State of California
The Natural Resources Agency
DEPARTMENT OF WATER RESOURCES
South Central Region Office

San Joaquin Valley
Drainage Monitoring Program
2006 - 2010

Region Report

September 2013

John Laird	Edmund G. Brown Jr.	Mark Cowin
Secretary for Natural Resources	Governor	Director
The Natural Resources Agency	State of California	Department of Water Resources

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Foreword

This report shares valuable information about agricultural drainage water in order to increase the understanding of its potential impacts and improve its management in the San Joaquin Valley (SJV).

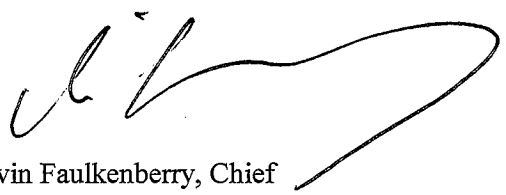
The Drainage Monitoring Program is a cooperative effort of State, federal, and local agencies. Program staff collect, assemble, review, evaluate, and disseminate data on both the quality of drainage water as well as the depth of shallow groundwater in the SJV. Fifty-two drainage sump systems are monitored for flow, sodium, sulfate, total dissolved solids, selenium, and other constituents. Staff also combine the Department of Water Resources' (DWR's) data with data from over 10 other agencies for this report.

DWR used depth information, gathered from approximately 1,200 shallow groundwater wells, to draw Present and Potential Drainage Problem Areas Maps for the period from 2006 through 2010. These maps show over one million acres of potentially impacted lands. Data provided by several agencies, including the Buena Vista Water Storage District, Central California Irrigation District, Firebaugh Canal Water District, Kern County Water Agency, Panoche Water and Drainage District, San Luis Canal Company, Westlands Water District, and DWR was combined to create the maps.

DWR also drew electrical conductivity (EC) maps from ECs measured in about 690 of those wells for the years 2009 and 2010. All of the maps help inform managers of potential drainage problems in their areas due to encroachment of shallow groundwater. The number of agencies participating is a reflection of the significance of drainage problems in the SJV and the potential impacts.

This report focuses on five years of data collection and compilation for the calendar years 2006 through 2010, with a special focus on historical arsenic, boron, and selenium. In addition, pesticide and nutrient data have been added to this report for your use.

Over the years, this report has been published and distributed. Starting next year, all of the collected drainage data and related information will be made available on our website. We will let you know when this occurs. Until then, please contact staff with your questions or needs.



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Symbols and Abbreviations

Acronyms

ASAR	adjusted sodium adsorption ratio
USBR	U.S. Bureau of Reclamation
DFA	California Department of Food and Agriculture
DFG	California Department of Fish and Game
DTW	depth-to-water
DWR	California Department of Water Resources
EC	electrical conductivity
EPA	U.S. Environmental Protection Agency
MCL	maximum contaminant level
MOU	memorandum of understanding
SAR	sodium adsorption ratio
SJVDIP	San Joaquin Valley Drainage Implementation Program
SJVDP	San Joaquin Valley Drainage Program
SWRCB	State Water Resources Control Board
TDS	total dissolved solids
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

Glossary

Time	Pacific Standard Time on a 24-hour clock
Temp.	Temperature of water at time of sampling in degrees Celsius (^{o}C) and degrees Fahrenheit (^{o}F)
pH	pH is the amount of hydrogen ions in solution; measures acidity (<7) or alkalinity (>7) of the solution
EC (µS/cm)	Electrical conductance in microsiemens per centimeter at 25 ^{o}C
mg/L	milligram per Liter – concentration of a constituent by weight in a liter of solution
meq/L	milliequivalents per Liter – concentration of a constituent by ionic strength in a liter of solution; meq/L is obtained by taking the concentration in mg/L and dividing the concentration by the constituent's atomic weight divided by the absolute value of the common valence
ppb	parts per billion
prv	percent reactance value – values indicate the relative percentage of the various major constituents

$$\text{prv (for each ion)} = \frac{\text{cation}}{\sum \text{cations}} \text{ or } \frac{\text{anion}}{\sum \text{anions}} \text{ in meq/L x } 100$$

Mineral and Trace Element Constituents

As	Arsenic
B	Boron
Ca	Calcium
$CaCO_3$	Calcium Carbonate
Cl	Chloride
HCO_3	Bicarbonate
K	Potassium
Mg	Magnesium
Na	Sodium
Ni	Nickel
NO_3	Nitrate
OH	Hydroxide
Se	Selenium
SO_4	Sulfate
T. Alk	Total Alkalinity (expressed as mg/L as $CaCO_3$)
TH	Total Hardness (expressed as mg/L as $CaCO_3$)
TDS	Gravimetric determination of total dissolved solids at 180 ^oC
Sum TDS	TDS approximation (for confirmation purposes) determined by addition of the following analyzed constituents:

$Ca + Mg + Na + 0.6$ (Total Alkalinity) $+ SO_4 + Cl + NO_3$

Indices

SAR — Sodium Adsorption Ratio (developed by U.S. Salinity Laboratory)

$$SAR = \frac{Na}{\sqrt{\frac{(Ca)+(Mg)}{2}}}$$

Na, *Ca*, and *Mg* represent the concentrations in milliequivalents per liter

ASAR — Adjusted Sodium Adsorption Ratio:

adj SAR = SAR [1 + (8.4 – pHc)] x 0.5

where pHc is a theoretical calculated pH of the irrigation water in contact with lime and in equilibrium with soil CO_2

Metric Conversion

Quantity	To convert from metric unit	To customary unit	Multiply metric unit by	To convert to metric unit multiply customary unit by
Length	millimeters (mm)	inches (in)	0.03937	25.4
	centimeters (cm) for snow depth	inches (in)	0.3937	2.54
	metros (m)	feet (ft)	3.2808	0.3048
	kilometers (km)	miles (mi)	0.62139	1.6093
Area	square millimeters (mm^2)	square inches (in^2)	0.00155	645.16
	square metros (m^2)	square feet (ft^2)	10.764	0.092903
	hectares (ha)	acres (ac)	2.4710	0.40469
	square kilometers (km^2)	square miles (mi^2)	0.3861	2.590
Volume	liters (L)	gallons (gal)	0.26417	3.7854
	mega liters (ML)	million gallons (10^6 gal)	0.26417	3.7854
	cubic meters (m^3)	cubic feet (ft^3)	35.315	0.028317
	cubic meters (m^3)	cubic yards (yd^3)	1.308	0.76455
	cubic decameters (dam^3)	acre-feet (ac-ft)	0.8107	1.2335
Flow	cubic meters per second (m^3/s)	cubic feet per second (ft^3/s)	35.315	0.028317
	liters per minute (L/min)	gallons per minute (gal/min)	0.26417	3.7854
	liters per day (L/day)	gallons per day (gal/day)	0.26417	3.7854
	mega liters per day (ML/day)	million gallons per day (mgd)	0.26417	3.7854
	cubic decameters per day (dam^3/day)	acre-feet per day (ac-ft/day)	0.8107	1.2335
Mass	kilograms (kg)	pounds (lb)	2.2046	0.45359
	megagrams (Mg)	tons (short, 2,000 lb)	1.1023	0.90718
Velocity	meters per second (m/s)	feet per second (ft/s)	3.2808	0.3048
Power	kilowatts (kW)	horsepower (hp)	1.3405	0.746
Pressure	kilopascals (kPa)	pounds per square inch (psi)	0.14505	6.8948
	kilopascals (kPa)	feet head of water	0.33456	2.989
Specific capacity	liters per minute per meter drawdown	gallons per minute per foot drawdown	0.08052	12.419
Concentration	milligrams per liter (mg/L)	parts per million (ppm)	1.0	1.0
Electrical conductivity	microsiemens per centimeter (μS/cm)	micromhos per centimeter (μmho/cm)	1.0	1.0
Temperature	degrees Celsius (°C)	degrees Fahrenheit (°F)	(1.8x°C)+32	(°F−32)/1.8

Introduction

In 1959, the California Department of Water Resources (DWR) began monitoring agricultural drainage water in the San Joaquin Valley. Initial monitoring efforts from 1959 to 1963 focused on mineral analyses. In 1963, the monitoring program became part of the San Joaquin Drainage Investigation and included analyses for pesticides in both surface and subsurface drainage waters. From 1966 to 1969, intensive nutrient sampling became a part of the investigation.

Although the San Joaquin Drainage Investigation ended in 1970, DWR continued the monitoring as a separate departmental activity until 1975 when DWR, the U.S. Bureau of Reclamation (USBR), and the State Water Resources Control Board (SWRCB) formed the San Joaquin Valley Interagency Drainage Program. The program continued until 1979 when monitoring resumed as a separate activity under its Agricultural Drainage Program.

The discovery in 1983 of migratory bird deaths and deformities linked to high selenium levels in drainage water at Kesterson Reservoir focused national attention on drainage of the San Luis Drain and drainage-related problems. This discovery resulted in an interagency drainage study.

The following year, U.S. Secretary of the Interior William Patrick Clark and Governor of California George Deukmejian established the San Joaquin Valley Drainage Program (SJVDP). It was created to investigate and identify solutions to drainage problems. Cooperating agencies were DWR, California Department of Fish and Game (DFG), U.S. Fish and Wildlife Service (USFWS), U.S. Geological Survey (USGS), and the U.S. Bureau of Reclamation (USBR). The SJVDP developed a comprehensive study titled *A Management Plan for Agricultural Subsurface Drainage and Related Problems on the Westside San Joaquin Valley*, also known as the *Rainbow Report* (September 1990). It summarized the results of subsurface agricultural drainage problems and presented a plan for managing drainage problems.

In 1991, federal and State agencies initiated the San Joaquin Valley Drainage Implementation Program (SJVDIP) to pick up where SJVDP left off. Four federal agencies (Natural Resources Conservation Service, USFWS, USGS, and the USBR) and four State agencies (DFG, DWR, Department of Food and Agriculture, and SWRCB) signed a memorandum of understanding (MOU) and released an implementation strategy in December 1991. They agreed to work together and identify specific tasks associated with responsible parties, seek needed funding and authority, and set schedules for implementing all components of the SJVDP's 1990 *Rainbow Report*.

All the agencies involved recognized that the success of the program depended on local districts and irrigators to effectively manage drainage. Because drainage is a regional problem, federal and State agencies continue to coordinate efforts. DWR continuously evaluates and modifies its drainage monitoring program so that it meets the needs of the implementation strategy.

The Drainage Problem

The San Joaquin Valley, one of the world's most productive agricultural regions, is experiencing mounting problems with the management and disposal of agricultural drainage water.

The drainage problem is an outgrowth of imported water, naturally saline soils, and the valley's distinctive geological makeup which prevents effective natural drainage in certain areas. Soils on the western side of the valley come from the marine sediments that make up the Coast Range. These soils, high in salts and trace elements, are similar to those that occur in the ocean. Also, just below the surface of much of the valley's soil, is a shallow clay layer that obstructs vertical movement of irrigation water. As salts and minerals from surface soils are leached into the shallow groundwater, the water table rises to within a few feet of the surface and into the root zone. Unless this water is removed, crops growing in these soils eventually die.

In the late 1940s, farmers began installing subsurface drains in fields with drainage problems. By 1965, 330 miles of subsurface drains and 750 miles of open ditch drains operated in the valley, delivering drainage water to evaporation ponds and other discharge sites. With this drainage network in operation, the main problem became how to manage and dispose of the salty drainage water.

The original plan was to construct a master drain (the San Luis Drain) to collect the water and route it out of the valley into the Sacramento-San Joaquin River Delta. By 1973, an 87-mile-long section of the San Luis Drain was receiving irrigation runoff and discharging into Kesterson Reservoir. The plan was to extend the drain north to a discharge site in the Delta. Kesterson Reservoir was intended to regulate discharges going to the Delta and provide a wetland habitat. However, the San Luis Drain was never completed, and drainage accumulated at Kesterson Reservoir.

In 1982, federal studies reported high selenium levels in fish taken from Kesterson Reservoir. In 1983, federal-State studies determined that the bioaccumulation of selenium was causing deformities in embryos of waterfowl nesting at the reservoir. In 1985, the U.S. Department of the Interior ordered a halt to drainage water discharges into the San Luis Drain and Kesterson Reservoir, even though irrigation water deliveries to west side agricultural lands continued.

Today, practices of disposing and managing drainage water are being scrutinized for their effects on the environment. Management practices such as source control, drainage reuse, groundwater management, integrated on-farm drainage management, and others identified in the *Rainbow Report* are being used. Monitoring of shallow groundwater and agricultural drainage water is integral to assist in the evaluation of the effectiveness of these management practices.

Drainage Problem Areas

The San Joaquin Valley is a rich agricultural region that encompasses large areas with high water tables. Irrigation practices, cropping patterns, seepage from unlined ditches or ponds, soil type, geology, and other factors influence the elevations of these water tables. The poor natural drainage conditions, coupled with rising groundwater levels and increasing soil salinity, have meant that various soils could no longer produce crops, and some farms in the problem area have been abandoned.

In this report, “present problem area” is defined as a location where the water table is within 5 feet of the ground surface at any time during the year. A "potential problem area" indicates the water table is between 5 and 20 feet below the surface. Present and potential drainage problem areas are determined by the use of ArcGIS software within specific intervals as found in DWR's annual "Present and Potential Drainage Problem Area" maps for 2006, 2007, 2008, 2009, and 2010, Figures 10, 11, 12, 13, and 14, respectively. In addition, Electrical Conductivity (EC) maps are presented for 2009 and 2010, Figures 15 and 16, respectively. Beginning with the 1991 map, DWR drew study-area boundaries that encompassed these problem areas.

Beginning in 1994, DWR established and published standard methods for collecting data for environmental measurement projects (DWR Quality Assurance Technical Document 2). This document specifies methods for the preparation, collection, handling, preservation, and transportation of samples and calibration of instruments. These methods were used to measure water levels in a network of monitoring wells in the study-area boundaries and in the interpretation of the data to establish acreage areas of the particular depth-to-water (DTW) intervals. The maps display an overview of the respective depth-to-water intervals, as well as the boundaries of study for Grasslands, Westlands, Tulare, and Kern subbasins. Table 1, Acreage of Present and Potential Drainage Problems, lists the acreages with drainage problems in the study area for 1991 through 2010. These acreage trends are graphed in Figure 1. Further focus on the individual subbasins can be found in Appendix A.

In preparing maps, DWR did not take into account items such as existing drainage systems, wildlife refuges, urban areas, pasture land, native vegetation, and data-poor areas. Therefore, one must consider other factors, such as water quality, permeability, and field conditions, when making projections about areas that will require drainage systems in the future.

Table 1. Acreages of Present and Potential Drainage Problems, 1991 through 2000

Depth to Groundwater	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Grasslands Subbasin										
0 to 5 ft	114,000	136,000	147,000	146,000	166,000	164,000	156,000	235,000	182,000	130,000
5 to 10 ft	184,000	150,000	131,000	128,000	144,000	153,000	186,000	117,000	150,000	165,000
10 to 15 ft	72,000	77,000	99,000	86,000	64,000	59,000	44,000	39,000	59,000	60,000
15 to 20 ft	42,000	46,000	33,000	51,000	35,000	33,000	22,000	7,000	5,000	17,000
TOTAL	412,000	409,000	410,000	411,000	409,000	409,000	408,000	398,000	396,000	372,000
Kern Subbasin										
0 to 5 ft	40,000	34,000	24,000	10,000	32,000	50,000	58,000	84,000	77,000	39,000
5 to 10 ft	121,000	172,000	126,000	148,000	173,000	163,000	182,000	195,000	155,000	176,000
10 to 15 ft	152,000	84,000	162,000	137,000	115,000	82,000	78,000	77,000	96,000	87,000
15 to 20 ft	15,000	40,000	17,000	32,000	8,000	31,000	8,000	0	5,000	11,000
TOTAL	328,000	330,000	329,000	327,000	328,000	326,000	326,000	356,000	333,000	313,000
Tulare Subbasin										
0 to 5 ft	119,000	189,000	199,000	131,000	195,000	219,000	307,000	264,000	233,000	113,000
5 to 10 ft	244,000	121,000	135,000	212,000	157,000	104,000	65,000	20,000	107,000	178,000
10 to 15 ft	2,000	54,000	30,000	23,000	11,000	17,000	6,000	0	0	0
15 to 20 ft	0	1,000	0	0	0	0	0	0	0	0
TOTAL	365,000	365,000	364,000	366,000	363,000	340,000	378,000	284,000	340,000	291,000
Westlands Subbasin										
0 to 5 ft	38,000	110,000	75,000	34,000	126,000	104,000	228,000	278,000	146,000	146,000
5 to 10 ft	201,000	160,000	172,000	194,000	150,000	205,000	90,000	94,000	180,000	178,000
10 to 15 ft	85,000	69,000	87,000	96,000	65,000	58,000	49,000	20,000	49,000	46,000
15 to 20 ft	85,000	73,000	77,000	85,000	68,000	41,000	41,000	0	32,000	15,000
TOTAL	409,000	412,000	411,000	409,000	409,000	408,000	408,000	392,000	407,000	385,000
TOTALS										
0 to 5 ft	311,000	469,000	445,000	321,000	519,000	537,000	749,000	861,000	638,000	428,000
5 to 10 ft	750,000	603,000	564,000	682,000	624,000	625,000	523,000	426,000	592,000	697,000
10 to 15 ft	311,000	284,000	378,000	342,000	255,000	216,000	177,000	136,000	204,000	193,000
15 to 20 ft	142,000	160,000	127,000	168,000	111,000	105,000	71,000	7,000	42,000	43,000
TOTAL AREA	1,514,000	1,516,000	1,514,000	1,513,000	1,509,000	1,483,000	1,520,000	1,430,000	1,476,000	1,361,000

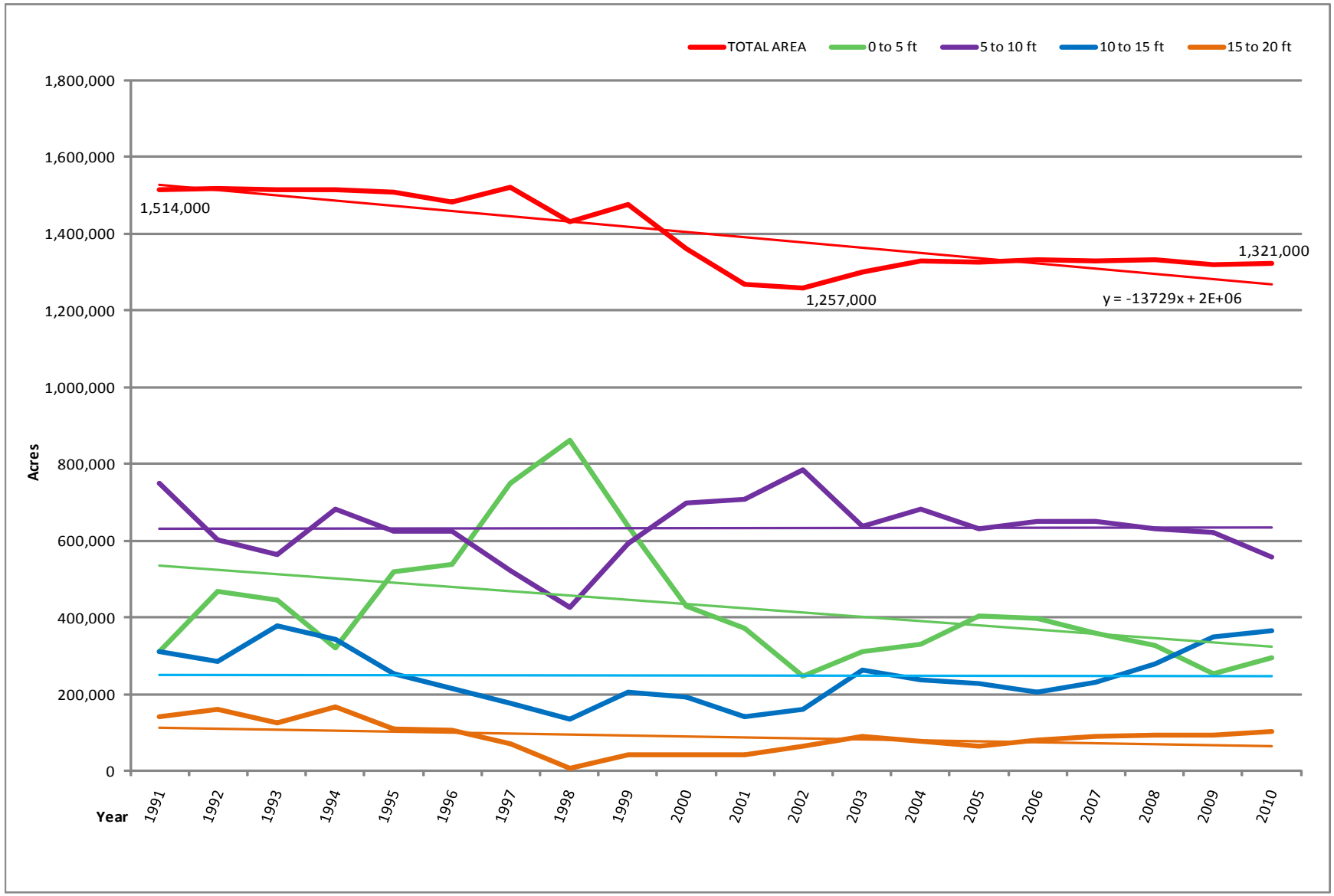
Variations in total result from rounding of numbers.

Table 1 (continued) Acreages of Present and Potential Drainage Problems, 2001 through 2010

Depth to Groundwater	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Grasslands Subbasin										
0 to 5 ft	96,000	129,000	95,000	128,000	163,000	138,000	128,000	130,000	89,000	121,000
5 to 10 ft	171,000	165,000	149,000	180,000	148,000	170,000	152,000	153,000	176,000	156,000
10 to 15 ft	47,000	54,000	77,000	50,000	52,000	53,000	61,000	70,000	73,000	64,000
15 to 20 ft	17,000	16,000	39,000	27,000	28,000	29,000	35,000	28,000	35,000	32,000
TOTAL	331,000	364,000	360,000	385,000	391,000	390,000	376,000	381,000	373,000	373,000
Kern Subbasin										
0 to 5 ft	26,000	6,000	6,000	2,000	2,000	8,000	6,000	2,000	5,000	2,000
5 to 10 ft	153,000	125,000	111,000	108,000	104,000	126,000	117,000	101,000	88,000	90,000
10 to 15 ft	53,000	58,000	68,000	78,000	77,000	49,000	66,000	80,000	89,000	95,000
15 to 20 ft	12,000	31,000	20,000	15,000	14,000	17,000	24,000	28,000	23,000	24,000
TOTAL	244,000	220,000	205,000	203,000	197,000	200,000	213,000	211,000	205,000	211,000
Tulare Subbasin										
0 to 5 ft	101,000	45,000	147,000	138,000	139,000	197,000	191,000	173,000	146,000	162,000
5 to 10 ft	243,000	279,000	165,000	190,000	185,000	141,000	160,000	167,000	185,000	158,000
10 to 15 ft	5,000	2,000	44,000	30,000	28,000	14,000	7,000	18,000	27,000	37,000
15 to 20 ft	0	0	3,000	0	0	6,000	0	0	1,000	1,000
TOTAL	349,000	326,000	359,000	358,000	352,000	358,000	358,000	358,000	359,000	358,000
Westlands Subbasin										
0 to 5 ft	149,000	67,000	62,000	62,000	99,000	55,000	33,000	21,000	14,000	11,000
5 to 10 ft	142,000	214,000	213,000	205,000	193,000	212,000	220,000	210,000	173,000	152,000
10 to 15 ft	36,000	48,000	73,000	80,000	70,000	88,000	96,000	112,000	161,000	171,000
15 to 20 ft	15,000	18,000	29,000	36,000	22,000	29,000	31,000	39,000	35,000	45,000
TOTAL	342,000	347,000	377,000	383,000	384,000	384,000	380,000	382,000	383,000	379,000
TOTALS										
0 to 5 ft	372,000	247,000	310,000	330,000	403,000	398,000	358,000	326,000	254,000	296,000
5 to 10 ft	709,000	783,000	638,000	683,000	630,000	649,000	649,000	631,000	622,000	556,000
10 to 15 ft	141,000	162,000	262,000	238,000	227,000	204,000	230,000	280,000	350,000	367,000
15 to 20 ft	44,000	65,000	91,000	78,000	64,000	81,000	90,000	95,000	94,000	102,000
TOTAL AREA	1,266,000	1,257,000	1,301,000	1,329,000	1,324,000	1,332,000	1,327,000	1,332,000	1,320,000	1,321,000

Variations in total result from rounding of numbers.

Figure 1, Depth to Water Acreage Trends of Drainage Impaired Lands



2006-2010 Drainage Monitoring Program

DWR's San Joaquin Valley drainage-monitoring for 2006 through 2010 consisted of collecting water samples from as many as 53 drainage sumps. Figure 2 (shown on page 9) provides an overview of the sampling area locations with boundaries representing the Northern, Central, and Southern areas.

The Northern Area, once monitored by USBR, is now a part of DWR's monitoring program. Beginning in 2010, preliminary investigative monitoring began with one surface and seventeen subsurface tile drains. As Northern locations and data are reviewed, only candidate sumps with continuing data and easy access will be included into the program.

The data presented includes all stations monitored, as shown in Tables 2 through 6, for the years 2006 through 2010, respectively. An overview of the monitoring stations are presented in Figures 2 through 7 (shown on pages 9 through 14), respectively.

TABLE 2
2006 DRAINAGE MONITORING STATIONS

Central Area		Southern Area	
BVS	6001	CCN	3550
BVS	7007	CNR	0801
BVS	7402	COC	4126
BVS	8003	COC	8221
BVS	8110	ERR	8429
CTL	3728	ERR	8641
DPS	1016	HCH	7841
DPS	1367	LME	7569
DPS	2535	LNW	5467
*DPS	3235	LNW	6459
DPS	3465	VGD	3906
DPS	4616	VGD	4406
FBH	2016	VGD	4806
FBH	3236	VGD	5412
FBH	4045	VGD	5509
FBH	5056		
FBH	8061		
HMH	7516		
OAS	0364		
OAS	2548		

*Surface drain

TABLE 3
2007 DRAINAGE MONITORING STATIONS

Central Area		Southern Area	
BVS	6001	CCN	3550
BVS	7007	CNR	0801
BVS	7402	COC	4126
BVS	8110	COC	8221
CTL	3728	ERR	8429
DPS	1016	ERR	8641
DPS	1367	GSY	0935
DPS	2535	HCH	7841
*DPS	3235	LME	7569
DPS	3465	LNW	5467
DPS	4616	LNW	6459
FBH	2016	LNW	6467
FBH	3236	VGD	3906
FBH	4045	VGD	4406
FBH	5056	VGD	4806
FBH	8061	VGD	5412
HMH	7516	VGD	5509
OAS	0364		
OAS	2548		

TABLE 4
2008 DRAINAGE MONITORING STATIONS

Central Area		Southern Area	
BVS	6001	BRL	2235
BVS	7007	CCN	3550
BVS	7402	CNR	0801
BVS	8110	COC	4126
CTL	3728	COC	8221
DPS	1016	ERR	8429
DPS	1367	ERR	8641
DPS	2535	GSY	0935
*DPS	3235	HCH	7841
DPS	3465	LME	7569
DPS	4616	LNW	5467
FBH	2016	LNW	6459
FBH	4045	LNW	6467
FBH	5056	VGD	3906
FBH	8061	VGD	4406
HMH	7516	VGD	4806
OAS	0364	VGD	5412
OAS	2548	VGD	5509

TABLE 5
2009 DRAINAGE MONITORING STATIONS

Central Area		Southern Area	
BVS	6001	BRL	2235
BVS	7007	CCN	3550
BVS	7402	CNR	0801
BVS	8110	COC	4126
CTL	3728	COC	8221
DPS	1016	ERR	8429
DPS	1367	ERR	8641
DPS	2535	GSY	0935
*DPS	3235	HCH	7841
DPS	3465	LNW	5467
DPS	4616	LNW	6467
FBH	2016	VGD	3906
FBH	4045	VGD	4406
FBH	5056	VGD	4806
FBH	8061	VGD	5412
HMH	7516	VGD	5509
OAS	2548		

TABLE 6
2010 DRAINAGE MONITORING STATIONS

Northern Area		Central Area		Southern Area	
*VNS	7027	BVS	6001	BRL	2235
VNS	7026	BVS	7007	CCN	3550
VNS	6927	BVS	7402	CNR	0801
VNS	6035	BVS	8003	COC	4126
VNS	5935	BVS	8110	COC	8221
VNS	4931	CTL	3728	ERR	8429
VNS	4731	DPS	1016	ERR	8641
VNS	4734	DPS	1367	GSY	0935
VNS	4141	DPS	2535	HCH	7841
VNS	3752	*DPS	3235	LNW	5467
VNS	4951	DPS	3465	LNW	6467
VNS	5951	DPS	4616	VGD	3906
VNS	6961	FBH	2016	VGD	4406
VNS	5661	FBH	4045	VGD	4806
VNS	3733	FBH	5056	VGD	5412
VNS	3622	FBH	8061	VGD	5509
VNS	2923	HMH	7516		
VNS	3244	OAS	0364		
		OAS	2548		

*Surface drain

Figure 2. Overview of Sampling Area Locations

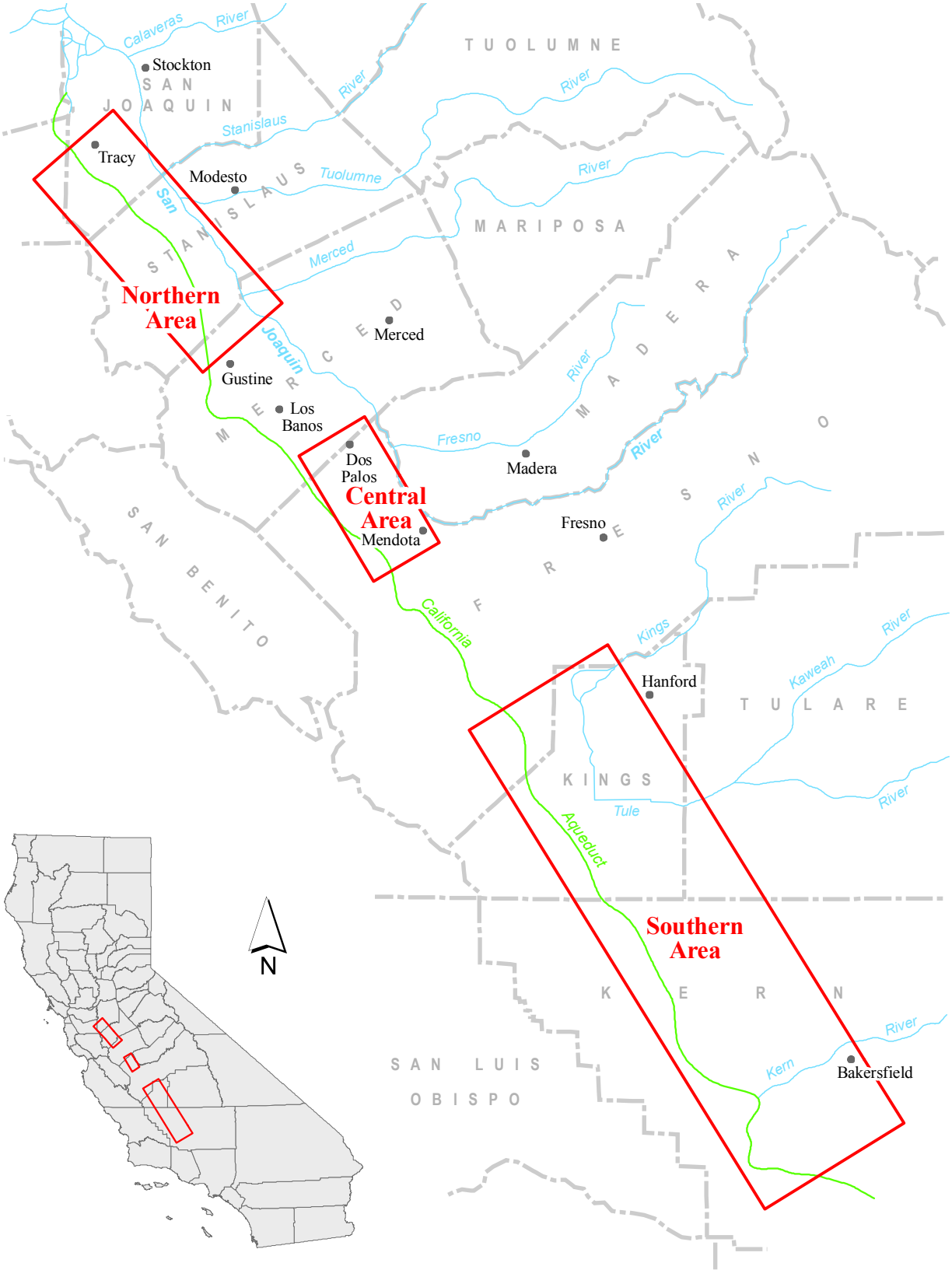


Figure 3. Northern Area Drain Locations

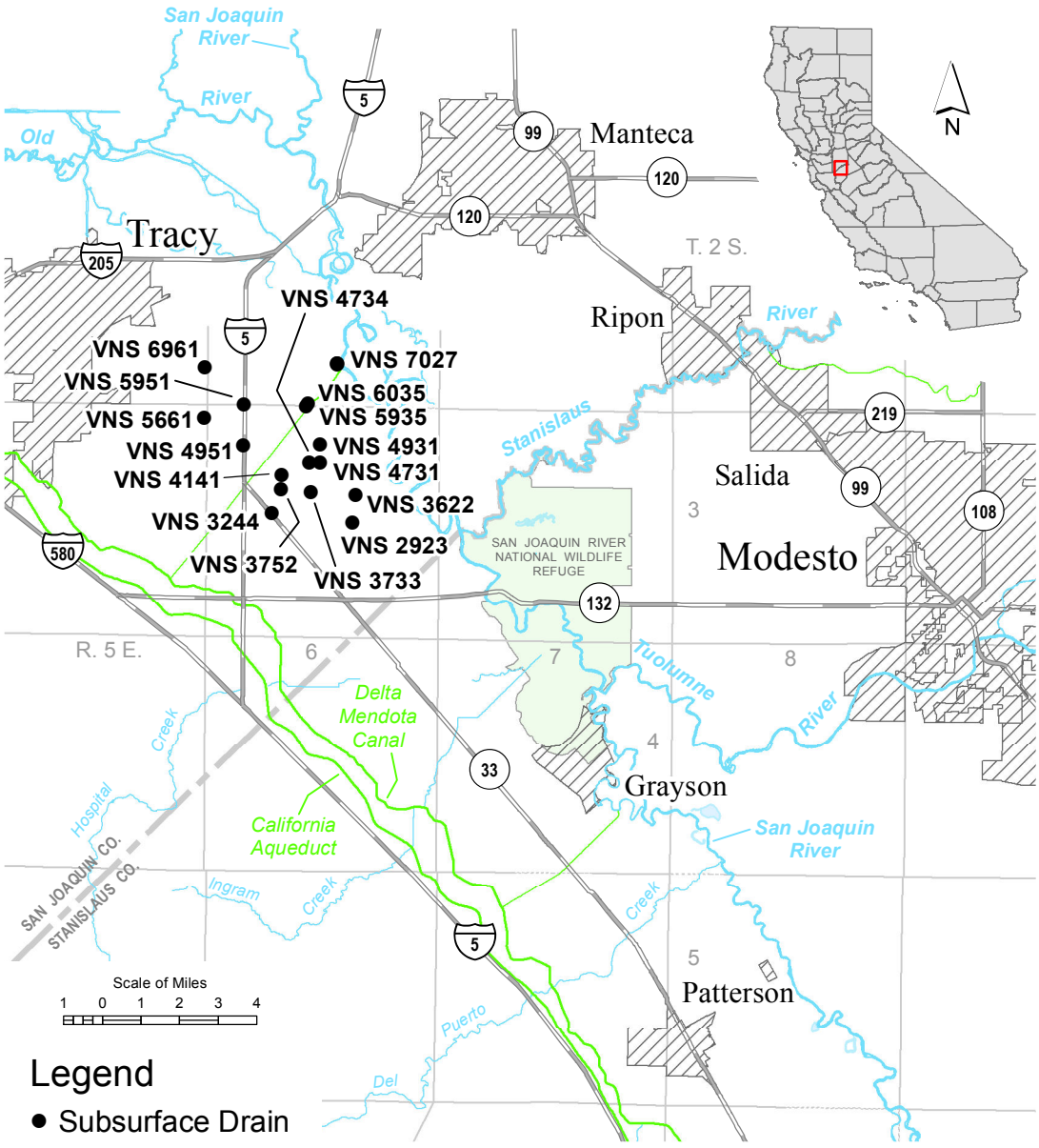


Figure 4. Central Area Drain Locations

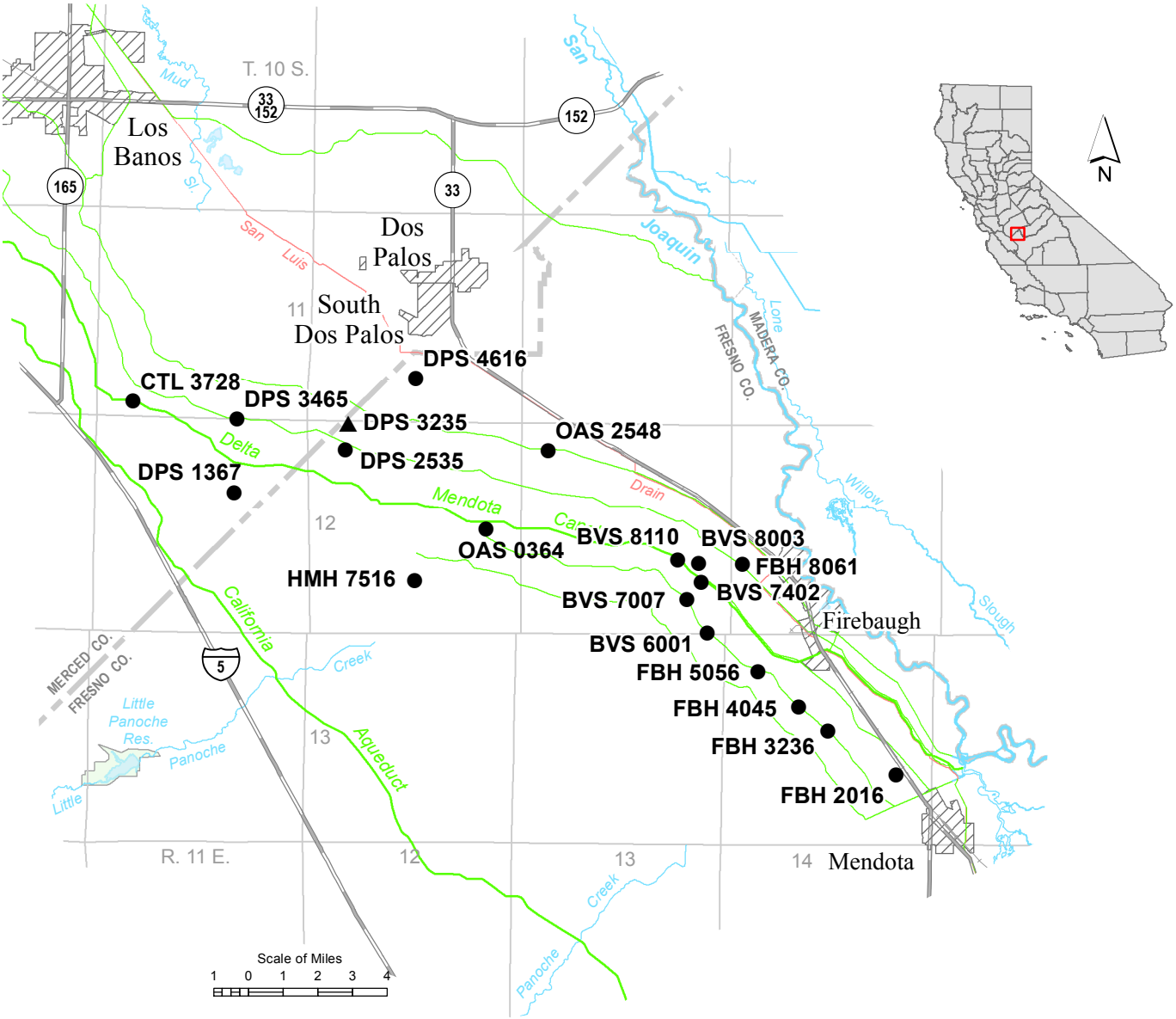


Figure 5. Southern Area Drain Locations - Lemoore/Corcoran

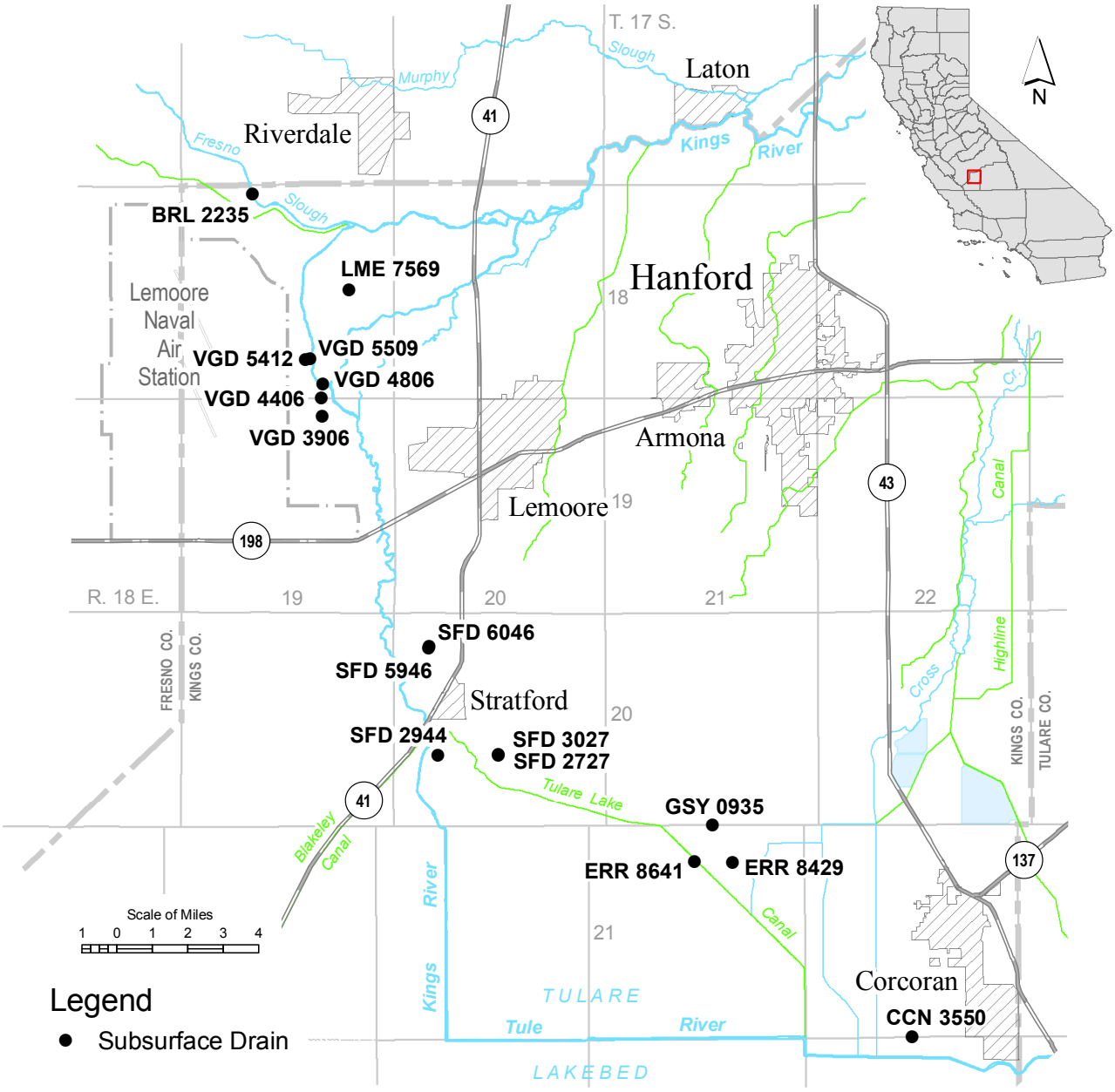


Figure 6. Southern Area Drain Locations - Lost Hills/Semitropic

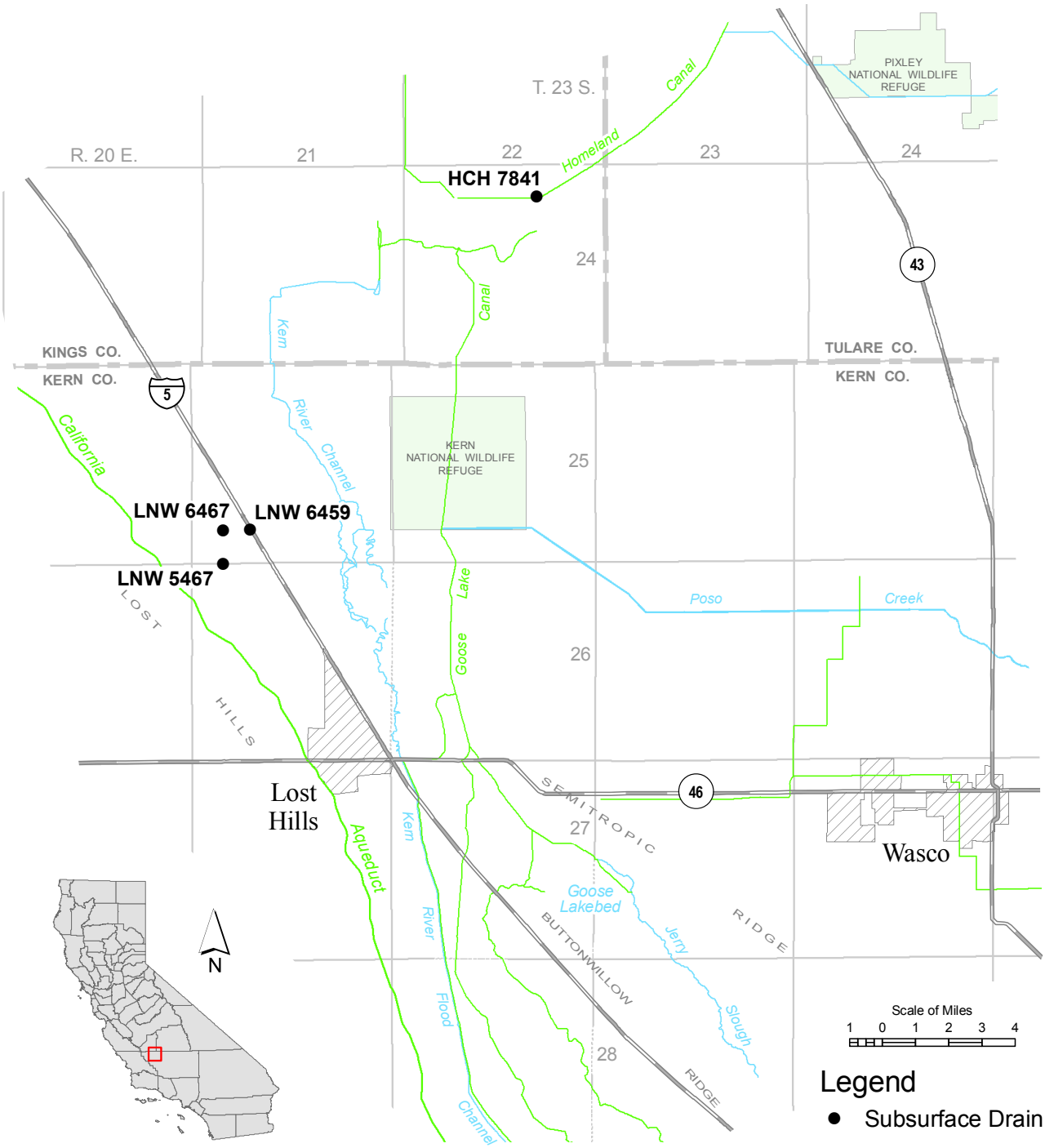
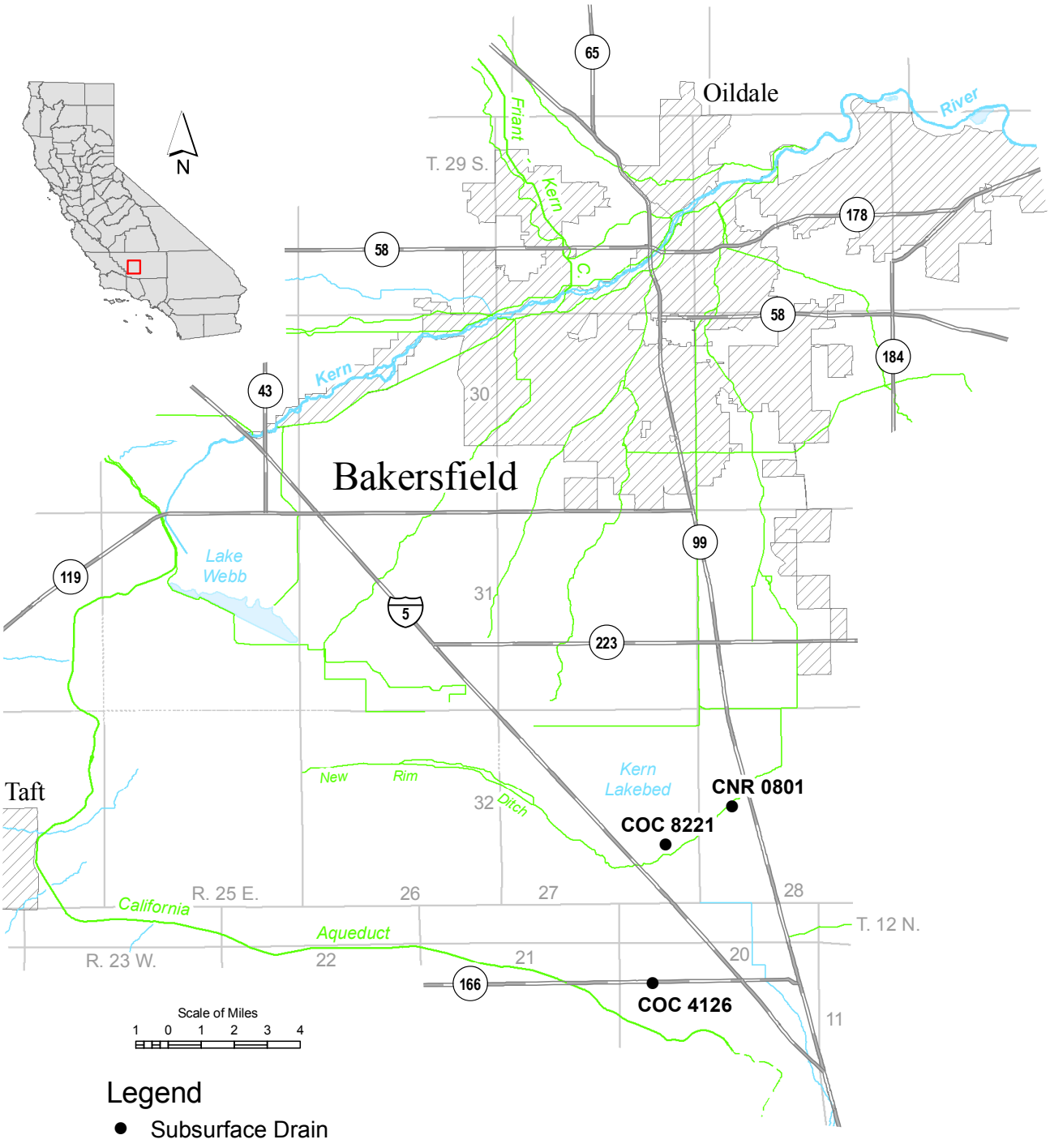


Figure 7. Southern Area Drain Locations - Kern Lakebed



Flows

DWR collects flow data from tiled area drainage sumps with functional flow meters. Many drains receive groundwater from areas outside the drainage pipe collector network. As a result, one drainage sump may act as a collector point for six or more systems. Depending on the soil surrounding the drain, one month's flow may have resulted from part of the previous month's irrigation. The 2006 – 2010 tiled acre subsurface drain flows are listed in Tables 7 through 11.

Table 7. Subsurface Drain Flows in acre-feet, 2006

Station	Area (acres)	Jan - Mar	Mar - May	May - Jul	Jul - Sep	Sep - Nov	Nov - Jan
			Central Area				
BVS 6001	-	12.9	11.2	17.1	5.3	3.5	4.6
BVS 7007	-	-	32.9	64.4	24.6	2.3	-
BVS 7402	-	107.1	45.1	-	-	18.4	8.9
BVS 8003	126	-	-	-	-	-	-
BVS 8110	-	0.9	0.2	0.1	-	-	-
CTL 3728	-	168	104	126.7	72.4	34.8	35.4
DPS 1016	-	12.0	39.2	-	2.9	0.1	0.3
DPS 1367	125	67.0	35.0	81.4	51.7	0.3	-
DPS 2535	295	38.7	92.0	110	68.3	-	-
DPS 3465	160	23.9	17.9	-	28.9	8.8	0.9
DPS 4616	140	11.5	13.3	14.4	12.0	1.5	1.5
FBH 2016	80	14.3	26.4	30.9	-	6.9	5.4
FBH 3236	-	-	-	-	-	0.03	-
FBH 4045	400	11.2	33.2	51.3	51.6	12.8	4.1
FBH 5056	-	86.4	49.1	42.0	17.6	7.7	2.6
FBH 8061	240	50.4	22.9	35.4	-	3.5	1.4
HMH 7516	320	-	-	-	-	-	-
OAS 0364	-	1.1	5.4	11.2	0.8	1.8	0.1
OAS 2548	-	-	17.0	29.6	29.4	20.4	15.9
			Southern Area				
CCN 3550	560	11.5	-	-	17.6	12.8	16.7
CNR 0801	68	-	-	-	-	-	-
COC 4126	120	24.1	16.1	19.4	5.3	3.8	0.5
COC 8221	-	-	-	-	-	-	-
ERR 8429	-	94.3	99.8	105	88.6	62.8	72.7
ERR 8641	258	14.7	17.8	17.7	16.4	11.4	9.7
HCH 7841	-	136	115	21.1	-	61.2	-
LME 7569	-	-	-	-	-	-	-
LNW 5467	1,770	-	-	-	-	-	-
LNW 6459	581	-	2.0	0.1	0.2	0.7	-
VGD 3906	870	-	-	-	-	-	-
VGD 4406	310	-	-	-	-	-	-
VGD 4806	-	-	-	-	-	-	-
VGD 5412	275	-	-	-	-	-	-
VGD 5509	-	-	-	-	-	-	-

- Denotes no reading or insufficient data

Table 8. Subsurface Drain Flows in acre-feet, 2007

Station	Area (acres)	Jan - Apr	Apr - May	May - Jul	Jul - Sep	Sep - Nov	Nov - Jan
			Central Area				
BVS 6001	-	8.9	1.8	9.8	2.8	0.9	0.5
BVS 7007	-	-	12.7	41.4	1.1	3.0	-
BVS 7402	-	125	19.7	144	-	-	-
BVS 8110	-	0.04	0.9	-	-	0.6	-
CTL 3728	-	228	59.3	190	98.9	55.7	91.9
DPS 1016	-	8.6	1.8	8.2	6.0	0.5	0.2
DPS 1367	125	25.4	23.5	40.5	16.5	12.2	23.9
DPS 2535	295	91.2	4.9	45	11.7	3.9	0.3
DPS 3465	160	27.8	7.6	28.9	19.3	9.3	5.4
DPS 4616	140	9.1	2.0	10.3	5.6	1.3	1.1
FBH 2016	80	26.9	6.9	30.3	20.2	3.2	-
FBH 3236	-	0.5	0.1	0.6	-	-	-
FBH 4045	400	32.7	10.9	85.4	33.3	8.7	2.8
FBH 5056	-	16.9	15.6	60.7	19.8	4.4	0.5
FBH 8061	240	21.8	4.9	16.7	5.6	0.8	0.01
HMH 7516	320	-	-	-	-	-	-
OAS 0364	-	8.8	3.3	5.2	2.6	0.02	-
OAS 2548	-	24.2	9.8	38.1	25.3	23.6	10.7
			Southern Area				
CCN 3550	560	29.4	20.5	27.3	19.6	4.2	19.1
CNR 0801	68	-	-	-	-	-	-
COC 4126	120	21.2	57.0	63.8	-	-	-
COC 8221	-	-	-	-	-	-	-
ERR 8429	-	1.7	192	96	0.02	11.7	9.7
ERR 8641	258	15.5	13.2	11.3	6.1	14.5	5.3
GSY 0935	-	-	-	-	-	-	162
HCH 7841	-	-	159	408	319	125	79.5
LME 7569	-	-	-	-	-	-	-
LNW 5467	1,770	-	-	-	-	-	-
LNW 6459	581	-	-	-	-	-	-
LNW 6467	1,420	-	7.5	3.3	19.8	5.0	8.4
VGD 3906	870	-	-	-	-	-	-
VGD 4406	310	-	-	-	-	-	-
VGD 4806	-	-	-	-	-	-	-
VGD 5412	275	-	-	-	-	-	-
VGD 5509	-	-	-	-	-	-	-

- Denotes no reading or insufficient data

Table 9. Subsurface Drain Flows in acre-feet, 2008

Station	Area (acres)	Jan - Mar	Mar - May	May - Jul	Jul - Sep	Sep - Nov	Nov - Jan
Central Area							
BVS 6001	-	0.8	2.4	6.0	0.9	0.9	-
BVS 7007	-	0.04	33.4	16.8	6.5	2.9	-
BVS 7402	-	-	-	-	-	-	8.0
BVS 8110	-	-	0.1	5.1	-	-	-
CTL 3728	-	118	111	85	45.7	58.1	35.7
DPS 1016	-	2.9	6.0	1.6	1.8	0.6	1.2
DPS 1367	125	49.3	44.4	49.6	15.3	18.6	15.6
DPS 2535	295	96.8	22.0	91	56.1	-	-
DPS 3465	160	15.5	-	-	-	-	-
DPS 4616	140	6.2	5.1	11.0	6.1	1.2	1.0
FBH 2016	80	7.2	13.3	27.8	25.5	11.2	4.0
FBH 4045	400	37.5	29.9	77.3	16.3	2.0	1.1
FBH 5056	-	0.2	53.7	56.2	4.3	-	-
FBH 8061	240	26.5	4.1	29.9	19.7	-	0.23
HMH 7516	320	-	-	-	-	-	-
OAS 0364	-	-	0.1	0.03	-	-	0.001
OAS 2548	-	18.7	20.2	41.4	51.0	18.4	9.2
Southern Area							
BRL 2235	-	-	-	-	-	-	-
CCN 3550	560	-	-	8.7	9.6	1.8	0.0
CNR 0801	68	-	-	-	-	-	-
COC 4126	120	-	-	-	-	-	-
COC 8221	-	-	-	-	-	-	-
ERR 8429	-	-	-	6	27	7.4	0.0
ERR 8641	258	-	-	3.7	-	-	14.2
GSY 0935	-	115	116	72.8	-	-	98
HCH 7841	-	-	-	-	-	-	-
LME 7569	-	-	-	-	-	-	-
LNW 5467	1,770	-	-	-	-	-	-
LNW 6459	581	-	-	-	-	-	-
LNW 6467	1,420	-	7.8	-	-	4.3	0.3
VGD 3906	870	-	-	-	-	-	-
VGD 4406	310	-	-	-	-	-	-
VGD 4806	-	-	-	-	-	-	-
VGD 5412	275	-	-	-	-	-	-
VGD 5509	-	-	-	-	-	-	-

- Denotes no reading or insufficient data

Table 10. Subsurface Drain Flows in acre-feet, 2009

Station	Area (acres)	Jan - Mar	Mar - May	May - Jul	Jul - Sep	Sep - Nov	Nov - Jan
Central Area							
BVS 6001	-	0.1	1.3	0.8	-	-	-
BVS 7007	-	-	5.8	9.7	-	-	-
BVS 7402	-	14.0	40.0	25.2	-	-	32.5
BVS 8110	-	0.9	8.8	7.6	-	-	-
CTL 3728	-	-	123.8	134.8	72.0	-	-
DPS 1016	-	0.8	3.2	1.7	0.6	2.0	0.3
DPS 1367	125	53.6	66.1	64.4	16.9	31.3	5.3
DPS 2535	295	14.5	-	11.8	-	-	-
DPS 3465	160	24.1	30.7	-	12.9	-	-
DPS 4616	140	1.7	6.1	8.9	3.6	2.6	0.3
FBH 2016	80	2.5	1.9	6.3	-	-	15.9
FBH 4045	400	-	32.6	28.1	-	-	3.7
FBH 5056	-	3.6	13.0	19.7	-	-	-
FBH 8061	240	4.2	6.9	1.1	-	-	5.1
HMH 7516	320	-	-	-	-	-	-
OAS 0364	-	-	-	-	-	-	-
OAS 2548	-	20.4	24.2	80.9	57.1	-	-
Southern Area							
BRL 2235	-	-	-	-	-	-	-
CCN 3550	560	-	9.6	12.6	5.6	-	-
CNR 0801	68	-	-	-	-	-	-
COC 4126	120	15.5	-	-	-	-	-
COC 8221	-	-	-	-	-	-	-
ERR 8429	-	23.0	5.6	-	-	-	-
ERR 8641	258	14.2	12.6	12.2	11.8	3.8	-
GSY 0935	-	117.9	197.7	133.0	61.6	114.2	-
HCH 7841	-	75.2	55.3	112.2	102.0	-	-
LNW 5467	1,770	-	-	-	-	-	-
LNW 6467	1,420	1.0	1.8	4.2	2.5	0.2	-
VGD 3906	870	-	-	-	-	-	-
VGD 4406	310	-	-	-	-	-	-
VGD 4806	-	-	-	-	-	-	-
VGD 5412	275	-	-	-	-	-	-
VGD 5509	-	-	-	-	-	-	-

- Denotes no reading or insufficient data

Table 11. Subsurface Drain Flows in acre-feet, 2010

Station	Area (acres)	Jan - Mar	Mar - May	May - Jul	Jul - Sep	Sep - Nov	Nov - Jan
Central Area							
BVS 6001	-	-	-	13.5	3.0	1.2	1.9
BVS 7007	-	-	-	128.4	44.0	0.2	-
BVS 7402	-	24.0	-	-	52.1	-	25.3
BVS 8003	126	-	-	-	-	-	-
BVS 8110	-	-	-	0.5	-	0.001	0.001
CTL 3728	-	-	-	-	-	48.3	87.4
DPS 1016	-	1.0	-	9.1	4.9	-	-
DPS 1367	125	58.6	-	101.6	62.5	20.6	32.0
DPS 2535	295	-	-	-	228.3	8.4	39.8
DPS 3465	160	-	-	32.8	-	39.5	12.2
DPS 4616	140	1.7	6.1	8.9	3.6	2.6	0.3
FBH 2016	80	8.3	-	21.0	12.9	1.7	9.0
FBH 4045	400	0.1	-	0.0	-	-	-
FBH 5056	-	0.1	-	28.8	3.9	0.1	-
FBH 8061	240	24.0	-	39.4	26.8	4.4	3.6
HMH 7516	320	-	-	-	-	-	-
OAS 0364	-	0.003	-	-	-	-	0.01
OAS 2548	-	-	-	47.6	37.1	8.6	12.5
Southern Area							
BRL 2235	-	-	-	-	-	-	-
CCN 3550	560	-	-	30.0	-	-	34.7
CNR 0801	68	-	-	-	-	-	-
COC 4126	120	-	-	-	-	-	-
COC 8221	-	-	-	-	-	-	-
ERR 8429	-	-	-	-	-	-	-
ERR 8641	258	-	-	116.9	-	-	156.5
GSY 0935	-	-	-	157.9	-	-	-
HCH 7841	-	-	-	-	-	-	-
LNW 5467	1,770	-	-	-	-	-	-
LNW 6467	1,420	-	-	19.0	5.7	0.001	20.9
VGD 3906	870	-	-	-	-	-	-
VGD 4406	310	-	-	-	-	-	-
VGD 4806	-	-	-	-	-	-	-
VGD 5412	275	-	-	-	-	-	-
VGD 5509	-	-	-	-	-	-	-

- Denotes no reading or insufficient data

Mineral Constituent and Trace Element Concentrations

This report provides data for minerals, associated salts, and trace elements. The Southern Area mineral constituents are divided into three sub-areas: Lemoore-Corcoran, Lost Hills-Semitropic, and Kern Lakebed. The report provides a summary of the analyzed constituents analyzed in Tables 12 through 22 (pages 21–36) for the Central, Southern, and Northern Area drains, respectively. A complete list of minerals and trace element results for each station is given in Appendices E through J. DWR monitored only arsenic, barium, boron, molybdenum, and selenium trace elements for this report.

Except for barium, the report presents two averages: arithmetic average and geometric mean. The arithmetic average is the average of all data obtained for the given period, whereas, the geometric mean (extensively used by regulatory agencies) gives an average of central tendency that is less influenced by spiked values in the data. This report evaluates detection-only analyses. Though detection limits are reported with a "<" sign, the data are not used to calculate the averages. As an example, the arithmetic average and the geometric mean were not calculated for barium because the barium concentrations were below the detection limits in 98.8 percent of the 842 samples collected from 2006-2010.

This report also includes the 2009 and 2010 Areal Distribution of Electrical Conductivity in Shallow Groundwater Maps (Figures 15 & 16). The maps display an overview of the shallow groundwater conductivity within the respective subbasins study areas.

We used the sodium adsorption ratio (SAR) as an index to evaluate infiltration problems. It is a ratio of calcium and magnesium to sodium for soil extracts and irrigation water and is used to express the relative activity of sodium ions in exchange reactions in the soil. When sodium exceeds calcium by a ratio of 3:1 or greater, severe water infiltration problems occur because of the soil's structural makeup. The soil particles that plug and seal pores are dispersed through the soil column. The adjusted SAR (ASAR) is a refinement of the SAR and is no longer recommended by Oster and Rhoades (1977), Oster and Schroer (1979), and Suarez (1981), who conclude the procedure over-predicts the sodium hazard. They suggest the method be further adjusted by a 0.5 factor to evaluate more correctly the effects of bicarbonate on calcium precipitation (adj SAR x 0.5). This report presents the ASAR without further adjustment for those who prefer the given data and want to follow up on the recommended studies.

Low salinity water, water below 500 µS/cm, can cause infiltration problems in much the same manner as a high ASAR water affects the soil column. Low salinity water leaches minerals and salts from the soil, reducing the soil’s structural integrity and causing soil dispersion. The finer dispersed soil particles fill many of the soil pores, plugging and sealing the pores, and preventing the irrigation water from passing through the soil column. Soil crusting and crop emergence problems often result (Ayers and Wescott, 1985).

This report presents historical arsenic, boron, and selenium data and trends. Arsenic was intermittently monitored from 1973-2001 and became a part of the program in 2002 as shown in Table 23 (page 37). Boron averages are presented from 1959-2010 Selenium averages for the years 1986-2010 are presented in Table 25 (page 41).

Table 12. 2006 Summary of Minerals and Trace Elements in Central Area Drains
(milligrams per Liter)

Element	Minimum	Maximum	Arithmetic Average	Geometric Mean
Subsurface Stations				
Arsenic	0.001	0.020	0.007	0.005
Barium*	< 0.05	< 1.0		
Boron	0.5	55	12	9.7
Calcium	144	752	451	433
Chloride	155	1,750	749	654
Hardness (as $CaCO_3$)	161	2,970	1,867	1,749
Magnesium	44	427	184	164
Molybdenum**	< 0.005	0.464	0.094	0.075
Nitrate	34.6	287	132	113
Potassium	1.7	5.0	2.9	2.8
Selenium	0.003	0.414	0.140	0.098
Sodium	245	2,700	1,085	962
Sulfate	736	6,340	2,794	2,524
Total Alkalinity (as CaCO3)	109	376	199	193
TDS	1,684	10,924	5,527	5,112
Lab EC (μS/cm)	2,280	12,800	6,648	6,246
SAR	3.8	24	11	10
ASAR	4.6	33	14	13

All data collected in accordance with DWR's Quality Assurance Technical Document 2

*One barium concentration was detected at 0.09 mg/L. The detection limits ranged from 0.05 mg/L to 1.0 mg/L.

**Minimum molybdenum concentration was detected at 0.009 mg/L.

Table 13. 2006 Summary of Minerals and Trace Elements in Southern Area Drains
(milligrams per liter)

Element	Minimum	Maximum	Arithmetic Average	Geometric Mean
Lemoore-Corcoran Stations				
Arsenic	0.002	0.105	0.036	0.024
Barium*	< 0.05	< 1.0		
Boron	0.1	42.1	13.1	6.4
Calcium	10	442	274	217
Chloride	4	1,800	759	557
Hardness (as $CaCO_3$)	33	4,910	1,967	1,323
Magnesium	2	935	312	175
Molybdenum	0.006	0.862	0.386	0.274
Nitrate	0.2	112	50.1	35.8
Potassium	2.1	22.6	6.7	5.3
Selenium	0.001	0.038	0.018	0.014
Sodium	7	9,130	2,883	1,819
Sulfate	5	20,500	6,531	3,442
Total Alkalinity (as CaCO3)	50	724	421	393
TDS	94	31,740	10,823	7,168
Lab EC (µS/cm)	132	24,060	11,676	8,483
SAR	0.5	57	26	22
ASAR	0.2	96	40	30
Lost Hills-Semitropic Stations				
Arsenic	0.010	0.208	0.081	0.049
Barium*	0.056	< 2.5		
Boron	1.2	47.4	18.3	11.6
Calcium	30	792	401	281
Chloride	229	24,100	4,684	2,274
Hardness (as $CaCO_3$)	141	4,714	1,921	1,370
Magnesium	16	764	224	156
Molybdenum	0.09	1.15	0.701	0.594
Nitrate	23	369	174	148
Potassium	2.5	10.5	6.4	6.0
Selenium	0.004	0.40	0.185	0.092
Sodium	365	19,900	4,633	2,850
Sulfate	337	14,600	5,168	3,560
Total Alkalinity (as CaCO3)	95	611	251	200
TDS	1,204	56,300	15,020	9,804
Lab EC (µS/cm)	1,941	66,120	18,275	12,674
SAR	9.9	125.6	40.5	33.5
ASAR	10.4	188.5	54.1	41.9

All data collected in accordance with DWR's Quality Assurance Technical Document 2

Table 13 continued on next page

Table 13 (continued). 2006 Summary of Minerals and Trace Elements in Southern Area Drains
(milligrams per Liter)

Element	Minimum	Maximum	Arithmetic Average	Geometric Mean
Kern Lakebed Stations				
Arsenic	0.005	0.017	0.011	0.009
Barium*	< 0.25	< 0.5		
Boron	1.9	18.1	7.3	5.3
Calcium	300	684	453	438
Chloride	187	373	266	259
Hardness (as $CaCO_3$)	798	2,408	1,815	1,770
Magnesium	123	272	178	171
Molybdenum	0.080	0.585	0.269	0.205
Nitrate	111	311	210	196
Potassium	3.8	49	21	14
Selenium	0.021	0.050	0.031	0.030
Sodium	431	1,630	926	852
Sulfate	2,130	4,420	3,029	2,951
Total Alkalinity (as CaCO3)	163	331	233	227
TDS	4,050	7,572	5,215	5,103
Lab EC (µS/cm)	4,421	8,720	5,954	5,820
SAR	4.2	16.0	9.5	8.6
ASAR	5.6	23.2	12.9	11.7

All data collected in accordance with DWR's Quality Assurance Technical Document 2

*Two barium concentrations for Southern Area samples were detected at 0.056 mg/L and 0.5 mg/L. The detection limits for Southern Area samples ranged from 0.05 mg/L to 2.5 mg/L.

Table 14. 2007 Summary of Minerals and Trace Elements in Central Area Drains
(milligrams per Liter)

Element	Minimum	Maximum	Arithmetic Average	Geometric Mean
Subsurface Stations				
Arsenic	0.001	0.010	0.006	0.005
Barium*	< 0.05	< 0.5		
Boron	1.3	66	11	8.9
Calcium	116	705	417	395
Chloride	71	2,780	715	597
Hardness (as $CaCO_3$)	421	3,309	1,729	1,622
Magnesium	30	519	168	146
Molybdenum**	< 0.025	0.224	0.085	0.075
Nitrate	0.4	257	115	88
Potassium	1.3	14.2	3.1	2.9
Selenium	0.004	0.356	0.122	0.085
Sodium	115	3,380	987	862
Sulfate	461	7,280	2,590	2,323
Total Alkalinity (as CaCO3)	104	292	192	186
TDS	461	14,610	4,991	4,561
Lab EC (µS/cm)	1,458	14,320	5,783	5,382
SAR	1.9	25.6	10.1	9.3
ASAR	2.2	37.1	13.2	12.0

All data collected in accordance with DWR's Quality Assurance Technical Document 2

*No barium was detected. The detection limits ranged from 0.05 mg/L to 0.5 mg/L

**A minimum molybdenum concentration was detected at 0.03 mg/L.

Table 15. 2007 Summary of Minerals and Trace Elements in Southern Area Drains
(milligrams per Liter)

Element	Minimum	Maximum	Arithmetic Average	Geometric Mean
Lemoore-Corcoran Stations				
Arsenic	0.001	0.176	0.037	0.022
Barium**	< 0.05	< 1.0		
Boron	0.1	39.7	12.1	5.5
Calcium	8	439	247	186
Chloride	8	1,660	728	515
Hardness (as $CaCO_3$)	31	4,499	1,842	1,162
Magnesium	2.0	860	298	157
Molybdenum***	< 0.005	0.836	0.357	0.251
Nitrate	0.3	84.5	37.5	27.5
Potassium	2.2	91.0	9.4	6.2
Selenium	0.001	0.025	0.012	0.009
Sodium	20	7,930	2,657	1,614
Sulfate	6	19,400	6,195	2,736
Total Alkalinity (as CaCO3)	57	720	424	397
TDS	123	30,660	9,687	6,191
Lab EC (µS/cm)	184	29,260	10,158	7,146
SAR	1.6	53.7	25.1	20.6
ASAR	0.5	88.6	37.2	28.1
Lost Hills-Semitropic Stations				
Arsenic*	< 0.010	0.230	0.087	0.051
Barium**	< 0.05	< 1.0		
Boron	1.2	26.0	15.7	10.9
Calcium	34	959	426	291
Chloride	200	10,000	2,858	1,932
Hardness (as $CaCO_3$)	155	3,919	1,829	1,339
Magnesium	17	370	185	144
Molybdenum	0.07	0.78	0.513	0.468
Nitrate	8.5	290	155	124
Potassium	2.4	7.2	4.2	3.9
Selenium	0.004	0.29	0.161	0.084
Sodium	344	7,470	2,946	2,347
Sulfate	272	6,320	3,922	3,066
Total Alkalinity (as CaCO3)	99	433	210	176
TDS	1,060	23,800	10,121	8,048
Lab EC (µS/cm)	1,591	30,400	12,402	12,402
SAR	12.0	51.9	29.3	27.9
ASAR	12.0	70.1	36.9	34.4

All data collected in accordance with DWR's Quality Assurance Technical Document 2

Table 15 continued on next page

Table 15 (continued). 2007 Summary of Minerals and Trace Elements in Southern Area Drains
(milligrams per Liter)

Element	Minimum	Maximum	Arithmetic Average	Geometric Mean
		Kern Lakebed Stations		
Arsenic*	< 0.005	0.016	0.013	0.012
Barium**	< 0.25	< 0.5		
Boron	2.6	15.7	6.5	5.2
Calcium	306	684	446	433
Chloride	194	353	261	256
Hardness (as $CaCO_3$)	1,190	2,847	1,841	1,808
Magnesium	115	270	177	170
Molybdenum	0.078	0.521	0.235	0.180
Nitrate	113	337	238	221
Potassium	4.2	50.0	20.3	14.5
Selenium	0.017	0.044	0.029	0.028
Sodium	475	1,470	868	824
Sulfate	2,110	4,230	2,899	2,848
Total Alkalinity (as CaCO3)	173	287	216	212
TDS	3,920	7,030	4,926	4,854
Lab EC (µS/cm)	4,140	8,136	5,427	5,341
SAR	4.3	14.6	8.9	8.4
ASAR	5.8	19.8	11.8	11.1

All data collected in accordance with DWR's Quality Assurance Technical Document 2

*Arsenic for Kern Lakebed had a minimum detection limit of 0.005 mg/L.

**Barium was detected in one sample at a concentration of 0.055 mg/L. The detection limits for Southern Area samples ranged from 0.05 mg/L to 1 mg/L.

***Molybdenum concentrations for Southern Area samples were detected at 0.078 mg/L to 0.836 mg/L with a minimum detection limit was 0.005 mg/L.

Table 16. 2008 Summary of Minerals and Trace Elements in Central Area Drains
(milligrams per Liter)

Element	Minimum	Maximum	Arithmetic Average	Geometric Mean
Subsurface Stations				
Arsenic	0.002	0.010	0.006	0.005
Barium*	< 0.25	< 0.5		
Boron	1.3	71	11	8.6
Calcium	156	717	424	405
Chloride	82	2,240	704	599
Hardness (as $CaCO_3$)	627	3,215	1,733	1,631
Magnesium	30	507	169	146
Molybdenum**	< 0.025	0.244	0.075	0.067
Nitrate	1.3	269	113	84
Potassium	0.7	9.1	3.6	3.2
Selenium	0.003	0.431	0.130	0.089
Sodium	106	3,180	928	802
Sulfate	567	6,590	2,473	2,218
Total Alkalinity (as CaCO3)	108	293	190	186
TDS	1,180	13,900	5,137	4,708
Lab EC (µS/cm)	1,533	15,490	6,233	5,792
SAR	1.8	24.4	9.4	8.5
ASAR	2.2	35.4	12.3	10.9

All data collected in accordance with DWR's Quality Assurance Technical Document 2

*No barium was detected. The detection limits ranged from 0.025 mg/L to 0.5 mg/L.

**Molybdenum concentrations were detected at 0.028 mg/L to 0.244 mg/L, with a minimum detection limit of 0.025 mg/L.

Table 17. 2008 Summary of Minerals and Trace Elements in Southern Area Drains
(milligrams per Liter)

Element	Minimum	Maximum	Arithmetic Average	Geometric Mean
Lemoore-Corcoran Stations				
Arsenic	0.003	0.190	0.060	0.034
Barium**	< 0.05	< 1.0		
Boron	0.8	36.5	10.9	5.3
Calcium	3.0	432	239	168
Chloride	50	1,880	597	444
Hardness (as $CaCO_3$)	10	4,253	1,629	986
Magnesium	1.0	797	251	129
Molybdenum	0.016	0.810	0.304	0.221
Nitrate***	< 0.1	92.4	41.7	29.4
Potassium	1.6	37	7.9	6.1
Selenium	0.001	0.030	0.010	0.008
Sodium	166	7,890	2,244	1,455
Sulfate	4.0	18,800	5,231	2,346
Total Alkalinity (as CaCO3)	265	980	428	410
TDS	482	27,220	8,818	5,737
Lab EC (µS/cm)	750	28,190	9,839	7,052
SAR	7.4	52.7	23.0	20.1
ASAR	9.2	89.5	33.1	27.2
Lost Hills-Semitropic Stations				
Arsenic*	< 0.010	0.251	0.077	0.044
Barium**	< 0.25	< 1.0		
Boron	2.8	31.7	18.6	13.3
Calcium	56	678	428	310
Chloride	679	7,060	3,105	2,292
Hardness (as $CaCO_3$)	353	3,435	1,959	1,512
Magnesium	45	423	216	174
Molybdenum	0.333	0.858	0.611	0.590
Nitrate	41	268	178	159
Potassium	1.5	8.8	5.9	5.3
Selenium	0.010	0.44	0.207	0.119
Sodium	929	6,120	3,111	2,610
Sulfate	1,010	7,190	4,269	3,566
Total Alkalinity (as CaCO3)	97	511	207	172
TDS	3,120	22,360	11,679	9,690
Lab EC (µS/cm)	4,692	27,530	14,901	12,718
SAR	20.7	51.7	30.3	29.2
ASAR	23.8	69.8	38.5	36.5

All data collected in accordance with DWR's Quality Assurance Technical Document 2

Table 17 continued on next page

Table 17 (continued). 2008 Summary of Minerals and Trace Elements in Southern Area Drains
(milligrams per Liter)

Element	Minimum	Maximum	Arithmetic Average	Geometric Mean
Kern Lakebed Stations				
Arsenic	0.005	0.017	0.010	0.008
Barium**	< 0.25	< 0.5		
Boron	2.4	16.0	6.9	5.4
Calcium	332	622	427	417
Chloride	144	386	253	240
Hardness (as $CaCO_3$)	1,472	2,180	1,838	1,823
Magnesium	133	277	187	179
Molybdenum	0.080	0.518	0.242	0.184
Nitrate	104	333	215	201
Potassium	4.5	49.3	23.1	16.2
Selenium	0.010	0.042	0.027	0.026
Sodium	516	1,580	899	845
Sulfate	2,340	4,340	3,048	2,987
Total Alkalinity (as CaCO3)	175	300	225	221
TDS	4,350	7,410	5,291	5,189
Lab EC (µS/cm)	4,808	8,205	5,966	5,854
SAR	4.9	15.3	9.1	8.6
ASAR	6.9	21.4	12.3	11.5

All data collected in accordance with DWR's Quality Assurance Technical Document 2

*Arsenic for Lost Hills-Semitropic had a minimum detection of 0.015 mg/L.
**Two barium concentrations for Southern Area samples were detected at 0.054 mg/L and 0.196 mg/L within the Lemoore-Corcoran stations.
Barium detection limits for Southern Area ranged from 0.05 mg/L to 1 mg/L.
***Nitrate for Lemoore-Corcoran had a minimum detection 0.4 mg/L.

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Table 18. 2009 Summary of Minerals and Trace Elements in Central Area Drains
(milligrams per Liter)

Element	Minimum	Maximum	Arithmetic Average	Geometric Mean
		Subsurface Stations		
Arsenic*	0.003	< 0.025	0.007	0.006
Barium**	< 0.050	< 1.250		
Boron	0.7	70	12	8.6
Calcium	62	700	401	365
Chloride	107	2,200	719	590
Hardness (as $CaCO_3$)	251	3,121	1,696	1,506
Magnesium	19	477	169	137
Molybdenum***	< 0.005	0.193	0.084	0.069
Nitrate	1.9	285	102	69
Potassium	0.8	7.2	3.3	3.0
Selenium	0.003	0.381	0.122	0.072
Sodium	105	3,160	966	778
Sulfate	230	6,350	2,367	1,951
Total Alkalinity (as CaCO3)	71	311	188	182
TDS	621	13,770	4,978	4,278
Lab EC (µS/cm)	1,000	15,260	5,916	5,792
SAR	2.2	24.6	9.9	8.7
ASAR	2.3	35.7	12.8	11.0

All data collected in accordance with DWR's Quality Assurance Technical Document 2

*Arsenic had a maximum concentration of 0.01 mg/L.

**No barium was detected. The detection limits ranged from 0.05 mg/L to 1.25 mg/L.

***Molybdenum had a minimum concentration of 0.008 mg/L.

Table 19. 2009 Summary of Minerals and Trace Elements in Southern Area Drains
(milligrams per Liter)

Element	Minimum	Maximum	Arithmetic Average	Geometric Mean
Lemoore-Corcoran Stations				
Arsenic	0.003	0.271	0.066	0.035
Barium*	< 0.05	< 1.0		
Boron	0.6	39.2	11.7	5.5
Calcium	20	433	229	168
Chloride	71	1,420	685	518
Hardness (as $CaCO_3$)	87	4,264	1,787	1,112
Magnesium	9.0	773	295	157
Molybdenum	0.021	0.924	0.303	0.218
Nitrate	2.9	99.1	40.7	28.8
Potassium	1.2	22	7.0	5.8
Selenium	0.002	0.025	0.011	0.009
Sodium	127	6,740	2,566	1,625
Sulfate	55.0	15,700	5,718	2,674
Total Alkalinity (as CaCO3)	201	743	457	444
TDS	446	24,400	9,635	6,100
Lab EC (µS/cm)	763	23,320	10,636	7,522
SAR	5.9	53.1	24.6	21.2
ASAR	5.0	82.4	36.4	29.4
Lost Hills-Semitropic Stations				
Arsenic	0.010	0.265	0.102	0.053
Barium*	< 0.25	< 1.0		
Boron	2.6	42.4	19.9	13.2
Calcium	51	716	411	280
Chloride	598	6,800	2,873	2,061
Hardness (as $CaCO_3$)	370	3,612	1,903	1,412
Magnesium	53	449	222	171
Molybdenum	0.278	1.060	0.696	0.666
Nitrate	35	282	174	130
Potassium	2.0	11.6	5.4	4.9
Selenium	0.015	0.44	0.212	0.115
Sodium	890	5,980	3,153	2,605
Sulfate	892	6,680	4,248	3,450
Total Alkalinity (as CaCO3)	104	415	214	181
TDS	2,720	20,700	11,253	9,097
Lab EC (µS/cm)	4,178	25,770	14,045	11,846
SAR	20.1	43.8	30.8	30.0
ASAR	23.1	59.2	38.6	37.0

All data collected in accordance with DWR's Quality Assurance Technical Document 2

Table 19 continued on next page

Table 19 (continued). 2009 Summary of Minerals and Trace Elements in Southern Area Drains
(milligrams per Liter)

Element	Minimum	Maximum	Arithmetic Average	Geometric Mean
Kern Lakebed Stations				
Arsenic	0.005	0.020	0.010	0.009
Barium*	< 0.25	< 1.0		
Boron	2.3	17.7	6.4	5.0
Calcium	298	608	432	421
Chloride	179	383	247	239
Hardness (as $CaCO_3$)	1,433	2,133	1,818	1,802
Magnesium	115	277	180	171
Molybdenum	0.085	0.542	0.250	0.202
Nitrate	111	407	190	177
Potassium	4.9	58.8	22.6	15.7
Selenium	0.017	0.042	0.028	0.027
Sodium	428	1,690	836	780
Sulfate	2,100	4,170	2,799	2,742
Total Alkalinity (as CaCO3)	172	313	225	220
TDS	3,860	7,080	4,891	4,808
Lab EC (µS/cm)	4,324	8,310	5,566	5,465
SAR	4.3	17.5	8.6	8.0
ASAR	5.5	25.4	11.5	10.6

All data collected in accordance with DWR's Quality Assurance Technical Document 2

*Barium was detected in one sample at a concentration of 0.06 mg/L within the Lemoore-Corcoran Stations. The detection limits for Southern Area samples ranged from 0.05 mg/L to 1 mg/L.

Table 20. 2010 Summary of Minerals and Trace Elements in Northern Area Drains (milligrams per Liter)

Element	Minimum	Maximum	Arithmetic Average	Geometric Mean
Subsurface Stations				
Arsenic	0.001	0.004	0.003	0.002
Barium*	< 0.050	0.055		
Boron	0.1	4.0	1.8	1.3
Calcium	10	228	123	100
Chloride	20	392	242	190
Hardness (as $CaCO_3$)	45	965	509	409
Magnesium	5	96	49	39
Molybdenum**	< 0.005			
Nitrate	1.5	78	49	36
Potassium	1.1	7.1	2.3	2.1
Selenium	0.001	0.011	0.006	0.005
Sodium	19	398	221	178
Sulfate	22	954	357	258
Total Alkalinity (as CaCO3)	33	333	236	206
TDS	115	2,400	1,247	1,006
Lab EC (µS/cm)	195	3,277	1,865	1,541
SAR	1.2	5.7	4.1	3.8
ASAR	0.4	7.4	4.8	4.0

All data collected in accordance with DWR's Quality Assurance Technical Document 2

*Barium was detected in one sample at a concentration of 0.055 mg/L, with a minimum detection limit of 0.05 mg/L.

**No Molybdenum was detected.

Table 21. 2010 Summary of Minerals and Trace Elements in Central Area Drains
(milligrams per Liter)

Element	Minimum	Maximum	Arithmetic Average	Geometric Mean
Subsurface Stations				
Arsenic*	0.003	< 0.020	0.005	0.005
Barium**	< 0.050	< 1.00		
Boron	1.2	79	13	9.5
Calcium	110	709	436	416
Chloride	119	2,790	762	639
Hardness (as $CaCO_3$)	370	3,586	1,839	1,716
Magnesium	23	576	182	155
Molybdenum	0.025	0.186	0.079	0.067
Nitrate	0.3	246	106	79
Potassium	1.4	6.4	3.6	3.4
Selenium	0.003	0.369	0.124	0.085
Sodium	128	3,710	1,066	909
Sulfate	281	7,630	2,629	2,311
Total Alkalinity (as CaCO3)	119	331	208	202
TDS	859	16,070	5,486	4,942
Lab EC (µS/cm)	1,247	17,300	6,552	6,014
SAR	2.4	27.0	10.4	9.4
ASAR	2.9	39.1	13.9	12.4

All data collected in accordance with DWR's Quality Assurance Technical Document 2

*Arsenic reported a maximum concentration of 0.013 mg/L.

**Barium was detected in one sample at a concentration of 0.057 mg/L.
The detection limits ranged from 0.05 mg/L to 1.0 mg/L.

Table 22. 2010 Summary of Minerals and Trace Elements in Southern Area Drains

(milligrams per Liter)

Element	Minimum	Maximum	Arithmetic Average	Geometric Mean
Lemoore-Corcoran Stations				
Arsenic	0.003	< 0.201		
Barium*	< 0.05	< 10.05		
Boron	1.0	33.1	15.3	7.8
Calcium	32	407	262	207
Chloride	158	1,820	761	619
Hardness (as $CaCO_3$)	152	4,180	2,064	1,416
Magnesium	17.0	850	342	206
Molybdenum	0.028	< 1.005	0.303	0.211
Nitrate	4.5	90.6	41.3	32.0
Potassium	2.4	16.1	7.2	6.3
Selenium	0.003	0.201	0.014	0.012
Sodium	295	7,400	3,256	2,125
Sulfate	140.0	16,600	7,398	3,807
Total Alkalinity (as CaCO3)	354	672	448	442
TDS	1,070	24,560	11,935	8,015
Lab EC (µS/cm)	1,793	26,320	12,958	9,542
SAR	8.3	53.7	29.0	24.6
ASAR	9.6	84.7	43.6	35.1
Lost Hills-Semitropic Stations				
Arsenic	0.014	0.190	0.070	0.041
Barium*	< 0.25	< 1.0		
Boron	3.5	37.4	21.0	15.5
Calcium	83	724	414	325
Chloride	963	6,820	2,609	2,141
Hardness (as $CaCO_3$)	497	3,633	1,902	1,568
Magnesium	70	443	211	180
Molybdenum	0.471	1.060	0.769	0.746
Nitrate	99	301	231	216
Potassium	2.4	7.8	4.6	4.3
Selenium	0.025	0.434	0.224	0.155
Sodium	1,220	6,110	3,274	2,897
Sulfate	1,320	6,640	4,853	4,127
Total Alkalinity (as CaCO3)	105	482	216	172
TDS	4,130	16,580	11,201	9,981
Lab EC (µS/cm)	6,157	25,760	14,347	12,954
SAR	23.9	44.1	32.4	31.9
ASAR	28.6	59.6	40.1	39.1

All data collected in accordance with DWR's Quality Assurance Technical Document 2

Table 22 continued on next page

Table 22 (continued). 2010 Summary of Minerals and Trace Elements in Southern Area Drains
(milligrams per Liter)

Element	Minimum	Maximum	Arithmetic Average	Geometric Mean
Kern Lakebed Stations				
Arsenic	0.004	0.017	0.013	0.011
Barium*	< 0.05	< 0.50		
Boron	2.1	18.2	7.1	5.3
Calcium	337	583	424	415
Chloride	163	475	274	256
Hardness (as $CaCO_3$)	1,348	2,049	1,760	1,740
Magnesium	103	278	171	158
Molybdenum	0.081	0.561	0.227	0.169
Nitrate	111	308	194	182
Potassium	6.2	60.9	24.9	17.4
Selenium	0.015	0.036	0.027	0.026
Sodium	397	1,890	944	839
Sulfate	2,000	4,840	2,984	2,853
Total Alkalinity (as CaCO3)	178	280	217	214
TDS	3,630	8,560	5,257	5,028
Lab EC (µS/cm)	4,077	9,422	5,927	5,698
SAR	4.2	18.2	9.7	8.8
ASAR	5.7	25.4	12.9	11.5

All data collected in accordance with DWR's Quality Assurance Technical Document 2

*Barium was detected in one sample at a concentration of 0.089 mg/L within the Lemoore-Corcoran Stations. The detection limits ranged from 0.05 to 10.05 mg/L.

Arsenic

Arsenic occurs naturally in rocks and soil, water, air, and plants and animals. It can be further released into the environment through natural activities such as volcanic action, erosion of rocks and forest fires, or through human actions. High arsenic levels come from certain fertilizers and animal feeding operations. Higher levels of arsenic tend to be found more in ground water sources than in surface water. As a result of irrigation, arsenic is brought from the subsurface to the soil surface. An increase in arsenic concentration in the soil surface can detrimentally impact crop growth and is a source of entry into the food chain. In the United States, the current maximum allowable level of arsenic in municipal drinking water is 10 µg/L. California's arsenic maximum contaminant level (MCL) is 0.010 mg/L (equivalent to 10 µg/L).

DWR sparsely monitored drainage water for arsenic from 1973 through 2001. In 2002, we established continued monitoring. In 2006 through 2010, we reported arsenic levels of 0.001 mg/L to 0.271 mg/L throughout the monitored subsurface drains with highest concentrations reported within the Southern Area, Lemoore-Corcoran, and Lost Hills-Semitropic stations.

We listed historic arsenic averages in Table 23 (page 37), with graphical trends presented in Appendix B. Because of the minimal amount of data, it was necessary to combine the early years.

Table 23. Arsenic in Subsurface Drains, 1973-2010

(milligrams per Liter)

1974-1979	1981-1986	1987-1989	1990-1992	2001-2002	2003	2004	2005	2006	2007	2008	2009	2010
						Central Area						
0.010	0.006	0.002	0.002	0.005	0.006	0.006	0.007	0.007	0.006	0.006	0.006	0.005
0.010	0.004	0.002	0.002	0.004	0.005	0.006	0.006	0.006	0.005	0.005	0.005	0.005

1973-1975	1976-1979	1980-1984	1985	1986	1987	1988	1989	1990	1991-1992
					Southern Area				
Lemoore-Corcoran									
0.064	0.067	0.044	0.055	0.037	0.037	0.056	0.038	0.048	0.048
0.046	0.043	0.032	0.037	0.018	0.020	0.032	0.025	0.029	0.028
Lost Hills-Semitropic									
0.025	0.038	0.277	0.262	0.157	0.207	0.281	0.298	0.255	0.171
0.024	0.032	0.118	0.110	0.029	0.035	0.103	0.115	0.072	0.042
Kern Lakebed									
			0.010	0.006	0.007	0.006	0.005	0.005	0.003
			0.010	0.005	0.005	0.005	0.005	0.004	0.003

2001-2002	2003	2004	2005	2006	2007	2008	2009	2010
Lemoore-Corcoran								
0.042	0.060	0.066	0.057	0.036	0.037	0.059	0.078	0.089
0.027	0.035	0.037	0.030	0.024	0.022	0.033	0.046	0.058
Lost Hills-Semitropic								
0.127	0.101	0.068	0.076	0.081	0.087	0.077	0.102	0.095
0.037	0.032	0.029	0.039	0.049	0.051	0.044	0.053	0.058
Kern Lakebed								
0.012	0.011	0.011	0.010	0.011	0.013	0.010	0.010	0.014
0.010	0.009	0.010	0.009	0.009	0.012	0.008	0.009	0.012

All data collected in accordance with DWR's Quality Assurance Technical Document 2

Arithmetic Average (top value), Geometric Mean (bottom value)

Boron

A toxicity problem is different from a salinity problem in that toxicity occurs within the plant itself. Toxicity normally results when certain ions are taken up from the soil water and accumulate in the leaves to such an extent that the result damages the plant. The degree of damage depends upon time, concentration, crop sensitivity, and crop water use; if damage is severe enough, crop yield is reduced. Common toxic ions in irrigation water are chloride, sodium, and boron. Damage can be caused by each individually, or in combination. Boron is needed in relatively small amounts; however, it becomes toxic if present in amounts greater than needed. Boron toxicity symptoms normally show first on older leaves as a yellowing, spotting, or drying of leaf tissue at the tips and edges. Boron tolerance levels vary from < 0.5 mg/L for very sensitive crops and 6-15 mg/L range for the very tolerant cotton and asparagus.

Within the Central Area, DWR established boron as a continuously-monitored constituent in 1959; the Southern Area began sampling in 1966. Boron monitoring in the subsurface drains for 2006 through 2010 shows a minimum of 0.1 mg/L to a maximum level of 79 mg/L throughout all area drains. The maximum boron concentrations within the Central Area drains for 2006, 2007, 2008, 2009, and 2010 were 55 mg/L, 66 mg/L, 70.8 mg/L, 70 mg/L, and 78.7 mg/L, respectively. The maximum boron concentrations in the Southern Area drains for 2006, 2007, 2008, 2009, and 2010 were 47 mg/L, 39.7 mg/L, 36.5 mg/L, 42.4 mg/L, and 37.4 mg/L, respectively. The maximum boron concentration for the Northern Area was 4.0 mg/L in 2010.

Historical boron averages are listed in Table 24 (page 39) from 1959 through 2010. Graphical trend analysis for boron within the Central and Southern Areas are presented in Appendix C.

Table 24. Boron in Subsurface Drains, 1959-2010

(milligrams per Liter)

Arithmetic Average
Geometric Mean

1959	1960-1962	1963-1969	1970-1974	1975	1976	1977-1979	1980-1984	1985	1986	1987	1988	1989	1990	1991	1992
Central Area															
16.0	28.1	13.7	13.0	12.0	13.2	11.9	14.3	14.8	14.1	16.8	14.4	14.6	14.2	15.0	14.1
14.6	16.1	11.4	10.8	9.9	10.9	10.0	11.7	12.2	11.6	13.6	11.4	11.3	11.0	11.3	10.3

1993	1994	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
14.0	15.1	13.3	12.7	13.8	12.9	11.0	10.9	10.9	11.8	11.0	11.3	12.3	11.2	11.1	12.1	12.8
11.0	10.7	10.3	9.7	10.3	10.3	9.4	9.2	9.2	10.0	8.8	8.9	9.7	8.9	8.6	8.6	9.5

Southern Area

1966-1969	1970-1975	1976-1979	1980-1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1996
Lemoore-Corcoran														
2.4	2.4	3.0	2.9	7.7	15.2	19.1	12.4	13.3	14.0	14.4	14.7	16.6	18.2	9.5
1.5	1.6	2.3	2.2	4.7	7.8	10.4	8.4	6.0	7.1	6.9	6.9	7.9	8.5	4.4
Lost Hills-Semitropic														
3.5	13.5	1.3	11.4	24.6	28.8	31.7	24.3	22.8	21.5	20.4	21.6	23.6	23.8	21.2
3.5	9.0	0.9	5.5	13.4	15.8	19.4	11.4	10.5	10.2	10.5	11.0	11.4	11.4	9.8
Kern Lakebed														
0.6	0.7	10.2		24.4	14.3	16.7	19.5	18.3	14.6	8.8	7.3	6.7	6.8	9.4
0.4	0.4	4.2		16.3	7.5	8.5	11.5	11.6	9.2	5.8	5.6	6.1	5.8	6.9

1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Lemoore-Corcoran													
13.5	11.5	13.1	10.8	10.9	9.6	11.0	11.6	14.1	13.1	12.1	10.9	11.7	15.3
6.3	6.1	6.3	4.6	5.0	3.6	5.1	5.3	7.3	6.4	5.5	5.3	5.5	7.8
Lost Hills-Semitropic													
25.0	33.6	22.8	23.3	22.5	19.6	14.8	15.3	14.0	18.3	15.7	18.6	19.9	21.0
16.0	28.5	16.7	16.7	15.6	13.6	11.5	10.7	11.3	11.6	10.9	13.3	13.2	15.5
Kern Lakebed													
9.9	12.0	13.4	10.0	10.0	42.7	15.4	7.7	7.9	7.3	6.5	6.9	6.4	7.1
6.6	8.4	9.0	7.0	7.1	13.2	7.1	5.7	5.8	5.3	5.2	5.4	5.0	5.3

All data collected in accordance with DWR's Quality Assurance Technical Document 2

Arithmetic Average (top value), Geometric Mean (bottom value)

Selenium

Selenium is a naturally-occurring, nonmetallic chemical element that accumulates in drainage water when selenium-enriched salts leach from the soil into the shallow groundwater. Water-quality problems associated with selenium are most likely to occur in the San Joaquin Valley where soils are formed of sediments from marine sedimentary rocks of the Coast Range. The occurrence of Coast Range sediments and the highest selenium concentrations are clearly linked throughout the Valley. Three areas of the western valley have the highest soil selenium concentrations:

- The alluvial fans near Panoche and Cantua Creeks in the central western valley
- An area west of the town of Lost Hills
- The Buena Vista Lake Bed area

High concentrations of selenium occur in subsurface drain water from some agricultural lands near, but not necessarily within, all three areas.

Selenium concentrations in samples collected from the Central Area subsurface drains ranged from 0.003 to 0.431 mg/L during 2006-2010. In 2006, the highest selenium concentrations were found in samples collected from central station OAS 2548, with selenium concentrations ranging from 0.003 mg/L to 0.414 mg/L. In 2007, the highest selenium concentrations were found in samples collected from central station FBH 2016, with concentrations ranging from 0.004 mg/L to 0.356 mg/L. In 2008, the highest selenium concentrations were found in samples collected from central station BVS 7007, with concentrations ranging from 0.003 mg/L to 0.431 mg/L. In 2009 and 2010, the highest selenium concentrations were found in samples collected from central station FBH 2016, with concentrations ranging from 0.003 mg/L to 0.381 mg/L.

The concentration levels of selenium in the Southern Area subsurface drains ranged from 0.001 to 0.44 mg/L during 2006-2010. In 2006, the highest selenium concentrations were found in samples collected from Lost Hills-Semitropic station LNW 6459, with concentrations ranging from 0.001 mg/L to 0.4 mg/L. In 2007, the highest selenium concentrations were found in samples collected from Lost Hills-Semitropic station LNW 6467, with concentrations ranging from 0.253 mg/L to 0.29 mg/L. In 2008, the highest selenium concentrations were found in samples collected from LNW 6467, with concentrations ranging from 0.29 mg/L-0.44 mg/L. In 2009, the highest selenium concentrations were found in samples collected from LNW 6467, with concentrations ranging from 0.128 mg/L-0.44 mg/L. In 2010, with only one sample taken at LNW 6467, the highest selenium concentration found in the Southern Area was 0.434 mg/L.

Historical averages are listed in Table 25 from 1986 through 2010 (page 41). Graphical trend analyses for selenium within the Central and Southern Areas are presented in Appendix D.

Table 25. Selenium in Subsurface Drains, 1986-2010

(milligrams per Liter)

Arithmetic Average
Geometric Mean

1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Central Area																								
0.099	0.110	0.095	0.090	0.085	0.091	0.066	0.071	0.077		0.077	0.089	0.080	0.086	0.114	0.117	0.133	0.139	0.146	0.134	0.140	0.122	0.130	0.122	0.124
0.061	0.053	0.057	0.053	0.053	0.050	0.042	0.054	0.050		0.049	0.061	0.059	0.057	0.080	0.083	0.097	0.099	0.104	0.093	0.098	0.085	0.089	0.072	0.085
Southern Area																								
Lemoore-Corcoran																								
0.004	0.004	0.007	0.009	0.009	0.007	0.006	0.010	0.005		0.007	0.004	0.005	0.009	0.015	0.014	0.011	0.011	0.014	0.020	0.018	0.012	0.010	0.011	0.014
0.003	0.003	0.004	0.005	0.005	0.005	0.004	0.006	0.004		0.005	0.003	0.004	0.007	0.012	0.011	0.008	0.009	0.012	0.015	0.014	0.009	0.008	0.009	0.012
Lost Hills-Semitropic																								
0.155	0.191	0.129	0.117	0.095	0.132	0.154	0.124	0.144		0.152	0.147	0.191	0.134	0.153	0.148	0.166	0.146	0.164	0.150	0.185	0.161	0.207	0.212	0.224
0.034	0.059	0.022	0.020	0.017	0.032	0.033	0.029	0.035		0.049	0.067	0.079	0.045	0.086	0.083	0.084	0.086	0.097	0.090	0.092	0.084	0.119	0.115	0.155
Kern Lakebed																								
0.115	0.124	0.157	0.177	0.094	0.049	0.101	0.094	0.152		0.099	0.085	0.118	0.141	0.293	0.194	0.093	0.047	0.033	0.034	0.031	0.029	0.027	0.028	0.027
0.041	0.043	0.078	0.073	0.044	0.027	0.025	0.026	0.032		0.040	0.045	0.063	0.052	0.098	0.074	0.050	0.036	0.032	0.033	0.030	0.028	0.026	0.027	0.026

All data collected in accordance with DWR's Quality Assurance Technical Document 2

Arithmetic Average (top value), Geometric Mean (bottom value). No data collected in 1995.

Nutrients and Nitrates

DWR resumed sampling of five Central and seven Southern Area drains for nutrient concentrations in 2007. The samples were analyzed for ammonia as nitrogen, nitrite, organic nitrogen, orthophosphate, and total phosphorous. The 2007-2009 data for these drains are included in Appendix K.

Nitrifying bacteria can oxidize ammonium to nitrite (NO_2^-) and then to nitrate (NO_3^-). Heavy, clay-rich soils favor denitrification whereas shallow, coarse-textured, highly permeable soils and aquifers, common in agricultural regions of the Southwest, are typically high in dissolved oxygen and more susceptible to higher levels of nitrate (Harter, 2009). Though nitrate is a useful form of nitrogen to plants and a valuable fertilizer, excessive levels of nitrate in drinking water can produce negative health impacts. The EPA has set a drinking water MCL of 10 mg/l for nitrate-nitrogen (44 mg/L nitrate = 10 mg/L nitrate-N).

The SJVDMP had not sampled subsurface drains for nutrients since 1987 when total ammonia and organic nitrogen, dissolved nitrate and nitrite, dissolved ammonia, dissolved orthophosphate, and total phosphorus were last analyzed.

However, the SJVDMP resumed sampling for nutrients and will continue monitoring biannually. A further study on nutrients and nitrates will be presented on our website.

Pesticides

Pesticide is a generic term for compounds used as fungicides, herbicides, insecticides, nematocides, acaracides, and rodenticides. In this report, the term "pesticide" also includes transformation products and other agriculturally related organic compounds, such as, pesticide by-products or additives. For example, aldicarb sulfoxide is a degradation product of aldicarb. Pesticides do not occur naturally in the environment. The application of pesticides on agricultural crops and right-of-ways results in the presence of pesticides in drainage water.

DWR began monitoring for pesticides in 1963. Samples were collected from San Joaquin Valley tile drains (8 locations), surface drains (13 locations), surface waters (26 locations), and bay and ocean waters (10 locations). We analyzed the samples for 15 organochlorine pesticides. At the time, DDT and its metabolites (DDE and DDD) were the pesticides detected at the highest frequency. The higher concentrations of pesticides were found in surface drains and surface waters. Over time, the sampling locations, as well as the pesticides, that we analyzed (organophosphorus pesticides were added) had changed. Because pesticide concentrations detected in agricultural drainage were low or often not detected, DWR stopped monitoring in 1986.

DWR resumed monitoring agricultural drainage water for pesticides in 2007 with plans to continue the program every two years. The Central and Southern tile drains collected are listed in Table 26, below.

Table 26. Pesticide Drainage Monitoring Stations, 2007-2009

Central Area		Southern Area	
BVS	6001	CCN	3550
CTL	3728	CNR	0801
FBH	2016	COC	4126
HMH	7516	ERR	8429
BVS	8110	HCH	7841
OAS	2548	LNW	5467
		VGD	3906

Many pesticides not available in 1986 are now in use, while many pesticides used in the past are now prohibited. In addition, today's analytical methods achieve much lower detection limits. The samples collected from 2007 to 2009 were analyzed for approximately 100 pesticides. The pesticides that were analyzed and their reporting limits are shown in Appendix L. On page 44, in Table 27, we have listed 15 pesticides that were detected in the samples.

Table 27. Pesticides Detected in Drainage Monitoring Stations, 2007-2009

Atrazine	Dimethoate	Norflurazon
Bromacil	Diuron	Pendimethalin
Chlorothalonil	Glyphosate	Simazine
Chlorpyrifos	Idicarb sulfoxide	Thiobencarb
Dacthal	Metolachlor	Triclopyr

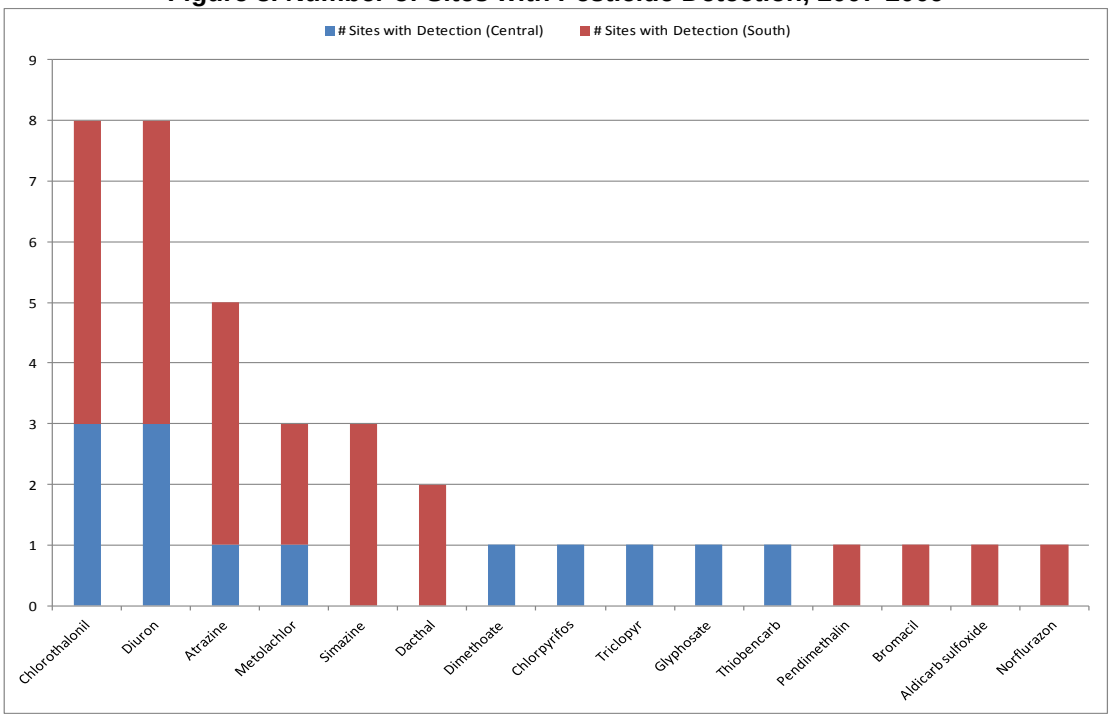
Six of the listed pesticides were found in subsurface drainage water samples from 1986 and earlier: atrazine, chlorothalonil, chlorpyrifos, dachthal, simazine, and thiobencarb. Analyses for the remaining nine pesticides were not performed during the pre-1987 monitoring.

Chlorpyrifos, dimethoate, glyphosate, thiobencarb, and triclopyr were found only in the Central Area, 2007-2009 samples. Aldicarb sulfoxide, bromacil, dachthal, norflurazon, pendimethalin, and simazine were detected only in Southern Area samples. Atrazine, chlorothalonil, diuron, and metolachlor were found in both areas.

At least one pesticide was found at each location that was tested for pesticides. Diuron was the only pesticide detected in the samples collected at station HMH 7516. No other pesticides were found in any of the other samples collected from this site. The station where the largest amount of pesticides were found was HCH 7841; six different pesticides were detected. Appendix L lists the locations, collection dates, concentrations, and reporting limits for the samples in which pesticides were detected.

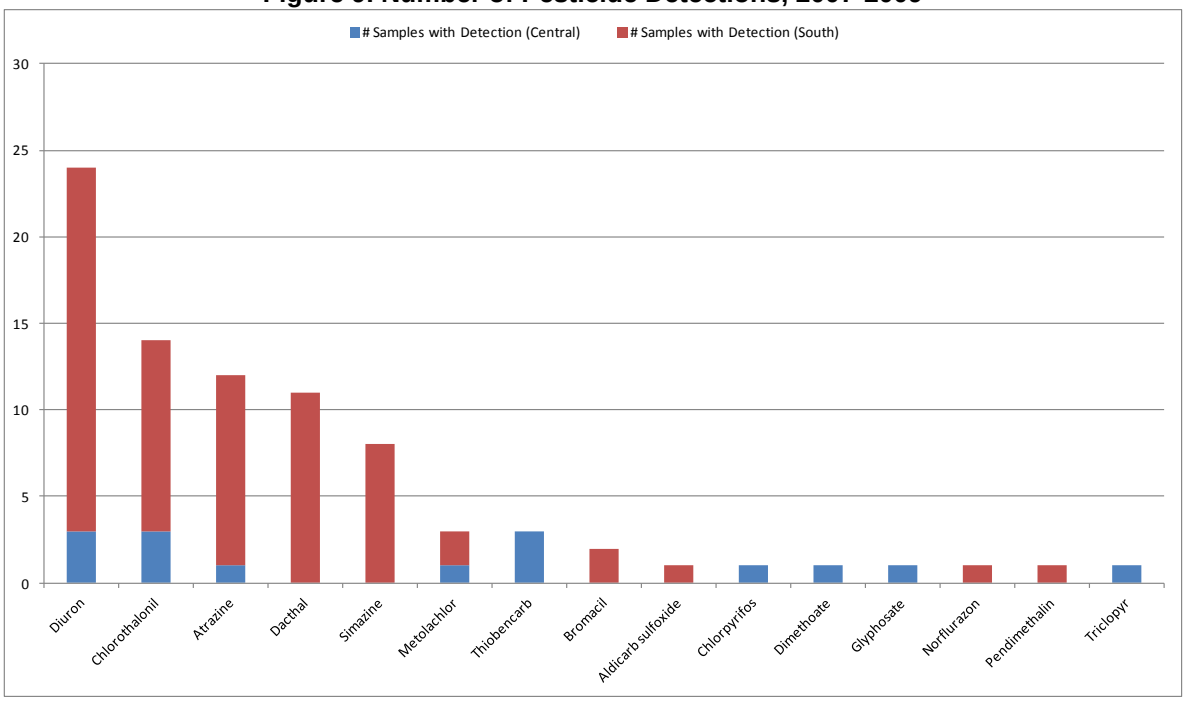
The pesticides found at the most locations were chlorothalonil and diuron; these pesticides were detected at three of the five sampling locations in the Central Area and five of the seven sampling sites in the Southern Area. Figure 8 shows the number of sites where each pesticide was detected.

Figure 8. Number of Sites with Pesticide Detection, 2007-2009



Diuron was detected in the most samples (24), followed by chlorothalonil, atrazine, dachthal, and simazine, as shown in Figure 9. Aldicarb sulfoxide, chlorpyrifos, dimethoate, glyphosate, norflurazon, pendimethalin, and triclopyr were detected only once during 2007-2009.

Figure 9. Number of Pesticide Detections, 2007-2009



Tables 28 and 29 show the months when samples were collected and marked by an "X". A shaded cell indicates a detected pesticide within the sample. In the Central Area, pesticides were detected in 11 of 51 samples (22%), and in the Southern Area, pesticides were found in 48% of the samples. Sampling Station OAS 2548 had the highest frequency of detected pesticides (33%) in the Central Area, and Station COC 4126 had the most samples with pesticides detected (82%) in the Southern Area.

Table 28. Central Area Samples with Pesticide Detections, 2007-2009

Station	Jan-07	Apr-07	May-07	Jul-07	Sep-07	Nov-07	Jan-08	Jan-09	May-09	Jul-09	Sep-09	# Samples with Detects	Total # Samples
BVS 6001	X	X	X	X	X	X	X		X	X	X	3	10
CTL 3728	X	X	X	X	X	X	X		X	X	X	2	10
FBH 2016	X	X	X	X	X	X	X	X	X	X	X	2	11
HMH 7516	X	X	X	X	X	X	X	X	X	X	X	1	11
OAS 2548	X	X	X	X	X	X		X		X	X	3	9
										Totals		11	51

Table 29. Southern Area Samples with Pesticide Detections, 2007-2009

Station	Jan-07	Apr-07	May-07	Jul-07	Sep-07	Nov-07	Jan-08	Jan-09	May-09	Jul-09	Sep-09	# Samples with Detects	Total # Samples
CCN 3550	X	X	X	X	X	X	X	X	X	X	X	5	11
CNR 0801	X	X	X	X	X	X	X	X	X	X	X	2	11
COC 4126	X	X	X	X	X	X	X	X	X	X	X	9	11
ERR 8429	X	X	X	X	X	X	X	X	X	X	X	6	11
HCH 7841	X	X	X	X	X	X	X	X	X	X	X	8	11
LNW 5467	X	X	X	X	X	X	X	X	X	X	X	4	11
VGD 3906	X	X	X	X	X	X	X	X	X	X	X	2	11
										Totals		36	77

All data collected in accordance with DWR's Quality Assurance Technical Document 2

Drinking water standards have been established for only five of the pesticides that were detected. The drinking water standards and the highest concentration of pesticide that was detected in the Central and Southern Areas are shown in Table 30. The only pesticide that was found above an enforceable drinking water standard was thiobencarb, which exceeded the secondary MCL, but was well below the primary (health-based) MCL for drinking water. Thiobencarb was only detected at Station OAS 2548 in the Central Area.

Atrazine was found in one sample at concentration above the California Public Health Goal (PHG), but below the primary MCL. In all of the other samples where atrazine was detected, the concentrations that were measured were below the PHG and the MCL.

Table 30. Detected Pesticide Compounds with Public Agency Standards, 2007-2009

Detected Compounds	Drinking Water Standards-Maximum Contaminant Levels (MCLs)					California Public Health Goal (PHG)	California Notification Levels	Highest Concentration Detected	
	California Dept. of Public Health		U.S. Environmental Protection Agency						
	Primary MCL (health based + technology + economics)	Secondary MCL (taste & odor or welfare-based)	Primary MCL (health based + technology + economics)	Secondary MCL (taste & odor or welfare-based)	MCL Goal (level for no adverse health effects)			Central	South
	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Aldicarb sulfoxide			4		1				5.0
Atrazine	1		3		3	0.15		0.02	0.19
Bromacil									0.37
Chlorothalonil								0.02	0.16
Chlorpyrifos								0.54	
Dacthal									10.8
Dimethoate							1	0.14	
Diuron								2.6	9.7
Glyphosate	700		700		700	900		53	
Metolachlor								0.19	0.1
Norflurazon									0.22
Pendimethalin									0.05
Simazine	4		4		4	4			0.05
Thiobencarb	70	1				70		4.45	
Triclopyr								0.38	

All data collected in accordance with DWR's Quality Assurance Technical Document 2

The distribution of a pesticide is a function of its physicochemical properties, such as solubility in water, the soil's biological and physicochemical properties, and climatic variables that influence the pesticide's environmental dispersal. Environmental monitoring of pesticides is complex because pesticides are taken up by the target organisms, and pesticides are sometimes metabolized by microorganisms in the soil, evaporated from water or soil to the air through volatilization, adsorbed to soils and sediments, and broken down by photolysis or hydrolysis. Thus, from the time a pesticide is applied to the time a sample of drainage water is collected, a pesticide may no longer be at a detectable concentration.

Fifteen pesticides were detected in agricultural drainage samples collected from 2007 through 2009. Some properties of these pesticides are shown in Appendix L. This information is from *The Agrochemicals Handbook*, 2nd edition, published by The Royal Society of Chemistry.

As previously mentioned, diuron was found in the most samples collected during the 2007-2009 sampling period; diuron and chlorothalonil were detected at most sampling locations. For a pesticide to end up in drainage water, it has to be somewhat water soluble and fairly persistent, which is the case for both of these pesticides.

Pesticide data collected from 2007 through 2009 are shown in Appendix L. These data show mostly non-detects for pesticides. There were 128 samples collected during this period, each analyzed for about 100 pesticides. Of these 12,800 analyses, pesticides were detected 84 times, which is about 0.6 percent of the analyses. The concentrations of several of the pesticides that were detected were slightly above or equal to the reporting limit, and the concentrations of pesticides that were detected in the drainage water were below all of the health-risk based drinking water standards.

DWR resumed monitoring some Northern Area drains for pesticides in 2011 and will continue monitoring biennially, together with the Central and Southern Area drains.

DWR's Future Monitoring Program

Plans are being formulated to modify and upgrade activities of DWR's ongoing monitoring program. This work involves cooperation and participation from water and drainage districts and from willing growers. Protocols to collect data from the various districts are being refined so that data can be obtained and evaluated in a timely manner. Plans are being made to solicit regulatory agencies for appropriate drainage data that can be included in future drainage monitoring program reports.

DWR's Agricultural Drainage web portal is located at **http://www.water.ca.gov/drainage**. The site presents various information to data, drainage and monitoring, and various projects the Region has participated in. Additional web pages are being developed to present monitoring data at this website.

Drainage monitoring reports, maps, and project reports are currently available at **http://www.water.ca.gov/publications/browse.cfm?display=topic&pub=120,6839 .** This report will also be posted at this address. This report will no longer be published, however, the data will be continued to be collected and made available through the Agricultural Drainage website.

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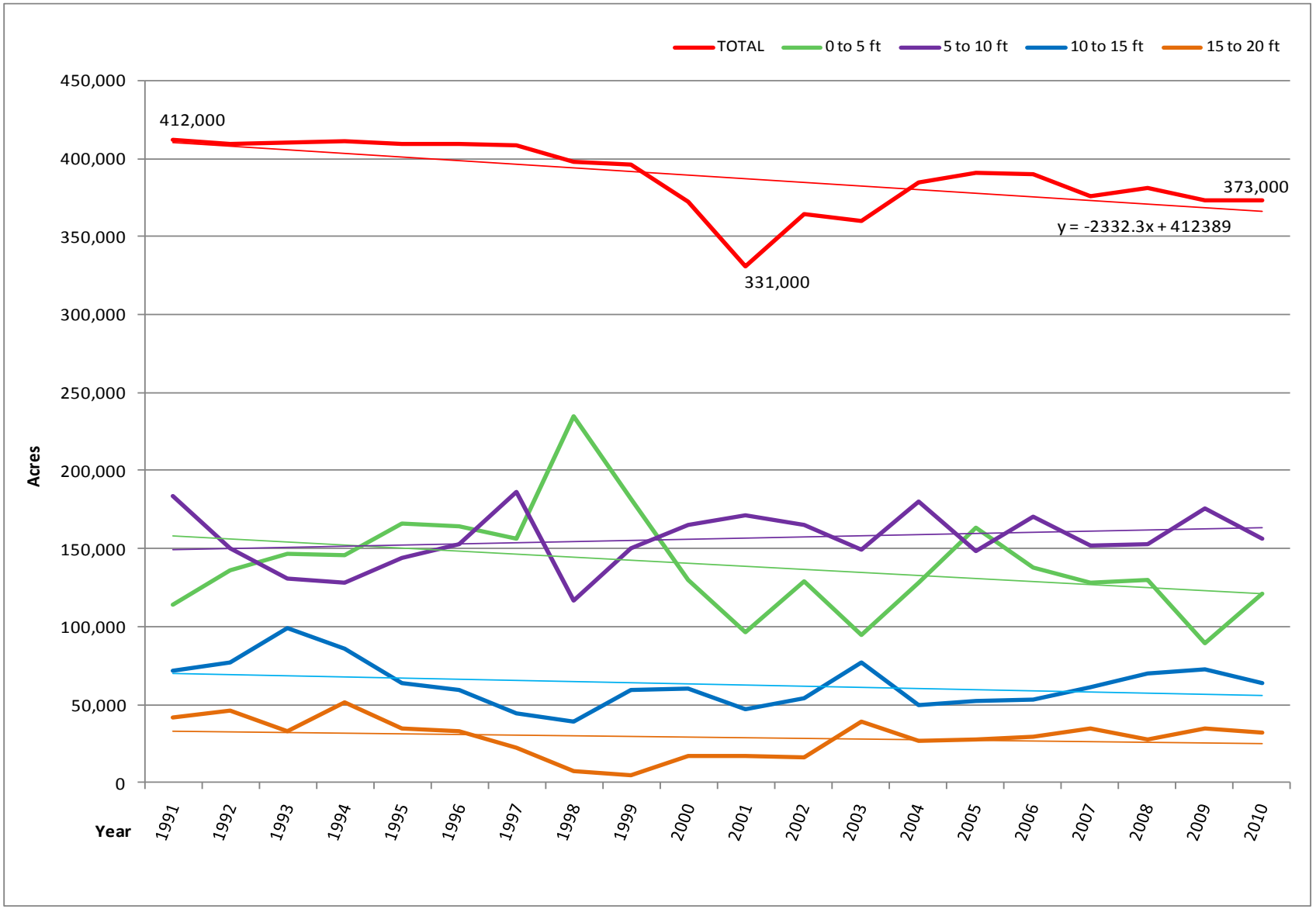
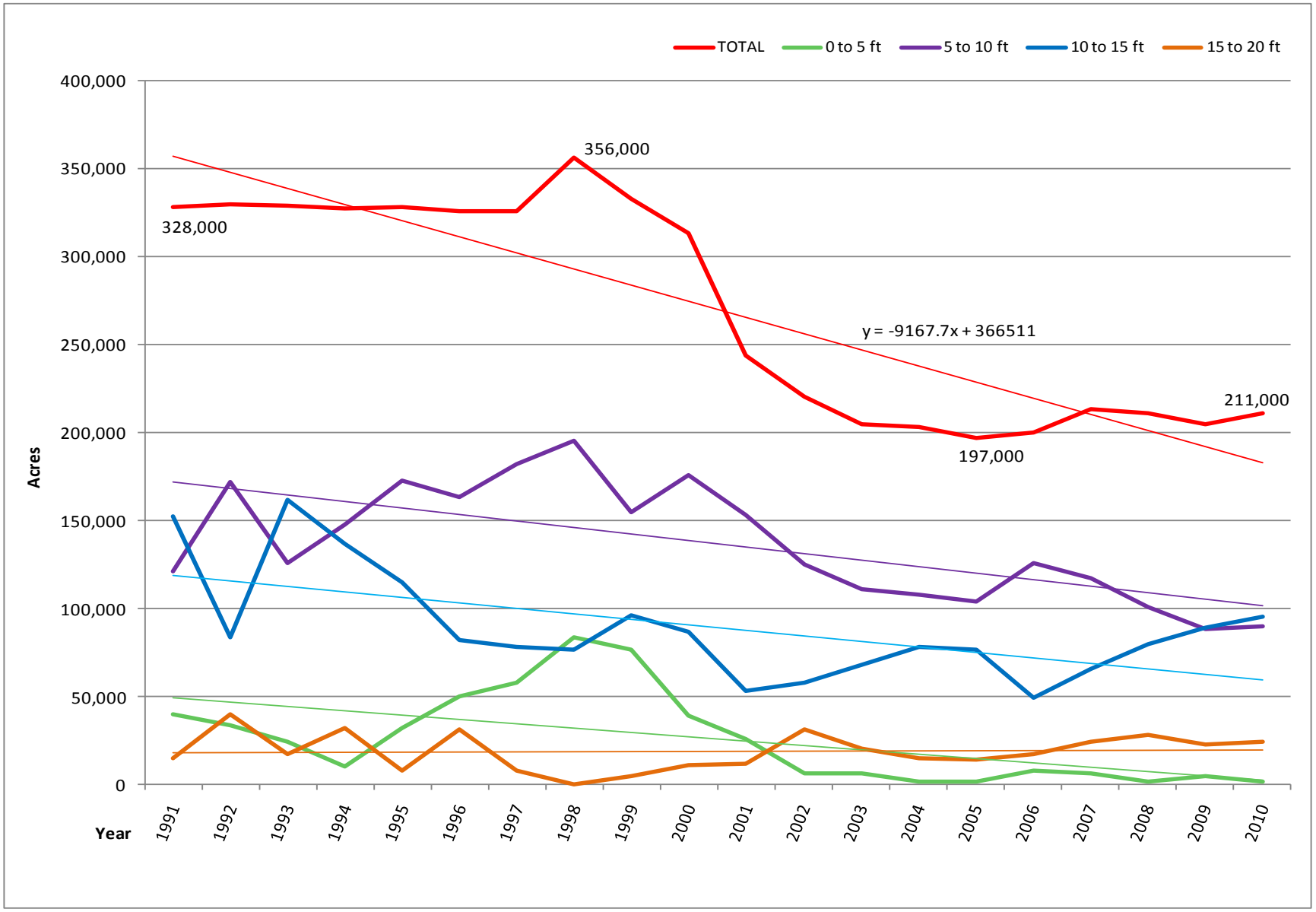
Appendix A
Depth to Water Acreage Trends of Drainage Impaired Lands 1991-2010

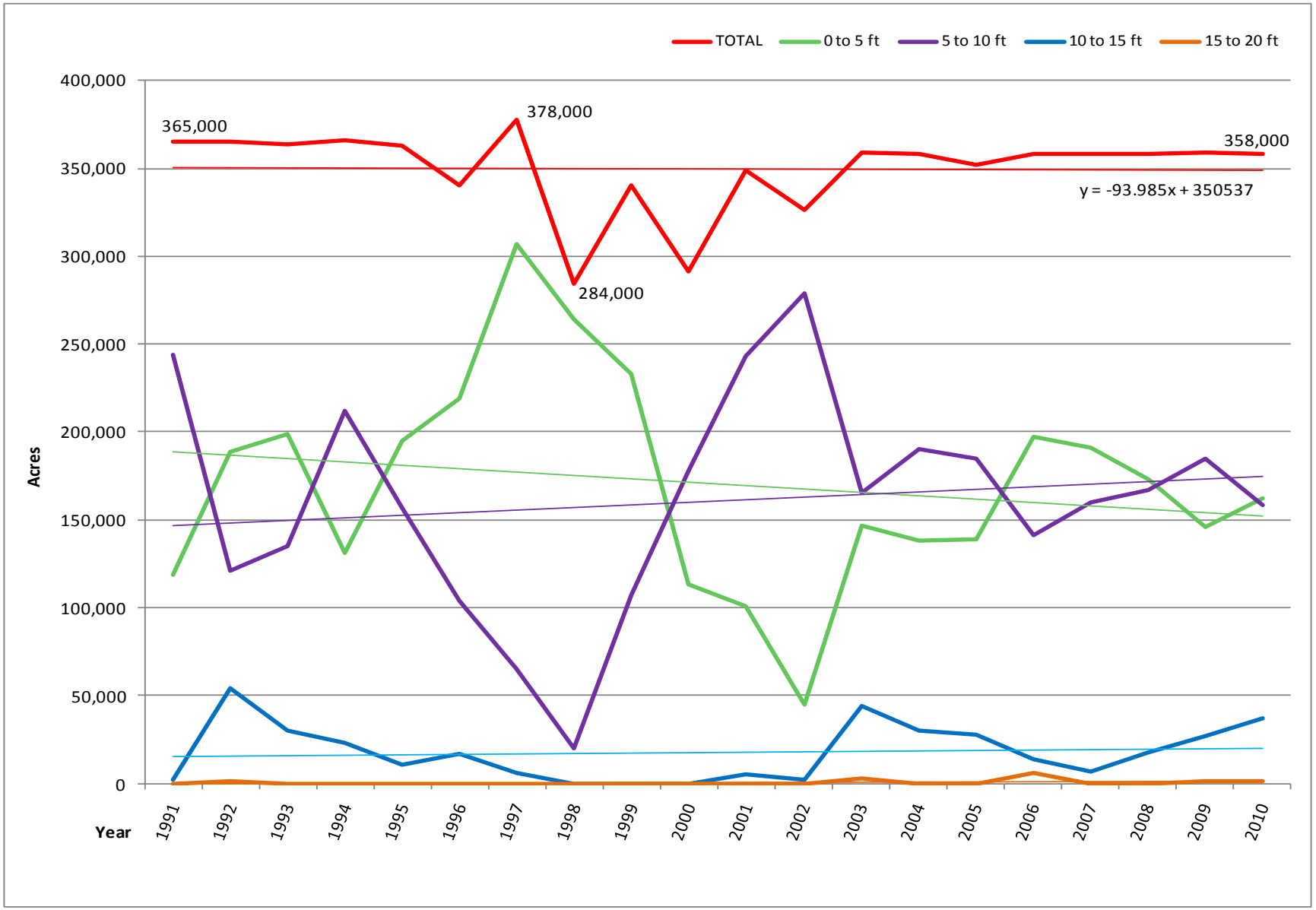
Grasslands Subbasin, Depth to Water Acreage Trends of Drainage Impaired Lands
1991-2010



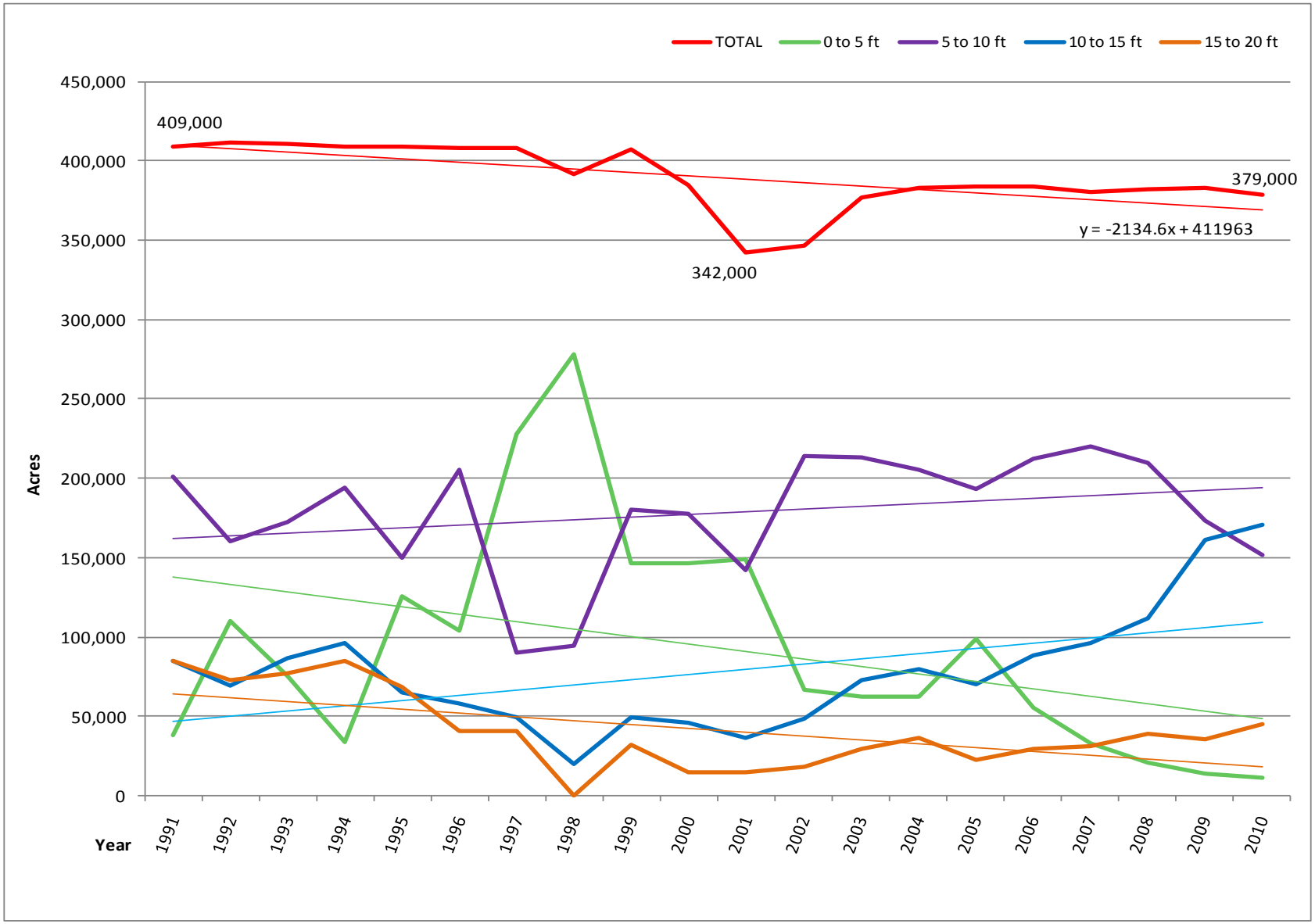
Kern Lakebed Subbasin, Depth to Water Acreage Trends of Drainage Impaired Lands
1991-2010



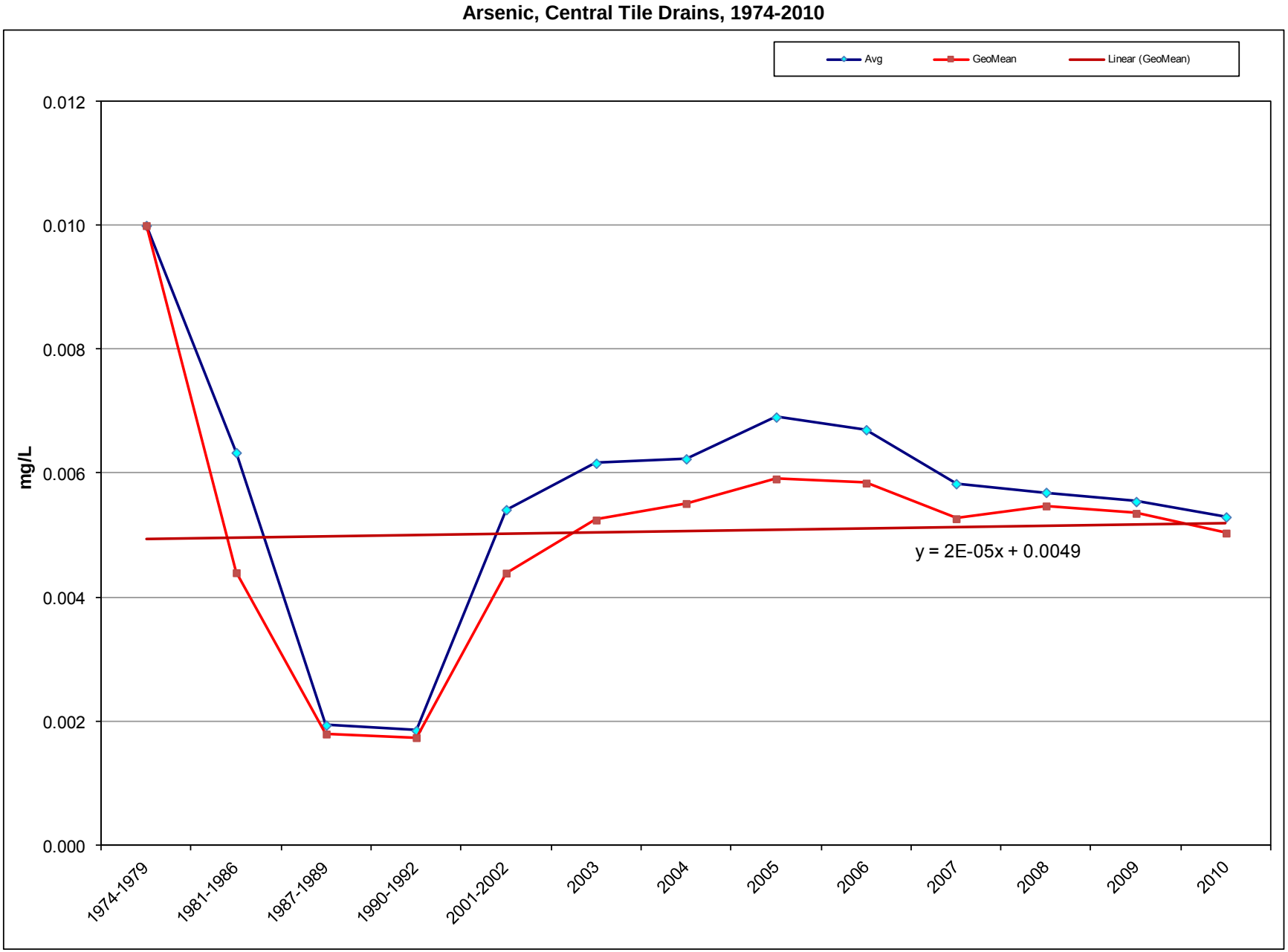
Tulare Subbasin, Depth to Water Acreage Trends of Drainage Impaired Lands
1991-2010

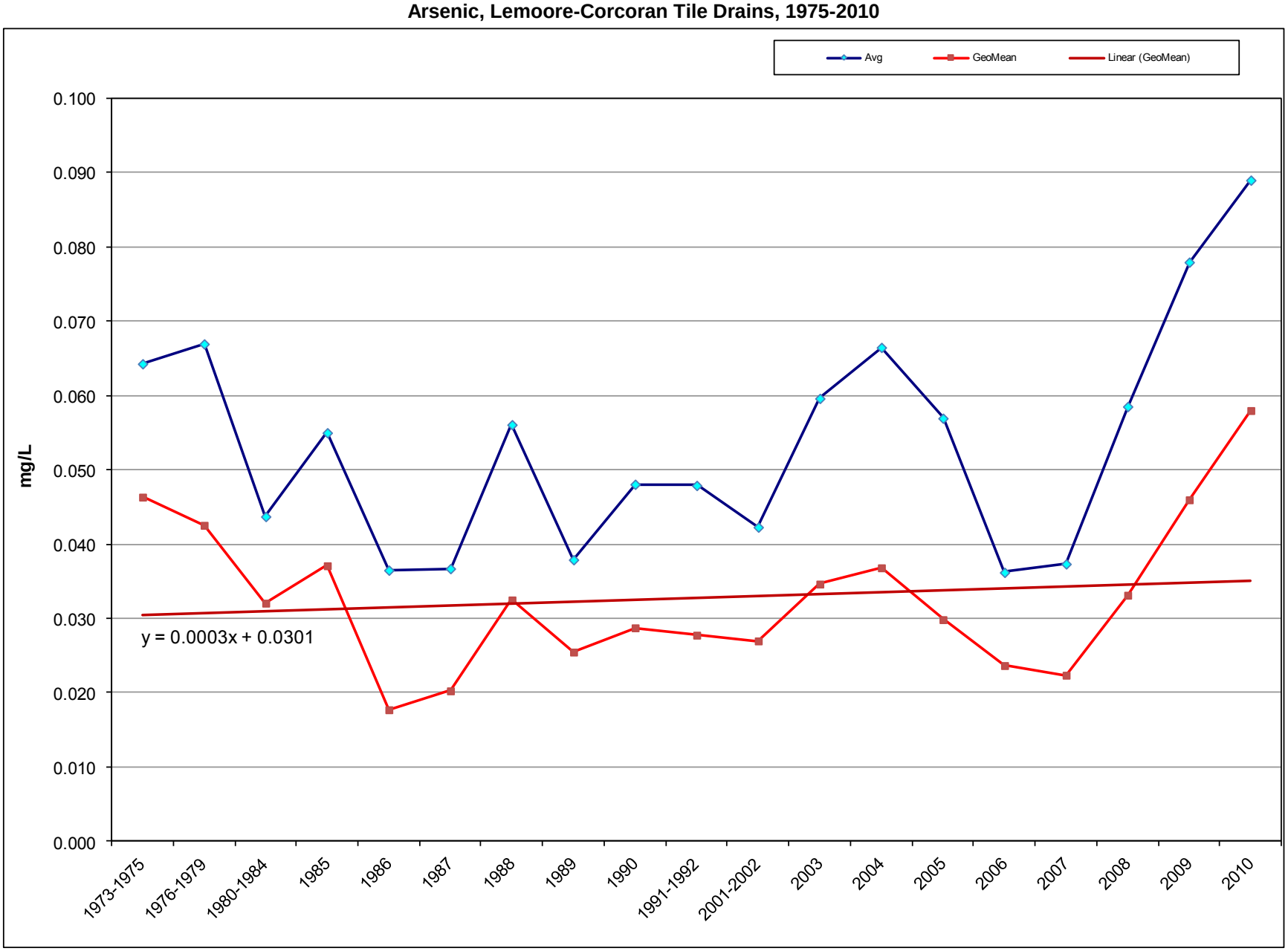


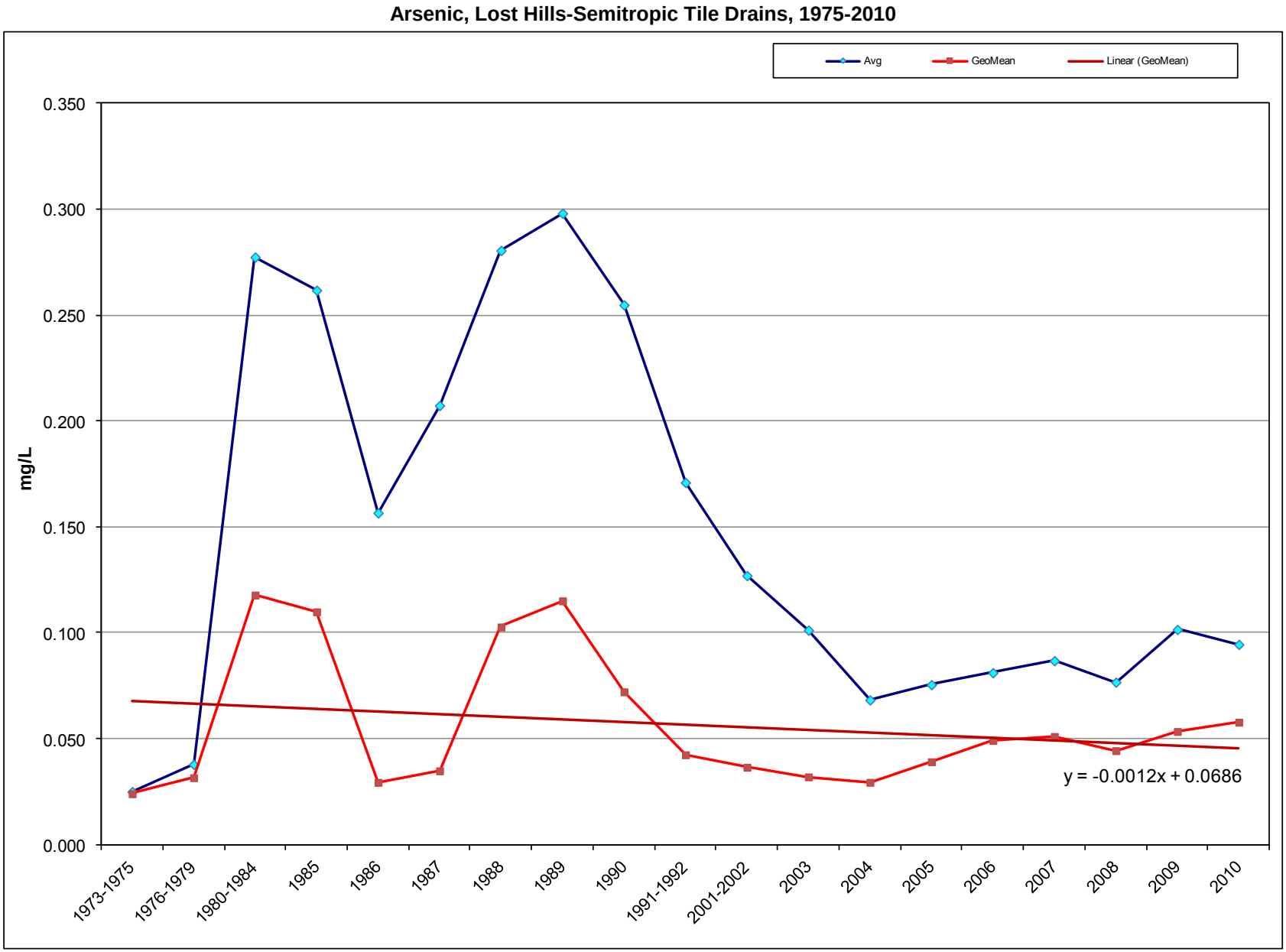
Westlands Subbasin, Depth to Water Acreage Trends of Drainage Impaired Lands
1991-2010

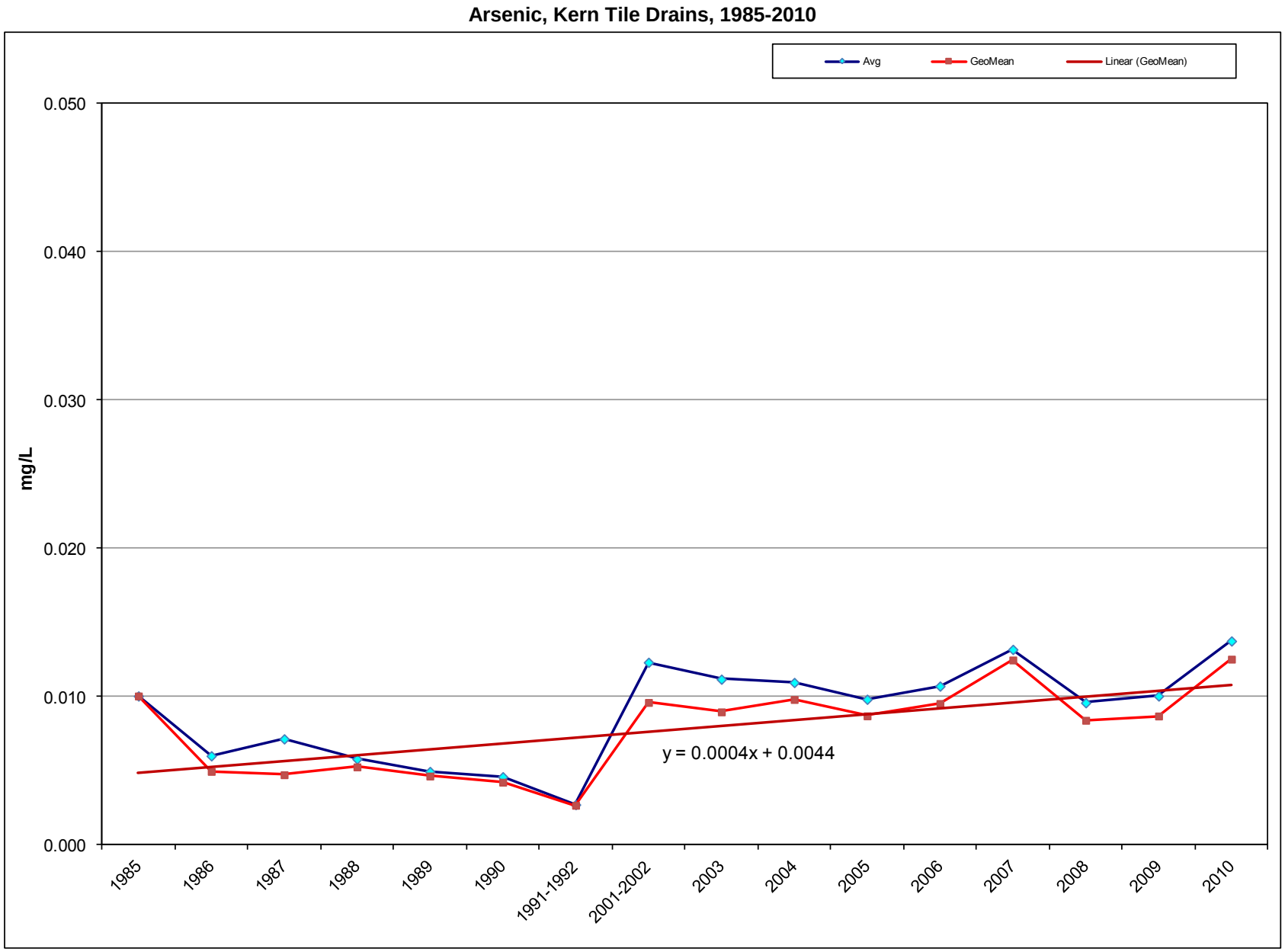


Appendix B
Arsenic Trends in Central and Southern Tile Drains Through 2010


Arsenic, Central Tile Drains, 1974-2010
Avg
GeoMean
Linear (GeoMean)
0.012
0.010
0.008
0.006
0.004
0.002
0.000
mg/L
y = 2E-05x + 0.0049
1974-1979
1981-1986
1987-1989
1990-1992
2001-2002
2003
2004
2005
2006
2007
2008
2009
2010

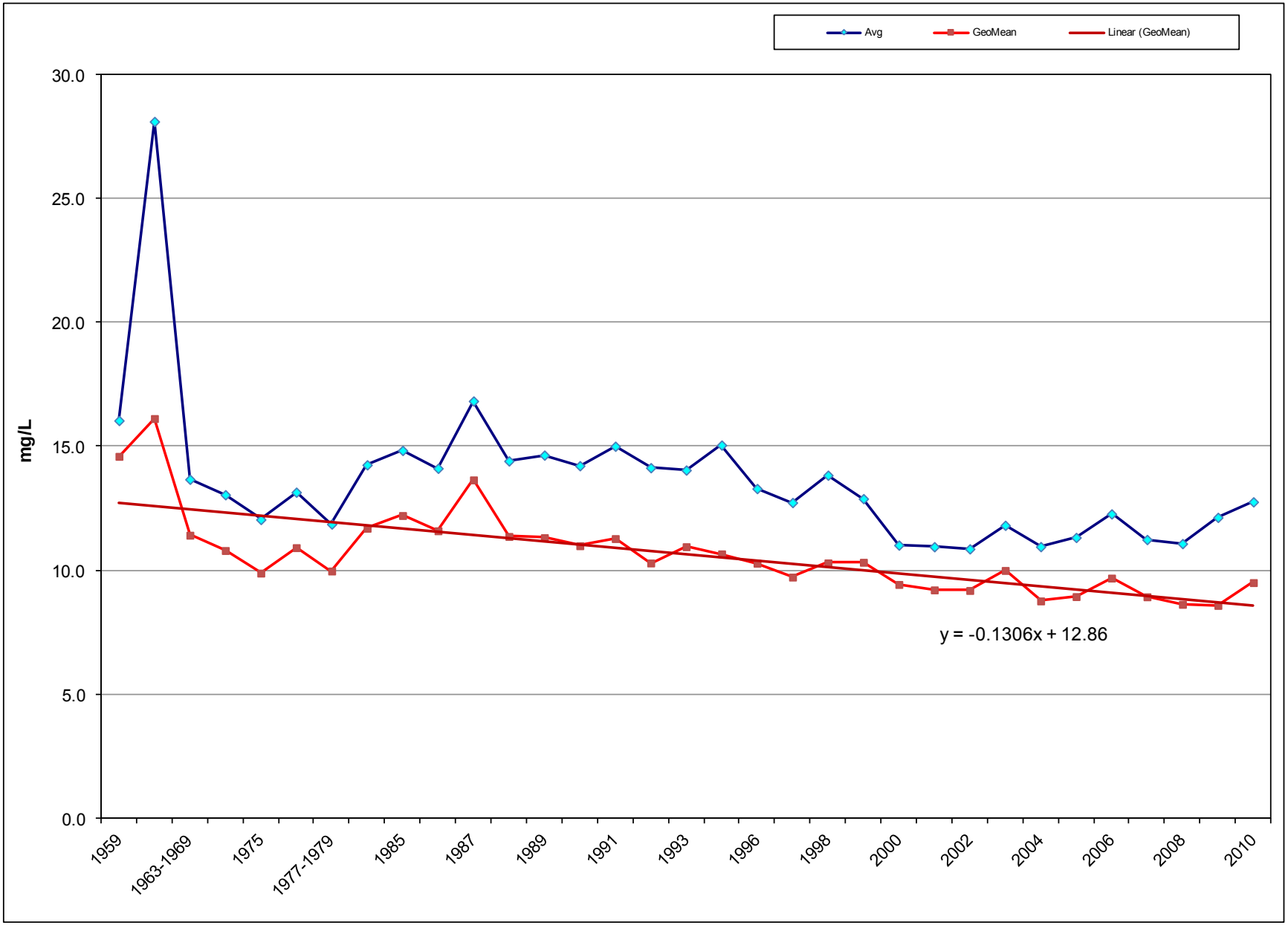

Arsenic, Lemoore-Corcoran Tile Drains, 1975-2010
Avg
GeoMean
Linear (GeoMean)
mg/L
0.100
0.090
0.080
0.070
0.060
0.050
0.040
0.030
0.020
0.010
0.000
y = 0.0003x + 0.0301
1973-1975
1976-1979
1980-1984
1985
1986
1987
1988
1989
1990
1991-1992
2001-2002
2003
2004
2005
2006
2007
2008
2009
2010

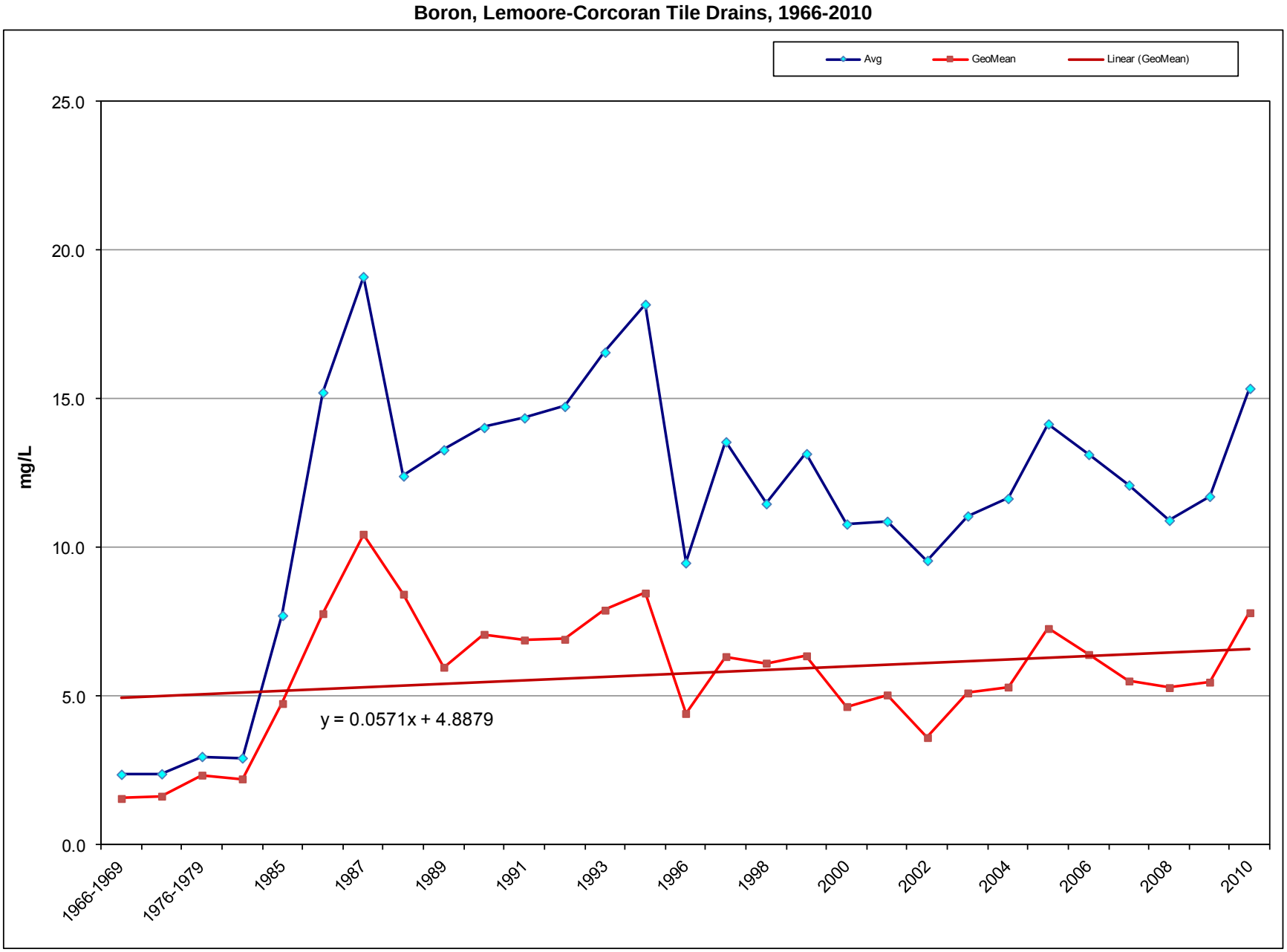

Arsenic, Lost Hills-Semitropic Tile Drains, 1975-2010
Avg
GeoMean
Linear (GeoMean)
mg/L
0.350
0.300
0.250
0.200
0.150
0.100
0.050
0.000
y = -0.0012x + 0.0686
1973-1975
1976-1979
1980-1984
1985
1986
1987
1988
1989
1990
1991-1992
2001-2002
2003
2004
2005
2006
2007
2008
2009
2010

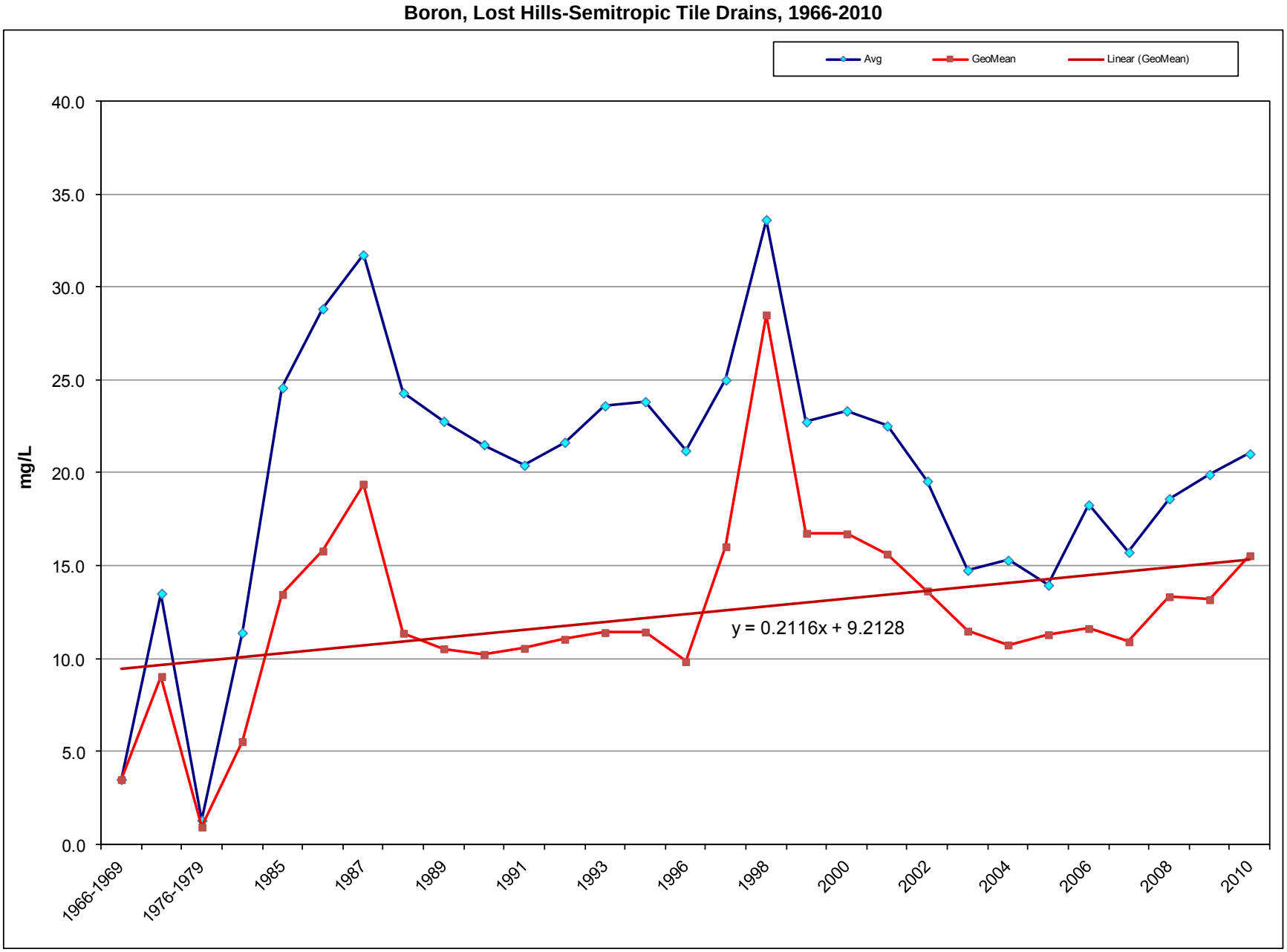

Arsenic, Kern Tile Drains, 1985-2010
Avg
GeoMean
Linear (GeoMean)
0.050
0.040
0.030
0.020
0.010
0.000
mg/L
y = 0.0004x + 0.0044
1985
1986
1987
1988
1989
1990
1991-1992
2001-2002
2003
2004
2005
2006
2007
2008
2009
2010

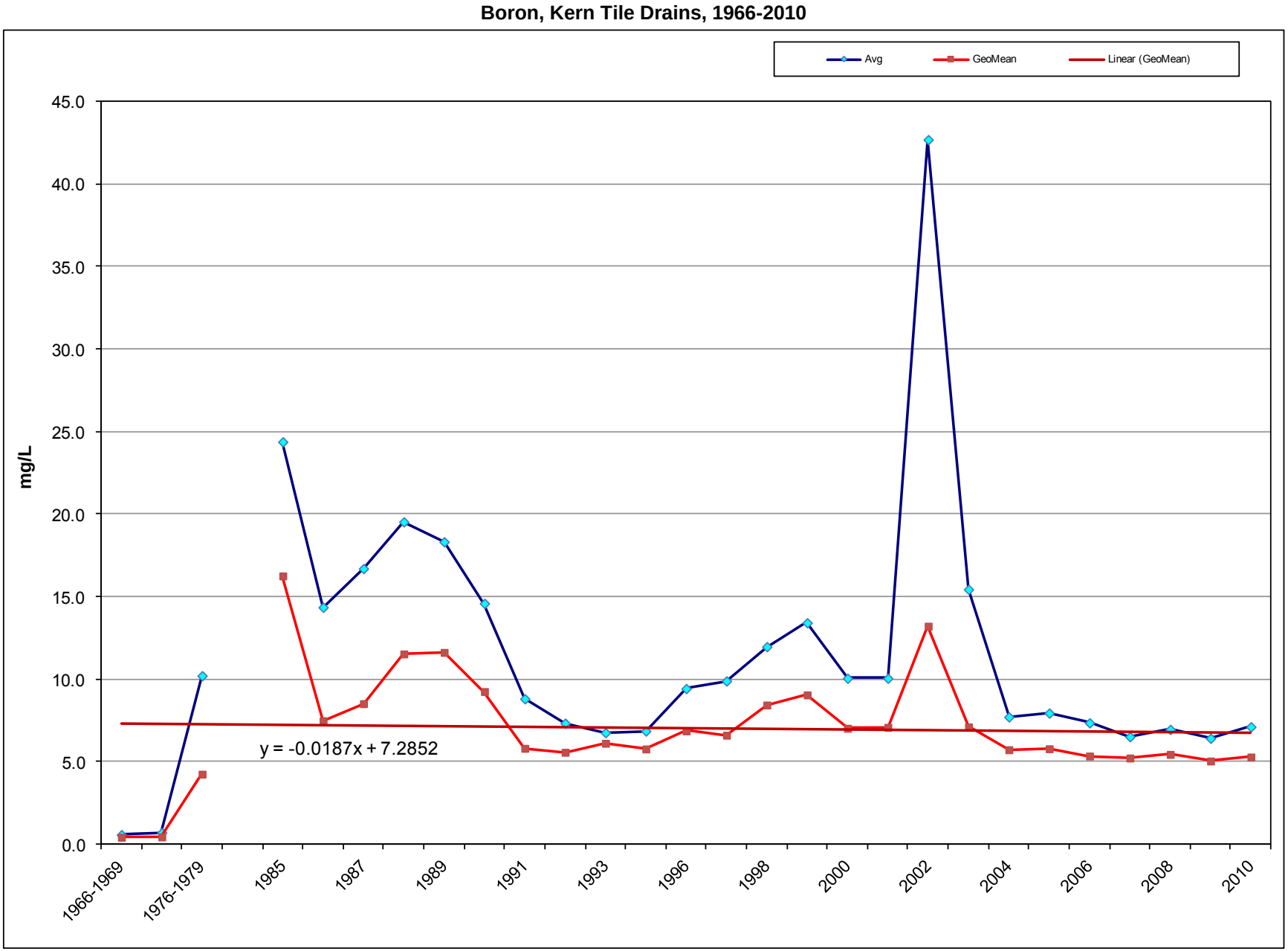
Appendix C
Boron Trends in
Central and Southern Tile Drains
Through 2010

Boron, Central Tile Drains, 1959-2010



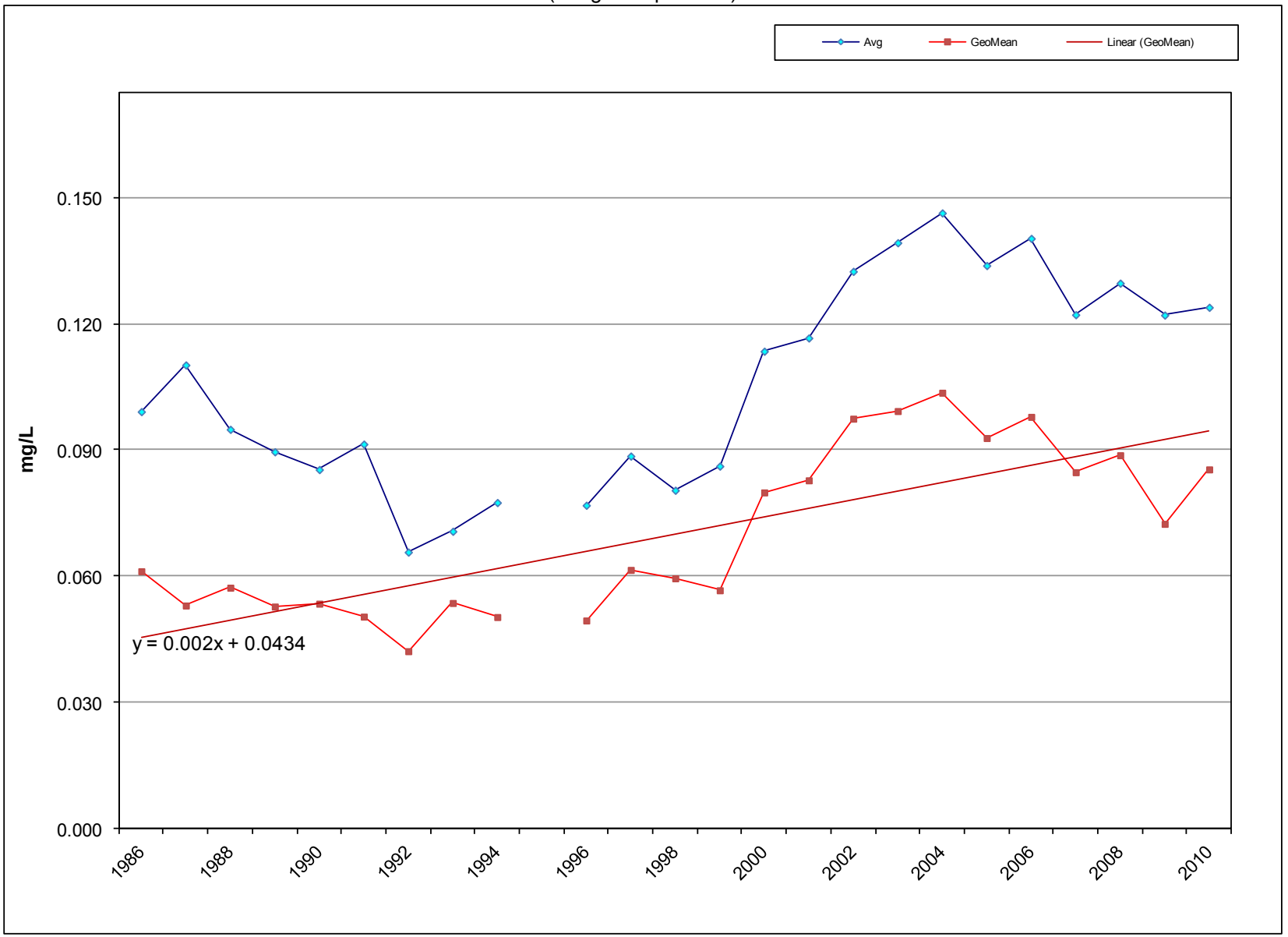

Boron, Lemoore-Corcoran Tile Drains, 1966-2010
Avg
GeoMean
Linear (GeoMean)
mg/L
25.0
20.0
15.0
10.0
5.0
0.0
y = 0.0571x + 4.8879
1966-1969
1976-1979
1985
1987
1989
1991
1993
1996
1998
2000
2002
2004
2006
2008
2010


Boron, Lost Hills-Semitropic Tile Drains, 1966-2010
Avg
GeoMean
Linear (GeoMean)
mg/L
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
y = 0.2116x + 9.2128
1966-1969
1976-1979
1985
1987
1989
1991
1993
1996
1998
2000
2002
2004
2006
2008
2010

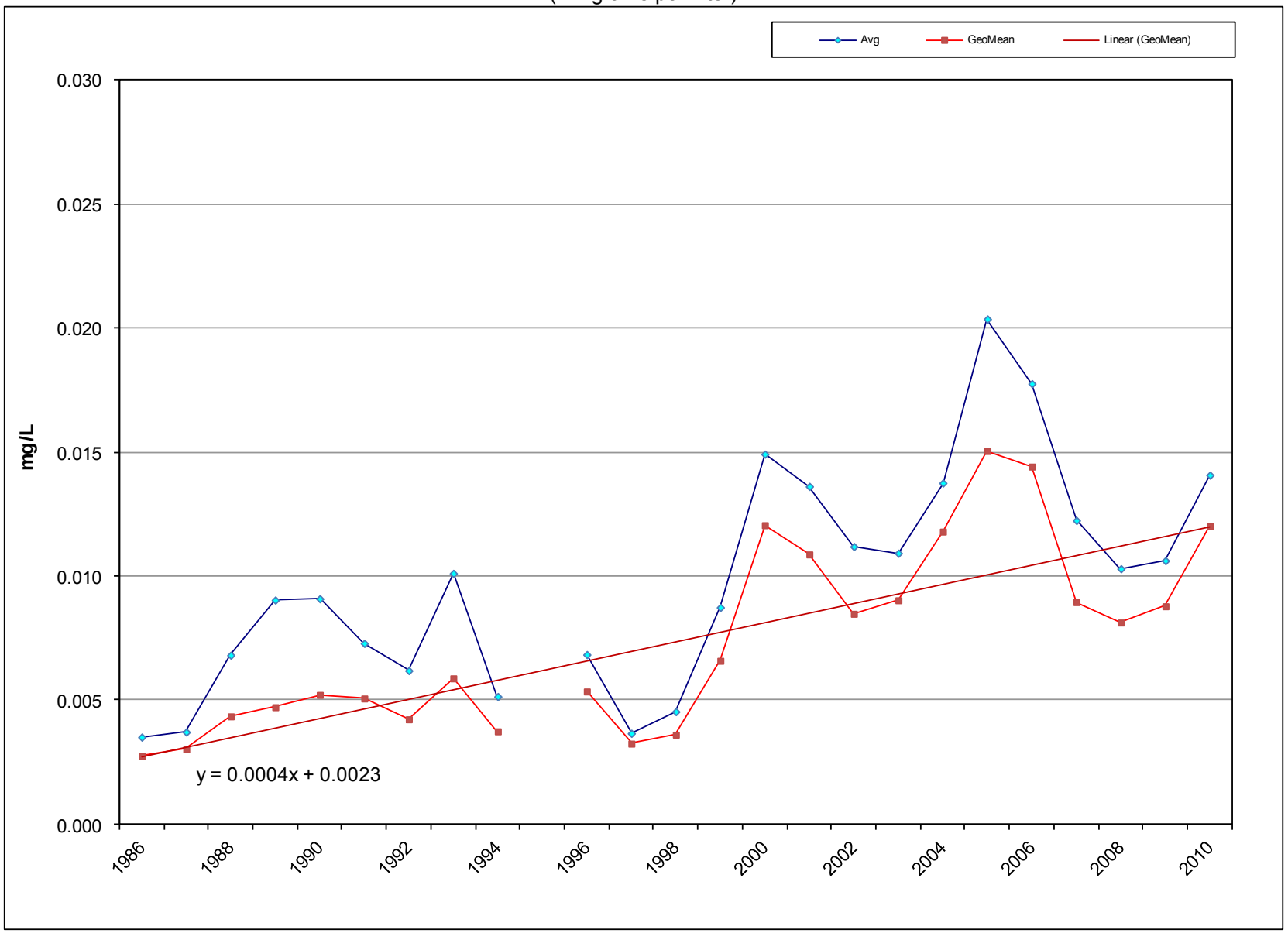

Boron, Kern Tile Drains, 1966-2010
Avg
GeoMean
Linear (GeoMean)
mg/L
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
y = -0.0187x + 7.2852
1966-1969
1976-1979
1985
1987
1989
1991
1993
1996
1998
2000
2002
2004
2006
2008
2010

Appendix D
Selenium Trends in Central & Southern Tile Drains through 2010

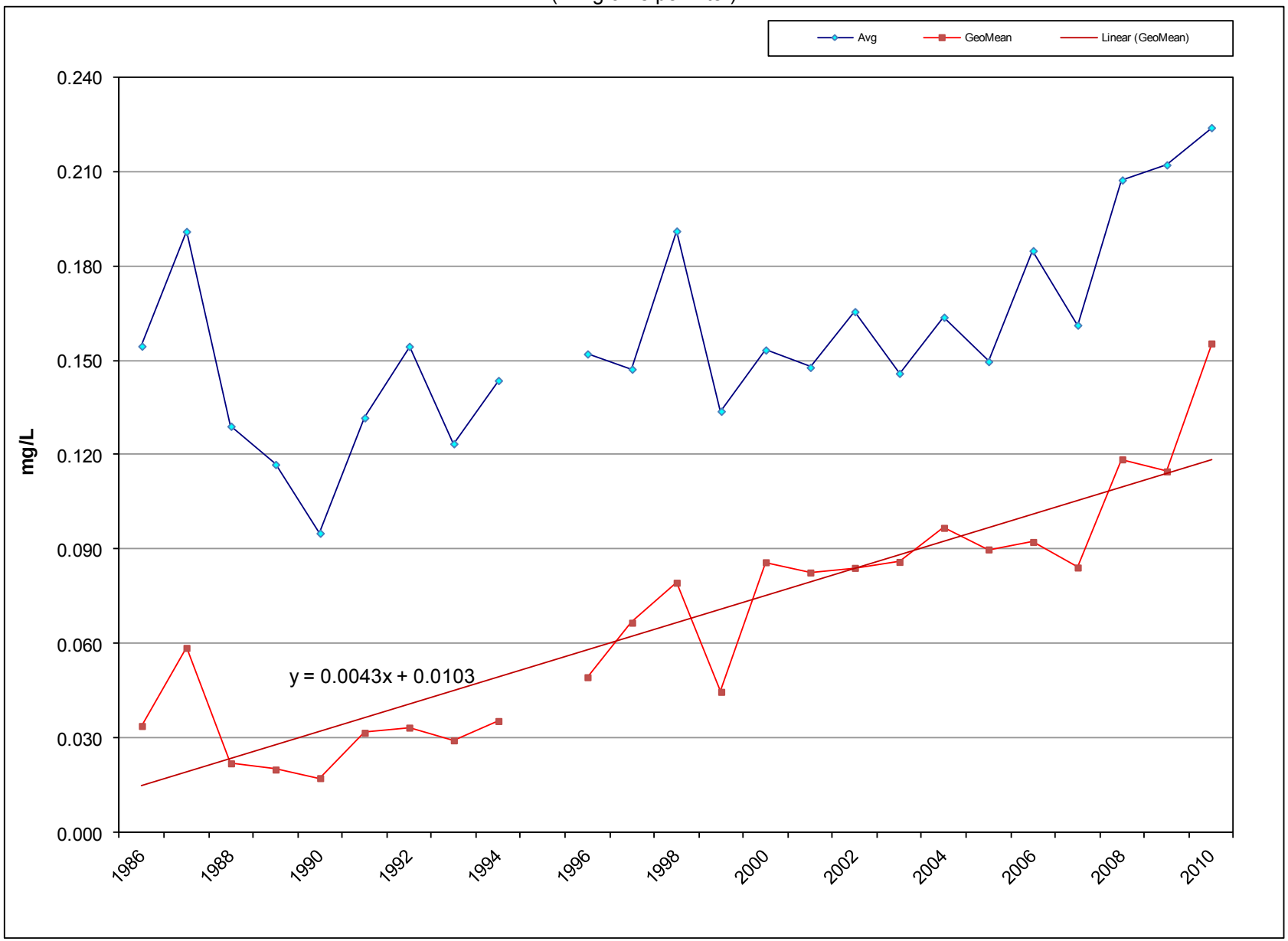
Selenium in Central Subsurface Drains, 1986-2010
(milligrams per Liter)



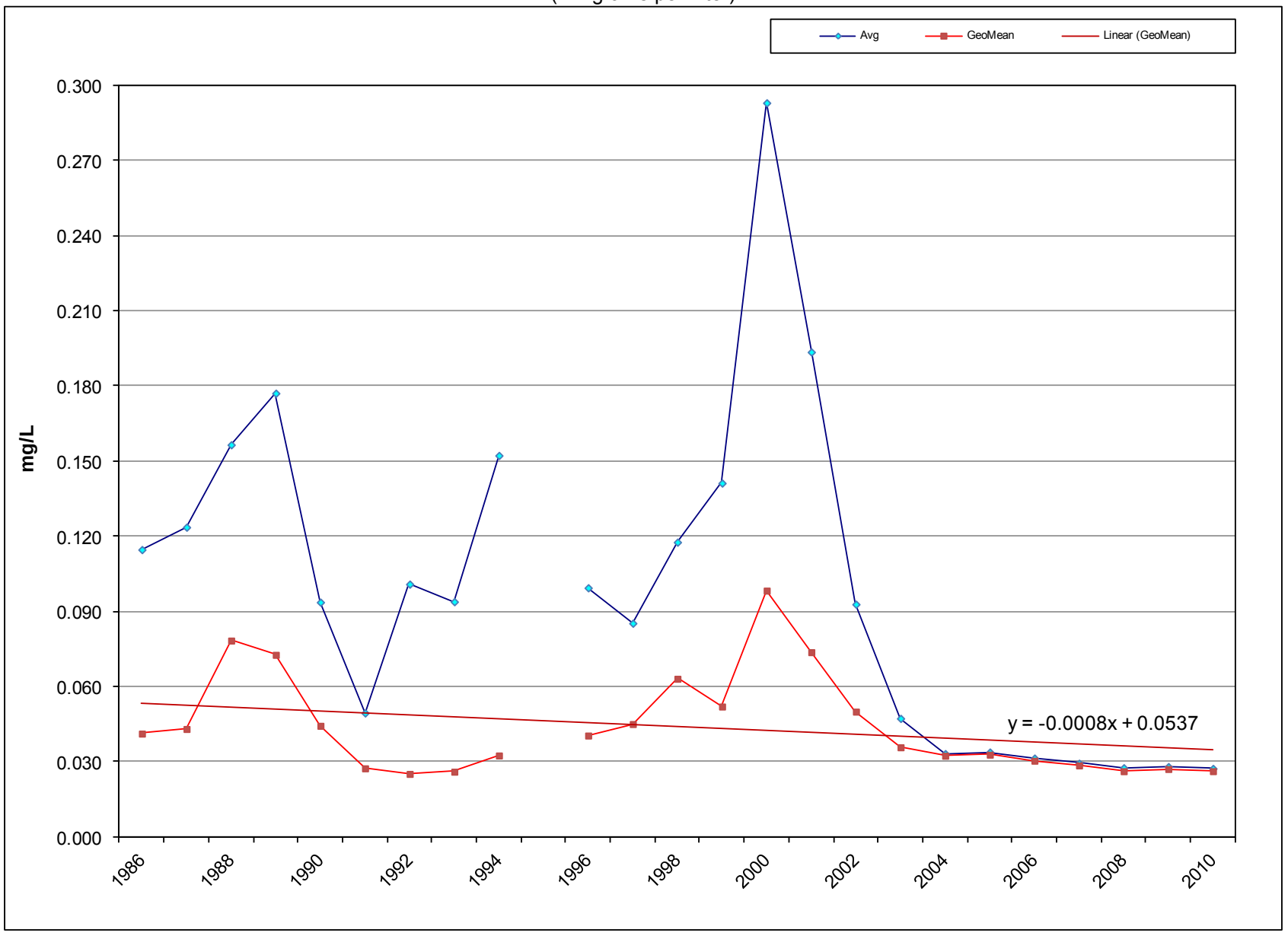
Selenium in Southern Subsurface Drains, Lemoore-Corcoran Stations, 1986-2010
(milligrams per Liter)



Selenium in Southern Subsurface Drains, Lost Hills-Semitropic Stations, 1986-2010
(milligrams per Liter)



Selenium in Southern Subsurface Drains, Kern Lakebed Stations, 1986-2010
(milligrams per Liter)



Appendix E
Mineral Analyses of Central Area Drains
2006-2010

Appendix E Mineral Analyses of Central Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
BVS 6001												
01/09/06	16	467	166	3.8	1,290	689	131	3,070	305	1,850	5,984	13.1
1130	61	23.3	13.7	0.10	56	19.4	2.11	64	6.1		6,000	37.9
		25	15	0.1	60	21	2.31	70	7			
03/23/06	14	493	183	3.3	1,160	604	139	3,140	258	1,985	5,892	11.3
1315	57	24.6	15.0	0.08	50	17.0	2.24	65	5.1		5,877	31.7
		27	17	0.1	56	19	2.50	73	6			
05/16/06	17	448	161	2.9	862	469	92	2,650	263	913	4,972	8.9
1145	63	22.4	13.2	0.07	37	13.2	1.48	55	5.2		4,842	24.9
		31	18	0.1	51	18	1.97	74	7			
07/18/06	20	494	184	2.7	945	492	101	2,930	234	1,992	5,444	9.2
900	68	24.7	15.1	0.07	41	13.8	1.63	61	4.6		5,289	24.9
		30	19	0.1	51	17	2.01	75	6			
09/19/06	21	497	195	3.4	1,080	528	97	3,140	230	2,044	5,720	10.4
1015	70	24.8	16.0	0.09	47	14.8	1.57	65	4.6		5,679	28.1
		28	18	0.1	53	17	1.82	76	5			
11/15/06	20	500	195	3.4	1,160	565	116	3,300	244	2,052	5,976	11.1
1115	68	25.0	16.0	0.09	50	15.9	1.87	69	4.8		5,986	30.1
		27	18	0.1	55	17	2.05	75	5			
01/17/07	15	487	180	3.2	1,070	594	108	3,070	249	1,957	4,190	10.5
1030	59	24.3	14.8	0.08	47	16.7	1.74	64	4.9		5,662	28.4
		28	17	0.1	54	19	2.00	73	6			
04/11/07	16	458	167	3.3	943	568	92	2,880	225	1,832	4,940	9.6
1145	61	22.9	13.7	0.08	41	16.0	1.48	60	4.5		5,246	25.9
		29	18	0.1	53	19	1.81	73	5			
05/08/07	18	415	152	3.7	911	517	98	2,620	237	1,662	5,128	9.7
1100	64	20.7	12.5	0.09	40	14.5	1.57	55	4.7		4,858	26.3
		28	17	0.1	54	19	2.09	72	6			
07/18/07	21	429	165	2.7	876	524	100	2,800	217	1,751	4,930	9.1
1000	70	21.4	13.6	0.07	38	14.7	1.61	58	4.3		5,027	24.6
		29	19	0.1	52	19	2.04	74	5			
09/10/07	22	473	187	3.6	1,040	564	210	3,090	231	1,951	5,480	10.2
1045	72	23.6	15.4	0.09	45	15.8	3.39	64	4.6		5,706	27.7
		28	18	0.1	54	18	3.84	73	5			

Appendix E Mineral Analyses of Central Area Drains

Station	T	Mineral Constituents: mg/L meq/L prv								Mineral Constituents (mg/L)		
Date / Time	°C / °F	Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	TH	TDS / Sum	SAR / ASAR
11/15/07	20	495	172	4.4	1,080	588	124	2,980	242	1,944	5,660	10.7
1200	68	24.7	14.1	0.11	47	16.5	2.00	62	4.8		5,589	28.8
		29	16	0.1	55	19	2.34	73	6			
01/15/08	17	511	189	3.9	1,220	606	137	3,200	262	2,054	6,140	11.7
1300	63	25.5	15.5	0.10	53	17.0	2.21	67	5.2		6,024	32.8
		27	17	0.1	56	19	2.43	73	6			
03/18/08	14	378	140	2.6	679	423	69	2,300	244	1,521	4,150	7.6
1230	57	18.9	11.5	0.07	30	11.9	1.11	48	4.8		4,138	20.5
		31	19	0.1	49	18	1.68	73	7			
05/13/08	18	453	168	3.3	873	458	76	2,710	238	1,823	4,850	8.9
1000	64	22.6	13.8	0.08	38	12.9	1.22	56	4.7		4,884	24.0
		30	19	0.1	51	17	1.62	75	6			
07/15/08	21	510	189	5.6	1,080	551	109	3,070	248	2,050	5,680	10.4
1045	70	25.4	15.5	0.14	47	15.5	1.76	64	4.9		5,663	28.0
		29	18	0.2	53	18	2.04	74	6			
09/16/08	22	388	117	4.4	959	550	54	2,550	219	1,451	4,970	11.0
1030	72	19.4	9.6	0.11	42	15.4	0.87	53	4.3		4,754	27.4
		27	14	0.2	59	21	1.18	72	6			
11/18/08	20	379	122	6.9	1,050	601	59	2,680	237	1,449	5,280	12.0
1030	68	18.9	10.0	0.18	46	16.9	0.96	56	4.7		5,041	30.0
		25	13	0.2	61	22	1.22	71	6			
05/27/09	19	462	185	3.0	939	522	100	2,730	234	1,916	4,950	9.3
945	66	23.1	15.2	0.08	41	14.7	1.61	57	4.6		5,081	25.2
		29	19	0.1	52	19	2.07	73	6			
07/28/09	23	399	132	4.1	1,160	586	71	2,850	246	1,540	5,460	12.9
1150	73	19.9	10.9	0.10	50	16.5	1.14	59	4.9		5,349	34.7
		24	13	0.1	62	20	1.39	73	6			
09/08/09	23	387	115	4.0	1,010	496	58	2,360	234	1,440	4,680	11.6
1000	73	19.3	9.5	0.10	44	13.9	0.94	49	4.6		4,571	29.0
		27	13	0.1	60	20	1.37	72	7			
01/11/10	16	405	141	3.5	974	467	70	2,500	293	1,592	4,840	10.6
1300	61	20.2	11.6	0.09	42	13.1	1.12	52	5.8		4,736	29.8
		27	16	0.1	57	18	1.55	72	8			

Appendix E Mineral Analyses of Central Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
03/23/10	16	472	185	4.1	881	538	107	2,700	254	1,941	4,820	8.7
1045	61	23.6	15.2	0.10	38	15.1	1.73	56	5.0		5,040	24.4
		31	20	0.1	50	19	2.21	72	6			
07/14/10	19	487	197	4.6	1,280	496	136	3,210	249	2,028	6,320	12.4
1100	66	24.3	16.2	0.12	56	13.9	2.19	67	4.9		5,960	33.4
		25	17	0.1	58	16	2.50	76	6			
11/17/10	19	309	113	3.5	749	361	55	1,890	279	1,237	3,790	9.3
830	66	15.4	9.3	0.09	33	10.1	0.89	39	5.5		3,648	24.1
		27	16	0.2	57	18	1.59	70	10			
BVS 7007												
01/09/06	14	451	209	3.6	1,270	690	261	3,290	215	1,987	6,396	12.4
1045	57	22.5	17.2	0.09	55	19.4	4.21	68	4.3		6,304	33.5
		24	18	0.1	58	20	4.37	71	4			
03/23/06	16	493	224	3.3	1,340	687	287	3,580	220	2,195	6,660	12.6
1330	61	24.6	18.4	0.08	58	19.3	4.63	75	4.4		6,746	33.9
		24	18	0.1	57	19	4.50	72	4			
05/16/06	17	464	208	2.8	1,200	630	242	3,190	213	2,016	6,100	11.6
1130	63	23.2	17.1	0.07	52	17.7	3.90	66	4.2		6,065	31.4
		25	18	0.1	56	19	4.23	72	5			
07/18/06	20	473	223	3.1	1,410	694	273	3,630	226	2,100	6,804	13.4
845	68	23.6	18.3	0.08	61	19.5	4.40	76	4.5		6,842	36.2
		23	18	0.1	59	19	4.23	73	4			
09/19/06	21	433	228	3.2	1,350	658	204	3,340	327	2,020	6,232	13.1
1030	70	21.6	18.8	0.08	59	18.5	3.29	70	6.5		6,412	37.9
		22	19	0.1	59	19	3.36	71	7			
04/11/07	16	451	234	3.4	1,250	640	219	3,500	212	2,090	6,430	11.9
1015	61	22.5	19.2	0.09	54	18.0	3.53	73	4.2		6,425	32.1
		23	20	0.1	57	18	3.58	74	4			
05/08/07	20	434	199	4.3	1,150	601	257	3,220	260	1,904	6,352	11.5
1030	68	21.7	16.4	0.11	50	16.9	4.14	67	5.2		6,021	32.1
		25	19	0.1	57	18	4.45	72	6			
07/18/07	21	166	80	2.0	630	285	71	1,210	249	744	2,580	10.1
1200	70	8.3	6.6	0.05	27	8.0	1.15	25	4.9		2,594	24.1
		20	16	0.1	65	20	2.92	64	13			

Appendix E Mineral Analyses of Central Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
09/10/07	21	116	54	1.6	283	145	27	666	230	512	1,420	5.4
1030	70	5.8	4.4	0.04	12	4.1	0.43	14	4.6		1,431	12.5
		26	20	0.2	55	18	1.89	60	20			
03/18/08	13	156	72	1.6	341	189	33	906	222	733	2,000	5.7
930	55	7.8	5.9	0.04	15	5.3	0.53	19	4.4		1,832	13.6
		27	21	0.1	52	18	1.82	65	15			
05/13/08	17	498	262	4.1	1,370	632	211	3,900	227	2,323	7,100	12.4
1010	63	24.9	21.5	0.10	60	17.8	3.40	81	4.5		7,013	33.4
		23	20	0.1	56	17	3.18	76	4			
07/14/08	21	413	232	4.7	1,050	458	236	2,940	208	1,990	5,640	10.3
930	70	20.6	19.1	0.12	46	12.9	3.81	61	4.1		5,459	27.7
		24	22	0.1	53	16	4.64	75	5			
09/16/08	21	376	259	4.8	1,490	769	269	3,780	222	2,006	7,380	14.5
1045	70	18.8	21.3	0.12	65	21.6	4.34	79	4.4		7,081	39.1
		18	20	0.1	62	20	3.98	72	4			
11/18/08	20	246	111	3.2	530	286	116	1,550	207	1,072	3,180	7.0
1000	68	12.3	9.1	0.08	23	8.0	1.87	32	4.1		2,966	18.3
		28	20	0.2	52	17	4.04	70	9			
05/27/09	19	443	250	3.9	1,460	665	285	3,880	244	2,136	7,220	13.8
930	66	22.1	20.6	0.10	63	18.7	4.60	81	4.8		7,133	37.1
		21	19	0.1	60	17	4.22	74	4			
07/28/09	23	376	199	3.2	1,130	560	219	3,050	234	1,759	5,740	11.7
1140	73	18.8	16.4	0.08	49	15.7	3.53	64	4.6		5,678	31.7
		22	19	0.1	58	18	4.04	73	5			
09/08/09	20	62	27	7.2	204	200	15	230	153	266	889	5.4
945	68	3.1	2.2	0.18	9	5.6	0.25	5	3.0		837	10.9
		22	15	1.3	62	41	1.79	35	22			
03/23/10	16	460	229	4.5	1,170	768	185	3,200	331	2,092	6,500	11.1
1000	61	23.0	18.8	0.12	51	21.6	2.98	67	6.6		6,215	32.3
		25	20	0.1	55	22	3.05	68	7			
07/14/10	19	479	233	4.5	1,390	677	246	3,220	251	2,156	6,520	13.0
1000	66	23.9	19.2	0.12	60	19.0	3.97	67	5.0		6,400	36.5
		23	18	0.1	58	20	4.18	71	5			

Appendix E Mineral Analyses of Central Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
11/17/10	19	363	202	4.2	1,150	560	140	2,700	202	1,739	5,480	12.0
900	66	18.1	16.6	0.11	50	15.7	2.26	56	4.0		5,240	32.4
		21	20	0.1	59	20	2.89	72	5			
BVS 7402												
01/09/06	11	144	48	3.8	309	178	35	932	110	557	1,684	5.7
1030	52	7.2	3.9	0.10	13	5.0	0.56	19	2.2		1,715	11.4
		29	16	0.4	54	18	2.06	71	8			
03/23/06	15	323	143	2.5	828	362	102	2,380	174	1,396	4,260	9.6
1345	59	16.1	11.8	0.06	36	10.2	1.64	50	3.5		4,245	23.2
		25	18	0.1	56	16	2.54	76	5			
05/16/06	18	313	134	2.5	772	352	96	2,200	188	1,334	3,942	9.2
1050	64	15.6	11.0	0.06	34	9.9	1.55	46	3.7		3,982	22.1
		26	18	0.1	56	16	2.54	75	6			
07/18/06	21	395	167	2.7	1,010	469	130	2,870	234	1,674	5,296	10.7
830	70	19.7	13.7	0.07	44	13.2	2.10	60	4.6		5,184	29.0
		25	18	0.1	57	17	2.63	75	6			
09/19/06	23	341	145	3.0	880	381	90	2,340	197	1,449	4,292	10.1
1115	73	17.0	11.9	0.08	38	10.7	1.46	49	3.9		4,299	24.2
		25	18	0.1	57	17	2.25	75	6			
11/15/06	20	353	166	3.5	934	429	132	2,640	195	1,565	4,814	10.3
1000	68	17.6	13.7	0.09	41	12.1	2.13	55	3.9		4,775	26.7
		24	19	0.1	56	17	2.92	75	5			
01/17/07	16	296	122	2.4	636	312	82	1,890	189	1,241	3,490	7.9
930	61	14.8	10.0	0.06	28	8.8	1.32	39	3.8		3,454	18.9
		28	19	0.1	53	16	2.48	74	7			
04/11/07	16	365	156	3.1	912	421	112	2,590	173	1,554	4,720	10.1
930	61	18.2	12.8	0.08	40	11.8	1.81	54	3.4		4,663	26.2
		26	18	0.1	56	17	2.54	76	5			
05/08/07	18	366	178	3.5	1,020	469	155	2,930	184	1,647	5,520	10.9
1030	64	18.3	14.6	0.09	44	13.2	2.50	61	3.7		5,232	28.4
		24	19	0.1	57	16	3.11	76	5			
07/18/07	21	378	166	3.0	1,040	465	123	2,820	237	1,628	4,980	11.2
915	70	18.9	13.7	0.08	45	13.1	1.98	59	4.7		5,137	30.3
		24	18	0.1	58	17	2.53	75	6			

Appendix E Mineral Analyses of Central Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
09/10/07	22	370	164	3.6	1,080	474	84	2,840	210	1,599	4,980	11.8
1015	72	18.5	13.5	0.09	47	13.3	1.35	59	4.2		5,141	31.7
		23	17	0.1	59	17	1.73	76	5			
03/18/08	14	298	122	< 2.5	707	321	57	1,790	199	1,247	3,640	8.7
915	57	14.9	10.0	0.06	31	9.0	0.91	37	3.9		3,417	20.9
		27	18	0.1	55	18	1.79	73	8			
05/13/08	18	366	149	2.9	861	388	110	2,560	219	1,528	4,610	9.6
1015	64	18.3	12.3	0.07	37	10.9	1.77	53	4.3		4,568	25.9
		27	18	0.1	55	15	2.52	76	6			
07/14/08	21	369	160	4.1	869	375	126	2,390	222	1,580	4,610	9.5
900	70	18.4	13.2	0.10	38	10.5	2.03	50	4.4		4,426	25.7
		27	19	0.2	54	16	3.04	75	7			
09/16/08	22	317	151	3.6	991	476	42	2,710	237	1,414	4,970	11.5
1100	72	15.8	12.4	0.09	43	13.4	0.68	56	4.7		4,833	28.7
		22	17	0.1	60	18	0.90	75	6			
11/17/08	20	278	123	3.9	730	396	112	2,020	197	1,201	3,880	9.2
1100	68	13.9	10.1	0.10	32	11.1	1.81	42	3.9		3,781	22.0
		25	18	0.2	57	19	3.07	71	7			
01/14/09	16	274	117	4.7	565	302	85	1,740	197	1,166	3,290	7.2
1040	61	13.7	9.6	0.12	25	8.5	1.38	36	3.9		3,206	18.0
		28	20	0.3	51	17	2.75	72	8			
05/27/09	19	302	135	3.0	781	337	65	2,100	213	1,310	4,060	9.4
915	66	15.1	11.1	0.08	34	9.5	1.04	44	4.2		3,850	23.5
		25	18	0.1	56	16	1.78	75	7			
07/28/09	23	298	134	3.0	1,040	455	52	2,480	276	1,296	4,700	12.6
1100	73	14.9	11.0	0.08	45	12.8	0.83	52	5.5		4,627	32.7
		21	15	0.1	64	18	1.18	73	8			
01/11/10	15	293	91	2.1	612	331	30	1,790	215	1,108	3,380	8.0
1345	59	14.6	7.5	0.05	27	9.3	0.49	37	4.3		3,279	20.8
		30	15	0.1	55	18	0.96	73	8			
03/23/10	14	293	114	5.0	748	440	35	1,950	230	1,201	3,820	9.4
930	57	14.6	9.4	0.13	33	12.4	0.56	41	4.6		3,723	23.5
		26	17	0.2	57	21	0.97	70	8			

Appendix E Mineral Analyses of Central Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
07/14/10	19	229	76	1.6	414	218	18	1,160	190	885	2,330	6.1
930	66	11.4	6.3	0.04	18	6.1	0.28	24	3.8		2,230	14.5
		32	17	0.1	50	18	0.83	70	11			
BVS 8003												
11/15/06	19	409	177	2.9	1,550	381	43	4,310	209	1,750	6,960	16.1
945	66	20.4	14.6	0.07	67	10.7	0.70	90	4.1		6,999	43.5
		20	14	0.1	66	10	0.66	85	4			
07/14/10	20	512	238	3.8	1,310	604	57	3,460	296	2,353	6,360	12.0
800	68	25.5	19.6	0.10	57	17.0	0.92	72	5.9		6,363	33.6
		25	19	0.1	56	18	0.96	75	6			
11/17/10	19	482	202	3.9	1,020	324	31	3,130	204	2,036	5,580	4.6
1015	66	24.1	16.6	0.10	44	9.1	0.51	65	4.0		5,316	12.3
		28	20	0.1	52	12	0.64	83	5			
BVS 8110												
01/09/06	14	211	77	3.0	400	309	42	929	340	844	2,252	6.0
1015	57	10.5	6.3	0.08	17	8.7	0.67	19	6.7		2,175	16.2
		31	18	0.2	51	24	1.90	55	19			
03/23/06	16	324	193	3.1	1,190	521	45	2,940	376	1,604	5,488	12.9
1400	61	16.2	15.9	0.08	52	14.6	0.73	61	7.5		5,442	37.5
		19	19	0.1	62	17	0.87	73	9			
05/16/06	18	239	104	3.3	672	350	68	1,660	276	1,025	3,364	9.1
1100	64	11.9	8.6	0.08	29	9.8	1.09	35	5.5		3,262	24.7
		24	17	0.2	59	19	2.14	68	11			
09/19/06	22	221	100	3.4	709	342	56	1,580	243	964	3,128	9.9
1100	72	11.0	8.2	0.09	31	9.6	0.90	33	4.8		3,157	23.9
		22	16	0.2	61	20	1.86	68	10			
11/15/06	16	239	104	3.1	625	372	53	1,560	290	1,025	3,168	8.5
1015	61	11.9	8.6	0.08	27	10.4	0.85	32	5.8		3,130	22.9
		25	18	0.2	57	21	1.72	66	12			
04/11/07	16	198	89	2.7	597	342	47	1,410	247	861	2,860	8.9
915	61	9.9	7.3	0.07	26	9.6	0.75	29	4.9		2,834	22.1
		23	17	0.2	60	22	1.69	66	11			

Appendix E Mineral Analyses of Central Area Drains

Station / Date	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
05/08/07	18	298	165	3.4	1,090	508	44	2,800	288	1,424	5,336	12.6
1000	64	14.9	13.6	0.09	47	14.3	0.71	58	5.7		5,081	32.7
		20	18	0.1	62	18	0.90	74	7			
07/18/07	22	291	166	3.5	1,190	495	42	2,860	280	1,410	4,810	13.8
900	72	14.5	13.7	0.09	52	13.9	0.68	60	5.6		5,215	35.9
		18	17	0.1	65	17	0.85	75	7			
09/10/07	23	193	89	3.3	703	327	36	1,520	259	849	2,990	10.5
1000	73	9.6	7.3	0.08	31	9.2	0.59	32	5.1		3,027	27.3
		20	15	0.2	64	20	1.26	68	11			
11/15/07	18	212	106	3.1	30	369	30	1,720	292	965	3,430	10.2
1115	64	10.6	8.7	0.08	1	10.4	0.48	36	5.8		2,645	25.6
		51	42	0.4	6	20	0.92	68	11			
07/14/08	22	253	119	4.3	749	369	43	1,840	244	1,122	3,660	9.7
830	72	12.6	9.8	0.11	33	10.4	0.70	38	4.8		3,524	24.3
		23	18	0.2	59	19	1.29	71	9			
05/27/09	20	336	190	4.2	1,150	529	54	2,920	250	1,622	5,450	12.4
900	68	16.8	15.6	0.11	50	14.9	0.87	61	5.0		5,333	33.6
		20	19	0.1	61	18	1.07	75	6			
07/28/09	23	282	127	4.5	861	457	38	2,220	252	1,227	4,230	10.7
1120	73	14.1	10.4	0.12	37	12.8	0.61	46	5.0		4,141	27.8
		23	17	0.2	60	20	0.95	71	8			
01/11/10	11	293	136	6.4	907	493	39	2,280	264	1,292	4,370	11.0
1400	52	14.6	11.2	0.16	39	13.8	0.63	47	5.2		4,313	28.6
		22	17	0.3	60	21	0.93	71	8			
07/14/10	21	306	139	6.2	1,050	496	41	2,230	300	1,337	4,540	12.5
900	70	15.3	11.4	0.16	46	13.9	0.67	46	6.0		4,449	32.5
		21	16	0.2	63	21	1.00	69	9			
CTL 3728												
01/10/06	18	570	104	2.2	773	767	168	2,210	156	1,852	4,744	7.8
930	64	28.4	8.6	0.06	34	21.5	2.71	46	3.1		4,688	20.3
		40	12	0.1	48	29	3.69	63	4			
03/23/06	16	484	87	2.8	626	616	146	1,730	137	1,566	3,736	6.9
800	61	24.2	7.2	0.07	27	17.3	2.35	36	2.7		3,774	17.2
		41	12	0.1	46	30	4.03	62	5			

Appendix E Mineral Analyses of Central Area Drains

Station	T	Mineral Constituents: mg/L meq/L prv								Mineral Constituents (mg/L)		
Date	°C										TDS	SAR
Time	°F	Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	TH	Sum	ASAR
05/17/06	20	440	80	< 2.5	569	546	114	1,540	133	1,428	3,430	6.6
1010	68	22.0	6.6	0.06	25	15.3	1.84	32	2.6		3,371	15.1
		41	12	0.1	46	30	3.54	62	5			
07/17/06	20	547	93	1.8	688	698	150	1,910	156	1,749	4,354	7.2
1045	68	27.3	7.6	0.05	30	19.6	2.42	40	3.1		4,181	18.6
		42	12	0.1	46	30	3.73	61	5			
09/18/06	18	636	102	1.9	737	662	149	2,150	134	2,008	4,518	7.2
900	64	31.7	8.4	0.05	32	18.6	2.40	45	2.7		4,518	17.9
		44	12	0.1	44	27	3.51	65	4			
11/14/06	17	565	105	1.9	791	715	129	2,110	190	1,843	4,586	8.0
1015	63	28.2	8.6	0.05	34	20.1	2.08	44	3.8		4,531	20.8
		40	12	0.1	48	29	2.98	63	5			
01/16/07	16	525	94	2.0	653	671	132	1,900	156	1,698	1,850	6.9
1115	61	26.2	7.7	0.05	28	18.8	2.13	40	3.1		4,071	17.9
		42	12	0.1	46	30	3.35	62	5			
04/10/07	17	477	75	< 2.5	598	344	87	2,070	142	1,500	3,670	6.7
915	63	23.8	6.2	0.06	26	9.7	1.40	43	2.8		3,738	15.5
		42	11	0.1	46	17	2.45	76	5			
05/08/07	19	537	100	< 2.5	718	740	152	2,030	138	1,753	4,680	7.5
1015	66	26.8	8.2	0.06	31	20.8	2.45	42	2.7		4,362	18.7
		40	12	0.1	47	30	3.59	62	4			
07/17/07	20	556	94	< 2.5	711	723	6	2,120	166	1,625	4,400	7.3
1045	68	27.7	7.7	0.06	31	20.3	0.09	44	3.3		4,312	19.1
		42	12	0.1	47	30	0.14	65	5			
09/11/07	21	597	110	2.6	847	779	131	2,520	183	1,944	4,820	8.4
1045	70	29.8	9.0	0.07	37	21.9	2.11	52	3.6		5,096	21.7
		39	12	0.1	49	27	2.64	66	5			
11/14/07	20	552	98	2.3	726	764	145	2,110	161	1,782	4,550	7.5
1115	68	27.5	8.1	0.06	32	21.5	2.34	44	3.2		4,494	19.5
		41	12	0.1	47	30	3.30	62	5			
01/14/08	16	525	107	2.1	667	731	137	1,890	144	1,752	4,290	6.9
1145	61	26.2	8.8	0.05	29	20.5	2.21	39	2.9		4,146	17.3
		41	14	0.1	45	32	3.40	61	4			

Appendix E Mineral Analyses of Central Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
03/18/08	16	531	103	< 2.5	696	694	123	1,740	152	1,750	4,340	7.2
1000	61	26.5	8.5	0.06	30	19.5	1.98	36	3.0		3,981	18.8
		41	13	0.1	46	32	3.27	60	5			
05/12/08	17	573	107	2.6	732	733	119	2,120	154	1,872	4,550	7.4
900	63	28.6	8.8	0.07	32	20.6	1.92	44	3.1		4,479	19.1
		41	13	0.1	46	30	2.75	63	4			
07/15/08	21	517	99	3.7	625	630	114	1,730	140	1,700	3,930	6.6
930	70	25.8	8.1	0.09	27	17.7	1.84	36	2.8		3,803	16.5
		42	13	0.2	44	30	3.15	62	5			
09/15/08	21	559	102	2.9	670	738	134	1,990	152	1,816	4,510	6.8
1000	70	27.9	8.4	0.07	29	20.7	2.16	41	3.0		4,287	17.8
		43	13	0.1	44	31	3.21	62	4			
11/18/08	20	521	100	3.2	688	714	130	1,930	158	1,713	4,450	7.2
900	68	26.0	8.2	0.08	30	20.1	2.10	40	3.1		4,181	18.8
		40	13	0.1	47	31	3.20	61	5			
05/26/09	19	387	101	4.1	544	640	71	1,370	157	1,383	3,290	6.4
1045	66	19.3	8.3	0.10	24	18.0	1.15	29	3.1		3,212	15.3
		38	16	0.2	46	35	2.26	56	6			
07/27/09	24	69	19	2.7	105	120	18	232	71	251	621	2.9
1100	75	3.4	1.6	0.07	5	3.4	0.30	5	1.4		609	4.6
		36	16	0.7	47	34	3.00	49	14			
09/08/09	22	395	102	3.3	550	645	76	1,290	145	1,407	3,250	6.4
1300	72	19.7	8.4	0.08	24	18.1	1.22	27	2.9		3,148	14.7
		38	16	0.2	46	37	2.49	55	6			
12/28/09	17	503	111	2.9	669	702	105	1,760	160	1,713	3,960	7.0
1000	63	25.1	9.1	0.07	29	19.7	1.69	37	3.2		3,949	18.3
		40	14	0.1	46	32	2.77	60	5			
01/11/10	16	549	108	2.3	652	702	118	1,960	159	1,816	4,240	6.7
1010	61	27.4	8.9	0.06	28	19.7	1.90	41	3.2		4,187	17.3
		42	14	0.1	44	30	2.90	62	5			
03/22/10	18	455	91	2.7	642	655	108	1,850	165	1,512	4,050	7.2
1200	64	22.7	7.5	0.07	28	18.4	1.74	39	3.3		3,903	18.7
		39	13	0.1	48	30	2.81	62	5			

Appendix E Mineral Analyses of Central Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
07/13/10	20	428	78	4.8	521	556	92	1,420	143	1,388	3,340	6.1
830	68	21.4	6.4	0.12	23	15.6	1.49	30	2.8		3,186	14.0
		42	13	0.2	45	32	3.01	60	6			
11/16/10	19	614	106	2.5	758	774	120	2,030	188	1,970	4,690	7.4
845	66	30.6	8.7	0.06	33	21.7	1.94	42	3.7		4,517	19.3
		42	12	0.1	46	31	2.78	61	5			
DPS 1016												
01/09/06	15	443	110	3.3	766	941	130	1,750	151	1,559	4,264	8.4
930	59	22.1	9.0	0.08	33	26.4	2.10	36	3.0		4,234	22.0
		34	14	0.1	52	39	3.08	54	4			
03/23/06	15	554	142	2.7	1,100	1,280	200	2,190	163	1,968	5,456	10.8
1100	59	27.6	11.7	0.07	48	36.0	3.23	46	3.2		5,567	28.1
		32	13	0.1	55	41	3.66	52	4			
05/16/06	18	560	145	< 2.5	1,180	1,330	200	2,180	156	1,996	5,664	11.5
850	64	27.9	11.9	0.06	51	37.4	3.23	45	3.1		5,691	29.9
		31	13	0.1	56	42	3.62	51	3			
07/17/06	21	520	132	2.5	1,080	1,240	201	2,130	160	1,842	5,688	11.0
1200	70	25.9	10.9	0.06	47	34.8	3.24	44	3.2		5,402	28.5
		31	13	0.1	56	41	3.79	52	4			
09/18/06	19	522	98	2.1	440	337	40	1,880	153	1,707	3,368	4.6
1145	66	26.0	8.1	0.05	19	9.5	0.64	39	3.0		3,411	12.1
		49	15	0.1	36	18	1.23	75	6			
11/14/06	17	532	101	2.5	510	525	53	1,870	192	1,744	3,824	5.3
1145	63	26.5	8.3	0.06	22	14.7	0.85	39	3.8		3,708	13.8
		46	15	0.1	39	25	1.45	67	7			
01/16/07	13	496	119	2.2	781	862	102	1,820	168	1,728	4,260	8.2
1030	55	24.8	9.8	0.06	34	24.2	1.64	38	3.3		4,283	21.3
		36	14	0.1	50	36	2.45	56	5			
04/10/07	15	473	117	2.6	963	1,050	140	1,960	144	1,663	4,740	10.3
1045	59	23.6	9.6	0.07	42	29.5	2.26	41	2.9		4,792	25.7
		31	13	0.1	56	39	2.99	54	4			
05/09/07	18	489	128	2.5	1,020	1,150	149	2,080	165	1,748	5,380	10.6
815	64	24.4	10.5	0.06	44	32.3	2.40	43	3.3		5,118	27.6
		31	13	0.1	56	40	2.96	53	4			

Appendix E Mineral Analyses of Central Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
07/17/07	22	536	114	2.9	999	1,180	162	2,030	162	1,548	4,980	10.2
1130	72	26.7	9.4	0.07	43	33.1	2.61	42	3.2		5,121	26.6
		34	12	0.1	55	41	3.22	52	4			
09/11/07	23	626	146	3.3	1,110	1,230	130	2,580	227	2,164	5,700	10.4
1200	73	31.2	12.0	0.08	48	34.6	2.10	54	4.5		5,962	28.0
		34	13	0.1	53	36	2.21	57	5			
11/14/07	17	306	95	3.0	697	592	204	1,550	146	1,155	3,630	8.9
1030	63	15.3	7.8	0.08	30	16.6	3.29	32	2.9		3,535	20.5
		29	15	0.1	57	30	5.97	59	5			
01/14/08	13	351	114	3.6	801	684	235	1,790	176	1,345	4,210	9.5
1145	55	17.5	9.4	0.09	35	19.2	3.79	37	3.5		4,084	22.8
		28	15	0.1	56	30	5.94	58	5			
03/18/08	16	509	139	< 2.5	990	1,050	136	1,930	168	1,844	5,250	10.0
1200	61	25.4	11.4	0.06	43	29.5	2.19	40	3.3		4,857	26.1
		32	14	0.1	54	39	2.92	53	4			
05/12/08	18	420	101	1.9	699	694	91	1,680	160	1,465	3,810	7.9
940	64	21.0	8.3	0.05	30	19.5	1.46	35	3.2		3,783	19.1
		35	14	0.1	51	33	2.47	59	5			
07/14/08	22	582	148	4.1	948	934	134	2,400	152	2,060	5,400	9.1
1000	72	29.0	12.2	0.10	41	26.2	2.16	50	3.0		5,241	
		35	15	0.1	50	32	2.66	61	4			
09/15/08	22	552	132	3.3	905	1,050	132	2,250	140	1,922	5,300	3.3
1045	72	27.5	10.9	0.08	39	29.5	2.13	47	2.8		5,108	8.2
		35	14	0.1	51	36	2.62	58	3			
11/17/08	17	261	78	4.1	590	545	118	1,190	144	973	3,000	8.2
1130	63	13.0	6.4	0.10	26	15.3	1.90	25	2.9		2,873	18.9
		29	14	0.2	57	34	4.24	55	6			
01/13/09	15	410	110	6.0	824	889	130	1,730	155	1,477	4,270	9.3
1240	59	20.5	9.0	0.15	36	25.0	2.10	36	3.1		4,192	22.4
		31	14	0.2	55	38	3.17	54	5			
05/26/09	19	260	74	4.9	511	554	51	1,070	154	956	2,710	7.2
915	66	13.0	6.1	0.13	22	15.6	0.83	22	3.1		2,618	17.3
		31	15	0.3	54	37	1.99	53	7			

Appendix E Mineral Analyses of Central Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
07/27/09	23	347	109	3.8	788	707	179	1,700	158	1,316	4,050	9.5
10	73	17.3	9.0	0.10	34	19.9	2.89	35	3.1		3,929	22.7
		29	15	0.2	57	32	4.71	58	5			
09/08/09	24	552	147	3.4	1,100	1,120	155	2,130	140	1,983	5,390	10.7
1320	75	27.5	12.1	0.09	48	31.5	2.50	44	2.8		5,291	26.9
		31	14	0.1	55	39	3.08	55	3			
12/28/09	17	523	138	2.8	1,020	1,150	156	2,030	144	1,875	4,670	10.3
1100	63	26.1	11.3	0.07	44	32.3	2.52	42	2.9		5,106	25.6
		32	14	0.1	54	40	3.15	53	4			
01/11/10	17	504	133	2.7	939	1,070	149	1,900	145	1,807	4,940	9.6
1100	63	25.1	10.9	0.07	41	30.1	2.40	40	2.9		4,785	24.0
		33	14	0.1	53	40	3.21	53	4			
03/22/10	15	484	128	5.2	1,050	1,120	140	2,220	177	1,736	5,450	11.0
1300	59	24.2	10.5	0.13	46	31.5	2.26	46	3.5		5,253	28.5
		30	13	0.2	57	38	2.71	55	4			
07/13/10	21	558	147	4.1	1,120	1,250	183	2,050	165	1,999	5,590	10.9
930	70	27.8	12.1	0.10	49	35.1	2.95	43	3.3		5,411	28.4
		31	14	0.1	55	42	3.51	51	4			
DPS 1367												
01/10/06	16	504	111	2.4	556	765	188	1,580	138	1,716	3,836	5.8
1000	61	25.1	9.1	0.06	24	21.5	3.03	33	2.7		3,789	14.6
		43	16	0.1	41	36	5.04	55	5			
03/23/06	16	662	144	1.9	572	987	227	1,730	132	2,246	4,508	5.3
830	61	33.0	11.8	0.05	25	27.7	3.66	36	2.6		4,403	13.1
		47	17	0.1	36	40	5.23	51	4			
05/17/06	18	706	150	< 2.5	612	1,010	221	1,760	130	2,381	4,534	5.5
1030	64	35.2	12.3	0.06	27	28.4	3.56	37	2.6		4,540	13.6
		47	17	0.1	36	40	5.01	51	4			
09/18/06	20	752	174	1.9	587	1,010	223	1,920	109	2,594	4,818	5.0
900	68	37.5	14.3	0.05	26	28.4	3.60	40	2.2		4,733	13.0
		48	18	0.1	33	38	4.85	54	3			
11/14/06	18	699	157	2.8	542	972	218	1,920	114	2,391	4,670	4.8
1115	64	34.9	12.9	0.07	24	27.3	3.52	40	2.3		4,579	11.6
		49	18	0.1	33	37	4.81	55	3			

Appendix E Mineral Analyses of Central Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
04/10/07	16	647	140	< 2.5	576	961	210	1,800	129	2,192	4,470	5.4
1015	61	32.3	11.5	0.06	25	27.0	3.39	37	2.6		4,414	13.4
		47	17	0.1	36	38	4.81	53	4			
05/09/07	19	631	140	< 2.5	581	943	195	1,790	143	2,153	4,672	5.5
1030	66	31.5	11.5	0.06	25	26.5	3.14	37	2.8		4,368	13.6
		46	17	0.1	37	38	4.51	53	4			
07/17/07	24	528	123	< 2.5	502	689	186	1,810	131	1,703	3,930	5.1
1100	75	26.3	10.1	0.06	22	19.4	3.00	38	2.6		3,919	12.8
		45	17	0.1	37	31	4.79	60	4			
09/11/07	20	705	147	1.9	564	966	211	1,920	106	2,365	4,500	5.0
1145	68	35.2	12.1	0.05	25	27.1	3.40	40	2.1		4,579	12.1
		49	17	0.1	34	37	4.69	55	3			
11/14/07	18	640	141	1.8	536	893	199	1,800	118	2,179	4,410	5.0
1100	64	31.9	11.6	0.05	23	25.1	3.21	37	2.3		4,282	12.0
		48	17	0.1	35	37	4.71	55	3			
01/14/08	16	578	150	2.1	479	880	211	1,770	118	2,061	4,380	4.6
1200	61	28.8	12.3	0.05	21	24.7	3.40	37	2.3		4,141	11.0
		46	20	0.1	34	37	5.05	55	3			
03/18/08	17	656	149	< 2.5	564	990	187	1,920	127	2,252	4,420	5.2
1115	63	32.7	12.3	0.06	25	27.8	3.02	40	2.5		4,545	12.9
		47	18	0.1	35	38	4.11	55	3			
05/12/08	18	652	145	1.6	531	937	172	1,780	122	2,225	4,420	4.9
930	64	32.5	11.9	0.04	23	26.3	2.77	37	2.4		4,292	11.8
		48	18	0.1	34	38	4.04	54	4			
07/15/08	21	717	159	2.5	528	933	199	1,800	108	1,080	4,520	4.6
1000	70	35.8	13.1	0.06	23	26.2	3.21	37	2.1		4,403	11.2
		50	18	0.1	32	38	4.65	54	3			
09/15/08	21	658	147	2.4	525	894	191	1,830	120	2,248	4,600	4.8
1015	70	32.8	12.1	0.06	23	25.1	3.08	38	2.4		4,319	11.6
		48	18	0.1	34	37	4.49	55	3			
11/17/08	20	626	144	3.3	522	899	188	1,810	121	2,156	4,650	4.9
1430	68	31.2	11.8	0.08	23	25.3	3.03	38	2.4		4,265	11.7
		47	18	0.1	34	37	4.43	55	4			

Appendix E Mineral Analyses of Central Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
01/13/09	16	665	148	3.6	547	901	187	1,820	128	2,269	4,490	5.0
1040	61	33.2	12.2	0.09	24	25.3	3.02	38	2.5		4,348	12.5
		48	18	0.1	34	37	4.39	55	4			
05/26/09	20	651	150	1.9	580	1,000	203	1,780	140	2,244	4,700	5.3
1100	68	32.5	12.3	0.05	25	28.1	3.27	37	2.8		4,450	13.3
		46	18	0.1	36	39	4.60	52	4			
07/27/09	22	633	146	2.4	588	956	172	1,840	165	2,182	4,560	5.5
1200	72	31.6	12.0	0.06	26	26.9	2.77	38	3.3		4,436	14.2
		46	17	0.1	37	38	3.90	54	5			
09/08/09	23	644	135	2.2	609	806	184	1,770	125	2,164	4,390	5.7
1320	73	32.1	11.1	0.06	26	22.6	2.97	37	2.5		4,225	13.7
		46	16	0.1	38	35	4.57	57	4			
12/28/09	17	700	157	2.4	573	1,000	202	1,840	135	2,395	4,450	5.1
1030	63	34.9	12.9	0.06	25	28.1	3.26	38	2.7		4,555	12.7
		48	18	0.1	34	39	4.50	53	4			
01/11/10	16	703	160	2.3	582	1,020	204	1,860	133	2,415	4,660	5.2
1030	61	35.1	13.2	0.06	25	28.7	3.29	39	2.6		4,611	12.9
		48	18	0.1	34	39	4.49	53	4			
07/13/10	21	568	108	2.5	536	612	168	1,670	122	1,863	3,830	5.4
900	70	28.3	8.9	0.06	23	17.2	2.71	35	2.4		3,738	13.0
		47	15	0.1	38	30	4.75	61	4			
11/16/10	19	709	165	3.2	638	958	178	1,750	173	2,450	4,890	5.6
930	66	35.4	13.6	0.08	28	26.9	2.87	36	3.4		4,505	14.6
		46	18	0.1	36	39	4.12	52	5			
DPS 2535												
03/23/06	16	410	161	1.9	1,380	1,090	119	2,760	190	1,687	5,956	14.6
930	61	20.5	13.2	0.05	60	30.6	1.92	57	3.8		6,036	38.0
		22	14	0.1	64	33	2.05	61	4			
05/17/06	18	403	153	< 2.5	1,360	1,030	113	2,630	200	1,637	5,864	14.6
930	64	20.1	12.6	0.06	59	28.9	1.82	55	4.0		5,812	38.0
		22	14	0.1	64	32	2.04	61	4			
07/17/06	20	328	116	1.8	1,070	803	104	2,210	210	1,297	4,872	12.9
1145	68	16.4	9.5	0.05	47	22.6	1.68	46	4.2		4,759	32.3
		23	13	0.1	64	30	2.25	62	6			

Appendix E Mineral Analyses of Central Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
09/18/06	21	501	225	2.4	1,820	1,430	115	3,480	194	2,178	7,488	17.0
1145	70	25.0	18.5	0.06	79	40.2	1.85	72	3.8		7,690	44.1
		20	15	0.1	64	34	1.57	61	3			
11/14/06	20	522	239	2.7	1,730	1,520	131	3,740	192	2,288	8,004	15.7
1220	68	26.0	19.7	0.07	75	42.7	2.11	78	3.8		8,000	40.9
		22	16	0.1	62	34	1.67	62	3			
04/10/07	17	358	138	< 2.5	1,270	981	100	2,560	175	1,462	5,560	14.5
1200	63	17.9	11.3	0.06	55	27.6	1.61	53	3.5		5,515	34.7
		21	13	0.1	65	32	1.88	62	4			
05/09/07	18	276	100	< 2.5	943	704	97	1,950	213	1,101	4,516	12.4
945	64	13.8	8.2	0.06	41	19.8	1.57	41	4.2		4,200	30.9
		22	13	0.1	65	30	2.37	61	6			
07/17/07	22	208	64	2.5	667	587	97	1,210	179	1,020	2,860	10.4
1000	72	10.4	5.3	0.06	29	16.5	1.56	25	3.6		2,943	24.9
		23	12	0.1	65	35	3.34	54	8			
09/11/07	21	487	207	2.8	1,690	1,520	142	3,710	195	2,068	7,220	16.2
1130	70	24.3	17.0	0.07	73	42.7	2.29	77	3.9		7,876	42.1
		21	15	0.1	64	34	1.82	61	3			
03/19/08	17	365	148	< 2.5	1,240	920	88	2,440	193	1,521	5,460	13.8
1100	63	18.2	12.2	0.06	54	25.8	1.41	51	3.8		5,319	36.0
		22	14	0.1	64	32	1.72	62	5			
05/12/08	18	542	242	4.2	1,690	1,450	99	3,750	186	2,350	7,960	15.2
1015	64	27.0	19.9	0.11	73	40.7	1.60	78	3.7		7,889	39.5
		22	17	0.1	61	33	1.29	63	3			
07/15/08	20	394	151	3.8	1,210	912	97	2,580	195	1,610	5,600	13.1
1000	68	19.7	12.4	0.10	53	25.6	1.57	54	3.9		5,465	34.2
		23	15	0.1	62	30	1.85	63	5			
09/15/08	21	434	188	3.6	1,520	1,250	113	3,220	184	1,858	7,050	15.3
1115	70	21.7	15.5	0.09	66	35.1	1.82	67	3.7		6,839	39.9
		21	15	0.1	64	33	1.69	62	3			
11/17/08	19	460	105	8.2	830	709	65	2,130	194	1,581	4,750	9.1
1330	66	23.0	8.6	0.21	36	19.9	1.05	44	3.8		4,424	23.6
		34	13	0.3	53	29	1.52	64	6			

Appendix E Mineral Analyses of Central Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
05/26/09	22	441	163	3.4	1,280	952	47	2,840	191	1,773	5,950	13.2
1015	72	22.0	13.4	0.09	56	26.7	0.76	59	3.8		5,841	34.4
		24	15	0.1	61	30	0.84	65	4			
07/27/09	22	397	161	2.2	1,480	1,110	104	2,900	195	1,655	6,220	15.8
1115	72	19.8	13.2	0.06	64	31.2	1.68	60	3.9		6,271	41.2
		20	14	0.1	66	32	1.73	62	4			
09/08/09	21	272	102	2.3	983	613	90	1,800	201	1,099	4,060	12.9
1209	70	13.6	8.4	0.06	43	17.2	1.45	37	4.0		3,983	32.3
		21	13	0.1	66	29	2.41	62	7			
03/22/10	18	346	138	2.9	1,140	896	101	2,490	188	1,433	5,360	13.1
1045	64	17.3	11.3	0.07	50	25.2	1.63	52	3.7		5,227	32.8
		22	15	0.1	63	31	1.98	63	5			
07/13/10	19	420	159	2.8	1,380	981	104	2,580	195	1,704	5,870	14.6
1030	66	21.0	13.1	0.07	60	27.6	1.68	54	3.9		5,744	31.4
		22	14	0.1	64	32	1.93	62	4			
11/16/10	20	501	220	3.5	1,710	1,330	117	3,430	202	2,157	7,640	16.0
1130	68	25.0	18.1	0.09	74	37.4	1.89	71	4.0		7,433	31.4
		21	15	0.1	63	33	1.65	62	3			
DPS 3235												
01/10/06	12	360	96	4.0	699	645	127	1,670	169	1,294	3,782	8.5
1100	54	18.0	7.9	0.10	30	18.1	2.05	35	3.4		3,702	
		32	14	0.2	54	31	3.51	60	6			
03/23/06	15	405	116	2.6	799	826	110	1,720	186	1,489	4,042	9.0
1000	59	20.2	9.5	0.07	35	23.2	1.77	36	3.7		4,090	
		31	15	0.1	54	36	2.75	56	6			
05/17/06	21	336	92	3.2	625	637	82	1,350	175	1,218	3,242	7.8
845	70	16.8	7.6	0.08	27	17.9	1.33	28	3.5		3,230	
		33	15	0.2	53	35	2.61	55	7			
07/17/06	24	381	93	2.4	635	642	118	1,520	175	1,335	3,498	7.6
945	75	19.0	7.6	0.06	28	18.0	1.90	32	3.5		3,496	
		35	14	0.1	51	33	3.46	57	6			
09/18/06	23	436	113	2.4	746	711	115	1,740	143	1,554	3,914	8.2
1115	73	21.8	9.3	0.06	32	20.0	1.85	36	2.8		3,949	
		34	15	0.1	51	33	3.05	59	5			

Appendix E Mineral Analyses of Central Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
11/14/06	17	361	99	2.6	675	608	125	1,650	155	1,309	3,686	8.1
1200	63	18.0	8.1	0.07	29	17.1	2.02	34	3.1		3,614	
		32	15	0.1	53	30	3.57	61	5			
01/16/07	7	317	79	3.1	566	519	118	1,330	150	1,117	2,970	7.4
1230	45	15.8	6.5	0.08	25	14.6	1.90	28	3.0		3,022	
		34	14	0.2	52	31	4.04	59	6			
04/10/07	18	404	106	3.0	735	725	133	1,720	158	1,446	3,970	8.4
1145	64	20.2	8.7	0.08	32	20.4	2.14	36	3.1		3,921	
		33	14	0.1	52	33	3.49	58	5			
05/09/07	20	335	94	< 2.5	678	652	110	1,570	181	1,224	3,680	8.4
930	68	16.7	7.7	0.06	29	18.3	1.77	33	3.6		3,550	
		31	14	0.1	55	32	3.15	58	6			
07/17/07	21	308	83	2.4	597	648	108	1,440	189	1,110	3,310	7.8
945	70	15.4	6.8	0.06	26	18.2	1.74	30	3.8		3,300	
		32	14	0.1	54	34	3.24	56	7			
09/11/07	23	322	93	2.8	685	688	97	1,560	143	1,187	3,410	8.7
1015	73	16.1	7.6	0.07	30	19.3	1.57	32	2.8		3,534	
		30	14	0.1	56	34	2.79	58	5			
11/14/07	15	388	93	3.7	615	658	90	1,570	158	1,352	3,270	7.3
1000	59	19.4	7.6	0.09	27	18.5	1.45	33	3.1		3,513	
		36	14	0.2	50	33	2.61	59	6			
01/14/08	10	372	109	2.6	653	735	157	1,620	167	1,378	3,780	7.7
1030	50	18.6	9.0	0.07	28	20.6	2.53	34	3.3		3,749	
		33	16	0.1	51	34	4.20	56	6			
03/19/08	14	283	89	< 2.5	663	581	94	1,270	187	1,073	3,230	8.8
945	57	14.1	7.3	0.06	29	16.3	1.52	26	3.7		3,095	
		28	15	0.1	57	34	3.17	55	8			
05/12/08	18	143	50	2.6	375	356	36	774	144	563	1,860	6.9
1100	64	7.1	4.1	0.07	16	10.0	0.58	16	2.9		1,823	
		26	15	0.2	59	34	1.95	55	10			
07/14/08	29	238	82	3.8	645	524	56	1,240	190	932	3,040	9.2
1215	84	11.9	6.7	0.10	28	14.7	0.90	26	3.8		2,903	
		25	14	0.2	60	33	2.00	57	8			

Appendix E Mineral Analyses of Central Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
11/17/08	17	222	83	5.1	627	551	73	1,340	143	896	3,140	9.1
1300	63	11.1	6.8	0.13	27	15.5	1.17	28	2.8		2,987	
		24	15	0.3	60	33	2.48	59	6			
01/13/09	10	271	78	4.1	592	566	98	1,260	186	996	3,020	8.2
1200	50	13.5	6.4	0.10	26	15.9	1.59	26	3.7		2,981	
		30	14	0.2	56	34	3.35	55	8			
05/26/09	19	321	128	3.0	939	807	75	1,940	219	1,329	4,420	11.2
945	66	16.0	10.5	0.08	41	22.7	1.21	40	4.3		4,345	
		24	16	0.1	61	33	1.77	59	6			
07/27/09	25	249	106	3.7	771	632	25	1,540	181	1,058	3,550	10.3
1030	77	12.4	8.7	0.09	34	17.8	0.41	32	3.6		3,436	
		23	16	0.2	61	33	0.76	60	7			
09/08/09	21	322	116	4.8	846	716	52	1,680	106	1,282	3,860	10.3
1140	70	16.1	9.5	0.12	37	20.1	0.84	35	2.1		3,800	
		26	15	0.2	59	35	1.44	60	4			
12/28/09	11	333	106	3.9	850	756	137	1,750	175	1,268	4,040	10.4
1230	52	16.6	8.7	0.10	37	21.2	2.21	36	3.5		4,041	
		27	14	0.2	59	34	3.49	58	5			
01/11/10	10	291	89	2.9	717	585	150	1,330	177	1,091	3,320	9.4
1200	50	14.5	7.3	0.07	31	16.4	2.42	28	3.5		3,271	
		27	14	0.1	59	33	4.83	55	7			
03/22/10	17	335	138	3.2	1,020	927	60	2,190	197	1,405	4,940	11.8
1015	63	16.7	11.3	0.08	44	26.0	0.96	46	3.9		4,791	
		23	16	0.1	61	34	1.26	60	5			
07/13/10	25	366	127	6.0	884	777	78	1,850	180	1,437	4,350	10.2
1230	77	18.3	10.4	0.15	38	21.8	1.26	39	3.6		4,196	
		27	16	0.2	57	33	1.94	59	5			
11/16/10	13	333	101	3.3	728	669	83	1,520	166	1,248	3,760	9.0
1100	55	16.6	8.3	0.08	32	18.8	1.34	32	3.3		3,537	
		29	15	0.1	56	34	2.44	57	6			
DPS 3465												
01/10/06	17	502	185	3.2	1,190	1,470	129	2,430	221	2,016	6,332	11.5
1030	63	25.0	15.2	0.08	52	41.3	2.08	51	4.4		6,042	31.2
		27	17	0.1	56	42	2.12	51	4			

Appendix E Mineral Analyses of Central Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
03/23/06	15	599	221	3.2	1,370	1,620	158	2,630	240	2,406	6,728	12.2
900	59	29.9	18.2	0.08	60	45.5	2.55	55	4.8		6,745	32.8
		28	17	0.1	55	42	2.37	51	4			
05/17/06	17	610	225	< 5.0	1,430	1,620	139	2,600	246	2,450	6,740	12.6
945	63	30.4	18.5	0.13	62	45.5	2.24	54	4.9		6,777	34.0
		27	17	0.1	56	43	2.10	51	5			
09/18/06	20	574	203	3.1	1,270	1,480	128	2,540	243	2,269	6,308	11.6
930	68	28.6	16.7	0.08	55	41.6	2.06	53	4.8		6,344	31.3
		28	17	0.1	55	41	2.04	52	5			
11/14/06	19	527	188	4.8	1,190	1,440	118	2,400	240	2,090	6,096	11.3
1055	66	26.3	15.5	0.12	52	40.4	1.90	50	4.8		6,012	30.6
		28	17	0.1	55	42	1.96	51	5			
01/16/07	13	535	191	3.3	1,060	1,130	141	2,250	289	2,124	5,520	10.0
1130	55	26.7	15.7	0.08	46	31.7	2.27	47	5.7		5,484	28.0
		30	18	0.1	52	37	2.63	54	7			
04/10/07	16	541	196	3.2	1,310	1,520	130	2,530	239	2,158	6,430	12.3
945	61	27.0	16.1	0.08	57	42.7	2.10	53	4.7		6,374	33.1
		27	16	0.1	57	42	2.05	52	5			
05/09/07	18	542	199	3.1	1,260	1,470	128	2,490	217	2,173	6,340	11.8
1000	64	27.0	16.4	0.08	55	41.3	2.06	52	4.3		6,222	31.8
		28	17	0.1	56	41	2.07	52	4			
07/17/07	22	456	166	3.6	1,030	1,180	150	2,300	276	1,823	5,540	10.5
930	72	22.8	13.7	0.09	45	33.1	2.42	48	5.5		5,451	29.4
		28	17	0.1	55	37	2.72	54	6			
09/11/07	21	549	198	3.7	1,340	1,580	153	2,790	253	2,186	6,480	12.5
1100	70	27.4	16.3	0.09	58	44.4	2.47	58	5.0		6,766	34.9
		27	16	0.1	57	40	2.24	53	5			
11/15/07	19	431	156	3.0	1,040	1,320	112	2,410	245	1,719	5,980	10.9
1045	66	21.5	12.8	0.08	45	37.1	1.81	50	4.9		5,619	29.5
		27	16	0.1	57	39	1.92	53	5			
01/14/08	16	486	194	2.7	1,100	1,290	133	2,260	240	2,013	6,060	10.7
1115	61	24.3	16.0	0.07	48	36.2	2.14	47	4.8		5,610	28.8
		28	18	0.1	54	40	2.38	52	5			

Appendix E Mineral Analyses of Central Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
03/19/08	16	552	231	2.6	1,240	1,410	134	2,520	241	2,330	6,440	11.2
1030	61	27.5	19.0	0.07	54	39.6	2.16	52	4.8		6,234	30.2
		27	19	0.1	54	40	2.18	53	5			
05/12/08	18	485	174	8.8	903	1,030	134	2,140	274	1,928	5,120	9.0
1030	64	24.2	14.3	0.23	39	28.9	2.16	45	5.4		5,039	25.1
		31	18	0.3	50	36	2.67	55	7			
07/15/08	21	497	167	6.7	788	822	150	1,930	293	1,930	4,650	7.8
845	70	24.8	13.7	0.17	34	23.1	2.42	40	5.8		4,537	21.9
		34	19	0.2	47	32	3.38	56	8			
09/15/08	22	523	202	5.9	1,230	1,380	152	2,460	254	2,138	6,320	11.6
1200	72	26.1	16.6	0.15	53	38.8	2.45	51	5.0		6,105	32.4
		27	17	0.2	56	40	2.51	53	5			
11/17/08	20	502	199	8.8	1,220	1,010	143	2,520	253	2,073	6,300	11.7
1400	68	25.0	16.4	0.23	53	28.4	2.31	52	5.0		5,755	32.7
		26	17	0.2	56	32	2.62	60	6			
01/13/09	14	458	157	5.0	653	662	141	1,730	311	1,790	4,110	6.7
1030	57	22.9	12.9	0.13	28	18.6	2.27	36	6.2		3,993	19.5
		36	20	0.2	44	29	3.61	57	10			
05/26/09	18	553	217	3.7	1,270	1,440	158	2,590	252	2,275	6,450	11.6
1030	64	27.6	17.8	0.09	55	40.4	2.55	54	5.0		6,383	32.5
		27	18	0.1	55	40	2.50	53	5			
09/08/09	21	586	236	6.4	1,450	1,540	149	2,730	266	2,435	6,910	12.8
1234	70	29.2	19.4	0.16	63	43.3	2.40	57	5.3		6,857	35.8
		26	17	0.1	56	40	2.23	53	5			
01/11/10	15	578	230	3.6	1,440	1,630	161	2,800	252	2,391	6,930	12.8
1130	59	28.8	18.9	0.09	63	45.8	2.60	58	5.0		6,994	35.9
		26	17	0.1	57	41	2.32	52	4			
03/22/10	17	541	224	4.9	1,330	1,590	157	2,760	249	2,274	6,950	12.1
1130	63	27.0	18.4	0.13	58	44.7	2.53	57	4.9		6,756	
		26	18	0.1	56	41	2.31	52	5			
07/13/10	19	523	194	5.0	1,140	1,180	142	2,280	301	2,105	5,750	10.8
1100	66	26.1	16.0	0.13	50	33.1	2.29	47	6.0		5,645	
		28	17	0.1	54	37	2.58	53	7			

Appendix E Mineral Analyses of Central Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
11/16/10	18	511	198	4.6	1,180	1,330	138	2,520	268	2,092	6,220	11.2
1200	64	25.5	16.3	0.12	51	37.4	2.23	52	5.3		6,042	
		27	17	0.1	55	38	2.29	54	5			
DPS 4616												
01/09/06	14	476	402	3.4	2,360	1,700	58	5,530	250	2,844	10,800	19.3
915	57	23.8	33.1	0.09	103	47.8	0.94	115	5.0		10,680	55.9
		15	21	0.1	64	28	0.56	68	3			
03/23/06	14	494	401	2.7	2,190	1,610	53	5,090	247	2,885	10,408	17.7
1030	57	24.7	33.0	0.07	95	45.2	0.85	106	4.9		9,989	51.5
		16	22	0.0	62	29	0.54	68	3			
05/16/06	16	485	427	< 5.0	2,490	1,750	54	5,320	244	2,970	10,924	19.9
900	61	24.2	35.1	0.13	108	49.2	0.88	111	4.8		10,678	57.7
		14	21	0.1	65	30	0.53	67	3			
07/17/06	21	385	330	2.6	2,000	1,420	71	4,310	228	2,321	8,856	18.1
1000	70	19.2	27.1	0.07	87	39.9	1.15	90	4.5		8,656	48.8
		14	20	0.0	65	29	0.85	66	3			
09/18/06	20	512	266	3.4	1,300	1,380	46	3,100	246	2,374	6,820	11.6
1045	68	25.5	21.9	0.09	57	38.8	0.75	65	4.9		6,755	31.4
		25	21	0.1	54	36	0.69	59	4			
11/14/06	17	578	277	4.0	1,290	1,551	35	3,100	242	2,584	7,224	11.0
1245	63	28.8	22.8	0.10	56	43.6	0.57	65	4.8		6,980	32.0
		27	21	0.1	52	38	0.50	57	4			
01/16/07	15	597	314	3.2	1,580	1,660	36	3,360	235	2,784	5,560	13.0
1500	59	29.8	25.8	0.08	69	46.6	0.58	70	4.7		7,691	37.8
		24	21	0.1	55	38	0.47	57	4			
04/10/07	15	469	519	< 5.0	3,380	2,780	43	7,280	241	3,309	14,610	25.6
1215	59	23.4	42.7	0.13	147	78.1	0.69	152	4.8		14,620	74.2
		11	20	0.1	69	33	0.29	64	2			
05/09/07	17	479	464	3.5	2,800	2,300	34	6,090	207	3,107	13,860	21.9
900	63	23.9	38.2	0.09	122	64.6	0.55	127	4.1		12,295	63.4
		13	21	0.0	66	33	0.28	65	2			
07/17/07	21	408	407	3.7	2,520	2,030	44	5,500	242	2,665	9,430	21.1
930	70	20.4	33.5	0.09	110	57.0	0.71	115	4.8		11,058	61.3
		12	20	0.1	67	32	0.40	65	3			

Appendix E Mineral Analyses of Central Area Drains

Station	T	Mineral Constituents: mg/L / meq/L / prv								Mineral Constituents (mg/L)		
Date / Time	°C / °F	Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	TH	TDS / Sum	SAR / ASAR
09/11/07	21	474	268	3.9	1,520	1,520	39	3,580	224	2,288	7,260	13.8
1000	70	23.7	22.0	0.10	66	42.7	0.63	75	4.4		7,539	37.4
		21	20	0.1	59	35	0.51	61	4			
11/14/07	19	494	256	3.1	1,400	1,340	23	3,160	214	2,288	7,030	12.7
945	66	24.7	21.1	0.08	61	37.6	0.37	66	4.2		6,804	34.4
		23	20	0.1	57	35	0.34	61	4			
01/14/08	15	460	260	2.8	1,320	1,350	29	2,970	209	2,220	7,410	12.2
1015	59	23.0	21.4	0.07	57	37.9	0.47	62	4.1		6,518	32.9
		23	21	0.1	56	36	0.45	59	4			
03/19/08	15	451	507	3.0	3,180	2,240	35	6,590	230	3,215	13,900	24.4
915	59	22.5	41.7	0.08	138	62.9	0.56	137	4.6		13,144	70.8
		11	21	0.0	68	31	0.27	67	2			
05/12/08	18	435	392	5.4	2,220	1,620	41	5,160	221	2,701	10,240	18.6
1000	64	21.7	32.2	0.14	97	45.5	0.66	107	4.4		10,006	53.9
		14	21	0.1	64	29	0.42	68	3			
07/15/08	22	484	423	8.2	2,390	1,940	45	5,180	225	2,951	11,210	19.2
1245	72	24.2	34.8	0.21	104	54.5	0.72	108	4.5		10,605	55.5
		15	21	0.1	64	33	0.43	64	3			
09/15/08	21	436	250	4.7	1,380	1,280	38	3,180	217	2,119	7,120	13.1
1100	70	21.8	20.6	0.12	60	36.0	0.61	66	4.3		6,699	35.2
		21	20	0.1	59	34	0.57	62	4			
11/17/08	19	473	251	9.1	1,380	1,240	30	3,010	204	2,215	7,260	12.8
1245	66	23.6	20.6	0.23	60	34.8	0.48	63	4.0		6,515	34.5
		23	20	0.2	57	34	0.47	61	4			
01/13/09	15	524	288	6.6	1,570	1,510	33	3,580	207	2,494	7,820	13.7
1110	59	26.1	23.7	0.17	68	42.4	0.53	75	4.1		7,635	36.9
		22	20	0.1	58	35	0.43	61	3			
05/26/09	19	472	467	4.9	2,940	2,030	53	6,160	224	3,102	12,760	23.0
930	66	23.6	38.4	0.13	128	57.0	0.85	128	4.4		12,261	66.6
		12	20	0.1	67	30	0.45	67	2			
07/27/09	22	463	477	5.1	3,160	2,200	50	6,350	230	3,121	13,770	24.6
1015	72	23.1	39.2	0.13	137	61.8	0.81	132	4.6		12,844	71.4
		12	20	0.1	69	31	0.41	66	2			

Appendix E Mineral Analyses of Central Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
09/08/09	21	492	257	4.3	1,510	1,170	27	3,300	198	2,286	7,080	13.7
1116	70	24.6	21.1	0.11	66	32.9	0.43	69	3.9		6,879	35.7
		22	19	0.1	59	31	0.41	65	4			
12/28/09	16	540	308	4.1	1,750	1,530	26	3,750	200	2,617	8,200	14.9
1300	61	26.9	25.3	0.10	76	43.0	0.41	78	4.0		8,028	41.7
		21	20	0.1	59	34	0.33	62	3			
01/11/10	16	514	300	3.9	1,730	1,490	26	3,740	199	2,519	8,220	15.0
1230	61	25.6	24.7	0.10	75	41.9	0.41	78	3.9		7,923	42.0
		20	20	0.1	60	34	0.33	63	3			
03/22/10	16	486	576	5.9	3,710	2,790	60	7,630	216	3,586	16,070	27.0
945	61	24.3	47.4	0.15	161	78.4	0.97	159	4.3		15,387	78.2
		10	20	0.1	69	32	0.40	66	2			
07/13/10	20	485	522	5.9	3,350	2,260	81	6,440	226	3,361	13,750	25.2
1145	68	24.2	42.9	0.15	146	63.5	1.31	134	4.5		13,280	73.0
		11	20	0.1	68	31	0.65	66	2			
11/16/10	19	528	257	4.7	1,510	1,280	26	3,260	201	2,377	7,540	13.5
1030	66	26.3	21.1	0.12	66	36.0	0.42	68	4.0		6,987	36.4
		23	19	0.1	58	33	0.39	63	4			
FBH 2016												
01/09/06	16	408	230	2.4	1,320	643	119	3,810	164	1,966	6,844	13.0
1300	61	20.4	18.9	0.06	57	18.1	1.92	79	3.3		6,631	33.7
		21	20	0.1	59	18	1.87	77	3			
03/23/06	16	436	226	1.8	1,180	567	100	3,420	168	2,020	6,112	11.4
1600	61	21.8	18.6	0.05	51	15.9	1.61	71	3.3		6,032	29.7
		24	20	0.1	56	17	1.75	77	4			
05/17/06	17	501	288	< 5.0	1,650	728	108	4,480	142	2,437	7,872	14.5
730	63	25.0	23.7	0.13	72	20.4	1.74	93	2.8		7,845	36.4
		21	20	0.1	60	17	1.47	79	2			
07/18/06	19	438	187	< 2.5	800	580	269	2,160	218	1,864	4,576	8.1
1000	66	21.9	15.4	0.06	35	16.3	4.34	45	4.3		4,567	21.8
		30	21	0.1	48	23	6.20	64	6			
09/19/06	19	469	237	1.9	1,210	578	76	3,490	149	2,147	6,092	11.4
1345	66	23.4	19.5	0.05	53	16.2	1.23	73	3.0		6,151	28.4
		24	20	0.1	55	17	1.32	78	3			

Appendix E Mineral Analyses of Central Area Drains

Station	T	Mineral Constituents: mg/L meq/L prv								Mineral Constituents (mg/L)		
Date / Time	°C / °F	Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	TH	TDS / Sum	SAR / ASAR
11/15/06	18	456	259	2.6	1,360	652	96	4,060	143	2,206	7,064	12.6
1240	64	22.8	21.3	0.07	59	18.3	1.55	85	2.8		6,972	31.5
		22	21	0.1	57	17	1.45	79	3			
01/17/07	16	468	327	2.2	1,830	780	105	4,920	136	2,516	5,640	15.9
1200	61	23.4	26.9	0.06	80	21.9	1.69	102	2.7		8,514	42.9
		18	21	0.0	61	17	1.32	80	2			
04/11/07	16	422	246	< 2.5	1,390	648	78	3,870	131	2,067	6,160	13.3
1215	61	21.1	20.2	0.06	60	18.2	1.26	81	2.6		6,735	33.3
		21	20	0.1	59	18	1.23	79	3			
05/08/07	18	399	230	< 2.5	1,240	618	71	3,560	147	1,944	6,356	12.2
930	64	19.9	18.9	0.06	54	17.4	1.14	74	2.9		6,208	30.6
		21	20	0.1	58	18	1.19	78	3			
07/18/07	21	412	236	< 2.5	1,300	663	78	3,880	158	2,001	6,220	12.7
1230	70	20.6	19.4	0.06	57	18.6	1.26	81	3.1		6,667	32.9
		21	20	0.1	59	18	1.21	78	3			
09/10/07	21	402	154	2.3	676	416	57	2,390	151	1,638	4,170	7.3
1135	70	20.1	12.7	0.06	29	11.7	0.91	50	3.0		4,188	18.9
		32	20	0.1	47	18	1.40	76	5			
11/14/07	19	447	253	2.2	1,270	614	89	3,750	126	2,158	6,670	11.9
1245	66	22.3	20.8	0.06	55	17.2	1.44	78	2.5		6,501	29.8
		23	21	0.1	56	17	1.45	79	3			
01/15/08	16	412	260	2.0	1,220	618	110	3,610	119	2,100	6,850	11.6
1220	61	20.6	21.4	0.05	53	17.4	1.77	75	2.4		6,303	27.8
		22	22	0.1	56	18	1.84	78	2			
03/18/08	16	423	209	< 2.5	1,030	478	55	2,920	140	1,917	5,470	10.2
1115	61	21.1	17.2	0.06	45	13.4	0.88	61	2.8		5,201	25.6
		25	21	0.1	54	17	1.13	78	4			
05/13/08	18	373	119	1.5	484	318	39	1,840	158	1,421	3,340	5.6
1200	64	18.6	9.8	0.04	21	8.9	0.62	38	3.1		3,269	14.0
		38	20	0.1	43	18	1.22	75	6			
07/15/08	20	446	236	3.2	1,220	573	79	3,550	159	2,090	6,350	11.6
1145	68	22.3	19.4	0.08	53	16.1	1.27	74	3.2		6,203	30.2
		23	20	0.1	56	17	1.35	78	3			

Appendix E Mineral Analyses of Central Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
09/16/08	21	382	141	2.7	668	423	75	2,240	183	1,535	4,170	7.4
1300	70	19.1	11.6	0.07	29	11.9	1.20	47	3.6		4,041	19.3
		32	19	0.1	49	19	1.90	74	6			
11/18/08	19	425	170	3.9	762	468	72	2,560	154	1,462	4,910	7.9
1130	66	21.2	14.0	0.10	33	13.1	1.16	53	3.1		4,553	20.5
		31	20	0.1	48	19	1.64	75	4			
01/14/09	16	450	300	3.8	1,440	685	99	4,370	129	2,359	7,520	12.9
115	61	22.5	24.7	0.10	63	19.2	1.59	91	2.6		7,425	32.3
		20	22	0.1	57	17	1.39	80	2			
05/26/09	17	414	260	1.6	1,340	614	88	3,860	119	2,105	6,770	12.7
1245	63	20.7	21.4	0.04	58	17.2	1.42	80	2.4		6,649	30.5
		21	21	0.0	58	17	1.40	79	2			
07/28/09	20	449	288	2.4	1,560	682	102	4,280	132	2,308	7,670	14.1
1245	68	22.4	23.7	0.06	68	19.2	1.64	89	2.6		7,443	35.3
		20	21	0.1	60	17	1.46	79	2			
09/08/09	21	479	309	2.6	1,660	719	108	4,460	128	2,468	7,910	14.5
1100	70	23.9	25.4	0.07	72	20.2	1.74	93	2.5		7,814	36.4
		20	21	0.1	59	17	1.48	79	2			
01/11/10	17	443	317	2.7	1,610	671	99	4,290	126	2,412	8,190	14.3
1140	63	22.1	26.1	0.07	70	18.8	1.60	89	2.5		7,509	35.7
		19	22	0.1	59	17	1.43	80	2			
03/23/10	17	427	258	3.0	1,330	627	85	3,940	135	2,129	6,980	12.5
1230	63	21.3	21.2	0.08	58	17.6	1.38	82	2.7		6,751	31.4
		21	21	0.1	58	17	1.33	79	3			
07/13/10	19	442	242	2.8	1,360	599	87	3,550	152	2,101	6,670	12.9
1345	66	22.1	19.9	0.07	59	16.8	1.40	74	3.0		6,374	33.6
		22	20	0.1	58	18	1.47	78	3			
11/17/10	18	452	266	2.9	1,400	638	99	4,020	119	2,224	7,180	12.9
1200	64	22.6	21.9	0.07	61	17.9	1.60	84	2.4		6,950	31.0
		21	21	0.1	58	17	1.52	79	2			
FBH 3236												
05/16/06	16	398	196	< 5.0	884	532	178	2,430	209	1,801	4,736	9.1
1300	61	19.9	16.1	0.13	38	14.9	2.87	51	4.1		4,748	24.5
		27	22	0.2	52	21	3.96	70	6			

Appendix E Mineral Analyses of Central Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
04/11/07	17	418	200	2.6	924	604	190	2,570	221	1,868	5,060	9.3
1145	63	20.9	16.4	0.07	40	17.0	3.06	54	4.4		5,041	25.1
		27	21	0.1	52	22	3.93	69	6			
05/08/07	21	414	196	3.1	873	601	182	2,620	226	1,841	5,436	8.9
845	70	20.7	16.1	0.08	38	16.9	2.94	55	4.5		5,025	23.9
		28	22	0.1	51	21	3.72	69	6			
07/18/07	22	397	196	2.6	894	600	158	2,780	230	1,799	4,820	9.2
1115	72	19.8	16.1	0.07	39	16.9	2.55	58	4.6		5,166	24.8
		26	22	0.1	52	21	3.11	71	6			
FBH 4045												
01/09/06	17	525	315	3.1	1,010	908	269	3,400	161	2,609	6,728	8.6
1200	63	26.2	25.9	0.08	44	25.5	4.34	71	3.2		6,527	24.1
		27	27	0.1	46	25	4.18	68	3			
03/23/06	16	561	318	2.3	1,010	927	255	3,130	180	2,711	6,380	8.4
1515	61	28.0	26.2	0.06	44	26.0	4.11	65	3.6		6,311	23.6
		29	27	0.1	45	26	4.16	66	4			
05/16/06	17	498	228	< 2.5	805	652	180	2,390	205	2,183	4,866	7.5
1245	63	24.9	18.8	0.06	35	18.3	2.90	50	4.1		4,879	20.3
		32	24	0.1	44	24	3.87	66	5			
07/18/06	20	438	187	< 2.5	800	580	269	2,160	218	1,864	4,576	8.1
945	68	21.9	15.4	0.06	35	16.3	4.34	45	4.3		4,567	21.8
		30	21	0.1	48	23	6.20	64	6			
09/19/06	20	539	270	2.8	925	776	228	2,910	177	2,458	5,584	8.1
1245	68	26.9	22.2	0.07	40	21.8	3.68	61	3.5		5,757	21.1
		30	25	0.1	45	24	4.10	68	4			
11/15/06	19	576	310	3.2	946	845	250	3,140	172	2,715	6,276	7.9
1200	66	28.7	25.5	0.08	41	23.7	4.03	65	3.4		6,173	22.1
		30	27	0.1	43	25	4.18	68	4			
01/17/07	16	609	180	2.6	559	494	138	2,390	238	2,262	3,040	5.1
1120	61	30.4	14.8	0.07	24	13.9	2.23	50	4.7		4,515	13.8
		44	21	0.1	35	20	3.15	70	7			
04/11/07	17	541	297	2.8	1,030	899	230	3,070	163	2,574	6,130	8.8
1130	63	27.0	24.4	0.07	45	25.3	3.71	64	3.2		6,168	24.7
		28	25	0.1	47	26	3.86	67	3			

Appendix E Mineral Analyses of Central Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
05/08/07	19	510	270	3.2	924	874	212	2,940	162	2,386	6,156	8.2
900	66	25.4	22.2	0.08	40	24.6	3.42	61	3.2		5,830	21.4
		29	25	0.1	46	27	3.70	66	3			
07/18/07	21	433	192	2.5	750	622	214	2,360	222	1,872	4,900	7.5
1100	70	21.6	15.8	0.06	33	17.5	3.45	49	4.4		4,707	20.4
		31	23	0.1	47	23	4.63	66	6			
09/10/07	21	490	251	3.1	952	785	240	3,000	215	2,258	5,590	8.7
1130	70	24.5	20.6	0.08	41	22.1	3.87	62	4.3		5,850	23.6
		28	24	0.1	48	24	4.18	67	5			
11/15/07	20	474	223	2.7	790	736	160	2,410	204	2,102	5,080	7.5
1230	68	23.7	18.3	0.07	34	20.7	2.58	50	4.0		4,918	20.3
		31	24	0.1	45	27	3.33	65	5			
01/15/08	16	467	332	2.4	945	842	250	3,250	166	2,493	6,890	8.2
1330	61	23.3	27.3	0.06	41	23.7	4.03	68	3.3		6,188	22.9
		25	30	0.1	45	24	4.09	69	3			
03/18/08	16	470	99	3.2	683	604	155	2,200	206	1,993	4,580	7.5
1030	61	23.5	8.1	0.08	30	17.0	2.50	46	4.1		4,338	20.2
		38	13	0.1	48	24	3.60	66	6			
05/13/08	17	483	213	2.5	809	725	170	2,510	213	2,083	5,100	7.7
1120	63	24.1	17.5	0.06	35	20.4	2.74	52	4.2		5,040	20.8
		31	23	0.1	46	26	3.44	66	5			
07/15/08	20	580	257	3.3	802	819	191	2,720	196	2,510	5,600	7.0
1115	68	28.9	21.1	0.08	35	23.0	3.08	57	3.9		5,490	19.5
		34	25	0.1	41	27	3.56	65	4			
09/16/08	21	533	282	4.3	894	847	216	3,120	170	2,035	6,210	7.8
1230	70	26.6	23.2	0.11	39	23.8	3.48	65	3.4		5,998	20.3
		30	26	0.1	44	25	3.64	68	4			
11/18/08	20	540	325	5.3	1,040	835	213	3,300	164	2,686	6,740	8.7
1100	68	26.9	26.7	0.14	45	23.5	3.43	69	3.3		6,357	24.5
		27	27	0.1	46	24	3.47	70	3			
01/14/09	17	519	330	3.8	1,020	741	175	3,540	180	2,655	6,600	8.6
1210	63	25.9	27.1	0.10	44	20.8	2.82	74	3.6		6,437	24.1
		27	28	0.1	45	21	2.80	73	4			

Appendix E Mineral Analyses of Central Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
05/26/09	19	510	242	2.5	805	730	191	2,530	205	2,271	5,170	7.4
1215	66	25.4	19.9	0.06	35	20.5	3.08	53	4.1		5,134	19.9
		32	25	0.1	44	26	3.83	66	5			
07/28/09	23	563	281	2.9	958	871	207	2,960	175	2,563	6,130	8.2
1215	73	28.1	23.1	0.07	42	24.5	3.34	62	3.5		5,948	23.1
		30	25	0.1	45	26	3.59	66	4			
09/08/09	22	573	336	3.6	1,100	821	206	3,330	184	2,815	6,600	9.0
1030	72	28.6	27.6	0.09	48	23.1	3.32	69	3.7		6,480	25.3
		27	27	0.1	46	23	3.34	70	4			
01/11/10	16	594	227	3.4	822	695	166	2,730	200	2,418	5,600	7.3
1045	61	29.6	18.7	0.09	36	19.5	2.68	57	4.0		5,357	18.9
		35	22	0.1	42	24	3.23	68	5			
03/23/10	18	426	161	2.9	635	559	119	2,020	224	1,727	4,230	6.7
1145	64	21.3	13.2	0.07	28	15.7	1.92	42	4.4		4,057	18.0
		34	21	0.1	44	24	2.99	66	7			
07/13/10	19	559	275	2.9	924	841	193	2,810	176	2,529	5,980	8.0
1200	66	27.9	22.6	0.07	40	23.6	3.11	59	3.5		5,711	22.4
		31	25	0.1	44	27	3.51	66	4			
11/17/10	19	565	294	4.3	1,020	834	175	3,150	247	2,622	6,430	8.7
1130	66	28.2	24.2	0.11	44	23.4	2.82	66	4.9		6,191	25.1
		29	25	0.1	46	24	2.92	68	5			
FBH 5056												
01/10/06	16	446	220	2.8	1,070	501	189	3,410	161	2,020	6,076	13.4
1300	61	22.3	18.1	0.07	47	14.1	3.05	71	3.2		5,935	34.9
		26	21	0.1	54	15	3.34	78	3			
03/23/06	16	472	217	2.4	986	494	188	3,070	182	2,073	5,560	9.4
1500	61	23.6	17.8	0.06	43	13.9	3.03	64	3.6		5,539	24.5
		28	21	0.1	51	16	3.59	76	4			
05/16/06	16	473	219	< 2.5	1,010	495	180	3,080	192	2,083	5,532	9.6
1230	61	23.6	18.0	0.06	44	13.9	2.90	64	3.8		5,575	25.0
		28	21	0.1	51	16	3.43	76	4			
07/18/06	18	479	235	< 2.5	1,100	504	191	3,280	189	2,164	5,860	10.3
930	64	23.9	19.3	0.06	48	14.2	3.08	68	3.8		5,905	26.8
		26	21	0.1	52	16	3.45	76	4			

Appendix E Mineral Analyses of Central Area Drains

Station	T	Mineral Constituents: mg/L meq/L prv								Mineral Constituents (mg/L)		
Date / Time	°C / °F	Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	TH	TDS / Sum	SAR / ASAR
09/19/06	20	490	258	3.5	1,190	541	208	3,180	183	2,286	6,264	10.8
1230	68	24.5	21.2	0.09	52	15.2	3.35	66	3.6		5,980	28.2
		25	22	0.1	53	17	3.79	75	4			
11/15/06	19	490	264	3.1	1,210	595	244	3,900	169	2,311	6,944	11.0
1145	66	24.5	21.7	0.08	53	16.7	3.93	81	3.4		6,808	28.5
		25	22	0.1	53	16	3.74	77	3			
01/17/07	15	486	246	2.7	1,090	499	200	3,480	170	2,227	4,600	10.1
1100	59	24.3	20.2	0.07	47	14.0	3.23	72	3.4		6,106	26.1
		26	22	0.1	52	15	3.47	78	4			
04/11/07	16	467	217	2.9	1,140	557	191	3,310	178	2,060	5,640	10.9
1115	61	23.3	17.8	0.07	50	15.6	3.08	69	3.5		5,992	28.4
		26	20	0.1	55	17	3.38	76	4			
05/08/07	17	433	217	2.5	1,010	500	179	3,280	171	1,975	6,192	9.9
915	63	21.6	17.8	0.06	44	14.0	2.89	68	3.4		5,724	25.7
		26	21	0.1	53	16	3.26	77	4			
07/18/07	19	428	230	2.6	1,100	523	196	3,340	189	2,016	5,960	10.7
1100	66	21.4	18.9	0.07	48	14.7	3.16	70	3.8		5,933	27.7
		24	21	0.1	54	16	3.47	76	4			
09/10/07	21	447	241	3.2	1,130	561	207	3,690	179	2,109	6,220	10.7
1115	70	22.3	19.8	0.08	49	15.8	3.34	77	3.6		6,387	27.9
		24	22	0.1	54	16	3.36	77	4			
11/15/07	20	447	261	4.6	1,260	548	212	3,700	166	2,191	6,700	11.7
1215	68	22.3	21.5	0.12	55	15.4	3.42	77	3.3		6,532	30.5
		23	22	0.1	56	16	3.45	78	3			
01/15/08	15	439	274	3.0	1,140	568	254	3,500	156	2,225	6,800	10.5
1335	59	21.9	22.5	0.08	50	16.0	4.10	73	3.1		6,272	27.4
		23	24	0.1	53	17	4.27	76	3			
03/18/08	16	470	289	< 2.5	1,230	608	230	4,000	156	2,364	6,650	11.0
1015	61	23.5	23.8	0.06	53	17.1	3.71	83	3.1		6,923	28.6
		23	24	0.1	53	16	3.46	78	3			
05/13/08	17	480	182	2.2	685	415	116	2,520	231	1,949	4,640	6.8
1100	63	24.0	15.0	0.06	30	11.7	1.87	52	4.6		4,539	18.2
		35	22	0.1	43	17	2.65	74	6			

Appendix E Mineral Analyses of Central Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
07/14/08	20	469	250	3.8	1,050	487	187	3,360	192	2,200	6,100	9.7
1100	68	23.4	20.6	0.10	46	13.7	3.02	70	3.8		5,922	25.3
		26	23	0.1	51	15	3.33	77	4			
09/16/08	21	447	251	3.9	1,060	526	204	3,600	204	2,150	6,220	10.0
1200	70	22.3	20.6	0.10	46	14.8	3.29	75	4.0		6,214	26.9
		25	23	0.1	52	15	3.39	77	4			
05/27/09	20	440	212	2.3	740	415	152	2,630	236	1,972	4,810	7.3
1015	68	22.0	17.4	0.06	32	11.7	2.45	55	4.7		4,733	19.6
		31	24	0.1	45	16	3.33	74	6			
07/28/09	23	434	225	2.7	982	407	154	3,130	224	2,011	5,630	9.5
1200	73	21.7	18.5	0.07	43	11.4	2.48	65	4.4		5,469	25.7
		26	22	0.1	51	14	2.97	78	5			
03/23/10	16	424	230	4.6	1,110	419	168	3,460	257	2,006	6,140	10.8
1115	61	21.2	18.9	0.12	48	11.8	2.71	72	5.1		5,970	30.2
		24	21	0.1	55	13	2.96	79	6			
07/14/10	19	440	209	3.0	989	455	155	2,890	252	1,960	5,420	9.7
1130	66	22.0	17.2	0.08	43	12.8	2.50	60	5.0		5,292	27.2
		27	21	0.1	52	16	3.11	75	6			
11/17/10	19	467	245	4.0	1,100	429	170	3,250	272	2,175	6,080	10.3
1100	66	23.3	20.1	0.10	48	12.1	2.74	68	5.4		5,828	28.7
		26	22	0.1	52	14	3.12	77	6			
FBH 8061												
03/23/06	15	310	119	3.0	520	256	72	1,740	198	1,264	3,148	6.4
1430	59	15.5	9.8	0.08	23	7.2	1.16	36	3.9		3,139	15.9
		32	20	0.2	47	15	2.40	75	8			
05/16/06	17	211	64	2.1	245	155	43	886	179	161	1,733	3.8
1015	63	10.5	5.3	0.05	11	4.4	0.69	18	3.6		1,714	9.1
		40	20	0.2	40	16	2.56	68	13			
07/18/06	21	312	115	2.0	556	235	101	1,690	238	1,253	3,186	6.8
745	70	15.6	9.5	0.05	24	6.6	1.63	35	4.7		3,154	17.8
		32	19	0.1	49	14	3.38	73	10			
09/19/06	21	423	156	1.7	703	279	35	2,350	268	1,698	4,090	7.4
1145	70	21.1	12.8	0.04	31	7.8	0.56	49	5.3		4,108	20.8
		33	20	0.1	47	13	0.90	78	8			

Appendix E Mineral Analyses of Central Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
11/15/06	17					-	-	-	-		2,224	
915	63		-			-	-	-	-		-	
						-	-	-	-			
01/17/07	13	119	30	14.2	141	109	28	461	126	421	1,000	3.0
900	55	5.9	2.5	0.36	6	3.1	0.45	10	2.5		978	6.3
		40	17	2.4	41	20	2.87	61	16			
04/11/07	15	264	78	6.2	431	192	103	1,390	179	980	2,400	6.0
1100	59	13.2	6.4	0.16	19	5.4	1.66	29	3.6		2,572	14.4
		34	17	0.4	49	14	4.20	73	9			
05/08/07	19	270	99	12.7	468	239	101	1,470	205	1,082	2,844	6.2
930	66	13.5	8.1	0.32	20	6.7	1.63	31	4.1		2,783	16.1
		32	19	0.8	48	16	3.79	71	9			
07/18/07	20	307	140	2.1	638	361	56	2,130	228	1,343	3,860	7.6
830	68	15.3	11.5	0.05	28	10.1	0.90	44	4.5		3,771	18.9
		28	21	0.1	51	17	1.50	74	8			
09/10/07	20	235	50	1.5	185	85	5	822	155	793	1,550	2.9
930	68	11.7	4.1	0.04	8	2.4	0.07	17	3.1		1,476	6.9
		49	17	0.2	34	11	0.33	76	14			
11/15/07	19	226	34	1.3	115	71	0	707	144	704	1,360	1.9
1145	66	11.3	2.8	0.03	5	2.0	0.01	15	2.9		1,241	4.3
		59	15	0.2	26	10	0.03	75	15			
01/14/08	15	200	31	1.6	106	82	1	567	156	627	1,240	1.8
1215	59	10.0	2.5	0.04	5	2.3	0.02	12	3.1		1,083	4.4
		58	15	0.2	27	13	0.12	69	18			
03/18/08	13	309	124	1.9	526	269	49	1,730	208	1,282	3,270	6.4
845	55	15.4	10.2	0.05	23	7.6	0.80	36	4.1		3,134	16.6
		32	21	0.1	47	16	1.64	74	9			
05/13/08	17	233	42	0.7	138	87	3	747	143	755	1,440	2.2
1040	63	11.6	3.5	0.02	6	2.4	0.05	16	2.8		1,337	5.0
		55	16	0.1	28	12	0.25	74	14			
07/14/08	20	306	119	1.6	549	224	72	1,760	197	1,254	3,300	6.7
730	68	15.3	9.8	0.04	24	6.3	1.17	37	3.9		3,150	16.9
		31	20	0.1	49	13	2.43	76	8			

Appendix E Mineral Analyses of Central Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
09/16/08	21	201	30	1.3	109	86	1	571	156	627	1,180	1.9
1145	70	10.0	2.5	0.03	5	2.4	0.02	12	3.1		1,093	4.4
		58	14	0.2	27	14	0.12	68	18			
01/14/09	14	118	31	1.2	142	107	3	400	191	423	984	3.0
1115	57	5.9	2.5	0.03	6	3.0	0.05	8	3.8		917	6.6
		40	17	0.2	42	20	0.30	55	25			
05/27/09	19	224	54	0.8	156	116	6	766	159	783	1,531	2.4
830	66	11.2	4.4	0.02	7	3.3	0.10	16	3.2		1,418	5.8
		50	20	0.1	30	15	0.43	71	14			
07/28/09	20	203	38	0.9	133	112	2	633	167	661	1,340	2.2
1030	68	10.1	3.1	0.02	6	3.1	0.03	13	3.3		1,222	5.4
		53	16	0.1	30	16	0.16	67	17			
09/08/09	22	165	45	1.1	165	121	2	535	188	597	1,250	2.9
845	72	8.2	3.7	0.03	7	3.4	0.03	11	3.7		1,147	6.8
		43	19	0.1	37	19	0.19	61	20			
01/11/10	15	110	23	1.6	128	119	0	281	202	370	859	2.9
945	59	5.5	1.9	0.04	6	3.3	0.00	6	4.0		784	6.4
		42	15	0.3	43	25	0.04	44	30			
03/23/10	14	271	100	1.4	389	255	28	1,440	192	1,087	2,780	5.1
830	57	13.5	8.2	0.04	17	7.2	0.46	30	3.8		2,600	12.8
		35	21	0.1	44	17	1.11	72	9			
07/14/10	19	309	116	1.7	519	295	63	1,670	228	1,249	3,200	6.4
830	66	15.4	9.5	0.04	23	8.3	1.01	35	4.5		3,110	16.6
		32	20	0.1	47	17	2.08	72	9			
11/17/10	19	191	41	1.5	143	137	5	586	159	644	1,320	2.4
1030	66	9.5	3.4	0.04	6	3.8	0.08	12	3.2		1,200	5.9
		50	18	0.2	32	20	0.42	63	16			
HMH 7516												
01/09/06	17	266	49	2.6	430	470	146	977	176	835	2,398	6.4
845	63	13.3	4.0	0.07	19	13.2	2.35	20	3.5		2,446	15.3
		37	11	0.2	52	34	5.98	52	9			
03/23/06	16	366	67	2.5	489	513	166	1,180	172	1,190	2,834	6.2
1130	61	18.3	5.5	0.06	21	14.4	2.68	25	3.4		2,887	15.4
		40	12	0.1	47	32	5.94	55	8			

Appendix E Mineral Analyses of Central Area Drains

Station	T	Mineral Constituents: mg/L meq/L prv								Mineral Constituents (mg/L)		
Date	°C										TDS	SAR
Time	°F	Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	TH	Sum	ASAR
05/16/06	17	284	54	< 2.5	457	441	137	899	192	932	2,374	6.5
833	63	14.2	4.4	0.06	20	12.4	2.21	19	3.8		2,390	15.6
		37	12	0.2	52	33	5.95	50	10			
07/17/06	20	301	58	2.4	488	491	150	994	184	991	2,630	6.7
845	68	15.0	4.8	0.06	21	13.8	2.42	21	3.7		2,595	16.2
		37	12	0.1	52	34	5.96	51	9			
09/18/06	21	217	44	2.4	392	392	130	736	198	723	2,014	6.3
1245	70	10.8	3.6	0.06	17	11.0	2.10	15	3.9		2,032	14.6
		34	11	0.2	54	34	6.48	47	12			
11/14/06	19	227	44	2.3	390	403	105	790	204	748	2,188	6.2
1130	66	11.3	3.6	0.06	17	11.3	1.69	16	4.0		2,084	14.9
		35	11	0.2	53	34	5.05	49	12			
01/16/07	17	258	51	2.4	412	449	137	874	186	854	2,300	6.1
1000	63	12.9	4.2	0.06	18	12.6	2.21	18	3.7		2,295	14.7
		37	12	0.2	51	34	6.02	50	10			
04/10/07	16	268	50	2.4	427	458	137	908	177	875	2,340	6.3
1100	61	13.4	4.1	0.06	19	12.9	2.21	19	3.5		2,357	15.1
		37	11	0.2	51	34	5.89	50	9			
05/09/07	19	290	57	2.8	442	470	139	975	172	959	2,576	6.2
745	66	14.5	4.7	0.07	19	13.2	2.24	20	3.4		2,479	14.9
		38	12	0.2	50	34	5.72	52	9			
07/17/07	21	330	62	2.7	460	526	154	1,180	177	1,080	2,860	6.1
1145	70	16.5	5.1	0.07	20	14.8	2.48	25	3.5		2,821	15.2
		40	12	0.2	48	33	5.48	54	8			
09/11/07	23	228	46	3.1	396	405	116	748	193	753	2,100	6.3
1230	73	11.4	3.8	0.08	17	11.4	1.87	16	3.8		2,058	15.0
		35	12	0.2	53	35	5.73	48	12			
11/14/07	20	235	48	2.8	406	430	124	821	187	785	2,250	6.3
1145	68	11.7	3.9	0.07	18	12.1	2.00	17	3.7		2,179	15.1
		35	12	0.2	53	35	5.73	49	11			
01/14/08	17	246	52	2.4	393	450	136	813	178	829	2,320	5.9
945	63	12.3	4.3	0.06	17	12.6	2.19	17	3.5		2,199	14.3
		36	13	0.2	51	36	6.21	48	10			

Appendix E Mineral Analyses of Central Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
03/19/08	17	357	69	2.5	464	499	140	1,160	164	1,176	2,890	5.9
1230	63	17.8	5.7	0.06	20	14.0	2.26	24	3.3		2,790	14.7
		41	13	0.1	46	32	5.17	55	7			
05/12/08	18	200	40	2.2	338	358	89	635	204	664	1,810	5.7
1115	64	10.0	3.3	0.06	15	10.1	1.44	13	4.0		1,785	13.7
		36	12	0.2	52	35	5.00	46	14			
07/14/08	22	221	44	2.6	391	397	113	769	197	733	2,110	6.3
1315	72	11.0	3.6	0.07	17	11.2	1.82	16	3.9		2,056	14.5
		35	11	0.2	54	34	5.54	49	12			
09/16/08	22	239	49	3.0	410	443	127	870	190	774	2,270	6.3
1000	72	11.9	4.0	0.08	18	12.4	2.05	18	3.8		2,255	15.2
		35	12	0.2	53	34	5.63	50	10			
11/18/08	20	219	46	3.0	398	399	108	767	194	735	2,180	6.4
930	68	10.9	3.8	0.08	17	11.2	1.74	16	3.8		2,056	14.7
		34	12	0.2	54	34	5.32	49	12			
01/13/09	17	236	49	2.7	402	426	120	817	187	792	2,200	6.2
1250	63	11.8	4.0	0.07	17	12.0	1.94	17	3.7		2,165	14.9
		35	12	0.2	52	35	5.59	49	11			
05/26/09	20	234	47	2.3	394	415	115	774	185	778	2,170	6.1
900	68	11.7	3.9	0.06	17	11.7	1.85	16	3.7		2,092	14.8
		36	12	0.2	52	35	5.57	48	11			
07/27/09	22	261	55	3.3	422	468	125	943	175	880	2,450	6.2
945	72	13.0	4.5	0.08	18	13.1	2.02	20	3.5		2,382	14.9
		36	13	0.2	51	34	5.27	51	9			
09/08/09	23	328	65	2.7	480	501	141	1,050	157	1,087	2,730	6.3
1400	73	16.4	5.3	0.07	21	14.1	2.27	22	3.1		2,662	15.8
		38	13	0.2	49	34	5.50	53	8			
12/28/09	17	271	55	2.7	431	444	123	883	178	902	2,310	6.2
1330	63	13.5	4.5	0.07	19	12.5	1.98	18	3.5		2,317	15.0
		37	12	0.2	51	34	5.45	51	10			
01/11/10	16	270	55	3.5	439	459	125	913	177	902	2,420	6.4
1345	61	13.5	4.5	0.09	19	12.9	2.02	19	3.5		2,371	15.3
		36	12	0.2	51	34	5.39	51	9			

Appendix E Mineral Analyses of Central Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
03/23/10	18	264	53	3.0	410	456	124	906	170	877	2,370	6.0
1400	64	13.2	4.4	0.08	18	12.8	2.00	19	3.4		2,318	14.5
		37	12	0.2	50	35	5.40	51	9			
07/13/10	20	323	60	3.0	485	471	131	1,000	174	1,055	2,570	6.5
1000	68	16.1	4.9	0.08	21	13.2	2.11	21	3.5		2,577	16.3
		38	12	0.2	50	33	5.33	53	9			
11/17/10	19	276	54	3.5	458	449	124	963	180	913	2,480	6.6
800	66	13.8	4.4	0.09	20	12.6	2.00	20	3.6		2,436	15.8
		36	12	0.2	52	33	5.23	52	9			
OAS 0364												
03/23/06	15	465	205	2.4	1,210	471	115	3,630	144	2,006	6,152	11.8
1200	59	23.2	16.9	0.06	53	13.2	1.85	76	2.9		6,185	29.4
		25	18	0.1	57	14	1.98	81	3			
05/17/06	16	483	211	< 5.0	1,320	506	108	3,760	149	2,075	6,544	12.6
1100	61	24.1	17.4	0.13	57	14.2	1.74	78	3.0		6,482	31.5
		24	18	0.1	58	15	1.79	81	3			
09/19/06	21	405	108	1.9	453	260	46	1,860	151	1,456	3,256	5.2
900	70	20.2	8.9	0.05	20	7.3	0.74	39	3.0		3,225	12.9
		41	18	0.1	40	15	1.49	78	6			
11/14/06	19	466	217	< 2.5	1,300	488	85	3,840	139	2,058	6,576	12.5
1300	66	23.3	17.8	0.06	57	13.7	1.37	80	2.8		6,482	31.2
		24	18	0.1	58	14	1.41	82	3			
01/16/07	14	496	156	1.7	599	404	64	2,350	161	1,880	4,320	6.0
1330	57	24.8	12.8	0.04	26	11.3	1.04	49	3.2		4,168	15.6
		39	20	0.1	41	18	1.60	76	5			
04/11/07	16	445	202	< 2.5	1,290	520	100	3,830	139	1,943	6,040	12.7
900	61	22.2	16.6	0.06	56	14.6	1.61	80	2.8		6,473	31.8
		23	17	0.1	59	15	1.63	81	3			
05/09/07	17	464	218	2.7	1,360	523	98	3,860	132	2,057	6,760	13.1
830	63	23.2	17.9	0.07	59	14.7	1.58	80	2.6		6,605	32.6
		23	18	0.1	59	15	1.59	81	3			
07/17/07	20	441	205	2.5	1,250	517	96	3,850	145	1,946	5,810	12.3
1115	68	22.0	16.9	0.06	54	14.5	1.54	80	2.9		6,448	30.8
		24	18	0.1	58	15	1.56	81	3			

Appendix E Mineral Analyses of Central Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
09/11/07	23	391	97	2.1	441	246	62	1,770	157	1,366	3,190	5.2
1215	73	19.5	8.0	0.05	19	6.9	1.00	37	3.1		3,103	12.9
		42	17	0.1	41	14	2.09	77	7			
11/14/07	20	329	82	2.0	430	249	57	1,530	182	1,159	2,870	5.5
1130	68	16.4	6.7	0.05	19	7.0	0.91	32	3.6		2,788	13.7
		39	16	0.1	45	16	2.10	73	8			
05/13/08	16	430	125	1.8	474	276	53	2,090	160	1,589	3,650	5.2
915	61	21.5	10.3	0.05	21	7.8	0.86	44	3.2		3,546	13.5
		41	20	0.1	39	14	1.55	79	6			
07/14/08	20	432	141	2.9	644	343	73	2,310	179	1,660	4,380	6.9
1030	68	21.6	11.6	0.07	28	9.6	1.17	48	3.6		4,053	17.9
		35	19	0.1	46	15	1.87	77	6			
03/22/10	17	428	244	3.1	1,500	615	90	4,220	189	2,074	7,420	14.3
1330	63	21.4	20.1	0.08	65	17.3	1.45	88	3.8		7,213	37.3
		20	19	0.1	61	16	1.31	80	3			
OAS 2548												
03/23/06	14	446	285	2.6	2,590	992	46	6,190	222	2,288	10,860	23.6
1230	57	22.3	23.4	0.07	113	27.9	0.74	129	4.4		10,685	63.6
		14	15	0.0	71	17	0.46	80	3			
05/17/06	16	464	265	< 5.0	2,510	935	41	5,900	178	2,250	10,284	23.0
1130	61	23.2	21.8	0.13	109	26.3	0.66	123	3.5		10,227	59.9
		15	14	0.1	71	17	0.43	80	2			
07/17/06	21	360	189		1,870	699	68	4,260	230	1,678	7,732	19.9
1245	70	18.0	15.5		81	19.6	1.10	89	4.6		-	53.7
						17	0.97	78	4			
09/19/06	20	499	281	2.8	2,360	890	42	5,720	182	2,404	9,724	21.0
945	68	24.9	23.1	0.07	103	25.0	0.68	119	3.6		9,904	54.5
		17	15	0.0	68	17	0.46	80	2			
11/14/06	18	446	290	2.8	2,700	988	47	6,340	241	2,308	10,890	24.5
1315	64	22.3	23.8	0.07	117	27.8	0.76	132	4.8		10,958	66.1
		14	15	0.0	72	17	0.46	80	3			
01/16/07	15	444	195	2.1	1,700	668	31	4,560	149	1,912	7,640	16.9
1400	59	22.2	16.0	0.05	74	18.8	0.50	95	3.0		7,689	42.3
		20	14	0.0	66	16	0.43	81	3			

Appendix E Mineral Analyses of Central Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
04/11/07	15	408	147	< 2.5	1,350	518	22	3,740	104	1,624	3,240	14.6
830	59	20.4	12.1	0.06	59	14.6	0.35	78	2.1		6,250	35.0
		22	13	0.1	64	15	0.37	82	2			
05/09/07	17	426	242	2.5	2,210	729	25	2,100	139	2,061	9,468	21.2
845	63	21.3	19.9	0.06	96	20.5	0.40	44	2.8		5,818	53.0
		15	14	0.0	70	30	0.59	65	4			
07/17/07	22	310	176	< 2.5	1,480	523	16	3,820	237	1,499	5,900	16.6
900	72	15.5	14.5	0.06	64	14.7	0.26	80	4.7		6,470	41.6
		16	15	0.1	68	15	0.26	80	5			
09/11/07	21	238	118	3.0	1,100	493	16	2,540	282	1,072	4,740	14.6
930	70	11.9	9.7	0.08	48	13.8	0.25	53	5.6		4,677	37.9
		17	14	0.1	69	19	0.35	73	8			
11/14/07	19	424	161	2.2	1,190	363	11	3,550	112	1,722	5,940	12.5
1200	66	21.2	13.2	0.06	52	10.2	0.18	74	2.2		5,769	30.0
		25	15	0.1	60	12	0.21	85	3			
03/19/08	14	423	265	< 2.5	2,360	854	29	5,530	176	2,148	9,940	22.2
900	57	21.1	21.8	0.06	103	24.0	0.47	115	3.5		9,570	57.6
		14	15	0.0	70	17	0.33	80	2			
05/13/08	17	308	157	3.6	1,435	593	20	3,570	242	1,415	6,440	16.6
900	63	15.4	12.9	0.09	62	16.7	0.32	74	4.8		6,232	41.5
		17	14	0.1	69	17	0.33	77	5			
07/14/08	23	280	147	3.8	1,370	541	22	3,310	262	1,300	6,060	16.5
1130	73	14.0	12.1	0.10	60	15.2	0.36	69	5.2		5,831	42.9
		16	14	0.1	69	17	0.40	77	6			
09/15/08	21	277	133	3.3	1,110	504	18	2,830	219	1,155	5,040	13.7
1230	70	13.8	10.9	0.08	48	14.2	0.29	59	4.3		5,007	34.3
		19	15	0.1	66	18	0.37	76	6			
11/17/08	18	397	158	4.0	1,290	481	21	3,770	119	1,642	6,410	13.9
1230	64	19.8	13.0	0.10	56	13.5	0.34	78	2.4		6,192	33.3
		22	15	0.1	63	14	0.35	83	2			
01/13/09	15	409	136	2.2	948	273	10	3,110	100	1,582	4,870	10.4
130	59	20.4	11.2	0.06	41	7.7	0.16	65	2.0		4,948	23.9
		28	15	0.1	57	10	0.21	87	3			

Appendix E Mineral Analyses of Central Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
05/26/09	19	357	247	2.8	2,090	828	65	2,930	212	1,909	8,830	20.8
1145	66	17.8	20.3	0.07	91	23.3	1.05	61	4.2		6,647	56.2
		14	16	0.1	70	26	1.17	68	5			
07/28/09	22	240	137	2.7	1,290	504	25	2,940	276	1,164	5,380	16.5
1000	72	12.0	11.3	0.07	56	14.2	0.40	61	5.5		5,304	42.8
		15	14	0.1	71	17	0.49	75	7			
09/08/09	22	227	112	1.8	960	389	15	2,130	221	1,028	4,070	13.0
1000	72	11.3	9.2	0.05	42	10.9	0.25	44	4.4		3,968	32.6
		18	15	0.1	67	18	0.41	74	7			
07/13/10	20	362	208	3.2	1,960	696	42	4,230	258	1,761	7,660	20.3
1345	68	18.1	17.1	0.08	85	19.6	0.67	88	5.1		7,656	56.9
		15	14	0.1	71	17	0.59	78	5			
11/16/10	18	408	152	3.1	1,340	479	22	3,460	152	1,645	6,100	14.4
1230	64	20.4	12.5	0.08	58	13.5	0.35	72	3.0		5,955	37.4
		22	14	0.1	64	15	0.40	81	3			

Appendix F
Electrical Conductivity, pH, & Trace Elements in Central Area Drains
2006-2010

Appendix F
Electrical Conductivity, pH, and Trace Elements in Central Area Drains

Station / Date	Field / Laboratory pH	Field / Laboratory EC (µS/cm)	Trace Elements (mg/L) As	B	Ba	Mo	Se
BVS 6001							
01/09/06	7.1	7,230	< 0.010	10.5	< 0.50	< 0.050	0.186
	7.6	7,078					
03/23/06	7.3	6,930	0.007	9.3	< 0.25	0.046	0.192
	7.4	7,058					
05/16/06	7.0	5,620	< 0.005	3.5	< 0.25	< 0.025	0.055
	7.5	5,974					
07/18/06	7.2	6,120	< 0.010	7.8	< 0.50	0.056	0.110
	7.3	6,366					
09/19/06	7.1	6,630	< 0.010	9.9	< 0.50	0.060	0.149
	7.1	6,516					
11/15/06	7.1	7,030	< 0.010	9.4	< 0.50	0.058	0.156
	7.6	6,422					
01/17/07	7.8	6,650	< 0.010	8.7	< 0.50	< 0.050	0.137
	7.6	4,607					
04/11/07	7.3	5,870	< 0.010	8.1	< 0.50	0.056	0.123
	7.5	5,550					
05/08/07	7.6	5,250	< 0.005	7.7	< 0.25	0.050	0.130
	7.5	5,792					
07/18/07	7.2	6,390	< 0.010	7.8	< 0.50	0.060	0.114
	7.4	5,530					
09/10/07	7.2	6,550	0.005	9.2	< 0.25	0.055	0.127
	7.2	6,324					
11/15/07	7.0	6,830	< 0.005	8.4	< 0.25	0.050	0.170
	7.5	6,726					
01/15/08	7.4	6,900	0.005	9.4	< 0.25	0.052	0.184
	7.5	7,223					
03/18/08	7.3	4,685	0.010	5.9	< 0.25	0.045	0.085
	7.5	4,931					
05/13/08	7.4	5,890	0.005	7.4	< 0.25	0.046	0.125
	7.7	5,802					
07/15/08	7.0	6,980	0.005	9.4	< 0.25	0.049	0.140
	7.4	6,704					
09/16/08	6.9	6,100	0.005	9.0	< 0.25	0.082	0.140
	7.1	5,919					

Appendix F
Electrical Conductivity, pH, and Trace Elements in Central Area Drains

Station Date	Field Laboratory		Trace Elements (mg/L)				
	pH	EC (µS/cm)	As	B	Ba	Mo	Se
11/18/08	7.7	6,610	0.006	10.1	< 0.25	0.085	0.160
	7.7	6,376					
05/27/09	7.2	6,070	0.005	7.9	< 0.25	0.041	0.127
	7.4	5,954					
07/28/09	7.2	6,510	0.006	10.5	< 0.25	0.076	0.189
	7.3	6,574					
09/08/09	7.6	5,790	0.005	9.9	< 0.25	0.075	0.142
	7.6	5,457					
01/11/10	7.5	6,040	0.005	8.3	< 0.25	0.056	0.133
	7.8	5,769					
03/23/10	7.4	6,250	0.006	7.3	< 0.25	0.039	0.145
	7.3	5,965					
07/14/10	7.0	7,580	< 0.010	10.2	< 0.50	< 0.050	0.177
	7.4	7,067					
11/17/10	9.3	4,751	< 0.005	7.0	< 0.25	0.068	0.101
	7.6	4,695					
BVS 7007							
01/09/06	7.5	7,490	< 0.010	11.3	< 0.50	0.051	0.269
	7.7	7,278					
03/23/06	7.5	7,860	0.008	11.6	< 0.25	0.063	0.284
	7.4	8,025					
05/16/06	7.1	6,870	0.005	10.1	< 0.25	0.060	0.250
	7.6	7,317					
07/18/06	7.3	7,900	< 0.010	12.3	< 0.50	0.072	0.265
	7.4	8,204					
09/19/06	7.1	7,520	< 0.010	12.9	< 0.50	0.060	0.274
	7.3	7,503					
04/11/07	7.5	7,040	< 0.010	11.4	< 0.05	0.070	0.251
	7.5	6,870					
05/08/07	7.5	6,200	< 0.005	10.1	< 0.25	0.043	0.235
	7.5	6,945					
07/18/07	7.6	3,413	< 0.005	5.3	< 0.25	0.075	0.100
	7.9	3,176					
09/10/07	7.6	2,065	< 0.005	3.0	< 0.25	0.057	0.030
	7.7	2,011					

Appendix F
Electrical Conductivity, pH, and Trace Elements in Central Area Drains

Station / Date	Field / Laboratory		Trace Elements (mg/L)				
	pH	EC (µS/cm)	As	B	Ba	Mo	Se
03/18/08	7.6	2,529	0.003	3.8	< 0.05	0.059	0.065
	7.7	2,684					
05/13/08	7.3	8,260	< 0.010	13.3	< 0.50	0.072	0.290
	7.6	8,117					
07/14/08	6.9	6,790	0.005	10.4	< 0.25	0.065	0.210
	7.3	6,533					
09/16/08	7.0	8,770	0.006	14.2	< 0.25	0.086	0.431
	7.2	8,481					
11/18/08	7.4	4,019	< 0.005	5.5	< 0.25	0.065	0.120
	7.6	3,930					
05/27/09	7.5	8,400	< 0.010	15.1	< 0.50	0.070	0.313
	7.6	8,109					
07/28/09	7.7	6,810	0.005	11.7	< 0.25	0.064	0.289
	7.7	6,834					
09/08/09	7.9	1,420	0.006	1.2	< 0.05	0.008	0.016
	7.8	1,429					
03/23/10	7.3	7,590	0.005	11.3	< 0.25	0.046	0.327
	7.2	7,512					
07/14/10	7.0	7,820	< 0.010	11.9	< 0.50	< 0.050	0.234
	7.5	7,338					
11/17/10	9.3	6,700	< 0.005	10.2	< 0.25	0.090	0.223
	7.6	6,600					
BVS 7402							
01/09/06	8.1	2,263	0.004	2.8	0.09	0.030	0.047
	8.0	2,280					
03/23/06	7.6	5,020	0.005	7.8	< 0.25	0.071	0.121
	7.5	5,289					
05/16/06	7.4	4,727	0.001	7.1	< 0.05	0.012	0.020
	7.7	4,941					
07/18/06	7.5	6,140	< 0.010	9.6	< 0.50	0.067	0.119
	7.6	6,419					
09/19/06	7.4	5,090	< 0.010	8.7	< 0.50	0.075	0.108
	7.5	5,229					
11/15/06	7.5	5,830	0.005	8.9	< 0.25	0.085	0.105
	7.8	5,400					

Appendix F
Electrical Conductivity, pH, and Trace Elements in Central Area Drains

Station Date	Field Laboratory		Trace Elements (mg/L)				
	pH	EC (µS/cm)	As	B	Ba	Mo	Se
01/17/07	7.9 7.7	4,244 3,851	0.001	6.0	< 0.25	0.065	0.090
04/11/07	7.7 7.6	5,340 5,030	< 0.010	8.5	< 0.50	0.064	0.114
05/08/07	7.6 7.6	5,640 6,139	< 0.005	10.0	< 0.25	0.082	0.133
07/18/07	7.3 7.5	6,320 5,541	< 0.010	9.3	< 0.50	0.074	0.102
09/10/07	7.3 7.3	6,160 6,006	0.005	10.5	< 0.25	0.076	0.185
03/18/08	7.4 7.6	4,279 4,519	0.005	6.3	< 0.25	0.063	0.125
05/13/08	7.3 7.7	5,600 5,578	0.005	8.1	< 0.25	0.058	0.128
07/14/08	7.2 7.5	5,510 5,435	0.005	8.5	< 0.25	0.055	0.100
09/16/08	7.2 7.4	6,130 5,941	0.006	9.6	< 0.25	0.073	0.174
11/17/08	7.4 7.7	4,913 4,780	< 0.005	7.3	< 0.25	0.065	0.181
01/14/09	7.8 7.6	4,190 4,053	0.005	5.7	< 0.25	0.052	0.083
05/27/09	7.5 7.6	4,758 4,896	0.005	8.2	< 0.25	0.082	0.135
07/28/09	7.3 7.3	5,130 5,789	0.008	9.3	< 0.25	0.077	0.180
01/11/10	7.3 7.6	4,337 4,170	< 0.005	5.4	< 0.25	0.055	0.096
03/23/10	7.5 7.5	4,916 4,805	0.005	6.6	< 0.25	0.061	0.135
07/14/10	6.8 7.3	2,982 2,842	< 0.005	3.8	< 0.25	0.055	0.052
BVS 8003							
11/15/06	7.5 7.8	8,065 7,287	< 0.010	18.1	< 0.50	0.184	0.108

Appendix F
Electrical Conductivity, pH, and Trace Elements in Central Area Drains

Station / Date	Field / Laboratory		Trace Elements (mg/L)				
	pH	EC (µS/cm)	As	B	Ba	Mo	Se
07/14/10	6.9	7,520	< 0.010	19.0	< 0.50	0.079	0.114
	7.3	7,140					
11/17/10	8.3	6,290	< 0.005	13.6	< 0.25	0.105	0.086
	7.5	6,199					
BVS 8110							
01/09/06	7.7	2,976	0.004	3.8	< 0.05	0.037	0.048
	7.9	2,966					
03/23/06	7.4	6,600	0.005	11.5	< 0.25	0.066	0.107
	7.4	6,701					
05/16/06	7.7	4,168	0.005	6.4	< 0.25	0.043	0.095
	7.9	4,387					
09/19/06	7.4	4,301	< 0.010	7.5	< 0.50	0.058	0.087
	7.6	4,148					
11/15/06	7.9	4,193	0.005	6.5	< 0.25	0.059	0.088
	8.1	3,932					
04/11/07	7.7	3,561	< 0.005	5.9	< 0.25	0.046	0.086
	7.6	3,350					
05/08/07	7.5	5,640	< 0.005	10.6	< 0.25	0.062	0.121
	7.6	6,138					
07/18/07	7.3	6,610	< 0.010	11.8	< 0.50	0.080	0.095
	7.5	5,712					
09/10/07	7.4	4,052	0.005	7.2	< 0.25	0.074	0.076
	7.5	3,964					
11/15/07	7.4	4,500	< 0.005	7.6	< 0.25	0.066	0.066
	8.0	4,518					
07/14/08	7.1	4,745	0.005	7.7	< 0.25	0.050	0.085
	7.5	4,630					
05/27/09	7.3	6,570	0.005	11.6	< 0.25	0.067	0.120
	7.5	6,491					
07/28/09	7.7	5,100	0.005	8.5	< 0.25	0.045	0.123
	7.7	5,283					
01/11/10	8.2	5,660	0.005	8.4	< 0.25	0.047	0.067
	8.2	5,375					
07/14/10	7.6	5,760	< 0.005	9.9	< 0.25	0.026	0.109
	7.8	5,509					

Appendix F
Electrical Conductivity, pH, and Trace Elements in Central Area Drains

Station / Date	Field / Laboratory pH	Field / Laboratory EC (µS/cm)	Trace Elements (mg/L) As	B	Ba	Mo	Se
CTL 3728							
01/10/06	7.4	5,770	< 0.005	5.7	< 0.25	< 0.025	0.149
	7.6	5,747					
03/23/06	7.4	4,165	0.006	4.4	< 0.25	< 0.025	0.155
	7.3	4,949					
05/17/06	7.2	4,333	0.005	3.8	< 0.25	< 0.025	0.120
	7.6	4,488					
07/17/06	7.1	5,060	< 0.010	4.7	< 0.50	< 0.050	0.147
	7.4	5,496					
09/18/06	7.1	5,280	< 0.010	5.5	< 0.50	0.125	0.163
	7.3	5,568					
11/14/06	7.0	5,910	0.005	5.3	< 0.25	< 0.025	0.149
	7.6	5,329					
01/16/07	7.4	4,226	0.010	4.7	< 0.25	< 0.025	0.160
	7.6	2,352					
04/10/07	7.6	4,170	< 0.005	3.4	< 0.25	< 0.025	0.095
	7.5	3,960					
05/08/07	7.5	5,020	< 0.005	4.8	< 0.25	< 0.025	0.186
	7.5	5,419					
07/17/07	7.1	5,640	0.006	4.4	< 0.25	< 0.025	0.161
	7.4	4,875					
09/11/07	7.2	5,940	< 0.005	5.4	< 0.25	< 0.025	0.165
	7.2	5,918					
11/14/07	7.1	2,765	< 0.005	4.9	< 0.25	< 0.025	0.180
	7.3	5,724					
01/14/08	7.2	5,110	0.007	4.7	< 0.25	< 0.025	0.160
	7.3	5,471					
03/18/08	7.2	5,190	0.005	4.8	< 0.25	< 0.025	0.160
	7.2	5,461					
05/12/08	7.1	5,500	0.005	5.2	< 0.25	< 0.025	0.174
	7.4	5,646					
07/15/08	7.0	5,010	0.005	4.8	< 0.25	< 0.025	0.120
	7.3	4,931					
09/15/08	6.8	5,500	0.005	5.0	< 0.25	< 0.025	0.177
	7.2	5,512					

Appendix F
Electrical Conductivity, pH, and Trace Elements in Central Area Drains

Station Date	Field Laboratory pH	EC (µS/cm)	Trace Elements (mg/L) As	B	Ba	Mo	Se
11/18/08	7.1 7.4	5,130 5,499	0.005	5.0	< 0.25	< 0.025	0.186
05/26/09	7.2 7.4	4,427 4,350	0.005	4.0	< 0.25	< 0.025	0.107
07/27/09	7.2 8.2	972 1,000	0.007	0.7	< 0.05	< 0.005	0.019
09/08/09	7.1 7.3	4,305 4,227	0.005	4.4	< 0.25	< 0.025	0.102
12/28/09	7.4 7.3	5,160 4,458	0.005	4.3	< 0.25	< 0.025	0.131
01/11/10	7.1 7.4	5,430 5,250	< 0.005	4.5	< 0.25	< 0.025	0.145
03/22/10	7.2 7.2	5,140 5,069	0.005	4.2	< 0.25	< 0.025	0.161
07/13/10	7.0 7.3	4,243 4,188	< 0.005	3.3	< 0.25	< 0.025	0.108
11/16/10	8.1 7.2	5,850 5,802	< 0.005	4.6	< 0.25	< 0.025	0.168
DPS 1016							
01/09/06	7.6 7.7	5,640 5,608	< 0.005	9.4	< 0.25	< 0.025	0.045
03/23/06	7.5 7.3	6,960 7,361	0.009	13.7	< 0.25	< 0.025	0.071
05/16/06	7.0 7.6	7,110 7,579	0.005	13.5	< 0.25	< 0.025	0.070
07/17/06	7.1 7.3	7,090 7,455	0.011	13.2	< 0.50	< 0.050	0.060
09/18/06	7.3 7.6	4,041 4,019	< 0.010	7.6	< 0.50	< 0.050	0.028
11/14/06	7.2 7.8	4,698 4,384	< 0.005	7.2	< 0.25	< 0.025	0.039
01/16/07	7.7 8.0	4,085 4,841	< 0.005	8.7	< 0.25	< 0.025	0.046
04/10/07	7.5 7.5	5,970 5,660	< 0.010	10.8	< 0.50	< 0.050	0.056

Appendix F
Electrical Conductivity, pH, and Trace Elements in Central Area Drains

Station / Date	Field / Laboratory		Trace Elements (mg/L)				
	pH	EC (µS/cm)	As	B	Ba	Mo	Se
05/09/07	7.5	6,190	< 0.005	12.1	< 0.25	< 0.025	0.060
	7.5	6,647					
07/17/07	7.1	6,980	0.005	11.7	< 0.25	< 0.025	0.057
	7.4	5,886					
09/11/07	7.3	7,180	0.005	14.2	< 0.25	< 0.025	0.046
	7.4	7,292					
11/14/07	8.2	4,881	< 0.005	8.2	< 0.25	< 0.025	0.167
	8.0	4,867					
01/14/08	8.1	5,020	0.006	8.6	< 0.25	< 0.025	0.193
	7.9	5,473					
03/18/08	7.1	6,420	0.005	12.2	< 0.25	< 0.025	0.060
	7.4	6,838					
05/12/08	6.9	5,010	< 0.005	8.5	< 0.25	< 0.025	0.042
	7.4	5,027					
07/14/08	7.0	6,800	< 0.005	13.7	< 0.25	< 0.025	0.045
	7.4	6,709					
09/15/08	7.4	6,670	0.005	10.7	< 0.25	< 0.025	0.065
	7.6	6,692					
11/17/08	8.0	4,202	0.005	6.6	< 0.25	< 0.025	0.107
	8.1	4,114					
01/13/09	7.9	5,800	0.005	9.2	< 0.25	< 0.025	0.069
	7.8	5,632					
05/26/09	7.5	3,786	0.005	6.7	< 0.25	< 0.025	0.023
	7.6	3,760					
07/27/09	7.1	5,270	0.006	8.6	< 0.25	< 0.025	0.156
	7.8	5,366					
09/08/09	7.6	7,200	< 0.010	13.6	< 0.50	< 0.050	0.064
	7.6	6,582					
12/28/09	7.5	6,890	0.005	10.9	< 0.25	< 0.025	0.053
	7.5	4,975					
01/11/10	7.5	6,670	0.005	10.6	< 0.25	< 0.025	0.055
	7.6	6,381					
03/22/10	7.1	7,040	0.005	12.8	< 0.25	< 0.025	0.069
	7.2	6,953					
07/13/10	6.9	7,380	< 0.010	14.3	< 0.50	< 0.050	0.073
	7.4	7,104					

Appendix F
Electrical Conductivity, pH, and Trace Elements in Central Area Drains

Station / Date	Field pH	Laboratory EC (µS/cm)	Trace Elements (mg/L) As	B	Ba	Mo	Se
DPS 1367							
01/10/06	7.2	4,986	< 0.005	5.6	< 0.25	< 0.025	0.094
	7.5	4,934					
03/23/06	7.3	5,210	0.007	4.8	< 0.25	< 0.025	0.227
	7.3	5,851					
05/17/06	7.0	5,645	0.005	4.6	< 0.25	< 0.025	0.231
	7.6	5,955					
09/18/06	7.1	5,940	< 0.010	4.5	< 0.50	< 0.050	0.250
	7.3	6,042					
11/14/06	7.2	6,020	0.005	4.0	< 0.25	< 0.025	0.253
	7.6	5,434					
04/10/07	7.4	5,270	< 0.010	4.4	< 0.50	< 0.050	0.203
	7.4	5,120					
05/09/07	7.6	5,080	< 0.005	5.1	< 0.25	< 0.025	0.195
	7.4	5,475					
07/17/07	7.9	5,080	0.005	3.8	< 0.25	< 0.025	0.141
	8.0	4,496					
09/11/07	7.4	5,810	0.006	4.3	< 0.25	< 0.025	0.231
	7.4	5,716					
11/14/07	7.5	5,690	< 0.005	4.1	< 0.25	< 0.025	0.212
	7.4	5,668					
01/14/08	7.3	5,270	0.006	5.0	< 0.25	< 0.025	0.215
	7.3	5,597					
03/18/08	7.4	5,400	0.005	4.4	< 0.25	< 0.025	0.195
	7.4	5,643					
05/12/08	7.1	5,700	0.006	4.2	< 0.25	< 0.025	0.207
	7.5	5,576					
07/15/08	7.1	5,790	< 0.005	4.1	< 0.25	< 0.025	0.200
	7.4	5,700					
09/15/08	7.0	5,820	0.005	4.1	< 0.25	< 0.025	0.244
	7.4	5,670					
11/17/08	7.5	5,880	0.006	4.1	< 0.25	< 0.025	0.229
	7.7	5,714					
01/13/09	7.6	5,720	0.005	4.1	< 0.25	< 0.025	0.210
	7.4	5,570					

Appendix F
Electrical Conductivity, pH, and Trace Elements in Central Area Drains

Station Date	Field Laboratory		Trace Elements (mg/L)				
	pH	EC (µS/cm)	As	B	Ba	Mo	Se
05/26/09	7.1 7.4	5,860 5,801	0.006	5.3	< 0.25	< 0.025	0.223
07/27/09	7.4 7.4	5,710 5,841	0.006	5.4	< 0.25	< 0.025	0.161
09/08/09	7.3 7.4	5,460 5,227	0.005	4.8	< 0.25	< 0.025	0.178
12/28/09	7.4 7.4	6,030 4,805	0.007	4.3	< 0.25	< 0.025	0.207
01/11/10	7.2 7.5	6,010 5,792	0.005	4.5	< 0.25	< 0.025	0.218
07/13/10	8.0 8.2	4,821 4,725	< 0.005	4.1	< 0.25	< 0.025	0.108
11/16/10	8.3 7.5	6,170 6,115	0.005	5.2	< 0.25	< 0.025	0.178
DPS 2535							
03/23/06	7.5 7.4	7,560 7,849	0.008	18.1	< 0.25	< 0.025	0.049
05/17/06	7.2 7.6	7,170 7,563	0.005	16.8	< 0.25	< 0.025	0.044
07/17/06	7.4 7.6	6,110 6,517	< 0.010	14.7	< 0.50	< 0.050	0.032
09/18/06	7.2 7.6	9,480 9,619	< 0.010	23.7	< 0.50	< 0.050	0.068
11/14/06	7.3 7.7	10,220 8,987	< 0.010	24.0	< 0.50	< 0.050	0.075
04/10/07	7.6 7.6	6,700 6,420	< 0.010	16.5	< 0.50	< 0.050	0.045
05/09/07	7.7 7.6	5,050 5,488	< 0.005	13.4	< 0.25	< 0.025	0.030
07/17/07	8.1 8.2	4,107 3,736	< 0.005	8.5	< 0.25	< 0.025	0.032
09/11/07	7.2 7.3	9,210 9,140	< 0.010	20.3	< 0.50	< 0.050	0.050
03/19/08	7.5 7.5	6,640 7,039	0.005	16.9	< 0.25	< 0.025	0.042

Appendix F
Electrical Conductivity, pH, and Trace Elements in Central Area Drains

Station Date	Field Laboratory		Trace Elements (mg/L)				
	pH	EC (µS/cm)	As	B	Ba	Mo	Se
05/12/08	7.0 7.5	9,930 9,767	< 0.010	23.0	< 0.50	< 0.050	0.068
07/15/08	7.1 7.5	7,200 7,125	< 0.005	17.4	< 0.25	< 0.025	0.035
09/15/08	7.0 7.3	9,090 8,794	< 0.010	20.3	< 0.50	< 0.050	0.041
11/17/08	7.9 7.9	6,010 5,866	0.006	10.8	< 0.25	< 0.025	0.040
05/26/09	8.0 8.0	7,430 7,188	0.007	16.3	< 0.25	0.035	0.048
07/27/09	7.5 7.5	7,590 7,876	< 0.010	18.8	< 0.50	< 0.050	0.043
09/08/09	7.4 7.5	5,330 5,138	< 0.005	15.3	< 0.25	< 0.025	0.028
03/22/10	7.4 7.5	7,000 6,857	< 0.005	16.1	< 0.25	< 0.025	0.038
07/13/10	7.0 7.5	7,600 7,355	< 0.010	17.4	< 0.50	< 0.050	0.048
11/16/10	9.3 7.5	9,580 9,402	< 0.010	20.4	< 0.50	< 0.050	0.055
DPS 3235							
01/10/06	8.4 8.1	4,819 4,866	< 0.005	8.5	< 0.25	< 0.025	0.093
03/23/06	7.5 7.7	5,110 5,575	0.006	9.3	< 0.25	< 0.025	0.065
05/17/06	7.7 7.9	4,363 4,517	0.005	7.1	< 0.25	< 0.025	0.050
07/17/06	7.8 7.8	4,573 4,863	< 0.010	7.5	< 0.50	< 0.050	0.046
09/18/06	8.3 8.2	4,920 5,175	< 0.005	8.8	< 0.25	< 0.025	0.062
11/14/06	8.4 8.3	4,935 4,522	< 0.005	7.4	< 0.25	< 0.025	0.105
01/16/07	8.0 8.1	3,872 3,684	0.005	5.7	< 0.25	< 0.025	0.073

Appendix F
Electrical Conductivity, pH, and Trace Elements in Central Area Drains

Station / Date	Field / Laboratory		Trace Elements (mg/L)				
	pH	EC (µS/cm)	As	B	Ba	Mo	Se
04/10/07	8.3	4,896	< 0.010	7.6	< 0.50	< 0.050	0.103
	8.3	4,560					
05/09/07	8.2	4,406	< 0.005	8.5	< 0.25	< 0.025	0.060
	8.1	4,705					
07/17/07	7.8	4,581	0.005	7.9	< 0.25	< 0.025	0.036
	7.9	4,048					
09/11/07	8.0	4,743	0.005	8.7	< 0.25	< 0.025	0.038
	7.9	4,662					
11/14/07	7.9	4,752	< 0.005	7.0	< 0.25	< 0.025	0.065
	7.9	4,887					
01/14/08	8.0	4,855	0.005	7.5	< 0.25	< 0.025	0.115
	7.8	5,168					
03/19/08	8.0	4,200	< 0.005	8.8	< 0.25	< 0.025	0.035
	7.8	4,427					
05/12/08	7.9	4,740	< 0.005	4.8	< 0.25	< 0.025	0.021
	8.2	2,718					
07/14/08	8.1	4,212	< 0.005	8.7	< 0.25	< 0.025	0.040
	8.2	4,151					
11/17/08	8.6	4,372	0.005	7.8	< 0.25	< 0.025	0.082
	8.4	4,290					
01/13/09	8.0	4,048	0.005	7.4	< 0.25	< 0.025	0.058
	8.0	4,130					
05/26/09	7.7	5,860	0.005	12.3	< 0.25	< 0.025	0.050
	7.8	5,757					
07/27/09	8.0	4,658	0.005	9.7	< 0.25	< 0.025	0.027
	8.0	4,760					
09/08/09	7.3	5,130	0.005	10.0	< 0.25	< 0.025	0.070
	8.8	4,952					
12/28/09	8.4	5,530	0.005	9.8	< 0.25	< 0.025	0.092
	8.2	4,293					
01/11/10	8.0	4,663	< 0.005	8.2	< 0.25	< 0.025	0.096
	8.1	4,449					
03/22/10	7.7	6,550	< 0.005	13.4	< 0.25	< 0.025	0.034
	7.7	6,399					
07/13/10	8.1	5,690	0.011	10.4	< 0.25	< 0.025	0.096
	8.3	5,551					

Appendix F
Electrical Conductivity, pH, and Trace Elements in Central Area Drains

Station Date	Field Laboratory pH	EC (µS/cm)	Trace Elements (mg/L) As	B	Ba	Mo	Se
11/16/10	11.3	5,050	< 0.005	8.6	< 0.25	< 0.025	0.038
	8.0	5,012					
DPS 3465							
01/10/06	7.2	8,180	< 0.010	15.3	< 0.50	< 0.050	0.040
	7.6	7,919					
03/23/06	7.4	8,420	0.012	17.4	< 0.25	< 0.025	0.055
	7.3	8,900					
05/17/06	7.0	8,490	0.010	16.9	< 0.50	< 0.050	0.051
	7.5	8,970					
09/18/06	7.1	8,030	< 0.010	17.6	< 0.50	< 0.050	0.045
	7.4	8,201					
11/14/06	7.2	8,250	< 0.010	15.1	< 0.50	< 0.050	0.036
	7.7	7,303					
01/16/07	7.6	6,830	< 0.010	13.0	< 0.50	< 0.050	0.028
	7.7	6,025					
04/10/07	7.3	7,800	< 0.010	15.7	< 0.50	< 0.050	0.042
	7.5	7,130					
05/09/07	7.4	7,390	< 0.005	15.9	< 0.25	< 0.025	0.023
	7.4	7,921					
07/17/07	7.3	7,410	0.006	13.7	< 0.25	< 0.025	0.031
	7.4	6,114					
09/11/07	7.2	8,630	< 0.010	17.5	< 0.50	< 0.050	0.033
	7.4	8,420					
11/15/07	7.2	8,040	< 0.010	12.8	< 0.50	< 0.050	0.027
	7.4	7,908					
01/14/08	7.3	7,410	0.010	14.0	< 0.25	< 0.025	0.044
	7.4	7,874					
03/19/08	7.2	8,000	0.005	17.0	< 0.25	< 0.025	0.040
	7.3	8,308					
05/12/08	7.1	6,710	0.005	11.4	< 0.25	< 0.025	0.029
	7.5	6,589					
07/15/08	6.9	6,130	< 0.005	11.0	< 0.25	< 0.025	0.015
	7.3	5,931					
09/15/08	7.0	8,390	< 0.010	16.5	< 0.50	< 0.050	0.040
	7.4	8,154					

Appendix F
Electrical Conductivity, pH, and Trace Elements in Central Area Drains

Station Date	Field Laboratory		Trace Elements (mg/L)				
	pH	EC (µS/cm)	As	B	Ba	Mo	Se
11/17/08	7.2 7.5	8,360 8,083	< 0.010	15.7	< 0.50	< 0.050	0.048
01/13/09	7.2 7.4	5,300 5,228	< 0.005	8.0	< 0.25	< 0.025	0.015
05/26/09	7.1 7.4	8,400 8,080	< 0.010	17.8	< 0.50	< 0.050	0.037
09/08/09	7.0 7.2	8,900 8,255	< 0.010	21.1	< 0.50	< 0.050	0.040
01/11/10	7.2 7.5	9,120 8,700	< 0.010	18.4	< 0.50	< 0.050	0.044
03/22/10	7.2 7.3	8,940 8,816	< 0.010	18.1	< 0.50	< 0.050	0.042
07/13/10	7.0 7.4	7,560 7,329	0.013	14.5	< 0.50	< 0.050	0.080
11/16/10	8.8 7.4	8,160 7,978	< 0.010	15.4	< 0.50	< 0.050	0.027
DPS 4616							
01/09/06	7.6 7.7	12,520 12,120	< 0.010	55.0	< 0.50	< 0.050	0.044
03/23/06	7.7 7.5	11,220 12,040	0.012	47.6	< 0.50	0.071	0.036
05/16/06	7.4 7.7	12,030 12,800	0.010	52.1	< 0.50	0.076	0.039
07/17/06	7.5 7.6	10,310 11,000	0.013	46.9	< 0.50	0.079	0.028
09/18/06	7.4 7.4	8,400 8,581	< 0.010	25.6	< 0.50	0.053	0.028
11/14/06	7.5 7.8	9,070 8,053	< 0.010	23.0	< 0.50	0.056	0.027
01/16/07	7.7 7.6	9,310 6,038	< 0.010	27.0	< 0.50	< 0.050	0.026
04/10/07	7.5 7.6	15,260 14,300	0.010	66.0	< 0.50	0.099	0.047
05/09/07	7.7 7.6	13,190 14,320	< 0.005	58.3	< 0.25	0.044	0.017

Appendix F
Electrical Conductivity, pH, and Trace Elements in Central Area Drains

Station / Date	Field / Laboratory		Trace Elements (mg/L)				
	pH	EC (µS/cm)	As	B	Ba	Mo	Se
07/17/07	7.4 7.5	13,870 10,240	< 0.010	55.2	< 0.50	0.097	0.022
09/11/07	7.4 7.5	8,930 9,024	< 0.010	28.7	< 0.50	0.060	0.019
11/14/07	7.5 7.5	8,330 8,707	< 0.010	24.4	< 0.50	0.060	0.025
01/14/08	7.5 7.5	8,550 8,991	0.010	22.7	< 0.25	0.057	0.025
03/19/08	6.9 7.6	15,140 15,490	0.010	70.8	< 0.50	0.110	0.040
05/12/08	7.1 7.6	11,800 11,790	< 0.010	48.0	< 0.50	0.072	0.033
07/15/08	7.2 7.5	13,240 12,720	< 0.010	50.8	< 0.50	0.076	0.026
09/15/08	7.3 7.5	8,710 8,645	< 0.010	25.9	< 0.50	0.062	0.027
11/17/08	7.4 7.6	9,110 8,765	< 0.010	23.7	< 0.50	0.064	0.021
01/13/09	7.5 7.5	9,670 9,337	< 0.010	25.8	< 0.50	0.058	0.018
05/26/09	7.5 7.6	14,560 13,780	< 0.010	67.6	< 0.50	0.108	0.033
07/27/09	6.9 7.5	14,910 15,260	< 0.010	70.0	< 0.50	0.114	0.033
09/08/09	7.3 7.4	8,700 8,001	< 0.010	26.6	< 0.50	0.063	0.021
12/28/09	7.6 7.5	10,250 8,480	0.010	27.5	< 0.50	0.062	0.029
01/11/10	7.3 7.6	10,160 9,615	< 0.010	28.3	< 0.50	0.059	0.026
03/22/10	7.5 7.5	93,100 17,300	< 0.020	78.7	< 1.00	0.126	0.049
07/13/10	7.3 7.6	16,100 15,380	< 0.020	71.7	< 1.00	< 0.100	0.120
11/16/10	8.8 7.6	9,250 9,057	< 0.010	23.3	< 0.50	< 0.050	0.060

Appendix F
Electrical Conductivity, pH, and Trace Elements in Central Area Drains

Station Date	Field Laboratory pH	EC (µS/cm)	Trace Elements (mg/L) As	B	Ba	Mo	Se
FBH 2016							
01/09/06	7.8	7,790	< 0.010	13.2	< 0.50	0.122	0.303
	7.8	7,612					
03/23/06	7.7	7,080	0.005	11.5	< 0.25	0.137	0.291
	7.5	7,223					
05/17/06	7.2	8,450	< 0.010	15.6	< 0.50	0.178	0.368
	7.6	8,941					
07/18/06	7.3	6,220	< 0.010	6.4	< 0.50	< 0.050	0.170
	7.4	5,851					
09/19/06	7.3	7,080	< 0.010	12.3	< 0.50	0.143	0.253
	7.6	7,180					
11/15/06	7.4	8,160	< 0.010	13.9	< 0.50	0.178	0.289
	7.7	7,380					
01/17/07	7.7	9,490	0.010	18.0	< 0.50	0.194	0.356
	7.7	6,198					
04/11/07	7.5	7,300	< 0.010	13.5	< 0.50	0.140	0.267
	7.7	6,880					
05/08/07	7.7	6,590	< 0.005	12.5	< 0.25	0.130	0.292
	7.8	7,158					
07/18/07	7.4	8,050	0.005	13.5	< 0.25	0.160	0.305
	7.6	6,850					
09/10/07	7.2	5,030	0.005	6.5	< 0.25	0.081	0.138
	7.4	4,965					
11/14/07	7.5	7,670	< 0.010	12.1	< 0.50	0.148	0.305
	7.6	7,629					
01/15/08	7.7	7,530	0.008	12.3	< 0.25	0.158	0.353
	7.6	7,914					
03/18/08	7.4	6,190	0.005	10.2	< 0.25	0.117	0.185
	7.6	6,443					
05/13/08	7.4	3,988	0.005	4.3	< 0.25	0.061	0.109
	7.7	3,991					
07/15/08	7.4	7,590	0.005	12.6	< 0.25	0.125	0.230
	7.6	7,325					
09/16/08	7.2	5,106	< 0.005	6.0	< 0.25	0.084	0.158
	7.5	5,013					

Appendix F
Electrical Conductivity, pH, and Trace Elements in Central Area Drains

Station Date	Field Laboratory pH	EC (µS/cm)	Trace Elements (mg/L) As	B	Ba	Mo	Se
11/18/08	7.4	5,780	0.005	7.1	< 0.25	0.094	0.213
	7.6	5,639					
01/14/09	7.6	8,780	0.010	13.7	< 0.50	0.188	0.375
	7.6	8,469					
05/26/09	7.5	7,860	< 0.010	14.1	< 0.50	0.165	0.305
	7.6	7,623					
07/28/09	7.6	8,610	< 0.010	15.9	< 0.50	0.193	0.377
	7.6	8,700					
09/08/09	7.6	9,170	< 0.010	17.7	< 0.50	0.181	0.381
	7.6	8,376					
01/11/10	7.8	9,350	< 0.010	16.8	< 0.50	0.186	0.369
	7.7	8,928					
03/23/10	7.6	8,060	< 0.010	13.5	< 0.50	0.158	0.309
	7.6	7,910					
07/13/10	7.2	7,820	< 0.010	13.1	< 0.50	0.128	0.247
	7.5	7,649					
11/17/10	9.4	8,260	< 0.010	13.5	< 0.50	0.173	0.311
	7.5	8,122					
FBH 3236							
05/16/06	7.6	6,940	< 0.010	6.9	< 0.50	0.068	0.134
	7.8	5,816					
04/11/07	7.1	5,710	< 0.010	7.3	< 0.50	0.067	0.134
	7.5	5,530					
05/08/07	7.7	5,480	< 0.005	7.4	< 0.25	0.065	0.150
	7.8	5,957					
07/18/07	7.4	6,640	< 0.010	7.8	< 0.50	0.091	0.126
	7.4	5,767					
FBH 4045							
01/09/06	7.2	7,820	< 0.010	9.4	< 0.50	< 0.050	0.292
	7.6	7,644					
03/23/06	7.2	7,480	0.009	8.9	< 0.25	0.047	0.361
	7.3	7,674					
05/16/06	6.9	5,660	0.006	6.4	< 0.25	0.033	0.235
	7.5	6,045					

Appendix F
Electrical Conductivity, pH, and Trace Elements in Central Area Drains

Station / Date	Field / Laboratory		Trace Elements (mg/L)				
	pH	EC (µS/cm)	As	B	Ba	Mo	Se
07/18/06	7.1	5,550	< 0.010	6.4	< 0.50	< 0.050	0.170
	7.4	5,851					
09/19/06	7.1	6,820	< 0.010	8.5	< 0.50	< 0.050	0.258
	7.3	6,848					
11/15/06	7.0	7,410	< 0.010	8.6	< 0.50	< 0.050	0.276
	7.6	6,709					
01/17/07	7.6	5,130	0.008	4.7	< 0.25	< 0.025	0.130
	7.5	3,385					
04/11/07	7.2	7,790	< 0.010	8.6	< 0.50	< 0.050	0.293
	7.4	6,600					
05/08/07	7.6	6,250	0.005	8.2	< 0.25	0.040	0.305
	7.5	6,874					
07/18/07	7.4	6,100	< 0.010	6.5	< 0.50	< 0.050	0.147
	7.6	5,374					
09/10/07	7.1	6,950	0.006	8.5	< 0.25	0.040	0.250
	7.3	6,851					
11/15/07	7.0	6,160	0.005	6.6	< 0.25	0.035	0.211
	7.4	6,192					
01/15/08	7.4	7,700	0.010	9.8	< 0.25	0.048	0.321
	7.4	7,989					
03/18/08	7.1	5,330	0.005	6.2	< 0.25	0.029	0.180
	7.4	5,678					
05/13/08	7.2	6,300	0.007	6.7	< 0.25	0.032	0.232
	7.4	6,212					
07/15/08	6.9	6,620	0.005	7.1	< 0.25	0.033	0.185
	7.4	6,422					
09/16/08	6.9	7,330	0.005	7.1	< 0.25	0.048	0.300
	7.2	7,220					
11/18/08	7.2	8,020	< 0.010	9.0	< 0.50	< 0.050	0.340
	7.5	7,751					
01/14/09	7.5	6,960	0.006	9.9	< 0.25	0.050	0.270
	7.5	7,493					
05/26/09	7.2	6,310	0.005	7.3	< 0.25	0.034	0.240
	7.4	6,187					
07/28/09	7.0	6,960	< 0.025	9.0	< 1.25	< 0.125	0.307
	7.2	7,270					

Appendix F
Electrical Conductivity, pH, and Trace Elements in Central Area Drains

Station Date	Field Laboratory		Trace Elements (mg/L)				
	pH	EC (µS/cm)	As	B	Ba	Mo	Se
09/08/09	7.1	7,750	< 0.010	11.0	< 0.50	< 0.050	0.253
	7.2	7,140					
01/11/10	7.8	6,620	0.005	7.2	< 0.25	0.035	0.221
	7.8	6,309					
03/23/10	7.3	5,120	0.005	5.5	< 0.25	0.027	0.168
	7.4	5,169					
07/13/10	6.7	7,270	< 0.010	8.1	< 0.50	< 0.050	0.237
	7.3	7,126					
11/17/10	9.4	7,610	< 0.010	8.9	< 0.50	< 0.050	0.242
	7.6	7,490					
FBH 5056							
01/10/06	7.4	7,050	< 0.010	9.5	< 0.50	< 0.050	0.206
	7.7	6,820					
03/23/06	7.2	6,430	0.005	8.1	< 0.25	0.053	0.213
	7.4	6,583					
05/16/06	7.0	6,160	0.005	7.9	< 0.25	0.050	0.221
	7.5	6,561					
07/18/06	7.2	6,650	< 0.010	9.3	< 0.50	0.056	0.221
	7.4	7,100					
09/19/06	7.6	7,260	< 0.010	10.8	< 0.50	0.066	0.295
	7.6	7,323					
11/15/06	7.4	7,970	< 0.010	11.0	< 0.50	0.071	0.311
	7.7	7,202					
01/17/07	7.8	6,840	0.010	9.3	< 0.50	0.054	0.220
	7.7	5,347					
04/11/07	7.3	6,460	< 0.010	8.7	< 0.50	< 0.050	0.169
	7.5	6,280					
05/08/07	7.6	5,980	< 0.005	8.9	< 0.25	0.050	0.182
	7.6	6,539					
07/18/07	7.3	7,280	< 0.010	10.3	< 0.50	0.062	0.218
	7.4	6,174					
09/10/07	7.3	7,440	< 0.010	10.7	< 0.50	0.064	0.254
	7.4	7,279					
11/15/07	7.0	7,660	< 0.010	10.7	< 0.50	0.072	0.284
	7.5	7,619					

Appendix F
Electrical Conductivity, pH, and Trace Elements in Central Area Drains

Station Date	Field Laboratory		Trace Elements (mg/L)				
	pH	EC (µS/cm)	As	B	Ba	Mo	Se
01/15/08	7.6	7,390	0.008	10.6	< 0.03	0.072	0.347
	7.6	7,813					
03/18/08	7.3	7,260	0.005	10.9	< 0.25	0.070	0.351
	7.4	7,642					
05/13/08	7.3	5,300	< 0.005	5.6	< 0.25	0.028	0.110
	7.5	5,371					
07/14/08	7.0	7,120	0.005	9.9	< 0.25	0.050	0.050
	7.4	6,933					
09/16/08	7.2	7,320	< 0.005	9.2	< 0.25	0.067	0.273
	7.4	7,105					
05/27/09	7.2	5,700	< 0.005	7.8	< 0.25	0.036	0.145
	7.4	5,671					
07/28/09	7.6	6,160	0.005	9.7	< 0.25	0.045	0.184
	7.7	6,447					
03/23/10	7.6	7,060	0.005	12.2	< 0.25	0.054	0.199
	7.6	6,945					
07/14/10	6.9	6,440	0.005	8.5	< 0.25	0.039	0.154
	7.5	6,303					
11/17/10	8.2	6,930	< 0.005	9.7	< 0.25	0.048	0.163
	7.4	6,846					
FBH 8061							
03/23/06	7.3	3,844	0.005	6.1	< 0.25	0.068	0.031
	7.5	3,999					
05/16/06	6.9	2,202	< 0.001	0.5	< 0.05	0.009	0.003
	7.6	2,315					
07/18/06	7.3	3,822	< 0.010	6.1	< 0.50	0.063	0.025
	7.5	4,105					
09/19/06	7.3	4,620	< 0.005	9.4	< 0.25	0.083	0.032
	7.6	4,829					
11/15/06	8.2	3,172	0.005	1.9	< 0.25	0.054	0.006
	8.2	3,034					
01/17/07	7.7	1,429	0.003	1.3	< 0.05	0.030	0.004
	7.5	1,458					
04/11/07	7.5	3,043	< 0.005	4.5	< 0.25	0.054	0.016
	7.4	2,920					

Appendix F
Electrical Conductivity, pH, and Trace Elements in Central Area Drains

Station / Date	Field / Laboratory		Trace Elements (mg/L)				
	pH	EC (µS/cm)	As	B	Ba	Mo	Se
05/08/07	7.5	3,140	< 0.005	5.1	< 0.25	0.052	0.025
	7.5	3,484					
07/18/07	7.4	4,562	< 0.010	8.2	< 0.50	0.071	0.031
	7.4	4,392					
09/10/07	7.6	1,958	0.003	2.4	< 0.05	0.056	0.006
	7.6	1,946					
11/15/07	7.4	6,093	< 0.005	1.5	< 0.25	0.048	0.005
	7.7	1,711					
01/14/08	7.6	1,490	0.003	1.3	< 0.05	0.043	0.003
	7.6	1,582					
03/18/08	7.3	3,239	< 0.005	6.6	< 0.25	0.053	0.027
	7.4	4,069					
05/13/08	7.5	1,800	< 0.005	1.6	< 0.25	0.040	0.005
	7.7	1,781					
07/14/08	7.0	4,006	< 0.005	6.8	< 0.25	0.067	0.020
	7.4	4,044					
09/16/08	7.8	1,557	0.002	1.3	< 0.05	0.042	0.003
	7.8	1,533					
01/14/09	8.1	1,380	0.004	1.5	< 0.05	0.053	0.004
	8.0	1,383					
05/27/09	7.3	1,907	0.003	1.9	< 0.05	0.043	0.007
	7.6	1,945					
07/28/09	7.7	1,662	0.003	1.6	< 0.05	0.033	0.004
	7.7	1,732					
09/08/09	7.8	1,665	0.003	1.9	< 0.05	0.041	0.003
	7.5	1,673					
01/11/10	7.9	1,207	0.003	1.2	0.06	0.025	0.003
	7.9	1,247					
03/23/10	7.4	3,456	< 0.005	4.8	< 0.25	0.056	0.019
	7.5	3,409					
07/14/10	7.1	3,910	< 0.005	5.7	< 0.25	0.051	0.030
	7.5	3,891					
11/17/10	9.0	1,728	0.003	1.5	< 0.05	0.041	0.003
	7.7	1,744					

Appendix F
Electrical Conductivity, pH, and Trace Elements in Central Area Drains

Station / Date	Field pH	Laboratory EC (µS/cm)	Trace Elements (mg/L) As	B	Ba	Mo	Se
HMH 7516							
01/09/06	7.3	3,258	< 0.005	6.4	< 0.25	< 0.025	0.035
	7.7	3,314					
03/23/06	7.4	3,774	< 0.005	7.2	< 0.25	< 0.025	0.051
	7.4	4,003					
05/16/06	7.0	3,147	< 0.005	6.4	< 0.25	< 0.025	0.039
	7.7	3,340					
07/17/06	7.0	3,526	< 0.010	7.1	< 0.50	< 0.050	0.036
	7.5	3,819					
09/18/06	7.0	2,969	0.001	6.7	< 0.05	< 0.005	0.023
	7.4	2,926					
11/14/06	7.3	3,189	< 0.005	6.4	< 0.25	< 0.025	0.028
	7.8	3,015					
01/16/07	7.4	2,981	< 0.005	6.3	< 0.25	< 0.025	0.032
	7.8	2,905					
04/10/07	7.4	3,910	< 0.005	6.1	< 0.25	< 0.025	0.031
	7.6	3,120					
05/09/07	7.7	3,070	< 0.005	6.6	< 0.25	< 0.025	0.035
	7.6	3,350					
07/17/07	7.1	3,912	< 0.005	7.1	< 0.25	< 0.025	0.041
	7.5	3,608					
09/11/07	7.2	3,040	< 0.005	6.6	< 0.25	< 0.025	0.025
	7.4	3,040					
11/14/07	7.4	3,165	< 0.005	6.3	< 0.25	< 0.025	0.030
	7.5	3,196					
01/14/08	7.4	3,075	< 0.005	6.1	< 0.25	< 0.025	0.035
	7.5	3,350					
03/19/08	7.3	3,686	< 0.005	6.9	< 0.25	< 0.025	0.045
	7.4	3,966					
05/12/08	7.1	3,040	< 0.005	5.2	< 0.25	< 0.025	0.021
	7.5	2,666					
07/14/08	7.1	3,038	< 0.005	6.5	< 0.25	< 0.025	0.020
	7.5	3,030					
09/16/08	7.1	3,269	< 0.005	6.7	< 0.25	< 0.025	0.031
	7.4	3,225					

Appendix F
Electrical Conductivity, pH, and Trace Elements in Central Area Drains

Station / Date	Field / Laboratory		Trace Elements (mg/L)				
	pH	EC (µS/cm)	As	B	Ba	Mo	Se
11/18/08	7.4	3,173	< 0.005	6.1	< 0.25	< 0.025	0.005
	7.7	3,096					
01/13/09	7.5	3,118	< 0.005	6.2	< 0.25	< 0.025	0.035
	7.6	3,124					
05/26/09	7.4	3,102	< 0.005	6.2	< 0.25	< 0.025	0.035
	7.5	3,093					
07/27/09	#####	3,343	< 0.005	7.0	< 0.25	< 0.025	0.043
	7.5	3,461					
09/08/09	7.1	3,736	< 0.005	7.8	< 0.25	< 0.025	0.049
	7.4	3,654					
12/28/09	7.4	3,386	< 0.005	6.0	< 0.25	< 0.025	0.038
	7.5	3,084					
01/11/10	7.6	3,441	< 0.005	6.2	< 0.25	< 0.025	0.041
	7.6	3,362					
03/23/10	7.4	3,400	< 0.005	6.1	< 0.25	< 0.025	0.040
	7.5	3,352					
07/13/10	7.0	3,561	< 0.005	6.4	< 0.25	< 0.025	0.005
	7.6	3,560					
11/17/10	9.5	3,536	< 0.005	6.5	< 0.25	< 0.025	0.035
	7.6	3,509					
OAS 0364							
03/23/06	7.7	7,080	0.005	12.8	< 0.25	0.120	0.298
	7.6	7,300					
05/17/06	7.4	7,210	< 0.010	12.8	< 0.50	0.116	0.297
	7.7	7,550					
09/19/06	7.5	3,716	< 0.005	5.2	< 0.25	0.069	0.062
	7.8	3,895					
11/14/06	7.7	7,550	< 0.010	14.0	< 0.50	0.138	0.261
	7.8	6,855					
01/16/07	7.8	4,797	0.005	6.4	< 0.25	0.070	0.115
	7.9	4,444					
04/11/07	8.4	6,950	< 0.010	13.1	< 0.50	0.116	0.250
	7.7	6,600					
05/09/07	7.7	6,800	< 0.005	14.0	< 0.25	0.114	0.265
	7.7	7,267					

Appendix F
Electrical Conductivity, pH, and Trace Elements in Central Area Drains

Station Date	Field Laboratory		Trace Elements (mg/L)				
	pH	EC (µS/cm)	As	B	Ba	Mo	Se
07/17/07	7.5 7.6	7,071 6,536	0.005	13.9	< 0.25	0.135	0.255
09/11/07	7.6 7.7	3,833 3,819	< 0.005	4.8	< 0.25	0.065	0.055
11/14/07	7.9 7.9	3,494 3,531	< 0.005	4.2	< 0.25	0.064	0.052
05/13/08	7.4 7.6	4,185 4,187	< 0.005	5.0	< 0.25	0.059	0.070
07/14/08	7.2 7.6	5,150 5,040	< 0.005	7.3	< 0.25	0.062	0.076
03/22/10	7.7 7.7	8,500 8,336	< 0.010	16.4	< 0.50	0.121	0.207
OAS 2548							
03/23/06	7.9 7.7	12,010 12,500	0.020	24.8	< 1.00	0.464	0.414
05/17/06	7.6 7.8	11,290 11,830	< 0.010	22.9	< 0.50	0.242	0.193
07/17/06	7.5 7.6	8,800 9,078	< 0.010	18.9	< 0.50	0.168	0.121
09/19/06	7.7 7.6	11,270 11,290	< 0.010	25.1	< 0.50	0.256	0.153
11/14/06	7.7 7.9	12,470 10,850	< 0.010	26.0	< 0.50	0.257	0.166
01/16/07	7.9 7.9	8,750 7,323	< 0.010	17.4	< 0.50	0.187	0.114
04/11/07	8.5 7.9	6,880 6,720	< 0.010	13.5	< 0.50	0.194	0.089
05/09/07	7.8 7.8	9,110 9,857	< 0.010	21.3	< 0.50	0.224	0.145
07/17/07	7.7 7.5	7,880 6,639	0.007	16.5	< 0.25	0.180	0.100
09/11/07	7.5 7.5	6,110 5,991	0.006	11.2	< 0.25	0.113	0.060
11/14/07	7.8 7.8	6,700 6,763	< 0.005	13.8	< 0.25	0.194	0.081

Appendix F
Electrical Conductivity, pH, and Trace Elements in Central Area Drains

Station Date	Field Laboratory		Trace Elements (mg/L)				
	pH	EC (µS/cm)	As	B	Ba	Mo	Se
03/19/08	7.0 7.7	10,780 11,460	0.006	24.1	< 0.25	0.244	0.170
05/13/08	7.4 7.6	7,660 7,656	0.006	14.0	< 0.25	0.137	0.097
07/14/08	7.2 7.6	7,510 7,316	0.005	14.3	< 0.25	0.133	0.079
09/15/08	7.2 7.6	6,330 6,181	< 0.005	9.9	< 0.25	0.138	0.071
11/17/08	7.7 7.8	7,510 7,303	0.005	14.3	< 0.25	0.204	0.098
01/13/09	7.9 7.8	6,000 5,818	0.005	11.7	< 0.25	0.184	0.063
05/26/09	7.5 7.7	10,210 9,877	< 0.010	23.1	< 0.50	0.189	0.179
07/28/09	7.6 7.7	6,520 6,722	0.006	13.5	< 0.25	0.143	0.090
09/08/09	7.5 7.6	5,160 5,010	< 0.005	10.6	< 0.25	0.104	0.052
07/13/10	8.4 7.6	9,210 9,028	< 0.010	18.8	< 0.50	0.155	0.121
11/16/10	10.0 7.8	7,120 7,094	< 0.005	13.4	< 0.25	0.168	0.070

Appendix G
Mineral Analyses of Southern Area Drains
2006-2010

Appendix G Mineral Analyses of Southern Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
BRL 2235												
09/16/08	23	19	6	13.1	211	84	< 0.1	46	332	74	748	10.8
1230	73	0.9	0.5	0.34	9	2.4	0.00	1.0	6.6		578	18.4
		9	5	3.1	84	24	0.02	10	66			
11/17/08	18	20	4	9.3	201	80	< 0.1	4	434	64	674	10.7
945	64	1.0	0.3	0.24	9	2.2	0.00	0.1	8.6		579	19.3
		10	3	2.3	85	21	0.01	1	79			
03/26/09	15	21	10	2.1	218	112	30.9	91	307	94	685	9.8
830	59	1.0	0.8	0.05	9	3.1	0.50	1.9	6.1		669	17.7
		9	7	0.5	83	27	4.28	16	52			
05/26/09	20	22	9	4.3	228	112	19.5	58	342	92	705	10.3
930	68	1.1	0.7	0.11	10	3.1	0.31	1.2	6.8		658	18.6
		9	6	0.9	84	27	2.75	11	59			
07/28/09	21	20	9	1.2	127	71	17.2	55	201	87	446	5.9
1215	70	1.0	0.7	0.03	6	2.0	0.28	1.1	4.0		421	10.1
		14	10	0.4	76	27	3.75	15	54			
09/14/09	23	70	36	2.6	371	204	43.5	258	475	323	1,290	9.0
1400	73	3.5	3.0	0.07	16	5.7	0.70	5.4	9.4		1,270	21.6
		15	13	0.3	71	27	3.30	25	44			
03/23/10	16	52	26	2.4	295	196	56.4	140	460	236	1,070	8.3
1415	61	2.6	2.1	0.06	13	5.5	0.91	2.9	9.1		1,044	19.2
		15	12	0.3	73	30	4.93	16	49			
CCN 3550												
01/25/06	15	176	59	3.9	472	317	81.9	948	315	683	2,298	7.9
930	59	8.8	4.9	0.10	21	8.9	1.32	19.7	6.3		2,247	20.4
		26	14	0.3	60	25	3.65	55	17			
03/22/06	15	236	82	3.8	562	384	90.3	1,210	312	927	2,719	8.0
1200	59	11.8	6.7	0.10	24	10.8	1.46	25.2	6.2		2,755	21.7
		27	16	0.2	57	25	3.34	58	14			
05/15/06	19	198	80	3.8	842	600	112.0	1,030	544	824	3,230	12.8
1100	66	9.9	6.6	0.10	37	16.9	1.81	21.4	10.8		3,192	35.8
		19	12	0.2	69	33	3.55	42	21			
07/18/06	22	196	65	4.0	486	332	73.0	1,040	285	757	2,282	7.7
845	72	9.8	5.3	0.10	21	9.3	1.18	21.7	5.7		2,367	20.0
		27	15	0.3	58	25	3.11	57	15			

Appendix G Mineral Analyses of Southern Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
09/20/06	22	181	60	4.2	448	280	56.9	945	286	699	2,116	7.4
1400	72	9.0	4.9	0.11	19	7.9	0.92	19.7	5.7		2,147	18.4
		27	15	0.3	58	23	2.69	58	17			
11/14/06	19	174	56	4.3	420	238	58.4	803	288	665	1,950	7.1
930	66	8.7	4.6	0.11	18	6.7	0.94	16.7	5.7		1,927	17.7
		27	15	0.3	58	22	3.13	56	19			
01/17/07	15	204	74	3.8	480	334	46.4	1,040	306	814	2,320	7.3
900	59	10.2	6.1	0.10	21	9.4	0.75	21.7	6.1		2,366	19.8
		27	16	0.3	56	25	1.98	57	16			
03/21/07	15	169	55	3.7	386	244	51.9	858	269	649	1,974	6.6
915	59	8.4	4.5	0.09	17	6.9	0.84	17.9	5.3		1,929	16.5
		28	15	0.3	56	22	2.71	58	17			
05/09/07	19	203	75	4.0	519	369	53.5	1,100	265	816	2,618	7.9
1000	66	10.1	6.2	0.10	23	10.4	0.86	22.9	5.3		2,483	20.6
		26	16	0.3	58	26	2.19	58	13			
07/17/07	23	184	62	4.6	452	323	62.8	1,020	290	715	2,350	7.4
1130	73	9.2	5.1	0.12	20	9.1	1.01	21.2	5.8		2,282	18.4
		27	15	0.3	58	24	2.73	57	16			
09/11/07	21	172	56	4.5	425	259	57.0	867	286	659	2,030	7.2
1330	70	8.6	4.6	0.12	18	7.3	0.92	18.1	5.7		2,012	18.0
		27	14	0.4	58	23	2.88	57	18			
11/15/07	20	147	46	3.7	398	239	56.0	737	302	557	1,850	7.3
1030	68	7.3	3.8	0.09	17	6.7	0.90	15.3	6.0		1,808	18.4
		26	13	0.3	61	23	3.12	53	21			
01/14/08	17	228	92	4.9	591	465	56.5	1,210	328	948	2,860	8.4
1200	63	11.4	7.6	0.13	26	13.1	0.91	25.2	6.5		2,844	22.6
		25	17	0.3	57	29	1.99	55	14			
03/13/08	16	216	83	4.8	509	405	44.6	1,120	301	881	2,540	7.5
830	61	10.8	6.8	0.12	22	11.4	0.72	23.3	6.0		2,563	20.2
		27	17	0.3	56	27	1.74	56	14			
05/13/08	17	222	80	5.4	503	400	40.2	1,120	314	884	2,550	7.4
745	63	11.1	6.6	0.14	22	11.2	0.65	23.3	6.2		2,559	19.9
		28	17	0.3	55	27	1.56	56	15			
07/14/08	22	229	81	6.5	524	407	59.6	1,190	313	903	2,800	7.6
1115	72	11.4	6.7	0.17	23	11.4	0.96	24.8	6.2		2,685	20.5
		28	16	0.4	56	26	2.22	57	14			

Appendix G Mineral Analyses of Southern Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
09/15/08	23	230	85	6.5	565	463	59.5	1,230	327	925	2,810	8.1
1200	73	11.5	7.0	0.17	25	13.0	0.96	25.6	6.5		2,835	21.8
		27	16	0.4	57	28	2.08	56	14			
11/17/08	21	228	87	7.3	561	431	57.3	1,180	330	928	3,240	8.0
1245	70	11.4	7.2	0.19	24	12.1	0.92	24.6	6.5		2,750	21.6
		26	17	0.4	57	27	2.09	56	15			
01/13/09	15	258	103	6.2	636	515	55.0	1,360	360	1,069	3,190	8.5
945	59	12.9	8.5	0.16	28	14.5	0.89	28.3	7.1		3,149	23.7
		26	17	0.3	56	28	1.75	56	14			
03/25/09	17	309	126	6.3	728	575	56.8	1,570	474	1,291	3,610	8.8
1200	63	15.4	10.4	0.16	32	16.2	0.92	32.7	9.4		3,656	24.7
		27	18	0.3	55	27	1.55	55	16			
05/26/09	21	310	131	5.1	778	628	64.2	1,620	379	1,314	3,840	9.3
1130	70	15.5	10.8	0.13	34	17.6	1.04	33.7	7.5		3,764	25.2
		26	18	0.2	56	29	1.73	56	13			
07/28/09	20	260	105	5.4	650	513	50.2	1,410	364	1,082	3,300	8.6
845	68	13.0	8.6	0.14	28	14.4	0.81	29.4	7.2		3,212	24.1
		26	17	0.3	57	28	1.56	57	14			
09/14/09	22	254	93	6.0	587	419	52.0	1,220	350	1,017	2,950	8.0
1000	72	12.7	7.6	0.15	26	11.8	0.84	25.4	6.9		2,841	22.4
		28	17	0.3	55	26	1.87	57	15			
12/15/09	18	294	127	5.0	805	561	42.4	1,480	371	1,257	3,510	9.9
1000	64	14.7	10.4	0.13	35	15.8	0.68	30.8	7.4		3,537	26.7
		24	17	0.2	58	29	1.25	56	13			
03/23/10	16	276	120	5.2	713	605	46.9	1,610	378	1,184	3,670	9.0
1000	61	13.8	9.9	0.13	31	17.0	0.76	33.5	7.5		3,603	24.4
		25	18	0.2	57	29	1.29	57	13			
07/13/10	21	310	136	5.7	901	637	46.5	1,650	389	1,334	4,100	10.7
1100	70	15.5	11.2	0.15	39	17.9	0.75	34.4	7.7		3,920	29.0
		23	17	0.2	59	29	1.24	57	13			
CNR 0801												
01/24/06	18	324	271	46.6	1,390	339	192.0	4,240	267	1,925	6,940	13.8
1345	64	16.2	22.3	1.19	60	9.5	3.10	88.3	5.3		6,963	38.6
		16	22	1.2	60	9	2.92	83	5			
03/22/06	17	353	272	45.9	1,630	373	290.0	4,420	255	2,002	7,572	15.9
745	63	17.6	22.4	1.17	71	10.5	4.68	92.0	5.1		7,537	44.4
		16	20	1.0	63	9	4.17	82	5			

Appendix G Mineral Analyses of Southern Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
05/16/06	18	338	260	44.2	1,410	333	231.0	3,930	272	1,915	6,680	14.0
730	64	16.9	21.4	1.13	61	9.4	3.73	81.8	5.4		6,709	39.3
		17	21	1.1	61	9	3.71	82	5			
07/17/06	22	349	246	44.0	1,410	339	311.0	3,920	214	1,885	6,600	14.1
1445	72	17.4	20.2	1.13	61	9.5	5.02	81.6	4.2		6,747	38.2
		17	20	1.1	61	9	5.00	81	4			
09/20/06	23	318	221	49.3	1,520	327	111.0	3,910	331	1,704	6,600	16.0
1115	73	15.9	18.2	1.26	66	9.2	1.79	81.4	6.6		6,655	46.5
		16	18	1.2	65	9	1.81	82	7			
11/13/06	22	300	200	42.6	1,320	300	200.0	3,600	280	1,573	6,056	14.5
1500	72	15.0	16.4	1.09	57	8.4	3.23	75.0	5.6		6,131	40.6
		17	18	1.2	64	9	3.50	81	6			
01/16/07	19	306	215	37.1	1,190	302	292.0	3,430	232	1,650	4,980	12.8
1500	66	15.3	17.7	0.95	52	8.5	4.71	71.4	4.6		5,911	34.4
		18	21	1.1	60	10	5.28	80	5			
03/20/07	18	352	249	40.8	1,180	298	337.0	3,450	193	1,905	6,112	11.8
1330	64	17.6	20.5	1.04	51	8.4	5.43	71.8	3.8		6,023	30.6
		19	23	1.2	57	9	6.07	80	4			
05/09/07	19	337	246	39.2	1,150	304	320.0	3,450	174	1,855	6,080	11.6
800	66	16.8	20.2	1.00	50	8.5	5.16	71.8	3.5		5,951	30.2
		19	23	1.1	57	10	5.80	81	4			
07/17/07	20	339	240	39.9	1,050	303	330.0	3,390	200	1,835	4,940	10.7
800	68	16.9	19.7	1.02	46	8.5	5.32	70.6	4.0		5,812	27.7
		20	24	1.2	55	10	6.02	80	4			
09/11/07	20	344	256	50.0	1,470	343	312.0	4,230	246	1,914	7,030	14.6
830	68	17.2	21.1	1.28	64	9.6	5.03	88.1	4.9		7,153	39.5
		17	20	1.2	62	9	4.68	82	5			
11/14/07	20	361	270	46.7	1,390	338	298.0	3,850	238	2,014	6,710	13.5
1400	68	18.0	22.2	1.19	60	9.5	4.81	80.2	4.7		6,697	36.4
		18	22	1.2	59	10	4.85	81	5			
01/14/08	19	352	277	47.8	1,580	386	327.0	4,190	255	2,020	7,410	15.3
1445	66	17.6	22.8	1.22	69	10.8	5.27	87.2	5.1		7,313	42.9
		16	21	1.1	62	10	4.86	80	5			
03/18/08	18	335	268	47.6	1,520	352	223.0	4,340	263	1,940	7,150	15.0
1330	64	16.7	22.0	1.22	66	9.9	3.60	90.4	5.2		7,243	42.1
		16	21	1.1	62	9	3.30	83	5			

Appendix G Mineral Analyses of Southern Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
05/12/08	19	374	275	44.6	1,260	335	314.0	3,870	215	2,067	6,640	12.1
1600	66	18.7	22.6	1.14	55	9.4	5.06	80.6	4.3		6,602	32.6
		19	23	1.2	56	9	5.10	81	4			
07/14/08	22	336	256	49.3	1,360	367	225.0	3,990	263	1,894	6,980	13.6
830	72	16.8	21.1	1.26	59	10.3	3.63	83.1	5.2		6,741	38.1
		17	21	1.3	60	10	3.55	81	5			
09/15/08	24	332	240	44.7	976	301	306.0	3,230	202	1,818	5,750	10.0
1045	75	16.6	19.7	1.14	42	8.5	4.93	67.2	4.0		5,551	26.9
		21	25	1.4	53	10	5.83	79	5			
11/18/08	20	357	264	48.3	1,120	317	333.0	3,500	210	1,979	6,190	11.0
1300	68	17.8	21.7	1.24	49	8.9	5.37	72.9	4.2		6,065	29.6
		20	24	1.4	54	10	5.88	80	5			
01/13/09	19	361	262	40.0	940	287	407.0	3,080	172	1,981	5,610	9.2
1400	66	18.0	21.5	1.02	41	8.1	6.56	64.1	3.4		5,480	23.9
		22	26	1.3	50	10	7.99	78	4			
03/23/09	18	365	271	45.4	1,070	318	286.0	3,333	212	2,027	5,790	10.3
1100	64	18.2	22.3	1.16	47	8.9	4.61	69.4	4.2		5,816	27.9
		21	25	1.3	53	10	5.29	80	5			
05/27/09	20	353	277	42.9	1,170	325	212.0	3,470	230	2,022	5,930	11.3
815	68	17.6	22.8	1.10	51	9.1	3.42	72.2	4.6		5,988	30.6
		19	25	1.2	55	10	3.83	81	5			
07/27/09	22	374	240	50.0	932	258	111.0	3,140	289	1,923	4,880	9.3
1345	72	18.7	19.7	1.28	41	7.2	1.79	65.4	5.7		5,278	25.9
		23	25	1.6	51	9	2.23	82	7			
09/14/09	23	298	252	58.8	1,690	376	128.0	4,170	313	1,766	7,080	17.5
1215	73	14.9	20.7	1.50	73	10.6	2.06	86.8	6.2		7,161	50.8
		13	19	1.4	66	10	1.95	82	6			
12/15/09	20	334	260	53.1	1,520	383	249.0	4,060	272	1,905	7,050	15.2
1100	68	16.7	21.4	1.36	66	10.8	4.02	84.5	5.4		7,022	42.5
		16	20	1.3	63	10	3.84	81	5			
01/12/10	20	362	277	53.0	1,500	389	250.0	4,090	267	2,045	7,260	14.4
1200	68	18.1	22.8	1.36	65	10.9	4.03	85.2	5.3		7,081	40.4
		17	21	1.3	61	10	3.82	81	5			
03/22/10	18	355	278	56.6	1,490	403	272.0	4,220	264	2,032	7,380	14.6
1400	64	17.7	22.9	1.45	65	11.3	4.39	87.9	5.2		7,233	40.8
		17	21	1.4	61	10	4.03	81	5			

Appendix G Mineral Analyses of Southern Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
11/16/10	22	367	275	60.9	1,890	475	308.0	4,840	280	2,049	8,560	18.2
930	72	18.3	22.6	1.56	82	13.3	4.97	100.8	5.6		8,384	50.9
		15	18	1.2	66	11	3.99	81	4			
COC 4126												
01/24/06	18	537	133	5.9	644	229	308.0	2,600	238	1,889	4,650	6.4
1300	64	26.8	10.9	0.15	28	6.4	4.97	54.1	4.7		4,600	17.4
		41	17	0.2	42	9	7.07	77	7			
03/22/06	17	599	188	4.7	653	201	304.0	2,680	282	2,270	4,890	6.0
830	63	29.9	15.5	0.12	28	5.6	4.90	55.8	5.6		4,799	16.7
		40	21	0.2	38	8	6.81	78	8			
05/16/06	19	618	187	3.8	575	187	285.0	2,550	274	2,314	4,572	5.2
930	66	30.8	15.4	0.10	25	5.3	4.60	53.1	5.4		4,570	14.6
		43	22	0.1	35	8	6.72	78	8			
07/17/06	22	630	132	5.7	505	303	270.0	2,220	210	2,117	4,050	4.8
1430	72	31.4	10.9	0.15	22	8.5	4.35	46.2	4.2		4,192	12.9
		49	17	0.2	34	13	6.88	73	7			
09/20/06	24	684	170	5.7	614	233	257.0	2,520	287	2,408	4,644	5.4
1030	75	34.1	14.0	0.15	27	6.5	4.14	52.5	5.7		4,656	15.2
		46	19	0.2	36	10	6.02	76	8			
11/13/06	22	601	124	6.2	431	345	231.0	2,130	243	2,012	4,122	4.2
1400	72	30.0	10.2	0.16	19	9.7	3.73	44.3	4.8		4,014	11.3
		51	17	0.3	32	15	5.95	71	8			
01/16/07	18	684	140	6.6	475	353	231.0	2,110	240	2,847	4,000	4.3
1430	64	34.1	11.5	0.17	21	9.9	3.73	43.9	4.8		4,144	11.7
		51	17	0.3	31	16	5.98	70	8			
03/20/07	18	594	149	5.4	629	240	303.0	2,480	256	2,097	4,666	6.0
1300	64	29.6	12.3	0.14	27	6.7	4.89	51.6	5.1		4,554	16.7
		43	18	0.2	39	10	7.15	76	7			
05/08/07	20	577	144	4.2	570	224	294.0	2,420	248	2,034	4,468	5.5
1415	68	28.8	11.8	0.11	25	6.3	4.74	50.4	4.9		4,382	14.9
		44	18	0.2	38	9	7.15	76	7			
07/16/07	23	554	146	5.5	616	209	258.0	2,600	287	1,985	4,140	6.0
1330	73	27.6	12.0	0.14	27	5.9	4.16	54.1	5.7		4,561	16.9
		42	18	0.2	40	8	5.96	77	8			
09/11/07	20	573	150	6.2	606	247	275.0	2,640	267	2,035	4,630	5.8
800	68	28.6	12.3	0.16	26	6.9	4.43	55.0	5.3		4,657	16.3
		42	18	0.2	39	10	6.19	77	7			

Appendix G Mineral Analyses of Southern Area Drains

Station	T	Mineral Constituents: mg/L meq/L prv								Mineral Constituents (mg/L)		
Date	°C										TDS	SAR
Time	°F	Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	TH	Sum	ASAR
11/14/07	20	595	153	6.6	643	263	265.0	2,450	249	2,116	4,600	6.1
1300	68	29.7	12.6	0.17	28	7.4	4.27	51.0	4.9		4,525	16.4
		42	18	0.2	40	11	6.32	75	7			
01/14/08	20	622	151	6.0	629	285	277.0	2,340	233	2,180	4,500	5.9
1530	68	31.0	12.4	0.15	27	8.0	4.47	48.7	4.6		4,450	15.8
		44	18	0.2	39	12	6.79	74	7			
03/18/08	18	552	167	5.2	613	176	228.0	2,670	270	2,066	4,670	5.9
1230	64	27.5	13.7	0.13	27	4.9	3.68	55.6	5.4		4,573	16.4
		40	20	0.2	39	7	5.29	80	8			
05/12/08	19	580	154	4.5	516	158	228.0	2,540	263	2,083	4,350	4.9
1430	66	28.9	12.7	0.12	22	4.4	3.68	52.9	5.2		4,338	13.8
		45	20	0.2	35	7	5.55	80	8			
07/15/08	22	570	153	5.3	573	144	209.0	2,580	300	2,050	4,730	5.5
930	72	28.4	12.6	0.14	25	4.0	3.37	53.7	6.0		4,414	15.4
		43	19	0.2	38	6	5.02	80	9			
09/15/08	24	522	142	6.7	556	195	230.0	2,530	278	1,888	4,570	5.6
1015	75	26.0	11.7	0.17	24	5.5	3.71	52.7	5.5		4,349	15.6
		42	19	0.3	39	8	5.50	78	8			
01/13/09	20	546	139	6.2	585	195	234.0	2,500	267	1,935	4,430	5.8
1230	68	27.2	11.4	0.16	25	5.5	3.77	52.1	5.3		4,365	16.2
		42	18	0.2	40	8	5.67	78	8			
03/23/09	17	569	173	6.8	615	200	233.0	2,500	289	2,133	4,730	6.1
1200	63	28.4	14.2	0.17	27	5.6	3.76	52.1	5.7		4,470	17.0
		41	20	0.3	38	8	5.59	78	9			
05/27/09	20	512	174	4.9	548	182	220.0	2,550	297	1,995	4,610	5.3
900	68	25.5	14.3	0.13	24	5.1	3.55	53.1	5.9		4,369	15.0
		40	22	0.2	37	8	5.24	78	9			
07/27/09	22	596	132	6.2	468	258	218.0	2,170	211	2,032	4,040	4.5
1230	72	29.7	10.9	0.16	20	7.2	3.52	45.2	4.2		3,975	12.2
		49	18	0.3	33	12	5.85	75	7			
09/14/09	23	608	135	6.9	542	295	224.0	2,260	205	2,074	4,370	5.2
1100	73	30.3	11.1	0.18	24	8.3	3.61	47.1	4.1		4,194	14.0
		47	17	0.3	36	13	5.73	75	6			
12/15/09	18	577	115	6.1	428	224	172.0	2,100	195	1,915	3,860	4.3
1035	64	28.8	9.5	0.16	19	6.3	2.77	43.7	3.9		3,739	11.1
		51	17	0.3	33	11	4.90	77	7			

Appendix G Mineral Analyses of Southern Area Drains

Station	T	Mineral Constituents: mg/L meq/L prv								Mineral Constituents (mg/L)		
Date	°C										TDS	SAR
Time	°F	Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	TH	Sum	ASAR
01/12/10	18	583	122	7.1	484	268	200.0	2,220	198	1,959	4,070	4.8
1100	64	29.1	10.0	0.18	21	7.5	3.23	46.2	3.9		4,003	12.4
		48	17	0.3	35	12	5.30	76	6			
07/13/10	22	560	134	6.9	658	259	228.0	2,460	213	1,950	4,630	6.5
1145	72	27.9	11.0	0.18	29	7.3	3.68	51.2	4.2		4,434	17.5
		41	16	0.3	42	11	5.54	77	6			
11/16/10	23	512	103	6.2	397	163	204.0	2,000	212	1,703	3,630	4.2
12	73	25.5	8.5	0.16	17	4.6	3.29	41.6	4.2		3,512	11.3
		50	16	0.3	34	9	6.12	78	8			
COC 8221												
01/24/06	19	384	129	13.5	761	221	135.0	2,690	174	1,490	4,454	8.6
1330	66	19.2	10.6	0.35	33	6.2	2.18	56.0	3.5		4,438	20.6
		30	17	0.5	52	9	3.21	83	5			
03/22/06	18	435	144	12.5	804	217	135.0	2,690	180	798	4,556	8.5
900	64	21.7	11.8	0.32	35	6.1	2.18	56.0	3.6		4,546	22.2
		32	17	0.5	51	9	3.21	83	5			
05/16/06	19	439	138	11.3	801	216	136.0	2,640	175	1,665	4,512	8.5
830	66	21.9	11.3	0.29	35	6.1	2.19	55.0	3.5		4,486	22.2
		32	17	0.4	51	9	3.29	82	5			
07/17/06	22	415	123	12.1	719	202	128.0	2,480	163	1,542	4,098	8.0
1400	72	20.7	10.1	0.31	31	5.7	2.06	51.6	3.2		4,177	20.7
		33	16	0.5	50	9	3.30	82	5			
09/20/06	23	432	135	12.7	756	211	126.0	2,610	168	1,635	4,400	8.1
1140	73	21.6	11.1	0.32	33	5.9	2.03	54.3	3.3		4,384	21.2
		33	17	0.5	50	9	3.10	83	5			
11/13/06	22	396	132	11.9	726	216	125.0	2,700	177	1,533	4,470	8.1
1430	72	19.8	10.9	0.30	32	6.1	2.02	56.2	3.5		4,413	21.0
		32	17	0.5	51	9	2.97	83	5			
01/16/07	20	456	149	13.1	818	218	113.0	2,660	177	1,190	4,450	8.5
1400	68	22.8	12.3	0.34	36	6.1	1.82	55.4	3.5		4,533	22.1
		32	17	0.5	50	9	2.73	83	5			
03/20/07	19	433	139	12.7	771	212	121.0	2,630	174	1,653	4,492	8.3
1245	66	21.6	11.4	0.32	34	6.0	1.95	54.8	3.5		4,423	21.5
		32	17	0.5	50	9	2.95	83	5			
05/08/07	20	400	137	12.1	786	219	125.0	2,650	173	1,563	4,656	8.7
1400	68	20.0	11.3	0.31	34	6.2	2.02	55.2	3.4		4,433	22.5
		30	17	0.5	52	9	3.02	83	5			

Appendix G Mineral Analyses of Southern Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
07/16/07	23	350	115	11.4	677	194	124.0	2,380	177	1,348	3,920	8.0
1400	73	17.5	9.5	0.29	29	5.4	2.00	49.6	3.5		3,958	19.3
		31	17	0.5	52	9	3.30	82	6			
09/11/07	20	385	140	14.1	805	227	152.0	2,750	175	1,537	4,350	8.9
745	68	19.2	11.5	0.36	35	6.4	2.45	57.3	3.5		4,578	23.2
		29	17	0.5	53	9	3.52	82	5			
11/14/07	20	395	140	13.9	801	202	133.0	2,610	177	1,562	4,450	8.8
1330	68	19.7	11.5	0.36	35	5.7	2.14	54.3	3.5		4,401	22.9
		30	17	0.5	52	9	3.27	83	5			
01/14/08	20	377	138	13.0	728	211	137.0	2,570	177	1,510	4,370	8.2
1500	68	18.8	11.3	0.33	32	5.9	2.21	53.5	3.5		4,280	21.2
		30	18	0.5	51	9	3.39	82	5			
03/18/08	19	411	143	11.9	791	194	104.0	2,790	178	1,615	4,460	8.6
1300	66	20.5	11.8	0.30	34	5.4	1.68	58.1	3.5		4,552	22.3
		31	18	0.5	51	8	2.44	84	5			
05/12/08	20	411	144	12.3	759	184	108.0	2,740	177	1,620	4,410	8.2
1445	68	20.5	11.8	0.31	33	5.2	1.74	57.0	3.5		4,465	21.3
		31	18	0.5	50	8	2.58	85	5			
07/15/08	22	398	137	15.0	730	169	125.0	2,550	175	1,558	4,640	8.1
845	72	19.9	11.3	0.38	32	4.7	2.02	53.1	3.5		4,229	20.9
		31	18	0.6	50	7	3.18	84	5			
09/15/08	24	362	142	15.2	814	202	150.0	2,700	186	1,490	4,490	9.2
945	75	18.1	11.7	0.39	35	5.7	2.42	56.2	3.7		4,497	22.0
		28	18	0.6	54	8	3.56	83	5			
11/18/08	23	370	133	15.3	766	318	133.0	2,690	181	1,472	4,640	8.7
1230	73	18.5	10.9	0.39	33	8.9	2.14	56.0	3.6		4,534	20.9
		29	17	0.6	53	13	3.03	79	5			
01/13/09	21	374	131	13.0	739	185	117.0	2,580	184	1,474	4,370	8.4
1315	70	18.7	10.8	0.33	32	5.2	1.89	53.7	3.7		4,249	20.1
		30	17	0.5	52	8	2.93	83	6			
03/23/09	18	394	143	14.0	788	213	123.0	2,690	189	1,573	4,470	8.6
1130	64	19.7	11.8	0.36	34	6.0	1.98	56.0	3.8		4,478	22.5
		30	18	0.5	52	9	2.93	83	6			
05/27/09	21	356	141	11.2	777	205	127.0	2,610	195	1,470	4,410	8.8
830	70	17.8	11.6	0.29	34	5.8	2.05	54.3	3.9		4,344	21.2
		28	18	0.5	53	9	3.10	82	6			

Appendix G Mineral Analyses of Southern Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
07/27/09	20	366	126	12.3	711	179	116.0	2,400	176	1,433	4,030	8.2
1300	68	18.3	10.4	0.31	31	5.0	1.87	50.0	3.5		4,016	19.6
		31	17	0.5	52	8	3.10	83	6			
09/14/09	23	387	130	14.1	733	182	128.0	2,350	173	1,502	4,140	8.2
1130	73	19.3	10.7	0.36	32	5.1	2.06	48.9	3.4		4,028	21.4
		31	17	0.6	51	9	3.47	82	6			
12/15/09	20	397	141	14.9	794	183	120.0	2,410	180	1,572	4,240	8.7
1120	68	19.8	11.6	0.38	35	5.1	1.94	50.2	3.6		4,168	22.7
		30	17	0.6	52	8	3.18	82	6			
01/12/10	20	372	126	13.2	713	192	119.0	2,510	180	1,448	4,230	8.2
1030	68	18.6	10.4	0.34	31	5.4	1.92	52.3	3.6		4,153	19.6
		31	17	0.6	51	9	3.04	83	6			
03/22/10	19	384	128	14.8	716	198	111.0	2,500	178	1,486	4,210	8.1
1315	66	19.2	10.5	0.38	31	5.6	1.79	52.1	3.5		4,159	19.4
		31	17	0.6	51	9	2.84	83	6			
07/13/10	23	403	140	14.8	804	204	114.0	2,540	192	1,583	4,390	8.8
1215	73	20.1	11.5	0.38	35	5.7	1.84	52.9	3.8		4,335	22.9
		30	17	0.6	52	9	2.86	82	6			
11/16/10	22	337	123	15.8	785	184	136.0	2,460	185	1,348	4,210	9.3
945	72	16.8	10.1	0.40	34	5.2	2.19	51.2	3.7		4,152	22.3
		27	16	0.7	56	8	3.52	82	6			
ERR 8429												
01/25/06	17	68	42	3.7	946	488	62.5	1,190	652	343	3,330	22.2
1000	63	3.4	3.5	0.09	41	13.7	1.01	24.8	12.9		3,191	57.8
		7	7	0.2	86	26	1.92	47	25			
03/22/06	16	82	45	6.8	918	460	72.0	1,140	595	390	3,020	20.2
1230	61	4.1	3.7	0.17	40	12.9	1.16	23.7	11.8		3,081	50.6
		9	8	0.4	83	26	2.34	48	24			
05/15/06	17	100	59	4.3	1,250	602	83.7	1,560	724	493	4,150	24.5
1045	63	5.0	4.9	0.11	54	16.9	1.35	32.5	14.4		4,093	63.7
		8	8	0.2	85	26	2.07	50	22			
07/18/06	20	84	49	3.8	1,050	498	61.8	1,210	645	412	3,280	22.5
915	68	4.2	4.0	0.10	46	14.0	1.00	25.2	12.8		3,344	58.6
		8	7	0.2	85	26	1.88	48	24			
09/20/06	22	68	40	3.9	746	375	47.5	857	643	335	2,596	17.8
1430	72	3.4	3.3	0.10	32	10.5	0.77	17.8	12.8		2,523	46.2
		9	8	0.3	83	25	1.83	43	30			

Appendix G Mineral Analyses of Southern Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
11/14/06	20	64	38	3.0	843	426	53.3	1,010	680	316	2,998	20.6
1000	68	3.2	3.1	0.08	37	12.0	0.86	21.0	13.5		2,845	53.6
		7	7	0.2	85	25	1.82	44	28			
01/17/07	18	98	63	4.1	1,390	666	53.1	1,760	695	504	4,430	26.9
930	64	4.9	5.2	0.10	60	18.7	0.86	36.6	13.8		4,451	72.8
		7	7	0.1	86	27	1.22	52	20			
03/21/07	16	121	82	4.9	1,820	960	50.6	2,630	667	640	6,132	31.3
945	61	6.0	6.7	0.13	79	27.0	0.82	54.8	13.2		6,069	87.7
		7	7	0.1	86	28	0.85	57	14			
05/09/07	19	84	52	3.9	1,130	544	72.4	1,350	691	424	3,792	23.9
1100	66	4.2	4.3	0.10	49	15.3	1.17	28.1	13.7		3,651	62.1
		7	7	0.2	85	26	2.00	48	24			
07/17/07	21	92	58	4.0	1,290	706	40.9	1,910	597	469	4,510	25.9
1200	70	4.6	4.8	0.10	56	19.8	0.66	39.8	11.8		4,459	64.9
		7	7	0.2	86	28	0.91	55	16			
09/11/07	19	63	38	3.5	886	379	60.7	871	660	314	2,640	21.8
1400	66	3.1	3.1	0.09	39	10.6	0.98	18.1	13.1		2,697	56.6
		7	7	0.2	86	25	2.28	42	31			
11/15/07	21	43	26	3.6	558	220	71.5	369	720	214	1,780	16.6
1100	70	2.1	2.1	0.09	24	6.2	1.15	7.7	14.3		1,723	39.8
		7	7	0.3	85	21	3.94	26	49			
01/14/08	18	57	32	3.1	696	303	69.3	661	730	274	2,300	18.3
1130	64	2.8	2.6	0.08	30	8.5	1.12	13.8	14.5		2,259	45.7
		8	7	0.2	84	22	2.95	36	38			
03/19/08	17	68	42	2.5	857	372	62.8	883	724	343	2,760	20.2
900	63	3.4	3.5	0.06	37	10.4	1.01	18.4	14.4		2,722	52.4
		8	8	0.1	84	24	2.29	42	32			
05/13/08	18	72	44	37.0	868	433	60.6	1,050	712	361	2,970	19.9
830	64	3.6	3.6	0.95	38	12.2	0.98	21.9	14.1		2,992	51.7
		8	8	2.1	82	25	1.99	44	29			
07/14/08	22	80	45	4.9	875	382	52.7	1,020	658	385	3,000	19.4
1130	72	4.0	3.7	0.13	38	10.7	0.85	21.2	13.1		2,854	50.5
		9	8	0.3	83	23	1.85	46	28			
09/15/08	24	46	24	3.4	522	217	80.8	366	694	214	1,770	15.5
1230	75	2.3	2.0	0.09	23	6.1	1.30	7.6	13.8		1,676	37.3
		8	7	0.3	84	21	4.53	26	48			

Appendix G Mineral Analyses of Southern Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
01/14/09	17	44	27	3.6	552	216	96.3	358	743	220	1,800	16.2
1015	63	2.2	2.2	0.09	24	6.1	1.55	7.5	14.7		1,743	38.8
		8	8	0.3	84	20	5.21	25	49			
03/25/09	18	47	24	3.0	614	234	47.9	489	686	216	1,750	18.2
1245	64	2.3	2.0	0.08	27	6.6	0.77	10.2	13.6		1,871	43.6
		8	6	0.2	86	21	2.48	33	44			
05/27/09	20	85	50	3.6	963	457	51.8	1,200	650	418	3,250	20.5
1100	68	4.2	4.1	0.09	42	12.8	0.84	25.0	12.9		3,200	53.3
		8	8	0.2	83	25	1.62	48	25			
07/28/09	19	80	44	3.6	867	382	52.7	973	652	381	2,830	19.3
940	66	4.0	3.6	0.09	38	10.7	0.85	20.3	12.9		2,794	50.3
		9	8	0.2	83	24	1.90	45	29			
09/14/09	23	44	25	3.3	509	173	99.1	274	687	213	1,600	15.2
1030	73	2.2	2.1	0.08	22	4.9	1.60	5.7	13.6		1,540	36.5
		8	8	0.3	84	19	6.20	22	53			
12/15/09	19	50	27	3.3	550	183	88.4	301	690	234	1,630	15.6
1200	66	2.5	2.2	0.08	24	5.1	1.43	6.3	13.7		1,617	37.4
		9	8	0.3	83	19	5.37	24	52			
03/23/10	17	46	25	3.4	481	189	90.6	308	648	218	1,620	14.2
1100	63	2.3	2.1	0.09	21	5.3	1.46	6.4	12.9		1,532	34.0
		9	8	0.3	82	20	5.61	25	49			
07/13/10	21	72	37	4.1	754	310	58.3	740	672	331	2,380	18.0
1320	70	3.6	3.0	0.10	33	8.7	0.94	15.4	13.3		2,378	46.9
		9	8	0.3	83	23	2.45	40	35			
ERR 8641												
01/25/06	17	282	292	19.8	2,850	1,420	9.2	5,800	588	1,907	10,880	28.4
1030	63	14.1	24.0	0.51	124	39.9	0.15	120.8	11.7		11,026	88.1
		9	15	0.3	76	23	0.09	70	7			
03/22/06	17	368	402	22.6	3,510	1,620	35.0	7,290	686	2,575	14,240	30.1
1245	63	18.4	33.1	0.58	153	45.5	0.56	151.8	13.6		13,659	102.4
		9	16	0.3	75	22	0.27	72	6			
05/15/06	17	335	367	18.9	3,420	1,590	16.8	6,920	655	2,348	13,360	30.7
1030	63	16.7	30.2	0.48	149	44.7	0.27	144.1	13.0		13,061	98.3
		9	15	0.2	76	22	0.13	71	6			
07/18/06	19	316	306	18.1	3,000	1,350	17.7	5,920	545	2,050	11,030	28.9
930	66	15.8	25.2	0.46	130	37.9	0.29	123.3	10.8		11,255	89.4
		9	15	0.3	76	22	0.17	72	6			

Appendix G Mineral Analyses of Southern Area Drains

Station Date Time	T °C °F	Mineral Constituents: mg/L meq/L prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS Sum	SAR ASAR
09/20/06	20	313	332	19.4	2,970	1,320	16.8	6,100	598	2,149	11,710	27.9
1500	68	15.6	27.3	0.50	129	37.1	0.27	127.0	11.9		11,430	86.5
		9	16	0.3	75	21	0.15	72	7			
11/14/06	19	153	100	11.7	1,380	748	0.8	2,400	477	773	5,116	21.3
1030	66	7.6	8.2	0.30	60	21.0	0.01	50.0	9.5		5,080	57.6
		10	11	0.4	79	26	0.02	62	12			
01/17/07	17	262	274	16.5	2,460	1,160	7.9	4,760	562	1,783	9,020	25.4
945	63	13.1	22.5	0.42	107	32.6	0.13	99.1	11.2		9,278	78.6
		9	16	0.3	75	23	0.09	69	8			
03/21/07	15	333	352	20.2	3,120	1,370	12.1	6,230	669	2,281	11,900	28.4
1030	59	16.6	28.9	0.52	136	38.5	0.20	129.7	13.3		11,839	91.0
		9	16	0.3	75	21	0.11	71	7			
05/08/07	19	292	333	19.6	3,050	1,430	11.0	6,140	643	2,101	12,320	29.0
1115	66	14.6	27.4	0.50	133	40.2	0.18	127.8	12.8		11,661	92.7
		8	16	0.3	76	22	0.10	71	7			
07/17/07	20	208	199	13.4	1,910	981	9.6	4,070	489	1,339	7,190	22.7
1230	68	10.4	16.4	0.34	83	27.6	0.15	84.7	9.7		7,684	63.6
		9	15	0.3	75	23	0.13	69	8			
09/11/07	22	122	59	8.3	662	284	8.4	1,090	310	548	2,350	12.3
1430	72	6.1	4.9	0.21	29	8.0	0.14	22.7	6.2		2,420	30.8
		15	12	0.5	72	22	0.37	61	17			
11/15/07	19	248	302	21.0	2,840	1,330	7.5	5,570	603	1,863	10,860	28.6
1130	66	12.4	24.8	0.54	123	37.4	0.12	116.0	12.0		10,680	88.8
		8	15	0.3	77	23	0.07	70	7			
01/14/08	18	388	320	20.9	2,870	1,880	2.2	4,970	980	2,287	11,100	26.1
1115	64	19.4	26.3	0.53	125	52.8	0.04	103.5	19.4		11,039	86.2
		11	15	0.3	73	30	0.02	59	11			
03/19/08	15	65	35	6.8	557	317	5.9	818	305	306	2,030	13.9
915	59	3.2	2.9	0.17	24	8.9	0.10	17.0	6.1		1,988	31.9
		11	9	0.6	79	28	0.30	53	19			
05/13/08	17	286	312	20.2	2,810	1,380	4.6	5,950	633	1,999	11,120	27.4
845	63	14.3	25.7	0.52	122	38.8	0.07	123.9	12.6		11,143	87.6
		9	16	0.3	75	22	0.04	71	7			
07/14/08	24	85	40	6.5	430	245	7.4	717	273	377	1,760	9.6
1145	75	4.2	3.3	0.17	19	6.9	0.12	14.9	5.4		1,695	21.2
		16	12	0.6	71	25	0.44	55	20			

Appendix G Mineral Analyses of Southern Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
09/15/08	22	243	275	20.0	2,500	1,280	3.2	5,050	564	1,740	9,700	26.1
1245	72	12.1	22.6	0.51	109	36.0	0.05	105.1	11.2		9,710	80.9
		8	16	0.4	76	24	0.03	69	7			
11/17/08	21	242	288	21.1	2,600	1,270	3.8	5,240	568	1,791	10,300	26.8
1215	70	12.1	23.7	0.54	113	35.7	0.06	109.1	11.3		10,006	82.9
		8	16	0.4	76	23	0.04	70	7			
01/14/09	17	238	261	17.4	2,420	1,230	3.7	4,970	570	1,669	9,600	25.8
1045	63	11.9	21.5	0.45	105	34.6	0.06	103.5	11.3		9,482	79.9
		9	15	0.3	76	23	0.04	69	8			
03/25/09	18	252	307	22.1	2,710	1,310	4.2	5,200	575	1,894	9,130	27.1
1300	64	12.6	25.2	0.57	118	36.8	0.07	108.3	11.4		10,150	84.0
		8	16	0.4	75	24	0.04	69	7			
05/27/09	20	245	309	17.9	2,930	1,420	3.5	5,580	598	1,885	10,870	29.4
1100	68	12.2	25.4	0.46	127	39.9	0.06	116.2	11.9		10,864	91.1
		7	15	0.3	77	24	0.03	69	7			
07/28/09	19	211	269	16.5	2,490	1,250	2.9	5,050	550	1,635	9,820	26.8
915	66	10.5	22.1	0.42	108	35.1	0.05	105.1	10.9		9,619	83.1
		7	16	0.3	77	23	0.03	70	7			
09/14/09	21	196	197	16.1	1,830	878	5.0	3,510	456	1,301	7,180	22.1
1045	70	9.8	16.2	0.41	80	24.7	0.08	73.1	9.0		6,906	61.9
		9	15	0.4	75	23	0.08	68	8			
12/15/09	20	167	135	12.0	1,270	599	4.9	2,240	434	973	4,960	17.7
1220	68	8.3	11.1	0.31	55	16.8	0.08	46.6	8.6		4,688	47.9
		11	15	0.4	74	23	0.11	65	12			
03/23/10	18	183	168	16.1	1,610	816	8.6	3,270	448	1,149	6,480	20.7
1115	64	9.1	13.8	0.41	70	22.9	0.14	68.1	8.9		6,341	57.9
		10	15	0.4	75	23	0.14	68	9			
GSY 0935												
11/15/07	21	41	20	2.8	351	117	84.5	340	407	184	1,270	11.2
1200	70	2.0	1.6	0.07	15	3.3	1.36	7.1	8.1		1,201	24.7
		11	9	0.4	80	17	6.88	36	41			
01/14/08	17	44	24	3.2	435	134	83.3	389	439	209	1,410	13.1
1100	63	2.2	2.0	0.08	19	3.8	1.34	8.1	8.7		1,376	28.8
		9	9	0.4	82	17	6.13	37	40			
03/19/08	16	47	23	2.7	353	117	59.6	398	394	212	1,280	10.6
945	61	2.3	1.9	0.07	15	3.3	0.96	8.3	7.8		1,237	23.2
		12	10	0.4	78	16	4.72	41	38			

Appendix G Mineral Analyses of Southern Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
05/13/08	18	34	20	2.3	397	134	64.5	380	454	167	1,380	13.4
930	64	1.7	1.6	0.06	17	3.8	1.04	7.9	9.0		1,304	28.1
		8	8	0.3	84	17	4.79	36	41			
07/14/08	22	39	21	3.0	428	134	66.2	424	458	185	1,470	13.7
1200	72	1.9	1.7	0.08	19	3.8	1.07	8.8	9.1		1,390	28.9
		9	8	0.3	83	17	4.69	39	40			
09/15/08	25	46	25	3.5	470	180	63.3	519	471	218	1,700	13.9
1300	77	2.3	2.1	0.09	20	5.1	1.02	10.8	9.3		1,589	30.5
		9	8	0.4	82	19	3.89	41	36			
11/17/08	22	49	27	4.2	478	168	61.9	519	461	234	1,670	13.6
1200	72	2.4	2.2	0.11	21	4.7	1.00	10.8	9.1		1,584	30.0
		10	9	0.4	81	18	3.89	42	36			
01/14/09	17	31	18	2.7	410	139	63.2	380	463	153	1,390	14.5
1115	63	1.5	1.5	0.07	18	3.9	1.02	7.9	9.2		1,322	30.4
		7	7	0.3	85	18	4.63	36	42			
03/25/09	17	130	62	6.7	494	203	89.7	890	365	581	2,170	8.9
1230	63	6.5	5.1	0.17	21	5.7	1.45	18.5	7.2		2,094	22.3
		20	15	0.5	65	17	4.39	56	22			
05/27/09	19	46	25	2.8	414	144	81.3	418	440	220	1,470	12.2
1300	66	2.3	2.1	0.07	18	4.0	1.31	8.7	8.7		1,395	26.9
		10	9	0.3	80	18	5.75	38	38			
07/28/09	19	33	21	2.6	475	171	72.7	408	513	169	1,560	15.9
1015	66	1.6	1.7	0.07	21	4.8	1.17	8.5	10.2		1,491	35.0
		7	7	0.3	86	19	4.76	34	41			
09/14/09	23	35	20	3.1	492	166	69.5	420	504	170	1,600	16.4
1100	73	1.7	1.6	0.08	21	4.7	1.12	8.7	10.0		1,508	36.2
		7	7	0.3	86	19	4.57	36	41			
12/15/09	20	50	28	3.7	618	219	70.2	581	522	240	1,900	17.4
1240	68	2.5	2.3	0.09	27	6.2	1.13	12.1	10.4		1,883	39.9
		8	7	0.3	85	21	3.81	41	35			
03/23/10	18	32	17	3.1	400	158	52.7	333	458	152	1,340	14.2
1200	64	1.6	1.4	0.08	17	4.4	0.85	6.9	9.1		1,271	28.4
		8	7	0.4	85	21	3.99	33	43			
07/13/10	22	44	24	3.7	527	193	64.4	471	529	206	1,680	16.0
1400	72	2.2	1.9	0.09	23	5.4	1.04	9.8	10.5		1,644	36.8
		8	7	0.3	84	20	3.88	37	39			

Appendix G Mineral Analyses of Southern Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
GSY0935												
03/23/10	18	32	17	3.1	400	158	52.7	333	458	152	1,340	14.2
1200	64	1.6	1.4	0.08	17	4.4	0.85	6.9	9.1		1,271	
		8	7	0.4	85	21	3.99	33	43			
07/13/10	22	44	24	3.7	527	193	64.4	471	529	206	1,680	16.0
1400	72	2.2	1.9	0.09	23	5.4	1.04	9.8	10.5		1,644	
		8	7	0.3	84	20	3.88	37	39			
HCH 7841												
01/25/06	15	123	106	8.2	1,670	1,430	128.0	1,930	611	744	5,880	26.7
845	59	6.1	8.7	0.21	73	40.2	2.06	40.2	12.1		5,762	72.0
		7	10	0.2	83	42	2.18	43	13			
03/22/06	16	156	144	7.7	2,250	1,820	164.0	2,600	581	983	7,504	31.2
1115	61	7.8	11.8	0.20	98	51.1	2.64	54.1	11.5		7,490	87.5
		7	10	0.2	83	43	2.21	45	10			
05/15/06	17	157	141	6.6	2,260	1,860	148.0	2,720	581	973	7,588	31.5
1130	63	7.8	11.6	0.17	98	52.2	2.39	56.6	11.5		7,641	88.3
		7	10	0.1	83	43	1.94	46	9			
07/18/06	24	66	22	6.3	365	229	114.0	406	266	255	1,371	9.9
800	75	3.3	1.8	0.16	16	6.4	1.84	8.5	5.3		1,368	20.9
		16	9	0.8	75	29	8.36	38	24			
09/20/06	21	69	59	4.9	1,090	755	56.8	1,290	388	415	3,610	23.3
1315	70	3.4	4.9	0.13	47	21.2	0.92	26.9	7.7		3,558	53.6
		6	9	0.2	85	37	1.62	47	14			
11/14/06	19	30	16	3.8	374	239	23.0	337	283	141	1,204	13.7
830	66	1.5	1.3	0.10	16	6.7	0.37	7.0	5.6		1,193	26.1
		8	7	0.5	85	34	1.88	36	28			
01/17/07	6	34	17	3.4	344	200	8.5	272	279	155	1,060	12.0
830	43	1.7	1.4	0.09	15	5.6	0.14	5.7	5.5		1,046	24.0
		9	8	0.5	82	33	0.81	33	33			
03/21/07	15	82	54	5.6	1,010	735	75.4	1,160	388	427	3,414	21.3
815	59	4.1	4.4	0.14	44	20.6	1.22	24.2	7.7		3,355	48.9
		8	8	0.3	84	38	2.26	45	14			
05/09/07	19	86	70	4.8	1,230	866	54.8	1,390	406	503	4,192	23.9
915	66	4.3	5.8	0.12	53	24.3	0.88	28.9	8.1		3,945	59.7
		7	9	0.2	84	39	1.42	47	13			

Appendix G Mineral Analyses of Southern Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
07/17/07	23	97	70	7.2	1,210	1,000	114.0	1,510	433	531	4,380	22.9
1015	73	4.8	5.8	0.18	53	28.1	1.84	31.4	8.6		4,268	57.2
		8	9	0.3	83	40	2.63	45	12			
09/11/07	19	81	67	7.0	1,260	890	110.0	1,370	431	478	3,910	25.1
1300	66	4.0	5.5	0.18	55	25.0	1.77	28.5	8.6		4,044	60.2
		6	9	0.3	85	39	2.78	45	13			
11/15/07	20	62	65	4.4	1,240	850	62.0	1,370	419	423	3,930	26.3
1000	68	3.1	5.3	0.11	54	23.9	1.00	28.5	8.3		3,905	63.0
		5	9	0.2	86	39	1.62	46	13			
01/14/08	18	66	62	3.8	1,080	751	40.6	1,310	390	420	3,570	22.9
1245	64	3.3	5.1	0.10	47	21.1	0.65	27.3	7.7		3,547	52.8
		6	9	0.2	85	37	1.15	48	14			
03/19/08	13	67	45	7.0	929	698	136.0	1,010	390	353	3,120	21.5
800	55	3.3	3.7	0.18	40	19.6	2.19	21.0	7.7		3,126	49.5
		7	8	0.4	85	39	4.34	42	15			
05/13/08	17	133	120	8.3	1,640	1,470	102.0	2,110	511	826	6,110	24.8
730	63	6.6	9.9	0.21	71	41.3	1.64	43.9	10.1		5,890	69.5
		8	11	0.2	81	43	1.70	45	10			
07/14/08	22	74	54	7.1	959	679	102.0	1,150	388	407	3,400	20.7
1045	72	3.7	4.4	0.18	42	19.1	1.64	23.9	7.7		3,258	49.7
		7	9	0.4	83	36	3.14	46	15			
09/15/08	23	62	56	6.2	979	729	86.8	1,200	396	385	3,550	21.7
1130	73	3.1	4.6	0.16	43	20.5	1.40	25.0	7.9		3,357	47.8
		6	9	0.3	84	37	2.56	46	14			
11/17/08	21	56	59	7.1	1,060	736	49.5	1,260	392	383	3,500	23.6
1300	70	2.8	4.9	0.18	46	20.7	0.80	26.2	7.8		3,463	51.9
		5	9	0.3	85	37	1.44	47	14			
01/14/09	15	51	62	4.5	1,140	801	37.5	1,370	415	384	3,790	25.4
900	59	2.5	5.1	0.12	50	22.5	0.60	28.5	8.2		3,715	58.4
		4	9	0.2	86	38	1.01	48	14			
03/25/09	17	79	62	4.9	1,020	687	34.9	1,220	386	453	3,300	20.9
1115	63	3.9	5.1	0.13	44	19.3	0.56	25.4	7.7		3,339	48.0
		7	10	0.2	83	36	1.06	48	14			
05/27/09	19	63	65	3.2	1,100	766	38.3	1,360	392	425	3,720	23.2
1045	66	3.1	5.3	0.08	48	21.5	0.62	28.3	7.8		3,631	53.4
		6	9	0.1	85	37	1.06	49	13			

Appendix G Mineral Analyses of Southern Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
07/28/09	22	70	64	4.2	1,090	758	34.7	1,350	385	438	3,600	22.7
815	72	3.5	5.3	0.11	47	21.3	0.56	28.1	7.6		3,602	52.1
		6	9	0.2	84	37	0.97	49	13			
09/14/09	22	78	82	4.9	1,440	935	43.0	1,600	403	533	4,240	27.2
915	72	3.9	6.7	0.13	63	26.3	0.69	33.3	8.0		4,425	67.9
		5	9	0.2	85	38	1.02	49	12			
12/15/09	14	62	53	5.1	890	598	56.8	892	353	370	2,720	20.1
1310	57	3.1	4.4	0.13	39	16.8	0.92	18.6	7.0		2,769	46.1
		7	9	0.3	84	39	2.12	43	16			
03/22/10	16	83	70	7.8	1,220	963	144.0	1,320	482	497	4,130	23.9
1030	61	4.1	5.8	0.20	53	27.1	2.32	27.5	9.6		4,097	57.3
		7	9	0.3	84	41	3.50	41	14			
07/14/10	21	105	87	6.6	1,530	1,060	98.8	1,720	454	619	4,770	26.8
1000	70	5.2	7.1	0.17	67	29.8	1.59	35.8	9.0		4,879	66.9
		7	9	0.2	84	39	2.09	47	12			
LME 7569												
03/21/06	14	12	2	2.1	197	58	12.3	32	343	38	589	13.9
1230	57	0.6	0.2	0.05	9	1.6	0.20	0.7	6.8		521	20.8
		6	2	0.6	91	18	2.13	7	73			
07/17/06	26	10	2	9.6	7	4	0.2	5	50	33	94	0.5
915	79	0.5	0.2	0.25	0	0.1	0.00	0.1	1.0		68	0.3
		41	14	20.2	25	9	0.27	9	82			
09/19/06	26	37	9	16.2	193	46	4.2	216	267	129	802	7.4
1320	79	1.8	0.7	0.41	8	1.3	0.07	4.5	5.3		682	14.0
		16	6	3.6	74	12	0.61	40	47			
03/20/07	14	25	10	45.3	190	67	2.2	22	507	104	741	8.1
830	57	1.2	0.8	1.16	8	1.9	0.04	0.5	10.1		666	17.1
		11	7	10.1	72	15	0.29	4	81			
07/16/07	25	9	2	5.2	20	8	10.4	6	57	31	123	1.6
845	77	0.4	0.2	0.13	1	0.2	0.17	0.1	1.1		95	1.1
		28	10	8.2	54	14	10.17	8	69			
09/10/07	24	8	3	20.4	196	59	0.3	9	396	32	574	15.0
900	75	0.4	0.2	0.52	9	1.7	0.00	0.2	7.9		533	19.5
		4	3	5.4	88	17	0.05	2	81			
11/15/07	17	37	18	91.0	147	61	17.5	76	539	167	852	5.0
1500	63	1.8	1.5	2.33	6	1.7	0.28	1.6	10.7		771	11.4
		15	12	19.3	53	12	1.98	11	75			

Appendix G Mineral Analyses of Southern Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
05/13/08	19	3	1	1.7	166	50	0.4	6	308	10	482	21.2
1030	66	0.1	0.1	0.04	7	1.4	0.01	0.1	6.1		413	21.2
		2	1	0.6	96	18	0.08	2	80			
LNW 5467												
01/24/06	18	476	196	2.5	3,030	2,240	269.0	5,540	104	1,996	11,760	29.5
1100	64	23.8	16.1	0.06	132	62.9	4.34	115.3	2.1		11,816	70.9
		14	9	0.0	77	34	2.35	62	1			
03/21/06	18	511	229	<2.5	3,460	2,310	286.0	5,750	110	2,219	12,220	32.0
1615	64	25.5	18.8	0.06	150	64.9	4.61	119.7	2.2		12,615	76.7
		13	10	0.0	77	34	2.41	63	1			
05/16/06	19	502	237	<5.0	3,880	2,570	369.0	6,810	113	2,230	14,310	35.8
1230	66	25.0	19.5	0.13	169	72.2	5.95	141.8	2.2		14,441	85.8
		12	9	0.1	79	32	2.68	64	1			
07/17/06	22	515	197	<2.5	3,040	1,940	243.0	5,610	109	2,098	11,328	28.9
1230	72	25.7	16.2	0.06	132	54.5	3.92	116.8	2.2		11,613	69.3
		15	9	0.0	76	31	2.21	66	1			
09/19/06	24	478	190	<2.5	2,840	1,920	190.0	5,570	95	1,976	11,120	27.8
1045	75	23.9	15.6	0.06	123	53.9	3.06	116.0	1.9		11,248	64.0
		15	10	0.0	76	31	1.75	66	1			
11/13/06	22	506	200	<2.5	2,980	1,860	194.0	5,480	111	2,087	11,090	28.4
1230	72	25.2	16.4	0.06	130	52.2	3.13	114.1	2.2		11,289	68.1
		15	10	0.0	76	30	1.82	66	1			
01/16/07	19	551	212	<2.5	3,040	1,950	208.0	5,290	108	2,249	9,820	27.9
1215	66	27.5	17.4	0.06	132	54.8	3.35	110.1	2.1		11,318	67.0
		16	10	0.0	75	32	1.97	65	1			
03/20/07	18	520	202	<2.5	2,950	2,170	248.0	5,280	106	2,131	11,590	27.8
1130	64	25.9	16.6	0.06	128	61.0	4.00	109.9	2.1		11,436	66.8
		15	10	0.0	75	34	2.26	62	1			
05/08/07	20	448	123	<2.5	1,910	895	137.0	4,320	99	1,625	8,256	20.6
1200	68	22.4	10.1	0.06	83	25.1	2.21	89.9	2.0		7,895	47.4
		19	9	0.1	72	21	1.85	75	2			
07/16/07	24	539	209	2.7	3,160	2,630	279.0	5,470	111	2,210	9,190	29.3
1200	75	26.9	17.2	0.07	137	73.9	4.50	113.9	2.2		12,356	70.3
		15	9	0.0	76	38	2.31	59	1			
09/11/07	21	556	220	2.6	3,500	2,700	290.0	5,740	109	2,295	12,240	31.8
1100	70	27.7	18.1	0.07	152	75.8	4.68	119.5	2.2		13,074	76.3
		14	9	0.0	77	38	2.31	59	1			

Appendix G Mineral Analyses of Southern Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
11/15/07	22	524	209	2.9	3,040	2,400	260.0	5,340	107	2,169	11,810	28.4
830	72	26.1	17.2	0.07	132	67.4	4.19	111.2	2.1		11,840	68.2
		15	10	0.0	75	36	2.27	60	1			
01/15/08	19	457	126	1.5	1,940	865	156.0	4,220	97	1,660	7,880	20.7
900	66	22.8	10.4	0.04	84	24.3	2.52	87.9	1.9		7,824	47.7
		19	9	0.0	72	21	2.16	75	2			
03/18/08	18	573	233	<5.0	3,340	2,460	226.0	5,370	105	2,391	11,990	29.7
1100	64	28.6	19.2	0.13	145	69.1	3.64	111.8	2.1		12,270	71.4
		15	10	0.1	75	37	1.95	60	1			
05/12/08	20	574	225	2.8	3,060	2,550	227.0	5,530	106	2,360	12,070	27.4
1115	68	28.6	18.5	0.07	133	71.6	3.66	115.1	2.1		12,232	65.8
		16	10	0.0	74	37	1.90	60	1			
07/15/08	23	535	219	5.7	3,110	2,590	261.0	5,460	110	2,240	12,540	28.6
1030	73	26.7	18.0	0.15	135	72.8	4.21	113.7	2.2		12,247	68.6
		15	10	0.1	75	38	2.18	59	1			
09/16/08	26	548	226	3.9	3,190	2,580	268.0	5,590	107	2,300	12,860	29.0
930	79	27.3	18.6	0.10	139	72.5	4.32	116.4	2.1		12,470	69.5
		15	10	0.1	75	37	2.21	60	1			
11/18/08	23	523	212	7.9	2,860	2,190	244.0	5,510	104	2,179	11,920	26.7
1030	73	26.1	17.4	0.20	124	61.5	3.93	114.7	2.1		11,609	64.0
		16	10	0.1	74	34	2.16	63	1			
01/13/09	19	484	199	5.6	2,990	2,270	244.0	5,560	106	2,028	12,010	28.9
1030	66	24.2	16.4	0.14	130	63.8	3.93	115.8	2.1		11,816	69.4
		14	10	0.1	76	34	2.12	62	1			
03/25/09	19	559	225	8.4	3,240	2,380	266.0	5,460	106	2,323	12,000	29.3
1000	66	27.9	18.5	0.21	141	66.9	4.29	113.7	2.1		12,202	70.2
		15	10	0.1	75	36	2.29	61	1			
05/26/09	22	541	237	3.0	3,560	2,550	271.0	5,760	107	2,327	12,950	32.1
1340	72	27.0	19.5	0.08	155	71.6	4.37	119.9	2.1		12,986	77.1
		13	10	0.0	77	36	2.21	61	1			
07/27/09	24	497	234	2.9	3,660	2,640	274.0	6,000	109	2,205	13,780	33.9
1100	75	24.8	19.2	0.07	159	74.2	4.42	124.9	2.2		13,373	81.4
		12	9	0.0	78	36	2.15	61	1			
09/16/09	23	523	247	4.4	3,960	2,440	282.0	6,680	106	2,323	14,300	35.8
930	73	26.1	20.3	0.11	172	68.5	4.55	139.1	2.1		14,200	85.8
		12	9	0.1	79	32	2.12	65	1			

Appendix G Mineral Analyses of Southern Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
12/16/09	20	489	206	2.0	3,170	1,780	229.0	5,650	104	2,070	12,030	30.3
1100	68	24.4	16.9	0.05	138	50.0	3.69	117.6	2.1		11,588	72.8
		14	9	0.0	77	29	2.13	68	1			
01/12/10	19	479	196	2.9	3,100	1,950	240.0	5,870	105	2,004	12,060	30.1
1315	66	23.9	16.1	0.07	135	54.8	3.87	122.2	2.1		11,901	72.4
		14	9	0.0	77	30	2.12	67	1			
03/22/10	18	502	218	2.4	3,340	2,570	275.0	5,670	108	2,152	12,510	31.3
1130	64	25.0	17.9	0.06	145	72.2	4.43	118.1	2.1		12,642	75.2
		13	10	0.0	77	37	2.25	60	1			
07/14/10	24	530	250	3.3	3,820	2,740	301.0	6,450	114	2,353	15,110	34.3
1200	75	26.4	20.6	0.08	166	77.0	4.85	134.3	2.3		14,163	82.3
		12	10	0.0	78	35	2.22	61	1			
11/16/10	22	476	210	4.3	3,800	2,160	290.0	6,640	111	2,054	13,250	36.5
1045	72	23.8	17.3	0.11	165	60.7	4.68	138.2	2.2		13,647	87.6
		12	8	0.1	80	29	2.27	67	1			
LNW 6459												
05/16/06	19	742	318	<10.0	8,040	9,420	108.0	7,150	168	3,163	26,020	62.2
1315	66	37.0	26.2	0.26	350	264.6	1.74	148.9	3.3		25,889	174.3
		9	6	0.1	85	63	0.42	36	1			
07/17/06	22	792	387	7.0	10,000	12,400	139.0	8,090	160	3,572	31,100	72.8
1200	72	39.5	31.8	0.18	435	348.3	2.24	168.4	3.2		31,911	203.9
		8	6	0.0	86	67	0.43	32	1			
09/19/06	22	644	764	10.5	19,900	24,100	165.0	14,600	165	4,714	56,300	125.6
1010	72	32.1	62.8	0.27	865	677.0	2.66	304.0	3.3		60,283	376.9
		3	7	0.0	90	69	0.27	31	0			
11/13/06	21	645	379	6.2	8,950	9,850	187.0	8,810	164	3,172	27,920	69.2
1145	70	32.2	31.2	0.16	389	276.7	3.02	183.4	3.3		28,926	193.7
		7	7	0.0	86	59	0.65	39	1			
03/20/07	19	959	370	6.2	7,470	10,000	86.4	5,230	143	3,919	23,800	51.9
1100	66	47.9	30.4	0.16	325	280.9	1.39	108.9	2.8		24,207	140.2
		12	8	0.0	81	71	0.35	28	1			
05/08/07	20	647	333	<5.0	6,400	7,360	141.0	6,320	142	2,987	21,000	51.0
1130	68	32.3	27.4	0.13	278	206.7	2.27	131.6	2.8		21,291	137.6
		10	8	0.0	82	60	0.66	38	1			
03/18/08	15	531	323	7.7	6,120	7,060	226.0	5,370	144	2,656	21,380	51.7
1030	59	26.5	26.6	0.20	266	198.3	3.64	111.8	2.9		19,724	139.6
		8	8	0.1	83	63	1.15	35	1			

Appendix G Mineral Analyses of Southern Area Drains

Station Date Time	T °C °F	Mineral Constituents: mg/L meq/L prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS Sum	SAR ASAR
09/16/08	26	542	331	8.1	6,050	6,740	253.0	7,190	132	2,716	22,360	50.5
900	79	27.0	27.2	0.21	263	189.3	4.08	149.7	2.6		21,193	136.4
		9	9	0.1	83	55	1.18	43	1			
LNW 6467												
05/08/07	20	605	253	<2.5	3,470	3,780	163.0	4,820	120	2,553	12,970	29.9
1230	68	30.2	20.8	0.06	151	106.2	2.63	100.4	2.4		13,166	77.7
		15	10	0.0	75	50	1.24	47	1			
07/16/07	24	599	261	2.4	3,770	4,130	171.0	5,120	130	2,571	11,310	32.4
1230	75	29.9	21.5	0.06	164	116.0	2.76	106.6	2.6		14,131	87.4
		14	10	0.0	76	51	1.21	47	1			
09/11/07	21	640	298	3.2	4,060	4,540	201.0	5,410	129	2,826	14,760	33.2
1130	70	31.9	24.5	0.08	177	127.5	3.24	112.6	2.6		15,230	89.8
		14	11	0.0	76	52	1.32	46	1			
11/15/07	22	646	303	2.8	3,960	4,350	180.0	5,180	128	2,861	14,550	32.2
900	72	32.2	24.9	0.07	172	122.2	2.90	107.8	2.5		14,699	87.0
		14	11	0.0	75	52	1.23	46	1			
01/15/08	19	641	310	2.9	3,780	4,260	202.0	5,050	126	2,878	14,190	30.7
930	66	32.0	25.5	0.07	164	119.7	3.26	105.1	2.5		14,322	82.8
		14	11	0.0	74	52	1.41	46	1			
03/18/08	19	620	300	<5.0	3,970	4,600	159.0	5,480	126	2,784	14,630	32.8
1115	66	30.9	24.7	0.13	173	129.2	2.56	114.1	2.5		15,210	88.4
		14	11	0.1	76	52	1.03	46	1			
05/12/08	21	644	316	2.9	4,130	4,740	160.0	5,600	127	2,910	15,430	33.3
1300	70	32.1	26.0	0.07	180	133.1	2.58	116.6	2.5		15,669	90.0
		14	11	0.0	76	52	1.01	46	1			
07/15/08	23	632	322	8.8	4,360	5,080	218.0	5,690	130	2,905	16,830	35.2
1100	73	31.5	26.5	0.23	190	142.7	3.52	118.5	2.6		16,389	95.1
		13	11	0.1	76	53	1.32	44	1			
09/16/08	25	610	356	5.4	4,650	5,600	241.0	5,890	130	2,989	17,740	37.0
1000	77	30.4	29.3	0.14	202	157.3	3.89	122.6	2.6		17,430	100.0
		12	11	0.1	77	55	1.36	43	1			
11/18/08	23	678	423	8.8	5,020	5,720	208.0	5,390	129	3,435	18,500	37.3
1100	73	33.8	34.8	0.23	218	160.7	3.35	112.2	2.6		17,525	100.7
		12	12	0.1	76	58	1.20	40	1			
01/13/09	20	661	396	9.2	5,130	6,240	197.0	5,870	131	3,281	18,090	39.0
1100	68	33.0	32.6	0.24	223	175.3	3.18	122.2	2.6		18,582	105.3
		11	11	0.1	77	58	1.05	40	1			

Appendix G Mineral Analyses of Southern Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
03/25/09	19	713	406	11.6	4,890	5,240	208.0	5,550	130	2,794	16,930	36.2
1015	66	35.6	33.4	0.30	213	147.2	3.35	115.6	2.6		17,097	97.8
		13	12	0.1	75	55	1.25	43	1			
05/26/09	21	691	444	3.9	5,390	6,440	256.0	6,080	130	3,553	19,290	39.4
1400	70	34.5	36.5	0.10	234	180.9	4.13	126.6	2.6		19,383	106.3
		11	12	0.0	77	58	1.31	40	1			
07/27/09	24	706	449	4.2	5,810	6,800	275.0	6,260	137	3,612	20,680	42.1
1115	75	35.2	36.9	0.11	253	191.0	4.43	130.3	2.7		20,386	113.6
		11	11	0.0	78	58	1.35	40	1			
09/14/09	23	716	422	7.1	5,980	6,730	268.0	6,220	149	3,526	20,700	43.8
1000	73	35.7	34.7	0.18	260	189.0	4.32	129.5	3.0		20,433	118.4
		11	10	0.1	79	58	1.33	40	1			
12/16/09	17	416	138	7.5	2,290	1,650	114.0	3,580	196	1,607	8,420	24.9
1045	63	20.8	11.3	0.19	100	46.3	1.84	74.5	3.9		8,313	64.6
		16	9	0.1	76	37	1.45	59	3			
07/14/10	22	724	443	5.1	6,110	6,820	269.0	6,300	139	3,633	16,580	44.1
1300	72	36.1	36.4	0.13	266	191.6	4.34	131.2	2.8		20,755	119.2
		11	11	0.0	79	58	1.32	40	1			
VGD 3906												
03/21/06	16	412	371	2.9	4,400	657	44.4	10,400	328	2,557	16,050	37.9
1415	61	20.6	30.5	0.07	191	18.5	0.72	216.5	6.5		16,484	117.4
		8	13	0.0	79	8	0.30	89	3			
05/15/06	16	408	445	<5.0	5,090	824	41.5	11,800	313	2,852	18,220	41.5
830	61	20.4	36.6	0.13	221	23.1	0.67	245.7	6.2		18,801	128.6
		7	13	0.0	79	8	0.24	89	2			
07/17/06	19	442	449	4.9	5,080	862	37.9	12,200	390	2,953	18,720	40.7
1030	66	22.1	36.9	0.13	221	24.2	0.61	254.0	7.7		19,310	126.2
		8	13	0.0	79	8	0.21	89	3			
09/19/06	20	369	426	4.2	5,760	874	32.7	12,400	299	2,676	19,160	48.5
1230	68	18.4	35.0	0.11	250	24.6	0.53	258.2	5.9		20,045	145.4
		6	12	0.0	82	8	0.18	89	2			
11/13/06	20	361	515	5.7	5,840	1,040	30.3	13,500	328	3,023	20,870	46.2
945	68	18.0	42.4	0.15	254	29.2	0.49	281.1	6.5		21,489	143.4
		6	13	0.0	81	9	0.15	89	2			
01/16/07	13	163	166	3.0	1,800	373	34.6	3,930	398	1,091	6,690	23.7
1015	55	8.1	13.7	0.08	78	10.5	0.56	81.8	7.9		6,708	64.1
		8	14	0.1	78	10	0.55	81	8			

Appendix G Mineral Analyses of Southern Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
03/20/07	16	398	510	5.6	5,510	967	22.6	13,000	304	3,094	20,030	43.1
900	61	19.9	41.9	0.14	240	27.2	0.36	270.7	6.0		20,596	133.7
		7	14	0.0	79	9	0.12	89	2			
05/08/07	18	434	176	<2.5	2,230	286	26.3	5,850	241	1,809	9,064	22.8
1000	64	21.7	14.5	0.06	97	8.0	0.42	121.8	4.8		9,149	61.6
		16	11	0.0	73	6	0.31	90	4			
07/16/07	21	358	375	3.9	4,640	786	36.6	11,400	303	2,439	12,040	40.9
1000	70	17.9	30.8	0.10	202	22.1	0.59	237.4	6.0		17,781	118.6
		7	12	0.0	81	8	0.22	89	2			
09/10/07	18	345	494	7.5	5,670	1,120	38.9	13,500	321	2,896	18,030	45.9
1030	64	17.2	40.6	0.19	247	31.5	0.63	281.1	6.4		21,368	142.2
		6	13	0.1	81	10	0.20	88	2			
11/15/07	19	338	541	6.8	5,820	1,070	20.7	13,900	329	3,072	21,450	45.7
1430	66	16.9	44.5	0.17	253	30.1	0.33	289.4	6.5		21,894	141.7
		5	14	0.1	80	9	0.10	89	2			
01/15/08	17	381	538	6.1	5,590	1,030	37.7	13,700	316	3,167	20,650	43.2
1145	63	19.0	44.2	0.16	243	28.9	0.61	285.2	6.3		21,472	134.1
		6	14	0.1	79	9	0.19	89	2			
03/18/08	16	411	352	<2.5	3,730	620	65.1	9,620	300	2,476	14,540	32.6
845	61	20.5	28.9	0.06	162	17.4	1.05	200.3	6.0		14,981	91.4
		10	14	0.0	77	8	0.47	89	3			
05/12/08	17	381	366	5.6	4,270	635	29.4	10,200	319	2,459	16,080	37.5
900	63	19.0	30.1	0.14	186	17.8	0.47	212.4	6.3		16,078	108.7
		8	13	0.1	79	8	0.20	90	3			
07/15/08	20	84	72	1.6	940	150	20.5	2,000	383	506	3,590	18.2
730	68	4.2	5.9	0.04	41	4.2	0.33	41.6	7.6		3,498	43.6
		8	12	0.1	80	8	0.61	77	14			
09/16/08	21	257	264	4.7	3,020	504	28.9	7,510	339	1,730	11,640	31.6
1130	70	12.8	21.7	0.12	131	14.2	0.47	156.4	6.7		11,792	91.7
		8	13	0.1	79	8	0.26	88	4			
11/17/08	20	384	218	5.2	2,460	373	92.4	6,590	320	1,857	9,680	24.9
1115	68	19.2	17.9	0.13	107	10.5	1.49	137.2	6.3		10,315	72.1
		13	12	0.1	74	7	0.96	88	4			
01/14/09	17	310	304	6.4	3,880	614	40.4	9,760	324	2,026	15,010	37.5
1230	63	15.5	25.0	0.16	169	17.2	0.65	203.2	6.4		15,109	108.8
		7	12	0.1	81	8	0.29	89	3			

Appendix G Mineral Analyses of Southern Area Drains

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03/26/09	15	63	59	1.8	783	124	9.7	1,320	516	398	2,650	17.0
1030	59	3.1	4.9	0.05	34	3.5	0.16	27.5	10.2		2,670	42.6
		7	12	0.1	81	8	0.38	66	25			
05/26/09	20	63	60	1.4	722	130	7.8	1,120	533	403	2,460	15.6
1040	68	3.1	4.9	0.04	31	3.7	0.13	23.3	10.6		2,424	40.6
		8	12	0.1	79	10	0.33	62	28			
07/28/09	18	279	348	5.2	3,910	694	17.0	9,290	343	2,130	14,400	36.9
1045	64	13.9	28.6	0.13	170	19.5	0.27	193.4	6.8		14,749	107.0
		7	13	0.1	80	9	0.12	88	3			
09/14/09	20	344	508	11.1	6,630	1,050	14.8	14,400	355	2,951	22,800	53.1
1245	68	17.2	41.8	0.28	288	29.5	0.24	299.8	7.0		23,171	164.7
		5	12	0.1	83	9	0.07	89	2			
12/16/09	18	300	352	5.1	4,250	717	20.8	9,630	364	2,199	15,390	39.5
1230	64	15.0	28.9	0.13	185	20.1	0.34	200.5	7.2		15,493	114.4
		7	13	0.1	81	9	0.15	88	3			
03/23/10	18	339	416	6.6	4,780	830	18.6	11,830	366	2,560	18,330	41.1
1300	64	16.9	34.2	0.17	208	23.3	0.30	246.3	7.3		18,440	127.5
		7	13	0.1	80	8	0.11	89	3			
07/14/10	19	367	487	9.5	5,710	896	13.7	12,400	429	2,922	19,340	46.0
1315	66	18.3	40.0	0.24	248	25.2	0.22	258.2	8.5		20,141	147.2
		6	13	0.1	81	9	0.08	88	3			
11/16/10	19	298	389	8.0	4,970	807	16.5	11,100	368	2,346	18,060	44.7
1240	66	14.9	32.0	0.20	216	22.7	0.27	231.1	7.3		17,809	129.5
		6	12	0.1	82	9	0.10	88	3			
VGD 4406												
01/25/06	17	394	213	2.7	2,780	372	82.5	7,450	299	1,861	11,640	28.1
1245	63	19.7	17.5	0.07	121	10.4	1.33	155.1	5.9		11,474	78.5
		12	11	0.0	76	6	0.77	90	3			
03/21/06	17	398	594	4.2	6,270	1,130	63.1	14,500	361	3,440	22,840	46.5
1400	63	19.9	48.8	0.11	273	31.7	1.02	301.9	7.2		23,176	144.3
		6	14	0.0	80	9	0.30	88	2			
05/15/06	17	424	596	<10.0	6,470	1,140	68.9	14,500	359	3,514	22,130	47.5
900	63	21.2	49.0	0.26	281	32.0	1.11	301.9	7.1		23,424	147.3
		6	14	0.1	80	9	0.32	88	2			
07/17/06	19	420	304	2.5	4,150	568	80.2	9,570	298	2,301	14,840	37.7
1015	66	21.0	25.0	0.06	180	16.0	1.29	199.3	5.9		15,274	105.5
		9	11	0.0	80	7	0.58	90	3			

Appendix G Mineral Analyses of Southern Area Drains

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09/19/06	21	378	580	4.4	6,340	1,260	64.8	15,200	328	3,333	22,920	47.8
1240	70	18.9	47.7	0.11	276	35.4	1.04	316.5	6.5		24,024	148.2
		6	14	0.0	81	10	0.29	88	2			
11/13/06	20	424	935	7.5	9,130	1,800	53.9	20,500	415	4,910	31,740	56.7
2006	68	21.2	76.9	0.19	397	50.6	0.87	426.8	8.2		33,099	192.9
		4	16	0.0	80	10	0.18	88	2			
01/16/07	17	387	593	4.5	6,170	1,190	66.5	14,800	369	3,409	18,090	46.0
1000	63	19.3	48.8	0.12	268	33.4	1.07	308.1	7.3		23,432	142.6
		6	14	0.0	80	10	0.31	88	2			
03/20/07	15	439	243	<2.5	3,260	383	65.6	7,930	285	2,097	11,390	31.0
915	59	21.9	20.0	0.06	142	10.8	1.06	165.1	5.7		12,494	86.8
		12	11	0.0	77	6	0.58	90	3			
05/08/07	16	376	281	<2.5	3,550	522	62.6	9,100	304	2,096	15,030	33.8
945	61	18.8	23.1	0.06	154	14.7	1.01	189.5	6.0		14,077	97.9
		10	12	0.0	79	7	0.48	90	3			
07/16/07	20	346	637	5.1	6,760	1,370	43.1	16,400	382	3,488	23,000	49.8
945	68	17.3	52.4	0.13	294	38.5	0.70	341.5	7.6		25,790	154.5
		5	14	0.0	81	10	0.18	88	2			
09/10/07	21	380	772	7.9	7,920	1,590	38.7	18,700	399	4,129	23,340	53.7
1015	70	19.0	63.5	0.20	344	44.7	0.62	389.3	7.9		29,648	177.1
		4	15	0.0	81	10	0.14	88	2			
11/15/07	20	387	850	7.3	7,930	1,660	36.1	19,400	414	4,467	30,660	51.7
1300	68	19.3	69.9	0.19	345	46.6	0.58	403.9	8.2		30,519	175.6
		4	16	0.0	79	10	0.13	88	2			
01/15/08	17	397	160	2.0	1,960	258	61.1	5,160	265	1,650	8,130	21.0
1200	63	19.8	13.2	0.05	85	7.2	0.99	107.4	5.3		8,157	58.8
		17	11	0.0	72	6	0.81	89	4			
03/18/08	16	378	310	<5.0	3,920	527	51.0	9,640	300	2,221	14,860	36.2
830	61	18.9	25.5	0.13	170	14.8	0.82	200.7	6.0		15,011	101.4
		9	12	0.1	79	7	0.37	90	3			
05/12/08	17	374	413	5.6	4,700	733	44.8	11,100	343	2,635	17,780	39.9
845	63	18.7	34.0	0.14	204	20.6	0.72	231.1	6.8		17,576	123.6
		7	13	0.1	79	8	0.28	89	3			
07/15/08	21	397	155	5.5	1,800	193	72.0	4,830	345	1,630	7,840	19.4
745	70	19.8	12.7	0.14	78	5.4	1.16	100.6	6.8		7,660	56.3
		18	11	0.1	71	5	1.02	88	6			

Appendix G Mineral Analyses of Southern Area Drains

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09/16/08	21	370	258	3.7	3,240	445	69.6	8,550	303	1,987	13,130	31.6
1145	70	18.5	21.2	0.09	141	12.5	1.12	178.0	6.0		13,118	91.8
		10	12	0.1	78	6	0.57	90	3			
11/17/08	20	389	797	14.9	7,890	1,660	54.5	18,800	404	4,253	27,220	52.7
1100	68	19.4	65.5	0.38	343	46.6	0.88	391.4	8.0		29,848	179.1
		5	15	0.1	80	10	0.20	88	2			
01/14/09	17	336	400	7.5	4,290	787	53.9	10,400	357	2,487	16,840	37.5
1245	63	16.8	32.9	0.19	187	22.1	0.87	216.5	7.1		16,489	108.6
		7	14	0.1	79	9	0.35	88	3			
03/26/09	16	393	491	8.4	5,210	825	66.4	11,800	353	3,004	18,330	41.4
1045	61	19.6	40.4	0.21	227	23.2	1.07	245.7	7.0		19,006	128.3
		7	14	0.1	79	8	0.39	89	3			
05/26/09	18	370	688	6.8	6,730	1,290	58.1	15,700	395	3,757	20,060	47.8
1020	64	18.5	56.6	0.17	293	36.2	0.94	326.9	7.8		25,080	148.2
		5	15	0.0	80	10	0.25	88	2			
07/28/09	18	390	203	2.2	2,420	304	62.4	5,820	347	1,810	9,710	24.8
1115	64	19.5	16.7	0.06	105	8.5	1.01	121.2	6.9		9,410	71.8
		14	12	0.0	74	6	0.73	88	5			
09/14/09	21	403	376	4.6	4,190	616	54.7	9,060	344	2,555	16,000	36.1
1300	70	20.1	30.9	0.12	182	17.3	0.88	188.6	6.8		14,911	111.9
		9	13	0.1	78	8	0.41	88	3			
12/16/09	17	339	550	8.6	6,220	1,240	22.7	14,200	348	3,112	22,030	48.5
1245	63	16.9	45.2	0.22	270	34.8	0.37	295.6	6.9		22,789	150.5
		5	14	0.1	81	10	0.11	88	2			
03/23/10	16	372	257	3.3	3,170	463	60.1	7,920	360	1,988	12,440	31.0
1320	61	18.6	21.1	0.08	138	13.0	0.97	164.9	7.1		12,461	89.8
		10	12	0.0	78	7	0.52	89	4			
07/14/10	21	369	495	6.2	5,570	977	66.0	12,500	354	2,960	19,530	44.6
1330	70	18.4	40.7	0.16	242	27.4	1.06	260.3	7.0		20,196	138.2
		6	14	0.1	80	9	0.36	88	2			
11/16/10	20	345	579	8.3	7,030	1,320	58.8	16,200	398	3,246	23,680	53.7
1030	68	17.2	47.6	0.21	306	37.1	0.95	337.3	7.9		25,780	166.5
		5	13	0.1	82	10	0.25	88	2			
VGD 4806												
01/25/06	17	285	521	5.1	3,450	1,060	62.0	8,990	432	2,858	14,650	28.1
1300	63	14.2	42.8	0.13	150	29.8	1.00	187.2	8.6		14,632	89.9
		7	21	0.1	72	13	0.44	83	4			

Appendix G Mineral Analyses of Southern Area Drains

Station	T	Mineral Constituents: mg/L meq/L prv								Mineral Constituents (mg/L)		
Date	°C									TH	TDS	SAR
Time	°F	Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk		Sum	ASAR
03/21/06	16	364	743	5.8	4,690	1,320	45.5	11,200	446	3,969	18,140	32.4
1330	61	18.2	61.1	0.15	204	37.1	0.73	233.2	8.8		18,636	103.7
		6	22	0.1	72	13	0.26	83	3			
05/15/06	18	268	402	<5.0	2,410	789	44.3	5,930	422	2,325	9,968	21.8
845	64	13.4	33.1	0.13	105	22.2	0.71	123.5	8.4		10,102	65.3
		9	22	0.1	69	14	0.46	80	5			
07/17/06	20	386	793	6.3	5,210	1,460	37.5	13,000	443	4,230	20,500	34.9
1000	68	19.3	65.2	0.16	227	41.0	0.60	270.7	8.8		21,159	118.6
		6	21	0.1	73	13	0.19	84	3			
09/19/06	21	376	772	6.0	4,990	1,400	34.6	12,300	413	4,119	19,410	33.9
1250	70	18.8	63.5	0.15	217	39.3	0.56	256.1	8.2		20,126	115.1
		6	21	0.1	72	13	0.18	84	3			
11/13/06	20	381	799	6.7	5,340	1,460	34.0	12,800	454	4,242	20,480	35.7
1015	68	19.0	65.7	0.17	232	41.0	0.55	266.5	9.0		21,093	121.4
		6	21	0.1	73	13	0.17	84	3			
01/16/07	16	368	684	5.1	4,420	1,270	33.9	11,100	449	3,736	14,830	31.5
945	61	18.4	56.3	0.13	192	35.7	0.55	231.1	8.9		18,150	100.7
		7	21	0.0	72	13	0.20	84	3			
03/20/07	16	383	860	6.8	5,640	1,600	18.0	13,900	439	4,499	22,320	36.6
930	61	19.1	70.7	0.17	245	44.9	0.29	289.4	8.7		22,671	124.5
		6	21	0.1	73	13	0.08	84	3			
05/08/07	17	357	828	6.7	5,440	1,640	19.6	14,200	392	4,302	23,650	36.1
930	63	17.8	68.1	0.17	237	46.1	0.32	295.6	7.8		22,727	119.2
		6	21	0.1	73	13	0.09	85	2			
07/16/07	23	275	456	3.8	3,250	942	20.6	8,250	428	2,565	9,560	27.9
930	73	13.7	37.5	0.10	141	26.5	0.33	171.8	8.5		13,454	89.4
		7	19	0.1	73	13	0.16	83	4			
09/10/07	21	254	476	5.4	3,710	1,040	23.9	9,240	408	2,595	13,100	31.7
1000	70	12.7	39.1	0.14	161	29.2	0.39	192.4	8.1		14,994	101.5
		6	18	0.1	76	13	0.17	84	4			
11/15/07	20	236	431	4.6	3,270	872	18.1	7,680	407	2,365	12,690	29.3
1330	68	11.8	35.4	0.12	142	24.5	0.29	159.9	8.1		12,756	87.8
		6	19	0.1	75	13	0.15	83	4			
01/15/08	13	195	364	3.7	2,640	770	22.8	6,070	397	1,990	10,730	25.8
1215	55	9.7	29.9	0.09	115	21.6	0.37	126.4	7.9		10,304	74.8
		6	19	0.1	74	14	0.24	81	5			

Appendix G Mineral Analyses of Southern Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
03/18/08	15	136	20	8.0	331	-	-	-	-	422	1,900	7.0
815	59	6.8	1.6	0.20	14	-	-	-	-		-	
		29	7	0.9	62	-	-	-	-			
05/12/08	17	307	642	8.4	4,690	1,200	15.6	10,900	438	3,411	18,000	35.0
830	63	15.3	52.8	0.21	204	33.7	0.25	226.9	8.7		18,026	111.9
		6	19	0.1	75	13	0.09	84	3			
07/15/08	19	315	686	10.4	4,890	1,360	19.5	12,600	447	3,612	19,520	35.4
800	66	15.7	56.4	0.27	213	38.2	0.31	262.3	8.9		20,149	113.4
		6	20	0.1	75	12	0.10	85	3			
09/16/08	21	263	647	14.8	5,070	1,320	15.7	12,000	427	3,322	19,660	38.3
1200	70	13.1	53.2	0.38	220	37.1	0.25	249.8	8.5		19,587	122.6
		5	19	0.1	77	13	0.09	85	3			
11/17/08	20	232	578	11.6	4,600	1,060	13.8	9,720	431	2,959	17,510	36.8
1045	68	11.6	47.5	0.30	200	29.8	0.22	202.4	8.6		16,474	117.8
		4	18	0.1	77	12	0.09	84	4			
01/14/09	17	212	546	9.3	4,370	1,230	11.3	10,900	445	2,777	17,310	36.1
1300	63	10.6	44.9	0.24	190	34.6	0.18	226.9	8.8		17,546	115.5
		4	18	0.1	77	13	0.07	84	3			
03/26/09	16	255	657	10.8	4,350	1,140	11.7	10,100	450	3,343	16,710	32.8
1015	61	12.7	54.0	0.28	189	32.0	0.19	210.3	8.9		16,795	104.8
		5	21	0.1	74	13	0.08	84	4			
05/26/09	19	247	641	7.1	4,530	1,070	11.1	9,570	439	3,257	16,010	34.6
1000	66	12.3	52.7	0.18	197	30.1	0.18	199.3	8.7		16,340	110.6
		5	20	0.1	75	13	0.08	84	4			
07/28/09	18	284	772	8.9	5,390	1,340	41.3	12,500	446	3,888	20,770	37.6
1100	64	14.2	63.5	0.23	234	37.6	0.67	260.3	8.8		20,604	120.4
		5	20	0.1	75	12	0.22	85	3			
09/14/09	22	255	662	8.3	4,730	1,230	7.7	10,800	435	3,363	18,400	35.5
1330	72	12.7	54.4	0.21	206	34.6	0.12	224.9	8.6		17,954	113.6
		5	20	0.1	75	13	0.05	84	3			
12/16/09	18	219	637	7.8	4,950	1,320	5.6	11,600	448	3,171	19,010	38.3
1230	64	10.9	52.4	0.20	215	37.1	0.09	241.5	8.9		19,008	122.5
		4	19	0.1	77	13	0.03	84	3			
03/23/10	17	243	697	8.8	5,300	1,410	5.7	12,400	456	3,478	19,880	39.1
1330	63	12.1	57.3	0.23	230	39.6	0.09	258.2	9.0		20,338	125.2
		4	19	0.1	77	13	0.03	84	3			

Appendix G Mineral Analyses of Southern Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
11/16/10	20	272	850	15.1	7,400	1,820	4.5	16,600	448	4,180	24,560	49.8
1255	68	13.6	69.9	0.39	322	51.1	0.07	345.6	8.9		27,230	169.4
		3	17	0.1	79	13	0.02	85	2			
VGD 5412												
03/21/06	16	327	273	3.1	3,150	522	15.4	7,290	344	1,941	11,520	31.1
1315	61	16.3	22.5	0.08	137	14.7	0.25	151.8	6.8		11,787	90.3
		9	13	0.0	78	8	0.14	87	4			
05/15/06	16	402	294	<5.0	3,890	591	23.6	8,900	404	2,215	14,170	36.0
745	61	20.1	24.2	0.13	169	16.6	0.38	185.3	8.0		14,348	108.0
		9	11	0.1	79	8	0.18	88	4			
07/17/06	24	252	203	3.1	2,430	453	23.1	5,470	358	1,465	8,780	27.6
945	75	12.6	16.7	0.08	106	12.7	0.37	113.9	7.1		9,049	74.6
		9	12	0.1	78	9	0.28	85	5			
07/16/07	24	191	115	2.2	1,690	313	22.1	4,060	352	885	6,610	23.9
915	75	9.5	9.5	0.06	73	8.8	0.36	84.5	7.0		6,605	62.0
		10	10	0.1	79	9	0.35	84	7			
11/15/07	19	373	245	3.7	3,510	531	12.4	8,280	396	1,941	12,950	34.7
1400	66	18.6	20.1	0.09	153	14.9	0.20	172.4	7.9		13,193	100.6
		10	11	0.0	80	8	0.10	88	4			
01/15/08	16	208	167	2.7	2,270	445	19.8	5,120	429	1,210	8,560	28.4
1130	61	10.4	13.7	0.07	99	12.5	0.32	106.6	8.5		8,490	79.6
		8	11	0.1	80	10	0.25	83	7			
03/18/08	16	389	266	<5.0	3,480	524	13.8	8,560	405	2,067	13,230	33.3
800	61	19.4	21.9	0.13	151	14.7	0.22	178.2	8.0		13,481	100.0
		10	11	0.1	79	7	0.11	89	4			
05/12/08	17	411	341	5.8	4,060	619	14.1	9,660	413	2,431	15,240	35.8
815	63	20.5	28.0	0.15	177	17.4	0.23	201.1	8.2		15,359	107.5
		9	12	0.1	78	8	0.10	89	4			
07/15/08	19	399	427	10.7	4,120	824	22.2	10,300	428	2,750	16,370	34.2
715	66	19.9	35.1	0.27	179	23.1	0.36	214.4	8.5		16,360	109.4
		8	15	0.1	76	9	0.15	87	3			
09/16/08	21	401	471	13.6	4,670	951	23.7	11,300	436	2,941	17,490	37.5
1115	70	20.0	38.7	0.35	203	26.7	0.38	235.3	8.7		18,092	120.0
		8	15	0.1	77	10	0.14	87	3			
11/17/08	20	432	578	16.8	5,390	1,110	25.9	13,100	442	3,459	20,600	39.9
1030	68	21.6	47.5	0.43	234	31.2	0.42	272.7	8.8		20,918	127.7
		7	16	0.1	77	10	0.13	87	3			

Appendix G Mineral Analyses of Southern Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
01/14/09	17	393	547	9.5	4,980	1,170	27.5	12,600	464	3,233	19,300	38.1
1215	63	19.6	45.0	0.24	217	32.9	0.44	262.3	9.2		20,005	122.0
		7	16	0.1	77	11	0.15	86	3			
03/26/09	16	390	504	13.1	4,880	961	23.0	11,200	468	3,050	17,830	38.5
945	61	19.5	41.4	0.34	212	27.0	0.37	233.2	9.3		18,252	123.1
		7	15	0.1	78	10	0.14	86	3			
05/28/09	18	419	689	8.8	5,770	1,190	25.3	13,900	486	3,883	19,000	40.3
945	64	20.9	56.7	0.23	251	33.4	0.41	289.4	9.6		22,294	129.0
		6	17	0.1	76	10	0.12	87	3			
07/28/09	19	433	773	10.4	5,900	1,320	25.8	14,300	480	4,264	23,280	39.3
1130	66	21.6	63.6	0.27	257	37.1	0.42	297.7	9.5		23,050	133.7
		6	19	0.1	75	11	0.12	86	3			
09/14/09	22	428	745	13.2	6,740	1,400	26.2	15,200	475	4,137	24,400	45.6
1215	72	21.4	61.3	0.34	293	39.3	0.42	316.5	9.4		24,837	155.1
		6	16	0.1	78	11	0.12	87	3			
12/16/09	19	339	343	4.6	4,020	718	44.9	9,000	484	2,259	14,750	36.8
1215	66	16.9	28.2	0.12	175	20.2	0.72	187.4	9.6		14,760	110.5
		8	13	0.1	79	9	0.33	86	4			
03/23/10	17	377	371	5.5	4,150	778	29.5	10,100	448	2,470	16,130	36.4
1345	63	18.8	30.5	0.14	180	21.9	0.48	210.3	8.9		16,080	109.1
		8	13	0.1	78	9	0.20	87	4			
07/14/10	20	381	546	9.0	5,340	1,020	31.6	11,900	481	3,200	18,700	41.1
1415	68	19.0	44.9	0.23	232	28.7	0.51	247.8	9.5		19,516	131.5
		6	15	0.1	78	10	0.18	86	3			
11/16/10	20	379	683	13.0	6,840	1,480	37.3	16,000	487	3,760	23,300	48.6
1015	68	18.9	56.2	0.33	297	41.6	0.60	333.1	9.7		25,725	155.4
		5	15	0.1	80	11	0.16	87	3			
VGD 5509												
01/25/06	17	259	194	2.8	1,460	276	91.6	3,700	307	1,446	6,128	16.7
1345	63	12.9	16.0	0.07	63	7.8	1.48	77.0	6.1		6,168	45.1
		14	17	0.1	69	8	1.60	83	7			
03/21/06	16	308	257	2.5	1,620	343	85.0	4,410	325	1,828	6,940	16.5
1300	61	15.4	21.1	0.06	70	9.6	1.37	91.8	6.4		7,221	47.8
		14	20	0.1	66	9	1.25	84	6			
05/15/06	17	339	323	<5.0	1,990	474	76.8	5,170	384	2,177	8,412	18.6
815	63	16.9	26.6	0.13	87	13.3	1.24	107.6	7.6		8,608	53.8
		13	20	0.1	66	10	0.95	83	6			

Appendix G Mineral Analyses of Southern Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
07/17/06	20	363	369	3.8	2,240	587	71.9	5,880	361	2,426	9,520	19.8
915	68	18.1	30.3	0.10	97	16.5	1.16	122.4	7.2		9,731	57.4
		12	21	0.1	67	11	0.79	83	5			
09/19/06	21	333	367	3.7	2,080	576	75.2	5,500	376	2,343	7,924	18.7
1200	70	16.6	30.2	0.09	90	16.2	1.21	114.5	7.5		9,161	54.3
		12	22	0.1	66	12	0.87	82	5			
11/13/06	20	337	430	4.9	2,740	697	66.1	6,780	445	2,613	11,220	23.3
915	68	16.8	35.4	0.13	119	19.6	1.07	141.2	8.8		11,322	74.7
		10	21	0.1	69	11	0.62	83	5			
01/16/07	12	397	455	3.9	1,970	699	33.9	5,610	423	2,865	7,830	16.0
915	54	19.8	37.4	0.10	86	19.6	0.55	116.8	8.4		9,423	51.3
		14	26	0.1	60	14	0.38	80	6			
03/20/07	16	386	439	3.6	2,000	677	38.5	5,770	379	2,772	9,792	16.5
845	61	19.3	36.1	0.09	87	19.0	0.62	120.1	7.5		9,542	51.3
		14	25	0.1	61	13	0.42	82	5			
05/08/07	18	294	309	3.4	1,790	487	54.5	5,050	381	2,007	8,960	17.4
900	64	14.7	25.4	0.09	78	13.7	0.88	105.1	7.6		8,217	50.4
		12	22	0.1	66	11	0.69	83	6			
07/16/07	21	318	407	4.3	2,160	645	72.6	5,610	435	2,470	8,010	18.9
900	70	15.9	33.5	0.11	94	18.1	1.17	116.8	8.6		9,478	56.8
		11	23	0.1	66	13	0.81	81	6			
09/10/07	21	343	421	7.0	2,300	618	84.2	6,020	457	2,591	8,980	19.7
930	70	17.1	34.6	0.18	100	17.4	1.36	125.3	9.1		10,067	63.0
		11	23	0.1	66	11	0.89	82	6			
11/15/07	20	407	576	7.2	3,100	913	42.8	8,030	433	3,389	12,960	23.2
1415	68	20.3	47.4	0.18	135	25.6	0.69	167.2	8.6		13,336	74.2
		10	23	0.1	67	13	0.34	83	4			
01/15/08	17	385	476	4.4	1,980	694	57.9	5,680	394	2,922	9,460	15.9
1115	63	19.2	39.1	0.11	86	19.5	0.93	118.3	7.8		9,514	49.4
		13	27	0.1	60	13	0.64	81	5			
03/18/08	16	394	520	3.6	2,130	754	40.5	6,350	408	3,126	9,940	16.6
745	61	19.7	42.8	0.09	93	21.2	0.65	132.2	8.1		10,437	53.1
		13	28	0.1	60	13	0.40	82	5			
05/12/08	16	424	497	4.8	1,920	673	32.6	5,860	424	3,106	9,560	15.0
800	61	21.2	40.9	0.12	83	18.9	0.53	122.0	8.4		9,666	48.0
		15	28	0.1	57	13	0.35	81	6			

Appendix G Mineral Analyses of Southern Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
07/15/08	20	273	261	4.2	1,500	313	69.9	4,240	358	1,757	7,170	15.6
700	68	13.6	21.5	0.11	65	8.8	1.13	88.3	7.1		6,876	45.2
		14	21	0.1	65	8	1.07	84	7			
09/16/08	21	275	342	7.6	1,950	539	68.7	5,170	423	2,095	8,500	18.5
1100	70	13.7	28.1	0.19	85	15.1	1.11	107.6	8.4		8,606	55.6
		11	22	0.2	67	11	0.84	81	6			
11/17/08	20	359	504	9.5	2,570	804	34.2	6,900	410	2,971	11,910	20.5
1015	68	17.9	41.4	0.24	112	22.6	0.55	143.7	8.1		11,427	65.7
		10	24	0.1	65	13	0.32	82	5			
01/14/09	17	360	451	5.5	1,920	761	25.8	5,760	426	2,757	9,580	15.9
1200	63	18.0	37.1	0.14	83	21.4	0.42	119.9	8.5		9,539	50.9
		13	27	0.1	60	14	0.28	80	6			
03/26/09	16	332	390	6.9	1,760	564	43.9	4,730	391	2,435	8,070	15.5
1000	61	16.6	32.1	0.18	77	15.8	0.71	98.5	7.8		8,061	45.0
		13	26	0.1	61	13	0.58	80	6			
05/26/09	18	352	473	5.8	2,300	663	72.7	5,940	463	2,827	9,690	18.8
1000	64	17.6	38.9	0.15	100	18.6	1.17	123.7	9.2		10,084	60.3
		11	25	0.1	64	12	0.77	81	6			
07/28/09	19	363	476	6.4	2,360	705	70.8	6,250	451	2,867	9,650	19.2
1145	66	18.1	39.1	0.16	103	19.8	1.14	130.1	8.9		10,502	61.4
		11	24	0.1	64	12	0.71	81	6			
09/14/09	21	331	466	7.3	2,710	736	68.7	6,540	477	2,746	11,400	22.5
1200	70	16.5	38.3	0.19	118	20.7	1.11	136.2	9.5		11,145	72.1
		10	22	0.1	68	12	0.66	81	6			
12/16/09	18	290	398	6.2	2,210	724	49.8	5,890	459	2,363	9,980	19.8
1200	64	14.5	32.7	0.16	96	20.3	0.80	122.6	9.1		9,843	59.4
		10	23	0.1	67	13	0.53	80	6			
03/23/10	17	261	331	5.3	1,930	533	71.3	5,010	464	2,015	8,510	18.7
1350	63	13.0	27.2	0.14	84	15.0	1.15	104.3	9.2		8,420	56.2
		10	22	0.1	68	12	0.89	80	7			
07/14/10	19	349	394	4.5	1,890	552	48.6	4,790	402	2,494	8,580	16.5
1430	66	17.4	32.4	0.11	82	15.5	0.78	99.7	8.0		8,269	49.4
		13	25	0.1	62	13	0.63	80	6			
11/16/10	20	407	477	11.2	1,870	745	22.2	5,490	418	2,981	9,190	14.9
1000	68	20.3	39.2	0.29	81	20.9	0.36	114.3	8.3		9,273	47.7
		14	28	0.2	58	15	0.25	79	6			

Appendix H
Electrical Conductivity, pH, & Trace Elements in Southern Area Drains
2006-2010

Appendix H
Electrical Conductivity, pH, and Trace Elements in Southern Area Drains

Station / Date	Field / Laboratory pH	Field / Laboratory EC (µS/cm)	Trace Elements (mg/L) As	B	Ba	Mo	Se
BRL 2235							
09/16/08	7.6	1,078	0.006	1.2	< 0.05	0.022	0.002
	7.7	1,049					
11/17/08	8.0	1,064	0.011	1.1	0.20	0.032	0.002
	8.0	1,077					
03/26/09	7.8	1,108	0.005	0.9	< 0.05	0.024	0.002
	7.6	1,162					
05/26/09	7.9	1,123	0.005	1.0	< 0.05	0.024	0.002
	8.0	1,165					
07/28/09	7.5	801	0.003	0.6	< 0.05	0.021	0.002
	7.6	763					
09/14/09	7.1	2,036	0.007	1.5	0.06	0.034	0.003
	7.5	2,091					
03/23/10	7.2	1,776	0.003	1.2	0.09	0.028	0.003
	7.4	1,793					
CCN 3550							
01/25/06	7.2	3,223	0.025	1.1	< 0.25	0.136	0.005
	7.8	3,212					
03/22/06	7.1	3,070	0.022	0.9	< 0.50	0.134	< 0.010
	7.5	3,783					
05/15/06	7.4	4,527	0.105	1.6	< 0.25	0.370	0.008
	7.8	4,548					
07/18/06	7.1	3,236	0.022	0.9	< 0.50	0.156	< 0.010
	7.6	3,243					
09/20/06	7.3	3,008	0.020	0.9	< 0.25	0.156	0.005
	7.5	2,981					
11/14/06	7.3	2,781	0.020	0.8	< 0.25	0.145	< 0.005
	7.8	2,637					
01/17/07	7.4	2,993	0.020	0.8	< 0.50	0.129	< 0.010
	7.6	2,806					
03/21/07	7.3	2,520	0.015	0.6	< 0.25	0.100	< 0.005
	7.9	2,442					
05/09/07	7.5	3,440	0.017	0.8	< 0.25	0.126	0.005
	7.8	3,387					
07/17/07	7.4	3,284	0.022	0.8	< 0.25	0.155	0.005
	7.6	3,064					

Appendix H
Electrical Conductivity, pH, and Trace Elements in Southern Area Drains

Station / Date	Field Laboratory pH	Field Laboratory EC (µS/cm)	Trace Elements (mg/L) As	B	Ba	Mo	Se
09/11/07	7.4	2,972	0.020	0.8	< 0.25	0.145	< 0.005
	7.5	2,893					
11/15/07	7.3	2,407	0.021	0.9	< 0.25	0.148	< 0.005
	7.5	2,609					
01/14/08	7.1	4,001	0.027	0.9	< 0.25	0.144	0.007
	7.3	3,880					
03/13/08	7.4	3,714	0.020	0.8	< 0.25	0.124	< 0.005
	7.3	3,473					
05/13/08	7.5	3,602	0.025	0.8	< 0.25	0.128	0.005
	7.6	3,506					
07/14/08	7.4	3,828	0.019	0.9	< 0.25	0.131	< 0.005
	7.6	3,796					
09/15/08	7.6	4,084	0.027	0.9	< 0.25	0.176	0.006
	7.6	3,947					
11/17/08	7.5	1,842	0.029	0.9	0.05	0.155	0.006
	7.7	3,835					
01/13/09	7.5	4,336	0.030	0.9	< 0.25	0.165	0.010
	7.6	4,327					
03/25/09	7.7	4,822	0.030	1.0	< 0.25	0.193	0.008
	8.5	4,604					
05/26/09	7.3	4,771	0.027	1.1	< 0.25	0.182	0.007
	7.4	5,072					
07/28/09	7.3	4,621	0.030	1.0	< 0.25	0.182	0.007
	7.3	4,345					
09/14/09	7.4	4,001	0.025	1.1	< 0.25	0.165	0.006
	7.5	3,534					
12/15/09	7.3	4,812	0.036	1.0	< 0.25	0.201	0.009
	7.4	4,720					
03/23/10	7.3	5,000	0.031	1.0	< 0.25	0.189	0.010
	7.4	4,906					
07/13/10	7.3	5,530	0.032	1.1	< 0.25	0.192	0.021
	7.5	5,379					
CNR 0801							
01/24/06	7.3	8,080	0.007	15.4	< 0.25	0.515	0.040
	7.7	7,966					

Appendix H
Electrical Conductivity, pH, and Trace Elements in Southern Area Drains

Station / Date	Field Laboratory		Trace Elements (mg/L)				
	pH	EC (µS/cm)	As	B	Ba	Mo	Se
03/22/06	7.4	7,410	0.005	16.7	< 0.25	0.466	0.034
	7.6	8,720					
05/16/06	7.2	7,540	0.008	14.4	< 0.25	0.485	0.035
	7.5	7,589					
07/17/06	7.2	7,510	< 0.010	14.5	< 0.50	0.523	0.033
	7.6	7,630					
09/20/06	7.5	7,875	< 0.010	18.1	< 0.50	0.535	0.022
	7.6	7,850					
11/13/06	7.6	7,300	< 0.010	14.5	< 0.50	0.585	0.031
	7.8	6,634					
01/16/07	7.5	6,450	< 0.010	13.0	< 0.50	0.512	0.035
	7.7	5,538					
03/20/07	7.4	7,380	< 0.010	11.6	< 0.50	0.447	0.038
	7.8	6,500					
05/09/07	7.6	6,750	< 0.005	11.5	< 0.25	0.391	0.035
	7.7	5,999					
07/17/07	7.0	6,870	< 0.005	10.9	< 0.25	0.450	0.031
	7.4	5,828					
09/11/07	7.4	8,390	< 0.010	15.7	< 0.50	0.502	0.036
	7.4	8,136					
11/14/07	7.2	7,460	< 0.010	13.4	< 0.50	0.521	0.033
	7.5	7,575					
01/14/08	7.2	8,510	< 0.010	16.0	< 0.50	0.518	0.034
	7.4	8,205					
03/18/08	7.3	8,270	< 0.010	16.0	< 0.50	0.506	0.026
	7.4	7,978					
05/12/08	7.4	7,710	< 0.010	12.3	< 0.50	0.448	0.035
	7.5	7,487					
07/14/08	7.4	8,090	< 0.010	14.4	< 0.50	0.428	0.035
	7.5	7,863					
09/15/08	7.5	7,100	< 0.005	9.7	< 0.25	0.435	0.042
	7.3	6,576					
11/18/08	7.3	6,940	0.005	11.8	< 0.25	0.465	0.035
	7.5	7,015					
01/13/09	7.3	6,430	0.005	9.3	< 0.25	0.408	0.042
	7.5	6,397					

Appendix H
Electrical Conductivity, pH, and Trace Elements in Southern Area Drains

Station / Date	Field Laboratory		Trace Elements (mg/L)				
	pH	EC (µS/cm)	As	B	Ba	Mo	Se
03/23/09	7.7	6,730	0.005	10.4	< 0.25	0.410	0.030
	7.5	6,258					
05/27/09	7.5	6,870	0.006	11.8	< 0.25	0.404	0.033
	7.5	6,796					
07/27/09	7.2	6,400	0.010	10.5	< 0.25	0.379	0.022
	7.3	5,948					
09/14/09	7.4	14,620	< 0.010	17.7	< 0.50	0.513	0.019
	7.6	8,310					
12/15/09	7.5	8,390	< 0.010	15.4	< 0.50	0.542	0.028
	7.5	8,104					
01/12/10	7.4	8,430	< 0.010	14.4	< 0.50	0.457	0.030
	7.5	7,788					
03/22/10	7.3	8,570	< 0.010	14.8	< 0.50	0.491	0.034
	7.5	8,354					
11/16/10	7.4	9,610	< 0.010	18.2	< 0.50	0.561	0.036
	7.5	9,422					
COC 4126							
01/24/06	7.3	5,360	< 0.005	3.0	< 0.25	0.151	0.032
	7.7	5,282					
03/22/06	7.1	4,600	0.005	2.3	< 0.25	0.276	0.041
	7.4	5,444					
05/16/06	6.9	4,940	0.006	1.9	< 0.25	0.265	0.044
	7.3	5,005					
07/17/06	6.8	4,626	< 0.010	2.6	< 0.50	0.134	0.027
	7.2	4,752					
09/20/06	7.5	5,150	0.005	2.7	< 0.25	0.236	0.035
	7.6	5,144					
11/13/06	7.2	4,855	< 0.005	2.8	< 0.25	0.140	0.050
	7.6	4,421					
01/16/07	7.3	4,457	< 0.005	3.0	< 0.25	0.116	0.044
	7.6	4,140					
03/20/07	7.4	5,460	< 0.005	2.8	< 0.25	0.135	0.033
	7.8	4,920					
05/08/07	7.4	4,934	< 0.005	2.6	< 0.25	0.117	0.030
	7.6	4,767					

Appendix H
Electrical Conductivity, pH, and Trace Elements in Southern Area Drains

Station / Date	Field / Laboratory		Trace Elements (mg/L)				
	pH	EC (µS/cm)	As	B	Ba	Mo	Se
07/16/07	7.1	5,280	< 0.005	2.9	< 0.25	0.175	0.025
	7.4	4,675					
09/11/07	7.3	5,320	0.005	2.9	< 0.25	0.181	0.029
	7.4	5,203					
11/14/07	7.2	4,932	< 0.005	2.8	< 0.25	0.183	0.030
	7.4	5,120					
01/14/08	7.3	5,090	0.005	2.7	< 0.25	0.155	0.029
	7.5	4,991					
03/18/08	7.3	5,250	0.005	2.7	< 0.25	0.199	0.028
	7.4	5,124					
05/12/08	7.3	4,939	0.005	2.4	< 0.25	0.151	0.030
	7.5	4,808					
07/15/08	7.2	5,070	< 0.005	2.6	< 0.25	0.082	0.010
	7.4	5,011					
09/15/08	7.6	5,230	0.005	2.7	< 0.25	0.218	0.032
	7.3	5,072					
01/13/09	7.5	4,988	0.005	2.7	< 0.25	0.176	0.030
	7.7	4,983					
03/23/09	7.8	5,200	0.005	2.3	< 0.25	0.255	0.037
	7.6	4,978					
05/27/09	7.3	5,050	0.005	2.3	< 0.25	0.273	0.042
	7.4	5,006					
07/27/09	7.0	4,767	< 0.005	2.4	< 0.25	0.129	0.028
	7.0	4,477					
09/14/09	7.6	4,846	< 0.005	3.2	< 0.25	0.153	0.028
	7.7	4,887					
12/15/09	7.9	4,485	< 0.005	2.3	< 0.25	0.146	0.027
	7.8	4,324					
01/12/10	7.9	4,684	< 0.005	2.8	< 0.25	0.131	0.033
	7.9	4,548					
07/13/10	7.2	5,290	< 0.005	3.4	< 0.25	0.145	0.032
	7.4	5,137					
11/16/10	7.6	1,020	0.004	2.1	< 0.05	0.135	0.030
	7.7	4,077					

Appendix H
Electrical Conductivity, pH, and Trace Elements in Southern Area Drains

Station / Date	Field / Laboratory		Trace Elements (mg/L)				
	pH	EC (µS/cm)	As	B	Ba	Mo	Se
COC 8221							
01/24/06	7.1	5,340	0.015	3.7	< 0.25	0.080	0.023
	7.7	5,220					
03/22/06	7.2	4,680	0.017	4.0	< 0.25	0.083	0.024
	7.5	5,387					
05/16/06	7.2	5,160	0.016	3.7	< 0.25	0.089	0.024
	7.5	5,216					
07/17/06	7.1	4,690	0.016	3.7	< 0.50	0.093	0.021
	7.5	4,810					
09/20/06	7.4	5,210	0.013	4.1	< 0.25	0.088	0.022
	7.6	5,191					
11/13/06	7.3	5,290	0.015	4.0	< 0.25	0.090	0.026
	7.7	4,913					
01/16/07	7.3	4,858	0.015	4.2	< 0.50	0.078	0.020
	7.6	4,667					
03/20/07	7.4	5,440	0.016	3.7	< 0.25	0.084	0.024
	7.8	4,910					
05/08/07	7.4	5,020	0.014	3.8	< 0.25	0.080	0.024
	7.7	4,939					
07/16/07	7.2	4,900	0.015	3.6	< 0.25	0.094	0.017
	7.6	4,347					
09/11/07	7.5	5,340	0.013	4.4	< 0.25	0.085	0.021
	7.6	5,227					
11/14/07	7.3	4,940	0.014	4.2	< 0.25	0.086	0.022
	7.6	5,187					
01/14/08	7.1	5,200	0.016	4.0	< 0.25	0.086	0.020
	7.4	5,110					
03/18/08	7.3	5,220	0.015	4.1	< 0.25	0.087	0.020
	7.4	5,134					
05/12/08	7.5	5,280	0.017	3.9	< 0.25	0.085	0.022
	7.6	5,138					
07/15/08	7.5	5,110	0.012	4.1	< 0.25	0.080	0.018
	7.6	5,077					
09/15/08	7.7	5,440	0.007	4.5	< 0.25	0.088	0.031
	7.5	5,272					

Appendix H
Electrical Conductivity, pH, and Trace Elements in Southern Area Drains

Station / Date	Field Laboratory pH	Field Laboratory EC (µS/cm)	Trace Elements (mg/L) As	B	Ba	Mo	Se
11/18/08	7.4	5,070	0.013	4.1	< 0.25	0.082	0.020
	7.6	5,559					
01/13/09	7.2	4,970	0.015	3.9	< 0.25	0.086	0.020
	7.6	5,044					
03/23/09	7.7	5,290	0.015	4.1	< 0.25	0.093	0.023
	7.5	5,008					
05/27/09	7.5	5,190	0.016	4.9	< 0.25	0.097	0.030
	7.6	5,158					
07/27/09	7.5	5,030	0.020	3.9	< 0.25	0.096	0.019
	7.5	4,700					
09/14/09	7.5	4,833	< 0.020	4.3	< 1.00	< 0.100	< 0.020
	7.7	4,832					
12/15/09	7.5	4,891	0.013	3.9	< 0.25	0.085	0.017
	7.6	4,985					
01/12/10	7.6	5,080	0.016	3.7	< 0.25	0.081	0.015
	7.7	4,882					
03/22/10	7.5	5,020	0.016	3.5	< 0.25	0.092	0.017
	7.6	4,959					
07/13/10	7.5	5,210	0.017	3.9	< 0.25	0.094	0.025
	7.7	5,086					
11/16/10	7.5	5,020	0.010	4.2	< 0.25	0.086	0.020
	7.6	5,015					
ERR 8429							
01/25/06	7.6	4,837	0.087	2.2	< 0.25	0.290	0.008
	8.1	4,794					
03/22/06	7.6	3,730	0.067	2.0	< 0.25	0.244	< 0.005
	7.8	4,501					
05/15/06	7.4	5,750	0.105	2.6	< 0.25	0.392	0.010
	7.8	5,870					
07/18/06	7.5	4,742	0.079	2.2	< 0.50	0.266	< 0.010
	7.8	4,793					
09/20/06	7.5	3,852	0.076	2.0	< 0.25	0.188	0.006
	8.0	3,810					
11/14/06	7.7	4,414	0.085	2.0	< 0.25	0.265	0.010
	8.0	4,147					

Appendix H
Electrical Conductivity, pH, and Trace Elements in Southern Area Drains

Station / Date	Field / Laboratory		Trace Elements (mg/L)				
	pH	EC (µS/cm)	As	B	Ba	Mo	Se
01/17/07	7.7	5,730	0.078	3.0	< 0.50	0.423	< 0.010
	7.9	5,560					
03/21/07	7.6	7,670	0.092	3.1	< 0.50	0.611	0.016
	8.0	7,390					
05/09/07	7.7	5,170	0.075	2.4	< 0.25	0.270	0.008
	7.9	5,078					
07/17/07	7.5	6,480	0.082	2.4	< 0.25	0.423	0.006
	7.8	5,506					
09/11/07	7.7	4,026	0.062	2.1	< 1.00	0.156	< 0.020
	7.8	3,500					
11/15/07	7.5	2,459	0.106	1.8	< 0.25	0.101	< 0.005
	7.7	2,701					
01/14/08	7.4	3,500	0.093	2.0	< 0.25	0.161	0.008
	7.6	3,426					
03/19/08	7.8	4,045	0.091	2.2	< 0.25	0.195	0.005
	7.8	3,981					
05/13/08	7.7	4,412	0.095	2.2	< 0.25	0.204	0.010
	7.8	4,299					
07/14/08	7.6	4,410	0.065	2.2	< 0.25	0.180	0.005
	7.8	4,358					
09/15/08	7.8	2,720	0.081	1.7	< 0.25	0.137	0.007
	7.8	2,668					
01/14/09	7.7	2,728	0.106	1.8	< 0.25	0.100	0.005
	7.9	2,750					
03/25/09	7.9	2,907	0.121	1.7	< 0.25	0.203	0.006
	7.8	2,822					
05/27/09	7.6	4,605	0.095	2.4	< 0.25	0.205	0.008
	7.8	4,664					
07/28/09	7.6	4,351	0.093	2.0	< 0.25	0.159	0.007
	7.6	4,063					
09/14/09	7.6	2,436	0.125	1.9	< 0.05	0.081	0.007
	7.8	2,475					
12/15/09	7.7	2,531	0.078	1.7	< 0.25	0.093	0.006
	7.8	2,492					
03/23/10	7.5	2,465	0.093	1.6	< 0.05	0.079	0.006
	7.8	2,464					

Appendix H
Electrical Conductivity, pH, and Trace Elements in Southern Area Drains

Station / Date	Field Laboratory		Trace Elements (mg/L)				
	pH	EC (µS/cm)	As	B	Ba	Mo	Se
07/13/10	7.6 7.8	3,559 3,545	0.074	1.8	< 0.25	0.115	0.010
ERR 8641							
01/25/06	7.1 7.8	13,390 13,190	0.018	3.6	< 0.25	0.278	0.013
03/22/06	7.2 7.4	13,610 16,300	0.044	4.3	< 0.50	0.706	0.033
05/15/06	7.0 7.4	14,920 15,260	0.043	3.8	< 0.50	0.667	0.037
07/18/06	7.2 7.5	12,900 13,010	0.035	3.3	0.50	0.570	0.026
09/20/06	7.2 7.4	13,750 13,610	0.033	3.5	< 0.50	0.598	0.024
11/14/06	7.4 7.8	6,990 6,445	0.050	2.5	< 0.50	0.417	0.012
01/17/07	7.3 7.6	10,470 9,349	0.035	3.1	< 0.50	0.472	0.023
03/21/07	7.3 7.8	12,620 12,150	0.035	3.5	< 0.50	0.502	0.025
05/08/07	7.3 7.5	13,550 13,130	0.031	3.4	< 0.50	0.511	0.022
07/17/07	7.3 7.5	10,040 7,886	0.035	2.4	< 0.25	0.440	0.010
09/11/07	7.8 7.8	3,450 3,372	0.030	1.3	< 0.25	0.172	0.005
11/15/07	7.2 7.4	11,750 12,900	0.042	2.9	< 0.50	0.539	0.025
01/14/08	6.9 7.2	13,800 13,480	0.027	2.3	< 0.50	0.281	0.026
03/19/08	8.0 7.8	3,068 3,039	0.056	1.3	< 0.25	0.161	< 0.005
05/13/08	7.4 7.5	13,490 13,000	0.042	2.9	< 0.50	0.495	0.024
07/14/08	8.2 8.1	2,627 2,621	0.038	0.9	< 0.05	0.082	0.003

Appendix H
Electrical Conductivity, pH, and Trace Elements in Southern Area Drains

Station / Date	Field / Laboratory		Trace Elements (mg/L)				
	pH	EC (µS/cm)	As	B	Ba	Mo	Se
09/15/08	7.5	12,110	0.041	2.3	< 0.50	0.468	0.023
	7.5	11,720					
11/17/08	7.3	12,210	0.045	2.5	< 0.50	0.486	0.023
	7.6	12,140					
01/14/09	7.3	11,530	0.040	2.4	< 0.50	0.449	0.020
	7.6	11,530					
03/25/09	7.5	12,460	0.042	2.6	< 0.25	0.472	0.025
	7.4	11,900					
05/27/09	7.3	13,080	0.035	3.0	< 0.50	0.477	0.024
	7.5	12,500					
07/28/09	7.3	12,520	0.043	2.5	< 0.50	0.466	0.017
	7.4	11,620					
09/14/09	7.4	8,810	0.032	2.3	< 0.50	0.348	0.017
	7.6	8,864					
12/15/09	7.5	6,660	0.045	1.7	< 0.25	0.230	0.012
	7.6	6,526					
03/23/10	7.4	8,320	0.037	2.0	< 0.50	0.311	0.020
	7.5	8,146					
GSY 0935							
11/15/07	7.9	1,729	0.176	1.1	< 0.05	0.088	0.008
	8.0	1,910					
01/14/08	7.8	2,110	0.170	1.4	< 0.25	0.102	0.006
	8.0	2,107					
03/19/08	8.1	1,933	0.160	1.2	< 0.05	0.090	0.030
	8.0	1,915					
05/13/08	8.3	2,110	0.184	1.3	< 0.25	0.096	0.008
	8.2	2,073					
07/14/08	8.2	2,173	0.167	1.4	< 0.05	0.088	0.007
	8.2	2,231					
09/15/08	8.4	2,505	0.189	1.4	< 0.25	0.134	0.009
	8.2	2,479					
11/17/08	8.0	2,402	0.190	1.5	< 0.25	0.125	0.008
	8.2	2,452					
01/14/09	8.2	2,064	0.201	1.3	< 0.25	0.105	0.009
	8.3	2,105					

Appendix H
Electrical Conductivity, pH, and Trace Elements in Southern Area Drains

Station / Date	Field / Laboratory pH	Field / Laboratory EC (µS/cm)	Trace Elements (mg/L) As	B	Ba	Mo	Se
03/25/09	7.9	2,738	0.065	1.3	< 0.25	0.130	0.006
	7.7	2,991					
05/27/09	8.1	2,230	0.150	1.3	< 0.25	0.093	0.007
	8.1	2,198					
07/28/09	8.3	2,497	0.247	1.5	< 0.25	0.105	0.010
	8.1	2,338					
09/14/09	8.1	2,380	0.271	1.2	< 0.05	0.099	0.012
	8.2	2,433					
12/15/09	8.1	2,851	0.196	1.8	< 0.25	0.133	0.011
	8.1	2,830					
03/23/10	8.1	2,064	0.141	1.2	< 0.05	0.076	0.007
	8.1	2,059					
07/13/10	8.0	2,544	0.169	1.6	< 0.25	0.102	0.011
	8.1	2,539					
GSY0935							
03/23/10	8.1	2,064	0.141	1.2	< 0.05	0.076	0.007
	8.1	2,059					
07/13/10	8.0	2,544	0.169	1.6	< 0.25	0.102	0.011
	8.1	2,539					
HCH 7841							
01/25/06	7.2	8,480	0.158	5.1	< 0.50	0.724	0.031
	8.0	8,270					
03/22/06	7.9	8,820	0.200	5.8	< 0.50	0.914	0.032
	7.8	10,700					
05/15/06	7.6	10,420	0.208	5.4	< 0.50	0.954	0.041
	7.9	10,690					
07/18/06	8.1	2,128	0.106	1.3	0.06	0.113	0.004
	8.2	2,151					
09/20/06	7.7	5,360	0.187	3.0	< 0.25	0.501	0.013
	8.1	5,328					
11/14/06	8.2	2,024	0.133	1.2	< 0.25	0.090	0.005
	8.3	1,941					
01/17/07	8.3	1,586	0.178	1.2	< 0.05	0.074	0.004
	8.3	1,591					
03/21/07	8.1	4,610	0.170	2.7	< 0.25	0.406	0.015
	8.3	4,600					

Appendix H
Electrical Conductivity, pH, and Trace Elements in Southern Area Drains

Station / Date	Field Laboratory		Trace Elements (mg/L)				
	pH	EC (µS/cm)	As	B	Ba	Mo	Se
05/09/07	8.1	6,010	0.171	3.1	< 0.25	0.520	0.015
	8.2	5,799					
07/17/07	7.8	6,550	0.175	3.2	< 0.25	0.560	0.011
	8.0	5,602					
09/11/07	8.0	5,990	0.172	3.6	< 0.25	0.480	0.012
	8.0	5,851					
11/15/07	7.9	5,290	0.230	3.4	< 0.25	0.590	0.017
	8.0	5,831					
01/14/08	7.8	5,300	0.197	3.0	< 0.25	0.534	0.013
	7.9	5,326					
03/19/08	8.2	3,714	0.150	3.0	< 0.25	0.333	0.013
	8.0	4,692					
05/13/08	7.9	8,850	0.182	4.6	< 0.25	0.788	0.038
	8.0	8,588					
07/14/08	8.0	4,983	0.140	2.9	< 0.25	0.385	0.010
	8.0	5,077					
09/15/08	8.1	5,390	0.187	2.8	< 0.25	0.497	0.020
	8.0	5,247					
11/17/08	8.0	5,090	0.251	2.9	< 0.25	0.591	0.015
	8.1	5,142					
01/14/09	8.2	5,540	0.264	3.1	< 0.25	0.635	0.019
	8.2	5,545					
03/25/09	8.3	4,789	0.225	2.7	< 0.25	0.585	0.017
	8.0	4,966					
05/27/09	8.3	5,430	0.246	3.2	< 0.25	0.609	0.015
	8.1	5,433					
07/28/09	8.1	5,430	0.265	3.1	< 0.25	0.612	0.016
	8.0	5,313					
09/14/09	8.1	6,380	0.239	3.7	< 0.25	0.735	0.020
	8.0	6,423					
12/15/09	8.1	4,211	0.181	2.6	< 0.25	0.415	0.017
	8.0	4,178					
03/22/10	7.9	6,200	0.144	3.5	< 0.25	0.471	0.025
	8.0	6,157					
07/14/10	7.8	7,150	0.190	4.0	< 0.25	0.660	0.040
	7.9	6,934					

Appendix H
Electrical Conductivity, pH, and Trace Elements in Southern Area Drains

Station / Date	Field / Laboratory pH	Field / Laboratory EC (µS/cm)	Trace Elements (mg/L) As	B	Ba	Mo	Se
LME 7569							
03/21/06	8.4	946	0.006	1.0	< 0.05	0.019	< 0.001
	8.3	926					
07/17/06	6.2	137	0.002	0.1	< 0.05	0.006	< 0.001
	7.2	132					
09/19/06	7.4	1,141	0.005	0.8	< 0.05	0.033	0.001
	7.9	1,145					
03/20/07	8.2	1,250	< 0.005	1.0	< 0.25	< 0.025	< 0.005
	8.2	1,254					
07/16/07	7.8	180	0.001	0.1	< 0.05	< 0.005	< 0.001
	7.5	184					
09/10/07	8.5	927	0.003	1.0	< 0.05	0.013	0.001
	8.3	968					
11/15/07	7.7	1,342	0.010	0.7	0.05	0.008	0.001
	7.9	1,489					
05/13/08	8.0	756	0.003	0.9	< 0.05	0.016	0.001
	8.2	750					
LNW 5467							
01/24/06	7.6	14,860	0.012	20.5	< 0.50	0.828	0.271
	7.7	14,480					
03/21/06	7.7	13,180	0.020	23.1	< 0.50	0.864	0.285
	7.5	15,560					
05/16/06	7.4	16,800	0.020	26.8	< 1.00	1.150	0.390
	7.6	17,560					
07/17/06	7.2	13,600	0.014	21.0	< 0.50	0.796	0.239
	7.4	13,790					
09/19/06	7.5	13,855	0.013	20.6	< 0.50	0.836	0.249
	7.5	13,760					
11/13/06	7.6	13,880	0.010	21.0	< 0.50	0.835	0.267
	7.8	11,880					
01/16/07	7.7	12,660	0.019	21.0	< 0.50	0.754	0.246
	7.7	10,970					
03/20/07	7.4	14,620	< 0.010	20.0	< 0.50	0.565	0.197
	7.8	13,800					
05/08/07	7.6	9,500	< 0.010	13.4	< 0.50	0.458	0.125
	7.7	9,123					

Appendix H
Electrical Conductivity, pH, and Trace Elements in Southern Area Drains

Station / Date	Field Laboratory		Trace Elements (mg/L)				
	pH	EC (µS/cm)	As	B	Ba	Mo	Se
07/16/07	7.6	15,650	0.018	22.8	< 0.50	0.777	0.224
	7.5	10,720					
09/11/07	7.7	15,650	0.018	23.2	< 0.50	0.762	0.242
	7.6	13,200					
11/15/07	7.5	13,480	0.014	22.2	< 0.50	0.753	0.257
	7.5	14,780					
01/15/08	7.4	9,570	< 0.010	13.1	< 0.50	0.469	0.108
	7.5	9,329					
03/18/08	7.7	15,010	0.018	24.6	< 0.50	0.729	0.245
	7.5	14,620					
05/12/08	7.6	15,470	0.019	23.1	< 0.50	0.774	0.248
	7.6	14,840					
07/15/08	7.6	15,830	0.016	23.6	< 0.50	0.766	0.265
	7.6	15,190					
09/16/08	7.6	16,100	0.015	22.4	< 0.50	0.844	0.290
	7.6	15,360					
11/18/08	7.7	14,460	0.017	22.5	< 0.50	0.858	0.266
	7.6	14,490					
01/13/09	7.6	14,560	0.016	22.3	< 0.50	0.810	0.228
	7.7	14,310					
03/25/09	7.9	14,970	0.016	21.5	< 0.50	0.831	0.271
	7.6	14,680					
05/26/09	7.5	15,960	0.019	29.0	< 0.50	0.876	0.301
	7.6	15,000					
07/27/09	7.5	16,550	0.020	27.2	< 1.00	0.994	0.310
	7.4	16,270					
09/16/09	7.6	10,770	0.150	27.8	< 0.50	1.060	0.292
	7.6	16,460					
12/16/09	7.8	14,760	0.015	22.4	< 0.50	0.937	0.241
	7.6	14,260					
01/12/10	7.8	14,670	0.014	21.8	< 0.50	0.820	0.245
	7.7	13,800					
03/22/10	7.5	15,860	0.016	24.6	< 0.50	0.849	0.275
	7.6	15,400					
07/14/10	7.5	8,270	0.019	28.4	< 0.50	0.915	0.297
	7.5	16,680					

Appendix H
Electrical Conductivity, pH, and Trace Elements in Southern Area Drains

Station / Date	Field Laboratory pH	Field Laboratory EC (µS/cm)	Trace Elements (mg/L) As	B	Ba	Mo	Se
11/16/10	7.7	16,060	< 0.020	27.5	< 1.00	1.060	0.252
	7.7	15,700					
LNW 6459							
05/16/06	7.2	32,720	0.055	27.0	< 1.00	0.496	0.199
	7.6	33,730					
07/17/06	7.4	39,900	0.050	30.2	< 1.00	0.542	0.222
	7.5	39,890					
09/19/06	7.1	68,250	0.075	47.4	< 2.50	0.760	0.400
	7.4	66,120					
11/13/06	7.5	36,430	0.037	32.9	< 1.00	0.808	0.310
	7.7	26,550					
03/20/07	7.4	33,450	0.040	21.1	< 1.00	0.330	0.180
	7.7	30,400					
05/08/07	7.6	27,160	0.026	26.0	< 1.00	0.414	0.270
	7.6	26,240					
03/18/08	7.9	27,950	0.027	28.7	< 1.00	0.620	0.250
	7.8	27,180					
09/16/08	7.6	28,870	0.029	28.6	< 1.00	0.796	0.316
	7.6	27,530					
LNW 6467							
05/08/07	7.5	17,050	< 0.020	22.2	< 1.00	0.372	0.274
	7.6	16,410					
07/16/07	7.4	18,890	0.023	23.5	< 0.50	0.477	0.253
	7.5	12,280					
09/11/07	7.5	19,950	0.028	25.6	< 1.00	0.472	0.270
	7.4	16,900					
11/15/07	7.3	17,380	0.020	24.8	< 1.00	0.472	0.290
	7.4	19,140					
01/15/08	7.5	19,440	< 0.020	24.5	< 1.00	0.446	0.292
	7.3	18,800					
03/18/08	7.5	19,520	0.020	25.3	< 1.00	0.460	0.290
	7.4	19,130					
05/12/08	7.4	20,070	0.028	26.4	< 1.00	0.502	0.298
	7.5	19,860					
07/15/08	7.4	22,030	0.025	29.2	< 1.00	0.560	0.342
	7.5	20,980					

Appendix H
Electrical Conductivity, pH, and Trace Elements in Southern Area Drains

Station / Date	Field Laboratory		Trace Elements (mg/L)				
	pH	EC (µS/cm)	As	B	Ba	Mo	Se
09/16/08	7.4	24,000	0.022	29.2	< 1.00	0.650	0.388
	7.4	22,660					
11/18/08	7.3	24,530	0.037	31.7	< 1.00	0.612	0.440
	7.4	23,970					
01/13/09	7.4	23,390	0.030	31.0	< 1.00	0.582	0.322
	7.5	23,310					
03/25/09	7.7	20,520	0.028	27.9	< 1.00	0.588	0.382
	7.4	22,020					
05/26/09	7.3	25,500	0.036	36.1	< 1.00	0.600	0.408
	7.5	22,600					
07/27/09	7.3	26,680	0.040	37.0	< 1.00	0.702	0.440
	7.3	25,770					
09/14/09	7.4	26,840	0.028	42.4	< 1.00	0.676	0.392
	7.5	25,480					
12/16/09	8.4	10,790	0.010	15.4	< 0.50	0.278	0.128
	8.1	10,790					
07/14/10	7.3	27,200	0.039	37.4	< 1.00	0.610	0.434
	7.4	25,760					
VGD 3906							
03/21/06	7.8	17,510	0.013	30.5	< 0.50	0.688	0.026
	7.7	17,720					
05/15/06	7.4	19,010	< 0.020	30.4	< 1.00	0.764	0.028
	7.6	19,620					
07/17/06	7.2	18,900	< 0.020	34.3	< 1.00	0.632	0.026
	7.5	19,220					
09/19/06	7.3	20,035	< 0.020	31.0	< 0.10	0.800	< 0.020
	7.6	20,120					
11/13/06	7.5	22,000	< 0.020	31.4	< 1.00	0.860	0.020
	7.7	17,830					
01/16/07	7.8	7,620	< 0.010	10.5	< 0.50	0.334	< 0.010
	8.0	6,975					
03/20/07	7.6	21,115	< 0.020	32.2	< 1.00	0.702	< 0.020
	7.8	19,750					
05/08/07	7.5	10,050	< 0.010	21.1	< 0.50	0.389	< 0.010
	7.7	9,689					

Appendix H
Electrical Conductivity, pH, and Trace Elements in Southern Area Drains

Station / Date	Field Laboratory		Trace Elements (mg/L)				
	pH	EC (µS/cm)	As	B	Ba	Mo	Se
07/16/07	7.5	19,120	0.011	29.6	< 0.50	0.757	< 0.010
	7.7	12,380					
09/10/07	7.7	22,440	< 0.020	31.6	< 1.00	0.788	< 0.020
	7.7	19,100					
11/15/07	7.4	20,360	< 0.020	30.9	< 1.00	0.802	< 0.020
	7.6	22,270					
01/15/08	7.4	21,850	< 0.020	32.2	< 1.00	0.790	< 0.020
	7.6	21,300					
03/18/08	7.6	15,940	0.010	25.7	< 0.50	0.595	0.015
	7.6	15,560					
05/12/08	7.4	17,500	< 0.020	26.7	< 1.00	0.706	< 0.020
	7.5	16,910					
07/15/08	8.0	4,753	0.010	6.3	< 0.25	0.230	< 0.005
	8.0	4,799					
09/16/08	7.8	13,520	0.011	18.4	< 0.50	0.652	0.010
	7.7	12,920					
11/17/08	7.5	11,400	< 0.010	19.1	< 0.50	0.509	0.012
	7.7	11,340					
01/14/09	7.6	15,980	< 0.020	26.5	< 1.00	0.790	< 0.020
	7.7	15,910					
03/26/09	8.4	3,653	0.010	4.5	< 0.25	0.208	< 0.005
	8.1	3,723					
05/26/09	8.1	3,353	0.008	4.6	< 0.25	0.153	< 0.005
	8.2	3,401					
07/28/09	7.3	16,890	< 0.020	23.1	< 1.00	0.654	< 0.020
	7.4	15,570					
09/14/09	7.3	23,100	< 0.020	39.2	< 1.00	0.811	< 0.020
	7.6	22,320					
12/16/09	7.4	17,070	< 0.020	26.4	< 1.00	0.754	< 0.020
	7.5	16,690					
03/23/10	7.5	19,530	< 0.020	31.7	< 1.00	0.826	< 0.020
	7.6	19,180					
07/14/10	7.2	20,880	< 0.020	29.5	< 1.00	0.612	0.026
	7.4	20,100					
11/16/10	7.4	18,740	< 0.020	27.4	< 1.00	0.766	< 0.020
	7.5	18,940					

Appendix H
Electrical Conductivity, pH, and Trace Elements in Southern Area Drains

Station / Date	Field / Laboratory pH	Field / Laboratory EC (µS/cm)	Trace Elements (mg/L) As	B	Ba	Mo	Se
VGD 4406							
01/25/06	7.6	13,000	0.010	23.9	< 0.50	0.643	0.014
	8.0	12,890					
03/21/06	7.7	23,270	0.015	33.9	< 0.50	0.768	0.035
	7.7	23,710					
05/15/06	7.4	22,800	< 0.020	33.7	< 1.00	0.792	0.038
	7.7	23,500					
07/17/06	7.2	18,900	< 0.020	28.7	< 1.00	0.808	< 0.020
	7.7	15,930					
09/19/06	7.4	23,915	< 0.020	35.1	< 0.10	0.862	0.020
	7.8	24,060					
11/13/06	7.5	31,220	0.021	42.1	< 1.00	0.848	0.024
	7.7	23,700					
01/16/07	7.5	21,050	< 0.020	33.0	< 1.00	0.644	0.020
	7.6	16,800					
03/20/07	7.8	13,630	< 0.010	26.7	< 0.50	0.630	< 0.010
	7.9	12,240					
05/08/07	7.7	15,170	< 0.010	26.0	< 0.50	0.687	< 0.010
	7.8	14,580					
07/16/07	7.4	26,140	< 0.020	34.5	< 1.00	0.836	< 0.020
	7.6	23,150					
09/10/07	7.6	27,180	< 0.020	39.7	< 1.00	0.834	< 0.020
	7.6	24,700					
11/15/07	7.4	26,740	< 0.020	38.3	< 1.00	0.810	0.021
	7.6	29,260					
01/15/08	7.5	9,300	< 0.010	16.8	< 0.50	0.412	< 0.010
	7.6	9,178					
03/18/08	7.7	16,260	< 0.020	26.2	< 1.00	0.810	< 0.020
	7.7	15,890					
05/12/08	7.7	19,200	< 0.020	27.5	< 1.00	0.792	< 0.020
	7.7	18,540					
07/15/08	7.7	8,850	< 0.010	17.3	< 0.50	0.415	< 0.010
	7.7	8,696					
09/16/08	7.8	14,800	0.011	23.3	< 0.50	0.743	0.010
	7.7	14,190					

Appendix H
Electrical Conductivity, pH, and Trace Elements in Southern Area Drains

Station / Date	Field / Laboratory		Trace Elements (mg/L)				
	pH	EC (µS/cm)	As	B	Ba	Mo	Se
11/17/08	7.5 7.6	28,750 28,190	< 0.020	36.5	< 1.00	0.802	< 0.020
01/14/09	7.6 7.7	17,540 17,520	< 0.020	23.9	< 1.00	0.592	< 0.020
03/26/09	8.0 7.7	20,070 19,260	< 0.020	28.8	< 1.00	0.924	< 0.020
05/26/09	7.6 7.6	18,750 22,210	0.015	36.0	< 0.50	0.743	0.017
07/28/09	7.6 7.6	11,570 10,640	< 0.010	18.1	< 0.50	0.445	< 0.010
09/14/09	7.4 7.6	16,920 16,570	0.010	29.0	< 0.50	0.588	0.010
12/16/09	7.4 7.4	23,860 23,210	< 0.020	30.8	< 1.00	0.816	0.020
03/23/10	7.6 7.7	13,800 13,480	< 0.010	23.0	< 0.50	0.533	0.010
07/14/10	7.4 7.6	20,800 20,180	< 0.201	29.7	<10.05	< 1.005	< 0.201
11/16/10	7.5 7.6	25,630 25,000	< 0.020	33.1	< 1.00	< 0.100	< 0.020
VGD 4806							
01/25/06	7.0 7.8	16,220 15,980	0.011	12.2	< 0.50	0.134	0.020
03/21/06	7.2 7.5	19,370 19,730	0.014	16.0	< 0.50	0.101	0.024
05/15/06	7.4 7.7	11,140 11,470	0.012	8.7	< 0.50	0.124	0.013
07/17/06	7.0 7.4	20,700 21,010	< 0.020	18.5	< 1.00	0.138	0.030
09/19/06	7.0 7.4	20,220 20,530	< 0.020	18.2	< 0.10	0.140	< 0.020
11/13/06	7.5 7.5	21,570 17,300	< 0.020	18.6	< 1.00	0.137	0.020
01/16/07	7.1 7.5	17,060 12,940	< 0.020	16.2	< 1.00	0.137	< 0.020

Appendix H
Electrical Conductivity, pH, and Trace Elements in Southern Area Drains

Station / Date	Field / Laboratory		Trace Elements (mg/L)				
	pH	EC (µS/cm)	As	B	Ba	Mo	Se
03/20/07	7.1 7.7	23,020 20,600	0.012	20.0	< 0.25	0.120	0.018
05/08/07	7.2 7.5	22,600 22,200	< 0.020	20.0	< 1.00	0.120	< 0.020
07/16/07	7.5 7.8	15,250 10,690	0.011	12.9	< 0.50	0.173	< 0.010
09/10/07	7.3 7.4	15,180 13,900	0.014	14.6	< 0.50	0.210	< 0.010
11/15/07	7.2 7.5	12,910 14,120	0.014	12.1	< 0.50	0.203	0.010
01/15/08	7.3 7.5	15,900 12,360	0.012	10.7	< 0.50	0.191	< 0.010
03/18/08	7.8	3,162 3,380	0.015	2.6	< 0.25	0.094	0.005
05/12/08	7.2 7.4	19,600 18,950	< 0.020	17.7	< 1.00	0.210	< 0.020
07/15/08	7.3 7.4	21,520 20,610	< 0.020	20.1	< 1.00	0.208	< 0.020
09/16/08	7.3 7.4	21,230 20,210	< 0.020	19.1	< 1.00	0.242	< 0.020
11/17/08	7.3 7.5	18,760 18,550	< 0.020	17.4	< 1.00	0.276	< 0.020
01/14/09	7.2 7.5	18,720 18,590	< 0.020	16.5	< 1.00	0.224	< 0.020
03/26/09	7.5 7.4	18,050 18,080	< 0.020	16.6	< 1.00	0.264	< 0.020
05/26/09	7.3 7.5	18,390 17,040	< 0.020	18.9	< 1.00	0.232	< 0.020
07/28/09	7.2 7.3	23,330 21,160	< 0.020	20.4	< 1.00	0.226	< 0.020
09/14/09	7.2 7.5	19,140 18,830	< 0.020	21.2	< 1.00	0.232	< 0.020
12/16/09	7.2 7.4	20,570 20,090	< 0.020	17.9	< 1.00	0.212	0.022
03/23/10	7.4 7.5	21,300 20,720	< 0.020	20.1	< 1.00	0.200	< 0.020

Appendix H
Electrical Conductivity, pH, and Trace Elements in Southern Area Drains

Station / Date	Field Laboratory pH	Field Laboratory EC (µS/cm)	Trace Elements (mg/L) As	B	Ba	Mo	Se
11/16/10	7.2	26,510	< 0.020	23.8	< 1.00	0.202	< 0.020
	7.4	26,320					
VGD 5412							
03/21/06	7.6	13,180	< 0.010	20.3	< 0.50	0.358	0.013
	7.7	13,310					
05/15/06	7.3	15,140	< 0.010	26.5	< 0.50	0.550	0.016
	7.6	15,520					
07/17/06	8.1	10,100	< 0.010	15.3	< 0.50	0.317	< 0.010
	8.1	10,330					
07/16/07	7.9	8,800	0.005	14.7	< 0.25	0.400	< 0.005
	8.0	7,102					
11/15/07	7.5	13,070	< 0.010	26.4	< 0.50	0.574	0.010
	7.7	14,300					
01/15/08	7.4	10,250	< 0.010	16.6	< 0.50	0.347	< 0.010
	7.6	10,140					
03/18/08	7.5	14,660	< 0.010	26.4	< 0.50	0.484	0.010
	7.6	14,500					
05/12/08	7.5	16,700	< 0.010	26.9	< 0.50	0.496	0.010
	7.6	16,160					
07/15/08	7.5	17,680	< 0.020	25.2	< 1.00	0.451	< 0.020
	7.6	17,170					
09/16/08	7.4	19,050	< 0.020	25.6	< 1.00	0.470	< 0.020
	7.6	18,120					
11/17/08	7.3	20,960	< 0.020	26.3	< 1.00	0.482	< 0.020
	7.5	20,760					
01/14/09	7.4	20,470	< 0.020	25.1	< 1.00	0.420	< 0.020
	7.6	20,350					
03/26/09	7.6	19,070	< 0.020	24.4	< 1.00	0.484	< 0.020
	7.6	18,860					
05/28/09	7.3	22,160	< 0.020	31.2	< 1.00	0.404	< 0.020
	7.5	20,040					
07/28/09	7.3	24,970	< 0.020	29.1	< 1.00	0.462	< 0.020
	7.4	22,940					
09/14/09	7.3	24,180	< 0.020	33.3	< 1.00	0.408	< 0.020
	7.5	23,320					

Appendix H
Electrical Conductivity, pH, and Trace Elements in Southern Area Drains

Station / Date	Field / Laboratory		Trace Elements (mg/L)				
	pH	EC (µS/cm)	As	B	Ba	Mo	Se
12/16/09	7.5 7.6	16,280 15,920	< 0.010	28.0	< 0.50	0.475	0.014
03/23/10	7.3 7.7	17,370 16,980	< 0.020	28.4	< 1.00	0.586	< 0.020
07/14/10	7.4 7.6	19,860 19,570	< 0.020	26.8	< 1.00	0.384	0.024
11/16/10	7.4 7.6	25,260 24,660	< 0.020	29.0	< 1.00	0.426	0.020
VGD 5509							
01/25/06	7.3 7.9	7,330 7,285	0.005	9.1	< 0.25	0.248	0.007
03/21/06	7.4 7.6	8,200 8,282	< 0.010	10.1	< 0.50	0.272	< 0.010
05/15/06	7.1 7.5	9,320 9,659	< 0.010	10.3	< 0.50	0.275	0.010
07/17/06	7.1 7.5	10,400 10,650	< 0.010	11.4	< 0.50	0.246	0.011
09/19/06	7.1 7.5	10,130 10,210	< 0.010	11.3	< 0.50	0.288	< 0.010
11/13/06	7.3 7.8	12,590 10,850	< 0.010	13.0	< 0.50	0.317	0.011
01/16/07	7.0 7.5	8,380 7,618	< 0.010	8.7	< 0.50	0.066	< 0.010
03/20/07	7.2 7.7	10,340 10,130	< 0.010	8.7	< 0.50	0.142	< 0.010
05/08/07	7.3 7.7	9,200 9,181	< 0.010	9.8	< 0.50	0.216	< 0.010
07/16/07	8.3 7.5	11,370 8,524	0.008	10.6	< 0.25	0.240	0.006
09/10/07	7.7 7.7	10,660 9,800	< 0.010	11.6	< 0.50	0.290	< 0.010
11/15/07	7.0 7.3	12,950 14,200	< 0.010	12.0	< 0.50	0.165	< 0.010
01/15/08	7.0 7.3	10,690 10,530	0.010	8.6	< 0.50	0.152	< 0.010

Appendix H
Electrical Conductivity, pH, and Trace Elements in Southern Area Drains

Station / Date	Field Laboratory		Trace Elements (mg/L)				
	pH	EC (µS/cm)	As	B	Ba	Mo	Se
03/18/08	7.1	11,440	< 0.010	9.2	< 0.50	0.107	0.012
	7.3	11,330					
05/12/08	7.1	10,800	0.010	7.7	< 0.50	0.093	0.010
	7.5	10,510					
07/15/08	7.5	8,200	< 0.010	8.1	< 0.50	0.240	< 0.010
	7.6	8,105					
09/16/08	7.4	10,000	< 0.010	9.1	< 0.50	0.305	0.010
	7.6	9,724					
11/17/08	7.2	12,650	< 0.010	9.8	< 0.50	0.119	0.010
	7.4	12,610					
01/14/09	7.1	10,730	0.011	7.3	< 0.50	0.061	< 0.010
	7.4	10,680					
03/26/09	7.6	9,100	< 0.010	6.7	< 0.50	0.134	< 0.010
	7.4	9,202					
05/26/09	7.3	11,250	< 0.010	11.7	< 0.50	0.206	0.010
	7.6	10,780					
07/28/09	7.2	12,380	0.010	11.2	< 0.50	0.175	< 0.010
	7.3	11,620					
09/14/09	7.2	12,130	< 0.010	14.0	< 0.50	0.204	< 0.010
	7.4	12,120					
12/16/09	7.3	11,470	< 0.010	10.2	< 0.50	0.141	0.014
	7.4	11,330					
03/23/10	7.5	9,730	< 0.010	9.4	< 0.50	0.252	< 0.010
	7.6	9,631					
07/14/10	7.2	9,450	< 0.010	7.3	< 0.50	0.108	0.015
	7.5	9,370					
11/16/10	7.0	10,020	< 0.010	6.9	< 0.50	0.063	< 0.010
	7.4	10,120					

Appendix I
Mineral Analyses of Northern Area Drains
2010

Appendix I Mineral Analyses of Northern Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
VNS 2923												
05/11/10	18	119	43	1.5	206	260	65	294	247	474	1,190	4.1
1515	64	5.9	3.5	0.04	9	7.3	1.05	6	4.9		1,137	9.5
		32	19	0.2	48	38	5.43	32	25			
08/17/10	19	136	48	1.5	226	246	59	271	268	537	1,200	4.2
1200	66	6.8	3.9	0.04	10	6.9	0.95	6	5.3		1,149	10.2
		33	19	0.2	48	37	5.07	30	28			
VNS 3244												
05/12/10	17	73	10	7.1	56	41	78	108	129	224	496	1.6
1100	63	3.6	0.8	0.18	2	1.2	1.26	2	2.6		451	3.1
		51	12	2.6	34	16	17.48	31	35			
VNS 3622												
05/11/10	18	114	42	1.5	208	256	66	293	247	459	1,180	4.2
1500	64	5.7	3.5	0.04	9	7.2	1.06	6	4.9		1,129	9.7
		31	19	0.2	50	37	5.53	32	25			
VNS 3733												
05/11/10	17	149	62	1.8	287	326	63	557	241	629	1,680	5.0
1300	63	7.4	5.1	0.05	12	9.2	1.02	12	4.8		1,591	12.0
		30	20	0.2	50	34	3.84	44	18			
08/17/10	20	162	71	1.8	306	292	57	528	263	696	1,320	5.0
1130	68	8.1	5.8	0.05	13	8.2	0.92	11	5.2		1,576	12.6
		30	21	0.2	49	32	3.64	43	21			
VNS 3752												
05/11/10	15	25	9	2.0	46	45	6	71	68	99	287	2.0
1330	59	1.2	0.7	0.05	2	1.3	0.10	1	1.3		245	2.4
		31	18	1.3	50	30	2.42	35	32			
VNS 4141												
05/11/10	17	216	86	2.4	389	385	39	953	263	892	2,400	5.7
1400	63	10.8	7.1	0.06	17	10.8	0.63	20	5.2		2,228	14.7
		31	20	0.2	49	30	1.73	54	14			
VNS 4731												
05/12/10	18	152	65	2.2	275	354	58	500	245	645	1,690	4.7
900	64	7.6	5.3	0.06	12	9.9	0.94	10	4.9		1,553	11.3
		30	21	0.2	48	38	3.58	40	19			

Appendix I Mineral Analyses of Northern Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
VNS 4734												
05/11/10	17	228	96	2.2	374	391	57	954	253	965	2,400	5.2
1245	63	11.4	7.9	0.06	16	11.0	0.92	20	5.0		2,254	13.6
		32	22	0.2	46	30	2.51	54	14			
08/17/10	19	224	92	2.1	398	392	51	706	285	937	2,100	5.7
1000	66	11.2	7.6	0.05	17	11.0	0.83	15	5.7		2,036	14.7
		31	21	0.1	48	34	2.56	46	18			
VNS 4931												
05/11/10	17	170	72	2.1	276	378	57	569	244	723	1,810	4.5
1230	63	8.5	5.9	0.05	12	10.6	0.91	12	4.8		1,670	10.7
		32	22	0.2	45	38	3.23	42	17			
08/17/10	19	198	80	1.8	339	339	56	610	266	825	1,810	5.1
1245	66	9.9	6.6	0.05	15	9.5	0.90	13	5.3		1,783	13.4
		32	21	0.1	47	34	3.17	45	19			
VNS 4951												
05/11/10	19	120	44	2.1	230	255	57	304	311	482	1,300	4.6
1425	66	6.0	3.6	0.05	10	7.2	0.93	6	6.2		1,199	11.4
		30	18	0.3	51	35	4.50	31	30			
08/17/10	19	137	52	2.2	263	263	53	329	323	557	1,350	4.9
1025	66	6.8	4.3	0.06	11	7.4	0.86	7	6.4		1,293	12.1
		30	19	0.2	51	34	3.98	32	30			
VNS 5661												
05/12/10	19	104	32	2.7	188	197	64	218	296	390	1,060	4.1
1045	66	5.2	2.6	0.07	8	5.5	1.03	5	5.9		983	9.5
		32	16	0.4	51	33	6.06	27	35			
08/17/10	19	118	36	3.0	204	170	56	190	311	443	1,040	4.2
1100	66	5.9	3.0	0.08	9	4.8	0.90	4	6.2		963	10.5
		33	17	0.4	50	30	5.69	25	39			
VNS 5935												
05/11/10	18	118	45	2.1	233	253	57	301	309	481	1,310	4.6
1110	64	5.9	3.7	0.05	10	7.1	0.91	6	6.1		1,194	11.6
		30	19	0.3	51	35	4.48	31	30			
VNS 5951												
05/12/10	17	108	49	1.8	234	285	74	274	299	471	1,300	4.7
930	63	5.4	4.0	0.05	10	8.0	1.19	6	5.9		1,205	11.3
		27	21	0.2	52	38	5.70	27	28			

Appendix I Mineral Analyses of Northern Area Drains

Station / Date / Time	T °C / °F	Mineral Constituents: mg/L / meq/L / prv Ca	Mg	K	Na	Cl	NO3	SO4	T. Alk	Mineral Constituents (mg/L) TH	TDS / Sum	SAR / ASAR
VNS 6035												
05/11/10	17	158	67	1.9	278	350	59	504	258	668	1,710	4.7
1100	63	7.9	5.5	0.05	12	9.8	0.95	10	5.1		1,572	11.7
		31	22	0.2	47	37	3.59	40	19			
08/17/10	19	141	58	2.8	245	256	55	257	333	593	1,240	4.4
1315	66	7.0	4.8	0.07	11	7.2	0.89	5	6.6		1,215	11.0
		31	21	0.3	47	36	4.43	27	33			
VNS 6927												
05/11/10	14	11	5	1.1	21	21	2	25	8	47	33	1.3
1040	57	0.5	0.4	0.03	1	0.6	0.03	1	0.1		90	0.8
		29	22	1.5	48	46	2.25	40	12			
08/17/10	23	37	19	2.7	80	87	6	81	102	168	379	2.7
930	73	1.8	1.6	0.07	3	2.4	0.10	2	2.0		374	4.5
		27	22	1.0	50	39	1.65	27	32			
VNS 6961												
05/12/10	18	119	50	2.5	219	287	48	274	310	505	1,290	4.2
1017	64	5.9	4.1	0.06	10	8.1	0.77	6	6.2		1,186	11.0
		30	21	0.3	48	39	3.74	28	30			
08/17/10	19	135	54	2.2	274	265	58	342	320	560	1,390	5.0
1300	66	6.7	4.4	0.06	12	7.4	0.94	7	6.3		1,323	12.6
		29	19	0.2	51	34	4.30	33	29			
VNS 7026												
05/11/10	15	10	5	1.3	19	20	2	22	36	45	117	3.0
1050	59	0.5	0.4	0.03	1	0.6	0.02	0	0.7		100	0.7
		28	23	1.9	47	32	1.38	26	41			
08/17/10	22	51	24	2.5	105	111	12	116	124	225	511	3.0
900	72	2.5	2.0	0.06	5	3.1	0.20	2	2.5		496	5.2
		28	22	0.7	50	38	2.40	29	30			
VNS 7027												
05/11/10	18	154	64	2.2	281	344	59	490	229	648	1,660	4.8
1025	64	7.7	5.3	0.06	12	9.7	0.95	10	4.5		1,532	5.8
		30	21	0.2	48	38	3.76	40	18			
08/17/10	19	161	67	2.0	294	296	54	417	306	679	1,530	4.9
845	66	8.0	5.5	0.05	13	8.3	0.88	9	6.1		1,475	6.4
		30	21	0.2	48	35	3.66	36	25			

Appendix J
Electrical Conductivity, pH, & Trace Elements in Northern Area Drains
2010

Appendix J
Electrical Conductivity, pH, and Trace Elements in Northern Area Drains

Station / Date	Field / Laboratory pH	Field / Laboratory EC (µS/cm)	Trace Elements (mg/L) As	B	Ba	Mo	Se
VNS 2923							
05/11/10	7.1	1,907	0.002	1.4	< 0.05	< 0.005	0.005
	7.5	1,887					
08/17/10	7.1	1,940	0.003	1.4	< 0.05	< 0.005	0.005
	7.5	1,894					
VNS 3244							
05/12/10	7.3	764	0.002	0.6	< 0.05	< 0.005	0.001
	7.6	752					
VNS 3622							
05/11/10	7.2	1,889	0.001	1.4	< 0.05	< 0.005	0.005
	7.6	1,863					
VNS 3733							
05/11/10	7.0	2,549	0.002	2.7	< 0.05	< 0.005	0.009
	7.4	2,463					
08/17/10	7.0	2,455	0.003	2.8	< 0.05	< 0.005	0.008
	7.4	2,384					
VNS 3752							
05/11/10	8.0	472	0.002	0.3	< 0.05	< 0.005	0.001
	8.0	464					
VNS 4141							
05/11/10	7.3	3,343	0.002	4.0	< 0.05	< 0.005	0.009
	7.6	3,265					
VNS 4731							
05/12/10	7.3	2,518	0.002	2.3	< 0.05	< 0.005	0.008
	7.6	2,459					
VNS 4734							
05/11/10	7.2	3,358	0.002	3.4	< 0.05	< 0.005	0.011
	7.5	3,277					
08/17/10	7.3	3,120	0.004	3.3	< 0.05	< 0.005	0.010
	7.6	2,974					
VNS 4931							
05/11/10	7.2	2,729	0.002	2.5	< 0.05	< 0.005	0.009
	7.5	2,632					

Appendix J
Electrical Conductivity, pH, and Trace Elements in Northern Area Drains

Station / Date	Field / Laboratory pH	Field / Laboratory EC (µS/cm)	Trace Elements (mg/L) As	B	Ba	Mo	Se
08/17/10	7.2	2,674	0.003	2.7	< 0.05	< 0.005	0.009
	7.6	2,573					
VNS 4951							
05/11/10	7.1	2,026	0.003	1.7	< 0.05	< 0.005	0.006
	7.4	1,972					
08/17/10	7.0	2,106	0.003	1.9	< 0.05	< 0.005	0.008
	7.4	2,036					
VNS 5661							
05/12/10	7.0	1,682	0.002	1.3	< 0.05	< 0.005	0.004
	7.4	1,641					
08/17/10	7.1	1,645	0.003	1.3	0.05	< 0.005	0.004
	7.4	1,602					
VNS 5935							
05/11/10	7.3	2,013	0.002	1.7	< 0.05	< 0.005	0.007
	7.6	1,933					
VNS 5951							
05/12/10	7.2	2,054	0.003	1.8	< 0.05	< 0.005	0.005
	7.6	2,011					
VNS 6035							
05/11/10	7.3	2,564	0.002	2.4	< 0.05	< 0.005	0.009
	7.5	2,449					
08/17/10	7.2	2,113	0.004	1.6	< 0.05	< 0.005	0.005
	7.4	1,889					
VNS 6927							
05/11/10	7.7	218	< 0.001	0.1	< 0.05	< 0.005	< 0.001
	7.5	204					
08/17/10	8.4	676	0.003	0.4	< 0.05	< 0.005	0.001
	8.5	632					
VNS 6961							
05/12/10	7.1	2,017	0.003	1.7	< 0.05	< 0.005	0.005
	7.5	1,989					
08/17/10	7.1	1,990	0.004	2.1	< 0.05	< 0.005	0.007
	7.5	2,104					

Appendix J
Electrical Conductivity, pH, and Trace Elements in Northern Area Drains

Station / Date	Field / Laboratory pH	Field / Laboratory EC (µS/cm)	Trace Elements (mg/L) As	B	Ba	Mo	Se
VNS 7026							
05/11/10	7.7	204	< 0.001	0.1	< 0.05	< 0.005	< 0.001
	7.5	195					
08/17/10	8.1	874	0.003	0.6	< 0.05	< 0.005	0.002
	8.1	818					
VNS 7027							
05/11/10	7.7	2,533	0.002	2.4	< 0.05	< 0.005	0.001
	7.8	2,409					
08/17/10	7.4	2,364	0.003	2.2	< 0.05	< 0.005	0.006
	7.6	2,198					

Appendix K
Nutrient Analyses in Area Drains
2007 - 2009

Appendix K

Nutrients Detected in Central Area Drains
2007-2009
(milligrams per liter unless indicated)

Station	Date	Ammonia as Nitrogen	Nitrite	Organic Nitrogen	Ortho-phosphate	Total Phosphorus
BVS 6001						
	01/17/07	< 0.01	< 0.01	0.30	0.04	0.05
	04/11/07	0.01	0.01	0.60	0.04	0.05
	05/08/07	< 0.01	0.01	0.60	0.06	0.07
	07/18/07	< 0.01	0.01	0.60	0.05	0.05
	09/10/07	< 0.01	0.01	0.80	0.03	0.05
	11/15/07	0.02	0.02	0.80	0.04	0.07
	01/15/08	< 0.01		0.80	0.04	0.09
	05/27/09	< 0.01	< 0.01	0.40	0.00	0.05
	07/28/09	0.02		0.80	0.06	0.06
	09/08/09	0.02	0.01	0.50	0.09	0.09
CTL 3728						
	01/16/07	0.01	< 0.01	0.40	0.03	0.04
	04/10/07	< 0.01	0.01	0.40	0.02	0.02
	05/08/07	1.60	0.08	< 0.10	0.02	0.03
	07/17/07	0.02	0.03	0.40	0.03	0.04
	09/11/07	0.03	0.01	0.80	0.02	0.02
	11/14/07	< 0.01	0.02	0.50	0.02	0.04
	01/14/08	< 0.01		0.50	0.01	0.03
	05/26/09	0.02	0.11	0.40	0.05	0.13
	07/27/09	0.50		4.10	0.01	0.22
	09/08/09	0.08	0.08	0.20	0.03	0.05
FBH 2016						
	01/17/07	< 0.01	< 0.01	0.40	0.04	0.04
	04/11/07	< 0.01	0.01	0.50	0.04	0.05
	05/08/07	< 0.01	0.01	0.40	0.04	0.04
	07/18/07	0.01	< 0.01	0.50	0.04	0.04
	09/10/07	0.02	0.01	0.70	0.03	0.05
	11/14/07	< 0.01	0.02	0.50	0.04	0.06
	01/15/08	< 0.01		0.90	0.03	0.07
	01/14/09	< 0.01	0.01	0.60	0.05	0.05
	05/26/09	< 0.01	< 0.01	0.20	0.04	0.04
	07/28/09	0.02		0.40	0.04	0.04
	09/08/09	0.01	0.01	0.50	0.05	0.05
HMH 7516						
	01/16/07	< 0.01	< 0.01	0.20	0.02	0.02
	04/10/07	< 0.01	< 0.01	0.10	0.01	0.02
	05/09/07	0.02	0.02	0.20	0.02	0.02
	07/17/07	0.02	0.01	< 0.10	0.02	0.02
	09/11/07	0.02	0.01	0.50	0.01	0.03
	11/14/07	0.02	0.02	0.40	0.02	0.03
	01/14/08	< 0.01		0.30	0.01	0.02
	01/13/09	< 0.01	0.01	0.40	0.01	0.02
	05/26/09	< 0.01	< 0.01	< 0.10	0.02	0.02
	07/27/09	0.03		0.60	0.02	0.02
	09/08/09	< 0.01	0.01	0.20	0.01	0.01
OAS 2548						
	01/16/07	< 0.01	< 0.01	0.20	0.03	0.07
	04/11/07	< 0.01	0.01	0.30	0.04	0.04
	05/09/07	< 0.01	0.02	0.40	0.05	0.06
	07/17/07	0.09	0.02	0.50	0.06	0.06
	09/11/07	0.07	0.01	0.60	0.04	0.05
	11/14/07	0.02	0.02	0.40	0.04	0.35
	01/13/09	< 0.01	0.01	0.40	0.06	0.06

Appendix K

Nutrients Detected in Southern Area Drains 2007-2009

(milligrams per liter unless indicated)

Station	Date	Ammonia as Nitrogen	Nitrite	Organic Nitrogen	Ortho-phosphate	Total Phosphorus
CCN 3550						
	01/17/07	0.02	0.01	0.90	0.36	0.44
	03/21/07	0.04	0.03	0.70	0.42	0.44
	05/09/07	0.02	0.02	0.60	0.35	0.42
	07/17/07	0.04	0.02	0.80	0.43	0.40
	09/11/07	0.01	0.02	0.60	0.42	0.47
	11/15/07	< 0.01	0.03	0.60	0.47	0.50
	01/14/08	0.03		1.00	0.52	0.50
	01/13/09	0.01	0.06	0.90	0.52	0.48
	05/26/09	0.03	0.03	0.60	0.44	0.50
	07/28/09	0.02		0.60	0.49	0.50
	09/14/09	0.02	0.04	0.60	0.46	0.49
CNR 0801						
	01/16/07	< 0.01	< 0.01	0.60	0.01	0.01
	03/20/07	< 0.01	0.01	< 0.10	0.01	0.01
	05/09/07	< 0.01	0.02	0.50	0.01	0.01
	07/17/07	0.05	0.01	< 0.10	0.02	0.02
	09/11/07	0.01	0.02	< 0.10	0.01	0.01
	11/14/07	0.01	0.03	< 0.10	0.01	0.01
	01/14/08	< 0.01		0.20	0.01	0.02
	01/13/09	< 0.01	0.02	0.20	0.01	0.01
	05/27/09	< 0.01	0.01	0.60	0.01	0.01
	07/27/09	< 0.01		0.30	0.02	0.02
	09/14/09	0.02	0.02	0.50	0.02	0.02
COC 4126						
	01/16/07	0.01	0.07	0.80	0.02	0.02
	03/20/07	< 0.01	0.02	< 0.10	0.02	0.02
	05/08/07	< 0.01	0.02	0.80	0.03	0.04
	07/16/07	0.03		0.80	0.03	0.03
	09/11/07	< 0.01	0.02	0.20	0.02	0.03
	11/14/07	< 0.01	0.04	0.70	0.02	0.03
	01/14/08	< 0.01		0.50	0.01	0.02
	01/13/09	< 0.01	0.02	0.80	0.04	0.03
	05/27/09	< 0.01	0.02	0.90	0.03	0.05
	07/27/09	< 0.01		0.50	0.02	0.02
	09/14/09	0.02	0.06	< 0.10	0.02	0.02
ERR 8429						
	01/17/07	0.24	0.03	1.90	2.93	3.55
	03/21/07	0.20	0.04	1.60	3.50	3.50
	05/09/07	0.26	0.03	1.10	2.10	2.50
	07/17/07	0.20	0.03	1.30	3.10	3.50
	09/11/07	0.21	0.02	1.00	2.80	3.20
	11/15/07	< 0.01	0.02	1.10	1.80	1.80
	01/14/08	0.19		1.30	2.30	1.70
	01/14/09	< 0.01	0.01	1.20	0.04	1.60
	05/27/09	0.20	0.02	0.90	2.40	3.20
	07/28/09	0.24		1.20	2.30	3.30
	09/14/09	< 0.01	0.01	1.00	1.50	1.50

Appendix K

Nutrients Detected in Southern Area Drains
2007-2009

(milligrams per liter unless indicated)

Station	Date	Ammonia as Nitrogen	Nitrite	Organic Nitrogen	Ortho-phosphate	Total Phosphorus
HCH 7841						
	01/17/07	< 0.01	0.02	0.40	0.66	0.50
	03/21/07	< 0.01	< 0.01	0.60	0.67	0.70
	05/09/07	0.01	0.01	0.60	0.74	0.73
	07/17/07	0.05	0.01	0.90	0.65	0.62
	09/11/07	< 0.01	0.01	0.50	0.66	0.64
	11/15/07	< 0.01	0.02	0.70	0.90	0.91
	01/14/08	< 0.01		0.60	0.89	0.65
	01/14/09	< 0.01	0.01	0.70	0.04	1.10
	05/27/09	< 0.01	0.01	0.40	1.00	1.00
	07/28/09	< 0.01		0.50	1.00	1.00
	09/14/09	< 0.01	< 0.01	0.60	1.10	1.40
LNW 5467						
	01/16/07	< 0.01	< 0.01	< 0.10	0.02	0.02
	03/20/07	0.01	< 0.01	< 0.10	0.02	0.02
	05/08/07	< 0.01	0.01	0.30	0.01	0.01
	07/16/07	0.05	< 0.01	< 0.10	0.03	0.02
	09/11/07	< 0.01	0.01	0.10	0.02	0.02
	11/15/07	< 0.01	0.01	0.10	0.02	0.02
	01/15/08	< 0.01		0.50	0.01	0.03
	01/13/09	< 0.01	0.01	0.10	0.04	0.02
	05/26/09	0.01	< 0.01	< 0.10	0.02	0.02
	07/27/09	< 0.01		< 0.10	0.02	0.02
	09/16/09	0.02	< 0.01	< 0.10	0.03	0.03
VGD 3906						
	01/16/07	0.02	0.03	0.50	0.47	0.47
	03/20/07	0.19	0.01	0.60	0.14	0.15
	05/08/07	< 0.01	0.01	0.30	0.08	0.09
	07/16/07	0.14	0.02		0.13	0.13
	09/10/07	0.21	0.02	0.60	0.15	0.19
	11/15/07	0.25	0.02	0.40	0.19	0.19
	01/15/08	0.20		0.90	0.13	0.23
	01/14/09	0.04	0.02	0.60	0.20	0.16
	05/26/09	0.01	0.01	0.40	0.41	0.47
	07/28/09	0.09		0.70	0.24	0.29
	09/14/09	0.24	0.02	0.30	0.19	0.24

Appendix L
Pesticides in Area Drains
2007 – 2009

Pesticide Analyses Performed, 2007-2009

Analyte	Rpt Limit	Units	Method [*]	Analyte	Rpt	Unit	Method [*]
Sulfur Pesticides				**Chlorinated Phenoxy Acid Herbicides**			
Propargite	1	µg/L	DWR Sulfur Pesticides [1]	2,4,5-T	0.1	µg/L	EPA 615 [1]
Carbamate Pesticides				2,4,5-TP (Silvex)	0.1	µg/L	EPA 615 [1]
3-Hydroxycarbofuran	2	µg/L	EPA 531.1 [1]	2,4-D	0.1	µg/L	EPA 615 [1]
Aldicarb	2	µg/L	EPA 531.1 [1]	2,4-DB	0.1	µg/L	EPA 615 [1]
Aldicarb sulfone	2	µg/L	EPA 531.1 [1]	Dacthal (DCPA)	0.1	µg/L	EPA 615 [1]
Aldicarb sulfoxide	2	µg/L	EPA 531.1 [1]	Dicamba	0.1	µg/L	EPA 615 [1]
Carbaryl	2	µg/L	EPA 531.1 [1]	Dichlorprop	0.1	µg/L	EPA 615 [1]
Carbofuran	2	µg/L	EPA 531.1 [1]	Dinoseb (DNPB)	0.1	µg/L	EPA 615 [1]
Formetanate hydrochloride	100	µg/L	EPA 531.1 [1]	MCPA	0.1	µg/L	EPA 615 [1]
Methiocarb	4	µg/L	EPA 531.1 [1]	MCPP	0.1	µg/L	EPA 615 [1]
Methomyl	2	µg/L	EPA 531.1 [1]	Pentachlorophenol (PCP)	0.1	µg/L	EPA 615 [1]
Oxamyl	2	µg/L	EPA 531.1 [1]	Picloram	0.1	µg/L	EPA 615 [1]
Glyphosate				Triclopyr	0.1	µg/L	EPA 615 [1]
Glyphosate	25	µg/L	EPA 547 [1]	**Phosphorus/Nitrogen Pesticides**			
Chlorinated Organic Pesticides				Azinphos methyl (Guthion)	0.05	µg/L	EPA 614 [1]
Alachlor	0.05	µg/L	EPA 608 [1]	Benfluralin	0.01	µg/L	EPA 614 [1]
Aldrin	0.01	µg/L	EPA 608 [1]	Bromacil	0.1	µg/L	EPA 614 [1]
Atrazine	0.02	µg/L	EPA 608 [1]	Carbophenothion (Trithion)	0.02	µg/L	EPA 614 [1]
BHC-alpha	0.01	µg/L	EPA 608 [1]	Chlorpyrifos	0.01	µg/L	EPA 614 [1]
BHC-beta	0.01	µg/L	EPA 608 [1]	Cyanazine	0.1	µg/L	EPA 614 [1]
BHC-delta	0.01	µg/L	EPA 608 [1]	Demeton (Demeton O + Demeton S)	0.1	µg/L	EPA 614 [1]
BHC-gamma (Lindane)	0.01	µg/L	EPA 608 [1]	Diazinon	0.02	µg/L	EPA 614 [1]
Captan	0.05	µg/L	EPA 608 [1]	Dimethoate	0.01	µg/L	EPA 614 [1]
Chlordane	0.05	µg/L	EPA 608 [1]	Disulfoton	0.1	µg/L	EPA 614 [1]
Chlorothalonil	0.01	µg/L	EPA 608 [1]	Esfenvalerate	0.02	µg/L	EPA 614 [1]
Chlorpropham	0.02	µg/L	EPA 608 [1]	Ethion	0.01	µg/L	EPA 614 [1]
Chlorpyrifos	0.01	µg/L	EPA 608 [1]	Malathion	0.01	µg/L	EPA 614 [1]
Cyanazine	0.1	µg/L	EPA 608 [1]	Methidathion	0.02	µg/L	EPA 614 [1]
Dacthal (DCPA)	0.01	µg/L	EPA 608 [1]	Mevinphos	0.01	µg/L	EPA 614 [1]
Dichloran	0.01	µg/L	EPA 608 [1]	Molinate	0.02	µg/L	EPA 614 [1]
Dicofol	0.05	µg/L	EPA 608 [1]	Naled	0.02	µg/L	EPA 614 [1]
Dieldrin	0.01	µg/L	EPA 608 [1]	Napropamide	0.05	µg/L	EPA 614 [1]
Diuron	0.25	µg/L	EPA 608 [1]	Norflurazon	0.05	µg/L	EPA 614 [1]
Endosulfan sulfate	0.02	µg/L	EPA 608 [1]	Parathion (Ethyl)	0.01	µg/L	EPA 614 [1]
Endosulfan-I	0.01	µg/L	EPA 608 [1]	Parathion, Methyl	0.01	µg/L	EPA 614 [1]
Endosulfan-II	0.01	µg/L	EPA 608 [1]	Pendimethalin	0.05	µg/L	EPA 614 [1]
Endrin	0.01	µg/L	EPA 608 [1]	Phorate	0.01	µg/L	EPA 614 [1]
Endrin aldehyde	0.01	µg/L	EPA 608 [1]	Phosalone	0.02	µg/L	EPA 614 [1]
Heptachlor	0.01	µg/L	EPA 608 [1]	Phosmet	0.02	µg/L	EPA 614 [1]
Heptachlor epoxide	0.01	µg/L	EPA 608 [1]	Profenofos	0.01	µg/L	EPA 614 [1]
Methoxychlor	0.05	µg/L	EPA 608 [1]	Prometryn	0.05	µg/L	EPA 614 [1]
Metolachlor	0.05	µg/L	EPA 608 [1]	Propetamphos	0.1	µg/L	EPA 614 [1]
Oxyfluorfen	0.1	µg/L	EPA 608 [1]	Thiobencarb	0.02	µg/L	EPA 614 [1]
PCB-1016	0.1	µg/L	EPA 608 [1]	Trifluralin	0.01	µg/L	EPA 614 [1]
PCB-1221	0.1	µg/L	EPA 608 [1]	s,s,s-Tributyl Phosphorotrithioate (DEF)	0.01	µg/L	EPA 614 [1]
PCB-1232	0.1	µg/L	EPA 608 [1]				
PCB-1242	0.1	µg/L	EPA 608 [1]				
PCB-1248	0.1	µg/L	EPA 608 [1]				
PCB-1254	0.1	µg/L	EPA 608 [1]				
PCB-1260	0.1	µg/L	EPA 608 [1]				
Pentachloronitrobenzene (PCNB)	0.01	µg/L	EPA 608 [1]				
Permethrin	0.02	µg/L	EPA 608 [1]				
Simazine	0.02	µg/L	EPA 608 [1]				
Thiobencarb	0.02	µg/L	EPA 608 [1]				
Toxaphene	0.4	µg/L	EPA 608 [1]				
o,p'-DDE	0.01	µg/L	EPA 608 [1]				
p,p'-DDD	0.01	µg/L	EPA 608 [1]				
p,p'-DDE	0.01	µg/L	EPA 608 [1]				
p,p'-DDT	0.05	µg/L	EPA 608 [1]				

2007-2009 Central Area Pesticides Detected

Station	Collection Date	Pesticide	Concentration (µg/L)	Reporting Limit (µg/L)
BVS 6001	05/08/07	Triclopyr	0.38	0.10
BVS 6001	07/18/07	Chlorothalonil	0.01	0.01
BVS 6001	07/18/07	Chlorpyrifos	0.54	0.01
BVS 6001	07/18/07	Chlorpyrifos	0.54	0.01
BVS 6001	07/28/09	Dimethoate	0.14	0.01
CTL 3728	07/17/07	Atrazine	0.02	0.02
CTL 3728	07/17/07	Atrazine	0.02	0.02
CTL 3728	07/27/09	Glyphosate	53.0	25.0
CTL 3728	07/27/09	Metolachlor	0.19	0.05
FBH 2016	07/18/07	Chlorothalonil	0.02	0.01
FBH 2016	01/14/09	Diuron	0.82	0.25
HMH 7516	01/13/09	Diuron	2.60	0.25
OAS 2548	07/17/07	Thiobencarb	4.45	0.02
OAS 2548	09/11/07	Thiobencarb	0.39	0.02
OAS 2548	01/13/09	Diuron	1.40	0.25
OAS 2548	07/28/09	Chlorothalonil	0.02	0.01
OAS 2548	07/28/09	Thiobencarb	1.80	0.02
OAS 2548	07/28/09	Thiobencarb	1.94	0.02

2007-2009 Southern Area Pesticides Detected

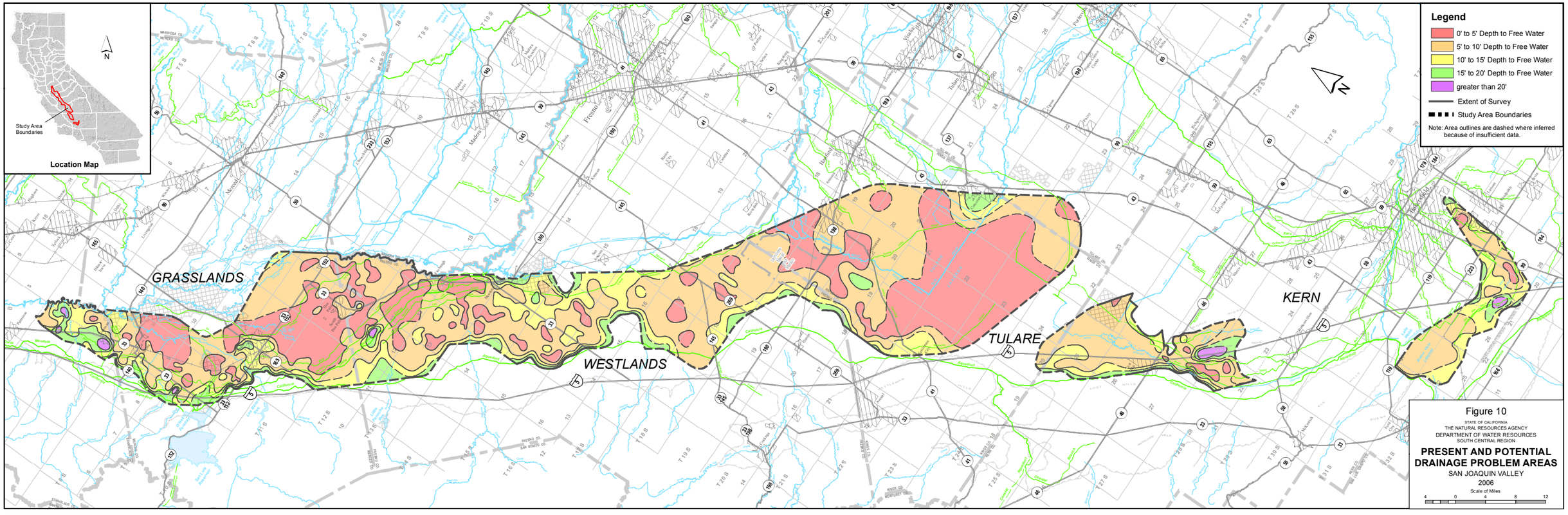
Station	Collection Date	Pesticide	Concentration (µg/L)	Reporting Limit (µg/L)
CCN 3550	01/17/07	Diuron	3.25	0.25
CCN 3550	03/21/07	Diuron	1.02	0.25
CCN 3550	03/21/07	Pendimethalin	0.05	0.05
CCN 3550	05/09/07	Atrazine	0.02	0.02
CCN 3550	05/09/07	Chlorothalonil	0.03	0.01
CCN 3550	05/09/07	Diuron	0.97	0.25
CCN 3550	07/17/07	Chlorothalonil	0.01	0.01
CCN 3550	07/17/07	Diuron	0.58	0.25
CCN 3550	09/11/07	Diuron	0.30	0.25
CNR 0801	07/17/07	Chlorothalonil	0.05	0.01
CNR 0801	09/14/09	Chlorothalonil	0.05	0.01
COC 4126	03/20/07	Bromacil	0.37	0.10
COC 4126	03/20/07	Dacthal (DCPA)	10.00	0.10
COC 4126	05/08/07	Atrazine	0.02	0.02
COC 4126	05/08/07	Bromacil	0.16	0.10
COC 4126	05/08/07	Chlorothalonil	0.16	0.01
COC 4126	05/08/07	Dacthal (DCPA)	3.14	0.10
COC 4126	05/08/07	Simazine	0.03	0.02
COC 4126	07/16/07	Dacthal (DCPA)	2.78	0.10
COC 4126	09/11/07	Dacthal (DCPA)	9.30	0.10
COC 4126	11/14/07	Dacthal (DCPA)	2.87	0.10
COC 4126	01/14/08	Dacthal (DCPA)	10.80	0.50
COC 4126	01/13/09	Dacthal (DCPA)	10.10	0.50
COC 4126	05/27/09	Chlorothalonil	0.06	0.01
COC 4126	05/27/09	Dacthal (DCPA)	9.10	0.50
COC 4126	07/27/09	Dacthal (DCPA)	2.89	0.50
COC 4126	07/27/09	Simazine	0.03	0.02
COC 4126	09/14/09	Chlorothalonil	0.12	0.01
COC 4126	09/14/09	Dacthal (DCPA)	3.40	0.50
COC 4126	09/14/09	Simazine	0.04	0.02
ERR 8429	01/17/07	Diuron	0.55	0.25
ERR 8429	03/21/07	Diuron	1.41	0.25
ERR 8429	05/09/07	Diuron	0.54	0.25
ERR 8429	07/17/07	Chlorothalonil	0.01	0.01
ERR 8429	07/17/07	Diuron	0.70	0.25
ERR 8429	05/27/09	Chlorothalonil	0.01	0.01
ERR 8429	05/27/09	Dacthal (DCPA)	0.61	0.50
ERR 8429	05/27/09	Diuron	0.31	0.25
ERR 8429	07/28/09	Diuron	0.31	0.25

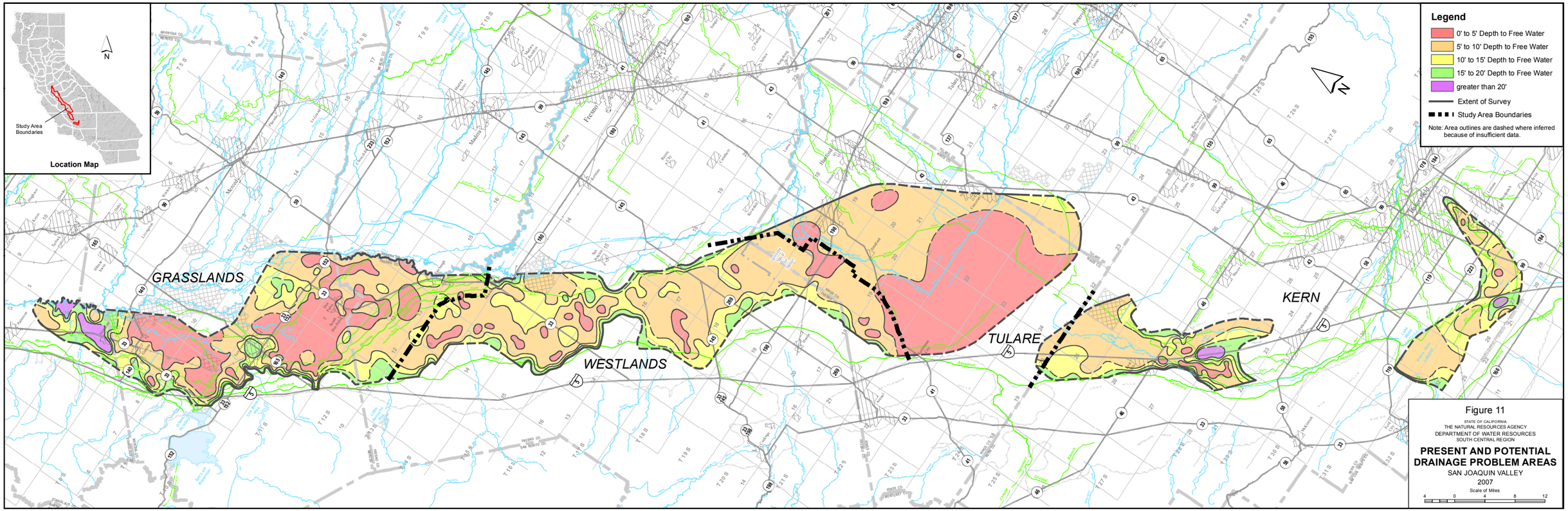
2007-2009 Southern Area Pesticides Detected (continued)

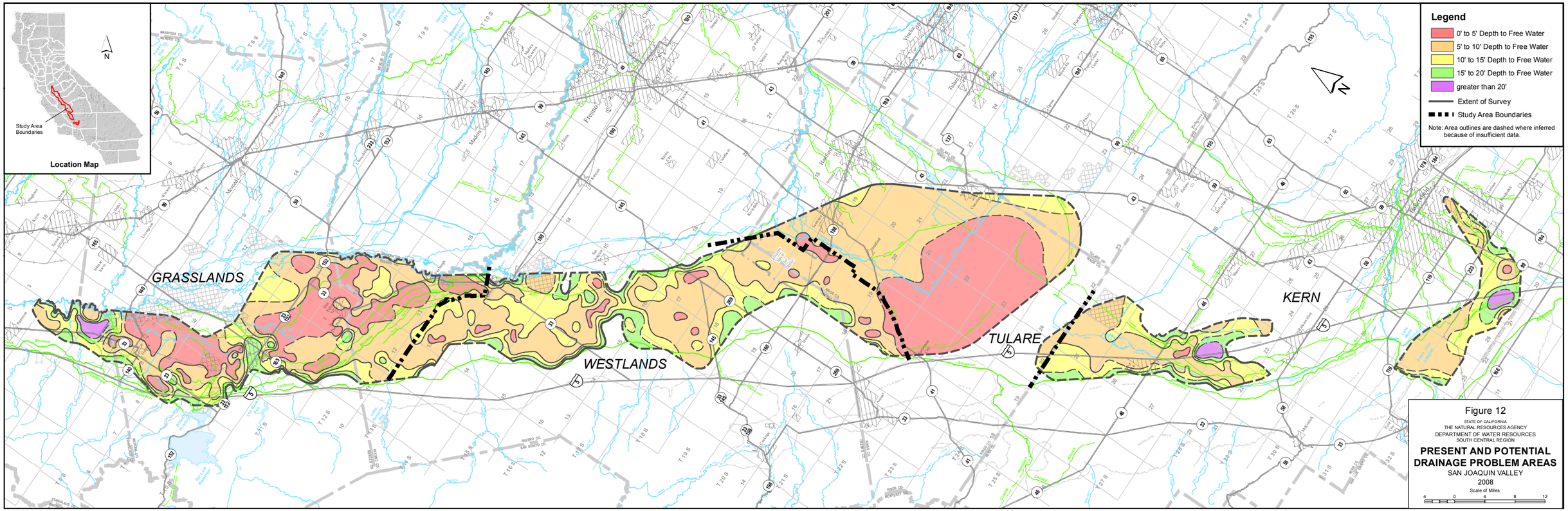
Station	Collection Date	Pesticide	Concentration (μg/L)	Reporting Limit (μg/L)
HCH 7841	01/17/07	Diuron	9.70	0.25
HCH 7841	03/21/07	Atrazine	0.13	0.02
HCH 7841	03/21/07	Diuron	2.83	0.25
HCH 7841	03/21/07	Simazine	0.02	0.02
HCH 7841	05/09/07	Atrazine	0.19	0.02
HCH 7841	05/09/07	Chlorothalonil	0.04	0.01
HCH 7841	05/09/07	Diuron	2.06	0.25
HCH 7841	05/09/07	Metolachlor	0.05	0.05
HCH 7841	05/09/07	Simazine	0.03	0.02
HCH 7841	07/17/07	Aldicarb sulfoxide	5.00	2.00
HCH 7841	07/17/07	Atrazine	0.05	0.02
HCH 7841	07/17/07	Chlorothalonil	0.03	0.01
HCH 7841	07/17/07	Diuron	0.35	0.25
HCH 7841	09/11/07	Atrazine	0.03	0.02
HCH 7841	05/27/09	Atrazine	0.04	0.02
HCH 7841	05/27/09	Diuron	1.20	0.25
HCH 7841	07/28/09	Atrazine	0.06	0.02
HCH 7841	09/14/09	Atrazine	0.07	0.02
HCH 7841	09/14/09	Diuron	0.42	0.25
LNW 5467	01/16/07	Diuron	0.34	0.25
LNW 5467	03/20/07	Atrazine	0.04	0.02
LNW 5467	03/20/07	Diuron	0.32	0.25
LNW 5467	03/20/07	Simazine	0.03	0.02
LNW 5467	05/08/07	Atrazine	0.09	0.02
LNW 5467	05/08/07	Diuron	0.30	0.25
LNW 5467	05/08/07	Simazine	0.05	0.02
LNW 5467	07/27/09	Simazine	0.03	0.02
VGD 3906	07/16/07	Metolachlor	0.10	0.05
VGD 3906	05/26/09	Diuron	4.10	0.25
VGD 3906	05/26/09	Norflurazon	0.22	0.05

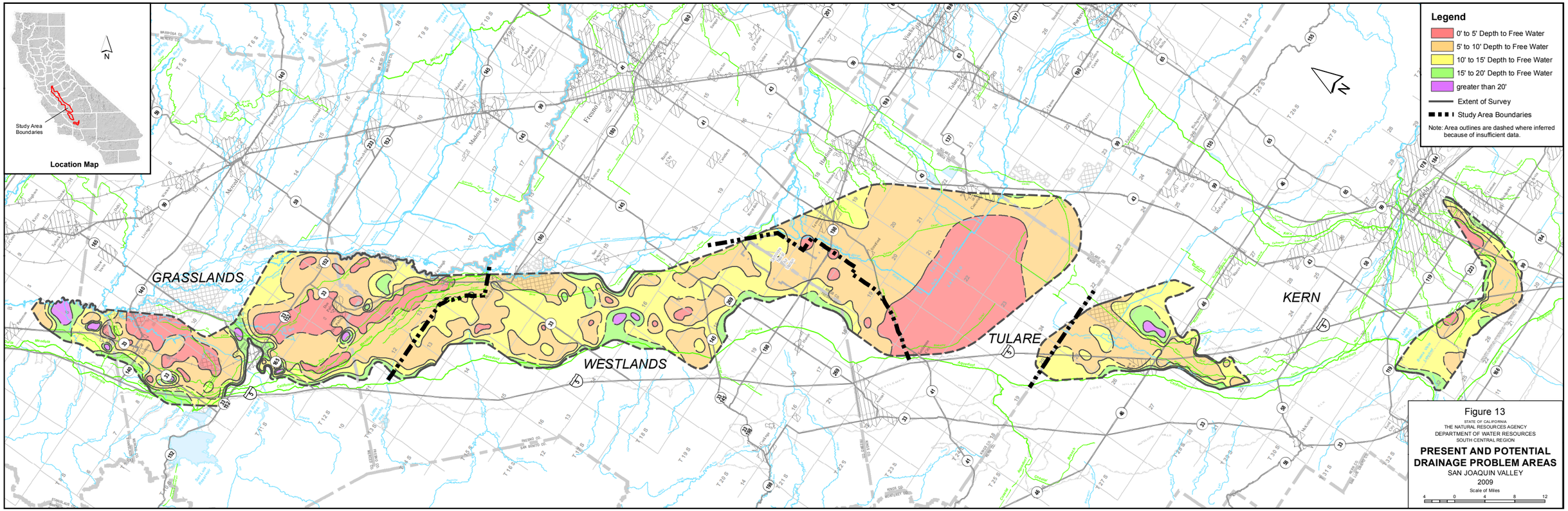
Detected Pesticide Properties

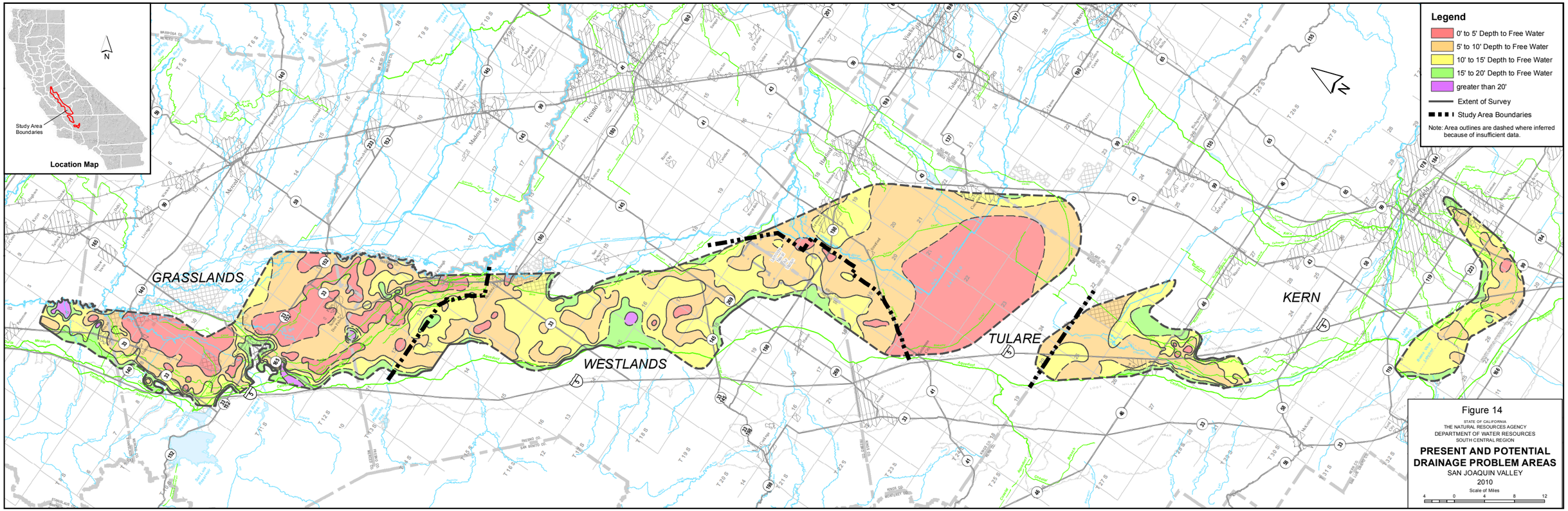
Pesticide	Solubility in Water	Environmental Degradation and Metabolism
Aldicarb sulfoxide is a breakdown product of aldicarb	6 g/L at 25°C for aldicarb	In soil, the sulfur atom of aldicarb is oxidized to sulfoxide and sulfone by chemical processes, possibly mediated biologically in some cases. Various oximes, nitriles, amides, acids, and alcohols are also formed. The duration of activity for aldicarb is about 10 weeks.
Atrazine	28 mg/L at 20°C	In soil, microbial degradation occurs, with a half-life of about 6-10 weeks. Hydroxyatrazine is the principal metabolite. The duration of residual activity in soil is approximately 5-7 months.
Bromacil	815 mg/L at 25°C	The duration of residual activity in soil is approximately 7 months.
Chlorothalonil	0.6 mg/L at 25°C	Half-life in soil is about 1.5 to 3 months, depending on moisture content and temperature
Chlorpyrifos	Approximately 2 mg/L at 25°C	In soil, chlorpyrifos is slowly degraded, with a half-life of about 80-100 days, to 3,5,6-trichloro-2-pyridinol, which is subsequently degraded to organochlorine compounds and carbon dioxide.
Dacthal	Approximately 0.5 mg/L at 25°C	In soil, microbial degradation leads to monomethyl tetrachloroterephthalate and 2,3,5,6-tetrachloroterephthalic acid (chlorthal). The duration of residual activity in soil is about 3 months.
Dimethoate	25 g/L at 21°C	
Diuron	42 mg/L at 25°C	In soil, enzymic and demethylation of the nitrogen atom and hydroxylation at position 2 of the benzene ring occur; duration of activity in soil is about 4 to 8 months, depending on soil type and humidity
Glyphosate	12 g/L at 25°C	Strongly adsorbed to soil. Microbial degradation is the major cause of loss from soil, with liberation of carbon dioxide. The half-life in soil is normally less than 60 days.
Metolachlor	530 mg/L at 20°C	
Norflurazon	28 mg/L at 23°C	Dissipated in soil by photodegradation and volatilization
Pendimethalin	0.3 mg/L at 20°C	The half-life in soil is 3-4 months. The 4-methyl group on the benzene ring is oxidized to the carboxylic acid via the alcohol, and the amino nitrogen is also oxidized.
Simazine	3.5 mg/L at 20°C	In soil, microbial activity probably accounts for degradation of a significant amount of simazine. Loss by photodecomposition or volatilization is insignificant. The low water solubility of simazine limits its downward movement or leaching. Several months after application, the greatest portion is found in the upper 2 inches of soil.
Thiobencarb	30 mg/L at 20°C	It is rapidly adsorbed by soil, and is not readily leached. Degradation is primarily by microbial breakdown, with little loss from volatilization and photodegradation. Its half-life in soil varies from 2-3 weeks under aerobic conditions to 6-8 months under anaerobic conditions.
Triclopyr	440 mg/L at 25°C	In soil, triclopyr is degraded fairly rapidly by microbial activity, with an average half-life of 46 days, depending on soil and climatic conditions. The major degradation product is 3,5,6-trichloro-2-pyridinol, which has a soil half-life of 30-90 days, and further degrades to carbon dioxide and soil organic matter. 3,5,6-Trichloro-2-methoxypyridine is also a degradation product.

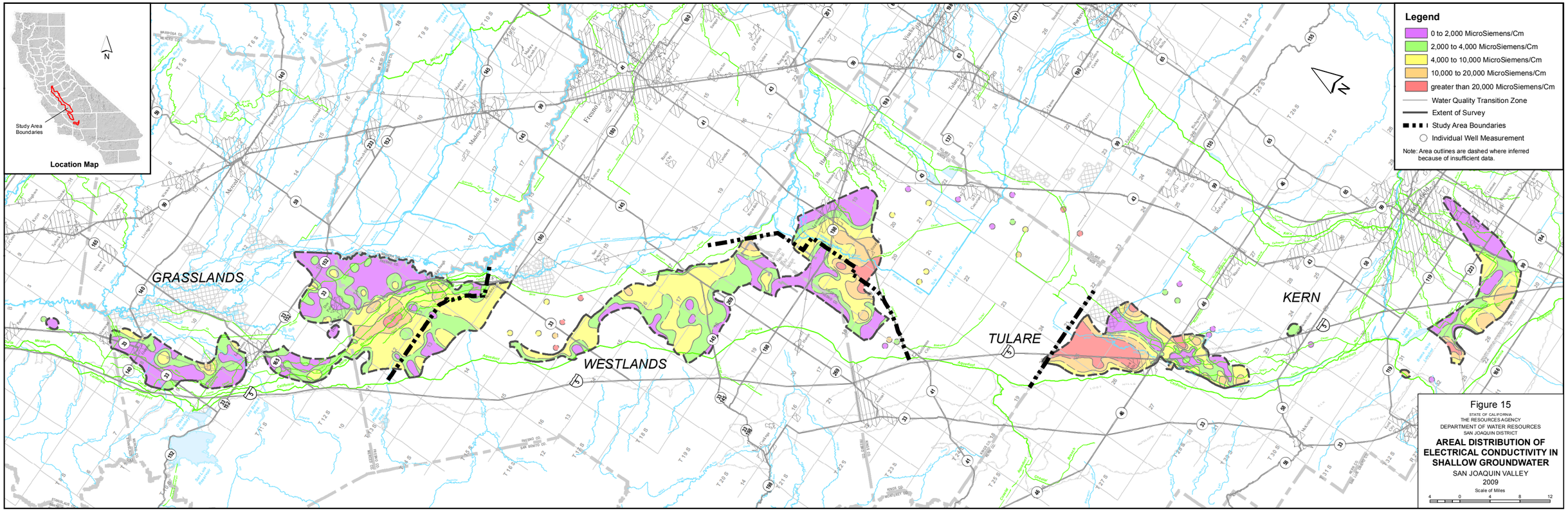

Location Map
Study Area Boundaries
N
Legend
0' to 5' Depth to Free Water
5' to 10' Depth to Free Water
10' to 15' Depth to Free Water
15' to 20' Depth to Free Water
greater than 20'
Extent of Survey
Study Area Boundaries
Note: Area outlines are dashed where inferred because of insufficient data.
GRASSLANDS
WESTLANDS
TULARE
KERN
Figure 10
STATE OF CALIFORNIA
THE NATURAL RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
SOUTH CENTRAL REGION
PRESENT AND POTENTIAL DRAINAGE PROBLEM AREAS
SAN JOAQUIN VALLEY
2006
Scale of Miles
4 0 4 8 12

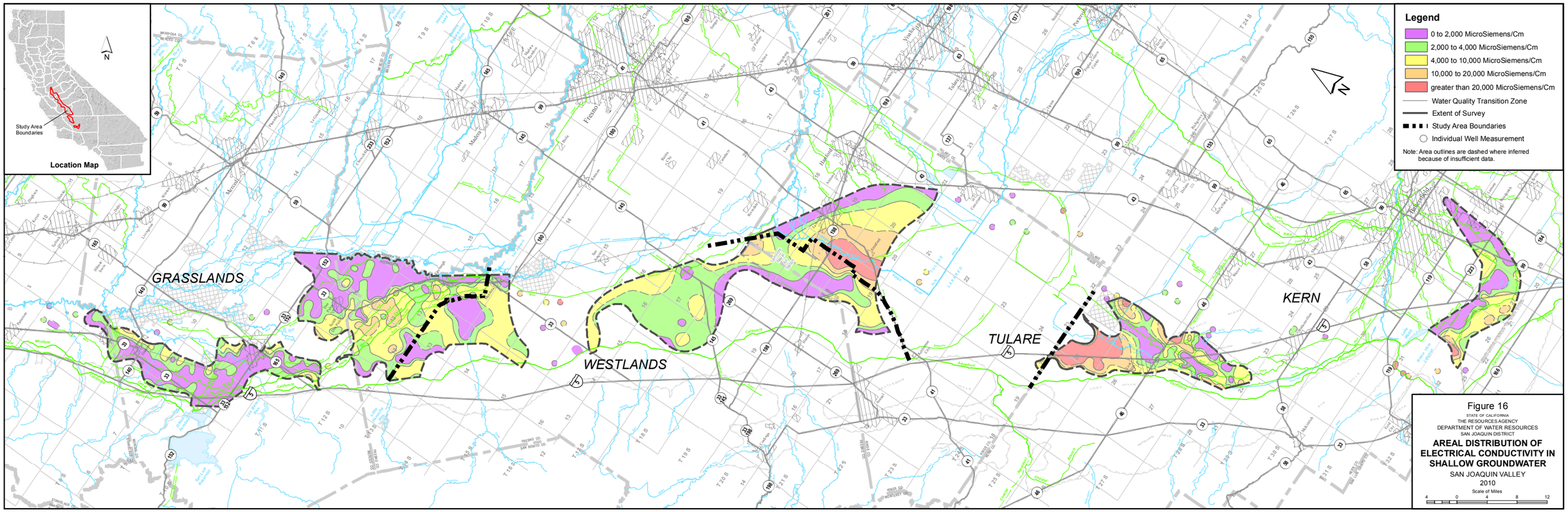

Location Map
Study Area Boundaries
N
Legend
0' to 5' Depth to Free Water
5' to 10' Depth to Free Water
10' to 15' Depth to Free Water
15' to 20' Depth to Free Water
greater than 20'
Extent of Survey
Study Area Boundaries
Note: Area outlines are dashed where inferred because of insufficient data.
GRASSLANDS
WESTLANDS
TULARE
KERN
Figure 11
STATE OF CALIFORNIA
THE NATURAL RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
SOUTH CENTRAL REGION
PRESENT AND POTENTIAL DRAINAGE PROBLEM AREAS
SAN JOAQUIN VALLEY
2007
Scale of Miles
4 0 4 8 12


Location Map
Study Area Boundaries
N
Legend
0' to 5' Depth to Free Water
5' to 10' Depth to Free Water
10' to 15' Depth to Free Water
15' to 20' Depth to Free Water
greater than 20'
Extent of Survey
Study Area Boundaries
Note: Area outlines are dashed where inferred because of insufficient data.
GRASSLANDS
WESTLANDS
TULARE
KERN
Figure 12
STATE OF CALIFORNIA
THE NATURAL RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
SOUTH CENTRAL REGION
PRESENT AND POTENTIAL DRAINAGE PROBLEM AREAS
SAN JOAQUIN VALLEY
2008
Scale of Miles
4 0 4 8 12


Location Map
Study Area Boundaries
N
GRASSLANDS
WESTLANDS
TULARE
KERN
Legend
0' to 5' Depth to Free Water
5' to 10' Depth to Free Water
10' to 15' Depth to Free Water
15' to 20' Depth to Free Water
greater than 20'
Extent of Survey
Study Area Boundaries
Note: Area outlines are dashed where inferred because of insufficient data.
Figure 13
STATE OF CALIFORNIA
THE NATURAL RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
SOUTH CENTRAL REGION
PRESENT AND POTENTIAL DRAINAGE PROBLEM AREAS
SAN JOAQUIN VALLEY
2009
Scale of Miles
4 0 4 8 12


Location Map
Study Area Boundaries
N
Legend
0' to 5' Depth to Free Water
5' to 10' Depth to Free Water
10' to 15' Depth to Free Water
15' to 20' Depth to Free Water
greater than 20'
Extent of Survey
Study Area Boundaries
Note: Area outlines are dashed where inferred because of insufficient data.
GRASSLANDS
WESTLANDS
TULARE
KERN
Figure 14
STATE OF CALIFORNIA
THE NATURAL RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
SOUTH CENTRAL REGION
PRESENT AND POTENTIAL DRAINAGE PROBLEM AREAS
SAN JOAQUIN VALLEY
2010
Scale of Miles
4 0 4 8 12


Location Map
Study Area Boundaries
N
Legend
0 to 2,000 MicroSiemens/Cm
2,000 to 4,000 MicroSiemens/Cm
4,000 to 10,000 MicroSiemens/Cm
10,000 to 20,000 MicroSiemens/Cm
greater than 20,000 MicroSiemens/Cm
Water Quality Transition Zone
Extent of Survey
Study Area Boundaries
Individual Well Measurement
Note: Area outlines are dashed where inferred because of insufficient data.
GRASSLANDS
WESTLANDS
TULARE
KERN
Figure 15
STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
SAN JOAQUIN DISTRICT
AREAL DISTRIBUTION OF ELECTRICAL CONDUCTIVITY IN SHALLOW GROUNDWATER
SAN JOAQUIN VALLEY
2009
Scale of Miles
4 0 4 8 12


Location Map
Study Area Boundaries
N
Legend
0 to 2,000 MicroSiemens/Cm
2,000 to 4,000 MicroSiemens/Cm
4,000 to 10,000 MicroSiemens/Cm
10,000 to 20,000 MicroSiemens/Cm
greater than 20,000 MicroSiemens/Cm
Water Quality Transition Zone
Extent of Survey
Study Area Boundaries
Individual Well Measurement
Note: Area outlines are dashed where inferred because of insufficient data.
GRASSLANDS
WESTLANDS
TULARE
KERN
Figure 16
STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
SAN JOAQUIN DISTRICT
AREAL DISTRIBUTION OF ELECTRICAL CONDUCTIVITY IN SHALLOW GROUNDWATER
SAN JOAQUIN VALLEY
2010
Scale of Miles
4 0 4 8 12