FINAL
Wet Weather Water Quality Sampling Activity Report

Oxford Retention Basin Sediment and Water Quality Characterization Study

Marina del Rey
Los Angeles, California

Prepared For:

County of Los Angeles Department of Public Works
Watershed Management Division
900 South Fremont Avenue
Alhambra, California 91803

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ACRONYMS AND ABBREVIATIONS

BOD	biological oxygen demand
CAM	California Assessment Manual
CMC	Criteria Maximum Concentration
COC	chain-of-custody
COD	chemical oxygen demand
COP	California Ocean Plan
CTR	California Toxics Rule
DOC	dissolved organic carbon
FAA	Federal Aviation Administration
GPS	Global Positioning System
HSP	Health and Safety Plan
ID	identification
IC	Ion Chromatography
MdRH	Marina del Rey Harbor
MPN	Most Probable Number
ORB	Oxford Retention Basin
PAH	polycyclic aromatic hydrocarbon
pH	hydrogen ion concentration
PCB	polychlorinated biphenyl
QA	Quality Assurance
SAP	Sampling and Analysis Plan
SM	Standard Methods
SVOC	semi-volatile organic compound
TDS	total dissolved solids
TKN	total Kjeldahl nitrogen
TMDL	Total Maximum Daily Load
TOC	total organic carbon
TPH	total petroleum hydrocarbons
TPH-CC	total petroleum hydrocarbon carbon chain
TSS	total suspended solids
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound
WAAS	Wide Area Augmentation System
WER	water effects ratio

1.0 INTRODUCTION

1.1 Sampling and Testing Objectives

The Oxford Retention Basin (ORB) serves primarily as a flood control facility and is an integral part of the Marina del Rey local drainage system. The purpose of the basin is to retain urban and stormwater runoff until it can be safely discharged into Basin E of the Marina del Rey Harbor (MdRH). During storms, contaminants associated with development and street runoff are carried into ORB and then into Basin E through two tide gates. The quality of the discharged water is speculated to be poor, mainly due to high recorded concentrations of bacteria and other pollutants of concern.

The objective of this project task was to utilize an efficient and scientifically defensible approach to characterize water quality during a storm event in both ORB and the adjacent Basin E. Specifically, the water quality study aimed to complete the following:

- Understand the extent of chemical and bacterial contamination in the water column within the ORB.
- Characterize water quality conditions in ORB in relation to the Bacteria and Toxics Total Maximum Daily Loads (TMDLs) compliance requirements at Basin E within MdRH.
- Determine the relationship among contaminants found in the ORB and their potential impacts to Basin E in MdRH.
- Satisfy the necessary requirements to evaluate the disposal options for sediment removal.

To attain these objectives, water from the ORB, Basin E, and the Boone Olive Pump Station were sampled and analyzed (Figure 1). Water was sampled prior to, during, and following a storm event and analyzed for chemicals and bacteria. In addition, water quality will be sampled once during dry weather and tested for chemical and physical parameters as well as bacterial content. Analyses for water samples included semi-volatile organic compounds (SVOCs), California Assessment Manual (CAM) 17 metals, chlorinated pesticides, total petroleum hydrocarbons (TPH), total organic carbon (TOC), hydrogen ion concentration (pH), nutrients, and indicator bacteria. Additional analyses for water included volatile organic compounds (VOCs), polychlorinated biphenyls (PCB), dissolved organic carbon (DOC), hardness, total dissolved solids (TDS), and total suspended solids (TSS).

Sample locations and analysis protocols established for this study were selected to provide high resolution data about water quality in ORB and the adjacent receiving water, Basin E.

2.0 MATERIALS AND METHODS

2.1 Field Collection Program for Wet Weather Water Quality Samples

The wet weather water quality field sampling program was completed on January 12-13, 2010 in accordance with the approved Sampling and Analysis Plan (SAP) and followed guidance provided in the Health and Safety Plan (HSP).

2.1.1 Station Locations

The sampling stations for both the wet and dry weather component of the water quality sampling are shown in Figure 1. Due to extremely shallow water during low tide, Station ORB-E was moved approximately 40 meters southwest of the proposed location as described in the SAP (Table 1). The relocation of Station ORB-E to an area slightly deeper allowed for water collection without the draft of the inflatable boat disturbing the sediment layer during water sample collection.

As the goal of these sampling events was to characterize the baseline wet weather water quality conditions in the two basins, water samples were collected from a number of locations and composited together to more accurately represent water quality conditions in each basin (Figure 1). In ORB, water was collected from five sample locations and composited to represent one sample for analysis. Basin E samples were collected from three sample locations and composited into one sample for laboratory analysis. Three of the constituents from the analyte list are not conducive to composite analysis. Thus, for VOCs, TPH, and fecal indicator bacteria analysis, samples were collected from a single sample location (Station ORB-C in ORB and Station E-C in Basin E) that was determined to best represent the basin water quality as a whole.

For the complete description of water quality sample compositing see Section 0.

Table 1. Station Identification (ID) and Latitude and Longitude Coordinates for Water Samples Collected Within the Oxford Retention Basin, Basin E, and at the Boone Olive Pump Station

Area/Basin	Station ID	Latitude	Longitude
Oxford Retention Basin	ORB-A	33.98482	-118.45650
	ORB-B	33.98530	-118.45570
	ORB-C	33.98524	-118.45525
	ORB-D	33.98548	-118.45505
	ORB-E	33.98536	-118.45479
Exchange Water	X-ORB	33.98437	-118.45632
	X-Basin E	33.98355	-118.45609
Basin E	Basin E-A	33.98290	-118.45499
	Basin E-B	33.98328	-118.45547
	Basin E-C	33.98292	-118.45600
Boone Olive Pump Station	Boone Olive	33.98461°	-118.45928°

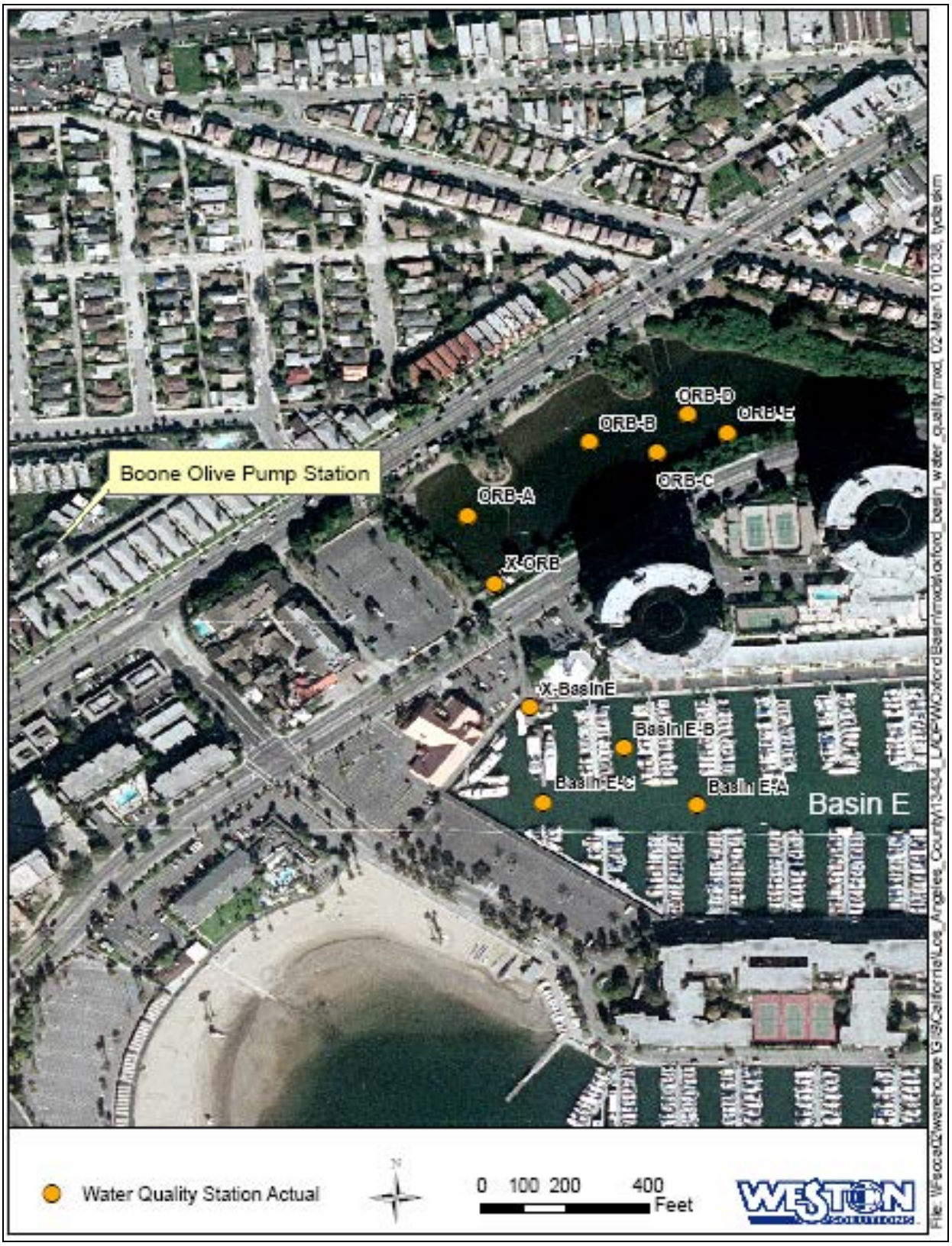

Figure 1. Water Quality Sampling Stations within the Oxford Retention Basin, Basin E, and Boone Olive Pumping Station

In addition to the samples collected in ORB and Basin E, samples were also collected from Boone Olive Pump Station. During dry weather conditions runoff entering Boone Olive Pump Station is diverted to the sanitary sewer system. However, during storm conditions the sanitary sewer diversion is shut off, and storm water flows freely to Basin E, approximately 90 meters south of the ORB outfall.

During the wet weather survey, an additional set of water quality grab samples were collected from ORB and the exchange water between ORB and Basin E. These samples were collected for use in understanding the potential feasibility of bioremediation techniques on existing sediment within ORB.

For the wet weather water sampling, "Exchange" water samples were collected on the "Basin E" side of the culverts during flood tide, and on the "ORB" side during ebb tide.

2.1.2 Water Quality Sample Collection and Handling

Water quality samples in ORB and Basin E for both wet and dry weather sampling events were collected from an inflatable boat in ORB and from a kayak in Basin E. At the five locations within ORB and three locations within Basin E: the latitude and longitude, as well as station depth, depth of saltwater lens (if present) and physical water quality measurements were recorded. The physical water quality measurements that were recorded at each station were: temperature, pH, specific conductivity, dissolved oxygen, and turbidity.

For the wet weather water sampling, "Exchange" water samples were collected on the "Basin E" side of the culverts during flood tide, and on the "ORB" side during ebb tide. Physical water quality measurements, depth, and presence/depth of the saltwater lens were recorded as well.

During the wet weather event, one water quality sample was collected from the Boone Olive Pump Station sump. The samples were collected using a telescoping sample pole with appropriate analyte sample containers. Physical water quality measurements, depth, and presence/depth of the saltwater lens were recorded as well.

Table 2 depicts the water quality sampling protocol. Samples were collected for each sampling effort as described in the table below.

At each water quality sample location, salinity measurements were collected to determine if any freshwater lenses or layers were present. If a freshwater lens was present, the depth of the lens at that location was recorded. Water quality samples for were collected from below the freshwater lens, if detected. During the course of this study one field duplicate and one field blank sample were collected for Quality Assurance (QA) purposes.

The composite water samples were collected directly into 2 liter glass jars and composited into 19 liter borosilicate glass jugs. The composite sample was then partitioned from the glass jug into separate, appropriate analyte containers as needed.

Field scientists wearing clean, disposable gloves collected water grab samples in sterile, glass containers. Water to be tested for conventional analytes was collected from beneath the water surface to a depth of 6 inches (or below the freshwater lens, if determined present). The bottle was submerged open-end down approximately 6 inches below the water's surface. The bottle was then turned face-up and allowed to fill. Care was taken to avoid contaminating the sample with debris and/or disturbed sediment.

Table 2. Water Quality Sampling Protocol

		Wet Weather								Dry Weather			
		Pre-Storm		Prior to Stormwater Release		During Stormwater Release		Oxford Basin Drained		Flood Tide		Ebb Tide	
Area/Basin	Station ID	Composite Samples[1]	Individual Grab Samples[2]	Composite Samples[1]	Individual Grab Samples[2]	Composite Samples[1]	Individual Grab Samples[2]	Composite Samples[1]	Individual Grab Samples[2]	Composite Samples[1]	Individual Grab Samples[2]	Composite Samples[1]	Individual Grab Samples[2]
Oxford Retention Basin	ORB-A												
	ORB-B												
	ORB-C	X	X	X (X)	X					X	X	X	X
	ORB-D												
	ORB-E												
Exchange Water	X-ORB	X	X	(X)		X	X					X	X
	X-Basin E	X	X							X	X		
Basin E	Basin E-A		X		X		X		X		X		X
	Basin E-B	X		X		X		X		X		X	
	Basin E-C												
Boone Olive Pump Station	Boone Olive					X	X					X	X

[1] **Composite Samples** SVOCs, Metals, Organochlorine Pesticides, PCBs, TOC, DOC, pH, Hardness, TDS, TSS, Nurrients

[2] **Individual Grab Samples** VOCs, TPH and fecal indicator bacteria

Only one of these two locations will be sampled based upon tide and gate conditions

No samples to be collected

(X) Additional analytes to be collected for bioremediation study (O+G, cyanide, BOD, COD, chloride, Organophosphorus Pesticides)

2.1.3 Sample Processing and Storage

The composite water samples were collected directly into new 2 liter glass jars and composited into 19 liter borosilicate glass jugs. The composite sample was then partitioned from the glass jug into separate, appropriate analyte containers as needed.

The grab samples that were not conducive to composite sampling, as well as the exchange water sites and additional analytes samples were collected in the field directly into the appropriate lab containers for each respective analyte.

After samples were partitioned to the appropriate analyte containers they were immediately placed in coolers on ice. The samples were kept in accordance with strict chain-of-custody (COC) procedures until relinquished to laboratory couriers.

2.2 Overall Field Collection Program Protocols

2.2.1 Navigation

All station locations were pre-planned (refer to SAP). Locations were determined using a Garmin Wide Area Augmentation System (WAAS) enabled Global Positioning System (GPS) device. The system uses corrections provided by the Federal Aviation Administration (FAA) and was accurate within 15 ft. All final station locations were recorded in the field using positions from the GPS.

2.2.2 Decontamination of Field and Laboratory Equipment

All sampling equipment was cleaned prior to sampling. Water samples collected for composite analysis samples were collected in new lab certified pre-cleaned 2 liter jars. The composite samples were then poured into lab-cleaned 19 liter borosilicate jars, and then homogenized and partitioned into appropriate containers for laboratory analysis.

The grab samples that were not conducive to composite sampling, as well as the exchange water sites and additional analytes samples were collected in the field directly into the appropriate lab containers for each respective analyte.

2.2.3 Shipping

Prior to delivery of samples to the various chemistry laboratories, sample containers were securely packed inside the cooler with ice. COC forms were filled out, and the original signed COC forms were inserted in a sealable plastic bag and placed inside the cooler. The cooler lids were securely taped shut. Samples were delivered to the analytical laboratories listed in Table 3.

Table 3. Analytical Laboratories, Point-of-Contact Information, and Shipping Information

Laboratory	Analyses Performed	Point-of-Contact	Shipping Information
CRG Marine Laboratories, Inc.	Sediment and Water chemistry	Mr. Eugene Chae (310) 533-5190/(310) 320-1276	CRG Marine Laboratories, Inc. 2020 Del Amo Blvd. Torrance, CA 90501

2.2.4 Documentation of Chain-of-Custody

Samples were considered to be in custody if they were: (1) in the custodian's possession or view, (2) retained in a secured place (under lock) with restricted access, or (3) placed in a secured container. The principal documents used to identify samples and to document possession were COC records, field log books, and field tracking forms. COC procedures were used for all samples throughout the collection, transport, and analytical process, and for all data and data documentation, whether in hard copy or electronic format.

COC procedures were initiated during sample collection. A COC record was provided with each sample or sample group. Each person who had custody of the samples signed the form and ensured that the samples were not left unattended unless properly secured. Minimum documentation of sample handling and custody included the following:

- Sample ID
- Sample collection date and time
- Any special notations on sample characteristics
- Initials of the person collecting the sample
- Date the sample was sent to the laboratory
- Shipping company and waybill information

The completed COC form was placed in a sealable plastic envelope that traveled inside the ice chest containing the listed samples. The COC form was signed by the person transferring the custody of the samples. The condition of the samples was recorded by the receiver. COC records were included in the final analytical report prepared by the laboratory, and were considered an integral part of that report.

2.3 Physical and Chemical Analyses

2.3.1 Wet Weather Water Quality Samples

A total of 16 water samples (14 samples plus 1 field duplicate and 1 blank) were collected and analyzed during this project. Each water sample was analyzed for:

- VOCs
- SVOCs
- CAM 17 Metals (Total and Dissolved)
- chlorinated pesticides
- TPH (C6-C44)
- PCBs
- TOC
- DOC
- pH
- Hardness
- TDS
- TSS
- Indicator Bacteria (Total and Fecal Coliform, *E. coli*, and Enterococcus) (not composited)
- Nutrients (ammonia, total Kjeldahl nitrogen (TKN), nitrate, nitrite, orthophosphate)
- sulfides

All chemical analyses were conducted in accordance with United States Environmental Protection Agency (USEPA) or Standard Methods (SM) approved methods. Total and dissolved metals were also analyzed and ultra-low detection limits (0.1 ng/l) for PCB analysis were used to satisfy established TMDL requirements.

To understand the potential feasibility of bioremediation techniques on existing sediment, WESTON, in consultation with Anderson Environmental, collected an additional volume of water from ORB and at the discharge point just prior to discharge to Basin E following the wet weather event. The following additional analyses on the composite water samples were performed:

- Oil and Grease
- Cyanide
- biological oxygen demand (BOD)
- chemical oxygen demand (COD)
- Chloride
- Organophosphorus Pesticides

3.0 RESULTS

3.1 Sample Collection

The wet weather water quality field sampling program was completed on January 12-13, 2010 in accordance with the approved SAP. Four sampling efforts were conducted during the sampling event.

The first sampling effort was conducted prior to the onset of rain (termed Pre-Storm) during the low tide. This Pre-Storm sampling effort was conducted to assess water quality during dry weather conditions. Samples were collected from ORB, Basin E, and the exchange water from the ORB side of the tide gate during this Pre-Storm sample collection.

The second sampling effort (termed Prior to Stormwater Release) was conducted after the storm had passed, and ORB had filled with stormwater runoff (with the tide gates closed). This sampling effort was collected to assess stormwater quality entering ORB via the associated storm drain system. During this sampling effort, samples were also collected from within Basin E, and represent water quality within Basin E prior to the release of stormwater runoff from ORB into Basin E. Samples were also collected during this sampling effort for the additional list of analytes listed at the end of Section 2.3.1. These additional analyte samples were collected from ORB as well as the exchange water between the two basins.

The third sampling effort (termed During Storm Water Release) was conducted after the tide gate between ORB and Basin E was opened. During this sampling effort samples were collected from the exchange water (discharge from ORB to Basin E), Basin E, and Boone Olive Pump Station.

The fourth sampling effort was collected after ORB had completely discharged (termed ORB Drained). Samples were collected from Basin E only during this sampling effort.

Table 4. Station ID and Latitude and Longitude Coordinates for Water Samples Collected Within the Oxford Retention Basin, Basin E, and at the Boone Olive Pump Station

Area/Basin	Station ID	Latitude	Longitude
Oxford Retention Basin	ORB-A	33.98482	-118.45650
	ORB-B	33.98530	-118.45570
	ORB-C	33.98524	-118.45525
	ORB-D	33.98548	-118.45505
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	Basin E-B	33.98328	-118.45547
	Basin E-C	33.98292	-118.45600
Boone Olive Pump Station	Boone Olive	33.98461°	-118.45928°

3.2 Wet Weather Water Quality Chemistry

3.2.1 Field Data Results

Physical parameter measurements were taken in the field during the wet weather event of January 12-13, 2010. Measurements were recorded at each designated station in conjunction with sample collection. The data collected in the field is summarized in Table 5.

3.2.2 Analytical Chemistry Results

Results of the wet weather water quality sampling are presented in Table 6. These results were compared to the either the California Ocean Plan (COP) and/or the California Toxics Rule (CTR) as appropriate.

3.2.3 Microbiology Results

Grab samples were collected during the storm event of January 13, 2010. A total of 12 samples were collected from ORB, Basin E and the Boone-Olive pump station. Results from the microbiology samples are presented in Table 6. While samples were collected and analyzed for total coliform, fecal coliform, and enterococci, *E. coli* were not enumerated.

3.2.4 Additional Analytes Results

To understand the potential feasibility of bioremediation techniques on existing sediment, WESTON, in consultation with Anderson Environmental, collected an additional volume of water from ORB and at the discharge point just prior to discharge to Basin E following the wet weather event. The additional analyses on the composite water samples are presented in Table 7.

Table 5. Field Observations of Water Quality During Wet Weather Monitoring Event at Oxford Retention Basin

Parameter	Unit	Pre Storm										
		Oxford Basin					Exchange Water		Basin E			Boone Olive Pump Station
		ORB-A	ORB-B	ORB-C	ORB-D	ORB-E	X-ORB	X-Basin E	Basin E-A	Basin E-B	Basin E-C	Boone Olive
Date		1.12.10	1.12.10	1.12.10	1.12.10	1.12.10	1.12.10		1.12.10	1.12.10	1.12.10	
Time		2040	2040	2040	2040	2040	2210		2310	2310	2310	
pH		8.31	8.37	8.50	8.38	8.23	7.94		8.03	8.04	8.02	
Conductivity	mS	28.91	27.29	27.34	25.39	20.76	54.16		50.69	50.15	50.82	
Turbidity	NTU	5.0	9.5	5.7	18.3	31.7	1		-0.4	-0.3	-0.5	
Dissolved Oxygen	mg/L	12.4	9.44	11.55	8.36	6.6	7.45		7.96	8.22	8.03	
Temperature	°C	16.48	16.59	15.97	15.46	15.38	14.64		14.8	14.79	14.82	
Color		slight yellow	slight yellow	slight yellow	slight yellow	yellow	None		None	None	None	
Odor		None	None	sulfide	sulfide	sufide	None		None	None	None	
Clarity		Clear	Clear	Clear	Clear	Opaque	Clear		Clear	Clear	Clear	
Water Depth (Total)	feet	1.0	0.9	0.6	0.6	0.4	4.16		14	12.5	18.6	
Fresh Water Lens Depth	feet	0	0	0	0	0	0		0	0	0	
Prior to Stormwater Release												
Date		1.13.10	1.13.10	1.13.10	1.13.10	1.13.10	1.13.10		1.13.10	1.13.10	1.13.10	
Time		1010	1010	1010	1010	1010	1130		1150	1150	1150	
pH		7.9	8.02	7.93	7.94	7.99	7.87		7.94	7.92	7.69	
Conductivity	mS	46.2	36.25	45.55	44.52	42.99	51.06		51.00	50.95	50.81	
Turbidity	NTU	5.6	9.2	5.2	6.4	9.8	1.4		-0.2	-0.2	-0.3	
Dissolved Oxygen	mg/L	7.70	7.77	7.23	7.09	7.12	7.98		7.54	7.53	7.69	
Temperature	°C	14.91	15.0	15.0	15.08	15.15	16.04		14.87	14.96	14.84	
Color		None	None	None	None	None	None		None	None	None	
Odor		None	None	None	None	None	None		None	None	None	
Clarity		Clear	Clear	Clear	Clear	Clear	Clear		Clear	Clear	Clear	
Water Depth (Total)	feet	3.5	2.25	2.4	1.8	2.0	5.8		12.5	11.2	15.5	
Fresh Water Lens Depth	feet	1.3	2.0	1.66	1.5	1.5	0		<0.3	0	0	
During Stormwater Release												
Date								1.13.10	1.13.10	1.13.10	1.13.10	1.13.10
Time								1400	1425	1425	1425	1500
pH								8.02	7.83	7.86	7.81	7.69
Conductivity	mS							32.53	50.04	50.41	50.58	N/A
Turbidity	NTU							12.5	1.1	1.0	1.7	34.8
Dissolved Oxygen	mg/L							7.48	7.62	7.91	7.45	7.36
Temperature	°C							18.36	15.2	15.25	15.04	16.56
Color								slight yellow	None	None	None	slight yellow
Odor								None	None	None	None	None
Clarity								Clear	Clear	Clear	Clear	Clear
Water Depth (Total)	feet							6.75	10.5	9.5	13.0	1.0
Fresh Water Lens Depth	feet							0	<0.3	<0.3	<0.3	N/A
Oxford Basin Drained												
Date									1.13.10	1.13.10	1.13.10	
Time									1600	1600	1600	
pH									7.91	7.93	7.81	
Conductivity	mS								50.7	51.28	50.85	
Turbidity	NTU								1.3	0.3	5.3	
Dissolved Oxygen	mg/L								7.79	7.84	6.33	
Temperature	°C								15.22	15.17	15.14	
Color									None	None	None	
Odor									None	None	None	
Clarity									Clear	Clear	Clear	
Water Depth (Total)	feet								11.3	9.9	13.0	
Fresh Water Lens Depth	feet								<0.3	<0.3	<0.3	

Table 6. Summary of Oxford Retention Basin Wet Weather Water Quality Chemistry

Parameter	Units	COP	CTR Freshwater	CTR Saltwater	Saltwater								Freshwater
					Oxford Retention Basin		Exchange		Basin E				Boone Olive
					ORB-1	ORB-2	X-ORB-1	X-BasinE-3	E-1	E-2	E-3	E-4	BO-3
					1/12/2010	1/13/2010	1/12/2010	1/13/2010	1/12/2010	1/13/2010	1/13/2010	1/13/2010	1/13/2010
General Chemistry													
Ammonia-N	mg/L	6			0.34B	<0.03	0.05B	0.33B	0.05B	0.05B	0.13B	0.08B	0.69B
Dissolved Organic Carbon	mg/L				3	2.9	<0.1	4.6	<0.1	<0.1	2.9	1.4J	11.3
Nitrate-N	mg/L				1.23	0.42	0.07	0.52	0.13	0.21	0.36	0.17	
Nitrate-N by IC	mg/L												1.98
Nitrite-N	mg/L				0.06	0.03J	0.01J	0.05	0.01J	0.01J	0.03J	0.01J	0.08
pH	pH Units				8H	7.4H	7.5H	7.2H	7.4H	7.3H	7.1H	7.2H	7.1H
Total Dissolved Solids	mg/L				15,840	24,980	33,380	19,000	31,660	31,320	27,400	29,420	1,106
Total Hardness as CaCO3	mg/L				3,097.9	4,688.4	6,035.6	3,676.0	5,856.8	5,735.5	5,075.4	5,616.3	276.9
Total Kjeldahl Nitrogen	mg/L				2.62	1.088	<0.456	1.862	<0.456	<0.456	0.872J	0.586J	2.06
Total Organic Carbon	mg/L				4.9	4.2	0.6J	8.2	0.1J	0.4J	4.3	6.3	15.4
Total Orthophosphate as P	mg/L				0.02	0.03	0.04	0.1	0.03	0.06	0.08	0.04	0.69
Total Sulfides	mg/L				0.01J,H	0.01J,H	<0.01	0.02J,H	<0.01	0.01J,H	0.01J,H	0.01J,H	0.04J,H
Total Suspended Solids	mg/L				29.3	20.8	3.3J	17.5	2J	5	9.8	5	39.3
Bacteria Indicators													
Enterococci	MPN/100mL	104			10	6,867	10	1,664	10	246	6,131	19,863	>241,960
Fecal Coliform	MPN/100mL	400			130	30,000	40	24,000	70	300	50,000	13,000	17,000
Total Coliform	MPN/100mL	10,000			1,100	50,000	70	50,000	300	2,400	220,000	24,000	240,000
Acid Extractable Compounds													
2,4,6-Trichlorophenol	ng/L				<50	<50	<50	<50	<50	<50	<50	<50	<50
2,4-Dichlorophenol	ng/L				<50	<50	<50	<50	<50	<50	<50	<50	<50
2,4-Dimethylphenol	ng/L				<100	<100	<100	<100	<100	<100	<100	<100	<100
2,4-Dinitrophenol	ng/L				<100	<100	<100	<100	<100	<100	<100	<100	<100
2-Chlorophenol	ng/L				<50	<50	<50	<50	<50	<50	<50	<50	<50
2-Methyl-4,6-dinitrophenol	ng/L				<100	<100	<100	<100	<100	<100	<100	<100	<100
2-Nitrophenol	ng/L				<100	<100	<100	<100	<100	<100	<100	<100	<100
4-Chloro-3-methylphenol	ng/L				<100	<100	<100	<100	<100	<100	<100	<100	<100
4-Nitrophenol	ng/L				<100	<100	<100	<100	<100	<100	<100	<100	<100
Pentachlorophenol	ng/L		(a)	13,000	988	<50	<50	951	<50	<50	<50	<50	1203
Phenol	ng/L				<100	<100	<100	<100	<100	<100	<100	<100	<100
Total Chlorinated Phenolics	ng/L	10,000			<100	<100	<100	<100	<100	<100	<100	<100	<100
Total Non-Chlorinated Phenolics	ng/L	300,000			988	<100	<100	951	<100	<100	<100	<100	1203
Base/Neutral Extractable Compounds													
1,2,4-Trichlorobenzene	ng/L				<10	<10	<10	<10	<10	<10	<10	<10	<10
2,4-Dinitrotoluene	ng/L				<50	<50	<50	<50	<50	<50	<50	<50	<50
2,6-Dinitrotoluene	ng/L				<50	<50	<50	<50	<50	<50	<50	<50	<50
2-Chloronaphthalene	ng/L				<50	<50	<50	<50	<50	<50	<50	<50	<50

Table 6. Summary of Oxford Retention Basin Wet Weather Water Quality Chemistry

Parameter	Units	COP	CTR Freshwater	CTR Saltwater	Saltwater								Freshwater
					Oxford Retention Basin		Exchange		Basin E				Boone Olive
					ORB-1	ORB-2	X-ORB-1	X-BasinE-3	E-1	E-2	E-3	E-4	BO-3
					1/12/2010	1/13/2010	1/12/2010	1/13/2010	1/12/2010	1/13/2010	1/13/2010	1/13/2010	1/13/2010
3,3'-dichlorobenzidine	ng/L				<50	<50	<50	<50	<50	<50	<50	<50	<50
4-Bromophenylphenylether	ng/L				<50	<50	<50	<50	<50	<50	<50	<50	<50
4-Chlorophenylphenylether	ng/L				<50	<50	<50	<50	<50	<50	<50	<50	<50
Azobenzene	ng/L				<50	<50	<50	<50	<50	<50	<50	<50	<50
Benzidine	ng/L				<50	<50	<50	<50	<50	<50	<50	<50	<50
Butylbenzyl Phthalate	ng/L				117	504	<25	593	35J	47J	347	132	450
Di-n-butyl Phthalate	ng/L				340	116	<75	182	84J	<75	274	<75	217
Di-n-octyl Phthalate	ng/L				79	113	<10	151	<10	12J	121	27	267
Diethyl Phthalate	ng/L				144	116J	<100	208	<100	<100	179	<100	234
Dimethyl Phthalate	ng/L				<50	97	<50	179	<50	<50	148	<50	89
Hexachlorobenzene	ng/L				<1	<1	<1	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene	ng/L				<50	<50	<50	<50	<50	<50	<50	<50	<50
Hexachlorocyclopentadiene	ng/L				<50	<50	<50	<50	<50	<50	<50	<50	<50
Hexachloroethane	ng/L				<50	<50	<50	<50	<50	<50	<50	<50	<50
Isophorone	ng/L				<50	<50	<50	<50	<50	<50	<50	<50	<50
N-Nitrosodi-n-propylamine	ng/L				<50	<50	<50	<50	<50	<50	<50	<50	<50
N-Nitrosodimethylamine	ng/L				<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	2.7
N-Nitrosodiphenylamine	ng/L				<50	<50	<50	<50	<50	<50	<50	<50	<50
Nitrobenzene	ng/L				<50	<50	<50	<50	<50	<50	<50	<50	<50
bis(2-Chloroethoxy)methane	ng/L				<50	<50	<50	<50	<50	<50	<50	<50	<50
bis(2-Chloroethyl)ether	ng/L				<50	<50	<50	<50	<50	<50	<50	<50	<50
bis(2-Chloroisopropyl)ether	ng/L				<50	<50	<50	<50	<50	<50	<50	<50	<50
bis(2-Ethylhexyl) Phthalate	ng/L				860	999	<100	1124	146	237	625	257	1983
Chlorinated Pesticides													
2,4'-DDD	ng/L				<1	<1	<1	<1	<1	<1	<1	<1	<1
2,4'-DDE	ng/L				<1	<1	<1	<1	<1	<1	<1	<1	<1
2,4'-DDT	ng/L				<1	<1	<1	<1	<1	<1	<1	<1	<1
4,4'-DDD	ng/L				<1	<1	<1	<1	<1	<1	<1	<1	<1
4,4'-DDE	ng/L				<1	<1	<1	<1	<1	<1	<1	<1	<1
4,4'-DDT	ng/L		1,100	130	<1	<1	<1	<1	<1	<1	<1	<1	<1
Total Detectable DDTs	ng/L				<1	<1	<1	<1	<1	<1	<1	<1	<1
Aldrin	ng/L		3,000	1,300	<1	<1	<1	<1	<1	<1	<1	<1	<1
BHC-alpha	ng/L				<1	<1	<1	<1	<1	<1	<1	<1	<1
BHC-beta	ng/L				<1	<1	<1	<1	<1	<1	<1	<1	<1
BHC-delta	ng/L				<1	<1	<1	<1	<1	<1	<1	<1	<1
BHC-gamma	ng/L		950	160	<1	<1	<1	<1	<1	<1	<1	<1	<1
Total Detectable BHC	ng/L	12			<1	<1	<1	<1	<1	<1	<1	<1	<1
Chlordane-alpha	ng/L				<1	<1	<1	<1	<1	<1	<1	<1	<1

Table 6. Summary of Oxford Retention Basin Wet Weather Water Quality Chemistry

Parameter	Units	COP	CTR Freshwater	CTR Saltwater	Saltwater								Freshwater
					Oxford Retention Basin		Exchange		Basin E				Boone Olive
					ORB-1	ORB-2	X-ORB-1	X-BasinE-3	E-1	E-2	E-3	E-4	BO-3
					1/12/2010	1/13/2010	1/12/2010	1/13/2010	1/12/2010	1/13/2010	1/13/2010	1/13/2010	1/13/2010
Chlordane-gamma	ng/L				<1	<1	<1	<1	<1	<1	<1	<1	<1
DCPA (Dacthal)	ng/L				<5	<5	<5	<5	<5	<5	<5	<5	<5
Dicofol	ng/L				<50	<50	<50	<50	<50	<50	<50	<50	<50
Dieldrin	ng/L		240	710	<1	<1	<1	<1	<1	<1	<1	<1	<1
Endosulfan Sulfate	ng/L				<1	<1	<1	<1	<1	<1	<1	<1	<1
Endosulfan-I	ng/L	27	220	34	<1	<1	<1	<1	<1	<1	<1	<1	<1
Endosulfan-II	ng/L	27	220	34	<1	<1	<1	<1	<1	<1	<1	<1	<1
Endrin	ng/L	6	83	37	<1	<1	<1	<1	<1	<1	<1	<1	<1
Endrin Aldehyde	ng/L				<1	<1	<1	<1	<1	<1	<1	<1	<1
Endrin Ketone	ng/L				<1	<1	<1	<1	<1	<1	<1	<1	<1
Heptachlor	ng/L		52	53	<1	<1	<1	<1	<1	<1	<1	<1	<1
Heptachlor Epoxide	ng/L		52	53	<1	<1	<1	<1	<1	<1	<1	<1	<1
Methoxychlor	ng/L				<1	<1	<1	<1	<1	<1	<1	<1	<1
Mirex	ng/L				<1	<1	<1	<1	<1	<1	<1	<1	<1
Oxychlordane	ng/L				<1	<1	<1	<1	<1	<1	<1	<1	<1
Perthane	ng/L				<5	<5	<5	<5	<5	<5	<5	<5	<5
Total Detectable Chlordane	ng/L				<1	<1	<1	<1	<1	<1	<1	<1	<1
Toxaphene	ng/L		730	210	<10	<10	<10	<10	<10	<10	<10	<10	<10
cis-Nonachlor	ng/L				<1	<1	<1	<1	<1	<1	<1	<1	<1
trans-Nonachlor	ng/L				<1	<1	<1	<1	<1	<1	<1	<1	<1
Aroclor PCBs													
Aroclor 1016	ng/L				<10	<10	<10	<10	<10	<10	<10	<10	<10
Aroclor 1221	ng/L				<10	<10	<10	<10	<10	<10	<10	<10	<10
Aroclor 1232	ng/L				<10	<10	<10	<10	<10	<10	<10	<10	<10
Aroclor 1242	ng/L				<10	<10	<10	<10	<10	<10	<10	<10	<10
Aroclor 1248	ng/L				<10	<10	<10	<10	<10	<10	<10	<10	<10
Aroclor 1254	ng/L				<10	<10	<10	<10	<10	<10	<10	<10	<10
Aroclor 1260	ng/L				<10	<10	<10	<10	<10	<10	<10	<10	<10
Total Aroclor	ng/L				<10	<10	<10	<10	<10	<10	<10	<10	<10
PCB Congeners													
PCB1	ng/L				0.0111	0.0071	0.0052	<0.0045	0.0047	<0.0066	<0.0044	<0.0036	<0.0065
PCB2	ng/L				0.0057	<0.0039	<0.0038	<0.0048	<0.0035	<0.0068	<0.0045	<0.0037	<0.0053
PCB3	ng/L				<0.0087	0.0074	0.0043	0.0066	0.0036	<0.0067	0.0066	0.0057	0.0136
PCB4	ng/L				0.038	0.0376	0.0424	0.021	0.035	0.025	0.0273	0.0227	0.0249
PCB5	ng/L				<0.0065	<0.0053	<0.0083	<0.0059	<0.0052	<0.0067	<0.0034	<0.0042	<0.0049
PCB6	ng/L				0.0187	0.0143	<0.015	0.0099	0.0146	<0.0091	0.0091	<0.0084	0.0117
PCB7	ng/L				<0.0064	<0.0053	<0.0082	<0.0067	<0.0051	<0.0076	<0.0038	<0.0048	<0.0056
PCB8	ng/L				0.086	0.0748	0.0753	0.0563	0.0744	0.0545	0.0523	0.0602	0.082

Table 6. Summary of Oxford Retention Basin Wet Weather Water Quality Chemistry

Parameter	Units	COP	CTR Freshwater	CTR Saltwater	Saltwater								Freshwater
					Oxford Retention Basin		Exchange		Basin E				Boone Olive
					ORB-1	ORB-2	X-ORB-1	X-BasinE-3	E-1	E-2	E-3	E-4	BO-3
					1/12/2010	1/13/2010	1/12/2010	1/13/2010	1/12/2010	1/13/2010	1/13/2010	1/13/2010	1/13/2010
PCB9	ng/L				0.0064	<0.0049	<0.0077	<0.0061	<0.0048	<0.007	<0.0035	<0.0044	<0.0051
PCB10	ng/L				<0.02	<0.013	<0.014	<0.012	<0.014	<0.018	<0.011	<0.012	<0.0053
PCB11	ng/L				0.12	0.13	0.0444	0.141	0.0243	0.0341	0.0857	0.0522	0.248
PCB12+13	ng/L				0.0076	<0.0061	<0.0079	<0.0068	0.0069	<0.0078	<0.0039	<0.0048	0.0063
PCB14	ng/L				<0.0059	<0.0048	<0.0075	<0.0064	<0.0047	<0.0073	<0.0037	<0.0046	<0.0054
PCB15	ng/L				0.045	0.0393	0.041	0.0243	0.0407	0.022	0.0254	0.0242	0.0346
PCB16	ng/L				0.036	0.048	<0.039	0.036	0.037	0.03	<0.031	0.038	0.043
PCB17	ng/L				0.045	0.055	0.049	0.027	0.043	0.024	<0.024	0.0255	0.0267
PCB18+30	ng/L				0.102	0.119	0.102	0.0665	0.083	<0.047	0.0572	0.0556	0.0556
PCB19	ng/L				<0.012	0.0138	<0.012	<0.0086	0.0153	0.0109	0.0098	0.0116	0.0087
PCB20+28	ng/L				0.159	0.14	0.178	0.0883	0.122	0.0853	0.0885	0.091	0.0911
PCB21+33	ng/L				0.0893	0.0837	0.091	0.052	0.069	0.047	0.0471	0.0482	0.0577
PCB22	ng/L				0.0533	0.0544	0.056	0.0335	0.0418	0.0291	0.0311	0.0295	0.0381
PCB23	ng/L				<0.0038	<0.0019	<0.0023	<0.0067	<0.0043	<0.0042	<0.0032	<0.003	<0.0035
PCB24	ng/L				<0.016	<0.01	<0.0097	<0.0074	<0.012	<0.0078	<0.0058	<0.0065	<0.0054
PCB25	ng/L				<0.011	0.011	0.0123	0.0076	<0.0085	0.0068	0.0076	<0.0062	0.0067
PCB26+29	ng/L				0.0271	0.0245	0.0251	0.015	0.0204	0.0142	<0.015	0.015	0.0153
PCB27	ng/L				<0.012	0.0088	0.0104	<0.0081	<0.009	<0.0085	<0.0058	<0.0071	<0.0059
PCB31	ng/L				0.138	0.122	0.132	0.0841	0.0912	0.063	0.0722	0.0711	0.0807
PCB32	ng/L				0.03	0.0355	0.0389	0.0206	0.0304	0.0197	0.0205	0.021	<0.016
PCB34	ng/L				<0.0035	<0.0017	<0.0021	<0.006	<0.0039	<0.0037	<0.0029	<0.0027	<0.0031
PCB35	ng/L				0.0055	<0.0058	<0.0022	0.0064	<0.0041	<0.0038	<0.0029	<0.0028	0.0099
PCB36	ng/L				<0.0032	<0.0016	<0.002	<0.0054	<0.0037	<0.0034	<0.0026	<0.0025	<0.0029
PCB37	ng/L				0.0365	0.0372	0.0446	0.0229	0.0254	0.0167	0.0198	0.0181	0.0341
PCB38	ng/L				<0.0036	<0.0018	<0.0022	<0.0062	<0.0041	<0.0039	<0.003	<0.0028	<0.0033
PCB39	ng/L				<0.0034	<0.0017	<0.0021	<0.0058	<0.0039	<0.0037	<0.0028	<0.0026	<0.0031
PCB40+41+71	ng/L				<0.073	0.0925	0.066	0.0854	0.0451	0.0319	0.0563	<0.038	0.045
PCB42	ng/L				0.042	0.0458	0.0414	0.0379	0.026	0.0191	0.0284	0.0243	<0.017
PCB43	ng/L				<0.01	<0.0081	<0.0057	<0.01	<0.0059	<0.011	<0.0065	<0.0092	<0.008
PCB44+47+65	ng/L				0.173	0.301	0.138	0.38	0.093	0.0774	0.191	0.118	0.0801
PCB45+51	ng/L				<0.022	0.0314	0.0229	0.0211	<0.017	<0.012	0.0169	0.0172	<0.013
PCB46	ng/L				<0.011	<0.0091	0.0092	0.0098	0.0071	<0.01	<0.006	<0.0086	<0.0075
PCB48	ng/L				0.0306	0.0364	0.0278	0.0254	0.0197	0.0132	<0.016	0.0159	<0.013
PCB49+69	ng/L				0.104	0.159	0.1	0.175	0.0606	0.0526	0.0992	0.0721	0.0427
PCB50+53	ng/L				0.0259	0.031	0.0226	0.0314	0.0182	<0.014	0.0218	0.021	<0.0092
PCB52	ng/L				0.298	0.558	0.16	0.791	0.103	0.0867	0.363	0.167	0.107
PCB54	ng/L				<0.013	<0.008	<0.008	<0.0088	<0.0089	<0.0097	<0.0077	<0.0097	<0.01
PCB55	ng/L				<0.0041	<0.0031	<0.003	<0.0051	<0.0023	<0.0051	<0.0024	<0.0047	<0.0049

Table 6. Summary of Oxford Retention Basin Wet Weather Water Quality Chemistry

Parameter	Units	COP	CTR Freshwater	CTR Saltwater	Saltwater								Freshwater
					Oxford Retention Basin		Exchange		Basin E				Boone Olive
					ORB-1	ORB-2	X-ORB-1	X-BasinE-3	E-1	E-2	E-3	E-4	BO-3
					1/12/2010	1/13/2010	1/12/2010	1/13/2010	1/12/2010	1/13/2010	1/13/2010	1/13/2010	1/13/2010
PCB56	ng/L				<0.043	0.0512	0.0391	0.0644	0.0167	0.0175	0.0333	0.0266	0.0386
PCB57	ng/L				<0.0037	<0.0028	<0.0028	<0.0048	<0.0021	<0.0049	<0.0023	<0.0044	<0.0047
PCB58	ng/L				<0.0041	<0.0031	<0.003	0.0262	<0.0023	<0.0049	<0.0087	<0.0044	<0.0047
PCB59+62+75	ng/L				0.012	0.0136	0.0136	0.0115	<0.0076	<0.0067	0.0102	0.0084	0.0068
PCB60	ng/L				0.0257	0.0276	0.0232	0.024	0.0091	<0.0093	0.0163	0.0121	0.0194
PCB61+70+74+76	ng/L				0.256	0.406	0.188	0.552	0.077	0.0817	0.271	0.14	0.141
PCB63	ng/L				0.0051	0.005	0.004	0.0061	0.0021	<0.0046	0.0034	<0.0042	<0.0044
PCB64	ng/L				<0.06	0.0924	0.0523	0.108	0.0315	0.0275	<0.054	0.0371	0.0341
PCB66	ng/L				0.115	0.118	0.105	0.149	0.047	0.0557	0.0936	0.0709	0.071
PCB67	ng/L				<0.0034	<0.0032	0.0029	<0.0046	<0.0019	<0.0047	<0.0022	<0.0043	<0.0045
PCB68	ng/L				<0.0038	<0.0029	<0.0028	<0.0047	<0.0021	<0.0048	<0.0023	<0.0043	<0.0046
PCB72	ng/L				<0.0037	<0.0028	<0.0027	<0.0047	<0.0021	<0.0048	<0.0023	<0.0044	<0.0046
PCB73	ng/L				<0.0075	<0.0059	<0.0042	<0.0065	<0.0043	<0.007	<0.0041	<0.0059	<0.0051
PCB77	ng/L				0.0196	0.0266	0.0084	0.0373	0.0046	<0.0061	0.018	0.0083	0.0293
PCB78	ng/L				<0.0038	<0.0029	<0.0028	<0.0047	<0.0022	<0.0048	<0.0023	<0.0044	<0.0046
PCB79	ng/L				<0.0034	0.0037	<0.0025	<0.0052	<0.0019	<0.0043	0.0037	<0.0039	<0.0042
PCB80	ng/L				<0.0034	<0.0026	<0.0026	<0.0043	<0.0019	<0.0043	<0.0021	<0.0039	<0.0042
PCB81	ng/L				<0.0052	<0.0039	<0.0039	<0.006	<0.0029	<0.006	<0.0029	<0.0055	<0.0058
PCB82	ng/L				0.042	0.0697	<0.011	0.102	<0.0048	<0.008	0.0452	0.019	0.0273
PCB83+99	ng/L				0.16	0.319	0.113	0.423	0.0427	0.0476	0.197	0.0947	0.0854
PCB84	ng/L				0.086	0.223	0.0331	0.339	0.0211	0.0185	0.142	0.0532	0.0524
PCB85+116+117	ng/L				0.0516	0.0896	0.0308	0.113	0.0117	<0.007	0.0492	0.0241	0.0291
PCB86+87+97+109+119+125	ng/L				0.23	0.469	0.105	0.649	0.0467	0.0541	0.29	0.119	0.165
PCB88+91	ng/L				0.047	<0.089	0.0229	0.144	0.0123	0.0091	0.0623	0.0269	0.0213
PCB89	ng/L				<0.0097	<0.0074	<0.0053	0.0101	<0.0042	<0.0077	<0.0053	<0.0048	<0.0065
PCB90+101+113	ng/L				0.334	0.722	0.205	0.94	0.0866	0.106	0.439	0.195	0.261
PCB92	ng/L				0.0585	0.119	0.0337	0.168	0.0143	0.0185	0.0746	0.0366	0.0405
PCB93+98+100+102	ng/L				<0.0093	0.0247	0.0083	0.0362	<0.0041	<0.0073	0.0162	0.0066	<0.0062
PCB94	ng/L				<0.0097	<0.0074	<0.0053	<0.0076	<0.0042	<0.0079	<0.0054	<0.0049	<0.0067
PCB95	ng/L				0.25	0.628	0.11	0.979	0.0685	0.0726	0.41	0.163	0.193
PCB96	ng/L				<0.012	<0.013	<0.022	<0.0086	<0.015	<0.014	<0.0073	<0.012	<0.011
PCB103	ng/L				<0.0082	<0.0063	<0.0044	<0.0061	<0.0036	<0.0064	<0.0043	<0.004	<0.0054
PCB104	ng/L				<0.0049	<0.0052	<0.0091	<0.0054	<0.006	<0.0085	<0.0046	<0.0075	<0.0066
PCB105	ng/L				0.126	0.177	0.0445	0.237	0.0196	0.025	0.113	0.0496	0.102
PCB106	ng/L				<0.0033	<0.0025	<0.0022	<0.0048	<0.0028	<0.0056	<0.0024	<0.0031	<0.0026
PCB107	ng/L				0.0181	0.0279	0.0106	0.0376	<0.0025	<0.005	0.0181	0.0104	0.0158
PCB108+124	ng/L				0.0108	0.0189	0.0053	0.0256	<0.0026	<0.0054	0.0115	0.0054	0.0103
PCB110+115	ng/L				0.379	0.742	0.188	1.06	0.0806	0.0944	0.492	0.206	0.305

Table 6. Summary of Oxford Retention Basin Wet Weather Water Quality Chemistry

Parameter	Units	COP	CTR Freshwater	CTR Saltwater	Saltwater								Freshwater
					Oxford Retention Basin		Exchange		Basin E				Boone Olive
					ORB-1	ORB-2	X-ORB-1	X-BasinE-3	E-1	E-2	E-3	E-4	BO-3
					1/12/2010	1/13/2010	1/12/2010	1/13/2010	1/12/2010	1/13/2010	1/13/2010	1/13/2010	1/13/2010
PCB111	ng/L				<0.0068	<0.0052	<0.0037	<0.0052	<0.003	<0.0054	<0.0037	<0.0034	<0.0046
PCB112	ng/L				<0.0074	<0.0057	<0.004	<0.0053	<0.0032	<0.0056	<0.0038	<0.0035	<0.0047
PCB114	ng/L				0.0052	0.0103	0.0029	0.0125	<0.0032	<0.0061	0.0047	<0.0033	0.0056
PCB118	ng/L				0.282	0.445	0.144	0.583	0.0516	0.0688	0.29	0.132	0.215
PCB120	ng/L				<0.0066	<0.0051	<0.0036	<0.005	<0.0029	<0.0052	<0.0035	<0.0032	<0.0044
PCB121	ng/L				<0.0068	<0.0053	<0.0037	<0.0052	<0.003	<0.0054	<0.0037	<0.0034	<0.0046
PCB122	ng/L				<0.0033	0.0041	<0.0022	<0.0055	<0.0028	<0.0057	<0.0025	<0.0031	<0.0027
PCB123	ng/L				<0.0048	0.0093	0.0032	0.0106	<0.0032	<0.0061	0.0047	<0.0033	<0.0029
PCB126	ng/L				<0.0052	<0.0058	<0.0024	0.0095	<0.0031	<0.006	0.0043	<0.0033	<0.0063
PCB127	ng/L				<0.003	<0.0023	<0.002	<0.0044	<0.0026	<0.0052	<0.0022	<0.0028	<0.0024
PCB128+166	ng/L				<0.07	<0.081	0.0222	0.144	<0.0086	0.015	0.0655	0.0281	0.0654
PCB129+138+163	ng/L				0.467	0.589	0.191	0.816	0.0791	0.11	0.377	0.171	0.458
PCB130	ng/L				0.028	0.037	0.0106	0.061	<0.011	<0.014	0.0245	0.0105	<0.022
PCB131	ng/L				<0.02	<0.013	<0.0078	0.017	<0.011	<0.014	<0.0073	<0.009	<0.01
PCB132	ng/L				0.16	0.233	0.051	0.341	0.024	0.036	0.146	0.058	0.143
PCB133	ng/L				<0.018	<0.012	<0.0072	<0.015	<0.01	<0.013	<0.0067	<0.0082	<0.0095
PCB134+143	ng/L				0.024	0.038	0.0082	0.05	<0.011	<0.014	0.0216	0.0117	0.019
PCB135+151	ng/L				<0.095	0.196	0.067	<0.2	0.03	0.04	0.098	0.053	0.12
PCB136	ng/L				0.052	0.097	0.022	<0.11	<0.016	<0.014	0.0557	0.025	0.0521
PCB137	ng/L				0.023	<0.022	<0.0073	0.046	<0.01	<0.013	0.0175	<0.0082	0.0121
PCB139+140	ng/L				<0.017	0.012	<0.0068	0.018	<0.0094	<0.012	0.0086	<0.0078	<0.009
PCB141	ng/L				0.072	0.1	0.0348	0.136	0.0107	0.014	0.0555	0.0298	0.0815
PCB142	ng/L				<0.019	<0.012	<0.0075	<0.016	<0.01	<0.013	<0.007	<0.0086	<0.01
PCB144	ng/L				0.023	<0.025	<0.013	0.032	<0.02	<0.016	0.015	<0.013	0.02
PCB145	ng/L				<0.016	<0.014	<0.011	<0.014	<0.017	<0.013	<0.009	<0.011	<0.01
PCB146	ng/L				<0.05	<0.061	0.0263	0.092	0.011	0.014	0.0468	0.0256	0.0604
PCB147+149	ng/L				0.329	0.464	0.142	0.582	0.0643	0.082	0.265	0.134	0.32
PCB148	ng/L				<0.02	<0.018	<0.014	<0.017	<0.022	<0.016	<0.011	<0.013	<0.012
PCB150	ng/L				<0.015	<0.013	<0.011	<0.013	<0.016	<0.012	<0.0084	<0.01	<0.0094
PCB152	ng/L				<0.015	<0.013	<0.011	<0.013	<0.016	<0.012	<0.0084	<0.01	<0.0094
PCB153+168	ng/L				0.316	0.413	0.186	0.5	0.0657	0.0907	0.247	0.138	0.325
PCB154	ng/L				<0.018	<0.016	<0.012	<0.015	<0.019	<0.015	<0.01	<0.012	<0.011
PCB155	ng/L				<0.007	<0.0061	<0.0049	<0.0087	<0.0074	<0.0085	<0.0058	<0.0069	<0.0065
PCB156+157	ng/L				0.049	0.0624	0.0171	0.087	0.0063	0.0105	<0.04	<0.015	0.0518
PCB158	ng/L				0.043	0.059	<0.013	0.081	<0.007	<0.009	0.0348	0.0156	0.0449
PCB159	ng/L				<0.0069	<0.0038	<0.0034	<0.0091	<0.0037	<0.0066	<0.0033	<0.004	<0.0049
PCB160	ng/L				<0.014	<0.0095	<0.0057	<0.012	<0.0079	<0.01	<0.0053	<0.0065	<0.0076
PCB161	ng/L				<0.013	<0.0088	<0.0053	<0.011	<0.0073	<0.0093	<0.0049	<0.006	<0.007

Table 6. Summary of Oxford Retention Basin Wet Weather Water Quality Chemistry

Parameter	Units	COP	CTR Freshwater	CTR Saltwater	Saltwater								Freshwater
					Oxford Retention Basin		Exchange		Basin E				Boone Olive
					ORB-1	ORB-2	X-ORB-1	X-BasinE-3	E-1	E-2	E-3	E-4	BO-3
					1/12/2010	1/13/2010	1/12/2010	1/13/2010	1/12/2010	1/13/2010	1/13/2010	1/13/2010	1/13/2010
PCB162	ng/L				<0.0072	<0.0039	<0.0035	<0.0095	<0.0038	<0.0069	<0.0035	<0.0042	<0.0052
PCB164	ng/L				0.029	0.0401	0.0113	0.053	<0.0076	<0.0096	0.0245	0.0123	0.0335
PCB165	ng/L				<0.015	<0.0098	<0.0059	<0.013	<0.0081	<0.01	<0.0055	<0.0067	<0.0078
PCB167	ng/L				0.0171	0.021	0.0062	0.033	<0.0047	<0.008	0.0151	0.007	0.0207
PCB169	ng/L				<0.0089	<0.0049	<0.0043	<0.011	<0.0048	<0.0082	<0.0041	<0.005	<0.0062
PCB170	ng/L				0.066	0.068	0.0346	0.085	0.0125	0.021	0.0445	0.028	0.131
PCB171+173	ng/L				<0.019	0.022	0.013	0.029	<0.0085	<0.018	<0.013	<0.012	<0.031
PCB172	ng/L				<0.019	<0.013	<0.0087	<0.016	<0.0085	<0.018	<0.01	<0.012	0.021
PCB174	ng/L				0.078	0.078	<0.036	0.074	0.019	0.023	0.041	0.026	0.103
PCB175	ng/L				<0.021	<0.011	<0.0096	<0.015	<0.0095	<0.014	<0.0067	<0.0097	<0.012
PCB176	ng/L				<0.016	0.0109	<0.0075	<0.012	<0.0074	<0.011	<0.0053	<0.0077	<0.011
PCB177	ng/L				0.042	0.04	<0.021	0.044	0.0099	<0.018	<0.022	0.015	0.065
PCB178	ng/L				<0.022	<0.015	<0.0099	<0.016	<0.0098	<0.015	0.01	<0.01	<0.022
PCB179	ng/L				0.039	0.0395	0.0206	<0.037	0.0116	0.012	0.022	0.0146	0.0368
PCB180+193	ng/L				0.142	0.125	0.0745	0.148	0.0269	<0.039	0.0802	0.0467	0.247
PCB181	ng/L				<0.019	<0.013	<0.0085	<0.015	<0.0083	<0.017	<0.0096	<0.011	<0.01
PCB182	ng/L				<0.021	<0.011	<0.0098	<0.015	<0.0097	<0.014	<0.0068	<0.0099	<0.012
PCB183	ng/L				0.038	0.038	0.0257	0.048	0.0113	<0.018	<0.022	0.021	0.078
PCB184	ng/L				<0.016	<0.0081	<0.0073	<0.011	<0.0072	<0.011	<0.0051	<0.0073	<0.0088
PCB185	ng/L				<0.02	<0.013	<0.009	<0.015	<0.0087	<0.017	<0.0096	<0.011	<0.01
PCB186	ng/L				<0.017	<0.0086	<0.0078	<0.012	<0.0077	<0.011	<0.0055	<0.0079	<0.0095
PCB187	ng/L				<0.095	0.099	0.0579	0.094	<0.026	0.032	0.0522	<0.034	0.127
PCB188	ng/L				<0.012	<0.0062	<0.0056	<0.011	<0.0055	<0.011	<0.0052	<0.0075	<0.0089
PCB189	ng/L				<0.013	<0.0091	<0.0043	<0.02	<0.0065	<0.0094	<0.012	<0.0078	<0.0081
PCB190	ng/L				<0.015	<0.012	0.0077	0.017	<0.0066	<0.014	0.0084	<0.009	<0.019
PCB191	ng/L				<0.014	<0.0093	<0.0063	<0.012	<0.0061	<0.014	<0.0079	<0.009	<0.0086
PCB192	ng/L				<0.015	<0.01	<0.007	<0.013	<0.0068	<0.015	<0.0084	<0.0096	<0.0091
PCB194	ng/L				0.031	<0.018	<0.0088	<0.025	<0.0079	<0.017	<0.014	<0.012	0.061
PCB195	ng/L				<0.024	<0.016	<0.0083	<0.021	<0.0084	<0.018	<0.015	<0.012	<0.02
PCB196	ng/L				<0.03	<0.023	<0.016	<0.027	<0.011	<0.023	<0.018	<0.016	0.035
PCB197	ng/L				<0.024	<0.019	<0.013	<0.02	<0.0088	<0.017	<0.014	<0.012	<0.016
PCB198+199	ng/L				<0.041	0.038	0.016	0.039	<0.011	<0.023	0.022	0.016	0.069
PCB200	ng/L				<0.021	<0.017	<0.011	<0.019	<0.0077	<0.016	<0.013	<0.011	<0.015
PCB201	ng/L				<0.023	<0.018	<0.012	<0.019	<0.0082	<0.017	<0.013	<0.011	<0.016
PCB202	ng/L				<0.021	<0.017	<0.011	<0.021	<0.0077	<0.018	<0.014	<0.012	0.018
PCB203	ng/L				<0.028	<0.022	<0.015	<0.024	<0.01	<0.021	<0.017	<0.014	0.038
PCB204	ng/L				<0.022	<0.017	<0.012	<0.019	<0.0081	<0.016	<0.013	<0.011	<0.016
PCB205	ng/L				<0.023	<0.015	<0.0078	<0.018	<0.008	<0.016	<0.013	<0.011	<0.011

Table 6. Summary of Oxford Retention Basin Wet Weather Water Quality Chemistry

Parameter	Units	COP	CTR Freshwater	CTR Saltwater	Saltwater								Freshwater
					Oxford Retention Basin		Exchange		Basin E				Boone Olive
					ORB-1	ORB-2	X-ORB-1	X-BasinE-3	E-1	E-2	E-3	E-4	BO-3
					1/12/2010	1/13/2010	1/12/2010	1/13/2010	1/12/2010	1/13/2010	1/13/2010	1/13/2010	1/13/2010
PCB206	ng/L				<0.046	<0.025	<0.014	<0.032	<0.016	<0.023	<0.025	<0.021	0.044
PCB207	ng/L				<0.04	<0.022	<0.012	<0.027	<0.014	<0.02	<0.022	<0.018	<0.012
PCB208	ng/L				<0.047	<0.026	<0.015	<0.033	<0.016	<0.024	<0.026	<0.022	<0.014
PCB209	ng/L				<0.048	<0.028	<0.014	<0.039	<0.017	<0.047	<0.019	<0.029	0.028
Total PCBs	ng/L				6.3154	10.081	4.0823	12.8006	2.1814	1.9604	6.2485	3.3569	5.9616
Polynuclear Aromatic Hydrocarbons													
1-Methylnaphthalene	ng/L				3J	<1	<1	2.6J	<1	<1	1.8J	1.1J	28.7
1-Methylphenanthrene	ng/L				<1	<1	<1	<1	<1	<1	<1	<1	26.5
2,3,5-Trimethylnaphthalene	ng/L				<1	<1	<1	<1	<1	<1	<1	<1	7.2
2,6-Dimethylnaphthalene	ng/L				38.5	5.4	<1	7.3	<1	<1	3.3J	1.5J	21.4
2-Methylnaphthalene	ng/L				3.8J	1.5J	<1	4.1J	<1	<1	3.1J	1.1J	54.8
Acenaphthene	ng/L				<1	<1	<1	<1	<1	<1	3.1J	<1	7.1
Acenaphthylene	ng/L				3.2J	2.7J	<1	1.6J	<1	<1	5	2.6J	5.6
Anthracene	ng/L				4.1J	7.9	<1	6.1	<1	<1	1.9J	3.8J	12.5
Benz[a]anthracene	ng/L				7.4	9.5	<1	6.6	<1	<1	4.6J	2.1J	20.3
Benzo[a]pyrene	ng/L				7.7	9	<1	9.8	<1	<1	6.2	4.1J	26.5
Benzo[b]fluoranthene	ng/L				13.1	11.9	<1	12.3	<1	5.1	8.5	6.1	39
Benzo[e]pyrene	ng/L				13.8	17.2	<1	14.1	<1	3.2J	7.4	4.9J	69.8
Benzo[g,h,i]perylene	ng/L				6.9	3.3J	<1	4.9J	<1	<1	<1	<1	38.5
Benzo[k]fluoranthene	ng/L				6.9	65	<1	8.4	<1	3.1J	6.7	2.6J	18.3
Biphenyl	ng/L				6.3	3.9J	<1	5.5	<1	<1	2.6J	2.8J	11
Chrysene	ng/L				20.2	34.2	<1	27.3	<1	4.1J	16.5	6.9	97.7
Dibenz[a,h]anthracene	ng/L				3.3J	<1	<1	5.5	<1	<1	<1	<1	8.6
Dibenzothiophene	ng/L				<1	<1	<1	<1	<1	<1	<1	<1	18.5
Fluoranthene	ng/L				26.6	40.9	<1	32.6	<1	7.5	17.2	7.4	89.5
Fluorene	ng/L				<1	3J	<1	5.2	<1	<1	3.3J	1.6J	14.8
Indeno[1,2,3-c,d]pyrene	ng/L				12.2	10.6	<1	17.4	<1	<1	2J	<1	19
Perylene	ng/L				2.1J	4.4J	<1	4.3J	<1	<1	4J	6.5	37.4
Phenanthrene	ng/L				11	15.7	<1	12.9	<1	5.5	9.8	4.6J	90.4
Pyrene	ng/L				29.7	35.5	<1	32.1	<1	6.8	20.7	7.5	94.7
Total Detectable PAHs	ng/L				219.8	281.6	<1	220.6	<1	35.3	127.7	67.2	857.8
TPH-CC													
C6	ug/L				<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4
C7	ug/L				<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1	<6.1
C8	ug/L				<9.9	<9.9	<9.9	<9.9	<9.9	<9.9	<9.9	<9.9	<9.9
C9-C10	ug/L				<13	<13	<13	<13	<13	<13	<13	<13	<13
C11-C12	ug/L				<14	<14	<14	<14	<14	<14	<14	<14	<14
C13-C14	ug/L				<16	<16	<16	16	<16	<16	<16	<16	28

Table 6. Summary of Oxford Retention Basin Wet Weather Water Quality Chemistry

Parameter	Units	COP	CTR Freshwater	CTR Saltwater	Saltwater								Freshwater
					Oxford Retention Basin		Exchange		Basin E				Boone Olive
					ORB-1	ORB-2	X-ORB-1	X-BasinE-3	E-1	E-2	E-3	E-4	BO-3
					1/12/2010	1/13/2010	1/12/2010	1/13/2010	1/12/2010	1/13/2010	1/13/2010	1/13/2010	1/13/2010
C15-C16	ug/L				<17	<17	<17	18	<17	<17	<17	<17	49
C17-C18	ug/L				<17	<17	<17	24	<17	<17	<17	<17	57
C19-C20	ug/L				<18	<18	<18	23	<18	<18	<18	<18	64
C21-C22	ug/L				<18	<18	<18	28	<18	<18	<18	<18	75
C23-C24	ug/L				<18	<18	<18	32	<18	<18	<18	<18	93
C25-C28	ug/L				<16	<16	<16	34	<16	<16	17	19	130
C29-C32	ug/L				15	20	<8.5	41	<8.5	<8.5	18	18	190
C33-C36	ug/L				<7.9	12	<7.9	21	<7.9	<7.9	8.5	8	140
C37-C40	ug/L				<6.8	<6.8	<6.8	21	<6.8	<6.8	<6.8	<6.8	130
C41-C44	ug/L				9	<6.6	<6.6	11	<6.6	<6.6	<6.6	<6.6	66
C6-C44 Total	ug/L				<47	<47	<47	270	<47	<47	<47	<47	1000
Dissolved Metals													
Antimony (Sb)	µg/L				0.38B	0.4B	0.14B	0.62B	0.23B	0.26B	0.5B	0.34B	<0.1
Arsenic (As)	µg/L		0.34 (b)	69	0.91B	1.45B	2.02B	1.36B	2.17B	2.24B	1.55B	1.59B	<0.2
Barium (Ba)	µg/L				43	21.3	10.6	25.9	12.5	12.9	16.5	12.9	34.4
Beryllium (Be)	µg/L				0.032	0.034	0.025	0.032	0.024	0.038	0.026	0.02	<0.2
Cadmium (Cd)	µg/L		(c)	42	0.015	0.067	0.108	0.048	0.112	0.123	0.105	0.107	<0.2
Chromium (Cr)	µg/L		(c)	1100	1.671B	0.701B	0.198B	0.859B	0.481B	0.256B	0.461B	0.303B	<0.1
Cobalt (Co)	µg/L				0.291B	0.203B	0.189B	0.237B	0.215B	0.198B	0.204B	0.183B	<0.1
Copper (Cu)	µg/L		(c)	4.8	1.46B	3.52B	10.74B	3.88B	12.11B	9.59B	7.02B	9.94B	<0.4
Lead (Pb)	µg/L		(c)	210	0.078	0.158	0.207	0.188	0.147	0.107	0.17	0.144	<0.05
Mercury (Hg)	µg/L				<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Molybdenum (Mo)	µg/L				8.044	7.408	7.995	6.667	8.135	8.598	7.197	7.943	<0.2
Nickel (Ni)	µg/L		(c)	74	1.019B	1.02B	0.572B	1.341B	0.629B	0.667B	0.959B	0.742B	<0.2
Selenium (Se)	µg/L			290	0.01J	0.03	0.02	0.04	0.02	0.03	0.02	0.03	<0.2
Silver (Ag)	µg/L		(c)	1.9	0.09B	0.07B	0.11B	0.06B	0.08B	0.09B	0.07B	0.07B	<0.5
Thallium (Tl)	µg/L				<0.005	<0.005	0.011	<0.005	0.012	0.01	0.007J	0.01	<0.1
Vanadium (V)	µg/L				3.08	2.01	1.89	2.32	2.17	1.97	2.09	1.92	<0.2
Zinc (Zn)	µg/L		(c)	90	10.22B	52.44B	89.5B	48.91B	84.59B	77.79B	66.53B	74.18B	<0.1
Total Metals													
Antimony (Sb)	µg/L				0.5B	0.55B	0.24B	0.76B	0.15B	0.26B	0.47B	0.34B	2.2B
Arsenic (As)	µg/L	80			1.11B	1.52B	2.07B	1.5B	2.24B	1.92B	1.72B	2.16B	3.6B
Barium (Ba)	µg/L				49.3	26.3	11.9	37.8	13	15	20.4	15.1	43.9
Beryllium (Be)	µg/L				0.046	0.048	0.033	0.046	0.03	0.04	0.035	0.037	<0.2
Cadmium (Cd)	µg/L	10			0.368	0.132	0.108	0.141	0.107	0.181	0.114	0.105	0.3J
Chromium (Cr)	µg/L	20			4.116B	1.951B	0.347B	2.169B	0.51B	0.463B	1.028B	0.676B	1.9B
Cobalt (Co)	µg/L				0.377B	0.308B	0.2B	0.324B	0.208B	0.204B	0.244B	0.208B	0.5B
Copper (Cu)	µg/L	30			10.6B	14.75B	14.03B	16.51B	14.14B	13.44B	15.04B	14.41B	21.6B

Table 6. Summary of Oxford Retention Basin Wet Weather Water Quality Chemistry

Parameter	Units	COP	CTR Freshwater	CTR Saltwater	Saltwater								Freshwater
					Oxford Retention Basin		Exchange		Basin E				Boone Olive
					ORB-1	ORB-2	X-ORB-1	X-BasinE-3	E-1	E-2	E-3	E-4	BO-3
					1/12/2010	1/13/2010	1/12/2010	1/13/2010	1/12/2010	1/13/2010	1/13/2010	1/13/2010	1/13/2010
Lead (Pb)	µg/L	20			3.504B	3.255B	0.56B	3.659B	0.332B	0.767B	1.748B	0.92B	7.38B
Mercury (Hg)	µg/L	0.4			0.01J	0.01J	<0.01	0.01J	<0.01	<0.01	<0.01	<0.01	0.01J
Molybdenum (Mo)	µg/L				6.707	5.279	7.423	4.912	8.093	7.072	5.636	6.71	5.3
Nickel (Ni)	µg/L	50			1.596B	1.464B	0.63B	1.861B	0.617B	0.702B	1.284B	0.85B	3.9B
Selenium (Se)	µg/L	150			0.04	0.04	0.02	0.04	0.03	0.03	0.04	0.03	2.3
Silver (Ag)	µg/L	7			0.09B	0.07B	0.11B	0.07B	0.08B	0.08B	0.06B	0.08B	<0.5
Thallium (Tl)	µg/L				<0.005	0.007J	0.012	0.006J	0.012	0.01	0.009J	0.01	<0.1
Vanadium (V)	µg/L				5.01	3.19	2.13	3.45	2.14	2.26	2.55	2.37	5.4
Zinc (Zn)	µg/L	200			50.35B	79.66B	91.85B	80.32B	67.43B	82.14B	77.5B	78.15B	89.7B
Volatile Organic Compounds													
1,1,1-Trichloroethane (TCA)	µg/L				<0.0365	<0.0365	<0.0365	<0.0365	<0.0365	<0.0365	<0.0365	<0.0365	<0.0365
1,1,2,2-Tetrachloroethane	µg/L				<0.0228	<0.0228	<0.0228	<0.0228	<0.0228	<0.0228	<0.0228	<0.0228	<0.0228
1,1,2-Trichloroethane	µg/L				<0.031	<0.031	<0.031	<0.031	<0.031	1.2	<0.031	<0.031	<0.031
1,1-Dichloroethane	µg/L				<0.0076	<0.0076	<0.0076	<0.0076	<0.0076	<0.0076	<0.0076	<0.0076	<0.0076
1,1-Dichloroethene	µg/L				<0.0177	<0.0177	<0.0177	<0.0177	<0.0177	<0.0177	<0.0177	<0.0177	<0.0177
1,2-Dichlorobenzene	µg/L				<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019
1,2-Dichloroethane (EDC)	µg/L				<0.031	<0.031	<0.031	<0.031	<0.031	<0.031	<0.031	<0.031	<0.031
1,2-Dichloropropane	µg/L				<0.0266	<0.0266	<0.0266	<0.0266	<0.0266	<0.0266	<0.0266	<0.0266	<0.0266
1,3-Dichlorobenzene	µg/L				<0.0283	<0.0283	<0.0283	<0.0283	<0.0283	<0.0283	<0.0283	<0.0283	<0.0283
1,4-Dichlorobenzene	µg/L				0.1J,B	<0.031	<0.031	<0.031	<0.031	<0.031	<0.031	<0.031	<0.031
2-Chloroethyl Vinyl Ether (2-CVE)	µg/L				<0.0951	<0.0951	<0.0951	<0.0951	<0.0951	<0.0951	<0.0951	<0.0951	<0.0951
Acrolein	µg/L				<0.8217	<0.8217	<0.8217	<0.8217	<0.8217	<0.8217	<0.8217	<0.8217	<0.8217
Acrylonitrile	µg/L				<1.401	<1.401	<1.401	<1.401	<1.401	<1.401	<1.401	<1.401	<1.401
Benzene	µg/L				<0.0118	<0.0118	<0.0118	<0.0118	<0.0118	<0.0118	<0.0118	<0.0118	<0.0118
Bromodichloromethane	µg/L				<0.0281	<0.0281	<0.0281	<0.0281	<0.0281	<0.0281	<0.0281	<0.0281	<0.0281
Bromoform	µg/L				<0.0347	<0.0347	<0.0347	<0.0347	<0.0347	<0.0347	<0.0347	<0.0347	<0.0347
Bromomethane (Methyl Bromide)	µg/L				0.4J,B	0.3J,B	0.5B	0.3J,B	0.3J,B	0.4J,B	0.3J,B	0.2J	0.2J
Carbon Tetrachloride	µg/L				<0.0323	<0.0323	<0.0323	<0.0323	<0.0323	<0.0323	<0.0323	<0.0323	<0.0323
Chlorobenzene	µg/L				<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019	<0.019
Chloroethane (Ethyl Chloride)	µg/L				<0.0583	<0.0583	<0.0583	<0.0583	<0.0583	<0.0583	<0.0583	<0.0583	<0.0583
Chloroform	µg/L				<0.1795	<0.1795	<0.1795	0.2J	<0.1795	<0.1795	<0.1795	<0.1795	<0.1795
Chloromethane (Methyl Chloride)	µg/L				0.4J,B	0.3J,B	0.4J,B	0.3J,B	0.4J,B	0.3J,B	0.2J	0.2J	0.2J
Dibromochloromethane	µg/L				<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021
Dichlorodifluoromethane (F12)	µg/L				0.3J,B	0.2J,B	0.2J,B	0.2J,B	0.2J,B	0.3J,B	0.2J,B	0.2J,B	0.2J,B
Ethylbenzene	µg/L				0.1J	<0.0156	<0.0156	<0.0156	<0.0156	<0.0156	<0.0156	<0.0156	<0.0156
Methyl-t-Butyl Ether (MTBE)	µg/L				<0.1318	<0.1318	0.2J	<0.1318	0.2J	0.2J	<0.1318	<0.1318	<0.1318
Methylene Chloride (Dichloromethane)	µg/L				1.5B	2.2B	1.3B	2.9B	2B	2.9B	2.3B	1.8B	0.3J,B
Tetrachloroethene (PCE)	µg/L				0.1J	<0.0167	<0.0167	<0.0167	<0.0167	<0.0167	0.1J	0.4J	10.7

Table 6. Summary of Oxford Retention Basin Wet Weather Water Quality Chemistry

Parameter	Units	COP	CTR Freshwater	CTR Saltwater	Saltwater								Freshwater
					Oxford Retention Basin		Exchange		Basin E				Boone Olive
					ORB-1	ORB-2	X-ORB-1	X-BasinE-3	E-1	E-2	E-3	E-4	BO-3
					1/12/2010	1/13/2010	1/12/2010	1/13/2010	1/12/2010	1/13/2010	1/13/2010	1/13/2010	1/13/2010
Toluene	µg/L				0.2J,B	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014
Trichloroethene (TCE)	µg/L				0.1J	<0.0277	<0.0277	<0.0277	<0.0277	<0.0277	<0.0277	<0.0277	0.4J
Trichlorofluoromethane (F11)	µg/L				<0.0312	<0.0312	<0.0312	<0.0312	<0.0312	<0.0312	<0.0312	<0.0312	0.1J
Vinyl Chloride	µg/L				0.1J	<0.0983	<0.0983	<0.0983	<0.0983	<0.0983	<0.0983	<0.0983	<0.0983
c-1,2-Dichloroethene	µg/L				<0.0215	<0.0215	<0.0215	<0.0215	<0.0215	<0.0215	<0.0215	<0.0215	0.3J
c-1,3-Dichloropropene	µg/L				<0.0198	<0.0198	<0.0198	<0.0198	<0.0198	<0.0198	<0.0198	<0.0198	<0.0198
o-Xylene	µg/L				<0.0152	<0.0152	<0.0152	<0.0152	<0.0152	<0.0152	<0.0152	<0.0152	<0.0152
p/m-Xylene	µg/L				<0.0201	<0.0201	<0.0201	<0.0201	<0.0201	<0.0201	<0.0201	<0.0201	<0.0201
t-1,2-Dichloroethene	µg/L				<0.0403	<0.0403	<0.0403	<0.0403	<0.0403	<0.0403	<0.0403	<0.0403	<0.0403
t-1,3-Dichloropropene	µg/L				<0.0218	<0.0218	<0.0218	<0.0218	<0.0218	<0.0218	<0.0218	<0.0218	<0.0218

<-Results are less than the method detection limit.

B-Analyte was detected in the associated method blank.

H-Sample received and/or analyzed past the recommended holding time.

J-Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.

(a) Water Quality Benchmark for Pentachlorophenol is based on pH as described by the USEPA Federal Register Doc. 40 CFR Part 131, May 18, 2000. The Criteria Maximum Concentration (CMC) was used.

(b) Water Quality Benchmark for dissolved metal fractions are based on a default water effects ratios (WER) value of 1 and are calculated as described by the USEPA Federal Register Doc. 40 CFR Part 131, May 18, 2000.

(c) Water Quality Benchmark for dissolved metal fractions are based on total hardness and are calculated as described by the USEPA Federal Register Doc. 40 CFR Part 131, May 18, 2000. The CMC was used.

* Indicates method detection limit above water quality objective.

Table 7. Summary of Additional Analytes Wet Weather Water Quality Chemistry

Parameter	Units	COP	CTR Freshwater	CTR Saltwater	Saltwater	
					Oxford Retention Basin	Exchange
					ORB-Add-2	X-ORB-Add-2
					1/13/2010	1/13/2010
General Chemistry						
Biochemical Oxygen Demand	mg/L				6.9	<2
COD	mg/L				119	161
Chloride by IC	mg/L				15143.34	17594.57
Cyanide	mg/L	0.01		0.001*	<0.005	<0.005
Oil & Grease	mg/L				1.7J	1.6J
Organophosphorus Pesticides						
Azinphos Methyl	ng/L				<10	<10
Bolstar (Sulprofos)	ng/L				<2	<2
Chlorpyrifos	ng/L				<1	<1
Demeton	ng/L				<1	<1
Diazinon	ng/L				<2	<2
Dichlorvos	ng/L				<3	<3
Dimethoate	ng/L				<3	<3
Disulfoton	ng/L				<1	<1
Ethoprop (Ethoprofos)	ng/L				<1	<1
Ethyl Parathion	ng/L				<10	<10
Fenchlorphos (Ronnel)	ng/L				<2	<2
Fenitrothion	ng/L				<10	<10
Fensulfothion	ng/L				<1	<1
Fenthion	ng/L				<2	<2
Malathion	ng/L				<3	<3
Merphos	ng/L				<1	<1
Methamidophos (Monitor)	ng/L				<50	<50
Methidathion	ng/L				<10	<10
Methyl Parathion	ng/L				<1	<1
Mevinphos (Phosdrin)	ng/L				<8	<8
Phorate	ng/L				<6	<6
Phosmet	ng/L				<50	<50
Tetrachlorvinphos (Stirofos)	ng/L				<2	<2
Tokuthion	ng/L				<3	<3
Trichloronate	ng/L				<1	<1

<-Results are less than the method detection limit.
J-Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.

* Indicates method detection limit above water quality objective.

4.0 DISCUSSION

4.1 Microbiology

This summary describes the implications of this data gap as it pertains to analysis of the presence of indicator organisms in Marina Del Rey.

E. coli survival in sea water is influenced by a number of different factors including salinity, temperature, pH and turbidity. Solar radiation and salinity are generally the factors which impact survival most significantly. Current research suggests that *E. coli* survival may extend to a few hours in sea water but that survival is limited by those factors mentioned above (Oren and Vlodavsky, 1985).

Ratios can sometimes be used to assess origins of fecal indicator species (Baxter-Potter and Gilliland, 1988). Geometric mean ratios of *E. coli* to fecal coliforms can also be used to assess potential illness rates (Gannon and Busse, 1989). However ratios should not be used to extrapolate *E. coli* results.

The results from the January 13, 2010 sampling event indicate elevated enterococci, fecal coliform, and total coliform concentrations in Boone-Olive, Basin E (Sites E-3, E-4) ORB (ORB-2) and Exchange (X-ORB-3). Based on these results it must be assumed that E.coli concentrations would be significantly above water quality objectives at each of these sites also.

5.0 REFERENCES

Aharon Oren and Lea Vlodavsky. 1985. Survival of Escherichia coli and Vibrio harveyi in Dead Sea water. FEMS Microbiology Letters, Vol. 31. Is 6. Pages 365-371

Baxter-Potter, W.R. and M.W. Gilliland, 1988. Bacterial runoff from agricultural lands. Journal of Environmental Quality 17:27-34.

Gannon, John J., Busse, Michael K. (1989).E. coli and enterococci levels in urban stormwater, river water and chlorinated treatment plant effluent. Water Research 23(9): 1167-1176.

Appendix A: Field Notes

Oxford Basin WQ - PRE-STORM/PRIOR/DURING/BASIN DRAINED Sampling (*circle correct round*)

if prior collect additional analytes at ORB-C

date: 12 JAN 2009 time begin/end: 2040 / 2145

station	latitude	longitude	H2O depth	fresh lens depth	color	odor	clairty
ORB-A	33.98482	-118.46650	1.0 ft	Ø	sl. yellow	none	Ø
	pH	DO (mg/L)	conductivity above/below lens		turbidity	temp (C)	
	8.31	12.40 mg/L	28.91 mS/cm		5.0 NTU	16.48°C	
station	latitude	longitude	H2O depth	fresh lens depth	color	odor	clairty
ORB-B	33.98536	-118.45570	0.9'	Ø	slt. yellow	Ø	Ø
	pH	DO (mg/L)	conductivity above/below lens		turbidity	temp (C)	
	8.37	9.44 mg/L	27.29 mS/cm		9.5 NTU	16.59°C	
station	latitude	longitude	H2O depth	fresh lens depth	color	odor	clairty
ORB-C	33.98524	-118.45525	0.6'	Ø	slt. yellow	slt. sulfide	Ø
	collect individual grabs at this station(VOCs, TPH,bacT)						
	pH	DO (mg/L)	conductivity above/below lens		turbidity	temp (C)	
	8.50	11.55 mg/L	27.34 mS/cm		5.7 NTU	15.97°C	
station	latitude	longitude	H2O depth	fresh lens depth	color	odor	clairty
ORB-D	33.98548	-118.45505	0.6'	Ø	slt. yellow	sulfide	Ø
	pH	DO (mg/L)	conductivity above/below lens		turbidity	temp (C)	
	8.38	8.36 mg/L	25.39 mS/cm		18.3 NTU	15.46	
station	latitude	longitude	H2O depth	fresh lens depth	color	odor	clairty
ORB-E	33.98534	-118.45479	0.4'	Ø	yellow	sulfide	opaque
	pH	DO (mg/L)	conductivity above/below lens		turbidity	temp (C)	
	8.23	6.66 mg/L	20.76 mS/cm		31.7 NTU	15.38°C	

comments: 2000 dropcal pop bouys entire Basin extremely shallow
exchange is flowing into Oxford
grabs taken at ORB-C @ 2100
Sample ID ORB-1

ORB-D → Organic scum layer observed on surface
ORB-E → South side of Basin extremely shallow + has opaque cloudiness

Rain Gague → 0.18"
@ 1100 1.13.10

Oxford Basin WQ--**PRE-STORM/PRIOR/DURING/BASIN DRAINED** Sampling (*circle correct round*)

if prior collect additional analytes at ORB-C ✓			date: 1.13.10		time begin/end: 1010 / 1110		
station	latitude	longitude	H2O depth	fresh lens depth	color	odor	clairty
ORB-A			3.5'	16"	clear	Ø	Ø
	pH	DO (mg/L)	conductivity above/below lens		turbidity	temp (C)	
	7.96	7.70 mg/L	6.210mS / 46.20mS		5.6NTU	14.91°C	
station	latitude	longitude	H2O depth	fresh lens depth	color	odor	clairty
ORB-B			2.25'	24"	Ø	Ø	Ø
	pH	DO (mg/L)	conductivity above/below lens		turbidity	temp (C)	
	8.02	7.77 mg/L	7.161mS / 36.25mS		9.2NTU	15.0°C	
station	latitude	longitude	H2O depth	fresh lens depth	color	odor	clairty
ORB-C			2.4'	20"	Ø	Ø	Ø
	collect individual grabs at this station(VOCs, TPH,bacT) ✓						
	pH	DO (mg/L)	conductivity above/below lens		turbidity	temp (C)	
	7.93	7.23 mg/L	7.384mS / 45.55mS		5.2NTU	15.0°C	
station	latitude	longitude	H2O depth	fresh lens depth	color	odor	clairty
ORB-D			1.8'	18"	Ø	Ø	Ø
	pH	DO (mg/L)	conductivity above/below lens		turbidity	temp (C)	
	7.94	7.09 mg/L	9.372mS / 44.52mS		6.4NTU	15.08°C	
station	latitude	longitude	H2O depth	fresh lens depth	color	odor	clairty
ORB-E			2.0'	18"	Ø	Ø	Ø
	pH	DO (mg/L)	conductivity above/below lens		turbidity	temp (C)	
	7.99	7.12 mg/L	8.782mS / 42.99mS		9.8NTU	15.15°C	

comments: photos taken
Samples collected from below fresh lens
Sample ID ORB-2 1030

ORB-C surface readings
Cond - 4.666
Temp - 16.28°C
pH - 8.09
D.O - 8.41 mg/L
Turb - 27.4 NTU

Oxford Basin WQ--**PRE-STORM/PRIOR/DURING/BASIN DRAINED** Sampling (*circle correct round)*							
if prior collect additional analytes at X				date: 12 JAN 2010	time begin/end: 2210/2255		
station	latitude	longitude	H2O depth	fresh lens depth	color	odor	clairty
X-ORB	33.98437	-118.45632	50"	~5	Ø	Ø	Ø
X-Basin E	pH	DO (mg/L)	conductivity above/below lens		turbidity	temp (C)	
circle above	7.94	7.45mg/L	51.16 mS/cm		1.0 NTU	14.64	

comments: grabs and DUP @ 2220

moderate/large seepage from E to OXB - aerated + turbulent

DUP WQ

pH 7.94 DO 7.70 mg/L cond: 51.24 mS/cm

Turb: 0.6 NTU Temp 14.65 °C

Oxford Basin WQ--**PRE-STORM/PRIOR/DURING/BASIN DRAINED** Sampling (*circle correct round)*							
if prior collect additional analytes at X ✓				date: 1.13.10	time begin/end: 1130/1145		
station	latitude	longitude	H2O depth	fresh lens depth	color	odor	clairty
X-ORB	37.[illegible]	-[illegible]	70"	Ø	Ø	Ø	Ø
X-Basin E	pH	DO (mg/L)	conductivity above/below lens		turbidity	temp (C)	
circle above	7.87	7.38 mg/L	51.06 mS/cm		1.4 NTU	16.04°C	

comments: photos + add sampler taken

Samp ID X-ORB-Add-2 1130

Oxford Basin WQ--**PRE-STORM/PRIOR/DURING/BASIN DRAINED** Sampling (*circle correct round)*							
if prior collect additional analytes at X				date: 1.13.10	time begin/end: 1400/1420		
station	latitude	longitude	H2O depth	fresh lens depth	color	odor	clairty
X-ORB	33.98355	-118.45609	81"	Ø	slt yellow	Ø	Ø
X-Basin E	pH	DO (mg/L)	conductivity above/below lens		turbidity	temp (C)	
circle above	8.02	7.48mg/L	31.53 mS		12.5 NTU	18.36	

comments: Extremely turbulant discharge

Oxford Basin WQ - **PRE-STORM/PRIOR/DURING/BASIN DRAINED** Sampling (*circle correct round)*

33.98290 -118.45499

				date: 1.12.10	time begin/end: 2310		
station	latitude	longitude	H2O depth	fresh lens depth	color	odor	clairty
Basin E-A	~~33.98299~~	~~-118.45502~~	14.0'	Ø	clear	Ø	Ø
	collect individual grabs at this station(VOCs, TPH, bacT)						
	pH	DO (mg/L)	conductivity above/below lens		turbidity	temp (C)	
	8.03	7.96 mg/L	50.69 mS/cm		-0.4 NTU	14.80°C	
station	latitude	longitude	H2O depth	fresh lens depth	color	odor	clairty
Basin E-B	33.98328	-118.45547	12.5'	Ø	clear	Ø	Ø
	pH	DO (mg/L)	conductivity above/below lens		turbidity	temp (C)	
	8.04	8.22 mg/L	50.15 mS/cm		-0.3 NTU	14.79°C	
station	latitude	longitude	H2O depth	fresh lens depth	color	odor	clairty
Basin E-C	~~33.98302~~	~~-118.45591~~	18.6	Ø	clear	Ø	Ø
	pH	DO (mg/L)	conductivity above/below lens		turbidity	temp (C)	
	8.02	8.03 mg/L	50.82 mS/cm		-0.5 NTU	14.82°C	

comments:

33.98292, -118.45600

Oxford Basin WQ--**PRE-STORM/PRIOR/DURING/BASIN DRAINED** Sampling (*circle correct round*)

				date:	time begin/end:		
				1.13.10	1150 / 1245		
station	latitude	longitude	H2O depth	fresh lens depth	color	odor	clairty
Basin E-A			~~15.5'~~ 12.5' (mid)	< 0.3"	clear	∅	∅
	collect individual grabs at this station(VOCs, TPH, bacT)						
	pH	DO (mg/L)	conductivity above/below lens		turbidity	temp (C)	
	7.94	7.54 mg/L	24.85 mS / 51.00 mS		-0.5 NTU	14.87°C	
station	latitude	longitude	H2O depth	fresh lens depth	color	odor	clairty
Basin E-B			11.2'	∅	∅	∅	∅
	pH	DO (mg/L)	conductivity above/below lens		turbidity	temp (C)	
	7.92	7.53 mg/L	48.65 mS / 50.95 mS		-0.2 NTU	14.96°C	
station	latitude	longitude	H2O depth	fresh lens depth	color	odor	clairty
Basin E-C			15.5'	∅	∅	∅	∅
	pH	DO (mg/L)	conductivity above/below lens		turbidity	temp (C)	
	7.96	7.69 mg/L	50.81 mS		-0.3 NTU	14.84°C	

readings @ 4'

comments: grabs taken from Basin E-C
physical parameters taken at a depth of 4'.

- E-A → ~~boat~~ boat wash down occurring

Basin E-A
Surface Readings → fresh lens < 0.3"
Temp 15.41 °C
pH 7.85
D.O ~~Cond~~ 8.28 mg/L
Turb 1.6 NTU
Cond 24.85 mS/cm
schlern observed in top 4 inches of surface water

~~B-2~~ grab - 1115 - LADPW sewer maint. crew hydro jet/power washing sanitary sewer near discharge Basin E outfall. Washing in sewer equip off w/ "fresh H_2O". Rinsate running overland directly into Basin E

Oxford Basin WQ--**PRE-STORM/PRIOR/DURING/BASIN DRAINED** Sampling (*circle correct round)*

				date:	time begin/end:		
				1.13.10	1425		
station	latitude	longitude	H2O depth	fresh lens depth	color	odor	clairty
Basin E-A			10.5'	minor	Ø	Ø	Ø
	collect individual grabs at this station(VOCs, TPH, bacT)						
	pH	DO (mg/L)	conductivity above/below lens		turbidity	temp (C)	
	7.83	7.62mg/L	44.35 mS	/ 50.04mS	1.1 NTU	15.28C	
station	latitude	longitude	H2O depth	fresh lens depth	color	odor	clairty
Basin E-B			9.5'	Menor	Ø	Ø	
	pH	DO (mg/L)	conductivity above/below lens		turbidity	temp (C)	
	7.96	7.9 mg/L	38.35 mS	/ 50.41 mS	1.0 NTU	15.25°C	
station	latitude	longitude	H2O depth	fresh lens depth	color	odor	clairty
Basin E-C			13.0'	minor lens	clear	Ø	Ø
	pH	DO (mg/L)	conductivity above/below lens		turbidity	temp (C)	
	7.81	7.45mg/L	42.667 mS	/ 50.58mS	1.7 NTU	15.04	

} less current than A+C

comments: grab Samples collected @ C
wind + current ↑ since previous sampling

Oxford Basin WQ--**PRE-STORM/PRIOR/DURING/BASIN DRAINED** Sampling *(circle correct round)*

				date:	time begin/end:		
				4.13.10	1600		
station	latitude	longitude	H2O depth	fresh lens depth	color	odor	clairty
Basin E-A			11.3'	minor	Ø	Ø	Ø
	collect individual grabs at this station(VOCs, TPH, bacT)						
	pH	DO (mg/L)	conductivity above/below lens		turbidity	temp (C)	
	7.91	7.79 mg/L	45.89 mS / 50.70 mS		1.3 NTU	15.22°C	
station	latitude	longitude	H2O depth	fresh lens depth	color	odor	clairty
Basin E-B			9.9'	minor	Ø	Ø	Ø
	pH	DO (mg/L)	conductivity above/below lens		turbidity	temp (C)	
	7.93	7.84 mg/L	47.01 mS / 51.28 mS		0.3 NTU	15.17°C	
station	latitude	longitude	H2O depth	fresh lens depth	color	odor	clairty
Basin E-C			13.0'	minor	clear	Ø	Ø
	pH	DO (mg/L)	conductivity above/below lens		turbidity	temp (C)	
	7.81	6.38 mg/L	43.62 mS / 50.85 mS		6.3 NTU	15.14°C	

comments: high winds
grabs taken @ Basin E-C

Oxford Basin WQ--**PRE-STORM/PRIOR/DURING/BASIN DRAINED** Sampling (*circle correct round)*							
				date: 1.13.10	time begin/end: 1500/1525		
station	latitude	longitude	H2O depth	fresh lens depth	color	odor	clairty
Boone Olive	33.98459	118.45924	1.0'	∅	slt yellow	∅	∅
	pH	DO (mg/L)	conductivity above/below lens		turbidity	temp (C)	
circle above	7.69	7.30 mg/L	2.308 mS		34.8 NTU	16.56°C	

comments: leaf debris, trash, muck/organic sand bottom
minor MEAS