

Organophosphorus Pesticides by EPA Method 8141A - Quality Control

Batch W3H1378 - EPA 8141A

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
Blank (W3H1378-BLK1)				Analyzed: 09/18/13 16:54						
Azinphos methyl (Guthion)	ND	0.10	ug/l							
Bolstar	ND	0.10	ug/l							
Chlorpyrifos	ND	0.10	ug/l							
Coumaphos	ND	0.10	ug/l							
Demeton-o	ND	0.10	ug/l							
Demeton-s	ND	0.10	ug/l							
Diazinon	ND	0.10	ug/l							
Dichlorvos	ND	0.10	ug/l							
Dimethoate	ND	0.25	ug/l							
Disulfoton	ND	0.10	ug/l							



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 08/28/13 09:20
Date Reported: 09/23/13 15:27

Organophosphorus Pesticides by EPA Method 8141A - Quality Control

Batch W3H1378 - EPA 8141A

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
Blank (W3H1378-BLK1)				Analyzed: 09/18/13 16:54						
Ethoprop	ND	0.10	ug/l							
Ethyl parathion	ND	0.25	ug/l							
Fensulfothion	ND	0.10	ug/l							
Fenthion	ND	0.10	ug/l							
Malathion	ND	0.25	ug/l							
Merphos	ND	0.10	ug/l							
Methyl parathion	ND	0.10	ug/l							
Mevinphos	ND	0.10	ug/l							
Naled	ND	0.10	ug/l							
Phorate	ND	0.10	ug/l							
Ronnel	ND	0.10	ug/l							
Stirophos	ND	0.10	ug/l							
Thionazin	ND	0.25	ug/l							
Tokuthion (Prothiofos)	ND	0.10	ug/l							
Total Demeton, -o and -s	ND	0.20	ug/l							
Total Parathion, ethyl & methyl	ND	0.35	ug/l							
Trichloronate	ND	0.10	ug/l							
Surr: Triphenyl phosphate	0.870		ug/l	1.00		87	10-181			
LCS (W3H1378-BS1)				Analyzed: 09/18/13 17:24						
Azinphos methyl (Guthion)	1.09	0.10	ug/l	1.00		109	12-167			
Bolstar	0.742	0.10	ug/l	1.00		74	36-146			
Chlorpyrifos	0.810	0.10	ug/l	1.00		81	35-149			
Coumaphos	1.02	0.10	ug/l	1.00		102	24-171			
Demeton-o	0.876	0.10	ug/l	1.00		88	22-117			
Demeton-s	0.803	0.10	ug/l	1.00		80	35-137			
Diazinon	0.830	0.10	ug/l	1.00		83	37-145			
Dichlorvos	1.26	0.10	ug/l	1.00		126	31-169			
Disulfoton	0.760	0.10	ug/l	1.00		76	39-140			
Ethoprop	1.01	0.10	ug/l	1.00		101	40-153			
Fensulfothion	1.07	0.10	ug/l	1.00		107	24-178			
Fenthion	0.755	0.10	ug/l	1.00		76	37-147			
Merphos	0.627	0.10	ug/l	1.00		63	25-159			
Methyl parathion	0.881	0.10	ug/l	1.00		88	29-160			
Mevinphos	1.09	0.10	ug/l	1.00		109	31-146			
Naled	0.590	0.10	ug/l	1.00		59	0.1-142			
Phorate	0.928	0.10	ug/l	1.00		93	43-146			
Ronnel	0.795	0.10	ug/l	1.00		80	30-156			
Stirophos	0.762	0.10	ug/l	1.00		76	31-166			
Tokuthion (Prothiofos)	0.703	0.10	ug/l	1.00		70	36-144			
Trichloronate	0.839	0.10	ug/l	1.00		84	38-148			
Surr: Triphenyl phosphate	0.933		ug/l	1.00		93	10-181			
LCS Dup (W3H1378-BSD1)				Analyzed: 09/18/13 17:55						
Azinphos methyl (Guthion)	1.29	0.10	ug/l	1.00		129	12-167	17	25	
Bolstar	0.833	0.10	ug/l	1.00		83	36-146	11	25	



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 08/28/13 09:20
Date Reported: 09/23/13 15:27

Organophosphorus Pesticides by EPA Method 8141A - Quality Control

Batch W3H1378 - EPA 8141A

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
LCS Dup (W3H1378-BSD1)		Analyzed: 09/18/13 17:55								
Chlorpyrifos	0.904	0.10	ug/l	1.00		90	35-149	11	25	
Coumaphos	1.15	0.10	ug/l	1.00		115	24-171	12	25	
Demeton-o	0.896	0.10	ug/l	1.00		90	22-117	2	25	
Demeton-s	0.826	0.10	ug/l	1.00		83	35-137	3	25	
Diazinon	0.897	0.10	ug/l	1.00		90	37-145	8	25	
Dichlorvos	1.35	0.10	ug/l	1.00		135	31-169	7	25	
Disulfoton	0.863	0.10	ug/l	1.00		86	39-140	13	25	
Ethoprop	1.02	0.10	ug/l	1.00		102	40-153	1	25	
Fensulfothion	1.17	0.10	ug/l	1.00		117	24-178	9	25	
Fenthion	0.842	0.10	ug/l	1.00		84	37-147	11	25	
Merphos	0.501	0.10	ug/l	1.00		50	25-159	22	25	
Methyl parathion	0.969	0.10	ug/l	1.00		97	29-160	10	25	
Mevinphos	1.18	0.10	ug/l	1.00		118	31-146	8	25	
Naled	0.631	0.10	ug/l	1.00		63	0.1-142	7	25	
Phorate	0.993	0.10	ug/l	1.00		99	43-146	7	25	
Ronnel	0.899	0.10	ug/l	1.00		90	30-156	12	25	
Stirophos	0.881	0.10	ug/l	1.00		88	31-166	14	25	
Tokuthion (Prothiofos)	0.800	0.10	ug/l	1.00		80	36-144	13	25	
Trichloronate	0.925	0.10	ug/l	1.00		93	38-148	10	25	
Surr: Triphenyl phosphate	0.986		ug/l	1.00		99	10-181			

Pyrethroid Pesticides by GC/MS SIM - Quality Control

Batch W3I0177 - GC/MS NCI-SIM

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
Blank (W3I0177-BLK1)		Analyzed: 09/12/13 19:53								
Allethrin	ND	2.0	ng/l							
Bifenthrin	ND	2.0	ng/l							
Cyfluthrin	ND	2.0	ng/l							
Cypermethrin	ND	2.0	ng/l							
Deltamethrin/Tralomethrin	ND	2.0	ng/l							
Dichloran	ND	2.0	ng/l							
Fenpropathrin (Danitol)	ND	2.0	ng/l							
Fenvalerate/Esfenvalerate	ND	2.0	ng/l							
L-Cyhalothrin	ND	2.0	ng/l							
Pendimethalin	ND	2.0	ng/l							
Permethrin	ND	5.0	ng/l							
Prallethrin	ND	2.0	ng/l							
Sumithrin	ND	10	ng/l							
Tefluthrin	ND	2.0	ng/l							
Surr: Perylene-d12	275		ng/l	250		110	70-130			
Surr: Triphenyl phosphate	192		ng/l	250		77	70-130			



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 08/28/13 09:20
Date Reported: 09/23/13 15:27

Pyrethroid Pesticides by GC/MS SIM - Quality Control

Batch W3I0177 - GC/MS NCI-SIM

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
LCS (W3I0177-BS1)		Analyzed: 09/12/13 20:16								
Allethrin	43.6	2.0	ng/l	50.0		87	48-156			
Bifenthrin	37.3	2.0	ng/l	50.0		75	25-191			
Cyfluthrin	32.8	2.0	ng/l	50.0		66	37-169			
Cypermethrin	36.2	2.0	ng/l	50.0		72	29-178			
Deltamethrin/Tralomethrin	67.7	2.0	ng/l	50.0		135	50-150			
Desulfinylfipronil	ND	2.0	ng/l				50-150			
Dichloran	59.4	2.0	ng/l	50.0		119	53-164			
Fenpropathrin (Danitol)	41.3	2.0	ng/l	50.0		83	50-150			
Fenvalerate/Esfenvalerate	40.7	2.0	ng/l	50.0		81	31-178			
Fipronil	ND	2.0	ng/l				50-150			
Fipronil sulfide	ND	2.0	ng/l				50-150			
Fipronil sulfone	ND	2.0	ng/l				50-150			
L-Cyhalothrin	54.9	2.0	ng/l	50.0		110	38-182			
Pendimethalin	47.5	2.0	ng/l	50.0		95	52-145			
Permethrin	39.1	5.0	ng/l	50.0		78	59-148			
Prallethrin	39.1	2.0	ng/l	50.0		78	54-148			
Sumithrin	52.4	10	ng/l	50.0		105	56-146			
Tefluthrin	58.2	2.0	ng/l	50.0		116	38-195			
Surr: Perylene-d12	260		ng/l	250		104	70-130			
Surr: Triphenyl phosphate	143		ng/l	250		57	70-130			S-11

LCS Dup (W3I0177-BSD1)		Analyzed: 09/12/13 20:40								
Allethrin	42.2	2.0	ng/l	50.0		84	48-156	3	30	
Bifenthrin	38.4	2.0	ng/l	50.0		77	25-191	3	30	
Cyfluthrin	35.5	2.0	ng/l	50.0		71	37-169	8	30	
Cypermethrin	37.7	2.0	ng/l	50.0		75	29-178	4	30	
Deltamethrin/Tralomethrin	73.9	2.0	ng/l	50.0		148	50-150	9	30	
Desulfinylfipronil	ND	2.0	ng/l				50-150			
Dichloran	58.8	2.0	ng/l	50.0		118	53-164	1	30	
Fenpropathrin (Danitol)	46.2	2.0	ng/l	50.0		92	50-150	11	30	
Fenvalerate/Esfenvalerate	43.1	2.0	ng/l	50.0		86	31-178	6	30	
Fipronil	ND	2.0	ng/l				50-150			
Fipronil sulfide	ND	2.0	ng/l				50-150			
Fipronil sulfone	ND	2.0	ng/l				50-150			
L-Cyhalothrin	55.0	2.0	ng/l	50.0		110	38-182	0.2	30	
Pendimethalin	54.2	2.0	ng/l	50.0		108	52-145	13	30	
Permethrin	39.9	5.0	ng/l	50.0		80	59-148	2	30	
Prallethrin	39.0	2.0	ng/l	50.0		78	54-148	0.3	30	
Sumithrin	55.5	10	ng/l	50.0		111	56-146	6	30	
Tefluthrin	58.4	2.0	ng/l	50.0		117	38-195	0.4	30	
Surr: Perylene-d12	261		ng/l	250		104	70-130			
Surr: Triphenyl phosphate	137		ng/l	250		55	70-130			S-11

Volatile Organic Compounds by EPA Method 524.2 - Quality Control



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 08/28/13 09:20
Date Reported: 09/23/13 15:27

Volatile Organic Compounds by EPA Method 524.2 - Quality Control

Batch W3I0292 - SM 5710B/EPA524.2

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	% REC Limits	RPD	RPD Limit	Data Qualifiers
Blank (W3I0292-BLK1)			Analyzed: 09/09/13 14:03							
Bromodichloromethane, FP	ND	0.50	ug/l							
Bromoform, FP	ND	0.50	ug/l							
Chloroform, FP	ND	0.50	ug/l							
Dibromochloromethane, FP	ND	0.50	ug/l							
THM Formation Potential	ND	2.0	ug/l							
Surr: 1,2-Dichlorobenzene-d4	7.29		ug/l	10.0		73	70-130			
Surr: 4-Bromofluorobenzene	7.91		ug/l	10.0		79	70-130			
LCS (W3I0292-BS1)			Analyzed: 09/09/13 11:33							
Bromodichloromethane, FP	5.91	0.50	ug/l	6.00		98	70-130			
Bromoform, FP	6.02	0.50	ug/l	6.00		100	70-130			
Chloroform, FP	5.76	0.50	ug/l	6.00		96	70-130			
Dibromochloromethane, FP	6.26	0.50	ug/l	6.00		104	70-130			
THM Formation Potential	24.0	2.0	ug/l	24.0		100	70-130			
Surr: 1,2-Dichlorobenzene-d4	9.94		ug/l	10.0		99	70-130			
Surr: 4-Bromofluorobenzene	10.0		ug/l	10.0		100	70-130			
LCS Dup (W3I0292-BSD1)			Analyzed: 09/09/13 12:03							
Bromodichloromethane, FP	5.80	0.50	ug/l	6.00		97	70-130	2	30	
Bromoform, FP	6.21	0.50	ug/l	6.00		104	70-130	3	30	
Chloroform, FP	5.54	0.50	ug/l	6.00		92	70-130	4	30	
Dibromochloromethane, FP	6.12	0.50	ug/l	6.00		102	70-130	2	30	
THM Formation Potential	23.7	2.0	ug/l	24.0		99	70-130	1	200	
Surr: 1,2-Dichlorobenzene-d4	10.1		ug/l	10.0		101	70-130			
Surr: 4-Bromofluorobenzene	10.2		ug/l	10.0		102	70-130			



Hydrofocus, Inc.
2827 Spafford St.
Davis CA, 95618

Date Received: 08/28/13 09:20
Date Reported: 09/23/13 15:27

Notes and Definitions

S-11	Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.
ND	NOT DETECTED at or above the Reporting Limit. If J-value reported, then NOT DETECTED at or above the Method Detection Limit (MDL)
NR	Not Reportable
Dil	Dilution
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
% Rec	Percent Recovery
Sub	Subcontracted analysis, original report available upon request
MDL	Method Detection Limit
MDA	Minimum Detectable Activity
MRL	Method Reporting Limit

Any remaining sample(s) will be disposed of one month from the final report date unless other arrangements are made in advance.

An Absence of Total Coliform meets the drinking water standards as established by the California Department of Health Services.

The Reporting Limit (RL) is referenced as the Laboratory's Practical Quantitation Limit (PQL) or the Detection Limit for Reporting Purposes (DLR).

All samples collected by Weck Laboratories have been sampled in accordance to laboratory SOP Number MIS002.

Marine Pollution Studies Laboratories
Moss Landing Marine Laboratories
7544 Sandholdt Road
Moss Landing, CA 95039

Project Manager: **Wes Heim**
Phone: **(831) 771-4459**
Fax: **(831) 633-0805**
Email: wheim@mlml.calstate.edu



Mercury Results

Project Name: Dutch Slough August 2013
Project Number: 341
Analyst: Adam Newman

Report #: Hg13-040w

Report Date: 9/9/2013

Lab Number	Station Name	Sample Type	Date Collected	Date Received	Batch Number	Hg ng/L	Flag
2103-3114	MC-5A	Raw	8/26/2013	8/27/2013	t130909	0.614	
2103-3115	MC-5B	Raw	8/26/2013	8/27/2013	t130909	0.598	
2103-3116	MC-5C	Raw	8/26/2013	8/27/2013	t130909	<MDL	
						MDL	0.200
						RL	0.200

Method: modified EPA 1631E

Marine Pollution Studies Laboratories
Moss Landing Marine Laboratories
7544 Sandholdt Road
Moss Landing, CA 95039



Project Manager: Wes Heim
Phone: 831-771-4459
Fax: 831-663-0805
e-mail: wheim@mlml.calstate.edu

Project Name: Dutch Slough August 2013
Parameter: Mercury
Report Number: Hg 13-040w

Project Number: 341
Matrix: Water
Report Date: 9/9/2013

QA/QC SUMMARY

SAMPLE CUSTODY

Three water samples were collected August 26, 2013 and were received in good condition on August 27, 2013. Cooler temperature was 4.2°C, which is inside the optimal temperature range of 4±2°C. Upon arrival, the samples were acidified to a final concentration of 0.5% v/v bromine monochloride (BrCl).

QA/QC DATA QUALITY OBJECTIVES (DQO)

<u>Analyte</u>	<u>Reference Method</u>	<u>Range of Recovery</u>	<u>Relative Precision</u>	<u>Detection Limit</u>
Hg	EPA 1631E M	±25%	±25%	0.200 ng/L

METHOD

Samples were analyzed using Modified EPA 1631, Revision E: Mercury in Water by Oxidation, Purge and Trap, and Cold Vapor Atomic Fluorescence Spectrometry.

HOLDING TIME

Samples were analyzed September 9, 2013. All samples were analyzed within the EPA holding time of 90 days from collection.

CALIBRATION CURVE

A calibration curve, covering the range of 0.50 – 100 ng/L Hg, was performed for each batch.

CALIBRATION VERIFICATION

Initial Calibration Verification (ICV) and all Continuing Calibration Verification (CCV) were within DQO of ±20% for each batch.

DETECTION LIMIT

All detection limits listed in the table above were achieved.

METHOD BLANKS

Three method blanks were analyzed with each batch of samples. All blanks were below detection limits, and samples are blank corrected with the average blank value per batch.

REPLICATES

One pair of analytical duplicates selected at random was analyzed with each batch of samples. All RPDs met the DQO of $\pm 25\%$.

MATRIX SPIKES

One matrix spike/matrix spike duplicate (MS/MSD) pair was analyzed with each batch of samples. All recoveries and RPDs met the DQO of $\pm 25\%$.

CERTIFIED REFERENCE MATERIAL

One CRM NIST-1641d was analyzed with each batch of samples. All recoveries met the DQO of $\pm 25\%$.

REFERENCES

US Environmental Protection Agency Method 1631. 2002. Mercury in Water by Oxidation, Purge and Trap, and Cold Vapor Atomic Fluorescence Spectrometry, Revision E. US Environmental Protection Agency, Washington, DC.

Modifications to EPA 1631E

Appendix E: Quality Assurance and Control Assessment

HydroFocus, Inc. performed sampling on July 29 and August 26, 2013. McCampbell Analytical, Inc analyzed alkalinity, total phosphorous, coliform, standard anions, standard cations, TDS, pH, electrical conductivity, ammonia, and TKN for all sampling events. Weck Laboratories analyzed for DOC, TOC, pesticides, herbicides, and trihalomethane formation potential for all sampling events. Moss Landing Marine Laboratories analyzed methyl mercury and total mercury for all sampling events. Finally, Frontier GeoSciences analyzed the split sample Marsh Creek methyl mercury for all sampling events. Appendix D contains all laboratory analytical reports.

Prescribed Holding Times

Holding time is defined as the maximum time allowed between sample collection and sample analysis. Results become questionable when the holding time is exceeded. Holding times vary between constituents, and can range from a few hours to a few months. McCampbell Analytical, Weck Laboratories, Moss Landing Marine Laboratory, and Frontier GeoSciences followed EPA recommended holding times for all constituents tested. Weck Laboratories detected possible lab contamination in the Pyrethroids bottle from the July 29, 2013 field blank. A duplicate sample bottle was re-analyzed in the lab past holding time.

Lab Blanks

The laboratory analyzes laboratory blanks using the same procedures as the environmental samples. The blanks consist of deionized and distilled (Reagent Grade Type II) water. Blank analysis can detect potential constituent sources contributed by the laboratory. Examples can include improperly cleaned laboratory equipment, impure reagents, and persistent airborne constituents in the laboratory environment.

The QA/QC review identifies lab blanks with detections of target analytes and evaluates the effect of the detections on associated sample results. No analytes were detected in the laboratory blanks for Weck Laboratories or McCampbell Laboratories. Frontier Global Sciences detected 0.002 ng/L of Methyl Mercury in three method blanks in conjunction with the July samples. These detections are below both the minimum detection limit and minimum reporting limit, and were therefore considered not detected according to laboratory standards. Moss Landing Marine Laboratories detected a low level Methyl Mercury value in one of the method blanks in conjunction with the July samples. This detect was less than the reporting limit and is considered not quantifiable.

Field Blanks

Field blanks detect possible constituent sources contributed from sampling methods and equipment. Examples include, but are not limited to, improperly cleaned sampling equipment, persistent airborne constituents in the sampling environment, and constituent sources in the sample containers.

HydroFocus collected one field blank during each sampling event¹. The laboratories detected the constituents in the blanks shown in the following table. All analytes in the field blanks were substantially below levels in environmental samples, except for Sumithrin. The July sample contained a methyl mercury value of 0.018 ng/L, which not quantifiable since it is less than the reporting limit (0.031 ng/L). Due to the detect in the blank water, we requested new deionized water and used the new bottle for the August sampling event. A Sumithrin value was detected in both the trip blank and field blank from the July sampling event. Weck Laboratories suspected possible contamination, and re-analyzed Sumithrin from a duplicate sample bottle past holding time. This yielded a non-detect Sumithrin result.

Sample Date	TKN (mg/L)	Methyl Mercury (ng/L)	Sumithrin (ng/L)
7/29/2013	0.42	0.018*	15
8/26/2013	ND	ND	11

ND denotes "not detected".

* indicates that a sample was detected, but not quantifiable since it is less than the reporting limit.

Trip Blanks

Trip blanks detect possible constituent sources contributed from sample bottles. Weck Laboratories provided HydroFocus with trip blanks in the appropriate bottles. 17 ng/L of Sumithrin was detected in the trip blank associated with the July 29 sampling event. There was also a Sumithrin detect in the field blank associated with this samples. Weck Laboratories re-analyzed Sumithrin from a separate field blank sample bottle and did not detect any constituents, therefore Weck Laboratories suspects this is possible contamination. All other trip blank analyses were non-detect.

Sample Duplicates

Duplicates monitor matrix consistency or heterogeneity. HydroFocus collected a sample duplicate on August 26, 2013. Most duplicate sample results (89 percent) agreed, had differences within 10-percent, or had differences within the PQL

¹ HydroFocus collected the field blank by filling unfiltered samples directly with deionized water and filling filtered samples by pumping through designated blank tubing. Personnel filled, preserved, stored, and transported sample bottles using the same procedures used for the creek samples.

(Practical Quantitation Limit). Minor variations could be attributed to lab analytical variability or constituent sources introduced in the laboratory, field, or sampling equipment.

Field Duplicates August 26, 2013

PQL	0.05	10	1	1	0.5	1	0.1	1	2	1	0.2	0.5
Analysis	pH (lab)	Cond (lab)	E. Coli	Total Coliform	Ca	Total Alkalinity	Cl	CO ₃	DOC	HCO ₃	Total Hg	K
MC-5 grab	7.96	1650	32	69,000	79	185	340	ND	3.7	225.7	0.614	20
Duplicate	8.14	1630	40	100,000	76	190	340	ND	3.8	231.8	0.598	20
% Difference	2.2%	1.2%	22.2%	36.7%	3.9%	2.7%	0.0%	0.0%	2.7%	2.7%	2.6%	0.0%

PQL	0.031	0.05	0.5	0.05	0.1	1	0.04	0.1	0.1	10	0.15	10
Analysis	MeHg	Mg	Na	NH ₃	NO ₃	OH ⁻	Total P	Ortho-P	SO ₄	TDS	TKN	Sumithrin
MC-5 grab	ND	39	260	0.12	7	ND	1.70	1.6	200	1060	0.68	11
Duplicate	ND	39	250	0.15	7	ND	1.90	1.6	200	1020	0.59	14
% Difference	0.0%	0.0%	3.9%	22.2%	0.0%	0.0%	11.1%	0.0%	0.0%	3.8%	14.2%	24.0%

Blue cell indicates difference is greater than 10% and not within the PQL.

Replicate Methyl Mercury Samples Submitted to Moss Landing Marine Laboratory and Frontier Geosciences Laboratory

As specified in the QAPP and to guarantee accuracy and ensure high quality analytical results, we collected a split sample from Marsh Creek for analysis by Moss Landing Marine Laboratory and Frontier GeoSciences. Also, Moss Landing Marine Laboratory analyzed duplicate Marsh Creek samples. The following table compares the Moss Landing Marine Laboratory reported values to the Frontier GeoSciences reported values. For reference, the minimum reporting limit for each laboratory is also shown.

Laboratory	Moss Landing Marine Laboratory	Frontier GeoSciences
Analysis	MeHg (ng/L)	MeHg (ng/L)
Minimum Detection Limit	0.011	0.026
Minimum Reporting Limit	0.031	0.050
7/29/2013	0.033	ND
7/29/2013 (Duplicate)	0.025*	--
8/26/2013	ND	ND
8/26/2013 (Duplicate)	ND	--

* indicates the concentration was detected, but not quantifiable since below the reporting limit

Matrix Spikes and Laboratory Control Samples

The laboratory analyzed matrix spikes (MS), matrix spike duplicates (MSD), laboratory control samples (LCS), and laboratory control sample duplicates (LCSD) to evaluate the accuracy and precision of the sample extraction and analysis procedures and to evaluate potential matrix interference. Matrix interference is defined as the sample matrix effect on the precision of the extraction and/or analysis procedure. These effects may bias the sample results either high or low.

The laboratory prepares MS or MSD samples by adding a known quantity of the target analyte(s) to a sample. The laboratory then extracts the samples, analyzes them as a typical environmental sample, and reports the results as a percent recovery.

$$\% \text{Recovery} = \frac{\text{Spike analysis result} - \text{original sample concentration}}{\text{Concentration of spike addition}} \times 100\%$$

The laboratory performs duplicate analyses to evaluate the precision of analytical procedures by performing LCSD analyses. The laboratory evaluates precision by calculating a relative percent difference (RPD) using the following equation:

$$RPD \% = \left(\frac{Spike\ Concentration - Spike\ Duplicate\ Concentration}{\frac{1}{2}(Spike\ Concentration + Spike\ Duplicate\ Concentration)} \right) \times 100\%$$

The RPD results for all analytes were within the QC control limits. The laboratory accepted the sample results for the QC batch based on the percent recoveries and/or other acceptable QC data.

Anion-Cation Charge Balance

We calculated anion-cation charge balance by using concentrations of the major anions and cations in milliequivalents per liter (meq/L). We calculate the difference between the two sums as a percentage:

$$\frac{Anions - Cations}{Anions + Cations} \times 100$$

We use +/- 5 percent as a guide for an acceptable percent difference.

The cation/anion balance difference fell within 5 percent for all samples (100 percent). The following table summarizes the results.

Site	Date	Sum Cations (meq/L)	Sum Anions (meq/L)	An/Cat Balance (percent difference)
MC-5 grab	7/29/2013	16.62	15.16	4.6%
MC-5 grab	8/26/2013	18.97	18.00	2.6%
MC-5 grab (D)	8/26/2013	18.39	18.10	0.8%

(D) duplicate sample.

Ratio of Calculated Sum of Dissolved Solids to Specific Conductance

We calculated the ratio of the calculated sum of dissolved solids (mg/L) to specific conductance as follows:

$$\frac{\text{Sum of dissolved solids in mg/L}}{\text{Specific Conductance}}$$

The sum of dissolved solids divided by the specific conductance should fall within the range 0.55 to 0.81². One of the three samples (33 percent) did not fall within this range. The following table summarizes the results.

Site	Date	Calculated Dissolved Solids (mg/L)	Specific Conductance (uS/cm)	Ratio of Calculated Dissolved Solids to Specific Conductance
MC-5 grab	7/29/2013	896	1,682	0.53
MC-5 grab	8/26/2013	1,058	1,871	0.57
MC-5 grab (D)	8/26/2013	1,048	1,871	0.56

(D) duplicate sample.

Ratios in **bold** are outside the recommended limits.

Ratio of the Sum of Reacting Constituents to Specific Conductance

The ratio of the sum of reacting cations (meq/L) to 0.01 times specific conductance, as well as the sum of reacting anions (meq/L) to 0.01 times specific conductance, should be within the range 0.92 to 1.24². We calculated this ratio as follows:

$$\frac{\text{Sum of reacting cations (or anions) in meq/L}}{0.01 \times \text{Specific Conductance}}$$

All of the samples (100 percent) for cations and fell within the range. One of the three samples (33 percent) for anions did not fall within the range. The following table summarizes the results.

Site	Date	Specific Conductance (uS/cm)	Ratio of Cations to 0.01 Specific Conductance	Ratio of Anions to 0.01 Specific Conductance
MC-5 grab	7/29/2013	1,682	0.99	0.90
MC-5 grab	8/26/2013	1,871	1.01	0.96
MC-5 grab (D)	8/26/2013	1,871	0.98	0.97

(D) duplicate sample.

Ratios in **bold** are outside the recommended limits.

² Friedman, L.C., and Erdmann, D.E., 1982, Quality assurance practices for the chemical and biological analyses of water and fluvial sediments: U.S. Geological Survey Techniques of Water-Resources Investigations, book 5, chap. A6, 181 p.

Appendix F: Field Sheets and Chain of Custody Forms

Sampling Log

Project: MC-5
 Site ID: 5586-Dutch Slough
 Date: 7/29/13
 Weather: Sunny, Breezy
 Personnel: CH, TI

Site Type: creek
 drainage ditch

Stage: _____

X-Coord: _____

Y-Coord: _____

Meter Calibration Log					
	pH	EC	DO	Eh	Turbidity
Standard Used	7.10	1413	100%	236.2	0.124
Temperature	21.63	21.67	20.38	20.73	24.76

Field Measurements							
Time	Temp	EC	DO	pH	Eh	Turbidity	Comments
9:53	20.85	1682	7.69	7.99	44.5	0.6	

Sampling Method: grab peristaltic other _____

Sample Collection Log						Sample time:
Analysis	Type	Volume	Quantity	Filtered	Preservative	Lab
MeHg <u>9:20</u>	Boro-Si	250mL	1	No		Moss Landing
Total Hg	Boro-Si	250mL	1	No		Moss Landing
MeHg	Boro-Si	250mL	1	No		Fronteir
Pesticides	Amber	1L	2	No		Weck
Pesticides - 8141	Amber	1L	2	No		Weck
Pesticides - 8081	Amber	1L	2	No		Weck
Herbicides - 8151	Amber	1L	2	No		Weck
Alkalinity	Poly	500mL	1	No		McC Campbell
Total Phosphorous	Amber	1L	1	No	H2SO4	McC Campbell
Coliform	Poly	125mL	2	No	Pre-Preserved	McC Campbell
DOC	Amber	250mL	1	Yes		Weck
Anions, ortho-PO4	Poly	250mL	1	Yes		McC Campbell
Cations	Poly	250mL	1	Yes	HNO3	McC Campbell
TDS, pH, EC	Poly	500mL	1	Yes		McC Campbell
NH3, TKN	Amber	1L	1	Yes	H2SO4	McC Campbell

Notes:

fatty spiders @ site. MC-5A sample @ 10:10
 MC-5C blank @ 10:30

Sampling Log

Project: 5584-Dutch Slough

Site ID: Emerson

Date: 7/29/13

Weather: CH, TI

Personnel: Windy, Sunny

Site Type: creek

drainage ditch

Stage: _____

X-Coord: _____

Y-Coord: _____

Meter Calibration Log

	pH	EC	DO	Eh	Turbidity
Standard Used	—	<u>See MC-5</u>	—	—	—
Temperature	—	—	—	—	—

Field Measurements

Time	Temp	EC	DO	pH	Eh	Turbidity	Comments
<u>12:43</u>	<u>21.14</u>	<u>1595</u>	<u>2.58</u>	<u>7.46</u>	<u>-6.7</u>	<u>13.4</u>	

Sampling Method: grab ~~peristaltic~~ other _____

Sample Collection Log

Sample time: 12:40

Analysis	Type	Volume	Quantity	Filtered	Preservative	Lab
MeHg	Boro-Si	250mL	1	No		Moss Landing
pH/EC	Poly	250mL	1	No		McC Campbell
TOC	Amber	250mL	1	No	H3PO4	Weck
THMFP	Amber	1L	2	Yes		Weck
DOC	Amber	250mL	1	Yes		Weck

Notes:

Dead animal smell @ site

Sampling Log

Project: 5886-Dutch Slough

Site ID: Gilbert

Date: 7/29/13

Weather: Windy, Sunny

Personnel: CHT

Site Type: creek

drainage ditch

Stage: _____

X-Coord: _____

Y-Coord: _____

Meter Calibration Log					
	pH	EC	DO	Eh	Turbidity
Standard Used	<u>7.10</u>	<u>1413</u>	<u>100%</u>	<u>234.9</u>	<u>See MC-5</u>
Temperature	<u>22.19</u>	<u>22.15</u>	<u>21.37</u>	<u>22.22</u>	<u> </u>

Field Measurements							
Time	Temp	EC	DO	pH	Eh	Turbidity	Comments
<u>13:39</u>	<u>20.95</u>	<u>1497</u>	<u>10.07</u>	<u>8.03</u>	37.8	<u>11.7</u>	
					<u>37.8</u>		

Sampling Method: grab peristaltic other _____

Sample Collection Log						Sample time: <u>13:25</u>
Analysis	Type	Volume	Quantity	Filtered	Preservative	Lab
MeHg	Boro-Si	250mL	1	No		Moss Landing
pH/EC	Poly	250mL	1	No		McC Campbell
TOC	Amber	250mL	1	No	H3PO4	Weck
THMFP	Amber	1L	2	Yes		Weck
DOC	Amber	250mL	1	Yes		Weck

Notes:

Sampling Log

Project: SSB Dutch Slough

Site Type: creek

Site ID: Burroughs

drainage ditch

Date: 7/29/13

Stage: _____

Weather: Sunny, windy

X-Coord: _____

Personnel: CH, TI

Y-Coord: _____

Meter Calibration Log					
	pH	EC	DO	Eh	Turbidity
Standard Used	—	2000	See Gilbert		
Temperature	—	21.85	—	—	—

Field Measurements							
Time	Temp	EC	DO	pH	Eh	Turbidity	Comments
14:30	20.88	2018	7.47	7.86	18.0	4.2	

Sampling Method: grab peristaltic other _____

Sample Collection Log						Sample time: 14:20
Analysis	Type	Volume	Quantity	Filtered	Preservative	Lab
MeHg	Boro-Si	250mL	1	No		Moss Landing
pH/EC	Poly	250mL	1	No		McC Campbell
TOC	Amber	250mL	1	No	H3PO4	Weck
THMFP	Amber	1L	2	Yes		Weck
DOC	Amber	250mL	1	Yes		Weck

Notes:

Pump running during sampling

Discharge Measurement

Site: MC-5

Date: 7/29/13 Start Time: 11:20 End Time: 11:35

Observer: CH, TI

Stream Conditions: moderate flow; banks very vegetated

Weather: Sunny, warm, breezy

Water Quality: clear

[illegible]

Page 2 of 23



Frontier Global Sciences

11720 North Creek Parkway North, Suite 400
Bothell, WA 98011
Phone: 425-686-1996
www.frontiergs.com

CHAIN OF CUSTODY FORMS

1307577

Chain of Custody Record & Laboratory Analysis Request:
Air, Water, Sediments, Plant and Animal Tissue,
Hydrocarbon & Other Samples

11720 Northcreek Pkwy N, Suite 400
Bothell, WA 98011
Phone: 425-686-1996
Fax: 425-686-3096
info@FrontierGS.com
http://www.FrontierGS.com



Frontier Global Sciences

Page 1 of 1

Client: HydroFocus, Inc.		Contact: Christina Hart								Analyses Requested		FGS PM:	
Address: 2827 Spafford St. Davis, CA 95618		Phone: (530)759-2484 Fax: (530)756-2687										Date:	
Project Name: Dutch Slough SW		E-mail: chart@hydrofocus.com										TAT (business days) <u>20</u> (std)	
Report To: HydroFocus, Inc.		Contract/PO: 5586										15 10 5 4 3 2 24 hrs.	
Address: 2827 Spafford St. Davis, CA 95618		Invoice To: Teresa Deverel										(For TAT < 10 days, contact PM.	
Phone: (530)759-2484 Fax: (530)756-2687		Address: P.O. Box 2401 Davis, CA 95617										Saturday delivery? ☐ Y ☐ N	
E-mail: chart@hydrofocus.com		Phone: (530)759-2484 Fax: (530)756-2687										(If yes, please contact PM)	
		E-mail: tdeverel@hydrofocus.com										EDD ☐ Y ☐ N	
												QA ☐ Standard ☐ High	
No.	Engraved Bottle ID	Sample ID	# of Bottles	Matrix	Date & Time	Sampled By	Field Filtered (Y/N)	Field Preserved: HNO ₃ HCl BrCl Other (%)	Methyl Mercury				Comments
1	B-131850	MC-SA	1	FW	7/29/13 9:20	TH	N	N	X				Please Ship cooler back with 2 sample bottles for next month. Thanks!
2	B-131854	MC-SC	1	FW	7/29/13 9:23	CH	N	N	X				
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
For Laboratory Use Only		Matrix Codes:		Relinquished By:		Received By:		Received By:					
COC Seal: ☒		Comments:		Name: Christina Hart		Name: OB		Name:					
Cooler Temp:		FW: Fresh Water		Organization: HydroFocus		Organization: EFGS		Organization:					
Carrier: VPS		WW: Waste Water		Date & Time: 7/29/13		Date & Time: 7:30:13		Date & Time:					
VTSR: 9.45		SB: Sea and Brackish Water		Tracking number: 12 413 943 01 4819 5143									
# of Coolers: 1		SS: Soil and Sediment											
		TS: Plant and Animal Tissue											
		HC: Hydrocarbons											
		TR: Trap											
		OT: Other											
Sample Disposal:						By signing, you declare that you agree with FGS' terms and conditions, and that you authorize FGS to perform the specified analyses.							
☐ Return (shipping fees may apply)						Customer Approval: _____ Date: _____							
☐ Standard Disposal - 30 Days after report													
☐ Retain for _____ weeks after report (storage fees may apply)													

Eurofins Frontier Global Sciences

The results in this report only apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Liz Siska

Liz Siska, Project Manager

Page 4 of 11
1307577 Final Report
08/26/2013

14859 East Clark Avenue : Industry : CA 91745
Tel 626-336-2139 ♦ Fax 626-336-2634 ♦ www.wecklabs.com

3G31051

CHAIN OF CUSTODY RECORD

STANDARD

Page 1 Of 4

[illegible]

12/2

CDC version 342797

14859 East Clark Avenue : Industry : CA 91745

Tel 626-336-2139 ♦ Fax 626-336-2634 ♦ www.wecklabs.com

36731051

STANDARD

Page 3 Of 4

CLIENT NAME: HydroFocus, Inc ADDRESS: P.O. Box 2401 Davis, CA 95617				PROJECT: 5586 - Dutch Slough Surface Water PHONE: (530) 759-2484 FAX: (530) 756-2687 EMAIL: chart@hydrofocus.com				ANALYSES REQUESTED Trihalomethane formation potential Organochlorine Pesticides (8081) Organophosphorus Pesticides (8141) Pyrethroid Pesticides by GC/MS SIM Chlorinated Herbicides (8151) Dissolved Organic Carbon Total Organic Carbon										SPECIAL HANDLING ☑ Same Day Rush 150% ☑ 24 Hour Rush 100% ☑ 48-72 Hour Rush 75% ☑ 4 - 5 Day Rush 30% ☑ Rush Extractions 50% ☑ 10 - 15 Business Days ☑ QA/QC Data Package		
PROJECT MANAGER Steve Deverel				SAMPLER Christina Hart, Tim Ingram														Charges will apply for weekends/holidays		
ID# (For Lab Use Only)	DATE SAMPLED	TIME SAMPLED	SMPL TYPE	SAMPLE IDENTIFICATION/SITE LOCATION		# OF CONT.													Method of Shipment:	COMMENTS
	07/29/13	12:40	AQ	Emerson		4	x							x	x					
	07/29/13	13:25	AQ	Gilbert		4	x							x	x					
	07/29/13	14:20	AQ	Burroughs		4	x							x	x					
RELINQUISHED BY <i>Christina Hart</i>				DATE / TIME <i>7/30/13 14:15</i>		RECEIVED BY <i>Ontrac</i>				SAMPLE CONDITION: Actual Temperature: <i>2-3 °C</i>				SAMPLE TYPE CODE AQ=Aqueous NA= Non Aqueous SL = Sludge DW = Drinking Water WW = Waste Water RW = Rain Water GW = Ground Water SO = Soil SW = Solid Waste OL = Oil OT = Other Matrix						
RELINQUISHED BY <i>Ontrac</i>				DATE / TIME <i>7-31-13 10:15</i>		RECEIVED BY <i>Stephanie Perry</i>				Received On Ice Preserved Evidence Seals Present Container Attacked Preserved at Lab				☑ Y / N Y / N Y / N Y / N ☐ N ☐ N ☐ N ☐ N						
RELINQUISHED BY				DATE / TIME		RECEIVED BY														
PRESCHEDULED RUSH ANALYSES WILL TAKE PRIORITY OVER UNSCHEDULED RUSH REQUESTS				SPECIAL REQUIREMENTS / BILLING INFORMATION																
Client agrees to Terms & Conditions at:				www.wecklabs.com																
GOC version 042707																				

CHAIN OF CUSTODY RECORD

14859 East Clark Avenue : Industry : CA 91745

Tel 626-336-2139 ♦ Fax 626-336-2634 ♦ www.wecklabs.com

363105

STANDARD

Page 4 Of 4

CLIENT NAME: HydroFocus, Inc ADDRESS: P.O. Box 2401 Davis, CA 95617				PROJECT: 5586 - Dutch Slough Surface Water PHONE: (530) 759-2484 FAX: (530) 756-2687 EMAIL: chart@hydrofocus.com		ANALYSES REQUESTED Trihalomethane formation potential Organochlorine Pesticides (8081) Organophosphorus Pesticides (8141) Pyrethroid Pesticides by GC/MS SIM Chlorinated Herbicides (8151) Dissolved Organic Carbon Total Organic Carbon										SPECIAL HANDLING Same Day Rush 150% 24 Hour Rush 100% 48-72 Hour Rush 75% 4 - 5 Day Rush 30% Rush Extractions 50% 10 - 15 Business Days QA/QC Data Package		
PROJECT MANAGER Steve Deverel				SAMPLER Christina Hart, Tim Ingram												Charges will apply for weekends/holidays		
ID# (For lab Use Only)	DATE SAMPLED	TIME SAMPLED	SMPL TYPE	SAMPLE IDENTIFICATION/SITE LOCATION		# OF CONT.											Method of Shipment:	
			AQ	Trip Blank		7	x	x	x	x	x	x	x			COMMENTS		
RELINQUISHED BY Christina Hart			DATE / TIME 7/30/13 12:00			RECEIVED BY Ontrac			SAMPLE CONDITION: Actual Temperature: 2.3 °C				SAMPLE TYPE CODE: AQ=Aqueous NA= Non Aqueous SL = Sludge DW = Drinking Water WW = Waste Water RW = Rain Water GW = Ground Water SO = Soil SW = Solid Waste OL = Oil OT = Other Matrix					
RELINQUISHED BY Ontrac			DATE / TIME 7-31-13 10:15			RECEIVED BY Arlene Hery			Received On Ice Preserved Evidence Seals Present Container Attacked Preserved at Lab				Y/N Y/N Y/N Y/N Y/N					
RELINQUISHED BY			DATE / TIME			RECEIVED BY												

PRESCHEDULED RUSH ANALYSES WILL TAKE PRIORITY
OVER UNSCHEDULED RUSH REQUESTS

Client agrees to Terms & Conditions at:

www.wecklabs.com

SPECIAL REQUIREMENTS / BILLING INFORMATION

Sampling Log

Project: 5586
 Site ID: MC-5
 Date: 8/26/13
 Weather: Sunny, warm, windy
 Personnel: CL, JT

Site Type: creek
drainage ditch

Stage: _____

X-Coord: _____

Y-Coord: _____

Meter Calibration Log					
	pH	EC	DO	Eh	Turbidity
Standard Used	7.16	2000	100%	236.2	0.124
Temperature	22.07	21.92	20.00	21.43	23.00

Field Measurements							
Time	Temp	EC	DO	pH	Eh	Turbidity	Comments
9:54	20.92	1871	6.56	7.60	421	0	

Sampling Method: grab peristaltic other _____

Sample Collection Log						Sample time:
Analysis	Type	Volume	Quantity	Filtered	Preservative	Lab
MeHg	Boro-Si	250mL	1	No		Moss Landing
Total Hg	Boro-Si	250mL	1	No		Moss Landing
MeHg	Boro-Si	250mL	1	No		Fronteir
Pesticides	Amber	1L	2	No		Weck
Pesticides - 8141	Amber	1L	2	No		Weck
Pesticides - 8081	Amber	1L	2	No		Weck
Herbicides - 8151	Amber	1L	2	No		Weck
Alkalinity	Poly	500mL	1	No		McC Campbell
Total Phosphorous	Amber	1L	1	No	H2SO4	McC Campbell
Coliform	Poly	125mL	2	No	Pre-Preserved	McC Campbell
DOC	Amber	250mL	1	Yes		Weck
Anions, ortho-PO4	Poly	250mL	1	Yes		McC Campbell
Cations	Poly	250mL	1	Yes	HNO3	McC Campbell
TDS, pH, EC	Poly	500mL	1	Yes		McC Campbell
NH3, TKN	Amber	1L	1	Yes	H2SO4	McC Campbell

Notes:

MC-5A Sample: 10:00
 MC-5B Duplicate: 10:10
 MC-5C Blank: 10:35 - windy during sampling

Sampling Log

Project: SS86
 Site ID: Emerson
 Date: 8/26/13
 Weather: Sunny Windy
 Personnel: CL, H

Site Type: creek
drainage ditch
 Stage: _____
 X-Coord: _____
 Y-Coord: _____

Meter Calibration Log					
	pH	EC	DO	Eh	Turbidity
Standard Used	—	<u>See MC-5</u>		—	—
Temperature	—	—	—	—	—

Field Measurements							
Time	Temp	EC	DO	pH	Eh	Turbidity	Comments
<u>12:34</u>	<u>21.30</u>	<u>2480</u>	<u>2.09</u>	<u>7.69</u>	<u>-31.0</u>	<u>2.0</u>	

Sampling Method: grab peristaltic other _____

Sample Collection Log						Sample time: <u>12:35</u>
Analysis	Type	Volume	Quantity	Filtered	Preservative	Lab
MeHg	Boro-Si	250mL	1	No		Moss Landing
pH/EC	Poly	250mL	1	No		McC Campbell
TOC	Amber	250mL	1	No	H3PO4	Weck
THMFP	Amber	1L	2	Yes		Weck
DOC	Amber	250mL	1	Yes		Weck

Notes:

Pump running during sampling

Sampling Log

Project: 8506

Site ID: Gilbert

Date: 8/26/13

Weather: CL, TI

Personnel: Sunny, Windy

Site Type: creek

drainage ditch

Stage: _____

X-Coord: _____

Y-Coord: _____

Meter Calibration Log					
	pH	EC	DO	Eh	Turbidity
Standard Used	7.16	2000	100%	238.0	See MC-5
Temperature	21.1	22.24	22.04	22.80	—

Field Measurements							
Time	Temp	EC	DO	pH	Eh	Turbidity	Comments
13:23	22.25	2058	8.81	7.67	55.1	9.6	

Sampling Method: grab peristaltic other _____

Sample Collection Log						Sample time: 13:10
Analysis	Type	Volume	Quantity	Filtered	Preservative	Lab
MeHg	Boro-Si	250mL	1	No		Moss Landing
pH/EC	Poly	250mL	1	No		McC Campbell
TOC	Amber	250mL	1	No	H3PO4	Weck
THMFP	Amber	1L	2	Yes		Weck
DOC	Amber	250mL	1	Yes		Weck

Notes:

Pump running during sampling

Sampling Log

Project: 5506
 Site ID: Burroughs
 Date: 8/26/13
 Weather: Sunny, Windy
 Personnel: CL, TI

Site Type: creek
drainage ditch

Stage: _____

X-Coord: _____

Y-Coord: _____

Meter Calibration Log					
	pH	EC	DO	Eh	Turbidity
Standard Used	-	1413	See Gilbert		
Temperature	-	22.44			

Field Measurements							
Time	Temp	EC	DO	pH	Eh	Turbidity	Comments
13:37	20.94	1967	17.9	7.61	1.6	5.5	

Sampling Method: grab peristaltic other _____

Sample Collection Log						Sample time: 13:55
Analysis	Type	Volume	Quantity	Filtered	Preservative	Lab
MeHg	Boro-Si	250mL	1	No		Moss Landing
pH/EC	Poly	250mL	1	No		McC Campbell
TOC	Amber	250mL	1	No	H3PO4	Weck
THMFP	Amber	1L	2	Yes		Weck
DOC	Amber	250mL	1	Yes		Weck

Notes:

Discharge Measurement

Site: MC-5

Date: 8/26/13 Start Time: 1115 End Time: 1130

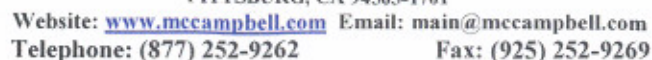
Observer: CH, TE

Stream Conditions: _____

Weather: _____

Water Quality: _____

	Location	Distance (in)	Distance from initial Point (in)	Depth (ft)	Method	Velocity (fpm)	Horiz. Angle of Msmt. (deg)
	RB	22	—	—		—	—
1 12		35	13	0.20		0.07	0
2 24		44	22	0.40		0.02	0
3 36		53	31	0.30		0.13	0
4 48		62	40	0.30		0.33	0
5 60		70	48	0.32		0.21	0
6 72		75	53	0.32		0.18	0
7 84		80	58	0.35		1.30	20
8 96		89	67	0.35		0.41	0
9 108		98	76	0.35		2.81	0
10 120		106	84	0.35		0.95	0
11 132		113	91	0.40		1.88	0
12 144		118	96	0.30		1.15	10
13 156		130	108	0.35		1.39	0
14 168		138	116	0.40		1.63	0
15 180		144	122	0.40		1.25	0
16 192		151	129	0.35		0.72	0
17 204		159	137	0.30		0.35	0
18 216		166	144	0.30		1.35	0
19 228		174	152	0.30		1.98	10
20 240		183	161	0.40		1.13	10
		191	169	0.40		0.46	0
		200	178	0.40		0.35	0
	LB	205	183	—		—	—



☐ RUSH ☐ 24 HR ☐ 48 HR ☐ 72 HR ☒ 5 DAY

GeoTracker EDF ☐ PDF ☐ Excel ☒ Write On (DW) ☐
☐ Check if sample is effluent and "J" flag is required

Report To: Christina Lucero	Bill To: Teresa Deverel
Company: HydroFocus	P.O. Box 2401
P.O. Box 2401	Davis, CA 95617
Davis, CA 95617	E-Mail: chart@hydrofocus.com
Tele: 530-759-2484	Fax: 530-756-2687
Project #: 5586	Project Name: Dutch Slough SW
Project Location: Dutch Slough	
Sampler Signature: <i>Christina Lucero</i>	

Analysis Request

Other

Comments

[illegible]

1308558



Frontier Global Sciences

Chain of Custody Record & Laboratory Analysis Request:
Air, Water, Sediments, Plant and Animal Tissue,
Hydrocarbon & Other Samples

11720 Northcreek Pkwy N, Suite 400
Bothell, WA 98011
Phone: 425-686-1996
Fax: 425-686-3096

info@FrontierGS.com
<http://www.FrontierGS.com>

Page 1 of 1

Client: HydroFocus, Inc.		Contact: Christina Lucero		Analyses Requested HNO ₃ HCl BrCl Other (%) Methyl Mercury		FGS PM:						
Address: 2827 Spafford St. Davis, CA 95618		Phone: (530)759-2484 Fax: (530)756-2687				Date:						
Project Name: Dutch Slough SW		E-mail: chart@hydrofocus.com				TAT (business days) <u>20</u> (std)						
Report To: HydroFocus, Inc.		Contract/PO: 5586				15 10 5 4 3 2 24 hrs.						
Address: 2827 Spafford St. Davis, CA 95618		Invoice To: Teresa Deverel				(For TAT < 10 days, contact PM.)						
Phone: (530)759-2484 Fax: (530)756-2687		Address: P.O. Box 2401 Davis, CA 95617				Surcharges apply for expedited TAT)						
E-mail: chart@hydrofocus.com		Phone: (530)759-2484 Fax: (530)756-2687		Saturday delivery? ☐ Y ☐ N		(If yes, please contact PM)						
E-mail: tdeverel@hydrofocus.com		E-mail: tdeverel@hydrofocus.com				EDD ☐ Y ☐ N						
						QA ☐ Standard ☐ High						
No.	Engraved Bottle ID	Sample ID	# of Bottles	Matrix	Date & Time	Sampled By	Field Filtered (Y/N)	Field Preserved: HNO ₃ HCl BrCl Other (%)	Methyl Mercury			Comments
1	B-131665	MC-SA	1	FW	8/24/13 9:20	TJ	N	N	X			
2	B-131691	MC-SC	1	FW	8/26/13 10:35	CH	N	N	X			
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
For Laboratory Use Only			Matrix Codes:		Relinquished By:		Received By:		Received By:			
COC Seal: N/A			FW: Fresh Water		Christina Lucero		Owen Valentine		Name:			
Cooler Temp: 0.4			WW: Waste Water		Name: Christina Lucero		Name: Owen Valentine		Organization:			
Carrier: UPS			SB: Sea and Brackish Water		Organization: HydroFocus		Organization: EFG8		Date & Time:			
VTSR: 0925			SS: Soil and Sediment		Date & Time: 8/24/13 14:15		Date & Time: 8/27/13 0932		Date & Time:			
# of Coolers:			TS: Plant and Animal Tissue		Tracking number: 1Z4139A30118158310							
			HC: Hydrocarbons									
			TR: Trap									
			OT: Other									
Sample Disposal:						By signing, you declare that you agree with FGS' terms and conditions, and that you authorize FGS to perform the specified analyses.						
☐ Return (shipping fees may apply)						Customer Approval: Christina Lucero						
☐ Standard Disposal - 30 Days after report						Date: 8/26/13						
☐ Retain for ____ weeks after report (storage fees may apply)												

14859 East Clark Avenue : Industry : CA 91745

Tel 626-336-2139 ♦ Fax 626-336-2634 ♦ www.wecklabs.com

3428014

CHAIN OF CUSTODY RECORD

STANDARD

Page 3 Of 4

CLIENT NAME:						PROJECT:											
HydroFocus, Inc						5586 - Dutch Slough Surface Water											
ADDRESS: P.O. Box 2401 Davis, CA 95617						PHONE: (530) 759-2484 FAX: (530) 756-2687 EMAIL: chart@hydrofocus.com											
PROJECT MANAGER Steve Deverel						SAMPLER Christina Lucero, Tim Ingram											
ID# (For lab Use Only)	DATE SAMPLED	TIME SAMPLED	SMP TYPE	SAMPLE IDENTIFICATION/SITE LOCATION		# OF CONT.	Trihalomethane formation potential	Organochlorine Pesticides (8081)	Organophosphorus Pesticides (8141)	Pyrethroid Pesticides by GC/MS SIM	Chlorinated Herbicides (8151)	Dissolved Organic Carbon	Total Organic Carbon				
	08/26/13	10:35	AQ	MC-5C		9	x	x	x	x	x						
RELINQUISHED BY <i>Christina Lucero</i>				DATE / TIME 8/27/13 13:30		RECEIVED BY				SAMPLE CONDITION: Actual Temperature: 71.4 °E				SAMPLE TYPE CODE: AQ=Aqueous NA= Non Aqueous SL = Sludge			
RELINQUISHED BY <i>Antrac</i>				DATE / TIME 8/27/13 09:20		RECEIVED BY <i>Husam Alian</i>				Received On Ice Preserved Y / N Evidence Seals Present Y / N Container Attacked Y / N Preserved at Lab Y / N				DW = Drinking Water WW = Waste Water RW = Rain Water GW = Ground Water SO = Soil SW = Solid Waste OL = Oil OT = Other Matrix			
RELINQUISHED BY				DATE / TIME		RECEIVED BY											

PRESCHEDULED RUSH ANALYSES WILL TAKE PRIORITY
OVER UNSCHEDULED RUSH REQUESTS

Client agrees to Terms & Conditions at:

www.wecklabs.com

SPECIAL REQUIREMENTS / BILLING INFORMATION

COC version: 042707

