ANNUAL REPORT FORM FOR INDIVIDUAL NPDES PERMITS FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS (RULE 62-624.600(2), F.A.C.)

- This Annual Report Form must be completed and submitted to the Department to satisfy the annual reporting requirements established in Rule 62-621.600, F.A.C.
- Submit this fully completed and signed form and any REQUIRED attachments by email to the NPDES Stormwater Program Administrator or to the MS4 coordinator. Their names and email addresses are available at: http://www.dep.state.fl.us/water/stormwater/npdes/contacts.htm. If files are larger than 10mb, materials may be placed on the NPDES Stormwater ftp site at: ftp://ftp.dep.state.fl.us/pub/NPDES_Stormwater/. After uploading the ANNUAL REPORT files, an email must be sent to the MS4 coordinator or the NPDES program administrator notifying them the report is ready for downloading
- Refer to the Form Instructions for guidance on completing each section.
- **Please print or type information in the appropriate areas below**

SECTION I. BACKGROUND INFORMATION

A.	Permittee Name: City of Lakeland		
B.	Permit Name: Polk County Municipal Separate Storm Sewer System		
C.	Permit Number: FLS000015-003 (Cycle 3)		
D.	Annual Report Year: ☐ Year 1 ☒ Year 2 ☐ Year 3 ☐ Year 4 ☐ Year 5 ☐ Other, specify Year:		
E.	Reporting Time Period (month/year): October 2012 through September 2013		
F.	Name of the Responsible Authority: Richard E. Lilyquist, P.E.		
	Title: Director, Public Works Department		
	Mailing Address: 228 South Massachusetts Avenue		
	City: Lakeland	Zip Code: 33801-2467	County: Polk
	Telephone Number: 863-834-6001	Fax Number: 863-834-8040	
	E-mail Address: rick.lilyquist@lakelandgov.net		
G.	Name of the Designated Stormwater Management Program Contact (if different from Section I.F above): Curtis Porterfield		
	Title: Manager, Lakes & Stormwater Division		
	Department: Public Works Department		
	Mailing Address: 407 Fairway Avenue		
	City: Lakeland	Zip Code: 33801-2467	County: Polk
	Telephone Number: 863-834-8439	Fax Number: 863-834-3308	
	E-mail Address: curtis.porterfield@lakelandgov.net		

SECTION II. MS4 MAJOR OUTFALL INVENTORY (Not Applicable In Year 1)

A.	Number of outfalls ADDED to the outfall inventory in the current reporting year (insert "0" if none): 0 (Does this number include non-major outfalls? ☐ Yes ☐ No ☒ Not Applicable)
B.	Number of outfalls REMOVED from the outfall inventory in the current reporting year (insert "0" if none): 0 (Does this number include non-major outfalls? ☐ Yes ☐ No ☒ Not Applicable)
C.	Is the change in the total number of outfalls due to lands annexed or vacated? ☐ Yes ☐ No ☒ Not Applicable

SECTION III. MONITORING PROGRAM

A.	An ambient monitoring program for this permit is established through an inter-local agreement with Polk County. Please see the Polk County Annual Report for the monitoring information. The County monitors the following lakes within the City of Lakeland's utility boundaries: Gibson, Parker, Crago, Hollingsworth, Hunter, Bonny, Little Bonny, Crystal, John, Somerset, Banana, and Deeson. The TMDL Prioritization report updated and submitted to FDEP with this report constitutes the City of Lakeland's current *targeted* SWMP (all other stormwater/surface water related activities are considered general maintenance and operation activities). Targeted SWMP data will be reported to FDEP on the timeline specified in the TMDL Prioritization report or at a minimum with every annual MS4 report.
B.	An updated TMDL Prioritization Report, dated April 1, 2014, is included as an attachment.
C.	Data summaries are included as appendices to the updated TMDL Prioritization Report attached.

SECTION IV. FISCAL ANALYSIS

A.	Total expenditures for the NPDES stormwater management program for the current reporting year: $7,858,276
B.	Total budget for the NPDES stormwater management program for the subsequent reporting year: $5,515,403. Note: The difference in expenditures is simply due to the scheduling of CIP projects (our budget revenues remain healthy and largely unchanged from previous years).

SECTION V. MATERIALS TO BE SUBMITTED WITH THIS ANNUAL REPORT FORM

Only the following materials are to be submitted to the Department along with this fully completed and signed Annual Report Form (check the appropriate box to indicate whether the item is attached or is not applicable):

Attached	N/A	***DEP Note: Please complete Checklists A & B at the end of the tailored form.***
☐	☒	Any additional information required to be submitted in this current annual reporting year in accordance with Part III.A of your permit that is not otherwise included in Section VII below.
☒	☐	A monitoring data summary as directed in Section III.C above and in accordance with Rule 62-624.600(2)(c), F.A.C.
☐	☒	Year 1 ONLY: An inventory of all known major outfalls and a map depicting the location of the major outfalls (hard copy or CD-ROM) in accordance with Rule 62-624.600(2)(a), F.A.C.
☐	☒	Year 3 ONLY: The estimates of pollutant loadings and event mean concentrations for each major outfall or each major watershed in accordance with Rule 62-624.600(2)(b), F.A.C.
☐	☒	Year 4 ONLY: Permit re-application information in accordance with Rule 62-624.420(2), F.A.C.

DO NOT SUBMIT ANY OTHER MATERIALS

(such as records and logs of activities, monitoring raw data, public outreach materials, etc.)

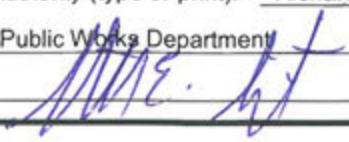
SECTION VI. CERTIFICATION STATEMENT AND SIGNATURE

The Responsible Authority listed in Section I.F above must sign the following certification statement, as per Rule 62-620.305, F.A.C:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based upon my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name of Responsible Authority (type or print): Richard E. Lilyquist, P.E.

Title: Director, Public Works Department

Signature:  Date: 3/26/14

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SECTION VII. STORMWATER MANAGEMENT PROGRAM (SWMP) SUMMARY TABLE

Part III.A.1 — **Structural Controls and Stormwater Collection Systems Operation**

The current MS4 inventory is robust and accurate. To ensure continued accuracy of data, the MS4 is continually undergoing GIS and field reviews by the City of Lakeland's Engineering and Lakes & Stormwater Divisions. Our inventory may change in nomenclature or change in quantity due to more accurate up-to-date information and not necessarily due to actual added/subtracted structural controls.

Type of Structure	Number of Activities Performed					Documentation / Record	Entity Performing the Activity	Comments
	Total Number of Structures	Number of Inspections	Percentage Inspected	Number of Maintenance Activities	Percentage Maintained			
Dry retention systems	56	322	100	322	100	COL WORK ORDER SYSTEM DATABASE	Public Works Construction & Maintenance	Note: naming of our ponds as dry vs wet vs retention vs detention is under review. Total number of structures in any given category may change in Yr 3 if errors are found.
Exfiltration trench / French drains (linear feet)	14	43	100	43	100	COL WORK ORDER SYSTEM DATABASE	Public Works Construction & Maintenance	
Grass treatment swales (miles)	8	60	100	60	100	COL WORK ORDER SYSTEM DATABASE	Public Works Construction & Maintenance	
Dry detention systems	42	331	100	331	100	COL WORK ORDER SYSTEM DATABASE	Public Works Construction & Maintenance	Note: naming of our ponds as dry vs wet vs retention vs detention is under review. Total number of structures in any given category may change in Yr 3 if errors are found.
Wet detention systems	26	65	100	65	100	COL WORK ORDER SYSTEM DATABASE	Public Works Construction & Maintenance	Note: naming of our ponds as dry vs wet vs retention vs detention is under review. Total number of structures in any given category may change in Yr 3 if errors are found.
Pollution control boxes	15	126	100	126	100	COL WORK ORDER SYSTEM DATABASE	Public Works Construction & Maintenance	
Stormwater pump stations	2	2	100	2	100	COL WORK ORDER SYSTEM DATABASE	Public Works Construction & Maintenance	
Total Major Outfall Ditches	19	105	100	105	100	COL WORK ORDER SYSTEM DATABASE	Public Works Construction & Maintenance	Based on mowing records. Each ditch is mowed and inspected multiple times annually and includes follow-up spraying and cleaning if applicable.
Total Major Outfall Pipes	119	0	0	0	0	COL WORK ORDER SYSTEM DATABASE	Public Works Construction & Maintenance	Major outfall pipes have traditionally not been inspected/maintained annually since maintenance records indicated this frequency was not necessary. All major outfall pipes will be inspected in Yr 3 and annually thereafter due to an in-house policy change. Maintenance activities will be scheduled accordingly based on inspection results.
Weirs or other control structures	13	610	100	5	38	COL WORK ORDER SYSTEM DATABASE and LAKES ELEVATION SPREADSHEET	Public Works Lakes & Stormwater	
MS4 pipes (LF)	1,440,737	26,143	2	26,143	2	COL WORK ORDER SYSTEM DATABASE	Public Works Construction & Maintenance	Total LF based on GIS analysis of the drain pipe attribute. Inspected and maintained based on LF pipes cleaned in work order system
Inlets / catch basins / grates	4,510	12,950	100	12,950	100	COL WORK ORDER SYSTEM DATABASE	Public Works Construction & Maintenance	INCLUDES CLEANINGS & INSPECTIONS,
Other Drainage Ditches, Swales, Canals	75	379	100	379	100	COL WORK ORDER SYSTEM DATABASE	Public Works Construction & Maintenance	Based on mowing records. Each ditch is mowed and inspected multiple times annually and includes follow-up spraying and cleaning if applicable.

Part III.A.2	Areas of New Development and Significant Redevelopment				
	Permit Activity	**Number of Activities**	**Documentation**	**Entity Performing the Activity**	**Comments**
	Review of redevelopment projects	72	Engineering Spreadsheet for Project Review	Public Works Engineering Division	

Part III.A.3	Roadways				
	Permit Activity	**Number of Activities**	**Documentation**	**Entity Performing the Activity**	**Comments**
	PERMITTEE Litter Control Program: Frequency of litter collection	140	Maximo	COL P & R & FDOT Crews	Number of days litter was picked up
	PERMITTEE Litter Control Program: Estimated amount of area maintained (miles)	37.682	FDOT Contract	COL P & R & FDOT Crews	Miles per FDOT Contract # 412947-1-78-92
	PERMITTEE Litter Control Program: Estimated amount of litter collected (Tons)	27	Maximo	COL P & R & FDOT Crews	
	Trash Pick-up Events: Total miles cleaned	19.75	Litter Pick up Worksheet	COL L&S	
	Trash Pick-up Events: Estimated amount of litter collected (Bags collected)	159	Lakes Issues database	COL L&S	
	Adopt-A-Lake Program: Total miles cleaned	6.85	Adopt-A-Lake Worksheet	COL L&S	
	Adopt-A-Lake Program: Estimated amount of litter collected (Bags collected)	47	Lakes Issues database	COL L&S	
	Frequency of street sweeping	DAILY	Street Sweeper Log Work order database	PW C & M	Work week-Mon-Thurs 6:30am to 5pm
	Total miles -swept (per year)	21,471	Street Sweeper Log Work order database	PW C & M	
	Estimated quantity of sweeping material collected (TONS)	3,101	Tonnage Spreadsheet	PW C & M	
	Total nitrogen loadings removed (pounds)	3,535	Street Sweeper Load Reduction Spreadsheet	PW C & M	FSA Assessment Tool Calculated Nutrient Load Reductions from MS4 Maintenance Practices
	Total phosphorus loadings removed (pounds)	2,257	Street Sweeper Load Reduction Spreadsheet	PW C & M	FSA Assessment Tool Calculated Nutrient Load Reductions from MS4 Maintenance Practices

	Facility	Number of Inspections	Documentation	Entity Performing the Activity	Comments
	Name of facility #1: Construction & Maintenance Yard & Transfer Station	12	Inspection reports	Public Works L & S & C & M	
	Name of facility #2: Parks & Recs Repair Shop/Dumpster Facility	1	Inspection reports	Public Works L & S & Fleet	
	Name of facility #3: Solid Waste Facility	1	Inspection Reports	Public Works L & S	

Part III.A.4	**Flood Control Projects**				
	Permit Activity	**Number of Activities**	**Documentation**	**Entity Performing the Activity**	**Comments**
	Flood control projects completed during the reporting period	2	Engineering Division Approved Plans Docs	Public Works Engineering	Curran Street and Shore Acres flood control projects
	Flood control projects completed during the reporting period that did <u>not</u> include stormwater treatment	1	n/a	n/a	Curran Street project did not include stormwater treatment
	Stormwater retrofit projects planned	2	Lakes & Stormwater Lake Parker Project Files	Lakes & Stormwater	Lake Parker Basin stormwater ponds Site K and G scheduled for modifications in Yr 3 and Yr 4 respectively.
	Stormwater retrofit projects under construction during the reporting period	0	Lakes & Stormwater Project Files	Lakes & Stormwater	Major stormwater retrofit projects will be scheduled in future years as specified in our TMDL Implementation Plans.
	Stormwater retrofit projects completed during the reporting period	0	Lakes & Stormwater Project Files	Lakes & Stormwater	Major stormwater retrofit projects will be scheduled in future years as specified in our TMDL Implementation Plans.

Part III.A.5	**Municipal Waste Treatment, Storage, and Disposal Facilities Not Covered by an NPDES Stormwater Permit**				
	Facility	**Number of Inspections**	**Documentation**	**Entity Performing the Activity**	**Comments**
	Name of facility #1: Construction & Maintenance Yard & Transfer Station	12	Inspection reports	Public Works L & S & C & M	
	Name of facility #2: Fleet Maintenance Facility	12	Inspection reports	Public Works L & S & Fleet	
	Name of facility #3: Parks & Recs Repair Shop/Dumpster Facility	1	Inspection report	Public Works L & S & Parks & Recs	

Part III.A.6	Pesticides, Herbicides, and Fertilizer Application				
	Permit Activity	**Number of Activities**	**Documentation**	**Entity Performing the Activity**	**Comments**
	PERSONNEL: Florida Department of Agriculture and Consumer Services (FDACS) certified applicators of pesticides and herbicides	20	FDACS Certificates	Parks & Recs, C & M, & Wastewater employees	# Personnel with Pesticide Applicator Licenses
	PERSONNEL: Green Industry BMP Program training completed	23	IFAS Certificates	Parks & Recs	# Personnel with Best Management Practices Certificates
	FYN PROGRAM FUNDING: Permittee Provides Funding? ☐ Yes ☒ No				
	Estimated percentage of the population reached by the activities in total	74	L&S Educational Outreach Spreadsheet	COL L&S	For displays, distributions, web hits, and airings it's assumed the message is received by a new individual each quarter and that only 1 in 2 people receiving the message actively listen to it. Thus for these activities the total # of occurrences is first divided by 4 and then by 2. This number is added to the participant counts from the remaining outreach events. The total is then divided by COL's total current population.
	Brochures/Flyers/Fact sheets distributed	4,002	Lakes Issues database, LE/AD files	COL L&S, LE/AD	3,502 COL, 500 LE/AD
	Neighborhood presentations: Number conducted	4	Lakes Issues database, LE/AD files	COL L&S, LE/AD, and FYN	LE/AD, Florida Yards and Neighborhoods
	Neighborhood presentations: Number of participants	67	Lakes Issues database, LE/AD files	COL L&S, LE/AD	LE/AD. Florida Yards and Neighborhoods
	Newspapers & newsletters: Number of articles/notices published	9	L&S NPDES file, LE/AD files	COL L&S, LE/AD	7 LE/AD Lakes LEADer newsletter, 2 COL Access Lakeland newsletter
	Newsletters: Number of newsletters distributed	477,400	L&S NPDES file, LE/AD files	COL L&S, LE/AD	2400 LE/AD Lakes LEADer newsletter, 5 mass-mailings (approximately 95,000 each) of Access Lakeland Utility newsletter
	Public displays (e.g., kiosks, storyboards, posters, etc.)	42	L&S Lakeside Educational file, LE/AD files	COL L&S. LE/AD	32 Lakeside educational displays, 10 pet waste stations
	Radio or television Public Service Announcements (PSAs)	38,582	L&S NPDES file; LE/AD files	COL L&S, LE/AD	17 LE/AD, 38,565 COL National Cinemedia Cobb Theatre
	School presentations: Number conducted	38	Lakes Issues database, LE/AD files	COL L&S, LE/AD	
	School presentations: Number of participants	5,040	Lakes Issues database, LE/AD files	COL L&S, LE/AD	
	Seminars/Workshops: Number conducted	18	Lakes Issues database, LE/AD files	COL L&S, LE/AD	
	Seminars/Workshops: Number of participants	319	Lakes Issues database, LE/AD files and sign in sheets	COL L&S, LE/AD	35 LE/AD, 284 COL L&S
	Special events: Number conducted	12	Lakes Issues database, LE/AD	COL L&S, LE/AD	8 COL, 4 LE/AD
	Special events: Number of participants	3,550	Lakes Issues database, LE/AD files	COL L&S, LE/AD	2,550 COL, 1,000 LE/AD
	Web Site: Number of hits / visitors to the stormwater-related pages	3,407	Website hits database	Engineering division	

Part III.A.7.a	Illicit Discharges and Improper Disposal Inspections, Ordinances, and Enforcement Measures
	No amendments made to the applicable codes or enforcement measures.

Part III.A.7.c	Illicit Discharges and Improper Disposal Investigation of Suspected Illicit Discharges and/or Improper Disposal				
	Permit Activity	**Number of Activities**	**Documentation**	**Entity Performing the Activity**	**Comments**
	Proactive inspections performed by Polk County on behalf of a co-permittee for suspected illicit discharges / connections / dumping	260	Lakeland hazardous waste/used oil inspections excel file	Polk County – Andrea Stermer Proactive Inspections Database	Proactive inspections performed by Polk County occur within the utility boundaries of Lakeland.
	Proactive inspections performed by the permittee for suspected illicit discharges / connections / dumping	13	Access database & Inspection Reports/photos/ map	COL & FDOT	Includes quarterly co-permittee proactive inspections completed by L&S staff and FDOT NPDES Administrator staff
	Illicit discharges / connections / dumping found during a proactive inspection	7	Access database & Inspection Reports/photos/ map	COL & FDOT	
	Notices of Violation (NOVs) / warning letters / citations issued for illicit discharges / connections / dumping found during a proactive inspection	0	n/a	n/a	No violations issued
	Fines issued for illicit discharges / connections / dumping found during a proactive inspection	0	n/a	n/a	No fines issued
	Reports received by Polk County of suspected illicit connections / discharges / dumping received	0	n/a	n/a	Polk County reports not tracked; please see Polk County report
	Reports received by the permittee of suspected illicit connections / discharges / dumping received	72	Access database & Inspection Reports/photos	COL L & S	
	Reactive investigations of reports of suspected illicit discharges/ connections / dumping	96	Access database & Inspection Reports/photos	COL L & S	
	Illicit discharges / connections / dumping found during a reactive investigation	60	Access database & Inspection Reports/photos	COL L & S	
	Notices of Violation (NOVs) / warning letters / citations issued for illicit discharges / connections / dumping found during a reactive investigation	0	Access database & Inspection Reports/photos	COL L & S	
	Fines issued for illicit discharges / connections / dumping found during a reactive investigation	0	n/a	n/a	

	Permit Activity	Number of Activities	Documentation	Entity Performing the Activity	Comments
	Initial Illicit Discharge Training - Personnel	4	Lakes Issues database, sign in sheets	COL L&S	
	Initial Illicit Discharge Training – Contractors	30	Lakes Issues database, sign-in sheets	COL L&S	
	Refresher Illicit Discharge Training - Personnel	336	Lakes Issues database, sign-in sheets	COL L&S	COL Public Works Annual Safety Fair training course
	Refresher Illicit Discharge Training - Contractors	7	Lakes Issues database, sign-in sheets	COL L&S	

Part III.A.7.d	**Illicit Discharges and Improper Disposal Spill Prevention and Response**				
	Permit Activity	**Number of Activities**	**Documentation**	**Entity Performing the Activity**	**Comments**
	Hazardous and non-hazardous material spills responded to	18	Response spreadsheet	COL Fire Department	
	Initial Hazardous Spill Training - Personnel	160	Training sign-in sheets	COL Fire Department	HAZWOPER & Refresher training
	Initial Hazardous Spill Training - Contractors	0	n/a	n/a	All fire department personnel are City employees, no contractors are trained in-house.
	Refresher Hazardous Spill Training - Personnel	160	Training sign-in sheets	COL Fire Department	HAZWOPER & Refresher training
	Refresher Hazardous Spill Training - Contractors	0	n/a	n/a	All fire department personnel are City employees, no contractors are trained in-house.

Part III.A.7.e	**Illicit Discharges and Improper Disposal Public Reporting**				
	Permit Activity	**Number of Activities**	**Documentation**	**Entity Performing the Activity**	**Comments**
	Estimated percentage of the population reached by the activities in total	15	-	-	For displays, distributions, web hits, and airings it's assumed the message is received by a new individual each quarter and that only 1 in 2 people receiving the message actively listen to it. Thus for these activities the total # of occurrences is first divided by 4 and then by 2. This number is added to the participant counts from the remaining outreach events. The total is then divided by COL's total current population.
	Publicize the Polk County or local Pollution Complaint Hotline	60,222	COL NPDES files	COL	12 street sweeper wraps (one each side of six sweepers), PSAs
	Brochures/Flyers/Fact sheets distributed	4,177	Lakes Issues database, LE/AD files	COL L&S, LE/AD	500 LE/AD, 3,677 COL
	Neighborhood presentations: Number conducted	2	COL NPDES files, LE/AD files	LE/AD and FYN	

	Neighborhood presentations: Number of participants	35	COL NPDES files, LE/AD files	LE/AD and FYN	
	Newspapers & newsletters: Number of articles/notices published	16	L&S NPDES files, LE/AD files	Lakeland Electric, LE/AD	12 Access Lakeland Utility Inserts; 4 LE/AD newsletters
	Newsletters: Number of newsletters distributed	1,142,400	L&S NPDES file, LE/AD Annual Report	Lakeland Electric, LE/AD	2,400 LE/AD Lakes LEADer newsletter, 12 mass mailing (approximately 95,000 each) of Access Lakeland Utility newsletter
	Public displays (e.g., kiosks, storyboards, posters, etc.)	38	Z:\Lakes & Stormwater Education Programs, LE/AD files	COL L&S, LE/AD	
	Radio or television Public Service Announcements (PSAs)	60,210	Lakes Issues database, LE/AD files & NCM Audit Report	COL L&S, LE/AD	
	School presentations: Number conducted	36	Lakes Issues database, LE/AD files	COL L&S, LE/AD	
	School presentations: Number of participants	4,940	Lakes Issues database, LE/AD files	COL L&S, LE/AD	
	Seminars/Workshops: Number conducted	18	Lakes Issues database, LE/AD files	COL L&S, LE/AD	
	Seminars/Workshops: Number of participants	284	Lakes Issues database, LE/AD files	COL L&S, LE/AD	
	Special events: Number conducted	8	Lakes Issues database, LE/AD files	COL L&S, LE/AD	
	Special events: Number of participants	3,550	Lakes Issues database, LE/AD files	COL L&S, LE/AD	
	Web Site: Number of visitors to the stormwater-related pages	3,407	Website hits database	Public Works Director's Office	

Part III.A.7.f	**Illicit Discharges and Improper Disposal Oils, Toxics, and Household Hazardous Waste Control**				
	Permit Activity	**Number of Activities**	**Documentation**	**Entity Performing the Activity**	**Comments**
	Estimated percentage of the population reached by the activities in total	100	-	-	For displays, distributions, web hits, and airings it's assumed the message is received by a new individual each quarter and that only 1 in 2 people receiving the message actively listen to it. Thus for these activities the total # of occurrences is first divided by 4 and then by 2. This number is added to the participant counts from the remaining outreach events. The total is then divided by COL's total current population.
	Household Chemical Collection Center Program: Amount of waste collected / recycled / properly disposed (lbs & gallons)	1,907 gallons liquids and 4,578 lbs solids	Material collected spreadsheet and waste manifests	COL & Polk County	

	Household Chemical Collection Center Program: Events	1	Newspaper & Access Lakeland document	COL Solid Waste division, Polk County Solid Waste	Annual Household Hazardous Waste Event (April 13, 2013) - 671 Lakeland resident participants
	Permit Activity	**Number of Activities**	**Documentation**	**Entity Performing the Activity**	**Comments**
	Household Hazardous Waste Materials Guides distributed	34,721	Rehrig Penn Logistics Delivery Summary Report & informational letters spreadsheet, summary report file	COL Solid Waste	29,194 Rehrig Penn (recycling delivery) 69 Letters to residents 5,458 (garbage delivery)
	Brochures/Flyers/Fact sheets distributed	33,371	Lakes Issues database, Rehrig Penn Logistics Summary Report	COL L&S, COL Solid Waste	4,177 COL L&S, 29,194 COL Solid Waste
	Neighborhood presentations: Number conducted	12	Lakes Issues database & Public outreach spreadsheet SW	Solid Waste	
	Neighborhood presentations: Number of participants	743	Lakes Issues database & Public outreach spreadsheet SW	Solid Waste	
	Newspapers & newsletters: Number of articles/notices published	15	Lakes Issues database, Ledger advertisement, Access Lakeland ads, Insite time out ads	COL L&S, COL Solid Waste, and LE/AD	March, April, and May 2013 Issues of Access Lakeland, and March 2013 In-Site Intranet Posting
	Newsletters: Number of newsletters distributed	382,400	Ledger, Access Lakeland ads & Insite ad docs, Utility bill insert distribution	COL L&S, COL Solid Waste, Lakeland Electric, and LE/AD	2,400 LE/AD Lakes LE/ADer newsletter, 4 (approximately 95,000 each) Access Lakeland Utility Newsletter
	Public displays (e.g., kiosks, storyboards, posters, etc.)	21	COL L&S Lakeside Display file, Access Lakeland; Solid Waste Spreadsheet	COL L&S & Solid Waste	6 Lakeside educational displays, 10 pet waste stations, 4 COL Solid Waste, 1 COL Solid Waste Poster
	Radio or television Public Service Announcements (PSAs)	64,490	L&S NPDES file, COL Single Stream Recycling & Solid Waste database	COL L&S & Solid Waste	Solid Waste Recycling Video, COL L&S PSAs
	School presentations: Number conducted	37	Lakes Issues database & Solid Waste database	COL L&S & Solid Waste	

	Permit Activity	Number of Activities	Documentation	Entity Performing the Activity	Comments
	School presentations: Number of participants	5,090	Lakes Issues database & Solid Waste database	COL L&S & Solid Waste	
	Seminars/Workshops: Number conducted	15	Lakes Issues database	COL L&S	
	Seminars/Workshops: Number of participants	2,844	Lakes Issues database	COL L&S	
	Special events: Number conducted	8	Lakes Issues database	COL L&S	
	Special events: Number of participants	2,550	Lakes Issues database	COL L&S	
	Storm sewer inlets newly marked/replaced	151	COL Engineering Surveying Spreadsheet	COL Engineering	
	Web Site: Number of visitors to the stormwater-related pages	3,407	Website hits database	COL Public Works Directors Office	

Part III.A.7.g	**Illicit Discharges and Improper Disposal Limitation of Sanitary Sewer Seepage**				
	Permit Activity	**Number of Activities**	**Documentation**	**Entity Performing the Activity**	**Comments**
	Activity to reduce/eliminate SSOs and inflow / infiltration: Sanitary sewer pipe inspected for infiltration (linear feet)	60,846	TV Main line work spreadsheet	COL Wastewater Department	
	Activity to reduce/eliminate SSOs and inflow / infiltration: Sanitary sewer pipe sealed, lined, and / or replaced (linear feet)	5,301	Line work spreadsheet	COL Wastewater Department	
	Activity to reduce/eliminate SSOs and inflow / infiltration: Sanitary sewer line breaks repaired	146	Point repair spreadsheet	COL Wastewater Department	
	Activity to reduce/eliminate SSOs and inflow / infiltration: Septic systems removed	0	n/a	n/a	See Polk County Annual Report for Polk Health Dept. records
	Activity to reduce/eliminate SSOs and inflow / infiltration: Emergency generator added	0	n/a	n/a	No emergency generators added
	SSO incidents discovered	2	SSO Database	COL Wastewater	2 were discovered that impacted the MS4
	SSO incidents resolved	2	SSO Database	COL Wastewater	2 were resolved that impacted the MS4
	Inflow / infiltration incidents discovered	0	n/a	n/a	None recorded
	Inflow / infiltration incidents resolved	0	n/a	n/a	None recorded
	Name of owner of the sanitary sewer system	-	-	-	City of Lakeland

Part III.A.8.a	Industrial and High-Risk Runoff Identification of Priorities and Procedures for Inspections							
		Number of Facilities	Number of Inspections	For violations discovered during a high risk inspection				
				Fines issued	Notices of Violation (NOVs) / warning letters / citations issued			
	Total high risk facilities	16	3	-	-	COL High Risk Facilities Access Database	COL Lakes & Stormwater	
	New high risk facilities added to the inventory during the current reporting period	0	-	-	-	COL High Risk Facilities Access Database	COL Lakes & Stormwater	
	Operating municipal landfills	0	0	0	0	COL High Risk Facilities Access Database	COL Lakes & Stormwater	None in jurisdiction
	Hazardous waste treatment, storage, disposal and recovery (HWTSDR) facilities	0	0	0	0	COL High Risk Facilities Access Database	COL Lakes & Stormwater	None in jurisdiction
	EPCRA Title III, Section 313 facilities (that are not landfills or HWTSDR facilities)	7	3	0	0	COL High Risk Facilities Access Database	COL Lakes & Stormwater	No violations observed during inspections
	Facilities determined as high risk by the permittee through the reactive inspections as per Part III.A.7.c	0	0	0	0	Copies of warning letters	FDEP	
	Other facilities determined as high risk by the permittee (that are not facilities identified through the reactive inspections)	9	0	0	0	COL High Risk Facilities Access Database	COL Lakes & Stormwater	No violations observed during inspections

Part III.A.8.b	Industrial and High-Risk Runoff Monitoring for High Risk Industries	
	High risk facilities sampled	None sampled

Part III.A.9.a	Construction Site Runoff Site Planning and Non-Structural and Structural Best Management Practices				
	Permit Activity	**Number of Activities**	**Documentation**	**Entity Performing the Activity**	**Comments**
	PERMITTEE SITES: Construction site plans reviewed	3	Eng. Div. Building Plans Docs	Engineering division	
	PERMITTEE SITES: Construction site plans approved	3	Eng. Div. Approved Plans Docs	Engineering division	
	PRIVATE SITES: Construction site plans reviewed	72	Engineering Review spreadsheet	Engineering division	
	PRIVATE SITES: Construction site plans approved	51	Engineering Review spreadsheet	Engineering division	
	Permit Activity	**Number of Activities**	**Documentation**	**Entity Performing the Activity**	**Comments**
	Notified of ERP stormwater permit requirements	51	Stamped Plans	Engineering division	
	Confirmed ERP coverage	0	n/a	n/a	This element is not currently tracked by COL. Changes to COL's development review process in Year 3 will include confirmation of ERP coverage.
	Notified of CGP stormwater permit requirements	51	Stamped Plans	Engineering division	
	Confirmed CGP coverage	51	Construction Site Inspection Documents	Engineering division	

Part III.A.9.b	Construction Site Runoff Inspection and Enforcement				
	Permit Activity	**Number of Activities**	**Documentation**	**Entity Performing the Activity**	**Comments**
	PERMITTEE SITES: Active construction sites	3	Public Works Engineering Construction Site Database	Public Works Engineering	
	PERMITTEE SITES: Inspections of active construction sites for proper stormwater, erosion and sedimentation BMPs	743	Public Works Engineering Construction Site Database	Public Works Engineering	Includes private sites; database records & tracks the # of inspections for permittee and private projects in total
	PERMITTEE SITES: Percentage of active construction sites inspected	100	Public Works Engineering Construction Site Database	Public Works Engineering	
	PRIVATE SITES: Active construction sites	19	Public Works Engineering Construction Site Database	Public Works Engineering	

	PRIVATE SITES: Inspections of active construction sites for proper stormwater, erosion and sedimentation BMPs	Included in total # above	Public Works Engineering Construction Site Database	Public Works Engineering	Includes permittee sites; database records & tracks the # of inspections for permittee and private projects in total
	PRIVATE SITES: Percentage of active construction sites inspected	100	Public Works Engineering Construction Site Database	Public Works Engineering	
	Red Tags issued	0	n/a	n/a	None Issued
	Notices of Violation (NOVs) issued	0	n/a	n/a	None Issued
	Stop Work Orders issued	0	n/a	n/a	None Issued
	Fines issued	0	n/a	n/a	None Issued

Part III.A.9.c	**Construction Site Runoff Site Operator Training**						
		Inspector Certification Training	**Non-Inspector Initial Training (non-certification)**	**Refresher Training**	**Documentation**	**Entity Performing the Activity**	**Comments**
	Permittee construction site inspectors	3	0	3	Certificates/Sign in Sheets	FDEP & COL	
	Permittee construction site plan reviewers	2	0	2	Certificates/Sign in sheets	FDEP & COL	Employees sent to FDEP Certified training
	Permittee construction site operators	8	0	3	Certificates & Sign in sheets	FDEP & COL	Employees sent to FDEP Certified training
	Private construction site operators	0	0	0	Sign in sheets	COL	

SECTION VIII. EVALUATION OF THE STORMWATER MANAGEMENT PROGRAM (SWMP)

Permit Citation/ SWMP Element	SWMP EVALUATION
Part II.A.1 Structural control inspection and maintenance	***Strengths:*** The City of Lakeland has experienced drainage personnel dedicated solely to the inspection and maintenance of the MS4 system. Significant progress has been made in upgrading the City's new work order database system that will ensure extremely accurate documentation of all MS4 inspection and maintenance activities. Drainage personnel are in contact with Lakes & Stormwater management on a daily basis and activities are directed according to the requirements of the NPDES permit. GIS, Engineering, and IT management staff are also partnering in this effort to ensure adequate up-to-date GIS documentation of the MS4 inventory. The overall inspection and maintenance program is supported by the Public Works Director, the City Manager, and the Board of City Commissioners. The City's stormwater utility fee continues to generate adequate monies for maintenance and operating expenses plus a healthy reserve. ***Weaknesses:*** No weaknesses known at this time. ***SWMP Revisions to address deficiencies:*** No deficiencies at this time.
Part II.A.2 Significant redevelopment	***Strengths:*** City ordinance requires new development to submit for a permit to construct. An engineering stormwater manual includes regulations required for new development in the City and are established in City ordinances and land development regulations. Land development regulations are tailored to compliment NPDES permit requirements. ***Weaknesses:*** Better tracking and documentation of ERP coverage for applicable construction entities is needed. ***SWMP Revisions to address deficiencies:*** Lakes and Stormwater and Engineering Division staff have partnered to refine the ERP tracking process and this element of the annual report will be fully satisfied in Yr 3.
Part II.A.3 Roadways	***Strengths:*** The City has robust street sweeping and litter control programs. Street sweeping activities are directed according to the NPDES permit requirements and dumped loads are accurately tracked to ensure reliable calculations of TN/TP removal numbers. ***Weaknesses:*** The sediment removal is not tracked by basins but in accordance with work zones thus making it difficult to calculate load removals per lake basin. ***SWMP Revisions to address deficiencies:*** This process will be refined based on an in-depth study of our street sweeping program occurring in FY14.
Part II.A.4 Flood control	Strengths: Two projects were completed during the permit cycle; one of which included stormwater control. When flood control projects are in the design phase, engineering staff always consult with Lakes & Stormwater staff to ensure that these projects include the appropriate design criteria to maximize stormwater retention and treatment. Weaknesses: No weaknesses known at this time. SWMP Revisions to address deficiencies: No deficiencies at this time.

Part II.A.5 Waste TSD Facilities	***Strengths:*** All City TSD facilities are participants in the City Hot Spot inspection program. This program consists of routine inspections (monthly and/or annual) for stormwater regulations and compliance at each Public Works facility. The facilities are tracked with an annual summary inspection report. ***Weaknesses:*** No weaknesses known at this time. ***SWMP Revisions to address deficiencies:*** No deficiencies at this time.
Part II. A. 6 Pesticide, herbicide, fertilizer application	***Strengths:*** All of the City herbicide and fertilizer applicators are Florida Department of Agriculture and Consumer Services (FDACS) certified sprayers and have completed the Green Industry BMP training. Personnel are continually educated and supplied with refresher training as necessary. The City has adopted the Polk County Fertilizer Ordinance which was implemented during Year 2 of the permit cycle. ***Weaknesses:*** No funding is provided to the FYN from the City as this time and SWFWMD has withdrawn funding to the program. ***SWMP Revisions to address deficiencies:*** City and County staff are currently working with the FYN program to try and ensure future funding with an interlocal agreement.
Part II.A.7 Illicit Discharge Detection and Elimination	***Strengths:*** A stormwater hotline is set up to handle pollutant concern phone calls from both residents & City employees. An access database is designated specifically to track this program. City staff and private industry personnel are provided with comprehensive training on IDDE on an annual basis. Proactive and reactive IDDE inspection programs are implemented by City, County and FDOT staff, and the agencies readily share information and partner in this effort, including co-permittee proactive inspections. The City's public outreach and education program is robust and well-funded and includes signage, brochures, education events, PSA's, and advertisement wraps on our six street sweepers. ***Weaknesses:*** Limited staff positions in the Lakes & Stormwater division has prohibited expansion of this program in the past. Enforcement measures to curb illicit discharges needs review for potential improvements. ***SWMP Revisions to address deficiencies:*** The Lakes & Stormwater staff is expected to be fully staffed during YR 3 of this permit cycle, thus allowing for increased proactive inspections. Planned activities will include a minimum of three hours per week of drive time by Lakes & Stormwater staff to visually observe specific areas of the city and proactively investigate illicit discharges and/or activities that may be susceptible to causing illicit discharges. A more robust inspection schedule of facilities including car washes, restaurants and industrial facilities will be implemented as well. Public Works staff is in the process of reviewing City codes and enforcement measures related to illicit discharges.
Part II.A.8 High Risk Industry Runoff	***Strengths:*** High Risk Industry facilities located within the City limits are inspected on a routine basis to ensure that stormwater pollution control measures are in place and effective, and the facilities are in compliance with stormwater regulations. A robust summary report & private employee training program is in place for all high risk facilities located in Lakeland. An access database is designated specifically to track this program. All facilities in the inventory list hold a current industrial NPDES permit. ***Weaknesses:*** No weaknesses ***SWMP Revisions to address deficiencies:*** No deficiencies at this time.
Part II.A.9 Construction Site Runoff	***Strengths:*** The City has three engineering inspectors certified and trained to conduct sediment & erosion (S&E) control inspections. City S&E inspectors attend construction kick-off meetings and provide education on stormwater controls to subcontractors and review the S&E control plans for the project. City S&E inspectors perform construction site inspections and attend weekly construction progress meetings, as warranted. A database is dedicated strictly for this type of inspection provides excellent tracking on S & E construction inspections. ***Weaknesses:*** Ability to better enforce construction site BMPs needs improvement. ***SWMP Revisions to address deficiencies:*** Public Works staff is in the process of reviewing City codes and enforcement measures related to illicit discharges including those from construction sites.

SECTION IX. CHANGES TO THE STORMWATER MANAGEMENT PROGRAM (SWMP) ACTIVITIES (Not Applicable In Year 4)		
A.	**Permit Citation/ SWMP Element**	**Proposed Changes to the Stormwater Management Program Activities Established as Specific Requirements Under Part III.A of the Permit (Including the Rationale for the Change) REQUIRES DEP APPROVAL PRIOR TO CHANGE IF PROPOSING TO REPLACE OR DELETE AN ACTIVITY.**
		No changes. The City's TMDL prioritization report establishes the City's targeted SWMP (all other operations are general operations and maintenance activities based on routine inspections and/or reactive work). Changes/updates to the TMDL Prioritization document are sent to FDEP for approval on an as needed basis or at least annually with the NPDES report.
B.	**Permit Citation/ SWMP Element**	**Changes to the Stormwater Management Program Activities NOT Established as Specific Requirements Under Part III.A of the Permit (Including the Rationale for the Change)**
		No changes. The City's TMDL prioritization report establishes the City's targeted SWMP (all other operations are general operations and maintenance activities based on routine inspections and/or reactive work). Changes/updates to the TMDL Prioritization document are sent to FDEP for approval on an as needed basis or at least annually with the NPDES report.

CHECKLIST A: ATTACHMENTS TO BE SUBMITTED WITH THE ANNUAL REPORTS

Below is a list of items required by the permit that may need to be attached to the annual report. Please check the appropriate box to indicate whether the item is attached or is not applicable for the current reporting period. Please provide the number and the title of the attachments in the blanks provided.

Attached	N/A	Rule / Permit Citation	Required Attachment	Attachment Number	Attachment Title/Comments
☐	☒	Part II.F	**EACH ANNUAL REPORT:** If program resources have decreased from the previous year, a discussion of the impacts on the implementation of the SWMP.		SWU revenue remains stable
☒	☐	Part III.A.1	**EACH ANNUAL REPORT:** An explanation of why the minimum inspection frequency in Table II.A.1.a was not met, if applicable.	1	Minimum Inspection Frequency Deficiencies for MS4 pipe network
☒	☐	Part III.A.4	**EACH ANNUAL REPORT:** A list of the flood control projects that did not include stormwater treatment and an explanation for each of why it did not, if applicable.	2	Flood Control Projects Not Including Stormwater Treatment
☐	☒	Part III.A.7.a	**EACH ANNUAL REPORT:** A report on amendments / changes to the legal authority to control illicit discharges, connections, dumping, and spills, if applicable.		No amendments
☒	☐	Part V.B.9	**EACH ANNUAL REPORT:** Reporting and assessment of monitoring results. **[Also addressed in Section III of the Annual Report Form]**	3	TMDL Prioritization Plan Update, which includes an updated monitoring plan, dated April 1, 2014
☐	☒	Part VI.B.2	**EACH ANNUAL REPORT:** An evaluation of the effectiveness of the SWMP in reducing pollutant loads discharged from the MS4 that, at a minimum, must include responses to the questions listed in the permit.		Annual Question Responses Only
☒	☐	Part VIII.B.3.e	**EACH ANNUAL REPORT:** A status report on the implementation of the requirements in this section of the permit and on the estimated load reductions that have occurred for the pollutant(s) of concern.		Implementation plan to reduce loads is included with the updated TMDL Prioritization Plan dated April 1, 2014 (attached).
☐	☒	Part VIII.B.4.f	**EACH ANNUAL REPORT after approval of the BPCP:** The status of the implementation of the Bacterial Pollution Control Plan (BPCP).		No BPCP plans for the City of Lakeland
☐	☒	Part III.A.1	**YEAR 1:** An inventory of all known major outfalls and a map depicting the location of the major outfalls (hard copy or CD-ROM).		
☐	☒	Part III.A.3	**YEAR 1:** If have curbs and gutters but no street sweeping program, an explanation of why no street sweeping program and the alternate BMPs used or planned.		
☒	☐	Part III.A.6	**YEAR 1 or YEAR 2:** A copy of the adopted Florida-friendly Ordinance, if applicable.	4	The Polk County Fertilizer Ordinance is applicable in Lakeland's municipal boundaries (attached).
☐	☒	Part III.A.7.c	**YEAR 1:** A proactive illicit discharge / connection / dumping inspection program plan.		
☐	☒	Part III.A.9.b	**YEAR 1:** A construction site inspection program plan. **[For approval by DEP]**		
☒	☐	Part III.A.2	**YEAR 2:** A summary report of a review of codes and regulations to reduce the stormwater impact from new development / redevelopment.	5	Summary Report of Review of Codes and Regulations to Reduce Stormwater Impact from New Development and Redevelopment, dated April 1, 2014 (attached).
☐	☒	Part V.A.2	**YEAR 3:** Estimates of annual pollutant loadings and EMCs, and a table comparing the current calculated loadings with those from the previous two Year 3 ARs.		
☐	☒	Part III.A.2	**YEAR 4:** A follow-up report on plan implementation of changes to codes and regulations to reduce the stormwater impact from new development / redevelopment.		
☐	☒	Part V.A.3	**YEAR 4:** If the total annual pollutant loadings have not decreased over the past two permit cycles, revisions to the SWMP, as appropriate.		
☐	☒	Part V.B.3	**YEAR 4:** The monitoring plan (with revisions, if applicable).		
☐	☒	Part VII.C	**YEAR 4:** An application to renew the permit.		
☐	☒	Part VIII.B.3.d	**YEAR 4:** A TMDL Implementation Plan / Supplemental SWMP.		

CHECKLIST B: THE REQUIRED ANNUAL REVIEWS OF WRITTEN STANDARD OPERATING PROCEDURES (SOPs) & PLANS

The permit requires annual review, and revision if needed, of written Standard Operating Procedures (SOPs) and plans (e.g., public education and outreach, training, inspections). Please indicate your review status below. **If you have made revisions that need DEP approval, you must complete Section VIII.A of the annual report.**

Did not complete review of existing SOP / Plan	Developed <u>new</u> written SOP / Plan	Reviewed & <u>no revision needed</u> to existing SOP / Plan	Reviewed & <u>revised</u> existing SOP / Plan	Permit Citation	Description of Required SOPs / Plans
☐	☐	☒	☐	Part III.A.1	SOP and/or schedule of inspections and maintenance activities of the structural controls and roadway stormwater collection system.
☐	☐	☒	☐	Part III.A.2	SOP for development project review and permitting procedures and/or local codes and regulations for new development / areas of significant development.
☐	☐	☒	☐	Part III.A.3	SOP for the litter control program.
☐	☐	☒	☐	Part III.A.3	SOP for the street sweeping program.
☐	☐	☒	☐	Part III.A.3	SOP for inspections of equipment yards and maintenance shops that support road maintenance activities.
☐	☐	☒	☐	Part III.A.5	SOP for inspections of waste treatment, storage, and disposal facilities not covered by an NPDES stormwater permit.
☐	☐	☒	☐	Part III.A.6	Plan for public education and outreach on reducing the use of pesticides, herbicides and fertilizer.
☐	☐	☒	☐	Part III.A.6	SOP for reducing the use of pesticides, herbicides and fertilizer, and for the proper application, storage and mixing of these products.
☐	☐	☒	☐	**Part III.A.7.c**	**Plan for proactive illicit discharge / connections / dumping inspections.***
☐	☐	☒	☐	Part III.A.7.c	SOP for reactive illicit discharge / connections / dumping investigations.
☐	☐	☒	☐	Part III.A.7.c	Plan for illicit discharge training.
☐	☐	☒	☐	Part III.A.7.d	SOP for spill prevention and response efforts.
☐	☐	☒	☐	Part III.A.7.d	Plan for spill prevention and response training.
☐	☐	☒	☐	Part III.A.7.e	Plan for public education and outreach on how to identify and report the illicit discharges and improper disposal to the MS4.
☐	☐	☒	☐	Part III.A.7.f	Plan for public education and outreach on the proper use and disposal of oils, toxics and household hazardous waste.
☐	☐	☒	☐	Part III.A.7.g	SOP to reduce / eliminate sanitary wastewater contamination of the MS4.
☐	☐	☒	☐	Part III.A.8	SOP for inspections of high risk industrial facilities.
☐	☐	☒	☐	Part III.A.9.a	SOP for construction site plan review for stormwater, erosion and sedimentation controls, and ERP and CGP coverage.
☐	☐	☒	☐	**Part III.A.9.b**	**Plan for inspections of construction sites.***
☐	☐	☒	☐	Part III.A.9.c	Plan for stormwater, erosion and sedimentation BMPs training.

*** Revisions to these plans require DEP approval – please complete Section VIII.A of the annual report.**

REMINDER LIST OF THE TMDL / BMAP REPORTS TO BE SUBMITTED SEPARATELY FROM AN ANNUAL REPORT		
Rule / Permit Citation	**Report Title**	**Due Date**
Part VIII.B.3.a	**6 MONTHS from effective date of permit:** TMDL Prioritization Report.	3/12/12
Part VIII.B.3.b	**12 MONTHS from effective date of permit:** TMDL Monitoring and Assessment Plan.	8/12/13
Part VIII.B.3.c	**6 MONTHS from receiving analyses from the lab:** TMDL Monitoring Report.	TBD
Part VIII.B.4	**30 MONTHS from start date per TMDL Prioritization Report:** A Bacterial Pollution Control Plan (BPCP).	TBD

BMAP Reporting

MS4 permittees are NOT required to submit the annual report required by any BMAP that applies to them since the NPDES Stormwater Staff can obtain them from the department's Watershed Planning and Coordination staff. However, to assure that the stormwater staff are aware of which BMAPs apply to the MS4 permittees and when the latest BMAP annual report was submitted, please complete the information below, if applicable:

Rule/Permit Citation	BMAP Title	Date BMAP Annual Report Submitted to DEP
Part VIII.B.2	Poley Creek (ongoing)	Pending finalization

END OF REVISED TAILORED MS4 AR FORM
CYCLE 3 PERMIT

CITY OF LAKELAND MINIMUM INSPECTIONS DEFICIENCIES

Area of Deficiency

The City of Lakeland (COL) Construction and Maintenance staff (C&M) coordinates with Lakes and Stormwater staff (L&S) to refine their maintenance and inspections procedures to fit with NPDES reporting requirements. The minimum inspection frequencies for structural controls and other MS4 infrastructure listed in Table II.A.1 of the Permit were met in most categories. One deficiency remains in that the COL is not currently meeting the 10% inspection frequency requirement for the MS4 pipes and culverts.

Corrective Actions

COL C&M and L&S staff are developing with City IT staff a new work order system to accurately code , identify, and track all MS4 infrastructure in need of inspection such that the minimum frequencies in Table II.A.1 of the permit can be satisfied each reporting year. Additionally, L&S, IT, and Engineering Staff are collaborating on a major GIS overhaul of the City's MS4 Inventory such that accurate GIS reference data is available for input into the new work order system. These implementations are costly and time intensive and require an adequate amount of monetary resources, staffing, IT support, and training. This entire effort is currently underway and will continue through FY 2013 and thereafter to ensure inspection, maintenance, and reporting compliance. It is anticipated that 100% of our MS4 pipes and culverts will be inspected over the course of 2 permit cycles as requested by our NPDES permit. In FY 2015, $350,000 has been allocated for the specific purchase of a TV truck and 3-man crew to televise 10% of our MS4 per year (see CIP worksheet included herein)

Department/Activity	PUBLIC WORKS/ C&M DIVISION	Date Prepared	June 17, 2013
Project Coordinator	Michael Whigham / Curtis Porterfield	Phone Number	8439
Project Title	TV & Cleaning Storm Drainage		

Description of the Project (Include a complete description including impact on operating budget, accomplished by contractor or city crews, and projected start and end date)

This program involves the implementation of a strategic maintenance inspection effort citywide. This program uses televising and pipe cleaning equipment to review the condition of existing storm sewer pipe and make recommendations for repair strategies. This funding level for the project is considered to be a minimum to properly manage system repair. This account is being merged with the Maintenance & Retrofit of storm Sewer and Lining.

Justification (Be as specific as possible).

Necessary to identify integrity of the storm sewer system. The additional annexed are will require TV and cleaning to evaluate the storm sewers to determine the proper maintenance or rehabilitation of the system. An additional $100,000 was added in FY 06 in order to fund system televising and cleaning in an approximately fifteen year cycle. The fund will require increase in 2008 & 2011 due to cost increases and increases in the number of strm sewer sytems in the City. The cost in FY14 increases to $350, 000 to facilitate the increase in TV-ing and associated cleaning needed to satisfy NPDES Permit requirements.

Cost			Recommended Sources of Financing (City, State, Federal, Other) **If City, designate which Fund**
Budget F.Y.		Total	
Program year F.Y. 14	$	150,000	Stormwater Utility Fund (Center 242)
Program year F.Y. 15	$	350,000	Stormwater Utility Fund (Center 242)
Program year F.Y. 16	$	350,000	Stormwater Utility Fund (Center 242)
Program year F.Y. 17	$	350,000	Stormwater Utility Fund (Center 242)
Program year F.Y. 18	$	375,000	Stormwater Utility Fund (Center 242)
Program year F.Y. 19	$	375,000	Stormwater Utility Fund (Center 242)
Program year F.Y. 20	$	375,000	Stormwater Utility Fund (Center 242)
Program year F.Y. 21	$	375,000	Stormwater Utility Fund (Center 242)
Program year F.Y. 22	$	375,000	Stormwater Utility Fund (Center 242)
Program year F.Y. 23	$	375,000	Stormwater Utility Fund (Center 242)
Total Ten Years	$	3,450,000	
After Ten Years	$		

Return to Top of

City Manager:	
	Yes
	No

Submitting Department	
Submitted By:	Curtis Porterfield
Signature:	
Position:	Manager of Lakes & Stormwater
Dept. Head:	Richard E. Lilyquist, P.E.
Date:	June 17, 2013

CITY OF LAKELAND FLOOD CONTROL PROJECTS NOT REQUIRING STORMWATER TREATMENT

Project Description

The City of Lakeland (COL) Engineering staff (EN) coordinates with Lakes and Stormwater staff (L&S) when flood control projects are in the initial design phase to ensure that appropriate stormwater controls are incorporated into the project as necessary. During this permit cycle year two flood control projects were completed by the COL EN division. Of the two projects, only one required stormwater controls to be incorporated (Shore Acres project). The Curren Street project consisted of modification to an existing storm drainage system to alleviate road flooding in a residential neighborhood. The project included the installation of pipes and inlets to allow for existing runoff to terminate to the west, to dry retention basin, upland of wetlands associated with a depression known as Lake Watkins.

Stormwater treatment was not incorporated into this project since the design did not include increase in impervious areas; increase in drainage area; no fill was placed within the 100 year floodplain; and no wetland areas were impacted. BMPs were incorporated into the construction phase to prevent erosion and turbidity.

CURRAN STREET DRAINAGE RETROFIT

SECTION 29- TOWNSHIP 28 SOUTH - RANGE 24 EAST
LAKELAND, FLORIDA

REPLAT OF BELVEDERE PB 48 PG 7

City of LAKELAND

PROJECT NARRATIVE

The purpose for this project is to modify an existing storm sewer system and reduce road flooding. One resident suffers from flooding of the driveway and some erosion resulting from an unfinished drainage system. The location is in SE Lakeland near US 98. Curran Street runs East to West however the West end was never finished and another development was constructed West of Curran Street not allowing for the existing runoff to continue West. The City has received numerous complaints and a project was approved to install pipe and inlets to solve the issue. The unfinished drainage system will be extended to a depression known as Lake Watkins where the existing drainage is currently draining over streets and into an existing storm sewer system.

No environmental impacts are anticipated since there is no existing treatment and no increase in impervious area associated with this project. This project has been budgeted to replace existing pipes in a series of phases and create a system that meets the requirements of the Comprehensive plan with a level of service using a 5 year design storm. And no fill will be placed within the 100 year flood plain.

The soil types identified in the drainage basin according to SCS Soil Survey of Polk County, Florida published in 1990 indicates No. 15 Tavares and No. 63 Tavares Urban Complex. The data shown in the survey lists good permeability down in excess of 6 inches per hour and lists a High Water Table of 3.5 - 6.0 feet below ground surface. This is borne out by neighborhood trees and plants including citrus trees which do not tolerate unusually high water tables. In addition the Type soil would appear to be Type A which coincides with a drained condition.

The termination of the system will terminate upland of any wetlands associated with the depression known as Lake Watkins and no wetland soils are mapped around the depression. The depression appears to be either an ancient sinkhole which has stabilized and plugged or manmade excavation and currently has a water table much lower than the surrounding homes. It appears to be an open basin as there is a network of pipes which if the water levels increased would outfall to the south through an existing storm sewer network.

The City has ROW or drainage easements for the extent of the project and no additional areas are required to construct the project. BMP's will be employed to prevent erosion and turbidity, and construction is expected in 2012.

A list of exhibits has been attached as documentation of the project area which is .32 acres in area.

TMDL Prioritization Report

City of Lakeland

Polk County, Florida

NPDES-MS4 Permit # FLS000015-003

Resubmitted for FDEP Approval on:
April 1st 2014

City of Lakeland
Department of Public Works
Division of Lakes & Stormwater
407 Fairway Ave.
Lakeland, FL 33801
863-834-8439

INTRODUCTION

This report represents the City of Lakeland's commitment to the process mandated by the Florida Department of Environmental Protection (FDEP) and the United States Environmental Protection Agency (EPA) to reduce pollutant loads entering waters of the State from the City's Municipal Separate Storm Sewer System (MS4). Under permit # FLS000015-003 issued by the FDEP to Polk County and co-permittees, pollutant loads from the City's MS4 are required to be identified, quantified, and reduced to comply with the Waste Load Allocations (WLAs) determined by FDEP and EPA through the Total Maximum Daily Load (TMDL) program. TMDLs represent the pounds per year of specified pollutants that are permitted to enter a waterbody without negatively impacting its biota or designated use. WLAs are attained through percentage reductions of stormwater pollutants to the degree that the TMDL is not being exceeded for any given pollutant. These pollutants must be eliminated through a combination of structural and non-structural Best Management Practices (BMPs). Specific actions to comply with this requirement are detailed in Part VIII of the City's MS4 permit which includes, by reference, TMDLs adopted by the FDEP and/or EPA during the 2011 - 2016 Cycle of Permit 3.

This document will be dynamic throughout the five-year permit cycle. As elements are prioritized, developed, implemented, evaluated, and refined, this report will form the basis of a comprehensive plan. This plan will be used to communicate planned activities externally to convey assurance that reasonable effort is being made toward compliance and internally to garner the necessary resources for successful implementation.

PERMIT REQUIREMENT

The following section is the language taken directly from the City's NPDES-MS4 permit # FLS000015-003 which has an effective issuance date of September 12, 2011. Some sections have been modified slightly in format and/or content to improve the usefulness of the permit conditions as a planning tool.

The Maximum Extent Practicable (MEP) Standard

The stormwater management program (SWMP) must be designed and implemented to reduce the discharge of pollutants from each permittee's MS4 to surface waters of the State to the Maximum Extent Practicable (MEP.) Narrative effluent limitations requiring implementation of BMPs are generally the most appropriate form of effluent limitations when designed to satisfy technology requirements (including reduction of pollutants to the MEP) and to protect water quality. Implementation of BMPs consistent with the provisions of the SWMP required pursuant to this permit constitutes compliance with the standard of reducing pollutants to the MEP. The MEP standard is applied to MS4s in recognition of the fact that an operator typically does not have total control over the quality or quantity of stormwater entering its system and ultimately entering waters of the State. SWMPs must be assessed and adjusted by the permittee, as part of an iterative process, to maximize their efficiency and make reasonable further progress

toward an ultimate goal of reducing the discharge of pollutants to the extent necessary to protect receiving waters.

Requirements for Impaired Waters with FDEP-adopted/EPA-established TMDLs

The requirements of this section apply only to the permittee's MS4 discharges to receiving waters with adopted or established TMDLs and associated allocations. It is the intent of this section to ensure that pollutant discharges for those parameters listed in the TMDL are reduced to the MEP through the implementation of the permittee's SWMP. Adequate progress toward achieving assigned WLAs will be demonstrated through the implementation of structural and nonstructural BMPs and other program activities that are targeted at TMDL-related pollutants within watersheds that discharge to a waterbody with an EPA-established or DEP-adopted TMDL. The requirements in this section apply to all of the TMDLs that have been adopted by FDEP for verified impaired waters as of the effective date of this permit. These requirements shall also apply to EPA-established TMDLs.

These TMDLs will be listed in Chapter 62-304, F.A.C.,
https://www.flrules.org/gateway/ChapterHome.asp?Chapter=62-304
Adopted TMDLs can also be found in the TMDL Tracker Application:
http://epic229.dep.state.fl.us/DwrmTmdl/welcomehz.do
EPA-established TMDLs can be accessed at:
http://iaspub.epa.gov/pls/waters/f?p=ASKWATERS:EXPERT:3322811596898750
http://iaspub.epa.gov/pls/waters/f?p=ASKWATERS:MAIN_MENU
EPA-established TMDLs can also be accessed at:
http://www.epa.gov/region4/water/tmdl/florida/

For waterbodies with adopted FDEP TMDLs and Basin Management Action Plan

If a Basin Management Action Plan (BMAP) is already adopted, the MS4 operator must comply with the adopted action items assigned to the respective permittee. If a BMAP is in development and will be adopted within two years of permit issuance, the permittee shall continue to participate in the BMAP process and shall comply with the adopted provisions of the BMAP that specify activities to be undertaken by the permittee during the permit cycle.

For waterbodies with adopted FDEP TMDL/EPA-established TMDL but without a BMAP

1. TMDL Prioritization Report

The permittee shall prepare a report that includes the most up-to-date list of adopted FDEP TMDLs or EPA-established TMDLs, the prioritization factors, the prioritized list, and the associated schedule, and submit it to FDEP for review and approval. This is to include:

- For the respective Permit Cycle, a list of waterbodies that have adopted FDEP TMDLs or EPA-established TMDLs to which its MS4 discharges (See Table 1),
- A list of factors that will be used to prioritize the waterbodies (See Prioritization Factors Section)
- The most up-to-date prioritized list of waterbodies with TMDLs (See Table 1),
- And a schedule (See Table 2): for completing the following remaining tasks

2. TMDL Monitoring and Assessment Plan

3. TMDL Monitoring

4. TMDL Implementation Plan

TMDL PRIORITIZATION REPORT – Final List of Adopted TMDLs

Table 1: Prioritized listing of TMDL waterbodies within the City of Lakeland's MS4 jurisdiction.

TMDL Waterbody	WBID	TMDL Status	TMDL Year	Verified Impairment	BMAP	No. COL Outfalls	Pollutant	MS4 WLA	TMDL/LA (lbs/yr)
Lake Hunter (1)	1543	FDEP Adopted / EPA Approved	2004	Yes	No	37	TN	80.0% REDUCTION	6,579
							TP	80.0% REDUCTION	489
Lake Bonny (2)	1497E	EPA Established	2006	Yes	No	17	TN	57.7% REDUCTION	14,523.2
							TP	57.7% REDUCTION	1,920.7
Crystal Lake (3)	1497A	EPA Established	2010	Yes	No	1	TN	51.3% REDUCTION	487.2
							TP	79.2% REDUCTION	26.5
Lake Parker (4)	1497B	EPA Established	2006	Yes[1]	No	36	TN	57.4% REDUCTION	151,683.6
							TP	57.1% REDUCTION	30,480.7

[1] Both Lake Parker and Lake Bonny were listed as verified impaired for nutrients on the 1998 303(d) list and again on the updated verified list in 2005. In 2005 the FDEP completed a draft nutrient TMDL for both waterbodies. These drafts were used by the EPA to establish a final TMDL in 2006. Neither lake appears on the 2010 verified list nor the delist list for nutrients. Both waterbodies are listed as belonging to assessment category 5 (verified impaired) for nutrients (TSI) according to the assessment dashboard tool in the TMDL tracker at http://webapps.dep.state.fl.us/DearTmdl/welcomehz.do.

PRIORITIZATION FACTORS

The factors used to prioritize the TMDL list is important in establishing a stepwise and focused effort that can be administratively defended and fits within fiscal limitations. The FDEP performed extensive prioritizations during development of the State's TMDLs which were based on criteria such as the social and economic importance of a waterbody given its designated uses and contributions to other waterbodies, severity of impairment, potential for positive biological response to pollutant reduction efforts, and relative availability of data. In doing so the FDEP performed what could be called the "first tier" prioritization by developing and adopting TMDLs in order of importance.

The City of Lakeland, through its MS4 permit, has been directed to perform a "second tier" prioritization of the TMDL waterbodies for which reduction of pollutants from its stormwater conveyance system is required. For the purposes of this document and given the classification of those of significance listed in Table 1, Lakeland's TMDL waterbodies will be referred to as lakes. The City is afforded the flexibility to determine the order in which the lake(s) will receive benefit of resources. The criteria used by the City can be of local significance and need not be based on biological factors. Socio-political factors such as current and planned land use, stakeholder involvement, adaptability of current programs, funding sources, historical level of effort and accessibility are acceptable metrics to consider in setting implementation priorities. The following metrics were used to prioritize Lakeland's TMDL waterbodies:

1. TMDL Status

TMDL status was taken into account while prioritizing the City's TMDL lakes. Not all TMDLs applied to the City of Lakeland share the same legal or scientific status. Instead there exists a hierarchy of TMDLs – FDEP adopted for Verified Impaired waterbody, EPA established for Verified Impaired waterbody, and EPA established for unverified impairment. Table 1 shows the TMDL Status whereby only Lake Hunter has been both FDEP adopted and EPA approved. This means that the water body was verified as impaired using the Impaired Waters Rule and that FDEP prepared and adopted the TMDL which subsequently was approved by EPA. All of the remaining TMDLs are classified as "EPA Established" but only some of the waterbodies have been verified as impaired. The Lake Bonny TMDL is for a verified impaired waterbody and it was developed in draft form at the State level by FDEP; however, it was not formally adopted through the State rule making process. As seen in Table 1, Crystal Lake is also verified as impaired but the TMDL was developed and established by EPA alone. Lake Parker is not verified as impaired and the TMDL was developed and established by EPA placing it in the third level of the TMDL hierarchy.

2. Pollutant Load Allocations

The size of required pollutant load reductions was taken into account while prioritizing the City's TMDL lakes. Within Table 1, Pollutants of Concern and their corresponding Waste-load Allocations and Load Allocations are shown. These headings represent the pollutant causing the waterbody impairment and how much it needs to be reduced

from the stormwater entering the identified waterbodies from the City's MS4. The values shown in the table were calculated by FDEP or EPA from the best available data, reasonable assumptions, extrapolations, and from mathematical models detailed in the individual TMDL study reports.

The TMDL equals the sum of the WLAs for point sources, the Load Allocation (LA) for nonpoint sources and an Implicit Margin of Safety (MOS). For regulatory compliance purposes, the WLA of the TMDL is the amount of loading that must be reduced from the City's MS4 discharge. Therefore, a portion of the City's nutrient loading to the lakes is allowable under the NPDES-MS4 permit. Through the TMDL program, FDEP has prescribed a percentage reduction of the MS4 loading that must occur to protect designated uses within a specified lake.

3. BMAP Status and No WLA

A BMAP is an implementation plan developed to achieve the required reductions to meet the TMDL. Waterbodies that have BMAPs in place or will within two years are excluded from the remaining steps in the four step TMDL process set forth in Part VIII.B.3 of the permit. Poley Creek has a BMAP in development and therefore it can be excluded from the TMDL prioritization process. Additionally, since the TMDL for Itchepackasasa Creek requires no load reduction it also not prioritized. The remaining TMDL waterbodies were reviewed during the prioritization process and it was determined they are not currently in BMAP status.

4. Watershed Factors

Watershed factors were taken into account while prioritizing the City's TMDL lakes. Land uses within a watershed have direct impacts on the type of pollutant reduction techniques employed. BMPs are divided into structural and non-structural categories. Structural BMPs are those that are constructed as capital projects that intercept and treat stormwater before it enters the receiving waterbody. Non-structural BMPs are those of an operations, policy, education, and less tangible nature that serve to reduce the stormwater pollution potential between rain events. The more varied the landuses within a watershed, the more varied are the types of BMPs that need to be employed to show results.

5. Funding Sources and stormwater pollutant protection status

Existing funding sources and stormwater pollutant protection levels were taken into account while prioritizing the City's TMDL lakes. Prior to the new TMDL mandates contained in Permit 3, the City was actively pursuing opportunities to reduce pollutant loads in and around many of its lakes. Funding sources for BMPs were already in-place in some of the TMDL watersheds and structural and non-structural controls were implemented accordingly. This resulted in some TMDL lakes having higher levels of protection from stormwater pollutant discharges than others.

6. Data Availability

Data availability was taken into account while prioritizing the City's TMDL lakes. A good watershed assessment and sensible implementation of pollutant load-reduction strategies requires an ample amount of pertinent, up-to-date, and accurate data regarding the MS4. Some watersheds are very large respective to others and some watersheds therefore have more data gaps than others.

WATERBODY PRIORITIZATION

The following prioritization is an update (as of August 1st, 2013) to the City of Lakeland's original prioritization plan submitted to the FDEP in March of 2012.

Priority Waterbody #1 - Lake Hunter

Lake Hunter is selected as the top priority waterbody. Lake Hunter lies entirely within the City of Lakeland's MS4 jurisdictional boundary with FDOT representing the only other co-permittee whose jurisdictional MS4 discharges to the lake. Lake Hunter's TMDL status is the highest of all Lakeland's lakes due to it being a verified impaired water body and that its TMDL was developed and adopted by the FDEP and approved by the EPA. Additionally, it currently has no structural controls in place to protect it from stormwater discharges. However, since this lake has a relatively low urban complexity primarily consisting of medium density residential and a large retirement community, BMP programs the City is currently funding can likely be tailored to meet the nutrient reduction needs of the watershed. The City's street sweeper program has been expanded to include two more units. In FY 15, the City of Lakeland will allocate more funding to TV-ing stormwater pipes and repairing damaged sections. These efforts will result in a general reduction across the City and load reductions specific to the Lake Hunter watershed will be calculated prior to development of the implementation plan. Additional structural controls may be necessary and this will be assessed as scheduled in Table 2. The MS4 GIS inventory update is also completed for this watershed and thus we have the most accurate information possible regarding our MS4 here and can model and perform stormwater monitoring with a high degree of accuracy.

Priority Waterbody #2 – Lake Bonny

To date there have been no regional structural efforts to reduce nutrient loadings into Lake Bonny. The City's street sweeper program has been expanded to include two more units. In FY 15, the City of Lakeland will allocate more funding to TV-ing stormwater pipes and repairing damaged sections. These efforts will result in a general reduction across the City and load reductions specific to the Lake Bonny watershed will be calculated prior to development of the implementation plan. Structural controls may be necessary in this watershed and this will be assessed as scheduled in Table 2. The MS4 GIS inventory update is on schedule to be completed by FY 14 for this watershed.

Priority Waterbody #3 – Crystal Lake

To date there have been no regional structural efforts from the City's MS4 to reduce nutrient loadings into Crystal Lake. However, the County has a large stormwater pond in-place to intercept County MS4 discharges and the City's MS4 discharge is relatively small (limited to 4 minor outfalls). The City's street sweeper program has been expanded to include two more units. In FY 15, the City of Lakeland will allocate more funding to TV-ing stormwater pipes and repairing damaged sections. These efforts will result in a general reduction across the City and load reductions specific to the Crystal Lake watershed will be calculated prior to development of the implementation plan. The MS4 GIS inventory update is on schedule to be completed by FY 15 for this watershed.

Priority Waterbody #4 – Lake Parker

Lake Parker ranks as the #4 priority waterbody due to the extent of regional stormwater treatment systems that have already been employed within its watershed, thus currently giving it adequate protection from stormwater discharges. The City's street sweeper program has been expanded to include two more units. In FY 15, the City of Lakeland will allocate more funding to TV-ing stormwater pipes and repairing damaged sections. These efforts will result in a general reduction across the City and load reductions specific to the Lake Parker watershed will be calculated prior to development of the implementation plan. An accounting of the treatment afforded by these systems has not been performed along with outfall monitoring such that the reductions can be documented. These assessments will be conducted prior to the development of the implementation plan. It is a very large watershed and will therefore take a substantial amount of time and effort to adequately update the City's MS4 GIS inventory, model the watershed, and monitor stormwater discharges. The MS4 GIS inventory update is on schedule to be completed by FY 16 for this watershed.

SCHEDULE FOR COMPLETION

The following summarizes the tasks outlined and scheduled in Table 2 for each TMDL waterbody:

Note: All deliverables due as scheduled in Table 2 are provided in the Appendix Section of this report which is updated on a yearly basis as a submittal to the FDEP with the City's NPDES Annual Report.

Task #1: Outfall Basin Delineations

Each outfall in the watershed of concern will be analyzed with GIS tools, field surveys and other drainage assessment tools to determine their respective sub-basins. Published EMCs and landuse characteristics will be used to estimate pollutant loads for each outfall.

Task #2: Outfall Monitoring Plan

Based on the Task #1 data and previously documented watershed characteristics, priority outfalls and other related artificial and/or natural drainage features will be selected for further storm event monitoring. The monitoring plan will lay out specific sampling logistics and will be submitted to FDEP as scheduled in Table 2.

Task #3: Stormwater Sampling

Storm event monitoring and post-sampling analyses from selected outfalls and drainage features will be conducted to validate and/or adjust the modeled loads derived from Task #1.

Task #4: Implementation Plan

A supplemental Stormwater Management Plan (SWMP) will be developed based upon the combination of data from Tasks 1 – 3 and general knowledge of the unique attributes in each watershed of concern. This plan will include strategies that best achieve the required pollutant load reductions and will be submitted to FDEP as scheduled in Table 2.

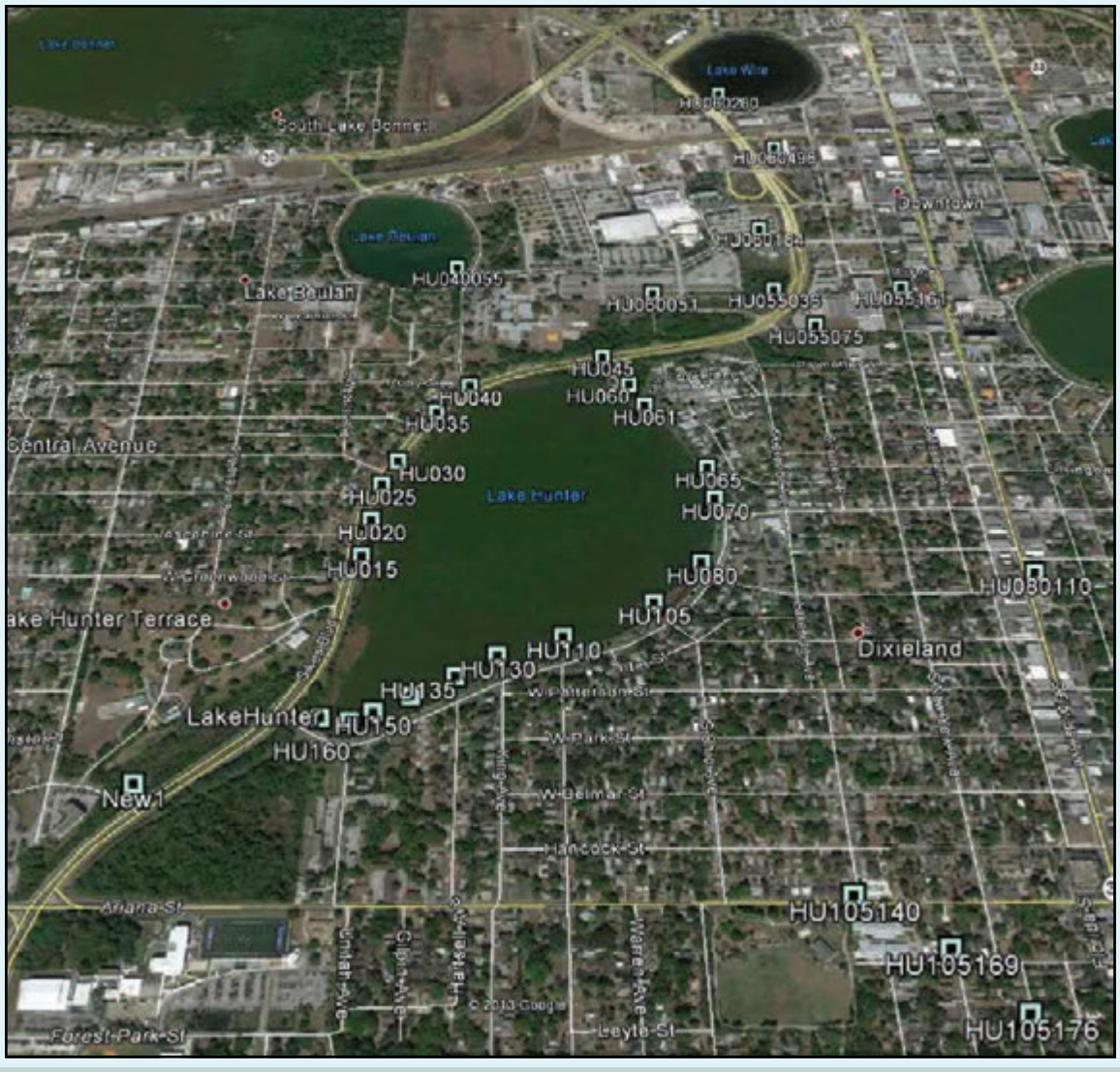
Table 2: Schedule Summary for TMDL Task Completion

TMDL Lake	WBID	Task#1 Outfall Basin Delineations And Loading Calculations Completed by:	Task #2 Outfalls Monitoring Scope to FDEP by:	Task #3 Stormwater Sampling Completed by:	Task #4 BMP Implementation Plan to FDEP by:
Lake Hunter	1543	**8/1/2013** *funds available to start 10/1/12*	**8/1/2013** *Finalized monitoring plan to be delivered to FDEP by 10/1/13*	**02/1/2015** *funds available to start 10/1/12*	**10/1/2015** *funds available to start 10/1/14*
Lake Bonny	1497E	**10/1/2014** *funds available to start 10/1/13*	**10/1/2014** *Finalized monitoring plan to be delivered to FDEP by 12/1/14*	**04/1/2016** *funds available to start 10/1/14*	**10/1/2016** *funds available to start 10/1/15*
Crystal Lake	1497A	**10/1/2014** *funds available to start 10/1/13*	**10/1/2014** *Finalized monitoring plan to be delivered to FDEP by 12/1/14*	**04/1/2016** *funds available to start 10/1/14*	**10/1/2016** *funds available to start 10/1/15*
Lake Parker	1497B	**10/1/2016** *funds available to start 10/1/15*	**10/1/2016** *Finalized monitoring plan to be delivered to FDEP by 12/1/16*	**10/1/2017** *funds available to start 10/1/16*	**10/1/2018** *funds available to start 10/1/17*

Appendix A

Lake Hunter Outfall Delineations

City of Lakeland—Lake Hunter
NPDES Outfalls Basin Delineations
And
Pollutant Loadings



Project No.: 600276
Date: September 2013

LAKE HUNTER
NPDES OUFALLS BASIN DELINEATIONS
&
POLLUTANT LOADINGS

Prepared for:

CITY OF LAKELAND
Lakeland, Florida

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AMEC Project No. 600276

September 2013

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1.0 INTRODUCTION

1.1 Purpose and Objectives

AMEC Environment & Infrastructure, Inc. (AMEC) was contracted by the City of Lakeland (COL) Lakes and Stormwater Department to assist with the development of the annual pollutant loading assessments for Lake Hunter as required by the recently issued NPDES permit for COL. The tasks include determining drainage basin boundaries; determining the extent of the associated land use types; and computing the resulting predictions of pollutant loading for each of the 35 outfalls identified.

1.2 Project Location and General Description

Lake Hunter is located in the southwest region of the COL limits and is surrounded by Lakes Beulah, Morton and Lake Hollingsworth. The City's database contains 86 point locations surrounding Lake Hunter - out of which 35 were identified as outfalls. The City's storm sewer network information was obtained by AMEC to assess the drainage area for each outfall. **Figure 1** illustrates the location of Lake Hunter within COL and **Figure 2** identifies the 35 outfalls analyzed for this report.

2.0 SURFACE WATER QUALITY MODEL

Pollutant load modeling was conducted to estimate the annual stormwater pollutant loads associated with each drainage basin. The pollutant load modeling was accomplished using an MS Excel spreadsheet tool named Pollutant Loadings and Load Reduction (PL2R) tool developed in-house by AMEC that is based on criteria of the Florida Statewide Stormwater Rule and using the modified U.S. Environmental Protection Agency's (EPA) Simple Method (Schueler, 1987). The Simple Method estimates stormwater pollutant loads as the product of annual runoff volume and pollutant concentration.

The Simple Method is a three-step calculation (Ohrel, 2000):

1. Runoff coefficient calculation, Rv:

   $Rv = 0.05 + 0.009 * I$

   Where:
   Rv = Mean runoff coefficient
   I = Percent of site imperviousness

2. Runoff volume (acre-feet per year) calculation:

   $R = (P * Pj * Rv / 12) * A$

   Where:

   R = Runoff volume (acre-feet per year)
   P = Annual rainfall depth (inches)
   Pj = Fraction of rainfall events that produce runoff (normally equal to 0.9)
   A = Study area (acres)

3. Annual pollutant loads (pounds per year)

   $L = 2.72 * R * C$

   Where:
   L = Annual pollutant load lb/year)
   C = Event mean concentration of the pollutant (mg/l)
   2.72 = Conversion factor (from mg/l to lb/acre-foot)

For this investigation, the Simple Method is modified in accordance with the Florida Statewide Stormwater Rule for calculating annual runoff as follows:

$Q = ciA$

Where:
Q = Runoff Volume (ac-ft)/yr
c = Runoff coefficient determined based on Florida Meteorological Zone
i = Rainfall depth (in)
A = Area (ac)

The runoff coefficient 'c' is determined based on the drainage basin non-directly connected impervious area curve number (NDCIA CN) and directly connected impervious area (DCIA) combination and the meteorological zone within which the project area falls into. The state rule handbook has the runoff coefficients published for each NDCIA CN-DCIA combination and for each meteorological zone in Florida. Among the five meteorological zones defined in Florida, Polk County falls into Zone 2. Published runoff coefficients for Zone 2 are tabulated in **Table 1**. The NDCIA CN and DCIA for the drainage basins were determined by using the lookup table provided in this report as **Table 3**.

The rainfall was determined by summarizing the rainfall depth for each calendar year calculating basic statistics such as minimum, maximum, and average annual rainfall depths. The years with annual rainfall amounts closest to the average of the entire analyzed dataset were selected for use in the model simulations. From over 90 years of rainfall data available, 8 to 10 years of data had annual rainfall depths close to the mean annual depth for all years.

Within this data set, years dominated by a few days with high rainfall depths, will have less total abstraction than a rainfall year with the same depth of rainfall spread over a longer period of time. In order to compensate for this effect, the rainfall year 1988 was selected for use to estimate pollutant loads since it had a total runoff closest to the average runoff from all 8 years of rainfall data tested. The year 1988 which recorded a depth of 51.65 inches was selected from this group of rainfall data and was used in determining the pollutant loading model simulations to estimate annual runoff volumes.

Although the Simple Method is accepted as an appropriate and reasonably accurate technique to estimate the pollution loading contributed during the storms, it does have several limitations (Center, 2003):

- This method cannot be used to estimate the pollutant loads generated by base flow, only the loads generated during the storm.
- The Simple Method should be limited to basin areas smaller than 640 acres. Larger basins require a more complex method of analysis.
- This technique may not accurately estimate pollutant loads for construction sites, heavily traveled highways, croplands, and undeveloped areas.

Despite the above limitations, the Simple Method is considered an excellent tool for comparing pollutant loads of different drainage sub-basins for prioritization purposes.

Table 2 lists the event mean concentrations (EMC) used to estimate pollutant loads for the Lake Hunter sub-basins. The EMCs are estimated average load concentrations from specific land uses based on past monitoring activities conducted throughout the State of Florida, and were derived from several sources as noted in the documentation.

Lake Hunter NPDES Outfall calculations and basin delineation maps are located in **Appendix A**.

Table 1
Published Runoff Coefficients (c) for Meteorological Zone 2
Based on Non-DCIA CN and Percent DCIA

NDCIA CN	PERCENT DCIA																				
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	0.002	0.043	0.083	0.123	0.164	0.204	0.244	0.285	0.325	0.366	0.406	0.446	0.487	0.527	0.567	0.608	0.648	0.688	0.729	0.769	0.809
35	0.004	0.044	0.085	0.125	0.165	0.205	0.246	0.286	0.326	0.366	0.407	0.447	0.487	0.528	0.568	0.608	0.648	0.689	0.729	0.769	0.809
40	0.007	0.047	0.087	0.127	0.167	0.207	0.248	0.288	0.328	0.368	0.408	0.448	0.488	0.528	0.569	0.609	0.649	0.689	0.729	0.769	0.809
45	0.01	0.05	0.09	0.13	0.17	0.21	0.25	0.29	0.33	0.37	0.41	0.45	0.49	0.53	0.57	0.61	0.65	0.69	0.729	0.769	0.809
50	0.015	0.055	0.095	0.134	0.174	0.214	0.254	0.293	0.333	0.373	0.412	0.452	0.492	0.531	0.571	0.611	0.651	0.69	0.73	0.77	0.809
55	0.022	0.061	0.101	0.14	0.179	0.219	0.258	0.298	0.337	0.376	0.416	0.455	0.494	0.534	0.573	0.613	0.652	0.691	0.731	0.77	0.809
60	0.03	0.069	0.108	0.147	0.186	0.225	0.264	0.303	0.342	0.381	0.42	0.459	0.498	0.537	0.576	0.615	0.654	0.693	0.731	0.77	0.809
65	0.042	0.08	0.119	0.157	0.195	0.234	0.272	0.311	0.349	0.387	0.426	0.464	0.502	0.541	0.579	0.618	0.656	0.694	0.733	0.771	0.809
70	0.057	0.095	0.133	0.17	0.208	0.245	0.283	0.321	0.358	0.396	0.433	0.471	0.509	0.546	0.584	0.621	0.659	0.697	0.734	0.772	0.809
75	0.079	0.116	0.152	0.189	0.225	0.262	0.298	0.335	0.371	0.408	0.444	0.481	0.517	0.554	0.59	0.627	0.663	0.7	0.736	0.773	0.809
80	0.111	0.146	0.181	0.216	0.251	0.285	0.32	0.355	0.39	0.425	0.46	0.495	0.53	0.565	0.6	0.635	0.67	0.705	0.74	0.774	0.809
85	0.16	0.192	0.225	0.257	0.29	0.322	0.355	0.387	0.42	0.452	0.485	0.517	0.55	0.582	0.614	0.647	0.679	0.712	0.744	0.777	0.809
90	0.242	0.27	0.299	0.327	0.355	0.384	0.412	0.44	0.469	0.497	0.526	0.554	0.582	0.611	0.639	0.667	0.696	0.724	0.753	0.781	0.809
95	0.404	0.424	0.444	0.464	0.485	0.505	0.525	0.546	0.566	0.586	0.606	0.627	0.647	0.667	0.688	0.708	0.728	0.749	0.769	0.789	0.809
98	0.595	0.605	0.616	0.627	0.638	0.648	0.659	0.67	0.68	0.691	0.702	0.713	0.723	0.734	0.745	0.756	0.766	0.777	0.788	0.799	0.809

Table 2
Summary Of Literature-Based Runoff Characterization Data For General Landuse Categories in Florida

Landuse Category	Typical Runoff Concentration (mg/l)						
	Total N	Total P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential[1]	1.5	0.18	4.7	23	0.008[4]	0.002[4]	0.031[4]
Single-Family	1.85	0.31	7.9	37.5	0.016	0.004	0.062
Multi-Family	1.91	0.48	11.3	77.8	0.009	0.006	0.086
Low-Intensity Commercial	0.93	0.16	7.7	57.5	0.018	0.005	0.094
High-Intensity Commercial	2.48	0.23	11.3	69.7	0.015	--	0.16
Light Industrial	1.14	0.23	7.6	60	0.003	0.002	0.057
Highway	1.37	0.17	5.2	37.3	0.032	0.011	0.126
Pasture	2.48	0.7	5.1	94.3	--	--	--
Citrus	2.31	0.16	2.55	15.5	0.003	0.001	0.012
Row Crops	2.47	0.51	--	19.8	0.022	0.004	0.03
General Agriculture[2]	2.42	0.46	3.8	43.2	0.013	0.003	0.021
Undeveloped / Rangeland / Forest	1.15	0.055	1.4	8.4	--	--	--
Mining / Extractive	1.18	0.15	7.6[3]	60.0[3]	0.003[3]	0.002[3]	0.057[3]
Wetland	1.01	0.09	2.63	11.2	0.001	0.001	0.006
Open Water / Lake	1.6	0.067	1.6	3.1		0.025[5]	0.028

1. Average of single-family and undeveloped loading rates
2. Mean of pasture, citrus, and row crop land uses
3. Runoff concentrations assumed equal to industrial values for these parameters
4. Value assumed to be equal to 50% of single-family concentration
5. Runoff concentrations assumed equal to wetland values for these parameters

Notes: This table is a replica of the Table 4-17 in the Final Report of "Evaluation of Current Stormwater Design Criteria within the state of Florida" prepared for: Florida Department of Environmental Protection (June 2007)
Prepared by: Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.

Total N and Total P EMC values
are from the Table 3.4 in March 2010 Draft
Department of Environmental Protection and Water Management Districts
Environmental Resource Permit Stormwater Quality Applicant's Handbook
Design Requirements for Stormwater Treatment Systems in Florida

Wetland and Open Water/Lake EMC values
are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc.
Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.

Table 3
Summary of Curve Numbers
Based On Landuse and Soil Group

FLUCCS	Generalized Landuse Description	Hydrologic Soils Group					
		A	B	B/D	C	D	W
1100	Residential-Low Density	39	61	61	74	80	99.8
1200	Residential-Med Density	39	61	61	74	80	99.8
1300	Residential-High Density	39	61	61	74	80	99.8
1400	Commercial	39	61	61	74	80	99.8
1500	Industrial	39	61	61	74	80	99.8
1600	Extractive	39	61	61	74	80	99.8
1700	Institutional	39	61	61	74	80	99.8
1800	Recreational	39	61	80	74	80	99.8
1900	Open Land	39	61	80	74	80	99.8
2100	Cropland and Pastureland	39	61	80	74	80	99.8
2200	Tree Crops - Citrus	32	58	79	72	79	99.8
2300	Feeding Operations	32	58	79	72	79	99.8
2400	Nurseries and Vineyards	67	78	89	85	89	99.8
2500	Specialty Farms	67	78	89	85	89	99.8
2600	Other Open Lands - Rural	39	61	80	74	80	99.8
3100	Herbaceous Rangeland	39	61	80	74	80	99.8
3200	Shrub and Brush Rangeland	30	48	73	65	73	99.8
3300	Mixed Rangeland	30	48	73	65	73	99.8
4100	Upland Coniferous Forest	32	58	79	72	79	99.8
4200	Upland Hardwood Forests	32	58	79	72	79	99.8
4300	Upland Hardwood Forests	32	58	79	72	79	99.8
4400	Tree Plantations	32	58	79	72	79	99.8
5000	Water	99.8	99.8	99.8	99.8	99.8	99.8
5100	Streams and Waterways	99.8	99.8	99.8	99.8	99.8	99.8
5200	Lakes	99.8	99.8	99.8	99.8	99.8	99.8
5300	Reservoirs	99.8	99.8	99.8	99.8	99.8	99.8
6100	Wetland Hardwood Forests	99.8	99.8	99.8	99.8	99.8	99.8
6200	Wetland Coniferous Forests	99.8	99.8	99.8	99.8	99.8	99.8
6300	Wetland Forested Mixed	98	98	98	98	98	99.8
6400	Vegetated Non-Forested Wetlands	98	98	98	98	98	99.8
7400	Mining	39	61	80	74	80	99.8
8100	Transportation / Utilities	83	89	89	92	93	99.8
8200	Communications	83	89	89	92	93	99.8
8300	Utilities	83	89	89	92	93	99.8

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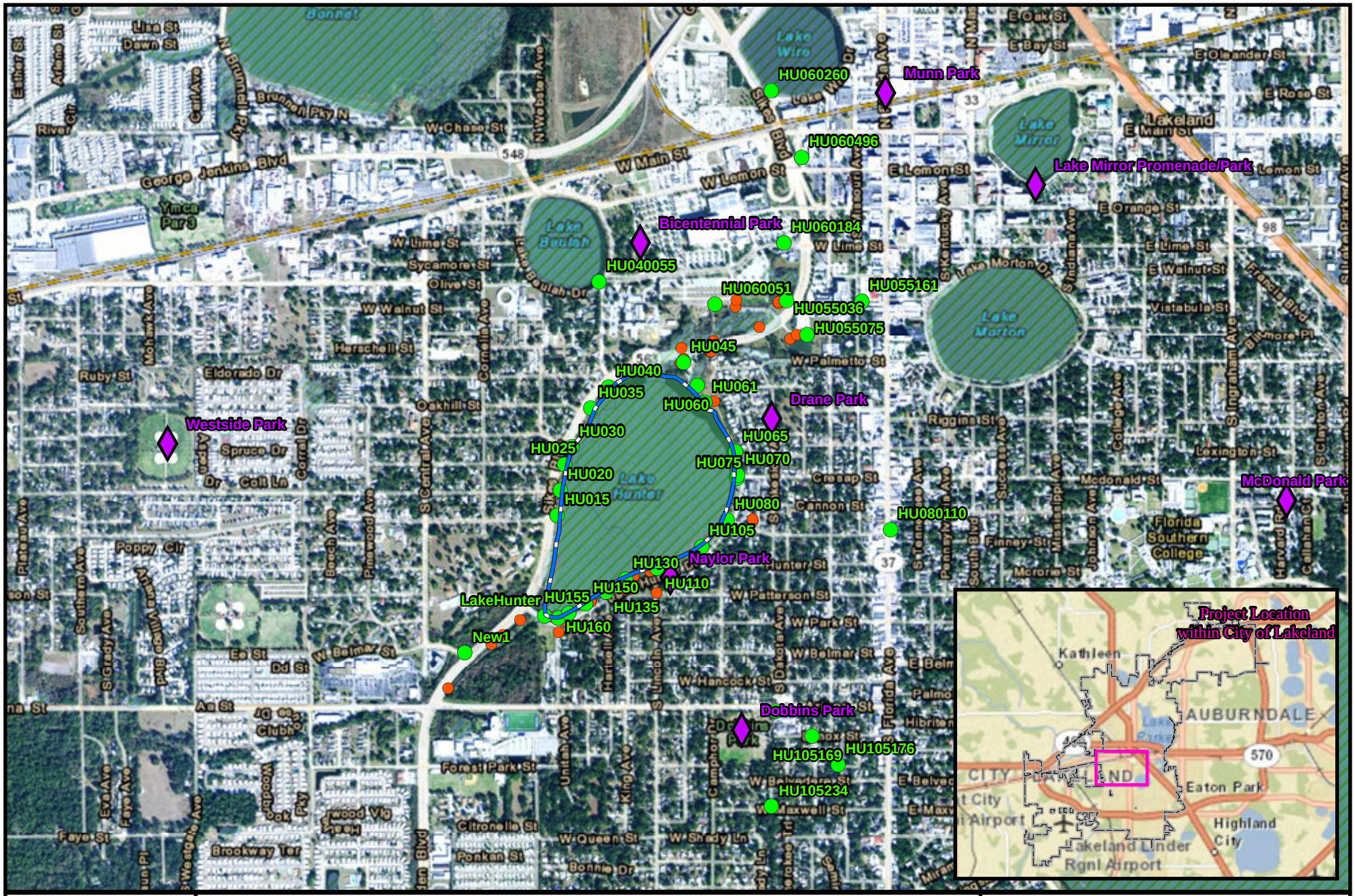
Figures



Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake HunterBoundary
- LakeHunter NPDES Outfalls
- Additional COL Database Points
- Wetlands
- Parks

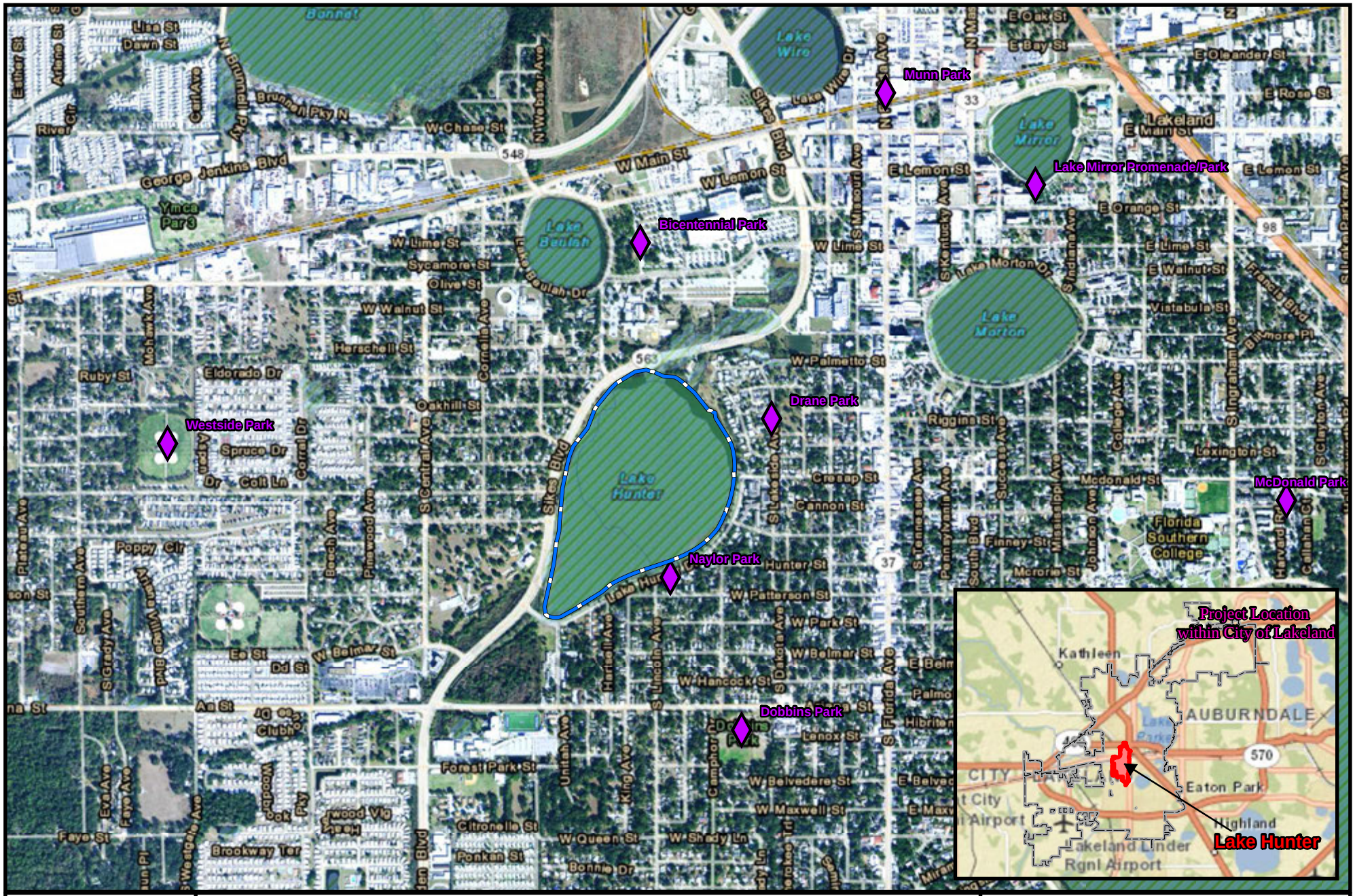
N W E S

0 750 1,500
Feet

FIGURE 2
LAKE HUNTER OUTFALLS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276 City of Lakeland - NPDES Lake Hunter\Report\MXD\LakHunterOutfalls1.mxd



Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
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Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake HunterBoundary
- Wetlands
- Parks

N
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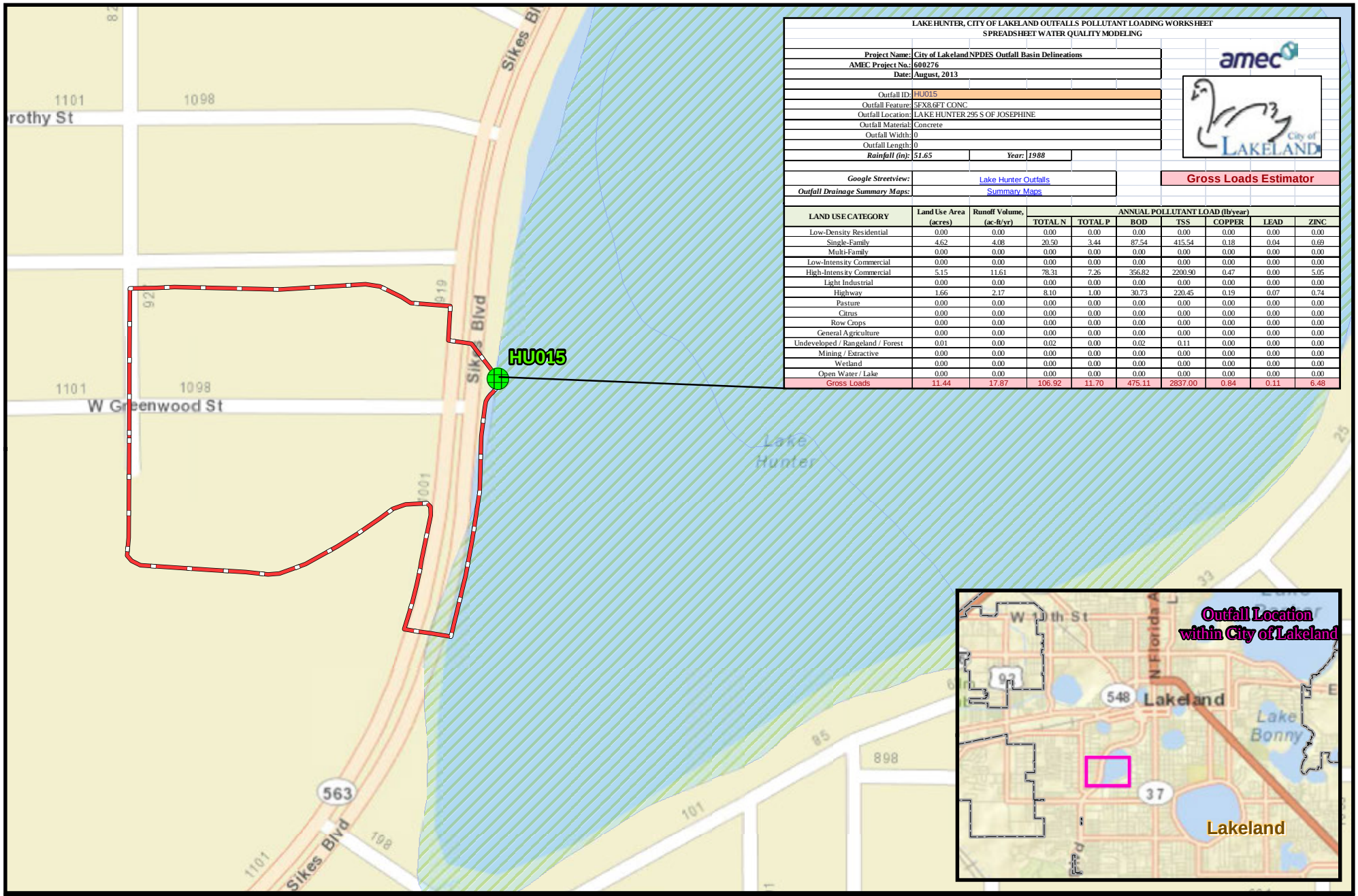
Feet

FIGURE 1
LAKE HUNTER LOCATION MAP

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276 City of Lakeland - NPDES Lake Hunter\Report\MXD\LakHunterOutfalls_Location1.mxd

Appendix A



LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**
Outfall ID:	HU015
Outfall Feature:	5FX8.6FT CONC
Outfall Location:	LAKE HUNTER 295 S OF JOSEPHINE
Outfall Material:	Concrete
Outfall Width:	0
Outfall Length:	0
Rainfall (in):	***51.65***
Year:	***1988***
Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	4.62	4.08	20.50	3.44	87.54	415.54	0.18	0.04	0.69
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	5.15	11.61	78.31	7.26	356.82	2200.90	0.47	0.00	5.05
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	1.66	2.17	8.10	1.00	30.73	220.45	0.19	0.07	0.74
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.01	0.00	0.02	0.00	0.02	0.11	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	11.44	17.87	106.92	11.70	475.11	2837.00	0.84	0.11	6.48

Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake Hunter Outfall Location
- Drainage area for outfall
- Parks
- Wetlands

N
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0 150 300
Feet

LAKE HUNTER NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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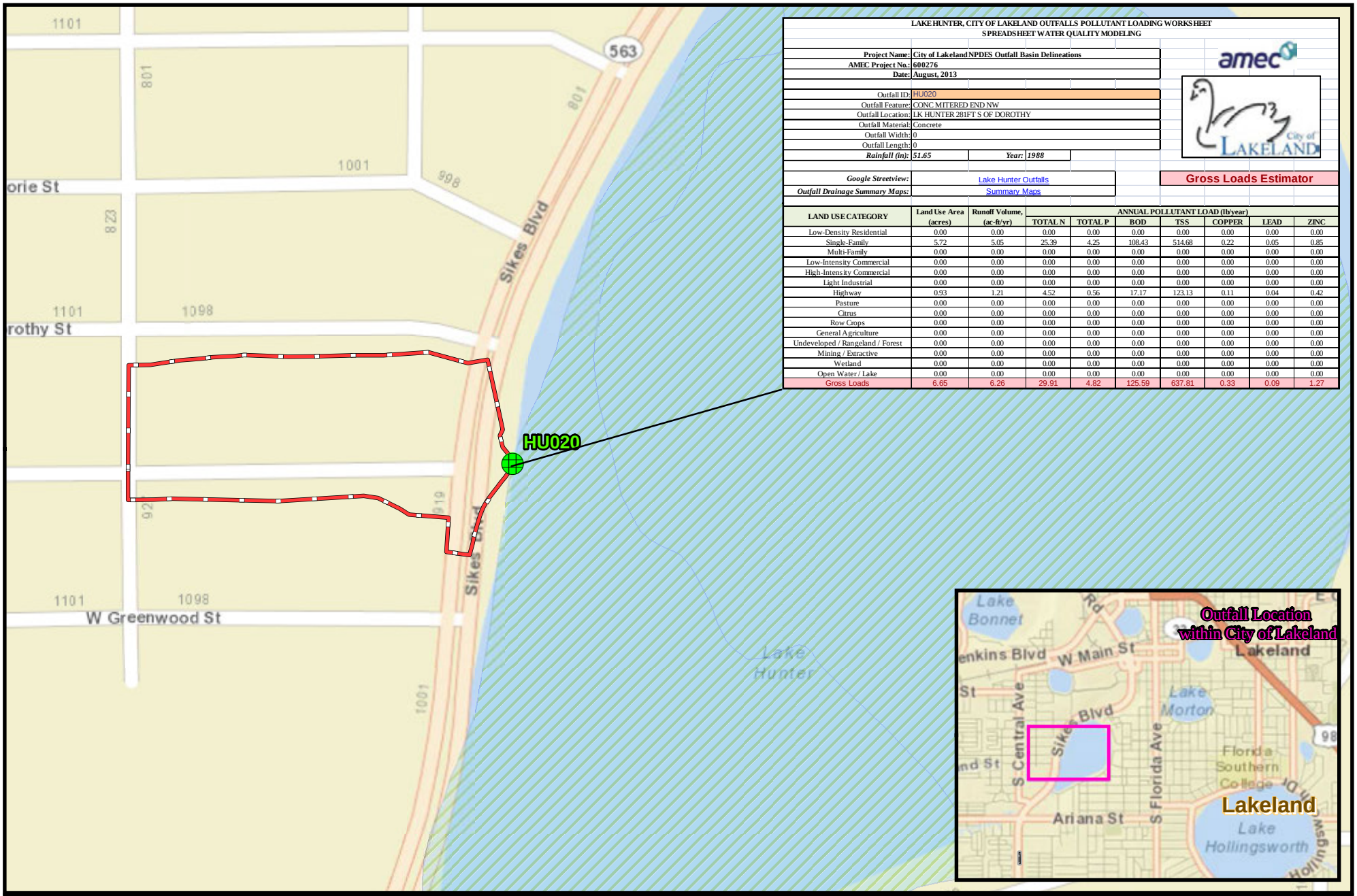

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276
Date:	August, 2013
Outfall ID:	HU020
Outfall Feature:	CONC MITERED END NW
Outfall Location:	LK HUNTER 281FT S OF DOROTHY
Outfall Material:	Concrete
Outfall Width:	0
Outfall Length:	0
Rainfall (in):	*51.65* — ***Year:*** *1988*
Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	5.72	5.05	25.39	4.25	108.43	514.68	0.22	0.05	0.85
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.93	1.21	4.52	0.56	17.17	123.13	0.11	0.04	0.42
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	6.65	6.26	29.91	4.82	125.59	637.81	0.33	0.09	1.27

Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake Hunter Outfall Location
- Drainage area for outfall
- Parks
- Wetlands

N
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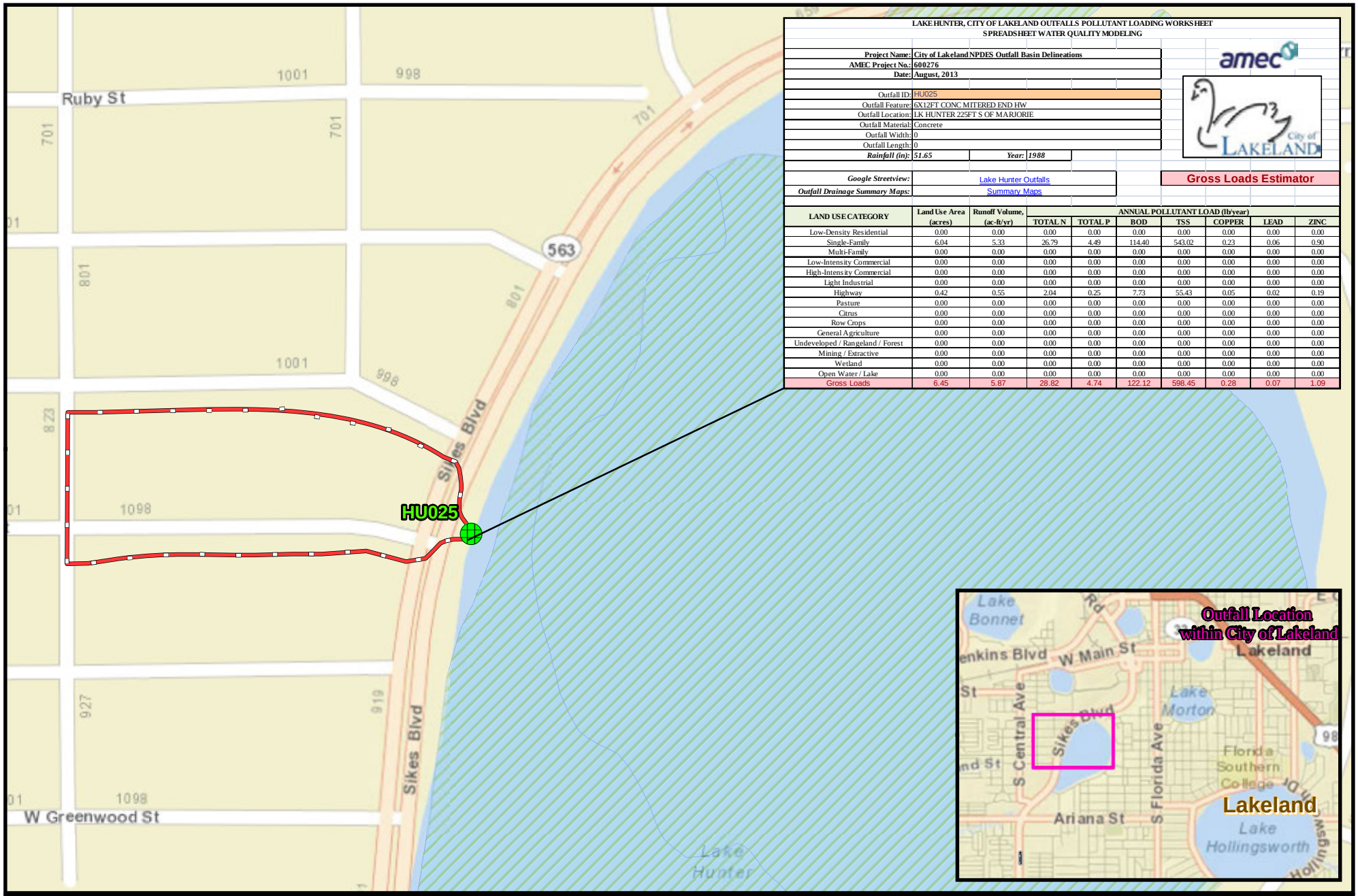
0 150 300
Feet

LAKE HUNTER NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276 City of Lakeland - NPDES Lake Hunter\0Deliverable\MXDs\OutfallHU020.mxd



LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276
Date:	August, 2013
Outfall ID:	HU025
Outfall Feature:	6X12FT CONC MITERED END HW
Outfall Location:	LK HUNTER 225FT S OF MARJORIE
Outfall Material:	Concrete
Outfall Width:	0
Outfall Length:	0
Rainfall (in):	*51.65* — ***Year:*** *1988*
Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	6.04	5.33	26.79	4.49	114.40	543.02	0.23	0.06	0.90
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.42	0.55	2.04	0.25	7.73	55.43	0.05	0.02	0.19
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	6.45	5.87	28.82	4.74	122.12	598.45	0.28	0.07	1.09

Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake Hunter Outfall Location
- Drainage area for outfall
- Parks
- Wetlands

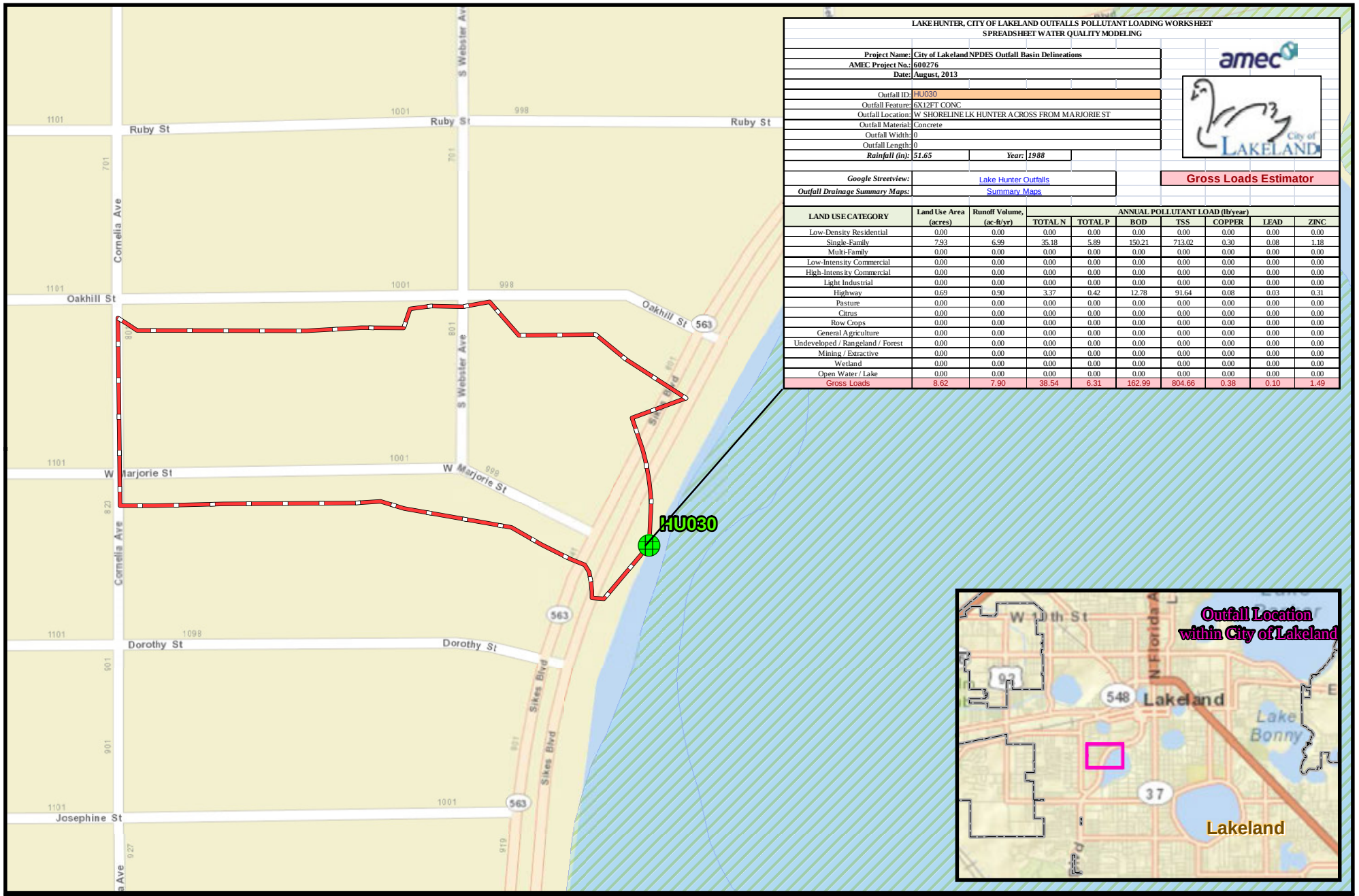
N W E S

0 150 300
Feet

LAKE HUNTER NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276 City of Lakeland - NPDES Lake Hunter\0Deliverable\MXDs\OutfallHU025.mxd



LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**
Outfall ID:	HU030
Outfall Feature:	6X12FT CONC
Outfall Location:	W SHORELINE LK HUNTER ACROSS FROM MARJORIE ST
Outfall Material:	Concrete
Outfall Width:	0
Outfall Length:	0
Rainfall (in):	***51.65***
Year:	***1988***
Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	7.93	6.99	35.18	5.89	150.21	713.02	0.30	0.08	1.18
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.69	0.90	3.37	0.42	12.78	91.64	0.08	0.03	0.31
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	8.62	7.90	38.54	6.31	162.99	804.66	0.38	0.10	1.49

Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake Hunter Outfall Location
- Drainage area for outfall
- Parks
- Wetlands

N W E S

0 125 250
Feet

LAKE HUNTER NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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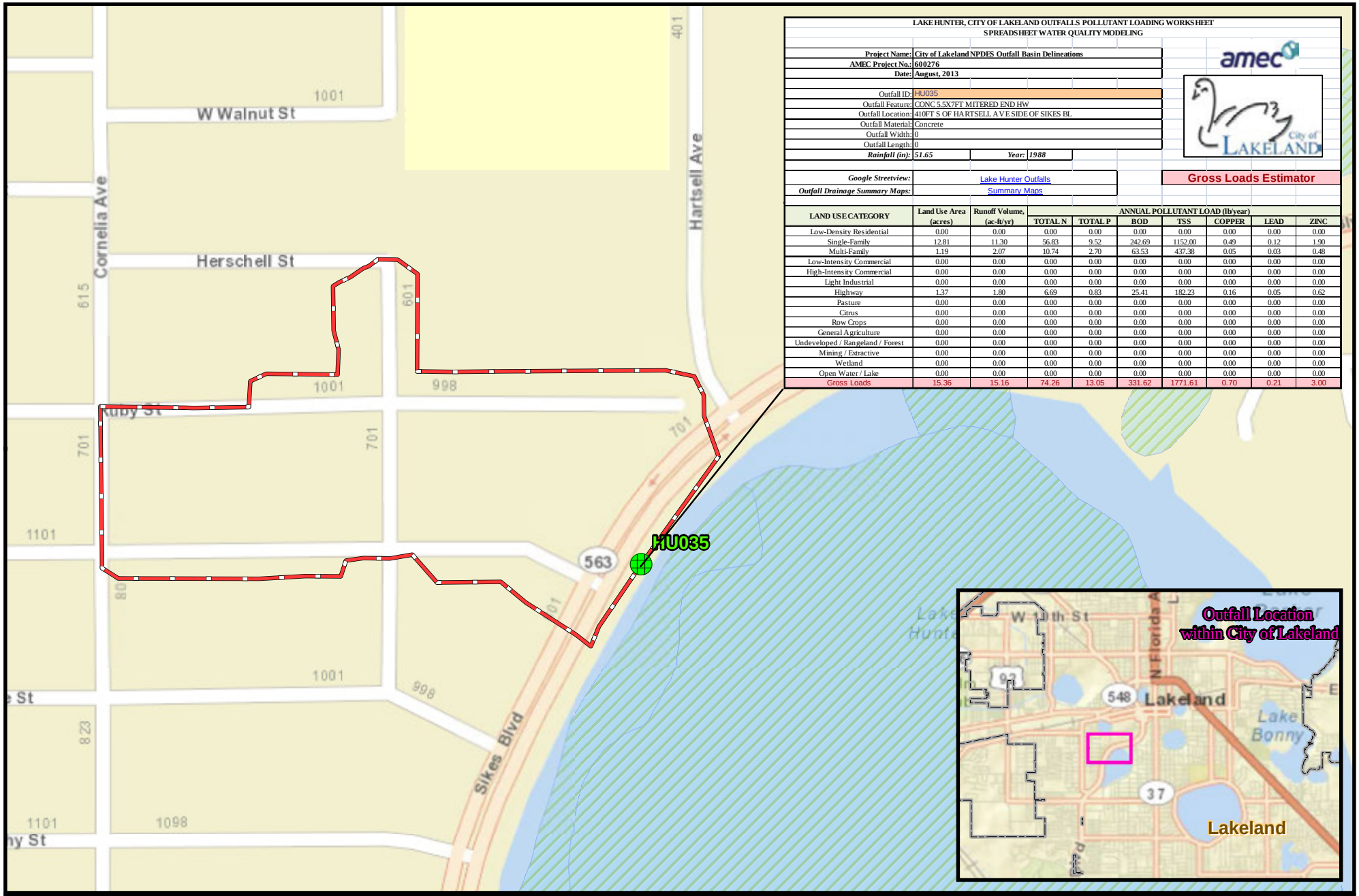

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**
Outfall ID:	HU035
Outfall Feature:	CONC 5.5X7FT MITERED END HW
Outfall Location:	410FT S OF HARTSELL AVE SIDE OF SIKES BL
Outfall Material:	Concrete
Outfall Width:	0
Outfall Length:	0
Rainfall (in):	***51.65***
Year:	***1988***
Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	12.81	11.30	56.83	9.52	242.69	1152.00	0.49	0.12	1.90
Multi-Family	1.19	2.07	10.74	2.70	63.53	437.38	0.05	0.03	0.48
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	1.37	1.80	6.69	0.83	25.41	182.23	0.16	0.05	0.62
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	15.36	15.16	74.26	13.05	331.62	1771.61	0.70	0.21	3.00

Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake Hunter Outfall Location
- Drainage area for outfall
- Parks
- Wetlands

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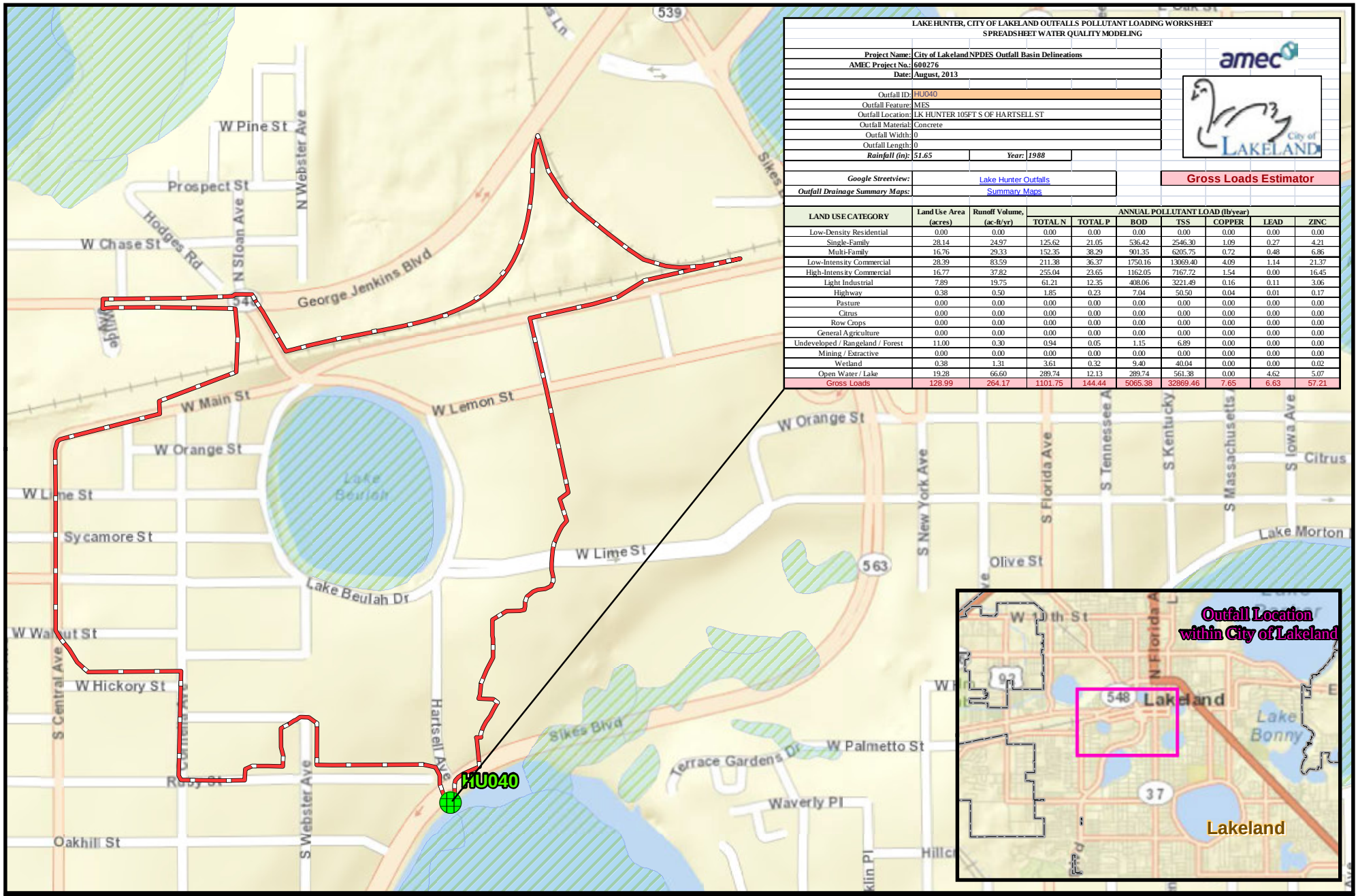
LAKE HUNTER NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276 City of Lakeland - NPDES Lake Hunter\0Deliverable\MXDs\OutfallHU035.mxd



LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276
Date:	August, 2013
Outfall ID:	HU040
Outfall Feature:	MES
Outfall Location:	LK HUNTER 105FT S OF HARTSELL ST
Outfall Material:	Concrete
Outfall Width:	0
Outfall Length:	0
Rainfall (in):	*51.65* — ***Year:*** *1988*
Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	28.14	24.97	125.62	21.05	536.42	2546.30	1.09	0.27	4.21
Multi-Family	16.76	29.33	152.35	38.29	901.35	6205.75	0.72	0.48	6.86
Low-Intensity Commercial	28.39	83.59	211.38	36.37	1750.16	13069.40	4.09	1.14	21.37
High-Intensity Commercial	16.77	37.82	255.04	23.65	1162.05	7167.72	1.54	0.00	16.45
Light Industrial	7.89	19.75	61.21	12.35	408.06	3221.49	0.16	0.11	3.06
Highway	0.38	0.50	1.85	0.23	7.04	50.50	0.04	0.01	0.17
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	11.00	0.30	0.94	0.05	1.15	6.89	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.38	1.31	3.61	0.32	9.40	40.04	0.00	0.00	0.02
Open Water / Lake	19.28	66.60	289.74	12.13	289.74	561.38	0.00	4.62	5.07
Gross Loads	128.99	264.17	1101.75	144.44	5065.38	32869.46	7.65	6.63	57.21

Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake Hunter Outfall Location
- Drainage area for outfall
- Parks
- Wetlands

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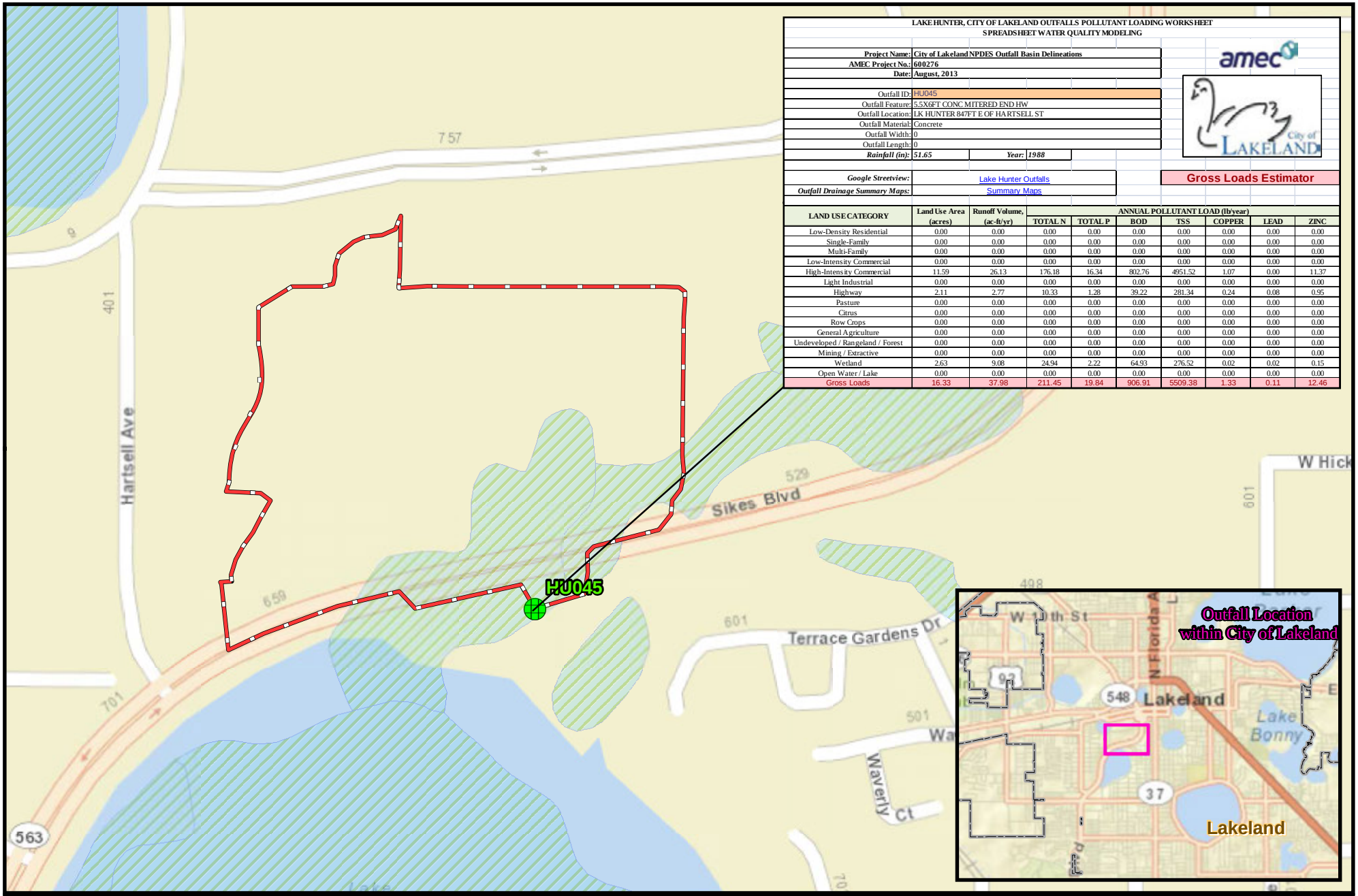
LAKE HUNTER NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276 City of Lakeland - NPDES Lake Hunter\0Deliverable\MXDs\OutfallHU040.mxd



LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276
Date:	August, 2013
Outfall ID:	HU045
Outfall Feature:	5.5X6FT CONC MITERED END HW
Outfall Location:	LK HUNTER 847FT E OF HARTSELL ST
Outfall Material:	Concrete
Outfall Width:	0
Outfall Length:	0
Rainfall (in):	*51.65*
Year:	*1988*
Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	11.59	26.13	176.18	16.34	802.76	4951.52	1.07	0.00	11.37
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	2.11	2.77	10.33	1.28	39.22	281.34	0.24	0.08	0.95
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	2.63	9.08	24.94	2.22	64.93	276.52	0.02	0.02	0.15
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	16.33	37.98	211.45	19.84	906.91	5509.38	1.33	0.11	12.46

Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake Hunter Outfall Location
- Drainage area for outfall
- Parks
- Wetlands

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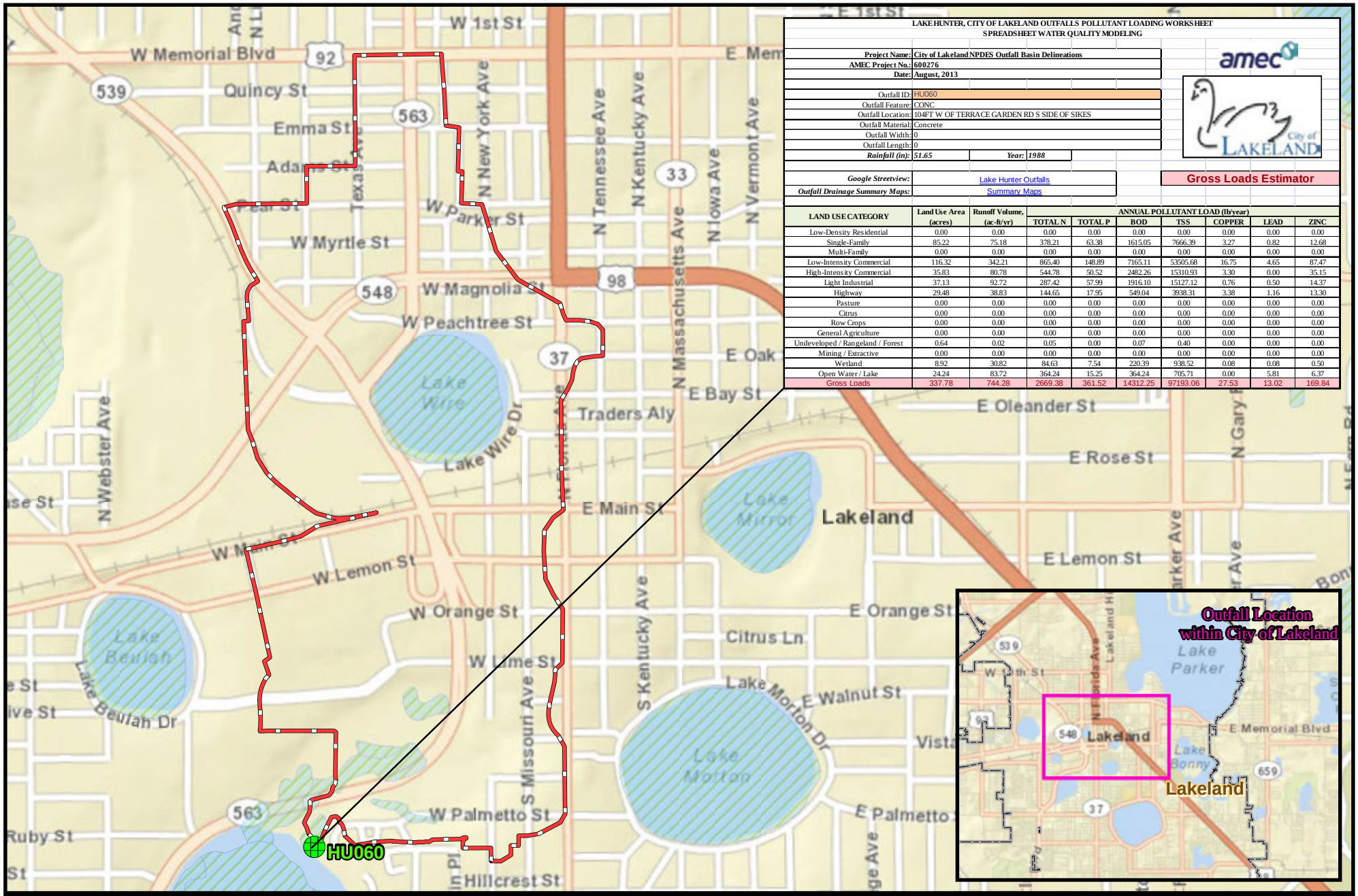
LAKE HUNTER NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276 City of Lakeland - NPDES Lake Hunter\0Deliverable\MXDs\OutfallHU045.mxd



LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276
Date:	August, 2013
Outfall ID:	HU060
Outfall Feature:	CONC
Outfall Location:	104FT W OF TERRACE GARDEN RD S SIDE OF SIKES
Outfall Material:	Concrete
Outfall Width:	0
Outfall Length:	0
Rainfall (in):	*51.65* — ***Year:*** *1988*
Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year) TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	85.22	75.18	378.21	63.38	1615.05	7666.39	3.27	0.82	12.68
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	116.32	342.21	865.40	148.89	7165.11	53505.68	16.75	4.65	87.47
High-Intensity Commercial	35.83	80.78	544.78	50.52	2482.26	15310.93	3.30	0.00	35.15
Light Industrial	37.13	92.72	287.42	57.99	1916.10	15127.12	0.76	0.50	14.37
Highway	29.48	38.83	144.65	17.95	549.04	3938.31	3.38	1.16	13.30
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.64	0.02	0.05	0.00	0.07	0.40	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	8.92	30.82	84.63	7.54	220.39	938.52	0.08	0.08	0.50
Open Water / Lake	24.24	83.72	364.24	15.25	364.24	705.71	0.00	5.81	6.37
Gross Loads	337.78	744.28	2669.38	361.52	14312.25	97193.06	27.53	13.02	169.84

Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake Hunter Outfall Location
- Drainage area for outfall
- Parks
- Wetlands

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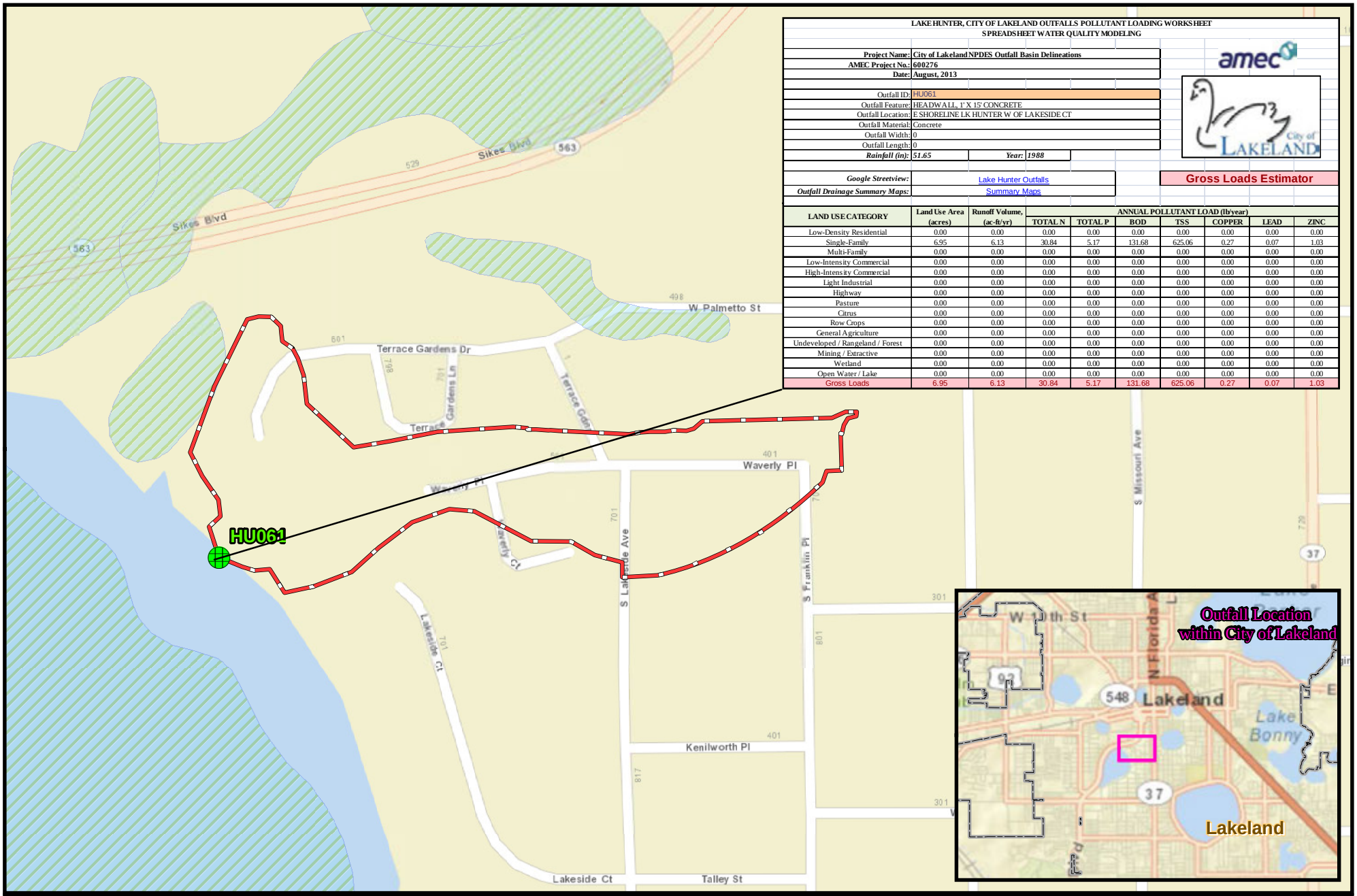
LAKE HUNTER NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276 City of Lakeland - NPDES Lake Hunter\0Deliverable\MXDs\OutfallHU060.mxd



LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276
Date:	August, 2013
Outfall ID:	HU061
Outfall Feature:	HEADWALL, 1' X 15' CONCRETE
Outfall Location:	E SHORELINE LK HUNTER W OF LAKESIDE CT
Outfall Material:	Concrete
Outfall Width:	0
Outfall Length:	0
Rainfall (in):	*51.65* — ***Year:*** *1988*
Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	6.95	6.13	30.84	5.17	131.68	625.06	0.27	0.07	1.03
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	6.95	6.13	30.84	5.17	131.68	625.06	0.27	0.07	1.03

Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake Hunter Outfall Location
- Drainage area for outfall
- Parks
- Wetlands

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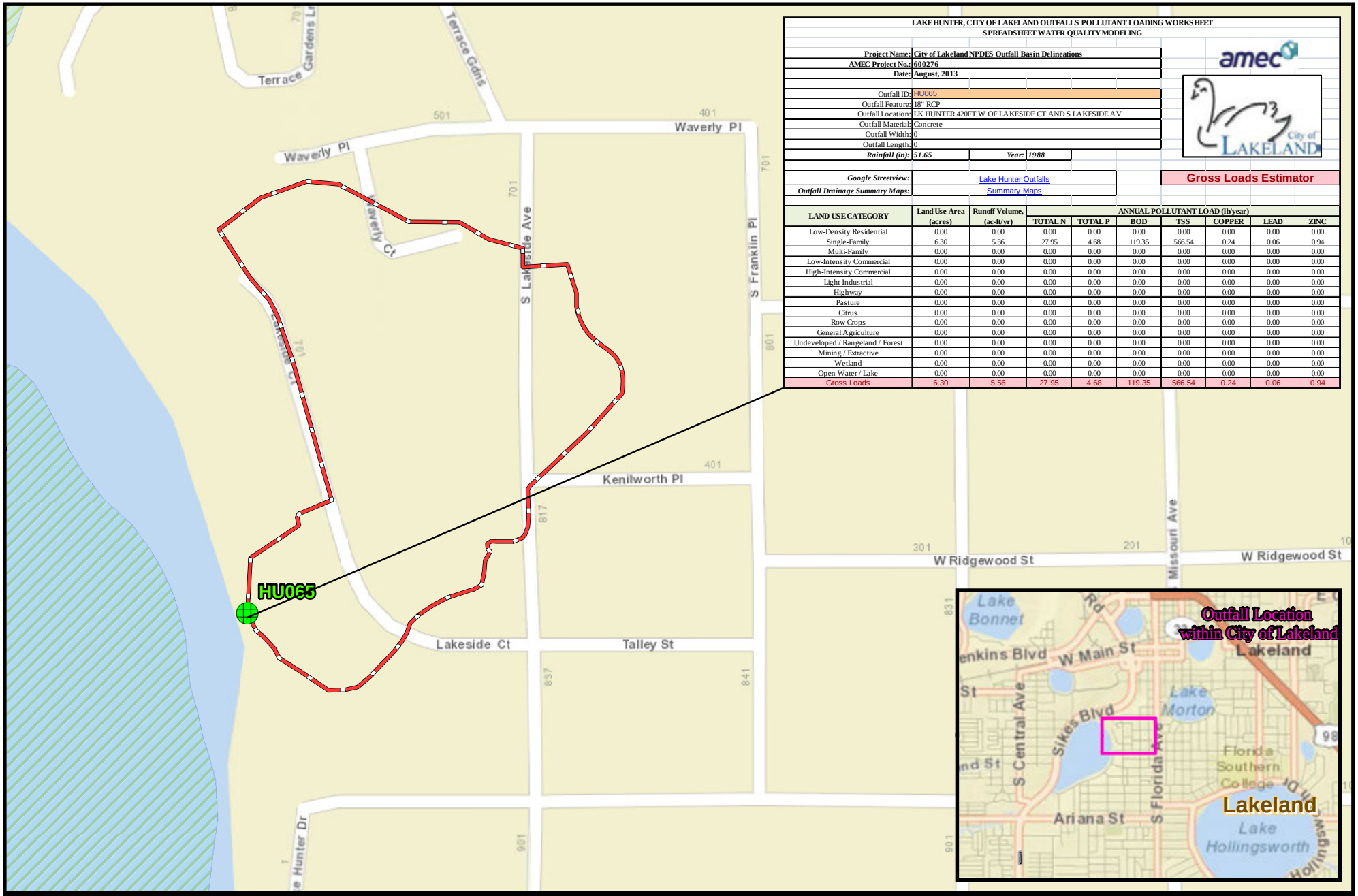
LAKE HUNTER NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276 City of Lakeland - NPDES Lake Hunter\0Deliverable\MXDs\OutfallHU061.mxd



LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276
Date:	August, 2013
Outfall ID:	HU065
Outfall Feature:	18" RCP
Outfall Location:	LK HUNTER 420FT W OF LAKESIDE CT AND S LAKESIDE AV
Outfall Material:	Concrete
Outfall Width:	0
Outfall Length:	0
Rainfall (in):	*51.65* — ***Year:*** *1988*
Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	6.30	5.56	27.95	4.68	119.35	566.54	0.24	0.06	0.94
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	6.30	5.56	27.95	4.68	119.35	566.54	0.24	0.06	0.94

Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake Hunter Outfall Location
- Drainage area for outfall
- Parks
- Wetlands

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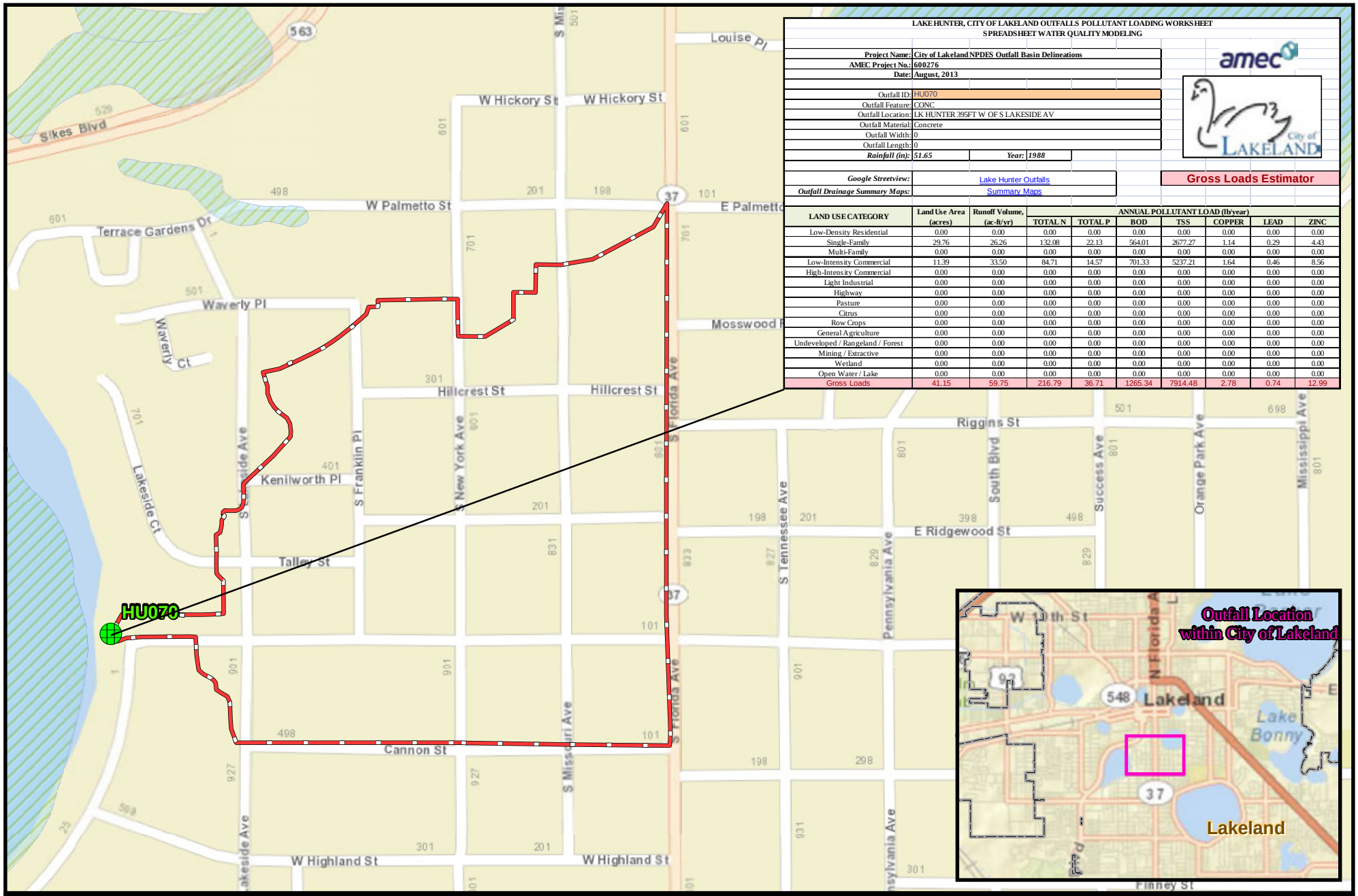
LAKE HUNTER NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276 City of Lakeland - NPDES Lake Hunter\0Deliverable\MXDs\OutfallHU065.mxd



LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276
Date:	August, 2013
Outfall ID:	HU070
Outfall Feature:	CONC
Outfall Location:	LK HUNTER 395FT W OF S LAKESIDE AV
Outfall Material:	Concrete
Outfall Width:	0
Outfall Length:	0
Rainfall (in):	*51.65*
Year:	*1988*
Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	29.76	26.26	132.08	22.13	564.01	2677.27	1.14	0.29	4.43
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	11.39	33.50	84.71	14.57	701.33	5237.21	1.64	0.46	8.56
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	41.15	59.75	216.79	36.71	1265.34	7914.48	2.78	0.74	12.99

Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake Hunter Outfall Location
- Drainage area for outfall
- Parks
- Wetlands

N W E S

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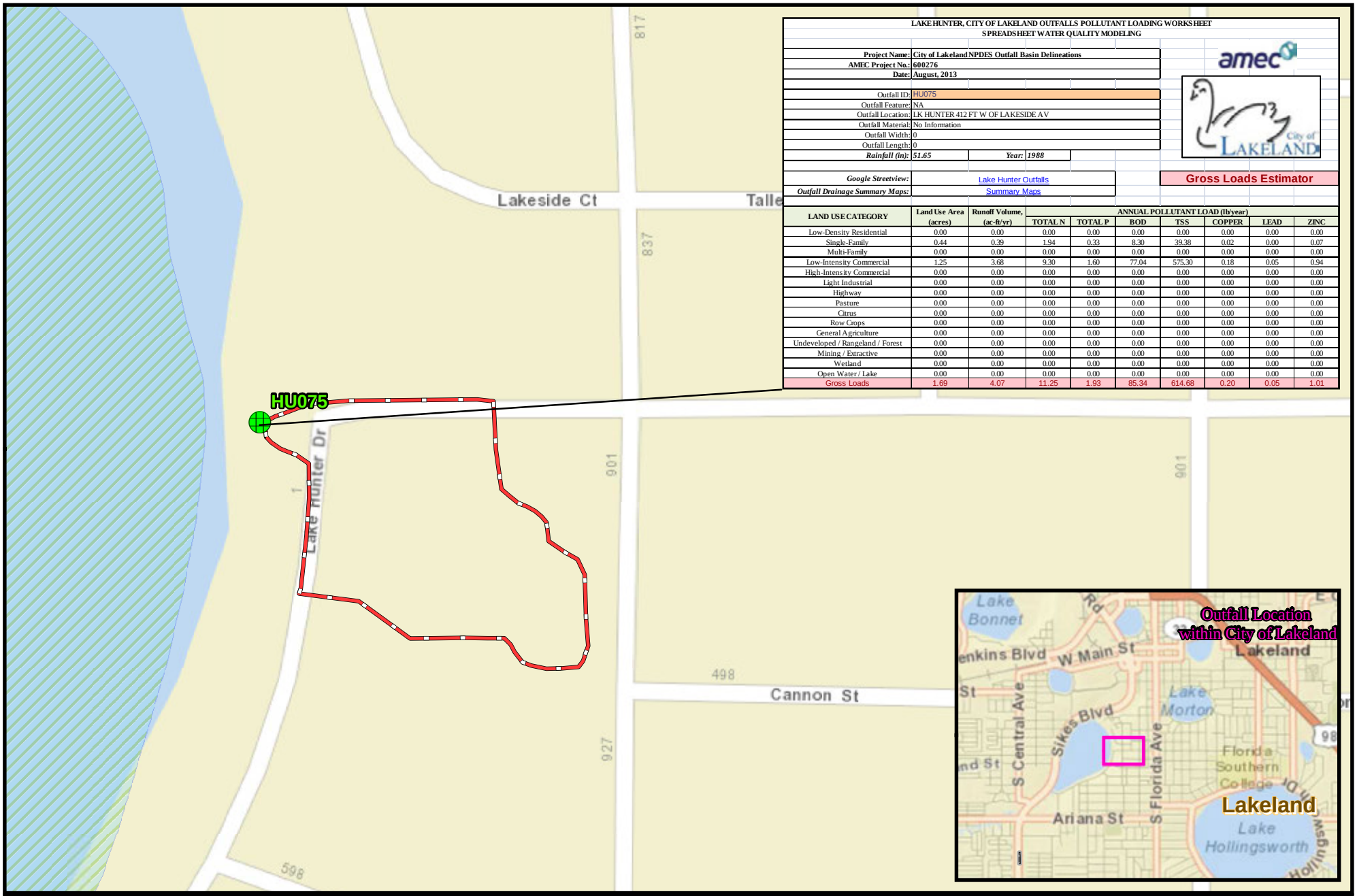
Feet

LAKE HUNTER NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276 City of Lakeland - NPDES Lake Hunter\0Deliverable\MXDs\OutfallHU070.mxd



LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276
Date:	August, 2013
Outfall ID:	HU075
Outfall Feature:	NA
Outfall Location:	LK HUNTER 412 FT W OF LAKESIDE AV
Outfall Material:	No Information
Outfall Width:	0
Outfall Length:	0
Rainfall (in):	*51.65* — ***Year:*** *1988*
Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.44	0.39	1.94	0.33	8.30	39.38	0.02	0.00	0.07
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	1.25	3.68	9.30	1.60	77.04	575.30	0.18	0.05	0.94
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	1.69	4.07	11.25	1.93	85.34	614.68	0.20	0.05	1.01

Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake Hunter Outfall Location
- Drainage area for outfall
- Parks
- Wetlands

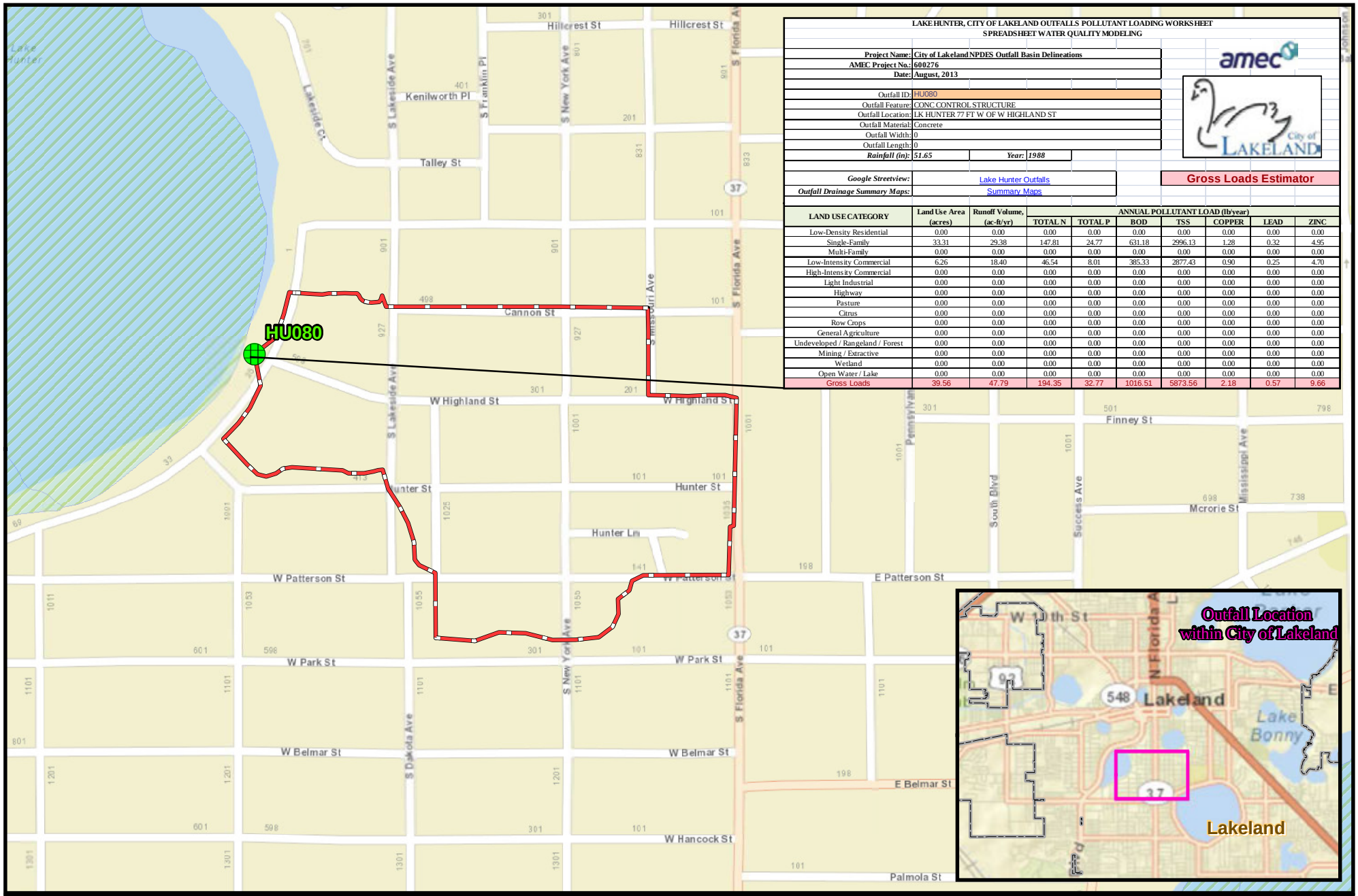
N W E S

0 75 150
Feet

LAKE HUNTER NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276 City of Lakeland - NPDES Lake Hunter\0Deliverable\MXDs\OutfallHU075.mxd



LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276
Date:	August, 2013
Outfall ID:	HU080
Outfall Feature:	CONC CONTROL STRUCTURE
Outfall Location:	LK HUNTER 77 FT W OF W HIGHLAND ST
Outfall Material:	Concrete
Outfall Width:	0
Outfall Length:	0
Rainfall (in):	*51.65* — ***Year:*** *1988*
Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year) TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	33.31	29.38	147.81	24.77	631.18	2996.13	1.28	0.32	4.95
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	6.26	18.40	46.54	8.01	385.33	2877.43	0.90	0.25	4.70
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	39.56	47.79	194.35	32.77	1016.51	5873.56	2.18	0.57	9.66

Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake Hunter Outfall Location
- Drainage area for outfall
- Parks
- Wetlands

N W E S

0 250 500
Feet

LAKE HUNTER NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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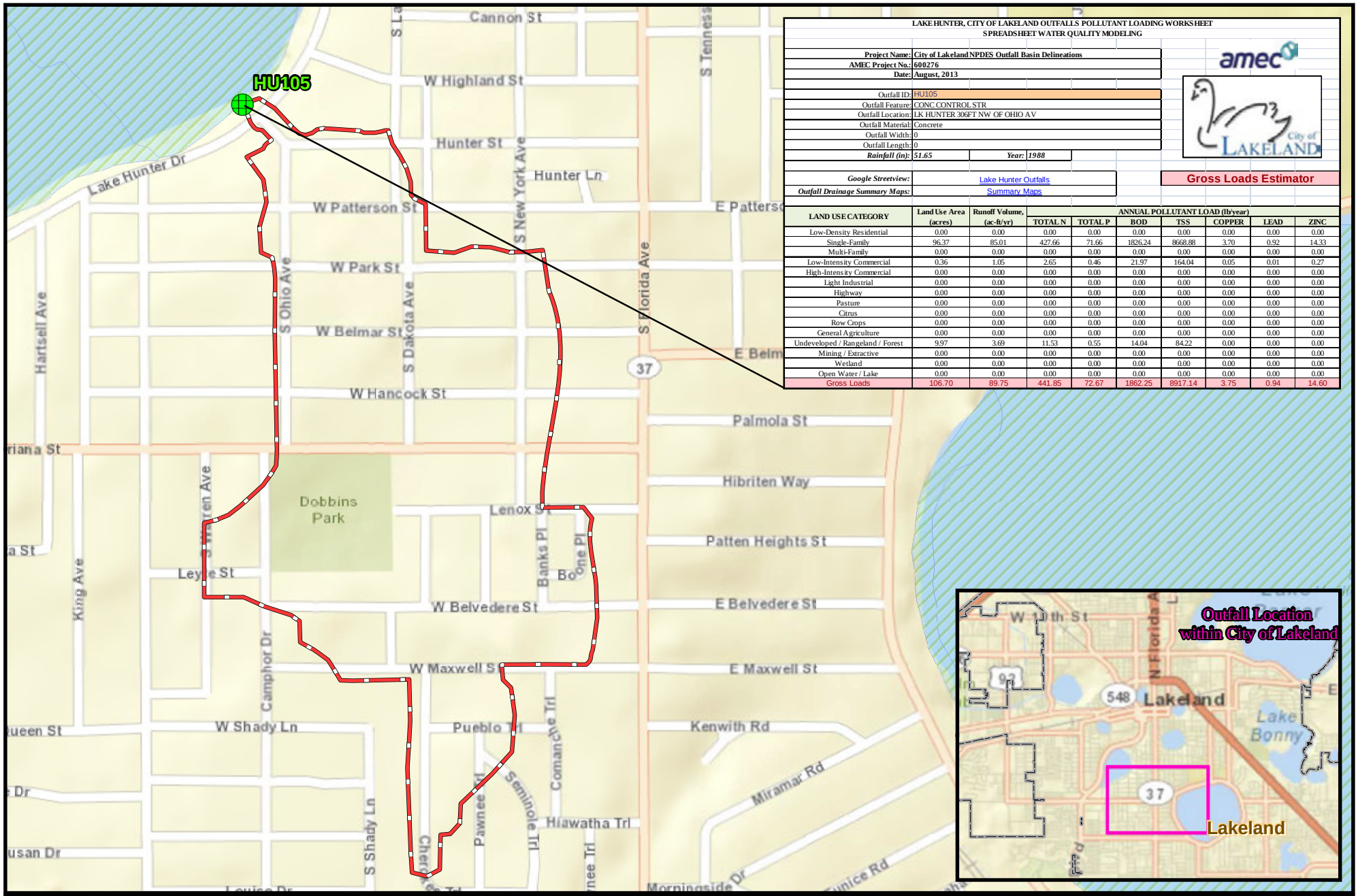

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276
Date:	August, 2013
Outfall ID:	HU105
Outfall Feature:	CONC CONTROL STR
Outfall Location:	LK HUNTER 306FT NW OF OHIO AV
Outfall Material:	Concrete
Outfall Width:	0
Outfall Length:	0
Rainfall (in):	*51.65* — ***Year:*** *1988*
Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year) TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	96.37	85.01	427.66	71.66	1826.24	8668.88	3.70	0.92	14.33
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.36	1.05	2.65	0.46	21.97	164.04	0.05	0.01	0.27
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	9.97	3.69	11.53	0.55	14.04	84.22	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	106.70	89.75	441.85	72.67	1862.25	8917.14	3.75	0.94	14.60

Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake Hunter Outfall Location
- Drainage area for outfall
- Parks
- Wetlands

N W E S

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Feet

LAKE HUNTER NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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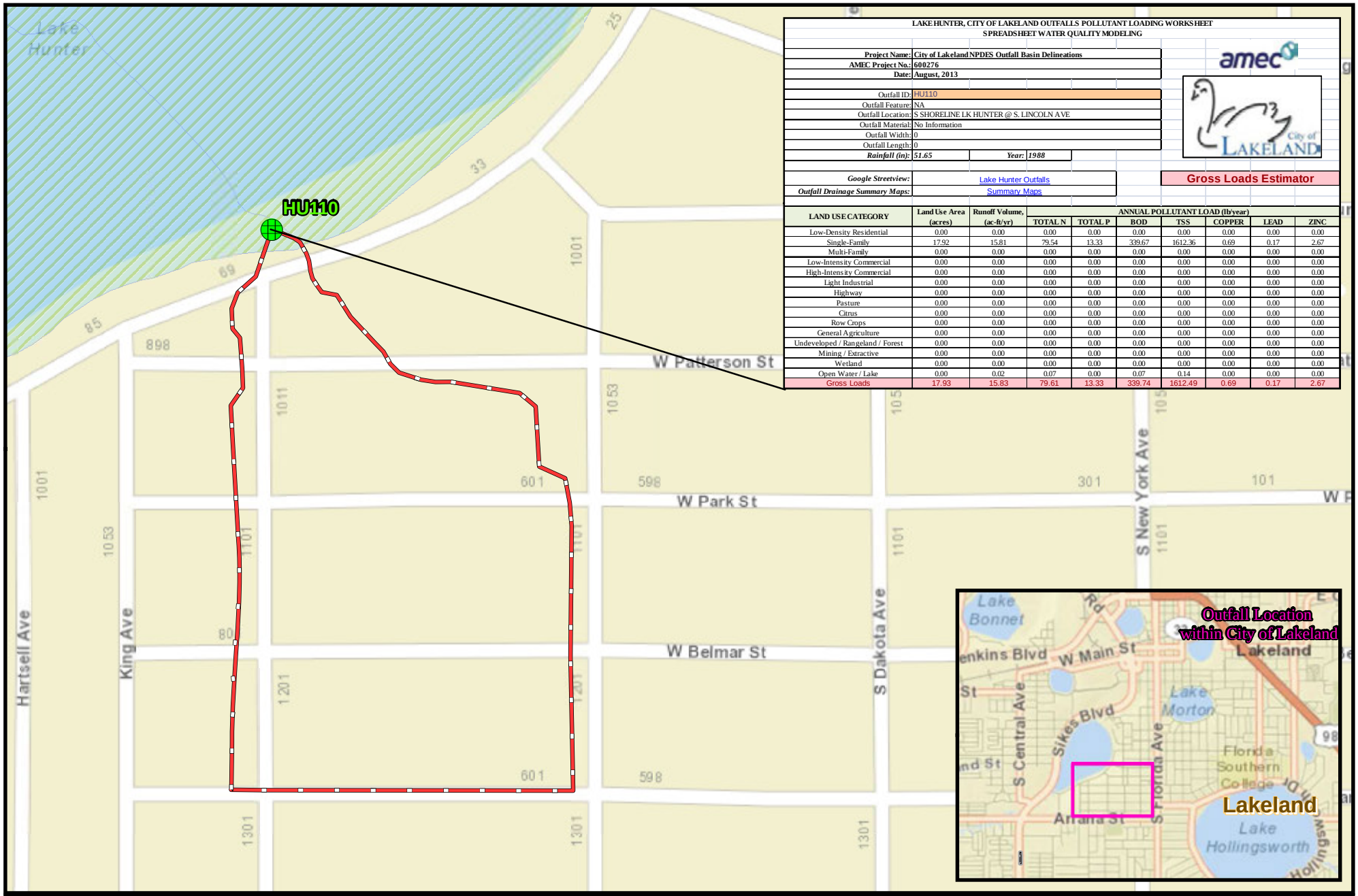

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276
Date:	August, 2013
Outfall ID:	HU110
Outfall Feature:	NA
Outfall Location:	S SHORELINE LK HUNTER @ S. LINCOLN AVE
Outfall Material:	No Information
Outfall Width:	0
Outfall Length:	0
Rainfall (in):	*51.65*
Year:	*1988*
Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	17.92	15.81	79.54	13.33	339.67	1612.36	0.69	0.17	2.67
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.02	0.07	0.00	0.07	0.14	0.00	0.00	0.00
Gross Loads	17.93	15.83	79.61	13.33	339.74	1612.49	0.69	0.17	2.67

Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake Hunter Outfall Location
- Drainage area for outfall
- Parks
- Wetlands

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LAKE HUNTER NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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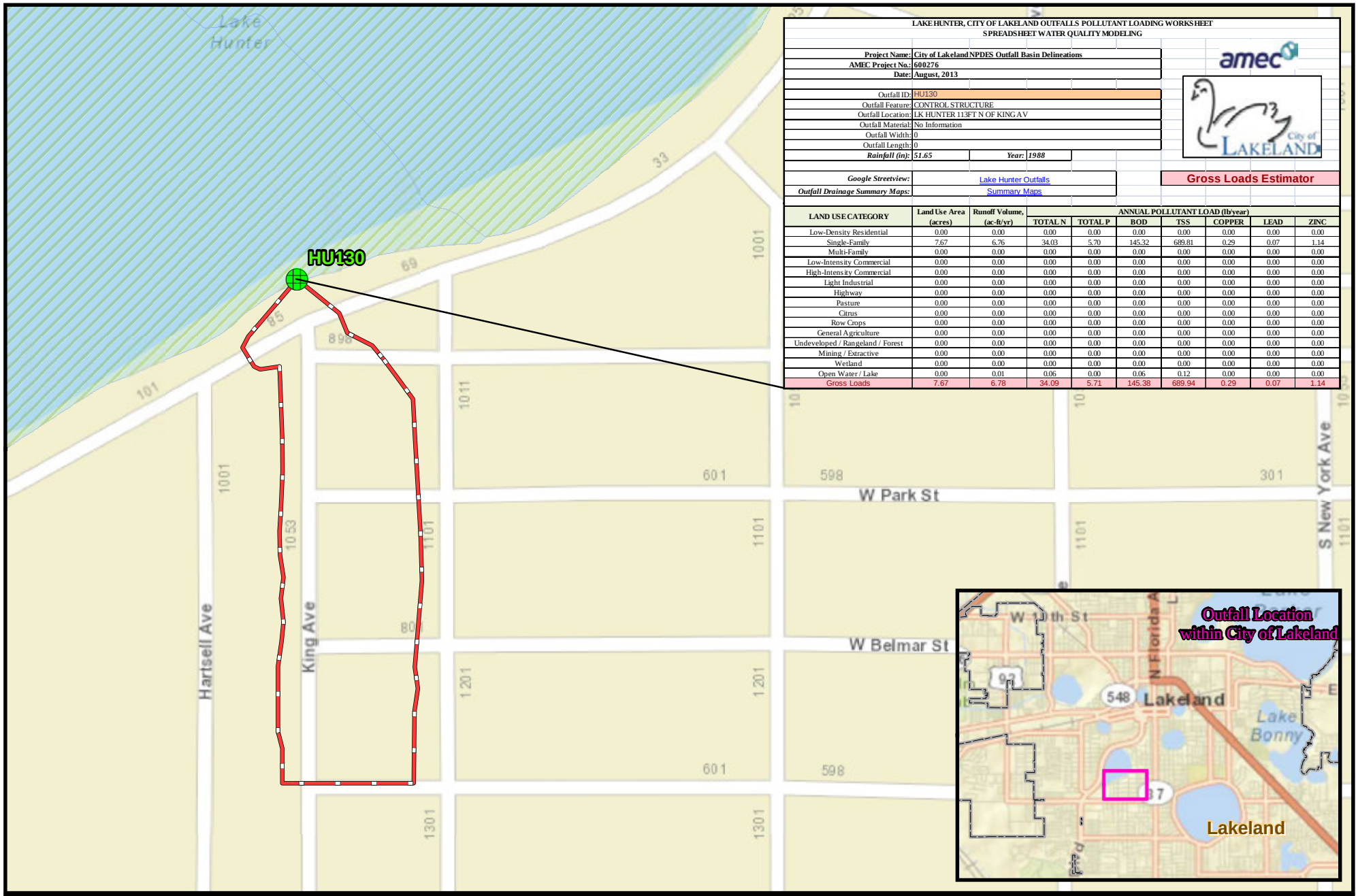

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276
Date:	August, 2013
Outfall ID:	HU130
Outfall Feature:	CONTROL STRUCTURE
Outfall Location:	LK HUNTER 113FT N OF KING AV
Outfall Material:	No Information
Outfall Width:	0
Outfall Length:	0
Rainfall (in):	*51.65* — ***Year:*** *1988*
Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	7.67	6.76	34.03	5.70	145.32	689.81	0.29	0.07	1.14
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.01	0.06	0.00	0.06	0.12	0.00	0.00	0.00
Gross Loads	7.67	6.78	34.09	5.71	145.38	689.94	0.29	0.07	1.14

Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake Hunter Outfall Location
- Drainage area for outfall
- Parks
- Wetlands

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Feet

LAKE HUNTER NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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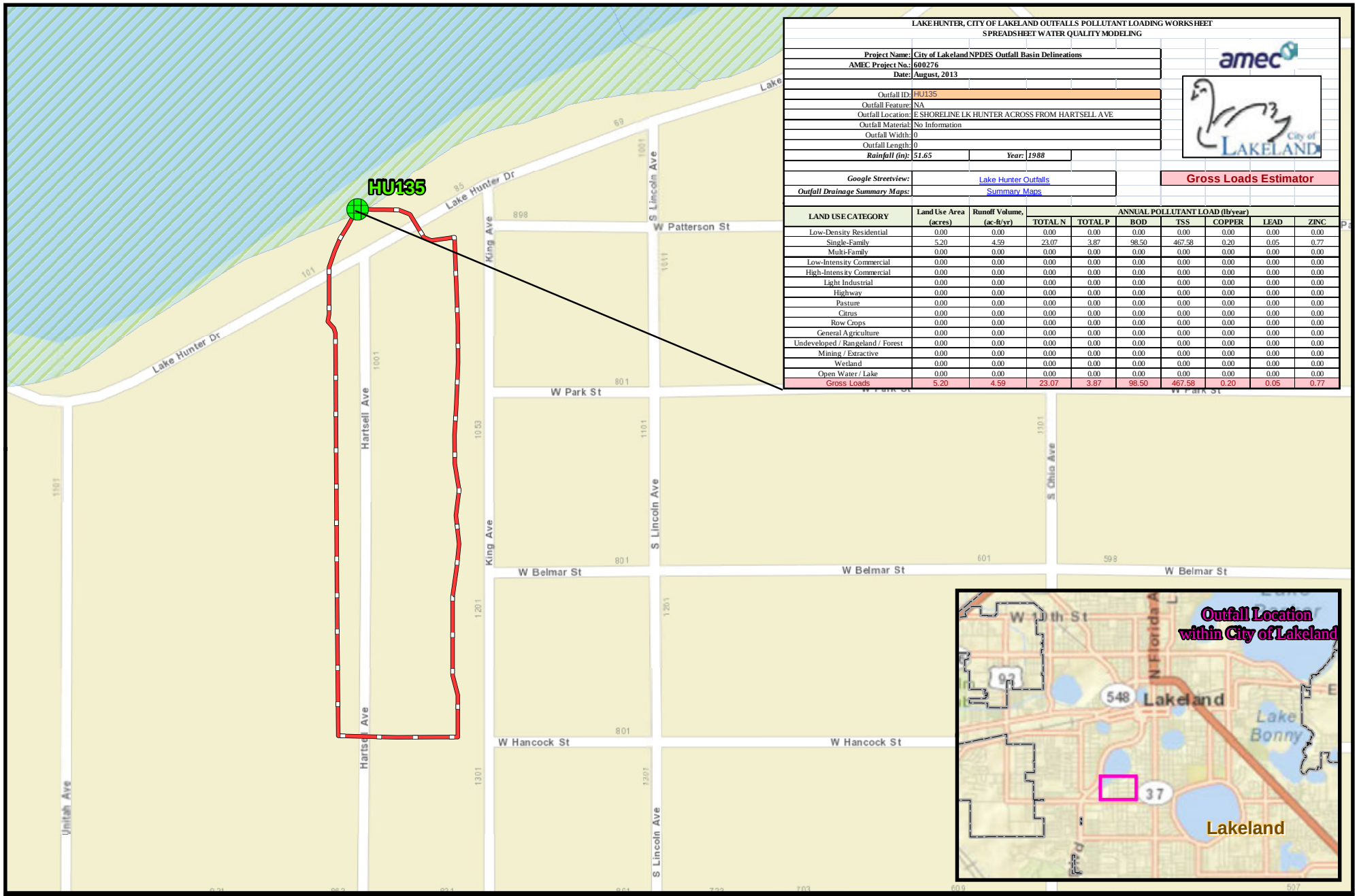


LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**
Outfall ID:	HU135
Outfall Feature:	NA
Outfall Location:	E SHORELINE LK HUNTER ACROSS FROM HARTSELL AVE
Outfall Material:	No Information
Outfall Width:	0
Outfall Length:	0
Rainfall (in):	***51.65***
Year:	***1988***
Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	5.20	4.59	23.07	3.87	98.50	467.58	0.20	0.05	0.77
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	5.20	4.59	23.07	3.87	98.50	467.58	0.20	0.05	0.77

Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake Hunter Outfall Location
- Drainage area for outfall
- Parks
- Wetlands

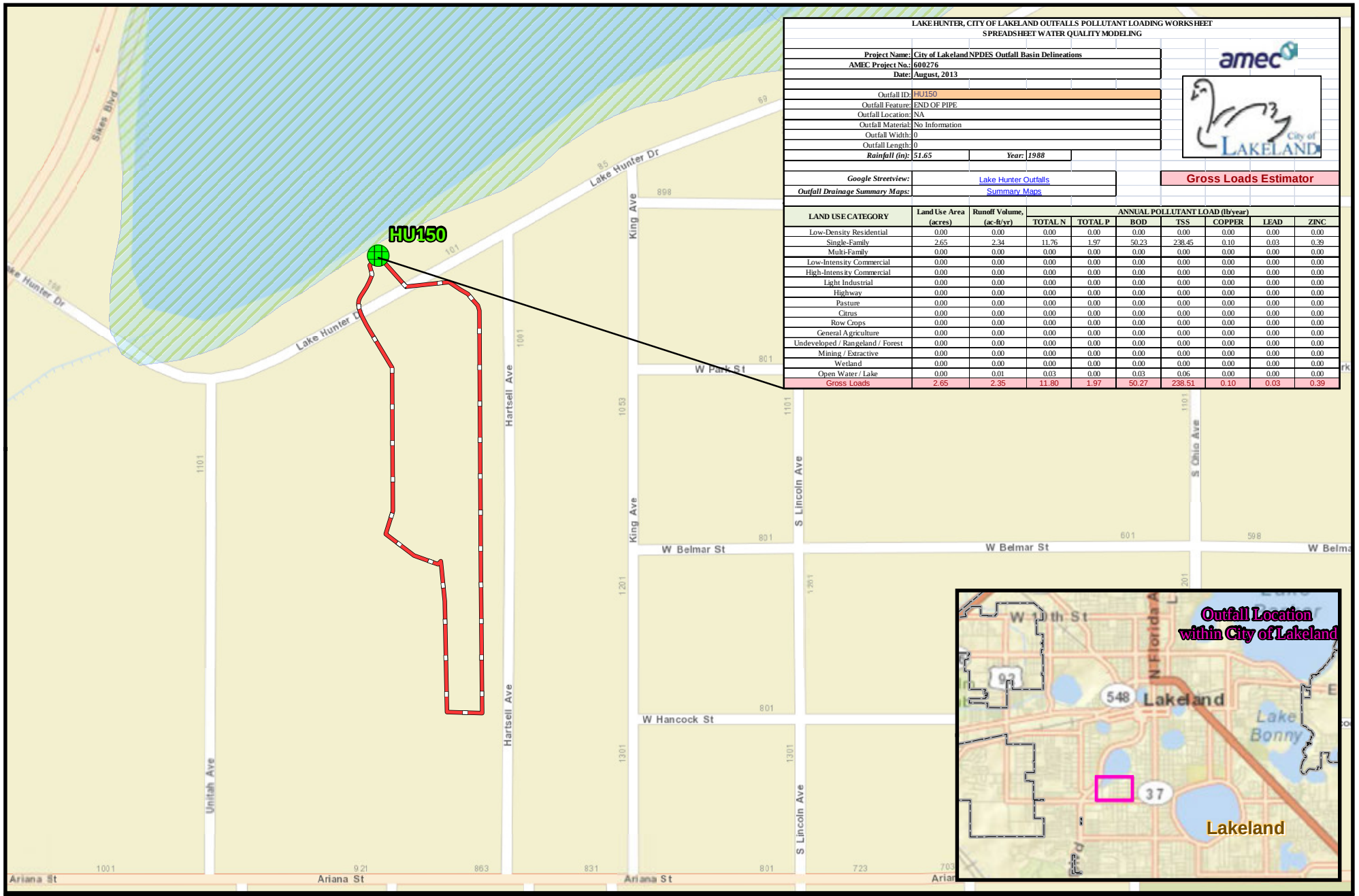
N W E S

0 125 250
Feet

LAKE HUNTER NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276 City of Lakeland - NPDES Lake Hunter\0Deliverable\MXDs\OutfallHU135.mxd



LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276
Date:	August, 2013
Outfall ID:	HU150
Outfall Feature:	END OF PIPE
Outfall Location:	NA
Outfall Material:	No Information
Outfall Width:	0
Outfall Length:	0
Rainfall (in):	*51.65*
Year:	*1988*
Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year) TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	2.65	2.34	11.76	1.97	50.23	238.45	0.10	0.03	0.39
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.01	0.03	0.00	0.03	0.06	0.00	0.00	0.00
Gross Loads	2.65	2.35	11.80	1.97	50.27	238.51	0.10	0.03	0.39

Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake Hunter Outfall Location
- Drainage area for outfall
- Parks
- Wetlands

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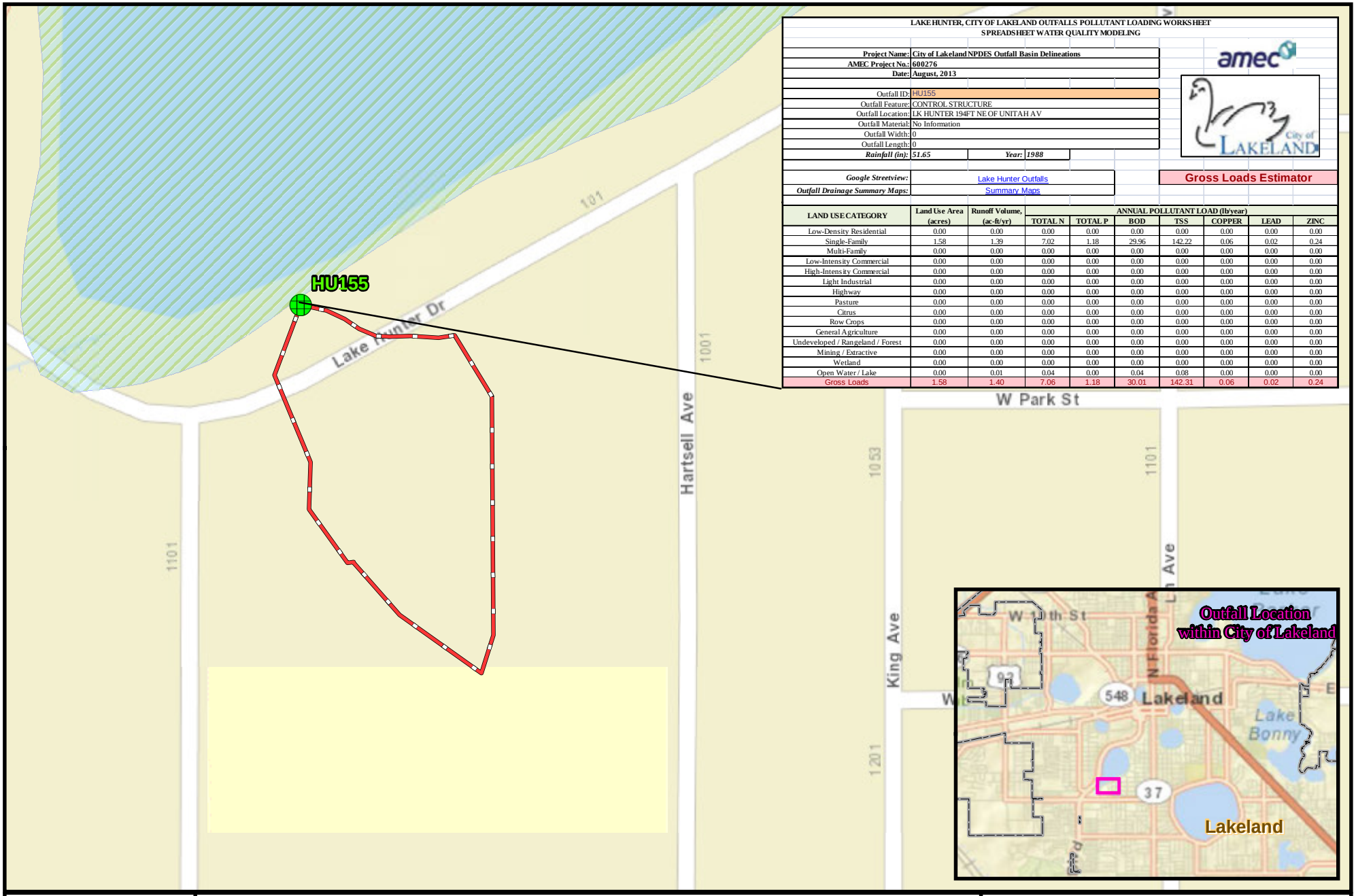
Feet

LAKE HUNTER NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276 City of Lakeland - NPDES Lake Hunter\0Deliverable\MXDs\OutfallHU150.mxd



LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**
Outfall ID:	HU155
Outfall Feature:	CONTROL STRUCTURE
Outfall Location:	LK HUNTER 194FT NE OF UNITAH AV
Outfall Material:	No Information
Outfall Width:	0
Outfall Length:	0
Rainfall (in):	***51.65***
Year:	***1988***
Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	1.58	1.39	7.02	1.18	29.96	142.22	0.06	0.02	0.24
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.01	0.04	0.00	0.04	0.08	0.00	0.00	0.00
Gross Loads	1.58	1.40	7.06	1.18	30.01	142.31	0.06	0.02	0.24

Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake Hunter Outfall Location
- Drainage area for outfall
- Parks
- Wetlands

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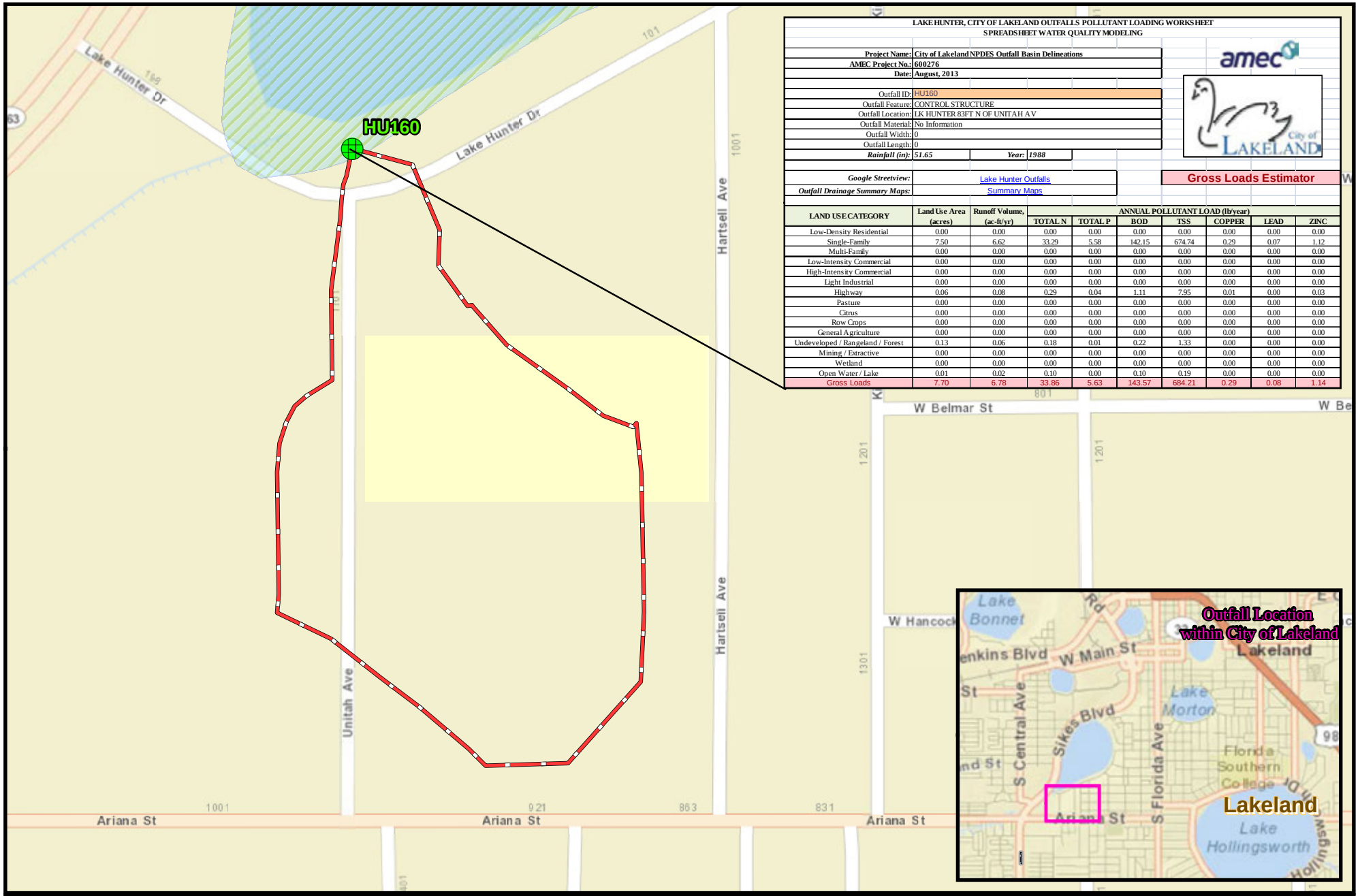
Feet

LAKE HUNTER NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276 City of Lakeland - NPDES Lake Hunter\0Deliverable\MXDs\OutfallHU155.mxd



LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276
Date:	August, 2013
Outfall ID:	HU160
Outfall Feature:	CONTROL STRUCTURE
Outfall Location:	LK HUNTER 83FT N OF UNITAH A V
Outfall Material:	No Information
Outfall Width:	0
Outfall Length:	0
Rainfall (in):	*51.65* — ***Year:*** *1988*
Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	7.50	6.62	33.29	5.58	142.15	674.74	0.29	0.07	1.12
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.06	0.08	0.29	0.04	1.11	7.95	0.01	0.00	0.03
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.13	0.06	0.18	0.01	0.22	1.33	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.01	0.02	0.10	0.00	0.10	0.19	0.00	0.00	0.00
Gross Loads	7.70	6.78	33.86	5.63	143.57	684.21	0.29	0.08	1.14

Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake Hunter Outfall Location
- Drainage area for outfall
- Parks
- Wetlands

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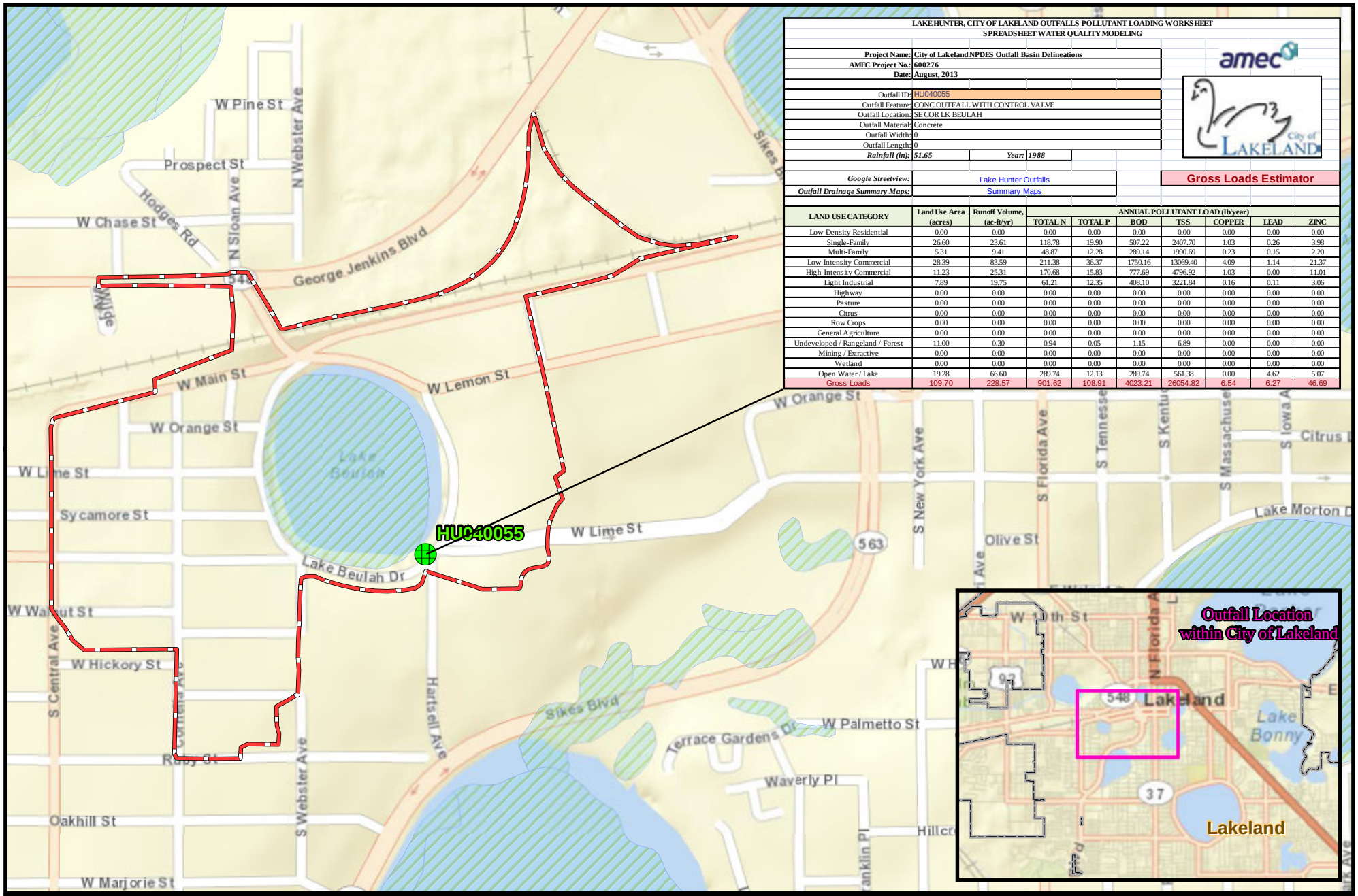
LAKE HUNTER NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276 City of Lakeland - NPDES Lake Hunter\0Deliverable\MXDs\OutfallHU160.mxd



LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276
Date:	August, 2013
Outfall ID:	HU040055
Outfall Feature:	CONC OUTFALL WITH CONTROL VALVE
Outfall Location:	SE COR LK BEULAH
Outfall Material:	Concrete
Outfall Width:	0
Outfall Length:	0
Rainfall (in):	*51.65* *Year:* *1988*
Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year) TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	26.60	23.61	118.78	19.90	507.22	2407.70	1.03	0.26	3.98
Multi-Family	5.31	9.41	48.87	12.28	289.14	1990.69	0.23	0.15	2.20
Low-Intensity Commercial	28.39	83.59	211.38	36.37	1750.16	13069.40	4.09	1.14	21.37
High-Intensity Commercial	11.23	25.31	170.68	15.83	777.69	4796.92	1.03	0.00	11.01
Light Industrial	7.89	19.75	61.21	12.35	408.10	3221.84	0.16	0.11	3.06
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	11.00	0.30	0.94	0.05	1.15	6.89	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	19.28	66.60	289.74	12.13	289.74	561.38	0.00	4.62	5.07
Gross Loads	109.70	228.57	901.62	108.91	4023.21	26054.82	6.54	6.27	46.69

Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake Hunter Outfall Location
- Drainage area for outfall
- Parks
- Wetlands

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LAKE HUNTER NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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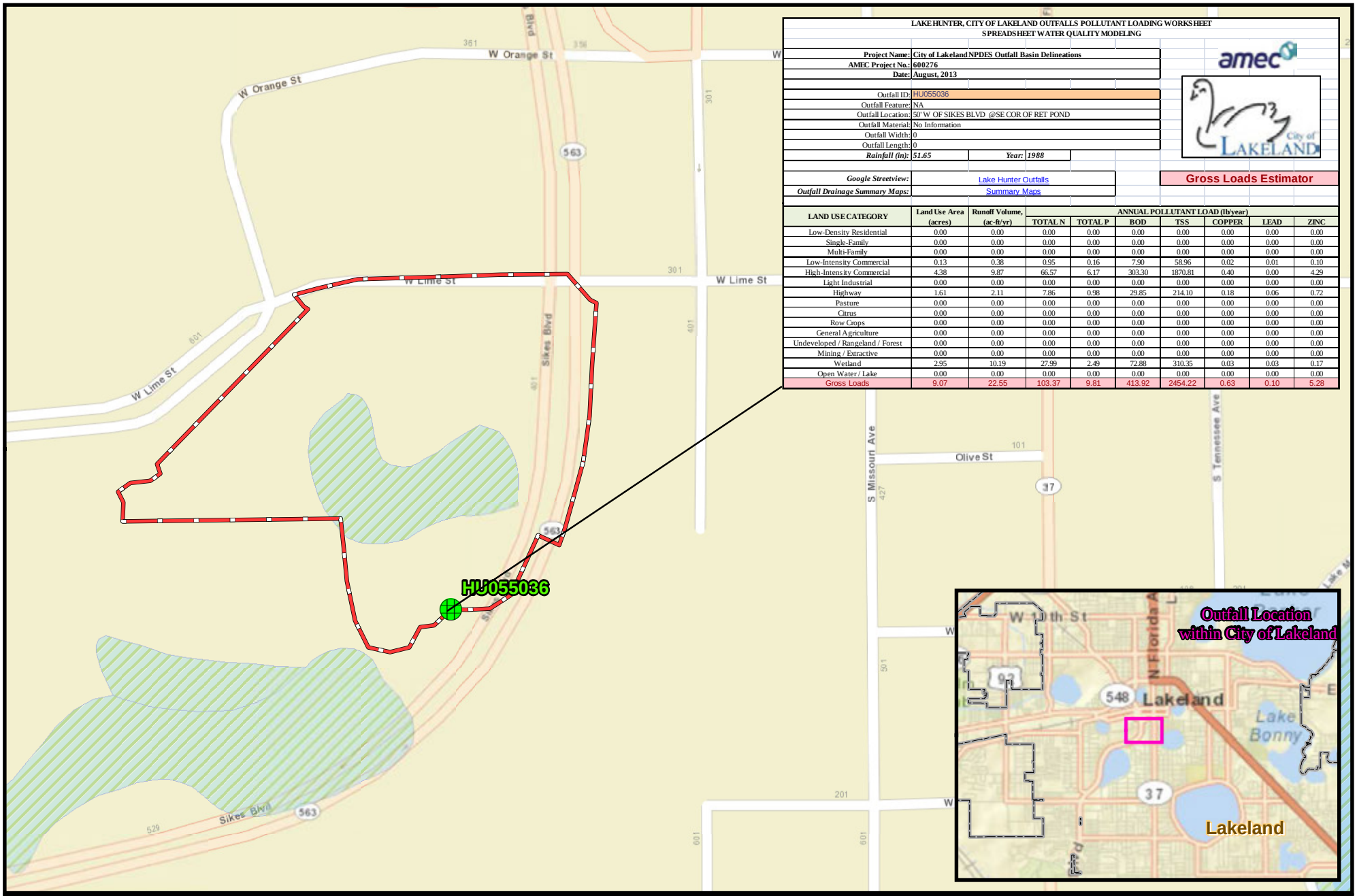

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276
Date:	August, 2013
Outfall ID:	HU055036
Outfall Feature:	NA
Outfall Location:	50' W OF SIKES BLVD @SE COR OF RET POND
Outfall Material:	No Information
Outfall Width:	0
Outfall Length:	0
Rainfall (in):	*51.65* — ***Year:*** *1988*
Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.13	0.38	0.95	0.16	7.90	58.96	0.02	0.01	0.10
High-Intensity Commercial	4.38	9.87	66.57	6.17	303.30	1870.81	0.40	0.00	4.29
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	1.61	2.11	7.86	0.98	29.85	214.10	0.18	0.06	0.72
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	2.95	10.19	27.99	2.49	72.88	310.35	0.03	0.03	0.17
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	9.07	22.55	103.37	9.81	413.92	2454.22	0.63	0.10	5.28

Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake Hunter Outfall Location
- Drainage area for outfall
- Parks
- Wetlands

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LAKE HUNTER NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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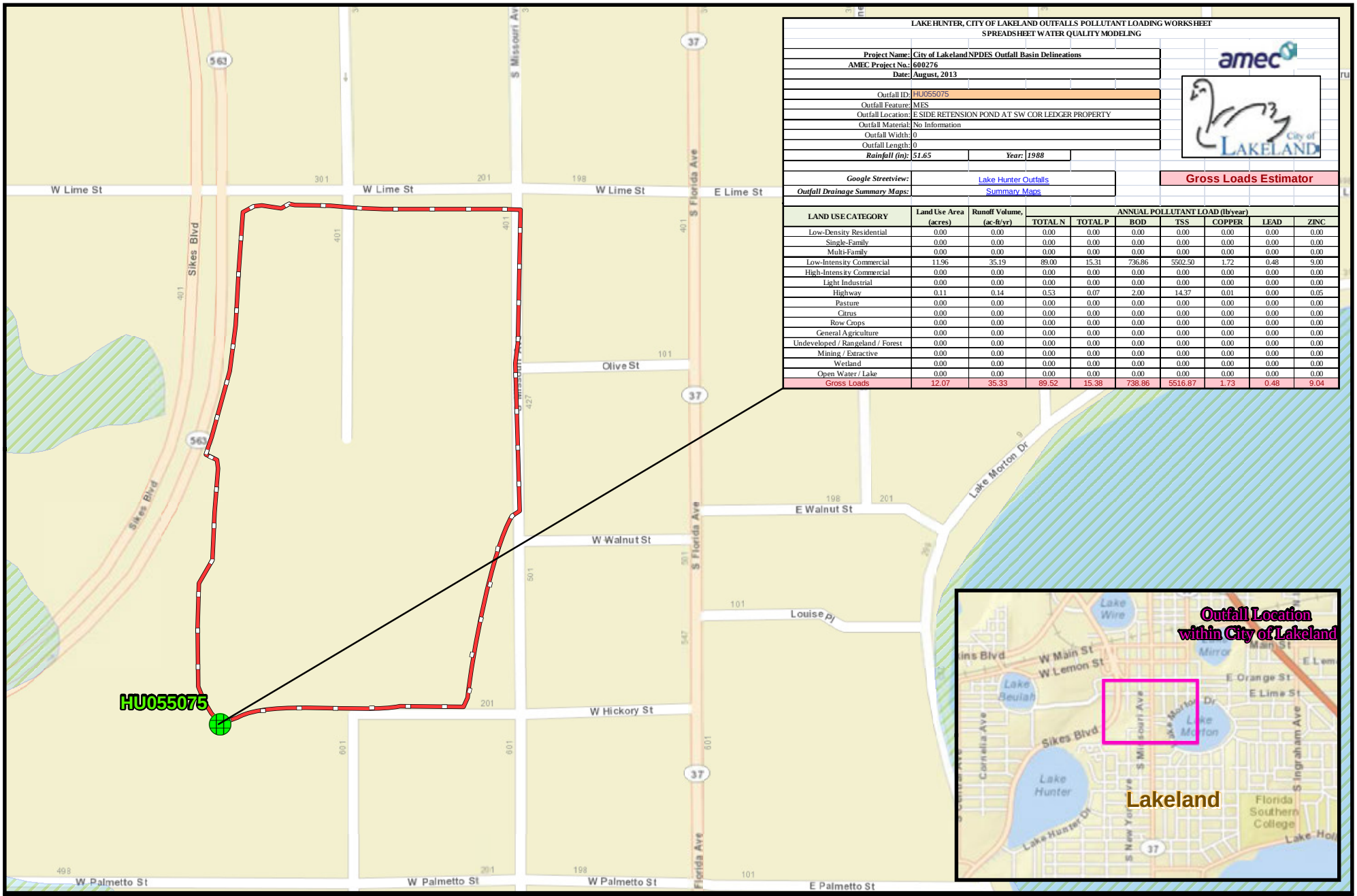

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**
Outfall ID:	HU055075
Outfall Feature:	MES
Outfall Location:	E SIDE RETENSION POND AT SW COR LEDGER PROPERTY
Outfall Material:	No Information
Outfall Width:	0
Outfall Length:	0
Rainfall (in):	***51.65*** *Year:* ***1988***
Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	11.96	35.19	89.00	15.31	736.86	5502.50	1.72	0.48	9.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.11	0.14	0.53	0.07	2.00	14.37	0.01	0.00	0.05
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	12.07	35.33	89.52	15.38	738.86	5516.87	1.73	0.48	9.04

Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake Hunter Outfall Location
- Drainage area for outfall
- Parks
- Wetlands

N W E S

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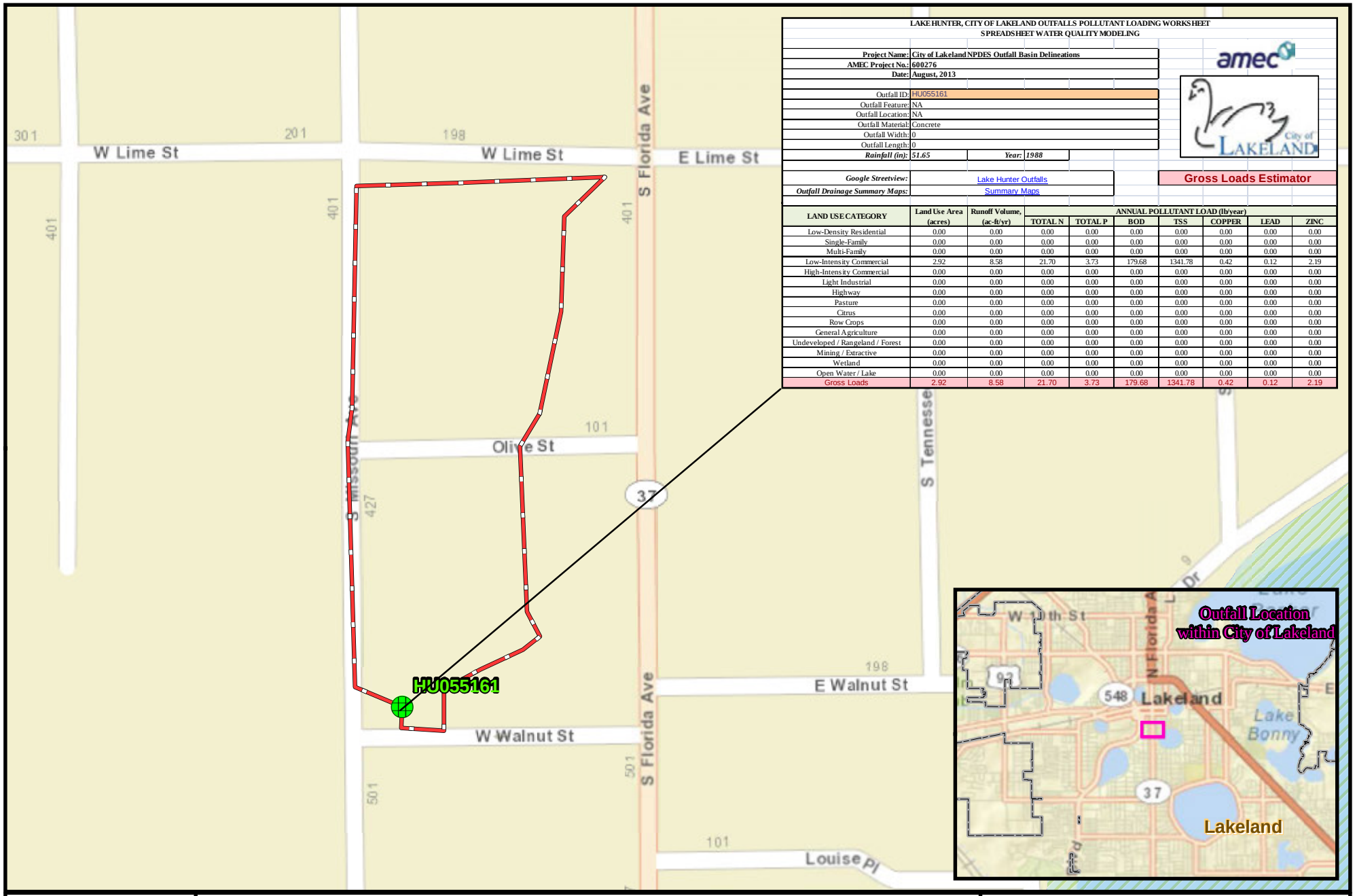
Feet

LAKE HUNTER NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276 City of Lakeland - NPDES Lake Hunter\0Deliverable\MXDs\OutfallHU055075.mxd



LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276
Date:	August, 2013
Outfall ID:	HU055161
Outfall Feature:	NA
Outfall Location:	NA
Outfall Material:	Concrete
Outfall Width:	0
Outfall Length:	0
Rainfall (in):	*51.65* — ***Year:*** *1988*
Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	2.92	8.58	21.70	3.73	179.68	1341.78	0.42	0.12	2.19
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	2.92	8.58	21.70	3.73	179.68	1341.78	0.42	0.12	2.19

Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake Hunter Outfall Location
- Drainage area for outfall
- Parks
- Wetlands

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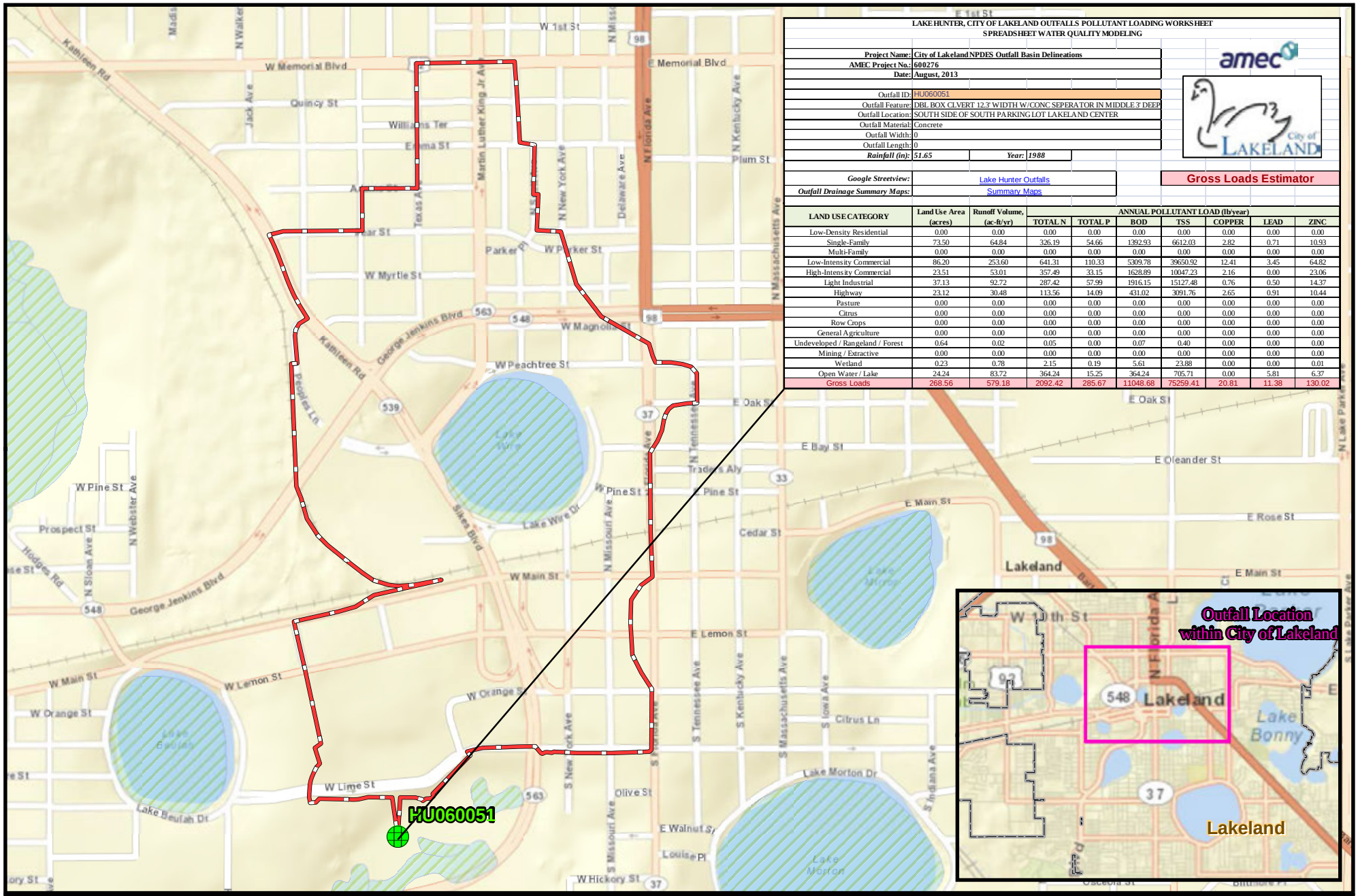
LAKE HUNTER NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276 City of Lakeland - NPDES Lake Hunter\0Deliverable\MXDs\OutfallHU055161.mxd



LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276
Date:	August, 2013
Outfall ID:	HU060051
Outfall Feature:	DBL BOX CLVERT 12.3' WIDTH W/CONC SEPERATOR IN MIDDLE 3' DEEP
Outfall Location:	SOUTH SIDE OF SOUTH PARKING LOT LAKELAND CENTER
Outfall Material:	Concrete
Outfall Width:	0
Outfall Length:	0
Rainfall (in):	*51.65* — ***Year:*** *1988*
Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	73.50	64.84	326.19	54.66	1392.93	6612.03	2.82	0.71	10.93
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	86.20	253.60	641.31	110.33	5309.78	39650.92	12.41	3.45	64.82
High-Intensity Commercial	23.51	53.01	357.49	33.15	1628.89	10047.23	2.16	0.00	23.06
Light Industrial	37.13	92.72	287.42	57.99	1916.15	15127.48	0.76	0.50	14.37
Highway	23.12	30.48	113.56	14.09	431.02	3091.76	2.65	0.91	10.44
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.64	0.02	0.05	0.00	0.07	0.40	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.23	0.78	2.15	0.19	5.61	23.88	0.00	0.00	0.01
Open Water / Lake	24.24	83.72	364.24	15.25	364.24	705.71	0.00	5.81	6.37
Gross Loads	268.56	579.18	2092.42	285.67	11048.68	75259.41	20.81	11.38	130.02

Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake Hunter Outfall Location
- Drainage area for outfall
- Parks
- Wetlands

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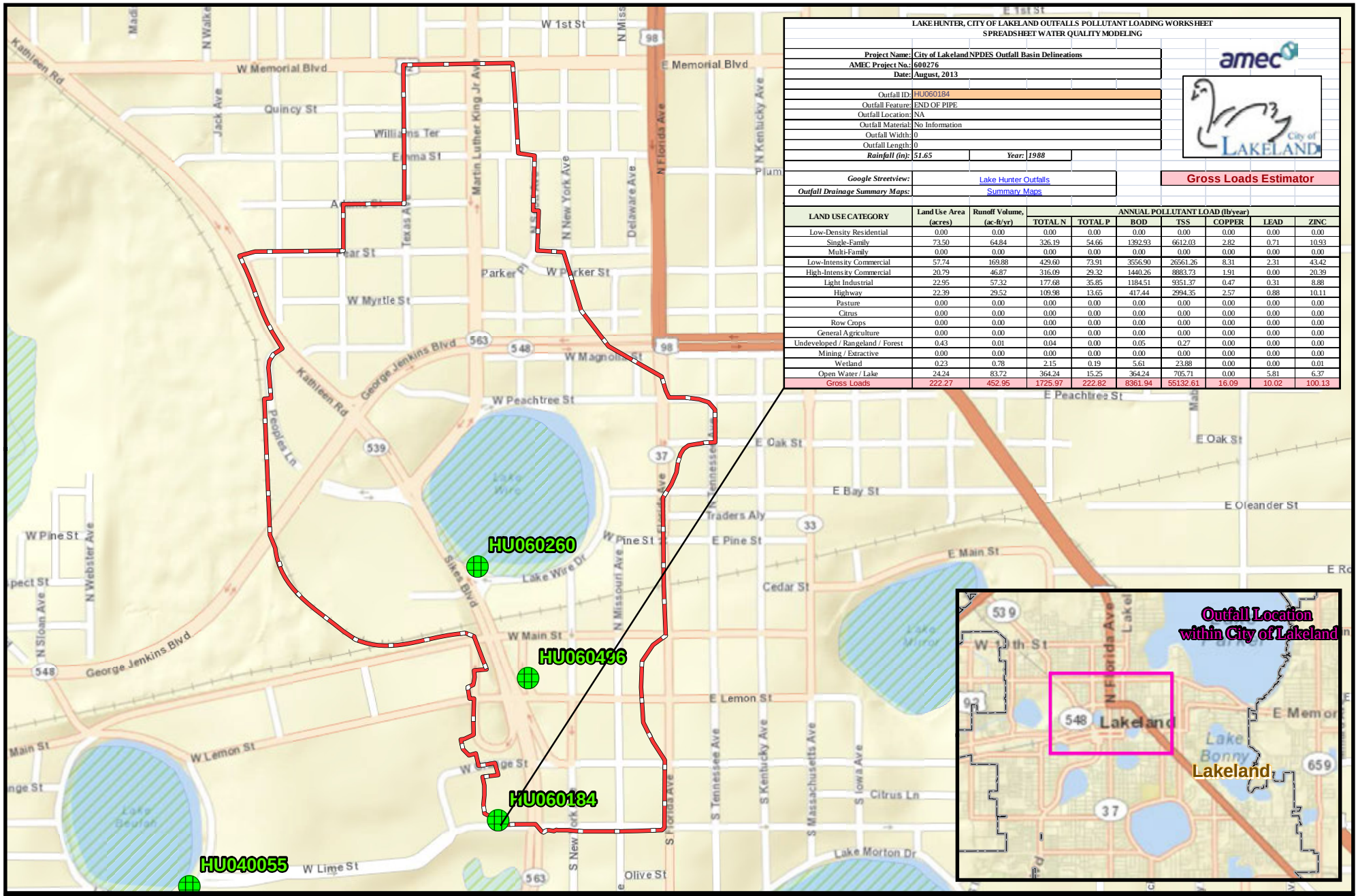
LAKE HUNTER NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276 City of Lakeland - NPDES Lake Hunter\0Deliverable\MXDs\OutfallHU060051.mxd



LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276
Date:	August, 2013
Outfall ID:	HU060184
Outfall Feature:	END OF PIPE
Outfall Location:	NA
Outfall Material:	No Information
Outfall Width:	0
Outfall Length:	0
Rainfall (in):	*51.65* — ***Year:*** *1988*
Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	73.50	64.84	326.19	54.66	1392.93	6612.03	2.82	0.71	10.93
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	57.74	169.88	429.60	73.91	3556.90	26561.26	8.31	2.31	43.42
High-Intensity Commercial	20.79	46.87	316.09	29.32	1440.26	8883.73	1.91	0.00	20.39
Light Industrial	22.95	57.32	177.68	35.85	1184.51	9351.37	0.47	0.31	8.88
Highway	22.39	29.52	109.98	13.65	417.44	2994.35	2.57	0.88	10.11
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.43	0.01	0.04	0.00	0.05	0.27	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.23	0.78	2.15	0.19	5.61	23.88	0.00	0.00	0.01
Open Water / Lake	24.24	83.72	364.24	15.25	364.24	705.71	0.00	5.81	6.37
Gross Loads	222.27	452.95	1725.97	222.82	8361.94	55132.61	16.09	10.02	100.13

Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake Hunter Outfall Location
- Drainage area for outfall
- Parks
- Wetlands

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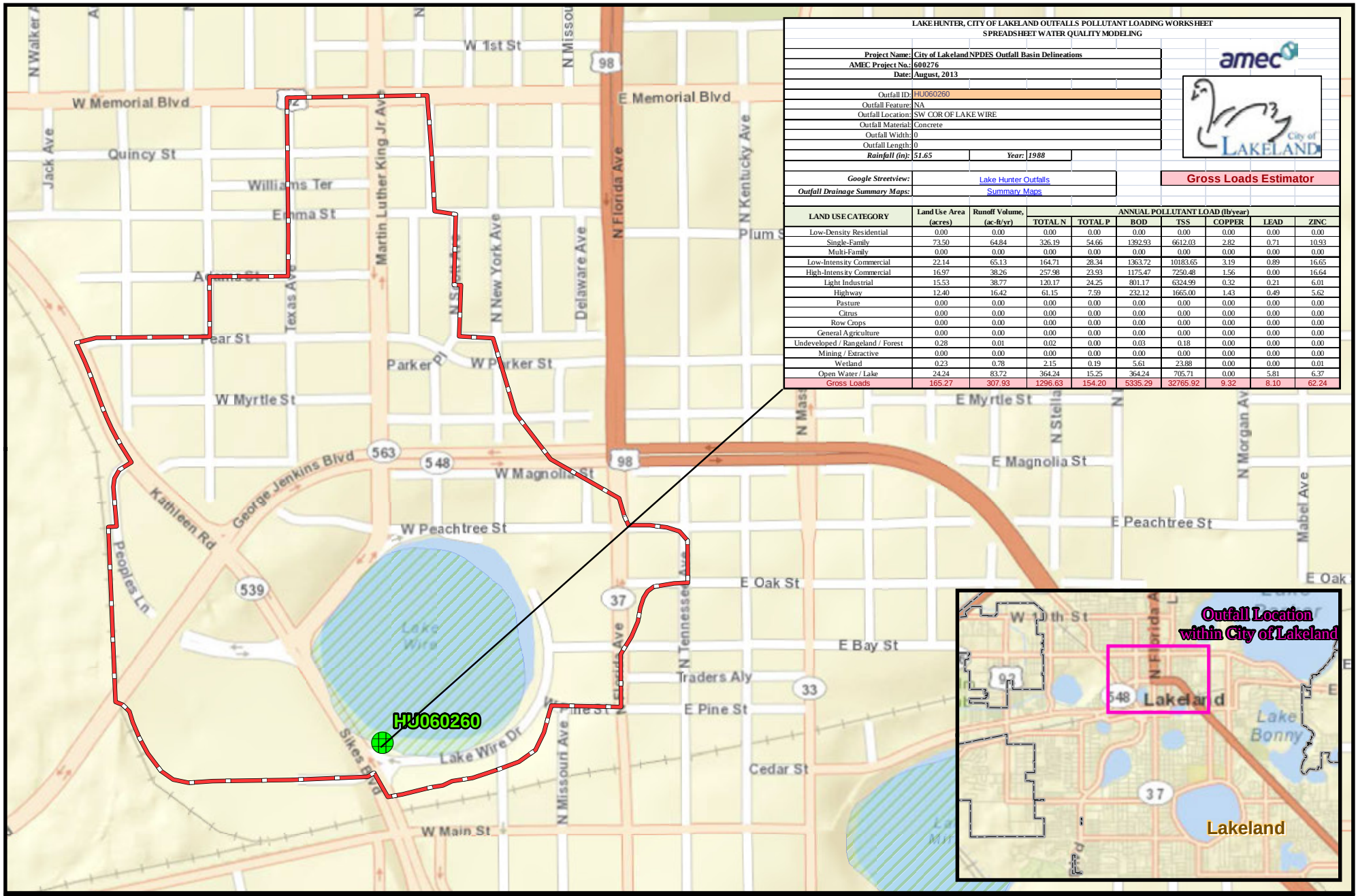
LAKE HUNTER NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276 City of Lakeland - NPDES Lake Hunter\0Deliverable\MXDs\OutfallHU060184.mxd



LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276
Date:	August, 2013
Outfall ID:	HU060260
Outfall Feature:	NA
Outfall Location:	SW COR OF LAKE WIRE
Outfall Material:	Concrete
Outfall Width:	0
Outfall Length:	0
Rainfall (in):	*51.65* — ***Year:*** *1988*
Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	73.50	64.84	326.19	54.66	1392.93	6612.03	2.82	0.71	10.93
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	22.14	65.13	164.71	28.34	1363.72	10183.65	3.19	0.89	16.65
High-Intensity Commercial	16.97	38.26	257.98	23.93	1175.47	7250.48	1.56	0.00	16.64
Light Industrial	15.53	38.77	120.17	24.25	801.17	6324.99	0.32	0.21	6.01
Highway	12.40	16.42	61.15	7.59	232.12	1665.00	1.43	0.49	5.62
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.28	0.01	0.02	0.00	0.03	0.18	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.23	0.78	2.15	0.19	5.61	23.88	0.00	0.00	0.01
Open Water / Lake	24.24	83.72	364.24	15.25	364.24	705.71	0.00	5.81	6.37
Gross Loads	165.27	307.93	1296.63	154.20	5335.29	32765.92	9.32	8.10	62.24

Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake Hunter Outfall Location
- Drainage area for outfall
- Parks
- Wetlands

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LAKE HUNTER NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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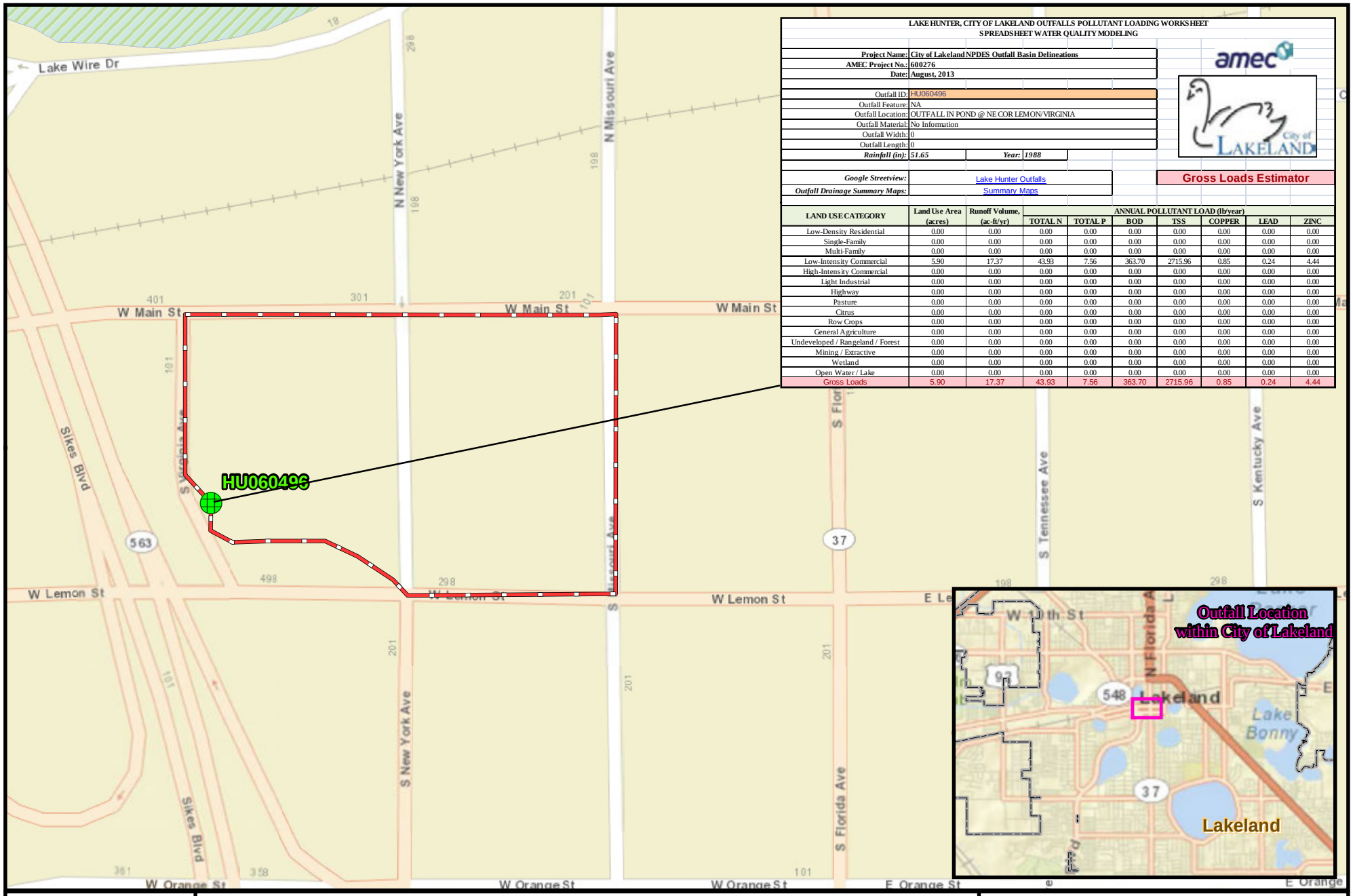

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276
Date:	August, 2013
Outfall ID:	HU060496
Outfall Feature:	NA
Outfall Location:	OUTFALL IN POND @ NE COR LEMON/VIRGINIA
Outfall Material:	No Information
Outfall Width:	0
Outfall Length:	0
Rainfall (in):	*51.65*
Year:	*1988*
Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	5.90	17.37	43.93	7.56	363.70	2715.96	0.85	0.24	4.44
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	5.90	17.37	43.93	7.56	363.70	2715.96	0.85	0.24	4.44

Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake Hunter Outfall Location
- Drainage area for outfall
- Parks
- Wetlands

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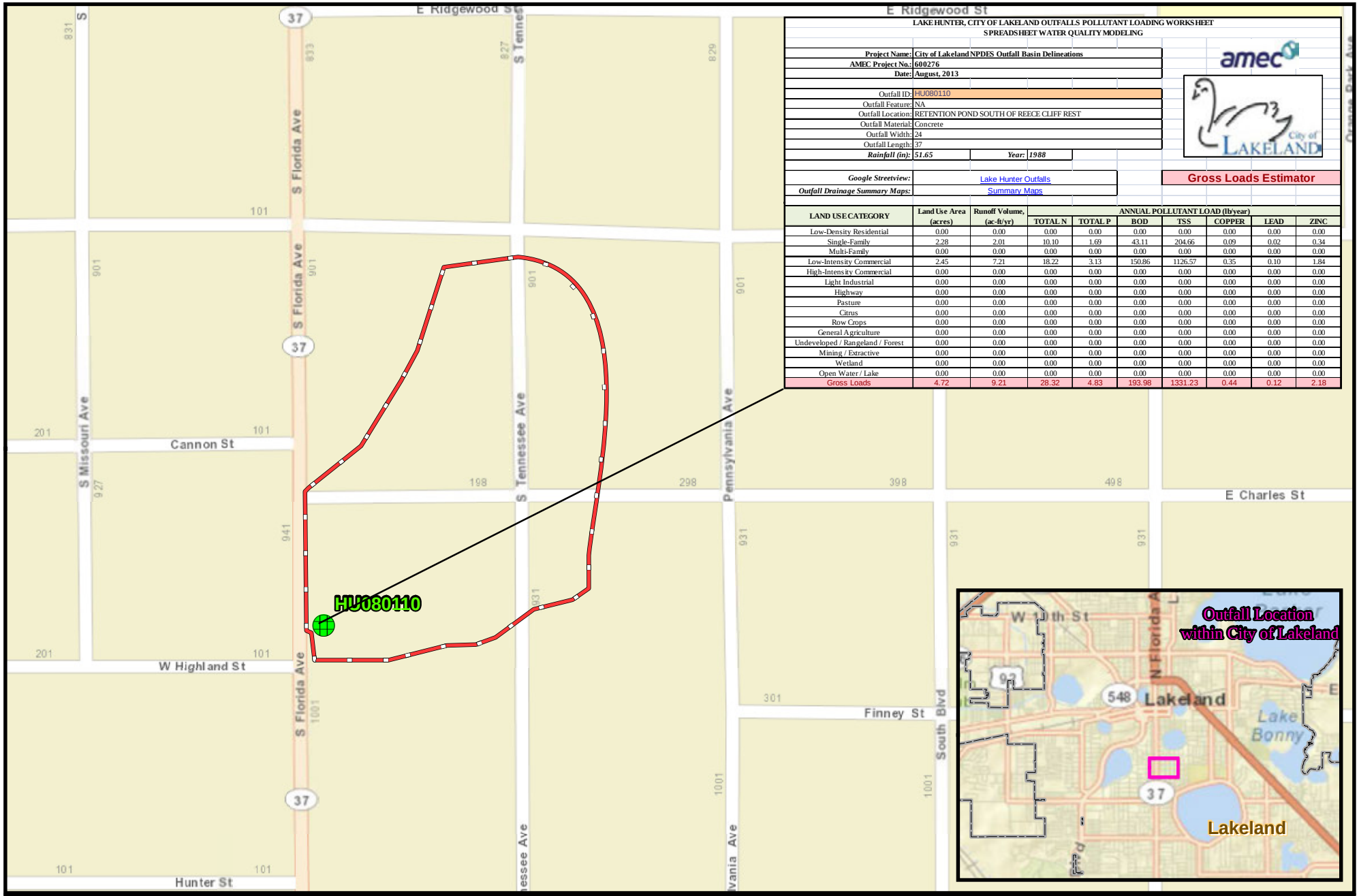
LAKE HUNTER NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276 City of Lakeland - NPDES Lake Hunter\0Deliverable\MXDs\OutfallHU060496.mxd



LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276
Date:	August, 2013
Outfall ID:	HU080110
Outfall Feature:	NA
Outfall Location:	RETENTION POND SOUTH OF REECE CLIFF REST
Outfall Material:	Concrete
Outfall Width:	24
Outfall Length:	37
Rainfall (in):	*51.65* — ***Year:*** *1988*
Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	2.28	2.01	10.10	1.69	43.11	204.66	0.09	0.02	0.34
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	2.45	7.21	18.22	3.13	150.86	1126.57	0.35	0.10	1.84
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	4.72	9.21	28.32	4.83	193.98	1331.23	0.44	0.12	2.18

Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake Hunter Outfall Location
- Drainage area for outfall
- Parks
- Wetlands

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LAKE HUNTER NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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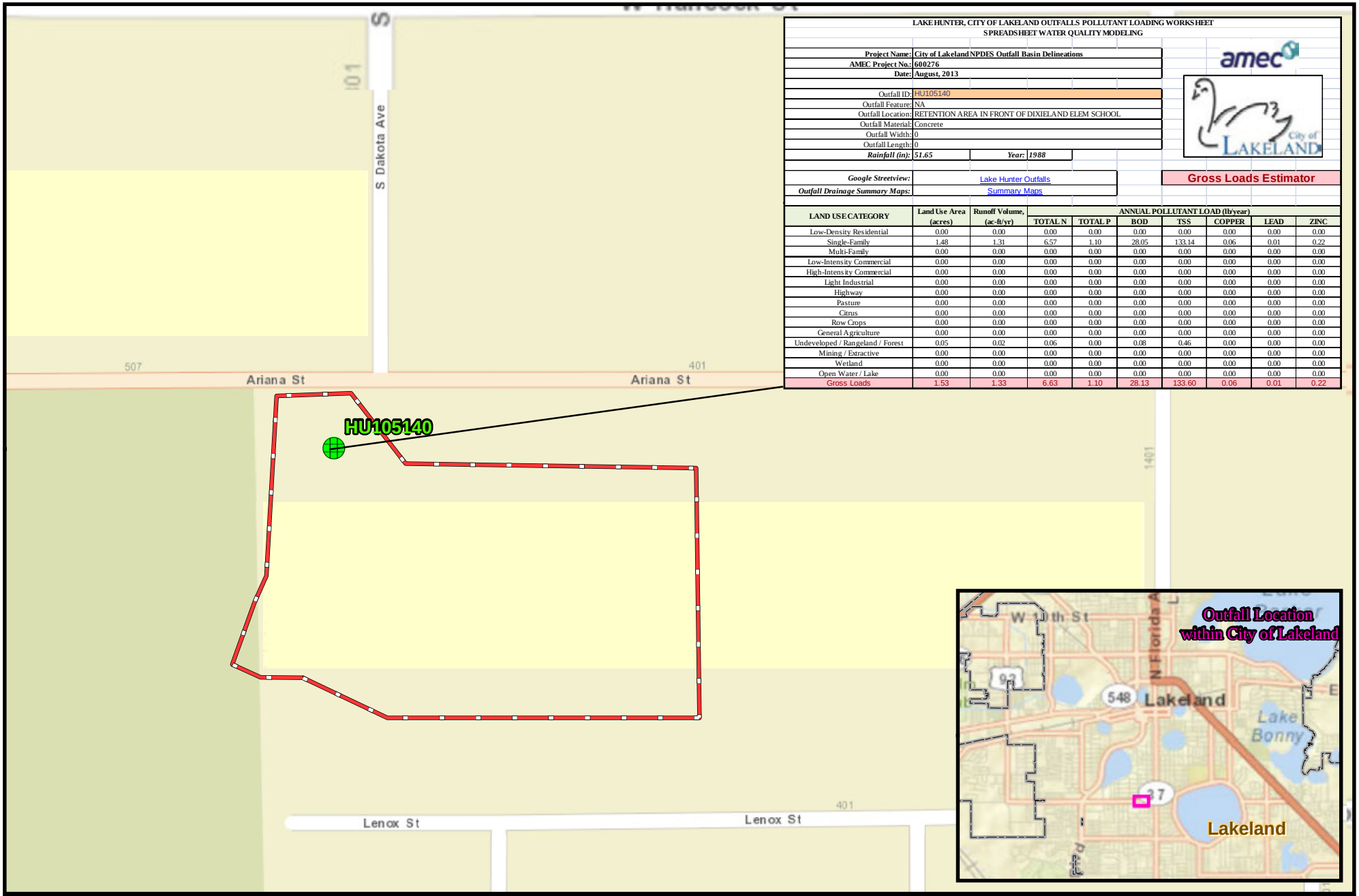
LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**
Outfall ID:	HU105140
Outfall Feature:	NA
Outfall Location:	RETENTION AREA IN FRONT OF DIXIELAND ELEM SCHOOL
Outfall Material:	Concrete
Outfall Width:	0
Outfall Length:	0
Rainfall (in):	***51.65***
Year:	***1988***
Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	1.48	1.31	6.57	1.10	28.05	133.14	0.06	0.01	0.22
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.05	0.02	0.06	0.00	0.08	0.46	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	1.53	1.33	6.63	1.10	28.13	133.60	0.06	0.01	0.22



Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake Hunter Outfall Location
- Drainage area for outfall
- Parks
- Wetlands

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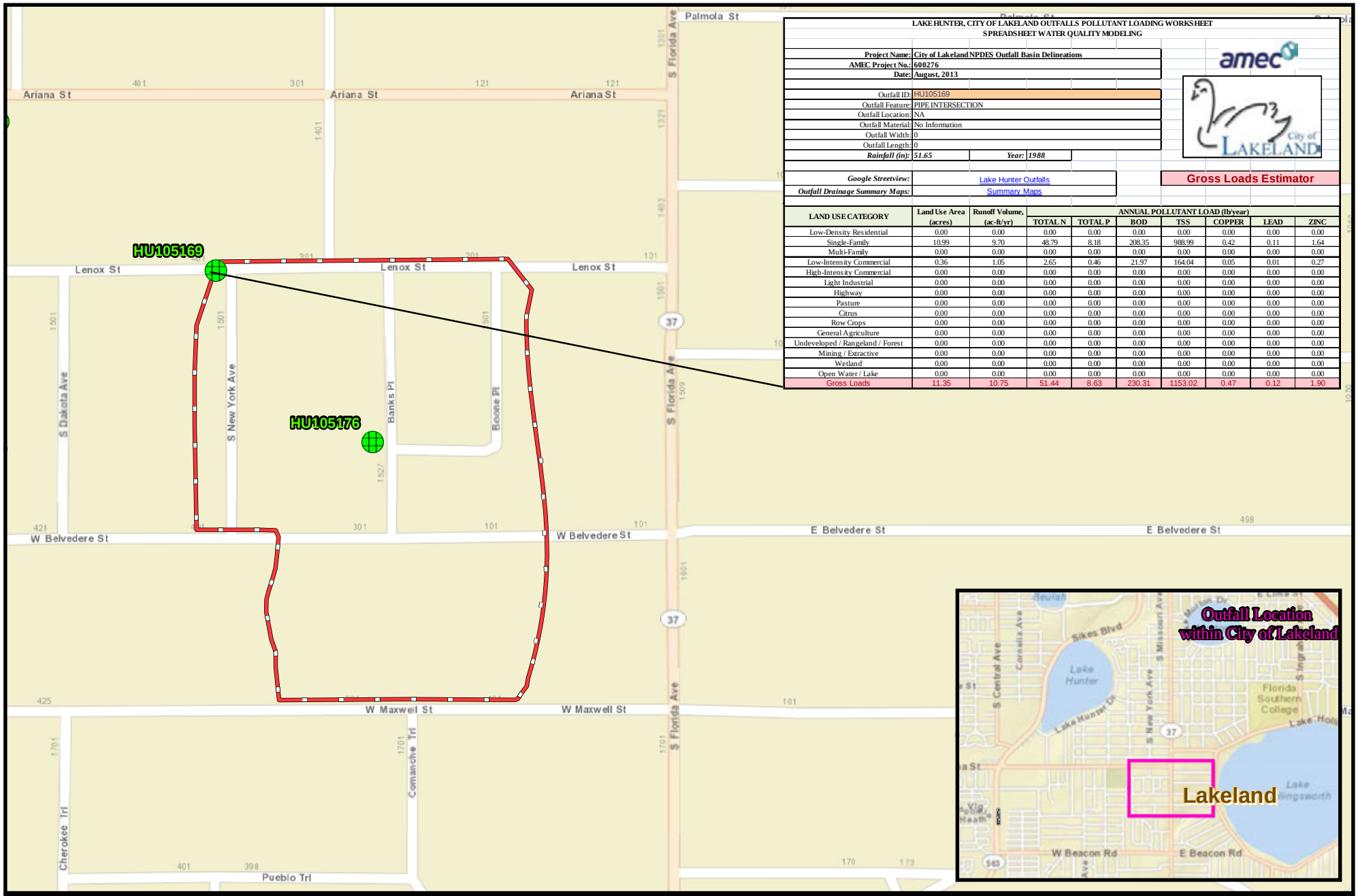
Feet

LAKE HUNTER NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276 City of Lakeland - NPDES Lake Hunter\0Deliverable\MXDs\OutfallHU105140.mxd



LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276
Date:	August, 2013
Outfall ID:	HU105169
Outfall Feature:	PIPE INTERSECTION
Outfall Location:	NA
Outfall Material:	No Information
Outfall Width:	0
Outfall Length:	0
Rainfall (in):	*51.65* — ***Year:*** *1988*
Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	10.99	9.70	48.79	8.18	208.35	988.99	0.42	0.11	1.64
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.36	1.05	2.65	0.46	21.97	164.04	0.05	0.01	0.27
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	11.35	10.75	51.44	8.63	230.31	1153.02	0.47	0.12	1.90

Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake Hunter Outfall Location
- Drainage area for outfall
- Parks
- Wetlands

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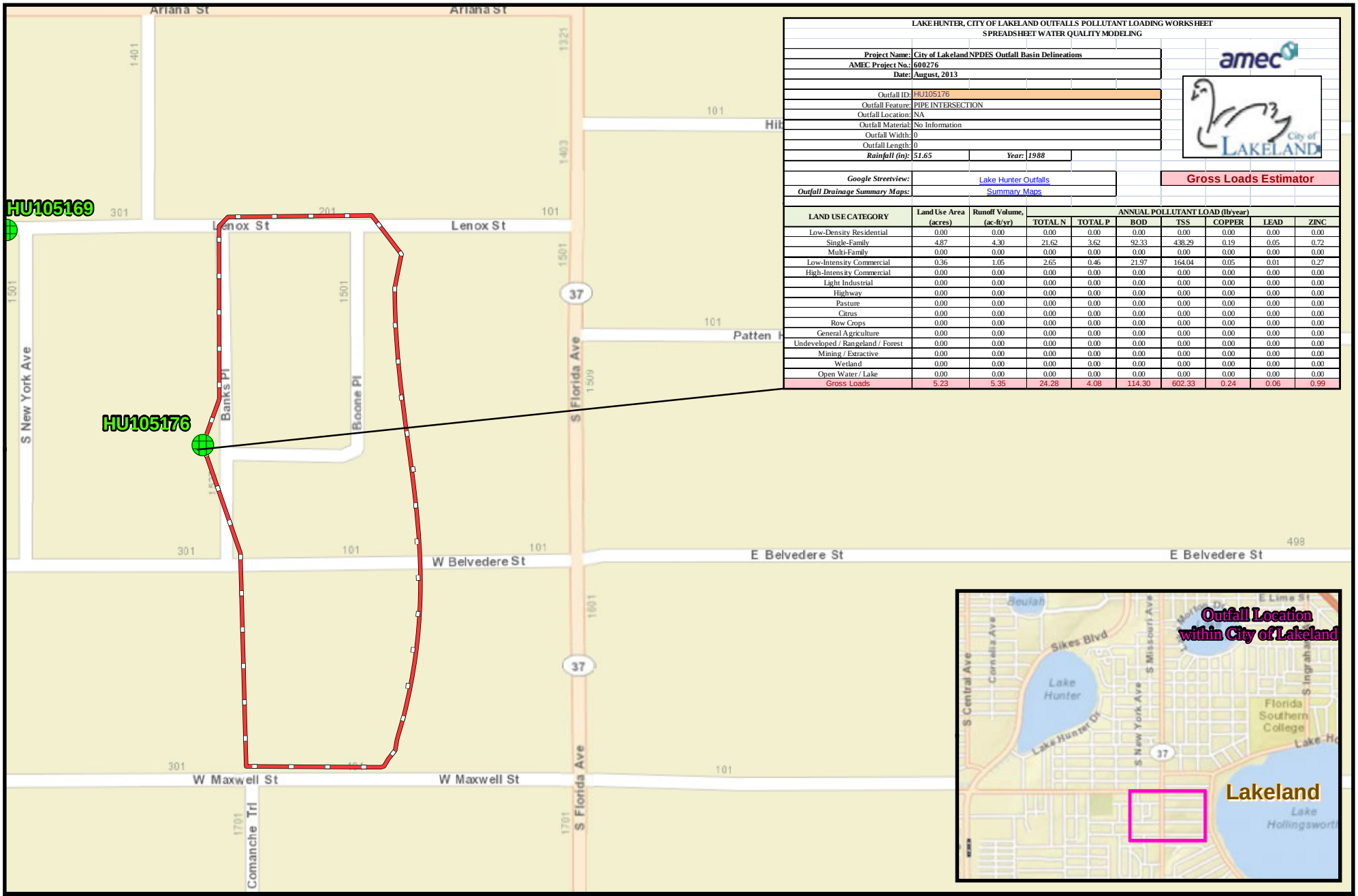
LAKE HUNTER NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276 City of Lakeland - NPDES Lake Hunter\0Deliverable\MXDs\OutfallHU105169.mxd



LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276
Date:	August, 2013
Outfall ID:	HU105176
Outfall Feature:	PIPE INTERSECTION
Outfall Location:	NA
Outfall Material:	No Information
Outfall Width:	0
Outfall Length:	0
Rainfall (in):	*51.65* — ***Year:*** *1988*
Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	4.87	4.30	21.62	3.62	92.33	438.29	0.19	0.05	0.72
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.36	1.05	2.65	0.46	21.97	164.04	0.05	0.01	0.27
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	5.23	5.35	24.28	4.08	114.30	602.33	0.24	0.06	0.99

Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake Hunter Outfall Location
- Drainage area for outfall
- Parks
- Wetlands

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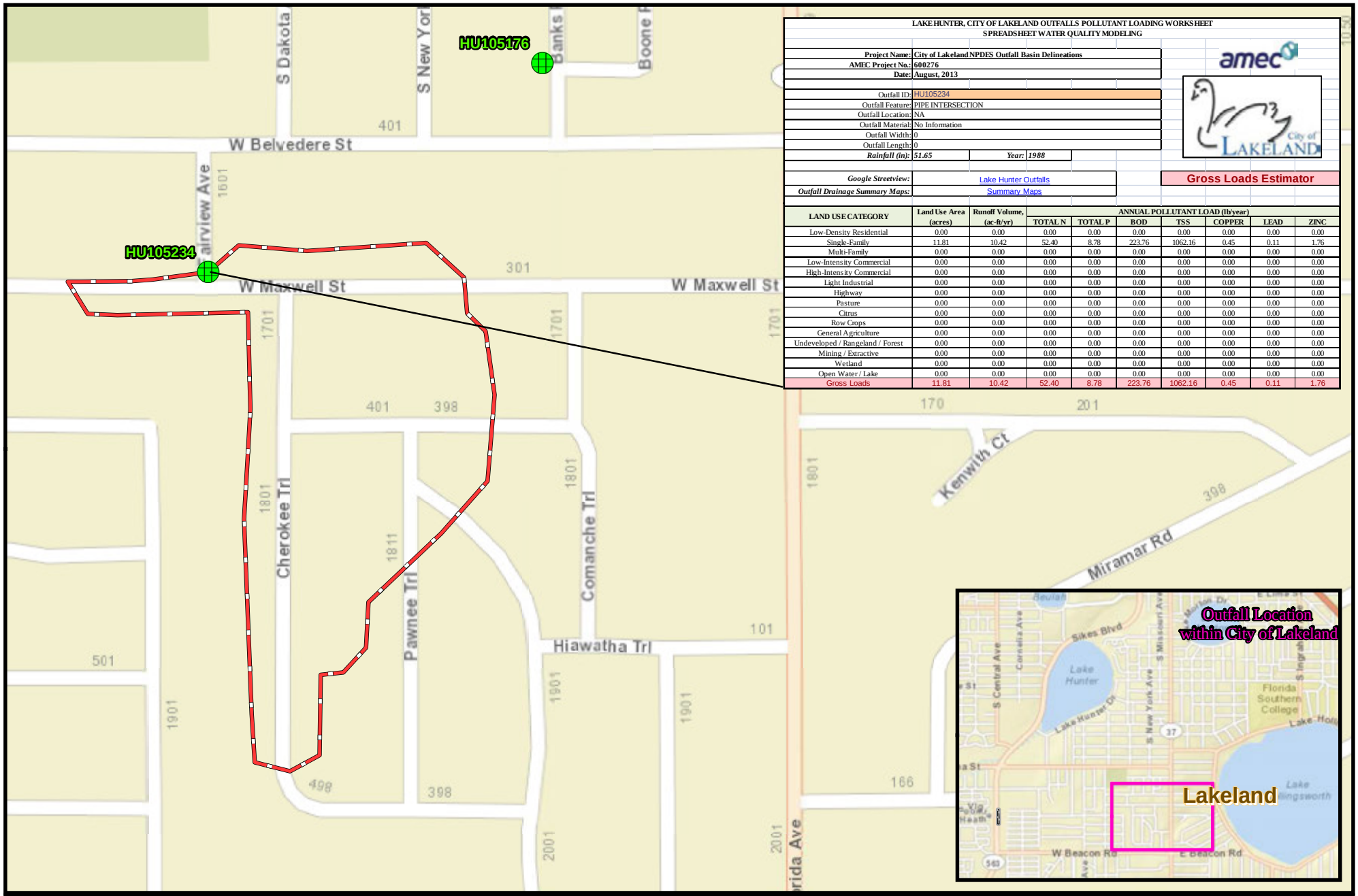
LAKE HUNTER NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276 City of Lakeland - NPDES Lake Hunter\0Deliverable\MXDs\OutfallHU105176.mxd



LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276
Date:	August, 2013
Outfall ID:	HU105234
Outfall Feature:	PIPE INTERSECTION
Outfall Location:	NA
Outfall Material:	No Information
Outfall Width:	0
Outfall Length:	0
Rainfall (in):	*51.65* — ***Year:*** *1988*
Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	11.81	10.42	52.40	8.78	223.76	1062.16	0.45	0.11	1.76
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	11.81	10.42	52.40	8.78	223.76	1062.16	0.45	0.11	1.76

Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake Hunter Outfall Location
- Drainage area for outfall
- Parks
- Wetlands

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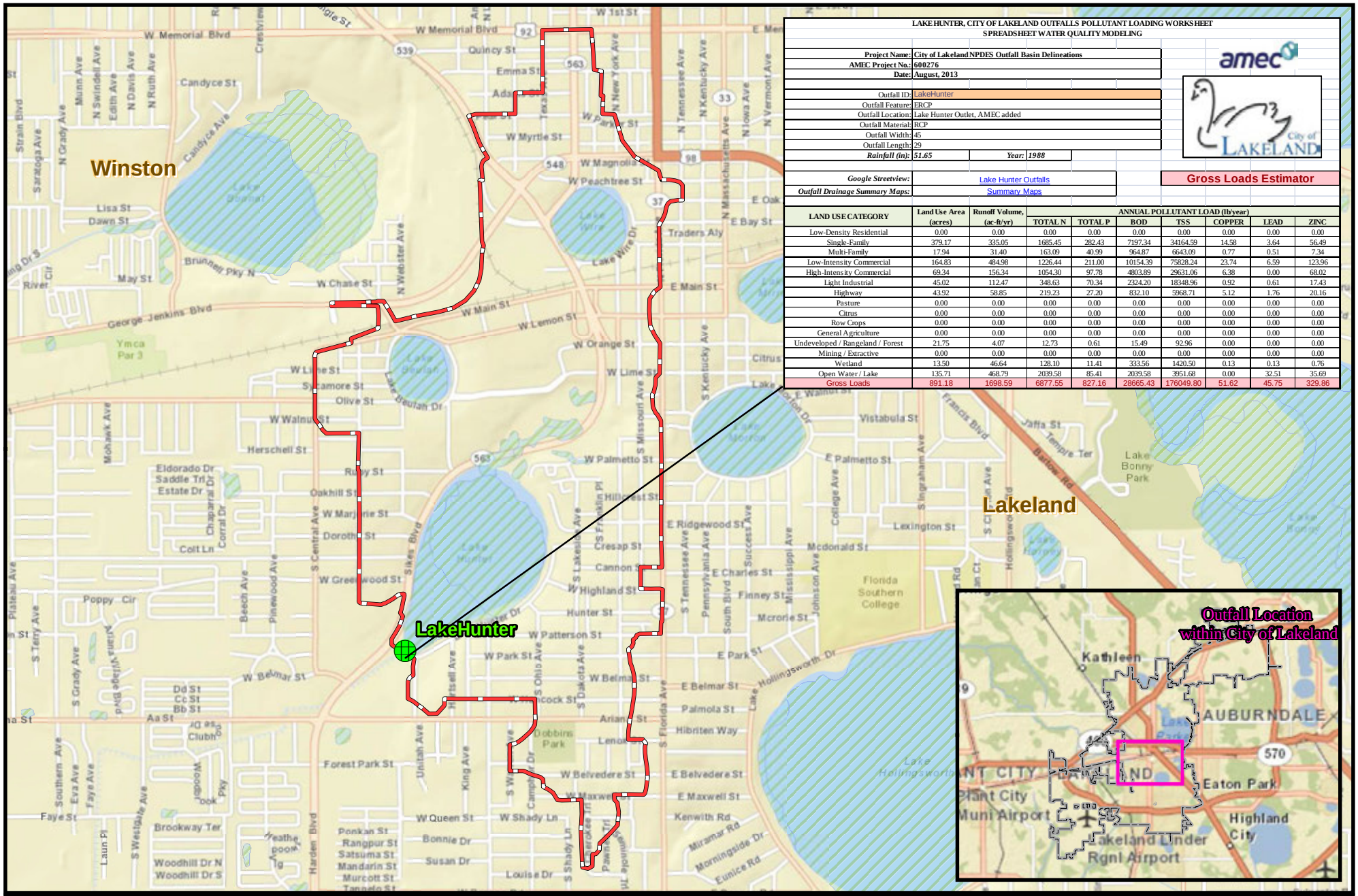
Feet

LAKE HUNTER NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276 City of Lakeland - NPDES Lake Hunter\0Deliverable\MXDs\OutfallHU105234.mxd



LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276
Date:	August, 2013
Outfall ID:	LakeHunter
Outfall Feature:	ERCP
Outfall Location:	Lake Hunter Outlet, AMEC added
Outfall Material:	RCP
Outfall Width:	45
Outfall Length:	29
Rainfall (in):	*51.65* — ***Year:*** *1988*
Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	379.17	335.05	1685.45	282.43	7197.34	34164.59	14.58	3.64	56.49
Multi-Family	17.94	31.40	163.09	40.99	964.87	6643.09	0.77	0.51	7.34
Low-Intensity Commercial	164.83	484.98	1226.44	211.00	10154.39	75828.24	23.74	6.59	123.96
High-Intensity Commercial	69.34	156.34	1054.30	97.78	4803.89	29631.06	6.38	0.00	68.02
Light Industrial	45.02	112.47	348.63	70.34	2324.20	18348.96	0.92	0.61	17.43
Highway	43.92	58.85	219.23	27.20	832.10	5968.71	5.12	1.76	20.16
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	21.75	4.07	12.73	0.61	15.49	92.96	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	13.50	46.64	128.10	11.41	333.56	1420.50	0.13	0.13	0.76
Open Water / Lake	135.71	468.79	2039.58	85.41	2039.58	3951.68	0.00	32.51	35.69
Gross Loads	891.18	1698.59	6877.55	827.16	28665.43	176049.80	51.62	45.75	329.86

Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake Hunter Outfall Location
- Drainage area for outfall
- Parks
- Wetlands

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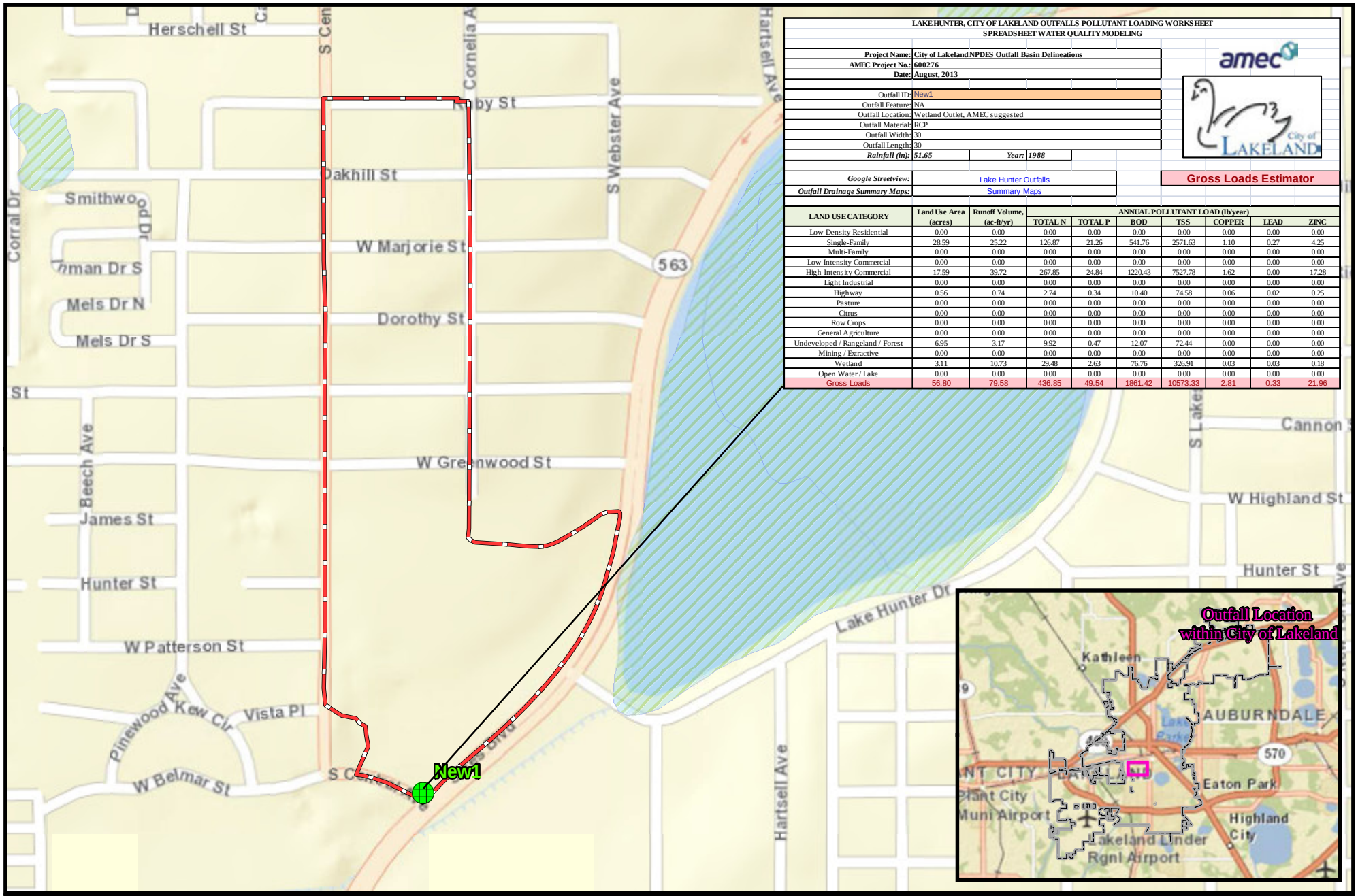
LAKE HUNTER NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276 City of Lakeland - NPDES Lake Hunter\0Deliverable\MXDs\OutfallLakeHunter.mxd



LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276
Date:	August, 2013
Outfall ID:	New1
Outfall Feature:	NA
Outfall Location:	Wetland Outlet, AMEC suggested
Outfall Material:	RCP
Outfall Width:	30
Outfall Length:	30
Rainfall (in):	*51.65*
Year:	*1988*
Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	28.59	25.22	126.87	21.26	541.76	2571.63	1.10	0.27	4.25
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	17.59	39.72	267.85	24.84	1220.43	7527.78	1.62	0.00	17.28
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.56	0.74	2.74	0.34	10.40	74.58	0.06	0.02	0.25
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	6.95	3.17	9.92	0.47	12.07	72.44	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	3.11	10.73	29.48	2.63	76.76	326.91	0.03	0.03	0.18
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	56.80	79.58	436.85	49.54	1861.42	10573.33	2.81	0.33	21.96

Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake Hunter Outfall Location
- Drainage area for outfall
- Parks
- Wetlands

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LAKE HUNTER NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276 City of Lakeland - NPDES Lake Hunter\0Deliverable\MXDs\OutfallNew1.mxd

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**

Outfall ID:	HU015		
Outfall Feature:	5FX8.6FT CONC		
Outfall Location:	LAKE HUNTER 295 S OF JOSEPHINE		
Outfall Material:	Concrete		
Outfall Width:	0		
Outfall Length:	0		
Rainfall (in):	***51.65***	***Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	4.62	4.08	20.50	3.44	87.54	415.54	0.18	0.04	0.69
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	5.15	11.61	78.31	7.26	356.82	2200.90	0.47	0.00	5.05
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	1.66	2.17	8.10	1.00	30.73	220.45	0.19	0.07	0.74
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.01	0.00	0.02	0.00	0.02	0.11	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	11.44	17.87	106.92	11.70	475.11	2837.00	0.84	0.11	6.48

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**

Outfall ID:	HU020		
Outfall Feature:	CONC MITERED END NW		
Outfall Location:	LK HUNTER 281FT S OF DOROTHY		
Outfall Material:	Concrete		
Outfall Width:	0		
Outfall Length:	0		
Rainfall (in):	***51.65***	***Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	5.72	5.05	25.39	4.25	108.43	514.68	0.22	0.05	0.85
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.93	1.21	4.52	0.56	17.17	123.13	0.11	0.04	0.42
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	6.65	6.26	29.91	4.82	125.59	637.81	0.33	0.09	1.27

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**

Outfall ID:	HU025		
Outfall Feature:	6X12FT CONC MITERED END HW		
Outfall Location:	LK HUNTER 225FT S OF MARJORIE		
Outfall Material:	Concrete		
Outfall Width:	0		
Outfall Length:	0		
Rainfall (in):	***51.65***	***Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	6.04	5.33	26.79	4.49	114.40	543.02	0.23	0.06	0.90
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.42	0.55	2.04	0.25	7.73	55.43	0.05	0.02	0.19
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	6.45	5.87	28.82	4.74	122.12	598.45	0.28	0.07	1.09

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**

Outfall ID:	HU030		
Outfall Feature:	6X12FT CONC		
Outfall Location:	W SHORELINE LK HUNTER ACROSS FROM MARJORIE ST		
Outfall Material:	Concrete		
Outfall Width:	0		
Outfall Length:	0		
Rainfall (in):	***51.65***	***Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	7.93	6.99	35.18	5.89	150.21	713.02	0.30	0.08	1.18
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.69	0.90	3.37	0.42	12.78	91.64	0.08	0.03	0.31
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	8.62	7.90	38.54	6.31	162.99	804.66	0.38	0.10	1.49

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**

Outfall ID:	HU035		
Outfall Feature:	CONC 5.5X7FT MITERED END HW		
Outfall Location:	410FT S OF HARTSELL AV E SIDE OF SIKES BL		
Outfall Material:	Concrete		
Outfall Width:	0		
Outfall Length:	0		
Rainfall (in):	***51.65***	***Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	12.81	11.30	56.83	9.52	242.69	1152.00	0.49	0.12	1.90
Multi-Family	1.19	2.07	10.74	2.70	63.53	437.38	0.05	0.03	0.48
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	1.37	1.80	6.69	0.83	25.41	182.23	0.16	0.05	0.62
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	15.36	15.16	74.26	13.05	331.62	1771.61	0.70	0.21	3.00

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**

Outfall ID:	HU040		
Outfall Feature:	MES		
Outfall Location:	LK HUNTER 105FT S OF HARTSELL ST		
Outfall Material:	Concrete		
Outfall Width:	0		
Outfall Length:	0		
Rainfall (in):	***51.65***	***Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	28.14	24.97	125.62	21.05	536.42	2546.30	1.09	0.27	4.21
Multi-Family	16.76	29.33	152.35	38.29	901.35	6205.75	0.72	0.48	6.86
Low-Intensity Commercial	28.39	83.59	211.38	36.37	1750.16	13069.40	4.09	1.14	21.37
High-Intensity Commercial	16.77	37.82	255.04	23.65	1162.05	7167.72	1.54	0.00	16.45
Light Industrial	7.89	19.75	61.21	12.35	408.06	3221.49	0.16	0.11	3.06
Highway	0.38	0.50	1.85	0.23	7.04	50.50	0.04	0.01	0.17
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	11.00	0.30	0.94	0.05	1.15	6.89	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.38	1.31	3.61	0.32	9.40	40.04	0.00	0.00	0.02
Open Water / Lake	19.28	66.60	289.74	12.13	289.74	561.38	0.00	4.62	5.07
Gross Loads	128.99	264.17	1101.75	144.44	5065.38	32869.46	7.65	6.63	57.21

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**

Outfall ID:	HU045		
Outfall Feature:	5.5X6FT CONC MITERED END HW		
Outfall Location:	LK HUNTER 847FT E OF HARTSELL ST		
Outfall Material:	Concrete		
Outfall Width:	0		
Outfall Length:	0		
Rainfall (in):	***51.65***	***Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	11.59	26.13	176.18	16.34	802.76	4951.52	1.07	0.00	11.37
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	2.11	2.77	10.33	1.28	39.22	281.34	0.24	0.08	0.95
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	2.63	9.08	24.94	2.22	64.93	276.52	0.02	0.02	0.15
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	16.33	37.98	211.45	19.84	906.91	5509.38	1.33	0.11	12.46

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**

Outfall ID:	HU060		
Outfall Feature:	CONC		
Outfall Location:	104FT W OF TERRACE GARDEN RD S SIDE OF SIKES		
Outfall Material:	Concrete		
Outfall Width:	0		
Outfall Length:	0		
Rainfall (in):	***51.65***	***Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	85.22	75.18	378.21	63.38	1615.05	7666.39	3.27	0.82	12.68
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	116.32	342.21	865.40	148.89	7165.11	53505.68	16.75	4.65	87.47
High-Intensity Commercial	35.83	80.78	544.78	50.52	2482.26	15310.93	3.30	0.00	35.15
Light Industrial	37.13	92.72	287.42	57.99	1916.10	15127.12	0.76	0.50	14.37
Highway	29.48	38.83	144.65	17.95	549.04	3938.31	3.38	1.16	13.30
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.64	0.02	0.05	0.00	0.07	0.40	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	8.92	30.82	84.63	7.54	220.39	938.52	0.08	0.08	0.50
Open Water / Lake	24.24	83.72	364.24	15.25	364.24	705.71	0.00	5.81	6.37
Gross Loads	337.78	744.28	2669.38	361.52	14312.25	97193.06	27.53	13.02	169.84

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**

Outfall ID:	HU061		
Outfall Feature:	HEADWALL, 1' X 15' CONCRETE		
Outfall Location:	E SHORELINE LK HUNTER W OF LAKESIDE CT		
Outfall Material:	Concrete		
Outfall Width:	0		
Outfall Length:	0		
Rainfall (in):	***51.65***	***Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	6.95	6.13	30.84	5.17	131.68	625.06	0.27	0.07	1.03
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	6.95	6.13	30.84	5.17	131.68	625.06	0.27	0.07	1.03

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**

Outfall ID:	HU065		
Outfall Feature:	18" RCP		
Outfall Location:	LK HUNTER 420FT W OF LAKESIDE CT AND S LAKESIDE AV		
Outfall Material:	Concrete		
Outfall Width:	0		
Outfall Length:	0		
Rainfall (in):	***51.65***	***Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	6.30	5.56	27.95	4.68	119.35	566.54	0.24	0.06	0.94
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	6.30	5.56	27.95	4.68	119.35	566.54	0.24	0.06	0.94

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**

Outfall ID:	HU070		
Outfall Feature:	CONC		
Outfall Location:	LK HUNTER 395FT W OF S LAKESIDE AV		
Outfall Material:	Concrete		
Outfall Width:	0		
Outfall Length:	0		
Rainfall (in):	***51.65***	***Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	29.76	26.26	132.08	22.13	564.01	2677.27	1.14	0.29	4.43
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	11.39	33.50	84.71	14.57	701.33	5237.21	1.64	0.46	8.56
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	41.15	59.75	216.79	36.71	1265.34	7914.48	2.78	0.74	12.99

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**

Outfall ID:	HU075		
Outfall Feature:	NA		
Outfall Location:	LK HUNTER 412 FT W OF LAKESIDE AV		
Outfall Material:	No Information		
Outfall Width:	0		
Outfall Length:	0		
Rainfall (in):	***51.65***	***Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.44	0.39	1.94	0.33	8.30	39.38	0.02	0.00	0.07
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	1.25	3.68	9.30	1.60	77.04	575.30	0.18	0.05	0.94
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	1.69	4.07	11.25	1.93	85.34	614.68	0.20	0.05	1.01

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**

Outfall ID:	HU080		
Outfall Feature:	CONC CONTROL STRUCTURE		
Outfall Location:	LK HUNTER 77 FT W OF W HIGHLAND ST		
Outfall Material:	Concrete		
Outfall Width:	0		
Outfall Length:	0		
Rainfall (in):	***51.65***	***Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	33.31	29.38	147.81	24.77	631.18	2996.13	1.28	0.32	4.95
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	6.26	18.40	46.54	8.01	385.33	2877.43	0.90	0.25	4.70
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	39.56	47.79	194.35	32.77	1016.51	5873.56	2.18	0.57	9.66

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**

Outfall ID:	HU105		
Outfall Feature:	CONC CONTROL STR		
Outfall Location:	LK HUNTER 306FT NW OF OHIO AV		
Outfall Material:	Concrete		
Outfall Width:	0		
Outfall Length:	0		
Rainfall (in):	***51.65***	***Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	96.37	85.01	427.66	71.66	1826.24	8668.88	3.70	0.92	14.33
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.36	1.05	2.65	0.46	21.97	164.04	0.05	0.01	0.27
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	9.97	3.69	11.53	0.55	14.04	84.22	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	106.70	89.75	441.85	72.67	1862.25	8917.14	3.75	0.94	14.60

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**

Outfall ID:	HU110		
Outfall Feature:	NA		
Outfall Location:	S SHORELINE LK HUNTER @ S. LINCOLN AVE		
Outfall Material:	No Information		
Outfall Width:	0		
Outfall Length:	0		
Rainfall (in):	***51.65***	***Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	17.92	15.81	79.54	13.33	339.67	1612.36	0.69	0.17	2.67
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.02	0.07	0.00	0.07	0.14	0.00	0.00	0.00
Gross Loads	17.93	15.83	79.61	13.33	339.74	1612.49	0.69	0.17	2.67

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**

Outfall ID:	HU130		
Outfall Feature:	CONTROL STRUCTURE		
Outfall Location:	LK HUNTER 113FT N OF KING AV		
Outfall Material:	No Information		
Outfall Width:	0		
Outfall Length:	0		
Rainfall (in):	***51.65***	***Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	7.67	6.76	34.03	5.70	145.32	689.81	0.29	0.07	1.14
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.01	0.06	0.00	0.06	0.12	0.00	0.00	0.00
Gross Loads	7.67	6.78	34.09	5.71	145.38	689.94	0.29	0.07	1.14

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**

Outfall ID:	HU135		
Outfall Feature:	NA		
Outfall Location:	E SHORELINE LK HUNTER ACROSS FROM HARTSELL AVE		
Outfall Material:	No Information		
Outfall Width:	0		
Outfall Length:	0		
Rainfall (in):	***51.65***	***Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	5.20	4.59	23.07	3.87	98.50	467.58	0.20	0.05	0.77
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	5.20	4.59	23.07	3.87	98.50	467.58	0.20	0.05	0.77

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**

Outfall ID:	HU150		
Outfall Feature:	END OF PIPE		
Outfall Location:	NA		
Outfall Material:	No Information		
Outfall Width:	0		
Outfall Length:	0		
Rainfall (in):	***51.65***	***Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	2.65	2.34	11.76	1.97	50.23	238.45	0.10	0.03	0.39
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.01	0.03	0.00	0.03	0.06	0.00	0.00	0.00
Gross Loads	2.65	2.35	11.80	1.97	50.27	238.51	0.10	0.03	0.39

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**

Outfall ID:	HU155		
Outfall Feature:	CONTROL STRUCTURE		
Outfall Location:	LK HUNTER 194FT NE OF UNITAH AV		
Outfall Material:	No Information		
Outfall Width:	0		
Outfall Length:	0		
Rainfall (in):	***51.65***	***Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	1.58	1.39	7.02	1.18	29.96	142.22	0.06	0.02	0.24
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.01	0.04	0.00	0.04	0.08	0.00	0.00	0.00
Gross Loads	1.58	1.40	7.06	1.18	30.01	142.31	0.06	0.02	0.24

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**

Outfall ID:	HU160		
Outfall Feature:	CONTROL STRUCTURE		
Outfall Location:	LK HUNTER 83FT N OF UNITAH AV		
Outfall Material:	No Information		
Outfall Width:	0		
Outfall Length:	0		
Rainfall (in):	***51.65***	***Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	7.50	6.62	33.29	5.58	142.15	674.74	0.29	0.07	1.12
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.06	0.08	0.29	0.04	1.11	7.95	0.01	0.00	0.03
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.13	0.06	0.18	0.01	0.22	1.33	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.01	0.02	0.10	0.00	0.10	0.19	0.00	0.00	0.00
Gross Loads	7.70	6.78	33.86	5.63	143.57	684.21	0.29	0.08	1.14

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**

Outfall ID:	HU040055		
Outfall Feature:	CONC OUTFALL WITH CONTROL VALVE		
Outfall Location:	SE COR LK BEULAH		
Outfall Material:	Concrete		
Outfall Width:	0		
Outfall Length:	0		
Rainfall (in):	***51.65***	***Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	26.60	23.61	118.78	19.90	507.22	2407.70	1.03	0.26	3.98
Multi-Family	5.31	9.41	48.87	12.28	289.14	1990.69	0.23	0.15	2.20
Low-Intensity Commercial	28.39	83.59	211.38	36.37	1750.16	13069.40	4.09	1.14	21.37
High-Intensity Commercial	11.23	25.31	170.68	15.83	777.69	4796.92	1.03	0.00	11.01
Light Industrial	7.89	19.75	61.21	12.35	408.10	3221.84	0.16	0.11	3.06
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	11.00	0.30	0.94	0.05	1.15	6.89	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	19.28	66.60	289.74	12.13	289.74	561.38	0.00	4.62	5.07
Gross Loads	109.70	228.57	901.62	108.91	4023.21	26054.82	6.54	6.27	46.69

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**

Outfall ID:	HU055036		
Outfall Feature:	NA		
Outfall Location:	50' W OF SIKES BLVD @SE COR OF RET POND		
Outfall Material:	No Information		
Outfall Width:	0		
Outfall Length:	0		
Rainfall (in):	***51.65***	***Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.13	0.38	0.95	0.16	7.90	58.96	0.02	0.01	0.10
High-Intensity Commercial	4.38	9.87	66.57	6.17	303.30	1870.81	0.40	0.00	4.29
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	1.61	2.11	7.86	0.98	29.85	214.10	0.18	0.06	0.72
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	2.95	10.19	27.99	2.49	72.88	310.35	0.03	0.03	0.17
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	9.07	22.55	103.37	9.81	413.92	2454.22	0.63	0.10	5.28

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**

Outfall ID:	HU055075		
Outfall Feature:	MES		
Outfall Location:	E SIDE RETENSION POND AT SW COR LEDGER PROPERTY		
Outfall Material:	No Information		
Outfall Width:	0		
Outfall Length:	0		
Rainfall (in):	***51.65***	***Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	11.96	35.19	89.00	15.31	736.86	5502.50	1.72	0.48	9.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.11	0.14	0.53	0.07	2.00	14.37	0.01	0.00	0.05
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	12.07	35.33	89.52	15.38	738.86	5516.87	1.73	0.48	9.04

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**

Outfall ID:	HU055161		
Outfall Feature:	NA		
Outfall Location:	NA		
Outfall Material:	Concrete		
Outfall Width:	0		
Outfall Length:	0		
Rainfall (in):	***51.65***	***Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	2.92	8.58	21.70	3.73	179.68	1341.78	0.42	0.12	2.19
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	2.92	8.58	21.70	3.73	179.68	1341.78	0.42	0.12	2.19

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**

Outfall ID:	HU060051		
Outfall Feature:	DBL BOX CLVERT 12.3' WIDTH W/CONC SEPERATOR IN MIDDLE 3' DEE		
Outfall Location:	SOUTH SIDE OF SOUTH PARKING LOT LAKELAND CENTER		
Outfall Material:	Concrete		
Outfall Width:	0		
Outfall Length:	0		
Rainfall (in):	***51.65***	***Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	73.50	64.84	326.19	54.66	1392.93	6612.03	2.82	0.71	10.93
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	86.20	253.60	641.31	110.33	5309.78	39650.92	12.41	3.45	64.82
High-Intensity Commercial	23.51	53.01	357.49	33.15	1628.89	10047.23	2.16	0.00	23.06
Light Industrial	37.13	92.72	287.42	57.99	1916.15	15127.48	0.76	0.50	14.37
Highway	23.12	30.48	113.56	14.09	431.02	3091.76	2.65	0.91	10.44
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.64	0.02	0.05	0.00	0.07	0.40	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.23	0.78	2.15	0.19	5.61	23.88	0.00	0.00	0.01
Open Water / Lake	24.24	83.72	364.24	15.25	364.24	705.71	0.00	5.81	6.37
Gross Loads	268.56	579.18	2092.42	285.67	11048.68	75259.41	20.81	11.38	130.02

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**

Outfall ID:	HU060184		
Outfall Feature:	END OF PIPE		
Outfall Location:	NA		
Outfall Material:	No Information		
Outfall Width:	0		
Outfall Length:	0		
Rainfall (in):	***51.65***	***Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	73.50	64.84	326.19	54.66	1392.93	6612.03	2.82	0.71	10.93
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	57.74	169.88	429.60	73.91	3556.90	26561.26	8.31	2.31	43.42
High-Intensity Commercial	20.79	46.87	316.09	29.32	1440.26	8883.73	1.91	0.00	20.39
Light Industrial	22.95	57.32	177.68	35.85	1184.51	9351.37	0.47	0.31	8.88
Highway	22.39	29.52	109.98	13.65	417.44	2994.35	2.57	0.88	10.11
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.43	0.01	0.04	0.00	0.05	0.27	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.23	0.78	2.15	0.19	5.61	23.88	0.00	0.00	0.01
Open Water / Lake	24.24	83.72	364.24	15.25	364.24	705.71	0.00	5.81	6.37
Gross Loads	222.27	452.95	1725.97	222.82	8361.94	55132.61	16.09	10.02	100.13

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**

Outfall ID:	HU060260		
Outfall Feature:	NA		
Outfall Location:	SW COR OF LAKE WIRE		
Outfall Material:	Concrete		
Outfall Width:	0		
Outfall Length:	0		
Rainfall (in):	***51.65***	***Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	73.50	64.84	326.19	54.66	1392.93	6612.03	2.82	0.71	10.93
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	22.14	65.13	164.71	28.34	1363.72	10183.65	3.19	0.89	16.65
High-Intensity Commercial	16.97	38.26	257.98	23.93	1175.47	7250.48	1.56	0.00	16.64
Light Industrial	15.53	38.77	120.17	24.25	801.17	6324.99	0.32	0.21	6.01
Highway	12.40	16.42	61.15	7.59	232.12	1665.00	1.43	0.49	5.62
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.28	0.01	0.02	0.00	0.03	0.18	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.23	0.78	2.15	0.19	5.61	23.88	0.00	0.00	0.01
Open Water / Lake	24.24	83.72	364.24	15.25	364.24	705.71	0.00	5.81	6.37
Gross Loads	165.27	307.93	1296.63	154.20	5335.29	32765.92	9.32	8.10	62.24

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**

Outfall ID:	HU060496		
Outfall Feature:	NA		
Outfall Location:	OUTFALL IN POND @ NE COR LEMON/VIRGINIA		
Outfall Material:	No Information		
Outfall Width:	0		
Outfall Length:	0		
Rainfall (in):	***51.65***	***Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	5.90	17.37	43.93	7.56	363.70	2715.96	0.85	0.24	4.44
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	5.90	17.37	43.93	7.56	363.70	2715.96	0.85	0.24	4.44

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**

Outfall ID:	HU080110		
Outfall Feature:	NA		
Outfall Location:	RETENTION POND SOUTH OF REECE CLIFF REST		
Outfall Material:	Concrete		
Outfall Width:	24		
Outfall Length:	37		
Rainfall (in):	***51.65***	***Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	2.28	2.01	10.10	1.69	43.11	204.66	0.09	0.02	0.34
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	2.45	7.21	18.22	3.13	150.86	1126.57	0.35	0.10	1.84
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	4.72	9.21	28.32	4.83	193.98	1331.23	0.44	0.12	2.18

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**

Outfall ID:	HU105140		
Outfall Feature:	NA		
Outfall Location:	RETENTION AREA IN FRONT OF DIXIELAND ELEM SCHOOL		
Outfall Material:	Concrete		
Outfall Width:	0		
Outfall Length:	0		
Rainfall (in):	***51.65***	***Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	1.48	1.31	6.57	1.10	28.05	133.14	0.06	0.01	0.22
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.05	0.02	0.06	0.00	0.08	0.46	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	1.53	1.33	6.63	1.10	28.13	133.60	0.06	0.01	0.22

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**

Outfall ID:	HU105169		
Outfall Feature:	PIPE INTERSECTION		
Outfall Location:	NA		
Outfall Material:	No Information		
Outfall Width:	0		
Outfall Length:	0		
Rainfall (in):	***51.65***	***Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	10.99	9.70	48.79	8.18	208.35	988.99	0.42	0.11	1.64
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.36	1.05	2.65	0.46	21.97	164.04	0.05	0.01	0.27
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	11.35	10.75	51.44	8.63	230.31	1153.02	0.47	0.12	1.90

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**

Outfall ID:	HU105176		
Outfall Feature:	PIPE INTERSECTION		
Outfall Location:	NA		
Outfall Material:	No Information		
Outfall Width:	0		
Outfall Length:	0		
Rainfall (in):	***51.65***	***Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	4.87	4.30	21.62	3.62	92.33	438.29	0.19	0.05	0.72
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.36	1.05	2.65	0.46	21.97	164.04	0.05	0.01	0.27
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	5.23	5.35	24.28	4.08	114.30	602.33	0.24	0.06	0.99

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**

Outfall ID:	HU105234		
Outfall Feature:	PIPE INTERSECTION		
Outfall Location:	NA		
Outfall Material:	No Information		
Outfall Width:	0		
Outfall Length:	0		
Rainfall (in):	***51.65***	***Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	11.81	10.42	52.40	8.78	223.76	1062.16	0.45	0.11	1.76
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	11.81	10.42	52.40	8.78	223.76	1062.16	0.45	0.11	1.76

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**

Outfall ID:	LakeHunter		
Outfall Feature:	ERCP		
Outfall Location:	Lake Hunter Outlet, AMEC added		
Outfall Material:	RCP		
Outfall Width:	45		
Outfall Length:	29		
Rainfall (in):	***51.65***	***Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	379.17	335.05	1685.45	282.43	7197.34	34164.59	14.58	3.64	56.49
Multi-Family	17.94	31.40	163.09	40.99	964.87	6643.09	0.77	0.51	7.34
Low-Intensity Commercial	164.83	484.98	1226.44	211.00	10154.39	75828.24	23.74	6.59	123.96
High-Intensity Commercial	69.34	156.34	1054.30	97.78	4803.89	29631.06	6.38	0.00	68.02
Light Industrial	45.02	112.47	348.63	70.34	2324.20	18348.96	0.92	0.61	17.43
Highway	43.92	58.85	219.23	27.20	832.10	5968.71	5.12	1.76	20.16
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	21.75	4.07	12.73	0.61	15.49	92.96	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	13.50	46.64	128.10	11.41	333.56	1420.50	0.13	0.13	0.76
Open Water / Lake	135.71	468.79	2039.58	85.41	2039.58	3951.68	0.00	32.51	35.69
Gross Loads	891.18	1698.59	6877.55	827.16	28665.43	176049.80	51.62	45.75	329.86

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276**
Date:	**August, 2013**

Outfall ID:	New1		
Outfall Feature:	NA		
Outfall Location:	Wetland Outlet, AMEC suggested		
Outfall Material:	RCP		
Outfall Width:	30		
Outfall Length:	30		
Rainfall (in):	***51.65***	***Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	28.59	25.22	126.87	21.26	541.76	2571.63	1.10	0.27	4.25
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	17.59	39.72	267.85	24.84	1220.43	7527.78	1.62	0.00	17.28
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.56	0.74	2.74	0.34	10.40	74.58	0.06	0.02	0.25
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	6.95	3.17	9.92	0.47	12.07	72.44	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	3.11	10.73	29.48	2.63	76.76	326.91	0.03	0.03	0.18
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	56.80	79.58	436.85	49.54	1861.42	10573.33	2.81	0.33	21.96

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

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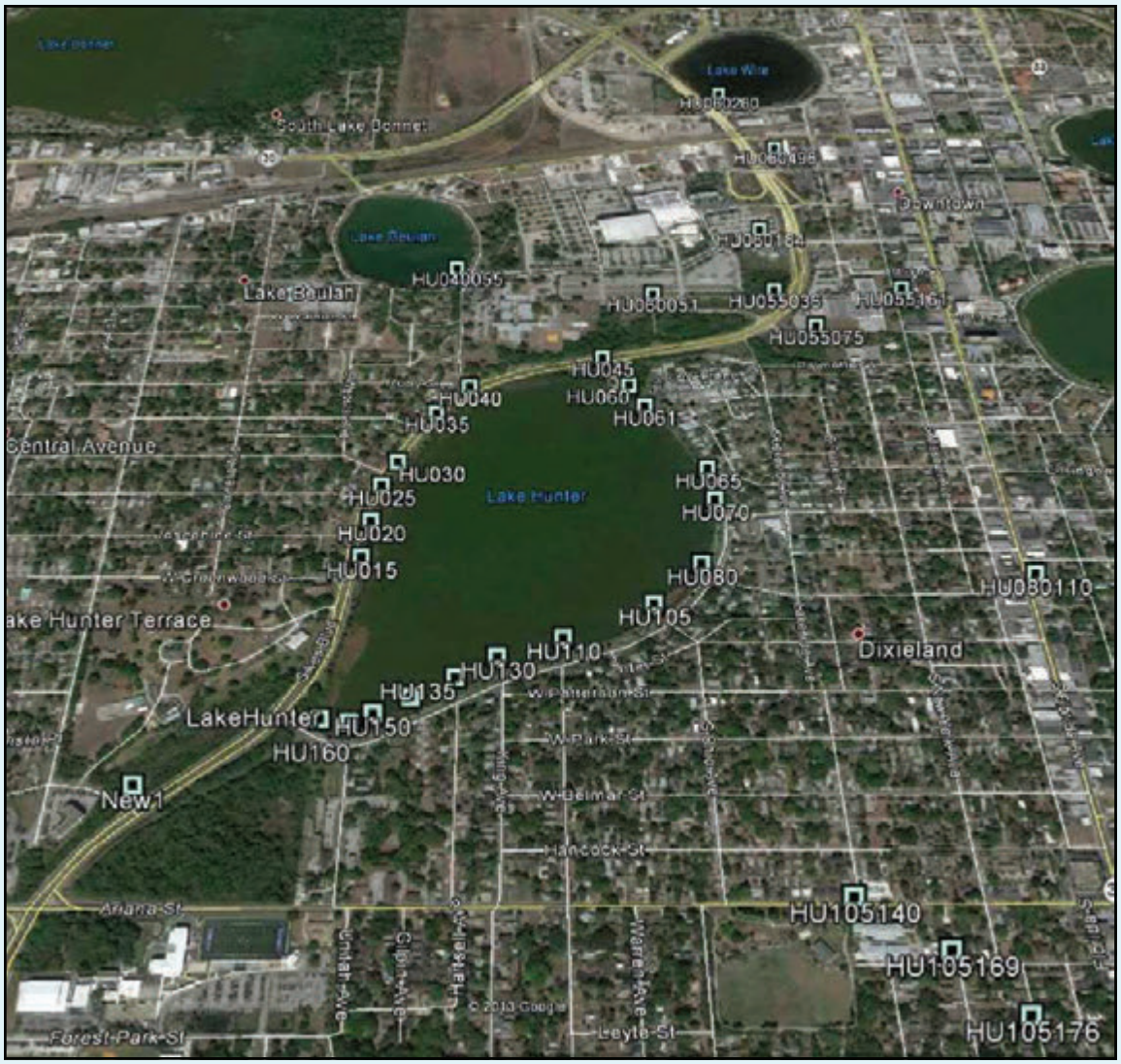

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Appendix B

Lake Hunter Monitoring Plan

TMDL MONITORING & ASSESSMENT PLAN IN ACCORDANCE WITH MS4 PERMIT NO. FLS000036-003

Prepared for

Florida Department of Environmental Protection
Tallahassee, Florida

From

City of Lakeland
Lakeland, Florida

Prepared by

AMEC
2000 E. Edgewood Drive, Suite 215
Lakeland, Florida 33803

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1.0 BACKGROUND

Lake Hunter is a shallow (mean depth = 5.5 feet) waterbody, approximately 94 acres in size, located within the City of Lakeland (**Figure 1**). Watershed soils are predominately phosphatic sands and clayey sands derived from Bone Valley and Hawthorne Group materials, and the area has historically been a site of intensive phosphate mining and processing activities. Other lakes in the region (the Lakeland/Bone Valley Upland Lake Region) are generally eutrophic to hypereutrophic and, characterized by elevated phosphorus, nitrogen and chlorophyll-*a* concentrations (Griffith et al. 1997). They also tend to be somewhat alkaline, with several receiving inputs of limestone-influenced groundwater (Griffith et al. 1997).

The Lake Hunter watershed has a surface area of approximately 900 acres (1.4 square miles) (AMEC 2013). It is highly urbanized, with approximately 97% of its surface area consisting of urban land uses and the remaining 3% made up of wetlands and wooded areas (Baniukiewicz and Gilbert 2004). Although no tributary streams discharge to the lake, it receives stormwater discharges from 18 MS4 outfalls located along the shoreline (**Figure 2**). Lakes Beulah and Wire, which are located up-gradient from Lake Hunter in the same watershed, provide periodic wet-weather discharges to the lake via two of these outfalls (Baniukiewicz and Gilbert 2004; see also Appendix A). The watershed contains no permitted domestic or industrial wastewater discharges (Baniukiewicz and Gilbert 2004). A total of 35 MS4 stormwater outfalls have been identified and mapped within the watershed (**Figure 2**) (AMEC 2013).

Lake Hunter is classified as a Class III freshwater body, with designated uses of human recreation and the propagation and maintenance of a healthy, well-balanced population of fish and wildlife. The lake was verified as impaired by the Florida Department of Environmental Protection (FDEP) due to elevated nutrient and chlorophyll-*a* levels and was included on the verified list of impaired waters for the Hillsborough River Basin that was adopted by FDEP Secretarial Order on May 27, 2004 (Baniukiewicz and Gilbert 2004).

A TMDL report (Baniukiewicz and Gilbert 2004) addressing the nutrient-related impairment was developed by FDEP in September, 2004. The MS4 wasteload allocation (WLA) calculated in the TMDL calls for 80% reductions below the TP and TN loadings that the lake is estimated to receive under current land use conditions (Baniukiewicz and Gilbert 2004).

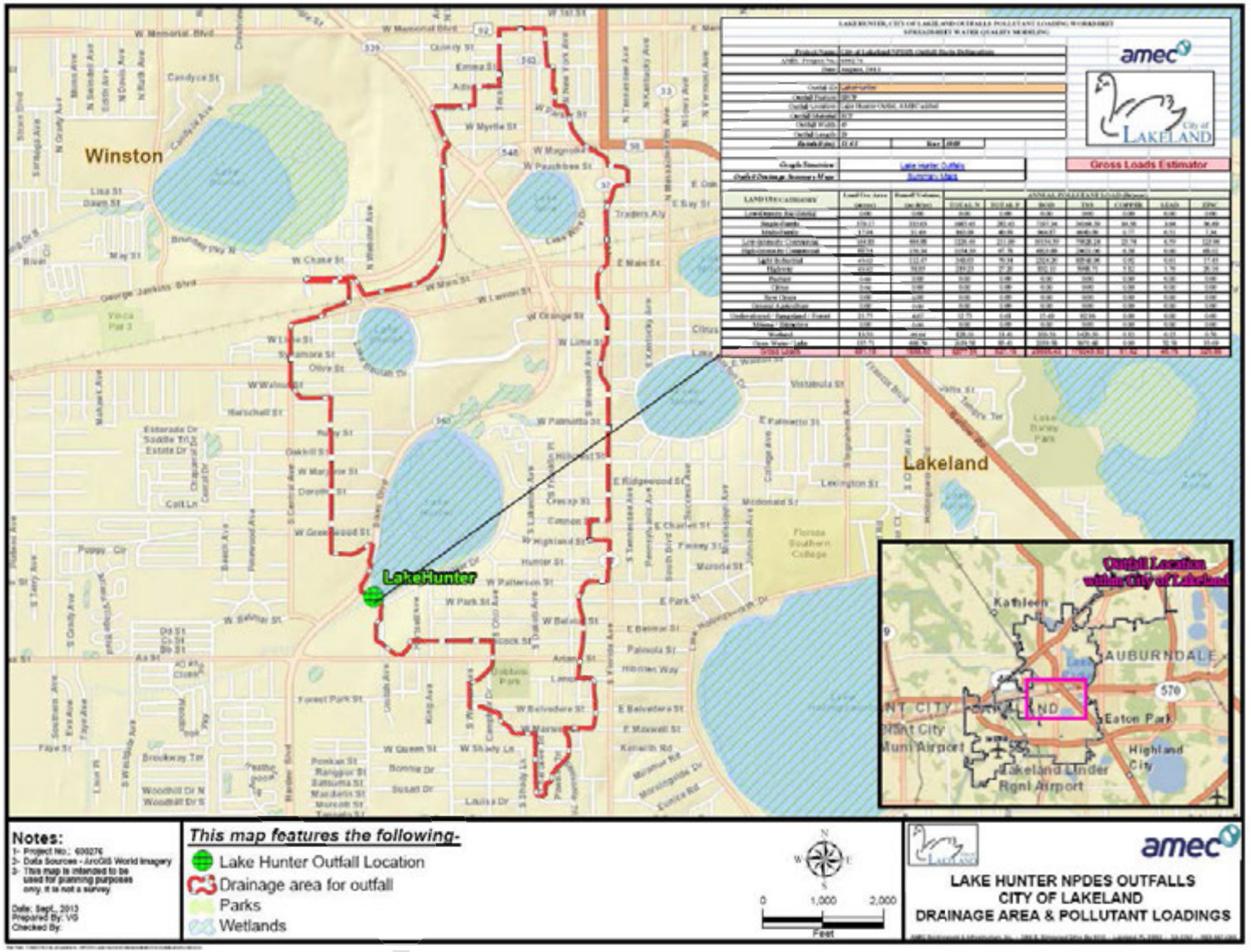

Figure 1 - Lake Hunter location map. (Source: AMEC 2013)

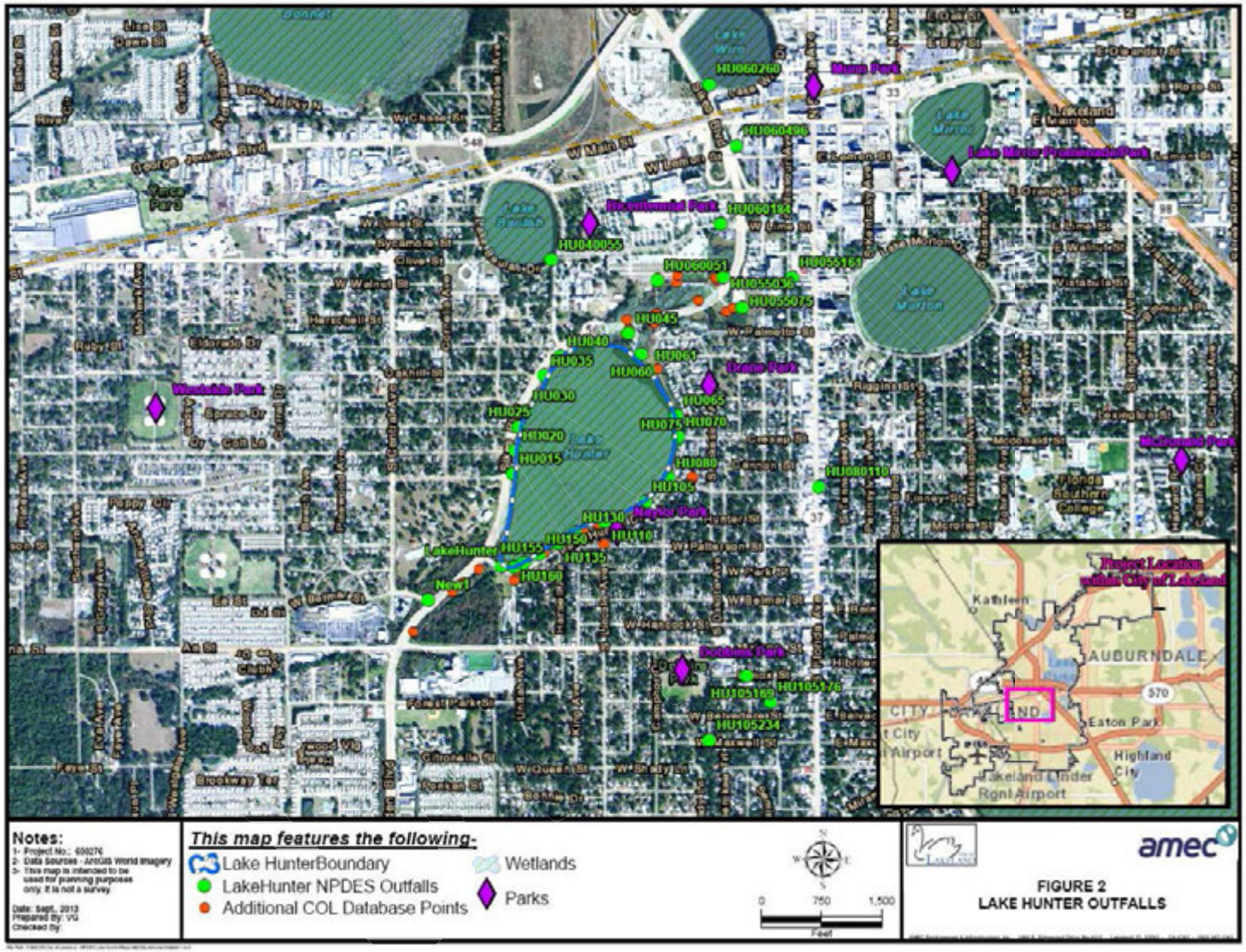

Figure 2 - MS4 outfalls in the Lake Hunter watershed. (Source: AMEC 2013)

2.0 OBJECTIVES OF TARGETED MS4 WATER QUALITY MONITORING

Primary objectives of the proposed monitoring program include:

- Documenting the stormwater loadings of TMDL pollutants (TP and TN) that are being discharged to Lake Hunter from the MS4 under current conditions;
- Identifying the major source areas of those stormwater pollutants within the contributing watershed; and
- Documenting future reductions in nutrient loadings and improvements in lake water quality as the TMDL Implementation Plan is carried out.

The monitoring plan proposed here includes a description of the proposed monitoring locations, monitoring methods to be used at each location, monitoring frequencies, and a narrative explaining how the data provided by the monitoring program will be used to evaluate temporal changes in stormwater nutrient loadings and water quality conditions in Lake Hunter.

3.0 MONITORING LOCATIONS, FREQUENCY AND METHODS

3.1 Stormwater Outfall Monitoring

Three MS4 outfalls (HU040, HU060 and HU105; locations shown in Appendix A) have been selected for the initial phase of targeted monitoring, based on the sizes of their contributing drainage basins and the estimated stormwater TP and TN loadings they deliver to Lake Hunter. All three outfalls discharge directly to the lake, and the combined surface area of their drainage basins makes up more than 70% of the Lake Hunter watershed. Outfall HU040 represents the discharge point of the 130-acre basin that includes Lake Beulah, while outfall HU060 is the discharge point for the 340-acre basin that includes Lake Wire. Outfall HU105 drains an approximately 110-acre basin located on the southeastern side of Lake Hunter. From model-based calculations, using the EPA "Simple Method", these three outfalls are estimated to be the lake's largest sources of stormwater nutrient loads, contributing about 60% of annual stormwater TP and 70% of annual stormwater TN inputs (AMEC 2013).

In order to document stormwater nutrient loads at these locations, flow-weighted storm event monitoring (using ISCO auto samplers) will be conducted at each of the three outfalls. A minimum of one dry-season and one wet-season storm event will be sampled at each location, providing data from a minimum of six storm events. Parameters monitored will include TSS, phosphorus forms (soluble reactive phosphorus and TP), nitrogen forms (ammonia-N, nitrate+nitrite N and TKN), and chlorophyll-a (for the Lake Beulah and Lake Wire discharges).

Baseflow sampling will also be conducted at each of the three sites, during periods when baseflows are present. Previous studies have suggested that the Lake Beulah and Lake Wire basins, in particular, can provide substantial baseflow discharges to Lake Hunter. Baniukiewicz and Gilbert (2004) stated that "discharges from those two lakes constitute major inflows to Lake Hunter." The magnitudes of these discharges appear to be highly variably from season to season and year to year, fluctuating in response to rainfall. Estimates provided by Baniukiewicz and Gilbert (2004) for the years 1988 through 2002 are shown in **Figure 3**.

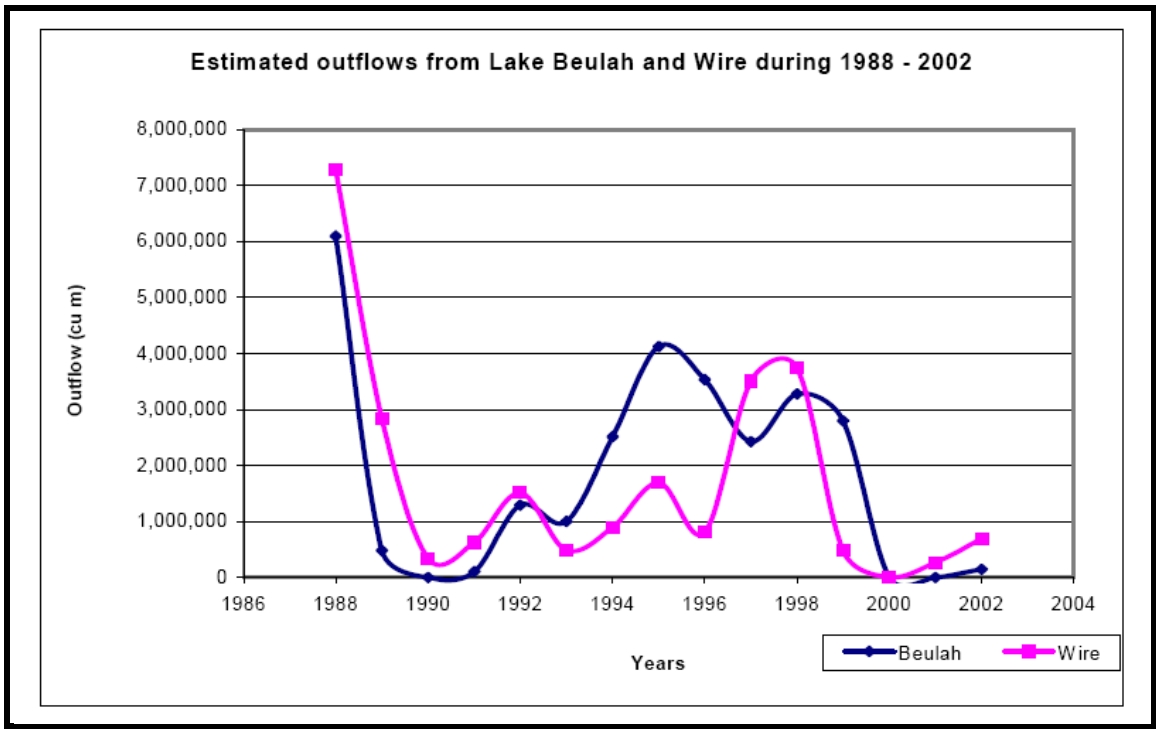

Figure 3 - Estimated discharges to Lake Hunter from lakes Beulah and Wire, 1988 – 2002. (Source: Baniukiewicz and Gilbert 2004)

To monitor baseflow quantity, continuous flow recording equipment will be installed at each outfall for a minimum of one calendar year. During periods when baseflow is occurring, water quality sampling will be performed on a monthly basis. Water quality parameters monitored will include phosphorus forms (soluble reactive phosphorus and TP), nitrogen forms (ammonia-N, nitrate+nitrite N and TKN), and chlorophyll-a (for the Lake Beulah and Lake Wire discharges). Initial samples from the Lake Wire basin will also be analyzed for lead (Pb), due to past detections of elevated levels of this pollutant in the lake (U.S. Dept. Health and Human Services 2008).

3.2 Lake Water Column Monitoring

The City of Lakeland's existing ambient water quality monitoring program will be continued in Lake Hunter, as well as in lakes Beulah and Wire. Samples are collected quarterly, at a single monitoring station in each lake. Water quality parameters included in the monitoring program include:

- Secchi disk depth (m)
- Water temperature (C)
- pH (SU)
- Dissolved oxygen (mg/L)
- Specific condutance (uS/cm)
- Alkalinity
- Chloride
- Chlorophyll-a (uncorrected)
- Chlorophyll-a (corrected for pheophytin)

- Color
- Sulfate
- TSS
- Turbidity
- NH3
- TKN
- NO_2-N + NO_3-N
- TN
- Ortho-P
- TP

Phytoplankton sampling will also be conducted, with cyanobacteria and other phytoplankton taxa identified to species and enumerated.

3.3 Lake Sediment Sampling

Lake Hunter has been highly eutrophic for several decades: since the early 1980s annual mean chlorophyll-*a* values have consistently exceeded 56 µg/L (Fig. 4), the commonly-used threshold for classifying a lake as "hypereutrophic". (Interestingly, chlorophyll-a and TN concentrations have been consistently higher in Lake Hunter than in lakes Beulah and Wire throughout this period [**Figures 4 and 5**].)

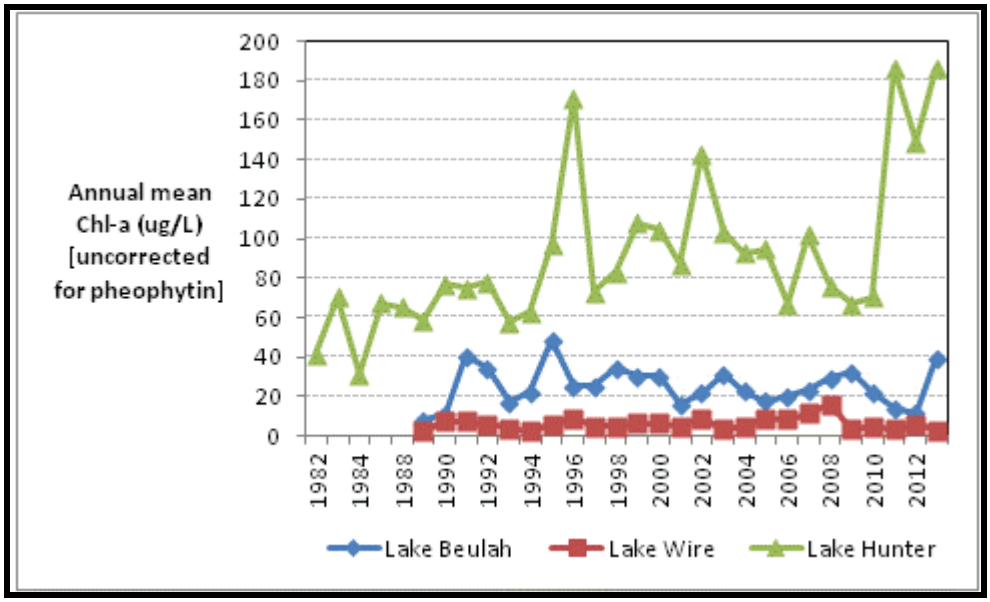

Figure 4 - Annual mean chlorophyll-a concentrations in lakes Hunter, Beulah, and Wire. (Data source: City of Lakeland)

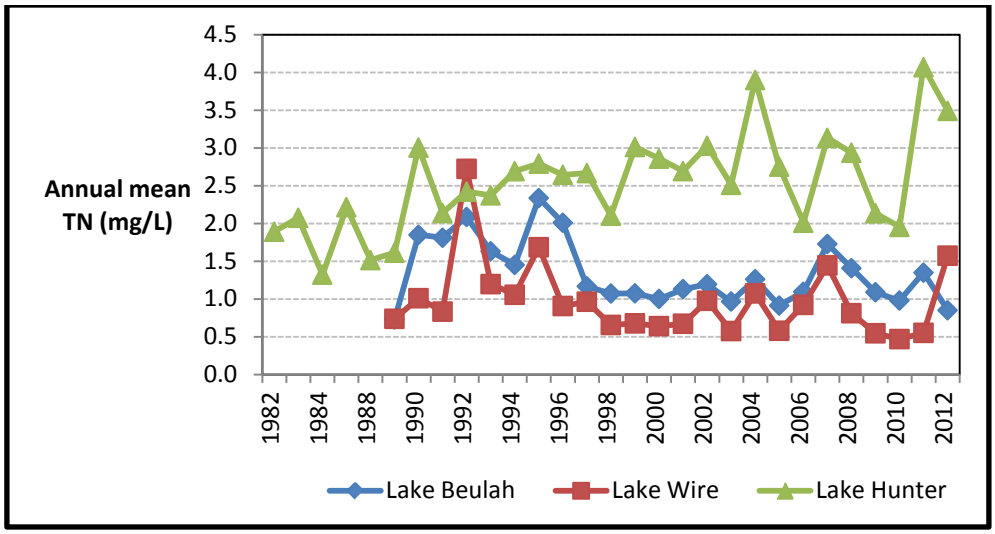

Figure 5 - Annual mean TN concentrations in lakes Hunter, Beulah, and Wire. (Data source: City of Lakeland)

In the 1980s, over-abundant macrophyte growth was also noted as a management issue for Lake Hunter. The City of Lakeland (2001) reported that grass carp were introduced at that time, at a high stocking rate that caused the elimination of the lake's macrophytes. Scheffer (2004) noted that grass carp introductions frequently have this effect, "leading to increased turbidity and sediment resuspension." The City of Lakeland (2001) reported that a lake drawdown "was attempted in 1983-1984 for soft sediment consolidation and removal".

The presence of a large quantity of unconsolidated sediment is a frequent management issue in highly eutrophic lakes (Scheffer 2004, Cook et al. 2005). If substantial deposits of unconsolidated sediments are currently present in Lake Hunter, it is possible that phosphorus fluxes from the sediments may be contributing to the current nutrient-related water quality impairment (e.g., Brezonik and Pollman 1999; Scheffer 2004, Cook et al. 2005).

In order to assess this possibility, a sediment mapping and sampling project will be conducted to quantify the mass of bioavailable phosphorus (BAP) that is currently present in the uppermost (upper 10 cm) layer of the lake's sediments. This information will be used to determine the potential importance of sediment BAP fluxes as a factor affecting water column productivity and lake trophic state, following the methods used by Olila et al. (1995) in Lake Apopka and Lake Okeechobee and Diaz et al. (2006) in the Everglades Water Conservation Areas.

Sediment sampling and analytical methods will follow those used by Meis et al. (2012). Intact sediment cores will be collected from multiple representative locations within the lake. The number and locations of coring sites will be determined following a bathymetric survey of the lake bottom, which will provide information on the current locations and thicknesses of sediment deposits. Following collection, cores will be extruded to a depth of 10 cm, purged with N_2, and stored in darkness at <4 ^{o}C during transport to the laboratory before being frozen prior to processing for chemical analyses.

The mass of potentially bioavailable P in the upper 10 cm of sediments will be quantified using the sequential phosphorus extraction procedures used by Meis et al. (2012), which are based on methods developed earlier by Hupfer et al. (1995) and Psenner et al. (1988). The sequence includes the following steps:

(1) extraction with 1 M NH_4Cl to determine loosely adsorbed and porewater P ('labile P');

(2) extraction with 0.11 M $NaHCO_3$/0.11 M $Na_2S_2O_4$ to determine P mainly bound to Fe-hydroxides or manganese (Mn) compounds ('reductant-soluble P');

(3a) extraction in 1 M NaOH to mobilize P which is mainly exchangeable against hydroxide ions determined as SRP ('metal-oxide adsorbed P') and

(3b) organic bound P in the same fraction quantified by subtracting NaOH-SRP from NaOH-TSP[1] ('organic P');

(4) extraction with 0.5 M HCl to determine P bound to carbonates and apatite P ('apatite bound P');

(5) digestion with 30% (v/v) H_2SO_4 and 8% $K_2S_2O_4$ followed by TSP quantification to determine refractory P ('residual P').

An overview of the operational sediment P fractions quantified using this procedure, the driving factors that cause them to release BAP to the water column, and the likelihood of BAP releases is provided in **Table 1**.

[1] TSP = total soluble phosphorus

TABLE 1
Summary of operational sediment P fractions based on sequential P-extraction procedures.
(Source: Meis et al. 2012)

P fraction	P forms in fraction	Driver of BAP release from sediments	Likelihood of BAP release to water column
'Labile P'	Directly bioavailable P; pore water P; loosely bound or adsorbed P	Desorption; diffusion; steep concentration gradients	High
'Reductant soluble P'	P bound to Fe-hydroxides and Mn-compounds	Anoxia	High
'Organic P'	Allochthonous and autochthonous organic material; detritus	Bacterial mineralization (temperature dependent)	Medium/High
'Metal-oxide adsorbed P'	P adsorbed to metal oxides (mainly Fe, Al); P exchangeable against OH^-	High pH (e.g., from high levels of photosynthetic activity in water column)	Medium/High
'Apatite bound P'	P bound to carbonates and apatite P	Low pH	Medium
'Residual P'	Refractory compounds		Low

4.0 Data Analysis Strategy

The proposed monitoring program will provide the following data sets:

- The quantity and quality of baseflows and stormwater discharges entering Lake Hunter from MS4 discharge points HU040, HU060 and HU105, whose drainage basins represent more than 70% of the Lake Hunter watershed;

- Water quality conditions and phytoplankton species composition within Lake Hunter; and

- The locations and volumes of unconsolidated sediment deposits on the lake bottom, the P forms present in those deposits, and the mass of bioavailable phosphorus present.

Following the initial year of monitoring, these data sets will be analyzed to:

- Quantify the hydrologic and nutrient loads discharged to Lake Hunter from the three monitored MS4 discharge points;
- Quantify annual mean values of nutrient and chlorophyll-*a* concentrations within the lake;
- Provide a summary of phytoplankton species composition on an annual and seasonal basis;
- Quantify the mass of bioavailable P present in the lake water column and sediments, and the potential impacts of sediment BAP fluxes on lake trophic state; and
- Determine the relative importance of stormwater P loads and internal (sediment-derived) P fluxes as factors underlying the lake's nutrient-related impairment.

At the end of the initial year of monitoring the monitoring plan will be re-evaluated to determine whether sampling methods, locations or frequencies need to be revised to improve data quality or the overall cost-effectiveness of the monitoring program. If one or more of the three MS4 outfalls monitored during the initial year is shown to be a key nutrient discharge point, additional targeted stormwater monitoring may be carried out at selected locations within the basin in subsequent years to identify the sub-basins that are contributing the largest nutrient loads.

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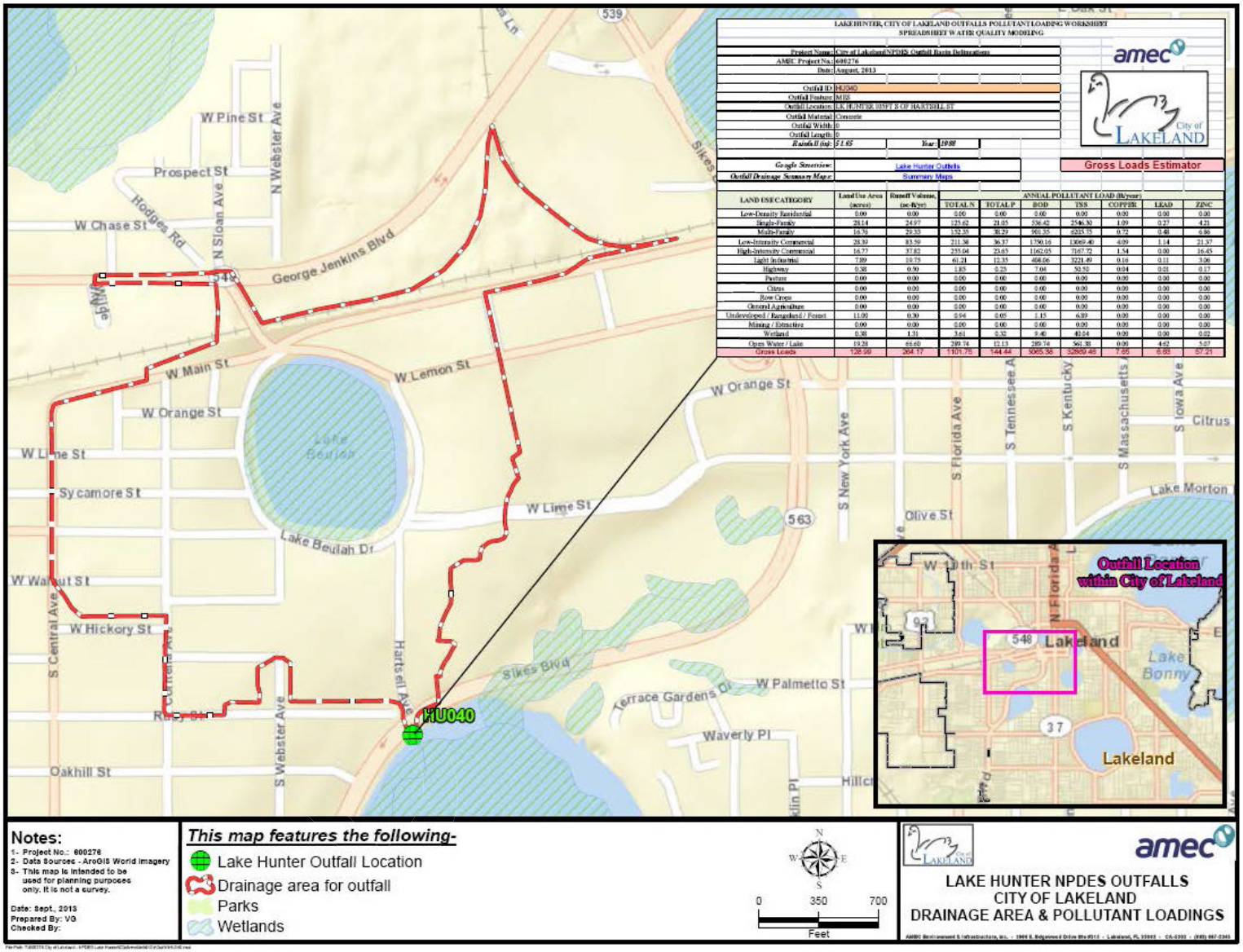
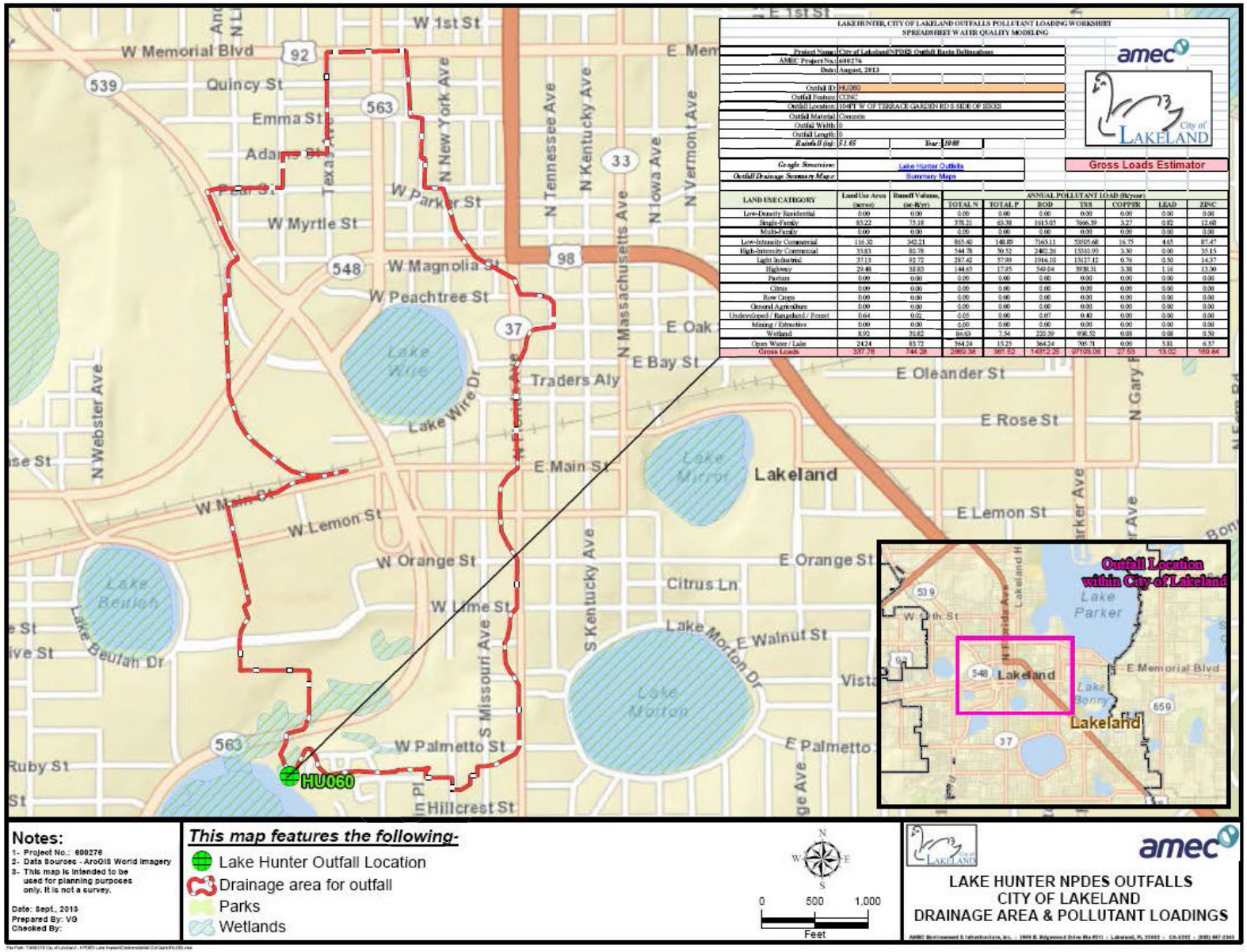
APPENDIX A:

MS4 Outfalls and Drainage Basins

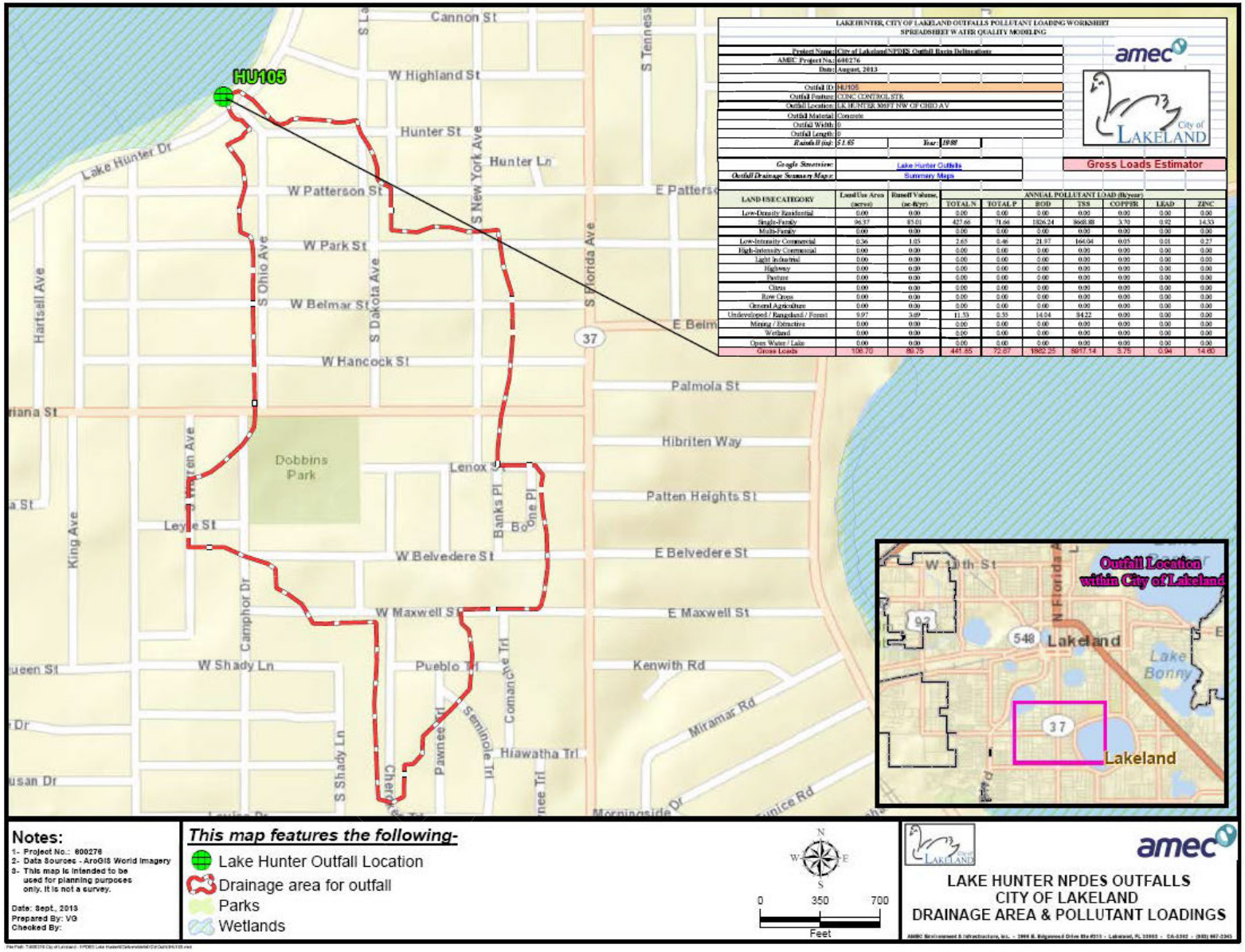
Outfall HU040



Outfall HU060



Outfall HU105



LAKE HUNTER, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276
Date:	August, 2013
Outfall ID:	HU105
Outfall Feature:	CONC CONTROL STR
Outfall Location:	LK HUNTER 30SFT NW OF OHIO AV
Outfall Material:	Concrete
Outfall Width:	0
Outfall Length:	0
Rainfall (in):	51.85
Year:	1988
Google Streetview:	Lake Hunter Outfalls
Outfall Drainage Summary Maps:	Summary Maps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year) TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	96.57	83.01	427.66	71.66	1826.24	8605.88	3.70	0.92	14.33
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.36	1.05	2.65	0.46	21.97	164.04	0.05	0.01	0.27
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	9.97	3.09	11.33	0.55	14.04	94.22	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	106.70	89.75	441.65	72.67	1862.25	8917.14	3.75	0.94	14.60

Appendix C

Lake Bonny Outfall Delineations

Lake Bonny
NPDES Outfall Basin Delineations
&
Pollutant Loadings

Project No.: 600276.2
Date: February 2014

LAKE BONNY
NPDES OUTFALL BASIN DELINEATIONS
&
POLLUTANT LOADINGS

Prepared for

CITY OF LAKELAND
Lakeland, Florida

Prepared by

AMEC Environment & Infrastructure, Inc.
2000 E. Edgewood Drive, Suite 215
Lakeland, Florida 33803

AMEC Project No. 600276.2

February 2014

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1.0 INTRODUCTION

1.1 Purpose and Objectives

AMEC Environment & Infrastructure, Inc. (AMEC) was contracted by the City of Lakeland (COL) Lakes and Stormwater Department to assist with the development of the annual pollutant loading assessments for Lake Bonny as required by the recently issued NPDES permit for COL. The tasks include determining drainage basin boundaries; determining the extent of the associated land use types; and computing the resulting predictions of pollutant loading for each of the 45 outfalls identified.

1.2 Project Location and General Description

Lake Bonny is located in the south side of the COL limits and is adjacent to Lake Parker to the North and Lake Hollingsworth to the Southwest. The City's available storm sewer network information was obtained by AMEC to help assess the drainage area for each outfall. **Figure 1** illustrates the location of Lake Bonny within COL and **Figure 2** identifies the 45 outfalls analyzed for this report.

2.0 SURFACE WATER QUALITY MODEL

Pollutant load modeling was conducted to estimate the annual stormwater pollutant loads associated with each drainage basin. The pollutant load modeling was accomplished using an MS Excel spreadsheet tool named Pollutant Loadings and Load Reduction (PL2R) tool developed in-house by AMEC that is based on criteria of the Florida Statewide Stormwater Rule and using the modified U.S. Environmental Protection Agency's (EPA) Simple Method (Schueler, 1987). The Simple Method estimates stormwater pollutant loads as the product of annual runoff volume and pollutant concentration.

The Simple Method is a three-step calculation (Ohrel, 2000):

1. Runoff coefficient calculation, Rv:

   $Rv = 0.05 + 0.009 * I$

   Where:
   - Rv = Mean runoff coefficient
   - I = Percent of site imperviousness

2. Runoff volume (ac-ft/yr) calculation:

   $R = (P * Pj * Rv / 12) * A$

   Where:
   - R = Runoff volume (ac-ft/yr)
   - P = Annual rainfall depth (in)
   - Pj = Fraction of rainfall events that produce runoff (normally equal to 0.9)
   - A = Study area (ac)

3. Annual pollutant loads (lb/yr)

   $L = 2.72 * R * C$

   Where:
   - L = Annual pollutant load (lb/yr)
   - C = Event mean concentration of the pollutant (mg/l)
   - 2.72 = Conversion factor (from mg/l to lb/ac-ft)

For this investigation, the Simple Method is modified in accordance with the Florida Statewide Stormwater Rule for calculating annual runoff as follows:

$Q = ciA$

Where:
- Q = Runoff Volume (ac-ft)/yr
- c = Runoff coefficient determined based on Florida Meteorological Zone
- i = Rainfall depth (in)
- A = Area (ac)

The runoff coefficient 'c' is determined based on the combination of the non-directly connected impervious area curve number (NDCIA CN), the percent of directly connected impervious area (DCIA), as well as the meteorological zone within which the project area falls. The state rule handbook has the runoff coefficients published for each NDCIA CN-DCIA combination and for each meteorological zone in Florida. Among the five meteorological zones defined in Florida, Polk County falls into Zone 2. Published runoff coefficients for Zone 2 are tabulated in **Table 1**. The NDCIA CN and DCIA for the drainage basins were determined by using the lookup table provided in this report as **Table 3**.

The rainfall was determined by summarizing the rainfall depth for each calendar year calculating basic statistics such as minimum, maximum, and average annual rainfall depths. The years with annual rainfall amounts closest to the average of the entire analyzed dataset were selected for use in the model simulations. From over 90 years of rainfall data available, 8 to 10 years of data had annual rainfall depths close to the mean annual depth for all years.

Within this data set, years dominated by a few days with high rainfall depths, will have less total abstraction than a rainfall year with the same depth of rainfall spread over a longer period of time. In order to compensate for this effect, the rainfall year 1988 was selected for use to estimate pollutant loads since it had a total runoff closest to the average runoff from all 8 years of rainfall data tested. The year 1988 which recorded a rainfall depth of 51.65 inches was selected from this group of rainfall data and was used in determining the pollutant loading model simulations to estimate annual runoff volumes.

Although the Simple Method is accepted as an appropriate and reasonable approximation technique to estimate the pollution loading contributed during the storms, it does have several limitations (Center, 2003):

- This method cannot be used to estimate the pollutant loads generated by base flow, only the loads generated during the storm.
- The Simple Method should be limited to basin areas smaller than 640 acres. Larger basins require a more complex method of analysis.
- This technique may not accurately estimate pollutant loads for construction sites, heavily traveled highways, croplands, and undeveloped areas.

Despite the above limitations, the Simple Method is considered an excellent tool for comparing pollutant loads of different drainage sub-basins for prioritization purposes.

Table 2 lists the event mean concentrations (EMC) used to estimate pollutant loads for the Lake Bonny sub-basins. The EMCs are estimated average load concentrations from specific land uses based on past monitoring activities conducted throughout the State of Florida, and were derived from several sources as noted in the documentation.

Lake Bonny NPDES Outfall calculations and basin delineation maps are located in **Appendix A**.

Table 1
Published Runoff Coefficients (c) for Meteorological Zone 2
Based on Non-DCIA CN and Percent DCIA

NDCIA CN	PERCENT DCIA																				
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
30	0.002	0.043	0.083	0.123	0.164	0.204	0.244	0.285	0.325	0.366	0.406	0.446	0.487	0.527	0.567	0.608	0.648	0.688	0.729	0.769	0.809
35	0.004	0.044	0.085	0.125	0.165	0.205	0.246	0.286	0.326	0.366	0.407	0.447	0.487	0.528	0.568	0.608	0.648	0.689	0.729	0.769	0.809
40	0.007	0.047	0.087	0.127	0.167	0.207	0.248	0.288	0.328	0.368	0.408	0.448	0.488	0.528	0.569	0.609	0.649	0.689	0.729	0.769	0.809
45	0.01	0.05	0.09	0.13	0.17	0.21	0.25	0.29	0.33	0.37	0.41	0.45	0.49	0.53	0.57	0.61	0.65	0.69	0.729	0.769	0.809
50	0.015	0.055	0.095	0.134	0.174	0.214	0.254	0.293	0.333	0.373	0.412	0.452	0.492	0.531	0.571	0.611	0.651	0.69	0.73	0.77	0.809
55	0.022	0.061	0.101	0.14	0.179	0.219	0.258	0.298	0.337	0.376	0.416	0.455	0.494	0.534	0.573	0.613	0.652	0.691	0.731	0.77	0.809
60	0.03	0.069	0.108	0.147	0.186	0.225	0.264	0.303	0.342	0.381	0.42	0.459	0.498	0.537	0.576	0.615	0.654	0.693	0.731	0.77	0.809
65	0.042	0.08	0.119	0.157	0.195	0.234	0.272	0.311	0.349	0.387	0.426	0.464	0.502	0.541	0.579	0.618	0.656	0.694	0.733	0.771	0.809
70	0.057	0.095	0.133	0.17	0.208	0.245	0.283	0.321	0.358	0.396	0.433	0.471	0.509	0.546	0.584	0.621	0.659	0.697	0.734	0.772	0.809
75	0.079	0.116	0.152	0.189	0.225	0.262	0.298	0.335	0.371	0.408	0.444	0.481	0.517	0.554	0.59	0.627	0.663	0.7	0.736	0.773	0.809
80	0.111	0.146	0.181	0.216	0.251	0.285	0.32	0.355	0.39	0.425	0.46	0.495	0.53	0.565	0.6	0.635	0.67	0.705	0.74	0.774	0.809
85	0.16	0.192	0.225	0.257	0.29	0.322	0.355	0.387	0.42	0.452	0.485	0.517	0.55	0.582	0.614	0.647	0.679	0.712	0.744	0.777	0.809
90	0.242	0.27	0.299	0.327	0.355	0.384	0.412	0.44	0.469	0.497	0.526	0.554	0.582	0.611	0.639	0.667	0.696	0.724	0.753	0.781	0.809
95	0.404	0.424	0.444	0.464	0.485	0.505	0.525	0.546	0.566	0.586	0.606	0.627	0.647	0.667	0.688	0.708	0.728	0.749	0.769	0.789	0.809
98	0.595	0.605	0.616	0.627	0.638	0.648	0.659	0.67	0.68	0.691	0.702	0.713	0.723	0.734	0.745	0.756	0.766	0.777	0.788	0.799	0.809

Table 2
Summary of Literature-Based Runoff Characterization Data for General Land use Categories in Florida

Land use Category	Typical Runoff Concentration (mg/l)						
	TN	TP	BOD	TSS	Cu	Pb	Zn
Low-Density Residential[1]	1.5	0.18	4.7	23	0.008[4]	0.002[4]	0.031[4]
Single-Family	1.85	0.31	7.9	37.5	0.016	0.004	0.062
Multi-Family	1.91	0.48	11.3	77.8	0.009	0.006	0.086
Low-Intensity Commercial	0.93	0.16	7.7	57.5	0.018	0.005	0.094
High-Intensity Commercial	2.48	0.23	11.3	69.7	0.015	--	0.16
Light Industrial	1.14	0.23	7.6	60	0.003	0.002	0.057
Highway	1.37	0.17	5.2	37.3	0.032	0.011	0.126
Pasture	2.48	0.7	5.1	94.3	--	--	--
Citrus	2.31	0.16	2.55	15.5	0.003	0.001	0.012
Row Crops	2.47	0.51	--	19.8	0.022	0.004	0.03
General Agriculture[2]	2.42	0.46	3.8	43.2	0.013	0.003	0.021
Undeveloped / Rangeland / Forest	1.15	0.055	1.4	8.4	--	--	--
Mining / Extractive	1.18	0.15	7.6[3]	60.0[3]	0.003[3]	0.002[3]	0.057[3]
Wetland	1.01	0.09	2.63	11.2	0.001	0.001	0.006
Open Water / Lake	1.6	0.067	1.6	3.1		0.025[5]	0.028

1. Average of single-family and undeveloped loading rates
2. Mean of pasture, citrus, and row crop land uses
3. Runoff concentrations assumed equal to industrial values for these parameters
4. Value assumed to be equal to 50% of single-family concentration
5. Runoff concentrations assumed equal to wetland values for these parameters

Notes: This table is a replica of the Table 4-17 in the Final Report of "Evaluation of Current Stormwater Design Criteria within the state of Florida" prepared for: Florida Department of Environmental Protection (June 2007). Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.

Total N and Total P EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.

Wetland and Open Water/Lake EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida". (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.

Table 3
Summary of Curve Numbers
Based On Landuse and Soil Group

FLUCCS	Generalized Land use Description	Hydrologic Soils Group						DCIA
		A	B	B/D	C	D	W	
1100	Residential-Low Density	39	61	61	74	80	99.8	20
1200	Residential-Med Density	39	61	61	74	80	99.8	25
1300	Residential-High Density	39	61	61	74	80	99.8	50
1400	Commercial	39	61	61	74	80	99.8	85
1500	Industrial	39	61	61	74	80	99.8	72
1600	Extractive	39	61	61	74	80	99.8	0
1700	Institutional	39	61	61	74	80	99.8	65
1800	Recreational	39	61	80	74	80	99.8	10
1900	Open Land	39	61	80	74	80	99.8	0
2100	Cropland and Pastureland	39	61	80	74	80	99.8	0
2200	Tree Crops - Citrus	32	58	79	72	79	99.8	10
2300	Feeding Operations	32	58	79	72	79	99.8	10
2400	Nurseries and Vineyards	67	78	89	85	89	99.8	5
2500	Specialty Farms	67	78	89	85	89	99.8	5
2600	Other Open Lands - Rural	39	61	80	74	80	99.8	0
3100	Herbaceous Rangeland	39	61	80	74	80	99.8	0
3200	Shrub and Brush Rangeland	30	48	73	65	73	99.8	0
3300	Mixed Rangeland	30	48	73	65	73	99.8	0
4100	Upland Coniferous Forest	32	58	79	72	79	99.8	0
4200	Upland Hardwood Forests	32	58	79	72	79	99.8	0
4300	Mixed Hardwood Forests	32	58	79	72	79	99.8	0
4400	Tree Plantations	32	58	79	72	79	99.8	0
5000	Water	99.8	99.8	99.8	99.8	99.8	99.8	100
5100	Streams and Waterways	99.8	99.8	99.8	99.8	99.8	99.8	100
5200	Lakes	99.8	99.8	99.8	99.8	99.8	99.8	100
5300	Reservoirs	99.8	99.8	99.8	99.8	99.8	99.8	100
6100	Wetland Hardwood Forests	99.8	99.8	99.8	99.8	99.8	99.8	100
6200	Wetland Coniferous Forests	99.8	99.8	99.8	99.8	99.8	99.8	100
6300	Wetland Forested Mixed	98	98	98	98	98	99.8	100
6400	Vegetated Non-Forested Wetlands	98	98	98	98	98	99.8	100
7400	Mining	39	61	80	74	80	99.8	0
8100	Transportation / Utilities	83	89	89	92	93	99.8	25
8200	Communications	83	89	89	92	93	99.8	25
8300	Utilities	83	89	89	92	93	99.8	25

3.0 REFERENCES

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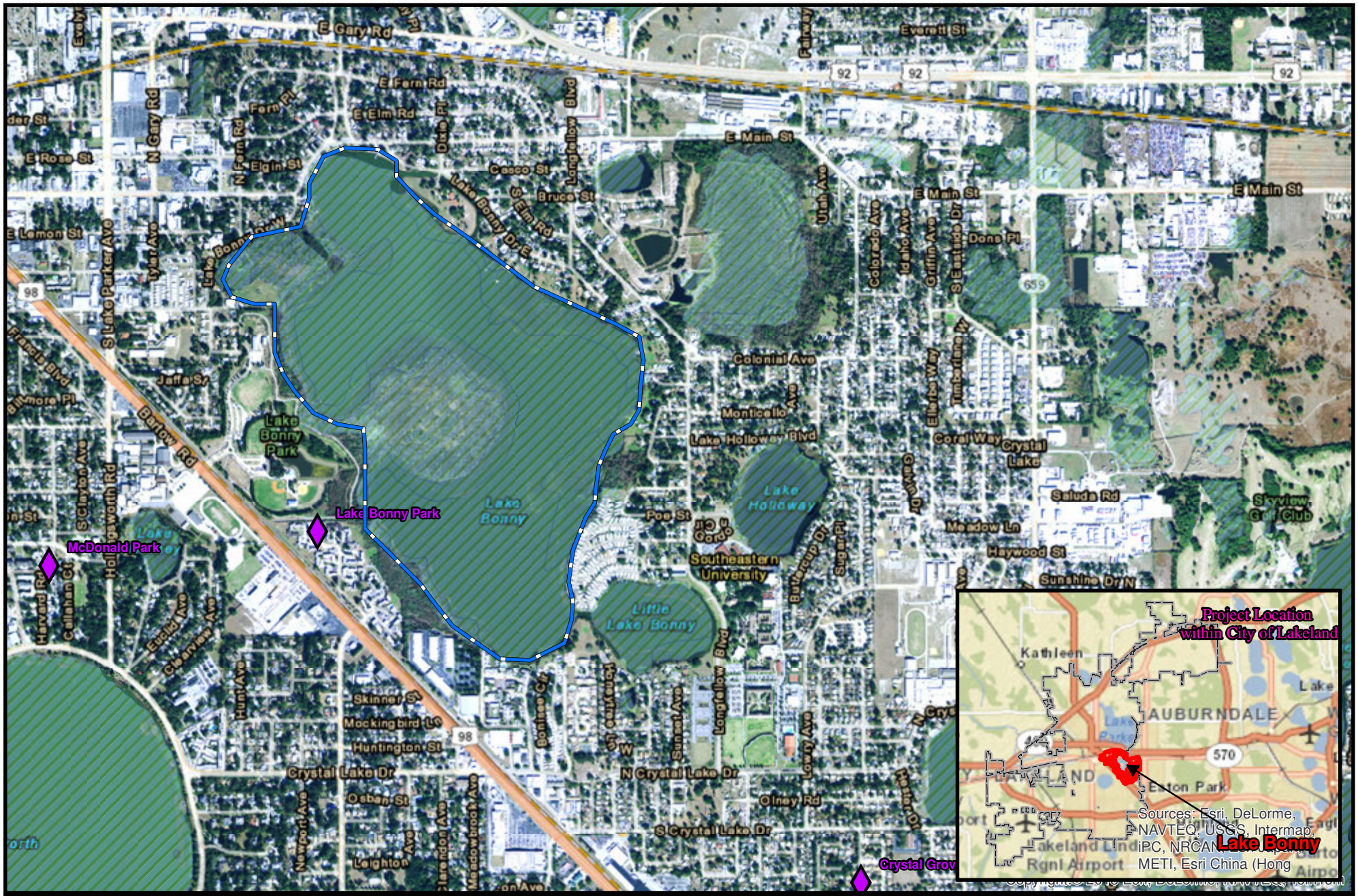
Figures



Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Boundary

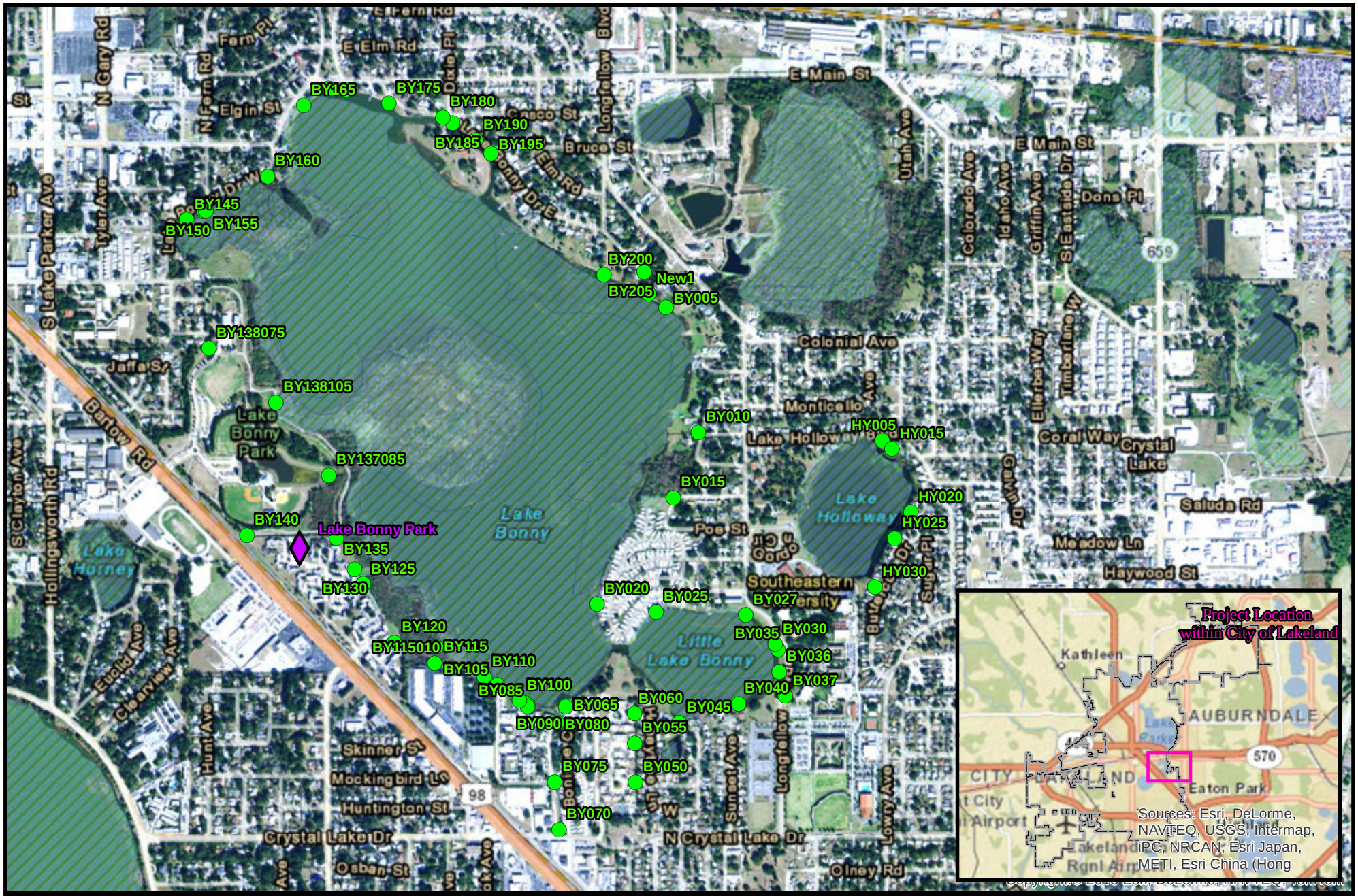
N
W E
S

0 700 1,400
Feet

FIGURE 1
LAKE BONNY LOCATION MAP

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276.2 City of Lakeland - NPDES Lake Bonny\Report\Figures\LakeBonnyOutfalls_Location1.mxd



Notes:

1- Project No.: 600276
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: Sept., 2013
Prepared By: VG
Checked By:

This map features the following-

- Lake Bonny NPDES Outfalls
- Wetlands
- Parks

N W E S

0 625 1,250

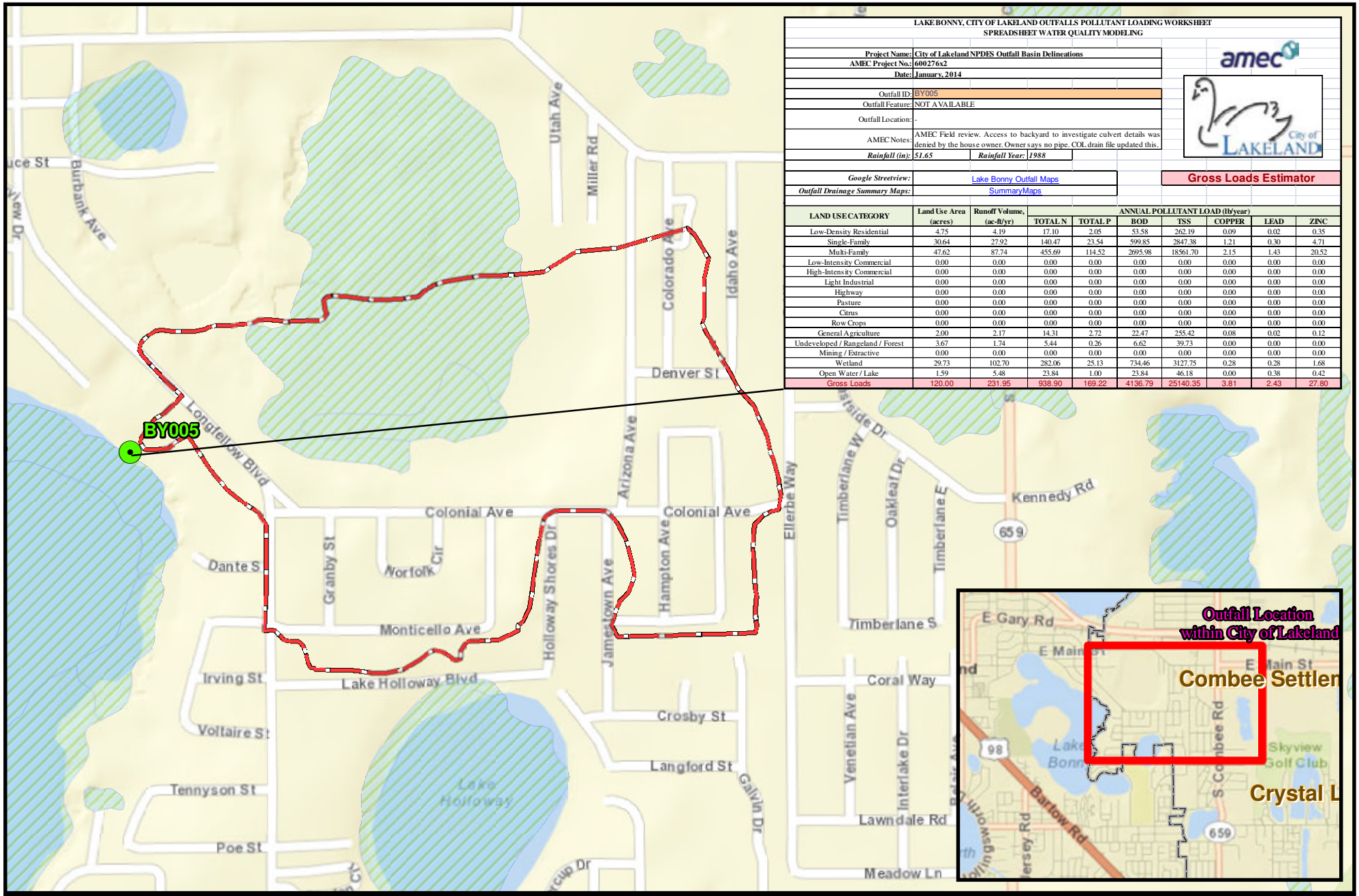
Feet

FIGURE 2
LAKE BONNY OUTFALLS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276.2 City of Lakeland - NPDES Lake Bonny\Report\Figures\LakeBonnyOutfalls1.mxd

Appendix A



LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY005
Outfall Feature:	NOT AVAILABLE
Outfall Location:	-
AMEC Notes:	AMEC Field review. Access to backyard to investigate culvert details was denied by the house owner. Owner says no pipe. COL drain file updated this.
Rainfall (in):	*51.65*
Rainfall Year:	*1988*
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	4.75	4.19	17.10	2.05	53.58	262.19	0.09	0.02	0.35
Single-Family	30.64	27.92	140.47	23.54	599.85	2847.38	1.21	0.30	4.71
Multi-Family	47.62	87.74	455.69	114.52	2695.98	18561.70	2.15	1.43	20.52
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	2.00	2.17	14.31	2.72	22.47	255.42	0.08	0.02	0.12
Undeveloped / Rangeland / Forest	3.67	1.74	5.44	0.26	6.62	39.73	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	29.73	102.70	282.06	25.13	734.46	3127.75	0.28	0.28	1.68
Open Water / Lake	1.59	5.48	23.84	1.00	23.84	46.18	0.00	0.38	0.42
Gross Loads	120.00	231.95	938.90	169.22	4136.79	25140.35	3.81	2.43	27.80

Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfall
- Drainage Area Boundary

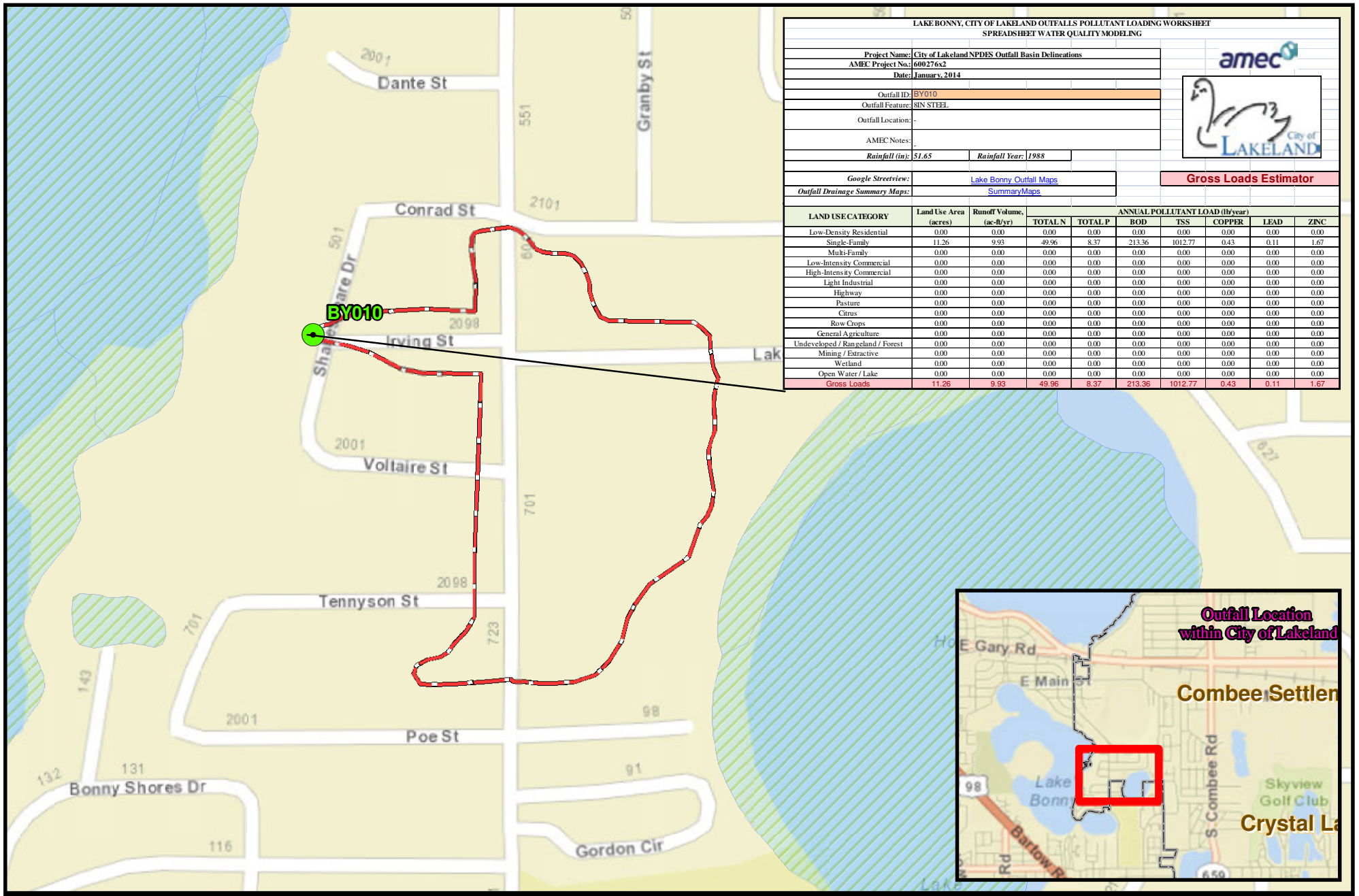
N W E S

0 350 700
Feet

LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276.2 City of Lakeland - NPDES Lake Bonny\Technical\GIS\Figures\FLakeBonny_BY005.mxd



LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY010
Outfall Feature:	SIN STEEL
Outfall Location:	-
AMEC Notes:	-
Rainfall (in):	*51.65*
Rainfall Year:	*1988*
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	11.26	9.93	49.96	8.37	213.36	1012.77	0.43	0.11	1.67
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	11.26	9.93	49.96	8.37	213.36	1012.77	0.43	0.11	1.67

Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

N W E S

0 150 300
Feet

LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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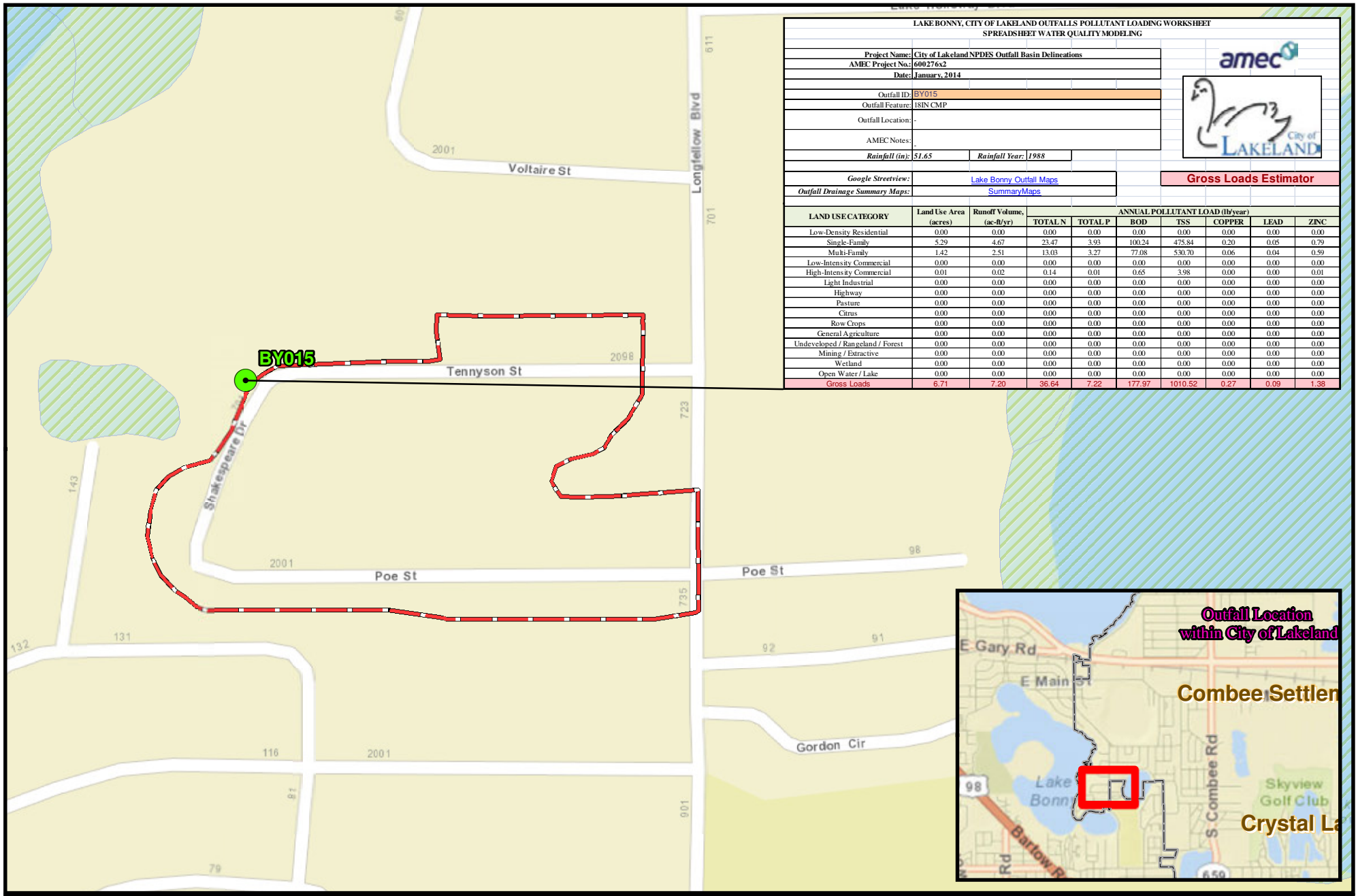

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY015
Outfall Feature:	18IN CMP
Outfall Location:	-
AMEC Notes:	-
Rainfall (in):	*51.65*
Rainfall Year:	*1988*
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	5.29	4.67	23.47	3.93	100.24	475.84	0.20	0.05	0.79
Multi-Family	1.42	2.51	13.03	3.27	77.08	530.70	0.06	0.04	0.59
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.01	0.02	0.14	0.01	0.65	3.98	0.00	0.00	0.01
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	6.71	7.20	36.64	7.22	177.97	1010.52	0.27	0.09	1.38

Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

N W E S

0 100 200
Feet

LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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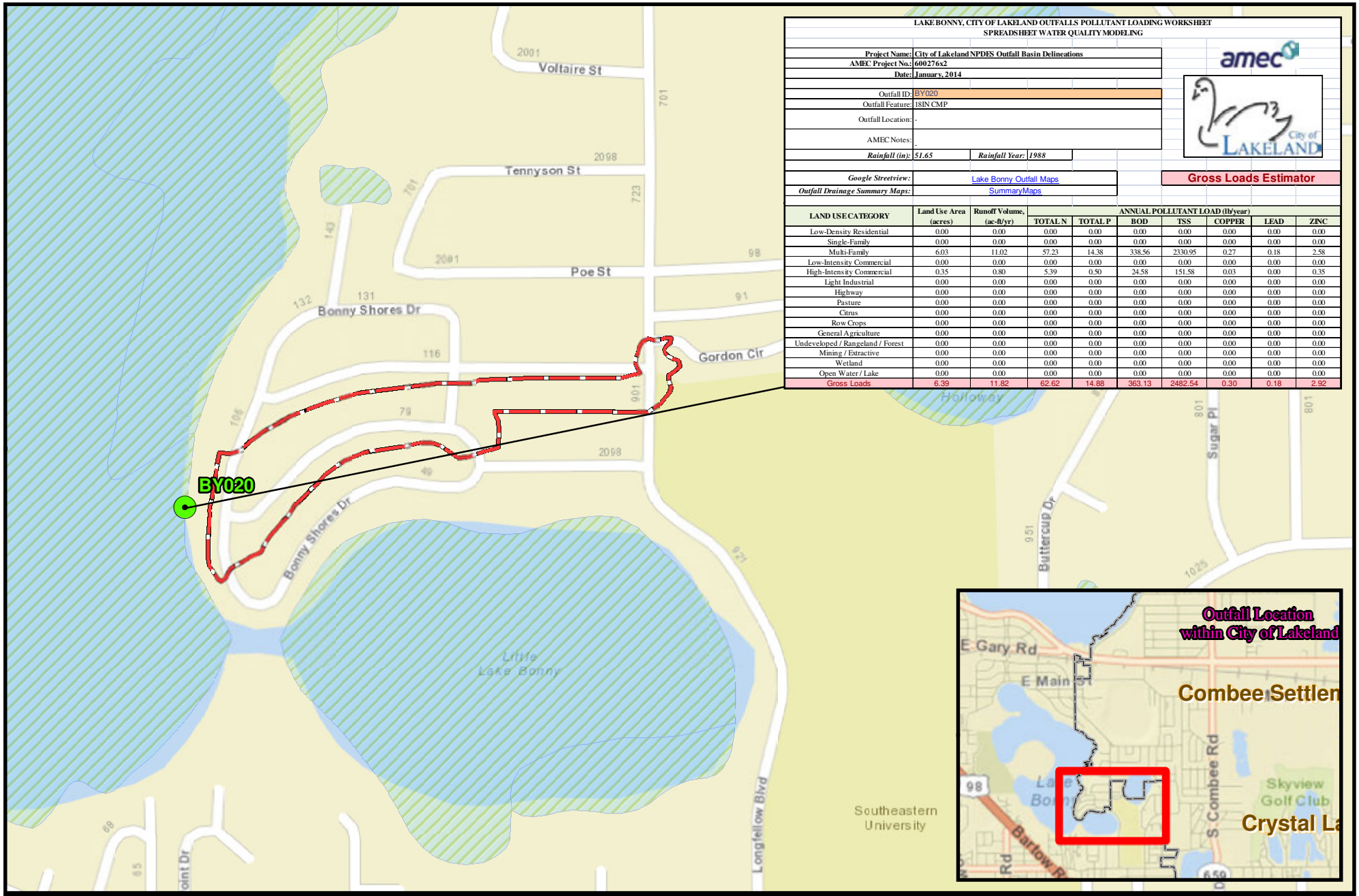

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY020
Outfall Feature:	18IN CMP
Outfall Location:	-
AMEC Notes:	-
Rainfall (in):	*51.65*
Rainfall Year:	*1988*
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	6.03	11.02	57.23	14.38	338.56	2330.95	0.27	0.18	2.58
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.35	0.80	5.39	0.50	24.58	151.58	0.03	0.00	0.35
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	6.39	11.82	62.62	14.88	363.13	2482.54	0.30	0.18	2.92

Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

N W E S

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Feet

LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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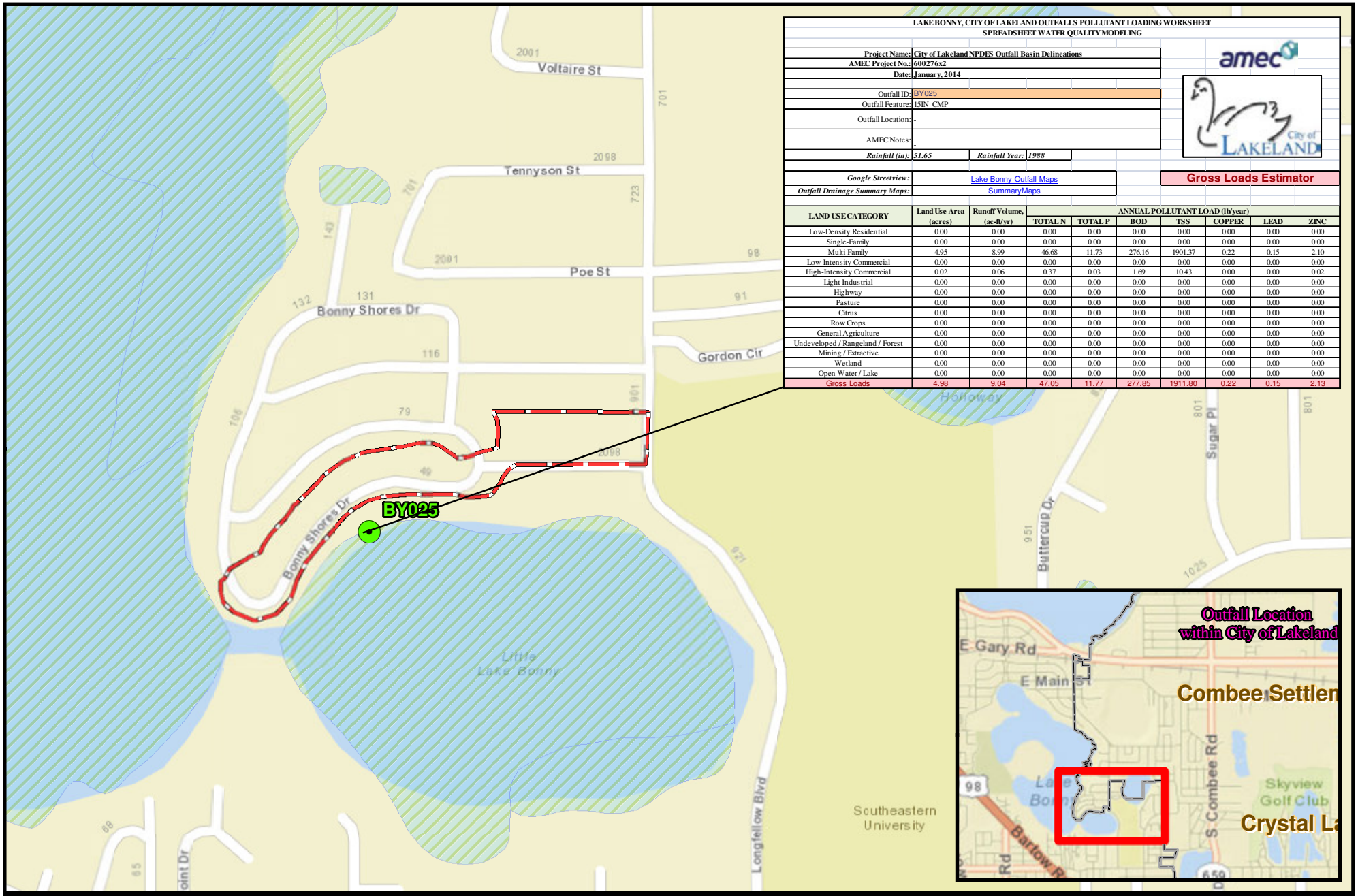

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY025
Outfall Feature:	15IN CMP
Outfall Location:	-
AMEC Notes:	-
Rainfall (in):	*51.65*
Rainfall Year:	*1988*
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	4.95	8.99	46.68	11.73	276.16	1901.37	0.22	0.15	2.10
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.02	0.06	0.37	0.03	1.69	10.43	0.00	0.00	0.02
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	4.98	9.04	47.05	11.77	277.85	1911.80	0.22	0.15	2.13

Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

N W E S

0 200 400
Feet

LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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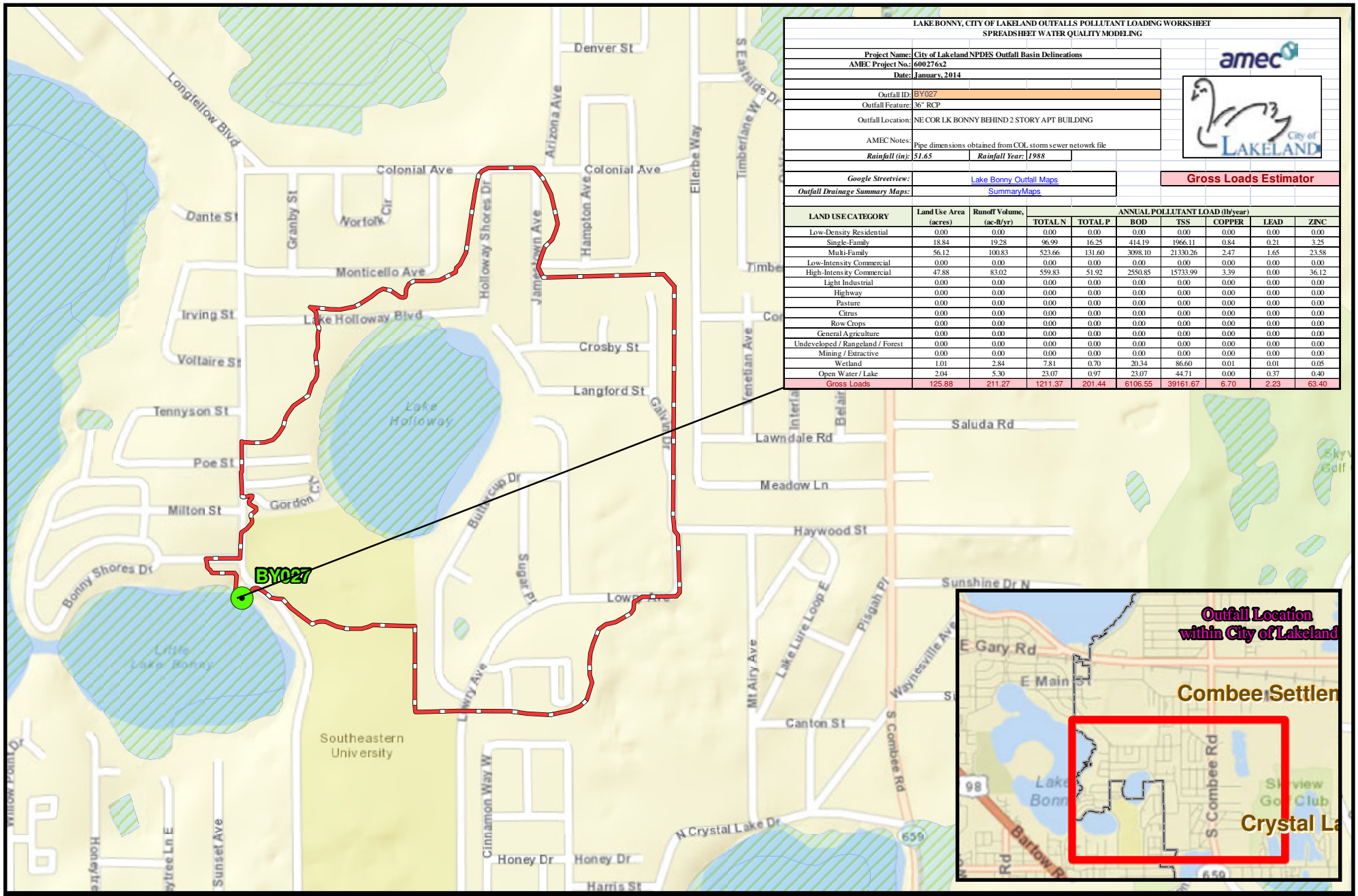


LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY027
Outfall Feature:	36" RCP
Outfall Location:	NE COR LK BONNY BEHIND 2 STORY APT BUILDING
AMEC Notes:	Pipe dimensions obtained from COL storm sewer netowrk file
Rainfall (in):	*51.65* — *Rainfall Year:* *1988*
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year) TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	18.84	19.28	96.99	16.25	414.19	1966.11	0.84	0.21	3.25
Multi-Family	56.12	100.83	523.66	131.60	3098.10	21330.26	2.47	1.65	23.58
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	47.88	83.02	559.83	51.92	2550.85	15733.99	3.39	0.00	36.12
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	1.01	2.84	7.81	0.70	20.34	86.60	0.01	0.01	0.05
Open Water / Lake	2.04	5.30	23.07	0.97	23.07	44.71	0.00	0.37	0.40
Gross Loads	125.88	211.27	1211.37	201.44	6106.55	39161.67	6.70	2.23	63.40

Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

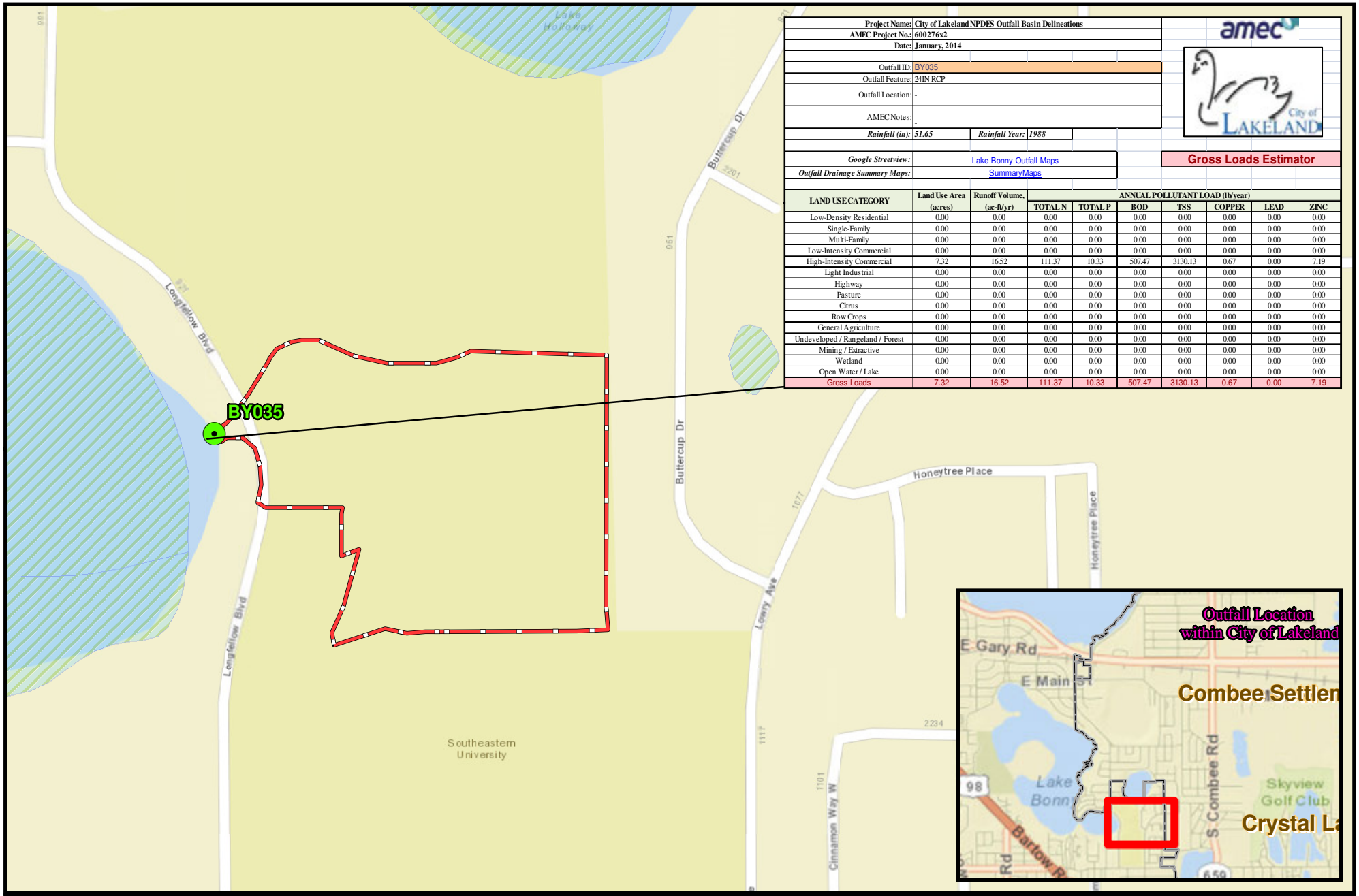
N W E S

0 400 800
Feet

LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276.2 City of Lakeland - NPDES Lake Bonny\Technical\GIS\Figures\FLakeBonny_BY027.mxd



Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY035
Outfall Feature:	24IN RCP
Outfall Location:	-
AMEC Notes:	-
Rainfall (in):	***51.65***
Rainfall Year:	***1988***
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	7.32	16.52	111.37	10.33	507.47	3130.13	0.67	0.00	7.19
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	7.32	16.52	111.37	10.33	507.47	3130.13	0.67	0.00	7.19

Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

N W E S

0 125 250
Feet

LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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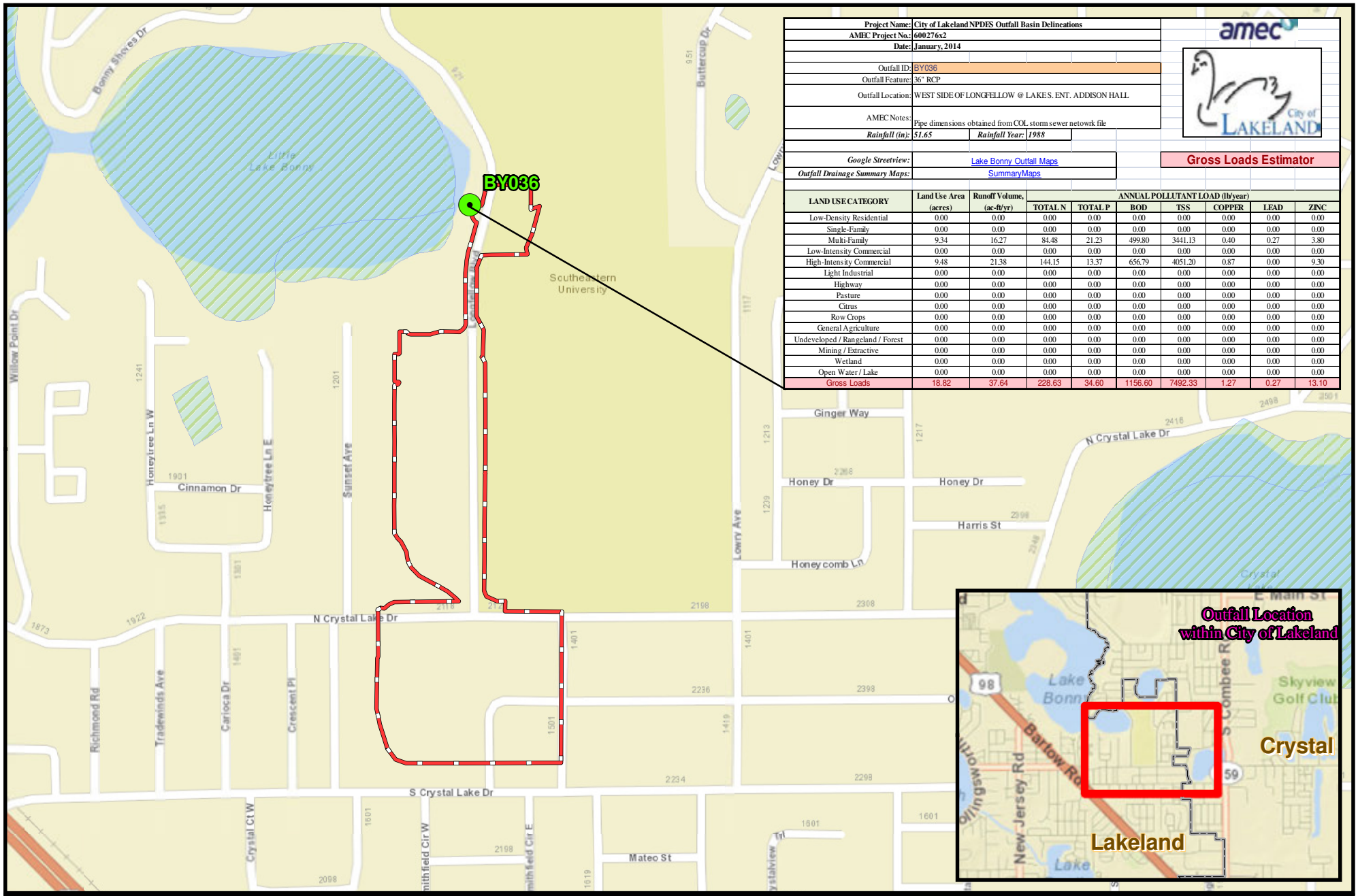

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY036
Outfall Feature:	36" RCP
Outfall Location:	WEST SIDE OF LONGFELLOW @ LAKE S. ENT. ADDISON HALL
AMEC Notes:	Pipe dimensions obtained from COL storm sewer netowrk file
Rainfall (in):	*51.65* — *Rainfall Year:* *1988*
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	9.34	16.27	84.48	21.23	499.80	3441.13	0.40	0.27	3.80
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	9.48	21.38	144.15	13.37	656.79	4051.20	0.87	0.00	9.30
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	18.82	37.64	228.63	34.60	1156.60	7492.33	1.27	0.27	13.10

Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

N W E S

0 250 500
Feet

LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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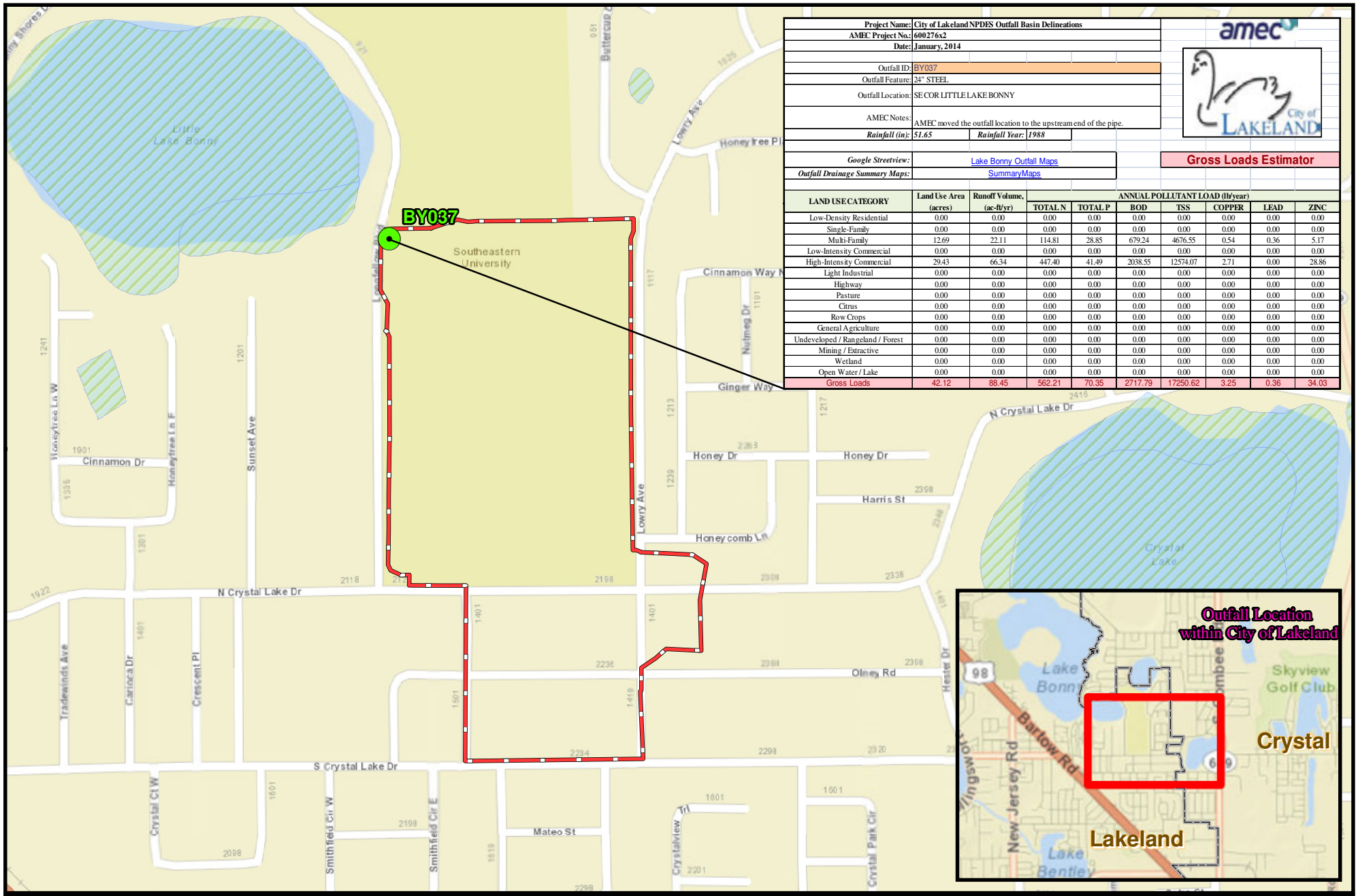

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY037
Outfall Feature:	24" STEEL
Outfall Location:	SE COR LITTLE LAKE BONNY
AMEC Notes:	AMEC moved the outfall location to the upstream end of the pipe.
Rainfall (in):	*51.65*
Rainfall Year:	*1988*
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	12.69	22.11	114.81	28.85	679.24	4676.55	0.54	0.36	5.17
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	29.43	66.34	447.40	41.49	2038.55	12574.07	2.71	0.00	28.86
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	42.12	88.45	562.21	70.35	2717.79	17250.62	3.25	0.36	34.03

Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

N W E S

0 250 500
Feet

LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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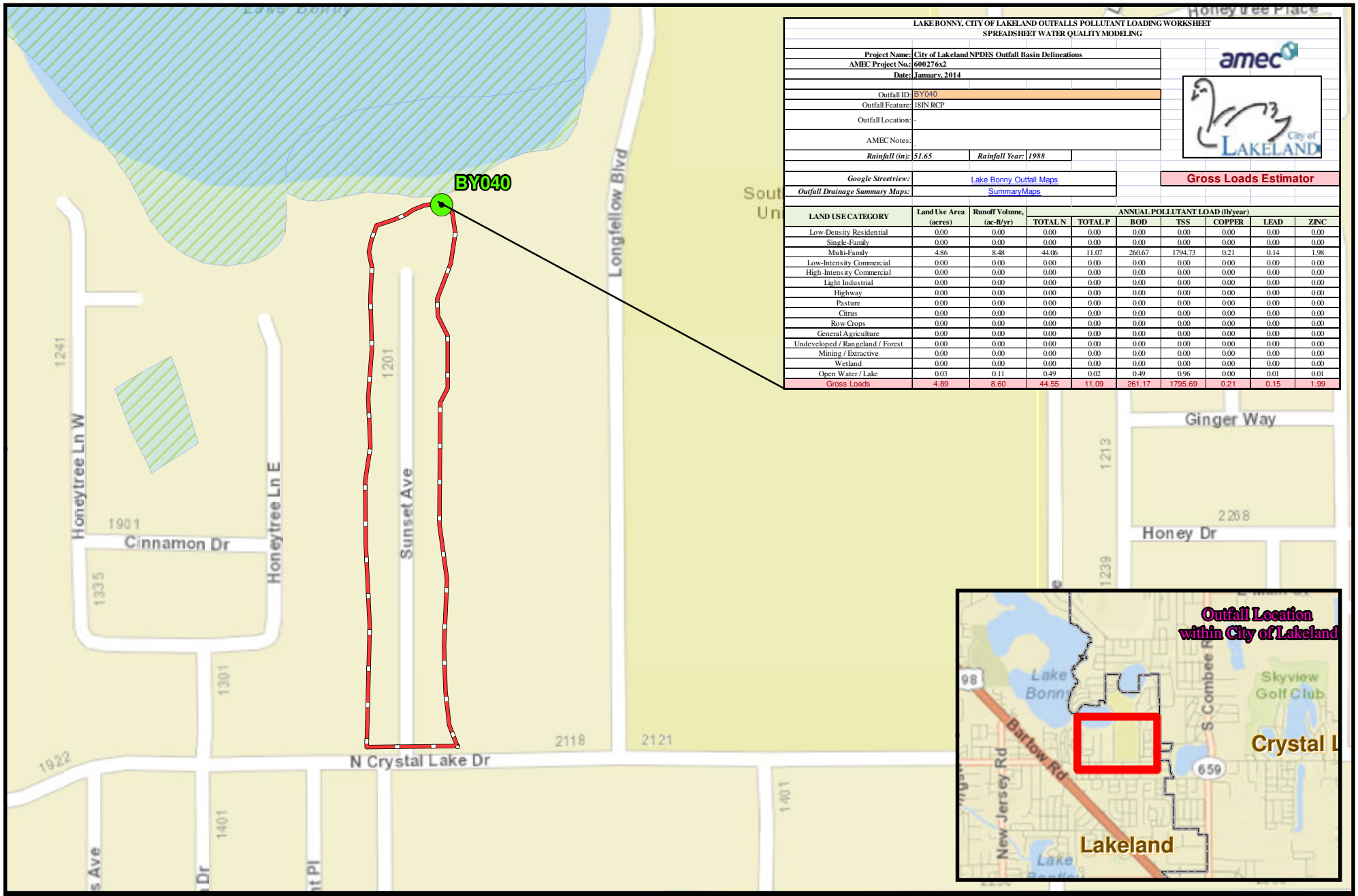

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY040
Outfall Feature:	18IN RCP
Outfall Location:	-
AMEC Notes:	-
Rainfall (in):	*51.65*
Rainfall Year:	*1988*
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	4.86	8.48	44.06	11.07	260.67	1794.73	0.21	0.14	1.98
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.03	0.11	0.49	0.02	0.49	0.96	0.00	0.01	0.01
Gross Loads	4.89	8.60	44.55	11.09	261.17	1795.69	0.21	0.15	1.99

Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

N W E S

0 150 300
Feet

LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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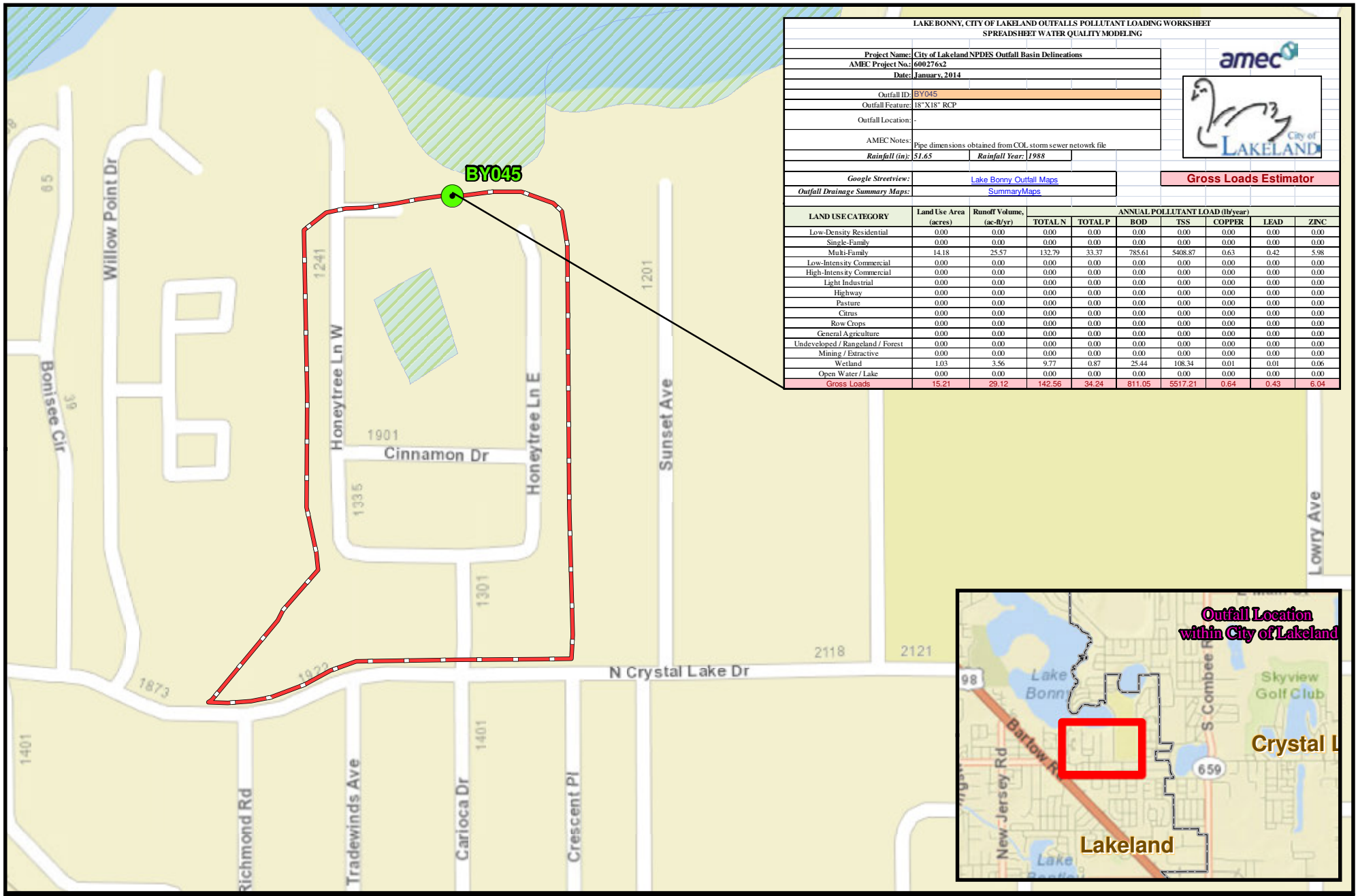

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY045
Outfall Feature:	18"X18" RCP
Outfall Location:	-
AMEC Notes:	Pipe dimensions obtained from COL storm sewer netowrk file
Rainfall (in):	*51.65* — ***Rainfall Year:*** *1988*
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	14.18	25.57	132.79	33.37	785.61	5408.87	0.63	0.42	5.98
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	1.03	3.56	9.77	0.87	25.44	108.34	0.01	0.01	0.06
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	15.21	29.12	142.56	34.24	811.05	5517.21	0.64	0.43	6.04

Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

N W E S

0 150 300
Feet

LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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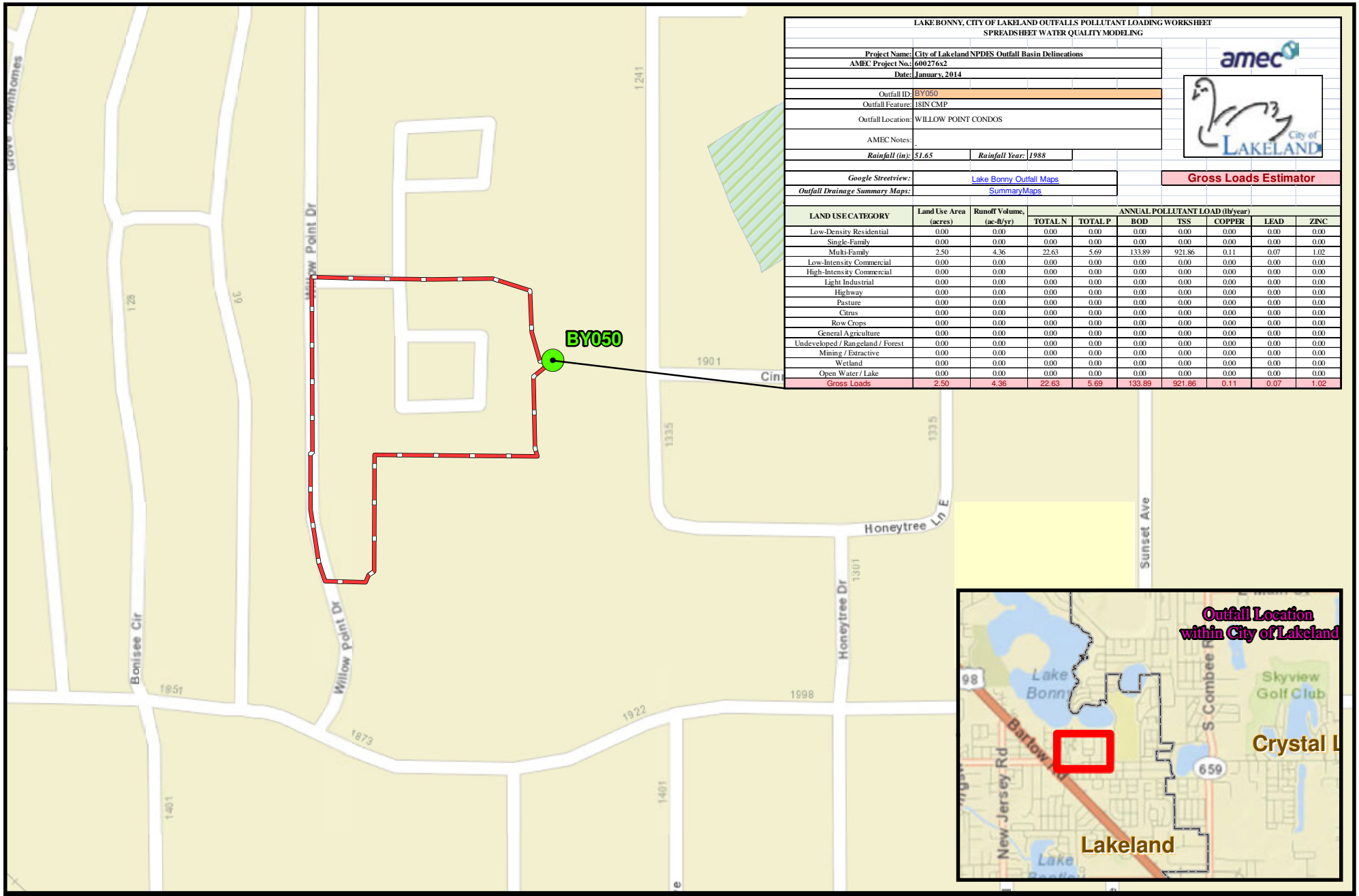

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY050
Outfall Feature:	18IN CMP
Outfall Location:	WILLOW POINT CONDOS
AMEC Notes:	
Rainfall (in):	*51.65*
Rainfall Year:	*1988*
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	2.50	4.36	22.63	5.69	133.89	921.86	0.11	0.07	1.02
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	2.50	4.36	22.63	5.69	133.89	921.86	0.11	0.07	1.02

Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

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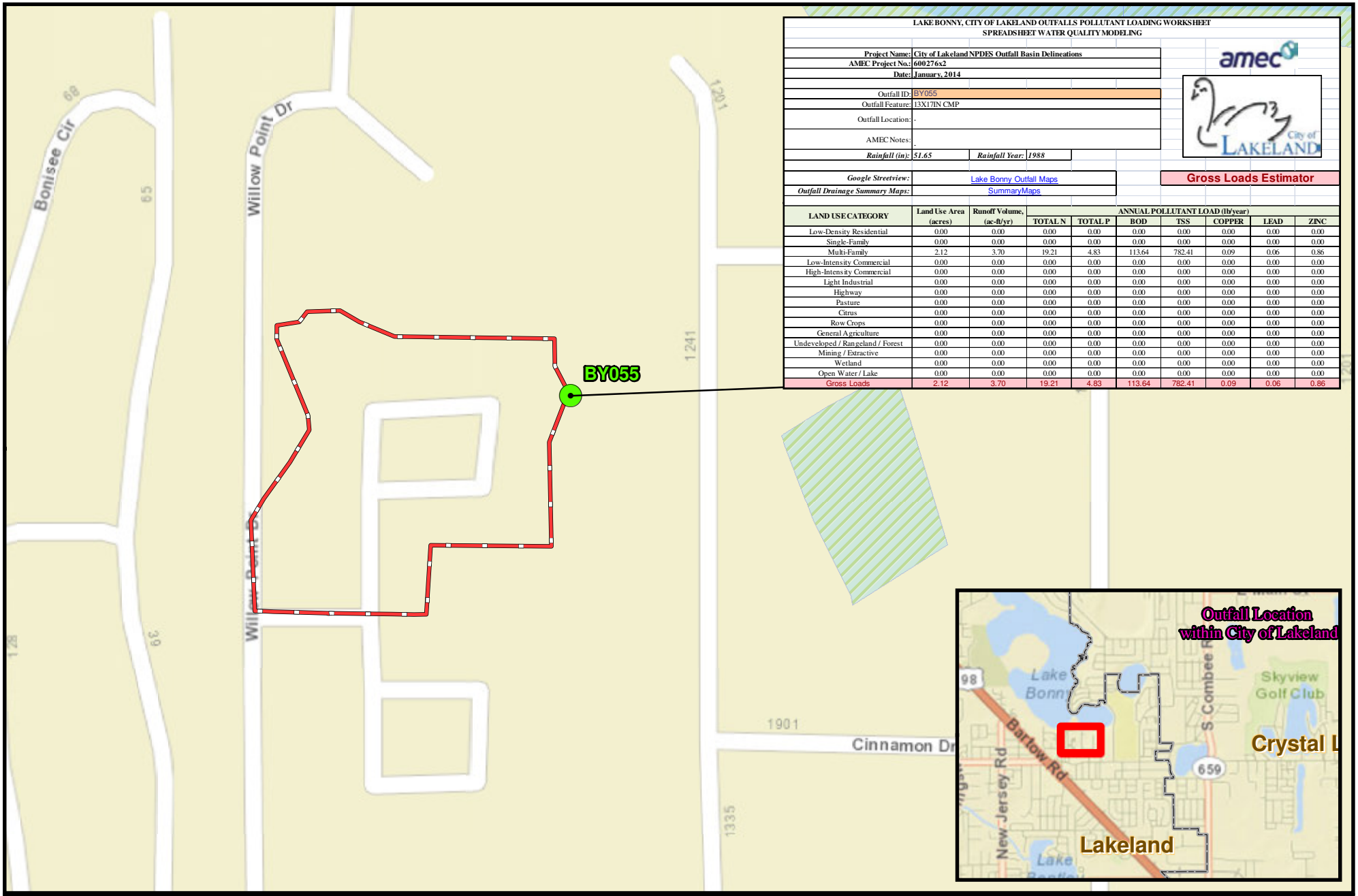
LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276.2 City of Lakeland - NPDES Lake Bonny\Technical\GIS\Figures\FLakeBonny_BY050.mxd



LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY055
Outfall Feature:	13X17IN CMP
Outfall Location:	-
AMEC Notes:	-
Rainfall (in):	*51.65*
Rainfall Year:	*1988*
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	2.12	3.70	19.21	4.83	113.64	782.41	0.09	0.06	0.86
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	2.12	3.70	19.21	4.83	113.64	782.41	0.09	0.06	0.86

Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

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LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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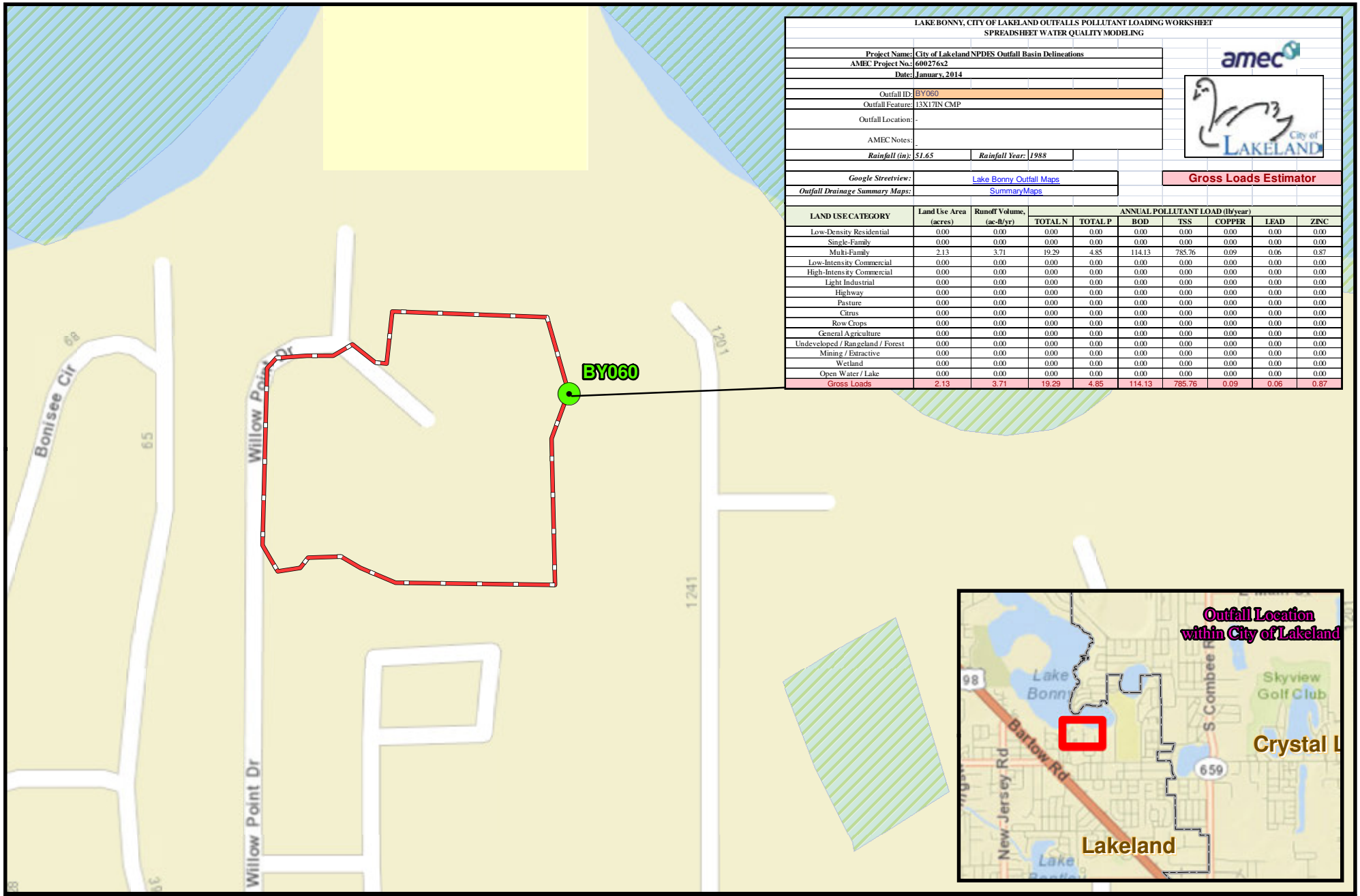
LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY060
Outfall Feature:	13X17IN CMP
Outfall Location:	-
AMEC Notes:	-
Rainfall (in):	*51.65*
Rainfall Year:	*1988*
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	2.13	3.71	19.29	4.85	114.13	785.76	0.09	0.06	0.87
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	2.13	3.71	19.29	4.85	114.13	785.76	0.09	0.06	0.87



Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

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LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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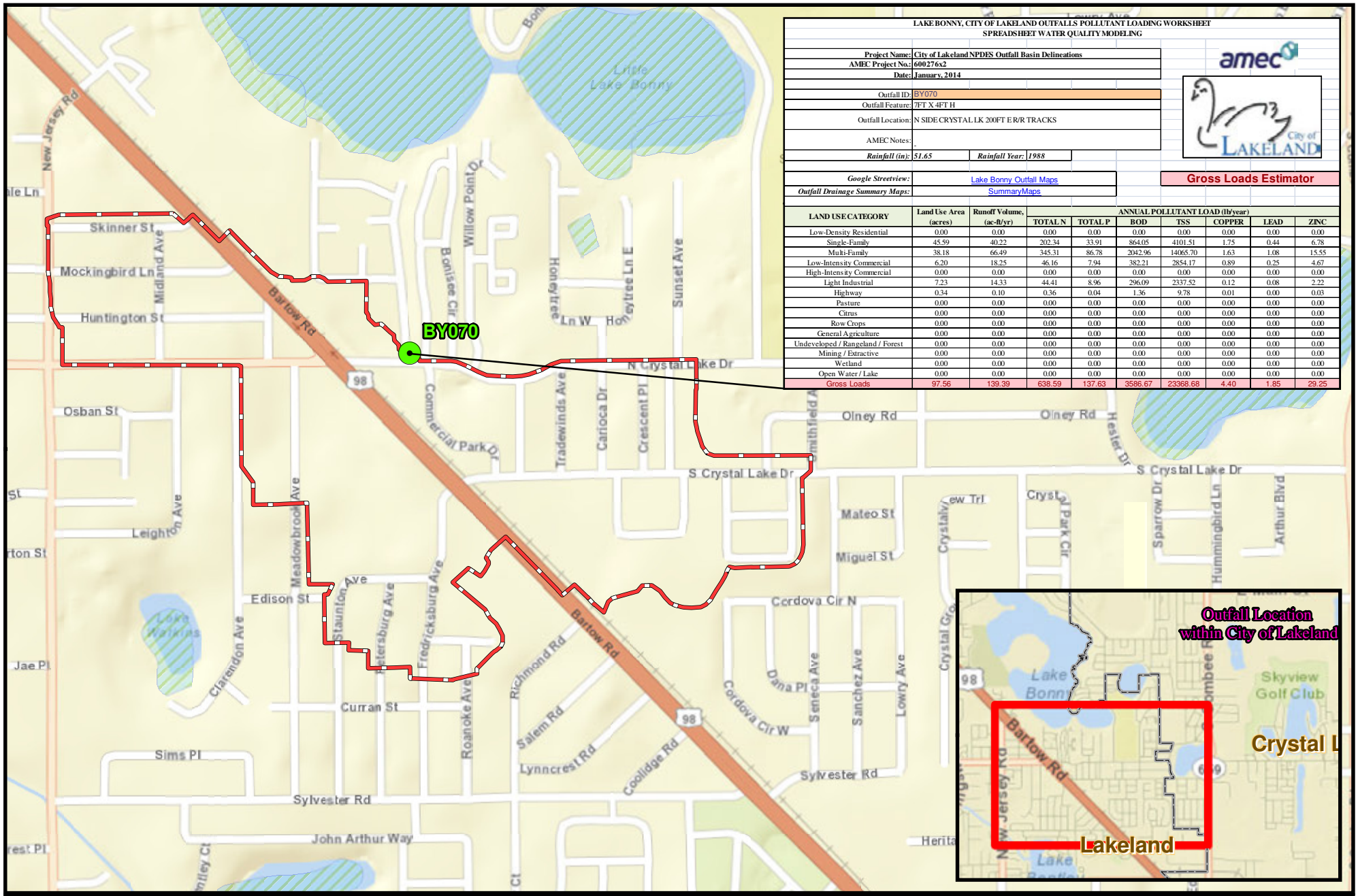

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY070
Outfall Feature:	7FT X 4FT H
Outfall Location:	N SIDE CRYSTAL LK 200FT E R/R TRACKS
AMEC Notes:	
Rainfall (in):	*51.65*
Rainfall Year:	*1988*
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	45.59	40.22	202.34	33.91	864.05	4101.51	1.75	0.44	6.78
Multi-Family	38.18	66.49	345.31	86.78	2042.96	14065.70	1.63	1.08	15.55
Low-Intensity Commercial	6.20	18.25	46.16	7.94	382.21	2854.17	0.89	0.25	4.67
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	7.23	14.33	44.41	8.96	296.09	2337.52	0.12	0.08	2.22
Highway	0.34	0.10	0.36	0.04	1.36	9.78	0.01	0.00	0.03
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	97.56	139.39	638.59	137.63	3586.67	23368.68	4.40	1.85	29.25

Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

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LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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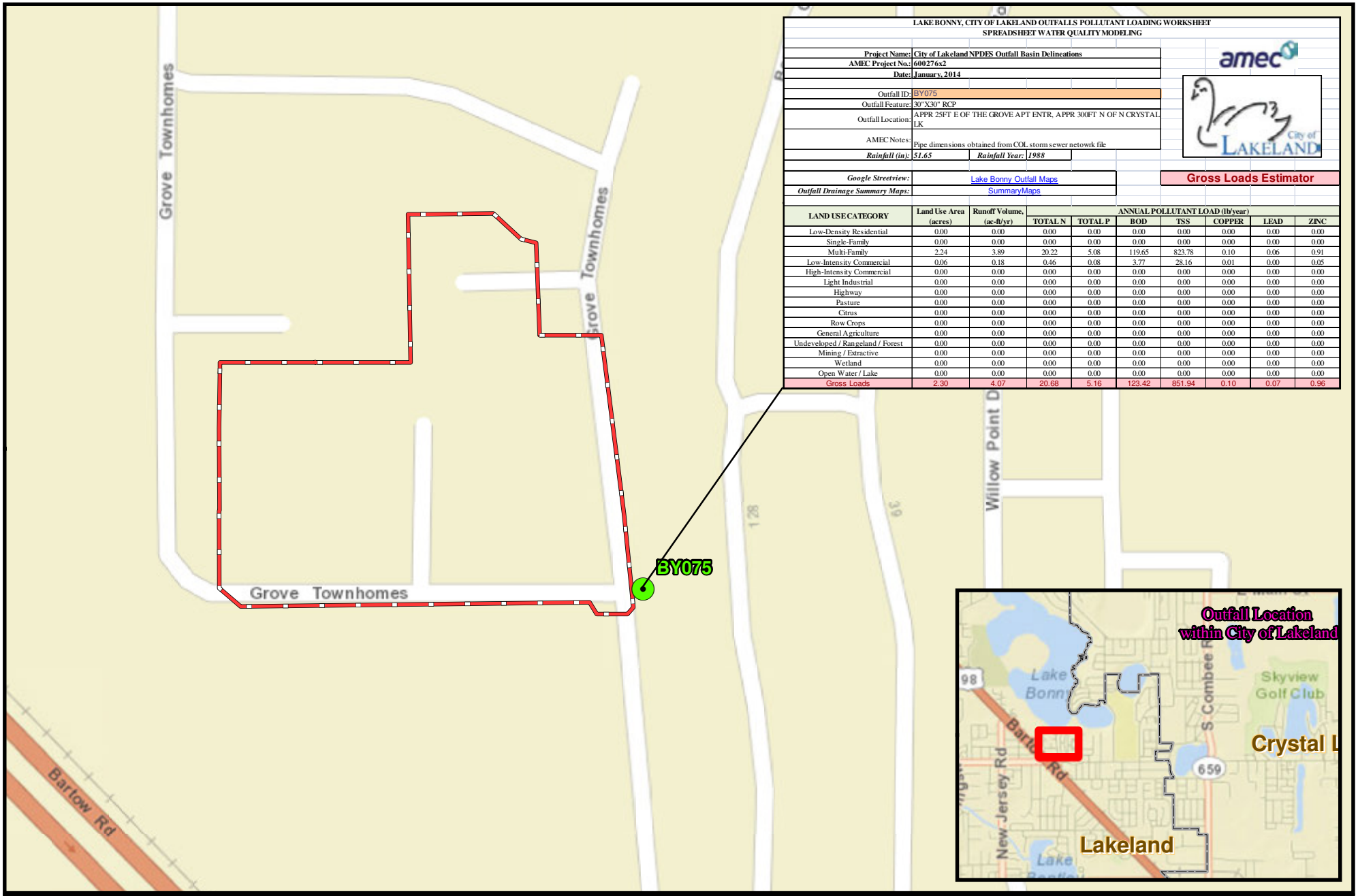

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**
Outfall ID:	BY075
Outfall Feature:	30"X30" RCP
Outfall Location:	APPR 25FT E OF THE GROVE APT ENTR, APPR 300FT N OF N CRYSTAL LK
AMEC Notes:	Pipe dimensions obtained from COL storm sewer netowrk file
Rainfall (in):	***51.65***
Rainfall Year:	***1988***
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	2.24	3.89	20.22	5.08	119.65	823.78	0.10	0.06	0.91
Low-Intensity Commercial	0.06	0.18	0.46	0.08	3.77	28.16	0.01	0.00	0.05
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	2.30	4.07	20.68	5.16	123.42	851.94	0.10	0.07	0.96

Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

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LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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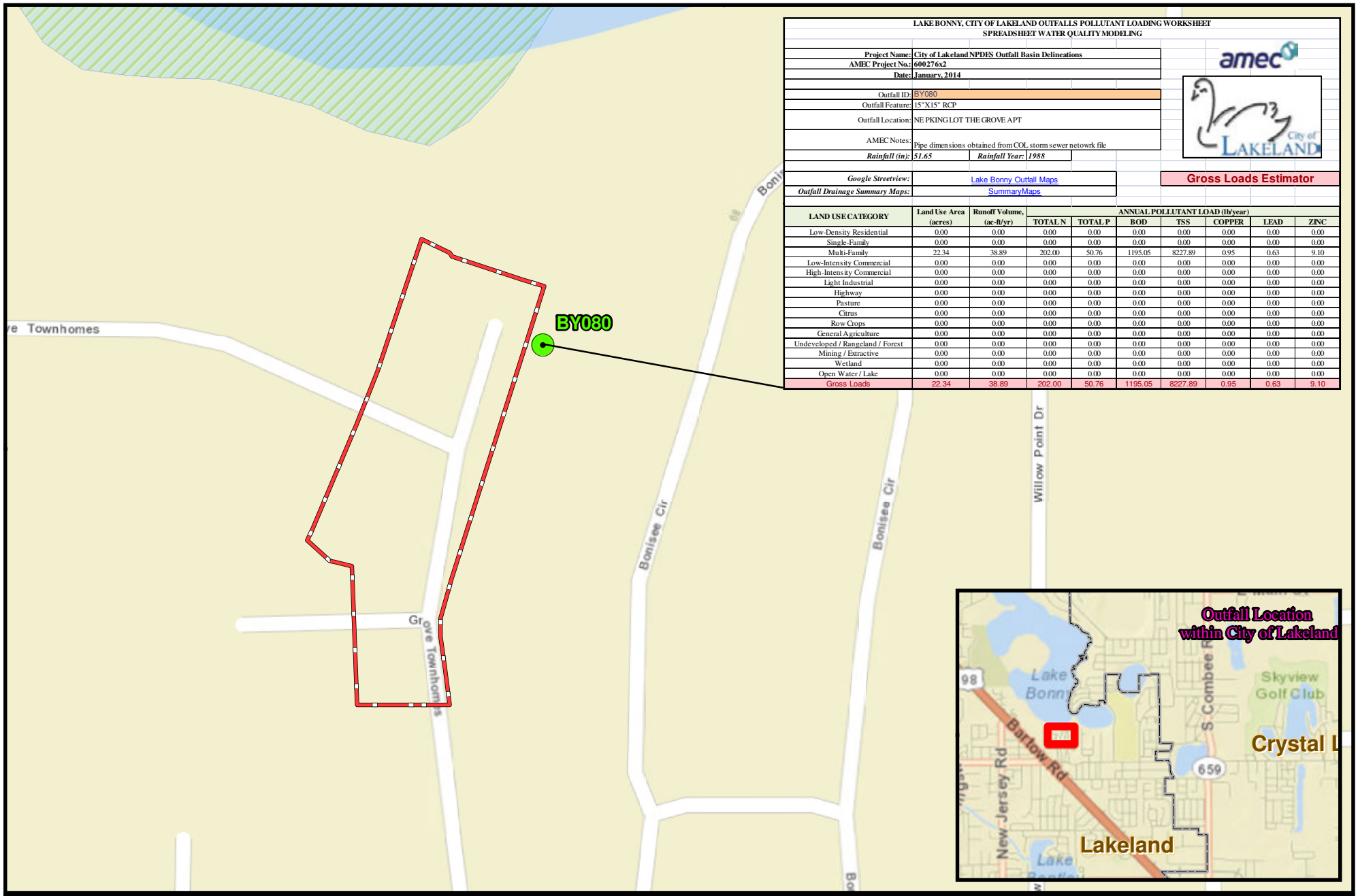

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY080
Outfall Feature:	15"X15" RCP
Outfall Location:	NE PKING LOT THE GROVE APT
AMEC Notes:	Pipe dimensions obtained from COL storm sewer netowrk file
Rainfall (in):	***51.65***
Rainfall Year:	***1988***
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	22.34	38.89	202.00	50.76	1195.05	8227.89	0.95	0.63	9.10
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	22.34	38.89	202.00	50.76	1195.05	8227.89	0.95	0.63	9.10

Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

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LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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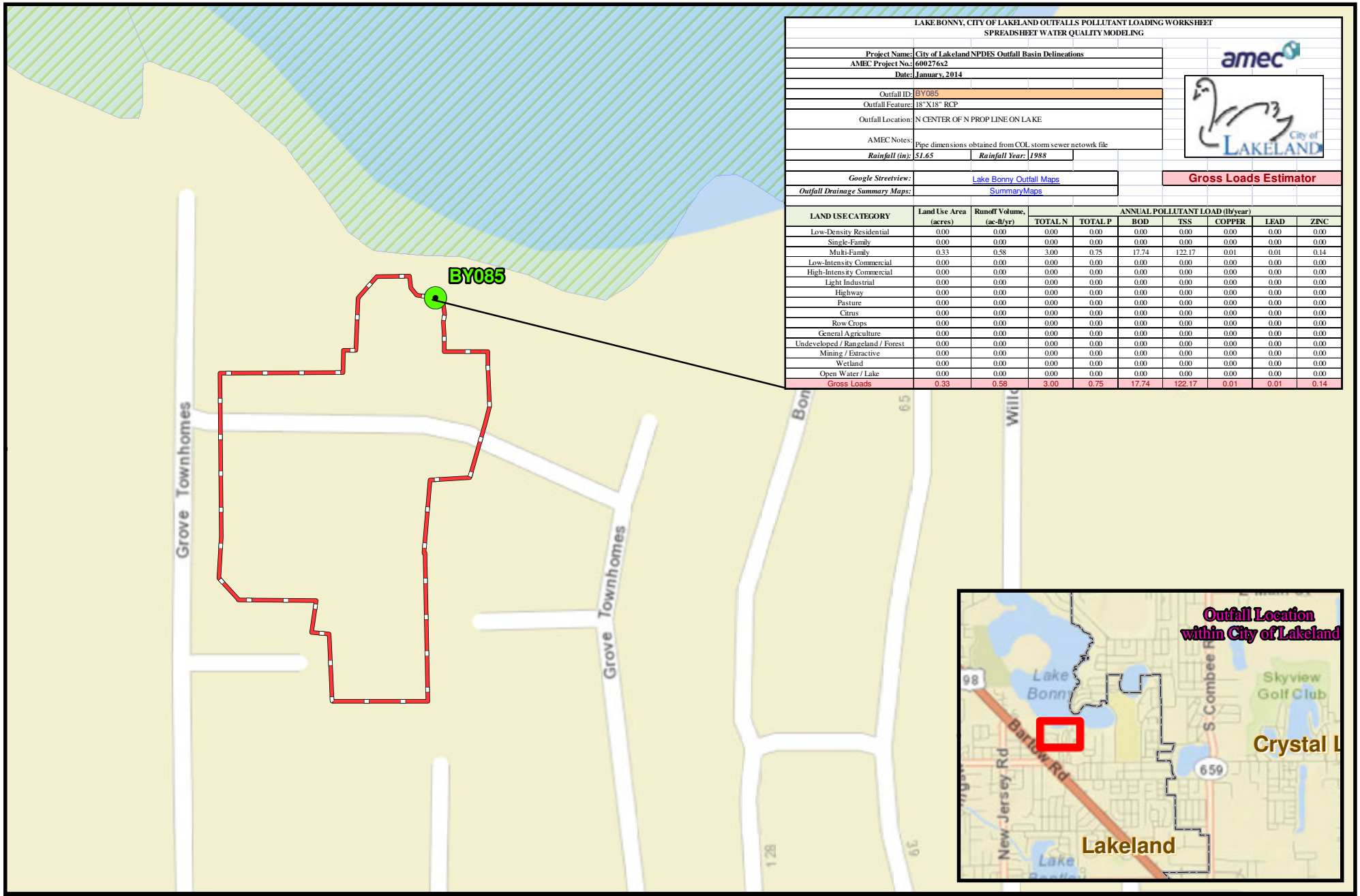
LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY085
Outfall Feature:	18"X18" RCP
Outfall Location:	N CENTER OF N PROP LINE ON LAKE
AMEC Notes:	Pipe dimensions obtained from COL storm sewer netowrk file
Rainfall (in):	*51.65*
Rainfall Year:	*1988*
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	0.33	0.58	3.00	0.75	17.74	122.17	0.01	0.01	0.14
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	0.33	0.58	3.00	0.75	17.74	122.17	0.01	0.01	0.14



Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

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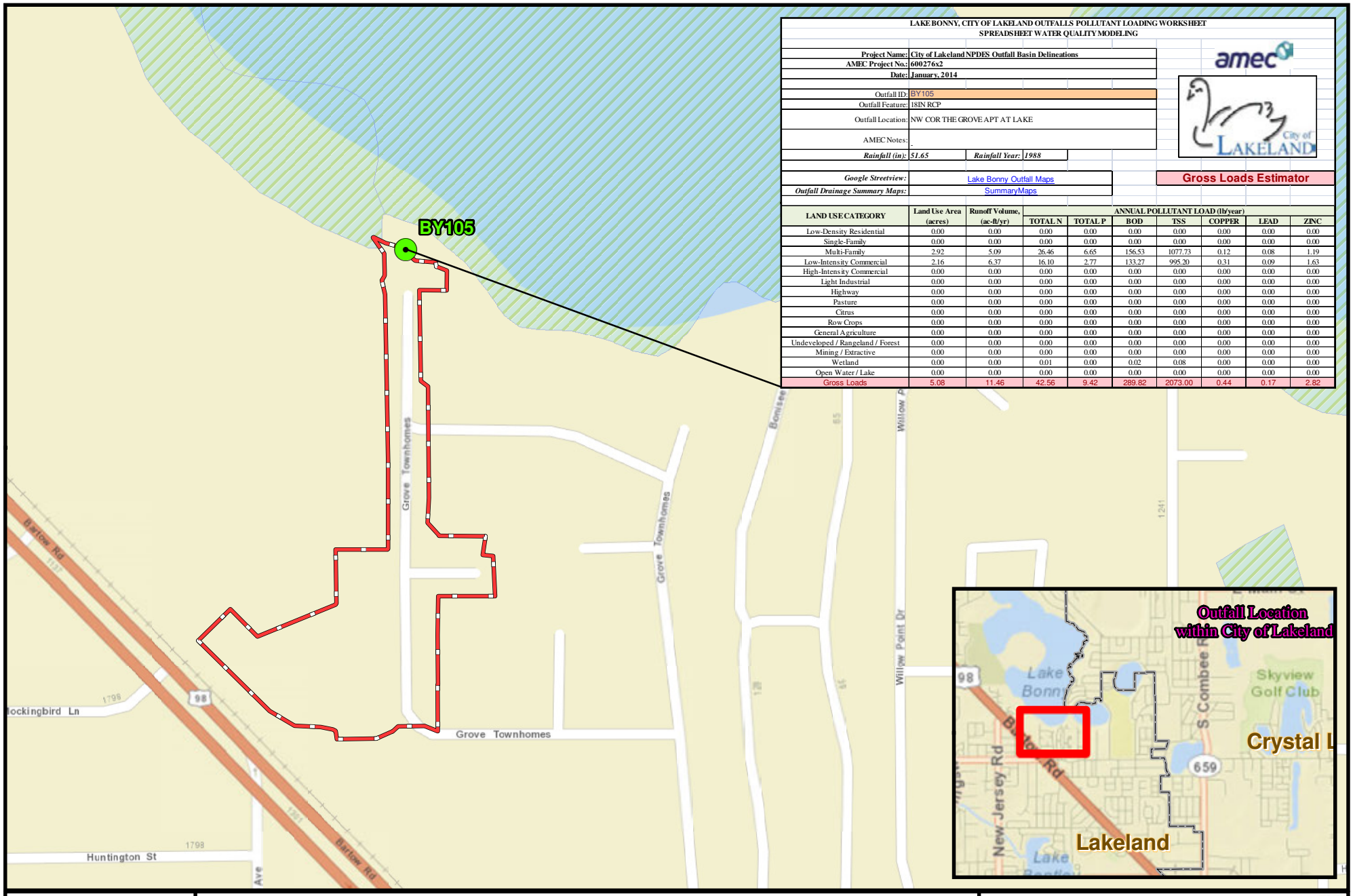
Feet

LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276.2 City of Lakeland - NPDES Lake Bonny\Technical\GIS\Figures\FLakeBonny_BY085.mxd



LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY105
Outfall Feature:	18IN RCP
Outfall Location:	NW COR THE GROVE APT AT LAKE
AMEC Notes:	
Rainfall (in):	*51.65*
Rainfall Year:	*1988*
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	2.92	5.09	26.46	6.65	156.53	1077.73	0.12	0.08	1.19
Low-Intensity Commercial	2.16	6.37	16.10	2.77	133.27	995.20	0.31	0.09	1.63
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.01	0.00	0.02	0.08	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	5.08	11.46	42.56	9.42	289.82	2073.00	0.44	0.17	2.82

Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

N
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Feet

LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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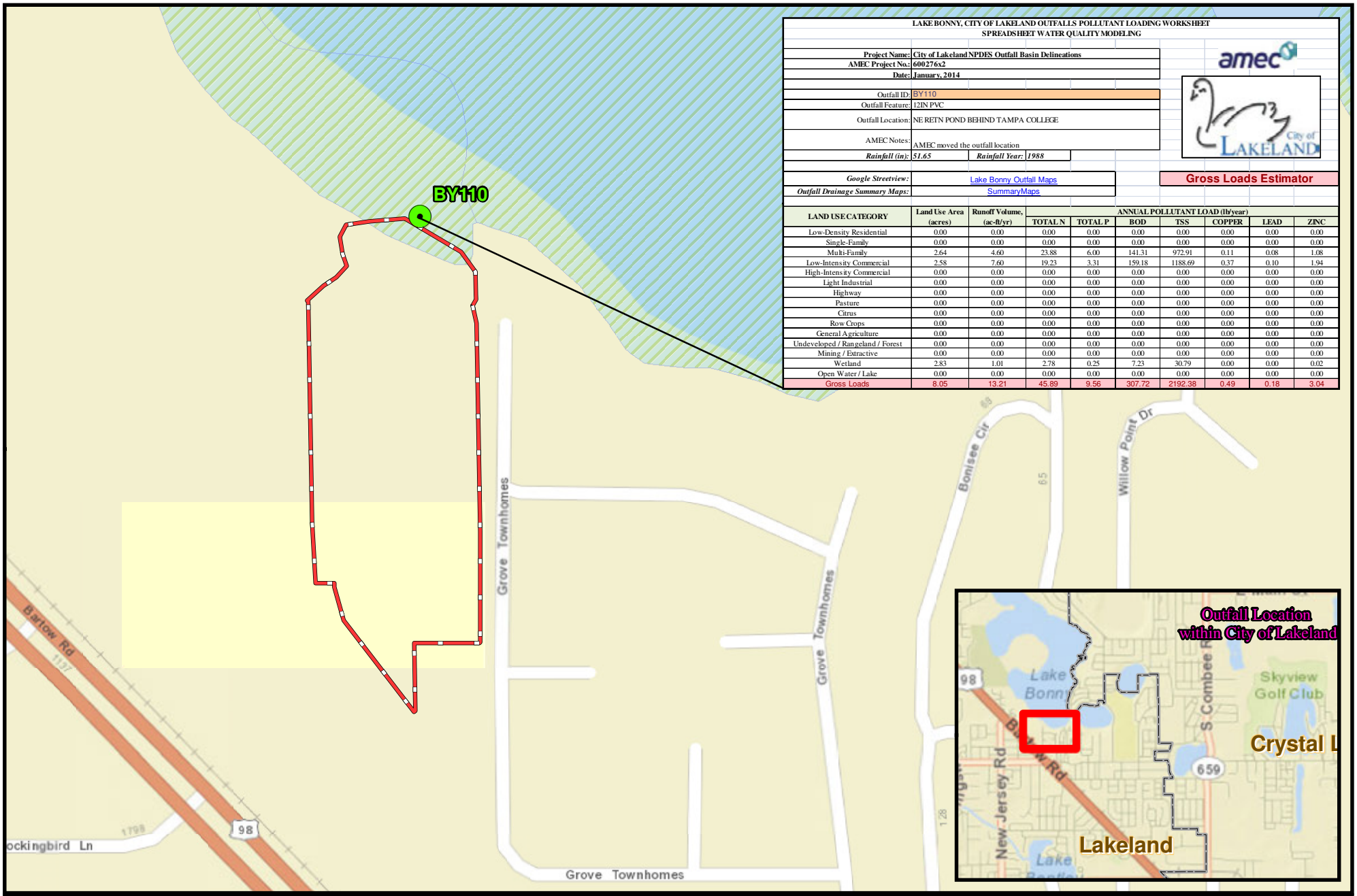

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY110
Outfall Feature:	12IN PVC
Outfall Location:	NE RETN POND BEHIND TAMPA COLLEGE
AMEC Notes:	AMEC moved the outfall location
Rainfall (in):	***51.65***
Rainfall Year:	***1988***
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	2.64	4.60	23.88	6.00	141.31	972.91	0.11	0.08	1.08
Low-Intensity Commercial	2.58	7.60	19.23	3.31	159.18	1188.69	0.37	0.10	1.94
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	2.83	1.01	2.78	0.25	7.23	30.79	0.00	0.00	0.02
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	8.05	13.21	45.89	9.56	307.72	2192.38	0.49	0.18	3.04

Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

N W E S

0 100 200
Feet

LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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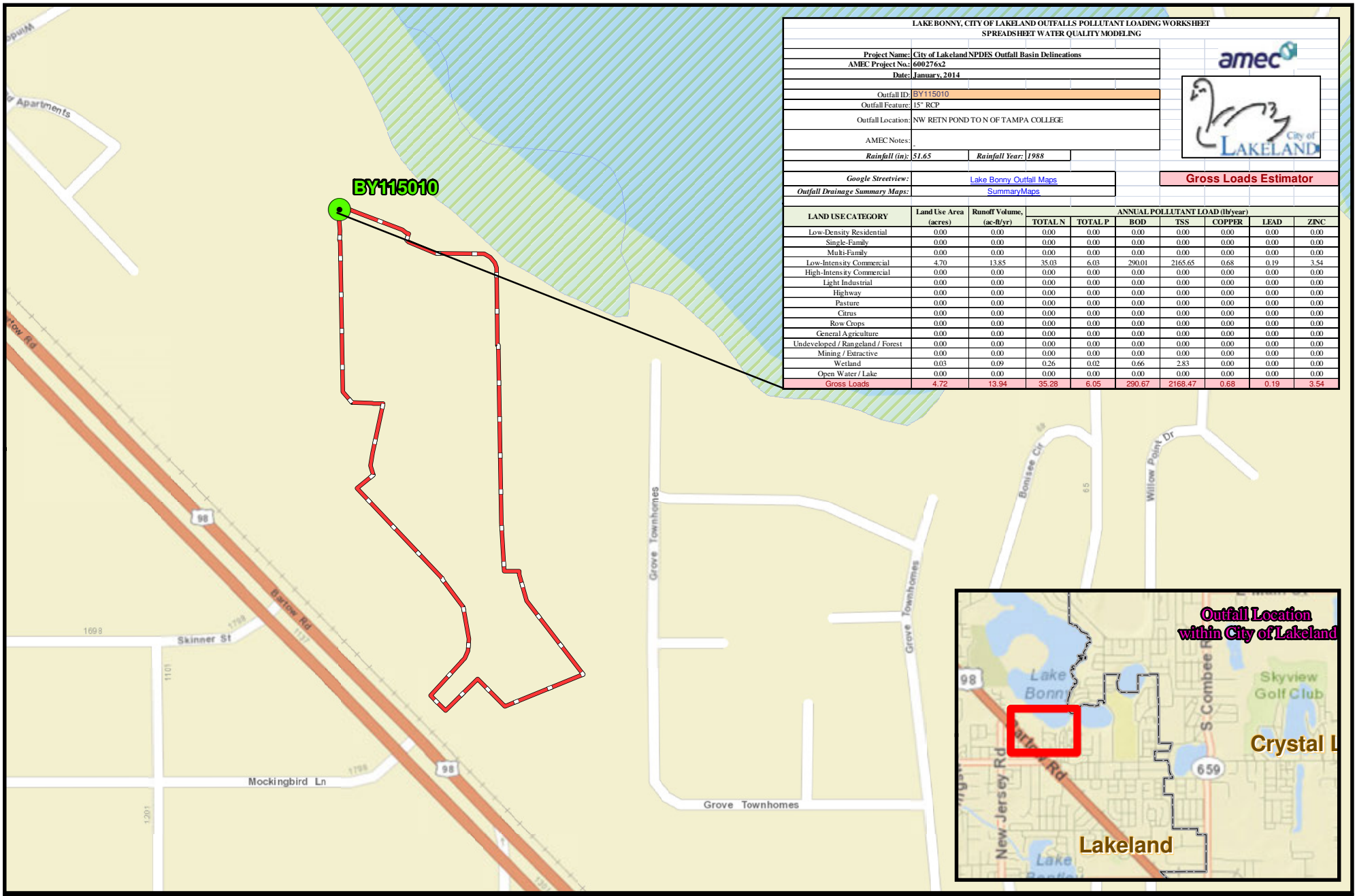

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY115010
Outfall Feature:	15" RCP
Outfall Location:	NW RETN POND TO N OF TAMPA COLLEGE
AMEC Notes:	
Rainfall (in):	*51.65*
Rainfall Year:	*1988*
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	4.70	13.85	35.03	6.03	290.01	2165.65	0.68	0.19	3.54
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.03	0.09	0.26	0.02	0.66	2.83	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	4.72	13.94	35.28	6.05	290.67	2168.47	0.68	0.19	3.54

Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

N W E S

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Feet

LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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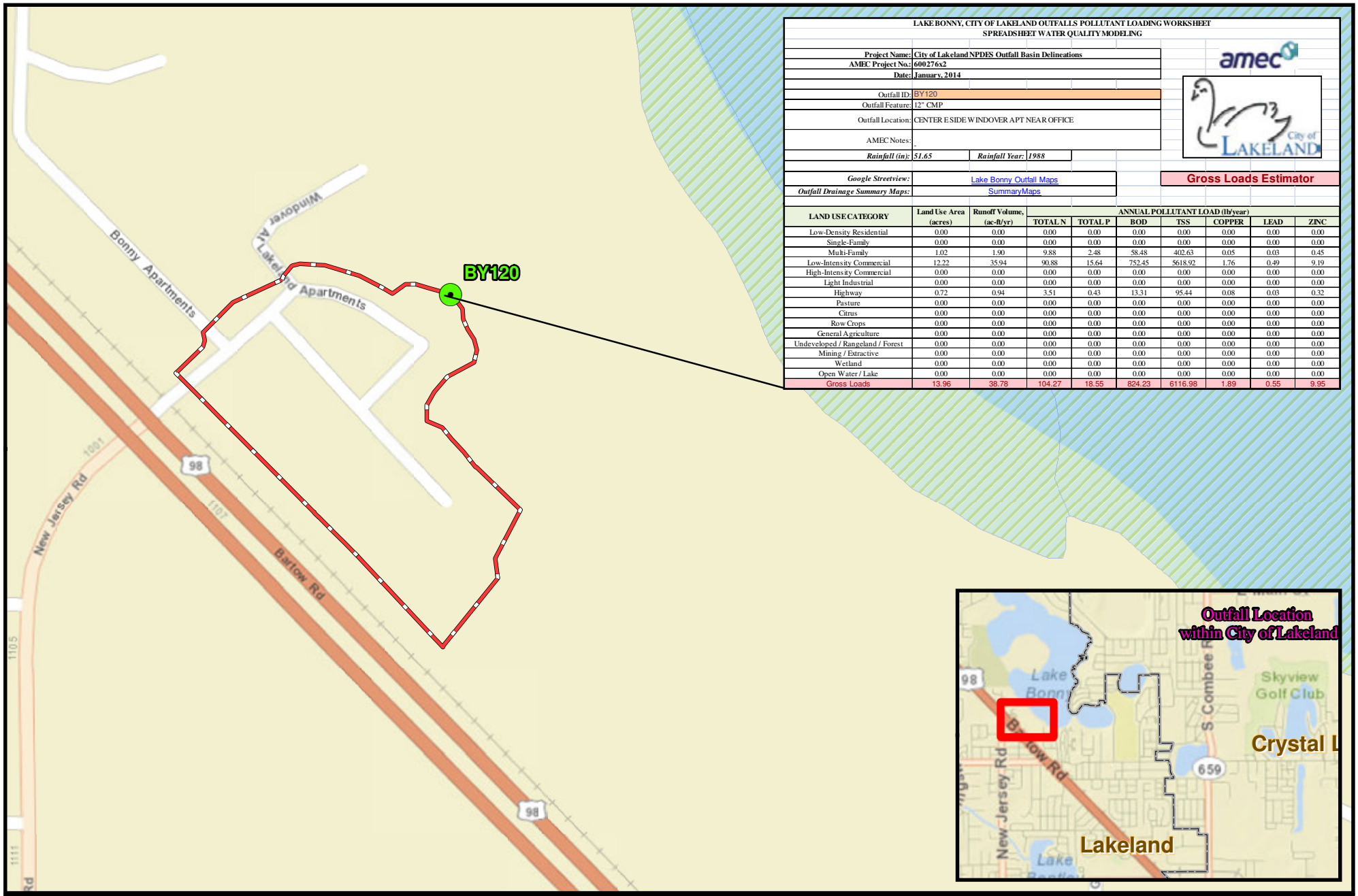

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**
Outfall ID:	BY120
Outfall Feature:	12" CMP
Outfall Location:	CENTER E SIDE W INDOVER APT NEAR OFFICE
AMEC Notes:	
Rainfall (in):	***51.65***
Rainfall Year:	***1988***
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	1.02	1.90	9.88	2.48	58.48	402.63	0.05	0.03	0.45
Low-Intensity Commercial	12.22	35.94	90.88	15.64	752.45	5618.92	1.76	0.49	9.19
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.72	0.94	3.51	0.43	13.31	95.44	0.08	0.03	0.32
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	13.96	38.78	104.27	18.55	824.23	6116.98	1.89	0.55	9.95

Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

N W E S

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Feet

LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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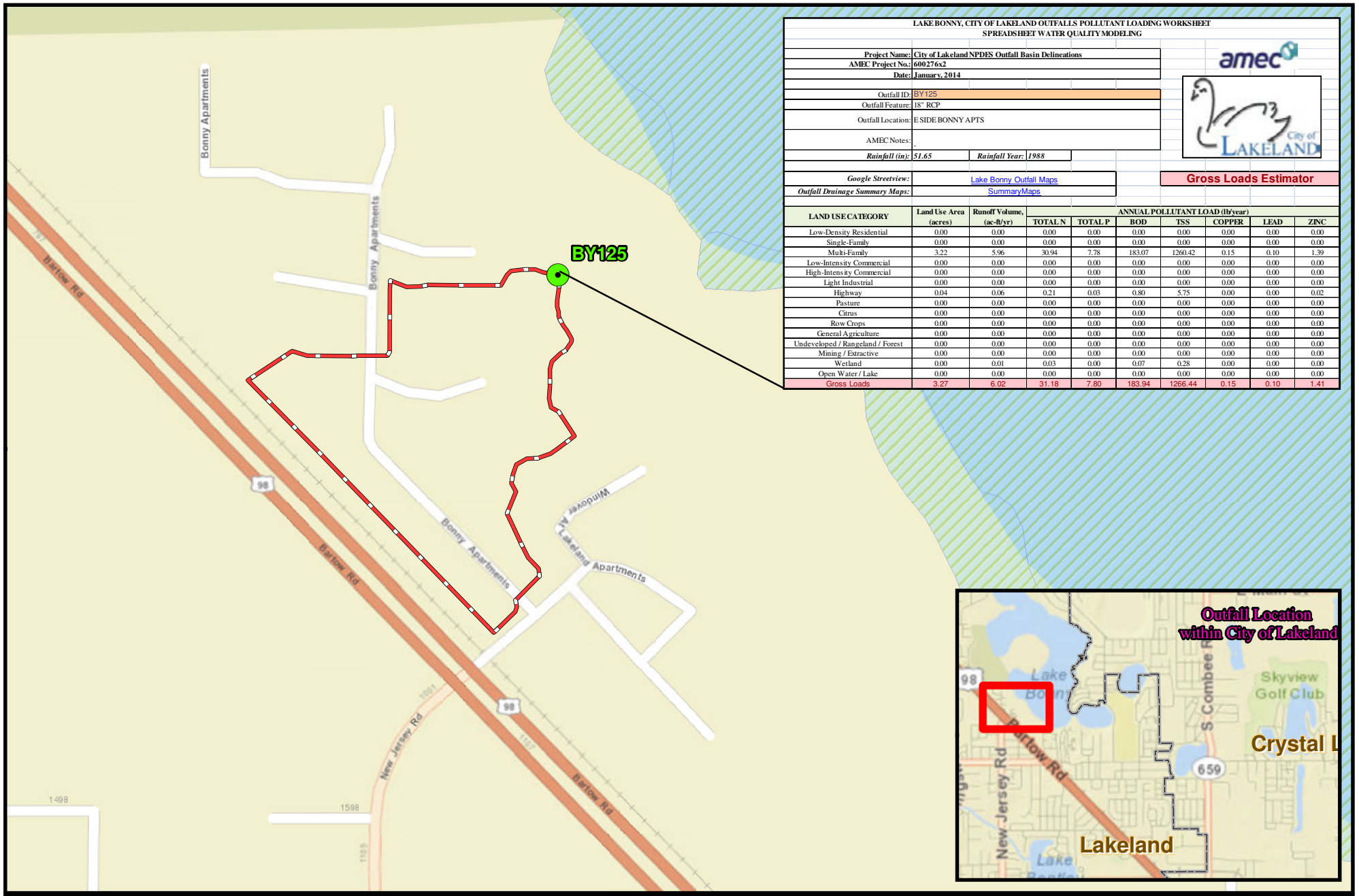

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY125
Outfall Feature:	18" RCP
Outfall Location:	E SIDE BONNY APTS
AMEC Notes:	
Rainfall (in):	*51.65*
Rainfall Year:	*1988*
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	3.22	5.96	30.94	7.78	183.07	1260.42	0.15	0.10	1.39
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.04	0.06	0.21	0.03	0.80	5.75	0.00	0.00	0.02
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.01	0.03	0.00	0.07	0.28	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	3.27	6.02	31.18	7.80	183.94	1266.44	0.15	0.10	1.41

Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

N W E S

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Feet

LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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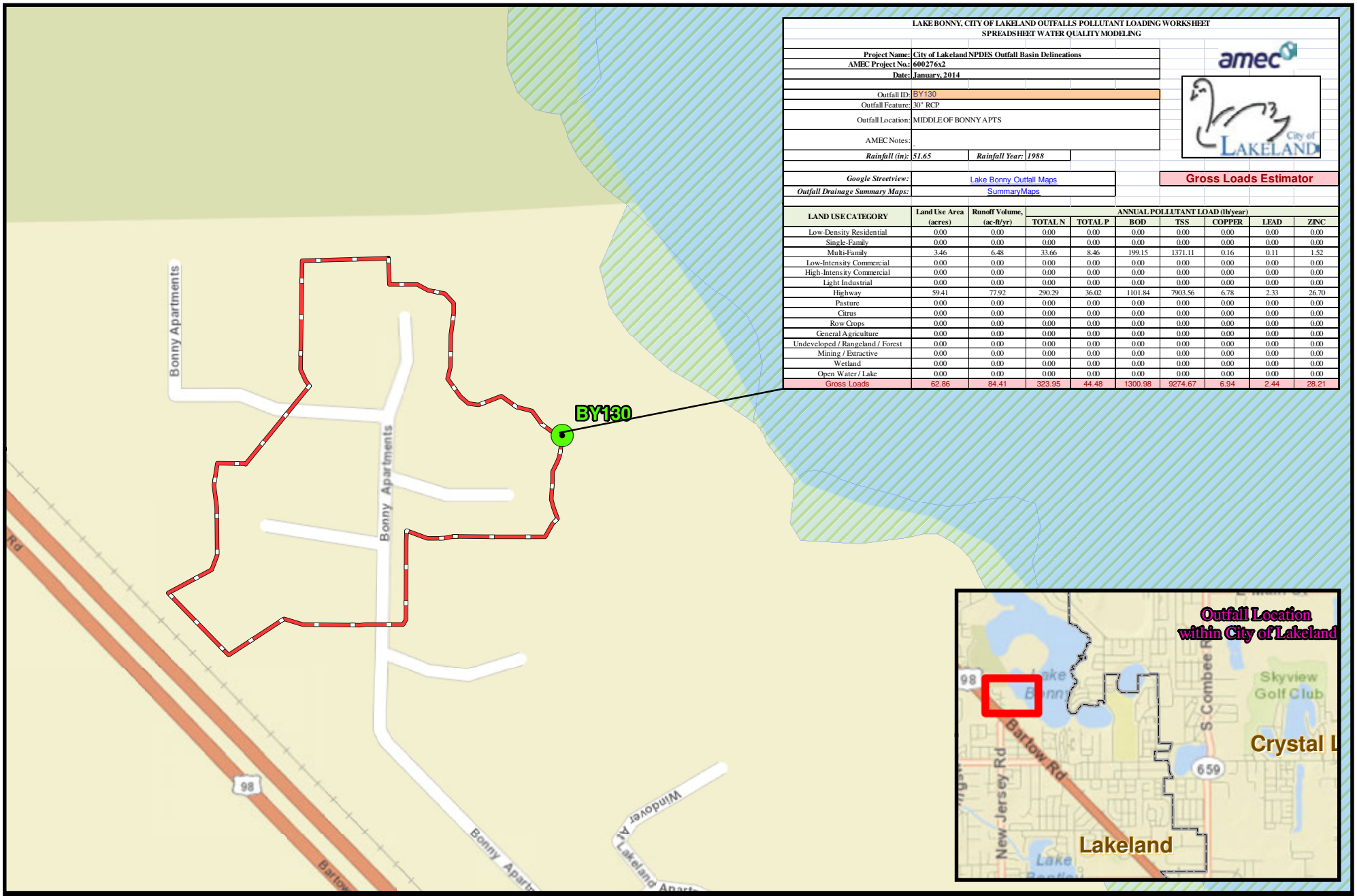

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**
Outfall ID:	BY130
Outfall Feature:	30" RCP
Outfall Location:	MIDDLE OF BONNY APTS
AMEC Notes:	
Rainfall (in):	***51.65***
Rainfall Year:	***1988***
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	3.46	6.48	33.66	8.46	199.15	1371.11	0.16	0.11	1.52
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	59.41	77.92	290.29	36.02	1101.84	7903.56	6.78	2.33	26.70
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	62.86	84.41	323.95	44.48	1300.98	9274.67	6.94	2.44	28.21

Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

N W E S

0 100 200
Feet

LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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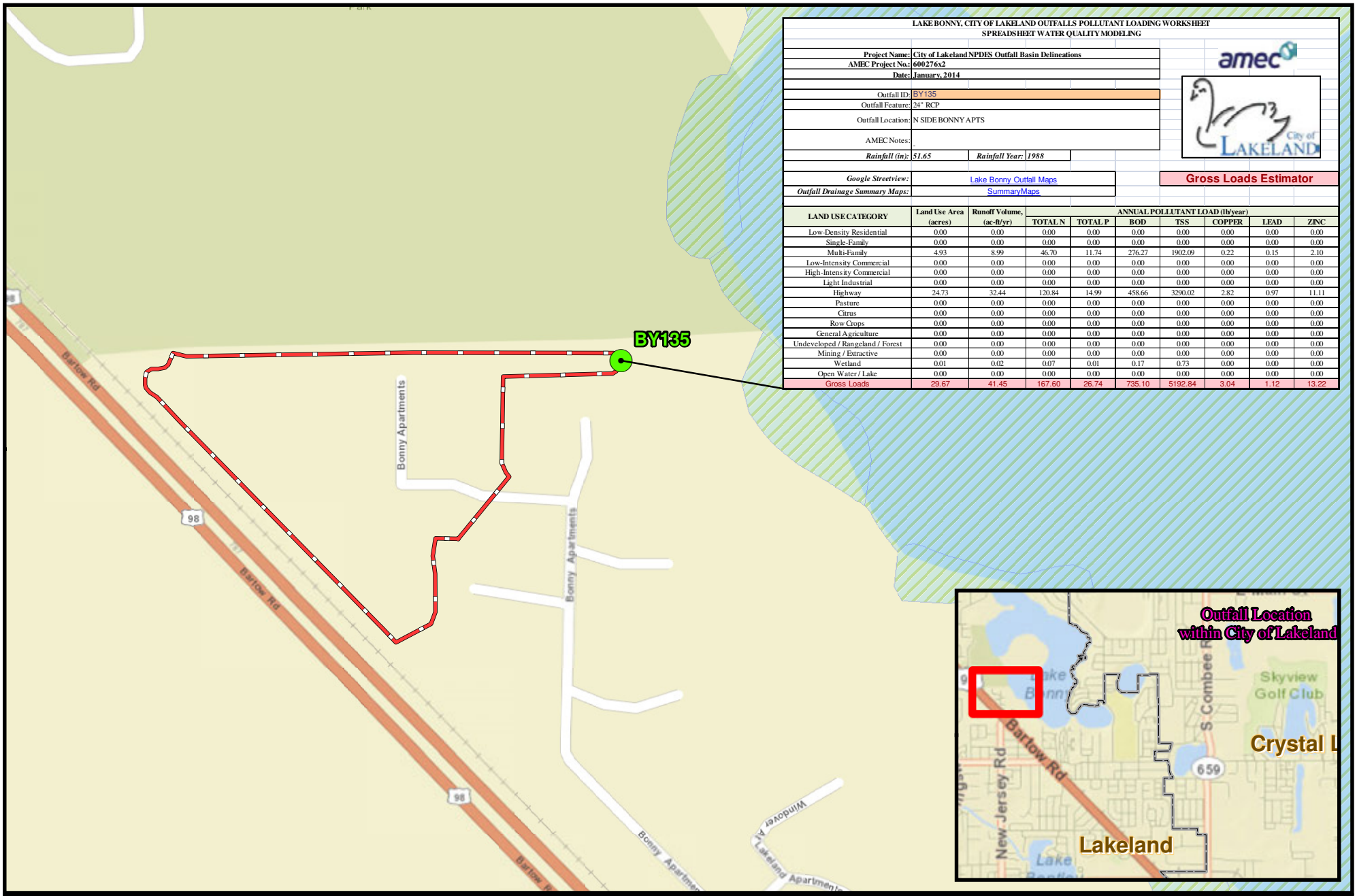

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY135
Outfall Feature:	24" RCP
Outfall Location:	N SIDE BONNY APTS
AMEC Notes:	
Rainfall (in):	*51.65*
Rainfall Year:	*1988*
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	4.93	8.99	46.70	11.74	276.27	1902.09	0.22	0.15	2.10
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	24.73	32.44	120.84	14.99	458.66	3290.02	2.82	0.97	11.11
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.01	0.02	0.07	0.01	0.17	0.73	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	29.67	41.45	167.60	26.74	735.10	5192.84	3.04	1.12	13.22

Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

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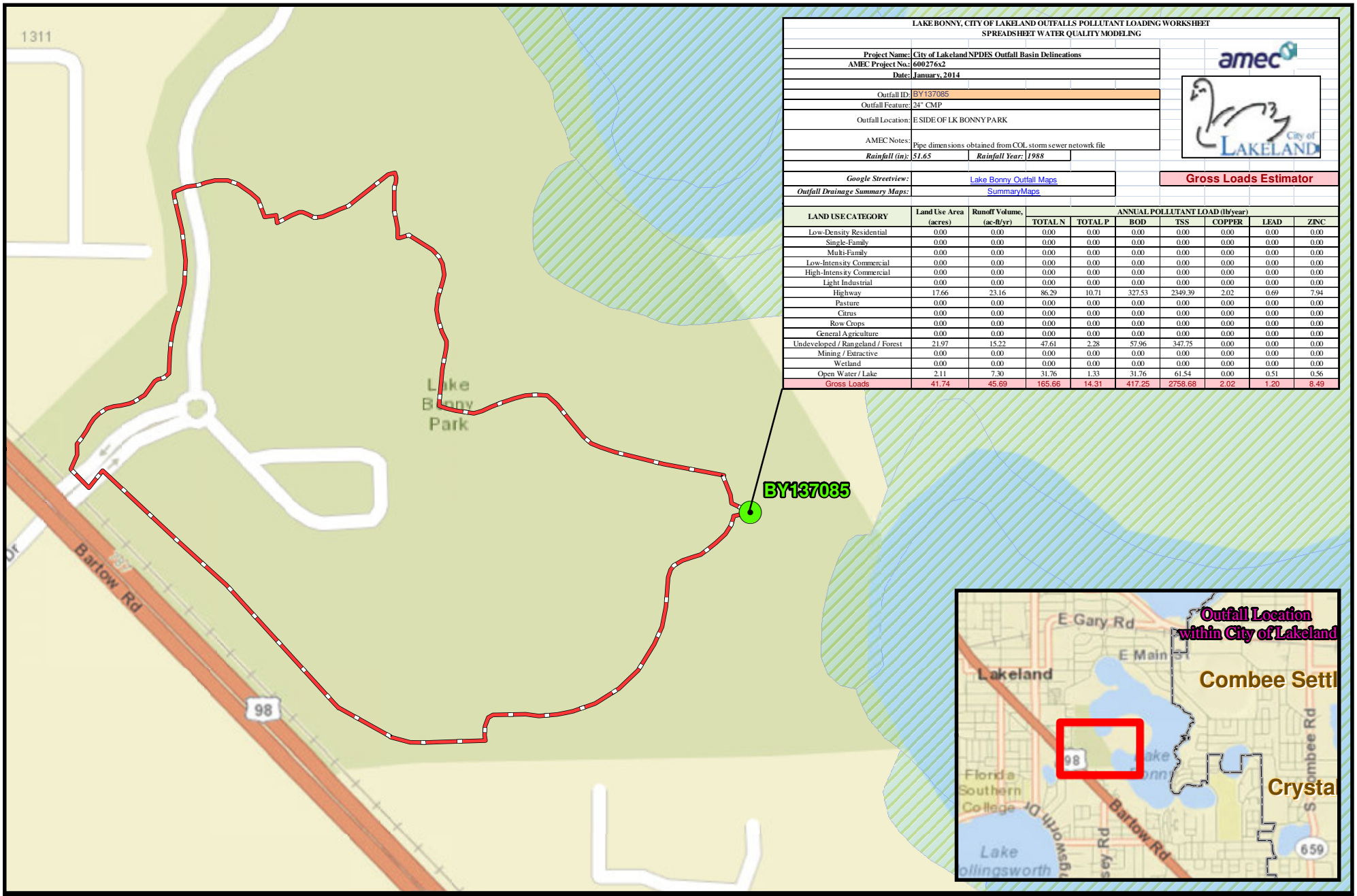
Feet

LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276.2 City of Lakeland - NPDES Lake Bonny\Technical\GIS\Figures\FLakeBonny_BY135.mxd



LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY137085
Outfall Feature:	24" CMP
Outfall Location:	E SIDE OF LK BONNY PARK
AMEC Notes:	Pipe dimensions obtained from COL storm sewer netowrk file
Rainfall (in):	***51.65*** ***Rainfall Year:*** ***1988***
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	17.66	23.16	86.29	10.71	327.53	2349.39	2.02	0.69	7.94
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	21.97	15.22	47.61	2.28	57.96	347.75	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	2.11	7.30	31.76	1.33	31.76	61.54	0.00	0.51	0.56
Gross Loads	41.74	45.69	165.66	14.31	417.25	2758.68	2.02	1.20	8.49

Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

N W E S

0 150 300
Feet

LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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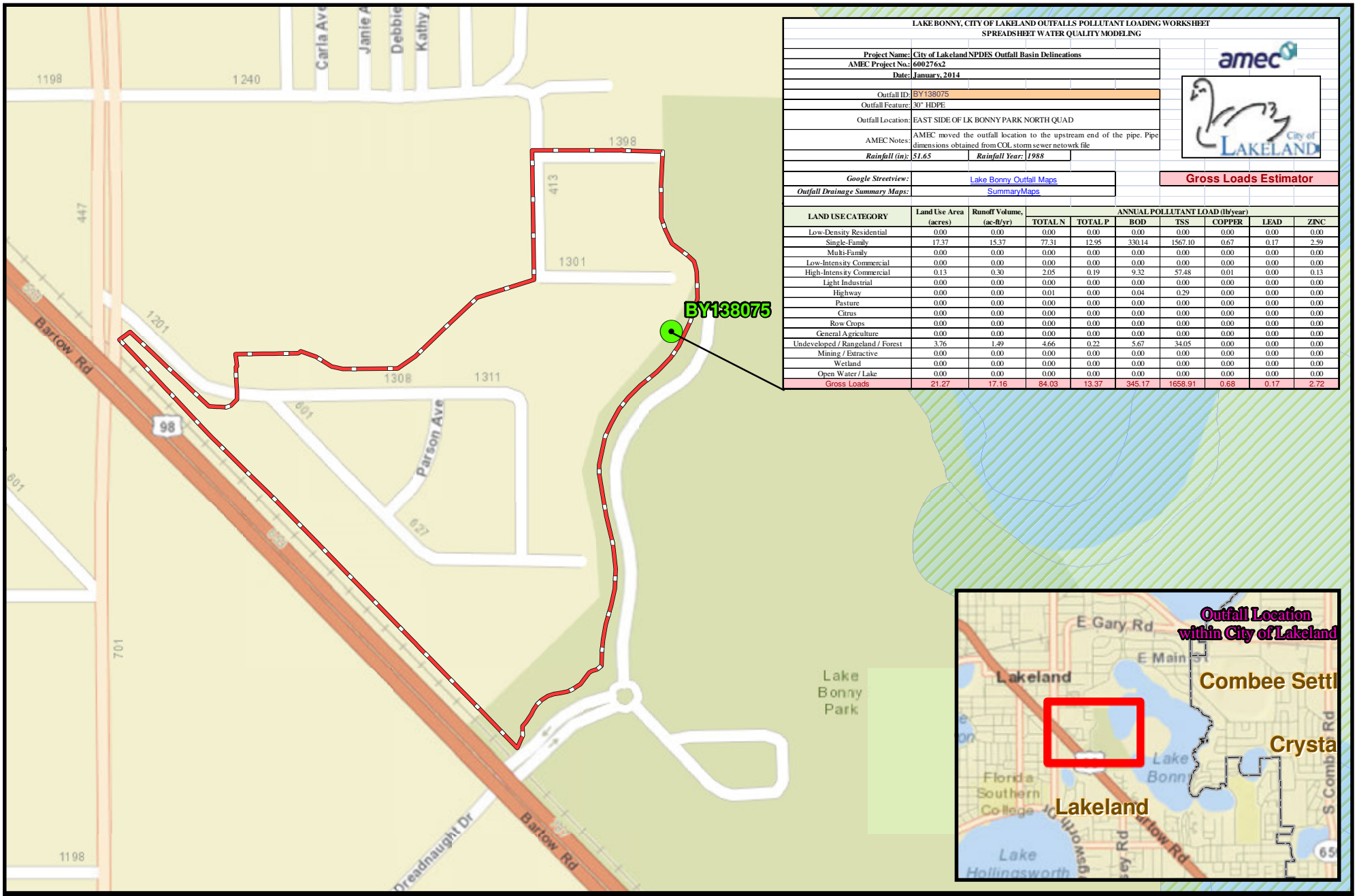

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY138075
Outfall Feature:	30" HDPE
Outfall Location:	EAST SIDE OF LK BONNY PARK NORTH QUAD
AMEC Notes:	AMEC moved the outfall location to the upstream end of the pipe. Pipe dimensions obtained from COL storm sewer netowrk file
Rainfall (in):	*51.65*
Rainfall Year:	*1988*
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	17.37	15.37	77.31	12.95	330.14	1567.10	0.67	0.17	2.59
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.13	0.30	2.05	0.19	9.32	57.48	0.01	0.00	0.13
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.01	0.00	0.04	0.29	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	3.76	1.49	4.66	0.22	5.67	34.05	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	21.27	17.16	84.03	13.37	345.17	1658.91	0.68	0.17	2.72

Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

N W E S

0 175 350
Feet

LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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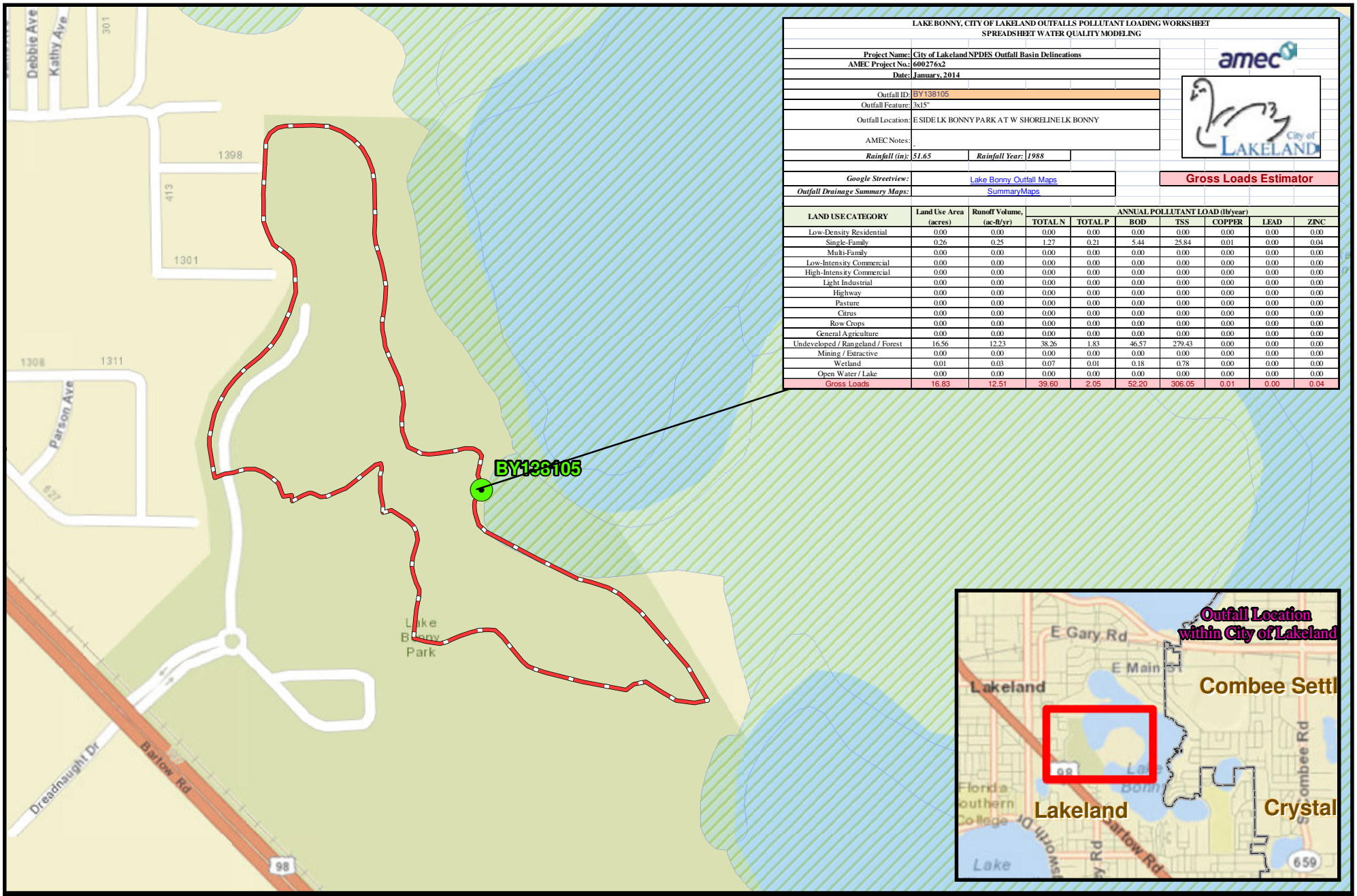

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY138105
Outfall Feature:	3x15"
Outfall Location:	E SIDE LK BONNY PARK AT W SHORELINE LK BONNY
AMEC Notes:	
Rainfall (in):	*51.65* — ***Rainfall Year:*** *1988*
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.26	0.25	1.27	0.21	5.44	25.84	0.01	0.00	0.04
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	16.56	12.23	38.26	1.83	46.57	279.43	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.01	0.03	0.07	0.01	0.18	0.78	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	16.83	12.51	39.60	2.05	52.20	306.05	0.01	0.00	0.04

Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

N W E S

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Feet

LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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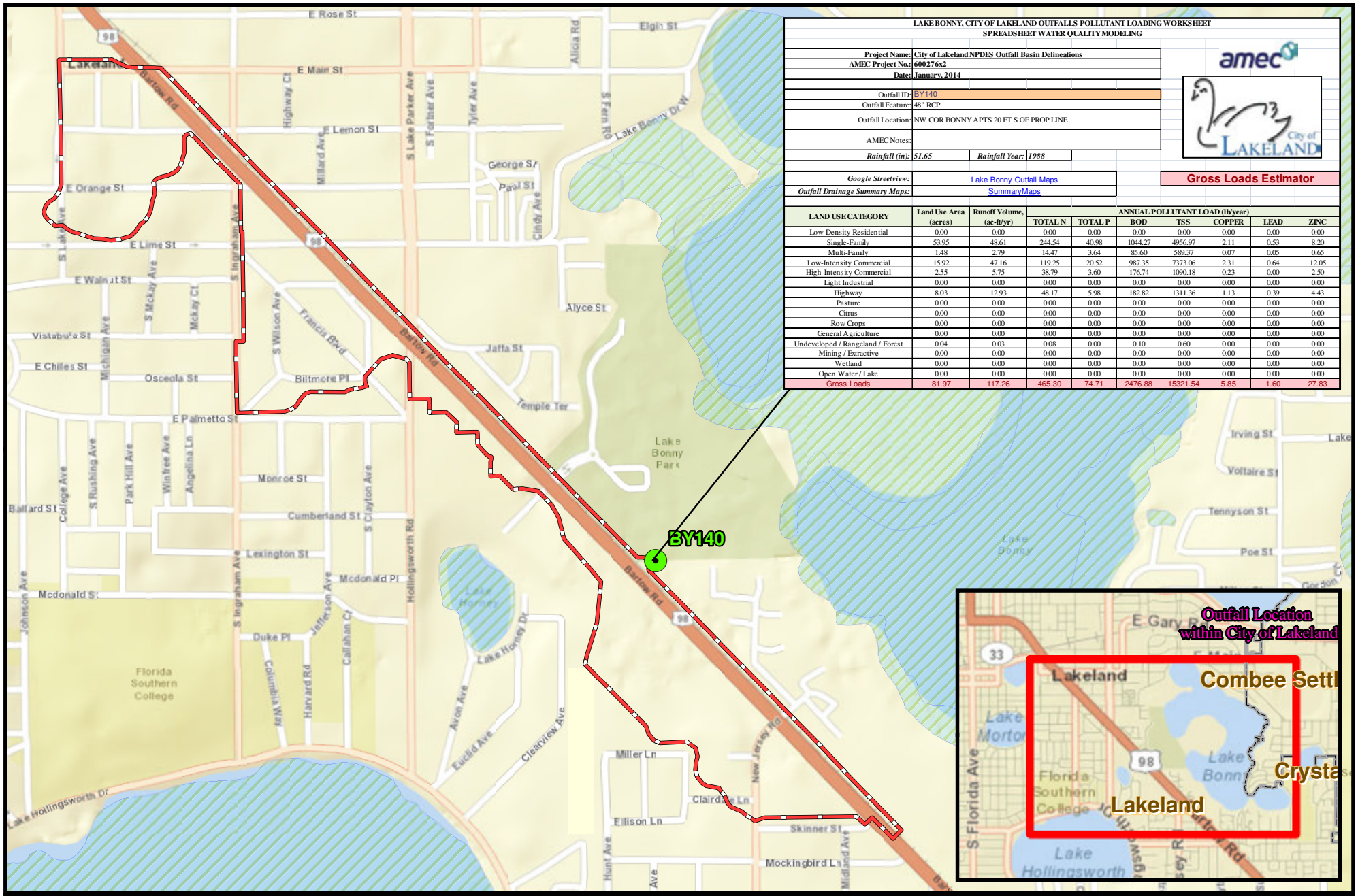

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY140
Outfall Feature:	48" RCP
Outfall Location:	NW COR BONNY APTS 20 FT S OF PROP LINE
AMEC Notes:	
Rainfall (in):	*51.65*
Rainfall Year:	*1988*
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	53.95	48.61	244.54	40.98	1044.27	4956.97	2.11	0.53	8.20
Multi-Family	1.48	2.79	14.47	3.64	85.60	589.37	0.07	0.05	0.65
Low-Intensity Commercial	15.92	47.16	119.25	20.52	987.35	7373.06	2.31	0.64	12.05
High-Intensity Commercial	2.55	5.75	38.79	3.60	176.74	1090.18	0.23	0.00	2.50
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	8.03	12.93	48.17	5.98	182.82	1311.36	1.13	0.39	4.43
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.04	0.03	0.08	0.00	0.10	0.60	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	81.97	117.26	465.30	74.71	2476.88	15321.54	5.85	1.60	27.83

Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

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LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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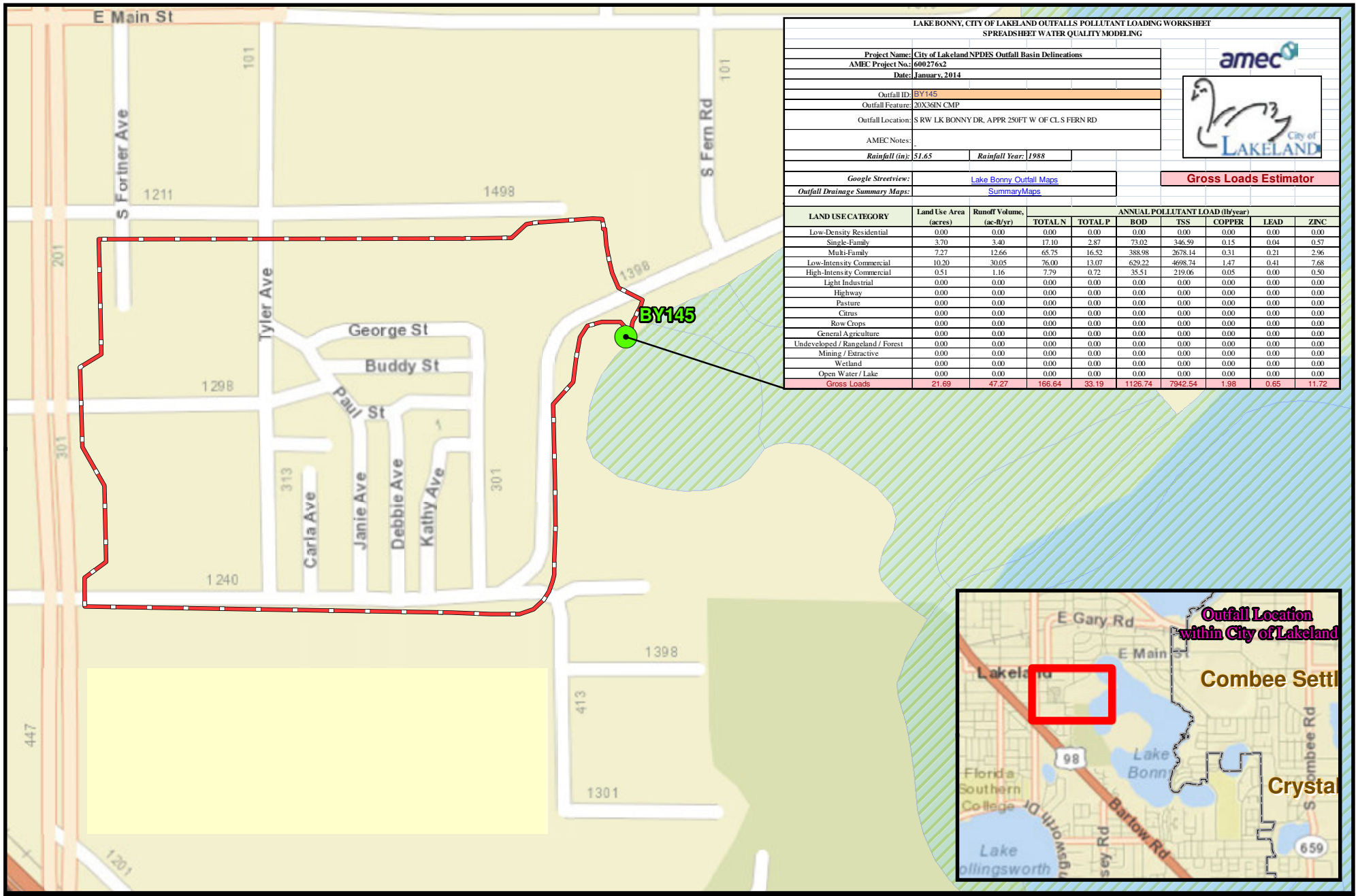

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY145
Outfall Feature:	20X36IN CMP
Outfall Location:	S RW LK BONNY DR, APPR 250FT W OF CL S FERN RD
AMEC Notes:	
Rainfall (in):	*51.65*
Rainfall Year:	*1988*
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year) TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	3.70	3.40	17.10	2.87	73.02	346.59	0.15	0.04	0.57
Multi-Family	7.27	12.66	65.75	16.52	388.98	2678.14	0.31	0.21	2.96
Low-Intensity Commercial	10.20	30.05	76.00	13.07	629.22	4698.74	1.47	0.41	7.68
High-Intensity Commercial	0.51	1.16	7.79	0.72	35.51	219.06	0.05	0.00	0.50
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	21.69	47.27	166.64	33.19	1126.74	7942.54	1.98	0.65	11.72

Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

N W E S

0 150 300
Feet

LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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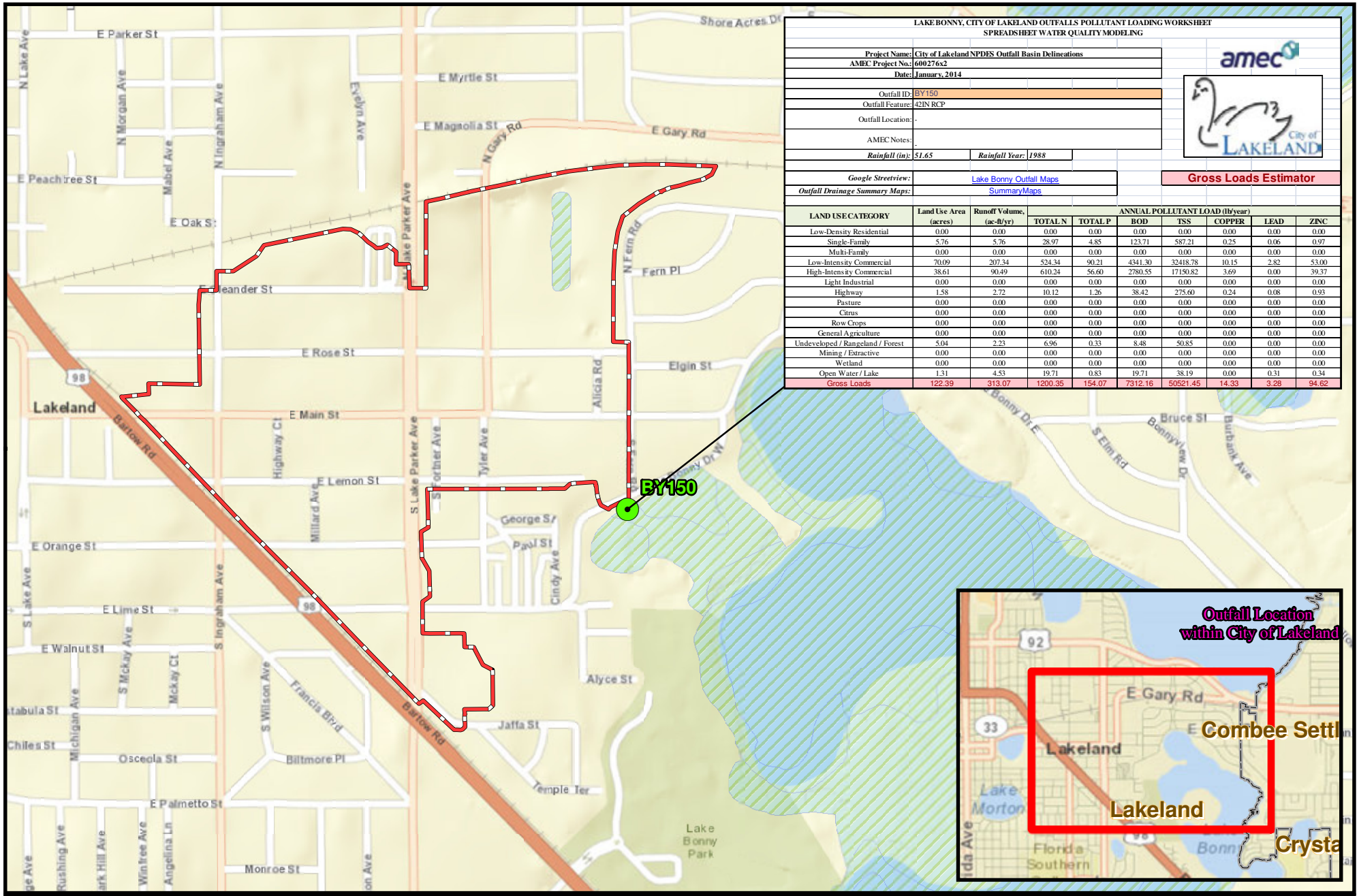
LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY150
Outfall Feature:	42IN RCP
Outfall Location:	-
AMEC Notes:	-
Rainfall (in):	*51.65*
Rainfall Year:	*1988*
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	5.76	5.76	28.97	4.85	123.71	587.21	0.25	0.06	0.97
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	70.09	207.34	524.34	90.21	4341.30	32418.78	10.15	2.82	53.00
High-Intensity Commercial	38.61	90.49	610.24	56.60	2780.55	17150.82	3.69	0.00	39.37
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	1.58	2.72	10.12	1.26	38.42	275.60	0.24	0.08	0.93
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	5.04	2.23	6.96	0.33	8.48	50.85	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	1.31	4.53	19.71	0.83	19.71	38.19	0.00	0.31	0.34
Gross Loads	122.39	313.07	1200.35	154.07	7312.16	50521.45	14.33	3.28	94.62



Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

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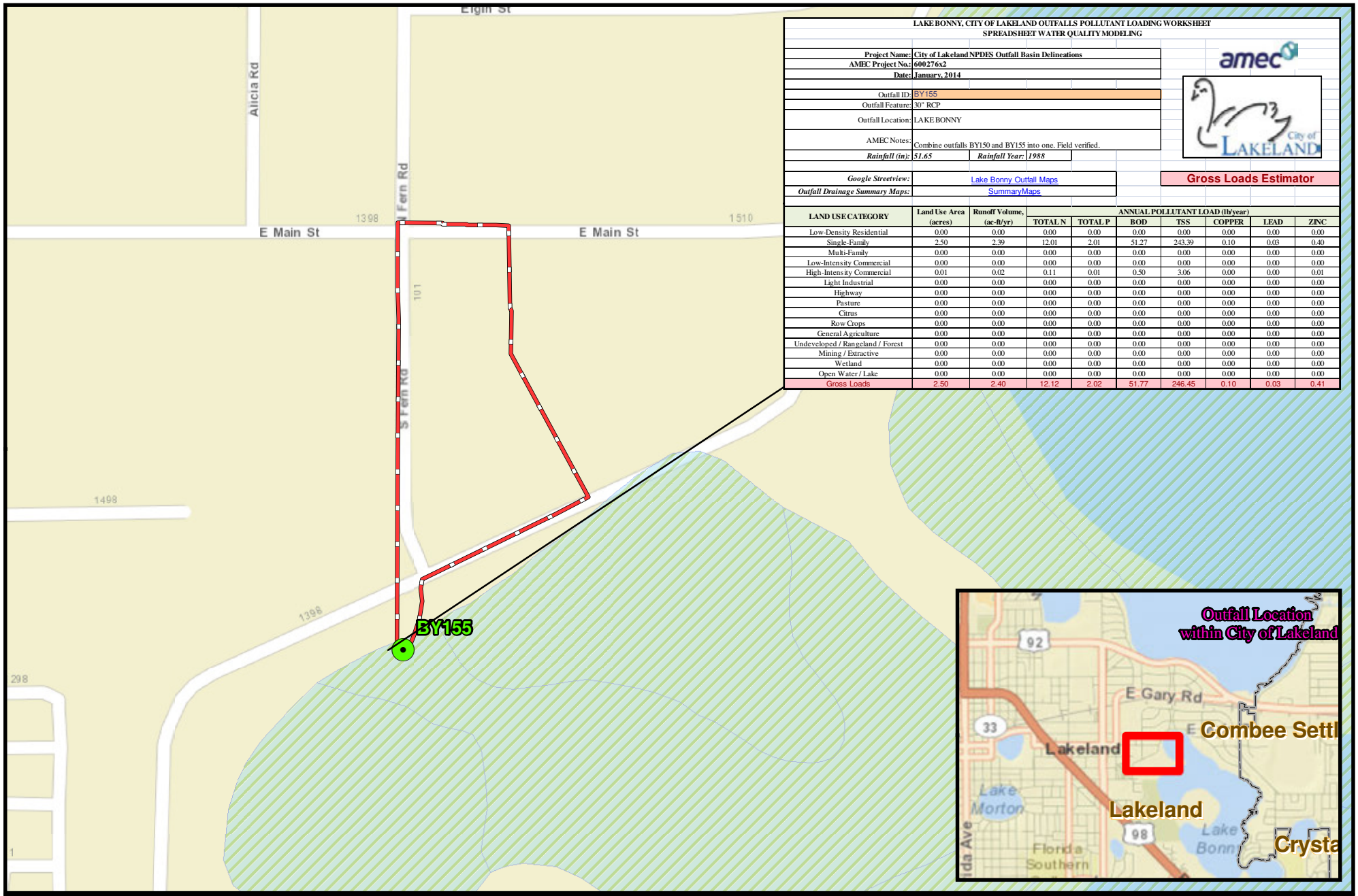
LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276.2 City of Lakeland - NPDES Lake Bonny\Technical\GIS\Figures\FLakeBonny_BY150.mxd



LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY155
Outfall Feature:	30" RCP
Outfall Location:	LAKE BONNY
AMEC Notes:	Combine outfalls BY150 and BY155 into one. Field verified.
Rainfall (in):	*51.65* ***Rainfall Year:*** *1988*
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	2.50	2.39	12.01	2.01	51.27	243.39	0.10	0.03	0.40
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.01	0.02	0.11	0.01	0.50	3.06	0.00	0.00	0.01
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	2.50	2.40	12.12	2.02	51.77	246.45	0.10	0.03	0.41

Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

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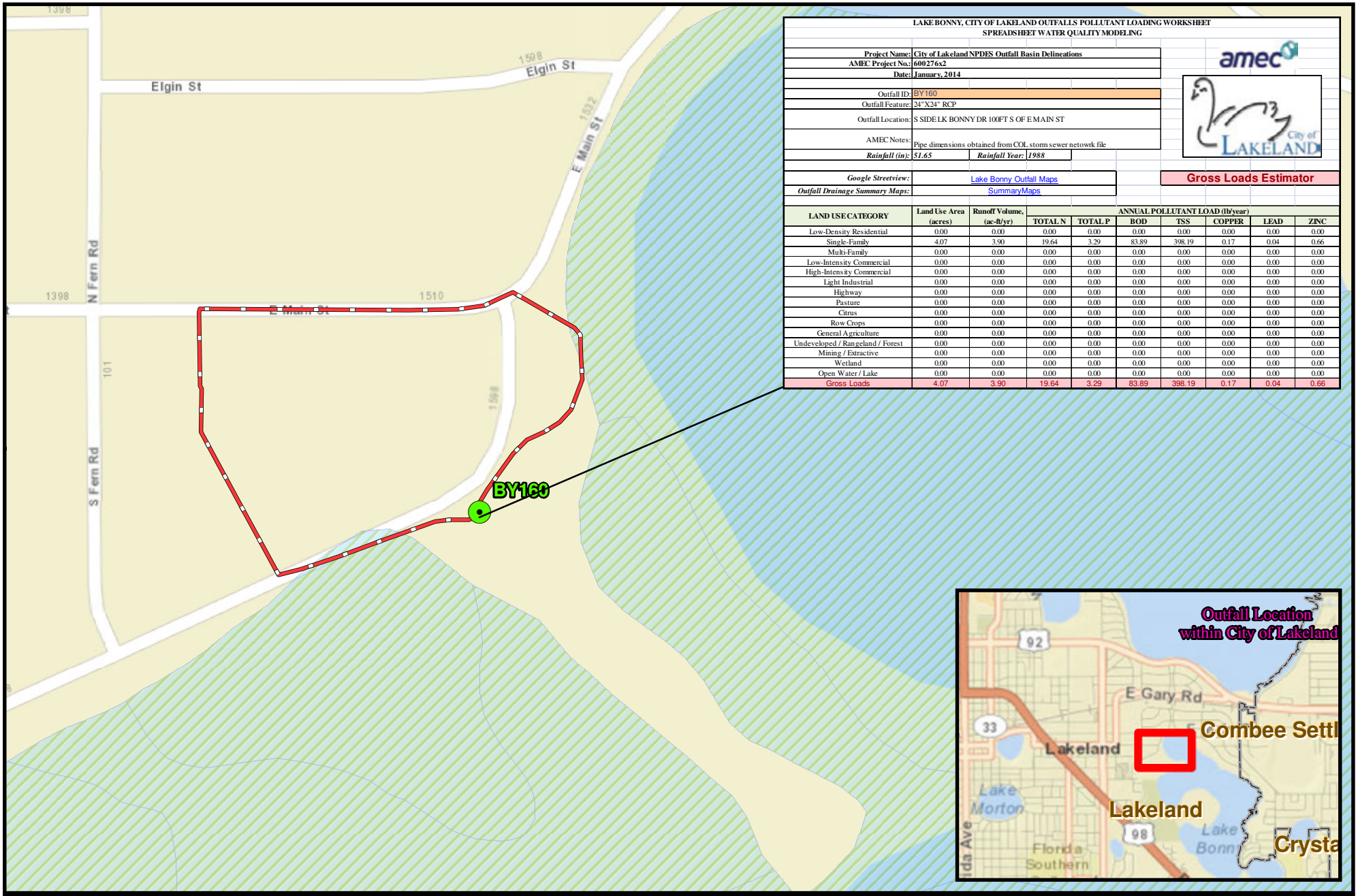
LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276.2 City of Lakeland - NPDES Lake Bonny\Technical\GIS\Figures\FLakeBonny_BY155.mxd



LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY160
Outfall Feature:	24"X24" RCP
Outfall Location:	S SIDE LK BONNY DR 100FT S OF E MAIN ST
AMEC Notes:	Pipe dimensions obtained from COL storm sewer netowrk file
Rainfall (in):	***51.65***
Rainfall Year:	***1988***
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	4.07	3.90	19.64	3.29	83.89	398.19	0.17	0.04	0.66
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	4.07	3.90	19.64	3.29	83.89	398.19	0.17	0.04	0.66

Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

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LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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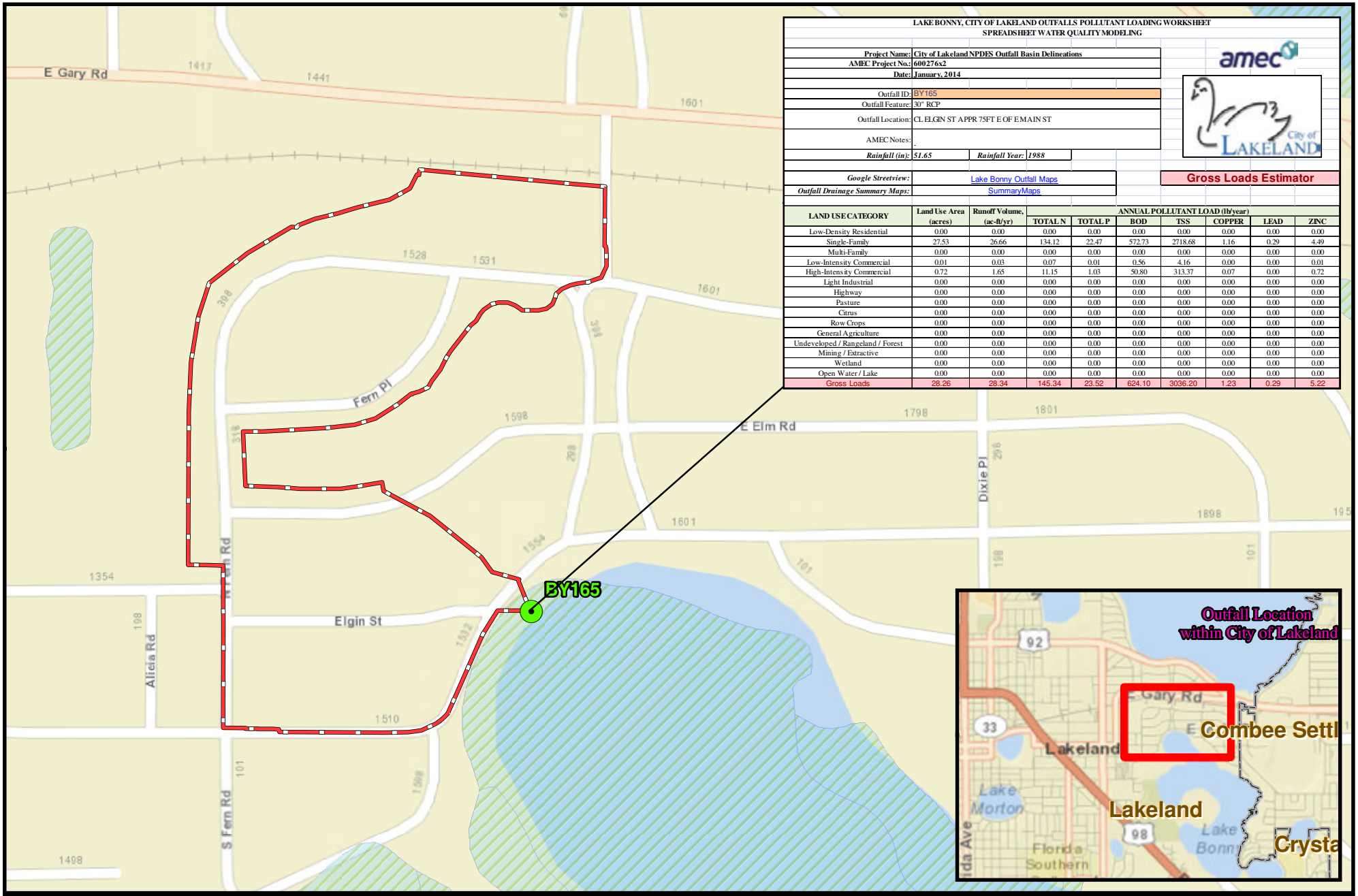
LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY165
Outfall Feature:	30" RCP
Outfall Location:	CL ELGIN ST APPR 75FT E OF E MAIN ST
AMEC Notes:	
Rainfall (in):	*51.65*
Rainfall Year:	*1988*
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	27.53	26.66	134.12	22.47	572.73	2718.68	1.16	0.29	4.49
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.01	0.03	0.07	0.01	0.56	4.16	0.00	0.00	0.01
High-Intensity Commercial	0.72	1.65	11.15	1.03	50.80	313.37	0.07	0.00	0.72
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	28.26	28.34	145.34	23.52	624.10	3036.20	1.23	0.29	5.22



Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

N W E S

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Feet

LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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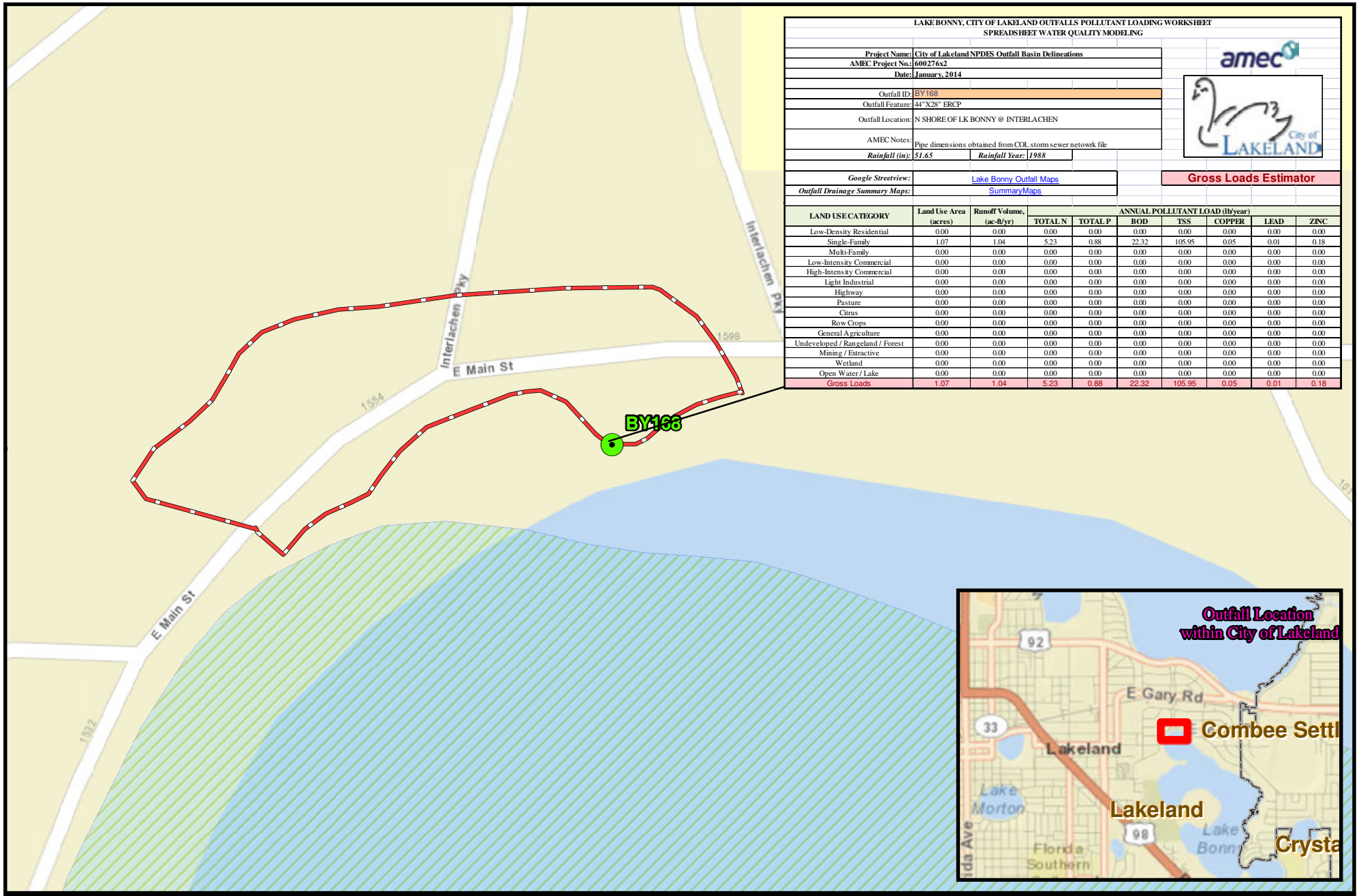

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY168
Outfall Feature:	44"X28" ERCP
Outfall Location:	N SHORE OF LK BONNY @ INTERLACHEN
AMEC Notes:	Pipe dimensions obtained from COL storm sewer netowrk file
Rainfall (in):	*51.65* — ***Rainfall Year:*** *1988*
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	1.07	1.04	5.23	0.88	22.32	105.95	0.05	0.01	0.18
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	1.07	1.04	5.23	0.88	22.32	105.95	0.05	0.01	0.18

Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

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LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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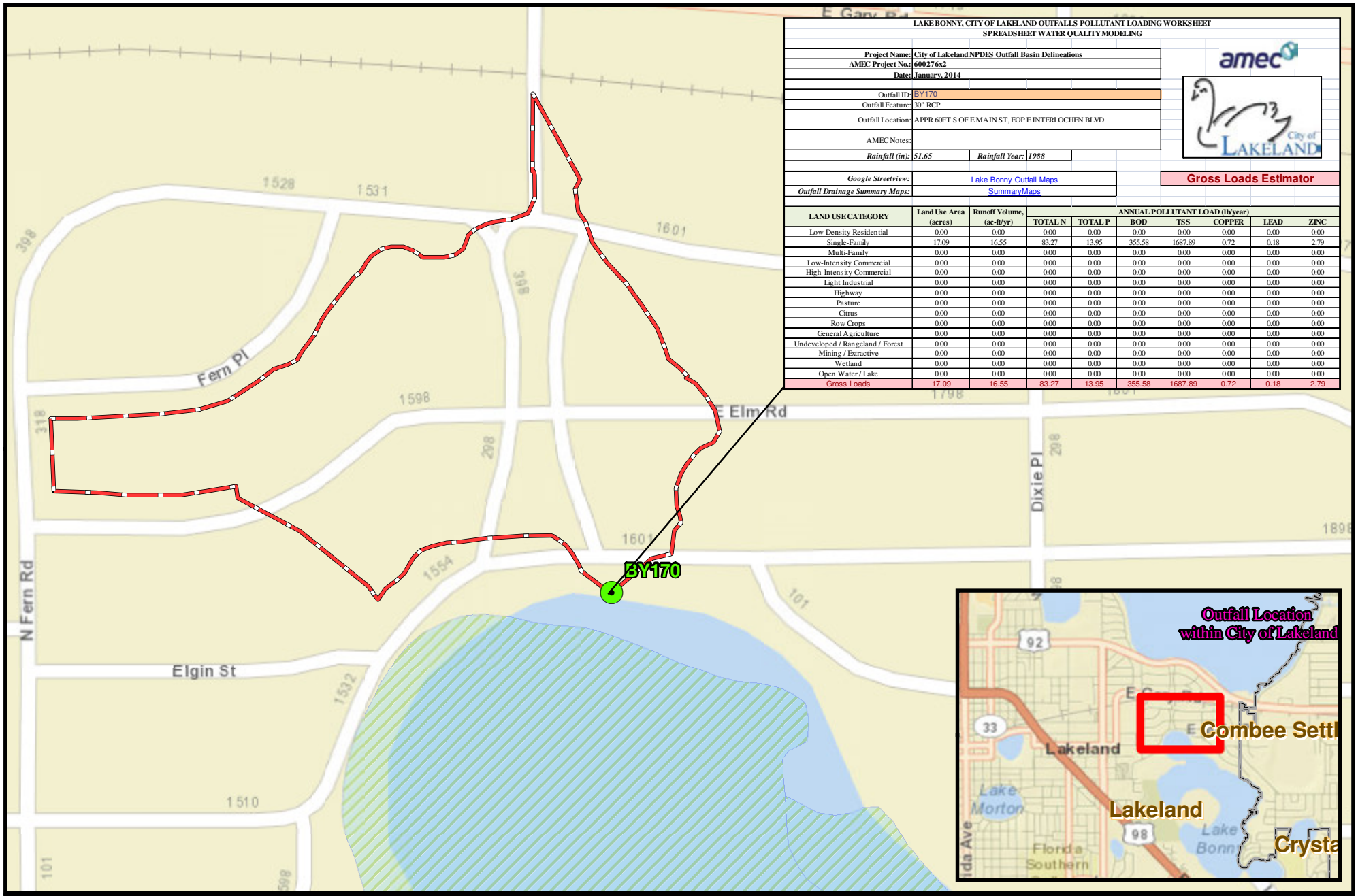

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY170
Outfall Feature:	30" RCP
Outfall Location:	APPR 60FT S OF E MAIN ST, EOP E INTERLOCHEN BLVD
AMEC Notes:	
Rainfall (in):	*51.65* — ***Rainfall Year:*** *1988*
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year) TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	17.09	16.55	83.27	13.95	355.58	1687.89	0.72	0.18	2.79
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	17.09	16.55	83.27	13.95	355.58	1687.89	0.72	0.18	2.79

Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

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LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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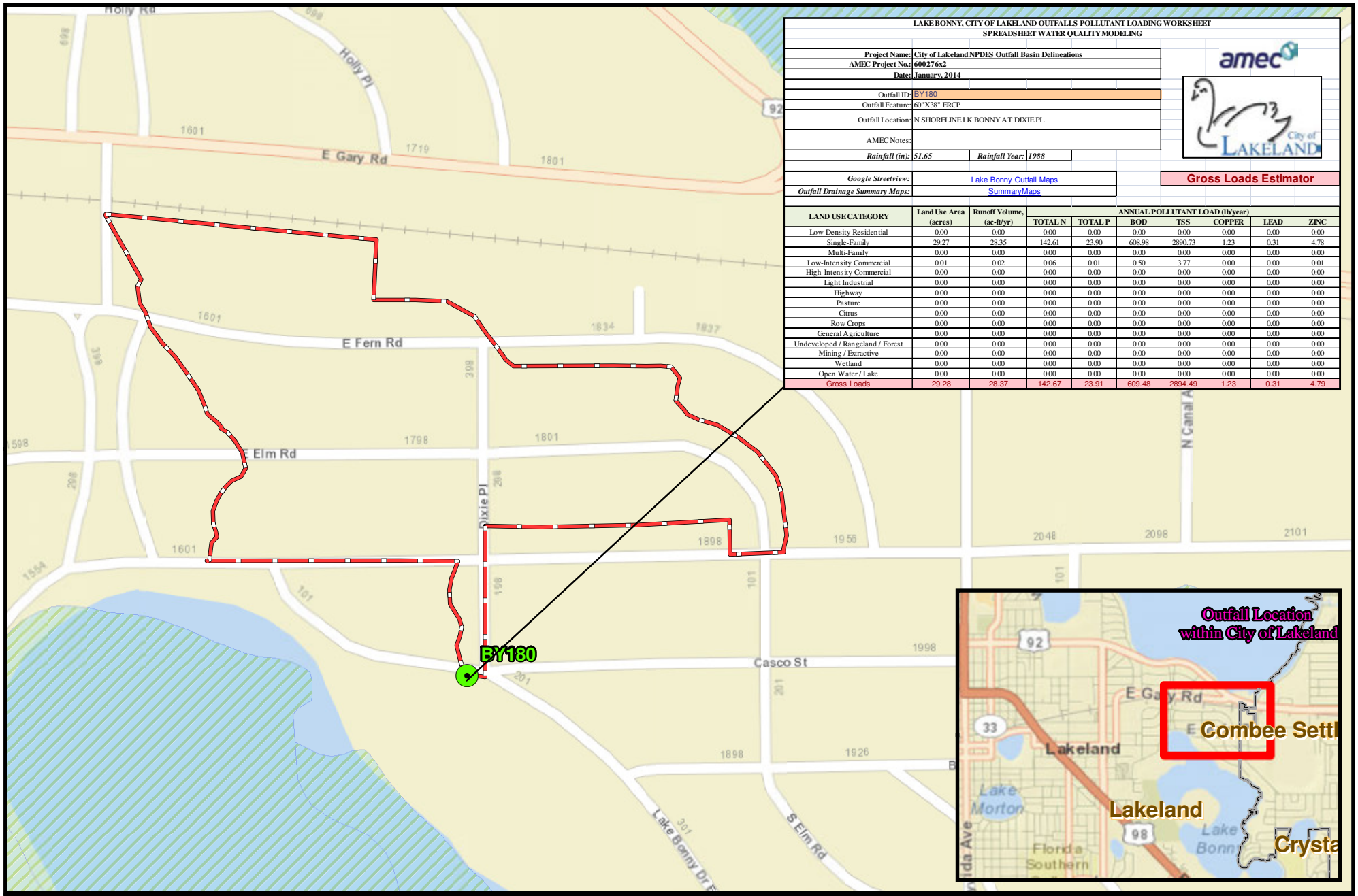


LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY180
Outfall Feature:	60"X38" ERCP
Outfall Location:	N SHORELINE LK BONNY AT DIXIE PL
AMEC Notes:	
Rainfall (in):	*51.65*
Rainfall Year:	*1988*
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year) TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	29.27	28.35	142.61	23.90	608.98	2890.73	1.23	0.31	4.78
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.01	0.02	0.06	0.01	0.50	3.77	0.00	0.00	0.01
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	29.28	28.37	142.67	23.91	609.48	2894.49	1.23	0.31	4.79

Notes:
1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-
- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

N W E S

0 200 400
Feet

LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

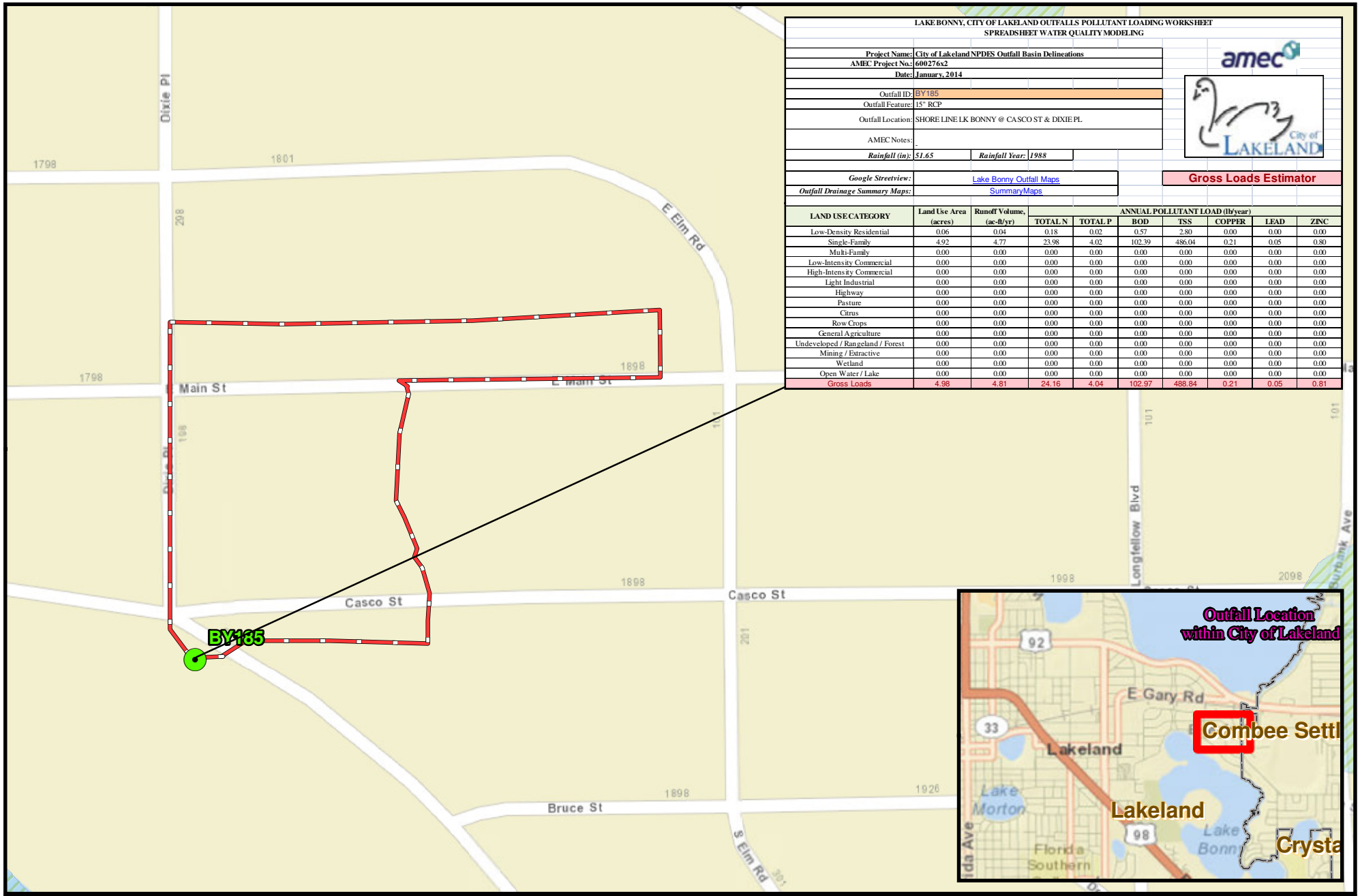
File Path: T:\600276.2 City of Lakeland - NPDES Lake Bonny\Technical\GIS\Figures\FLakeBonny_BY180.mxd

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY185
Outfall Feature:	15" RCP
Outfall Location:	SHORE LINE LK BONNY @ CASCO ST & DIXIE PL
AMEC Notes:	
Rainfall (in):	*51.65*
Rainfall Year:	*1988*
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.06	0.04	0.18	0.02	0.57	2.80	0.00	0.00	0.00
Single-Family	4.92	4.77	23.98	4.02	102.39	486.04	0.21	0.05	0.80
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	4.98	4.81	24.16	4.04	102.97	488.84	0.21	0.05	0.81



Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

N W E S

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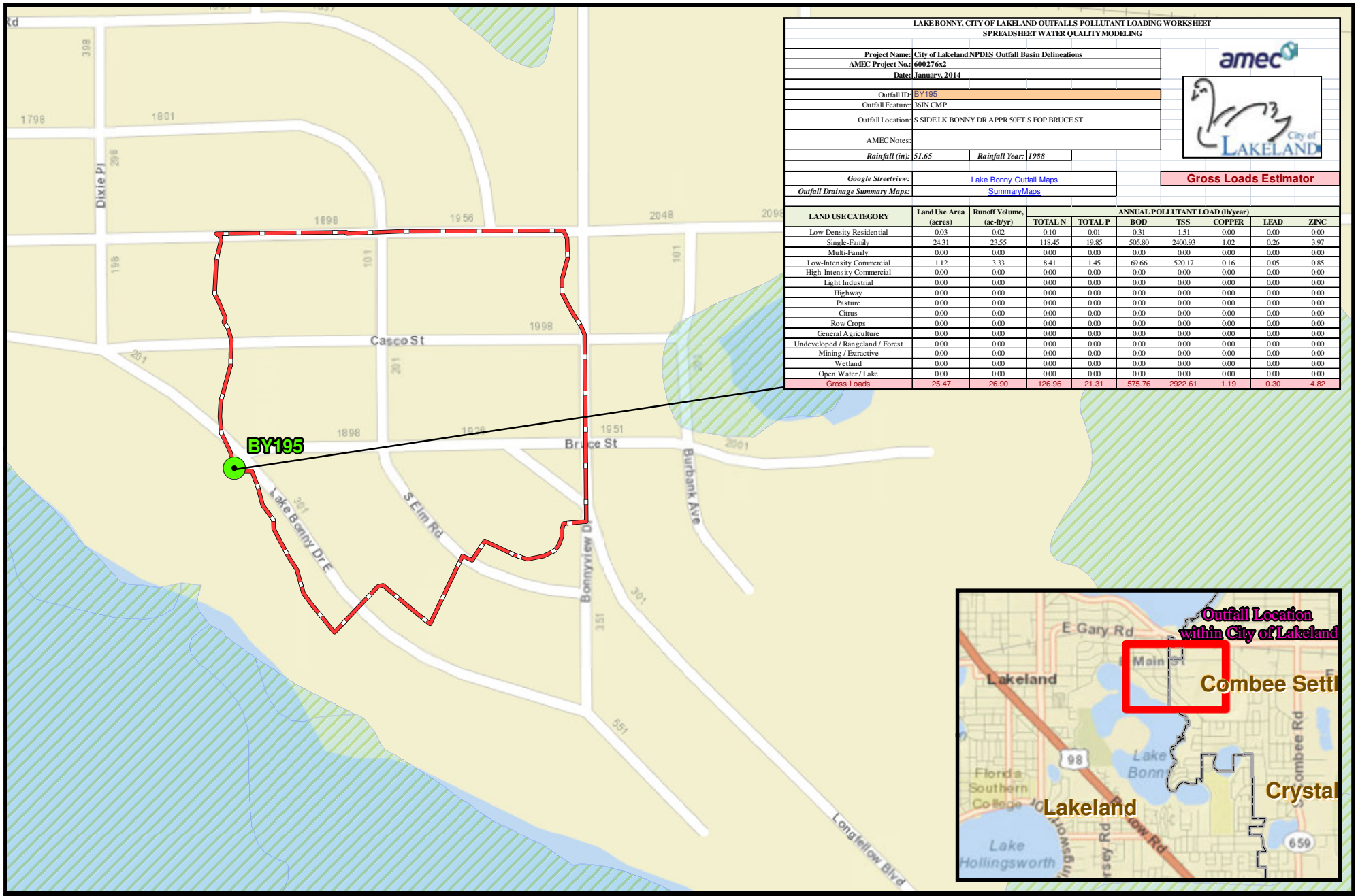
Feet

LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276.2 City of Lakeland - NPDES Lake Bonny\Technical\GIS\Figures\FLakeBonny_BY185.mxd



LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY195
Outfall Feature:	36IN CMP
Outfall Location:	S SIDE LK BONNY DR APPR 50FT S EOP BRUCE ST
AMEC Notes:	
Rainfall (in):	*51.65*
Rainfall Year:	*1988*
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.03	0.02	0.10	0.01	0.31	1.51	0.00	0.00	0.00
Single-Family	24.31	23.55	118.45	19.85	505.80	2400.93	1.02	0.26	3.97
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	1.12	3.33	8.41	1.45	69.66	520.17	0.16	0.05	0.85
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	25.47	26.90	126.96	21.31	575.76	2922.61	1.19	0.30	4.82

Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

N W E S

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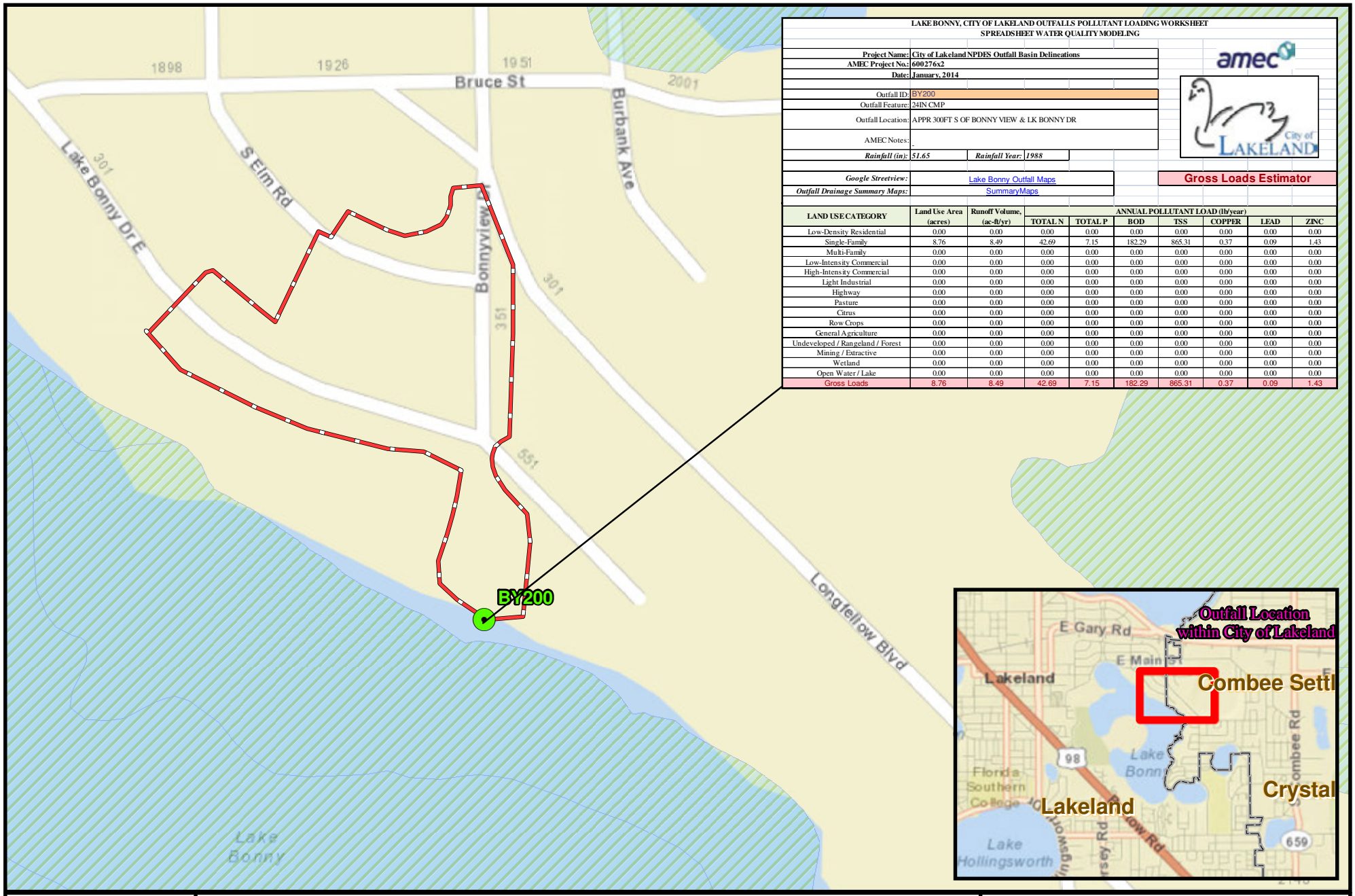
Feet

LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

File Path: T:\600276.2 City of Lakeland - NPDES Lake Bonny\Technical\GIS\Figures\FLakeBonny_BY195.mxd



LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY200
Outfall Feature:	24IN CMP
Outfall Location:	APPR 300FT S OF BONNY VIEW & LK BONNY DR
AMEC Notes:	
Rainfall (in):	*51.65*
Rainfall Year:	*1988*
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	8.76	8.49	42.69	7.15	182.29	865.31	0.37	0.09	1.43
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	8.76	8.49	42.69	7.15	182.29	865.31	0.37	0.09	1.43

Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

N W E S

0 150 300
Feet

LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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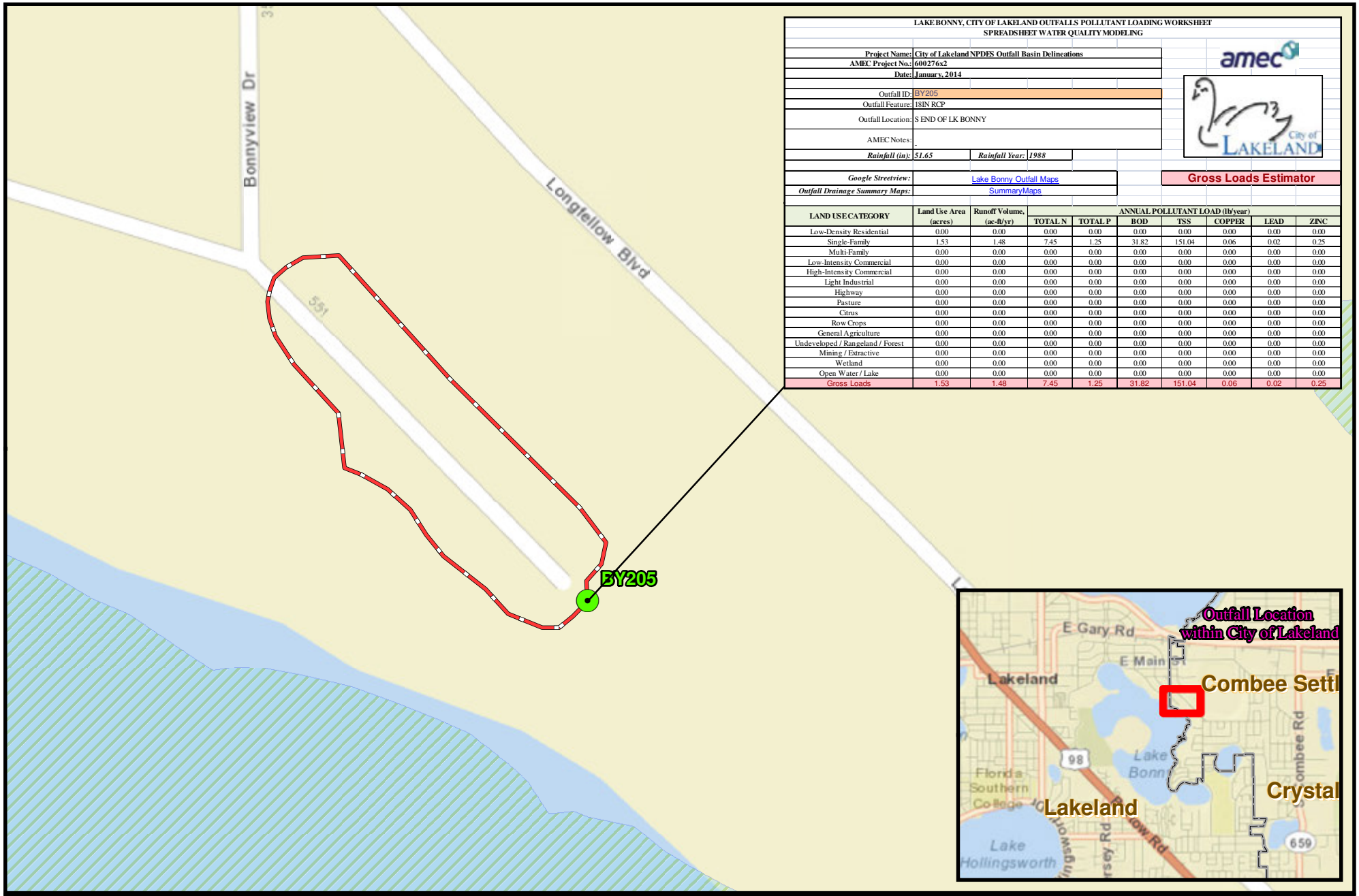

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	City of Lakeland NPDES Outfall Basin Delineations
AMEC Project No.:	600276x2
Date:	January, 2014
Outfall ID:	BY205
Outfall Feature:	18IN RCP
Outfall Location:	S END OF LK BONNY
AMEC Notes:	
Rainfall (in):	*51.65*
Rainfall Year:	*1988*
Google Streetview:	Lake Bonny Outfall Maps
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year) TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	1.53	1.48	7.45	1.25	31.82	151.04	0.06	0.02	0.25
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	1.53	1.48	7.45	1.25	31.82	151.04	0.06	0.02	0.25

Notes:

1- Project No.: 600276x2
2- Data Sources - ArcGIS World Imagery
3- This map is intended to be used for planning purposes only. It is not a survey.

Date: January, 2014
Prepared By: VG
Checked By:

This map features the following-

- Wetlands
- Parks
- Lake Bonny Outfalls
- Drainage Area Boundary

N W E S

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Feet

LAKE BONNY NPDES OUTFALLS
CITY OF LAKELAND
DRAINAGE AREA & POLLUTANT LOADINGS

AMEC Environment & Infrastructure, Inc. - 2000 E. Edgewood Drive Ste #215 - Lakeland, FL 33803 - CA-5392 - (863) 667-2345

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LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY005		
Outfall Feature:	NOT AVAILABLE		
Outfall Location:	-		
AMEC Notes:	AMEC Field review. Access to backyard to investigate culvert details was denied by the house owner. Owner says no pipe. COL drain file updated this.		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	4.75	4.19	17.10	2.05	53.58	262.19	0.09	0.02	0.35
Single-Family	30.64	27.92	140.47	23.54	599.85	2847.38	1.21	0.30	4.71
Multi-Family	47.62	87.74	455.69	114.52	2695.98	18561.70	2.15	1.43	20.52
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	2.00	2.17	14.31	2.72	22.47	255.42	0.08	0.02	0.12
Undeveloped / Rangeland / Forest	3.67	1.74	5.44	0.26	6.62	39.73	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	29.73	102.70	282.06	25.13	734.46	3127.75	0.28	0.28	1.68
Open Water / Lake	1.59	5.48	23.84	1.00	23.84	46.18	0.00	0.38	0.42
Gross Loads	120.00	231.95	938.90	169.22	4136.79	25140.35	3.81	2.43	27.80

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY010		
Outfall Feature:	8IN STEEL		
Outfall Location:	-		
AMEC Notes:	-		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	11.26	9.93	49.96	8.37	213.36	1012.77	0.43	0.11	1.67
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	11.26	9.93	49.96	8.37	213.36	1012.77	0.43	0.11	1.67

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*
Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY015		
Outfall Feature:	18IN CMP		
Outfall Location:	-		
AMEC Notes:	-		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	5.29	4.67	23.47	3.93	100.24	475.84	0.20	0.05	0.79
Multi-Family	1.42	2.51	13.03	3.27	77.08	530.70	0.06	0.04	0.59
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.01	0.02	0.14	0.01	0.65	3.98	0.00	0.00	0.01
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	6.71	7.20	36.64	7.22	177.97	1010.52	0.27	0.09	1.38

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*
Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY020		
Outfall Feature:	18IN CMP		
Outfall Location:	-		
AMEC Notes:	-		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	6.03	11.02	57.23	14.38	338.56	2330.95	0.27	0.18	2.58
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.35	0.80	5.39	0.50	24.58	151.58	0.03	0.00	0.35
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	6.39	11.82	62.62	14.88	363.13	2482.54	0.30	0.18	2.92

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*
Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY025		
Outfall Feature:	15IN CMP		
Outfall Location:	-		
AMEC Notes:	-		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	4.95	8.99	46.68	11.73	276.16	1901.37	0.22	0.15	2.10
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.02	0.06	0.37	0.03	1.69	10.43	0.00	0.00	0.02
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	4.98	9.04	47.05	11.77	277.85	1911.80	0.22	0.15	2.13

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*
Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY027		
Outfall Feature:	36" RCP		
Outfall Location:	NE COR LK BONNY BEHIND 2 STORY APT BUILDING		
AMEC Notes:	Pipe dimensions obtained from COL storm sewer netowrk file		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	18.84	19.28	96.99	16.25	414.19	1966.11	0.84	0.21	3.25
Multi-Family	56.12	100.83	523.66	131.60	3098.10	21330.26	2.47	1.65	23.58
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	47.88	83.02	559.83	51.92	2550.85	15733.99	3.39	0.00	36.12
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	1.01	2.84	7.81	0.70	20.34	86.60	0.01	0.01	0.05
Open Water / Lake	2.04	5.30	23.07	0.97	23.07	44.71	0.00	0.37	0.40
Gross Loads	125.88	211.27	1211.37	201.44	6106.55	39161.67	6.70	2.23	63.40

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*
Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY035		
Outfall Feature:	24IN RCP		
Outfall Location:	-		
AMEC Notes:	-		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	7.32	16.52	111.37	10.33	507.47	3130.13	0.67	0.00	7.19
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	7.32	16.52	111.37	10.33	507.47	3130.13	0.67	0.00	7.19

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*
Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY036		
Outfall Feature:	36" RCP		
Outfall Location:	WEST SIDE OF LONGFELLOW @ LAKE S. ENT. ADDISON HALL		
AMEC Notes:	Pipe dimensions obtained from COL storm sewer netowrk file		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	9.34	16.27	84.48	21.23	499.80	3441.13	0.40	0.27	3.80
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	9.48	21.38	144.15	13.37	656.79	4051.20	0.87	0.00	9.30
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	18.82	37.64	228.63	34.60	1156.60	7492.33	1.27	0.27	13.10

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY037		
Outfall Feature:	24" STEEL		
Outfall Location:	SE COR LITTLE LAKE BONNY		
AMEC Notes:	AMEC moved the outfall location to the upstream end of the pipe.		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	12.69	22.11	114.81	28.85	679.24	4676.55	0.54	0.36	5.17
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	29.43	66.34	447.40	41.49	2038.55	12574.07	2.71	0.00	28.86
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	42.12	88.45	562.21	70.35	2717.79	17250.62	3.25	0.36	34.03

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY040		
Outfall Feature:	18IN RCP		
Outfall Location:	-		
AMEC Notes:	-		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	4.86	8.48	44.06	11.07	260.67	1794.73	0.21	0.14	1.98
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.03	0.11	0.49	0.02	0.49	0.96	0.00	0.01	0.01
Gross Loads	4.89	8.60	44.55	11.09	261.17	1795.69	0.21	0.15	1.99

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*
Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY045		
Outfall Feature:	18"X18" RCP		
Outfall Location:	-		
AMEC Notes:	Pipe dimensions obtained from COL storm sewer netowrk file		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	14.18	25.57	132.79	33.37	785.61	5408.87	0.63	0.42	5.98
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	1.03	3.56	9.77	0.87	25.44	108.34	0.01	0.01	0.06
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	15.21	29.12	142.56	34.24	811.05	5517.21	0.64	0.43	6.04

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY050		
Outfall Feature:	18IN CMP		
Outfall Location:	WILLOW POINT CONDOS		
AMEC Notes:	-		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	2.50	4.36	22.63	5.69	133.89	921.86	0.11	0.07	1.02
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	2.50	4.36	22.63	5.69	133.89	921.86	0.11	0.07	1.02

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*
Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY055		
Outfall Feature:	13X17IN CMP		
Outfall Location:	-		
AMEC Notes:	-		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	2.12	3.70	19.21	4.83	113.64	782.41	0.09	0.06	0.86
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	2.12	3.70	19.21	4.83	113.64	782.41	0.09	0.06	0.86

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY060		
Outfall Feature:	13X17IN CMP		
Outfall Location:	-		
AMEC Notes:	-		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	2.13	3.71	19.29	4.85	114.13	785.76	0.09	0.06	0.87
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	2.13	3.71	19.29	4.85	114.13	785.76	0.09	0.06	0.87

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*
Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY070		
Outfall Feature:	7FT X 4FT H		
Outfall Location:	N SIDE CRYSTAL LK 200FT E R/R TRACKS		
AMEC Notes:	-		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	45.59	40.22	202.34	33.91	864.05	4101.51	1.75	0.44	6.78
Multi-Family	38.18	66.49	345.31	86.78	2042.96	14065.70	1.63	1.08	15.55
Low-Intensity Commercial	6.20	18.25	46.16	7.94	382.21	2854.17	0.89	0.25	4.67
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	7.23	14.33	44.41	8.96	296.09	2337.52	0.12	0.08	2.22
Highway	0.34	0.10	0.36	0.04	1.36	9.78	0.01	0.00	0.03
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	97.56	139.39	638.59	137.63	3586.67	23368.68	4.40	1.85	29.25

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY075		
Outfall Feature:	30"X30" RCP		
Outfall Location:	APPR 25FT E OF THE GROVE APT ENTR, APPR 300FT N OF N CRYSTAL LK		
AMEC Notes:	Pipe dimensions obtained from COL storm sewer netowrk file		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	2.24	3.89	20.22	5.08	119.65	823.78	0.10	0.06	0.91
Low-Intensity Commercial	0.06	0.18	0.46	0.08	3.77	28.16	0.01	0.00	0.05
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	2.30	4.07	20.68	5.16	123.42	851.94	0.10	0.07	0.96

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*
Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY080		
Outfall Feature:	15"X15" RCP		
Outfall Location:	NE PKING LOT THE GROVE APT		
AMEC Notes:	Pipe dimensions obtained from COL storm sewer netowrk file		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	22.34	38.89	202.00	50.76	1195.05	8227.89	0.95	0.63	9.10
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	22.34	38.89	202.00	50.76	1195.05	8227.89	0.95	0.63	9.10

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY085		
Outfall Feature:	18"X18" RCP		
Outfall Location:	N CENTER OF N PROP LINE ON LAKE		
AMEC Notes:	Pipe dimensions obtained from COL storm sewer netowrk file		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	0.33	0.58	3.00	0.75	17.74	122.17	0.01	0.01	0.14
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	0.33	0.58	3.00	0.75	17.74	122.17	0.01	0.01	0.14

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY105		
Outfall Feature:	18IN RCP		
Outfall Location:	NW COR THE GROVE APT AT LAKE		
AMEC Notes:	-		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	2.92	5.09	26.46	6.65	156.53	1077.73	0.12	0.08	1.19
Low-Intensity Commercial	2.16	6.37	16.10	2.77	133.27	995.20	0.31	0.09	1.63
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.01	0.00	0.02	0.08	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	5.08	11.46	42.56	9.42	289.82	2073.00	0.44	0.17	2.82

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*
Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY110		
Outfall Feature:	12IN PVC		
Outfall Location:	NE RETN POND BEHIND TAMPA COLLEGE		
AMEC Notes:	AMEC moved the outfall location		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	2.64	4.60	23.88	6.00	141.31	972.91	0.11	0.08	1.08
Low-Intensity Commercial	2.58	7.60	19.23	3.31	159.18	1188.69	0.37	0.10	1.94
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	2.83	1.01	2.78	0.25	7.23	30.79	0.00	0.00	0.02
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	8.05	13.21	45.89	9.56	307.72	2192.38	0.49	0.18	3.04

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*
Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY115010		
Outfall Feature:	15" RCP		
Outfall Location:	NW RETN POND TO N OF TAMPA COLLEGE		
AMEC Notes:	-		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	4.70	13.85	35.03	6.03	290.01	2165.65	0.68	0.19	3.54
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.03	0.09	0.26	0.02	0.66	2.83	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	4.72	13.94	35.28	6.05	290.67	2168.47	0.68	0.19	3.54

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*
Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY120		
Outfall Feature:	12" CMP		
Outfall Location:	CENTER E SIDE WINDOVER APT NEAR OFFICE		
AMEC Notes:	-		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	1.02	1.90	9.88	2.48	58.48	402.63	0.05	0.03	0.45
Low-Intensity Commercial	12.22	35.94	90.88	15.64	752.45	5618.92	1.76	0.49	9.19
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.72	0.94	3.51	0.43	13.31	95.44	0.08	0.03	0.32
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	13.96	38.78	104.27	18.55	824.23	6116.98	1.89	0.55	9.95

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*
Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY125		
Outfall Feature:	18" RCP		
Outfall Location:	E SIDE BONNY APTS		
AMEC Notes:	-		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	3.22	5.96	30.94	7.78	183.07	1260.42	0.15	0.10	1.39
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.04	0.06	0.21	0.03	0.80	5.75	0.00	0.00	0.02
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.01	0.03	0.00	0.07	0.28	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	3.27	6.02	31.18	7.80	183.94	1266.44	0.15	0.10	1.41

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*
Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY130		
Outfall Feature:	30" RCP		
Outfall Location:	MIDDLE OF BONNY APTS		
AMEC Notes:	-		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	3.46	6.48	33.66	8.46	199.15	1371.11	0.16	0.11	1.52
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	59.41	77.92	290.29	36.02	1101.84	7903.56	6.78	2.33	26.70
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	62.86	84.41	323.95	44.48	1300.98	9274.67	6.94	2.44	28.21

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY135		
Outfall Feature:	24" RCP		
Outfall Location:	N SIDE BONNY APTS		
AMEC Notes:	-		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	4.93	8.99	46.70	11.74	276.27	1902.09	0.22	0.15	2.10
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	24.73	32.44	120.84	14.99	458.66	3290.02	2.82	0.97	11.11
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.01	0.02	0.07	0.01	0.17	0.73	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	29.67	41.45	167.60	26.74	735.10	5192.84	3.04	1.12	13.22

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*
Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY137085		
Outfall Feature:	24" CMP		
Outfall Location:	E SIDE OF LK BONNY PARK		
AMEC Notes:	Pipe dimensions obtained from COL storm sewer netowrk file		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	17.66	23.16	86.29	10.71	327.53	2349.39	2.02	0.69	7.94
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	21.97	15.22	47.61	2.28	57.96	347.75	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	2.11	7.30	31.76	1.33	31.76	61.54	0.00	0.51	0.56
Gross Loads	41.74	45.69	165.66	14.31	417.25	2758.68	2.02	1.20	8.49

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*
Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY138075		
Outfall Feature:	30" HDPE		
Outfall Location:	EAST SIDE OF LK BONNY PARK NORTH QUAD		
AMEC Notes:	AMEC moved the outfall location to the upstream end of the pipe. Pipe dimensions obtained from COL storm sewer netowrk file		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	17.37	15.37	77.31	12.95	330.14	1567.10	0.67	0.17	2.59
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.13	0.30	2.05	0.19	9.32	57.48	0.01	0.00	0.13
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.01	0.00	0.04	0.29	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	3.76	1.49	4.66	0.22	5.67	34.05	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	21.27	17.16	84.03	13.37	345.17	1658.91	0.68	0.17	2.72

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY138105		
Outfall Feature:	3x15"		
Outfall Location:	E SIDE LK BONNY PARK AT W SHORELINE LK BONNY		
AMEC Notes:	-		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	0.26	0.25	1.27	0.21	5.44	25.84	0.01	0.00	0.04
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	16.56	12.23	38.26	1.83	46.57	279.43	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.01	0.03	0.07	0.01	0.18	0.78	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	16.83	12.51	39.60	2.05	52.20	306.05	0.01	0.00	0.04

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*
Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY140		
Outfall Feature:	48" RCP		
Outfall Location:	NW COR BONNY APTS 20 FT S OF PROP LINE		
AMEC Notes:	-		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	53.95	48.61	244.54	40.98	1044.27	4956.97	2.11	0.53	8.20
Multi-Family	1.48	2.79	14.47	3.64	85.60	589.37	0.07	0.05	0.65
Low-Intensity Commercial	15.92	47.16	119.25	20.52	987.35	7373.06	2.31	0.64	12.05
High-Intensity Commercial	2.55	5.75	38.79	3.60	176.74	1090.18	0.23	0.00	2.50
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	8.03	12.93	48.17	5.98	182.82	1311.36	1.13	0.39	4.43
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.04	0.03	0.08	0.00	0.10	0.60	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	81.97	117.26	465.30	74.71	2476.88	15321.54	5.85	1.60	27.83

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*
Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY145		
Outfall Feature:	20X36IN CMP		
Outfall Location:	S RW LK BONNY DR, APPR 250FT W OF CL S FERN RD		
AMEC Notes:	-		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	3.70	3.40	17.10	2.87	73.02	346.59	0.15	0.04	0.57
Multi-Family	7.27	12.66	65.75	16.52	388.98	2678.14	0.31	0.21	2.96
Low-Intensity Commercial	10.20	30.05	76.00	13.07	629.22	4698.74	1.47	0.41	7.68
High-Intensity Commercial	0.51	1.16	7.79	0.72	35.51	219.06	0.05	0.00	0.50
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	21.69	47.27	166.64	33.19	1126.74	7942.54	1.98	0.65	11.72

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*
Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY150		
Outfall Feature:	42IN RCP		
Outfall Location:	-		
AMEC Notes:	-		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	5.76	5.76	28.97	4.85	123.71	587.21	0.25	0.06	0.97
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	70.09	207.34	524.34	90.21	4341.30	32418.78	10.15	2.82	53.00
High-Intensity Commercial	38.61	90.49	610.24	56.60	2780.55	17150.82	3.69	0.00	39.37
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	1.58	2.72	10.12	1.26	38.42	275.60	0.24	0.08	0.93
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	5.04	2.23	6.96	0.33	8.48	50.85	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	1.31	4.53	19.71	0.83	19.71	38.19	0.00	0.31	0.34
Gross Loads	122.39	313.07	1200.35	154.07	7312.16	50521.45	14.33	3.28	94.62

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY155		
Outfall Feature:	30" RCP		
Outfall Location:	LAKE BONNY		
AMEC Notes:	Combine outfalls BY150 and BY155 into one. Field verified.		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	2.50	2.39	12.01	2.01	51.27	243.39	0.10	0.03	0.40
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.01	0.02	0.11	0.01	0.50	3.06	0.00	0.00	0.01
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	2.50	2.40	12.12	2.02	51.77	246.45	0.10	0.03	0.41

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*
Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY160		
Outfall Feature:	24"X24" RCP		
Outfall Location:	S SIDE LK BONNY DR 100FT S OF E MAIN ST		
AMEC Notes:	Pipe dimensions obtained from COL storm sewer netowrk file		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	4.07	3.90	19.64	3.29	83.89	398.19	0.17	0.04	0.66
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	4.07	3.90	19.64	3.29	83.89	398.19	0.17	0.04	0.66

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*

Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY165		
Outfall Feature:	30" RCP		
Outfall Location:	CL ELGIN ST APPR 75FT E OF E MAIN ST		
AMEC Notes:	-		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	27.53	26.66	134.12	22.47	572.73	2718.68	1.16	0.29	4.49
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.01	0.03	0.07	0.01	0.56	4.16	0.00	0.00	0.01
High-Intensity Commercial	0.72	1.65	11.15	1.03	50.80	313.37	0.07	0.00	0.72
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	28.26	28.34	145.34	23.52	624.10	3036.20	1.23	0.29	5.22

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*
Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY168		
Outfall Feature:	44"X28" ERCP		
Outfall Location:	N SHORE OF LK BONNY @ INTERLACHEN		
AMEC Notes:	Pipe dimensions obtained from COL storm sewer netowrk file		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	1.07	1.04	5.23	0.88	22.32	105.95	0.05	0.01	0.18
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	1.07	1.04	5.23	0.88	22.32	105.95	0.05	0.01	0.18

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*
Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY170		
Outfall Feature:	30" RCP		
Outfall Location:	APPR 60FT S OF E MAIN ST, EOP E INTERLOCHEN BLVD		
AMEC Notes:	-		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	17.09	16.55	83.27	13.95	355.58	1687.89	0.72	0.18	2.79
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	17.09	16.55	83.27	13.95	355.58	1687.89	0.72	0.18	2.79

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*
Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY180		
Outfall Feature:	60"X38" ERCP		
Outfall Location:	N SHORELINE LK BONNY AT DIXIE PL		
AMEC Notes:	-		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	29.27	28.35	142.61	23.90	608.98	2890.73	1.23	0.31	4.78
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.01	0.02	0.06	0.01	0.50	3.77	0.00	0.00	0.01
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	29.28	28.37	142.67	23.91	609.48	2894.49	1.23	0.31	4.79

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*
Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY185		
Outfall Feature:	15" RCP		
Outfall Location:	SHORE LINE LK BONNY @ CASCO ST & DIXIE PL		
AMEC Notes:	-		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.06	0.04	0.18	0.02	0.57	2.80	0.00	0.00	0.00
Single-Family	4.92	4.77	23.98	4.02	102.39	486.04	0.21	0.05	0.80
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	4.98	4.81	24.16	4.04	102.97	488.84	0.21	0.05	0.81

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*
Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY195		
Outfall Feature:	36IN CMP		
Outfall Location:	S SIDE LK BONNY DR APPR 50FT S EOP BRUCE ST		
AMEC Notes:	-		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.03	0.02	0.10	0.01	0.31	1.51	0.00	0.00	0.00
Single-Family	24.31	23.55	118.45	19.85	505.80	2400.93	1.02	0.26	3.97
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	1.12	3.33	8.41	1.45	69.66	520.17	0.16	0.05	0.85
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	25.47	26.90	126.96	21.31	575.76	2922.61	1.19	0.30	4.82

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*
Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY200		
Outfall Feature:	24IN CMP		
Outfall Location:	APPR 300FT S OF BONNY VIEW & LK BONNY DR		
AMEC Notes:	-		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	8.76	8.49	42.69	7.15	182.29	865.31	0.37	0.09	1.43
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	8.76	8.49	42.69	7.15	182.29	865.31	0.37	0.09	1.43

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*
Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

LAKE BONNY, CITY OF LAKELAND OUTFALLS POLLUTANT LOADING WORKSHEET
SPREADSHEET WATER QUALITY MODELING

Project Name:	**City of Lakeland NPDES Outfall Basin Delineations**
AMEC Project No.:	**600276x2**
Date:	**January, 2014**

Outfall ID:	BY205		
Outfall Feature:	18IN RCP		
Outfall Location:	S END OF LK BONNY		
AMEC Notes:	-		
Rainfall (in):	***51.65***	***Rainfall Year:***	***1988***

Google Streetview:	Lake Hunter Outfalls on Google
Outfall Drainage Summary Maps:	SummaryMaps

Gross Loads Estimator

LAND USE CATEGORY	Land Use Area (acres)	Runoff Volume, (ac-ft/yr)	ANNUAL POLLUTANT LOAD (lb/year)						
			TOTAL N	TOTAL P	BOD	TSS	COPPER	LEAD	ZINC
Low-Density Residential	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single-Family	1.53	1.48	7.45	1.25	31.82	151.04	0.06	0.02	0.25
Multi-Family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Low-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High-Intensity Commercial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Light Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Highway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pasture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Citrus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Row Crops	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General Agriculture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Undeveloped / Rangeland / Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mining / Extractive	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Open Water / Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gross Loads	1.53	1.48	7.45	1.25	31.82	151.04	0.06	0.02	0.25

Total N and Total P *EMC values are from the Table 3.4 in March 2010 Draft Department of Environmental Protection and Water Management Districts Environmental Resource Permit Stormwater Quality Applicant's Handbook Design Requirements for Stormwater Treatment Systems in Florida.*
Wetland and Open Water/Lake *EMC values are from Table 7 of the Final Report of "Evaluation of Alternative Stormwater Regulations for Southwest Florida" (Revised Sept 08, 2003) Submitted to Water Enhancement & Restoration Coalition, Inc. Prepared by Environmental Research & Design, Inc. Harvey H. Harper, Ph.D., P.E. & David M. Baker, P.E.*

2000 East Edgewood Drive
Suite 215
Lakeland, Florida 33803
1.877.550.4224

ORDINANCE NO. 13-005

AN ORDINANCE RELATED TO FERTILIZER MANAGEMENT AND REGULATING THE APPLICATION OF FERTILIZER TO URBAN LANDSCAPES IN POLK COUNTY; PROVIDING FOR A SHORT TITLE, TO BE KNOWN AS THE "POLK COUNTY FERTILIZER MANAGEMENT ORDINANCE"; PROVIDING FOR A FINDING OF FACTS; ESTABLISHING APPLICABILITY; PROVIDING DEFINITIONS; ADDRESSING WEATHER RELATED RESTRICTIONS ON FERTILIZER APPLICATION; IDENTIFYING RESTRICTIONS ON THE FERTILIZER CONTENT AND THE RATE OF FERTILIZER APPLICATION; ESTABLISHING FERTILIZER FREE ZONES; PROVIDING LIMITATIONS TO THE MODE OF APPLICATION; ADDRESSING THE MANAGEMENT OF GRASS CLIPPINGS AND VEGETATIVE MATERIAL/DEBRIS; ESTABLISHING TRAINING AND CERTIFICATION REQUIREMENTS FOR COMMERCIAL APPLICATORS OF FERTILIZER; PROVIDING FOR VARIANCES AND EXEMPTIONS; PROVIDING FOR ENFORCEMENT; PROVIDING FOR SEVERABILITY AND INCLUSION INTO THE COUNTY CODE OF ORDINANCES; AND PROVIDING AN EFFECTIVE DATE.

BE IT ORDAINED BY THE BOARD OF COUNTY COMMISSIONERS OF POLK COUNTY, A POLITICAL SUBDIVISION OF THE STATE OF FLORIDA THAT:

ARTICLE I – GENERAL PROVISIONS

SECTION 1-1 SHORT TITLE:

This Ordinance shall be known as the Polk County Fertilizer Management Ordinance.

SECTION 1-2 FINDING OF FACTS:

Stormwater runoff from residential neighborhoods, commercial centers, industrial areas, and other lands transports pollutants through the drainage conveyances to the natural water bodies of Polk County. Phosphorus and nitrogen are the primary nutrients associated with the degradation of groundwater and surface water, and are the primary components of fertilizer used on urban landscapes. Improper fertilization practices contribute excess nitrogen and phosphorus to Polk County's water bodies through the drainage conveyances that regulate the flow of stormwater to prevent flooding. This reduces the drainage conveyances capacity to provide flood protection from the overgrowth of vegetation.

Pursuant to Section 303(d) of the federal Clean Water Act and Chapter 62-303 of the Florida Administrative Code, the Florida Department of Environmental Protection (FDEP) has classified specific water bodies in Polk County as "impaired" as a result of the presence of excess nutrients. In addition, the FDEP has issued a National Pollutant Discharge Elimination System

(NPDES) permit to Polk County requiring the adoption of an ordinance to limit the nutrient contributions from the fertilization of urban landscapes within the watershed of any nutrient impaired water bodies. The Board of County Commissioners of Polk County, Florida, therefore finds it necessary to adopt this ordinance to reduce nutrient leaching and runoff through improved fertilizer management in order to protect the quality of waters receiving stormwater discharges for the health, safety, and general welfare of the citizens of Polk County.

SECTION 1-3 APPLICABILITY:

The regulations herein set forth shall apply to the unincorporated areas of Polk County and the incorporated areas of those municipalities that have not adopted an ordinance regulating the application of fertilizer on the effective date of this Ordinance. This Ordinance shall not be applicable in the incorporated areas of those municipalities which adopt an ordinance regulating the application of fertilizer subsequent to the effective date of this Ordinance as of the effective date of the municipal ordinance.

All references to state or federal law, statute, or code shall include any amendment to or superseding law, statute, or code.

ARTICLE II - DEFINITIONS

SECTION 2-1 DEFINITIONS:

A. *Administrator* means the County Manager, or an administrative official of Polk County government designated by the County Manager to administer and enforce this Ordinance.

B. *Application* or *Apply* means the actual physical deposit of fertilizer to turf or landscape plants.

C. *Applicator* means any person who applies fertilizer on turf and/or landscape plants.

D. *Board* or *Governing Board* means the Board of County Commissioners of Polk County, Florida.

E. *Best Management Practices (BMPs)* means turf and landscape practices or combination of practices based on research, field-testing, and expert review, determined to be the most effective and practicable on-location means, including economic and technological considerations, for improving water quality, conserving water supplies and protecting natural resources.

F. *Code Enforcement Officer, Official, or Inspector* means any designated employee or agent of Polk County whose duty it is to enforce codes and ordinances enacted by Polk County.

G. *Commercial Applicator,* except as provided in Section 482.1562(9) Florida Statutes., means any person who applies fertilizer for payment or other consideration to property not owned by the person or firm applying the fertilizer or the employer of the applicator.

H. *Fertilize, Fertilizing, or Fertilization* means the act of applying fertilizer to turf, specialized turf, or landscape plants.

I. *Fertilizer* means any substance or mixture of substances that contains one or more recognized plant nutrients and promotes plant growth, or controls soil acidity or alkalinity, or provides other soil enrichment, or provides other corrective measures to the soil.

J. *Guaranteed Analysis* means the percentage of plant nutrients or measures of neutralizing capability claimed to be present in a fertilizer.

K. *Institutional Applicator* means any person, other than a Private Non-commercial Applicator or Commercial Applicator, that applies fertilizer for the purpose of maintaining turf and/or landscape plants. Institutional Applicators shall include but not be limited to, owners, manager, or employees of public lands, schools, parks, religious institutions, utilities, industrial or business sites, and any residential properties maintained in condominium and/or common ownership.

L. *Landscape Plant* means any native or exotic tree, shrub, or groundcover (excluding turf).

M. *Low Maintenance Zone* means an area a minimum of ten (10) feet wide adjacent to water courses which is planted and managed in order to minimize the need for fertilizer, watering, mowing, etc.

N. *Person* means any natural person, business, corporation, limited liability company, partnership, limited partnership, association, club, organization, and/or any group of people acting as an organized entity.

O. *Private Non-commercial Applicator* means a person applying fertilizer to their own residence, or that of another, without financial gain.

P. *Saturated soil* means a soil in which the voids are filled with water. Saturation does not require flow. For the purposes of this ordinance, soils shall be considered saturated if standing water is present or the pressure of a person standing on the soil causes the release of free water.

Q. *Slow Release, Controlled Release, Timed Release, Slowly Available, or Water Insoluble Nitrogen* means nitrogen in a form which delays its availability for plant uptake and use after application, or which extends its availability to the plant longer than a reference rapid or quick release product.

R. Turf, Sod, or Lawn means grass-covered soil held together by the roots of the grass.

S. *Urban Landscape* means pervious areas on residential, commercial, industrial, institutional, highway rights-of-way, or other non-agricultural lands that are planted with turf or horticultural plants.

ARTICLE III – FERTILIZER MANAGEMENT

SECTION 3-1 WEATHER RELATED RESTRICTIONS:

No fertilizer containing nitrogen or phosphorus shall be applied to urban landscapes during a period for which the National Weather Service has issued any of the following advisories for any portion of Polk County: a severe thunderstorm warning or watch, flood warning or watch, tropical storm warning or watch, hurricane warning or watch, or heavy rain is likely to exceed two (2) inches in a 24 hour period.

SECTION 3-2 FERTILIZER CONTENT & APPLICATION RATES:

(a) All fertilizer applied to urban landscapes shall be labeled in accordance with Section 576.031, Florida Statutes, as it may be amended or superseded.

(b) Applications to urban landscapes shall be in accordance with the requirements and directions provided by the manufacturers label or as recommended for landscape plants, vegetable gardens, or fruit trees and shrubs by the University of Florida's Institute of Food and Agricultural Sciences (IFAS) unless a soil or tissue deficiency has been verified by an approved test by IFAS or an accredited laboratory.

(c) No fertilizer shall be applied to turf at a rate that exceeds the range per plant species set forth in guidelines established in Rule 5E-1.003(2), Florida Administrative Code, or in the most recent publication of *Florida Friendly Best Management Practices for Protection of Water Resources by the Green Industries*, as stated below:

Annual Rates:
Bahiagrass: 2-4 pounds of nitrogen per 1,000 square feet per year.
Bermudagrass: 4-6 pounds of nitrogen per 1,000 square feet per year.
Centipedegrass: 2-3 pounds of nitrogen per 1,000 square feet per year.
St. Augustinegrass: 2-5 pounds of nitrogen per 1,000 square feet per year.
Zoysiagrass*: 2-5 pounds of nitrogen per 1,000 square feet per year.

*Newer cultivars of Zoysiagrass, including Empire, will generally perform well with 1-1.5 pounds per 1,000 square feet less nitrogen annually (ie.2-3.5 lbs. per 1,000 sq. ft. per year).

Single Application Rates to turf areas shall not exceed 0.5 lbs. per 1,000 square feet for water soluble fertilizers, or as otherwise recommended in the most recent edition of the "Florida Friendly Best Management Practices for Protection of Water Resources by the Green Industries" as published by the Florida Department of Environmental Protection and the University of Florida – IFAS Extension. Slow release fertilizers shall not be applied at a rate in excess of 1.0 lb. per 1,000 square feet total nitrogen for a single application, unless otherwise indicated in the most recent edition of the "Florida Friendly Best Management Practices for Protection of Water Resources by the Green Industries".

(d) The above listed application rates shall be reduced appropriately on properties where reclaimed wastewater is used for irrigation based on available nutrients in the reclaimed water.

(e) Fertilizer containing nitrogen or phosphorus shall not be applied before seeding or sodding a site, and shall not be applied for the first 30 days after seeding or sodding, except when hydro-seeding for temporary or permanent erosion control in an emergency situation, such as wildfire, or in accordance with the Stormwater Pollution Prevention Plan for that site.

SECTION 3-3 FERTILIZER-FREE ZONES:

(a) No fertilizer shall be applied within ten (10) feet of any lake, pond, stream, water body, water course or canal. Additionally, no fertilizer shall be applied within ten (10) feet of any wetland as defined by the Florida Department of Environmental Protection (Chapter 62-340, Florida Administrative Code, as it may be amended or superseded).

(b) No fertilizer shall be deposited, washed, swept, or blown off intentionally or inadvertently onto any impervious surface, public right-of-way, public property, stormwater drain, ditch or other stormwater conveyance, or directly to a water body. Any fertilizer spilled or deposited on an impervious surface shall be immediately and completely removed to the extent reasonably possible.

(c) A low-maintenance zone is strongly recommended, though not required, for all areas within ten (10) feet of the water's edge of any lake, pond, stream, water body, water course or canal, or any wetland. Low-maintenance zones should be planted and managed in such a way as to minimize the need for watering, mowing, and other active maintenance.

SECTION 3-4 MODE OF APPLICATION:

Broadcast spreaders used for applying fertilizers must be equipped with deflector shields positioned to deflect fertilizer from the Fertilizer Free Zones described in Section 3-3.

SECTION 3-5 GRASS CLIPPINGS AND VEGETATIVE MATERIAL/DEBRIS:

In no case shall grass clippings, vegetative material, and/or vegetative debris be washed, swept, or blown off into stormwater drains, ditches, conveyances, water bodies, wetlands, or sidewalks or roadways. Any material that is accidently so deposited shall be immediately removed to the extent reasonably possible.

ARTICLE IV – TRAINING AND CERTIFICATION

SECTION 4-1 TRAINING REQUIREMENTS

(a) All Commercial and Institutional Applicators of fertilizer shall abide by and successfully complete the six-hour training program in the "*Florida-Friendly Best Management Practices for Protection of Water Resources by the Green Industries*" offered by the Florida Department of Environmental Protection through the UF/IFAS Florida-Friendly Landscaping™ program, or an approved equivalent per Section 403.9338 Florida Statutes.

(b) Private Non-commercial Applicators are encouraged to follow the recommendations of the University of Florida IFAS *Florida Yards and Neighborhoods* program when applying fertilizers.

SECTION 4-2 CERTIFICATION OF COMMERCIAL APPLICATORS:

(a) Prior to January 1, 2014, all Commercial Applicators shall obtain and maintain certification by successfully completing training and continuing education requirements in the *"Florida Friendly Best Management Practices for Protection of Florida Water Resources by the Green Industries"* offered by the UF/IFAS Florida-Friendly Landscaping™ program. Certification may be obtained through a County Extension Service Office, or an approved equivalent program.

(b) All businesses applying fertilizer to turf and landscape plants on their own property (including but not limited to residential lawns, golf courses, commercial properties, and multi-family and condominium properties) must ensure that at least one employee has a "Florida Friendly Best Management Practices for Protection of Florida Water Resources by the Green Industries" training certificate.

(c) After December 31, 2013, all Commercial Applicators of fertilizer shall have, and carry in their possession at all times when in the possession of fertilizer, a Florida Department of Agriculture and Consumer Services Limited Certification for Urban Landscape Commercial Fertilizer as required per 5E-14.117(18) Florida Administrative Code.

ARTICLE V – VARIANCES AND EXEMPTIONS

SECTION 5-1 VARIANCES (Reserved):

SECTION 5-2 EXEMPTIONS:

(a) Section 3-2 of this article shall not apply to golf courses; provided, however, fertilizer shall not be applied to golf courses in excess of the provisions of the Florida Department of Environmental Protection ("FDEP") document, *BMPs for the Enhancement of Environmental Quality on Florida Golf Courses, January 2007*.

(b) This Ordinance shall not apply to sports turf areas at parks and athletic fields for which fertilizer is applied in accordance with the applicable provisions of Rule 5E-1.003(2)(d) FAC.

(c) This Ordinance shall not apply to any bona fide farm operation as defined in the Florida Right to Farm Act, Section 823.14, *et seq.*, Florida Statutes.

(d) This Ordinance shall not apply to any lands classified as agricultural lands pursuant to Section 193.461 Florida Statutes, including without limitation, other properties not subject to or covered under the Florida Right to Farm Act that have pastures used for grazing livestock.

(e) This Ordinance shall not apply to any lands used for bona fide scientific research, including, but not limited to, research on the effects of fertilizer use on urban stormwater, water quality, agronomics, or horticulture.

ARTICLE VI – ORDINANCE ADMINISTRATION

SECTION 6-1 ENFORCEMENT:

(a) If a violation of this Ordinance occurs within a municipality, the violation shall be enforced by the municipality in accordance with the ordinance or ordinances governing prosecution of ordinance violations within the municipality in which the violation occurs.

(b) If a violation of this Ordinance occurs in unincorporated Polk County, the enforcement provisions and procedures contained in the Polk County Code Enforcement Special Magistrate Ordinance, as it may be amended or superseded, are incorporated herein by reference and will apply.

(c) Nothing contained herein shall prevent Polk County or a municipality from taking such other lawful action in law and equity as may be necessary to remedy any violation of any part of this Ordinance, including but not limited to:

1. Pursuit of injunction and/or declaratory relief in a court of competent jurisdiction;
2. Utilizing any other action or enforcement method permitted by law; or
3. Prosecution as a misdemeanor with a fine not exceeding Five Hundred Dollars ($500.00) or by imprisonment for a term not exceeding sixty (60) days or by both fine and imprisonment.

(d) Funds generated by penalties imposed under this section shall be used by Polk County or the municipality for the administration and enforcement of Section 403.9337, Florida Statutes, this ordinance, and to further nonpoint pollution prevention activities.

SECTION 6-2 SEVERABILITY:

If any section, subsection, sentence, clause, phrase or word of this article is for any reason, held or declared to be unconstitutional, inoperative, or void, such holding of invalidity shall not affect the remaining portions of this article; and it shall be construed to have been the intent to adopt this article without such unconstitutional, invalid, or inoperative part therein; and the remainder of this article, after the exclusion of such part or parts, shall be deemed to be held valid as if such part or parts had not been included herein.

SECTION 6-3 INCLUSION IN THE POLK COUNTY CODE OF ORDINANCES:

It is the intention of the Board of County Commissioners hereby provided that the provisions of this ordinance shall be made a part of the Polk County Code of Ordinances; that the sections of this ordinance may be renumbered or re-lettered to accomplish such intention; and that the word "ordinance" may be changed to "section," "article," or other appropriate designation.

SECTION 6-4 EFFECTIVE DATE:

This Ordinance shall become effective upon filing a certified copy with the Department of State.

ADOPTED THIS 19th DAY OF March, 2013.

POLK COUNTY, FLORIDA

Polk County Board of County Commissioners

By: Mary M Bell
Chairman

P. 23

ATTEST: Stacy M. Butterfield, Clerk

By: Kim Hancock
Deputy Clerk

Stacy M. Butterfield
Clerk of the Circuit Court & County Comptroller
Polk County, Florida

330 West Church Street
Post Office Box 988
Bartow, FL 33831-0988

(863) 534-6508 Phone
(863) 534-5951 Fax

www.polkcountyclerk.net

CLERK AND COMPTROLLER TO THE BOARD

March 21, 2013

Ms. Liz Cloud, Program Administrator
Administrative Code
Florida Department of State
R.A. Gray Building
500 South Bronough Street, Room 101
Tallahassee, Florida 32399-0250

Dear Ms. Cloud,

Enclosed are copies of certified Polk County Ordinances, that were adopted by the Polk County Board of County Commissioners in regular session, March 19, 2013

Ordinance 2013-004
Ordinance 2013-005
Ordinance 2013-006

Please direct the official filing notification letter to:

Alison Prevatt, Deputy Clerk
Finance and Accounting
PO Box 988
Bartow, Florida 33831-0988

Thank you for your assistance.

Stacey M. Butterfield
Clerk of Courts

Alison Prevatt

By: Alison Prevatt,
Deputy Clerk

STATE OF FLORIDA)
)
COUNTY OF POLK)

I Stacy M. Butterfield, County Clerk and Comptroller for Polk County, Florida, hereby certify that the foregoing is a true and correct copy of Ordinance No.13-004 adopted by the Board on March 19th, 2013.

WITNESS my hand and official seal on this 21st day of March, 2013.

STACY M. BUTTERFIELD, CLERK

By: Alison Prevatt
Alison Prevatt
Deputy Clerk

FLORIDA DEPARTMENT of STATE

RICK SCOTT
Governor

KEN DETZNER
Secretary of State

March 26, 2013

Ms. Alison Prevatt
Deputy Clerk
Finance and Accounting
Post Office Box 988
Bartow, Florida 33831-0988

Dear Ms. Prevatt:

Pursuant to the provisions of Section 125.66, Florida Statutes, this will acknowledge receipt of your letter dated March 21, 2013 and certified copies of Polk County Ordinance Nos. 13-004 through 2013-006, which were filed in this office on March 26, 2013.

Sincerely,

Liz Cloud

Liz Cloud
Program Administrator

LC/elr

RECEIVED
4/2/13 Alprevatt
Clerk Of The Board

R. A. Gray Building • 500 South Bronough Street • Tallahassee, Florida 32399-0250
Telephone: (850) 245-6270 • Facsimile: (850) 488-9879
www.dos.state.fl.us

SUMMARY REPORT OF CODES AND REGULATIONS TO REDUCE STORMWATER IMPACTS FROM NEW DEVELOPMENT AND REDEVELOPMENT.

APRIL 1, 2014

POLICY STATEMENT

The City of Lakeland follows established City policies and procedures to mitigate stormwater quality and storm magnitude impacts due to development and redevelopment activities.

APPLICABLE LOCAL CODES AND REGULATIONS

The City of Lakeland mitigates stormwater quality and storm magnitude impacts due to development and redevelopment activities as set forth in the City's Land Development Regulations (specifically Article 6 and Article 4) and Chapter IV of the City of Lakeland Comprehensive Plan.

DESCRIPTION OF CURRENT TECHNIQUES TO REDUCE STORMWATER IMPACTS

A. Chapter IV of the City of Lakeland Comprehensive Plan requires management techniques be adopted to generally ensure that the volume, rate, timing, and pollutant load which exists after development or redevelopment of a site are similar to or better than the drainage characteristics which existed prior to development.

B. Provisions in Article 6 of the City of Lakeland's Land Development Regulations specifically address management techniques to reduce development impacts to: aquifer recharge, surface water quality, existing stormwater drainage, natural habitats, and floodplains. Additionally, it addresses soil erosion control and standards for the review of development site plans in regard to the protection of natural resources.

C. Provisions in Article 4 of the City of Lakeland's Land Development Regulations specify that parking quantities above the maximum allowed under Section 4.12.4.1 may be considered for projects which document a demonstrated need and incorporate alternative design techniques to minimize impervious surface areas within the project. Such techniques may include but are not limited to the use of pervious pavers for perimeter and/or overflow parking, the use of bioswales and the creation of site amenities such as additional green space areas.

INNOVATIVE STORMWATER PLANNING TECHNIQUES

TMDL Implementation Plans

The City of Lakeland's Total Maximum Daily Load (TMDL) Prioritization Plan was submitted in Year 1 and updated and submitted in Year 2 of the National Pollutant Discharge Elimination System (NPDES) annual report to the Florida Department of Environmental Protection (FDEP). This plan outlines the schedule by which TMDL watersheds will be analyzed and a corresponding implementation plan developed. The implementation plan for each applicable watershed will incorporate Low Impact Development (LID) concepts and a mixture of innovative structural and non-structural control designs to a) reduce existing stormwater loads to the maximum extent possible (MEP) and b) reduce future development and/or redevelopment impacts on stormwater loading to the receiving waterbody. These concepts will ultimately form the basis of the initial draft of the implementation plan. All concepts will be discussed with and reviewed by the City of Lakeland's Public Works Department, Community Development staff, the City Manager, the City Mayor, and the City Commissioners. The final TMDL implementation plan will ultimately consist of LID concepts and stormwater planning techniques deemed logistically and monetarily feasible. Potentially, subsequent changes to City of Lakeland Land Development Regulations may occur if the City Commission authorizes such.

Support for Florida Yards and Neighborhoods

In addition to the above TMDL planning, the City of Lakeland plans to partner with the City of Winter Haven and Polk County in FY15 to provide funding and support to the Florida Yards and Neighborhoods (FYN) Extension Program. In doing so, FYN will provide educational outreach services tailored to the needs of City of Lakeland residents with the ultimate goal of changing behavior and reducing stormwater quality and quantity impacts from routine residential activities such as lawn care, watering, and fertilizer usage. Moreover, FYN will assist the City by providing the mandated Best Management Practices (BMPs) training for commercial and municipal fertilizer and pesticide applicators.

Adoption of Polk County Fertilizer Ordinance

On March 9, 2013 The Polk County Fertilizer Ordinance was fully executed. Since the City of Lakeland chose not to adopt an ordinance of its own, by default, the stipulations of the ordinance became applicable within Lakeland's municipal boundaries. The ordinance, in general, seeks to limit the impact of fertilizers on receiving waterbodies throughout Polk County.

PLAN TO IMPLEMENT INNOVATIVE STORMWATER REDUCTION TECHNIQUES IN TMDL WATERSHEDS

TMDL Lake	WBID	Task#1 Outfall Basin Delineations And Loading Calculations Completed by:	Task #2 Outfalls Monitoring Scope to FDEP by:	Task #3 Stormwater Sampling Completed by:	Task #4 Implementation Plan Development to Include Innovative Stormwater Techniques
Lake Hunter	1543	**8/1/2013** *funds available to start 10/1/12*	**8/1/2013** *Finalized monitoring plan to be delivered to FDEP by 10/1/13*	**02/1/2015** *funds available to start 10/1/12*	**10/1/2015**
Lake Bonny	1497E	**10/1/2014** *funds available to start 10/1/13*	**10/1/2014** *Finalized monitoring plan to be delivered to FDEP by 12/1/14*	**04/1/2016** *funds available to start 10/1/14*	**10/1/2016**
Crystal Lake	1497A	**10/1/2014** *funds available to start 10/1/13*	**10/1/2014** *Finalized monitoring plan to be delivered to FDEP by 12/1/14*	**04/1/2016** *funds available to start 10/1/14*	**10/1/2016**
Lake Parker	1497B	**10/1/2016** *funds available to start 10/1/15*	**10/1/2016** *Finalized monitoring plan to be delivered to FDEP by 12/1/16*	**10/1/2017** *funds available to start 10/1/16*	**10/1/2018**

PLAN TO IMPLEMENT INNOVATIVE STORMWATER REDUCTION TECHNIQUES CITE WIDE

Date	Activity
10/1/2014	FYN Funding and Support projected to begin (see draft agreement in Appendix D)
3/9/2013	Polk County Fertilizer Ordinance takes effect in the City of Lakeland (see final executed ordinance in Appendix E)

Appendix A: Chapter IV of Lakeland's Comprehensive Plan

STORMWATER

Stormwater is the water which runs off buildings, streets, and all other impervious and pervious surfaces during a rainfall event. Untreated stormwater runoff can transport pollutants to city lakes and streams. Stormwater runoff is now considered to be the most significant source of pollutant loading to surface waters.

Stormwater management refers to techniques for dealing with runoff in a manner that ensures adequate removal of pollutants and flood protection in an economical manner. These management techniques must generally ensure that the volume, rate, timing and pollutant load which exists after development or redevelopment of a site are similar to or better than the drainage characteristics which existed prior to development.

There are distinct land topographies in the Lakeland Planning Area which require different approaches to stormwater management. There is a high, sandy ridge running north and south through the center of the City dotted with several natural lakes. West of this ridge lies a flat terrain with a maze of streams and expansive floodplains. East of the ridge is a wide swath of formerly mined lands, much of which is unreclaimed, except for establishment over time of dense natural vegetation. Water filled mine pits are also characteristic of these mined-out areas. Illustration IV-10 depicts the four watersheds within the Lakeland Planning Area which give rise to rivers flowing eventually into the Gulf of Mexico.

Local Rainfall Per the Water Management District, the region and County averages, respectively, approximately 51 and 49 inches of rainfall in a year (1990-2009). According to rain gauge readings taken near the Lakeland Linder Airport, local yearly rainfall has averaged about 49 inches from 2005 to 2009. In planning for the capacity of stormwater facilities to handle rainfall, the standard of a 25-year storm is generally chosen for open basin systems and is used by the water management district. This storm can be described as the largest amount of rainfall that can be expected during any 25-year period. In Lakeland such a storm would result in about 7.5 inches of rain during a 24-hour period. Stormwater facilities should be designed to accommodate a storm of that level.

DRAINAGE SYSTEM

The two key aspects of the local drainage system are the natural drainage features and the man-made drainage system. Illustration IV-10 depicts the Lakeland Planning Area's natural drainage features. The lakes, rivers, and other surface waters in the city are an integral part of the larger regional drainage basins also depicted in Illustration IV-10. Man-made drainage improvements within Lakeland are largely a function of street and site improvements which connect to the existing system of channels, lakes and streams. The City drainage system, shown in Illustration IV-11, is maintained and operated by the Lakeland Public Works Department. The illustration incorporates the location of the storm sewer pipelines as located via the Division’s extensive survey map of stormwater facilities.

This survey will assist the City with the effort to maintain its National Pollution Discharge Elimination System (NPDES) permit.

DRAINAGE REGULATION

Stormwater control focuses on the temporary storage of water on-site. On-site detention areas are effective in controlling short, intense, local storm runoff and catch the initial pollutant wash. Detention strategies also help reduce downstream flooding and soil erosion, and help to recharge the groundwater aquifer. The City of Lakeland has had regulations requiring on-site stormwater detention and treatment since at least 1977. Following the adoption of the 1991 Comprehensive Plan, the City compiled and enhanced most existing development regulations into one ordinance, referred to as the *Land Development Regulations*.

Provisions in Article 34 of Lakeland's land development regulations address aquifer recharge protection, surface water quality/stormwater management requirements, natural habitat protection, floodplain management, soil erosion control and standards for the review of development site plans in regard to the protection of natural resources. Most construction activity that results in an increase in impervious surface area requires prior submittal and approval of a stormwater management plan for the site. A pre-post match of peak rate, volume, and pollutant loads is required for new development and redevelopment. The City's standards were historically more stringent than the current water management district requirements in that the district did not require a pre-post match for volume vs. rate. In an urban area where redevelopment is key to a healthy economy, the City's drainage policies are crucial to prevent further degradation of our lakes or any new flooding problems. Developments in a floodplain area must first attempt to locate on the non-floodplain portion of the site. When a development must infringe on part of a 100 year floodplain, the flood water storage function and capacity must be compensated, usually somewhere else on site, according to City and Southwest Florida Water Management District and/or FDEP standards which address this issue; also, structures within a floodplain must be elevated per City regulations. If a site is totally within a 100 year floodplain, development should be prohibited except where it would result in a "taking" of private property unless it's been permitted by the appropriate regulatory agencies (SWFWMD &/or FDEP.) New surface water and stormwater quality standards are being proposed by the federal government that could require significant increases in water treatment capabilities with associated new costs. As these new regulations become vetted, the City will need to monitor the impact on its lakes management and stormwater treatment projects, as well as examine its development regulations for any required changes.

FLOOD AND SURFACE WATER QUALITY PROBLEMS

The results of a 1988 study and generalized stormwater master plan completed by the firm of Dames and Moore in 1992 were somewhat problematic in regard to predicting flood problem areas. The City's Public Works Department uses a work order system that tracks

current flood problem areas. Some of the worst areas as of 2010 included streets, intersections and/or segments of the streets as follows (the list will tend to vary each year):

STREETS/ STREET SEGMENTS

1. Robson Road, west of N. Florida Ave
2. Buckingham Avenue, north of Easton Drive
3. Gilmore Avenue, south of Memorial Blvd.
4. Elm Road

The City Public Works Department is largely responsible for correction of drainage problems. Corrective actions must be appropriately funded in the City's 5-year Capital Budget Program.

Surface water quality problems are present in all City lakes. All of the lakes in Lakeland are over-enriched with nutrients, primarily nitrogen and phosphorus. This condition, termed eutrophy, results in reduced water clarity, persistent algal blooms, accelerated sedimentation/aging and imbalances in fish and wildlife populations. In Lakeland, eutrophy is due in part to the rich deposits of phosphorus naturally occurring in area soils. The problem is compounded by the discharge of untreated stormwater runoff to surface waters since this stormwater carries fertilizers, pesticides and other pollutants from yards and streets into the lakes.

Another source of nutrient loading to lakes is internal recycling from the lake sediments. Sediment dredging or chemical inactivation may be required in lakes with extensive deposits of organic sediments. Lake specific diagnostic studies, as scheduled in the City of Lakeland Comprehensive Lakes Management Plan, are needed to identify the sources of pollution and other management needs.

In 2009 federal courts ruled that the US Environmental Protection Agency (EPA) must establish limits to pollution of Florida's lakes, rivers and bays as a result of the State's failure to meet the 2004 deadline mandated by the Clean Water Act. The EPA is expected to develop methodologies for restricting the discharge of the violating pollutants such as phosphorous and nitrogen, originating from various sources including sewage, fertilizer and manure, between 2010 and 2011. Since the City's lakes do not meet the goals and objectives of the Federal Clean Water Act, they are subject to future regulation by Federal and State government.

STORMWATER PROJECTS

The natural surface water system that runs through Polk County includes Lakeland. It is not restricted by any political boundaries but is an integrated natural system influenced by the built environment including man-made stormwater systems. Thus, the City and the County can benefit from joint stormwater projects and should remain aware of each others stormwater/flood control projects. Heavy rains in the mid-1990's led the Polk County Commission to begin an intensified effort to correct flooding in over 60 flood problem areas throughout the County. The effort includes continued maintenance of stormwater ditches to

retain their proper functioning. The County has implemented a series of regional flood control projects in chronically wet areas along Itchepackesassa, Blackwater, Peace and Gator Creeks; these projects and/or the studies for them were jointly funded by the County and the Southwest Florida Water Management District.

In addition, Polk County has initiated studies and efforts in the Lakeland Urban Area. This includes stormwater studies and projects for the following:

1. Lake Parker Drainage Area Study. A study for Polk County was conducted by Keith & Schnars, consultant firm, to examine the outfall from Lake Bonny to Lake Parker and perform the drainage system analysis of the Lake Parker-Saddle Creek drainage system in the late 1990's. Additionally, the Florida Department of Environmental Protection also contracted a study (with USF and BCI Engineers) to model drainage from the Tenoroc Recreation area (which is primarily unreclaimed mined lands) through the Saddle Creek Basin. The study evaluated the feasibility of reconnecting isolated unreclaimed mined lands to the Peace River System and includes modeling of the inflows from the Lake Parker sub-basin. According to the Lakes Management and Stormwater Division, phases I and II of Lake Tenoroc Area Lake Parker-Saddle Creek Drainage Project were completed in 2008 and subsequent phases were being permitted as of 2010.
2. The County conducted a study to revise federal Flood Insurance Rate Maps (FIRMs) for an area near Scott Lake. This was a jointly funded project with some funding by Alafia River Basin Board. All work was completed by April 2003.

Specific City projects for stormwater management include the following:

1. **Lake Hollingsworth Restoration:** The removal of 3.6 million cubic yards of organic deposits to restore lake bathymetry and improve water quality was completed 2001.
2. **Lake Hollingsworth Watershed Management Plan:** A plan to treat a significant portion of stormwater runoff entering Lake Hollingsworth. The following projects have been completed: Southern Landing stormwater treatment pond, wetland forest rehydration project adjacent to Buckingham Avenue, native vegetation replanting along the shoreline, and ongoing control of exotic plant species. The Westside Stormwater Treatment Project was completed in 2009.
3. **Comprehensive Lakes Management Plan:** Initially adopted in 1996, the 20-year plan identifies projects and costs for improving and protecting our lake resources to specifically address Federal Stormwater National Pollutant Discharge Elimination System (NPDES) and the State Total Maximum Daily Load (TMDL) programs. The plan served as the impetus for the City to approve the creation of a Stormwater Utility in 1999. An update to the plan, conducted in 2006, made the following findings and recommendations:
    - From 2000 to 2006 there has been an average of 16 water quality and 12 drainage capital improvement projects under way simultaneously;

- Replacement cost for the City's aging stormwater infrastructure is estimated to be $248 million;
- The cost of complying with the TMDL program in Lakeland will exceed $100 million;
- Annual expenditures on stormwater management in the City will cost $18.5 million/year;
- Based on the Impaired Waters Rule, most surface water in the City of Lakeland are impaired for one or more pollutants;
- Incorporation of the areas identified in the City's Annexation Plan would double the City's cost for the TMDL program to over $200 million.
- Increase the stormwater fee from $2.00 to $4.00 in 2007 (completed);
- Add 2 additional street sweepers (completed);
- Allocate the remaining additional revenue for watershed management, water quality enhancement, and flood control projects (ongoing process);
- Conduct a street sweeping study to evaluate the existing program and identify ways to increase efficiency (in progress as of 2010);
- Perform an extensive evaluation of city codes and regulations that impact lake and natural resource protection. Incorporate incentive based, low impact development principles and standards into land development regulations and the comprehensive planning process wherever possible (subject to further study);
- Update and revise this plan every five years. This will correspond with the TMDL's 5-year rotating basin plan. This will guide the City in regards to prioritizing CIP projects.

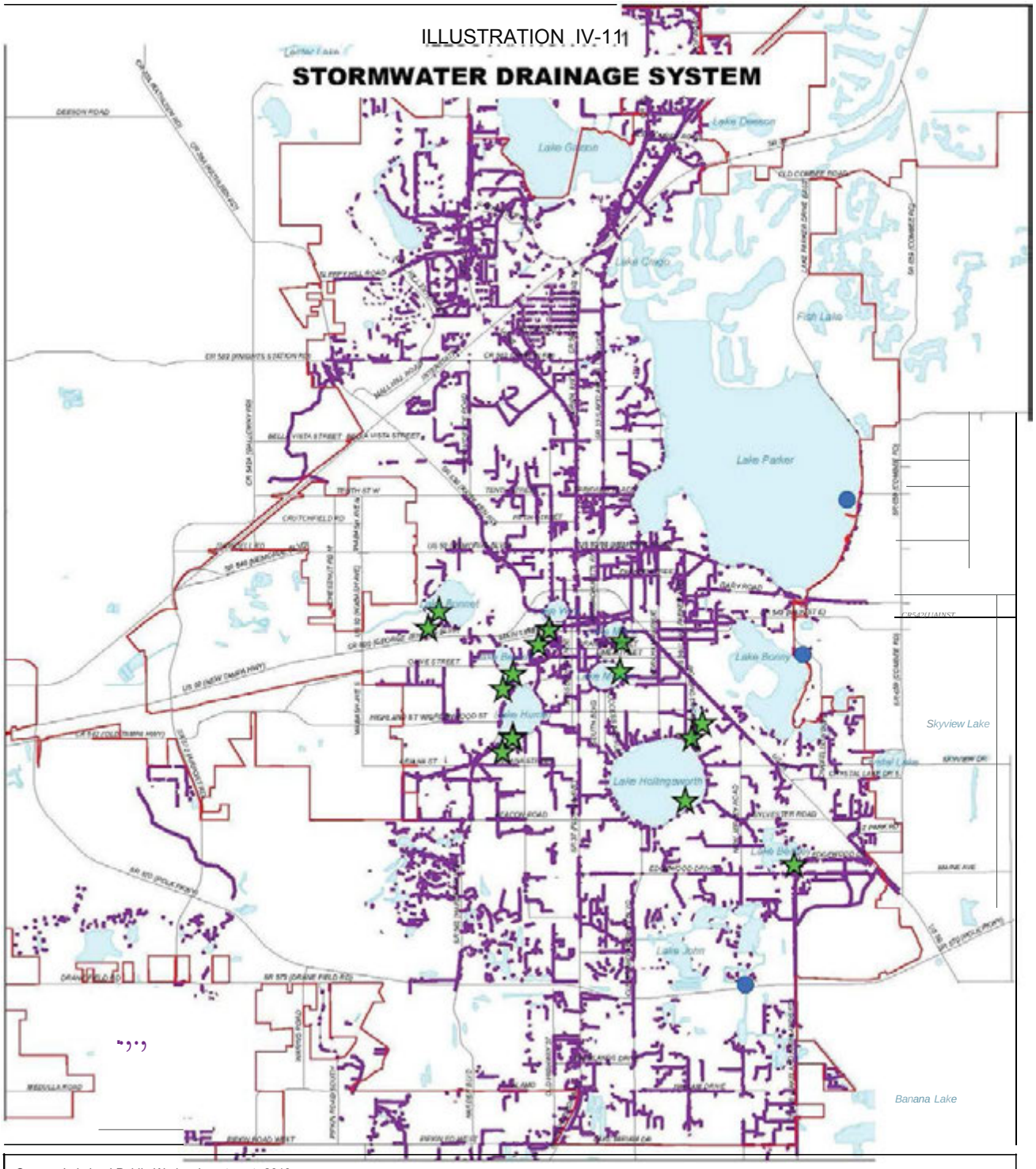
4. **Pollution Control Device Program:** A program to install pollutant removal devices in the existing city stormwater system beginning in 1999. Approximately 50 control devices were in operation and being actively maintained as of 2010; however the City is not pursuing expansion of this program.
5. **Lake Parker Southwest Outfall Retrofit:** Retrofitting a major stormwater outfall to Lake Parker by constructing a series of stormwater detention ponds within the southwest watershed of the Southwest Basin. Phase I construction was completed in 2008 and phase II scheduled to go under construction in mid-to-late 2010.
6. **Street Sweeping:** The City of Lakeland has four street sweepers. They remove 2,265 tons per year of sediments, trash, and leaves from the streets each year. Furthermore, this program reduces street stormwater runoff levels for heavy metals, nutrients, pesticides, and hydrocarbons. Without the street sweeping program, these materials and associated contaminates would be discharged into our lakes.
7. **Public Education:** The City is involved in public education projects to advise citizens on how they can help protect our lakes. This includes financial and technical support to the grassroots organization – Lakes Education/Action Drive (LE/AD). The public education effort has resulted in numerous activities such as lake displays,

stormwater inlet plaques, Lakes Appreciation Month events, neighborhood/lake cleanups, public service announcements, educational brochures and presentations to adult and school groups.

8. **Lake Parker Tributary Swamp:** Restoring the hydrology of a large forested swamp located northeast of Lake Parker. The restoration will revitalize the swamp while providing treatment to stormwater flowing into Lake Parker (this project was on hold as of early 2010.)


Gator Creek
ILLUSTRATION IV-10
NATURAL DRAINAGE AND WATERSHED BOUNDARIES
Lake Gibson
Fish Lake
Lake Parker
Saddle Creek
Lake Bonny
Lake Hollingsworth
Banana Lake
Lake Hancock
Scott Lake
Lake Drain
Source: Florida Department of Environmental Protection, 2010
Elevations
Principal Drainage Features
Lakeland Planning Area
Watershed Boundaries
City of LAKELAND
COMMUNITY DEVELOPMENT
k:\cd\maps\esri\comp_plan\infrastructure\NATURAL DRAINAGE.mxd

ILLUSTRATION IV-11



Source: Lakeland Public Works department, 2010

D Corporate Limits

Stormwater Line

* City Owned Control Structures

-Non-City Owned Control Structures

LAKELAND
COMMUNITY DEVELOPMENT

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Appendix B: Article 6 of Lakeland's Land Development Regulations

ARTICLE 6: NATURAL RESOURCE PROTECTION STANDARDS

6.1 GENERAL

6.1.1 INTENT

It is the intent of this Article to protect, maintain and enhance the health, safety and general welfare of the community by regulating land development activity with the potential of degrading important natural resources. More specifically, it is the purpose of this Article to create a clear compilation of regulatory standards which implement the environmental goals, objectives and policies of the Comprehensive Plan.

6.1.2 DEFINITIONS

Adverse Impacts: Any direct or indirect effect likely to cause, or actually causing, a decline in the quality, stability, natural function, diversity or aesthetic value of a natural resource.

Alter: To change, rearrange, enlarge, extend or reduce any land or part thereof.

Aquifer: An underground formation, group of formations, or part of a formation that is permeable enough to transmit, store or yield a quantity of water providing a beneficial use.

Area of Shallow Flooding: A designated AO or VO Zone on a community's Flood Insurance Rate Map (FIRM) with base flood depths from one to three feet where a clearly defined channel does not exist, where the path of flooding is unpredictable and indeterminate and where velocity flow may be evident.

Area of Special Flood Hazard: The land in the floodplain within a community subject to a one percent or greater chance of flooding in any given year.

Base Flood: The flood having a one percent chance of being equaled or exceeded in any given year.

Biotechnical Erosion Control Method: primarily non-structural method of shoreline stabilization which uses native vegetation to stabilize the shoreline substrate.

Biological Inventory: A biological inventory prepared for a defined area of land based upon standard in-field methodologies to derive habitat types, species populations, biological interactions and other associated ecological factors.

Buffer Zone: An area, exclusive of land development activity, used to visibly separate one use from another or to shield or block noise, lights or other nuisances.

Contaminant: An undesirable substance not naturally present or an unusually high concentration of a naturally occurring substance in water, soil, or other environmental medium in addition to regulated substances listed in Appendix A.

Cut and Fill: The practice, associated with development, involving the removal of soil or substrate from one area and relocation of that soil to another location for the purpose of land alteration.

Discharge: The release of stormwater by any means into the environment excluding transpiration, evaporation, or natural percolation into the groundwater.

Elevated Building: A non-basement structure built to have the lowest floor elevated above the ground level by means of fill, solid foundation perimeter walls, pilings, columns (posts and piers), shear walls, or breakaway walls.

Flood or Flooding: A general and temporary condition of partial or complete inundation of normally dry land areas from the overflow in inland or tidal waters or the unusual and rapid accumulation or runoff of surface waters from any source.

Flood Hazard Boundary Map (FHBM): An official map of a community, issued by the Federal Emergency Management Agency, where the boundaries of the areas of special flood hazard have been defined as Zone A.

Flood Insurance Rate Map (FIRM): An official map of a community, on which the Federal Emergency Management Agency has delineated both the areas of special flood hazard and the risk premium zones applicable to the community.

Floodplain: Land that will be inundated by flood waters known to have occurred or reasonably characteristic of what can be expected to occur from overflow of inland waters and the accumulation of runoff of surface waters from rainfall.

Floodproofing: Any combination of structural and nonstructural additions, changes or adjustments to structures which reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures and their contents.

Floodway: The channel of a river or other watercourse and the adjacent areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot.

Free Board: A factor of safety usually expressed in feet above a flood level for purposes of flood plain management.

Impervious Surface: Any surface of material that prevents the absorption of water into the underlying soil.

Lake Bottom Construction: The construction, alteration or repair of any shoreline stabilization structure or water access structure.

Land Clearing: The removal of vegetation from any site, parcel or lot, however, land clearing does not include the removal of dead trees or routine mowing, trimming or pruning to maintain vegetation in a healthy, viable condition.

Natural Resources: Those resources, functions, and forms, concrete or abstract, which are of natural creation or form and which directly or indirectly contribute to the health, safety, general welfare and wellbeing of the community.

100-Year Flood: A flood having a one percent chance of being equalled or exceeded in any given year.

Ordinary High Water Line: The ten year flood line for each respective lake as provided through Flood Insurance Rate Maps or historical city records and is ultimately established by the city Public Works Director.

Physical Protection Devices: Berms, fences, vegetation, water features, or similar physical barriers established for the purpose of protecting habitat or to minimize disturbance to a protected species.

Potable Public Groundwater: All public groundwater supplies meeting the standards of Class II water within Chapter 17, F.A.C. and the drinking water criteria of Health and Rehabilitative Services of the Polk County Health Department.

Protected Species: Animal species listed as endangered, threatened, or of special concern by the Florida Game and Fresh Water Fish Commission in Rules 39-27.003, 39-27.004, 39-27.005, Florida Administrative Code.

Setback: A minimum distance in which a structure or use can be located in proximity to a physical feature or specific boundary (property line, mean high water line).

Shoreline Stabilization Structure: Any structure or man-made feature whose purpose is to stabilize the shoreline substrate and protect it from erosion. Shoreline stabilization structures include but are not limited to seawalls, revetments, rip-rap and biotechnical erosion control methods.

Stormwater Runoff: The total volume of water accumulated over a surface during any form of precipitation resulting in a flowing quantity of water upon a site. Such waters are resistant to percolation into the groundwater due to the saturation of the soil matrix, impervious surface, or the large volume accumulated at the immediate time of occurrence.

Substantial Damage: Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before-damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

Substantial Improvement: Any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the "start of construction" of the improvement.

Surface Waters: Natural or man-altered lands which are submerged during normal hydroperiods. Surface waters include lakes, ponds, rivers, creeks, canals and ditches. The landward extent of surface waters shall be delineated using methods prescribed in Florida Administrative Code Rule Chapter 17-301.

Undisturbed Land: A parcel, lot, or plot of land which has been absent of land use activities for a period exceeding twenty years.

Water Access Structure: Any man-made structure which has as its purpose the facilitation of human or vehicular access to surface waters, including, but not limited to, docks, floating docks, piers, mooring pilings, boat ramps, boathouses and boat lifts.

Wetlands: All areas within dredge and fill jurisdictions of the Department of Environmental Regulation (pursuant to Section 403, Florida statutes); the Army Corp of Engineers (pursuant to Section 404, Clean Water Act, Florida Statutes): or the Southwest Florida Water Management District (pursuant to chapter 40D-4, Florida Administrative Code). These may include, but are not limited to, areas; inundated by water periodically through the seasons, characterized by specific vegetation, in the base floodplain or characterized by specific soil types.

6.1.3 RULES OF INTERPRETATION

For the purpose of the administration and enforcement of these regulations, unless specifically stated otherwise within this text, the following standard rules of interpretation shall apply to the text hereof.

6.1.3.1 Calculating Time Periods

In calculating any period of time prescribed for or allowed by this regulation, the day of the act, event or default from which the designated period of time begins to run, shall not be included. The last day of the period so computed shall be included unless it is a Saturday, Sunday or legal holiday, in which event the period shall run until the end of the next day which is neither a Saturday, Sunday or legal holiday. Where "working days" are specified for a computation, intermediate Saturdays, Sundays and legal holidays, shall be excluded in the computation.

6.1.3.2 Conflict with Standing Regulations

Where this regulation conflicts with or overlaps other standing regulations, whichever imposes the more stringent restrictions or limitations, shall prevail.

6.1.3.3 Interpretation by City Officials

Notwithstanding specified rules of language or definitions, city permitting agents and city regulatory inspectors shall interpret all conditions, provisions, and standards herein, in a reasonable manner to achieve the goals and purposes intended by this regulation.

6.2 FLOODPLAIN MANAGEMENT

6.2.1 APPLICABILITY

The requirements established within this Section shall apply in the following conditions: Any site alteration, construction or expansion of any structure within a delineated area of special flood hazard as defined by the Federal Emergency Management Administration (FEMA) on Flood Insurance Rate Maps.

6.2.2 DISCLAIMER OF LIABILITY

The degree of flood protection required by this Section is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger floods can and will occur on rare occasions. Flood heights may be increased by manmade or natural causes. This Section does not imply that land outside the areas of special flood hazard or uses permitted within such areas will be free from flooding or flood damages. This Section shall not create liability on the part of the city or by any officer or employee thereof for any flood damages that result from reliance on this Section or by any administrative decision lawfully made hereunder.

6.2.3 GENERAL STANDARDS

6.2.3.1 Development Permit Application within Areas of Special Flood Hazard

The Building Official is hereby authorized to administer and implement the provisions of this Section. Application for a development permit shall be made to the Building Inspection Division prior to any development activities, and may include, but not be limited to, plans, drawn to scale, showing the location, dimensions and elevations of the area in question, existing or proposed structures, areas receiving fill and the storage of materials. More specifically, the following information shall be required on the site plan prior to approval:

a. Elevation in relation to mean sea level of the proposed lowest floor (including the basement) of all new or substantially improved structures;

b. Elevation in relation to mean sea level to which the new or structurally altered structures have been floodproofed;

c. Any calculations deriving the altered volume of the floodplain and required measures of excavation to compensate for volume taken by the development activity;

d. Description of the extent to which any watercourse will be altered or relocated as a result of proposed development;
e. Provide an as-built floor elevation or floodproofing certification after the lowest floor is completed; and

f. Plans to assure that techniques have been used to prevent the flotation, collapse or lateral movement of the structure or otherwise demonstrate anchoring of structures.

6.2.3.2 Construction Methods

Electrical, heating, ventilation, plumbing, air conditioning equipment, and other service utilities shall be designed and/or located so as to prevent water from entering or accumulating within components during conditions of flooding. All city building codes shall apply to the construction of any structure.

6.2.3.3 Utilities

Water, sewerage and solid waste facilities shall comply with the following standards:

a. All water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the system.

b. All sanitary sewerage systems shall be designed to minimize or eliminate infiltration of flood waters into the system. Discharges or drain fields from the system shall be located to avoid impairment or contamination during flooding.

c. All solid waste disposal systems shall be located to avoid impairment or contamination during flooding.

6.2.3.4 Pre-Post Development Volume of the Floodplain

Post-development stormwater run-off volume shall not exceed pre-development volume, with additional compensating storage for all flood water displaced by development below the elevation of the base flood. Compensating storage is to be calculated between the base flood elevation and the seasonal high water table. The seasonal high water table shall be established by a qualified technician at the expense of the developer or by Southwest Florida Water Management District data, if available.

6.2.4 SPECIFIC PROVISIONS

6.2.4.1 Residential Construction

New construction or substantial improvements of any residential structure (including mobile homes) shall have the lowest floor and all utilities and equipment servicing the building, elevated one foot minimum above (freeboard) base flood elevation (zone AE) as designated on the Federal Insurance Rate Map (FIRM).

6.2.4.2 Non-Residential Construction

New construction or substantial improvements of any commercial, industrial or other non-residential structure shall either have the lowest floor and all utilities and equipment servicing the building elevated one foot minimum above (freeboard) base flood elevation or, together with attending utility and sanitary facilities, be flood proofed so that below the base flood level the structure is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. These flood proofing methods shall be adequate to withstand the flood depths, pressures, velocities, impact and uplift forces and other factors associated with the base flood.

6.2.4.3 Elevated Buildings

New construction or substantial improvements of elevated buildings that include fully enclosed areas formed by foundation and other exterior walls shall be designed to preclude finished living space below the base flood elevation and designed to allow for the entry and exit of floodwaters to automatically equalize hydrostatic flood forces on exterior walls. Designs for complying with this requirement must be certified by a professional engineer or architect or meet the following minimum criteria:

a. Provide at least two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding;

b. The bottom of all openings shall be no higher than one foot above grade; and

c. Openings may be equipped with screens, louvers, valves, or other coverings or devices provided they permit the automatic flow of flood waters in both directions.

6.2.4.4 Mobile Homes

All mobile homes shall be anchored consistent with HUD rules and the manufacturer's specifications to resist flotation, collapse or lateral movement by providing frame ties to ground anchors. Specific requirements are:

a. Ties shall be provided at each of the four corners of the mobile home. Mobile homes of 50 feet or longer must have two additional ties per side at intermediate locations. Mobile homes less than 50 feet long require one additional tie per side.

b. Frame ties shall be provided at each corner of the home. Mobile homes of 50 feet or longer must have five additional ties per side at intermediate points. Mobile homes less than 50 feet long require four additional ties per side.

c. All components of the anchoring system shall be capable of carrying a force of 4,800 pounds.

d. Any additions to the mobile home shall be similarly anchored and permitted through the Building Inspection Division.

6.2.4.5 Subdivisions

Subdivisions shall meet the following standards:

a. Comply with all provisions within this section; and

b. Base flood elevation data prepared by a registered professional engineer shall appear on the preliminary and final plat.

6.2.4.6 Other Available Data Defining the Base Flood Elevation

In the absence of Federal Housing Authority or Federal Emergency Management Agency base flood or floodway data, the Building Official shall consider other available data as a basis for establishing the elevation of residential structures to or above the base flood level, and floodproofing or elevating non-residential structures above the base flood elevation.

6.2.4.7 Hazardous Materials

No hazardous materials or waste shall be stored within the 100-year flood plain.

6.2.4.8 Floodway Standards

The following developments are prohibited from locating within areas designated as floodways:

a. Development using fill for structural support;

b. Development utilizing septic tank systems;

c. Development creating off-site increases in flood stage levels (an increase of not more than one foot on-site will be allowed if the Engineer of Record can satisfactorily demonstrate that this increase on-site will not raise off-site flood levels); and

d. Mobile homes except when located within existing approved mobile home parks or platted mobile home subdivisions.

6.2.4.9 Certification

A professional engineer registered in the State of Florida shall certify that the standards of this Section are satisfied. Such certification shall be provided to the Building Official.

6.3 GREEN SWAMP AREA OF CRITICAL STATE CONCERN

6.3.1 INTENT AND APPLICABILITY

a. Intent

The Green Swamp Area of Critical State Concern (ACSC) as defined under Ch. 380, Sec. 5, Florida Statutes, has been identified as a geographical area with special environmental significance and is protected by guiding principles which outline key issues of state concern. This Section is established to address minimum standards for development and redevelopment within the ACSC in the City of Lakeland.

b. Applicability

Applies to all public and private land located within the geographic boundaries of the Green Swamp ACSC within the City of Lakeland.

6.3.2 DENSITY AND INTENSITY OF USE

6.3.2.1 Future Land Use Designations

The following Future Land Use designations may be permitted in the Green Swamp ACSC, as defined in the Future Land Use Element of the Comprehensive Plan.

a. Agricultural Residential Low (ARL)
b. Residential Very Low (RVL)
c. Public Institutional (PI)
d. Business Park (BP)
e. Interchange Activity Center (IAC)
f. Convenience Center (CC)
g. Recreation (R)
h. Conservation (C)
i. Preservation (P)

6.3.2.2 Density and Infrastructure Requirements

Table 6.3-1: Green Swamp Density And Infrastructure Requirements

FUTURE LAND USE DESIGNATION	Maximum Gross Density	Central Wastewater Required?	Paved Roads Required?	Central Water Required?	Transit District Petition Required?
ARL Agricultural Residential Low	1:10 du/ac[1] &/or Agriculture	NO	YES, external only	NO	NO
RVL Residential Very Low	1:3 du/ac &/or Agriculture	YES	YES	YES	If subdivision 10 ac. +
PI Public Institutional	N.A.	YES	YES	YES	If near SR 33 or I-4
BP Business Park	N.A.	YES	YES	YES	YES
IAC[2] Interchange Activity Center	Med. & high density up to 35% of IAC	YES	YES	YES	YES
CC Convenience Center	NONE	YES	YES	YES	If near SR 33 or I-4
R Recreation	NONE	YES	YES	YES	If near SR 33 or I-4
C Conservation	1:10 du/ac uplands only; requires conditional use approval	YES	YES	YES	If near SR 33 or I-4
P Preservation	NONE	N.A.	N.A.	N.A.	N.A.

[1]Allows 40,000 sq ft lots if clustering on uplands, but gross density must remain same.
[2]IAC limited in ACSC to the proposed Williams (DRI) I-4 Interchange Area, if approved.

6.3.2.3 Permitted Zoning Districts

Table 6.3-2: Green Swamp Permitted Zoning Districts

Zoning Districts	Possible Future Land Use Designations							
	ARL	RVL	PI	BP	IAC[1]	CC	C	P
LD	X	X	X	X		X	X[2]	X
RA-1		X						
MF-12					X			
MF-16					X			
O-1			X	X	X	X		
O-2			X	X	X	X		
O-3				X	X			
C-1				X	X	X		
C-3					X	X		
I-1					X[3]			
I-2				X				
PUD[4]	X	X	X	X	X	X	X	X

[1] Limited to parcels within Williams Proposed Interchange.
[2] Only allowed with conditional use approval.
[3] Retail uses are prohibited.
[4] Any proposed changes to an approved, binding PUD development plan will require modification to the PUD.

6.3.2.4 Prohibited Uses

In addition to those uses that are prohibited by the respective zoning district classification of the property; the following uses shall also be prohibited in the Green Swamp ACSC:

a. Chemical research operations
b. Dry cleaning plants
c. Electric power generation facilities of any type
d. Golf Courses
e. Hazardous substances or materials; no substances or materials shall be stored or used except as they would, in such quantity, be permissible for domestic or household purposes
f. Industrial activities as defined in the Federal EPA's National Pollution Discharge Elimination System (NPDES) for Stormwater Associated with Industrial Activity (Ch. 40, CFR, Part 122), with the exception of general construction activities
g. Mining
h. Package wastewater treatment facilities; wastewater treatment residuals and the spreading of sludge from septic tanks
i. Petroleum pipelines
j. Petroleum related industries and fuel dealers (not including gas stations)
k. New schools, private or public
l. Wholesale chemical operations
m. Noxious forms of agriculture (specifically, agricultural activity such as crop production, silviculture, cattle grazing/pasture uses and aquaculture uses ARE allowed, but feed lots, poultry farms and similar "noxious" uses shall be prohibited.)

6.3.2.5 Use of Conservation Lands

Conservation land uses on privately owned lands may allow passive recreation uses and up to 1 unit per 10 acres if clustered on upland areas and outside of wetland and 100 year floodplain areas. Level one Utility and Essential Service Facilities as defined in Article 2, and as permitted by the city and applicable federal, state and/or regional agencies, are permitted in Conservation land uses. Any changes to Utility and Essential Service Facilities shall be subject to state review for impacts to the ACSC.

6.3.2.6 Interstate 4 Interchange

In the event that an Interchange Justification Report (IJR) for the proposed Interstate-4 interchange for the Williams DRI is approved by the U.S. Federal Highway Administration and the Florida DOT, then an Interchange Activity Center land use, as defined otherwise in the Comprehensive Plan, may be proposed in the Green Swamp ACSC within the Williams Community Redevelopment Area, consistent with the Williams CRA Redevelopment Plan. However, all proposed land use map amendments are subject to City and State review and approval. Final development plan approvals for these IAC areas shall be dependent upon meeting the city's concurrency management provisions including adequate funding for construction of the new interchange in the first three years of a CIP or the CRA Trust Fund as reflected in a locally adopted CIP. Other appropriate future land uses of RVL or BP may be proposed for lands targeted in the CRA Plan for IAC uses until final approval of the IJR is obtained.

6.3.3 DEVELOPMENT REGULATIONS

6.3.3.1 Minimum Lot Size Requirements

Minimum lot size requirements shall be in accordance with the underlying zoning district, except for the following:

LD zoning district, when
Water and wastewater are available..... 5 acres
Water and wastewater are unavailable..... 10 acres
RA-1 zoning district..... 14, 520 sq. ft.[1]
..... 40,000 sq. ft. [2]

[1]Only permitted with an RVL Future Land Use designation. Central water and wastewater, as well as paved external and internal access roads are required.
2Only permitted with an ARL Future Land Use designation. Development must be clustered to meet the open space, wetland and/or floodplain protection requirements. The gross density for the overall development must not exceed the requirements for the applicable Future Land Use designation.

6.3.3.2 Setbacks

The setbacks for principal and accessory structures shall be in accordance with the underlying zoning district classification.

6.3.3.3 Open Space, Lot Coverage and Impervious Surface Ratios

a. The minimum open space, maximum lot coverage and impervious surface ratio requirements shall be in accordance with the underlying zoning district classification, except for the following:

Table 6.3-3: Green Swamp Residential Developments

Standard	Zoning District		
	RA-1	LD	MF-12/MF-16
Minimum Open Space[1]	Within ARL – 80% Within RVL – 30%	80%	MF-12 – 0.73 MF-16 -0.70
Maximum Impervious Surface Ratio[2]	50%	50%	60%

[1]Open space is defined as any area of land or water set aside, designated or reserved for public or private enjoyment or use. (NOTE: We have typically treated this as everything except buildings and parking areas, whether paved or unpaved.)
[2]Impervious surface ratio as defined by the Southwest Florida Water Management District (SWFWMD).

Table 6.3-4: Green Swamp Non-Residential Developments

Standard	Zoning District		
	All Commercial	All Office	All Industrial
Maximum Lot Coverage	35%	35%	50%
Maximum Impervious Surface Ratio	Within BP – 70% All Others – 60%	Within BP -70% All Others- 60%	70%

Impervious surface ratio, as defined by SWFWMD.

b. Site plans and subdivision plats shall identify portion of land reserved for open space and shall state "No clearing and no structures of any kind are allowed in the open space area." Stormwater retention, as allowed by regulatory and permitting agencies, would be permitted in open space areas.

c. At least 10 percent of the above open space requirements for all types of land uses shall be on the uplands portion of the property in order to preserve some portion of original aquifer recharge rates.

d. No variances or waivers shall be granted for open space provisions in the Green Swamp ACSC within the City of Lakeland.

6.3.4 LANDSCAPING

In addition to the landscape requirements established in Article 4, all development and redevelopment in the Green Swamp ACSC shall employ Xeriscaping techniques to reduce water consumption.

Xeriscaping, as a method of landscaping that conserves water by clustering plants according to similar sunlight and water needs. Where possible, irrigation systems should use stormwater runoff to irrigate landscaped areas and should preserve existing on-site vegetation.

6.3.5 WATER AND WASTEWATER UTILITY REQUIREMENTS

a. Connection to city wastewater service shall be required where it is available, as defined by Statute. Necessary septic system permits shall be obtained and submitted prior to issuance of a building permit.

b. New septic systems shall not be permitted for non-residential uses.

c. The city shall enforce the cases referred to it by the Polk County Health Department for violations of the Health Department's special septic system inspection program in the Green Swamp ACSC. That inspection program provides for notices to be mailed every 5 years to those who have a septic system indicating it must be cleaned and maintained. Failure to meet the inspection program requirements will result in referral to the local code enforcement board for further action and as referred to in City Resolution 4465.

d. Wastewater treatment package plants, if allowed, shall have a minimum treatment capacity of at least 100,000 gallons per day.

6.3.6 ROAD REQUIREMENTS

a. Parking, loading and internal circulation of developments within the Green Swamp ACSC shall be of pervious materials wherever feasible.

b. Paved external and internal access roads are required for all development.

c. In Conservation (C) future land use areas within the Green Swamp ACSC, a single primary access road shall be allowed to access upland areas where upland options are not feasible and where not in conflict with city policies and standards including those for natural resource protection, and as approved by the Public Works Department. Identified wetlands shall not be impacted unless such results in a taking of private property. Any impacts to the 100 year floodplain for such an access road shall be made only as a last resort, shall be minimized and compensated to avoid a taking of property and must include all mitigation measures as required by applicable local, regional and state agencies.

6.3.7 TRANSIT DISTRICT REQUIREMENTS

Submission of a voluntary petition for inclusion into the Lakeland Area Mass Transit District (LAMTD) shall be required for the following developments within the Green Swamp ACSC, prior to issuance of site plan approval, subdivision plat approval or building permit:

a. All development along Interstate 4 or SR 33

b. Any development or redevelopment in a non-residential or multi-family residential zoning district

c. Any residential subdivision of 10 acres or more

6.3.8 WETLANDS AND FLOODPLAIN AREAS

6.3.8.1 Development Criteria

a. No new lots shall be created which are entirely within a wetland or FEMA designated 100-year floodplain area.

b. No development shall be permitted within an identified wetland or within the 100-year floodplain area except where allowed by the applicable federal, state or regional permitting agencies and as specified below. Development shall cluster in non-wetland and non-floodplain areas. All structures (other than pile supported docks) shall be set back a minimum of 50 feet from the most landward extent of a jurisdictional wetland.

c. No disturbance of wetlands within the Green Swamp ACSC is allowed unless authorized or exempted from the regulation by the Florida Department of Environmental Protection, the U.S. Army Corps of Engineers, and the applicable water management district. Evidence of the appropriate permit or exemption shall be required prior to the commencement of development.

d. Where impacts to wetlands cannot be avoided, all permits for an agency with jurisdiction shall be approved prior to the city issuing a final development order. An "intent to issue a final development order" may be issued in writing prior to the issuance of said order if pre-approval is required by an agency with jurisdiction. Consideration of wetland impacts shall include, but not necessarily be limited to, the following circumstances where no reasonable alternative exists:

    1. To provide access to the site;
    2. To provide necessary internal traffic circulation;
    3. To provide necessary utility lines;
    4. To provide necessary pre-treated stormwater management;
    5. For purposes of public safety;
    6. To avoid precluding all beneficial use of the property.

e. All wetland and 100-year floodplain areas must be identified as environmental set-aside areas on all final site plans or subdivision plats.

f. Septic systems shall be set back a minimum of 75 feet from designated wetlands and 100 feet from the high water line of water bodies and outside the 100-year floodplain.

g. A detailed flood insurance study shall be performed for all subdivision proposals and other proposed development with five acres or more of the 100 year floodplain. The

study shall be performed in accordance with the Flood Insurance Study Guidelines and Specifications for Flood Contractors (FEMA Publication 37).

h. Subsequent development phases are not exempt from this section if the overall development meets the five acre criterion. If existing subdivisions are proposed for re-platting, the re-platted portion shall be required to comply with this requirement if the re-platted portion meets the five acre criterion.

i. Subdivisions which contain 10 lots or less shall be exempt from these requirements.

j. The construction of a single-family residence on a parcel of land containing five or more acres within the 100 year floodplain which is not part of a subdivision or which is part of a subdivision in existence prior to December 1, 1992, is exempt from this requirement.

k. Wetlands shall be maintained in their natural and unaltered state. However, controlled burns, selective thinning, and ecosystem restoration and maintenance are permissible activities within the wetlands, provided they are performed in accordance with current Silviculture Best Management Practices published by the Division of Forestry. Any isolated wetlands of less than one acre shall be exempt from these requirements.

6.3.8.2 Density Transfers

a. Development within wetland or 100 year floodplain areas may be allowed to transfer density of up to 1 dwelling unit per 20 acres to contiguous uplands (non-wetland and non-floodplain) areas on property under the same ownership or control.

b. Gross density requirements still apply and open space and impervious surface limits shall be maintained.

c. Lot sizes shall be as governed by the assigned city context classification.

d. Transfers of density shall be noted on the face of the final plat as a restrictive covenant.

6.3.9 STORMWATER MANAGEMENT FACILITIES

a. Stormwater management shall be executed in a manner consistent with the level of service policies in the Infrastructure Element of the Comprehensive Plan. Specifically, all development is required to manage runoff from the 25-year frequency, 24-hour duration design storm event on-site so that post-development runoff rates, volumes and pollutant loads do not exceed pre-development conditions.

b. Stormwater management facilities shall not cause a reduction in the flood storage capacity of the 100 year floodplain.

c. Stormwater management facilities shall be designed to accommodate access for maintenance equipment, and shall facilitate regular operational maintenance including under-drain replacement, unclogging filters, sediment removal, mowing and vegetation control.

d. Prior to final plat or site plan approval, the developer shall ensure that a designated responsible entity, approved by the city for the maintenance of the stormwater management system has been established and is listed on the plat or final site plan.

e. Monitoring and operational requirements for stormwater management facilities shall include the following:

1. Periodic inspections of the system with a written inspection report to the appropriate water management district and a copy sent to Public Works Engineering to ensure that the system is functioning as designed and permitted.

2. Inspection reports will be submitted 1 year after construction and every year thereafter to the relevant water management district.

3. A registered professional engineer must sign and seal the report certifying the stormwater management system is operational as designed and maintained adequately for that design.

4. Pollution abatement requirements shall be the first 1 inch (or 2.5 inches times the impervious area) of runoff for the developed site, or as per the regulations of SWFWMD, with this volume being recovered within 72 hours.

5. Projects or portions of projects in Most Effective Recharge Areas must retain three inches of runoff from directly connected impervious areas within the project. Applicants may instead demonstrate that the-post-development recharge will be equal to or greater than the pre-development recharge. Most Effective Recharge Areas are those areas with soils classified by the Soil Conservation Service as Type "A" Hydrologic Soil Group. Directly connected impervious areas are those impervious areas which are connected to the surface water management system by a drainage improvement such as a ditch, storm sewer, paved channel, or other man-made conveyance. Stormwater that is retained must be infiltrated into the soil or evaporated such that the storage volume is recovered within 14 days following a storm event.

6.3.10 LISTED SPECIES SURVEYS

a. To protect fauna and flora species identified as being endangered, threatened, and/or species of special concern by the U.S. Fish and Wildlife Service (USFWS) and/or the Florida Fish and Wildlife Conservation Commission, (FWC), the developer shall perform and pay for listed species survey for the following types of development:

1. Any residential development consisting of 100 acres or more, OR

2. Any residential development of more than 10 lots, OR

3. Any non-residential development in excess of five acres,

   If it is determined that listed species are located on the site, the developer shall prepare a habitat management plan using guidelines and protocols of the FWC and/or USFWS. It shall be the responsibility of the owner and/or developer to notify the city, the FWC and/or the USFWS of proposed development which will affect protected habitat and subsequently prepare and submit the above referenced habitat management plan. Prior to final plat or site plan approval, the city must receive a letter from FWC stating that the proposed Management Plan meets the standards placed on Management Plans by the FWC.

b. Protected habitat, for the purpose of the Management Plan, shall be defined as habitat for endangered, threatened, and/or species of special concern, and in most cases, the specific boundaries of these areas may not be determined until site-specific field inspections are conducted to verify those boundaries. It shall be the responsibility of the owner and/or developer to submit documentation to all relevant review agencies including exhibits, studies, etc., for the purpose of establishing that properties should not be classified as protected habitat for such species.

c. Those properties identified as containing protected habitat shall comply with the following requirements:

   1. Development shall be required to locate on the non-protected habitat portions of a development site. Transfer of residential densities shall be permitted from protected habitat areas to contiguous non-protected habitat areas within the same subdivision, subject to the following:

   2. Residential densities shall be transferred from protected habitat areas to non-protected habitat areas at the underlying density and shall be clustered to the greatest extent possible to protect habitat.

   3. Any transfer of density to facilitate clustering shall not result in lot sizes, or areas per dwelling unit less than that required by this Code (the minimum lot/area size shall be exclusive of the wetland area); for lots utilizing septic tanks, the area shall not be less than 40,000 square feet.

   4. Portions of lots may be platted into habitat areas and shall not be construed as having disturbed the habitat area for a density-transfer provision so long as that portion of the lot does not include any fill, construction, improvements, or other development, and a restriction is placed upon the plat to prohibit such future actions within habitat areas.

   5. All such transfers of density shall be to contiguous property under the same ownership or control and shall only be permitted within a subdivision platted and developed in accordance with this Code. Such transfers shall be noted on the face of the final plat as a restrictive covenant.

6. Commercial and industrial development shall locate on the non-protected habitat portion of a development site.

6.3.11 PERMITTING REQUIREMENTS AND EFFECTIVE DATES

a. In accordance with Chapter 9J-1, F.A.C., the Community Development Department shall render development orders to the State Land Planning Agency (LPA) for development approvals that shall include, but not be limited to:

1. zoning
2. rezoning
3. conditional use
4. variance
5. plat approval
6. major development review
7. community impact assessment
8. building permit
9. fill permit
10. excavation permit
11. land clearing or landscaping permit
12. any change or amendment to a previously issued development order
13. any action that increases the impervious surface
14. any other action having the effect of permitting development

b. It shall be the responsibility of the developer to provide all necessary exhibits, applications, or documents to the City of Lakeland to be included in the development order for rendition to the LPA.

c. City permits will include a reminder note that a development order in the Green Swamp Area of Critical State Concern shall not take effect or be acted upon by the developer until 45 calendar days after rendition to the LPA, unless a later date is specified in the order. If no comments are received from the LPA by the 45th day, the development order may be acted upon.

6.3.11.1 Additional Review Requirements

a. In the Green Swamp ACSC, Planning and Zoning Board review and approval shall be required for all site plans and subdivision plan/plat approvals.

b. Prior to commencement of development, all state and federal permits must be obtained.

c. All development approvals within the Green Swamp ACSC are subject to review and approval by the LPA, up to 45 days after such approvals have been officially rendered to the LPA by the City. The LPA has authority to appeal any development approvals in the ACSC.

6.3.11.2 Application Narrative Requirement

All development, as defined in Section 380.04, FS, with the exception of a single-family dwelling unit and accessory uses, shall submit to the city a project narrative describing the proposed development. This narrative shall also address how their development supports the following State objectives in the Green Swamp Area of Critical State Concern:

a. Minimize the adverse impacts of development on resources of the Floridan Aquifer, wetlands, and flood-detention areas.

b. Protect or improve the normal quantity, quality and flow of ground water and surface water which are necessary for the protection of resources of state and regional concern.

c. Protect or improve the water available for aquifer recharge.

d. Protect or improve the functions of the Green Swamp Potentiometric High of the Floridan Aquifer.

e. Protect or improve the normal supply of ground and surface water.

f. Prevent further salt-water intrusion into the Floridan Aquifer.

g. Protect or improve existing ground and surface-water quality.

h. Protect or improve the water-retention capabilities of wetlands.

i. Protect or improve the biological-filtering capabilities of wetlands.

j. Protect or improve the natural flow regime of drainage basins.

k. Protect or improve the design capacity of flood-detention areas and the water-management objectives of these areas through the maintenance of hydrologic characteristics of drainage basins.

6.4 LAKE AND NATURAL HABITAT PROTECTION

6.4.1 INTENT AND APPLICABILITY

a. Intent

It is the intent of this Section to preserve environmentally sensitive or beneficial areas including lakes, lakeshores, wetlands, areas harboring protected species, fisheries and conservation areas.

b. Applicability

The requirements established within this Section shall apply to all construction or site alteration activity occurring or proposed upon a site in which the potential exists to impact protected habitat areas defined in this section or to impact a parcel of undisturbed land.

6.4.2 DETERMINATION OF PROTECTED HABITAT BOUNDARIES

It shall be the responsibility of the developer or landowner, the city and all effected regulatory agencies to establish to what extent protected habitat exists upon a site prior to development or site alteration activity. Delineation of a protected habitat area shall be based upon the following criteria:

6.4.2.1 Protected Lakeshores

Protected lakeshores shall exist around the following natural lakes:

a. Lake Beulah
b. Lake Bonnet
c. Lake Bonny
d. Lake Crago
e. Lake Gibson
f. Lake Hollingsworth
g. Lake Holloway
h. Lake Hunter
i. Lake Morton
j. Lake Parker
k. Lake Wire

6.4.2.2 Wetlands

Wetland boundaries shall be determined by the compilation of relevant evidence collected by professional in-field survey methods to derive botanical, physical, geomorphological and historic indicators that, when considered by a qualified professional, can delineate an area as a wetland. At a minimum, areas which meet the following established criteria shall be defined as wetlands:

a. Areas within the dredge and fill jurisdiction of the FDEP as authorized by Chapter 403, Florida Statutes;

b. Areas within the jurisdiction of the Army Corp of Engineers as authorized by Section 10, River and Harbor Act; and

c. Areas within the jurisdiction of the Southwest Florida Water Management District pursuant to Chapter 40D-4 and 40D-40, Florida Administrative Code.

6.4.2.3 Protected Species

The city shall reserve the right to require a biological inventory of a development site to be performed in response to the documented presence or sighting of a protected species or based on the size or ecological diversity of the proposed development site.

Determination of areas harboring or supporting protected species shall be delineated by standardized field assessments conducted by a qualified professional.

6.4.2.4 Fisheries

Fishery habitats shall include all natural lakes within the corporate limits.

6.4.2.5 Conservation Areas

Conservation areas are designated upon the future land use map of the Comprehensive Plan.

6.4.2.6 Community Development Department Resources

The Community Development Department shall maintain and update maps contained within the Comprehensive Plan showing the general location of each regulated habitat type to the extent of available information. These maps shall be available to the public for reference to general habitat locations, however, habitat area boundaries may be established wherever the criteria for their determination exists.

6.4.3 STANDARDS FOR PROTECTED HABITAT AREAS

6.4.3.1 Identification within the Site Plan Review Process

Development plans submitted for site plan review shall be required to identify the extent and location of any protected habitat (lakeshores, wetlands, protected species, fisheries, conservation areas) areas within the proposed development plan. Failure to indicate these areas may result in the rejection of the site plan.

6.4.3.2 Minimum Setbacks for Protected Lakeshores

a. All commercial, residential and industrial structures, either primary or accessory, shall maintain a minimum landward setback of 50 feet from the ordinary high water line around protected lakeshores. Activity within the fifty foot setback shall be regulated by the following:

    1. Gravel paths, non-contiguous wood steps or wood platforms, raised boardwalks, docks and boathouses are exempt from these setback requirements.

    2. All ground area within the setback shall be covered with some form of vegetative ground cover. Barren soil shall not be exposed for a period exceeding one day.

    3. Pesticides, excluding appropriate herbicides, shall not be used within the setback distance due to their potential to harm the aquatic ecosystem. All required state or federal permits shall be obtained prior to the control or management of any wetland or aquatic plants. Fertilizer products may be applied to this setback area, in amounts prescribed by label, no more than once a year.

4. Variances to the 50 foot lakeshore setback shall be considered based on the relative impact to the water body, existing setbacks on adjacent and nearby properties and in accordance with the process utilized for other variances to zoning setbacks by the Zoning Board of Adjustment and Appeals. Provided, application to the Zoning Board of Adjustment and Appeals shall not be required when application to the City Commission is otherwise required pursuant to Subsection 34.04.03.02b. below and City Commission approval is secured.

b. It shall be unlawful for any person to build, place or cause to be built or placed any building, house, shed, dock, wharf or any other structure of any kind or nature whatsoever upon the shores or margin of the following parkway lakes: Lake Mirror, Lake Morton, Lake Wire, Lake Beulah, Lake Hunter, Lake Hollingsworth, Lake Bonny and Lake Parker, where such lake is surrounded or bordered by a public collector roadway, as defined in Article 2, without obtaining the proper permits and permissions.

1. All of that certain area within the city, lying within 500 feet of the high water mark and between any public collector roadway, as defined in Article 2, and the waterline of either and all of the above named lakes, is hereby designated for parks and parkways and restricted against the planting of any and all shrubs or plants without a specific permit issued by the City Manager, said permit being valid for sixty days. It being the purpose of this section to establish and maintain a healthy and functioning lake ecosystem and establish a systematic beautification of such area.

2. It shall be unlawful for any person to place or cause to be placed upon the area defined herein , any brush, debris, wood, structure or other thing or object of whatsoever kind or nature except as authorized herein.

3. Nothing herein shall be construed to prohibit the city from building or placing buildings, structures or other objects at such points within the area described in Subsection 1. above, when such construction or placement is approved by action of the City Commission. Prior to approval, the City Commission shall determine that the building, structure or other object will not constitute a hazard to or interfere with traffic nor mar the beauty or appearance of the adjacent property or area surrounding the site of said building, structure or other object.

6.4.3.3 Lake Bottom Construction Regulations

This Section shall apply to all lake bottom construction, as defined herein, on all lakes and wetlands within the city. In addition to the regulations and approvals required below, lake bottom construction on the entire lakeshore of the parkway lakes listed in Section 6.4.3.2 shall be subject to City Commission review and approval. Nothing in this Section shall be construed to prohibit the placement of ski ramps upon lakes within the city if the City Commission shall determine that the placement of any such ski ramp will not be detrimental to the public health, safety and welfare, the management of fish and wildlife, or the water quality of the lake.

a. Regulations Applicable to All Lake Bottom Construction

Lake bottom construction shall:

1. Minimize changes in the physical or biological conditions of the natural environment within or adjacent to the area that result in a detrimental effect upon flora, fauna, air, water, minerals or other natural characteristic(s) of the area. Special consideration shall be given to the protection of listed species.

2. Minimize adverse impacts on the natural beauty of wetlands/waters within the city.

3. Minimize adverse impacts on navigability of adjacent waters.

4. Minimize the adverse impacts on traditional and future recreational uses of adjacent wetlands/waters.

5. Minimize adverse impacts on historic resources.

6. Minimize adverse impacts on views from adjacent properties.

7. Be consistent with the Comprehensive Plan.

8. Be maintained in sound condition. All elements, such as railings, planks, pilings, and ornamentation, shall be securely attached. All unsecured, missing, rotten, decayed, or corroded elements shall be repaired or replaced. Any structure deemed to be unsafe by the Building Official shall be restored to a safe and sound condition or shall be demolished.

b. Regulations Applicable to All Water Access Structures

1. All water access structures shall be located along the riparian shoreline where the least destruction will occur to shoreline and aquatic vegetation, and the associated faunal communities.

2. Dredging or filling to provide access from uplands to a water access structure, or to provide access from a water access structure to deeper water, where such access has not previously existed, is prohibited.

3. No water access structure shall include fueling facilities of any kind.

4. No water access structure shall be larger than necessary to provide access to the water for customary recreational purposes.

c. The construction of boat ramps shall be permitted in those surface waters where public access facilities are not available. Where possible, multiple boat ramps shall be consolidated or shared to minimize shoreline disturbance.

d. Standard water access structures are water access structures that meet the following criteria:

1. All decks, platforms, gangways and similar elements of the water access structure shall be no higher than three feet above the Ordinary High Water Line (OHW) except and only where necessary to make a connection to the upland shore.

2. Vertical elements such as pilings and railings shall extend no higher than 3 1/2 feet above the deck, platform, gangway or other surface and shall not include or accommodate non-water dependent structures (e.g. gazebos, screen houses or other enclosed or semi-enclosed structures).

3. The water access structure shall meet the minimum sideyard structure setbacks for from the side lot lines of the lot or parcel that the structure serves extended into the water.

4. The total horizontal area of all decks, platforms, gangways and other surfaces shall not exceed 500 square feet over water.

5. The length of the water access structure shall be no greater than 50 feet over water.

e. Extraordinary water access structures include any water access structures that do not meet the criteria for standard water access structures, including, but not limited to, those with boathouses.

1. Boathouses shall not be larger than the minimum size required to accommodate one watercraft. A boathouse shall not be enclosed or include living quarters. There shall be no fueling facilities in a boathouse located over water.

f. Regulations Applicable to Shoreline Stabilization Structures

1. No shoreline stabilization structure shall be permitted unless the applicant clearly demonstrates that an erosion problem is posing a significant threat to life or property.

2. To the maximum extent possible, shoreline stabilization should be accomplished by using a biotechnical erosion control method which uses appropriate native vegetation.

3. A seawall may be constructed only as a last resort where the applicant shows that neither biotechnical erosion control methods nor rip-rap type revetments will alleviate a significant threat to life or property.

6.4.3.4 Lake Bottom Construction Permit Procedures

It shall be unlawful for any person to erect or deposit any object upon, or fix, fill or otherwise use the bottom of any lake or to construct or alter any water access structure

or shoreline stabilization structure within the corporate limits of the city, or cause the same to be done by or through any person, without first obtaining a permit from the City in accordance with the following procedures:

a. All permit applications shall be accompanied by the following information:

   1. A location map of the proposed improvement.

   2. A detailed statement describing the proposed improvement, including a list of plants to be used for shoreline stabilization, where applicable.

   3. Copies of permits from applicable state and federal regulatory agencies. Water access structures over 1,000 square feet must obtain the proper permissions from the Southwest Florida Water Management District and the Florida Department of Environmental Protection before submitting an application to the City of Lakeland. A city permit for lake bottom construction shall be issued only after all required state and federal permits have been obtained.

   4. Detailed drawings of the proposed improvement, including construction materials and planting schemes where applicable.

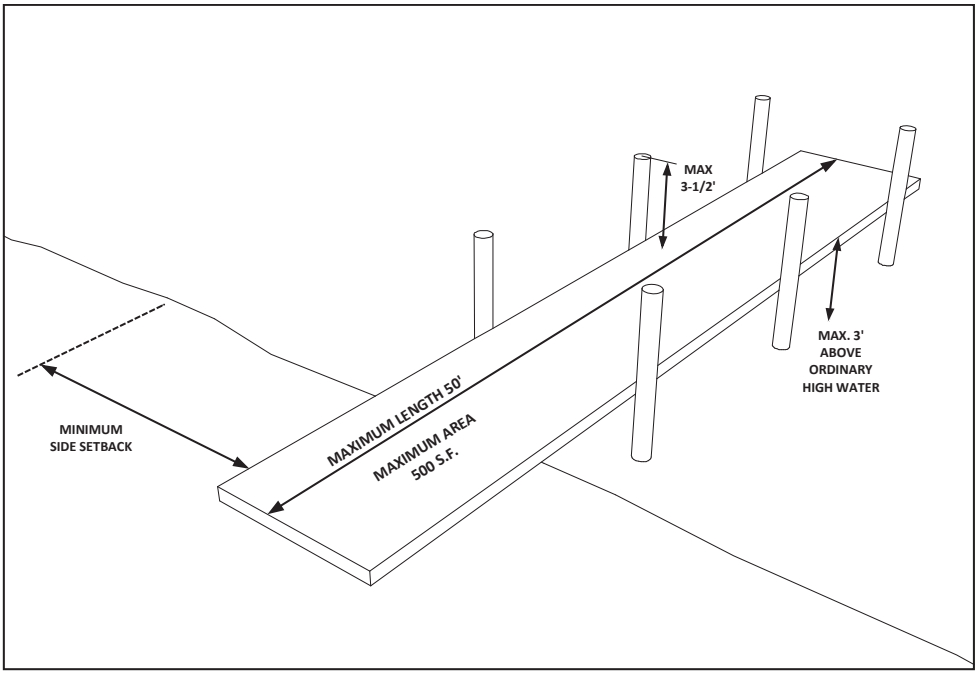
   5. Satisfactory evidence of title or other riparian rights of the applicant to the riparian upland ownership or submerged ownership, with a copy of the applicant's deed in the chain of title.

b. All permit applications shall be submitted to the Building Inspection Division along with the applicable fee. If the submission is determined to be sufficient, the permit application will be reviewed by the Building Official and the Manager of the Lakes and Stormwater Division. Before any permit is issued, the Building Official will review the plans to ensure compliance with applicable building codes; the Manager of Lakes and Stormwater shall make a written determination that all applicable conditions are met. If a negative determination is made as to any applicable condition, the permit shall be denied.

c. Permitting Procedures for Standard Water Access Structures and Shoreline Stabilization Structures on Non-Parkway Lakeshores

   Standard water access structures and shoreline stabilization structures on non-parkway lakeshores shall require review and approval of the Manager of the Lakes and Stormwater Division and Building Official before a permit is issued. Upon a determination that the permit application is sufficient and all applicable conditions are met, the Building Inspection Division shall provide the required building permits. No further reviews shall be required.

Figure 6.4-1 Standard Water Access Structure



d. Permitting Procedures for Extraordinary Water Access Structures on Non-Parkway Lakeshores

Extraordinary water access structures on non-parkway lakeshores shall require initial review and approval of the Manager of the Lakes and Stormwater Division and Building Official. Upon a determination that the permit application is sufficient and all applicable conditions have been met, the Building Inspection Division shall send a notice letter by regular mail to all neighbors within 250 feet of the applicant's property advising them of the proposed structure and of the city's intention to issue a permit for the structure unless a written request for a public hearing and decision by the Zoning Board of Adjustment and Appeals is received by the Building Inspection Division within 30 days of the date of the letter. If a written request for public hearing is not received within said 30 day period, the Building Inspection Division shall issue a permit for the structure. If a written request for a public hearing is timely received, the Building Inspection Division shall schedule a hearing before the Zoning Board of Adjustment and Appeals and mail notice of said hearing to the permit applicant and all neighbors within 250 feet of the applicant's property. The Zoning Board of Adjustment and Appeals shall conduct a hearing in accordance with its normal procedures. The Board shall consider the testimony and evidence and determine whether or not all conditions applicable to the structure have been met. If the Board finds that all conditions have been satisfied, it shall approve the application and direct the Building Inspection Division to issue a permit for the structure. If the Board finds that one or more applicable conditions have not been satisfied, the Board shall disapprove the application and direct the Building Inspection Division to deny the permit. The decision of the Zoning Board of Adjustment and Appeals shall constitute

final action by the city and may be appealed in the same manner as any other decision of the Zoning Board of Adjustment and Appeals.

e. Permitting Procedures for Lake Bottom Construction on Parkway Lakeshores

Any lake bottom construction on parkway lakeshores outlined in Section 6.4.3.2 shall require City Commission review and approval before a permit is issued. The Manager of the Lakes and Stormwater Division and Building Official shall review each application for sufficiency. Upon a determination that the permit application is sufficient for review, the Building Inspection Division shall schedule the application before the City Commission and send a notice letter by regular mail to all property owners within 250 feet of the applicant's property advising them of the proposed water access structure and of the date and time of the City Commission meeting. The Lakes and Stormwater Division shall review each request for proposed standard water access structures for compliance with the conditions applicable to the structure or improvement and provide a written recommendation to the City Commission. Proposed extraordinary water access structures shall be reviewed by both the Lakes and Stormwater Division and the Community Development Planning Division, who shall jointly provide a written recommendation to the City Commission. The City Commission shall consider all relevant public comment and determine whether or not all conditions applicable to the structure or improvement have been met. Because of the public significance of parkway lakeshores, the City Commission may also consider any other factor appropriate for legislative consideration, including whether or not the proposed structure or improvement furthers or adversely impacts the overall public health, safety and welfare of the city. If the Commission finds that all conditions have been met and that the proposed structure or improvement is otherwise appropriate, it shall approve the application and direct the Building Inspection Division to issue a permit for the structure or improvement. If the Commission finds that one or more applicable conditions have not been satisfied, or that the proposed structure or improvement is otherwise incompatible with the public health, safety and welfare of the City, the Commission shall disapprove the application and direct the Building Inspection Division to deny the permit.

f. If approved, the Building Inspection Division shall issue a permit subject to the condition that all work shall be fully and completely finished, in accordance with the approved plans, within the period of one year. Permits issued pursuant to this Article shall expire if the work authorized by the permit has not commenced within one year.

g. Repair and maintenance of existing structures

No permit shall be required for the repair or maintenance of water access or shoreline stabilization structures constructed pursuant to all required Federal, State and local permits provided the work does not change the original dimensions, design, or placement of the structure, and is necessary to maintain the structure in good condition.

6.4.3.5 Minimum Standards for Protection Of Wetland Habitats

All residential, commercial or industrial structures are prohibited within the jurisdictional boundaries of a wetland.

6.4.3.6 Lakeshore and Wetland Area Buffer Requirement

A natural vegetative buffer zone of 15 feet measured landward from the ordinary high water line or the delineated boundary of the wetland shall be maintained around all protected lakeshores and wetland areas. This buffer shall exist within the 50 foot lakeshore protection setback area and shall remain undisturbed and free of development activity at all times except for maintenance in the form of trimming.

6.4.3.7 Required Protected Species Habitat Management

Upon completion of an environmental assessment establishing the extent to which a protected species exists upon a site, special management programs shall be created by the developer or landowner to preserve the species upon the site by protection of its supporting habitat. Management programs, implemented in coordination with the development activity, shall use buffer zones, setbacks, conservation areas or easements and physical protection devices to preserve the supporting habitat and prevent disturbance of the species.

6.4.3.8 Protection of Fisheries

Protection of fishery habitats shall be accomplished by following all standards established within these regulations. Measures to ensure surface water quality, lakeshore and conservation area protection shall apply to the preservation of local fisheries.

6.4.3.9 Maximum Allowable Density

Maximum density within a conservation area shall not exceed a gross density of one unit per ten acres. All land development within these areas shall take measures to ensure minimal disruption to the natural environment.

6.5 SITE ALTERATION

6.5.1 APPLICABILITY

A site alteration permit shall be required for all clearing, contouring and grading of land including, but not limited to the alteration of land in preparation for sale or development, the placement or storage of fill, borrow pits, and/or the removal of regulated trees as defined in Section 4.5, regardless of changes to grade. The provisions of this Section shall not apply to existing platted lots zoned for single-family or two family dwellings, to bona fide general maintenance or agricultural maintenance not undertaken in association with the preparation of land for sale or development, or to operations necessary for the substantial improvement of existing structures.

6.5.2 SITE ALTERATION PLAN

6.5.2.1 Site Alteration Plan Required

A site alteration plan shall be prepared by a professional engineer, architect or landscape architect registered in the State of Florida based on contours and site feature locations that have been verified, signed and sealed by a land surveyor and mapper registered in the State of Florida. The plan shall not exceed one inch equals 200 feet in scale and shall contain the following information and documentation. For projects requiring site plan review, a separate site alteration plan shall not be required if this information can be shown on the site plan.

a. Existing topography versus graded topography indicated as cut and fill areas (contours shall be shown in one foot intervals);
b. The exact location of drainage basins, streams, channels, floodplains, floodways, wetlands, and lakes, which exist on the site;
c. The location of any protected habitat areas which exist on the site pursuant to the provisions of Section 6.4.3;
d. An Erosion Control Plan;
e. The location of all regulated trees as defined in Section 4.5; and
f. A legend containing the definition of all symbols used in the layout of the plan, the scale of the map, the orientation and location, including the legal description.

6.5.2.2 Plan Submission

If a separate site alteration plan is required, six copies of the plan shall be submitted to the Building Official who shall transmit copies to the Public Works Department, the Parks and Recreation Department and the Community Development Department for review. One copy shall remain with the Building Inspection Division.

6.5.2.3 Plan Review

The Public Works Department, the Parks and Recreation Department and the Community Development Department shall approve or disapprove the site alteration plan within twenty days of receipt of a complete plan. The basis for approval shall be a finding by the Public Works Department that the plan provides for adequate erosion control, a finding by the Parks and Recreation Department that the plan provides for the protection of regulated trees or compensation for the destruction of regulated trees, and a finding by the Community Development Department that the plan provides adequate habitat protection standards in accordance with this Section.

Upon the approval of the plan by all review departments, the Building Official shall issue the site alteration permit. The applicant shall display the permit on the site at all times during site alteration work.

The site alteration permit shall constitute a tree removal permit in accordance with Section 4.5.

6.5.3 EROSION CONTROL STANDARDS

6.5.3.1 Criteria for Erosion Control Devices

Measures of erosion control needed to minimize or eliminate any transfer or removal of soil from a site during a rainfall event shall be established upon all applicable sites. Compilation of all features upon a site may necessitate unified measures of control.

6.5.3.2 Natural Bodies of Water

The use of natural bodies of water for siltation settling ponds shall be strictly prohibited.

6.5.3.3 Development Adjacent to Roadways and Rights-Of-Way

All roads and public rights-of-way shall be protected from the encroachment of any siltation or erosion-created spoils. Any material encroaching upon a roadway or public right-of-way due to the effects of erosion from a private site shall be immediately removed by the owner or developer of the property and all damages compensated or the material will be removed by the city at the expense of the owner or developer.

6.6 SURFACE WATER QUALITY

6.6.1 INTENT AND APPLICABILITY

a. Intent

It is the intent of this Section to maintain standards of water quality and quantity within local bodies of water by establishing provisions regulating the management of stormwater within the city.

b. Applicability

1. The requirements established within this section shall apply under the following conditions:

(a) Construction of a structure or the alteration of a site;

(b) Alteration to the rate, volume, and quality characteristics of stormwater runoff occurring upon a site; or

(c) Increase in the amount of impervious surface area upon a site.

b. Exemptions to Stormwater Management Provisions

The following land development activities are exempt from the stormwater management provisions:

1. A single-family or a single duplex dwelling unit;

2. Any structure constructed prior to the requirement for a stormwater plan;

3. Those projects which have received a Southwest Florida Water Management District permit prior to the adoption of these regulations, including multiple-use developments which have an approved master drainage plan;

4. Maintenance activity that does not change or affect the quality, intensity, volume, or location of stormwater runoff upon the site; and

5. Actions taken under emergency conditions to prevent imminent harm or danger to persons, or to protect property from imminent damage. A report of the emergency action shall be made to the Public Works Department immediately following the event.

All activities which are exempt, nevertheless, are to be accomplished in a manner which prevents flooding of adjacent sites and roadways by stormwater runoff.

6.6.2 STORMWATER MANAGEMENT PLAN

A stormwater management plan shall be prepared for each site proposed for development in accordance with the following:

a. Prior to the issuance of a permit for any construction activity which increases the area of impervious surface, except that deemed exempt, a stormwater management plan shall be submitted to the Public Works Department for review and approval.
b. The stormwater management plan shall be made a part of the required site plan for any proposed alteration, addition, structure or development and shall include the following:

1. All required information pursuant to Southwest Florida Water Management District application requirements for the management and storage of surface waters contained in Chapter 40D, Florida Administrative Code (FAC);

2. The location of all bodies of water and jurisdictional wetlands indicated upon the topographic map required within Chapter 40D, FAC;

3. Any additional stormwater related information that the Public Works Department finds to be necessary for the proper review of the proposed activity; and

4. Certification that the plan was prepared by a professional engineer registered in the State of Florida.

6.6.3 GENERAL STORMWATER MANAGEMENT REQUIREMENTS

6.6.3.1 Maintenance of Pre-Development Standards

The characteristics of stormwater conveyed from the site shall, at a minimum, approximate the volume, quality and intensity that occurred on the site prior to development activity.

6.6.3.2 Water Quality Standards of Treated Stormwater

Treated stormwater standards are set forth and hereby adopted within these regulations by reference to Section 62-25 and Section 62-302 of the Florida Administrative Code.

6.6.3.3 Compliance with State and Regional Regulations

The design and performance of all stormwater management systems shall comply with the following State of Florida regulations:

a. Section 62-25, Florida Administrative Code, regulating stormwater discharge;

b. Requirements of the Southwest Florida Water Management District, Section 40D-4 and 40D-40, Florida Administrative Code; and

c. Chapter 373, Florida Statutes.

6.6.3.4 Intergovernmental Coordination of Approval

Prior to approval by the Public Works Department, the stormwater management plan shall be reviewed and its approval documented by all other governmental authorities having jurisdiction. Approval by such authorities shall be a mandatory requirement prior to obtaining a building permit from the city. Government agencies which may have authority include:

a. Florida Department of Transportation (FDOT);

b. Southwest Florida Water Management District (SWFWMD);

c. Florida Department of Environmental Protection (FDEP);

d. Polk County Board of County Commissioners (BOCC);

e. Army Corp of Engineers (ACOE); and

f. The Environmental Protection Agency (EPA).

6.6.4 STORMWATER MANAGEMENT SYSTEM STANDARDS

6.6.4.1 Minimum Design Standards for Stormwater Systems

All structures required as necessary devices within a stormwater management system shall be designed and constructed so as to conform with the Engineering Standards Manual.

6.6.4.2 Certification of Established Systems

The design and construction of the proposed stormwater management system shall be certified as meeting the requirements of this section by a professional engineer registered in the State of Florida.

6.6.4.3 Systems within Phased Developments

In phased developments, stormwater systems for each integrated phase shall be independently functional unless specific development provisions are approved by the Public Works Department.

6.6.4.4 Access to Stormwater Structures

All man-made components within a stormwater management system shall be easily accessible for maintenance by streets, public rights-of-way or access easements.

6.6.4.5 Responsibility for Maintenance

It shall be the landowner who is responsible for maintenance of the established stormwater management system and structures therein unless legal and binding agreements are established to transfer this responsibility.

6.7 WELLHEAD AND AQUIFER PROTECTION

6.7.1 INTENT AND APPLICABILITY

a. Intent

It is the intent of this Section to preserve the quality and availability of safe drinking water by protecting large capacity wells and areas of high aquifer recharge from the potential of contamination and degradation due to the proximity of specific land uses or activities. The Community Development Department shall review applicable development activity for conformance with this Section.

b. Applicability

The requirements of this Section shall apply to the construction or expansion of any structure or any impervious surface, or any change in use involving such structure or site, if any part of the development site (lot or parcel) falls within a Wellhead Protection Zone or within a designated area of high aquifer recharge as defined herein.

6.7.2 WELLHEAD PROTECTION STANDARDS

6.7.2.1 Wellhead Protection Zones

Wellhead Protection Zones having a radius of 500 feet around each public potable water wellhead possessing a pumping capacity of one million gallons a day or greater shall be delineated on the Official Zoning Map.

6.7.2.2 Prohibited Uses within Wellhead Protection Zones

The following uses, temporary or permanent, shall be prohibited:

a. Sanitary landfills and junk yards;

b. Wastewater treatment plants;

c. Petroleum storage and distribution facilities as a primary use and all underground fuel, petroleum or chemical storage facilities;

d. Dairy farming;

e. Agricultural land treated with any regulated substance listed in Table 6.7-1;

f. Land uses incorporating deep penetration injector wells; and

g. Facilities which store, process, or handle any hazardous, toxic or medical waste.

Table 6.7-1: REGULATED SUBSTANCES

acenaphthene
acenaphylene
acetaldehyde
acetic acid
acetic anhydride
acetone
acetone cyanohydrin
acetonitrile
acetophenone
acetyl bromide
acetyl chloride
acetylaminofluorene
acrolein
acrylonitrile
adipic acid
aldrin
allyl alcohol
allyl chloride
alpha-BHC
aluminum sulfate
aminobiphenyl
ammonia
ammonium acetate
ammonium benzoate
ammonium bicarbonate
ammonium bichromate
ammonium bifluoride
ammonium bisulfide
ammonium carbamate
ammonium chloride
ammonium chromate
ammonium citrate
ammonium fluoride
ammonium fluoroborate
ammonium hydroxide

ammonium oxalate
ammonium silicofluoride
ammonium sulfamate
ammonium sulfide
ammonium sulfite
ammonium tartrate
ammonium thiocyanate
ammonium thiosulfate
amyl acetate
aniline
anthracene
antimony pentachloride
antimony potassium tartrate
antimony tribromide
antimony trichloride
antimony trifluoride
antimony trioxide
aroclor 1016
aroclor 1221
aroclor 1232
aroclor 1242
aroclor 1248
aroclor 1254
aroclor 1260
arsenic
arsenic disulfide
arsenic pentoxide
arsenic trichloride
arsenic trioxide
arsenic trisulfide
barium cyanide
benzene
benzenethiol
benzidine (dihydrochloride)
benzoic acid

bezonitrile
benzoquinone
benzoyl chloride
benzo (a) anthracene
benzo (a) pyrene
benzo (b) fluoranthene
benzo (ghi) perylene
benzo (k) fluoranthene
benzyl alcohol
benzyl chloride
beryllium
beryllium chloride
beryllium fluoride
beryllium nitrate
beta-BHC
bis (2-chloroethoxy) methane
bis (2-chlorethyl) ether
bis (2-chloroisopropyl) ether
bis (2-chloromethyl) ether
bis (2-ethylhexyl) phthalate
bromoform
bromophenylphenyl ether
butylacetate
butylbenzyl phthalate
butyldinitrophenol
butylphthalate
butyric acid
cadmium acetate
cadmium bromide
cadmium chloride
calcium arsenate
calcium arsenite
calcium carbide
calcium chromate
calcium cyanide

calcium dodecylbenzene sulfonate
calcium hypochlorite
captan
carbaryl
carbofuran
carbon disulfide
carbon tetrachloride
chlordane
chlordecone
chloroaniline
chlorobenzene
chlorobenzilate
chlorobutadiene
chlorocresol
chlorodibromomethane
chloroethane
chloroethyl vinyl ether
chloroform
chloronaphthalene
chlorophenol
chlorophenylphenyl ether
chloropropionitrile
chloropyrifos
chlorosulfonic acid
chlorotoluene
chromic acid
chromic sulfate
chromoic acetate
chromous chloride
chrysene
cobaltous bromide
cobaltous formate
cobaltous sulfamate
coumaphos
cresol
crontonaldehyde
cupric acetate
cupric acetoarsenite

cupric ammonium sulfate
cupric chloride
cupric nitrate
cupric oxalate
cupric sulfate
cupric tartrate
cyclohexane
DDD
DDE
DDT
delta-BHC
diazinon
dibenzofuran
dibenzo (a,e) pyrene
dibenzo (a,h) pyrene
dibenzo (a,l) pyrene
dibenzo (a,h) anthracene
dibutyl phthalate
dicamba
dichlobenil
dichlone
dichlorobenzene
dichlorobenzidine
dichlorobromomethane
dichlorobutene
dichlorodifluoromethane
dichloroethane
dichloroethylene
dichloroiodomethane
dichlorophenol
dichlorophenoxyacetic acid
dichloropropane
dichloropropene
dichloropropionic acid
dichlorvos
dieldrin
diethyl phthalate
diethylamine

diethylpyrazinyl
phosphorothioate
dimethoxybenzidine
dimethyl phthalateq
dimethylamine
dimethylaminoazobenzene
dimethylbenzidine
dimethylbenz (a) anthracene
dimethylphenethylamine
dimethylphenol
dinitrobenzene
dinitrocresol
dinitropheno
dinitrotoluene
dioctyl phthalate
dioxane
diphenylamine
diphenylhydrazine
dipropylnitrosamine
diquat (dibromide)
disulfoton
diuron
dodecylbenzene- sulfonate
dodecylbenzene sulfonic acid
EDTA
Endosulfan
endosulfan
endrin
endrin aldehyde
epichloro hydrin
ethion
ethyl cyanide
ethylamine
ethylene dibromide
ethylene oxide
ethylenediamine
ethylmethacrylate
ferric ammonium citrate

ferric ammonium oxalate
ferric chloride
ferric fluoride
ferric nitrate
ferric sulfate
ferrous ammonium sulfate
ferrous chloride
ferrous sulfate
fluoranthene
fluorene
formaldehyde
formic acid
fumaric acid
furfural
guthion
heptachlor
heptachlor epoxide
hexachlorobenzene
hexachlorobutadiene
hexachlorocyclopentadiene
hexanchlorodibenzofuran
hexachlorodibenzo-p-dioxin
hexachloroethane
hexachlorophene
hexachloropropene
hexanone
hydrochloric acid
hydrofluoric acid
hydrogen cyanide
hydrogen sulfide
indeno (1,2,3-cd) pyrene
iodomethane
isobutyl alcohol
isophorone
isoprene
isopropanolamine
isosafrole
kelthane

kepone
lead acetate
lead arsenate
lead chloride
lead fluoride
lead iodide
lead nitrate
lead stearate
lead sulfate
lead sulfide
lead thiocyanate
lindane
lithium chromate
malathion
maleic acid
malononitrile
mercaptodimethur
mercuric cyanide
mercuric nitrate
mercuric sulfate
mercuric thiocyanate
mercurous nitrate
methacrylonitrile
methapyrilene
methyl chloride
methylamine
methylcholanthrene
methylene chloride
methylenebis (chloroaniline)
methylethylketone
methylmercaptan
methylmethacrylate
methylmethanesulfonate
methylnaphthalene
methylparathion
methylpentanone
mevinphos
mexacarbate

mirex
naled
naphthalene
naphthoquinone
naphthylamine
naphthenic acid
nickel
nickel ammonium sulfate
nickel chloride
nickel hydroxide
nickel nitrate
nickel sulfate
nitric acid
nitroaniline
nitrobenzene
nitrophenol
nitropiperidine
nitrosodibutylamine
nitrosodiethylamine
nitrosodimethylamine
nitrosodiphenolamine
nitrosodipropylamine
nitrosomethylethylamine
nitrosomorpholine
nitrosophyrrolidine
nitrotoluene
nitrotoluidine
osmium
parathion
pentachloroenzene
pentachlorodibenzofuran
pentachlorodibenzo-p-dioxin
pentachloroethane
pentachloronitrobenzene
pentachlorophenol
phenacetin
phenanthrene
phenol

phosphoric acid
phosphorous
phosphorous oxychloride
phosphorous pentasulfide
phosphorous trichloride
picoline
potassium arsenate
potassium arsenite
potassium cyanide
potassium dichromate
potassium hydroxide
potassium permanganate
pronemide
propargite
propionic acid
propionic anhydride
propylene oxide
propynol
pyrene
pyrethrin
pyridine
quinoline
resourcinol
safrole
selenium oxide
silver nitrate
sodium
sodium arsenate
sodium arsenite
sodium bichromate
sodium bifluoride
sodium bisulfite
sodium bichromate
sodium cyanide
sodium dodecylbenzene sulfonate
sodium fluoride
sodium hydrosulfide
sodium hypochlorite

sodium methylate
sodium nitrite
sodium phosphate
sodium selenite
strontium chromate
strychnine
styrene
sulfur chloride
sulfuric acid
TCDD
TDE
Tetrachlrobenzene
tetrachlorodibenzo dioxin
tetrachlorodibenzofuran
tetrachloroethane
tetrachloroethylene
tetrachlorophenol
tetraethyl lead
tetraethyldithiopyrophosphate
tetraethylpyrophosphate
thallium
thallium sulfate
toluene
toxaphene
tribromomethane
trichlorfon
trichlorobenzene
trichloroethane
trichloroethylene
trichlorofluoromethane
trichloromethanethiol
trichlorophenol
trichloropropane
triethanolamine dodecylbenzenesulfonate
triethylamine
trimethylamine
tris(2,3-dibromopropyl)phosphate
uranyl acetate

uranyl nitrate
vanadium
vanadium pentoxide
vanadium sulfate
vinyl acetate
xylene
zinc acetate
zinc ammonium chloride
zinc borate
zinc bromide
zinc carbonate
zinc chloride
zinc cyanide
zinc fluoride
zinc formate
zinc hydrosulfonate
zinc nitrate
zinc phenolsulfonate
zinc phosphide
zinc silicofluoride
zinc sulfate
zinconium nitrate
zirconium potassium fluoride
zirconium sulfate
zirconium tetrachloride

6.7.2.3 Restricted Uses

Any commercial or industrial land use, temporary or permanent, which requires the storage, use or production of any regulated substance in excess of 10 gallons in liquid form or 10 pounds in solid form, shall require a restricted use operating permit. This shall not include the storage of any routine cleaning or other maintenance products, provided that all other applicable state and federal regulations are satisfied. Restricted uses shall include, but not be limited to, the following:

a. Commercial laundry, dry cleaning, dying processes, textile manufacturing;

b. Printing, photographic processing, and paper manufacture;

c. Herbicide, fertilizer and pesticide manufacturing or distribution;

d. Manufacturing or distribution of chemical products, plastics or other general manufacturing which utilizes any of the regulated substances listed in Table 6.7-1; and

e. Uses associated with automobile maintenance, storage and repair.

6.7.2.4 Restricted Use Operating Permit

Application for a restricted use operating permit shall be made through the Water Utilities Department in accordance with such submittals and procedures as the department shall require.

6.7.3 AQUIFER RECHARGE PROTECTION STANDARDS

In the event that any areas of high aquifer recharge are determined by the Southwest Florida Water Management District to exist upon a property within the corporate limits, the city shall reserve the right to limit land use intensity and set specific standards regulating stormwater management upon the affected parcels.

6.7.4 PREVENTION OF SINKHOLE CONTAMINATION

Sinkholes, sinks and similar karst formations, having direct connection with the aquifer system, shall be protected from contamination by the following:

6.7.4.1 Stormwater Contamination

Stormwater runoff shall be prohibited from direct or indirect discharge into any geological feature possessing unrestricted connection to an aquifer system or any channeling structure that directly achieves this action. Exceptions may be considered pursuant to Chapter 17-25, Florida Administrative Code, if pre-development standards of runoff warrant such an exemption of treated stormwater runoff.

6.7.4.2 Fill Material

Material to be used for the purpose of bulk fill of an sinkhole cavity shall be clean and free of the following contaminants:

a. All regulated substances listed in Table 6.7-1;

b. All petroleum based products including tar and roofing material; and

c. Biological wastes.

6.8 ENFORCEMENT

6.8.1 ENFORCEMENT

6.8.1.1 Stop Work Order

The city may, at any time during development or site alteration activity, reserve the right to issue a stop work order to a developer or landowner in the interest of enforcing the provisions of these regulations. A stop work order may be issued when the impact of a development activity violates the purpose or provisions of this Article. This may include the following:

a. Non-compliance with the requirements of this Article;

b. Documented or verifiable evidence reveals the presence of a protected species or protected habitat on a site not recognized or specifically reviewed in the site alteration plan;

c. Habitat management programs have not been implemented according to pre-development approval conditions;

d. Erosion control devices have not been established pursuant to the approved site alteration plan;

e. Improper use, disposal, handling or spillage of regulated substances, construction supplies or other materials which may result in an adverse impact upon a natural resource protected within these regulations; or

f. Necessary permits from state or regional government agencies have not been properly obtained.

6.8.1.2 Removal of a Stop Work Order

The Stop Work Order can only be removed by fulfilling all remedial requirements and compliance with the provisions of these regulations.

6.8.1.3 Monitoring

Management measures implemented or devices required by these regulations shall be subject to spot inspections by the city. Violations may be recorded at any time and referred to the Code Enforcement Board.

6.8.2 VIOLATIONS AND PENALTIES

6.8.2.1 General Violations

A violation against any provision of these regulations may be held as grounds for denying or repealing a development permit.

6.8.2.2 Repeated Non-Compliance

Any owner, developer, or other party representing a site which does not conform to the provisions of this Article shall be referred to the Code Enforcement Board. The board shall have the authority to impose a re-occurring daily fine for non-compliance.

Appendix C: Article 4 of Lakeland's Land Development Regulations

ARTICLE 4: GENERAL SITE DEVELOPMENT STANDARDS

4.1 INTENT AND APPLICABILITY

4.1.1 INTENT

It is the intent of this Article to establish minimum standards for the layout and design of development sites to ensure a quality urban form that is compatible with the context. These standards are intended to supplement the development standards set forth in Article 3.

4.1.2 GENERAL APPLICABILITY

a. Except as otherwise provided in this Code, no building, structure, or land located within the city shall hereafter be developed except in conformity with the standards and requirements of this Article. Determinations regarding applicability shall be made by the Director of Community Development.

b. Nonconforming Sites Lawfully Existing as of the Effective Date of this Code

1. Except as otherwise specifically provided herein, existing development that does not conform to the standards and requirements of this Article shall conform in full or, where site constraints exist, shall conform to the greatest practical extent upon:

(a) Expansions of principal buildings which exceed 50 percent of the existing square footage of the building, or buildings in the case of a multi-building complex, or

(b) Alterations or improvements to principal buildings if the aggregate cost exceeds 50 percent of the assessed value of the building, or buildings in the case of a multi-building complex.

2. Except as otherwise specifically provided herein, where an improvement or alteration is proposed to a portion of an existing nonconforming development site, the standards and requirements of this Article shall apply only to that portion of the site. (Example 1: If only a section of a nonconforming fence is replaced, only that section of the fence must meet the standards and requirements for fences. Example 2: If only a portion of a nonconforming parking lot is repaved, only that portion must meet the standards and requirements for vehicle use areas.

3. Except as otherwise specifically provided herein, where an improvement or alteration is proposed to an existing development site that eliminates constraints or impediments that had prevented conformity with one or more of the standards and requirements of this Article, the standards and requirements thus enabled shall henceforth conform to the greatest practical extent. (Example: If a new conforming access point eliminates the need for a nonconforming access point, the nonconforming access point shall be removed.)

c. Each Section of this Article contains further applicability provisions which are specific to that set of standards and requirements.

d. If any provision of this Article is found to be in conflict with the development standards set forth in Article 3, the adopted Design Guidelines for a Historic District, the conditions of an Overlay District, the conditions of a Planned Unit Development or the conditions of a Conditional Use, the more restrictive shall prevail.

4.2 ACCESS MANAGEMENT

4.2.1 INTENT AND APPLICABILITY

4.2.1.1 Intent

The intent of this Section is to provide and manage access to properties while preserving the operating efficiency of the roadway system, to improve the safety of motorists and non-motorists, reduce traffic congestion and delay associated with poor access location and design, to coordinate access management with the Florida Department of Transportation (FDOT) and Polk County, and to support a multi-modal transportation system. This Section is also intended to help implement the access management policies of the US Highway 98 South Corridor Access Management Plan.

4.2.1.2 Applicability

This Section shall apply to all arterial and collector roadways within the city limits, and to all properties that abut or have access to these roadways.

4.2.2 DEFINITIONS

Access Classification: A system for assigning the appropriate degree of access control to roadways, based upon roadway function, traffic characteristics, and community development objectives.

Access Management: The process of providing and managing access to land development, while preserving the safety and efficiency of travel on the surrounding roadway system.

Arterial Roadways: Routes that provide service that is relatively continuous and of relatively high traffic volume, long average trip length, high operating speed, and high mobility importance. In addition, every United States numbered highway is an arterial road. Arterial roadways are given the highest capacities since they are designed to carry the greatest amount of through-traffic while generally providing a lower amount of access to adjacent land uses.

Central City Transit Supportive Area (CCTSA): Area within which roadway levels-of-service are less stringent due to the presence of a traditional street grid network, extensive bicycle and pedestrian networks and transit services and facilities.

Collector Roadways: Routes which provide service which is of moderately average traffic volume, moderately average trip length, and moderately average operating speed. Such a route also collects and distributes traffic between local roads or arterial roads and serves as a linkage between land access and mobility needs.

Connection: A driveway, street, turnout, or other means of providing for the right of vehicle access to or from transportation facilities. For the purpose of this Section, two one-way connections to a property may constitute a single connection.

Corner Clearance: The distance from an intersection of a public or private road to the nearest connection along the public roadway. The distance is measured from the closest edge of pavement of the intersecting road to the closest edge of the pavement of the connection. The projected future edge of pavement of the intersecting road should be used, where available. (See Figure 4.2-1.)

Cross Access: An easement or service drive providing vehicular access between two or more contiguous sites.

Directional Median Opening: An opening in a restrictive median that provides for specific traffic movements and physically restricts other movements.

Edge of Pavement: The physical existing edge of a paved road or the future edge. Future edge shall be used for the measurement where the associated capacity improvements are within an adopted 5 year capital improvements program or within the Polk Long Range Transportation Plan short term, financially feasible work program.

Full Median Opening: An opening in a restrictive median designed to allow all turning movements to take place from the public road system and the adjacent connection, and which therefore is intended for signalization.

Functional Area (of an intersection): That area beyond the physical intersection of two roadways that comprises decision and maneuver distance, plus any required vehicle storage length, and is protected through corner clearance standards and connection spacing standards.

Functional Classification: A system used to group public roadways into classes according to their purpose in moving vehicles and providing access.

Joint Access (or Shared Access): A driveway connecting two or more contiguous sites to the public street system.

Local Roads: Routes providing service that is of relatively low average traffic volume, short average trip length or minimal through-traffic movements, and high land access for abutting property. Local roads provide the greatest amount of access to adjacent properties and have the lowest vehicle capacities.

Lot Frontage: The linear portion of property that directly abuts a roadway.

Minimum Connection Spacing: The minimum allowable distance between conforming connections, measured from the closest edge of the pavement of the first connection to the closest edge of the pavement of the second connection along the edge of the traveled way.

Minimum Median Opening Spacing: The minimum allowable spacing between openings in a restrictive median to allow for crossing the opposite traffic lanes to access property or for crossing the median to travel in the opposite direction (U-turn). The minimum spacing or distance is measured from centerline to centerline of the openings along the traveled way.

Minimum Signal Spacing: The minimum spacing or distance between adjacent traffic signals on a public roadway measured from centerline to centerline of the signalized intersections along the traveled way.

Multi-Modal Transportation Level of Service: Refers to minimum level of service standards for roadways outlined in the Comprehensive Plan, in the Transportation Element, whereby the standards will vary based upon transit service frequency, bicycle amenities and pedestrian facilities.

M-3 Level of Service District: The geographic area, adopted in the Comprehensive Plan, which provides a multi-modal level of service standard for transportation facilities. The M-3 District is where the local bicycle-accommodated bus system provides service at least every 30 minutes and where there is a substantial sidewalk system present within ¼ mile of those 30 minute routes.

Non-Restrictive Median: A median or painted centerline that does not provide a physical barrier between center traffic turning lanes or traffic lanes traveling in opposite directions. This includes highways with continuous center turn lanes and undivided highways.

Outparcel: A lot identified on a site plan or subdivision plan that is owned by a party other than the primary owner of the parent property, and is intended to be developed separately from the parent property and/or is intended to be developed for a different use (e.g. a non-residential use vs. residential use).

Peak Hour: The highest hour of vehicular traffic volume on the adjacent public street network as measured for the city's level of service standards for transportation. In some instances, the peak hour of the development is evaluated for access management purposes when the project could create an operational or safety problem on the public road network during an off-peak time for adjacent street traffic.

Reasonable Access: The minimum number of connections, direct or indirect, necessary to provide safe ingress and egress to the public road system based on the access management classification (if any), the proposed connection(s) and projected roadway traffic volumes, posted speeds, and the type and intensity of the land use.

Restrictive Median: The portion of a divided highway physically separating vehicular traffic traveling opposite directions. Restrictive medians include physical barriers that restrict movement of traffic across the median such as a concrete barrier, a raised concrete curb and /or island, and a grass or a swaled median.

Service Road: A public or private street or road, auxiliary to a controlled access facility, which has as its purpose the maintenance of local road continuity and provision of access to parcels adjacent to the controlled access facility.

Stub-Out (Stub Street): A portion of a street or cross access drive used as an extension to an abutting property that may be developed in the future.

Throat Length: The distance parallel to the centerline of a driveway to the first on-site location at which a driver can make a right turn or a left turn. On roadways with curb and gutter, the throat length shall be measured from the face of the curb to the end of the physical barrier. On roadways without a curb and gutter, the throat length shall be measured from the edge of the paved shoulder to the end of the physical barrier.

Transit Oriented Corridors (TOC): See definition in Article 1.

4.2.3 CONNECTION LOCATION STANDARDS

4.2.3.1 Connection Spacing

a. Roadways classified under the State Access Classification System shall, at a minimum, meet FDOT Access Management Standards for the roadway as prescribed by Florida Statutes and Florida Administrative Code, unless waived by the FDOT. Driveway connections within the US Highway 98 South corridor must meet the FDOT adopted spacing criteria as outlined in the US Highway 98 South Corridor Access Management Plan. Any existing substandard connections within the US Highway 98 South corridor shall be removed at the time of re-development where alternate access to the property exists or is feasible.

b. Roadways operated/maintained by Polk County shall, at a minimum, meet the standards that are outlined in the Polk County Land Development Code, unless waived by the County.

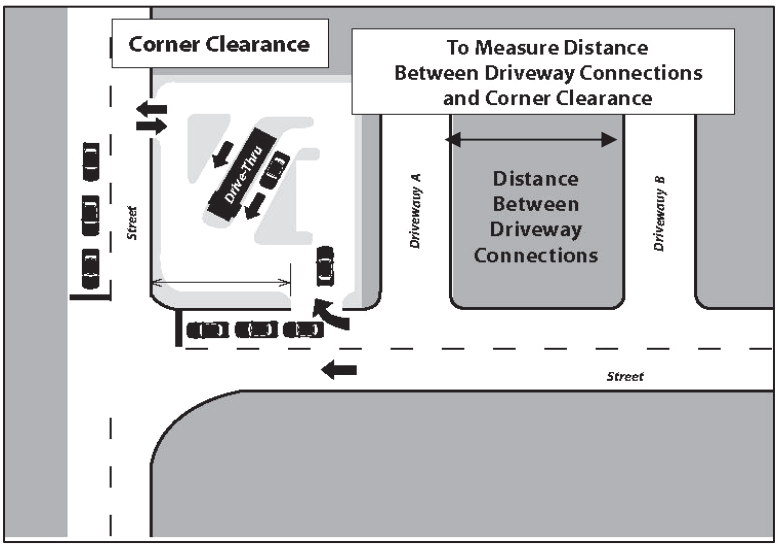
c. Separation between access connections on all collector and arterial roadways under the jurisdiction of the City of Lakeland shall meet the minimum connection requirements set forth in Table 26.01.

Table 4.2-1 Minimum Connection Spacing Standards

Posted Speed Limit	Arterial	Collector
35 mph	245’	125’
40 to 45 mph	440’	245’
> 45 mph	660’	440 ‘

d. Connection spacing shall be measured from the closest edge of the pavement of one connection to the next closest edge of the pavement of the next connection. (See Figure 4.2-1)

Figure 4.2-1 Corner Clearance and Connection Spacing



e. The minimum lot frontage for all newly created lots on public arterial or collector roadways shall not be less than the applicable minimum connection spacing standards of this Section, unless the property is served by an internal road system.

f. Existing individual or assembled lots with less than the required frontage may be permitted individual access where the Director of Public Works determines joint or cross access is infeasible.

g. Adjacent properties under the same ownership shall be considered as a single property for application of connection spacing or for connection permits.

h. Applications for multiple connections for a single development shall conform to the spacing standards of this Section. Multiple connections shall be considered by the Director of Public Works for approval based on the following criteria:

1. Separation of standard vehicles from heavy trucks or emergency vehicles;

2. Two one-way connections that in combination serve ingress and egress to the development;

3. Multiple connections enhance the safety of the abutting roadway and improve the on-site traffic circulation.

i. To reduce turning movement conflicts, connections on undivided arterial and collector roadways should be aligned with those connections across the roadway. If such alignment is not possible, connections on opposite sides of the undivided roadway shall be designed to meet the standards shown in Table 4.2-2 to ensure safety in traffic and turning movements.

Table 4.2-2 Connection Offsets

Posted Speed	Minimum Offset
< 35 mph	125’
35 to 40 mph	450’
> 40 mph	600’

4.2.3.2 Connections at Intersections

a. General

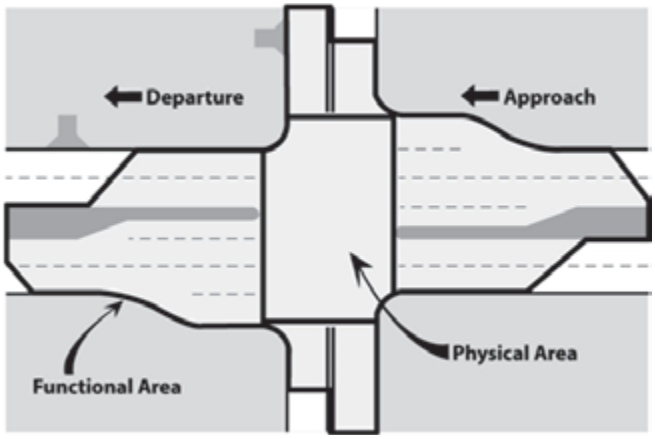
1. New connections shall not be permitted within the functional area of an intersection, as illustrated in Figure 4.2-2, unless:

(a) No other reasonable access to the property is available, and

(b) The connection does not create a potential safety or operational problem as determined by the Director of Public Works, and

(c) A condition is included in the permit that the applicant shall agree to close the access if and when alternative access becomes available that is more consistent with the corner clearance standards for the abutting roadways.

Figure 4.2-2 Functional and Physical Area of the Intersection

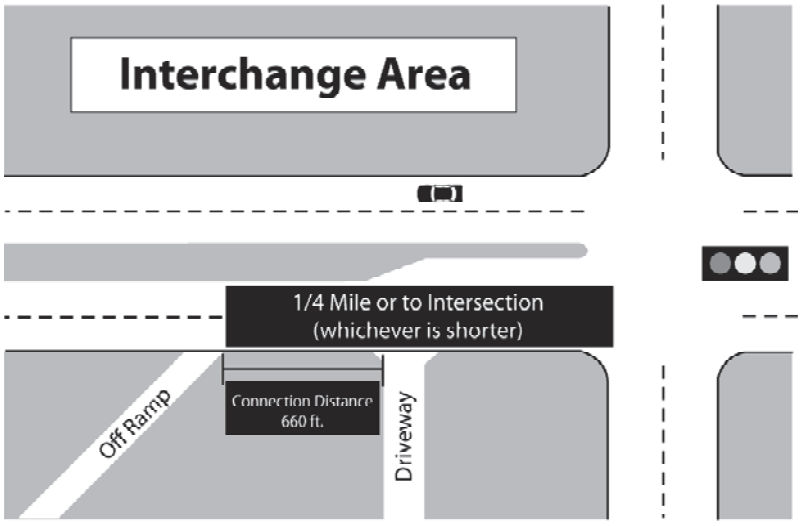


2. Where no other alternatives exist, construction of an access connection may be allowed along the property line farthest from the functional area of the roadway intersection as a non-conforming access. Property access will be restricted to the roadway with the lower functional classification and shall be closed within six months of when any conforming access becomes available.

b. Limited Access Interchange Areas

1. Connections and median openings on arterial and collector roadways located up to 1,320 feet (1/4 mile) from an interchange area or up to the first intersection, whichever distance is less, shall be regulated to protect the safety and operational efficiency of the limited access facility and the interchange area. (See Figure 4.2-3.)

Figure 4.2-3 Interchange Area Connections



2. The minimum distance to the first connection from the terminus of the exit ramp shall be at least 660 feet (1/8 mile). (See Figure 4.2-3.)

3. The city may require the use of service roads for direct access to property within the area abutting freeway interchanges. These roads shall be designed to connect to more than one other roadway, wherever feasible, to enhance the overall accessibility of interchange development to the surrounding area.

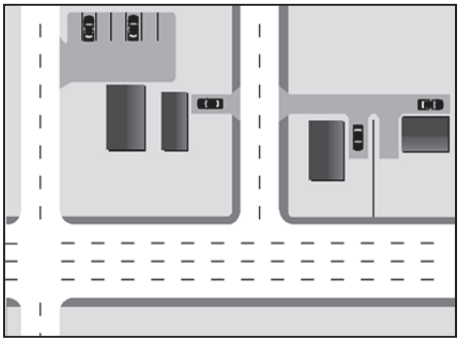
4. The minimum distance to the first full median opening shall meet FDOT connection spacing standards.

4.2.3.3 Connection to Lower Classification Roadway

a. Where property is served by roads of different functional classifications, the cty may require development to provide primary access on the road with the lower functional classification in order to minimize access and traffic congestion on the primary roadway.

b. Access to through lots shall be required on the street with the lower functional classification. (See Figure 4.2-4.) Access onto the higher functional classification roadway may be approved by the Director of Public Works.

Figure 4.2-4 Double Frontage Lot Access



4.2.3.4 Service Roads

a. Service roads and/or shared access roads may be required on roadways operating below acceptable level-of-service standards to help mitigate the adverse impact of access on roadway safety and efficiency for concurrency purposes.

b. Parcels that abut service roads must provide a primary connection to the service road. Secondary driveways to the public road system shall be prohibited. In instances where a connection cannot be made to a service road (for example, the planned service road has not yet been constructed to the subject property), a temporary connection to the public road system may be granted by the proper permitting authority (City, County or State). This temporary connection must be removed within six months from the time that a service road is constructed to or adjacent to the subject property.

c. Service roads shall not access any roadway within the functional area of an existing intersection and shall not create a new access point that violates the connection spacing criteria in this Section.

d. All service roads shall be constructed to public street standards.

4.2.3.5 Cross Access and Joint Access

a. If the connection spacing standards of this Section cannot be achieved, then joint use connections and/or cross access easements shall be required.

b. Applicants for all non-residential developments may be required to use cross access easements and joint use connections to connect adjacent properties in order to reduce curb cuts, to increase the area for parking and landscaping, and to preserve the capacity and safety of the roadway system.

c. Property owners utilizing joint and/or cross access shall record with the Polk County Clerk of Court:

    1. An easement allowing cross access to and from the adjacent properties;

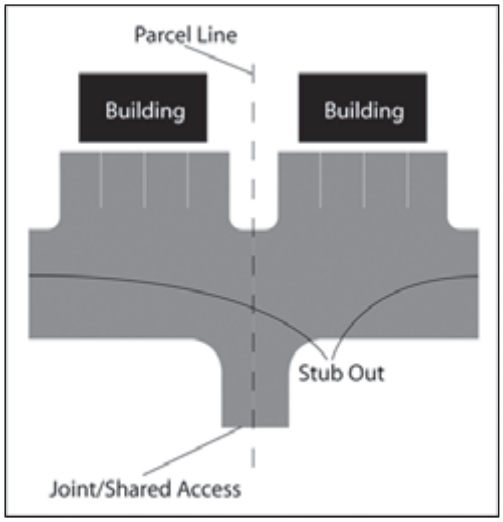
    2. A joint maintenance agreement defining maintenance responsibility of property owners that share the joint use connection and cross access system.

d. Property owners that provide for joint and cross access may be granted a temporary connection permit, where necessary, to provide reasonable access until such time as the joint use connection and cross access connections are provided with adjacent properties.

e. Within six months after construction of a joint use or cross access connection, property owners utilizing such access shall close and remove any existing temporary connections provided for access in the interim.

f. Development may be required to construct a paved stub-out to the property line in anticipation of a future cross access connection. (See Figure 4.2-5.)

Figure 4.2-5 Cross Access Stub-Outs



g. The design of the cross access corridor or joint connection including driveway apron shall conform to the Engineering Standards. The design shall ensure efficient and safe vehicular operation and pedestrian movements for internal traffic circulation and for traffic mobility on the adjacent roadway.

h. Cross access easements are not intended to be publicly maintained.

i. Properties that provide for joint use driveways under this Section shall be eligible for a reduction in the number of required off-street parking spaces of up to 15 percent, subject to review and approval of the Director of Community Development.

4.2.3.6 Unified Access

a. In the interest of promoting unified access and circulation systems, development sites under the same ownership or consolidated for the purposes of development and comprised of more than one building site shall be considered unified parcels for purposes of this Section. This shall also apply to phased development plans and master developments such as Planned Unit Developments that contain a mix of land uses. Accordingly, the following requirements shall apply:

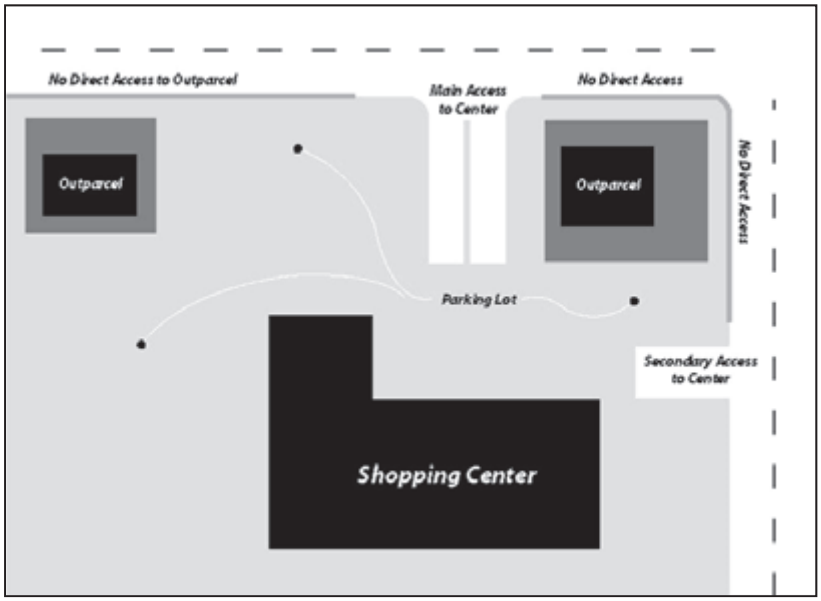
1. The number of connections permitted shall be the minimum number necessary to provide reasonable access to the overall site and not the maximum available for that frontage.

2. All easements and agreements required under Section 4.2.3.5 shall be provided.

3. Access to outparcels shall be internalized using the shared circulation system. (See Figure 4.2-6.) Internal connections (vehicular and non-vehicular) shall be

made between different land uses within a master or planned development. The shared internal circulation system shall be designed to avoid excessive movement across parking aisles or queuing across surrounding parking and driving aisles and shall encourage pedestrian and bicyclist safety.

Figure 4.2-6 Internalized Access to Out-Parcels



b. Where abutting properties are in different ownership and not part of an overall development plan, cooperation among the various owners in development of a unified access and circulation system is encouraged; this includes pedestrian connections. Such coordinated access may qualify for impact fee credits where it in effect creates a reliever road system and provides at least two points of connection to the public road network. Only the building sites under consideration for development approval shall be subject to the requirements of this Section. Abutting properties shall not be required to provide unified access and circulation until they are developed or are redeveloped.

c. Access to an outparcel shall be appropriately designed and marked with pavement markings, signage, and similar appropriate guidance to maximize the efficiency of the internal traffic circulation.

d. An adequately demarcated pedestrian pathway shall provide a safe route for pedestrians between the outparcel and the primary development.

e. Outparcels for land uses with connection volumes exceeding 100 peak hour trips may be considered for a single right-in access point. This access shall not be within the functional area of an existing intersection. The Director of Public Works shall determine whether or not the proposed right-in access point is appropriate, based upon the roadway characteristics, relevant traffic data, and the existing and proposed land uses.

4.2.4 CORRIDOR MANAGEMENT FOR "TYPE I" ROADWAYS

4.2.4.1 General

a. The Comprehensive Plan identifies "Type I" roadways that are of particular significance for freight movement and high capacity connectivity to Lakeland's urban core. Type I roadways include: US 98, County Line Road, SR 548 (George Jenkins Boulevard from Sloan to US 98), SR 563 (Harden Boulevard from Ariana to SR 570/Polk Parkway), State Road 33 (north of Granada Street), West Pipkin Road (west of Old Highway 37 to County Line Road) and SR 546 (Memorial Boulevard between US 92/Wabash Avenue and Interstate 4).

b. To minimize local traffic and improve corridor efficiency and safety, access to development sites on Type I roadways shall be controlled and cross-access and/or service roads to adjacent properties and improvements to adjacent corridors shall be required.

c. Access from development sites to County Line Road shall be restricted to the minimum amount necessary to provide safe ingress/egress. Driveway connections shall be coordinated with Polk County as the permitting agency.

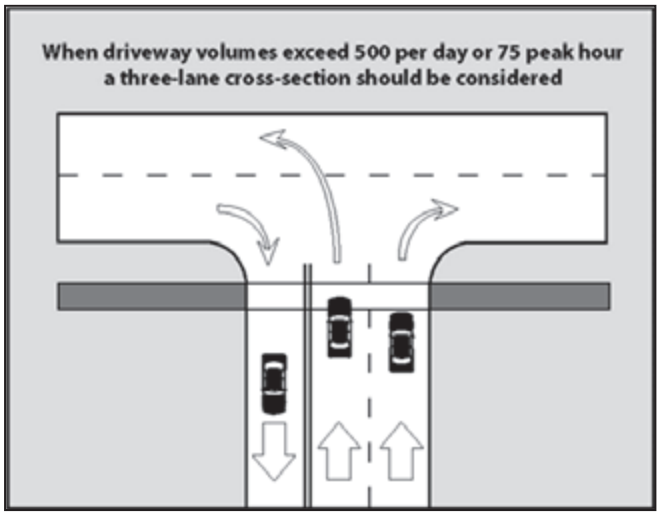
4.2.5 CONNECTION DESIGN STANDARDS

4.2.5.1 General

a. Connections shall not be designed to require vehicles to back out directly onto the abutting roadway except for driveways serving single family detached or two-family dwellings on individual lots.

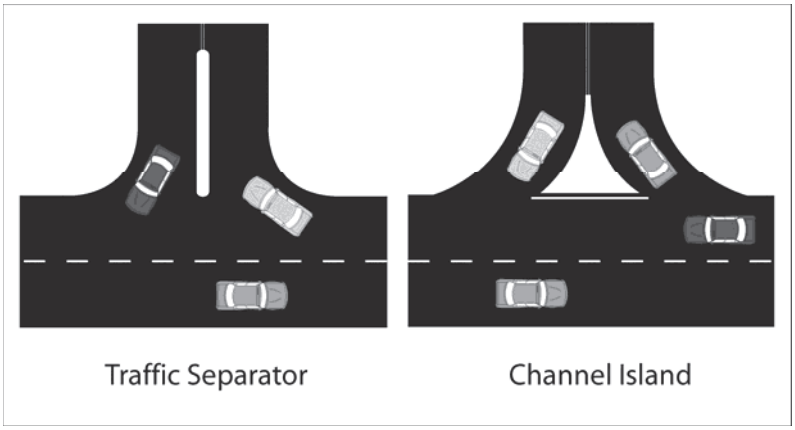
b. Where the roadway is undivided or where there is no signal control, and when existing or projected connection volumes exceed 75 vehicles in the peak hour or 500 vehicles per day, a 3-lane connection typical section may be required. (See Figure 4.2-7.)

Figure 4.2-7 Large Volume Connection Diagram



c. Where there is no traffic signal, raised traffic separators may be required when connection volumes exceed 200 vehicles in the peak hour or 1,000 vehicles per day. Channelization islands shall conform to appropriate City, County or State design standards and shall be reviewed by the Director of Public Works. (See Figure 4.2-8.) Small "pork chop" raised islands are not an appropriate design alternative.

Figure 4.2-8 Traffic Separators



4.2.5.2 Throat Length

a. The minimum throat length for unsignalized driveway connections to arterial and collector roadways shall, at a minimum, meet the following standards shown in Table 4.2-3 and Figure 4.2-9. However, deviations may be allowed by the Director of Public Works for all constrained development sites on a Transit Oriented Corridor or within the Central City Transit Supportive Area.

Table 4.2-3 Connection Throat Length – Unsignalized

Connection Peak Hour Volume	Throat Length
Up to 25	25’/30’
26 to 50	40’/55’
51 to 99	75’/100’
100 or more	150’/200’

b. Connection throat lengths for signalized driveways shall meet the minimum standards shown in Table 4.2-4. (See also Figure 4.2-9.) Deviations shall be allowed by the Director of Public Works for all sites within the M-3 Level of Service District.

Table 4.2-4 Connection Throat Length – Signalized

Number of Exit Lanes (left, through, right)	Throat Length
2	75’
3	200’
4	300’

Figure 4.2-9 Throat Length

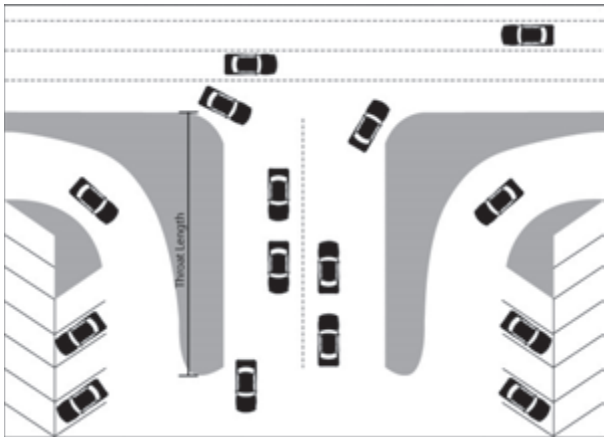
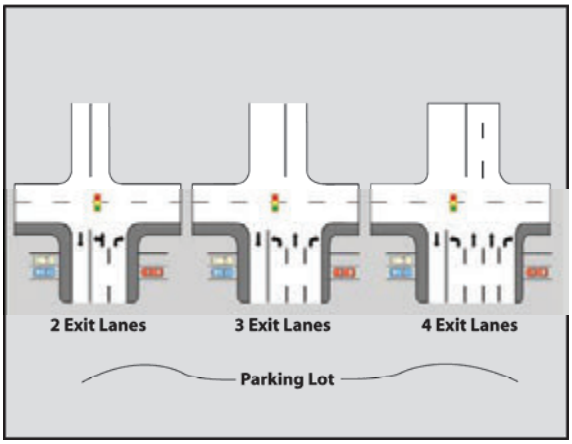


Figure 4.2-10 Number of Exit Lanes



4.2.5.3 Turn Lanes

a. Exclusive turn lanes for connections required on divided or undivided arterials or collector roadways shall not violate any spacing standards that have been established by City, County or State. Exclusive left turn lanes if the following conditions are met:

    1. Posted roadway speed limit 35 mph or more and 40 or more existing and/or projected left turns in the peak hour.

b. Exclusive right turn lanes for connections may be required if any of the following conditions are met:

    1. Posted roadway speed limit equal to or greater than 45 mph and 50 or more right turns in the peak hour, or

    2. Posted roadway speed limit less than 45 mph and 80 or more right turns in the peak hour.

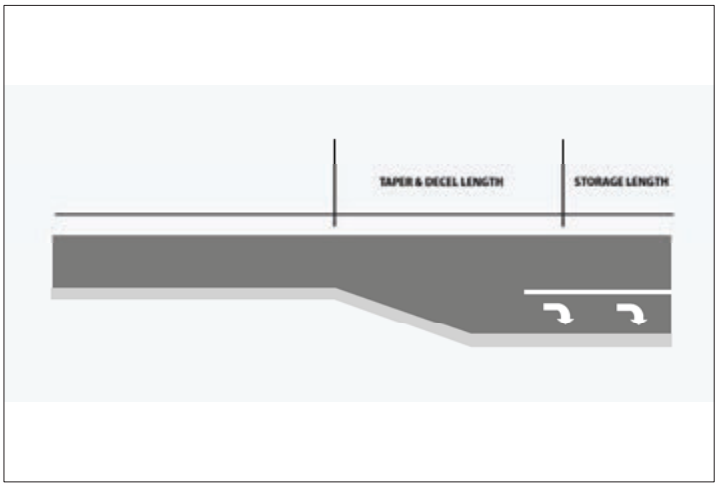
c. The left turn storage lengths and deceleration lengths are required in accordance with the FDOT Plans Preparation Manual.

d. Queue (storage) and taper plus deceleration lane lengths for right turn lanes shall, at a minimum, meet the standards set forth in Table 4.2-5. (See also Figure 4.2-11.)

Table 4.2-5 Right Turn Lane Taper and Storage

Posted Speed	Taper & Decel Length (TL)	Storage Lane Length (SL)	
		Stop Condition	Free Right
35 mph	145’	105’	80’
40 mph	155’	135’	110’
45 mph	185’	165’	140’
50 mph	240’	195’	170’
55 mph or greater	385’	210’	200’

Figure 4.2-11 Right Turn Storage and Taper Lanes



e. Continuous right turn lanes shall be prohibited.

f. Turn lane warrant requirements may be modified for a development based on factors including but not limited to higher peak period traffic volumes, higher operating speeds, localized roadway congestion, pedestrian volume, crash experience (especially rear-end crashes) and facilities that have a larger number of heavy trucks or similar vehicles. Modifications to requirements shall be supported by traffic operations data and approved by the Director of Public Works.

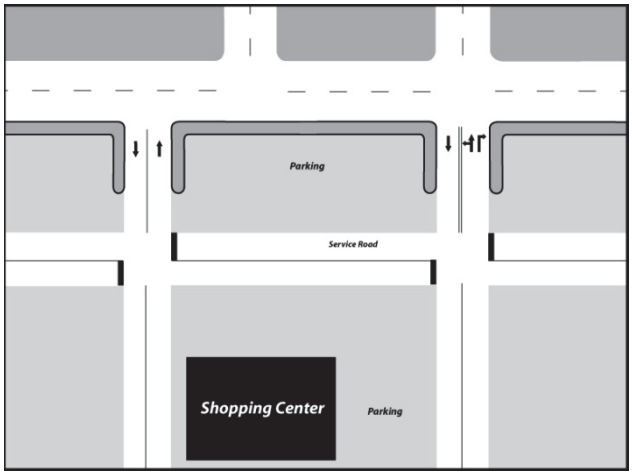
4.2.6 INTERNAL SITE CIRCULATION

a. For non-residential developments that are projected to generate 300 or more total peak hour trips and that are located along a roadway that has public transit service, the following internal traffic circulation features shall be included in the development

plans. These features are in addition to other site plan requirements in the Land Development Regulations.

1. Internal service roads to serve as internal collectors and which can accommodate transit vehicles shall be defined through the use of pavement markings/striping and if possible via physical delineation techniques such as curbing of landscaped areas in the parking lot. (See Figure 4.2-10.)

Figure 4.2-12 Service Road

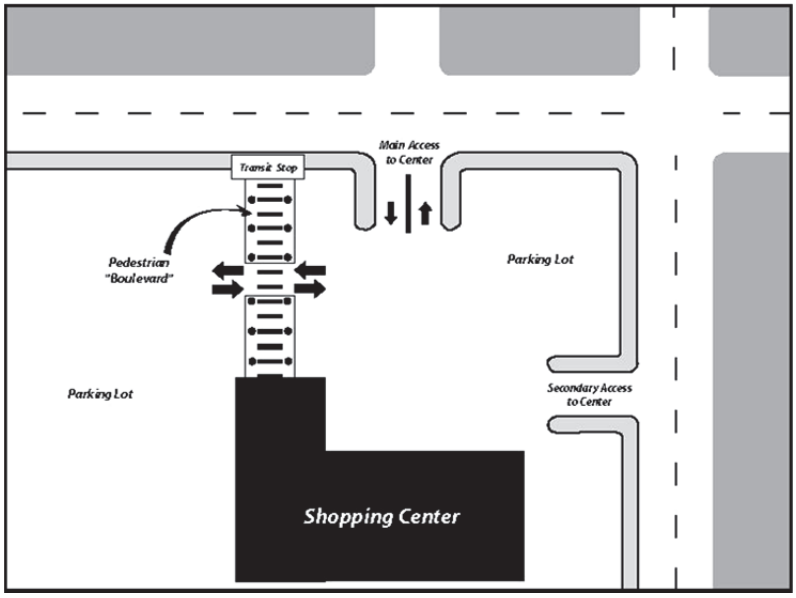


2. Coordination with the local transit system Director of Public Works or their designee(s) regarding the feasibility of a transit circulation route that allows for a transit stop within the site and near or along the front of the principal building(s).

3. Separation of heavy trucks routed to the side or rear of the principal building(s) including use of appropriate directional signage, as necessary.

b. Non-residential developments that are adjacent to a public sidewalk and projected to generate less than 300 peak hour trips shall provide an adequately marked pedestrian pathway between the building entrance and the adjacent sidewalk. For projects located on corner parcels fronting more than one public street with a sidewalk, the number of dedicated pedestrian pathways shall correspond to the number of project driveways onto the public street system, with a maximum of one such connection per frontage. Additional connections may be required for large retail and employment center projects, including those within Developments of Regional Impact or Planned Unit Developments. (See Figure 4.2-13.) Marking for the pedestrian pathway may include pavement striping, landscaping, bollards, or similar markings and appropriate directional signage, as needed.

Figure 4.2-13 Pedestrian Crossing within a Site



c. Residential developments shall provide internal Americans with Disabilities Act (ADA)-compliant pedestrian connectivity within the development with special emphasis on access to on-site recreational amenities, trails, clubhouses and open spaces.

d. The internal road networks for new or redevelopment plans shall include, at minimum, a mainline internal roadway that maximizes on-site connectivity and shall also include, wherever possible, a system of internal grid or modified grid connections throughout the plan. This provision shall not be interpreted to prevent all use of the cul-de-sac but shall promote internal connections for vehicular traffic to the degree such is reasonable and possible. Where cul-de-sacs or other street terminations are used, sidewalk extensions or other such pathway connections to adjacent streets may be required to maintain or enhance overall network connectivity.

e. Developments with drive-through facilities shall have adequate space to store the projected peak demand of vehicles off the public rights-of-way and off public and private streets. The minimum vehicle queue storage lengths for developments with drive-through facilities that have direct access to arterial or collector roadways shall, at a minimum, meet the standards set forth in Table 4.2-6.

Table 4.2-6 Drive-Through Queues

Development	Queue length
Fast-food	200’
Bank	150’
Day care	200’
Pharmacy	100’

Note: The length of multiple queue lanes, such as at a bank, may be added together to meet the total required queue length.

4.2.7 DEVIATION FROM CONNECTION STANDARDS

a. Meeting the standards of this Section may not always be possible. Therefore, the following process is available to evaluate requested deviations from the standards of this Section. In all cases, however, safety for the driving public and pedestrians shall be the primary consideration.

b. The Director of Public Works may make a determination to modify or waive the requirements of Section 4.2.3.5 (Cross Access and Joint Access) where the characteristics of abutting parcels would make adherence to the standards infeasible. This determination shall be made in consultation with the Director of Community Development.

c. Deviations of up to 10 percent of the connection standards in this Section or deviations of up to 100 feet, whichever is less, are considered Minor Deviations. The Director of Public Works may grant such deviations based on roadway characteristics, land use, traffic operations, and safety.

d. Except where otherwise provided for in this Section for determination by the Director of Public Works, other requests for deviations are considered Major Deviations and shall be considered by the Zoning Board of Adjustment and Appeals (ZBAA) in accordance with the standards for variances contained in Article 12.

e. In addition to the general requirements for a variance contained in Article 12, the applicant for a variance (major deviation) from the terms of this Section shall provide adequate data and analysis to the Director of Public Works to demonstrate how the proposed alternate access management and/or site circulation plan is equal to or better than the relevant required access management and internal circulation provisions of this Section. A staff report and recommendation from the Director of Public Works, prepared in consultation with the Director of Community Development, shall accompany the major deviation request to the ZBAA. Applicants for major deviations from access spacing standards shall submit an access management plan to the Director of Public Works as follows:

    1. Encompasses a study area that includes the length of the property frontage on all abutting roadways, plus the distance established by access spacing

standards on either side of the property lines, and the corresponding area on the opposite side of undivided roadways or divided roadways where a median opening is present.

2. Addresses existing and future access for study area properties.

3. Evaluates impacts of the proposed plan versus impacts of adherence to adopted standards.

4. Includes all improvements and recommendations necessary to implement the proposed plan.

4.3 ACCESSORY STRUCTURES

4.3.1 GENERAL

a. Certain accessory structures are permitted in addition to principal structures in accordance with all standards of the context sub-district in which they are located and the procedures and standards of this Section.

b. Accessory structures shall be clearly incidental and subordinate to the principal structure and located in a district that allows the principal use.

c. No accessory structure shall be constructed prior to the construction of a principal structure.

d. Accessory structures shall be located on the same lot or parcel as the principal structure or on a contiguous lot or parcel under the same ownership.

e. Vehicles and trailers including overseas shipping containers are prohibited as storage buildings except as provided in Section (construction trailers/ PODs as temporary uses).

4.3.2 ACCESSORY DWELLING UNITS

4.3.2.1 General Standards

a. Subject to the following standards and procedures, accessory dwelling units shall be permitted in urban contexts where any legally-conforming single-family detached dwelling unit is the principal structure on, or under construction on, the same lot or parcel. Accessory dwelling units shall also be permitted where specifically allowed as part of a residential Planned Unit Development or Overlay District.

b. Only one accessory dwelling unit shall be permitted per lot or parcel and the lot or parcel shall have a minimum area of 5,000 square feet.

c. Accessory dwelling units may be constructed over a garage in accordance with Table 4.3-1.

d. Either the principal dwelling unit or the accessory dwelling unit shall be the legal residence of the property owner.

e. Accessory dwelling units shall have a separate street address from the principal dwelling.

f. Electric service to accessory dwelling units shall be by a feed from the principal dwelling. Accessory dwelling units shall not have a separate electric meter from the principal dwelling.

g. Accessory dwelling units shall not be sold separately from the principal dwelling.

h. Where a lot or parcel is non-conforming by virtue of containing two legally established dwelling units in a single family zoning district, one of the two units may be converted to an accessory dwelling unit, provided that it meets all of the requirements of this section.

4.3.2.2 Design Standards

a. Accessory dwelling units shall be detached from the principal dwelling and shall be located in rear yards or interior side yards in accordance with the following standards.

Table 4.3-1 Accessory Dwelling Unit Standards

A) Min. Front Setback	5’ from front façade of the principal structure
B) Min. Interior Side Setback	5’[1]
C) Min. Rear Setback	5’
D) Min. Street Side Setback	In accordance with principal building minimum street side setback*
E) Max. Height	12½’ 24’ over garage
F) Min. Separation Between Structures	In accordance with applicable building codes
G) Min. Living Area	Min. 300 sf Max. 800 sf or 40% of principal dwelling, whichever is less
[1]Subject to applicable building codes, the side yard setback may be 0’ on one side property line if the adjacent parcel consists of a Sideyard building type with a 10’ minimum separation between structures on the adjacent lot; else minimum setback as specified for context sub-district	

b. Vehicle access to the accessory dwelling unit shall be from an alley, from the side street of a corner lot, or from a shared driveway connection to the street.

c. A minimum of one off-street parking space shall be provided for the accessory dwelling unit in addition to off-street spaces required for the principal dwelling. Tandem parking in driveways is permitted.

d. The design and exterior treatment of accessory dwelling units shall be architecturally compatible with the principal dwelling as determined by the Planning and Zoning Board or by the Historic Preservation Board, if located in a designated historic district.

e. The sides of accessory dwelling units facing abutting residential property shall be designed to protect the privacy of neighbors. This may include no windows or privacy windows on the abutting side and may include fencing and/or landscaping to provide screening.

4.3.2.3 Procedure for Establishment

a. For proposed accessory dwelling units not in designated historic districts, the applicant shall submit to the Planning and Zoning Board a site development plan showing site layout with respect to the principal dwelling, vehicle access and other appropriate site features, and elevations or other architectural drawings showing the proposed exterior treatment. The Board shall make determinations regarding d. 1 through 5 below.

b. For proposed accessory dwelling units in designated historic districts, the applicant shall submit to the Planning and Zoning Board a site development plan showing site layout with respect to the principal dwelling, vehicle access and other appropriate site features. The Planning and Zoning Board shall make determinations regarding d. 3, 4 and 5 below. If approved by the Planning and Zoning Board, the applicant shall then apply to the Historic Preservation Board for a Certificate of Review/Appropriateness. The Historic Preservation Board shall make determinations regarding the criteria outlined in d. 1 and 2 below.

c. The Planning and Zoning Board shall notify the owners of record of properties abutting or across the street from the lot or parcel on which the accessory dwelling unit is proposed and shall conduct a public hearing on the matter at a regular meeting.

d. In making its determination, the Board (or Boards) shall find that:

1. The exterior design is architecturally compatible with the principal dwelling with respect to building form, height, materials, colors and landscaping. If located in a historic district, the Historic Preservation Board shall make this determination with specific reference to the design guidelines for the historic district in which the accessory dwelling unit is to be located.

2. The exterior design is in harmony with and maintains the scale of the neighborhood. If located in a historic district, the Historic Preservation Board

shall make this determination with specific reference to the design guidelines for the historic district in which the accessory dwelling unit is to be located.

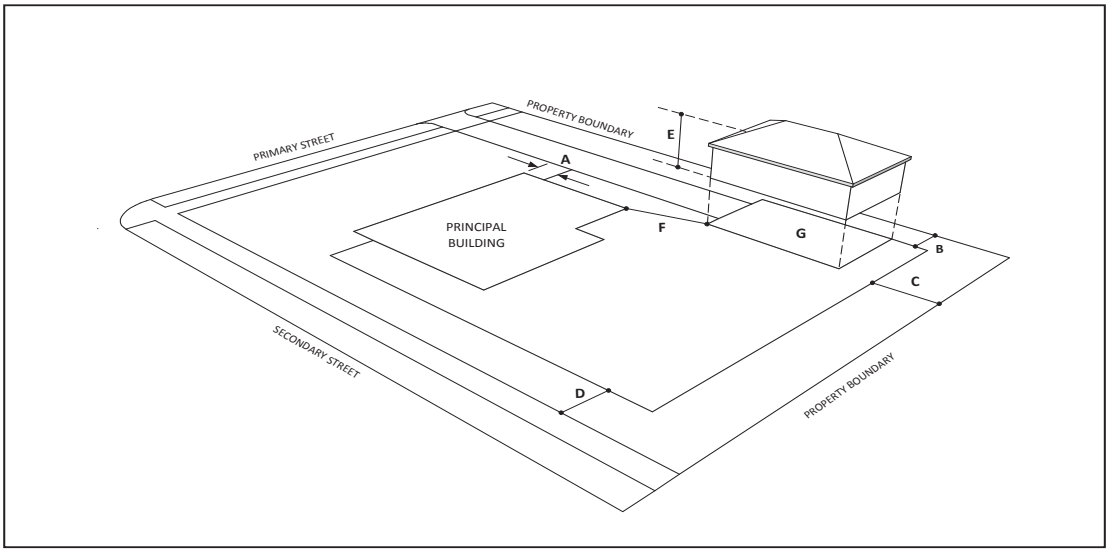
3. The accessory unit does not result in excessive noise, traffic, or parking congestion.

4. There is adequate open space for both the principal and accessory units and, to the extent feasible, significant trees are retained.

5. The accessory unit does not significantly impact the privacy, light, air, or parking of adjacent properties.

e. The Planning and Zoning Board may impose any conditions or limitations upon the establishment, location, construction, maintenance or operation of the accessory dwelling unit which in its judgment may reasonably be necessary to prevent the use from being detrimental to other permitted land uses and for the protection of the public interest and welfare. Conditions and requirements stated as part of the approval shall be a continuing obligation of holders of approval.

Figure 4.3-1 Accessory Dwelling Unit/General Accessory Structure



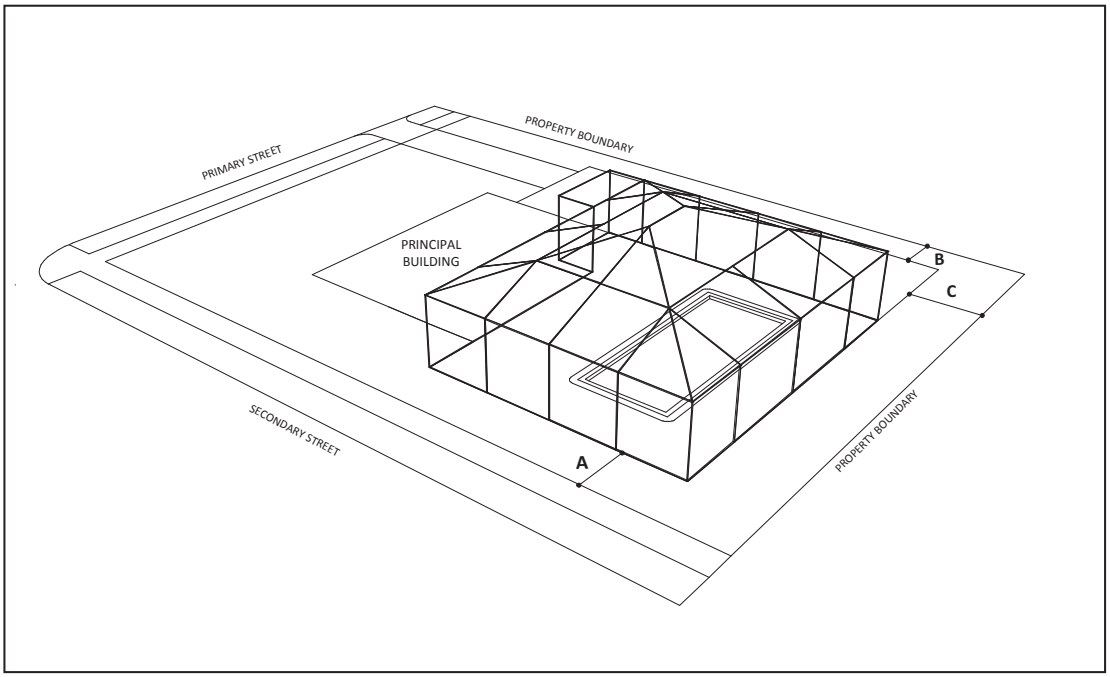
4.3.3 SCREEN ENCLOSURES

Screen enclosures, including unroofed screen rooms and swimming pool cages, shall be located only in rear yards or interior side yards in accordance with Table 4.3-2. For context sub-districts not listed in the table, screen enclosures shall be permitted in rear yards or interior side yards in accordance with the principal building envelope standards of the context sub-district.

Table 4.3-2 Screen Enclosure Standards

	Context Sub-District			
	Urban		Suburban	
	(RA-1, RA-2)	(RA-3, RA-4, RB-1, RB-2)	(RA-1, RA-2)	(RA-3, RA-4, RB-1, RB-2)
A) Min. Street Setback	20’	15’	25’	20’
B) Min. Interior Side Setback	5’	3’	5’	3’
C) Min. Rear Setback	5’	3’	5’	3’

Figure 4.3-2 Screen Enclosure



4.3.4 SWIMMING POOLS

Swimming pools including above-ground and in-ground swimming pools, spas and hot tubs shall be located only in rear yards or interior side yards in accordance with Table 4.3-3. In-ground swimming pools, spas and hot tubs may also be located in front yards or street side yards in accordance with the principal building envelope standards. For context sub-districts not listed in the table, above-ground and in-ground swimming pools, spas and hot tubs shall be permitted in rear yards or interior side yards in accordance with the principal building envelope standards of the context sub-district.

Figure 4.3-3 Swimming Pool

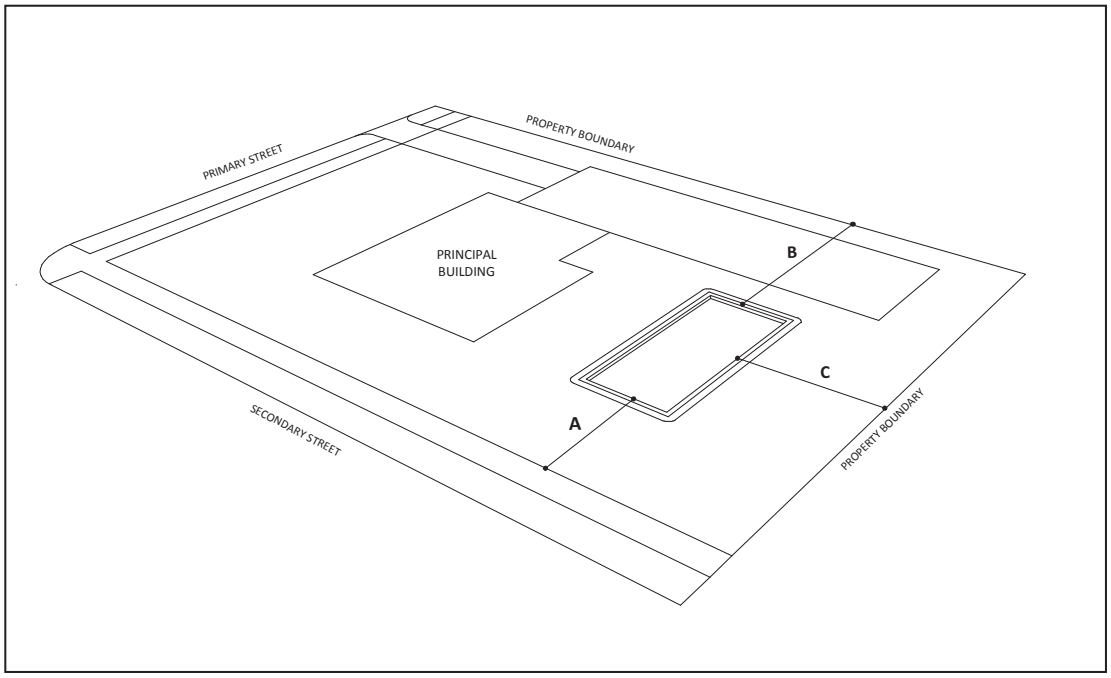


Table 4.3-3 Swimming Pool Standards

	Context Sub-District:			
	Urban		Suburban	
	(RA-1, RA-2)	(RA-3, RA-4, RB-1, RB-2)	(RA-1, RA-2)	(RA-3, RA-4, RB-1, RB-2)
A) Min. Street Setback	20’	15’	30’	20’
B) Min. Interior Side Setback	10’	5’	10’	5’
C) Min. Rear Setback	10’	5’	10’	5
All setbacks are measured from water's edge of swimming pool				

4.3.5 GENERAL ACCESSORY STRUCTURES

All other accessory structures not specifically listed in this Section shall be classified as general accessory structures and shall be located in accordance with the Table 4.3-4. (See Section 6.4 for regulations governing docks, boat houses and other water access structures.)

Table 4.3-4 General Accessory Structure Standards

A) Min. Front Setback[1]	3' from front façade of the principal structure in RA-3/RA-4 sub-district; 5' in all other sub-districts
B) Min. Interior Side Setback[1]	3' in RA-3/RA-4 sub-district; 5' in all other sub-districts
C) Min. Rear Setback[1]	3' in RA-3/RA-4 sub-district; 5' in all other sub-districts
D) Min. Street Side Setback[1]	In accordance with principal building minimum street side setback
E) Max. Height	12½'
	Except ground-mounted TV and radio antennas, in accordance with Section 3.6.2.
F) Min. Separation Between Structures	In accordance with applicable building codes

[1] 3' for accessory equipment such as air conditioners, heaters, pumps, swimming pool filters and emergency generators

Unroofed gazebos and pergolas not exceeding 36 sf or 8' in height may be located in any required setback area with a minimum setback of 3' from any parcel boundary. Larger or roofed gazebos and pergolas shall be located in accordance with this table.

4.4 FENCES AND WALLS

4.4.1 GENERAL

a. For purposes of this section, fences and walls shall mean free-standing fences and walls that are not structural elements of a building.

b. Fences and walls, whether required or optional, shall be constructed of the following types of materials.

1. Chain link or ornamental wire manufactured for fences with uniformly spaced metal or wood posts; or
2. Ornamental wrought iron, aluminum, or plastics manufactured for fences; or
3. Treated or finished wood or wood units of uniform size; or
4. Brick, stone, split block, stucco on concrete block or other finished precast masonry units of uniform size; or
5. Finished poured concrete.

c. The Director of Community Development may approve other fence or wall materials on a particular site if he finds that the proposed materials would provide equal or greater protection, would result in equivalent impacts on the general appearance of near or adjacent property, and do not violate the intent of the code.

d. No barbed wire, razor wire or electrified fence shall be allowed in any residential district.

e. Fences and walls, whether required or optional, may be erected adjacent to or on property lines, subject to the standards herein and subject to regulations relating to visibility triangles.

f. Where a lot or parcel abuts a use or district that allows a higher fence or wall, a fence or wall may be erected at the greater height along the common property boundary without requiring a variance. For example, a residential use having a maximum fence height of six feet that abuts a commercial use having a maximum fence height of eight feet may erect an eight foot fence along the common property boundary.

g. In the case of through-lots, the Director of Community Development shall have the discretion to apply rear yard standards to one of the two frontages upon a determination that a particular yard functions as a rear yard.

h. The measurement of maximum fence or wall height shall not include decorative caps on wall columns or fence posts, or decorative arches above gates.

i. Fences and walls, whether required or optional, shall be maintained in sound condition.

j. No fence or wall shall be erected in such a manner as to interfere with drainage.

4.4.2 REQUIRED BUFFER FENCES AND WALLS

a. Fences or walls required as part of a required buffer shall have at least 90 percent opacity and are referred to herein as view blockage fences or walls.

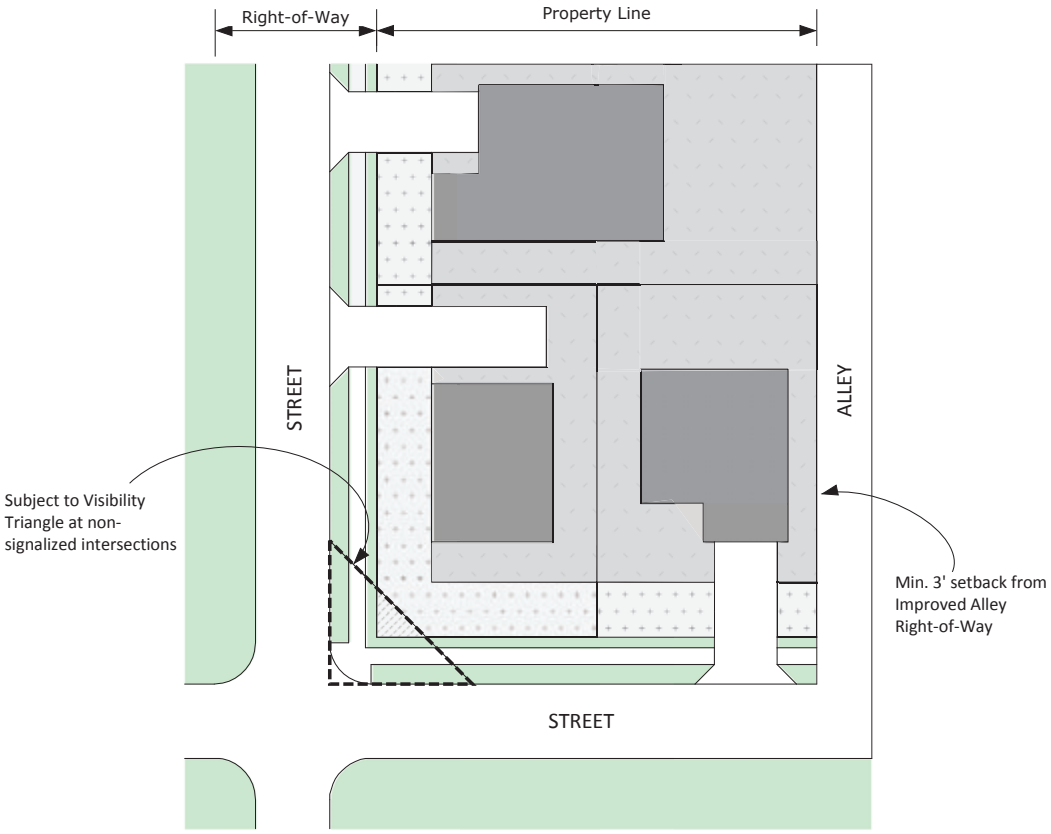
b. Openings shall be permitted in required buffer fences or walls in side and rear yards for the purpose of secondary vehicular access to an alley or secondary street. Each such opening shall not exceed 20 feet in width and there shall be no more than one such opening for each one 100 linear feet of side or rear yard dimension. All other fence or wall openings in side and rear yards shall contain a gate constructed of materials permitted herein and shall have at least 90 opacity.

4.4.3 OPTIONAL FENCES AND WALLS

a. Residential Zoning Districts

Standards for the location and height of optional fences and walls in residential zoning districts shall be as set forth in Figure 4.2-16.

Figure 4.4-1 Residential Fences and Walls



b. Non-Residential Zoning Districts

1. Optional fences or walls erected in areas zoned for commercial use or in the I-1 zoning district shall not exceed eight feet in height, except that in required front yards, the portion of such fences or walls that extends above four feet in height shall be made of pickets, wrought iron, chain link or similar open construction having no greater than 50 percent view blockage.

2. Optional fences or walls erected in the I-2 or I-3 zoning districts shall not exceed eight feet in height.

4.5 LANDSCAPING, TREES AND BUFFERING

4.5.1 INTENT AND APPLICABILITY

4.5.1.1 INTENT

It is the intent of this Article to protect the public health, safety and welfare and to improve the quality and appearance of the built environment by preserving natural vegetation and trees where possible and by incorporating new landscaping and trees into development; to establish minimum standards for landscaped areas; to establish and maintain street trees within rights-of-way; to establish minimum standards for buffer screens between incompatible land uses; to establish minimum standards for water efficient irrigation systems; to prevent excessive surface water runoff and maintain permeable land areas; to encourage the use of native plants and discourage the use of exotic or nuisance plants in landscape design.

It is further the intent of this Article to prevent the destruction of existing tree canopy where possible and to mitigate for the loss of tree canopy when its destruction cannot be avoided. Trees are a valuable public resource. A healthy tree canopy prevents soil erosion; provides windbreaks; beautifies the urban environment; increases the value of land; reduces noise, dust, and glare; controls air pollution through the production of oxygen and the reduction of carbon dioxide; provides wildlife habitat and moderates extreme temperatures.

4.5.1.2 APPLICABILITY

Except as otherwise provided herein, the requirements of this Article shall apply as follows:

a. Upon the construction of any principal structure, the entire site shall conform to the requirements of this Article, except as follows:

    1. In the case of single-family and two-family structures, only the minimum tree density requirements of Section 4.5.4.2 shall apply.
    2. In the case of phased development, the requirements of this Article shall apply to phases in accordance with the approved landscape plan.
    3. In the case of multiple structure complexes, the requirements of this Article shall apply only to that portion of the site containing the new structure unless Section 4.5.1.2 b. or c. applies.

b. When any principal non-residential structure or complex of structures is enlarged by 50 percent or more in gross floor area, the entire site shall conform to the requirements of this Article.

c. When alterations to any principal non-residential or multi-family structure or complex of structures exceed 50 percent of the assessed value, the entire site shall conform to the requirements of this Article.

d. When any vehicle use area is constructed or established or when any existing vehicle use area is enlarged by 50 percent or more in area, the entire vehicle use area shall conform to the requirements of Section 4.5.7. When any existing vehicle use area is enlarged by less than 50 percent in area, the requirements of Section 4.5.7 shall apply only to the enlarged area unless Section 4.5.1.2 b. or c. applies.

e. Proposed subdivisions requiring landscaping within rights-of-way and/or common areas in accordance with Article 9 Subdivision Regulations.

f. The requirements of this Article shall not apply to those portions of an airport or heliport determined by the Federal Aviation Administration or the Florida Department of Transportation to be required for the ground or aerial maneuvering of aircraft, or land owned or operated by a public aviation authority in connection with the development, operation or maintenance of airports and aviation areas or facilities used for runways, taxiways, aprons, runway protection zones and approaches, air traffic control towers, and aircraft navigational aids.

4.5.2 ADMINISTRATIVE MODIFICATIONS

The Director of Parks and Recreation shall be authorized to modify the requirements of this Article pertaining to street trees and to the preservation of regulated trees as provided herein. At the recommendation of the Director of Parks and Recreation, the Director of Community Development may modify other requirements of this Article under the following circumstances. Such modifications shall be noted on the applicable permit or site plan. Applicants are not entitled to such modifications which are at the discretion of the Director of Community Development or Director of Parks and Recreation.

4.5.2.1 Modification for Physical Limitations

If the Director of Community Development determines that it is impossible or impractical to meet the requirements of this Article due to physical limitations imposed by the location and arrangement of existing buildings, existing site dimensions or other existing physical constraints, he may allow part or all of the required landscaping to be provided elsewhere on the same site, or waive part of such requirements altogether, provided that the requirements are implemented to the fullest extent possible given the physical limitations.

4.5.2.2 Modification for Solar Access

If the Director of Community Development determines that required trees or landscaping will materially impede the functioning of any solar energy system or solar power generating facility, he may allow part or all of the required landscaping to be provided elsewhere on the same site, or modify the landscape requirements, provided that the modification is the minimum necessary to allow the solar energy system or solar power generating facility to operate properly.

4.5.3 DEFINITIONS

Beautification Board: A board appointed by the City Commission empowered to consider and study beautification in the City of Lakeland.

Canopy: The area shaded by the crown spread of a tree.

Destroy: The cutting, removing or loss of 30 percent or more of the crown, trunk or root system of a tree or plant as the result of natural causes, accident, willful action or neglect, including but not limited to the failure to irrigate, or any action which results in the loss of aesthetic or physiological viability of the plant or tree or which causes the plant or tree to fall or be in danger of falling.

Diameter at Breast Height (DBH): The standard measure of the diameter of a single stemmed tree at four and one-half feet above grade. In the case of multi-stemmed trees, the DBH shall be equal to the sum of the diameters of the individual stems.

Drip-Line: An imaginary, vertical line that extends downward from the outermost tips of the tree branches to the ground.

Florida Friendly Landscaping: Landscapes designed and maintained to maximize water conservation by minimizing irrigation needs.

Groundcover: Low-growing plants that cover the ground.

Hedge: A dense row of shrubs intended to provide a visual barrier. Specific types of hedges are defined as follows:

Type A Hedge:

A hedge with a minimum height of 18 inches and 50 percent view blockage at the time of planting, with the capability of attaining a minimum height of four feet and 90 percent view blockage within two years.

Type B Hedge:

A hedge with a minimum height of 30 inches and 50 percent view blockage at the time of planting, with the capability of attaining a height of six feet and 90 percent view blockage within three years.

Natural Vegetation: A grouping of native or naturalized plants occurring in a natural state, relatively undisturbed by human activity and growing under natural hydrologic and soil conditions requiring little or no maintenance, irrigation or fertilization.

Regulated Trees: Living pine trees that are 12 inches DBH or greater and living trees of all other species listed in Table 4.5-6 (Qualified Trees) that are six inches DBH or greater but not including street trees or trees growing on public property.

Required Landscaping: All landscaping including trees, shrubs and groundcover required by development under this Article in accordance with the approved landscape plan at the time of building permit approval in the case of single family or two family development, or at the time of site plan approval in the case of multi-family or non-residential development or the approved subdivision construction plan at the time of final plat approval in the case of a subdivision. Required landscaping shall also include existing trees and natural vegetation designated for preservation on the landscape plan.

Shrub: A woody, perennial plant.

Street Tree: Any tree located or required to be planted within road rights-of-way.

Tree: A perennial woody plant usually having a distinct crown.

Tree Abuse:

A. Damage inflicted upon any part of a tree, including the root system, by machinery, storage of material, soil compaction, excavation, vehicle accidents, chemical application or change to the natural grade;
B. Cutting flat the top of a tree, cutting the leader or leaders, or otherwise cutting a tree in a manner which destroys its natural shape ("hatracking");
C. Tearing or splitting of limb ends or peeling and stripping of bark or bark removal of more than one-third of the caliper of the tree; or
D. Nailing or mounting of signs, grade stakes, or any other foreign materials on protected trees or trees on a public right-of-way.

Tree Trust Fund: A city account established for the receipt of funds, as specified herein, to be used for the planting, establishment, and care of new trees on city-owned properties, dedicated open spaces and rights-of-way.

Vehicle Use Area: Any surface area, whether pervious or impervious, used for the off-street parking, storage or display of vehicles; the off-street movement of vehicles such as driveways and drive aisles; the off-street loading and unloading of goods, materials or passengers; service areas and the like. Driveways serving single family or two family dwellings and parking garages of any type shall not be considered vehicle use areas for purposes of this Article.

4.5.4 MINIMUM TREE DENSITY

4.5.4.1 Applicability

Development listed in Section 4.5.1.2 shall have a minimum number of trees on the same lot or parcel in accordance with the following. The tree size classifications are as set forth in Table 4.5-6, subject to allowable substitutions in accordance with Section 4.5.11.2.

4.5.4.2 Minimum Tree Density Requirements

a. Single-Family and Two-Family (Duplex) Residential: One A (Large) tree for each dwelling unit. In lieu of a landscape plan, the required landscape information may be provided on the site plan.

b. Multi-Family Residential: One A (Large) tree for each dwelling unit.

c. Mobile Home Parks or Mobile Home Subdivisions: One B (Medium) tree for each dwelling unit.

d. Non-Residential Development: One A (Large) tree for each one-eighth acre (5,445 square feet) of land or fraction thereof in the development. Trees that are part of the interior and perimeter landscaping shall count towards this requirement.

4.5.5 FOUNDATION LANDSCAPING

4.5.5.1 Intent

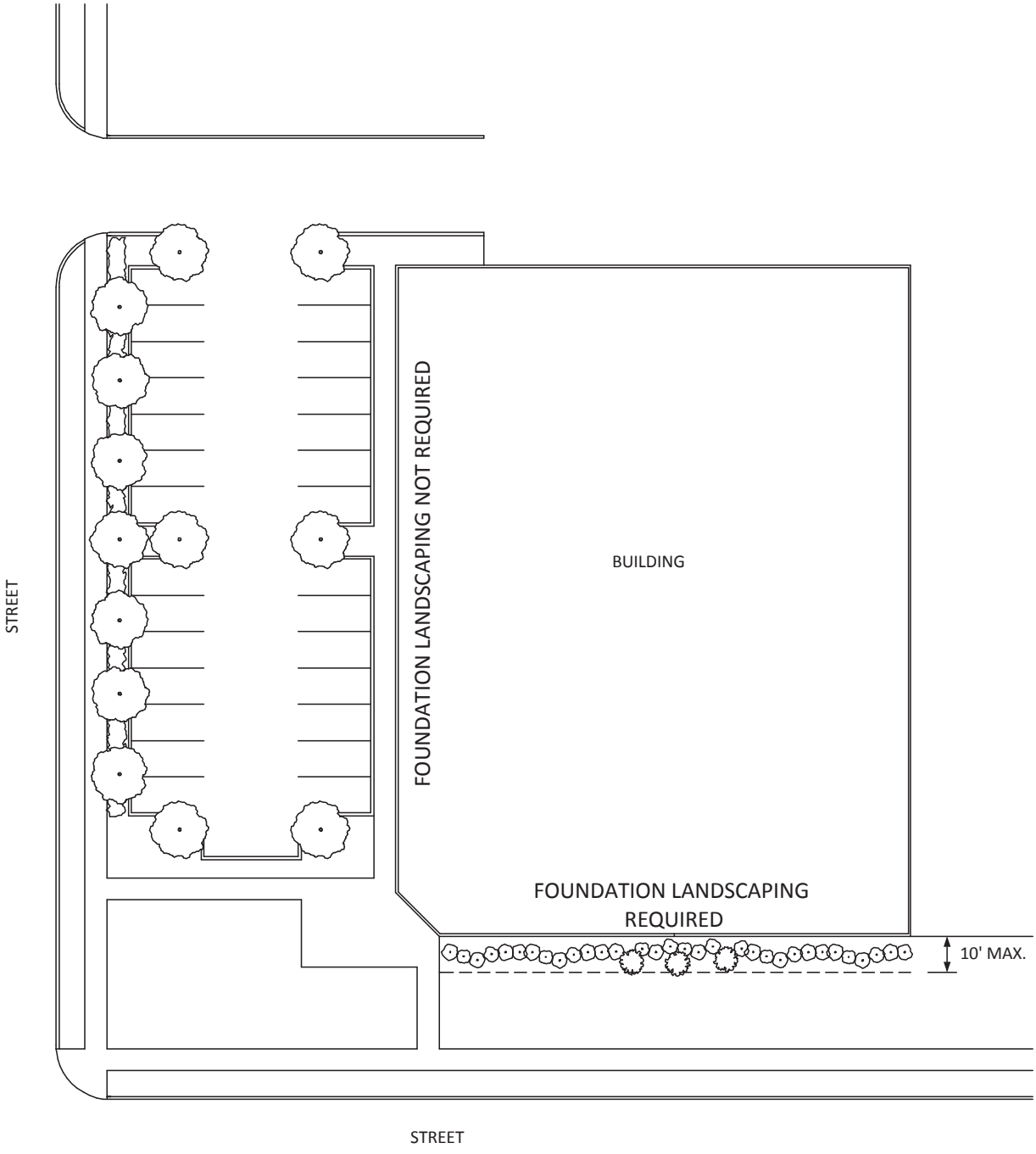
It is the intent of this Section to establish minimum standards for the landscaping of certain non-residential and multi-family building facades that otherwise would have little or no landscaping between the building and the street.

4.5.5.2 Applicability

Non-residential and multi-family building facades 35 feet or longer that face streets, including the facades of parking garages, shall provide foundation landscaping in accordance with these standards, with the following exceptions:

a. Where there is a frontage buffer meeting the requirements of Section 4.5.7.3 a. between the façade and the street.
b. Where the façade is immediately adjacent to a sidewalk or public entrance.
c. Where the façade is adjacent to an alley.
d. Where the façade is adjacent to service or loading areas.

Figure 4.5-1 Foundation Landscaping



4.5.5.3 Standards

a. Foundation landscaping shall consist of a minimum of one shrub, accent plant or ornamental bunch (tussock) grass per three linear feet of façade and one C (Small) tree per 30 linear feet of façade. The balance of the planter area shall be planted with turf grass or groundcover plants so that 100 percent ground coverage is achieved within one year of planting. Foundation landscaping shall not be required in front of doors or under canopies and such areas shall not be included in the calculation of foundation plants required.

b. Where foundation plants are planted adjacent to a building façade, the minimum planter width shall be five feet; seven feet if vehicles are allowed to overhang the planter. However, wider planters are permitted and required foundation plants and trees may be planted up to ten feet away from the façade.

c. The required foundation plants may be planted evenly along the façade or they may be planted in groups for aesthetic effect or for safety in accordance with Crime Prevention Through Environmental Design (CPTED) principles.

d. Required C (Small) foundation trees shall apply toward tree density requirements in accordance with Section 4.5.11.2.

4.5.6 STREET TREES

4.5.6.1 Applicability

a. The Director of Parks and Recreation shall determine the number, species and spacing of street trees to be planted on any particular street segment.

b. The developer of any subdivision shall plant street trees within subdivision rights-of-way in accordance with Section 9.9.1.7 where the Director of Parks and Recreation has determined that street trees are appropriate.

c. The developer of other development projects listed in Section 4.5.1.2 shall plant street trees within the right-of-way of streets abutting the project where the Director of Parks and Recreation has determined street trees are appropriate and where such trees do not exist at the time of application for development approval.

d. The Director of Parks and Recreation may modify the requirements of this Section where there is insufficient planter strip width, where there are conflicts with utilities, where the road is scheduled to be widened or other mitigating circumstances.

4.5.6.2 Street Tree Standards

a. Species Selection, Spacing and Location

Street trees shall be limited to those species listed as Street Trees in Table 4.5-6. Street trees shall be planted so as to create the appearance of a uniformly tree-lined street. The Director of Parks and Recreation shall determine the particular species and spacing of street trees to be used in a particular case, subject to the following guidelines. Where a pattern of street tree planting pre-exists elsewhere along a street, the pattern with respect to species, spacing and location shall be continued. Otherwise, the desired spacing is 1 tree per 50 linear feet of roadway for A (Large) trees, 1 tree per 40 linear feet of roadway for B (Medium) trees and 1 C (Small) tree per 30 linear feet of roadway for C (Small) trees, subject to the Visibility Triangle requirements of Section 4.12. The location of street trees with respect to utilities and other infrastructure shall be in accordance with Figures 9.9-3 and 9.9-4, unless the Director of Parks and Recreation authorizes alternative locations.

b. Minimum Planting Standards

1. Minimum street tree specifications:
   Container size: 15 gallons or balled and burlapped
   Height: 8 feet
   Caliper: 1 inch DBH

2. The developer shall irrigate newly planted street trees by means of a permanent in-ground irrigation system or temporary irrigation system approved by the Director of Parks and Recreation for a minimum of one year or until the Director of Parks and Recreation considers the trees established and accepts them for city maintenance.

3. The Director of Parks and Recreation may require the use of tree grates, tree wells, root barriers or other special treatments as he deems necessary to assure the viability of street trees in particular locations.

c. Acceptance for Maintenance

The Director of Parks and Recreation shall determine the terms and conditions upon which the city will accept established street trees for maintenance.

4.5.7 VEHICLE USE AREAS

4.5.7.1 Intent

The intent of this Section is to establish minimum standards for the landscaping of vehicle use areas, to maintain or establish a tree canopy over vehicle use areas, to incorporate existing trees and natural vegetation into the landscape design where possible, to use landscape areas for stormwater retention and treatment where

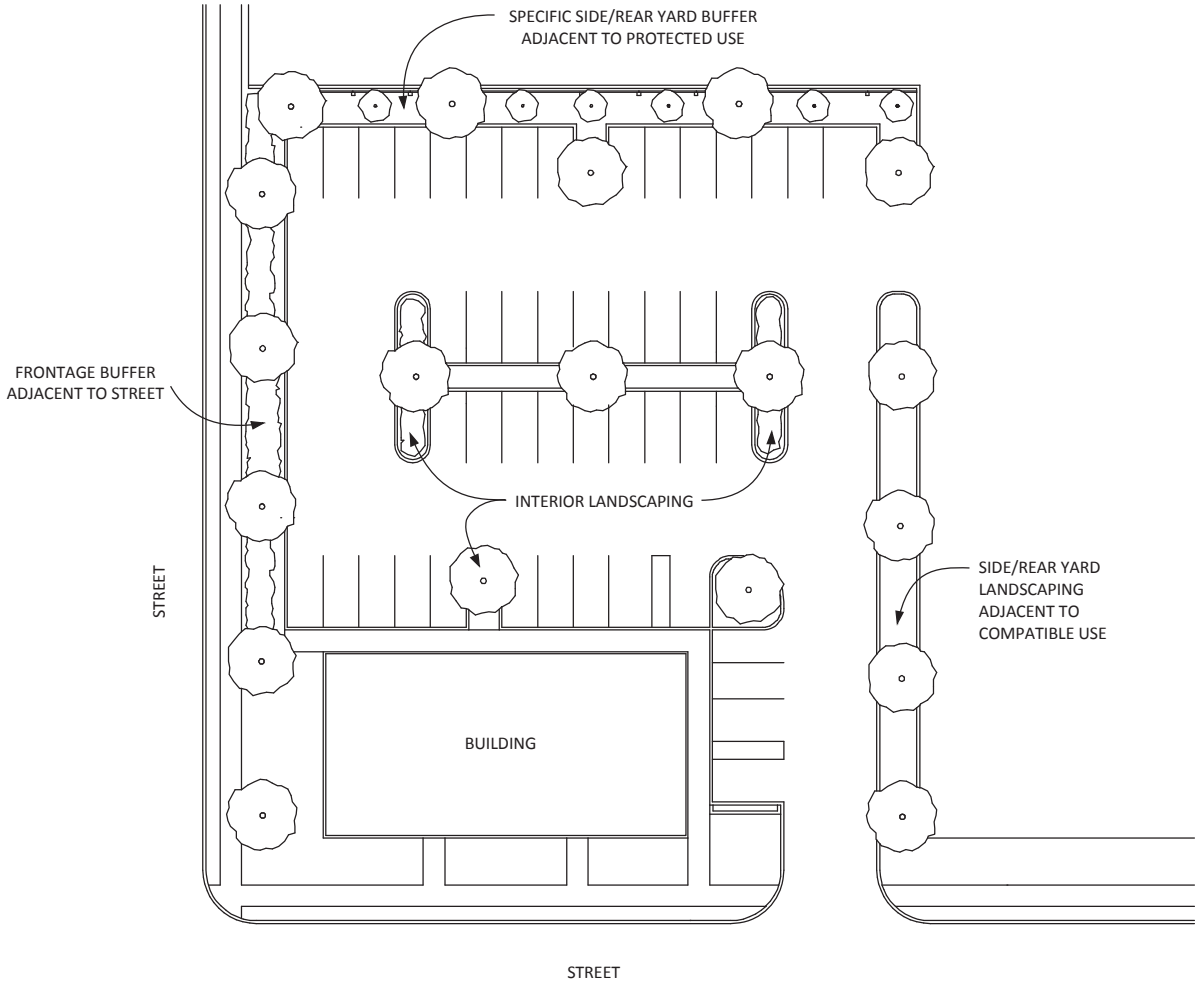
possible, and to buffer roadways and protected uses from the negative impacts of vehicle use areas.

4.5.7.2 Applicability

a. Vehicle use areas serving development in accordance with Section 4.5.1.2 shall be landscaped and buffered in accordance with this Section, subject to administrative modifications. The required landscaping of vehicle use areas consists of a frontage buffer where the vehicle use area abuts a street, a side or rear yard buffer where the vehicle use area abuts another use and interior landscaping.

b. Where off-street parking is provided within the Parking Exempt Area (Figure 4.11-1), it shall be landscaped in accordance with this Section.

Figure 4.5-2 Landscaping of Vehicle Use Areas



4.5.7.3 Landscape Standards

a. Frontage Buffer

Where a vehicle use area is adjacent to a street, a frontage buffer shall be provided in accordance with Table 4.5-1.

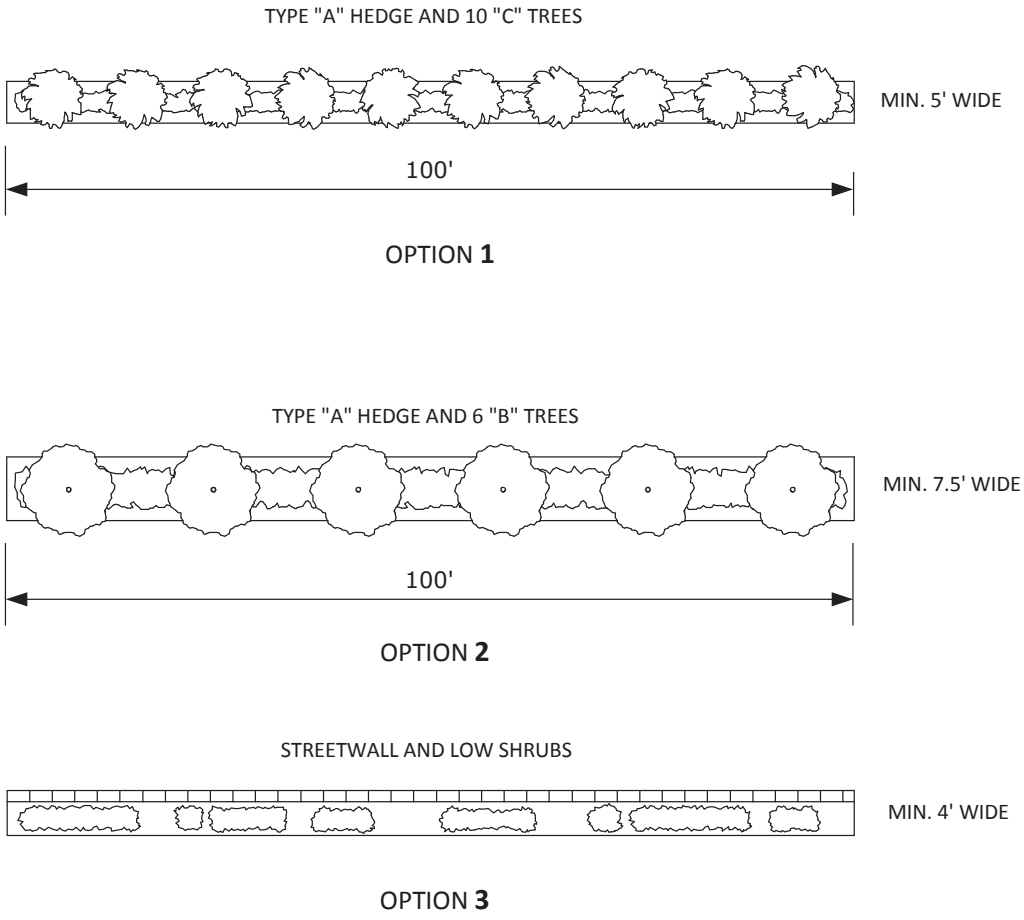
TABLE 4.5-1 FRONTAGE BUFFER OPTIONS

Options	Minimum Planter Strip Width	Minimum Landscaping Required
Option 1	5’	Type A hedge and 8 C (Small) trees per 100 lin. ft. or fraction thereof
Option 2	7.5’	Type A hedge and 4 B (Medium) trees per 100 lin. ft. or fraction thereof
Option 3 (Limited to 150 lin. ft. per frontage in Central City Area)	4’ including wall	3 ft. high masonry streetwall with low shrubs and groundcover on street side

Notes:

1. These are minimum standards. Buffers may incorporate greater width and additional plant materials.
2. Tree species shall be in accordance with Table 4.5-6. Hedge, shrub and groundcover species shall be in accordance with Table 4.5-8.
3. Where located with less than 15 feet offset from overhead powerlines, trees shall be limited to specific C (Small) trees in accordance with Table 4.5-6.
4. Planter strip width is measured to the inside of curbs with no vehicle overhang. Curbing, wheelstops or posts shall be used to control vehicle overhang.
5. Tree spacing may vary but the intent is to space trees evenly across the frontage. The spacing standard indicates the number of trees to be planted, not the precise location of trees. Where street trees exist or are proposed within the adjacent right-of-way, the intent is to alternate the frontage buffer canopy trees between the street trees.
6. All ground area within planters shall be covered by turf grass, low shrubs or groundcover plants.
7. Streetwalls shall have a minimum 75% view blockage and shall match the architectural materials and finish of the principal building.

Figure 4.5-3 Frontage Buffer Options



b. Side or Rear Yard Landscaping

1. Where a vehicle use area is adjacent to a protected use, a required buffer shall be provided in accordance with Tables 4.5-2 and 4.5-3.

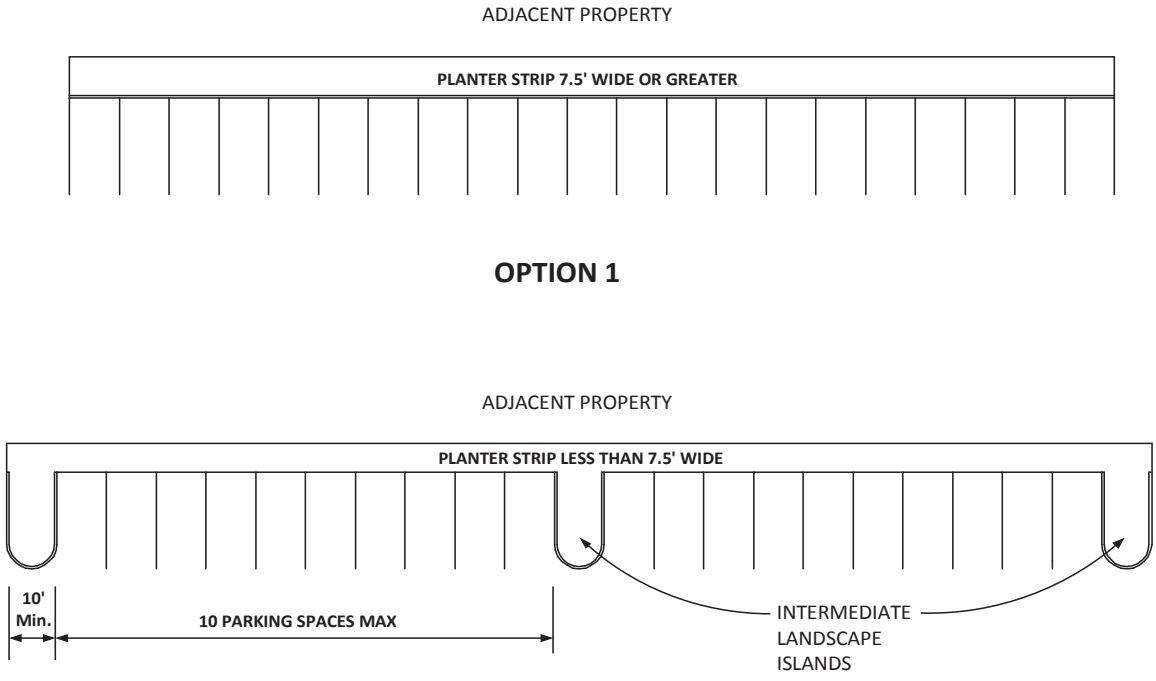
2. Where a vehicle use area is adjacent to a use that is not a protected use, the side or rear yard landscaping shall consist of a minimum of five feet wide planter strip with one B (Medium) tree per 20 linear feet or one C (Small) tree per 16 linear feet.

3. In either case, where the planter strip is less than 7.5 feet wide, landscape islands shall also be provided a minimum of one every ten parking spaces as illustrated in Figure 4.5-4 (Side or Rear Yard Landscaping Options). One B (Medium) shall be planted within each landscape island.

4. Planter dimensions are measured to the inside of curbs but may include fences or walls.

5. All ground area within planters shall be covered by turf grass, low shrubs or groundcover plants.

Figure 4.5-4 Side or Rear Yard Landscaping Options



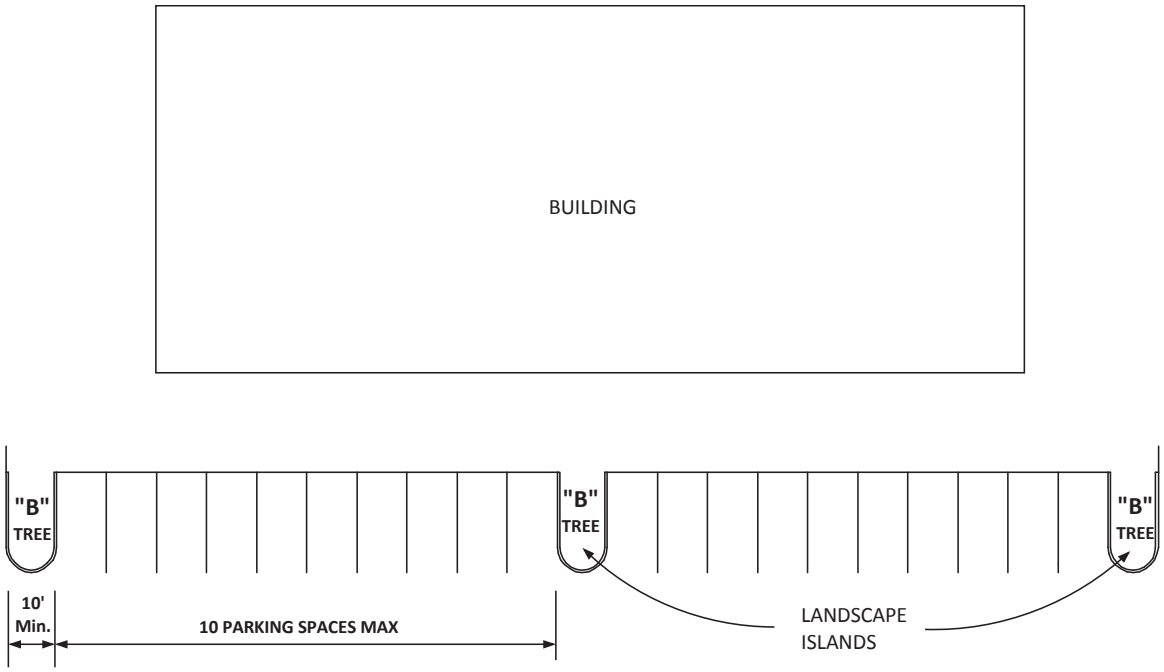
NOTE: BOTH OPTIONS SUBJECT TO BUFFER IF ADJACENT TO PROTECTED USE

c. Interior Landscaping

1. Parking spaces interior to vehicle use areas shall be landscaped in accordance with the design options illustrated in Figure 4.5-6 which may be used singly or in combination, except that interior landscaping shall be optional for any vehicle use area containing 20 or fewer total parking spaces. Planter dimensions are measured to the inside of curbs. The design options may be modified to suit angled parking.

2. Where a vehicle use area is adjacent to a building, terminal and intermediate landscape islands, each having the length of one parking space, a minimum of ten feet wide and spaced a minimum of every ten parking spaces, shall be provided.

Figure4.5-5 Parking Adjacent to Building



3. Trees shall be planted within each terminal landscape island, each intermediate landscape island and each interior landscape median in accordance with Figure 4.5-5 and Figure 4.5-6.

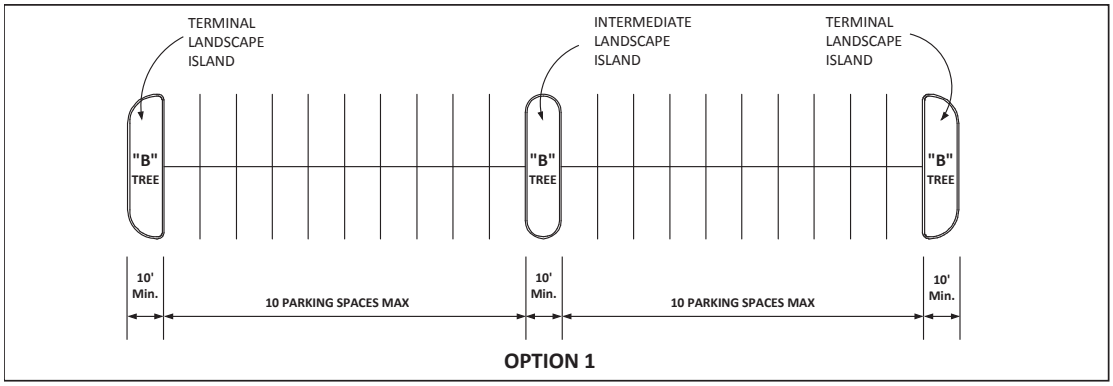
4. Tree species shall be selected and planted in accordance with Table 4.5-6.

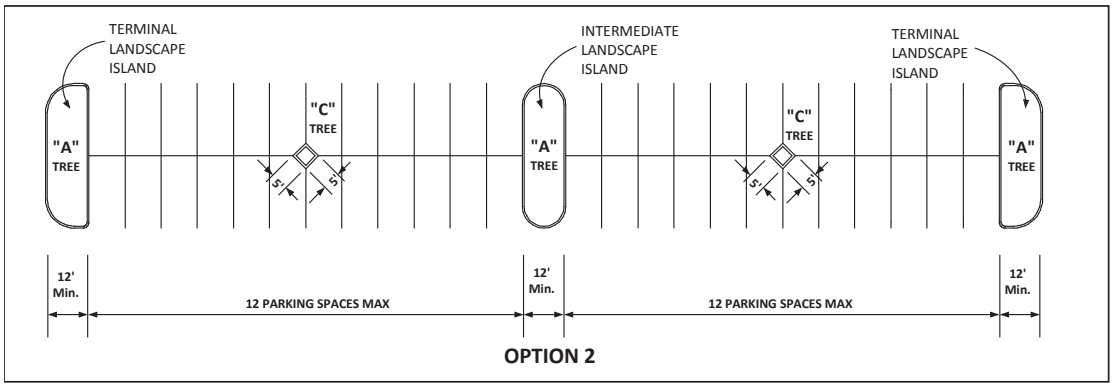
5. All ground area within planters shall be covered by turf grass, low shrubs or groundcover plants.

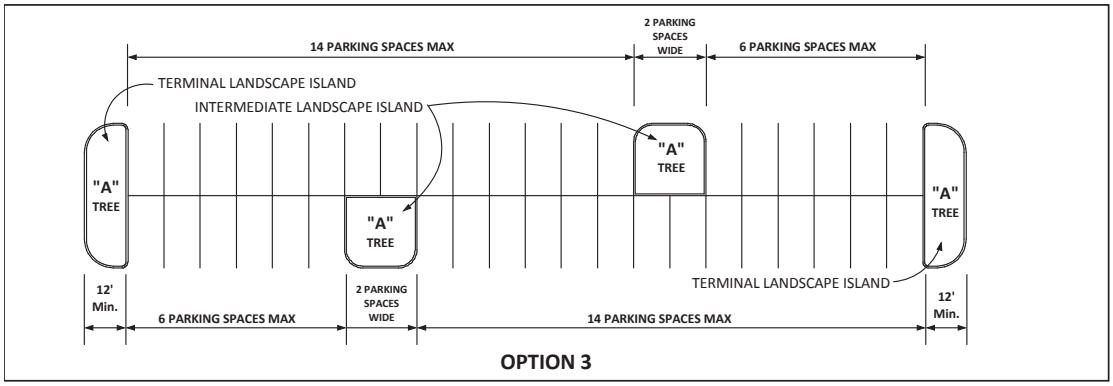
6. Interior portions of vehicle use areas specifically designated on the approved site plan for the display of motor vehicles for sale or rent or for the parking, maneuvering or storage of commercial trucks or trailers shall provide interior landscaping in accordance with the following options which may be used singly or in combination. The location and design of such landscaping shall be as determined by the Director of Parks and Recreation at the time of site plan approval.

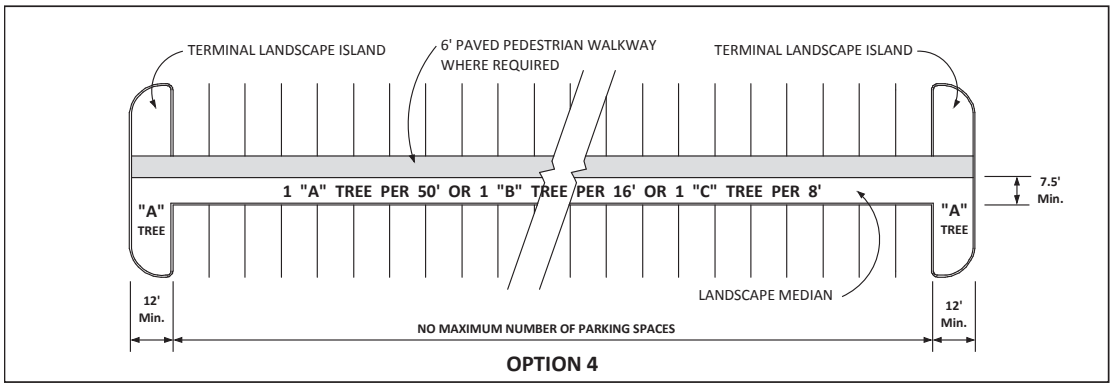
   (a) Option 1: Provide interior planters and trees in accordance with a. above.
   (b) Option 2: Provide interior planters without trees and locate the trees elsewhere on the site.
   (c) Option 3: In lieu of interior planters, provide an equivalent amount of landscaped open space and trees elsewhere on the site.
   (d) Option 4: In lieu of required trees, pay a fee into the Tree Trust Fund, the amount of which shall be determined by the Director of Parks and Recreation. The fee schedule shall be as established by resolution of the City Commission.

Figure 4.5-6 Interior Landscaping Options







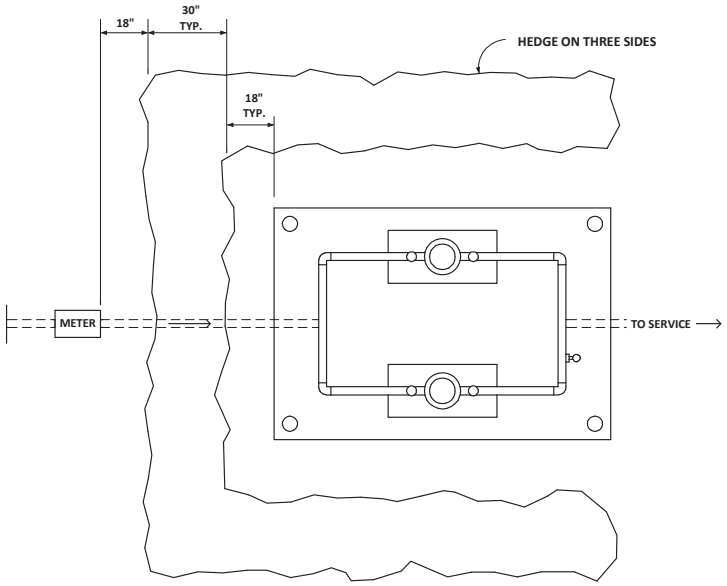


4.5.8 LANDSCAPING OF OTHER ON-SITE FACILITIES

4.5.8.1 Backflow Prevention Assemblies

Backflow prevention assemblies shall be screened from view by a Type A hedge on three sides, leaving the service side open for maintenance and repair accessibility as illustrated in Figure 4.5-7 (Landscaping of Backflow Prevention Assemblies).

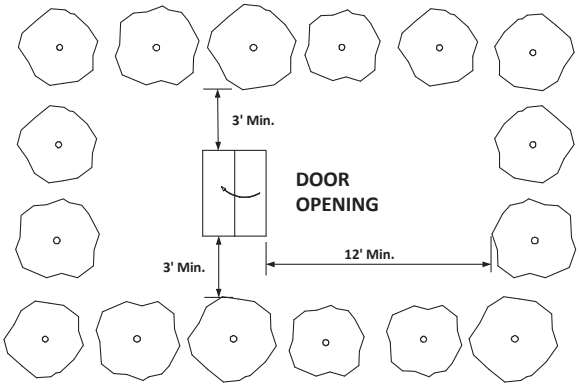
Figure 4.5-7 Landscaping of Backflow Prevention Assemblies



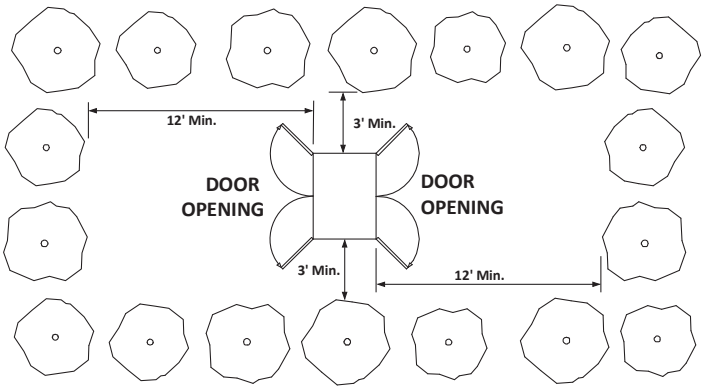
4.5.8.2 Transformer and Switchgear Boxes

Trees and shrubs planted around pad-mounted transformer and switchgear boxes shall maintain minimum planting clearances as illustrated in Figure 4.5-8 (Landscaping of Transformer and Switchgear Boxes).

Figure 4.5-8 Landscaping of Transformer and Switchgear Boxes



TRANSFORMER



SWITCHGEAR

4.5.8.3 Stormwater Management Facilities

a. To the extent practicable, stormwater management facilities shall have non-angular, freeform, curvilinear contouring that mimics natural terrain.

b. Berms and swales above the high water line shall be sodded and planted with trees on the ratio of one B (Medium) tree per 50 linear feet along the top of bank and shrubs covering 25 percent of the top of bank. Trees and shrubs may be grouped to mimic natural growth and need not be evenly spaced.

c. Plant material shall be selected from Tables 4.5-6, 4.5-7 and 4.5-8 and shall be suitable for the individual characteristics of the site including soil, slope, aspect, hydro-period and microclimate. Areas designed to be permanently or seasonally wet may include native aquatic plants.

4.5.9 BUFFERING OF PROTECTED USES

4.5.9.1 When any burdened use listed in Table 4.5-2 is adjacent to a listed protected principal use, the burdened use shall provide a buffer on or near the intervening property boundary in accordance with the minimum standards for that type as set forth in Table 4.5-3. Where more than one buffer type is listed, any of the listed types may be used. The burdened uses listed include all vehicle use areas serving those uses.

4.5.9.2 The buffer types listed in Table 4.5-3 may also be used for other buffer applications as specified elsewhere in this Code.

4.5.9.3 Tree species shall be selected and planted in accordance with Table 4.5-6. Plant species to be used for hedges shall be selected and planted in accordance with Table 4.5-8.

4.5.9.4 The incorporation of existing trees, tree lines, shrubs, hedge rows and other natural vegetation into buffers is encouraged and the Director of Parks and Recreation may recommend that the Director of Community Development modify these requirements if existing vegetation will provide a buffer of equal or greater density and view blockage to the required buffer.

TABLE 4.5-2 REQUIRED BUFFER BY TYPE

BURDENED USE REQUIRING BUFFER	**PROTECTED USE**		
	Single Family, Two Family	**Multi-Family, Institutional Res.**	**Church, School, Daycare etc.**
Multi-Family, Institutional Residential	A	None	None
Church, School, Daycare etc.	A	A	None
Office	A	A	A
Commercial (retail or service)	A	A	A
Parking as a principal use	A	A	A
Drive-through uses	B	B	B
Bars and related entertainment uses	B	B	B
Vehicle service uses	B	B	B
Outdoor display, sales, rental or storage	B	B	B
Outdoor entertainment, recreation or assembly	B	B	B
Industrial	C	C	C

Figure 4.5-9 Required Buffers

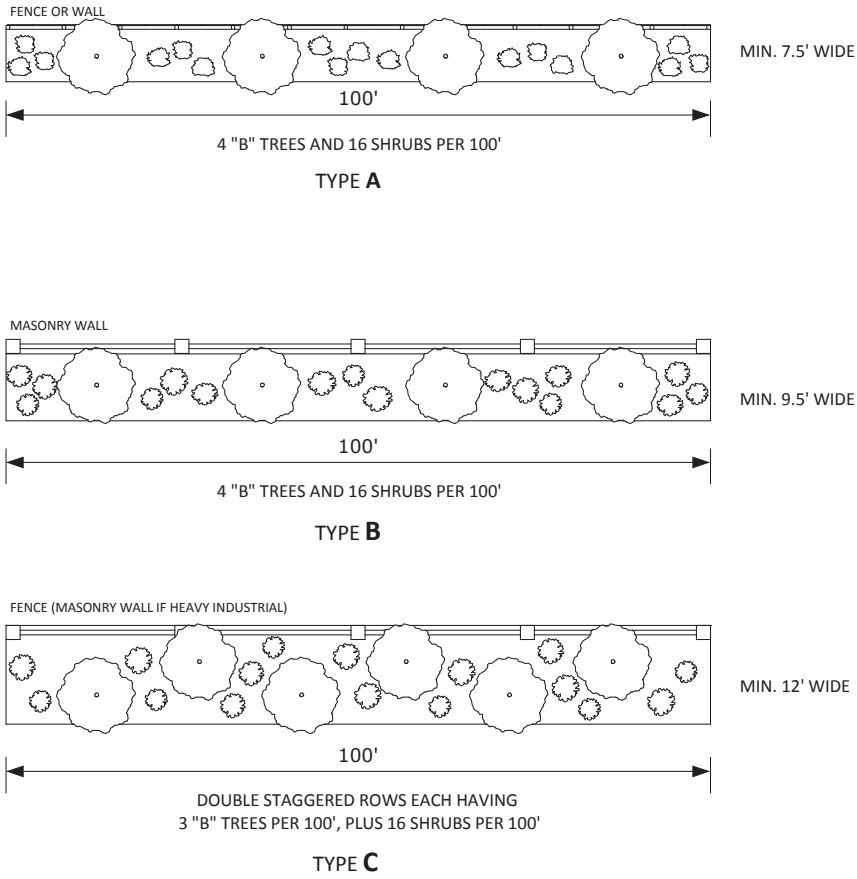


TABLE 4.5-3 REQUIRED BUFFER STANDARDS

Type A Minimum Width: 7.5' including fence or wall Structure: View blockage fence or masonry wall. Minimum 6' high. Maximum 8' high. Landscaping: 16 shrubs plus 4 B(Medium) trees per 100 linear feet or fraction thereof
Type B Minimum Width: 9.5' including wall Structure: View blockage masonry wall. Minimum 6' high. Maximum 8' high. Landscaping: 16 shrubs plus 4 B(Medium) trees per 100 linear feet or fraction thereof
Type C Minimum Width: 12' including fence or wall Structure: View blockage fence (masonry wall required if burdened use is heavy industrial). 8' high. Landscaping: Staggered double row of trees, each row consisting of 16 shrubs plus 3 B(Medium) trees per 100 linear feet or fraction thereof
Notes: 1. These are minimum standards. Buffers may incorporate greater width, additional plant materials and/or denser structures; however, buffer structure height shall not exceed the standard for that type. 2. A Type B hedge may be substituted for the required buffer structure where the following minimum width of intervening open space exists between any structures or vehicle use areas of the burdened use and the property boundary of the protected use: 100' minimum for Type A buffer, 200' minimum for Type B buffer and 500' minimum for Type C buffer. The open space may include dry retention ponds. 3. Tree species shall be in accordance with Table 4.5-6. Shrub species shall be in accordance with Table 4.5-8. 4. Where located with less than 15 feet offset from overhead powerlines, trees shall be limited to specific C (Small) trees in accordance with Table 4.5-6. In which case, each required B (Medium) tree shall be replaced with C (Small) trees in accordance with Section 4.5.11.2. 5. Buffer widths are measured from and perpendicular to the property boundary and include the required buffer structure. 6. Tree spacing may vary but the intent is to space trees more or less evenly across the property boundary. The spacing standard indicates the number of trees to be planted, not the precise location of trees. 7. All ground area within planters shall be covered by turf grass, low shrubs or groundcover plants. 8. Fences and walls shall have a minimum 90 percent view blockage in accordance with Section 4.4.2 a. 9. Masonry walls shall be constructed of finished masonry such as brick, stone, split block or stucco on concrete block. 10. Required buffer structures shall be located within 6 inches of the property boundary. 11. Slats in chain link fence shall be prohibited for use as a view blockage fence except to allow a change in use on sites with existing chain link fence, subject to approval of the Director of Community Development.

4.5.9.5 Development located adjacent to limited access highways shall plant A (Large) trees adjacent to the right-of-way on the ratio of one tree for each 50 linear feet of frontage.

4.5.10 TREE PRESERVATION

4.5.10.1 Intent and Applicability

a. Intent

1. It is the intent of this Section to establish standards to prevent, mitigate or compensate for the loss of the public resource where tree canopy is proposed to be destroyed by development.

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2. Except as specifically provided herein, the preservation of existing trees on development sites is to be preferred to the planting of new trees.
3. Efforts to preserve existing trees are encouraged and the Director of Parks and Recreation may recommend that the Director of Community Development modify development standards in order to save specific trees.

b. Applicability

The provisions of this Section shall apply to the proposed destruction or relocation of any regulated tree as the result of development activity, with the following exceptions:

1. Lots or parcels zoned for single-family or two family dwellings. (However, this Section shall apply to proposed subdivisions for single-family or two family dwellings);
2. Any vertical mixed use development where residential or office uses are located above ground floor commercial and a minimum of 60 percent of the building frontage is dedicated to retail or service commercial uses;
3. Bona fide agricultural uses, commercial nurseries and botanical gardens;
4. Bona fide utility maintenance, safety or fire reduction activities; or
5. Emergency or disaster recovery activities.

4.5.10.2 Credit for Preservation of Existing Trees

a. Existing trees (except palms) located in proposed vehicle uses areas, proposed perimeter buffers or proposed stormwater retention areas that are preserved in accordance with this Section shall be credited toward the number of trees otherwise required by this Code as follows:

TABLE 4.5-4 TREE PRESERVATION CREDIT

DBH of Preserved Tree	Number of Required Trees Credited
5 to 7 inches	1 A or 3 B or 6 C
8 to 12 inches	2 A or 6 B or 12 C
13 to19 inches	3 A or 9 B or 18 C
20 to 25 inches	4 A or 12 B or 24 C
26 to 29 inches	5 A or 15 B or 30 C
30 to 35 inches	6 A or 18 B or 36 C
36 inches or greater	7 A or 21 B or 42 C

b. To receive credit, the tree or trees to be preserved shall be identified on the landscape plan or site alteration plan as preserved, shall be free from disease and flourishing and shall be protected during construction in accordance with Section 4.5.10.5. Trees damaged during construction shall not receive credit.

4.5.10.3 Preservation of Regulated Trees

a. Tree Removal Permit Required

1. Except as otherwise provided herein, no regulated tree may be removed, relocated or destroyed without a tree removal permit as provided in this Section.

2. For development activity requiring a landscape plan or site alteration plan, the approval of the landscape plan or site alteration plan shall constitute the tree removal permit.

3. Any regulated tree that is proposed to be removed, relocated or destroyed for any other reason shall require a separate tree removal permit using such form and submittals as the Director of Parks and Recreation may require.

b. Identification on Landscape Plan or Site Alteration Plan

1. The location, size and species of all regulated trees shall be indicated on the landscape plan or site alteration plan and shall indicate whether each is proposed to be preserved, relocated or destroyed. As an alternative, regulated trees proposed to be destroyed may be documented on a separate tree survey or existing conditions plan. A table shall be included summarizing the total number of trees by species and the total caliper inches of trees to be preserved, relocated or destroyed. The applicant shall consider the following as a means to preserve regulated trees and incorporate them into the site design:

(a) The location of proposed buildings;
(b) The location and design of proposed roads and vehicle use areas;
(c) The location and design of proposed drainage systems and stormwater retention ponds;
(d) The use of tree wells, tree guards, root protection devices, hardening of utilities or other methods of protecting trees on developed sites.

2. The landscape plan or site alteration plan shall indicate proposed grade changes which may adversely impact or endanger regulated trees to be preserved. Spot elevations may be required prior to the issuance of a tree removal permit.

c. Review by Director of Parks and Recreation

1. The Director of Parks and Recreation shall review the landscape plan, site alteration plan or tree removal permit, which review shall include a field visit to the site, and shall either approve or deny the plan as to each regulated tree proposed to be preserved, relocated or destroyed.

2. Approval Criteria

The Director of Parks and Recreation shall approve the plan or permit upon a finding that the regulated trees will be preserved, or that adequate measures are

in place to assure the viability of regulated trees proposed to be relocated, or that compensation has or will be provided for regulated trees proposed to be destroyed.

d. Compensation Required

When the Director of Parks and Recreation approves a plan authorizing the destruction of regulated trees, such trees shall be subject to compensation in accordance with the following. Replacement trees shall be planted in accordance with Section 4.5.11. Trees planted in fulfillment of other requirements of this Article, such as required trees in vehicle use areas or required buffers, shall count toward the number of trees required as compensation for destroyed regulated trees. Compensation shall not be required for regulated trees that the Director of Parks and Recreation determines pose a safety hazard, have been weakened by disease, age, storm, fire or other injury or are near the end of their lifespan and likely to become a hazard; are of negligible public value including exotic, invasive, ornamental or fruit-bearing species; are likely to cause damage to buildings, utilities or other planned infrastructure; or are overcrowded and selective thinning is appropriate.

1. Option 1: Tree Replacement on Same Lot or Parcel

Each destroyed regulated tree subject to compensation shall be replaced elsewhere on the same lot or parcel as follows:

Destroyed Tree	Replacement Trees
6” – 23” DBH	Two new trees of the same class size (A or B)
24”+ DBH	New trees totaling the number of caliper inches destroyed

2. Option 2: Off-Site Mitigation

If the Director of Parks and Recreation determines that it is impractical to locate the replacement trees on the same lot or parcel, he may authorize the replacement trees to be planted at one or more off-site locations within the corporate limits of the City of Lakeland.

3. Option 3: Payment of Fee-in-Lieu

If he determines that other options are not feasible, the Director of Parks and Recreation, may authorize the payment of a fee-in-lieu for the value of regulated trees that are destroyed. The fee schedule shall be as established by resolution of the City Commission. If a fee-in-lieu is approved, the fee shall be paid into the Tree Trust Fund prior to the issuance of any permit authorizing construction or site alteration.

4.5.10.4 Preservation of Street Trees

a. No person shall destroy, remove, mutilate or abuse any street tree except as provided herein.

b. Visibility of signage other than signs within rights-of-way shall not be grounds for the destruction, removal or trimming of street trees.

c. The maintenance of all street trees shall be the responsibility of the city, except where trees within rights-of-way are maintained by a homeowners association or other entity in accordance with a duly recorded agreement. Authorized city personnel and authorized contractors working for the city may trim or remove street trees as needed to maintain the health of street trees; to allow free passage of pedestrians and vehicles; to prevent the obstruction of or interference with utilities, street lights, traffic lights, street signs and traffic control devices; or to prevent obstruction of the view of vehicle operators at any street intersection.

d. Nothing in this section shall prevent the cutting or removal of any street tree that in the opinion of the Director of Parks and Recreation is required for public safety.

e. Authorization Required to Work on Street Trees

1. Except where trees within rights-of-way are maintained by a homeowners association or other entity in accordance with an agreement with the city, all work on street trees shall be done only with the authorization of the Director of Parks and Recreation. The Director of Parks and Recreation may authorize utility companies, including contractors working for utility companies, and tree service contractors to perform the following types of work on or near street trees: tree removal, trimming or pruning, grading or trenching near street trees, installation of pavement over street tree root zones, transport of buildings or other large items that could damage street trees. All underground work performed in the city-maintained right-of-way shall also require a right-of-way permit issued by the Public Works Department. In the event of an emergency such as a storm, such work may be performed without prior authorization, provided that documentation of the work performed is provided afterward to the Director of Parks and Recreation.

2. In granting such authorization, the Director of Parks and Recreation shall find that there is a need for the proposed work; that those who are to perform the work are qualified to do so and are insured, bonded or pre-registered with the city; and that any potential detriment to the city's street tree population entailed by the proposed work is justified in the individual case. In making this determination, the Director of Parks and Recreation shall consider factors such as the probability that the proposed work will destroy or seriously injure the tree, the tree's health, whether the tree's condition and size threaten serious damage to property, the condition and number of other city street trees in the vicinity and other related criteria.

3. The Director of Parks and Recreation may place conditions on any such authorization that he deems necessary.

4. Where tree roots damage sidewalks, curbs, underground pipelines or similar public facilities, every effort shall be made to correct the problem without removing or damaging the tree. The Director of Parks and Recreation shall determine corrective measures in consultation with the Public Works Department. If repairs will result in extensive root damage, the Director of Parks and Recreation may direct the department to remove the tree prior to facility repairs.

5. All pruning shall be done in accordance with ANSI A300 (Part 1) Pruning. Any proposed deviation from this standard must be approved by the Director of Parks and Recreation in advance.

6. All trenching and tunneling shall be done in accordance with Trenching & Tunneling Near Trees: A Field Pocket Guide for Qualified Utility Workers, by Dr. James R. Fazio, 1998, The National Arbor Day Foundation. Any proposed deviation from this standard must be approved by the Director of Parks and Recreation in advance.

7. The Director of Parks and Recreation may inspect such work and shall have the authority to stop any work if the standards of this Article are not being followed.

8. In the event that development activity will destroy or require the relocation of street trees or other public landscaping, the developer shall relocate such trees and landscaping or shall replace such trees in accordance with Table 4.5-5 in a location approved by the Director of Parks and Recreation. Such proposed replacement or relocation shall be approved in advance by the Director of Parks and Recreation and shall be shown on site plans or construction plans submitted for review and approval. Such work shall be performed only by those authorized by the Director of Parks and Recreation and shall include any required irrigation systems. Repairs for any damage caused to utilities during such relocation shall be at the expense of the developer.

TABLE 4.5-5 PUBLIC TREE REPLACEMENT STANDARDS

DBH of Tree Destroyed	Number of Replacement Trees (min. 2” DBH)
2” to 7”	4
8” to 11”	6
12” to 15”	8
16” to 19”	10
20” to 27”	12
28” and up	inch per inch

4.5.10.5 Protection of Trees During Development Activity

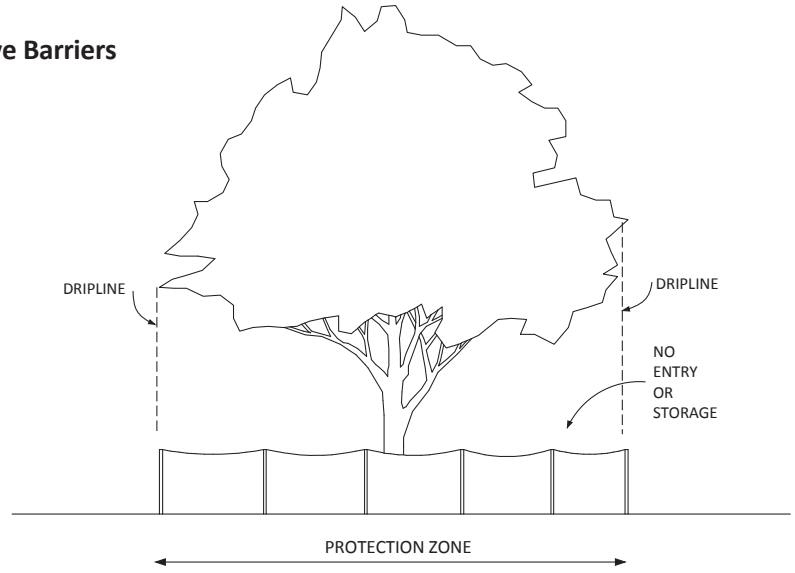
Trees identified for preservation on the approved landscape plan, whether individually or within a generalized area of natural vegetation, shall be protected during development activity as follows.

a. Protected trees or groups of trees shall be clearly marked by flagging, painting or other means.

b. All protected trees shall have the trunk and roots protected by protective barriers erected prior to development activity in accordance with the following.

1. Protective barriers constructed of wood rails, pipe, chain link fabric or orange plastic safety netting shall be placed around the tree or trees to form a continuous barricade at least four feet high. Ideally such barriers will form a protection zone described by the drip line. The Director of Parks and Recreation may allow a smaller protection zone or alternative tree protection measures where space is constrained. The barriers shall be shown on the site alteration plan and/or landscaping plan.
2. Signs or other markings shall be placed on all sides of the protective barrier to designate the protected area.
3. Protective barriers shall remain in place until landscape operations begin or until construction in the immediate area has been completed.
4. Existing street trees located within rights-of-way interior to or adjacent to the development shall have protective barriers before site work begins.
5. Trenching for underground utilities shall be prohibited inside the protective barriers. If underground utilities must be routed through the protected area, tunneling shall be required. All landscape preparation in these areas shall be conducted by hand, except for mechanical tunneling as needed.
6. No vehicles, equipment, materials or fill shall be placed or stored within the protected area.

Figure 4.5-10 Protective Barriers



4.5.11 STANDARDS FOR LANDSCAPE DESIGN, INSTALLATION AND MAINTENANCE

4.5.11.1 Required landscaping and irrigation shall be installed and maintained in accordance with the following standards. Approved landscape and irrigation plans shall provide the basis on which compliance is determined.

4.5.11.2 Selection and Installation of Plant Material

a. Required plant material shall be selected from and planted in accordance with Tables 4.5-6, 4.5-7 and 4.5-8. Other species not listed may be approved by the Director of Parks and Recreation.

b. A (Large) trees shall be used except when the use of B (Medium) or C (Small) trees is specified or permitted herein. The Director of Parks and Recreation may authorize the use of smaller tree sizes depending on specific site conditions. If so, tree size substitution shall be made on the following basis: One A (Large) tree shall equal three B (Medium) trees or six C (Small) trees. One B (Medium) tree shall equal three C (Small) trees.

c. Newly planted trees shall be a minimum eight feet high and a minimum diameter of one inch DBH or one and one-half inches six inches above grade at the time of planting.

d. Upon the recommendation of the Director of Parks and Recreation, palms listed in Table 4.5-7 may be used in place of required qualified trees on a case-by-case basis such as where planting space is limited or where immediate vegetation height is needed. The substitution ratio shall be as determined by the Director of Parks and Recreation.

e. The use of exotic and nuisance plants is prohibited. For purposes of this Section, exotic and nuisance plants shall be those on the most recent Invasive Plant List of the Florida Exotic Pest Plant Council.

f. Plant material shall conform to the standards for Florida No. 1, or better, based on the Florida Department of Agriculture and Consumer Services Publications "Grades & Standards of Nursery Plants, Parts I and II."

g. Grass areas shall be planted in species normally grown in permanent lawns in Polk County. Grass areas may be sodded, plugged, sprigged, or seeded. Solid sod shall be used in swales and other areas subject to erosion. In areas where grass seed is needed, nurse grass seed (i.e., rye, millet) shall also be sown for immediate effect.

h. Ground covers used in lieu of grass shall be planted so as to provide full coverage within one year after planting.

i. No tree shall be planted closer than 15 feet to any light pole.

j. All newly planted trees shall be properly guyed and staked. Guys and stakes shall be maintained for a minimum of one year.

k. Plant material that has been subjected to severe pruning or maintenance practices that results in stunted or abnormal growth shall not be accepted as required plants.

l. Planter beds shall be filled to a depth of three inches with weed free native topsoil incorporated with organic matter. Bare soil shall be covered with a minimum of three inches of mulch consisting of shredded softwood or hardwood chips, nuggets, needles or oak leaves, or two inch diameter stone or brick chips. Non-porous materials shall not be placed under or over the mulch.

TABLE 4.5-6 QUALIFIED TREES

Botanical Name √ = Native	Common Name	Street Tree	Mature Height	Mature Spread	Power Line Offset	Water/ Sewer Offset	Deciduous/ Evergreen	Growth Habit	Soil Moisture	Drought Tolerance	Wind Resistance
LARGE "A" TREES											
Carya illinoinensis	Pecan	No	60'-100'	40'-60'	30'	8’	Deciduous	Broad Oval	Moist to Well-Drained	High	Low
Carya glabra √	Pignut Hickory	No	50'-65'	30'-40'	30'	8’	Deciduous	Oval	Well-Drained	High	Medium
Carya tomentosa √	Mockernut Hickory	Yes	50'-75'	35'-50'	30'	8’	Deciduous	Oval	Well-Drained	High	Medium
Celtis laevigata √	Sugarberry	No	50'-70'	50'-60'	30'	8’	Deciduous	Rounded Vase	Varied	Low	Medium
Chorisia speciosa	Floss Silk Tree	No	35'-50'	40'-50'	30'	8’	Deciduous	Upright	Well-Drained	High	Medium
Cinnamomum camphora	Camphor	Yes	40'-50'	50'-70'	30'	8’	Evergreen	Spreading	Varied	High	High
Fraxinus pennslyvanica √	Green Ash	No	60'-70'	40'-45'	30'	8’	Deciduous	Upright	Varied	Medium	Low
Liquidambar formosana	Formosan Sweetgum	Yes	40'-60'	30'-45'	30'	8’	Deciduous	Pyramidal Rounded	Well-Drained	Medium	Medium
Liquidambar styraciflua √	Sweetgum	Yes	60'-75'	30'-50'	30'	8’	Deciduous	Upright	Moist to Well-Drained	High	Medium
Liriodendron tulipifera √	Tulip Tree	Yes	80'-120'	30'-50'	30'	8’	Deciduous	Pyramidal	Moist to Well-Drained	Medium	Medium
Magnolia grandiflora √	Southern Magnolia	Yes	60'-80'	30'-40'	30'	8’	Evergreen	Upright Pyramidal	Varied	Medium	High

TABLE 4.5-6 QUALIFIED TREES

Botanical Name √ = Native		Common Name	Street Tree	Mature Height	Mature Spread	Power Line Offset	Water/ Sewer Offset	Deciduous/ Evergreen	Growth Habit	Soil Moisture	Drought Tolerance	Wind Resistance
Nyssa sylvatica	√	Black Gum	No	65'-75'	25'-35'	30'	8’	Deciduous	Pyramidal Oval	Moist to Wet	High	Medium
Pinus clausa	√	Sand Pine	No	60'-80'	15'-40'	30'	8’	Evergreen	Pyramidal	Well-Drained	High	Low
Pinus elliotti	√	Slash Pine	No	60'-100'	30'-60'	30'	8’	Evergreen	Upright Open	Varied	High	Medium
Pinus elliotti densa	√	South Fla. Slash Pine	Yes	40'-60'	30'-60'	30'	8’	Evergreen	Upright Open	Varied	High	Medium
Pinus glabra	√	Spruce Pine	No	30'-60'	25'-40'	30'	8’	Evergreen	Upright Open	Varied	Medium	Medium
Pinus palustris	√	Longleaf Pine	No	60'-80'	30'-40'	30'	8’	Evergreen	Upright Irregular	Varied	High	Medium
Platanus occidentalis	√	Sycamore	Yes	75'-90'	60'-70'	30'	8’	Deciduous	Pyramidal Rounded	Varied	Medium	Medium
Quercus hemispherica	√	Laurel Oak	No	65'-100'	40'-60'	30'	8’	Semi-deciduous	Upright	Well-Drained	Medium	Low
Quercus lyrata	√	Overcup Oak	Yes	60'-80'	30'-50'	30'	8’	Deciduous	Rounded	Varied	Medium	High
Quercus michauxii	√	Swamp Chestnut	Yes	60'-80'	30'-50'	30'	8’	Deciduous	Narrow Pyramidal	Moist	Low	High
Quercus nuttalii	√	Nuttal Oak	Yes	60'-80'	40'-50'	30'	8’	Deciduous	Upright	Varied	Medium	Medium
Quercus shumardii	√	Shumard Oak	Yes	60'-80'	40'-50'	30'	8’	Deciduous	Upright	Moist	Medium	Medium
Quercus virginiana	√	Live Oak	Yes	60'-80'	60'-120'	30'	8’	Semi-deciduous	Spreading	Varied	High	High

TABLE 4.5-6 QUALIFIED TREES

Botanical Name √ = Native		Common Name	Street Tree	Mature Height	Mature Spread	Power Line Offset	Water/ Sewer Offset	Deciduous/ Evergreen	Growth Habit	Soil Moisture	Drought Tolerance	Wind Resistance
Tipuana tipu		Pride of Bolivia	Yes	30'-50'	20'-40'	30'	8’	Evergreen	Spreading	Moist	Medium	Medium
Ulmus alata	√	Winged Elm	Yes	40'-70'	30'-40'	30'	8’	Deciduous	Rounded Vase	Dry to Wet	High	Medium
Ulmus americana	√	American Elm	Yes	50'-70'	30'-50'	30'	8’	Deciduous	Vase	Dry to Wet	High	Medium
MEDIUM "B" TREES												
Acer barbatum	√	Florida Sugar Maple	Yes	40'-50'	30'-40'	15'	5’	Deciduous	Rounded	Moist to Medium	Medium	Medium
Acer rubrum	√	Red Maple	No	40'-60'	25'-30'	15'	5’	Deciduous	Upright	Moist to Wet	Medium	Low
Averrhoa carambola		Star Fruit	No	25'-35'	20'-30'	15'	5’	Evergreen	Rounded	Well-Drained	Poor	Medium
Bauhinia blakeana		Hong Kong Orchid Tree	No	25'-30'	25'-35'	15'	5’	Deciduous	Vase	Well-Drained	High	Low
Betula nigra	√	River Birch	No	40'-50'	25’-35’	15'	5’	Deciduous	Upright Angular	Moist to Wet	Low	Medium
Brachychiton acerifolius		Bottle Tree	No	35'-50'	20'-30'	15'	5’	Deciduous	Oval Rounded	Well-Drained	High	Medium
Carpinus caroliniana	√	Blue Beech	No	20'-40'	20'-40'	15'	5’	Deciduous	Upright Oval	Moist to Wet	Medium	High
Cassia leptophylla		Gold Medallion Tree	No	30'-40'	30'-40'	15'	5’	Deciduous	Rounded	Well-Drained	Medium	Medium
Citrus spp.		Orange, Lemon, Grapefruit	No	15'-30’	10’-20'	15'	5’	Evergreen	Spreading	Well-Drained	Medium	Medium

TABLE 4.5-6 QUALIFIED TREES

Botanical Name √ = Native		Common Name	Street Tree	Mature Height	Mature Spread	Power Line Offset	Water/ Sewer Offset	Deciduous/ Evergreen	Growth Habit	Soil Moisture	Drought Tolerance	Wind Resistance
Cupressus arizonica	√	Carolina Saphire	Yes	30'-40'	15'-25'	15'	5’	Evergreen	Columnar	Varied	Medium	Low
Diospyros virginiana	√	Persimmon	No	40’-60'	20'-35'	15'	5’	Deciduous	Rounded	Moist to Wet	High	High
Elaeocarpus decipiens		Japanese Blueberry	Yes	25'-35'	10'-15'	15'	5’	Evergreen	Upright Narrow	Well-Drained	Medium	Medium
Eriobotrya japonica		Loquat	Yes	20'-30'	30'-35'	15'	5’	Evergreen	Round Vase	Varied	Medium	Medium
Gordonia lasianthus	√	Loblolly Bay	No	30'-40'	10'-20'	15'	5’	Evergreen	Narrow Conical	Wet	Low	High
Ilex cassine	√	Dahoon Holly	No	20'-30'	8'-12'	15'	5’	Evergreen	Upright Dense	Moist to Wet	Medium	High
Jacaranda mimosifolia		Jacaranda	No	25'-40'	25'-60'	15'	5’	Deciduous	Vase	Well-Drained	High	Low
Juniperus silicicola	√	Southern Red Cedar	Yes	30'-40'	20'-30'	15'	5’	Evergreen	Conical Open	Varied	High	Medium
Juniperus virginiana	√	Eastern Red Cedar	Yes	40'-50'	10'-25'	15'	5’	Evergreen	Oval Pyramidal	Varied	High	Medium
Koelreuteria formosana		Gold Rain Tree	Yes	25'-35'	25'-35'	15'	5’	Deciduous	Rounded	Well-Drained	High	Low
Lagerstroemia indica ‘Arapaho’		Crape Myrtle	Yes	12’-25’	12’-20’	15'	5’	Deciduous	Vase	Varied	High	High
Lagerstroemia indica ‘Bashams Party Pink’		Crape Myrtle	Yes	15’-25’	15’-20’	15'	5’	Deciduous	Rounded	Varied	High	High
Lagerstroemia indica ‘Biloxi’		Crape Myrtle	Yes	15’-25’	15’-20	15'	5’	Deciduous	Open	Varied	High	High

TABLE 4.5-6 QUALIFIED TREES

Botanical Name √ = Native	Common Name	Street Tree	Mature Height	Mature Spread	Power Line Offset	Water/ Sewer Offset	Deciduous/ Evergreen	Growth Habit	Soil Moisture	Drought Tolerance	Wind Resistance
Lagerstroemia indica 'Dynamite'	Crape Myrtle	Yes	15'-25'	15'-20	15'	5'	Deciduous	Upright	Varied	High	High
Lagerstroemia indica 'Fantasy'	Crape Myrtle	Yes	15'-25'	15'-20	15'	5'	Deciduous	Vase	Varied	High	High
Lagerstroemia indica 'Glendora White'	Crape Myrtle	Yes	15'-25'	15'-20	15'	5'	Deciduous	Upright	Varied	High	High
Lagerstroemia indica 'Kiowa'	Crape Myrtle	Yes	15'-25'	15'-20	15'	5'	Deciduous	Vase	Varied	High	High
Lagerstroemia indica 'Miami'	Crape Myrtle	Yes	15'-25'	15'-20	15'	5'	Deciduous	Upright	Varied	High	High
Lagerstroemia indica 'Muskogee'	Crape Myrtle	Yes	15'-25'	15'-20	15'	5'	Deciduous	Rounded	Varied	High	High
Lagerstroemia indica 'Natchez'	Crape Myrtle	Yes	15'-25'	15'-20	15'	5'	Deciduous	Rounded	Varied	High	High
Lagerstroemia indica 'Townhouse'	Crape Myrtle	Yes	15'-25'	15'-20	15'	5'	Deciduous	Vase	Varied	High	High
Lagerstroemia indica 'Tuscarora'	Crape Myrtle	Yes	15'-25'	15'-20	15'	5'	Deciduous	Upright	Varied	High	High
Lagerstroemia indica 'Tuskegee'	Crape Myrtle	Yes	15'-25'	15'-20	15'	5'	Deciduous	Vase	Varied	High	High
Lagerstroemia indica 'Wichita'	Crape Myrtle	Yes	15'-25'	15'-20	15'	5'	Deciduous	Upright	Varied	High	High
Morus rubra √	Red Mulberry	No	30'-50'	35'-50'	15'	5'	Deciduous	Rounded	Moist to Wet	Medium	Low
Olea europaea	Olive	Yes	25'-50'	25'-35'	15'	5'	Evergreen	Irregular	Varied	High	Medium

TABLE 4.5-6 QUALIFIED TREES

Botanical Name √ = Native	Common Name	Street Tree	Mature Height	Mature Spread	Power Line Offset	Water/ Sewer Offset	Deciduous/ Evergreen	Growth Habit	Soil Moisture	Drought Tolerance	Wind Resistance
Podocarpus macrophyllus	Podocarpus	Yes	30'-50'	15'-25'	15'	5’	Evergreen	Upright	Varied	High	High
Podocarpus nagi	Broadleaf Podocarpus	Yes	30'-50'	15'-25'	15'	5’	Evergreen	Upright	Varied	High	High
Podocarpus gracilior	Weeping Podocarpus	Yes	30'-50'	25'-35'	15'	5’	Evergreen	Weeping	Varied	High	High
Quercus austrina √	Bluff Oak	Yes	40'-60'	30'- 40'	15'	5’	Deciduous	Broad Pyramidal	Wet to Medium	Medium	High
Quercus geminata √	Sand Live Oak	Yes	30'-50'	45'-60'	15'	5’	Semi-deciduous	Spreading	Well-Drained Sandy	High	High
Quercus incana √	Bluejack Oak	No	25'-50'	25'-35'	15'	5’	Deciduous	Rounded	Varied	High	High
Quercus marilandica √	Blackjack Oak	No	30'-40'	20'-30'	15'	8’	Deciduous	Rounded	Medium to Dry	High	High
Quercus marilandica √	Sand Post Oak	No	25'-50'	25'-35'	15'	5’	Deciduous	Oval	Well-Drained	High	High
Quercus stellata √	Post Oak	Yes	20'-40'	15'-25'	15'	5’	Deciduous	Irregular	Varied	High	High
Salix babylonica	Weeping Willow	No	45'-70'	45'-70'	15'	5’	Semi-deciduous	Rounded Upright	Moist to Wet	Medium	Low
Salix caroliniana √	Coastal Plain Willow	No	30'	20'-25'	15'	5’	Deciduous	Round Spreading	Wet	Medium	Low
Tabebuia caraiba	Trumpet Tree	No	15'-25'	10'-15'	15'	5’	Deciduous	Irregular	Varied	High	Low
Tabebuia chrysotricha	Gold Trumpet	Yes	25'-35'	25'-35'	15'	5’	Deciduous	Upright	Varied	Medium	Low

TABLE 4.5-6 QUALIFIED TREES

Botanical Name √ = Native	Common Name	Street Tree	Mature Height	Mature Spread	Power Line Offset	Water/ Sewer Offset	Deciduous/ Evergreen	Growth Habit	Soil Moisture	Drought Tolerance	Wind Resistance
	Tree										
Tabebuia heterophylla	Pink Trumpet Tree	Yes	40'-50'	35'-50'	15'	5’	Deciduous	Oval Round	Varied	Medium	Low
Tabebuia impetiginosa	Purple Trumpet Tree	Yes	20'-30'	15'-25'	15'	5’	Deciduous	Oval Round	Varied	Medium	Low
Tabebuia umbellata	Yellow Trumpet Tree	Yes	10'-20'	25'-35'	15'	5’	Deciduous	Horizontal	Varied	High	Low
Taxodium ascendens √	Pond Cypress	No	60'-80'	15'-30'	15'	5’	Deciduous	Upright	Dry to Wet	High	High
Taxodium distichum √	Bald Cypress	Yes	60'-80'	15'-30'	15'	5’	Deciduous	Upright	Dry to Wet	High	High
Tecoma stans	Yellow Elder	No	20'-30'	20'-30'	15'	5’	Evergreen	Oval	Varied	High	Medium
Thuja occidentalis	Arborvitae	No	30'-50'	15'-25'	15'	5’	Evergreen	Upright	Varied	Medium	Medium
Ulmus parvifolia 'Allee'	Allee Elm	Yes	40'-50'	35'-50'	15'	5’	Deciduous	Upright Oval	Well-Drained	High	Low
SMALL "C" TREES											
Acacia farnesiana √	Sweet Acacia	No	15'-25'	15'-25'	None	None	Semi-Evergreen	Rounded	Varied	High	High
Caesalpinia pulcherrima	Dwarf Poinciana	No	8'-12'	10'-12'	None	None	Evergreen	Rounded	Well-Drained	High	Low
Callistemon rigidus	Bottlebrush	No	15'-20'	15'-20'	None	None	Evergreen	Upright	Moist to Well-	High	Medium

TABLE 4.5-6 QUALIFIED TREES

Botanical Name √ = Native	Common Name	Street Tree	Mature Height	Mature Spread	Power Line Offset	Water/ Sewer Offset	Deciduous/ Evergreen	Growth Habit	Soil Moisture	Drought Tolerance	Wind Resistance
									Drained		
Callistemon viminalis	Weeping Bottlebrush	No	15'-20'	15'-20'	None	None	Evergreen	Weeping	Moist to Well-Drained	High	Medium
Camellia sansanqua	Sansanqua	No	15'-20'	15'-20'	None	None	Evergreen	Rounded	Well-Drained	Medium	Medium
Cassia bicapsularis	Butterfly Bush	No	8'-12'	8'-10'	None	None	Semi-Evergreen	Rounded	Well-Drained	Medium	Low
Chionanthus retusa √	Chinese Fringetree	No	15'-20'	10'-15'	None	None	Deciduous	Rounded	Well-Drained	Medium	Medium
Cordia boissieri	White Geiger Tree	No	15'-20'	10'-15'	None	None	Evergreen	Rounded	Well-Drained	High	High
Eugenia foetida	Simpson Stopper	Yes	10'-20'	10'-15'	None	None	Evergreen	Rounded	Varied	High	Medium
Ilex cornuta 'Burfordii' √	Burford Holly	Yes	15'-25'	15'-25'	None	None	Evergreen	Rounded	Well-Drained to Moist	Medium	High
Ilex vomitoria √	Yaupon Holly	Yes	15'-25'	15'-20'	None	None	Evergreen	Rounded Vase	Varied	High	High
Ilex vomitoria pendula √	Weeping Yaupon Holly	Yes	15'-30'	8'-12'	None	None	Evergreen	Weeping	Varied	High	High
Lagerstroemia indica	Crape Myrtle	Yes	10'-30'	15'-25'	None	None	Deciduous	Vase	Varied	High	High
Lagerstroemia indica 'Acoma'	Crape Myrtle	Yes	6'-12'	6'-10'	None	None	Deciduous	Pendulous	Varied	High	High
Lagerstroemia indica 'Apalachee'	Crape Myrtle	Yes	12'-20'	10'15'	None	None	Deciduous	Upright	Varied	High	High

TABLE 4.5-6 QUALIFIED TREES

Botanical Name √ = Native	Common Name	Street Tree	Mature Height	Mature Spread	Power Line Offset	Water/ Sewer Offset	Deciduous/ Evergreen	Growth Habit	Soil Moisture	Drought Tolerance	Wind Resistance
Lagerstroemia indica 'Centennial'	Crape Myrtle	Yes	6'-12'	6'-10'	None	None	Deciduous	Rounded	Varied	High	High
Lagerstroemia indica 'Cherokee'	Crape Myrtle	Yes	6'-12'	6'-10'	None	None	Deciduous	Upright	Varied	High	High
Lagerstroemia indica 'Comanche'	Crape Myrtle	Yes	12'-20'	10'-15'	None	None	Deciduous	Upright	Varied	High	High
Lagerstroemia indica 'Hope'	Crape Myrtle	Yes	6'-12'	6'-10'	None	None	Deciduous	Open	Varied	High	High
Lagerstroemia indica 'Hopi'	Crape Myrtle	Yes	6'-12'	6'-10'	None	None	Deciduous	Open	Varied	High	High
Lagerstroemia indica 'Lipan'	Crape Myrtle	Yes	12'-20'	10'-15'	None	None	Deciduous	Upright	Varied	High	High
Lagerstroemia indica 'Near East'	Crape Myrtle	Yes	12'-20'	10'-15'	None	None	Deciduous	Open	Varied	High	High
Lagerstroemia indica 'Osage'	Crape Myrtle	Yes	12'-20'	10'-15'	None	None	Deciduous	Rounded	Varied	High	High
Lagerstroemia indica 'Osage Blush'	Crape Myrtle	Yes	12'-20'	10'-15'	None	None	Deciduous	Rounded	Varied	High	High
Lagerstroemia indica 'Pecos'	Crape Myrtle	Yes	6'-12'	6'-10'	None	None	Deciduous	Vase	Varied	High	High
Lagerstroemia indica 'Red Rooster'	Crape Myrtle	Yes	6'-12'	6'-10'	None	None	Deciduous	Rounded	Varied	High	High
Lagerstroemia indica 'Sarahs Favorite'	Crape Myrtle	Yes	12'-20'	10'-15'	None	None	Deciduous	Upright	Varied	High	High

TABLE 4.5-6 QUALIFIED TREES

Botanical Name √ = Native		Common Name	Street Tree	Mature Height	Mature Spread	Power Line Offset	Water/ Sewer Offset	Deciduous/ Evergreen	Growth Habit	Soil Moisture	Drought Tolerance	Wind Resistance
Lagerstroemia indica 'Sioux'		Crape Myrtle	Yes	12'-20'	10'-15'	None	None	Deciduous	Upright	Varied	High	High
Lagerstroemia indica 'Tonto'		Crape Myrtle	Yes	6'-12'	6'-10'	None	None	Deciduous	Rounded	Varied	High	High
Lagerstroemia indica 'Yuma'		Crape Myrtle	Yes	12'-20'	10'-15'	None	None	Deciduous	Open	Varied	High	High
Ligustrum japonicum		Waxleaf Privet	Yes	10'-15'	15'-20'	None	None	Evergreen	Oval Round	Varied	High	Medium
Parkinsonia aculeata		Jerusalem Thorn	No	15'-20'	20'-25'	None	None	Deciduous	Vase Spreading	Varied	High	High
Prunus angustifolia	√	Chickasaw Plum	No	12'-20'	15'-20'	None	None	Deciduous	Rounded	Well-Drained	High	Medium
Prunus umbellatta	√	Flatwoods Plum	No	15'-20'	15'-20'	None	None	Deciduous	Rounded	Well-Drained	Medium	High
Viburnum odoratissimum 'Awabuki'		Awabuki Sweet Viburnum	No	15'-20'	15'-20'	None	None	Evergreen	Rounded	Well-Drained	High	High
Vitex agnus-castus	√	Chastetree	Yes	10'-15'	15'-20'	None	None	Deciduous	Rounded	Varied	High	Medium

TABLE 4.5-7 QUALIFIED PALMS

Botanical Name √ = Native	Common Name	Street Tree	Mature Height	Mature Spread	Power Line Offset	Water/ Sewer Offset	Deciduous/ Evergreen	Growth Habit	Soil Moisture	Drought Tolerance	Wind Resistance
"D" PALMS											
Bismarkia nobilis 'Silver'	Silver Bismark Palm	No	30'-60'	10'-20'	30'	5’	Evergreen	Upright Palm	Varied	High	High
Phoenix canariensis	Canary Island Date Palm	No	40'-60'	15'-25'	30'	5’	Evergreen	Upright with long fronds	Varied	High	High
Phoenix reclinata 'X'	Senegal Date Palm	No	25'-30'	10'-20'	30'	5’	Evergreen	Upright with long fronds	Varied	High	High
Phoenix rupicola	Cliff Date Palm	No	40'-60'	10'-20'	30'	5’	Evergreen	Upright with long fronds	Varied	High	High
Phoenix sylvestris	Sylvester Palm	No	40'-50'	10'-20'	30'	5’	Evergreen	Upright with long fronds	Varied	High	High
Syagrus romanzoffiana	Queen Palm	No	30'-50'	15'-20'	30'	5’	Evergreen	Upright with long fronds	Varied	High	High
Archontophoenix alexandrae	Alexandra Palm	No	60'-90'	5'-10'	15'	5’	Evergreen	Upright Palm	Varied	High	High
Archontophoenix cunninghamiana	Picabeen Palm	No	30'-40'	10'-15'	15'	5’	Evergreen	Upright Palm	Varied	High	High
Butia capitata	Pindo Palm	No	15'-25'	10'-15'	15'	5’	Evergreen	Upright Palm	Varied	High	High

TABLE 4.5-7 QUALIFIED PALMS

Botanical Name √ = Native	Common Name	Street Tree	Mature Height	Mature Spread	Power Line Offset	Water/ Sewer Offset	Deciduous/ Evergreen	Growth Habit	Soil Moisture	Drought Tolerance	Wind Resistance
Livistonia chinensis	Chinese Fan Palm	No	30'-50'	5'-10'	15'	5’	Evergreen	Upright Palm	Varied	High	High
Livistonia decipiens	Ribbon Palm	No	30'-50'	5'-10'	15'	5’	Evergreen	Upright Palm	Varied	High	High
Livistonia nitida	Ribbon Palm	No	30'-50'	5'-10'	15'	5’	Evergreen	Upright Palm	Varied	High	High
Sabal causiarum	Hat Palm	No	40'-50'	10'-15'	15'	5’	Evergreen	Upright Palm	Varied	High	High
Sabal balckburiana	Hat Palm	No	40'-50'	10'-15'	15'	5’	Evergreen	Upright Palm	Varied	High	High
Sabal palmetto √	Cabbage Palm	No	30’-80’	10'-15'	15'	5’	Evergreen	Upright Palm	Varied	High	High
Washingtonia filifera	California Fan Palm	No	40'-50'	10'-15'	15'	5’	Evergreen	Upright Palm	Varied	High	High
Washingtonia robusta	Petticoat Palm	No	40'-60'	10'-15'	15'	5’	Evergreen	Upright Palm	Varied	High	High

TABLE 4.5-8 QUALIFIED SHRUBS, FLOWERS AND GROUNDCOVERS

Botanical Name √ = Native		Common Name	Light Intensity	Flower Season
GROUNDCOVERS FOR NORMAL TO WET SITES				* Subject to freeze damage
Acrostichum danaeifolium	√	Giant Leather Fern	Low	NA
Ajuga reptans		Ajuga	Partial	Spring
Andropogon virginicus		Broomsedge	Full	Fall
Asparagus aethiopicus 'Myers'		Foxtail Fern	Partial	NA
Asparagus densiflorus		Sprengeri Fern	Partial	NA
Asplenium nidus		Birdsnest Fern	Low/Partial	NA
Bacopa monnieri		Smooth Water-hyssop	Full	
Blechnum serrulatum	√	Swamp Fern	Partial/Full	NA
Chasmanthium latifolium		Broadleaf Woodoats	Full	
Cuphea hyssopifolia		False Heather	Full	Spring/Summer
Cyrtomium falcatum		Holly Fern	Low	NA
Distichilis spicata		Grass Salt	Full	
Eremochloa ophiuroides		Grass Centipede	Full	NA
Evolvulus glomerata		Blue Daze	Full	Summer
Ficus pumila		Creeping Fig	Partial	NA
Juniperus procumbens		Juniper Japanese Garden	Full	NA
Mimosa strigillosa	√	Powderpuff	Full	
Muhlenbergia capillaris	√	Grass, Muhly	Full	Summer
Nephrolepis biserrata	√	Giant Sword Fern	Partial	NA
Nephrolepis exaaltata	√	Boston Fern	Partial	NA
Osmunda cinnamomea	√	Cinnamon Fern	Low	NA
Osmunda regalis	√	Royal Fern	Low/Partial	NA
Panicum hemitomon		Maidencane	Full	
Rumohra adiantiformis		Leatherleaf Fern	Partial/Full	NA
Sophastrum secundum	√	Grass, Lopsided Indian	Full	
Spartina alterniflora	√	Grass, Smooth Cord	Full	
Stachytarpheta Jamaicensis	√	Porterweed	Full	Summer
*Tetrastigma voinerianum**		Grape Ivy	Low/Partial	NA

TABLE 4.5-8 QUALIFIED SHRUBS, FLOWERS AND GROUNDCOVERS

Botanical Name √ = Native		Common Name	Light Intensity	Flower Season
Thelypteris kunthii		Southernshield Fern		NA
Trachelospermum asiaticum		Jasimine Asiatic	Partial	NA
Tradescantia pallida		Purple Queen	Low	
*Various species**	√	Bromeliad	Low	VARIES
GROUND COVERS FOR NORMAL TO DRY SITES				* Subject to freeze damage
Aspidistra elatior		Cast Iron Plant	Full	NA
Cynodon dactylon		Grass, Bermuda	Full	NA
Dianella tasmanica		Flax Lily	Full	
Eragrostis spectabilis	√	Grass, Purple Love	Full	
Gelsemium sempervirens	√	Carolina Jasmine	Full	Summer
Helianthus debilis	√	Beach Sunflower	Full	
Hypericum reductum	√	St. John's Wort	Full	
FLOWERS FOR NORMAL TO DRY SITES				* Subject to freeze damage
Lupinus diffusus		Lupine, Sky-blue	Full	
Monarda punctata		Dotted Horsemint	Full	
Neomarica spp		Iris, walking	Full	
Penstemon multiflorus		Beardtongue, White	Full	
Pentas lanceolata		Pentas	Full	Summer/Spring
Phlox divaricata		Phlox, Woodland	Full	Winter
Phlox drummondii		Phlox, Garden	Full	Winter
Pityopsis graminifolia		Silkgrass	Full	
Portulaca grandiflora		Moss Rose or Portulaca	Full	Summer
Ruellia caroliniensis		Wild Petunia	Full	Spring/Summer
Salvia splendens		Sage, Tropical	Full	Winter
Senecio cineraria		Dusty-miller	Full	Winter
Stokesia laevis		Aster, Stokes'	Full	Winter
Tithonia diversifolia		Mexican Sunflower	Full	Winter
Tithonia rotundifolia		Mexican Zinnia	Full	Winter
Verbena bonariensis		Verbena, Purpletop or Roadside	Full	Winter
Yucca spp		Yucca	Full	Summer
SHRUBS FOR NORMAL TO WET SITES				* Subject to freeze damage ^ Recommended for vehicle use areas
Acalypha hispida		Chenille Plant	Full	Summer
Acca sellowia		Pineapple Guava	Full	
Agarista populifolia		Pipestem	Low/Partial	
Brunfelsia grandiflora		Yesterday Today Tomorrow	Partial	Spring
Calycanthus	√	Sweet Shrub	Partial/Full	Summer

TABLE 4.5-8 QUALIFIED SHRUBS, FLOWERS AND GROUNDCOVERS

Botanical Name √ = Native		Common Name	Light Intensity	Flower Season
floridaus				
Clerodendrum quadriloculare 'Brandonii'*		Variegated Shooting Star	Partial/Full	Summer
*Clerodendrum quadriloculare**		Shooting Star	Full	Summer
Clethra alnifolia	√	Sweet Pepperbush	Full	Spring
Cocculus laurifolius		Snailseed		
*Conocarpus erectus**	√	Silver Buttonwood	Full	NA
Cyrilla racemiflora	√	Titi	Fall/Low	Summer
Elaeocarpus decipiens		Japanese Blueberry	Full	NA
Galphimia gracilis		Thryallis	Full	Summer
Gardenia augusta		Gardenia, Cape Jasmine	Full	Spring
Hamelia patens	√	Firebush	Full/Partial	Summer
Hibiscus rosa-sinensis		Hibiscus	Full	Spring
Hydrangea macrophylla		Hydrangea	Partial	Summer
Llex crenata^		Japanese Holly	Full/Partial	NA
Llex glagra	√	Galberry	Full	NA
Jasminum mesnyi		Jasmine	Full	NA
Jasminum multiflorum		Downy Jasmine	Full	Summer
Juniperus chinensis		Chinese Juniper	Full	NA
Lyonia lucida	√	Lyonia Shiny	Full/Partial	
Myrica cerifera	√	Wax Myrtle	Full/Partial	
Odontonema cuspidata		Firespike	Full	Spring
Osmanthus fragrans		*Sweel Olive	Full	NA
*Philodendron spp**		Philodendron, 'Xanadu'	Low	Fall/Winter
Plumbago auriculata		Plumbago	Low	NA
Podocarpus macrophyllus^		Podocarpus	Full	Spring/Summer
Psychotria nervosa	√	Wild Coffee	Low	
Pyracantha coccinea		Firethorn	Low	
Rapanea punctata	√	Myrsine	Full	Winter
Rhaphiolepis indica^		Indian Hawthorne	Full	Winter
Rhododendron austrinum		Azalea, Florida Flame	Low	Spring/Summer
Rhododendron Minus 'Chapmanii'	√	Chapemans Rhododendron	Low	
Rosa hybrid		Rose, 'Knockout'	Full	

TABLE 4.5-8 QUALIFIED SHRUBS, FLOWERS AND GROUNDCOVERS

Botanical Name √ = Native		Common Name	Light Intensity	Flower Season
Rosa laevigata		Rose, Charokee	Full	
Hibiscus syriacus		Rose of Sharon	Full	
*Robus spp'*Brazos'	√	Blackberry	Full	
Percea palustris	√	Swamp Bay	Full	
Tecoma capensis		Honeysuckle, Cape	Full	Winter
Tibouchina spp		Glory Bush	Full	NA
Tripsacum dactyloides		Fakahatchee Grass	Full	
Vaccinium cultivars	√	Blueberry	Full	
Viburnum obovatum	√	Viburnum, 'Miss Shiller's Delight'	Full	
viburnum obovatum^	√	Viburnum, 'Walters'	Full	
Viburnum odoratissimum		Viburnum, Sweet	Full	
Viburnum odoratissimum 'Awabuki'^		Viburnum, Mirror Leaf	Full	
Virburnum suspensum^		Viburnum, sandankwa	Full	
*Zingiber zerumbet**		Variegated Ginger	Full/Partial	
SHRUBS FOR NORMAL TO DRY SITES				* Subject to freeze damage ^ Recommended for vehicle use areas
*Acalypha wilkesiana**		Copper Plant	Full	NA
Agave americana		Century Plant	Full	Summer
*Allamanda cathartica**		Allamanda	Full	Summer
Bougainvillea glabra		Bougainvillea	Full	Spring/Summer
Callicarpa americana	√	American Beautiberry	Partial/Full	Summer
Callistemon citrinos		Bottle Brush, 'Red Cluster'	Full	Summer
Camellia japonica	√	Camellia	Partial	Winter/Spring
Camellia sasanqua	√	Camellia	Full	Fall
*Coccoloba uvifera**	√	Sea Grape	Full	Spring
*Codiaeum variegatum**		Croton	Partial/Full	NA
Cortaderia Selloana		Pampas Grass	Full	Summer
Crinum asiaticum	√	Crinum Lily	Partial/Full	Summer/Fall
*Duranta erecta**		Duranta, 'Cuban Gold'	Full	Summer
*Duranta erecta**		Duranta, 'Gold Mound'	Full	Summer
*Duranta erecta**		Duranta, 'Sapphire Showers'	Fall	Summer
Elaeagnus pungens^		Silverthorn	Fall	NA
*Eugenia uniflora**		Surinam Cherry	Fall	Spring
Hydrangea quefcifolia	√	Hydrangea Oakleaf	Partial	Spring

TABLE 4.5-8 QUALIFIED SHRUBS, FLOWERS AND GROUNDCOVERS

Botanical Name √ = Native		Common Name	Light Intensity	Flower Season
Ilex vomitoria^	√	Holly, 'Stoke's Dwarf'	Fall	
*Ixora coccinea**		Lxora	Fall	Summer
*Jatropha spp**		Jatropha	Fall	Summer
Lantana involucrata	√	Wild Sage	Fall	Winter/Spring
Lycium carolinianum		Christmas Berry		
Lyonia ferruginea	√	Lyonia, Rusty		
Malvaviscus arboreus		Turk's Cap		
Nandina domestica		heavenly Bamboo	Fall/Partial	Summer
Nerium oleander		Oleander	Fall	Spring/Summer
Philodendron selloum		Philodendron	Partial	NA
*Plumbago auriculata**		Plumbago	Fall	Winter/Spring
Platycladus orientalis		Arbor-vitae, Oriental	Fall	NA
Podocarpus macrophyllus		Podocarpus	Fall/Partial	NA
Rasmarinus officinalis		Rosemary	Fall	NA
*Schefflera arbicola**		Dwarf Schefflera	Partial	NA
Severinia buxifolia		Boxthorn		NA
Sophora tomentosa	√	Yellow Necklace Pod		Summer
Vaccinium darrowii	√	Blueberry Darrow's	Fall	Spring
Yucca aloifolia	√	Spanish Bayonet	Fall	Summer

4.5.11.3 Irrigation Systems

a. Unless otherwise provided herein, all required landscaping shall be irrigated by a permanent irrigation system designed for maximum water conservation which shall provide 100 percent coverage of plant material, and shall be fully operational before building occupancy, except that no irrigation system shall be required in those areas where existing trees or areas of natural vegetation are to be preserved as indicated on the approved landscape plan. If approved by the Director of Parks and Recreation, newly planted trees may be irrigated by a temporary irrigation system. Newly planted trees shall be irrigated until they are established, at which time irrigation may be terminated and any temporary irrigation system removed.

b. Rain shut-off devices shall be required.

c. Irrigation systems serving landscape areas having different irrigation demand shall be zoned accordingly.

d. Water Source

1. At the discretion of the Water Utilities Department, the use of non-potable water sources may be required for irrigation. Non-potable sources include shallow wells, agricultural wells, lakes, ponds, stormwater retention and detention facilities, and reclaimed/reuse water systems. Where non-potable irrigation water systems are planned but not yet operational, at the discretion of the Water Utilities Department the irrigation system may be connected to the potable water system and disconnected when non-potable irrigation water becomes available. The use of non-potable irrigation water sources shall not exempt development from the water-efficient landscaping principles of this Article.

2. Irrigation systems shall not be connected to both potable and non-potable sources due to the potential of contaminating the City's potable water system. Any water source other than the City's potable water system is an "auxiliary supply." Where an auxiliary supply is used, there shall be a physical disconnect (air gap) between the two piping systems. An approved backflow prevention assembly shall be installed at the City's water service connection to any premises where there is an auxiliary water supply, even though there is no connection between the auxiliary water supply and the public potable water system. Backflow prevention assemblies approved by the Water Utilities Department shall be installed on all potable water service connections/meters to the site, including those for domestic, fire service and irrigation water.

4.5.11.4 Maintenance of Landscaping

a. Required landscaping shall be maintained in healthy condition at all times. No required shrubs or trees shall be destroyed without a permit issued by the Director of Parks and Recreation upon approval of a proposed landscape plan or subdivision construction plan.

b. Required trees shall not be abused. Required trees shall not be pruned or trimmed in such a manner as to prevent the tree from reaching its mature height and canopy.

c. All areas that are to be preserved as natural vegetation shall be maintained to eliminate invasive vegetation, lawn grasses, trash, or other debris and shall be managed to maintain the plant community in its natural state.

d. Stormwater management facilities shall be maintained free of cattails or other invasive or noxious growth in accordance with City of Lakeland and SWFWMD requirements and permits.

e. Landscaping within visibility triangles shall be maintained in accordance with Section 4.12.

f. Mulch shall be replenished as necessary to maintain a three inch depth.

g. This section shall not apply to tree clearance activity or emergency repair work authorized by a public utility within a right-of-way or utility easement.

4.5.12 LANDSCAPE AND IRRIGATION PLANS

4.5.12.1 Landscaping and Irrigation Plans Required

a. A landscape plan and an irrigation plan, prepared in accordance with this Article and the most recent administrative procedures, shall be submitted with applications for building permits, site plans, preliminary subdivision plats and occupancy permits for all projects to which this Article applies (See Section 4.5.1.2 Applicability.) Additional landscaping, landscape plans and irrigation plans shall not be required for premises with conforming landscaping. Landscape and irrigation plans for commercial and multi-family projects of five acres or greater shall be signed and sealed by a Registered Landscape Architect licensed in the State of Florida.

b. A separate landscape plan and an irrigation plan is optional in the case of single-family or two-family structures. In lieu of a separate landscape plan, the location of all trees necessary to meet minimum tree density and all trees to be preserved and protected during construction shall be shown on the construction plans as part of the application for a building permit. Where irrigation is provided, rain shut-off devices and back flow preventers are required and non-potable water sources may be required.

4.5.12.2 Landscaping Plan Requirements

Landscaping plans shall contain the following minimum information:

a. Name, address, and telephone number of both the owner and the designer.
b. Scale (minimum 1" = 40'), north arrow, and date.
c. Location, common name and DBH of all regulated trees. Indicate whether each is to be preserved, relocated or destroyed. The new location of all relocated trees. The

proposed location of replacement trees. As an alternative, regulated trees proposed to be destroyed may be documented on a separate tree survey or existing conditions plan. This requirement may be waived by the Director of Parks and Recreation if he finds after a field visit that there are no significant trees in the site.

d. Areas of natural vegetation proposed to be preserved.
e. Location and dimensions of all planter strips, planter beds, landscape islands and plant materials.
f. Vehicle use areas including parking spaces, driveways, drive aisles, loading areas and other vehicle maneuvering areas.
g. Abutting rights-of-way, street names, centerlines, curb lines, curb cuts and median openings.
h. Stormwater retention ponds, backflow prevention assemblies, transformers, switchgear boxes and other on-site facilities.
i. Overhead and underground utilities.
j. Sight visibility triangles in accordance with Section 4.12.

4.5.12.3 Irrigation Plan Requirements

Irrigation plans shall contain the following minimum information. Such plans should be separate from the landscape plan but should use the same format and scale.

a. Location of rotor and spray heads, drip system mainlines, valves and valve boxes, controller, rain shut-off devices, and back flow preventer;
b. Location and identification of water source including, if applicable, location of well and size of pump;
c. Location and size of pipes;
d. Location of sleeves, if any;
e. Design radius of rotor and spray heads; and
f. Flow rate and static water pressure at the point of connection.

4.5.13 ENFORCEMENT

4.5.13.1 General

a. No building permit shall be issued unless the landscape and irrigation plans have been approved.

b. No Certificate of Occupancy shall be issued unless all required landscaping has been installed in accordance with the approved landscape and irrigation plans, unless a cash bond in the amount of 200 percent of the cost of the required landscaping is posted by the developer in lieu of complete installation. The amount of the bond shall be determined by the Director of Parks and Recreation. The owner shall comply with these landscaping requirements within 30 days from the date the bond is posted.

c. Failure to comply with the provisions of this Article shall constitute grounds for the issuance of a stop work order and/or the withholding or revocation of site plan approval, building permits, certificates of occupancy or any other approvals necessary to commence or continue development.

d. The property owner shall take immediate corrective action upon notice from the city that any tree or landscaping is a threat to public safety or to property.

e. This section shall not apply to tree clearance activity or emergency repair work authorized by a public utility within a right-of-way or utility easement.

4.5.13.2 Penalties for Non-Compliance

Should a non-compliance with the requirements of this Article be found to exist at any time, the property owner shall take remedial action within 30 days from the date of notification from the city in accordance with the following.

a. Required Landscaping Damaged or Destroyed Due to Natural or Accidental Causes

1. Required landscaping damaged as the result of natural or accidental causes may require pruning, fertilizing, watering or other remedial action to restore the health of the landscaping, as the Director of Parks and Recreation may determine.

2. Required landscaping destroyed as the result of natural or accidental causes shall be replaced on a plant by plant basis. Each required tree that is destroyed shall be replaced with a tree or number of trees equivalent to the diameter of the required tree when it was destroyed. The quantity and quality of replacement plant material shall be in accordance with the approved landscape plan or subdivision construction plan and the requirements of this Article. In the event that replacement trees cannot be located in accordance with the original landscape plan, alternative locations or other mitigating actions may be approved by the Director of Parks and Recreation.

b. Required Landscaping Damaged or Destroyed Due to Willful Action or Neglect

1. Required landscaping damaged as the result of willful action or neglect, including the failure to irrigate, may require pruning, fertilizing, watering or other remedial action to restore the health of the landscaping and may be subject to penalties as the Director of Parks and Recreation may determine is warranted under the particular circumstances.

2. Required landscaping destroyed by willful action or neglect, including failure to obtain a tree removal permit or other permission, shall be replaced on a plant by plant basis and, in addition, may be subject to the following penalties as the Director of Parks and Recreation may determine is warranted under the particular circumstances. In the event that replacement trees cannot be located in accordance with the original landscape plan, alternative locations or other mitigating actions may be approved by the Director of Parks and Recreation.

(a) Installation of landscape plantings over and above plant by plant replacement, not to exceed 150 percent of the required landscaping in the

case of shrubs or 150 percent of the diameter of required trees based on the diameter of each required tree when it was destroyed.

(b) Payment of a fine into the Tree Trust Fund, not to exceed 150 percent of the valuation of required trees based on the diameter of each required tree when it was destroyed. Fines shall be as adopted by resolution of the City Commission.

3. The quantity, quality and location of replacement plant material shall, at a minimum, be in accordance with the approved landscape plan or subdivision construction plan and the requirements of this Article.

4. In the event a person abuses a tree in violation of this Article, the violator shall be responsible for the cost of pruning and other remedial actions that the Director of Parks and Recreation determines are reasonably necessary to protect public safety and property, and to help the tree survive the abuse.

5. In the case of street trees destroyed by willful action or neglect, the violator shall be required to mitigate the loss with the installation of replacement trees. The Beautification Board may require up to ten times the DBH of the destroyed tree in replacement trees in accordance with Table 4.5-5. The minimum size of replacement trees shall be two inch caliper.

4.5.13.3 Referral to Code Enforcement Board

In the event that a property owner is unwilling or unable to resolve a non-compliance by remedial actions in accordance with Section 4.5.13.2, the Director of Parks and Recreation shall notify the Code Enforcement Board and request a hearing.

4.5.14 APPEALS

4.5.14.1 Any order, requirement, decision or determination by any official or by the Beautification Board alleged to have been made in error of this Article may be made to the Zoning Board of Adjustment and Appeals.

4.5.14.2 In cases where literal enforcement of the terms of this Article would result in unnecessary hardship and the granting of a variance would not be contrary to the public interest, application for a variance may be made to the Zoning Board of Adjustment and Appeals, in accordance with the provisions of Article 12.

4.6 OUTDOOR LIGHTING

4.6.1 INTENT AND APPLICABILITY

4.6.1.1 Intent

It is the intent of this Section to minimize the amount of light trespass onto adjacent properties and thoroughfares, minimize the amount of light spill into the night sky and

minimize the negative impacts of excessive outdoor light while preserving safety, security and nighttime use and enjoyment of property.

4.6.1.2 Applicability

a. Unless otherwise provided herein, all development shall meet the requirements of this Section.

b. Subject to Section 4.1.2, development lawfully existing as of the effective date of this Code may be maintained, renovated or repaired without modifying outdoor lighting in conformance with this Section.

c. This Section shall not apply to:

1. Single family or two family dwellings.

2. Lights within road rights-of-way.

3. Lighting required by the Federal Communications Commission, Federal Aviation Administration, Federal Occupational Safety and Health Administration, or other federal , state or county agencies.

4. Lighting required by law enforcement, fire and rescue, or other emergency response agencies to perform emergency or construction repair work or to perform nighttime road construction.

5. Holiday lighting displays.

6. Ornamental lighting using low voltage, low wattage light fixtures and neon lighting used to outline buildings or structures.

4.6.2 OUTDOOR LIGHTING STANDARDS

4.6.2.1 General

a. Outdoor lighting levels shall be the lowest levels that meet the requirements of the task.

b. All outdoor lighting shall be located, aimed or shielded so as to minimize stray light trespassing across property boundaries.

c. Except for security lighting fixtures, all outdoor lighting fixtures (luminaires) shall be of the fully shielded type such that the light emitting, distributing, reflecting and refracting components of the light fixture (lamp, lens, reflective surfaces, etc.) do not extend beyond the opaque housing of the fixture.

d. The lighting of off-street parking areas shall not be greater than 5 footcandles or less than 1 ½ footcandles as measured at pavement level.

e. Light fixtures shall be aimed no higher than 45 degrees above vertical down (half-way between straight down and straight to the side) when the light source is visible from any off-site residential property or thoroughfare.

f. Lighting of canopy areas over motor vehicle fuel pump islands, drive-through lanes or similar installations shall use fully shielded or fully recessed light fixtures.

g. Prohibited Lights

- Flashing, revolving or intermittent lights visible from any property line.

- High intensity light beams such as but not limited to searchlights, laser lights or strobe lights visible from any property line.

4.6.2.2 Security Lighting

a. Security lighting fixtures such as wall packs shall be restricted to loading, storage, and service locations and shall not be substituted for appropriate fully shielded area lighting such as in parking areas or walkways.

b. Security lighting fixtures such as wall packs shall be shielded to avoid light trespass onto residential dwellings or adjacent thoroughfares.

c. Building-mounted security lighting fixtures such as wall packs shall not project above the fascia or roof line of the building.

4.6.2.3 Architectural Lighting

Lighting used to illuminate architectural details of buildings, landscaping, flags, statues, signs or other objects shall use fully shielded lighting fixtures that are aimed and controlled so that the directed light is substantially confined to the object intended to be illuminated.

4.6.2.4 Outdoor Recreation Facilities

Because of their unique requirements for nighttime visibility and their limited hours of operation, outdoor active recreation facilities, including but not limited to ball diamonds, athletic fields, tennis courts and driving ranges, are exempt from the outdoor lighting standards of this Section, subject to the following:

a. All playing field/court lighting fixtures shall use full cut-off or directionally shielded lighting fixtures, aimed toward the playing field/court and shielded in directions away from the playing field/court so as to minimize glare and light trespass onto adjacent properties.

b. The use of outdoor playing field/court lighting shall not be permitted between the hours of 11:00 PM and 7:00 AM, unless other hours are specifically approved as part of a PUD, conditional use or special event permit.

4.6.2.4 EXCEPTIONS

a. The provisions of this Section are not intended to prevent the use of any design, material or method of lighting not specifically prescribed herein, provided that any such alternative is designed by a registered engineer, architect or certified lighting designer and meets the intent of this Section as determined by the Director of Community Development.

b. The Director of Community Development may authorize the temporary use of outdoor lighting not in conformance with the standards and requirements of this Section for a period not to exceed thirty days.

Figure 4.6-1 Fully Shielded Light Fixture

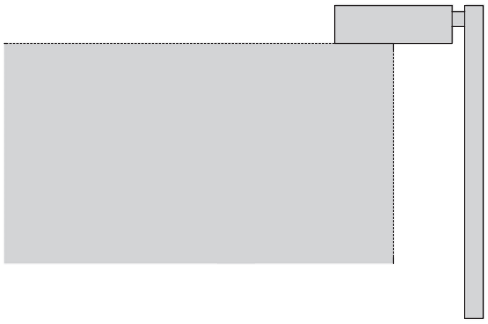


Figure 4.6-2 Recessed Canopy Light

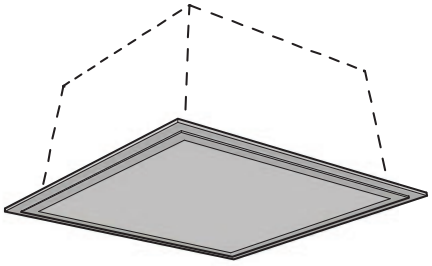
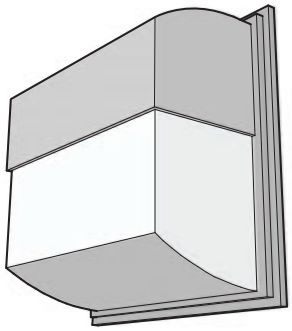


Figure 4.6-3 Wall Pack



4.7 PEDESTRIAN, BICYCLE AND TRANSIT FACILITIES

4.7.1 INTENT

It is the intent of this Section to establish minimum standards for pedestrian, bicycle and transit facilities, to reduce reliance on the automobile by promoting safe and efficient mobility by other modes of travel, to establish connections between different modes of travel, to implement the transportation policies of the Comprehensive Plan.

4.7.2 SIDEWALKS

4.7.2.1 Applicability

a. Principal Structure on Lot or Parcel

Prior to the issuance of a Certificate of Occupancy for any residential or non-residential principal structure, the developer or property owner shall construct sidewalks along roadways adjacent to all front and street side lot lines where sidewalks do not presently exist, except for any new single family or two-family structure on any local street where a sidewalk presently exists directly on the opposite side of the street. Such sidewalks shall not be required for the enlargement, alteration or reconstruction of existing single family or two-family structures, provided that a building permit for reconstruction is pulled within 12 months of the demolition of the existing single family or two-family principal structure. In the case of new principal structures in existing multi-building complexes, such sidewalks shall only be required when the aggregate cost of the improvements exceeds 50 percent of the total assessed value of all structures located on the same lot or parcel.

b. Enlarged, Altered or reconstructed Multi-Family or Non-Residential Principal Structure on Lot or Parcel

Prior to the issuance of a Certificate of Occupancy for any enlarged, altered or reconstructed multi-family or non-residential principal structure on a lot or parcel, the developer or property owner shall construct sidewalks along roadways adjacent to all front and street side lot lines where sidewalks do not presently exist when the aggregate cost of the improvements exceeds 50 percent of the total assessed value of all structures located on the same parcel.

c. Subdivisions (including Mobile Home Subdivisions).

1. Abutting Streets: Upon the construction of roadways for any new subdivision or resubdivision, the developer shall construct sidewalks along the subdivision side of each roadway abutting the subdivision where sidewalks do not presently exist, except that in the case of abutting local streets, no sidewalk shall be required where a sidewalk presently exists directly on the side opposite the subdivision and, if no sidewalk presently exists on either side, the required sidewalk may be constructed on the side opposite the subdivision if it results in better pedestrian connectivity.

2. Internal Streets: Upon the construction of roadways for any new subdivision or resubdivision, the developer shall construct sidewalks along both sides of arterial and collector roadways internal to the subdivision, and along at least one side of local streets internal to the subdivision. As an alternative, required sidewalks on internal local streets adjacent to building sites may be constructed on a lot by lot basis prior to the issuance of a Certificate of Occupancy for a structure on each respective lot. If this alternative is used, the developer shall construct sidewalks on arterial roadways, collector roadways, and on local streets adjacent to common areas that are not building sites at the time of roadway construction. If the developer elects to have sidewalks on only one side of any internal local street, he shall indicate on the plat the side of the street on which the sidewalk will be constructed. Such sidewalks shall be continuous on one side of the street within the same block but may cross to the other side on the next block. In the case of through lots, the Director of Community Development shall determine which yards function as rear yards and which functions as front yards and the developer shall constructed sidewalks adjacent to any yards that function as rear yards at the time of roadway construction. Sidewalks adjacent to through lot yards that function as front yards may be constructed on a lot by lot basis as above.

d. Multi-family Developments

Prior to the issuance of a Certificate of Occupancy for the first unit in any new multi-family residential development, the developer or property owner shall construct sidewalks along the development side of each roadway abutting the development where sidewalks do not presently exist, except on any local street where a sidewalk presently exists directly on the opposite side of the street, and along at least one side of all internal roadways. Internal sidewalks shall connect all buildings, on-site amenities and any existing or planned external sidewalks along the project frontage.

e. Mobile Home Parks

Prior to the issuance of a Certificate of Occupancy for any new mobile home park, the developer or property owner shall construct sidewalks along the development side of each roadway abutting the development where sidewalks do not presently exist, except on any local street where a sidewalk presently exists directly on the opposite side of the street, and along at least one side of all entrance roadways.

f. Shopping Centers

Prior to the issuance of a Certificate of Occupancy for the first unit in any new shopping center, the developer or property owner shall construct sidewalks along the development side of each roadway abutting the shopping center where sidewalks do not presently exist.

g. Multi-Unit Industrial or Office Park Developments

Prior to the issuance of a Certificate of Occupancy for the first unit in any new multi-unit industrial or office park development, the developer or property owner shall construct sidewalks along the development side of each roadway abutting the development where sidewalks do not presently exist, except on any local street where a sidewalk presently exists directly on the opposite side of the street, and along at least one side of the principal entrance roadway. Sidewalks shall be constructed between the principal customer entrances of each building entrance within an office park campus.

4.7.2.2 Exceptions

a. Payment in Lieu of Construction

1. Where Sidewalk Network Does Not Exist on Local Streets: In the case of infill development or infill redevelopment on a local street where there is no existing sidewalk to tie into on the same side of the street and no existing sidewalk directly on the opposite side of the street, the developer or property owner shall make a payment into the Sidewalk Construction Fund in lieu of constructing sidewalks along local streets. Such payment shall be equivalent to twenty percent of the per linear foot cost to the City for installing the sidewalk

based upon the current market price as determined by the City Engineer. Payment shall be made prior to the issuance of a building permit for the structure. This exception shall not apply in the case of lots in subdivisions where the developer has chosen to construct sidewalks on a lot by lot basis in accordance with Section 4.8.1.2 c. 2.

2. Where Sidewalk Not Feasible, Regardless of Street Classification: The City Engineer shall be authorized to determine if the construction of sidewalks required by this section is infeasible, impractical, unsafe or otherwise undesirable in a particular case due to topographic conditions, right-of-way restrictions that cannot be mitigated, the presence of existing physical impediments including trees, impending roadway or utility construction, or other circumstances that the City Engineer shall deem appropriate. In such case, the developer or property owner shall make a payment into the City of Lakeland Sidewalk Construction Fund in lieu of constructing the required sidewalks. Such payment shall be equivalent to eighty five percent of the per linear foot cost to the city for installing the sidewalk based upon the current market price as determined by the City Engineer. Payment shall be made prior to the issuance of any building permit for the development, or in the case of a subdivision, prior to final plat approval.

b. Sidewalks shall not be required along roads that are specifically exempted as part of an approved Alternative Pedestrian Circulation System Plan pursuant to Section 4.8.1.4.

c. The Director of Community Development may grant relief from some or all of the requirements of this section for qualified affordable housing developments including single family, two-family and multi-family developments, in accordance with administrative policies for affordable housing. In granting such relief, the Director may propose a plan to fund the construction of sidewalks from other sources, including but not limited to the City of Lakeland Sidewalk Construction Fund.

4.7.2.3 Alternative Pedestrian Circulation System Plan

To allow for flexibility and to encourage innovative design, the developer may submit an alternative pedestrian circulation system plan as part of a Planned Unit Development, conditional use or subdivision plat. The city may also initiate an alternative pedestrian circulation system plan as part of an Overlay District. Such plan may incorporate paths, trails, overpasses, underpasses or other design features that provide equal or greater pedestrian mobility to the requirements of this section. If the site design elements of the plan are approved, relief may be granted from some or all of the requirements of this section. Facilities that are part of an alternative pedestrian circulation system that are not conventional sidewalks to be dedicated for public maintenance shall be privately maintained. All components of an alternative pedestrian network shall be located within a dedicated access easement approved by the Director of Public Works.

4.7.2.4 Sidewalk Construction Standards

All required sidewalks shall meet requirements of the City of Lakeland Engineering Standards Manual regardless of whether they are located in a public right-of-way, private right-of-way, or easement.

4.7.2.5 Donation of Right-of-Way or Easement

Sidewalks may be constructed within public road rights-of-way, private road rights-of-way, or within suitable easements. Where sidewalks required by this section are to be publicly maintained and sufficient public right-of-way does not exist to construct the sidewalks, the property owner shall donate the right-of-way or shall provide easements to allow the sidewalks to be constructed. The City Engineer shall determine the amount of right-of-way or easement needed in each case. Where the donation of additional right-of-way would cause unnecessary hardship with respect to minimum building setbacks, the Zoning Board of Adjustment and Appeals may issue a variance. A private entity such as a developer or property owners association may construct required sidewalks on private property without donating land for public right-of-way, provided that the sidewalks are privately maintained.

4.7.2.6 Protection of Street Trees

Where possible, sidewalks shall be routed to avoid existing street trees and root zones of street trees. Sidewalk construction that will involve the removal of street trees or paving over or grading within 30 percent or more of the root zone of street trees shall require authorization of the City Arborist in accordance with Section 4.5 (Landscaping, Trees and Buffering).

4.7.2.7 Construction Bond

Construction plans shall include sufficient detail for the construction of required sidewalks. Except as noted herein, construction of sidewalks shall be completed prior to the issuance of a Certificate of Occupancy, provided, however, that in instances where completion of sidewalk construction is delayed due to circumstances beyond the reasonable control of the developer or property owner, and all other requirements for a Certificate of Occupancy have been met, the Building Official shall be authorized to issue the Certificate of Occupancy upon receipt of a cash bond in the amount of 110 percent of the cost of the sidewalk construction. Such bond shall be held for a period not to exceed four weeks from date of receipt; after which if the sidewalk construction has not been started by the developer or property owner, the bond shall be applied toward construction of the sidewalk by the city.

4.7.2.8 Maintenance

Sidewalks within public rights of way shall be maintained by the City of Lakeland. The City of Lakeland shall repair defects caused by normal deterioration in accordance with Public Works Department policy, provided, however, that in the event any sidewalk is damaged by the act or omission of the abutting property owner or one acting by, through or with

the permission of the abutting property owner, including lack of maintenance of vegetation that causes damage or slippery conditions to the sidewalk, then the cost of repairing any damage occasioned by the act or omission of the abutting property owner or the act or omission of other person acting by, through or with the permission of the abutting property owner shall be borne by such abutting property owner. If the abutting property owner fails to cause such repairs to be made, the City of Lakeland shall repair or restore the sidewalk and shall assess the cost of such repair or restoration against such abutting property owner in the manner prescribed for the assessment of local improvements.

4.7.3 MULTI-USE PATHWAYS AND BIKE LANES

4.7.3.1 Applicability

a. Prior to the issuance of a first Certificate of Occupancy, development located on any Priority Pathways Corridor, as designated in the Transportation Element of the Comprehensive Plan, and which generates more than 120 daily automobile trips, shall construct the appropriate pathway or bike lane segment in accordance with the following.

   1. The type of pathway or bike lane shall be in accordance with Table III-17 of the Comprehensive Plan Transportation Element and constructed in accordance with Section 4.7.3.2.

   2. The pathway or bike lane shall provide a continuous route that connects with existing or future segments of the Priority Pathways Corridor and shall be routed along the project frontage or within or through the development as the Director of Public Works may determine is most appropriate.

   3. If construction of the Priority Pathway segment is not feasible, with the approval of the Director of Public Works the developer may pay a fee in lieu of construction into the Transportation Fund for Pathways Projects. The fee shall be based on a signed and sealed cost estimate prepared by a registered professional engineer in the State of Florida. If the pathway facility is not necessary to achieve a favorable transportation concurrency determination, the development may provide a payment to the Pathways Fund equivalent to the Sidewalk Construction Fund payment otherwise allowed under Section 4.7.2.2.

b. Any subdivision or development proposing a multi-use pathway as part of an Alternative Pedestrian Circulation System Plan shall do so in accordance with the requirements of Section 4.7.3.2 for the appropriate pathway type.

c. Any development not located on a Priority Pathways Corridor which voluntarily provides multi-use pathways or bike lanes, shall do so in accordance with the requirements of Section 4.7.3.2 for the appropriate pathway type.

4.7.3.2 Standards

a. General

1. Pathways not located within a public right-of-way shall be within a minimum 20-foot wide easement and shall be privately maintained unless a public agency agrees to maintain the facility.

2. Design and construction shall be in accordance with the American Association of State Highway and Transportation Officials (AASHTO) Bicycle Facilities Guide.

3. Signage shall be in accordance with the Manual of Uniform Traffic Control Devices (MUTCD).

4. Surfaces shall be paved except that off-road pathways located within any Conservation context, wetland or required minimum setback from a protected lakeshore may have a stabilized, unpaved surface.

5. Site design shall minimize driveway crossings and other conflicts with pathways and bike lanes to the greatest practical extent.

b. Specific to Type

1. Priority Pathway, Off-Road

Minimum 12-foot wide asphalt trail with 2-foot shoulder/clear zone on each side. Minimum 5-foot separation between pathway and roadway. Minimum 10-foot wide, stabilized, unpaved trail may be used in bona fide conservation areas such a wetlands.

2. Priority Pathway, On-Road

Minimum 5-foot wide designated bicycle lane on curbed roadway section without gutter. Minimum 4-foot wide with curb-and-gutter. A minimum 4-foot wide paved shoulder may be used where roadway is constrained, subject to appropriate signage and striping.

3. Alternative Pedestrian Routes

Minimum 8-foot wide asphalt or concrete off-road pathway. Stabilized, unpaved trail may be used in bona fide conservation areas such a wetlands.

4.7.4 TRANSIT FACILITIES

4.7.4.1 Applicability

a. Development that is required to incorporate transit facilities as part of transportation concurrency mitigation requirements of Article 10, or in accordance with any other provision of this Code, shall do so in accordance with the standards and requirements of this Section.

b. Development which voluntarily provides transit facilities shall do so in accordance with the standards and requirements of this Section.

4.7.4.2 Standards

a. The location of transit stops on the public street system or internal to a development site shall be as approved by the Lakeland Area Mass Transit District or successor agency (transit agency).

b. Transit stops shall be designed in accordance with the Engineering Standards Manual and shall comply with Americans with Disabilities Act (ADA) standards.

c. Transit stops shall be placed within a right-of-way or recorded easement. Easements shall be executed prior to the issuance of a first Certificate of Occupancy for the development.

d. Transit shelter pads and associated structures shall require a building permit. Transit shelter pads constructed within public rights-of-way shall require a right-of-way use permit. Site plans for transit shelters, including those submitted by the transit agency, shall be reviewed by the Development Review Team.

e. Transit stops shall provide connections to the nearest sidewalk or pedestrian pathway.

f. Where a transit stop is required to be located internal to a development, to the greatest practical extent the site shall be designed to minimize conflicts between transit vehicles and off-street parking areas and shall be located to minimize pedestrian travel distance between the transit stop and principal building entrances.

4.8 RADIO AND TELEVISION ANTENNAS

4.8.1 INTENT

It is the intent of this Section to regulate the placement and height of antennas for radios, televisions and similar devices for the purpose of limiting their visual impact and ensuring compatibility with surrounding land uses.

4.8.2 APPLICABILITY

Antennas and large dish antennas are permitted as accessory uses in all zoning districts subject to the standards set forth in this Section.

4.8.3 DEFINITIONS

Unless the context clearly indicates a different meaning, for the purposes of this Section, the following words and terms shall be defined as follows:

Antenna: An external device for sending or receiving electromagnetic signals for radios, televisions or similar devices and which is accessory to the principal use or structure on or about which it is located. This shall include small parabolic or dish-shaped antennas one (1) meter in diameter or less. This shall not include antennas which are part of Personal Wireless Service Facilities or antennas mounted on communication towers.

Building-Mounted: An antenna mounted on the roof, eaves or wall of a structure or on a support, mast or pole that is attached to a roof, eaves or wall of a structure.

Ground-Mounted: An antenna mounted on a free-standing support, mast or pole on the ground.

Large Dish Antenna: A parabolic or dish-shaped antenna greater than one meter in diameter.

4.8.4 STANDARDS FOR ANTENNAS

a. Location: Ground-mounted antennas shall be located in rear or side yards. Building-mounted antennas shall be permitted on all buildings.

b. Setbacks: Ground-mounted antennas shall meet the setback requirements for accessory structures in the zoning district where located.

c. Maximum Height: The maximum height of antennas shall be subject to Section 3.6.2. This shall not apply to any antenna owned and operated by a federally licensed amateur radio station operator (ham), provided, however, that said owner/operator complies with applicable federal, state or county laws, regulations, or standards.

4.8.5 STANDARDS FOR LARGE DISH ANTENNAS

a. Building Permit Required

A building permit shall be required prior to installing any large dish antenna.

b. Ground-Mounted

1. Location: Ground-mounted large dish antennas shall be located in rear yards unless a side yard exception is granted. (See “Placement Permit”.) No large dish antenna shall be located in any front yard, except that a properly licensed business which sells large dish antennas may display them in the front yard of its properly zoned business location for demonstration or sales promotion purposes.

2. Setbacks: Ground-mounted large dish antennas shall meet the setback requirements for accessory structures in the zoning district where located except that in no case shall any portion of a large dish antennas extend to within ten feet of any property line.

3. Maximum Height:
   A. Residential and O-1 Districts 20 feet
   B. Office (other than O-1), Commercial
   C. Industrial Districts 25 feet

c. Building-Mounted

1. Location: Building-mounted large dish antennas are permitted on principal or accessory building within any office (except O-1), commercial or industrial district.

2. Setbacks: In no case shall any portion of a large dish antenna extend to within ten feet of any property line.

3. Maximum Height: Large dish antennas shall not exceed a height of more than 15 feet above the roof of the building upon which it is mounted, including base.

d. Placement Permit

Prior to the side-yard placement of any ground-mounted large dish antenna, the owner must secure a placement permit from the city. The application for the placement permit must be accompanied by a plot plan showing the lot lines and dimensions of the subject property, the location and dimensions of any structures thereon, the location of any public or private rights-of-way adjacent to said property and the proposed placement site for the antenna. Additionally, the application shall be accompanied by an affidavit from the owner or installer stating that a rear yard placement is not possible and the reasons therefore. The fee for a placement permit shall be set by Resolution.

4.8.6 GROUNDS FOR VARIANCE

The Zoning Board of Adjustments and Appeals may approve antennas and large dish antennas in other locations upon finding that adherence to the standards of this section does not permit the antennas to receive or send an acceptable quality signal and the alternative location does not otherwise violate the intent of this code.

4.8.7 ANTENNAS IN HISTORIC DISTRICTS

Antennas and large dish antennas proposed in designated historic districts may be subject to design review for architectural or historic compatibility provided, however, that such antennas and large dish antennas are restricted no more than other comparable devices allowed in those districts.

4.9 SIGNS

4.9.1 INTENT

It is the intent of the City Commission through the provisions of this Article to create the legal framework for comprehensive sign regulations. Furthermore, it is the intention of this Article to authorize the use of signs which are:

a. Compatible with the surroundings;
b. Appropriate to the type of activity to which they pertain;
c. Expressive in the identity of individual proprietors or of the community as a whole; and,
d. Legible in the circumstances in which they are seen.

The City Commission has determined that the public has a primary interest in controlling the erection, location, and maintenance of on-premises and off-premises signs in a manner designed to protect the public health and safety, to promote the public welfare, including the preservation and improvement of the aesthetic beauty of the community and to protect the free speech rights of its citizens. The number, size and location of such signs may, if uncontrolled, detract from traffic safety by diverting the driver's attention away from the driving task. The indiscriminate erection and maintenance of numerous large signs seriously detract from the enjoyment and pleasure of the natural scenic beauty of the city.

Therefore, the promotion and preservation of the public health, safety and welfare of the people of the city requires that the erection, construction, location, maintenance, size, and number of signs be regulated and controlled.

4.9.2 DEFINITIONS

Unless the context clearly indicates a different meaning, for the purposes of this Code, the following words and terms shall be defined as follows:

Abandoned Sign: Any sign, including the sign structure, which has been abandoned by its owner. Abandonment shall be presumed if, for a period of 180 days or longer, the sign has not 1) advertised goods, services, facilities, events or attractions available on the premises where located, 2) identified the owner or occupant, 3) directed traffic on the premises, or 4) displayed a noncommercial message which may or may not relate to an activity located on the premises.

Animated Sign: Any sign which involves motion or rotation of any part by any means, or displays flashing, intermittent or color changing light or lighting, except as defined under Electronic Message Center Sign.

Awning Sign: A building sign applied to or hanging from an awning; said awning to mean a structure made of cloth or metal with a rigid frame that is attached to a building wall so as to provide cover over a storefront, window or door.

Banner Sign: A sign made of cloth, paper, or non-rigid material of any kind, either with or without frames, excluding flags as permitted by this article.

Bench Sign: A sign imprinted upon a public service bench whose primary purpose is a collateral transportation service to the public.

Billboard: An outdoor advertising sign which exceeds 25 feet in height and 250 square feet in sign area.

Building Sign: An on-premises sign applied to or mounted on a wall, awning, marquee, window, door, parapet, mansard or other part of a building, the display surface of which does not extend above the roof line, parapet, marquee or mansard, whichever forms the top line of the building silhouette. Awning signs, marquee signs, projecting signs and wall signs are included within this definition.

Figure 4.9-1 Building Signs

Changeable Copy Sign: Any sign with copy that can be changed, rearranged, or altered manually whereby the sign face is not changed.

Community Development Director: The officer, or his designee, charged with the administration and enforcement of this Article.

Cornerstone Sign or Tablet: A sign cut into any masonry surface and constructed of bronze or other non-combustible materials.

Directional Sign: An on-premises sign providing direction or indicating the location of any object, place or area located on the premises, including, but not limited to, those signs indicating avenues of ingress and egress from the premises.

Directory Sign: An on previses sign located on property with two or more separate commercial buildings.

Drive Through Sign: A sign located on property which has previously been approved for a restaurant with drive through window(s).

Electronic Message Center Sign: An internally illuminated sign on which the copy can be changed, rearranged, or altered automatically through electrical or electronic means.

Flag: A square or rectangular sign made of cloth, paper, or non-rigid material of any kind and displayed from a flagpole by being tethered along one side.

Flagpole: A freestanding, ground mounted structure, or a structure mounted to a building, wall, or roof and used for the sole purpose of displaying a flag.

Functional Sign: A ground sign located on property where new cars and/or trucks are sold.

Ground Sign: A sign which is supported by structures or supports, in or upon the ground, and independent of support from any building.

Height, Sign: The distance from the top of the combination sign and sign structure to the ground elevation above which the sign is located.

Home Occupation Sign: A building sign displayed where there is a licensed home occupation.

Human Sign: A sign held by or attached to a person that displays a commercial message advertising or otherwise drawing attention to a business, commodity, service or product.

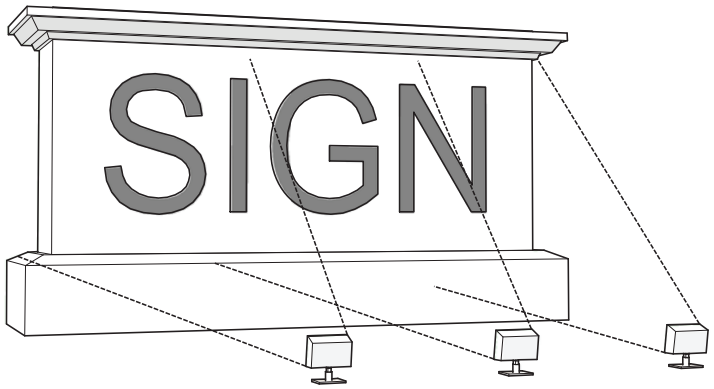
Illuminated Sign: Any sign illuminated by any light source including by not limited to electric bulbs, luminous tubes, fiber optics and LED (light emitting diodes), whether or not the light source is part of the sign proper.

Illuminated Sign, Internally: Any sign illuminated by one or more light sources constituting an integral part of the sign proper.

Figure 4.9-2 Internally Illuminated Sign/ Electronic Message Center Sign

flood or spotlights, directed primarily toward such sign.

Figure 4.9-3 Externally Illuminated Sign



Marquee Sign: A building sign upon, attached to, or hanging from a marquee; said marquee to mean a canopy or covered structure projecting from and supported by a building when such canopy or covered structure extends beyond the building line or property line.

Monument Sign: Any sign, other than a pole sign, which is placed upon or supported by structures or supports in or upon the ground and independent of support from any building.

Figure 4.9-4 Monument Sign

Nonconforming Sign: A sign or sign structure which was lawful when erected, but which does not conform to the requirements of this Ordinance.

Off-Premises Sign: A sign relating, in its subject matter, to other than the premises on which it is located or to products, accommodations or activities available on premises other than the premises on which the sign is located. A sign bearing a non-commercial message shall be deemed to be On-premises.

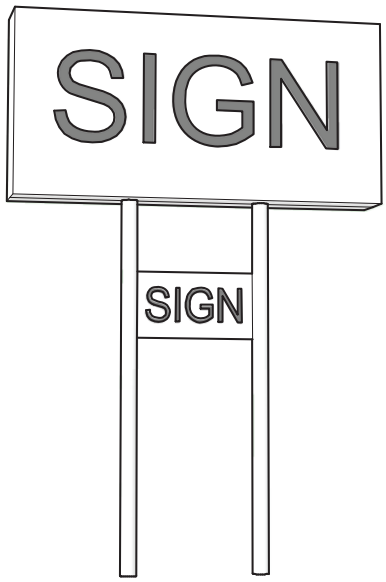
On-Premises Sign: Any sign which 1) advertises goods, services, facilities, events or attractions available on the premises where located, 2) identifies the owner or occupant of the premises, 3) directs traffic on the premises, or 4) displays a non-commercial message which may or may not relate to an activity located on the premises.

Parapet: That part of a perimeter wall vertically extending above the juncture of the roof and perimeter wall.

Parasite Sign: Any sign, for which no permit has been issued, which is attached to another sign.

Pole Sign: A ground sign that is mounted on free standing poles or other supports such that the bottom edge of the sign face is eight feet or more above grade.

Figure 4.9-5 Pole Signs



Portable Sign: A sign which is not permanently erected upon the ground or on the roof of any building or affixed to the wall of any building and shall include, but is not limited to, the following:

a. Trash receptacles, and similar sidewalk appliances which display advertising copy;
b. Sidewalk signs; and
c. A sign, of any material, for use with or without changeable copy, illuminated or non-illuminated, mounted on a trailer or similar device, with or without wheels.

Projecting Sign: A building sign projecting perpendicular from and supported by a wall of a building.

Real Estate Sign: A sign erected on a premise which is for sale, lease or exchange.

Roof Line: The juncture of the roof and the perimeter wall of the structure or the top of the parapet or mansard, whichever forms the top line of the building silhouette.

Roof Sign: A sign which is wholly or partially fastened to and supported by or on the roof of a structure, or which extends above the mansard roof line of a structure.

Setbacks, Sign: The minimum horizontal distance between the lot line and the closest edge or part of the sign structure.

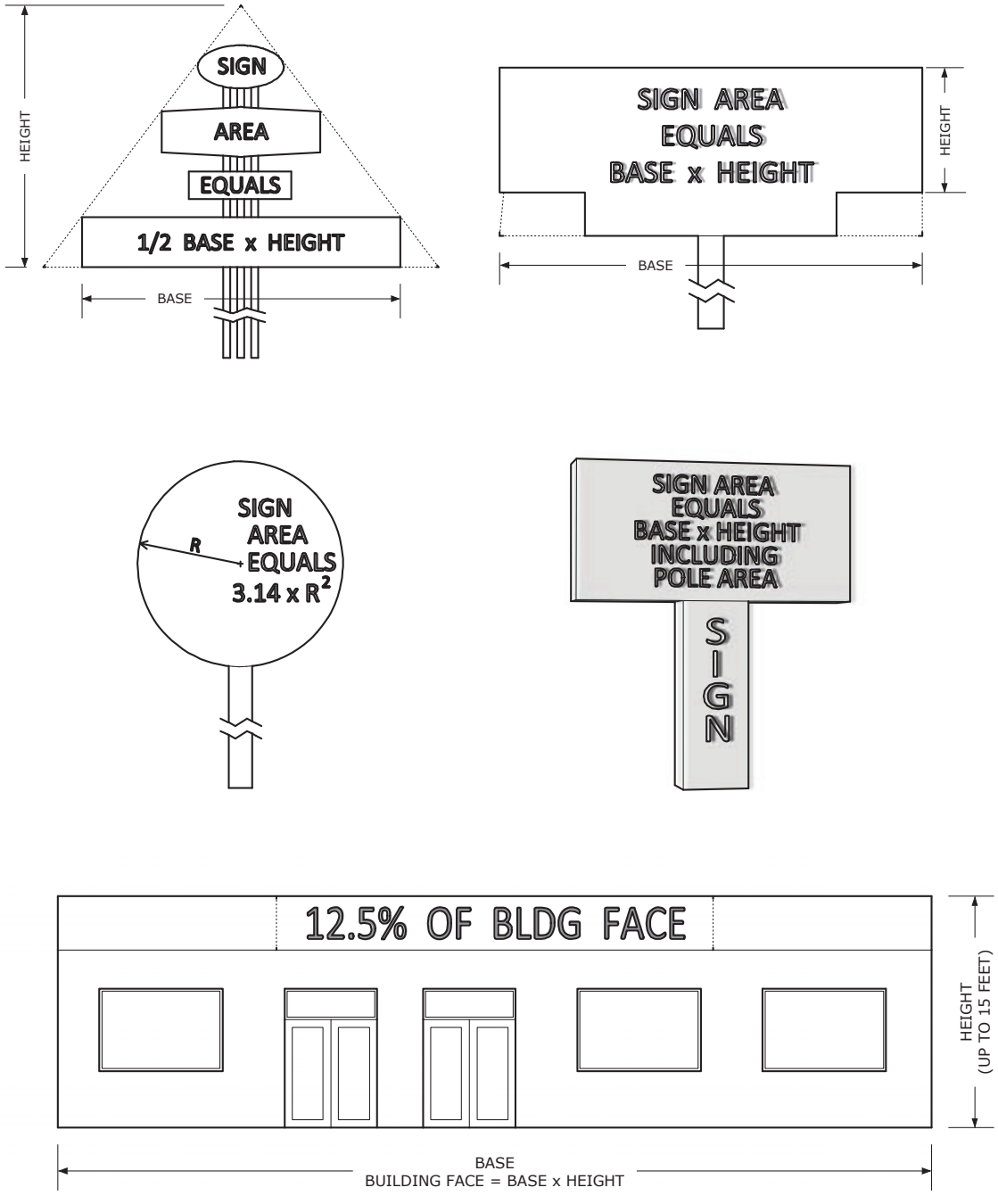
Sidewalk Sign: A self-supporting, portable sign designed to be placed upon a public or private sidewalk, plaza, courtyard or other area where pedestrians walk or gather.

Sign: A name, identification, image, description, display, illustration, device, figure, drawing, message, placard, poster, or other thing, designed, intended, or used to advertise or inform the public which is affixed to, painted, or represented directly or indirectly upon a building, structure, or piece of land, and which directs attention to an object, product, place, activity, facility, service, event, attraction, person, institution, organization, or business and which is visible from any street, right-of-way, sidewalk, alley, park, private parking lot, private street, or access drive where the general public customarily has access. Customary displays of merchandise placed behind a store window are not signs or parts of signs.

Sign Area: The entire area within one circle, triangle, or parallelogram enclosing the extreme limits of writing, representation, emblem, or any figure of similar character together with any frame of other material or color forming an integral part of the display or used to differentiate the sign from the background against which it is placed; excluding the sign structure unless the sign structure contains copy or is used as an integral part of the sign by introducing or extending the design, emblem, or logo or by utilizing colors or lighting in such a way as to attract attention to the sign. Where a sign has two or more faces or where the sign faces are mounted on a wall constructed of masonry or wood materials, the area of all faces shall be included in determining the area of the sign, except; where two such faces are placed back to back and are at no point more than two feet from one another, the area of the sign shall be taken as the area of one face if the two faces are of equal area, or as the area of the larger face if the two faces are of unequal area. Where a sign consists solely of lettering or other sign elements printed or mounted on a wall of a building without any distinguishing border, panel or background, any blank rectangular area which is more than 10 percent of the area of the sign as otherwise computed shall be disregarded. All of the lettering and other sign elements printed or mounted upon a wall of a building without any distinguishing border, panel or

background shall be treated as a single sign for purposes of area computation. (See Figure 4.2-26.)

Figure 4.9-6 Sign Area Computations



Sign Face: The display surface of a sign including non-structural trim but excluding the sign structure supports.

Sign, Nonstructural Trim: The molding, battens, capping, nailing strips, latticing, and walkways attached to the sign structure.

Sign Structure: The supports, uprights, braces, and framework supporting the sign.

Unlawful Sign: No sign shall be considered to be a lawful nonconforming sign if it was erected without approval of the permitting authority or a building and/or sign permit having been obtained, or if the sign was erected contrary to the provisions or limitations of a building and/or sign permit. Any such sign shall be considered unlawful and shall be subject to removal in accordance with these regulations.

Vehicle Sign: A sign displayed upon a vehicle where the vehicle is routinely parked or displayed adjacent to and visible from the public right-of-way and where other parking spaces are available to the vehicle that are not adjacent to and visible from the public right-of-way.

Wall Sign: A building sign applied to or mounted on a wall, the display surface of which is parallel to the plane of the building wall on which it is applied to or mounted on and which does not extend more than 18 inches from the surface of the wall.

Window Sign: A sign applied to or mounted on the window panes or glass of any window or door.

4.9.3 GENERAL PROVISIONS

4.9.3.1 General Requirements throughout the City

a. Traffic Hazard Signs

Signs shall not be located, constructed, or maintained in such a way that such sign may be confused or interfere with any official traffic sign, signal, or device placed by any public authority or which may obstruct or interfere with the driver's view of approaching, merging, or intersecting traffic.

b. Obstructing Signs

Signs shall not be located as to obstruct any window, door, fire escape, stairway, or any opening required for legal ventilation, ingress, or egress for any building or structure.

c. Signs Projecting Over Pedestrian Pathways within Public Right-Of-Way

Signs shall not be erected within or overhanging any public right-of-way, except that signs on marquees and awnings and projecting signs may overhang that portion of the

public right-of-way that includes a pedestrian pathway, subject to the following conditions:

1. Marquee signs may be attached to the sides and front of a marquee, and shall not extend beyond the surface area of the marquee, except as hereinafter provided.

2. A sign may be attached to the bottom horizontal surface of a marquee in a position which is perpendicular to the street right-of-way, but not parallel thereto, and shall not extend more than one foot below such bottom horizontal surface and shall maintain a vertical clearance of eight feet above the sidewalk or ground level. No sign shall be attached to the top horizontal surface of a marquee.

3. Marquee and awning signs shall be included in calculating the maximum allowable building sign area for the zoning districts in which they are located.

4. Projecting signs permitted in accordance with Section 4.9.3.1 l. shall maintain a vertical clearance of eight feet between the bottom edge of the sign and the sidewalk or ground level of the pedestrian pathway.

d. Sign Supporting Structures

Signs shall not be tacked, painted, posted, or affixed in any manner on trees, utility poles, rocks, and other such supporting structures.

e. Illuminated Signs

Illuminated signs are subject to the following restrictions:

1. Illuminated signs are permitted only in Office Commercial, Retail Commercial and Industrial zoning districts; and in the PUD district for non-residential uses which are also permitted in the aforementioned conventional zoning districts; and in residential zoning districts for Conditional Uses where such uses are permitted on arterial or collector streets and the Conditional Use specifically permits an illuminated sign(s).

2. Illuminated signs erected in a commercial district contiguous to a residential district shall be so shielded or directed so that the light or brightness shall not exceed five foot candles of light measuring at the property line contiguous to the residential district.

3. No light from an illuminated sign shall be emitted into any residential dwelling or premises in excess of three foot candles of light measuring at any exterior wall of the residential dwelling or premises provided said dwelling or premises is located in a residential district.

4. No illumination or glare from any sign shall be emitted directly onto a public street or roadway so as to constitute a hazard or impediment to motorist traffic or safety, nor shall any sign impair or obstruct a full view of a traffic control device.

5. No revolving or rotating beam or beacon of light that simulates any emergency light or device shall be permitted as part of any sign. Flashing signs and flashing lighting devices shall not be permitted upon a sign.

6. Electronic message center signs are permitted only in Office, Commercial, Retail Commercial and Industrial zoning districts; and in a PUD districts for non-residential uses which are also permitted in the aforementioned conventional zoning districts; and in residential zoning districts for Conditional Uses as specified below for middle and high schools. An electronic message center sign may only be used as part of a permitted ground sign, and shall not exceed 20 square feet. No exposed reflective type bulb or incandescent lamp which exceeds 11 watts shall be used on the exterior surface of any sign so as to expose the face of the bulb, light or lamp to any public street or adjacent property. Electronic message center signs shall use only a black-colored messages that do not change more frequently than once every five seconds. An electronic message center sign shall not flash or animate static information. Electronic message center signs in residential zoning districts are limited to middle schools and high schools may only be permitted as a conditional use in accordance with Section 4.9.3.1 e. 1. and Section 4.9.4.1 a. 1. and shall be subject to the following conditions:

   (a) The conditional use shall include at least 20 acres of land area; and
   (b) The conditional use shall have at least 500 lineal feet of frontage on an arterial or collector roadway; and
   (c) The conditional use shall be contiguous to or across the street from property zoned for office, retail or industrial uses.

f. Abandoned Signs

Any abandoned sign, now or hereafter existing, shall be taken down and removed by the owner, agent, or person having the beneficial use of the building, structure, or property upon which such sign may be found, within 30 days after written notification from the Community Development Director. Upon failure to comply with such notice within the time specified by such order, the Community Development Director shall notify the Code Enforcement Board and request a hearing. In making a determination that a sign is abandoned the Community Development Director shall consider among other factors, the existence or absence of a current Business Tax Receipt for the premises, whether there are active utilities or a utilities service deposit at that location, and use of the premises.

g. Non-use of On-premises Sign

Any on-premises sign which otherwise conforms to the provisions of this Article, and by reason of the cessation of activity on the premises, becomes an off-premises sign, may be retained by one of the following methods:

1. Painted Sign: The sign shall be covered by painting over the sign area.

2. Removable Sign Face: The sign face shall be removed and replaced with a blank insert or the sign face may be reversed.

3. Temporary Covering: The sign face may be temporarily covered by the installation of a sock or boot.

h. Nonconforming Signs

1. A sign within the corporate limits of the City of Lakeland which was lawfully erected, but by the date hereof should have been removed under provisions of prior law, and is not permitted herein, shall be immediately removed or made to comply with the requirements of this Code. A sign which is subject to the provisions of Section 70.20 F.S. shall be removed in conformance with the requirements of that section.

2. Subject to the provisions of this Section, any sign which does not conform to the requirements of this Code shall be removed or brought into compliance with this Code on or before the expiration of five years i) from the date of the adoption of this Code, or any subsequent amendment making the sign nonconforming, or ii) from the date the premises was annexed into the city, whichever is later. A sign which is subject to the provisions of Section 70.20 F.S. shall be removed as provided in this subsection, but only after compliance with the requirements of Section 70.20 F.S.

3. On-Premises Signs: Nonconforming on-premises sign(s) shall be removed as provided in subsections 1. and 2. above, except as follows:

(a) Single Occupant Premises

One nonconforming ground or building sign per street frontage for each premise may be continued provided such nonconforming sign is maintained in accordance with the requirements of this Article. No changes to the sign shall be permitted except a change in copy. In the event a change of occupancy occurs, which for purposes of this Article is defined as a change of tenants or proprietors, and the new tenant or proprietor chooses to change advertising on the sign or change the name of the business as advertised on the sign, the previously allowed nonconforming sign shall be brought into conformance with this Article.

(b) Multiple Occupant Premises

Shopping centers and other multi-occupant premises shall be permitted to continue only one nonconforming ground sign per street frontage for each premise, and one building sign for each unit. No changes to the sign shall be permitted except a change in copy. In the event a change of ownership of the shopping center or multi-occupant premises occurs and the new owner chooses to change advertising on the sign or change the name of the center or premises as advertised on the sign, the previously

allowed nonconforming sign shall be brought into conformance with this Article.

(c) Nonconforming signs shall not be reestablished after damage or destruction if the estimated cost of reconstruction or repair exceeds 50 percent of the reproduction and installation cost of the sign.

(d) Nonconforming on-premises signs may be considered conforming to this ordinance, if determined to be a historic or landmark sign subject to the terms and conditions set forth below:

i. Any person who chooses to pursue the historic or landmark designation for a nonconforming sign shall make application to the Historic Preservation Board. The Historic Preservation Board shall conduct such investigation and inquiry as is necessary to determine that a sign is eligible for the historic or landmark designation. The Board may refer the application to its Design Review Committee for a recommendation to the full Board. The Board is not empowered to approve an increase in the degree of nonconformity of a sign when approving it for a historic or landmark designation.

ii. To be considered for designation as an historic or landmark sign by the Historic Preservation Board, a sign shall possess the following characteristics:

The sign shall have been erected or installed prior to 1960;
The sign is a unique example of a time period or era prior to 1960;
The sign must be structurally sound or repairable;
The sign may contain neon which is characteristic of the era or period prior to 1960;
The sign shall have been designed and constructed as an integral part or feature of a structure, development or development site.

4. On-Premises Signs, Areas Annexed Pursuant to Annexation/Wastewater or Water Service Agreements: Any On-Premise sign erected or installed on a parcel or premises after the effective date of a city Annexation/Wastewater or Water service agreement for said parcel or premises, shall conform to the city sign regulations in effect at the time of the erection of the sign. Any sign, in existence on the date of the Annexation/Wastewater or Water Service Agreement which does not conform to the provisions of the sign regulations shall be brought into conformance or shall be taken down and removed by the owner, agent, or person having beneficial use of the building, structure or property upon which such sign may be found within 30 days after written notification.

i. Bench Signs

Bench signs will be permitted, provided the signs are located only on benches which are placed according to agreements approved by the City Commission and subject to the conditions expressed therein.

j. Temporary Signs

1. Sign types: A temporary sign may be a ground sign or a building sign, but may not be illuminated by electricity and must be constructed of rigid materials. Each premises shall be permitted temporary signs as follows:

(a) One real estate sign per street frontage.

(b) Three construction signs provided that such sign shall not be displayed prior to submission of an application for Building Permit for the project, and shall be removed no later than the date of issuance of the Certificate of Occupancy for the construction project. In the event a construction sign is displayed but construction is not initiated within 60 days after the sign is erected, or if construction is discontinued for a period of more than 60 days, the construction sign shall be removed.

(c) Temporary non-commercial signs displayed before, during, or after an event or occurrence scheduled to take place at a specific time and place are permitted in all zoning districts and shall be removed within 21 days after the end of the scheduled event or occurrence to which they relate.

(d) One temporary “grand opening” commercial sign which may be displayed for 30 days after the issuance of a Business Tax Receipt for any new business, new owner of an existing business, or business name change.

2. Maximum size: Each premise may display temporary signs, the area of which shall not exceed 32 square feet per sign. Temporary non-commercial signs shall not exceed an aggregate sign area of 32 square feet. Real estate signs located in residential districts shall not exceed five square feet in sign area.

3. Maximum height: Temporary signs shall not exceed eight feet in height.

k. Flags

Flags are permitted in all zoning classifications provided that no more than three flags may be displayed per premises, and each flag must be flown from a flagpole, subject to the following conditions:

1. Except for flags flown on single-family property, the height of a flag permitted by this section shall not exceed 25 percent of the total height of the flagpole.

2. The display of flags permitted pursuant to this section shall not count as chargeable square footage under the sign regulations.

l. Projecting Signs

Projecting signs shall be permitted as building signs within the C-6 and C-7 zoning districts subject to the following conditions:

1. Projecting signs shall be included in calculating the maximum allowable building sign area and shall have no more than two sides.

2. One projecting sign may be permitted per principal ground-floor business.

3. Projecting signs shall not exceed eight square feet in sign area if mounted at a height of 15 feet or lower measured from the finished sidewalk to the bottom of the sign.

4. Projecting signs shall not exceed 25 square feet in sign area if mounted higher than 15 feet measured from the finished sidewalk to the bottom of the sign.

5. Projecting signs shall be located within five feet of the principal business entrance. In no case, however, shall a projecting sign be mounted within 10 feet of any other projecting sign.

6. Projecting signs may project no more than 42 inches from the building wall.

7. Projecting signs shall maintain an eight foot clearance, between the bottom of the sign and the finished surface of all public and private pedestrian pathways.

8. Within the C-7 zoning district, exceptions to conditions b. through e. above may be approved by the Historic Preservation Board based upon a determination that sufficient historical documentation exists to justify the exception(s).

9. Projecting signs on South Florida Avenue shall be subject to FDOT review and approval.

4.9.3.2 Prohibited Signs

All of the following signs shall be prohibited and shall be removed in accordance with the procedure established for each category of prohibited signs.

1. Abandoned signs.

2. Animated signs and flashing lights on signs.

3. Banners, pennants, spinners, streamers, balloons, inflatable objects, fluttering devices other than flags, and lights designed to attract attention.

4. Billboards and Off-premises signs.

5. Parasite signs.

6. Portable signs, except sidewalk signs where specifically permitted.

7. Signs located on public rights-of-way or public property, except signs displayed by the governmental agency having jurisdiction over the public right-of-way and as may be authorized by law.

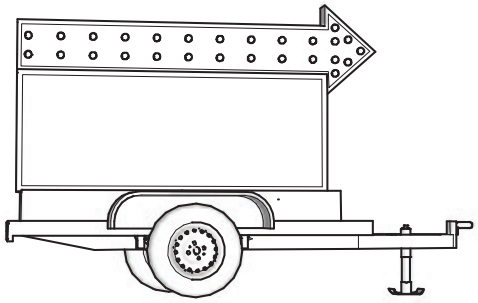
8. Roof signs, unless retained and maintained as the one nonconforming sign an owner is permitted to continue in use.

9. Horizontal and vertical advertising, not required by State or Federal laws, located on motor vehicle fuel pump island canopy supports, "spanner boards", and on light poles or other supporting structures at noncanopied pump islands, to be removed within 30 days after written notification.

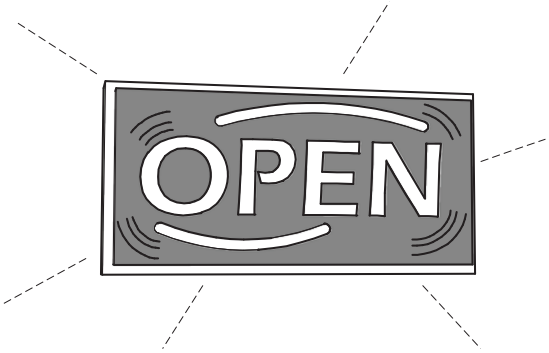
10. Vehicle signs as defined by these regulations.

11. Any sign that is not specifically described or enumerated as permitted by these regulations.

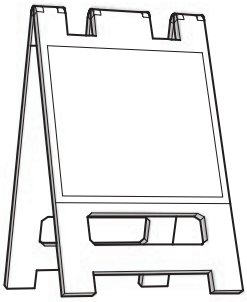
Figure 4.9-7 Examples of Prohibited Signs



PORTABLE SIGNS



FLASHING SIGNS

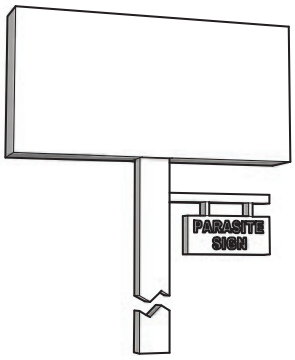


SIDEWALK SIGNS OUTSIDE OF DOWNTOWN

SPINNERS

INFLATABLES

BANNERS



PARASITE SIGNS

4.9.3.3 Exemptions

a. Exemptions from Permitting Requirements

The provisions of this Article which require permits shall not apply to the following signs; however, said signs shall be subject to the requirements of these sign regulations and other applicable codes of the city:

1. Signs on a truck, bus, or other motor vehicle;

2. Cornerstone signs or tablets not exceeding six square feet when cut into any masonry surface or when constructed of any noncombustible material and affixed to a building;

3. Signs within the structure or structures of shopping centers or multi-occupant premises;

4. Flags;

5. Temporary signs;

6. Signs permitted by Sections 4.9.4.1 a. 8. and 4.9.4.2 a. 6.

7. Home Occupation signs.

8. Window signs in accordance with the maximum sign area specified for each zoning district.

9. Fuel point of sale and fuel pump topper signs provided that such signs utilize a rigid frame that is permanently affixed to or integrated into the structure of the pump enclosure. This includes fuel pump toppers that utilize electronic visual displays.

10. Human signs in accordance with Section 4.9.4.4 c..

b. Other Exemptions

The provisions of this Article shall not apply to traffic control, directional, and street name signs installed by state or local jurisdictions or to signs for municipal facilities on public property that are deemed necessary by the City Manager or his designee.

4.9.4 ZONING DISTRICT REGULATIONS

4.9.4.1 Single-Family, Two-Family, and Mobile Home Zoning District Regulations (RA-1, RA-2, RA-3, RA-4, RB, and MH)

a. Permitted Signs

1. Signs which are permitted in single-family, two-family, and mobile home districts may be externally illuminated. Notwithstanding this provision, internally illuminated signs may be considered in accordance with Section 4.9.3.1 e. 1. for non-residential uses in residential zoning where such uses are permitted as a conditional use and an illuminated sign is expressly permitted.

2. Home Occupation Signs: One per street frontage, not to exceed one square foot in area.

3. Subdivision and Mobile Home Park Identification Signs: Such signs may be permitted per each public street frontage at the perimeter of the subdivision or park and may be provided in accordance with one of the following alternatives:

    (a) One double-faced sign may be erected perpendicular to the perimeter street. Such sign shall not exceed 32 square feet in area and shall not exceed six feet in height to the top of the sign above the established grade at the base of the wall or sign structure. In the event certain design features such as berms and landscaping are utilized as part of the subdivision entrance, the top of the sign shall not exceed 10 feet above the finished elevation of the crown of the entrance street.

    (b) One single-faced sign may be erected on one or both sides of the subdivision or park entrance street. Each sign shall not exceed 32 square feet in area and shall not exceed six feet in height to the top of the sign above the established grade at the base of the wall or sign structure. In the event certain design features such as berms and landscaping are utilized as part of the subdivision entrance, the top of the sign shall not exceed 10 feet above the finished elevation of the crown of the entrance street. Where a fence or wall is constructed at the perimeter of a subdivision or mobile home park, such sign(s) may be located on the face of the fence or wall.

4. Clubs, Golf Courses, Parks and Other Recreation Uses, Public Buildings, Cemeteries, Utilities and Other Similar Uses: Shall be permitted one on-premises sign per public street frontage, which sign shall not exceed 20 square feet in area and shall not exceed six feet in height.

5. Public and Private Schools:

    (a) Ground Signs for Middle Schools and High Schools - One sign per each public street frontage, subject to the following:

        i. Sign Area and Sign Height, Principal Street - One square foot of sign area for each two lineal feet of street frontage or 20 square feet of sign area, whichever is larger. The maximum sign area shall not exceed 50 square feet and the sign shall not exceed 15 feet in height.

ii. Sign Area and Sign Height, Secondary Street

Maximum sign area ..... 20 square feet
Maximum height..... 6 feet

(b) Ground Signs for Public and Private Elementary Schools –

One sign per public street frontage, subject to the following:

i. Sign Area and Sign Height, Principal Street - One square foot of sign area for each two lineal feet of street frontage or 20 square feet of sign area, whichever is larger. The maximum sign area shall not exceed 36 square feet and the sign shall not exceed 10 feet in height.

ii. Sign Area and Sign Height, Secondary Street

Maximum sign area ..... 20 square feet
Maximum height..... 6 feet

(c) Building Signs for Public and Private High Schools, Middle Schools and Elementary Schools - Building signs shall not exceed an aggregate sign area equal to 12.5 percent of the square footage of the first 15 feet in height of the wall face upon which the sign is located. In the event the height of the wall is less than 15 feet, the allowable building sign area is the aggregate sign area equal to 12.5 percent of the square footage of the wall face upon which the sign is located.

6. Churches:

(a) Ground Signs for Churches

One ground sign per public street frontage, subject to the following:

i. Sign Area and Sign Height, Principal Street - One square foot of sign area for each two lineal feet of street frontage or 20 square feet of sign area, whichever is larger. The maximum ground sign area shall not exceed 36 square feet and the sign shall not exceed 10 feet in height.

ii. Sign Area and Sign Height, Secondary Street

Maximum sign area ..... 20 square feet
Maximum height..... 6 feet

(b) Building Signs for Churches - Building signs shall not exceed an aggregate sign area equal to 12.5 percent of the square footage of the first 15 feet in height of the wall face upon which the sign is located. In the event the height of the wall is less than 15 feet, the allowable building sign area is

the aggregate sign area equal to 12.5 percent of the square footage of the wall face upon which the sign is located.

7. Directional Signs for Accessory Off-Street Parking Areas: Directional signs shall not exceed two square feet in sign area and shall not exceed 30 inches in height. Only one directional sign may be erected at each point of ingress and egress and may be located at the property line, but shall not be located on or overhang the public right-of-way.

8. On-premises sign: One on-premises sign not to exceed five square feet in sign area or six feet in height. Home occupation signs shall be governed by Subsection 4.9.4.1 2.

b. General Restrictions

Minimum Sign Setbacks: Signs permitted in the single-family, two-family, and mobile home zoning districts shall not be erected within five feet of any property line, except subdivision identification signs on a perimeter wall and directional signs for off-street parking areas as specified herein.

4.9.4.2 Multiple-Family Zoning District Regulations (MF-12, MF-16 and MF-22)

a. Permitted Signs for Residential Uses

1. Signs which are permitted in multiple-family zoning districts may be externally illuminated.

2. Multiple-Family Apartments: On-premises signs for multiple-family apartment developments are permitted according to the following conditions:

Maximum sign area:

Developments ≤ 50 units:..... 20 square feet per public street frontage
Developments > 50 units:..... 50 square feet per public street frontage

Minimum sign setbacks:

Front, side or rear setback..... 5 feet

Maximum sign height:

Signs located in the area between minimum
sign setback line and building setback line ..... 4 feet
Signs located at or behind the building setback line .....10 feet*
*(May also be permitted on a wall of an apartment structure)

Where a boundary fence or wall is constructed at the perimeter of a rental or condominium apartment development, an identification sign may be located on the face of the fence or wall in the same manner as for subdivisions.

3. Home Occupation Signs: Same as single-family zoning districts.

4. Subdivision Signs: Same as single-family zoning districts.

5. Directional Signs for Accessory Off-Street Parking Areas: Directional signs may be located anywhere on site and shall not exceed two square feet in area and thirty inches in height. Directional signs shall be set back a minimum of five feet from any perimeter property line, except one directional sign may be erected at each point of ingress and egress and may be located at the property line, but shall not be located on or overhang the public right-of-way.

6. One On-premises sign not to exceed five square feet in sign area or six feet in height. Home occupation signs shall be governed by Subsection 4.9.4.1 2.

b. Permitted Signs for Non-Residential Uses

1. Externally Illuminated Signs: Are permitted for non-residential permitted uses.

2. On-premises Signs for Churches, Public and Private Schools, Clubs, Golf Courses, Parks and Other Recreation Uses, and Public Buildings, Cemeteries, Utilities and Other Similar Uses: As permitted in single-family zoning districts.

3. Subdivision Signs: Same as single-family zoning districts.

4. Signs for Off-Street Parking Lots as Principal Uses: When parcels are developed for off-street parking lots as the principal use, one on-premises sign shall be permitted per public street frontage, with a maximum sign area not to exceed 16 square feet and a maximum height not to exceed 10 feet. Such signs shall not be erected on required parking spaces.

5. Directional Signs of Off-Street Parking Areas: The requirements as specified for multiple-family apartment accessory parking areas shall apply.

c. General Restrictions

1. Internally Illuminated Signs: Shall not be permitted in multiple-family zoning districts. Notwithstanding this provision, internally illuminated signs may be considered in accordance with Section 4.9.3.1 e. for non-residential uses in residential zoning where such uses are permitted as a conditional use and an illuminated sign is expressly permitted.

2. Minimum Sign Setbacks: Signs permitted in multiple-family zoning districts shall not be erected within five feet of any property line, except subdivision and

apartment identification signs on a perimeter wall and directional signs for off-street parking areas as specified herein.

4.9.4.3 Office Commercial and Small Lot General Commercial Zoning District Regulations (O-1, 0-2 and C-1)

a. Permitted On-Premises Signs

On-premises signs are permitted subject to the following conditions:

1. Ground Signs: Ground signs are permitted in accordance with the following provisions:

(a) Limited Commercial Uses on Less Than Five Acres of Land - One ground sign per premises (whether in a single usage or as a group of structures or businesses on a single premises).

i. Sign Area - One square foot of sign area for each two lineal feet of street frontage, or 20 square feet of sign area, whichever is larger. No premises shall have a total ground sign area in excess of 50 square feet.

(b) Limited Commercial Developments and Establishments on Five or More Acres of Land - One ground sign is permitted for each frontage on an arterial or collector street as designated in Figure 3.3-1 as follows:

i. Sign Area - One square foot of sign area for each two lineal feet of street frontage, or 20 square feet of sign area, whichever is larger. No premises shall have a total ground sign area in excess of 50 square feet for each frontage on an arterial or collector street.

(c) Minimum Sign Setbacks

Front, side and rear setback..... 5 feet

Adjacent to Residential Zoning District - A ground sign shall be located not closer than 75 feet to any residence in any residential zoning district. Such sign shall be oriented away from residential zoning districts and toward the commercial district in which it is located.

(d) Maximum Sign Height

Maximum height ..... 10 feet

2. Building Signs:

(a) Building signs, excluding window signs , shall not exceed an aggregate sign area equal to 12.5 percent of the square footage of the first 15 feet

in height of the wall face upon which the sign is located. In the event the height of the wall is less than 15 feet, the allowable building sign area is equal to 12.5 percent of the square footage of the actual height of the wall face upon which the sign is located.

(b) Window signs shall be permitted along the ground floor elevations of buildings and shall cover no more than 25 percent of each window. Window signs shall not be included in calculating the aggregate sign area of building signs.

3. Directory Signs: Directory signs are permitted on properties of three acres or more in accordance with the following provisions:

(a) One (1) directory sign is permitted for each street frontage.

Maximum sign area ..... 20 square feet

Minimum sign setbacks

Public street right-of-way..... 30 feet
Interior property lines ..... 5 feet
Maximum height ..... 6 feet

4. Subdivision Signs: Same as single-family zoning districts.

5. Signs for Off-Street Parking Lots as Principal Uses: The same requirements as specified for multiple-family zoning districts shall apply.

6. Directional Signs for Off-Street Parking Areas: The same requirements as specified for multiple-family zoning districts shall apply.

b. General Restrictions

Minimum Sign Setbacks: Signs permitted in office commercial zoning districts shall not be erected within five feet of any property line, except directional signs for off-street parking areas as specified herein.

4.9.4.4 Retail Commercial and Large Lot Office Zoning District Regulations (C-2, C-3, C-4, C-5, C-6, C-7 and 0-3)

a. Permitted On-Premises Signs

On-premises signs are permitted subject to the following conditions:

1. Ground Signs: Ground signs are permitted in accordance with the following provisions:

(a) Ground Signs on Less than Five Acres of Land - One ground sign per premises (whether in a single usage or as a group of structures or businesses on a single premises).

i. Sign Area - One square foot of sign area for each two lineal feet of street frontage along the front lot line, or 32 square feet of sign area, whichever is larger. No premises shall have a total ground sign area in excess of 150 square feet.

(b) Ground Signs on Five or More Acres of Land - One ground sign is permitted for each frontage on an arterial or collector street as designated on Figure 3.3-1. In the event the functional classification of a street is not contained on Figure 3.3-1 or is uncertain, the Community Development Director shall make a determination of the functional classification for purposes of this Article.

i. Sign Area - One square foot of sign area for each two lineal feet of street frontage or 50 square feet of sign area per acre of the premises, whichever is larger. No premises shall have a total ground sign area in excess of 250 square feet on the principal street. Maximum ground sign area on secondary streets shall be 125 square feet.

(c) Ground Signs for Theaters in Shopping Centers Containing Five or More Acres of Land - Any movie theater located in a shopping center containing five or more acres, may have one ground sign separate from the ground sign for the shopping center.

i. Sign Area - Such sign shall not exceed 150 square feet in area.

(d) Minimum Sign Setbacks

Front, side or rear setback ..... 5 feet

Adjacent to residential zoning district - A ground sign shall be located not closer than 75 feet to any residence in any residential zoning district. Such sign shall be oriented away from residential zoning districts and toward the commercial district in which it is located.

Lakeland Electric shall have the authority to review and approve all applications for pole signs for which the height would exceed 15 feet, to ensure that the setbacks for such signs provide a sufficient separation between existing or proposed electric utility lines and support facilities and any portion of the sign and sign structure.

(e) Maximum Sign Height

Maximum height on commercial corridors* ..... 15 feet
Maximum height on non-commercial corridors* ..... 10 feet
Maximum height on commercial corridors* and within an Interchange Activity Center as designated by the Comprehensive Plan..... 35 feet
*As defined on Figure 4.9-8

2. Building Signs: The same requirements as specified for office commercial zoning districts shall apply.

3. Directory Signs: The same requirements as specified for office commercial zoning districts shall apply.

4. Subdivision Signs: Same as single-family zoning districts, except such signs may contain a maximum size of 72 square feet.

5. Signs for Off-Street Parking Lots as Principal Uses: The same requirements as specified for multiple-family zoning districts shall apply.

6. Directional Signs. The same requirements as specified for multiple-family zoning districts shall apply.

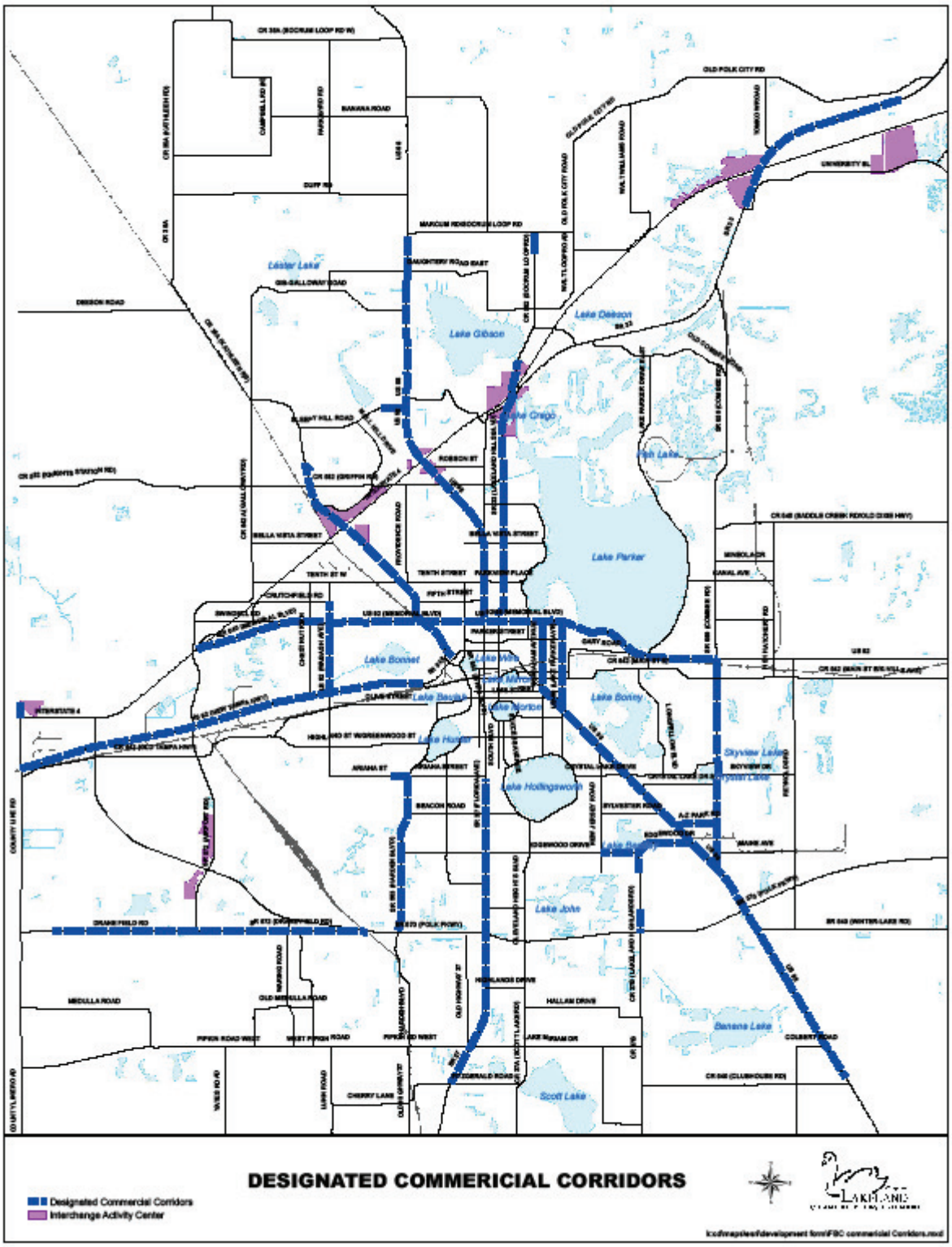
7. Functional Signs:

   (a) One functional sign may be permitted for each entrance to the dealership from the principal street; not to exceed a maximum number of three functional signs, regardless of the number of entrances from the principal street. A maximum of one functional sign may be permitted on a secondary street regardless of the number of entrances from the secondary street. When functional signs are utilized, directional signs shall not be utilized at the same entrance.

   Sign Area - Shall not exceed 50 percent of the allowable ground sign area.

   Minimum Setbacks ..... 5 feet from any property line
   Maximum height on commercial corridors* ..... 15 feet
   Maximum height on non-commercial corridors* ..... 10 feet
   *As defined on Figure 4.9-8

Figure 4.9-8 Designated Commercial Corridors



8. Drive Through Signs: Drive through signs are only allowed on lots which have previously been approved for restaurants with drive-through windows and under the following conditions:

   (a) Two drive through signs per drive through lane

   Maximum sign area ..... 32 square feet
   Maximum height ..... 6 feet
   Minimum setback from public street Right-of-way ..... 30 feet

b. Sidewalk Signs

1. Sidewalk signs are limited to the C-6 and C-7 zoning districts and shall be subject to the following conditions:

   (a) Location Standards

   i. One sidewalk sign may be permitted per principal ground-floor retail business use frontage, which sign may be placed on a sidewalk, plaza, courtyard or other pedestrian walkway directly in front of the business premises.

   ii. The display of sidewalk signs shall be limited to business hours only.

   iii. Signs shall only be placed where the sidewalk or pedestrian walkway is a minimum of 10 feet in width.

   iv. Signs shall not block or restrict pedestrian movement and when the sign is in place, there shall be a minimum of five feet clear sidewalk or walkway width for pedestrian travel.

   v. Signs shall not be placed within two feet of the face of any curb.

   vi. Signs shall not be placed where they interfere with any exit, fire hydrant, parking meter, bus stop, loading zone, bicycle rack, sidewalk ramp, wheelchair ramp, or similar public facility.

   vii. Signs shall not be attached to any tree, light pole, fire hydrant, street furniture or similar fixed object.

   (b) Design Standards

   i. Signs shall be of a type that has been pre-approved by the Lakeland Downtown Development Authority (LDDA) or alternative designs meeting these standards may be submitted to the LDDA for review and approval.

ii. Signs shall be constructed of durable, weather-resistant materials such as wood, steel, aluminum and PVC. The use of cardboard, paper, fabric and non-rigid materials is prohibited.

iii. Maximum sign area: Six square feet per side. Maximum number of sides: Two.

iv. Sign height: Maximum four feet. Minimum three feet.

v. Signs must be readily portable but stable, able to withstand modest wind speeds and accidental contact from pedestrians.

vi. Signs shall not be illuminated.

vii. Signs may contain a changeable copy area which shall consist of a chalkboard or whiteboard only.

viii. Signs may have a transparent sleeve or holder that does not extend beyond the sign area in which temporary printed material may be displayed.

ix. Lights, balloons, parasite signs or other attachments are prohibited.

(c) Other

i. Sidewalk signs shall require sign permits. For those signs to be placed on public property, the permit shall include proof of Comprehensive General Liability insurance with limits of at least $300,000 per occurrence naming the City of Lakeland as an additional insured and an agreement to indemnify and hold the city harmless in any claim or cause of action against the city arising from the placement of such signs. Violation of any provisions or conditions of this section shall be grounds for revocation of the sign permit.

ii. Sidewalk signs shall not be displayed during severe weather watches or warnings.

iii. Sidewalk signs on South Florida Avenue shall be subject to FDOT review and approval.

2. Amortization

Sidewalk signs in use as of the effective date of this section that do not conform to the above standards and conditions shall be removed and their use discontinued within six months of the effective date of this section.

c. Human Signs

Human Signs are permitted in all non-residential zoning districts and shall be subject to the following conditions.

1. Only one human sign per business is permitted; and

2. Human signs must remain on the same parcel on which the business, commodity, service or product being advertised is located or within the common areas of a commercial subdivision within which the business, commodity, service or product being advertised is located; and

3. Human signs shall not occupy and portion of the public right-of-way or other public property.

4.9.4.5 Industrial Zoning District Regulations (I-1, I-2 and I-3)

Permitted On-Premises Signs

The same requirements as specified for retail commercial zoning districts shall apply.

4.9.4.6 Planned Unit Development (PUD) Zoning District Regulations

Signs for the types of developments and land uses in PUD zones shall be determined by applying the sign regulations for the conventional zoning district classifications in which the types of development and land uses are customarily permitted, except as otherwise provided below.

a. Comprehensive Sign Plans for Large Developments

1. Comprehensive Sign Plan

(a) Where a proposed or existing development contains 50 acres or more, the applicant may elect to submit a comprehensive sign plan for the development. Such plan may propose signs which depart from the conventional sign regulations for the zoning district in which the development is located, provided that the signs have a uniform or coordinated design motif that is compatible with the development and surrounding land uses.

(b) A comprehensive sign plan shall include a site development plan showing the locations of proposed signs by type and elevations illustrating the height, area and significant design features of each sign type.

b. Procedure for Approval

1. The applicant shall submit the proposed comprehensive sign plan to the Planning Zoning Board which shall conduct a public hearing on the matter at a regular meeting. If the comprehensive sign plan proposes signs that exceed the

height and/or area of signs otherwise permitted in the zoning district, the Board shall notify the owners of record of properties abutting or across the street from the development sites.

2. In approving a comprehensive sign plan, the Board shall find that the proposed signs are compatible with the character of the surrounding area.

3. Historic Preservation Board (HPB) approval of the sign plan will also be required for developments located within a designated historic district in which the review authority for signs is specifically granted to the HPB.

4.9.5 ADMINISTRATION

4.9.5.1 Permits, Applications, Structural Requirements, Fees, Issuance of Permit, and Inspection

a. Permits Required

It shall be unlawful for any person to erect, construct, alter, display, or relocate within the city any sign, not otherwise exempted, as provided in this Article, without first obtaining a permit from the Building Inspection Division and making payment of the required fee.

b. Application for Sign Permit

The city shall provide application forms for sign permits, which forms will require the following information:

1. Name, address, telephone number, and signature of the owner of the premises granting permission for the construction, operation, maintenance or displaying of sign or sign structure;

2. Name, address, telephone number and signature of sign contractor, if any;

3. Legal description and street address of premises or property upon which the sign is to be located;

4. The height, shape and dimensions of the sign structure, if any, and the dimensions and shape of the sign area;

5. The approximate value of the sign to be installed, including the installation cost;

6. Type of sign for which a permit is being sought; and

7. Two copies of a sketch, drawing, print or similar presentation drawn to scale and dimensioned, showing elevations of the sign as proposed on a building facade, awning or canopy, provided further, the relationship to other existing adjacent signs shall also be shown. In the case of a freestanding sign, these sketches shall include a site plan showing the sign location.

c. Structural Requirements

1. All signs shall comply with the appropriate detailed provisions of the building code, relating to design, structural members and connections. Signs shall also comply with the provisions of the electrical code.

2. All signs that contain more than 50 square feet in area or are greater than 15 feet in height shall be designed by an engineer registered in the State of Florida. Structural drawings along with wind load calculations shall be prepared by the engineer and submitted prior to a permit being issued.

d. Sign Permit Fees

Prior to receiving a permit for the erection, reconstruction, alteration, placement, or relocation of a sign, the applicant shall pay to the City of Lakeland all required fees, as established by resolution of the City Commission.

e. Issuance of Permit

It shall be the duty of the Chief Building Official, upon receiving an application for a sign permit, to examine such plans and specifications and other data, and if considered necessary, inspect the premises upon which it is proposed to erect the sign or other advertising structure. If the proposed structure, or sign, is in compliance with all of the requirements of this Article and all other applicable laws and ordinances of the city, a sign permit shall then be issued.

Every sign permit issued by the Building Inspection Division shall become null and void if erection is not completed within six months from the date of the permit. In order to start, continue, or restart work on the sign or sign structure after the six month period has expired, a new permit application and fees will be required.

f. Inspections

1. All signs for which a permit is required by this Article are subject to inspection by the Building Inspection Division.

2. When requested by the permit holder, the following required inspections shall be made by the city:

(a) A foundation inspection prior to pouring concrete for any approved ground or freestanding sign;
(b) Final electrical inspection for all electrical signs; and
(c) Final inspection for completion of all signs in accordance with approved plans.

3. If corrections of defects, or nonconformities, are not made within 10 days after notification, no permits for any sign work will be issued to the delinquent contractor until after all corrections have been completed.

4.9.5.2 CODE REQUIREMENTS

a. Building Code Requirements

The application for a permit for erection of a sign or other advertising structure must meet all of the applicable requirements of the building code before a sign permit is issued.

b. Electrical Code Requirements

The application for a permit for erection of a sign or other advertising structure in which electrical wiring and connections are used must meet the requirements of the electrical code before a sign permit will be issued. The sign company representative shall check with Lakeland Electric for power line clearance.

c. Code Conflict

In the event any of these regulations are in conflict with the requirements of the building code, electrical code or other governmental regulations; the more restrictive provisions of either shall govern. Nothing in this Article shall be construed to authorize signs if otherwise regulated or prohibited by private restrictions.

4.9.5.3 ENFORCEMENT

a. Enforcement of Regulations

It shall be the duty of the Community Development Director to administer and enforce the provisions of this Article in conjunction with the city's Building and Electrical Codes.

b. Unsafe Signs

All signs shall be maintained in proper repair and in a proper state of preservation. Should any sign become insecure or in danger of falling, in disrepair or a deteriorated state of preservation, or otherwise unsafe in the opinion of the Community Development Director, the owner thereof or the person or firm maintaining the same shall, secure the same or cause the same to be placed in good repair in a manner to be approved by the Community Development Director, in conformity with the provisions of this code and any other applicable laws or ordinances of the city or said sign must be removed. If such order is not complied with the city may remove said sign at the expense of the owner or lessee thereof. If the cost of removal is not paid within 90 days after said charges have been submitted to the owner or lessee, same shall become a lien upon the property from which the sign is removed upon the passage of a resolution by the City Commission.

c. Variances and Appeals

1. In those situations where streets have been widened and existing setbacks which were previously in compliance with zoning are reduced or where property was developed before the existence of zoning, and strict adherence to the setback provisions of this code is impossible or impractical, the sign permit applicant may erect a building sign parallel to the adjacent public right-of-way within a required setback area without applying for a variance.

2. The Zoning Board of Adjustment and Appeals is hereby authorized:

(a) To hear and decide appeals where it is alleged there is an error in any order, requirement, decision or determination made by an administrative official in the enforcement of this Article or of any amendments adopted pursuant thereto; and

(b) To hear applications for variances from the provisions of this Article regulating the height and setbacks of signs and to grant variances from such height and setback provisions where, owing to special conditions, literal enforcement of the requirements of said provisions will result in unnecessary hardship; will not be contrary to the public interest; will observe the spirit and intent of this Article; and will do substantial justice.

The Zoning Board of Adjustment and Appeals shall not have the power to vary any other provisions of these sign regulations except as set forth hereinabove.

3. Any person aggrieved by a decision of the Zoning Board of Adjustment and Appeals may seek judicial review by filing a petition for writ of certiorari in the Circuit Court within 30 days from the date of the written order appealed from.

d. Construction and Application

Anything contained in this Article to the contrary notwithstanding, any sign authorized by this code is allowed to contain non-commercial copy or messages in lieu of any other copy or message. For purposes of this Code, all non-commercial speech shall be deemed On-Premises.

4.10 SOLID WASTE COLLECTION BINS

4.10.1 GENERAL

a. For purposes of this section, the term "solid waste collection bin" shall include all solid waste containers or devices that require mechanical pickup or servicing, including dumpsters, trash compactors, bailers etc.

b. Solid waste collection bins shall be provided in all office, commercial, and industrial development or redevelopment projects and in multi-family development or redevelopment projects of five or more dwelling units. The minimum number, size and type of solid waste collection bins required for a development site shall be as determined by the Public Works Department as appropriate for the proposed use. The Director of Public Works may waive provisions of this section or may authorize curbside pickup of solid waste where, in his opinion, site conditions make strict adherence to these regulations infeasible.

c. The construction specifications for bin pads and bin enclosures shall be as set forth in the Engineering Standards Manual.

d. The location of solid waste collection bins and the construction of bin pads and bin enclosures shall be approved by the Public Works Department through the site plan review and inspection process in accordance with the following standards. Alternative locations for solid waste collection bins may be approved as part of adopted site development plans for Planned Unit Developments or Conditional Uses.

e. Where site conditions on redevelopment projects make the application of a particular standard impractical on a specific site, the Director of Public Works may authorize an administrative variance in accordance with the procedure set forth in the Engineering Standards Manual.

4.10.2 LOCATION STANDARDS

a. Solid waste collection bins shall not be located in required front or street side yards.

b. Solid waste collection bins shall be located where collection vehicles have an unobstructed path to enter, collect the waste or service the device, back up, and depart without having to make unnecessary or unsafe maneuvers. Over-the-cab collection vehicles must be able to lift solid waste collection bins without overhead obstructions.

c. Solid waste collection bins that are serviced by the city shall be located so that collection vehicles are not required to back up more than 60 feet in order to service the solid waste collection bin.

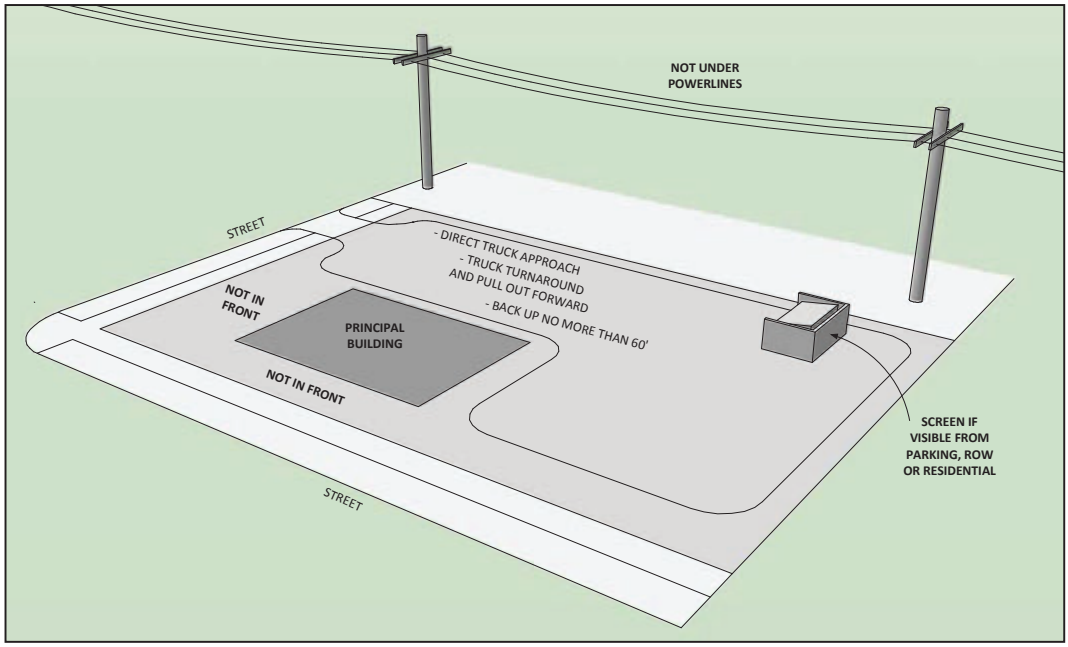
d. Solid waste collection bins shall not be placed on or encroach upon any public right-of-way or where they would require collection vehicles to back out onto the public right-of-way.

e. Solid waste collection bins and bin enclosures shall not be offset more than 30 degrees from the direction of collection vehicle approach.

f. Solid waste collection bins shall be located away from building entrances and exits.

g. Solid waste collection bins and bin enclosures shall be located at least three feet away from any non-combustible existing or planned structure and at least five feet away from any combustible existing or planned structure.

Figure 4.10-1 Solid Waste Collection Bin Location and Screening



4.10.3 VISIBILITY AND SCREENING STANDARDS

a. Solid waste collection bins shall be screened from view from the right-of-way of any public or private named street, and from any adjacent residentially zoned property, as viewed from any point on the property line at a height of five feet above grade. In shopping centers, office complexes, business parks and other multi-building sites, solid waste collection bins shall be screened from view from public areas of the site including parking lots, walkways, driveways etc. to which the public normally has access.

b Solid waste collection bins may be screened from view by principal or accessory structures; perimeter fences, walls or hedges; or by bin enclosures.

c. Where needed to screen solid waste collection bins from view, bin enclosures shall be constructed of durable, opaque materials that are compatible with the design, color and materials of the principal structures as determined by the city during site plan review. Where needed to screen solid waste collection bins from view, bin enclosures shall include gates of durable, opaque materials. Bin enclosures located in historic districts shall comply with the design review guidelines for historic districts.

d. Chain-link fencing with woven opaque slats shall be acceptable as a bin enclosure material only where the enclosure also incorporates a hedge or other view-blocking vegetation on the outside as determined by the city during site plan review.

e. Bin enclosures shall be maintained in good condition and appearance at all times. If needed for proper screening, bin enclosure gates shall remain closed except to access the solid waste collection bin and shall be maintained in operable condition.

4.11 VEHICLE USE AREAS

4.11.1 INTENT

It is the intent of this Section to provide minimum standards for the off-street parking, display, storage and maneuvering of vehicles, to provide for adequate loading space, to ensure the safe movement of traffic on the public streets, and to mitigate the potential adverse impacts of traffic and parking congestion on adjacent land uses and the human and natural environment.

4.11.2 APPLICABILITY

The vehicle use area requirements of this Section shall apply throughout the city. Development within that portion of Downtown described in Figure 4.11-1 shall be exempt from providing off-street parking, however, where such parking is provided, it shall conform to the design and dimensional standards of this Section. Prior to issuance of any building or construction permit, all required off-street parking spaces and loading space requirements shall be provided for on the required parking plan. Unless otherwise provided in this Section, the total off-street parking and loading space requirement shall be the sum of the requirements for all uses on the same lot or parcel.

Figure 4.11-1 Parking Exempt Area

4.11.2.1 Establishment of New Use

a. When a specified new use is established within a new structure or existing structure, whether in place of or in addition to existing uses, off-street parking and loading space shall be provided in accordance with this Section.

b. When an unspecified new use is established within a new structure or existing structure, whether in place of or in addition to existing uses, off-street parking and loading space shall be provided in accordance with the highest requirements applicable to any use permitted in the zoning district in which the new structure is to be located, as set forth in Table 4.12-1.

4.11.2.2 Expansion of Existing Use or Change of Use

When there is an expansion of an existing use or a change of use resulting in an increase in required off-street parking and /or loading space in excess of 125 percent of the overall requirement for the current use, such additional space shall be provided in accordance with the provisions of this Section. Otherwise, additional off-street parking and /or loading space shall not be required.

4.11.3 DEFINITIONS

Unless the context clearly indicates a different meaning, for the purposes of this Section, the following words and terms shall be defined as follows:

Bicycle Parking Facility: A device such as a rack or locker where bicycles can be parked and secured.

Employee: Employee shall mean the total number of employees present on the site at any one time.

Gross Floor Area (GFA): Gross Floor Area (GFA) shall mean the sum of the gross horizontal areas of the several floors of a building measured from the exterior face of exterior walls, or from the centerline of a wall separating two buildings, but not including interior parking spaces, loading space for motor vehicles, or any space where the floor-to-ceiling height is less than six feet.

Off-Street Parking: An area, space or facility for the temporary off-street keeping of motor vehicles of occupants, employees, patrons, students or visitors of the use or uses served.

Person-Capacity: Person-capacity shall mean the capacity of a use to accommodate one person, based on the maximum design capacity of the use.

For public assembly uses utilizing fixed seats, one unit shall mean one patron seat.

For public assembly uses utilizing temporary seating arrangements, one unit shall mean 20 square feet of the floor area utilized for temporary seating.

For uses involving public assembly for the purpose of dancing, one unit shall mean 50 square feet of dance floor area.

Seat: For public assembly uses, seat shall mean either one fixed seat or each 24 lineal inches of benches, pews or other similar seating arrangements.

4.11.4 VEHICLE USE AREA STANDARDS

4.11.4.1 Required Off-Street Parking Spaces

a. The minimum number of off-street parking spaces to be provided shall be as set forth in Table 4.12-1. The maximum number of off-street parking spaces allowed shall be the minimum number plus 10 percent. A modification to these requirements may be considered by the Director of Community Development pursuant to Section 4.12.5.

b. The minimum number of handicapped / accessible parking spaces shall be as set forth in the applicable building codes.

c. When the calculation of the number of required parking spaces results in a fractional number, any fraction over one-half shall be counted as one whole space.

d. Existing parking facilities which provide required parking shall not be reduced in capacity to an amount less than hereinafter required for a similar new building or use.

e. Existing parking facilities which provide required parking shall not be changed to any other use unless and until equal facilities are provided according to the provisions of this Section.

Table 4.11-1 Minimum Off-Street Parking Requirement

Use	Minimum Off-Street Parking Requirement
RESIDENTIAL	
Single-Family	2 spaces per dwelling unit
Two-Family, Three-Family and Four-Family	2 spaces per dwelling unit
Mobile Homes	1 space per dwelling unit
Recreational Vehicles	1 space per dwelling unit
*Space to accommodate the towing vehicle may be provided on either the vehicle site, or at a centrally located parking area.	
One or more dwelling units located above the first floor of a building which contains another permitted principal use on the first floor.	
1-bedroom	1.5 spaces per dwelling unit
2-Bedroom or more	2 spaces per dwelling unit
Multiple-Family for the General Public	
1-bedroom	1.5 spaces per dwelling unit
2-Bedroom or more	2 spaces per dwelling unit
Multiple –Family for the Elderly	0.5 spaces per dwelling unit
Group Homes, Levels I-III	1 space per 2 beds

Table 4.11-1 Minimum Off-Street Parking Requirement

Use	Minimum Off-Street Parking Requirement
Institutional Residential, Levels I-III	1 space per 2 beds
Residential Clubs	1 space per 2 beds
Rooming Houses, Hostels and Similar uses, Level I-III	1 space per 2 beds
COMMERCIAL	
Automotive	
Motor vehicle and boat sales and rental	1 space per 400 sf gfa
Motor vehicle parts and accessory stores	1 space per 300 sf gfa
Motor vehicle repair, Retail	4 spaces per bay
Motor vehicle services uses	
Automobile service station	4 spaces per bay
Motor vehicle fuel sales	
Automobile filling stations	1 space per employee
Automobile washing establishments, attended	1 space per employee, plus 5 queuing spaces per bay in approach lane and 5 queuing spaces per bay in exit lane
Automobile washing establishments, self-service	3 queuing spaces per bay
Commercial Uses	
Banks, Credit Unions and Savings and Loan Associations	1 space per 2oo sf gfa (400 sf gfa in C-6)
Drive-Through Facilities not listed elsewhere	5 queuing spaces per window
Retail sales	1 space per 300 sf gfa
Department Stores, Food Stores and Supermarkets	1 space per 200 sf gfa
Liquor Stores, Party Stores and Convenience Stores	1 space per 300 sf gfa
Single-Destination Commercial Uses	1 space per 300 sf gfa
Specialty Comparison Commercial Uses	1 space per 400 sf gfa
Shopping Centers occupying from 100,000 – 400,000 sf gfa	1 space per 200 sf gfa, excluding indoor common areas
Shopping Centers occupying over 400,000 sf gfa	1 space per 300 sf gfa, excluding indoor common areas
Hotels and Motels	1 space per guest room
Mobile Home Sales, Rental and Service Agencies	1 space per 400 sf gfa
Outdoor Retail Sales of new and used merchandise	1 space per 300 sf of sales area
Recycling Collection Centers	2 spaces, plus 1 space per employee
Retail Building Materials Sales Level II	1 space per 1,000 sf gfa
Retail Marine Sales and Services	1 space per 400 sf gfa
Commercial Uses within C-6 or C-7 located outside parking exempt area	
Retail	1 space per 400 sf
Hotel	1 space per 0.8 rooms
Restaurant	1 space per 200 sf
Office Uses	
General	1 space per 275 sf gfa
Health and Medical Care	1 space per *225* sf gfa
Government	1 space per 325 sf gfa
*Including U.S. Postal Service Facilities and Administrative Offices of City, County, State and Federal Government Agencies.	
Office-Type Research and Development Facilities	1 space per 250 sf gfa
All office Uses within C-6 or C-7 located outside parking exempt area	1 space per 325 sf gfa
Personal Service Uses	
Barber and Beauty Shops occupying less than 750 sf gfa	1 space per 75 sf gfa
Barber and Beauty Shops occupying more than 750 sf gfa	1 space per 100 sf gfa

Table 4.11-1 Minimum Off-Street Parking Requirement

Use	Minimum Off-Street Parking Requirement
Coin-operated Laundry and Dry Cleaning Establishments	1 space per 100 sf gfa
Exercise and Martial Arts Studios	1 space per 100 sf gfa
Other Personal Service Uses	1 space per 300 sf gfa
Funeral Homes	1 space per 3-person capacity in main chapel plus 10 queuing spaces for funeral procession.
Indoor Gun clubs and Shooting Galleries	1 space per 70 sf gfa
Kennels	5 spaces
Laundry and Cleaning Establishments, Level I & II	1 space per 200 sf gfa
*Not including facilities that serve primarily institutional costomers or facilities that serve other laundry and cleaning establishment serving the public.	
Regulated Uses	1 space per 200 sf gfa
Restaurants	
Very High Turnover	3 spaces, plus 1 space per 66 sf, plus 5 queuing spaces for each drive –up window
Other	1 space for each 4 patron seats, plus 1 for each 2 employees
Bars, Lounges and Related Entertainment	1 space per 70 sf gfa
INDUSTRIAL	
Industrial and Industrial Services Uses	
All uses within this category	5 spaces, plus 1.1 space per employee
Warehouse, Wholesale Trade and Transportation Uses	
Transit terminal facilities for passenger transportation operations	5 spaces, plus 1.1 space per employee, plus 1 space per 100 sf of passenger arrival and departure area
Commercial Warehouse, Wholesale trade and Transportation Uses	1 space per 1,200 sf gfa for 1st 20,000 sf, plus required parking for sf devoted to other uses. 1 space per 2,000 sf for 2nd 20,000 sf. 1 space per 4,000 sf in excess of 40,000 sf.
Mini-storage Warehousing	1 space per 25 storage cubicles, plus required parking for other uses
HEALTH SERVICES	
Hospitals	2 spaces per patient bed
Clinics	1 space per 150 sf gfa
Veterinary Clinics and Hospitals	1 space per 250 sf gfa
Convalescent and Nursing Homes	1 space per 2 beds
EDUCATIONAL	
Day Nursery/Child Care Centers	1 space per employee, plus 1 loading space per 6 pupils
Elementary and Middle Schools	1.5 spaces per classroom
Senior High Schools	10 spaces per classroom
Colleges, Junior Colleges, Universities and Seminaries	
All uses within this category	5 spaces per classroom and administrative office
Dormitories	1 space per 2 beds
Fraternities and Sororities	1 space per 2 beds
Vocational Training for activities permitted in the district where located (Trade School)	5 spaces per classroom and administrative office
*Not involving industrial, motor vehicles or other heavy equipment.	
ENTERTAINMENT AND RECREATION	
Indoor Entertainment and Assembly Facilities, including Theaters, Auditoriums and Meeting Halls	1 space per 3 person capacity
Outdoor Entertainment and Assembly Facilities, including Amphitheaters	1 space per 3 person capacity

Table 4.11-1 Minimum Off-Street Parking Requirement

Use	Minimum Off-Street Parking Requirement
Indoor Commercial Recreation	1 space per 70 sf gfa
Outdoor Commercial Recreation	1 space per 3 person capacity
Bowling Alleys, Billiard Halls	4 spaces per alley plus 2 spaces per billiard table plus required parking for other uses
Game Arcades	1 space per 70 sf gfa
Golf Courses and Executive Golf Courses	6 spaces per hole plus required parking for other uses
Miniature Golf Courses	3 spaces per hole plus required parking for other uses
Driving Range	1 space per tee plus required parking for other uses
MISCELLANEOUS	
Public and Quasi-Public Non-Commercial Uses	
Aquariums, Aviaries, Botanical Gardens	1 space per 300 sf gfa
Community Buildings	1 space per 300 sf gfa
Libraries, Museums and Art Galleries	1 space per 300 sf gfa
Churches, Synagogues and other Houses of Worship	
All uses within this category	1 space per 4 fixed seats (if used), or 1 space per 20 sf fa, in largest assembly, meeting or congregation area
Convents and Monasteries	1 space per 2 beds
Principal Communication Uses	
Communication studios	1 space per 3-person-capacity for studio audience, plus 1 space per 200 sf gfa for offices
Other principal communication uses	5 spaces, plus 1.1 space per employee
Utility and Essential Service Facilities	
All uses within this category	1.1 space per employee

4.11.4.2 Use and Location of Off-Street Parking Spaces

a. Off-street parking spaces required by this Section shall be used solely for the purpose of parking by occupants, employees, patrons, students or visitors in connection with the use or uses served and shall be limited to motor vehicles. Use of required parking spaces for placement of motor vehicles for purposes of display, sale, repair or storage is prohibited. Use of required parking spaces for the display or storage of merchandise is prohibited.

b. No off-street parking space shall exist or encroach upon any street right-of-way nor shall any part of any vehicle overhang the right-of-way of any public street, road, highway, alley or walkway.

c. For uses not specifically mentioned, the off-street parking space requirements for a use which is so mentioned and similar in character to the use not listed shall apply.

d. Residential

1. Required off-street parking spaces for single-family and two-family residential uses shall consist of a parking lot, driveway, garage, carport or combination thereof, and shall be located on the same lot or parcel as the building they are intended to serve.

2. Required off-street parking facilities serving multi-family residential uses of three or more dwelling units shall be located on the same lot or parcel as the residential uses served. Tandem parking is permitted where parking is reserved and both tandem spaces are assigned to the same dwelling unit.

e. Non-Residential

Required off-street parking spaces for non-residential uses shall be located on the same lot or parcel as the use or structure to be served, or may be located on a separate lot or parcel provided that the property upon which the required parking is to be located meets the following criteria:

1. Is within 600 feet of the primary entrance of the structure to be served, as measured by the shortest route of pedestrian travel which does not cross an arterial street.

2. Is located in either a commercial or industrial zoning district, or is approved for accessory parking as a conditional use.

3. Is owned by the same person as the property upon which the principal use is located, jointly owned with another person, or is under unified control which will ensure its continued use for required parking, as evidenced by city-approved agreements, contracts, covenants, deed restrictions, sureties or other instruments. If a written agreement securing the required number of parking spaces is not provided, then the use and occupancy of the premises shall cease until the parking requirements of these regulations are satisfied.

4.11.4.3 Use and Location of Truck Parking, Vehicle Display and Vehicle Storage Areas

a. Where permitted in accordance with the applicable zoning district, vehicle use areas may contain separate areas for truck parking, vehicle display and/or vehicle storage areas in addition to the required off-street parking area. Such areas shall be located on the same lot or parcel as the building they are intended to serve.

b. Every company or government car, truck, tractor and trailer legally and normally kept or parked on the site shall be provided with a space in an area reserved for that purpose, in addition to the off-street parking spaces required for the use.

4.11.4.4 Parking Plan Required

A parking plan shall be submitted as part of the permit application for construction of any new off-street parking facility or expansion of any existing off-street parking facility. For uses to which site plan review requirements apply, the parking plan shall be submitted as part of the site plan.

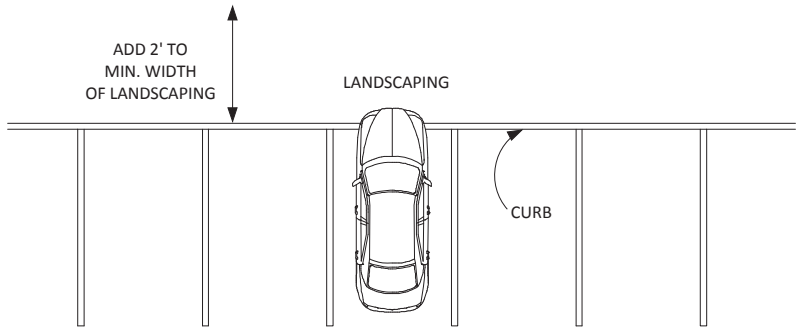
4.11.4.5 Vehicle Use Area Design and Construction Standards

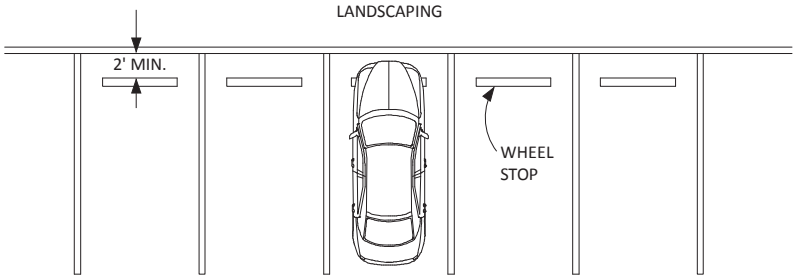
Vehicle use area design and construction standards set forth in this Section shall apply to vehicle use areas for non-residential uses and multi-family residential uses.

a. Vehicle use areas shall be designed in accordance with the minimum dimensional standards as set forth in Figure 4.11-3. Each required off-street parking space and truck parking space shall be a clearly designated and marked stall for one vehicle. Unpaved parking facilities may use wheelstops to demarcate individual parking spaces.

b. Curbing or wheelstops shall be used to control vehicle overhang in accordance with Figure 4.11-2. Vehicles shall not overhang sidewalks. Minimum landscape planter widths are exclusive of vehicle overhang. Where vehicles are allowed to overhang planters, a minimum of 1 foot shall be added to the width of the planter. A minimum of 2 feet shall be added to the width of the planter where vehicles overhang both sides of a planter median.

Figure 4.11-2 Curb-Wheelstop Location





c. Handicapped / accessible parking spaces shall be designed and marked in accordance with the applicable building codes.

d. Driveways shall conform to those sections of the latest Engineering Standards Manual pertaining to driveways. Private streets shall conform to those sections of the latest Engineering Standards Manual pertaining to streets.

e. Vehicle use areas shall ensure that adequate fire lane access is provided.

f. Vehicle use areas shall ensure that parking stalls, aisles, layout, ingress/egress, and other design features are functional and that maneuvering can be accomplished in a safe manner.

e. Setback Requirements

The minimum setback for off-street vehicle use areas in the front and street side yard shall be five feet.

f. Access Requirements

All off-street vehicle use areas shall have direct access to a public right-of-way or be linked to a public right-of-way by private streets, driveways or permanent easements which provide a suitable means of vehicular access.

g. Maneuvering Space Requirements

1. Maneuvering space and access aisles shall be provided for all parking areas, except those serving single-family or two-family dwellings. Maneuvering space and access aisles shall be sufficient to ensure that motor vehicles are not required to back into or maneuver within the street right-of-way when entering or leaving a parking space. No parking stall shall be so located as to require a vehicle to back up more than 40 feet in order to vacate the stall.

2. Alleys may be used as maneuvering space for off-street parking areas where space is constrained. When 90-degree parking is directly off of an alley, an apron shall be provided such that the combined width of the alley and apron provide a minimum of 23 feet of maneuvering space. When an alley serves a parking garage, the garage door that faces the alley shall be set back a minimum of five feet from the lot line abutting the alley.

h. Landscaping and Buffering

Vehicle use areas shall be landscaped and buffered in accordance with Section 4.5 (Landscaping, Trees and Buffering).

i. Surface Maintenance and Drainage Requirements

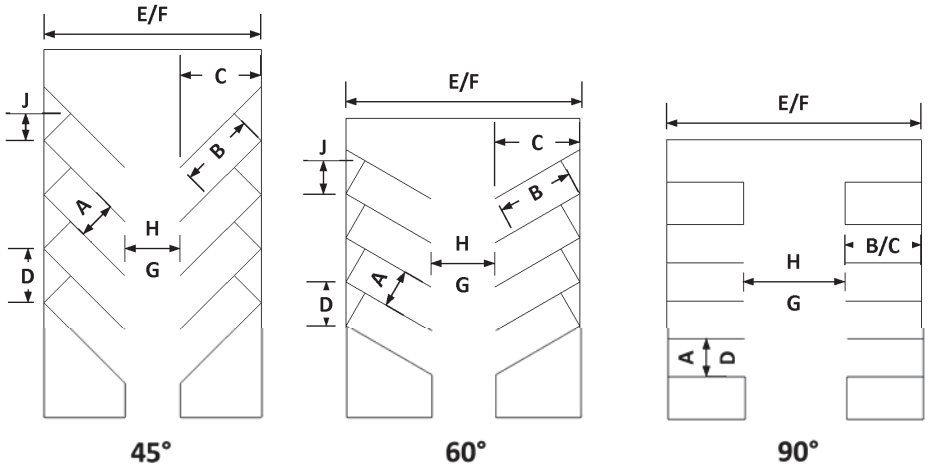
Vehicle use areas shall be surfaced and maintained to provide a durable, dust-free surface and shall provide adequate drainage facilities for disposal of all collected surface water. The use of floatable materials such as wood chips and shredded rubber as surfacing material is prohibited.

j. Lighting Requirements

All off-street parking facilities as a principal use or accessory to commercial uses shall be lighted after dark throughout the hours during which such facilities are to be used by the public in accordance with Section 4.7 (Outdoor Lighting).

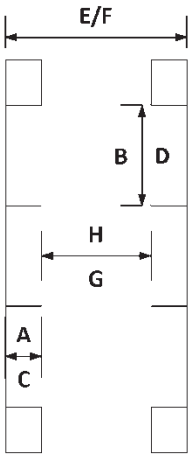
Figure 4.11-3 Minimum Parking Dimensions (Nonparallel)

		45°	60°	90°
A	Stall Width	9’	9’	9’
B	Stall Length	18’	18’	18’
C	Stall Projection	19.09’	20.09’	18’
D	Curb Length	12.73’	10.39’	9’
E	Wall to Wall-One Way	51.18’	55.21’	60’
F	Wall to Wall-Two Way	58.18’	60.21’	60’
G	Aisle Width-One Way	13’	15’	24’
H	Aisle Width-Two Way	20’	20’	24’
J	Last Car Requirement	6.36‘	7.79’	N/A



* Where abutting a wall, fence, support column or other vertical structure which would obstruct access to the vehicle, the minimum stall width shall be increased by two feet.

Figure 4.11-4 Minimum Parking Dimensions (Parallel)



A	Stall Width	8’
B	Stall Length	22’
C	Stall Projection	8’
D	Curb Length	22’
E	Wall to Wall-One Way	26’
F	Wall to Wall-Two Way	36’
G	Aisle Width-One Way	10’
H	Aisle Width-Two Way	20’

4.11.5 ADMINISTRATIVE MODIFICATIONS

4.11.5.1 General Procedures

a. The purpose of this section is to provide flexibility in modifying the minimum required and the maximum allowed number of off-street parking spaces of Section 4.12.4.1 through a number of parking options which may be approved through an administrative modification.

b. An administrative modification to Section 4.12.4.1 that utilizes one or more of the Parking Options listed below may be approved by the Director of Community Development or his designee after consultation with the Public Works Department.

c. Applications seeking to modify the required number of parking spaces shall be made in writing to the Director of Community Development and shall:

1. Demonstrate that a particular use or situation, such as physical site constraints, is unusual or unique to the extent that it poses practical difficulty in complying with the required number of off-street spaces; and

2. Include technical justification in the form of an independent parking analysis or alternative standards published by a recognized professional organization such as the American Planning Association (APA), the Urban Land Institute (ULI) and/or the Institute of Traffic Engineers (ITE).

4.11.5.2 Parking Options

a. Alternative Design

Parking quantities above the maximum allowed under Section 4.12.4.1 may be considered for projects which document a demonstrated need and incorporate alternative design techniques to minimize impervious surface areas within the project. Such techniques may include but are not limited to the use of pervious pavers for perimeter and/or overflow parking, the use of bioswales and the creation of site amenities such as additional green space areas.

b. Parking Offsets (Reductions)

1. Tree Protection Offset

The required number of off-street parking spaces may be reduced by up to 20 percent if that area which would normally be required for parking is used for the protection of existing trees or for landscaping in addition to the minimum required by Section 4.5 (Landscaping, Trees and Buffering).

2. Transit Offset

The required number of off-street parking spaces may be reduced up to a maximum of 10 percent for non-residential or multi-family projects that are located along a fixed transit route operated by either the Lakeland Area Mass Transit District (LAMTD) or the Polk County Transit Authority. The route on which the project is located must provide service at headways, or frequency, of thirty minutes or less and must have a designated transit stop located within 1,320 feet (¼ mile) of a project's boundaries.

3. Cumulative Parking Offsets

In no case shall the reduction of required off-street parking spaces by offsets be greater than 20 percent. This includes any credit against minimum off-street parking requirements that may be granted through the provision of bicycle parking facilities in accordance with Section 4.12.6.

c. Tandem Parking

Tandem parking may be allowed for existing commercial buildings or existing buildings which undergo a change in use (e.g. residential to commercial). Tandem parking shall be defined as the arrangement of not more than two parking spaces in depth, wherein one space is located directly in front of another space, so that one vehicle must be moved before the other can be accessed. The use of tandem spaces shall be subject to the following:

1. Tandem spaces shall be reserved for employee parking and shall be identified and designated as such through the use of signage and/or pavement markings.

2. No more than 25 percent of the required parking spaces may be tandem spaces.

d. Joint Use Facilities and Shared Parking

The total parking space requirement for individual uses or structures may be reduced by the Director of Community Development through joint/shared parking facilities which serve two or more uses or structures, subject to the following conditions:

1. The minimum number of off-street parking spaces shall be calculated using a professionally accepted methodology that is based upon parking demands for individual uses occurring at different times. Such methodologies may include those published by the professional organizations cited in Section 4.12.5.1 c.2.

2. Not more than 50 percent of the off-street parking spaces required for theaters, churches, bowling alleys, dance halls, and establishments for the sale and consumption of alcoholic beverages, food or refreshments shall be supplied by off-street parking spaces required by other uses or structures.

3. A copy of the agreement between joint users shall be filed with the required parking plan and recorded with the Clerk of the Circuit Court for Polk County. The agreement shall include a guarantee for continued use of the parking facility by each party. Any violation of such an agreement shall be a violation of this code.

4. The required off-street parking for a particular use may be reduced by its proportionate share of any publicly-owned parking area for which it has been specially allocated.

4.11.6 BICYCLE PARKING REGULATIONS

4.11.6.1 Applicability

a. Bicycle parking facilities shall be required for each new or redeveloped non-residential or multi-family principal building requiring 10 or more off-street motor vehicle parking spaces when such building is located:

1. In any Activity Center as identified on the Future Land Use Map

2. In the Central City Transit Supportive Area or on a Transit Oriented Corridor as defined in the Comprehensive Plan

3. On any current or proposed public transit route as identified in the Transportation Development Plan

4. On any corridors identified in the Pathways Plan or Lake-to-Lake Greenway Connector Network as defined in the Comprehensive Plan

5. In any individual or unified development complex having or expected to have more than 50 employees on site at any one time

6. In the following public or quasi-public facilities: Schools; colleges, junior colleges, universities, seminaries; hospitals; museums; recreation facilities including parks; and community buildings.

b. Principal buildings listed above that are located within the area exempt from off-street motor vehicle parking requirements in accordance with Figure 4.11-1 shall provide bicycle parking notwithstanding that exemption. The amount of bicycle parking shall be in accordance with Section 4.12.6.3 as applicable and shall be based upon the amount of off-street motor vehicle parking that would otherwise be required if the motor vehicle parking exemption were not in effect. The renovation of existing buildings in the Central Business District shall be exempt from the bicycle parking requirements.

c. The following uses shall be exempt from bicycle parking requirements: Residential for the elderly; houses of worship.

4.11.6.2 Minimum Number of Bicycle Parking Spaces Required:

a. Two bicycle parking spaces for the first 10 required off-street motor vehicle parking spaces.

b. Two additional bicycle parking spaces for each additional 20 required off-street motor vehicle parking spaces or fraction thereof.

c. In no case shall more than 32 bicycle parking spaces be required.

d. Where 32 bicycle parking spaces are required, 10 of these spaces shall be covered spaces for long-term bicycle parking. Covered spaces may include racks under roof or lockers that protect bicycles from the elements.

e. Where space within a building is dedicated to and available for the parking of bicycles, credit shall be given against the bicycle parking requirements on a one to one basis. To receive credit, such interior bicycle parking shall be noted on the site plan.

4.11.6.3 Bicycle Parking Facility Design Standards

a. Bicycle racks shall support the bicycle frame at two points, not just the wheel; shall allow both the frame and one wheel to be locked to the rack; and shall accommodate bicycles of all types and frame sizes. Facilities that support the bicycle only at the wheel are not acceptable.

b. Bicycle lockers shall be lockable and shall provide a secure enclosure around the bicycle.

c. Bicycle parking facilities shall be permanently affixed to a hard surface such as concrete, asphalt, or pavers.

d. It is the intent of this section to locate bicycle parking facilities on the project site where they will best encourage the use of bicycles for transportation. The preferred location is near the primary entrance of the principal building. The Director of Community Development or his designee shall have the authority to determine the most appropriate location during site plan review.

e. Bicycle parking facilities shall be located outside of the public right-of-way except where public bicycle parking is provided by a governmental entity.

f. Bicycle parking facilities shall not impede ingress or egress to any building or project site and shall not be placed in the functional area of a sidewalk or where it interferes with any fire hydrant, parking meter, bus stop, loading zone, sidewalk ramp, wheelchair ramp, or similar public facility.

g. Bicycle parking facilities shall be identified using signage and/or pavement markings.

4.11.6.4 Credit Against Minimum Off-Street Parking Requirements

For non-residential or multi-family principal buildings located anywhere in the city, the minimum number of motor vehicle parking spaces required by Section 4.12.4.1 may be reduced at the rate of one motor vehicle space per two bicycle parking spaces provided, whether or not such bicycle parking spaces are required, to a maximum of 10 percent of the required motor vehicle parking spaces.

4.11.6.5 Administrative Waivers

a. The Director of Community Development or his designee shall have the authority to modify the bicycle parking requirements contained in this section, including but not limited to situations in which compliance cannot be met due to physical site constraints. Such modification shall be noted on the site plan.

b. The Director of Community Development or his designee may recommend to the Zoning Board of Adjustments and Appeals that bicycle parking facilities be provided by any development project that is granted a variance to the minimum number of required off-street motor vehicle parking spaces.

4.11.7 OFF-STREET LOADING SPACE REGULATIONS

4.11.7.1 Applicability

a. Uses involving the receipt or delivery by vehicles of materials or merchandise shall provide the indicated number of permanent, paved 10’ x 25’ and 10’ x 50’ off-street loading spaces. The Director of Community Development may waive or modify the requirements of this section due to physical limitations of the site or if he determines that the particular use has little or no need for deliveries or that public right-of-way or adjacent property provides a safe, legal and available loading space location.

b. Off-street loading spaces shall be located on the same premises as the use requiring such spaces and shall be accessible to delivery vehicles when all parking spaces are filled. Off-street loading spaces may be open or enclosed.

c. Off-street loading spaces serving two or more uses or structures on the same zoning lot may be located in a common area, provided that the number of spaces is not less than the sum of the spaces required for each individual use or structure served.

4.11.7.2 Number of Off-Street Loading Spaces Required

a. Office, public and quasi-public non-commercial, churches, synagogues and other houses of worship, colleges, junior colleges, universities and seminaries, vocational training uses:

	NUMBER OF LOADING SPACES	
SF GFA	10' x 25'	10' x 50'
0 - 99,999	1	0
100,000 - 149,999	0	1
150,000 and over	0	2

b. Commercial, industrial, warehouse, wholesale trade, communication, utility and essential services uses:

	NUMBER OF LOADING SPACES	
SF GFA	10' x 25'	10' x 50'
0 - 4,999	1	0
5,000 - 19,999	0	1
20,000 - 49,999	0	2
50,000 - 79,999	0	3
80,000 - 99,999	0	4
100,000 - and over	0	5
For each additional 50,000 over 150,000	0	1

c. For uses not specifically listed, the off-street loading space requirement shall be that for a use which is so mentioned and similar in character to the use not listed shall apply.

4.12 VISIBILITY AT INTERSECTIONS

4.12.1 INTENT AND APPLICABILITY

4.12.1.1 Intent

It is the intent of this Section to provide minimum standards for visibility at street intersections and the intersections of driveways with streets.

4.12.1.2 Applicability

This Section shall apply citywide to non-signalized street intersections and to intersections of non-signalized driveways or alleys with streets, except driveways serving single family or two family dwellings.

4.12.2 STANDARDS

No structure, object, fence, wall, hedge, tree, shrub, earth berm, sign, bus bench, newsrack, or portions of same shall be placed, erected, constructed or maintained in such a manner as to materially obstruct the visibility of vehicle operators between the heights of 24 inches and 8 ½ feet above grade within the following described visibility triangles:

a. Non-Signalized Intersections:

Beginning where the edges of the pavement of the intersecting streets meet at the corner, or in the case of rounded corners, the point at which they would meet without such rounding, thence 45 feet along one edge of pavement, thence diagonally to a point along the edge of pavement of the intersecting street 45 feet from the point of beginning, thence to the point of beginning. In the case of rounded corners having a radius larger than 45 feet, both legs of the triangle at the edge of pavement shall be equal to the radius. Example: For a corner radius of 55 feet, both legs shall be 55 feet.

b. Intersection of Non-Signalized Driveways or Alleys with Streets:

Beginning where the edges of the pavement (or stabilized way) of the intersecting driveway or alley and street meet at the corner, or in the case of rounded corners, the point at which they would meet without such rounding, thence 30 feet along the edge of pavement of the driveway or alley, thence diagonally to a point along the edge of pavement of the intersecting street 30 feet from the point of beginning, thence to the point of beginning. In the case of rounded corners having a radius larger than 30 feet, both legs of the triangle at

the edge of pavement shall be equal to the radius. Example: For a corner radius of 35 feet, both legs shall be 35 feet.

c. Exceptions

1. Up to 24 inches combined diameter of the trunks of required trees or of poles, all having clear spans between 30 inches and eight feet above grade, may be located within the visibility triangle outside of the right-of-way.

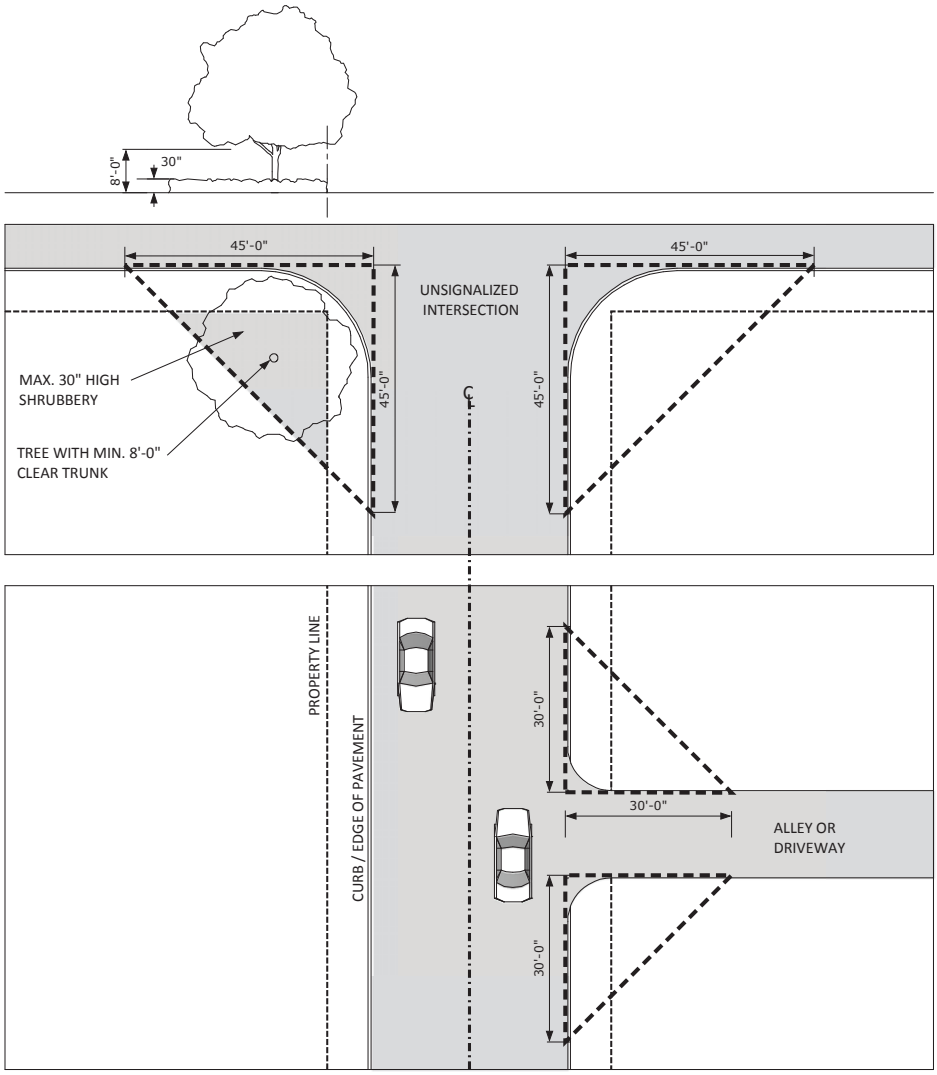
2. Utility poles, street trees, traffic signs, traffic control devices, fire hydrants and similar infrastructure may be located within the visibility triangle in accordance with the traffic engineering standards applicable to the intersection.

3. Where grade differentials, horizontal curves or other physical characteristics materially affect vehicle operator visibility at a particular intersection, the Director of Public Works may recommend to the Director of Community Development that the visibility triangle be modified, consistent with the intent of this Section.

4.12.3 MAINTENANCE

The city shall maintain street trees located within the visibility triangle in accordance with this Section. The property owner shall maintain all other landscaping within the visibility triangle in accordance with this Section at all times and shall trim all other trees and vegetation accordingly.

Figure 4.12-1 Visibility Triangles (Radius 45' or less)



Appendix D: FYN Draft Agreement

MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding (herein referred to as "AGREEMENT") entered into on October 1, 2014 between Polk County, a political subdivision of the State of Florida, hereinafter referred to as "COUNTY," and the City of Winter Haven (City of Lakeland, City of Bartow), Florida, hereinafter referred to as "CITY." (as discussed in the partner meeting, county divisions (Parks and Natural Resources and Utilities) will utilize an internal memo for funding, but this can be used as a basis)

WITNESSETH

WHEREAS, Polk County and the City of Winter Haven (City of Lakeland, City of Bartow) want to implement Florida-Friendly Landscaping™ principles to protect and conserve Florida's water and unique natural resources; and

WHEREAS, the National Pollutant Discharge Elimination System (NPDES) MS4 permitting authority, the Florida Department of Environmental Protection, expects and requires local governments to provide evidence of public education in efforts to reduce storm water runoff and threats to the quality of local waterways, along with evidence that local commercial applicators of pesticides and herbicides are up-to-date with requisite certifications from the Florida Department of Agriculture and Consumer Services; and

WHEREAS, the University of Florida IFAS (UF/IFAS) Extension Polk County's educational mission includes providing education to commercial applicators seeking certification, county and municipal employees, homeowners, seasonal residents, homeowner and property owner associations, and youth audiences, and will provide assistance to Polk County and the City of Winter Haven (City of Lakeland, City of Bartow) in order to utilize and implement the Florida Friendly Landscaping ™ Program by providing personnel, educational, technical and research information to the County and the Cit(ies).

NOW, THEREFORE, in consideration of the mutual covenants and provisions contained herein, the parties hereto agree as follows:

ARTICLE I
PURPOSE

Florida-friendly landscapes protect Florida's unique natural resources by conserving water, reducing waste and pollution, creating wildlife habitat, and preventing erosion. Any landscape can be Florida-Friendly if it is designed and cared for according to the nine Florida-Friendly Landscaping™ principles. In 2009, the Florida Legislature found "that the use of Florida-friendly landscaping and other water use and pollution prevention measures to conserve or protect the state's water resources serves a compelling public interest and that the participation of homeowners' associations and local governments is essential to the state's efforts in water conservation and water quality protection and restoration."

As is the case with counties throughout Florida, Polk County faces critically important issues in water quality and future water supply. The Florida-Friendly Landscaping™ program is an umbrella for Florida Yards and Neighborhoods, which is focused on residential, community, and youth audiences, and for the Green Industries-Best Management Practices (GI-BMP) certification, aimed at "green industry" lawn and landscape workers who apply fertilizers and pesticides. The behavior of these target audiences has tremendous impact on Polk County's waterways, including the waterways that lie within the responsibility of the City of Winter Haven (Lakeland, Bartow) for quality and supply.

Polk County and the 17 municipalities must comply with requirements of the National Pollutant Discharge Elimination System (NPDES) MS4 permit in order to be in compliance with the Florida Department of Environmental Protection (FDEP) and be able to discharge storm water into lakes and rivers. Further, the Southwest Florida Water Management District (SWFWMD) issues water consumptive use permits which direct entities (commercial? municipal? everyone seeking a permit?) to reduce water usage by a minimum of 10% every five years.

The Florida-Friendly Landscaping™ educational efforts of the UF/IFAS Extension Polk County office, along with the Extension horticulture, natural resources, and integrated pest management programs, will include workshops and classes, plant and landscape advice, online resources and certifications to assist the County and municipalities in meeting requirements for improving water quality and reducing water consumption.

This Memorandum of Understanding establishes the respective responsibilities of the COUNTY, through the UF/IFAS Extension Polk County office, and the City of Winter Haven (Lakeland, Bartow). The purpose of this AGREEMENT is to specify the terms under which the COUNTY, through support from the University of Florida IFAS, will provide personnel and educational, technical and research information to the CITY(ies), and funding arrangements for sustainability of the Florida-Friendly Landscaping™ coordinator position.

ARTICLE II
COMMON OBJECTIVES FOR THE FLORIDA-FRIENDLY LANDSCAPING™ PUBLIC EDUCATION PROGRAM

UF/IFAS Extension Polk County provides leadership for the planning, implementation, and evaluation of a Florida-Friendly Landscaping™ (FFL) education program for the COUNTY and CITY(ies). Core educational areas will include the nine FFL principles and overall water quality, conservation, and public awareness of water supply, along with requisite certifications for environmental fertilizer and pesticide applicators.

These services are provided by joint funding of the University of Florida IFAS Extension, the COUNTY, and the City of Winter Haven (Lakeland, Bartow). Educational efforts will include targeted programs based on needs of COUNTY and municipal residents, as identified by the professional staff representing the funding partners.

Funding partners mutually agree to fund personnel and programming resources that support delivery of these services, including the Florida-Friendly Landscaping™ coordinator position. Additionally, UF/IFAS Extension faculty in urban horticulture, natural resources and conservation, integrated pest management, and Master Gardener volunteers contribute toward the common educational and programming objectives of the funding partners, along with legal requirements, which include:

- Reduction of storm water runoff and compliance with NPDES permitting and local fertilizer use ordinances, including reduced and appropriate use of fertilizers and pesticides
- Consumptive water use reduction for high-use commercial properties and residential associations
- Education program delivery methods that target green industry retailers and the general public to become aware of FFL principles and adopt them for implementation

(The 11 common outcomes identified in the partner meeting on 2-24-14 are consolidated in the three bulleted statements above)

ARTICLE III
TERMINATION OF SERVICES

This AGREEMENT may be terminated at will by either party hereto giving three (3) months prior written notice thereof to the other.

ARTICLE IV
RESPONSIBILITIES

1) Responsibilities of the COUNTY
    a. With respect to the Florida-Friendly Landscaping™ Coordinator position, the UF/IFAS Extension Polk County office, under the COUNTY's delegated authority, shall:
        i. Establish minimum employment requirements and qualifications for the FFL Coordinator;
        ii. Recruit, interview, and screen candidates for the FFL Coordinator position;
        iii. Establish the total of amount of base salary of the FFL Coordinator;
        iv. Pay Extension's proportionate share of the salary and fringe benefits for the FFL Coordinator;

v. Determine the total dollar amount of any cost-of-living or merit raises, or salary bonuses;
vi. Provide direct supervision to the FFL Coordinator through the County Extension Director and Urban Horticulture Agent;
vii. Provide office space, support personnel, equipment, supplies, utilities, demonstration materials, and vehicles for official county travel, and other operational needs for the Extension office as the COUNTY deems appropriate

b. With respect to the educational services provided by the Extension programs for urban horticulture, natural resources and conservation, and Integrated Pest Management, the UF/IFAS Extension Polk County office shall:
    i. Meet the expectations provided in the attached Scope of Work (Exhibit A) related to:
        1. Certification of pesticide, herbicide, and fertilizer commercial applicators
        2. Provide public education programs, included targeted education to youth audiences, to encourage water use conservation and reduce storm water runoff

2) Responsibilities of the CITY(ies)
    a. With respect to the Florida-Friendly Landscaping™ Coordinator, the CITY shall:
        i. Pay the CITY's portion of salary as set forth in Article V of this AGREEMENT and Exhibit B which is attached hereto and incorporated in this AGREEMENT.
        ii. Assist with the creation of the annual work plan as required in the attached Scope of Work (Exhibit A), including contacts, ideas, and an approach that will work for the community.
        iii. Provide assistance at the request of the Florida-Friendly Landscaping™ Coordinator to schedule meetings and projects
        iv. Provide technical assistance to the FFL coordinator and other UF/IFAS Extension personnel in generating information related to lakes, hydrology, water quality, water consumption and related areas, as needed, as well as mailing and contact lists, if feasible.
3) General Provisions:
    a. Management and Administration of the Florida-Friendly Landscaping™ staff
        i. The FFL Coordinator shall follow COUNTY policies relative to office hours and holidays;
        ii. The COUNTY and CITY cooperatively coordinate Equal Employment Opportunity plans for the Extension FFL Coordinator position (see Article IX, Section 4);

iii. The COUNTY has determined that the FFL Coordinator, an employee of the COUNTY, is non-exempt under provisions of the Fair Labor Standards Act;
iv. The FFL Coordinator will be evaluated annually using the COUNTY's employee evaluation process, in the corresponding month of the anniversary of hire.

ARTICLE V
FUNDING AND PAYMENTS

With respect to funding and sustainability of the UF/IFAS Extension Polk County FFL coordinator position, a COUNTY staff position, the following conditions apply:

1) The CITY(ies) agrees to pay the COUNTY a fixed rate not more than the total sum of $10,000 (to be adjusted as appropriate for each entity) as indicated in Exhibit B, which includes salary and fringe expenses for the FFL coordinator, and support for educational services from UF/IFAS Extension.
2) Contribute $5,000 per year towards program related expenses, including but not limited to plant materials, irrigation work, contractors, educational support materials, meeting space, refreshments, and landscape equipment.(this portion is from the drafted agreement with City of Winter Haven in 2013. Entities may consider funding toward programming costs, but there isn't an expectation that each will pay $5000, and in the draft budget programming costs are covered by anticipated revenue through grants).

3) It is understood that no amount of funds specified hereto above should be used for payment of salaries or any other expenses of COUNTY personnel other than the FFL coordinator.

4) The COUNTY will not charge Facilities and Administrative costs to the CITY.

5) The policies established by the COUNTY in administering annual, sick, civil, holiday, and military leave, and regarding payment of unused annual and sick leave upon separation, shall apply.

6) The COUNTY may elect to pay an annual salary supplement to the FFL coordinator. The COUNTY shall fund 100% of the supplement, including salary, fringe benefits, and worker's compensation.

7) Payments shall be made bi-annually as invoiced by the COUNTY. The bi-annual payments shall be in the amount as indicated on Exhibit B, and will be due within 45 days of receipt of the invoices. Invoices submitted by the COUNTY to the CITY should be sent to the following COUNTY address:

UF/IFAS Polk County Extension Office
Polk County Board of County Commissioners
P.O. Box 9005, Drawer HS03
Bartow, FL 33831-9005

ARTICLE VI
PERIOD OF CONTRACT – RENEWAL – MODIFICATION

This AGREEMENT shall be effective as of October 1, 2014 and shall continue through September 30, 2015, unless modified or terminated earlier. At the time of expiration, this Agreement will be updated as needed and resigned by both parties. This AGREEMENT may be modified at any time by mutual consent of both parties herein above.

(The blue sections below are all University of Florida "legal-ese." The format of this agreement is based on the format of a UF MOU but doesn't have to remain as such. For purposes of an agreement between Polk County BoCC and the municipalities, this can be dissected to only necessary language as approved by the legal departments of each municipality and the Polk County Attorney).

ARTICLE VII
MAINTENANCE OF RECORDS

The COUNTY will keep adequate records and supporting documentation applicable to this contractual matter. Said records and documentation will be retained by the COUNTY for a minimum of five (5) years from the date of termination of this AGREEMENT. The CITY and its authorized agents shall have the right to audit, inspect and copy all such records and documentation as often as the CITY deems necessary during the period of this AGREEMENT and during the period of five (5) years thereafter; providing, however, such activity shall be conducted only during normal business hours. The CITY, during the period of time expressed by the preceding sentence, shall also have the right to obtain a copy of and otherwise inspect any audit made at the direction of the COUNTY as concerns the aforesaid records and documentation.

ARTICLE VIII
LIABILITY

The COUNTY assumes any and all risks of personal injury and property damage attributable to the negligent acts of omissions of the COUNTY and the officers, employees, servants and agents thereof while acting within the scope of their employment by the COUNTY. The CITY assumes any and all risks of personal injury and property damage attributable to the negligent acts of omissions of the CITY and the officers, employees, servants and agents thereof while acting within the scope of their employment by the CITY. The COUNTY, as a state agency warrants and represents that it is self-funded for liability insurance, both public and property, with said protection being applicable to officers, employees, servants and agents while acting within the scope of their employment by the COUNTY. The CITY warrants and represents that it is self-funded for liability insurance, both public and property with such protection being applicable to officers, employees, servants and agents while acting within the scope of their employment by the CITY. The COUNTY and CITY further agree that nothing contained herein shall be construed or interpreted as (1) denying to either party any remedy or defense available to such party under the laws of the State of Florida; (2) the consent of the State of Florida or its agents, agencies, and subdivisions, to be sued; or (3) a waiver of sovereign immunity of the State of Florida or its agents, agencies, and subdivisions, beyond the waiver provided in section 768.28, Florida Statutes.

ARTICLE IX
CONTRACTUAL REQUIREMENTS

1) COUNTY shall maintain all books, records and documents directly pertinent to performance under this AGREEMENT in accordance with generally accepted accounting principles consistently applied. Each party to this AGREEMENT or their authorized representatives shall have reasonable and timely access to such records of each other party to this AGREEMENT for public records purposes during the term of the AGREEMENT and for five (5) years following the termination of this AGREEMENT. If an auditor employed by the CITY or Clerk determines that monies paid to the COUNTY pursuant to this AGREEMENT were spent for purposes not authorized by this AGREEMENT, the COUNTY shall repay the monies together with interest calculated pursuant to Section 55.03, Florida Statutes, running from the date the monies were paid to the COUNTY.
2) Governing Law, Venue, Interpretation, Costs, and Fees: This AGREEMENT shall be governed by and construed in accordance with the laws of the State of Florida applicable to contracts made and to be performed entirely in the State.
3) Binding Effect. The terms, covenants, conditions and provisions of this AGREEMENT shall bind and inure to the benefit of the CITY and COUNTY and their respective legal representatives, successors, and assigns.
4) Nondiscrimination. The CITY and COUNTY agree that there will be no discrimination against any person, and it is expressly understood that upon a determination by a court of competent jurisdiction that discrimination has occurred, this AGREEMENT automatically

terminates without any further action on the part of any party, effective the date of the court order. The CITY and COUNTY agree to comply with all Federal and Florida statutes, and all local ordinances, as applicable, relating to nondiscrimination. These include but are not limited to: a) Title VI of the Civil Rights Act of 1964 (PL 88-352) which prohibits discrimination on the basis of race, color or national origin; b) Title IX of the Education Amendment of 1972, as amended (20 USC ss. 1681-168,m and 1685-1686), which prohibits discrimination on the basis of sex; c) Section 504 of the Rehabilitation Act of 1973, a amended (20 USC s. 794), which prohibits discrimination on the basis of handicaps; d) The Age Discrimination Act of 1975, as amended (42 USC ss. 6101-6107) which prohibits discrimination on the basis of age; e) The Drug Abuse Office and Treatment Act of 1972 (PL 92-255), as amended, relating to nondiscrimination on the basis of drug abuse; f) The Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (PL 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; g) The Public Health Service Act of 1912, ss. 523 and 527 (42 USC ss. 690dd-3 and 290ee-3), as amended, relating to confidentiality of alcohol and drug abuse patent records; h) Title VIII of the Civil Rights Act of 1968 (42 USC s. et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; i) The Americans with Disabilities Act of 1990 (42 USC s. 1201 Note), as may be amended from time to time, relating to nondiscrimination on the basis of disability; j) prohibiting discrimination on the bases of race, color, sex, religion, disability, national origin, ancestry, sexual orientation, gender identity or expression, familial status of age; and k) any other nondiscrimination provisions in any Federal or state statutes which may apply to the parties to, or the subject matter of, this AGREEMENT.

5) Covenant of No Interest. The CITY and COUNTY covenant that neither presently has any interest, and shall not acquire any interest, which would conflict in any manner or degree with its performance under this AGREEMENT, and that only interest of each is to perform and receive benefits as recited in this AGREEMENT.
6) Code of Ethics. The CITY and the COUNTY agree that officers and employees of the CITY and the COUNTY recognize and will be required to comply with the standards of conduct for public officers and employees as delineated in Section 112.313, Florida Statutes, regarding, but not limited to, solicitation or acceptance of gifts; doing business with one's agency; unauthorized compensation; misuse of public position, conflicting employment or contractual relationship; and disclosure or use of certain information.
7) No Solicitation/Payment. The CITY and COUNTY warrant that , in respect to itself, it has neither employed nor retained any company or person, other than a bona fide employee working solely for it, to solicit or secure this AGREEMENT and that it has not paid or agreed to pay any person, company, corporation, individual or firm, other than a bona fide employee working solely for it, any fee, commission, percentage, gift or other consideration contingent upon ore resulting from the award or making of this AGREEMENT. For the breach or violation of the provision, the COUNTY agrees that the CITY shall have the right to

terminate this AGREEMENT without liability and at its discretion, to offset from monies owed, or otherwise recover, the full amount of such fee, commission, percentage, gift, or consideration. For the breach or violation of the provision, the CITY agrees that the COUNTY shall have the right to terminate this AGREEMENT without liability and at its discretion, to offset from monies owed, or otherwise recover, the full amount of such fee, commission, percentage, gift, or consideration.

8) Public Access. The CITY and COUNTY shall allow and permit reasonable access to, and inspection of, all documents, papers, letters or other materials in its possession or under its control subject to the provisions of Chapter 119, Florida Statutes, and made or received by the CITY and COUNTY in conjunction with this AGREEMENT; and the CITY shall have the right to unilaterally cancel this AGREEMENT upon violation of this provision by the COUNTY.

9) Non-Waiver of Immunity. Notwithstanding the provisions of Sec. 768.28, Florida Statutes, the participation of the CITY and COUNTY in this AGREEMENT and the acquisition of any commercial liability insurance coverage, self-insurance coverage or local government liability insurance pool coverage shall not be deemed a waiver of immunity to the extent of liability coverage, nor shall any contract entered into by the CITY and the COUNTY be required to contain any provision for waiver.

10) Privileges and Immunities. All of the privileges and immunities for liability, exemptions from laws, ordinances, and rules and pensions and relief, disability, workers' compensation and other benefits which apply to the activity of officers, agents, or employees of any public agents or employees of the CITY, when performing their respective functions under this AGREEMENT within the territorial limits of the CITY shall apply to the same degree and extent to the performance of such functions and duties of such officers, agents, volunteers, or employees outside the territorial limits of the CITY.

11) Legal Obligations and Responsibilities: Non-Delegation of Constitutional or Statutory Duties. This AGREEMENT is not intended to, nor shall it be construed as, relieving any participating entity from any obligation or responsibility imposed upon the entity by law except to the extent of actual and timely performance thereof by any participating entity, in which case the performance may be offered in satisfaction of the obligation or responsibility. Further, this AGREEMENT is not intended to, nor shall it be construed as, authorizing the delegation of the constitutional or statutory duties of the CITY and the COUNTY, except to the extent permitted by the Florida constitution, state statute and case law.

12) Non-Reliance by Non-Parties. No person or entity shall be entitled to rely upon the terms, or any of them, of this AGREEMENT to enforce or attempt to enforce any third-party claim or entitlement to or benefit of any service or program contemplated hereunder, and the CITY and COUNTY agree that neither the CITY nor the COUNTY or any agent, officer or employee of either shall have the authority to inform, counsel, or otherwise indicate that any particular individual or group of individuals, entity or entities, have entitlements or benefits

under this AGREEMENT separate and apart, inferior to or superior to the community in general or for the purposes contemplated in this AGREEMENT.

13) No Personal Liability. No covenant or agreement contained herein shall be deemed to be a covenant or agreement of any member, officer, agent or employee of the CITY and the COUNTY in his or her individual capacity, and no member, officer, agent or employee of the CITY and the COUNTY shall be liable personally on this AGREEMENT or be subject to any personal liability or accountability by reason of the execution of this AGREEMENT.

14) Execution in Counterparts. This AGREEMENT may be executed in any number of counterparts, each of which shall be regarded as an original, all of which taken together shall constitute one and the same instrument and any of the parties hereto may execute this AGREEMENT by signing any such counterpart.

15) Section Headings. Section headings have been inserted in this AGREEMENT as a matter of convenience of reference only, and it is agreed that such section heading are not a part of this AGREEMENT and will not be used in the interpretation of any provision of this AGREEMENT.

ARTICLE X
NOTICES

Any notice, request, demand, consent approval or other communication required or permitted by this AGREEMENT shall be given or made in writing and shall be served (as elected by the party giving such notice) by one of the following methods: a) hand delivery to the other party; b) delivery by commercial overnight courier service; or c) mailed by registered or certified mail (postage prepaid), return receipt requested. For the purposes of notice the addresses are:

To County:

Nicole Walker
Extension Director and 4-H Youth Development
UF/IFAS Polk County Extension Service
P.O. Box 9005, Drawer HS03
Bartow, FL 33831-9005
P: 863.519.1045

To City: (Winter Haven, Lakeland, Bartow)

Kim Hansell, Utilities Director
City of Winter Haven
P.O. Box 2277
Winter Haven, FL 33883

And copied to

Polk County Board of County Commissioners
Office of the County Manager
P.O. Box 9005, Drawer CA01
Bartow, FL 33831-9005

This AGREEMENT shall be effective on October 1, 2014.
APPROVED BY:

FOR COUNTY:

_____ _____
Chairman - Board of County Commissioners Representative DATE

APPROVED AS TO FORM AND LEGALITY:

_____ _____
County Attorney DATE

ATTEST:

_____ _____
Clerk of the Courts DATE

FOR THE CITY:

_____ _____
Deric C. Feacher, City Manager DATE
City of Winter Haven, FL
(appropriate designee for each entity will be named here)

Appendix E: Polk County Fertilizer Ordinance

ORDINANCE NO. 13-005

AN ORDINANCE RELATED TO FERTILIZER MANAGEMENT AND REGULATING THE APPLICATION OF FERTILIZER TO URBAN LANDSCAPES IN POLK COUNTY; PROVIDING FOR A SHORT TITLE, TO BE KNOWN AS THE "POLK COUNTY FERTILIZER MANAGEMENT ORDINANCE"; PROVIDING FOR A FINDING OF FACTS; ESTABLISHING APPLICABILITY; PROVIDING DEFINITIONS; ADDRESSING WEATHER RELATED RESTRICTIONS ON FERTILIZER APPLICATION; IDENTIFYING RESTRICTIONS ON THE FERTILIZER CONTENT AND THE RATE OF FERTILIZER APPLICATION; ESTABLISHING FERTILIZER FREE ZONES; PROVIDING LIMITATIONS TO THE MODE OF APPLICATION; ADDRESSING THE MANAGEMENT OF GRASS CLIPPINGS AND VEGETATIVE MATERIAL/DEBRIS; ESTABLISHING TRAINING AND CERTIFICATION REQUIREMENTS FOR COMMERCIAL APPLICATORS OF FERTILIZER; PROVIDING FOR VARIANCES AND EXEMPTIONS; PROVIDING FOR ENFORCEMENT; PROVIDING FOR SEVERABILITY AND INCLUSION INTO THE COUNTY CODE OF ORDINANCES; AND PROVIDING AN EFFECTIVE DATE.

BE IT ORDAINED BY THE BOARD OF COUNTY COMMISSIONERS OF POLK COUNTY, A POLITICAL SUBDIVISION OF THE STATE OF FLORIDA THAT:

ARTICLE I – GENERAL PROVISIONS

SECTION 1-1 SHORT TITLE:

This Ordinance shall be known as the Polk County Fertilizer Management Ordinance.

SECTION 1-2 FINDING OF FACTS:

Stormwater runoff from residential neighborhoods, commercial centers, industrial areas, and other lands transports pollutants through the drainage conveyances to the natural water bodies of Polk County. Phosphorus and nitrogen are the primary nutrients associated with the degradation of groundwater and surface water, and are the primary components of fertilizer used on urban landscapes. Improper fertilization practices contribute excess nitrogen and phosphorus to Polk County's water bodies through the drainage conveyances that regulate the flow of stormwater to prevent flooding. This reduces the drainage conveyances capacity to provide flood protection from the overgrowth of vegetation.

Pursuant to Section 303(d) of the federal Clean Water Act and Chapter 62-303 of the Florida Administrative Code, the Florida Department of Environmental Protection (FDEP) has classified specific water bodies in Polk County as "impaired" as a result of the presence of excess nutrients. In addition, the FDEP has issued a National Pollutant Discharge Elimination System

(NPDES) permit to Polk County requiring the adoption of an ordinance to limit the nutrient contributions from the fertilization of urban landscapes within the watershed of any nutrient impaired water bodies. The Board of County Commissioners of Polk County, Florida, therefore finds it necessary to adopt this ordinance to reduce nutrient leaching and runoff through improved fertilizer management in order to protect the quality of waters receiving stormwater discharges for the health, safety, and general welfare of the citizens of Polk County.

SECTION 1-3 APPLICABILITY:

The regulations herein set forth shall apply to the unincorporated areas of Polk County and the incorporated areas of those municipalities that have not adopted an ordinance regulating the application of fertilizer on the effective date of this Ordinance. This Ordinance shall not be applicable in the incorporated areas of those municipalities which adopt an ordinance regulating the application of fertilizer subsequent to the effective date of this Ordinance as of the effective date of the municipal ordinance.

All references to state or federal law, statute, or code shall include any amendment to or superseding law, statute, or code.

ARTICLE II - DEFINITIONS

SECTION 2-1 DEFINITIONS:

A. *Administrator* means the County Manager, or an administrative official of Polk County government designated by the County Manager to administer and enforce this Ordinance.

B. *Application* or *Apply* means the actual physical deposit of fertilizer to turf or landscape plants.

C. *Applicator* means any person who applies fertilizer on turf and/or landscape plants.

D. *Board* or *Governing Board* means the Board of County Commissioners of Polk County, Florida.

E. *Best Management Practices (BMPs)* means turf and landscape practices or combination of practices based on research, field-testing, and expert review, determined to be the most effective and practicable on-location means, including economic and technological considerations, for improving water quality, conserving water supplies and protecting natural resources.

F. *Code Enforcement Officer, Official, or Inspector* means any designated employee or agent of Polk County whose duty it is to enforce codes and ordinances enacted by Polk County.

G. *Commercial Applicator,* except as provided in Section 482.1562(9) Florida Statutes., means any person who applies fertilizer for payment or other consideration to property not owned by the person or firm applying the fertilizer or the employer of the applicator.

H. *Fertilize, Fertilizing, or Fertilization* means the act of applying fertilizer to turf, specialized turf, or landscape plants.

I. *Fertilizer* means any substance or mixture of substances that contains one or more recognized plant nutrients and promotes plant growth, or controls soil acidity or alkalinity, or provides other soil enrichment, or provides other corrective measures to the soil.

J. *Guaranteed Analysis* means the percentage of plant nutrients or measures of neutralizing capability claimed to be present in a fertilizer.

K. *Institutional Applicator* means any person, other than a Private Non-commercial Applicator or Commercial Applicator, that applies fertilizer for the purpose of maintaining turf and/or landscape plants. Institutional Applicators shall include but not be limited to, owners, manager, or employees of public lands, schools, parks, religious institutions, utilities, industrial or business sites, and any residential properties maintained in condominium and/or common ownership.

L. *Landscape Plant* means any native or exotic tree, shrub, or groundcover (excluding turf).

M. *Low Maintenance Zone* means an area a minimum of ten (10) feet wide adjacent to water courses which is planted and managed in order to minimize the need for fertilizer, watering, mowing, etc.

N. *Person* means any natural person, business, corporation, limited liability company, partnership, limited partnership, association, club, organization, and/or any group of people acting as an organized entity.

O. *Private Non-commercial Applicator* means a person applying fertilizer to their own residence, or that of another, without financial gain.

P. *Saturated soil* means a soil in which the voids are filled with water. Saturation does not require flow. For the purposes of this ordinance, soils shall be considered saturated if standing water is present or the pressure of a person standing on the soil causes the release of free water.

Q. *Slow Release, Controlled Release, Timed Release, Slowly Available, or Water Insoluble Nitrogen* means nitrogen in a form which delays its availability for plant uptake and use after application, or which extends its availability to the plant longer than a reference rapid or quick release product.

R. Turf, Sod, or Lawn means grass-covered soil held together by the roots of the grass.

S. *Urban Landscape* means pervious areas on residential, commercial, industrial, institutional, highway rights-of-way, or other non-agricultural lands that are planted with turf or horticultural plants.

ARTICLE III – FERTILIZER MANAGEMENT

SECTION 3-1 WEATHER RELATED RESTRICTIONS:

No fertilizer containing nitrogen or phosphorus shall be applied to urban landscapes during a period for which the National Weather Service has issued any of the following advisories for any portion of Polk County: a severe thunderstorm warning or watch, flood warning or watch, tropical storm warning or watch, hurricane warning or watch, or heavy rain is likely to exceed two (2) inches in a 24 hour period.

SECTION 3-2 FERTILIZER CONTENT & APPLICATION RATES:

(a) All fertilizer applied to urban landscapes shall be labeled in accordance with Section 576.031, Florida Statutes, as it may be amended or superseded.

(b) Applications to urban landscapes shall be in accordance with the requirements and directions provided by the manufacturers label or as recommended for landscape plants, vegetable gardens, or fruit trees and shrubs by the University of Florida's Institute of Food and Agricultural Sciences (IFAS) unless a soil or tissue deficiency has been verified by an approved test by IFAS or an accredited laboratory.

(c) No fertilizer shall be applied to turf at a rate that exceeds the range per plant species set forth in guidelines established in Rule 5E-1.003(2), Florida Administrative Code, or in the most recent publication of *Florida Friendly Best Management Practices for Protection of Water Resources by the Green Industries*, as stated below:

Annual Rates:
Bahiagrass: 2-4 pounds of nitrogen per 1,000 square feet per year.
Bermudagrass: 4-6 pounds of nitrogen per 1,000 square feet per year.
Centipedegrass: 2-3 pounds of nitrogen per 1,000 square feet per year.
St. Augustinegrass: 2-5 pounds of nitrogen per 1,000 square feet per year.
Zoysiagrass*: 2-5 pounds of nitrogen per 1,000 square feet per year.

*Newer cultivars of Zoysiagrass, including Empire, will generally perform well with 1-1.5 pounds per 1,000 square feet less nitrogen annually (ie.2-3.5 lbs. per 1,000 sq. ft. per year).

Single Application Rates to turf areas shall not exceed 0.5 lbs. per 1,000 square feet for water soluble fertilizers, or as otherwise recommended in the most recent edition of the "Florida Friendly Best Management Practices for Protection of Water Resources by the Green Industries" as published by the Florida Department of Environmental Protection and the University of Florida – IFAS Extension. Slow release fertilizers shall not be applied at a rate in excess of 1.0 lb. per 1,000 square feet total nitrogen for a single application, unless otherwise indicated in the most recent edition of the "Florida Friendly Best Management Practices for Protection of Water Resources by the Green Industries".

(d) The above listed application rates shall be reduced appropriately on properties where reclaimed wastewater is used for irrigation based on available nutrients in the reclaimed water.

(e) Fertilizer containing nitrogen or phosphorus shall not be applied before seeding or sodding a site, and shall not be applied for the first 30 days after seeding or sodding, except when hydro-seeding for temporary or permanent erosion control in an emergency situation, such as wildfire, or in accordance with the Stormwater Pollution Prevention Plan for that site.

SECTION 3-3 FERTILIZER-FREE ZONES:

(a) No fertilizer shall be applied within ten (10) feet of any lake, pond, stream, water body, water course or canal. Additionally, no fertilizer shall be applied within ten (10) feet of any wetland as defined by the Florida Department of Environmental Protection (Chapter 62-340, Florida Administrative Code, as it may be amended or superseded).

(b) No fertilizer shall be deposited, washed, swept, or blown off intentionally or inadvertently onto any impervious surface, public right-of-way, public property, stormwater drain, ditch or other stormwater conveyance, or directly to a water body. Any fertilizer spilled or deposited on an impervious surface shall be immediately and completely removed to the extent reasonably possible.

(c) A low-maintenance zone is strongly recommended, though not required, for all areas within ten (10) feet of the water's edge of any lake, pond, stream, water body, water course or canal, or any wetland. Low-maintenance zones should be planted and managed in such a way as to minimize the need for watering, mowing, and other active maintenance.

SECTION 3-4 MODE OF APPLICATION:

Broadcast spreaders used for applying fertilizers must be equipped with deflector shields positioned to deflect fertilizer from the Fertilizer Free Zones described in Section 3-3.

SECTION 3-5 GRASS CLIPPINGS AND VEGETATIVE MATERIAL/DEBRIS:

In no case shall grass clippings, vegetative material, and/or vegetative debris be washed, swept, or blown off into stormwater drains, ditches, conveyances, water bodies, wetlands, or sidewalks or roadways. Any material that is accidently so deposited shall be immediately removed to the extent reasonably possible.

ARTICLE IV – TRAINING AND CERTIFICATION

SECTION 4-1 TRAINING REQUIREMENTS

(a) All Commercial and Institutional Applicators of fertilizer shall abide by and successfully complete the six-hour training program in the "*Florida-Friendly Best Management Practices for Protection of Water Resources by the Green Industries*" offered by the Florida Department of Environmental Protection through the UF/IFAS Florida-Friendly Landscaping™ program, or an approved equivalent per Section 403.9338 Florida Statutes.

(b) Private Non-commercial Applicators are encouraged to follow the recommendations of the University of Florida IFAS *Florida Yards and Neighborhoods* program when applying fertilizers.

SECTION 4-2 CERTIFICATION OF COMMERCIAL APPLICATORS:

(a) Prior to January 1, 2014, all Commercial Applicators shall obtain and maintain certification by successfully completing training and continuing education requirements in the *"Florida Friendly Best Management Practices for Protection of Florida Water Resources by the Green Industries"* offered by the UF/IFAS Florida-Friendly Landscaping™ program. Certification may be obtained through a County Extension Service Office, or an approved equivalent program.

(b) All businesses applying fertilizer to turf and landscape plants on their own property (including but not limited to residential lawns, golf courses, commercial properties, and multi-family and condominium properties) must ensure that at least one employee has a "Florida Friendly Best Management Practices for Protection of Florida Water Resources by the Green Industries" training certificate.

(c) After December 31, 2013, all Commercial Applicators of fertilizer shall have, and carry in their possession at all times when in the possession of fertilizer, a Florida Department of Agriculture and Consumer Services Limited Certification for Urban Landscape Commercial Fertilizer as required per 5E-14.117(18) Florida Administrative Code.

ARTICLE V – VARIANCES AND EXEMPTIONS

SECTION 5-1 VARIANCES (Reserved):

SECTION 5-2 EXEMPTIONS:

(a) Section 3-2 of this article shall not apply to golf courses; provided, however, fertilizer shall not be applied to golf courses in excess of the provisions of the Florida Department of Environmental Protection ("FDEP") document, *BMPs for the Enhancement of Environmental Quality on Florida Golf Courses, January 2007*.

(b) This Ordinance shall not apply to sports turf areas at parks and athletic fields for which fertilizer is applied in accordance with the applicable provisions of Rule 5E-1.003(2)(d) FAC.

(c) This Ordinance shall not apply to any bona fide farm operation as defined in the Florida Right to Farm Act, Section 823.14, *et seq.*, Florida Statutes.

(d) This Ordinance shall not apply to any lands classified as agricultural lands pursuant to Section 193.461 Florida Statutes, including without limitation, other properties not subject to or covered under the Florida Right to Farm Act that have pastures used for grazing livestock.

(e) This Ordinance shall not apply to any lands used for bona fide scientific research, including, but not limited to, research on the effects of fertilizer use on urban stormwater, water quality, agronomics, or horticulture.

ARTICLE VI – ORDINANCE ADMINISTRATION

SECTION 6-1 ENFORCEMENT:

(a) If a violation of this Ordinance occurs within a municipality, the violation shall be enforced by the municipality in accordance with the ordinance or ordinances governing prosecution of ordinance violations within the municipality in which the violation occurs.

(b) If a violation of this Ordinance occurs in unincorporated Polk County, the enforcement provisions and procedures contained in the Polk County Code Enforcement Special Magistrate Ordinance, as it may be amended or superseded, are incorporated herein by reference and will apply.

(c) Nothing contained herein shall prevent Polk County or a municipality from taking such other lawful action in law and equity as may be necessary to remedy any violation of any part of this Ordinance, including but not limited to:

1. Pursuit of injunction and/or declaratory relief in a court of competent jurisdiction;
2. Utilizing any other action or enforcement method permitted by law; or
3. Prosecution as a misdemeanor with a fine not exceeding Five Hundred Dollars ($500.00) or by imprisonment for a term not exceeding sixty (60) days or by both fine and imprisonment.

(d) Funds generated by penalties imposed under this section shall be used by Polk County or the municipality for the administration and enforcement of Section 403.9337, Florida Statutes, this ordinance, and to further nonpoint pollution prevention activities.

SECTION 6-2 SEVERABILITY:

If any section, subsection, sentence, clause, phrase or word of this article is for any reason, held or declared to be unconstitutional, inoperative, or void, such holding of invalidity shall not affect the remaining portions of this article; and it shall be construed to have been the intent to adopt this article without such unconstitutional, invalid, or inoperative part therein; and the remainder of this article, after the exclusion of such part or parts, shall be deemed to be held valid as if such part or parts had not been included herein.

SECTION 6-3 INCLUSION IN THE POLK COUNTY CODE OF ORDINANCES:

It is the intention of the Board of County Commissioners hereby provided that the provisions of this ordinance shall be made a part of the Polk County Code of Ordinances; that the sections of this ordinance may be renumbered or re-lettered to accomplish such intention; and that the word "ordinance" may be changed to "section," "article," or other appropriate designation.

SECTION 6-4 EFFECTIVE DATE:

This Ordinance shall become effective upon filing a certified copy with the Department of State.

ADOPTED THIS 19th DAY OF March, 2013.

POLK COUNTY, FLORIDA

Polk County Board of County Commissioners

By: Mary M Bell
Chairman

P. 23

ATTEST: Stacy M. Butterfield, Clerk

By: Kim Hancock
Deputy Clerk

Stacy M. Butterfield
Clerk of the Circuit Court & County Comptroller
Polk County, Florida

330 West Church Street
Post Office Box 988
Bartow, FL 33831-0988

(863) 534-6508 Phone
(863) 534-5951 Fax

www.polkcountyclerk.net

CLERK AND COMPTROLLER TO THE BOARD

March 21, 2013

Ms. Liz Cloud, Program Administrator
Administrative Code
Florida Department of State
R.A. Gray Building
500 South Bronough Street, Room 101
Tallahassee, Florida 32399-0250

Dear Ms. Cloud,

Enclosed are copies of certified Polk County Ordinances, that were adopted by the Polk County Board of County Commissioners in regular session, March 19, 2013

Ordinance 2013-004
Ordinance 2013-005
Ordinance 2013-006

Please direct the official filing notification letter to:

Alison Prevatt, Deputy Clerk
Finance and Accounting
PO Box 988
Bartow, Florida 33831-0988

Thank you for your assistance.

Stacey M. Butterfield
Clerk of Courts

Alison Prevatt

By: Alison Prevatt,
Deputy Clerk

STATE OF FLORIDA)
)
COUNTY OF POLK)

I Stacy M. Butterfield, County Clerk and Comptroller for Polk County, Florida, hereby certify that the foregoing is a true and correct copy of Ordinance No.13-004 adopted by the Board on March 19th, 2013.

WITNESS my hand and official seal on this 21st day of March, 2013.

STACY M. BUTTERFIELD, CLERK

By: Alison Prevatt
Alison Prevatt
Deputy Clerk

FLORIDA DEPARTMENT of STATE

RICK SCOTT
Governor

KEN DETZNER
Secretary of State

March 26, 2013

Ms. Alison Prevatt
Deputy Clerk
Finance and Accounting
Post Office Box 988
Bartow, Florida 33831-0988

Dear Ms. Prevatt:

Pursuant to the provisions of Section 125.66, Florida Statutes, this will acknowledge receipt of your letter dated March 21, 2013 and certified copies of Polk County Ordinance Nos. 13-004 through 2013-006, which were filed in this office on March 26, 2013.

Sincerely,

Liz Cloud

Liz Cloud
Program Administrator

LC/elr

RECEIVED
4/2/13 Alprevatt
Clerk Of The Board

R. A. Gray Building • 500 South Bronough Street • Tallahassee, Florida 32399-0250
Telephone: (850) 245-6270 • Facsimile: (850) 488-9879
www.dos.state.fl.us