EPC COMMISSIONERS
Lesley "Les" Miller, Jr., *Chair*
Victor D. Crist, *Vice Chair*
Kevin Beckner
Ken Hagan
Al Higginbotham
Sandra L. Murman
Stacy White

Janet L. Dougherty
Executive Director

Richard Tschantz, Esq.
General Counsel

EPC MEETING AGENDA

August 20, 2015 at 9 am

601 East Kennedy Boulevard, Tampa, FL *County Center Board Room 2nd Floor*

1. **CALL TO ORDER, PLEDGE OF ALLEGIANCE, and INVOCATION**
2. **CHANGES TO THE AGENDA**
3. **REMOVAL OF CONSENT AGENDA ITEMS FOR QUESTIONS, COMMENTS, or SEPARATE VOTE**
4. **COMMENDATIONS or RECOGNITIONS** (None)
5. **PUBLIC COMMENT** (Three minutes are allowed for each speaker unless the Commission directs differently.)
6. **CITIZENS' ENVIRONMENTAL ADVISORY COMMITTEE UPDATE (**by CEAC Chair)
7. **APPROVAL OF CONSENT AGENDA**

EPC AGENDA ITEMS:

Any person who might wish to appeal any decision made by the EPC regarding any matter considered at the forthcoming public hearing or meeting is hereby advised that they will need a record of the proceedings, and for such purpose they may need to ensure that a verbatim record of the proceedings is made which will include the testimony and evidence upon which such appeal is to be based.

ENVIRONMENTAL PROTECTION COMMISSION

AGENDA ITEM COVER SHEET

Date of EPC Meeting: August 20, 2015

Subject: Approval of EPC Meeting Minutes for June 18 and June 24, 2015

Agenda Section: Consent Agenda

Item: Legal and Administrative Services Division

Recommendation: Approve EPC Meeting Minutes

Brief Summary: Staff for the Clerk of the Circuit Court in Hillsborough County prepares minutes for all EPC meetings in conformance with Sunshine Law requirements. The Commission is requested approve the minutes at subsequent meetings.

Financial Impact: No Financial Impact

Background: Staff for the Clerk of the Circuit Court in Hillsborough County prepares minutes for all meetings of the Environmental Protection Commission of Hillsborough County in conformance with Sunshine Law requirements. The Commission is requested approve the minutes at subsequent meetings. June 18, 2015 was a regular meeting and June 24, 2015 was a special meeting of the EPC.

List of Attachments: Minutes for June 18 and 24, 2015

JUNE 18, 2015 - ENVIRONMENTAL PROTECTION COMMISSION – DRAFT MINUTES

The Environmental Protection Commission (EPC), Hillsborough County, Florida, met in Regular Meeting scheduled for Thursday, June 18, 2015, at 9:00 a.m., in the Boardroom, Frederick B. Karl County Center, Tampa, Florida.

The following members were present: Chairman Lesley Miller Jr. and Commissioners Kevin Beckner, Al Higginbotham, Sandra Murman, and Stacy White.

The following members were absent: Commissioners Victor Crist and Ken Hagan.

Chairman Miller called the meeting to order at 9:06 a.m.

INVOCATION AND PLEDGE OF ALLEGIANCE

CHANGES TO THE AGENDA

Dr. Richard Garrity, EPC Executive Director, reviewed the changes to the agenda and noted additional addendum information was submitted. **Commissioner Beckner moved the changes, seconded by Commissioner Murman, and carried five to zero.** (Commissioners Crist and Hagan were absent.)

I. PUBLIC COMMENT

Chairman Miller summarized public comment procedures. EPC General Counsel Richard Tschantz deferred to Attorney Rick Muratti, EPC Legal Department, who imparted new evidence specifics. In response to Mr. Thomas Singletary, 164 Baltic Circle, Attorney Anthony Cuva, representing Mr. Bryan and Ms. Janet Truex, applicants/appellees, raised an objection on the introduction of new evidence. Attorney Muratti allowed concluding remarks from Mr. Singletary, who favored a compromise between the parties of the Final Order Hearing, Ogden, et al. vs. Truex and the EPC.

II. CITIZENS ENVIRONMENTAL ADVISORY COMMITTEE (CEAC)

Summary of recent CEAC meeting by CEAC Chairman

Mr. Jason Gorrie, CEAC Chairman, highlighted the report.

III. CONSENT AGENDA

A. Approval of Meeting Minutes: March 3, 2015; March 4, 2015; May 6, 2015; and May 21, 2015.

B. Monthly Activity Reports – May 2015

C. Pollution Recovery Fund Report – October 2014 through May 2015

D. Monthly Legal Case Summary – June 2015

Commissioner Beckner moved the Consent Agenda, seconded by Commissioner Murman, and carried five to zero. (Commissioners Crist and Hagan were absent.)

IV. PRESENTATION, CERTIFICATE OF APPRECIATION TO DEPUTY MARKUS BATES

Dr. Garrity introduced Deputy Bates, Hillsborough County Sheriff's Office (Sheriff's Office), and elaborated on the certificate. Chairman Miller presented the certificate to Deputy Bates, who thanked Sheriff's Office staff; recognized EPC members for their commitment; and remarked on Dr. Garrity's extensive track record with the EPC.

V. FINAL ORDER HEARING: Ogden, et al. vs. Truex and EPC (Case Number 12-EPC-005, Consolidated – an appeal of a dock permit issued by the EPC)

Chairman Miller ensured the legal counsel to the Ogdens was present via telephone. Following comments from Attorney Tschantz, Attorney Muratti gave procedural details and a case history. Chairman Miller opened oral argument.

Attorneys Robert Chapman and Mahlon H. (Tripp) Barlow, representing Mr. Randy and Ms. Mindy Ogden, appellants, argued the most conservative approach to measure the shortest distance between the walls of the canal was not incorporated into the hearing officer's recommendation and displayed property surveys to that effect.

Attorney Jeffrey Willis, appellant, stated the hearing officer ignored the findings of fact regarding canal measurement methodology, asked the dock be denied or amended to include the measurement change, and deferred the remainder of his time for appellant rebuttal. Upon being informed of rebuttal procedures, Chairman Miller observed the issue would be taken up after remaining testimony was heard. Attorney Muratti confirmed the legal counsel for Mr. Larry Kent and Ms. Julia Vincent Kent, appellees, would not appear.

Attorney Andrew Zodrow, EPC Legal Department, appellee, highlighted the legal standards of review with respect to exceptions to the recommended order; referenced agreed-upon disputed facts; contended the surveyor, Mr. Richard Hinson, was accepted as an expert witness by both the hearing officer and appellants during proceedings; affirmed the riparian view rights were limited to property boundaries; and maintained the EPC's order was based on competent evidence.

Attorney Cuva referenced dock surveys and diagrams, asserted the applicant's permit was endorsed by credible expert evidence/testimony, stated riparian rights were not obstructed, asked the EPC to adopt the recommended order, sought to reserve his remaining time for rebuttal, and appealed for equal rebuttal apportionments for both parties if provided.

Chairman Miller noted the rebuttal request from Attorney Willis and desired guidance from legal counsel. After Attorney Muratti observed the EPC rules did not address rebuttals and welcomed a motion to permit counterarguments, **Commissioner Murman moved to allow rebuttal, seconded by Commissioner White.** Commissioner Higginbotham wanted to add the same amount of rebuttal time for each party. **Commissioner Murman clarified the motion was to allow the one side to have five minutes, twenty-three seconds left, and allowed the other side to have rebuttal, also, five minutes, which carried five to zero.** (Commissioners Crist and Hagan were absent.) Attorney Willis shared rebuttal statements that favored an interpretation of the law that would achieve a consistent determination of distance. Attorney Barlow argued the surveyor's conclusion was not a factual finding and placed emphasis on reexamining the hearing officer's application of the EPC Rules. Attorney Cuva offered rebuttal remarks.

Attorney Muratti advised the EPC reject the exceptions raised by the appellants, uphold the hearing officer's order, and strike Paragraph 25, which determined the applicants had incurred significant expenses in constructing the dock, from said order. Chairman Miller requested a motion for the EPC's recommendation. **Commissioner White so moved, seconded by Commissioner Beckner, and carried four to one; Commissioner Murman voted no.** (Commissioners Crist and Hagan were absent.) Chairman

Miller solicited a motion to authorize the Chairman to execute a final order prepared by the staff, based on the EPC Board's ruling. **Commissioner Beckner so moved, seconded by Commissioner White, and carried four to one; Commissioner Murman voted no.** (Commissioners Crist and Hagan were absent.)

VI. WETLANDS MANAGEMENT DIVISION

Progress Report: Status of Memorandum of Understandings/Agreements between the EPC Wetlands Management Division and Hillsborough County's Economic Development Department

Dr. Scott Emery, Director, EPC Wetlands Management Division, submitted the report, as shown in background material.

VII. WATER MANAGEMENT DIVISION

Tampa Bay Estuary Program (TBEP) Interlocal Agreement

Mr. Tom Ash, EPC, introduced Ms. Holly Greening, executive director, TBEP, who expanded on the item, as delivered in background material. After Mr. Ash recommended the approval of the amended TBEP interlocal agreement, **Commissioner Murman so moved, seconded by Commissioner White, and carried five to zero.** (Commissioners Crist and Hagan were absent.)

Chairman Miller requested a motion to authorize the execution of the agreement on behalf of the EPC by the Chairman. **Commissioner White so moved, seconded by Commissioner Murman, and carried five to zero.** (Commissioners Crist and Hagan were absent.)

VIII. AIR MANAGEMENT DIVISION

Climate Adaptation Report

Ms. Margaret Rush, EPC, provided the report, as illustrated in background material. Commissioner White cautioned against politicizing the issue, inquired on specific Comprehensive (Comp) Plan language, and would not support the text in its draft form. Dr. Garrity mentioned having the EPC work with the Planning Commission to develop language to bring back to the EPC Board in the future. Commissioner Murman echoed Commissioner White's concerns regarding the Comp Plan language being too broad, was not prepared to move forward, wanted more cooperation between the EPC and Development Services, and called for a collective report for discussion. **Commissioner Higginbotham moved to direct staff to come back with further reports after staff had meetings with the parties that had been mentioned by the other commissioners, seconded by Commissioner Murman, and carried four to zero.** (Commissioner Beckner was out of the room; Commissioners Crist and Hagan were absent.) In reply to Commissioner White, Attorney Muratti confirmed the report's original recommendations were replaced by Commissioner Higginbotham's motion. Talks ensued.

IX. LEGAL AND ADMINISTRATIVE SERVICES DIVISION

A. Introduction of EPC's Community Relations Coordinator

Attorney Tschantz introduced Ms. Marcia Biggs, EPC, who made comments.

B. Employment Agreement for EPC Executive Director Services with Janet L. Dougherty

Chief Assistant County Attorney Jennie Granahan Tarr explicated the item, as offered in background material. Chairman Miller asked if the provisions of the County charter applied to the EPC Executive Director. Following Chairman Miller's question, Attorney Tarr suggested the EPC consider a residency requirement and a political activity provision that would prohibit political office-holding/action other than voting since the items were not included in the charter. After passing the gavel to Commissioner Murman, **Chairman Miller moved to add the two provisions into the contract, in the same contract of the three direct reports to the EPC; being the County Attorney, the County Administrator, and the Internal Auditor, seconded by Commissioner Beckner.** Commissioner White recommended having Ms. Dougherty review the additional provisions before a vote was taken. Ms. Dougherty concurred with the residency requirement and implored a brief amount of time to analyze the second provision before the employment agreement was approved. Commissioner Murman requested a motion to defer the item to the end of the meeting. **Commissioner White so moved, seconded by Commissioner Beckner, and carried five to zero.** (Commissioners Crist and Hagan were absent.)

Attorney Tarr stated a draft had been prepared that included the new language and urged the EPC move forward with the motion. Ms. Dougherty was amenable to the changes. Commissioner Higginbotham supported the motion given scheduling restrictions. After passing the gavel to

Commissioner Murman, **Chairman Miller moved the EPC approve the employment contract and add the two provisions dealing with residency and political activity, seconded by Commissioner White, and carried four to zero.** (Commissioner Beckner was out of the room; Commissioners Crist and Hagan were absent.)

X. EXECUTIVE DIRECTOR REPORT

Florida Sterling Council's Governor's Sterling Award (GSA) Pre-Application

Dr. Garrity recognized Mr. Terry Payton, EPC, and reported on applying for the GSA and the subsequent certification process.

XI. FAREWELL RECEPTION FOR DR. GARRITY

Mr. Tschantz noted a sendoff gathering for Dr. Garrity and welcomed statements. Commissioner Murman made comments in recognition of Dr. Garrity's service, argued the need to change how docks were addressed, expressed disagreement with the final order hearing outcome, and wanted similar cases to arrive at fair determinations. Commissioner White agreed with potential dock language revisions, echoed Commissioner Murman's sentiments, supported reform endeavors, and commended EPC staff's administrative qualities. EPC members lauded Dr. Garrity's tenure. Dr. Garrity relayed final remarks.

There being no further business, the meeting was adjourned at 11:05 a.m.

READ AND APPROVED: ______________________________
CHAIRMAN

ATTEST:
PAT FRANK, CLERK

By: _______________________
Deputy Clerk

dy

JUNE 24, 2015 - ENVIRONMENTAL PROTECTION COMMISSION SPECIAL MEETING – DRAFT MINUTES

The Environmental Protection Commission (EPC), Hillsborough County, Florida, met in Special Meeting scheduled for Wednesday, June 24, 2015, at 2:10 p.m., in the Boardroom, Frederick B. Karl County Center, Tampa, Florida.

The following members were present: Chairman Lesley Miller Jr. and Commissioners Kevin Beckner, Victor Crist, Ken Hagan, Al Higginbotham, Sandra Murman, and Stacy White.

1. OPEN EPC SPECIAL MEETING

Chairman Miller called the meeting to order at 2:10 p.m. and outlined the meeting purpose.

2. DISCUSS AND TAKE ACTION ON ITEMS RELATED TO MS. JANET DOUGHERTY'S PROPOSED EMPLOYMENT AGREEMENT FOR EXECUTIVE DIRECTOR OF THE EPC

Chief Assistant County Attorney Jennie Granahan Tarr touched on Ms. Dougherty's residency and political activity issues with the employment agreement. Ms. Dougherty deferred to Attorney Brian Langford, who cited no objections to the residency requirement, highlighted the item timeline, challenged the agreement language regarding political activities, wanted guidance in conducting EPC Executive Director day-to-day affairs, distributed material, and offered revised agreement wording. In answer to Commissioner Higginbotham, Attorney Langford and Chairman Miller confirmed the information had not been provided to the EPC Board prior to the meeting. After Attorney Tarr verified the proposed changes had not been reviewed, Commissioner Higginbotham stated he would not support any alterations without an evaluation.

Responding to Commissioner White, Ms. Dougherty clarified political interaction/lobbying concerns and opined the current employment agreement language was ambiguous. Citing problems with County staff involvement in political partisan campaigning/lobbying, Commissioner Crist favored defining "campaign" versus "political" terms in the agreement. Commissioner Beckner suggested wording against backing an individual candidate or ballot initiative not approved by the EPC Board and restricting financial contributions to individual campaigns or partisan elements. Commissioner Murman advocated including verbiage the EPC Executive Director could consult the EPC Board for special requests. Ms. Dougherty concurred with EPC Board member comments and accepted the refined directives. Commissioner Murman favored a short recess for the attorneys to review the language.

Inquiring if the recess would include deliberation among the EPC Board members, Commissioner White requested the candidate/counsel temporarily leave the room to allow for EPC Board consideration. Following discussion, Chairman Miller suggested the EPC Board take a 15-minute recess and let Ms. Dougherty's attorneys and the County attorneys get together to draft some language; when it came back, if the EPC Board wanted to debate the language, it could debate it. Commissioner Higginbotham so moved, seconded by Commissioner Murman. (The motion was not voted on.) Commissioner Hagan questioned the requirement for wording that did not exist in similar contracts. Comments occurred on political/partisan terminology in the employee agreement.

Attorney Tarr reported a consensus and deferred to Attorney Langford, who relayed the revised agreement language would state "the Executive Director shall not hold any political office nor take part in any political campaign activity other than voting; in the event the Executive Director requires clarification regarding any proposed or potential political campaign activity, the EPC attorney shall provide the Executive Director with his or her opinion regarding the applicability of this Section 15 to said proposed or potential political campaign activity." **Commissioner Crist moved the changes, seconded by Commissioner Murman.** After General Counsel Mary Helen Farris clarified the term "political parties" was, in essence, a political campaign endeavor, **the motion carried seven to zero.** Upon dialogue, Commissioner Crist thanked Chairman Miller for his efforts.

3. ADJOURN MEETING

There being no further business, the meeting was adjourned at 3:09 p.m.

READ AND APPROVED: ______________________________
CHAIRMAN

ATTEST:
PAT FRANK, CLERK

By: ________________________
Deputy Clerk

jh

AIR DIVISION ACTIVITIES
Monthly Input Report
FY15

		JUN	JUL
A.	**Public Outreach/Education Assistance**		
1	Phone calls	210	232
2	Literature Distributed	0	0
3	Presentations	1	1
4	Media Contacts	0	0
5	Internet	56	46
6	Host/Sponsor Workshops, Meetings, Special Events	0	1
B.	**Industrial Air Pollution Permitting**		
1	Permit Applications received (Counted by Number of Fees Received)		
	a. Operating	0	1
	b. Construction	4	8
	c. Amendments / Transfers / Extensions	0	3
	d. Title V Operating:	0	0
	e. Permit Determinations	1	1
	f. General	2	2
2	Delegated Permits Issued by EPC and Non-delegated Permits Recommended to DEP for Approval ([1]Counted by Number of Fees Collected)-([2]Counted by Number of Emission Units affected by the Review):		
	a. Operating [1]	1	8
	b. Construction [1]	12	7
	c. Amendments / Transfers / Extensions [1]	0	0
	d. Title V Operating [2]	2	11
	e. Permit Determinations [2]	0	0
	f. General	2	2
3	Intent to Deny Permit Issued	0	0
C.	**Administrative Enforcement**		
1	New cases received	2	0
2	On-going administrative cases		
	a. Pending	4	4
	b. Active	2	2
	c. Legal	0	0
	d. Tracking compliance (Administrative)	9	9
	e. Inactive/Referred cases	0	0
	TOTAL	**15**	**15**
3	NOIs issued	1	1
4	Citations issued	0	0
5	Consent Orders Signed	1	0
6	Contributions to the Pollution Recovery Fund	$1,000.00	$0.00
7	Cases Closed	1	0

D.	**Inspections**		
1	Industrial Facilities	9	10
2	Air Toxics Facilities		
	a. Area Sources (i.e. Drycleaners, Chrome Platers, etc.)	0	0
	b. Major Sources	6	7
3	Asbestos Demolition/Renovation Projects	21	23
E.	**Open Burning Permits Issued**	5	4
F.	**Number of Division of Forestry Permits Monitored**	285	202
G.	**Total Citizen Complaints Received**	51	52
H.	**Total Citizen Complaints Closed**	34	41
I.	**Noise Complaints Received by EPC (Chapter 1-10)**	32	27
J.	**Noise Complaints Received by Sheriff's Office (County Ord. #12-1**	323	318
K.	**Number of cases EPC is aware that both EPC & Sheriff respondec**	1	0
L.	**List of Historical Sources EPC is aware that both EPC & Sheriff responded**		
	Twilight Zone		
	Green Gators (2)		
	Dixie Dockside		
	South Fork - Construction Area Anti-Theft Alarm		
	Taiga Lounge (3)		
	18520 Ramblewood Rd		
	Los Gorditos Bar & Grill(4)		
	The Rack(2)		
	Show-Me's		
	One Blood Services		
	PJ Dolan's Irish Pub Knanaya Catholic CC		
	The Roundup(3) The River of Life Christian Center(2)		
M.	**Noise Sources Monitored:**	2	1
N.	**Air Program's Input into Development Regional Impacts:**	0	1
O.	**Test Reports Reviewed:**	51	25
P.	**Compliance:**		
1	Warning Notices Issued	4	4
2	Warning Notices Resolved	2	2
3	Advisory Letters Issued	1	3
Q.	**AOR'S Reviewed**	1	86
R.	**Permits Reviewed for NESHAP Applicability**	1	2
S.	**Air Program's Input into non-DRI Planning Documents**	14	4

FY 15 - MONTHLY ACTIVITIES REPORT
WATER MANAGEMENT DIVISION

		JUN
A. ENFORCEMENT		
1. New Enforcement Cases Received		-
2. Enforcement Cases Closed		-
3. Enforcement Cases Outstanding		12
4. Enforcement Documents Issued		-
5. Recovered Costs to the General Fund	$	1,500
6. Contributions to the Pollution Recovery Fund	$	-
B. PERMITTING/PROJECT REVIEW - DOMESTIC		
1. Permit Applications Received		**30**
a. Facility Permit		11
(i) Types I and II		1
(ii) Type III		10
b. Collection Systems - General		10
c. Collection systems-Dry Line/Wet Line		9
d. Biosolids Disposal		-
2. Permit Applications Approved		**35**
a. Facility Permit		5
b. Collection Systems - General		7
c. Collection systems-Dry Line/Wet Line		10
d. Biosolids Disposal		-
e. Final Construction approval		13
3. Permit Applications Recommended for Disapproval		-
a. Facility Permit		-
b. Collection Systems - General		-
c. Collection systems-Dry Line/Wet Line		-
d. Biosolids Disposal		-
4. Permit Applications (Non-Delegated)		-
a. Recommended for Approval		-
5. Permits Withdrawn		-
a. Facility Permit		-
b. Collection Systems - General		-
c. Collection systems-Dry Line/Wet Line		-
d. Biosolids Disposal		-
6. Permit Applications Outstanding		**36**
a. Facility Permit		15
b. Collection Systems - General		11
c. Collection systems-Dry Line/Wet Line		3
d. Biosolids Disposal		-

7. Permit Determination	7
8. Special Project Reviews	-
a. Reuse	-
b. Biosolids/AUPs	-
c. Others	-

C. INSPECTIONS - DOMESTIC

1. Compliance Evaluation	**15**
a. Inspection (CEI)	5
b. Sampling Inspection (CSI)	10
c. Toxics Sampling Inspection (XSI)	-
d. Performance Audit Inspection (PAI)	-
2. Reconnaissance	**30**
a. Inspection (RI)	4
b. Sample Inspection (SRI)	-
c. Complaint Inspection (CRI)	26
d. Enforcement Inspection (ERI)	-
3. Engineering Inspections	**16**
a. Reconnaissance Inspection (RI)	-
b. Sample Reconnaissance Inspection (SRI)	-
c. Residual Site Inspection (RSI)	-
d. Preconstruction Inspection (PCI)	-
e. Post Construction Inspection (XCI)	16
f. On-site Engineering Evaluation	-
g. Enforcement Reconnaissance Inspection (ERI)	-

D. PERMITTING/PROJECT REVIEW - INDUSTRIAL

1. Permit Applications Received	**7**
a. Facility Permit	4
(i) Types I and II	1
(ii) Type III with Groundwater Monitoring	-
(iii) Type III w/o Groundwater Monitoring	3
b. General Permit	-
c. Preliminary Design Report	3
(i) Types I and II	3
(ii) Type III with Groundwater Monitoring	-
(iii) Type III w/o Groundwater Monitoring	-
2. Permits Recommended to DEP for Approval	4
3. Special Project Reviews	3
a. Facility Permit	3
b. General Permit	-

4. Permitting Determination	**-**
5. Special Project Reviews	**36**
a. Phosphate	10
b. Industrial Wastewater	13
c. Others	13

E. INSPECTIONS - INDUSTRIAL

1. Compliance Evaluation (Total)	**13**
a. Inspection (CEI)	12
b. Sampling Inspection (CSI)	1
c. Toxics Sampling Inspection (XSI)	-
d. Performance Audit Inspection (PAI)	-
2. Reconnaissance (Total)	**26**
a. Inspection (RI)	4
b. Sample Inspection (SRI)	-
c. Complaint Inspection (CRI)	22
d. Enforcement Inspection (ERI)	
3. Engineering Inspections (Total)	**10**
a. Compliance Evaluation (CEI)	10
b. Sampling Inspection (CSI)	-
c. Performance Audit Inspection (PAI)	-
d. Complaint Inspection (CRI)	-
e. Enforcement Reconnaisance Inspections (ERI)	-

F. INVESTIGATION/COMPLIANCE

1. Citizen Complaints	
a. Domestic	**28**
(i) Received	17
(ii) Closed	11
b. Industrial	**26**
(i) Received	15
(ii) Closed	11
2. Warning Notices	
a. Domestic	**3**
(i) Issued	2
(ii) Closed	1
b. Industrial	**3**
(i) Issued	1
(ii) Closed	2
3. Non-Compliance Advisory Letters	**12**
4. Environmental Compliance Reviews	**196**
5. Special Project Reviews	**12**

G. RECORD REVIEWS

1. Permitting Determination	1
2. Enforcement	-

H. ENVIRONMENTAL SAMPLES ANALYZED/REPORTS REVIEWED (LAB)

1. Air Division	52
2. Waste Division	-
3. Water Division	13
4. Wetlands Division	-
5. ERM Division	174
6. Biomonitoring Reports	-
7. Outside Agency	14

I. SPECIAL PROJECT REVIEWS

1. DRIs	1
2. ARs	-
3. Technical Support	1
4. Other	1

FY 15 - MONTHLY ACTIVITIES REPORT
WATER MANAGEMENT DIVISION

		JUL
A. ENFORCEMENT		
1. New Enforcement Cases Received		1
2. Enforcement Cases Closed		1
3. Enforcement Cases Outstanding		13
4. Enforcement Documents Issued		-
5. Recovered Costs to the General Fund	$	-
6. Contributions to the Pollution Recovery Fund	$	500
B. PERMITTING/PROJECT REVIEW - DOMESTIC		
1. Permit Applications Received		**16**
a. Facility Permit		6
(i) Types I and II		2
(ii) Type III		4
b. Collection Systems - General		6
c. Collection systems-Dry Line/Wet Line		4
d. Biosolids Disposal		-
2. Permit Applications Approved		**23**
a. Facility Permit		2
b. Collection Systems - General		2
c. Collection systems-Dry Line/Wet Line		2
d. Biosolids Disposal		-
e. Final Construction approval		17
3. Permit Applications Recommended for Disapproval		-
a. Facility Permit		-
b. Collection Systems - General		-
c. Collection systems-Dry Line/Wet Line		-
d. Biosolids Disposal		-
4. Permit Applications (Non-Delegated)		1
a. Recommended for Approval		1
5. Permits Withdrawn		-
a. Facility Permit		-
b. Collection Systems - General		-
c. Collection systems-Dry Line/Wet Line		-
d. Biosolids Disposal		-
6. Permit Applications Outstanding		**37**
a. Facility Permit		17
b. Collection Systems - General		15
c. Collection systems-Dry Line/Wet Line		5
d. Biosolids Disposal		-

7. Permit Determination	3
8. Special Project Reviews	-
a. Reuse	-
b. Biosolids/AUPs	-
c. Others	-
C. INSPECTIONS - DOMESTIC	
1. Compliance Evaluation	**16**
a. Inspection (CEI)	7
b. Sampling Inspection (CSI)	9
c. Toxics Sampling Inspection (XSI)	-
d. Performance Audit Inspection (PAI)	-
2. Reconnaissance	**43**
a. Inspection (RI)	8
b. Sample Inspection (SRI)	-
c. Complaint Inspection (CRI)	32
d. Enforcement Inspection (ERI)	3
3. Engineering Inspections	**37**
a. Reconnaissance Inspection (RI)	11
b. Sample Reconnaissance Inspection (SRI)	-
c. Residual Site Inspection (RSI)	-
d. Preconstruction Inspection (PCI)	-
e. Post Construction Inspection (XCI)	25
f. On-site Engineering Evaluation	1
g. Enforcement Reconnaissance Inspection (ERI)	-
D. PERMITTING/PROJECT REVIEW - INDUSTRIAL	
1. Permit Applications Received	**1**
a. Facility Permit	1
(i) Types I and II	-
(ii) Type III with Groundwater Monitoring	-
(iii) Type III w/o Groundwater Monitoring	1
b. General Permit	-
c. Preliminary Design Report	-
(i) Types I and II	-
(ii) Type III with Groundwater Monitoring	-
(iii) Type III w/o Groundwater Monitoring	-
2. Permits Recommended to DEP for Approval	1
3. Special Project Reviews	2
a. Facility Permit	2
b. General Permit	-

4. Permitting Determination	**-**
5. Special Project Reviews	**31**
a. Phosphate	5
b. Industrial Wastewater	10
c. Others	16

E. INSPECTIONS - INDUSTRIAL

1. Compliance Evaluation (Total)	**6**
a. Inspection (CEI)	6
b. Sampling Inspection (CSI)	-
c. Toxics Sampling Inspection (XSI)	-
d. Performance Audit Inspection (PAI)	-
2. Reconnaissance (Total)	**17**
a. Inspection (RI)	-
b. Sample Inspection (SRI)	-
c. Complaint Inspection (CRI)	17
d. Enforcement Inspection (ERI)	
3. Engineering Inspections (Total)	**4**
a. Compliance Evaluation (CEI)	4
b. Sampling Inspection (CSI)	-
c. Performance Audit Inspection (PAI)	-
d. Complaint Inspection (CRI)	-
e. Enforcement Reconnaisance Inspections (ERI)	-

F. INVESTIGATION/COMPLIANCE

1. Citizen Complaints	
a. Domestic	**41**
(i) Received	20
(ii) Closed	21
b. Industrial	**17**
(i) Received	9
(ii) Closed	8
2. Warning Notices	
a. Domestic	**8**
(i) Issued	6
(ii) Closed	2
b. Industrial	**2**
(i) Issued	1
(ii) Closed	1
3. Non-Compliance Advisory Letters	**9**
4. Environmental Compliance Reviews	**165**
5. Special Project Reviews	**22**

G. RECORD REVIEWS

1.	Permitting Determination	3
2.	Enforcement	-

H. ENVIRONMENTAL SAMPLES ANALYZED/REPORTS REVIEWED (LAB)

1.	Air Division	60
2.	Waste Division	-
3.	Water Division	14
4.	Wetlands Division	-
5.	ERM Division	175
6.	Biomonitoring Reports	-
7.	Outside Agency	23

I. SPECIAL PROJECT REVIEWS

1.	DRIs	1
2.	ARs	-
3.	Technical Support	-
4.	Other	5

EPC Wetlands Management Division
Backup AGENDA
July 2015

Assessment Report

Agriculture Exemption Report

	# Agricultural exemptions reviewed	# isolated wetlands impacted	# acres of isolated wetlands impacted	# isolated wetlands qualify for mitigation exemption	# acres of wetlands qualify for mitigation exemption
July 2015	0	0	0.00	0	0.00
Since January 2008	7	8	1.03	7	1.03

Development Services Performance Report

# of Reviews	Timeframes met	Since April 2008
71	97%	98%

Formal Wetland Delineation Surveys

	Projects	Total Acres	Total Wetland Acres	# isolated wetlands < ½ acre	Isolated wetland acreage
July 2015	16	380	42	1	0.36
Since April 2008	842	15827	3667	286	54.76

Construction Plans Approved

	Projects	Total Wetland Acres	# isolated wetlands < ½ acre	Isolated Wetland Acreage	Total Impacts Approved Acreage	Impacts Exempt Acreage
July 2015	16	55	4	0.38	0.25	0.06
Since April 2008	1277	3226	292	65.02	141.57	82.85

Mitigation Sites in Compliance

22/25	88%

Compliance/Enforcement Actions

Acreage of Unauthorized Wetland Impacts	Acreage of Water Quality Impacts	Acreage Restored/Created
0.1	0.0	0.5

TPA Minor Work Permits

Permits Issued For July 2015	Permits Issued Fiscal Year 2015	Cumulative Permits Issued Since TPA Delegation (07/09)
29	279	1356

WETLAND REPORT FOR REVIEW TIME 2015
(Overall Reviews)

Month	# Of Reviews	% On Time	% Late
December			
November			
October			
September			
August			
July	392	97%	3%
June	417	96%	4%
May	362	95%	5%
April	314	93%	7%
March	367	98%	2%
February	320	98%	2%
January	311	97%	3%

EPC WETLANDS MANAGEMENT DIVISION
BACKUP AGENDA
July 2015

A. General	Totals
1. Telephone Conferences	504
2. Unscheduled Citizen Assistance	376
3. Scheduled Meetings	576
4. Correspondence	2759
5. Interagency Coordination	84
6. Trainings	12
7. Public Outreach/Education	1
8. Quality Control	40
B. Assessment Reviews	
1. Wetland Delineations	20
2. Surveys	21
3. Miscellaneous Activities in Wetland	36
4. Mangrove	6
5. Notice of Exemption	6
6. Impact/ Mitigation Proposal	6
7. Tampa Port Authority	100
8. Wastewater Treatment Plants (FDEP)	0
9. DRI Annual Report	0
10. On-Site Visits	123
11. Phosphate Mining	1
12. CPA	0
13. Pre-Applications	69
14. AG SWM	4
Planning Growth Management Review	
15. Land Alteration/Landscaping	1
16. Land Excavation	0
17. Rezoning Reviews	21
18. Site Development	24
19. Subdivision	29
20. Wetland Setback Encroachment	1
21. Easement/Access-Vacating	0
22. Agriculture Exemption	0
C. Investigation and Compliance	
1. Warning Notices Issued	7
2. Warning Notices Closed	5
3. Complaints Closed	20
4. Complaint Inspections	42
5. Return Compliance Inspections for open cases	29
6. Mitigation Monitoring Reports	10
7. Mitigation Compliance Inspections	30
8. Erosion Control Inspections	1
9. MAIW Compliance Site Inspections	3
10. TPA Compliance Site Inspections	8
11. Mangrove Compliance Site Inspections	0
12. Conservation Easement Inspection	5
D. Enforcement	
1. Active Cases	2
2. Legal Cases	2
3. Number of "Notice of Intent to Initiate Enforcement"	0
4. Number of Citations Issued	0
5. Number of Consent Orders Signed	4
6. Administrative - Civil Cases Closed	2
7. Cases Refered to Legal Department	2
8. Contributions to Pollution Recovery	$7,449.00
9. Enforcement Costs Collected	$0.00
E. Ombudsman	
1. Agriculture	5
2. Permitting Process & Rule Assistance	5
3. Citizen Assistance	3
4 . Staff Assistance	5

EPC WETLANDS MONTHLY WORKSHEET

General	Enforcement	Compliance	Assessment	TPA-MWP	Dev.&Plan.	Engineering	Admin	Totals
Telephone Conferences	41	145	82	37	60	14	125	**504**
Unscheduled Citizen Assistance	10	59	69	153	41	2	52	**376**
Scheduled Meetings	22	47	29	108	336	30	4	**576**
Correspondence	184	646	412	847	305	210	155	**2759**
Interagency Coordination			21	17	31	15		**84**
Trainings	1	1	3	6			1	**12**
Public Outreach/Education				1				**1**
Quality Control						40		**40**
Assessment Reviews								
Wetland Delineations			20					**20**
Surveys			21					**21**
Miscellaneous Activities in Wetland			36					**36**
Mangrove			6					**6**
Notice of Exemption			6					**6**
Impact/ Mitigation Proposal			6					**6**
Tampa Port Authority Permit				100				**100**
Wastewater Treatment Plants (FDEP)								**0**
DRI Annual Report								**0**
On-Site Visits		34	41	15	31	2		**123**
Phosphate Mining			1					**1**
CPA								**0**
AG SWM			**4**					**4**
Pre-Applications					69			**69**
Planning Growth Management Review								
Land Alteration/Landscaping					1			**1**
Land Excavation								**0**
Rezoning Reviews					21			**21**
Site Development					24			**24**
Subdivision					29			**29**
Wetland Setback Encroachment					1			**1**
Easement/Access-Vacating								**0**
Agriculture Exemption								**0**
Investigation and Compliance								
Warning Notices Issued		7						**7**
Warning Notices Closed		5						**5**
Complaints Closed		20						**20**
Complaint Inspections		40	2					**42**
Return Compliance Inspections for open cases		29						**29**
Mitigation Monitoring Reports		10						**10**
Mitigation Compliance Inspections		30						**30**
Erosion Control Inspections		1						**1**
MAIW Compliance Site Inspections		3						**3**
TPA Compliance Site Inspections		8						**8**
Mangrove Compliance Site Inspections		0						**0**
Conservation Easement Inspection		5						**5**
Enforcement								
Active Cases	2							**2**
Legal Cases	2							**2**
Number of "Notice of Intent to Initiate Enforcement"	0							**0**
Number of Citations Issued	0							**0**
Number of Consent Orders Signed	4							**4**
Administrative - Civil Cases Closed	2							**2**
Cases Refered to Legal Department	2							**2**
Contributions to Pollution Recovery	$7,449							**$7,449.00**
Enforcement Costs Collected								**$0.00**
Ombudsman								
Agriculture			4	1				**5**
Permitting Process & Rule Assistance			4	1				**5**
Citzen Assistance			2	1				**3**
Staff Assistance	2		2	1				**5**

EPC Wetlands Management Division
Backup AGENDA
June 2015

Assessment Report

Agriculture Exemption Report

	# Agricultural exemptions reviewed	# isolated wetlands impacted	# acres of isolated wetlands impacted	# isolated wetlands qualify for mitigation exemption	# acres of wetlands qualify for mitigation exemption
June 2015	0	0	0.00	0	0.00
Since January 2008	7	8	1.03	7	1.03

Development Services Performance Report

# of Reviews	Timeframes met	Since April 2008
79	97%	98%

Formal Wetland Delineation Surveys

	Projects	Total Acres	Total Wetland Acres	# isolated wetlands < ½ acre	Isolated wetland acreage
June 2015	15	380	42	1	0.36
Since April 2008	826	15447	3625	285	54.40

Construction Plans Approved

	Projects	Total Wetland Acres	# isolated wetlands < ½ acre	Isolated Wetland Acreage	Total Impacts Approved Acreage	Impacts Exempt Acreage
June 2015	18	162	1	0.30	3.98	0
Since April 2008	1261	3171	288	64.64	141.32	82.79

Mitigation Sites in Compliance

19/23	83%

Compliance/Enforcement Actions

Acreage of Unauthorized Wetland Impacts	Acreage of Water Quality Impacts	Acreage Restored/Created
3.6	0.0	0.1

TPA Minor Work Permits

Permits Issued For June 2015	Permits Issued Fiscal Year 2015	Cumulative Permits Issued Since TPA Delegation (07/09)
32	250	1327

WETLAND REPORT FOR REVIEW TIME 2015
(Overall Reviews)

Month	# Of Reviews	% On Time	% Late
December			
November			
October			
September			
August			
July			
June	417	96%	4%
May	362	95%	5%
April	314	93%	7%
March	367	98%	2%
February	320	98%	2%
January	311	97%	3%

EPC WETLANDS MANAGEMENT DIVISION
BACKUP AGENDA
June 2015

A. General	Totals
1. Telephone Conferences	623
2. Unscheduled Citizen Assistance	383
3. Scheduled Meetings	365
4. Correspondence	2867
5. Interagency Coordination	91
6. Trainings	21
7. Public Outreach/Education	1
8. Quality Control	14
B. Assessment Reviews	
1. Wetland Delineations	25
2. Surveys	21
3. Miscellaneous Activities in Wetland	21
4. Mangrove	3
5. Notice of Exemption	4
6. Impact/ Mitigation Proposal	15
7. Tampa Port Authority	92
8. Wastewater Treatment Plants (FDEP)	0
9. DRI Annual Report	0
10. On-Site Visits	118
11. Phosphate Mining	0
12. CPA	0
13. Pre-Applications	65
14. AG SWM	
Planning Growth Management Review	
15. Land Alteration/Landscaping	0
16. Land Excavation	0
17. Rezoning Reviews	9
18. Site Development	23
19. Subdivision	37
20. Wetland Setback Encroachment	8
21. Easement/Access-Vacating	1
22. Agriculture Exemption	0
C. Investigation and Compliance	
1. Warning Notices Issued	5
2. Warning Notices Closed	3
3. Complaints Closed	45
4. Complaint Inspections	35
5. Return Compliance Inspections for open cases	20
6. Mitigation Monitoring Reports	18
7. Mitigation Compliance Inspections	39
8. Erosion Control Inspections	2
9. MAIW Compliance Site Inspections	3
10. TPA Compliance Site Inspections	11
11. Mangrove Compliance Site Inspections	0
12. Conservation Easement Inspection	5
D. Enforcement	
1. Active Cases	3
2. Legal Cases	2
3. Number of "Notice of Intent to Initiate Enforcement"	6
4. Number of Citations Issued	0
5. Number of Consent Orders Signed	11
6. Administrative - Civil Cases Closed	6
7. Cases Refered to Legal Department	2
8. Contributions to Pollution Recovery	$9,663.00
9. Enforcement Costs Collected	$1,723.00
E. Ombudsman	
1. Agriculture	4
2. Permitting Process & Rule Assistance	2
3. Citizen Assistance	0
4 . Staff Assistance	2

FY 15 - MONTHLY ACTIVITIES REPORT
WASTE MANAGEMENT DIVISION

JUN

A. ENFORCEMENT

1.	New cases received	-
2.	On-going administrative cases	43
	Pending	1
	Active	15
	Legal	3
	Tracking Compliance (Administrative)	23
	Inactive/Referred Cases	1
3.	NOI's issued	-
4.	Citations issued	-
5.	Consent Orders and Settlement Letter Signed	-
6.	Civil Contributions to the Pollution Recover Fund ($)	$ 650
7.	Enforcement Costs Collected ($)	$ 425
8.	Cases Closed	1

B. SOLID AND HAZARDOUS WASTE

1.	FDEP Permits Received	0
2.	FDEP Permits Reviewed	1
3.	EPC Authorization for Facilities NOT Requiring DEP Permit	1
4.	Other Permits and Reports	
	County Permits Received	3
	County Permits Reviewed	2
	Reports Received (SW/HW + SQG)	20
	Reports Reviewed (SW/HW + SQG)	25
5.	Inspections (Total)	
	Complaints (SW/HW + SQG)	21
	Compliance/Reinspections (SW/HW + SQG)	11
	Facility Compliance	14
	Small Quantity Generator Verifications	162
	P2 Audits	0
6.	Enforcement (SW/HW + SQG)	
	Complaints Received	21
	Complaints Closed	22
	Warning Notices Issued	0
	Warning Notices Closed	1
	Compliance Letters	144
	Letters of Agreement	0
	Agency Referrals	2
7.	Pamphlets, Rules and Material Distributed	248

C. STORAGE TANK COMPLIANCE

1.	Inspections	
	Compliance	50
	Installation	6
	Closure	5
	Compliance Re-Inspections	29

FY 15 - MONTHLY ACTIVITIES REPORT
WASTE MANAGEMENT DIVISION

		JUN
2.	Installation Plans Received	7
3.	Installation Plans Reviewed	3
4.	Closure Plans & Reports	
	Closure Plans Received	1
	Closure Plans Reviewed	-
	Closure Reports Received	-
	Closure Reports Reviewed	-
5.	Enforcement	
	Non-Compliance Letters Issued	47
	Warning Notices Issued	-
	Warning Notices Closed	-
	Cases Referred to Enforcement	-
	Complaints Received	1
	Complaints Investigated	1
	Complaints Referred	-
6.	Discharge Reporting Forms Received	-
7.	Incident Notification Forms Received	7
8.	Cleanup Notification Letters Issued	-

D. STORAGE TANK CLEANUP

1.	Inspections	84
2.	Reports Received	62
3.	Reports Reviewed	65
	Site Assessment Received	7
	Site Assessment Reviewed	6
	Source Removal Received	-
	Source Removal Reviewed	-
	Remedial Action Plans (RAP'S) Received	-
	Remedial Action Plans (RAP'S) Reviewed	1
	Site Rehabilitation Completion Order/No Further Action Rec'	2
	Site Rehabilitation Completion Order/No Further Action Rev	2
	Active Remediation/Monitoring Received	27
	Active Remediation/Monitoring Reviewed	25
	Others Received	26
	Others Reviewed	30

E. RECORD REVIEWS	14
F. LEGAL PIR'S	29

FY 15 - MONTHLY ACTIVITIES REPORT
WASTE MANAGEMENT DIVISION

A. ENFORCEMENT

		JUL
1.	New cases received	-
2.	On-going administrative cases	42
	Pending	1
	Active	15
	Legal	3
	Tracking Compliance (Administrative)	23
	Inactive/Referred Cases	1
3.	NOI's issued	-
4.	Citations issued	-
5.	Consent Orders and Settlement Letter Signed	-
6.	Civil Contributions to the Pollution Recover Fund ($)	$ -
7.	Enforcement Costs Collected ($)	$ -
8.	Cases Closed	-

B. SOLID AND HAZARDOUS WASTE

1.	FDEP Permits Received	0
2.	FDEP Permits Reviewed	0
3.	EPC Authorization for Facilities NOT Requiring DEP Permit	2
4.	Other Permits and Reports	
	County Permits Received	7
	County Permits Reviewed	7
	Reports Received (SW/HW + SQG)	10
	Reports Reviewed (SW/HW + SQG)	22
5.	Inspections (Total)	
	Complaints (SW/HW + SQG)	12
	Compliance/Reinspections (SW/HW + SQG)	9
	Facility Compliance	11
	Small Quantity Generator Verifications	133
	P2 Audits	0
6.	Enforcement (SW/HW + SQG)	
	Complaints Received	12
	Complaints Closed	9
	Warning Notices Issued	0
	Warning Notices Closed	0
	Compliance Letters	137
	Letters of Agreement	0
	Agency Referrals	4
7.	Pamphlets, Rules and Material Distributed	188

C. STORAGE TANK COMPLIANCE

1.	Inspections	
	Compliance	-
	Installation	7
	Closure	7
	Compliance Re-Inspections	7

FY 15 - MONTHLY ACTIVITIES REPORT
WASTE MANAGEMENT DIVISION

		JUL
2.	Installation Plans Received	8
3.	Installation Plans Reviewed	12
4.	Closure Plans & Reports	
	Closure Plans Received	2
	Closure Plans Reviewed	1
	Closure Reports Received	-
	Closure Reports Reviewed	-
5.	Enforcement	
	Non-Compliance Letters Issued	11
	Warning Notices Issued	-
	Warning Notices Closed	-
	Cases Referred to Enforcement	-
	Complaints Received	2
	Complaints Investigated	2
	Complaints Referred	-
6.	Discharge Reporting Forms Received	-
7.	Incident Notification Forms Received	1
8.	Cleanup Notification Letters Issued	-

D. STORAGE TANK CLEANUP

1.	Inspections	15
2.	Reports Received	58
3.	Reports Reviewed	48
	Site Assessment Received	11
	Site Assessment Reviewed	10
	Source Removal Received	3
	Source Removal Reviewed	1
	Remedial Action Plans (RAP'S) Received	1
	Remedial Action Plans (RAP'S) Reviewed	-
	Site Rehabilitation Completion Order/No Further Action Rec'	-
	Site Rehabilitation Completion Order/No Further Action Rev	1
	Active Remediation/Monitoring Received	30
	Active Remediation/Monitoring Reviewed	28
	Others Received	13
	Others Reviewed	8

E. RECORD REVIEWS	7
F. LEGAL PIR'S	28

ENVIRONMENTAL PROTECTION COMMISSION
OF HILLSBOROUGH COUNTY
FY 15 POLLUTION RECOVERY FUND
10/1/2014 through 7/31/2015

REVENUE			EXPENDITURES			RESERVES			NET PRF	
Beginning Balance	$	537,486	Artificial Reef	$	24,632	Minimum Balance	$	120,000		
Interest	$	3,848	Open Projects	$	285,733	Proj. FY 16 Budgets	$	24,632		
Deposits	$	247,412				Asbestos Removal	$	5,000		
Fund 10132 Balance	$	210,964								
Total	$	999,710	Total	$	310,365	Total	$	149,632	$	539,713

PROJECT			Project Amount		Project Balance
FY 12 Projects					
Bahia Beach Mangrove Enhancement	10131.102063.581990.5370.1187	$	56,700	$	56,700
USGS Partnership	10131.102063.581990.5370.1188	$	25,000	$	18,750
		$	81,700	$	75,450
FY 13 Projects					
USF Fertilizer Study Peer Review	10131.102063.581990.5370.1189	$	25,000	$	25,000
Community Partnering Program	10131.102073.582990.5370.0000	$	15,000	$	15,000
		$	40,000	$	40,000
FY 14 Projects					
Mercury Collection Public Education	10131.102063.581990.5370.1176	$	5,000	$	5,000
Electric Car Charging Station Software	10131.102063.581990.5370.1175	$	4,200	$	1,400
Audubon Oyster Bar Restoration	10131.102063.582990.5370.1177	$	50,000	$	32,980
Lake Magdalene Outfall	10131.102063.582990.5370.1178	$	50,000	$	50,000
		$	109,200	$	89,380
FY 15 Projects					
TBW Rock Ponds Wetland Restoration	10131.102063.582990.5370.1247	$	50,000	$	43,551
Agricultural Pesticide Collection Day	10131.102063.581990.5370.1248	$	24,241	$	-
East Lake Watershed Edu. & Restoratio	10131.102063.582990.5370.1249	$	5,012	$	5,012
		$	79,253	$	48,563

ENVIRONMENTAL PROTECTION COMMISSION

AGENDA ITEM COVER SHEET

Date of EPC Meeting: August 20, 2015

Subject: Monthly Legal Case Summary – July & August 2015

Agenda Section: Consent Agenda

Item: Legal and Administrative Services Division

Recommendation: None, informational update.

Brief Summary: The EPC Legal Department provides a monthly summary of its ongoing civil, appellate and administrative matters.

Financial Impact: No Financial Impact anticipated; information update only.

Background: In an effort to provide the Commission with timely information regarding legal challenges, the EPC staff provides this monthly summary. The update serves not only to inform the Commission of current litigation but may also be used as a tool to check for any conflicts they may have in the event a legal matter is discussed by the Commission. The summary provides general details as to the status of the civil and administrative cases. There is also a listing of cases where parties have asked for additional time in order to allow them to decide whether they will file an administrative challenge to an agency action (e.g. – permitting decision or enforcement order), while concurrently attempting to seek resolution of the agency action.

List of Attachments: Monthly EPC Legal Case Summary

EPC LEGAL DEPARTMENT MONTHLY REPORT
July and August 2015

I. ADMINISTRATIVE CASES

Jeffrey Willis and Terri Willis [14-EPC-008]: The Appellants filed a Notice of Appeal on July 3, 2014 challenging the issuance of the TPA Minor Work Permit No. 56663. On July 22, 2014 a Hearing Officer was appointed and the appeal was transferred to the Hearing Officer to conduct an administrative hearing in this matter. On July 25, 2014, the Hearing Officer issued an Order of Consolidation joining this appeal with two other appeals that challenge the same Agency decision; 14-EPC-005; 14-EPC-006; and 14-EPC-008. The Hearing Officer and parties conducted an administrative hearing on March 5^{th} and 6^{th}. A Recommended Order has been entered by the Hearing Officer, exceptions to the Recommended Order and responses to the Exceptions have been filed by the parties and the Final Order Hearing was held on June 18, 2015. The Commission upheld the Hearing Officer's Recommended Order and the Final Order was entered on June 22, 2015. The case is closed. (AZ)

Larry Kent and Julia Vincent Kent [14-EPC-006]: The Appellants filed a Notice of Appeal on July 3, 2014 challenging the issuance of the TPA Minor Work Permit No. 56663. On July 22, 2014 a Hearing Officer was appointed and the appeal was transferred to the Hearing Officer to conduct an administrative hearing in this matter. On July 25, 2014, the Hearing Officer issued an Order of Consolidation joining this appeal with two other appeals that challenge the same Agency decision; 14-EPC-005; 14-EPC-006; and 14-EPC-008. The case has been closed, see above. (AZ)

Randy Ogden and Mindy Ogden [14-EPC-005]: The Appellants filed a Notice of Appeal on July 1, 2014 challenging the issuance of the TPA Minor Work Permit No. 56663. On July 22, 2014 a Hearing Officer was appointed and the appeal was transferred to the Hearing Officer to conduct an administrative hearing in this matter. On July 25, 2014, the Hearing Officer issued an Order of Consolidation joining this appeal with two other appeals that challenge the same Agency decision; 14-EPC-005; 14-EPC-006; and 14-EPC-008. The case has been closed. See above. (AZ)

J.E. McLean, III and RaceTrac Petroleum, Inc. [12-EPC-014]: On October 24, 2012, the Appellants, RaceTrac Petroleum, Inc. and the property owner, filed a request for an extension of time to file an Appeal challenging the Executive Director's denial for wetland impacts on the corner of Lumsden and Kings Avenue. The extension was granted and the Appellants filed an appeal in this matter on December 7, 2012. A Hearing Officer has been assigned and conducted a case management conference. This matter has been placed in abeyance as the parties are discussing options.(AZ)

Robert Vance v. John Vath and EPC [15-EPC-001]: On January 15, 2015, the Appellant filed a request for an extension of time to file an Appeal challenging the issuance of Tampa Port Authority MWP #54731 for the construction of a dock. The request was granted and the Appellant had until March 2, 2015 to file an appeal in this matter. On February 17, 2015 the Appellant filed the administrative appeal and the matter was assigned to a Hearing Officer to conduct an evidentiary hearing. An Administrative Hearing was conducted on June 1, 2015. A Recommended Order will be filed by the Hearing Officer in accordance with Chapter 1-2, Rules of the EPC. No exceptions were filed and the rendering of a Final Order in this matter is scheduled for the August 20, 2015 EPC meeting. (AZ)

II. CIVIL CASES

WOB S. Tampa, LLC [14-EPC-003]: On May 15, 2014, the World of Beer in South Tampa filed a Complaint in Civil Court for declaratory and injunctive relief against the City of Tampa and EPC regarding noise pollution issues. A trial was set for early January 2015. The parties agreed at mediation to abate the litigation and continue to negotiate. Currently it is abated through August. (RM)

Greg and Karin Hart [LEPC10-004]: On March 18, 2010, the Commission granted authority to take legal action against the Defendants Mr. and Mrs. Greg Hart for various impacts to wetlands that are violations of the EPC Act, Chapter 1-11 (Wetland Rule), and a conservation easement encumbering the Defendants' property. On March 29, 2010, the EPC filed a civil lawsuit in Circuit Court. The case was consolidated with a related Hillsborough County case seeking an injunction to remove fill from a drainage canal. A second mediation on January 21, 2011, resulted in a very limited partial settlement with EPC and full settlement with the County. A jury trial was held the week of September 19, 2011. The jury returned a verdict in favor of the EPC. Defendants filed a motion for new trial and an appeal of the jury verdict. The appeal was dismissed as premature and the request for a new trial was denied. The Defendants then appealed the denial of a new trial, which was dismissed. A Final Judgment Against Defendants was entered on March 5, 2012, requiring Defendants to restore the wetland and pay penalties. Defendants filed a Motion for Relief from Judgment dated May 22, 2012 and the court denied the motion on July 30, 2012. On July 31, 2012, the court awarded the EPC reasonable trial costs. The Harts moved for re-consideration of the Motion for Relief from Judgment denial and it was denied. An appeal of the denial was dismissed. The EPC moved for contempt for failure to restore the wetland, but the Court ordered the EPC to conduct the wetland remediation and to tax those costs to the Defendants. The Harts began the remediation process in early February 2015 by removing some of the fill and planting ferns. The remediation is currently in the plant survival monitoring phase. This case will be closed. (RM)

U.S. Bankruptcy Court in re Jerry A. Lewis [LEPC09-011]: On May 1, 2009, the U.S. Bankruptcy Court Middle District of Florida filed a Notice of Chapter 13 Bankruptcy Case regarding Jerry A. Lewis. On May 26, 2009, the EPC filed a Proof of Claim with the Court. The EPC's basis for the claim is a recorded judgment lien awarded in Civil Court against Mr. Lewis concerning unauthorized disposal of solid waste. The EPC obtained an award of stipulated penalties from the state court. The site remains out of compliance with applicable EPC solid waste regulations and no liens have been paid. The bankruptcy case is ongoing. (AZ)

Grace E. Poole and Michael Rissell [LEPC08-015]: Authority to take appropriate legal action against Grace E. Poole and Michael Rissell for failure to properly assess petroleum contamination in accordance with EPC and State regulations was granted on June 19, 2008. The property owner and/or other responsible party are required to initiate a site assessment and submit a Site Assessment Report. They have failed to do the required work and the EPC is attempting to obtain appropriate corrective actions. (AZ)

Boyce E. Slusmeyer [LEPC10-019]: On Sept 20, 2001, the EPC staff received authority to take legal action for failure to comply with an Executive Director's Citation and Order to Correct Violation for the failure to initiate a cleanup of a petroleum-contaminated property. The Court entered a Consent Final Judgment on March 13, 2003. The Defendant has failed to perform the appropriate remedial actions for petroleum contamination on the property. The EPC filed a lawsuit on October 7, 2010 seeking injunctive relief and recovery of costs and penalties. The EPC is waiting for the lawsuit to be served. (AZ)

Thomas Jennings and Lorene Hall-Jennings [14-EPC011]: On October 7, 2014, the EPC was served with a Declaratory Action challenging the validity of a conservation easement conveyed to the EPC on September 16, 1997. The EPC Legal Department has responded to the lawsuit with an Answer and Affirmative Defenses on October 27, 2014 and the case will move forward as appropriate. (AZ)

III. PENDING ADMINISTRATIVE CHALLENGES

The following is a list of cases assigned to the EPC Legal Department that are not in litigation, but a party has asked for an extension of time to file for administrative litigation in an effort to negotiate a settlement prior to forwarding the case to a Hearing Officer. The below list may also include waiver or variance requests.

Anthony Prieto [15-EPC-002]: On February 12, 2015, the Appellant filed a request for an extension of time to file an Appeal challenging the Agency's revocation of Tampa Port Authority MWP #58462. The request was granted and the Appellant has until May 8, 2015 to file an appeal in this matter. (AZ)

ENVIRONMENTAL PROTECTION COMMISSION

AGENDA ITEM COVER SHEET

Date of EPC Meeting: August 20, 2015

Subject: PRF Agreement between EPC and USF for Peer Review of Fertilizer Study and to Authorize EPC Chair to Execute Agreement on Behalf of the Commission.

Agenda Section: Consent Agenda

Item: Water Management Division

Recommendation: Staff recommends approval of PRF Agreement between EPC and USF for Peer Review of Fertilizer Study and to Authorize EPC Chair to Execute Agreement on Behalf of the Commission

Brief Summary: At the September 20, 2012 EPC meeting, staff was directed to enter into an agreement with the University of South Florida to perform an independent peer review of the fertilizer study. At the December 13, 2012 EPC Meeting, the use of Pollution Recovery Funds up to $25,000 was approved by the Commission. This item will formalize the PRF agreement between the EPC and USF and allow payment for professional services rendered from March 1, 2015 through December 31, 2015.

Financial Impact: Up to $25,000 of Pollution Recovery Funds

Background: At the September 20, 2012 EPC meeting, staff was directed to enter into an agreement with the University of South Florida to perform an independent peer review of the fertilizer study. At the December 13, 2012 EPC Meeting, the use of Pollution Recovery Funds up to $25,000 was approved by the Commission and USF began their independent peer review. This item will formalize the agreement between the EPC and USF and allow payment for professional services rendered from March 1, 2015 through December 31, 2015.

List of Attachments: [Double-click to list any attachments or put “None.”]

AGREEMENT FOR PEER REVIEW SERVICES
between
The ENVIRONMENTAL PROTECTION COMMISSION
OF HILLSBOROUGH COUNTY
and
THE UNIVERSITY OF SOUTH FLORIDA,
Board of Trustees, a public body corporate

THIS AGREEMENT (Agreement), made and entered into on the date noted by the last signatory below, by and between the **ENVIRONMENTAL PROTECTION COMMISSION OF HILLSBOROUGH COUNTY,** a political subdivision of the State of Florida, hereinafter referred to as the EPC, and **THE UNIVERSITY OF SOUTH FLORIDA, Board of Trustees,** a public body corporate, hereinafter referred to as USF;

WITNESSETH

WHEREAS, the EPC is a local environmental agency established by Chapter 84-446, Laws of Florida as amended (EPC Act);

WHEREAS, the EPC Commission pursuant to section 1-15.14, Rules of the EPC, required that a peer reviewed study in coordination with USF and other entities be conducted to analyze the "effectiveness of the fertilizer regulations and whether any changes are merited."

WHEREAS, on December 13, 2012, the EPC Commission found the use of funds in conformance with EPC Act Section 19 and approved the expenditure of such funds for the University of South Florida Peer Review of Residential Stormwater Quality Evaluation Project (hereinafter referred to as Project) as further detailed in the attached Scope of Work, and it is conditioned upon the following;

NOW, THEREFORE, in consideration of the mutual promises contained herein, the parties hereto agree as follows:

1. PURPOSE and AMOUNT. This Agreement is for an amount not to exceed **$25,000** for the purpose of the work described in this Agreement and the hereby incorporated and adopted Scope of Work (see Attachment 1). The Scope of Work is enforceable as part of this Agreement.

2. DURATION OF AGREEMENT. This Agreement is retroactively effective March 1, 2015 and expires December 31, 2015.

3. INVOICE. When submitting any invoice pursuant to paragraph 4, USF shall provide a brief

status report on the Project.

4. REIMBURSEMENT. This Agreement is on a reimbursement basis only and USF must provide the necessary resources to conduct the work described in this Agreement and the Scope of Work. Upon receipt by the EPC Project Manager of an appropriate invoice and supporting documentation from USF, EPC shall process and reimburse USF for its allowable costs and expenses noted in the invoice and pursuant to this Agreement. Upon receipt of the final invoice, EPC reserves the right to perform a last review of the Project prior to issuance of any final payment. Prior to any reimbursement, if EPC has any questions or needs additional information (including supporting documentation) to ensure that any reimbursement is appropriate under this Agreement, USF shall promptly provide the additional information and/or allow for appropriate inspection of USF's files as needed. Failure to respond to a reimbursement information request within 30 days of the EPC's issuance of the request may result in denial of some or all of the request that cannot be substantiated. USF acknowledges that indirect costs (e.g. – overhead) may not exceed five percent (5%) of the total direct costs of the Pollution Recovery Fund (PRF)-funded portion of the Project.

5. ADDITIONAL CONDITIONS. USF shall comply with the additional following conditions:

(a) All Pollution Recovery Fund monies designated for this Project shall be allocated and used only for the portions of the Project funded by the PRF.

(b) USF is to obtain all necessary federal, state, and local (including EPC) permits or authorizations prior to performing Project, if any are required. Entry into this Agreement does not waive USF's obligation to comply with all federal, state, and local (including EPC) laws and regulations.

6. RECORDS RETENTION. USF shall maintain appropriate and adequate records and supporting documentation applicable to this Agreement, including but not limited to the Project file, plans, photographs, and costs and expenditures sufficient for any pre- and post- audit that may be required. All documents that meet the definition of a public record shall be maintained subject to the public records law (including but not limited to Chp. 119, Florida Statutes). Notwithstanding the public records laws, this Project's records and documentation will be retained by USF for a minimum of five (5) years from the date of termination of this Agreement. The EPC and its authorized agents shall have the right to audit, inspect and copy all such records and documentation as often as the EPC deems necessary during the period of this Agreement and during the period of five (5) years thereafter. The five (5) year time period will be extended until audit findings are issued if an audit is initiated during the five (5) year period. This right shall survive the expiration or termination of this Agreement.

7. PROJECT MANAGERS. The Project Managers are as follows:

(a) USF Project Manager:
Dr. James Mihelcic, Ph.D., BCEEM
Department of Civil and Environmental Engineering, ENB118
University of South Florida
4202 E Fowler Ave, Tampa, FL 33620
(813) 974-9896, Email: jm41@usf.edu

(b) EPC Project Manager:
Tom Ash, Assistant Director
Water Management Division
3629 Queen Palm Drive, Tampa, FL 33619
(813) 627-2600, Ext. 1011, Email: ash@epchc.org

8. LIABILITY and INDEMNIFICATION. Each party and the officers, employees, and agents thereof shall not be deemed by virtue of this Agreement to be the officers, agents, contractors, or employees of the other party. Each party hereto agrees that it shall be solely responsible for the negligent or wrongful acts of its respective officers, agents, and employees arising from the duties related to this Agreement. Notwithstanding any provision in this Agreement, all issues relating to liability, including but not limited to waivers or assumptions of liability, in this Agreement are subject to, may not be contrary to, and are limited by the sovereign immunity laws, including but not limited to, section 768.28, Florida Statutes.

9. CANCELLATION AND MODIFICATION.

(a) This Agreement may be immediately cancelled in writing (via fax, e-mail, hand delivery, or U.S. mail) by EPC without prior notice, if USF refuses to allow public access to all public records subject to the provisions of Chapter 119, Florida Statutes, which are made or received in conjunction with the Agreement.

(b) This Agreement may be cancelled by either party upon no less than 30 days written notice; notice shall be delivered by certified mail, return receipt requested, or in person with proof of delivery.

(c) In case of a cancellation, all documents, records, work accomplished, equipment (purchased with PRF money), and other items prepared, purchased, or acquired pursuant to this Agreement and in the possession of USF shall be immediately forwarded and turned over to EPC, but no later than 30 days from cancellation. Upon receipt of EPC’s notice of cancellation or upon issuance of USF’s notice of cancellation, USF shall immediately cancel all outstanding obligations (e.g. – orders for services or goods with third parties) and cease all PRF funded activities, besides those necessary to implement the cancellation as described above.

(d) No changes, transfers, assignments, extensions, or other modifications of this

Agreement shall be valid unless the same are in writing and signed by all parties.

WHEREFORE, USF and EPC have caused this PRF Agreement to be executed as of the date noted by the last signatory below.

ENVIRONMENTAL PROTECTION COMMISSION OF HILLSBOROUGH COUNTY

By: ________________________________
Lesley "Les" Miller, Jr., EPC Chairman

Date: ________________________________

UNIVERSITY OF SOUTH FLORIDA BOARD OF TRUSTEES

By: ________________________________
Keith Anderson, Associate Director

Date: ______________________________

SCOPE OF WORK
for
AGREEMENT BETWEEN EPC AND THE UNIVERSITY OF SOUTH FLORIDA (USF), BOARD OF TRUSTEES

A. PROJECT BACKGROUND AND OBJECTIVES

The objective of this project is to perform a rigorous scientific peer review[1] of the Residential Stormwater Quality Evaluation Project. That project has a stated objective to measure the nutrient contribution from yards in the Tampa Bay area by identifying the socio economic and ecological factors that influence fertilizer application rates. The project will estimate the contribution of lawn fertilization to the community nutrient budget to define residential fertilizer inputs as parameters for hydro-ecological models. The Residential Stormwater Quality Evaluation Project has two phases. Phase I (Task 1) explores regional and community level social differences through research methods focused at different scales. Phase I addresses two hypotheses: H1-1). There is no significant difference in residential nutrient fertilization practices between residents in Pinellas, Hillsborough, and Manatee counties where various forms of residential fertilizer ordinances or rules have been enacted. H1-2). Sarasota County residents will have increased ordinance awareness and associated behaviors relative to residents in the other three counties. Phase II (Tasks 2-5) focuses on nutrient dynamics in residential communities, engaging recruited homeowners in social and environmental monitoring. H2-1). There is no significant difference in nutrient dynamics between water bodies receiving stormwater inputs from residential landscapes in Pinellas, Hillsborough, and Manatee counties where various forms of residential fertilizer ordinances or rules have been enacted. The Stormwater Quality Evaluation Project team members state that much of the study design is based on the work of Law et al. (2004) at the Baltimore Ecosystem Study.

[1]Peer review is defined by the USEPA in their Peer Review Handbook (EPA/100/B-06/002) as "a documented critical review of a specific scientific and/or technical work product. Peer review is conducted by qualified individuals (or organizations) who are independent of those who performed the work, and who are collectively equivalent in technical expertise (i.e., peers) to those who performed the original work. Peer review is conducted to ensure that activities are technically supportable, competently performed, properly documented, and consistent with established quality criteria. Peer review is an in-depth assessment of the assumptions, calculations, extrapolations, alternate interpretations, methodology, acceptance criteria, and conclusions pertaining to the specific major scientific and/or technical work product and of the documentation that supports them. ………. Peer review is usually characterized by a one-time interaction or a limited number of interactions by independent peer reviewers. Peer review is encouraged during the early stages of the project or methods selection, and/or as part of the culmination of the work product, as appropriate. Regardless of the timing of peer review, the goal is ensuring that the final product is technically sound."

B. <u>PROJECT SPECIFIC CONDITIONS</u>

Unless otherwise noted below, prior to expiration of the Agreement, USF shall:

(1) Comply with all conditions in the PRF Agreement and any attachments to the Agreement.

(2) EPC will send the final report to USF in care of Dr. Mihelcic. Dr. James R. Mihelcic will be the Director of this peer review project in coordination with his designated Team.

(3) The University of South Florida Team will complete the peer review and provide the EPC a written report six weeks after receiving the final report and any supplementary materials such as raw data.

(4) The USF Team will present the peer review to EPC staff. The project team would also be available to the EPC or other affiliated entities for several other planning meetings related to the peer review. The study team would like four weeks notification before the final report is received by the EPC.

(5) Upon request, the USF team or its representative will provide a final presentation to the EPC Commission on a date and time mutually agreed upon by both parties.

(6) This Agreement is for an amount not to exceed **$25,000.00** (Twenty five thousand dollars).

ENVIRONMENTAL PROTECTION COMMISSION

AGENDA ITEM COVER SHEET

Date of EPC Meeting: August 20, 2015

Subject: Select Performance Measure Goals for 2015

Agenda Section: Consent Agenda

Item: Executive Director Report

Recommendation: None – Informational Only

Brief Summary: As part of the Sterling Management process, the Agency measures key activities and has set goals for 2015. These are tabulated and periodically presented to the Board in the consent agenda.

Financial Impact: No Financial Impact.

Background: The Agency measures performance for all five of its core functions. These core functions include permitting, compliance assurance, citizen support, enforcement, and ambient air & water quality monitoring. As part of the Agency's annual evaluation, staff sets goals for select activities and reports them periodically to the Board. This is an integral part of the continuous improvement required by Sterling.

List of Attachments: Table Titled 2015 Goals

2015 Goals

Core Function	Measure	Pre-Sterling Year (2009)	2012	2013	2014	2015 YTD (2^{nd} Qtr)	2015 Goal
Permitting	Average Time to Issue an Intent for State Construction Permits	57 days	36 days	29 days	20 days	18 days	Less Than or Equal to 35 days
	Average Time to Issue an Intent for Tampa Port Authority Permits	56 days	43 days	46 days	55 days	40 days	Less Than or Equal to 55 days
	Average Time EPC Permits were In-house	21 days	16 days	17 days	19 days	22 days	Less Than or Equal to 25 days
Compliance	Timely Resolution of Lower Level Non-Compliance Cases	92%	91%	92%	93%	91%	Greater Than or Equal to 90%
Environmental Complaints	Timely Initiation of Investigation	99% in 5 Days	99% in 5 Days	99% in 5 Days	99% in 5 Days	97% in 3 Days	Greater Than or Equal to 90% in 3 Days
Enforcement	Timely Initiation of Enforcement	73%	76%	94%	96%	100%	Greater Than or Equal to 90%

ENVIRONMENTAL PROTECTION COMMISSION

AGENDA ITEM COVER SHEET

Date of EPC Meeting: August 20, 2015

Subject: 2015 Second Quarter Action Plan Updates

Agenda Section: Consent Agenda

Item: Legal and Administrative Services Division

Recommendation: None – Informational Only

Brief Summary: Earlier this year EPC staff brought the finalized versions of the Agency's 2015 action plans to the Board for approval. These measurable action plans are divided into five individual initiatives which support the Agency's strategic priorities for calendar year 2015. The second quarter status reports are listed for all five.

Financial Impact: No additional funds required at this time. Monies for the individual action plans are paid out of the current budget, or will be brought to the Board and requested separately as needed.

Background: As part of the Agency's Sterling Management planning process and philosophy of continuous improvement, staff held a strategic planning retreat in December 2014. This included input from the Board and a broad range of EPC staff. Besides reviewing the priorities and guiding mission statements, staff also prepared a slate of new initiatives to improve the EPC's effectiveness and efficiency. Since the Agency started this formal procedure in 2010, they have completed some fifty-seven of these initiatives.

The five detailed action plans reflecting the Agency's strategic objectives for 2015 were brought to the Board and approved, and detailed outlines were provided at the April 2015 Board meeting. Each Agency initiative is described in an individual action plan with measurable goals. The attachment reflects the update on the status of each action plan as of the end of the second quarter of 2015. The owners of select action plans may be scheduled to present an overview of their project to the Board at regularly scheduled EPC Board meetings during the year.

Many of the action plans are considered critical to the Agency's long term goal to qualify as a Governor's Sterling Award winning organization, similar to what the County's Tax Collector has already achieved.

List of Attachments: Quarterly Update for 2015 Action Plans

Quarterly Update for 2015 Action Plans

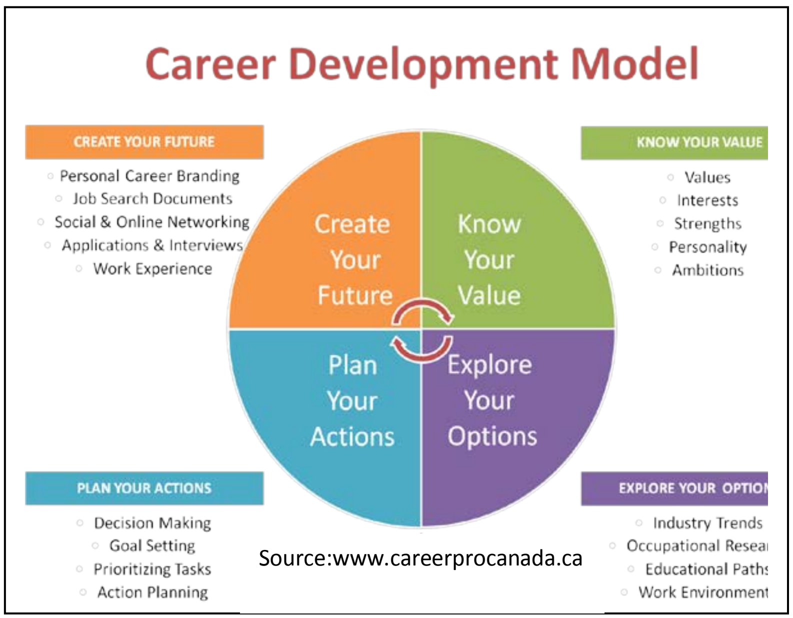
Strategic Objective	Action Plans	2015 Year End Goal	Status
1.3 Protection of Air Quality	Mercury in Fish Advisory	**Assemble a committee comprised of representatives from each division and assign specific tasks to complete the objective.**	Completed. Made an early evaluation and determined that this action plan can be completed solely by the Plan Owner.
		Determine the basis used in developing advisory updates.	Completed. Contacted the State DOH and determined the frequency of updates is based on monitoring locations and funding.
		If necessary, make case to the State DOH to update their advisory.	Completed. Determined State DOH advisories are current, as of 2015.

	Contact DOH and offer to promote the existing 2015 DOH advisory and if necessary, evaluate the possibility of developing updating the EPC advisory	8/2015
	Make written recommendation to the Executive Director (ED)on whether to put out a new brochure	8/2015
	Based on the DOH and ED's response, update EPC advisory brochures to reflect latest fish testing data or take action to promote 2015 DOH advisory.	9/2015
	Based on the ED's	9/2015

	response, contact doctor's offices and interested groups to distribute and promote new brochures.	
	Based on the ED's response contact interested groups and offer outreach at events or a speaker. Discuss success of air emission reductions and current advisories. Highlight mercury product use and collection events.	9/2015 – 10/2015
	Make Board presentation.	10/2015 - 11/15
	Closeout Action Plan	12/2015

Quarterly Update for 2015 Action Plans

Strategic Objective	Action Plans	2015 Year End Goal	Status
2.1 Successful / Engaged Workforce / Employee Training	Career Development Program	Convene Staff Development & Training (SD&T) Committee	Complete. SDTC have met several times to define action plan objective, steps of process, and metrics for the action plan.
		Initiate former focus group meetings	Scheduled. Focus groups are proposed to be held in the middle - end of July 2015.
		Committee summarizes suggestions / ideas from focus groups feedback applicable for career development opportunities	Not complete. Action plan started in mid-march, dates were set prior to action plan commencing. Focus groups (scheduled 7/15)



	Benchmark external agency’s Career Development programs	Started. Met with reps from several sister agencies to explore programs and options for career development. Additional opportunities for benchmarking are being researched and pursued.

Quarterly Update for 2015 Action Plans

Strategic Objective	Action Plans	2015 Year End Goal	Status
2.2 Successful / Engaged Workforce / Employee Satisfaction	Roger P. Stewart Building Renewal Project	Form a multi-divisional/agency wide committee whose purpose is to research and develop a plan to update the RPS Building.	Complete. Committee members from several divisions and Code Enforcement representative met April 2015.
		Submit work requests to HC Facilities.	Complete. 2 work requests for repainting submitted and scheduled.
		Identify needed improvements and summarize in a report.	Ongoing. List of needed improvements compiled.

	Develop and deploy employee questionnaire #1 for prioritization of all improvements and summarize results.	Ongoing. Paint color for Main Conference Room chosen by majority vote. Additional questionnaires to be deployed.
	Research building modifications permitted by HC Real Estate & Facilities.	Complete. To be itemized within final report.
	Develop plans for identified improvements to the RPS Building based on prioritization.	Ongoing. To be explained in final report.
	Proposed improvement plans to be released agency wide.	Ongoing. Presented in final report.

		Perform fiscal analysis to determine FY 15-16 budget. Implement any small scale improvements within current budget.	Complete. 2^{nd} floor south hallway repainted and Main Conference Room. Funds not designated for improvements.

Quarterly Update for 2015 Action Plans

Strategic Objective	Action Plans	2015 Year End Goal	Status
3.1 - Customer Service	EcoCommunity Maps	Interview and place interns each semester.	We are currently working with two Summer Interns and two from Spring who have stayed on.
		Get input from public.	We have made several attempts to get feedback from the public: Facebook, TBEP updates, and email sharing. Need to pursue other avenues

Quarterly Update for 2015 Action Plans

Strategic Objective	Action Plans	2015 Year End Goal	Status
4.1 Fiscal Responsibility/Responsible Budgeting	Return On Investment (ROI) Culture Training	Develop List of Resources for ROI Evaluations.	Researched ROI calculator and ROI certification program options.
		Identify and assemble Agency Workgroup.	Workgroup members being identified with representatives from each Division.
		Develop staff training plan.	To be completed following Workgroup meetings.

ENVIRONMENTAL PROTECTION COMMISSION

AGENDA ITEM COVER SHEET

Date of EPC Meeting: August 20, 2015

Subject: G.F. Financial, LLC/LIST Developers, LLC, Section 1-7.203(7), Waste Management Rule waiver request

Agenda Section: Public Hearing

Item: Waste Management Division

Recommendation: Hold a public hearing and approve waiver of Section 1-7.203(7) rule request

Brief Summary: G.F. Financial, LLC/LIST Developers, LLC (Applicant) is hereby requesting that Environmental Protection Commission of Hillsborough County's (EPC) grant a waiver of the testing requirements under Rule 1-7.203(7) pursuant to the EPC Administrative Procedures Rule Section 1-2.50. The applicant seeks a waiver from testing of Recovered Screen Materials (RSM) based on engineering and institutional controls and safeguards that will be in place under the February 3, 2011 Florida DEP guidance document entitled <u>Guidance For Disturbance And Use Of Waste Disposal Areas In Florida</u>. The applicant seeks a waiver from conducting the soil sampling and analysis requirements under Rule 1-7.203(7), regarding development of the property located at the corner of Gandy Boulevard and Church Street, City of Tampa. The EPC staff recommends granting the waiver based on the hardship the sampling and analysis would require and based on the Applicant meeting the underlying purpose of the rule requiring the sampling

Financial Impact: [No financial impact]

Background: G.F. Financial, LLC/LIST Developers, LLC (Applicant) is applying for a waiver from the soil sampling and analysis required under the EPC local rule 1-7.230(7), Rules of the EPC at a redevelopment project. Rule Section 1-7.203(7) requires that sampling and analysis of soils be performed before beginning construction in areas impacted by solid waste. Due to the various engineering and institutional controls in place, the Applicant seeks to use the EPC's variance process to avoid the requirements of additional testing of soils that is deemed unnecessary in this specific instance.

This waiver is requested pursuant to section 1-2.50, Rules of the EPC and states as follows:

1-2.50 REQUEST FOR VARIANCE OR WAIVER

(a) Upon application, the Executive Director may recommend to the Commission that a variance or waiver be granted from the provisions of the rules adopted pursuant to Chapter 84-446, where the applicant demonstrates:

(1) A substantial hardship as defined by section 120.542, F.S., or that a violation of the principles of fairness as defined by section 120.542, F.S., would occur, and

(2) The purpose of the underlying rule can be, or has been, achieved by other means, and

List of Attachments: 1) Former Tampa Jai Alai Property, "Portico," Waiver Request
2) Proposed Waiver Final Order

(3) The provision from which the variance or waiver is being sought did not originate with the DEP where the variance must be considered by the DEP pursuant to section 403.201, F.S. or the variance or waiver must be considered by the DEP or the Southwest Florida Water Management District pursuant to Chapter 120, F.S. Additionally, the Commission does not process variances or waivers of state-delegated rules.

(b) The application must specify the rule for which the variance or waiver is requested, the type of action requested, the specific facts that would justify a variance or waiver, and the reasons why and the manner by which the purposes of the underlying rule would still be met.

(c) Notice of the application must be published by the applicant in a newspaper of general circulation summarizing the factual basis for the application, the date of the Commission hearing, and information regarding how interested persons can review the application and provide comment.

(d) The Commission will consider the application, the Executive Director's recommendation, and the comments of the public at a public hearing during a Commission meeting. The Commission shall grant, in whole or part, or deny the application by written decision supported by competent substantial evidence. The Commission may impose additional conditions in a variance or waiver.

The Applicant requests a waiver of EPC Rule Section 1-7.203(7) for the apartment construction based on a substantial hardship and based on compliance with the underlying purpose of the rule. EPC staff asserts that the Applicant has demonstrated that complying with the additional requirements under EPC Rule Section 1-7.203(7) would impose a substantial hardship if the Applicant were not granted a waiver in this specific situation. In addition, the Applicant asserts that the purpose of complying with the testing requirements of the rule would still be achieved through work previously performed, as well as the engineering (such as impervious surfaces, foundations, hardscape, or 24-inches of protective soil cover) and institutional controls that will be in place under the Florida FDEP Brownfield Redevelopment program. These measures would ensure ample protection to human health and the environment.

Finally, the waiver being sought is not one that State agencies have jurisdiction over. Therefore, EPC staff recommends granting the waiver from the additional requirements of performing soil sampling and analysis for this specific project.

List of Attachments: 1) Former Tampa Jai Alai Property, "Portico," Waiver Request
2) Proposed Waiver Final Order

CONESTOGA-ROVERS
& ASSOCIATES

4019 East Fowler Avenue, Tampa, Florida 33617
Telephone: (813) 971-3882 Fax: (813) 971-1862
www.CRAworld.com

June 3, 2015 Project No. 096218

Mr. Ronald A. Cope, General Manager
Mr. Andrew Zodrow, Assistant Counsel
Solid and Hazardous Waste Section
Environmental Protection Commission of Hillsborough County
3629 Queen Palm Drive
Tampa, Florida 33619-1309

Dear Mr. Cope/Zodrow:

RE: **Request for Waiver**
Former Tampa Jai Alai Property, "Portico"
5145 South Dale Mabry Highway
Tampa, Florida

Conestoga-Rovers & Associates, Inc. (CRA), on behalf of G.F. Financial, LLC/LIST Developers, LLC, is requesting a waiver to Hillsborough County Environmental Protection Commission (EPC) Rule 1-7.203(7). Our proposed waiver and justification are included below.

Background

G.F. Financial, LLC/LIST Developers, LLC, intends to redevelop the subject site for multi-family residential use. The subject site is known as City of Tampa Landfill #16 (former Tampa Jai Alai). The City of Tampa was a private landfill that received solid waste disposal up until 1964. The site is approximately 17.9 acres, and the eastern portion of the site is currently developed. The remaining undeveloped portion of the site is approximately 13 acres in size. CRA submitted an application for Director's Authorization to the EPC in July 2014.

Proposed Variance

In accordance with Rule 1-7.203(7), RSM proposed for onsite reuse shall be characterized. CRA proposes a waiver to the characterization requirements for RSM reused based on "principles of fairness", because the literal application of this requirement affects G.F. Financial, LLC/LIST Developers, LLC in a manner that is significantly different from the way it affects parties conducting similar activities at other Florida Department of Environmental Protection (FDEP) regulated sites. Specifically, CRA requests a waiver from the RSM sampling and laboratory analyses requirements of §1-7.203(7) if the material will be placed beneath and fully controlled through the installation of approved engineering controls in the form of buildings, asphalt covered areas, and/or two feet of clean fill. This will ensure that violations of applicable air, groundwater and/or surface standards do not occur. Furthermore, this will prevent a significant threat to human health in the future and will not cause public nuisance. The rationale for the proposed variance is Section 4.5 of the Florida Department of Environmental Protection (FDEP) guidance document entitled "Guidance for Disturbance of Old Closed Landfills or Waste Disposal Areas in Florida" dated February 3, 2011.

Given that the debris disposal occurred more than 50 years ago, any placement of RSM in the original boundaries of the waste disposal footprint is expected to result in similar leachability concerns as the remaining waste and conditions prior to disturbance.

Closing

We trust that the Hillsborough County EPC will consider this request justified and consider the request in the near future during a regular Commission meeting. Please feel free to contact me in the event that you have any questions.

Sincerely,
Conestoga-Rovers & Associates

Brian Moore, P.E.
Principal Engineer

ENVIRONMENTAL PROTECTION COMMISSION
OF HILLSBOROUGH COUNTY

In re: G.F. Financial, LLC/
LIST Developers, LLC **Case No. 15-EPC-003**

Petition for Waiver.
__________________________________/

FINAL ORDER ON APPLICATION FOR WAIVER UNDER SECTION 1-2.50, RULE OF THE ENVIRONMENTAL PROTECTION COMMISSION

BACKGROUND

On June 3 2015, G.F. Financial, LLC/LIST Developers, LLC, (hereinafter "applicant") submitted a waiver request to the Environmental Protection Commission of Hillsborough County (EPC) under section 1-2.50, Rules of the EPC. The applicant requested a waiver of Section 1-7.203(7), Rules of the EPC with respect to testing of soils and Recovered Screen Material (RSM) for some areas during construction of an apartment complex. This Rule Section 1-7.203(7) requires that RSM proposed for onsite reuse and excavated solid waste shall be characterized, managed, reused and disposed in accordance with the specific requirements, including extensive sampling and testing.

The applicant requests a waiver of the above rule section for the apartment construction based on a substantial hardship and based on compliance with the underlying purpose of the rule. The applicant asserts that the purpose of complying with the testing requirements of the rule would still be achieved through work previously performed, as well as the engineering (such as impervious surfaces, foundations, hardscape, or 24-inches of protective soil cover). These measures would ensure ample protection to human health and the environment.

FINDINGS OF FACT

1. The applicant owns property located at the corner of Gandy Boulevard and Church Street in the City of Tampa in Hillsborough County where they are intending to construct an apartment complex.

2. The site will have engineering and institutional controls put in place during site development which will provide ample protection to human health and the environment.

3. The applicant requests a variance from Rule 1-7.203(7), Rules of the EPC for soils and RSM specifically intended for reuse under engineering controls (but all other provisions of Rule 1-7.203(7) would apply to any RSM intended for reuse by other means and in other locations.

4. The additional extensive testing provided in Section 1-7.203(7), Rules of the EPC would be a substantial hardship for the applicant. This is because the requirements would result in a demonstrated additional and unnecessary expense to the applicant. Further, the

principles of fairness would be violated since the literal application of the testing rules would affect the applicant in a manner significantly different from the way it affects other similarly situated persons who are subject to the applicant's tests would not provide added protection considering the various engineering and institutional controls that will be implemented during site development with the agreement of the EPC.

5. The purpose of Section 1-7.203(7), Rules of the EPC to protect human health and the environment is fully achieved under the February 3, 2011 Florida Department of Environmental Protection guidance document entitled Guidance For Disturbance And Use Of Waste Disposal Areas In Florida, including the planned institutional and engineering controls.

6. Finally, the requirement is not a rule provision which originates from the FDEP. The EPC rules under Chapter 1-7 at issue does not originate with FDEP.

CONCLUSIONS OF LAW

7. This variance is requested pursuant to section 1-2.50, Rules of the EPC, which states as follows:

1-2.50 REQUEST FOR VARIANCE OR WAIVER

(a) Upon application, the Executive Director may recommend to the Commission that a variance or waiver be granted from the provisions of the rules adopted pursuant to Chapter 84-446, where the applicant demonstrates:

(1) A substantial hardship as defined by section 120.542, F.S., or that a violation of the principles of fairness as defined by section 120.542, F.S., would occur, and

(2) The purpose of the underlying rule can be, or has been, achieved by other means, and

(3) The provision from which the variance or waiver is being sought did not originate with the DEP where the variance must be considered by the DEP pursuant to section 403.201, F.S. or the variance or waiver must be considered by the DEP or the Southwest Florida Water Management District pursuant to Chapter 120, F.S. Additionally, the Commission does not process variances or waivers of state-delegated rules.

(b) The application must specify the rule for which the variance or waiver is requested, the type of action requested, the specific facts that would justify a variance or waiver, and the reasons why and the manner by which the purposes of the underlying rule would still be met.

(c) Notice of the application must be published by the applicant in a newspaper of general circulation summarizing the factual basis for the application, the date of the Commission hearing, and information regarding how interested persons can review the application and provide comment.

(d) The Commission will consider the application, the Executive Director's recommendation, and the comments of the public at a public hearing during a Commission meeting. The Commission shall grant, in whole or part, or deny the application by written decision supported by competent substantial evidence. The Commission may impose additional conditions in a variance or waiver.

8. The applicant has demonstrated that complying with the additional requirements under Rule 1-7.203(7), Rules of the EPC, would impose a substantial hardship if the applicant were not granted a waiver in this specific situation.

9. The applicant has demonstrated that by following the planned institutional and engineering controls under Chapter 62-785, F.A.C., the purpose of Section 1-7.203(7), Rules of the EPC will still be achieved.

10. The applicant has demonstrated that the provision from which the waiver is being sought did not originate with the FDEP where the variance must be considered by the FDEP pursuant to Section 403.201, F.S.

11. This waiver applies only to the soils and RSM intended for reuse as stated herein, and these materials will not require the soil sampling and analysis required under Rule 1-7.203(7), Rules of the EPC.

ORDER

For the foregoing reasons, the subject requested waiver from Section 1-7.203(7), Rules of the EPC, is **GRANTED**. All provisions of Section 1-7.203(7), Rules of the EPC would still apply to other soil and RSM located at the subject property.

NOTICE OF RIGHTS

The EPC's proposed action on this waiver shall become final unless a timely appeal via writ of *certiorari* to the 13th Judicial Circuit is filed with any appropriate fee. A copy of the appeal must be provided to the EPC Legal Department, 3629 Queen Palm Dr., Tampa, Florida 33619.

DONE AND ORDERED this ______ of ____________________, 2015 in Tampa, Florida.

____
Lesley "Les" Miller, Jr., Chairman
Environmental Protection Commission
of Hillsborough County
3629 Queen Palm Drive
Tampa, Florida 33619
(813) 627-2600

ENVIRONMENTAL PROTECTION COMMISSION

AGENDA ITEM COVER SHEET

Date of EPC Meeting: August 20, 2015

Subject: Informational Update on Completion of Fertilizer Rule Study and Peer Review

Agenda Section: Regular Agenda

Item: Water Management Division

Recommendation: Information Only

Brief Summary: Informational presentation by staff and USF College of Engineering Peer Review Team on the final reports of both the fertilizer study and the peer review of the study.

Financial Impact: No Financial Impact

Background: In July 2010, as part of the adoption of Chapter 1-15 Rules of the EPC, the language in the rule directed that "… Within 3 years of the effective date of this rule, the Commission shall, in coordination with the University of South Florida, IFAS, and other entities, study the effectiveness of fertilizer regulations and whether any changes are merited." This agenda item is an informational presentation by staff and the USF College of Engineering Peer Review Team on the final reports of both the fertilizer study and the peer review of the study.

List of Attachments: [Double-click to list any attachments or put "None."]

Tampa Bay Residential Stormwater Evaluation Final Project Report

Prepared For

Tampa Bay Estuary Program

Prepared by

Claudia Listopad, Ph.D.

Applied Ecology, Inc.

Leesa Souto, Ph.D. & Patrick Bohlen, Ph.D.

University of Central Florida

February 22, 2015

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Executive Summary

The Tampa Bay Residential Stormwater Quality Evaluation was an applied research project that attempted to address the crucial linkage between human behavior and subsequent environmental response by investigating the effectiveness of fertilizer educational and ordinance interventions in four Tampa Bay, Florida communities. One of the goals of this study was to initiate a long-term evaluation of potential water quality changes associated with changes in landscape management behavior at a local neighborhood scale.

Social survey and environmental monitoring datasets were collected at the county- and community-scale to assess the awareness of the ordinance intervention, behavioral changes, and water quality changes in residential communities. Although a lag in water quality response was expected following implementation of local fertilizer ordinances in Tampa Bay residential communities, several important conclusions were drawn from the limited sampling events that were initiated under this study:

- Pinellas County residents differed significantly from Manatee and Hillsborough County residents in terms of their awareness and knowledge of fertilizer ordinances and fertilization behaviors.
    - Pinellas County residents were significantly more aware of fertilizer ordinances; they were significantly more likely to cite specific details prescribed by the ordinance; and they were applying significantly less fertilizer to their lawns as demonstrated by fertilizer frequency and the estimated nitrogen inputs associated with their behavior.
    - The Hillsborough County community had the highest estimated fertilizer nitrogen inputs (93.6 lbs/acre), the highest fertilizer frequency, the highest percentage of professionals responsible for landscape management, and the highest estimated annual total nitrogen loads (3.8 lbs/acre) of the communities studied.
- Statistical power analyses based on the variation of data collected under this study indicated that at least 23-32 stormwater pond samples and 54-85 stormwater runoff samples would need to be collected to detect a 20% change in Total Nitrogen (TN) concentrations from these samples (with 90% power). Detecting a 20% reduction in Total Phosphorus (TP) concentrations would require even a greater number of samples, between 38-139 for stormwater pond samples and 54-85 for stormwater runoff samples.
    - The power analyses indicate that at least 3-4 years of additional monitoring would be needed to test for statistically significant differences in environmental data collected from Tampa Bay residential communities.
    - Implementing a long-term sampling methodology similar to the one developed under this study would help identify environmental benefits that may result from implementation of an ordinance and/or educational program within the region.
- Evidence of fertilizer use within the communities was observed from a number of the environmental data collection efforts:
    - Peaks in TN concentrations were observed in both stormwater runoff and stormwater pond samples, particularly during months when fertilizer was reported to be most often applied by homeowners (March, April, and October).

  - Isotopic signatures of stormwater runoff and resident lawn soil samples strongly indicated nitrate constituents from fertilizer sources.
- Applied fertilizers contributed to the total nitrogen loads stemming from residential landscapes. They are a manageable source of nutrients from these landscapes, if reductions of overall nitrogen loads from urban environments are a desired outcome. However, several observations and uncertainties regarding fertilizer application behavior arose during this study:
  - Homeowner, "do-it-yourselfers," consistently reported that they did not typically apply fertilizer in the summer, rainy season months (Wekiva 2009, SWFWMD 2007, countywide survey)
  - Professional landscape maintenance staff associated with the studied communities reported that they applied fertilizers year-round according to IFAS recommended rates. (Therefore, seasonal fertilizer restrictions may not impact the annual total nitrogen being applied by professionals, who strive to apply fertilizer according to IFAS rates.
  - In this study, we were unsuccessful at obtaining specific fertilizer formula details from professionals during the interviews. So, a detailed accounting of applied fertilizers by professionals within the study communities was not possible.
  - Professional fertilizer applicators working in cities that fall within the jurisdictional boundaries of a County with strict fertilizer controls <u>may</u> abide by the stricter regulations throughout their operating region.
- Several modifications are recommended to improve future studies that strive to evaluate intervention strategies and their effectiveness in improving water quality at the residential community scale:
  - Further in situ research is needed at the landscape scale to fully appreciate the extent that residential lawn fertilizer is impacting water quality.
  - In situ experiments to evaluate interventions should be set-up as a time series before and after the effective intervention such as an ordinance, education program, or other behavioral incentive.
  - An intervention study where the landscape is managed or controlled by the research team allows control of application amount and timing that can help clarify the behavioral effect at a community scale.
  - Fertilizer tracer studies where a fertilizer labeled with heavy nitrogen (high $d^{15}N$) is applied at a known rate and then followed through the system using long-term monitoring of soil, plant, and local and downstream receiving waterbodies.
  - Socio-behavioral studies dedicated to community-level socio-demographics and behaviors to compare differences in behaviors over time between pre-defined treatment and control groups.
  - A minimum of 5-7 years and preferable 10 years of data collection should be targeted for any statistical detection to be able to take place. It might be possible to observe a reduction in concentrations of local pond water samples in less time, but extreme weather events and drought years might clearly increase the measured variability used as basis for the sample size estimates above. An alternative would be to sample for 2 years prior to implementing behavioral changes and again 5-10 years later comparing communities with or without significant interventions.

Overview

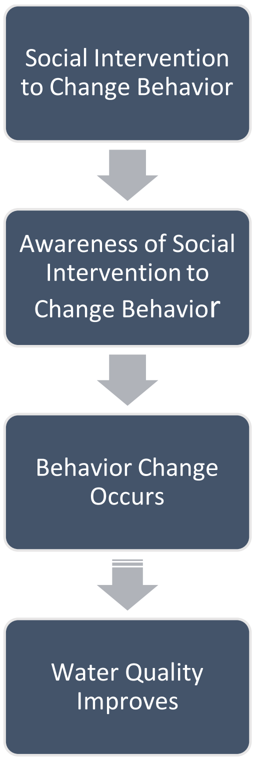
Nitrogen from fertilizer sources can persist in soils for years, and there is a potential lag-time between the reduction or complete elimination of fertilizer use and the resulting reduction of nutrient concentrations in receiving waters (Raciti et al 2008, Sebilo et al., 2013). Lehman et al (2008, 2009) projected that it would take 8 years to see a 25% reduction in soluble reactive phosphorus, 3 years for similar reduction in dissolved phosphorus, and 2 years for the same in total phosphorus in Ann Arbor, MI receiving waters after elimination of phosphorus in residential fertilizers. Community scale research must be designed to account for this lag-time and nutrient processing in the residential landscape (Vitousek and Reiners, 1975) whereby the relationship between nutrient inputs and outputs change over time as they are accumulated by soils and vegetation biomass and released from the system as stormwater runoff.

The Tampa Bay Residential Stormwater Evaluation was an in-situ, socio-environmental research project that investigated the potential impact of local interventions (i.e. residential fertilizer ordinances or rules), on resident awareness, landscape management behavior and subsequent local water quality conditions in four neighborhoods located in three Florida counties. The research examined residential water quality at a unique scale, from individual household lots, to stormwater runoff generated from communities, to onsite stormwater retention pond systems. One of the critical outcomes of this study was to establish a long-term, community-scale monitoring program to track changes in resident behavior and community water quality conditions that may result from implementation of residential fertilizer ordinances (see Figure 1 for key research hypotheses).

All communities in this study were under some type of fertilizer ordinance which varied by county. In 2010, Pinellas County passed the most restrictive urban fertilizer ordinance in the State of Florida. The ordinance: 1) required that residential fertilizer contain at least 50% slow-release nitrogen, 2) required a soil test to confirm the need for phosphorus application, 3) established a 10-foot setback from the water for fertilization, and 4) restricted the application and sale of nitrogenous fertilizer during the summer rainy season defined as June 1 to September 30. During the rainy season, fertilizer distributors were required to remove nitrogenous fertilizer from the shelves.

Hillsborough County's rule, also enacted in 2010, prohibits the use of phosphorous without a soil test, requires a 10' set-back from water bodies, implements and enforces lawn care professional training, and prohibits the application of fertilizer during or within 36 hours of a rain event. In contrast to Pinellas County's ordinance, Hillsborough County's does not include a seasonal restriction, does not require 50% slow-release nitrogen, and does not restrict the sale of nitrogenous fertilizer during the rainy season.

In 2011, state legislation was enacted that prevented any other local government from passing fertilizer sales restriction -- making the Pinellas County ordinance unique in the State of Florida. Following the state action in 2012, Manatee County passed an ordinance similar to Pinellas County's which contained the seasonal restriction, but Manatee's does not restrict sales. Therefore, it has been viewed that Pinellas County's urban fertilizer use ordinances are the most restrictive in the Tampa Bay region, followed by Manatee County's ordinance, and then Hillsborough County's rules.



A residential fertilizer ordinance that imposes a seasonal sales-restriction on nitrogenous lawn fertilizer is passed in one county and not two adjacent counties.

H1: There is no significant difference in ordinance awareness among residents living where a sales-restriction is in effect relative to those living in counties without the sales restriction.

H2: There is no significant difference in fertilizing practices among residents living where a sales-restriction is in effect relative to those living in counties without the sales restriction.

H3: There is no significant difference in pollutant loads to water bodies where fertilizer sales restrictions are in effect relative to waterbodies where the fertilizer sales restrictions have not been implemented.

Figure 1. Schematic outlining the hypotheses tested under the Tampa Bay Residential Stormwater Quality Evaluation which links the social interventions (residential fertilizer use ordinances) with potential outcomes (changes in residential fertilizer application behavior and quality of residential water resources). Lag in response between all these steps is expected to occur, particularly when trying to measure quantifiable water quality improvements in a real-life setting.

The research objectives under this project were to demonstrate in a real-world experiment a method to track the long-term ecological response (reduced nitrogen loads) associated with a social intervention (urban fertilizer ordinance) that reinforces an environmentally-responsible behavior (fertilizer application timing). This study was not a controlled experiment and was not designed to confidently demonstrate causal effects between behavior change and environmental quality. The limited research budget and timeline did not allow the establishment of baseline data or more than 1 replicate as control. Differences observed among communities from different counties could simply be due to random sampling and inherent variability.

Introduction

Goal and significance of the study

The Tampa Bay Residential Stormwater Evaluation compared socio-ecological variables in four communities. The research project integrated human behavior, socio-demographics, and water quality data in residential communities to provide a method for assessing the environmental impact of varying residential fertilizer controls.

The community-scale focus of this study contributes much-needed information to the growing body of urban ecology literature to expand the methods and tools that can be used to evaluate educational programs and municipal policies related to fertilizer and landscape management ordinances. The research collected stormwater runoff, surface water from retention ponds, irrigation water from residents' homes, and soil nutrient data. In addition, human behavior and socio-demographic data were collected to identify linkages between land-based nutrient inputs from community resident landscape management behavior and the receiving aquatic ecosystems within their communities.

The overall goal of this study was to identify ecological and socio-demographic factors influencing fertilizer-related nutrient contributions to receiving waters in communities where different fertilizer controls were enacted by local municipalities. This included the following specific objectives:

1. Measure and compare residential landscape management practices and knowledge among residents in each community and municipality at-large;
2. Measure and compare average nitrogen loads (lbs/area) among the communities; Estimate residential fertilizer inputs to the community nutrient budget;
3. Measure nutrient concentrations in stormwater runoff and surface waters (stormwater retention ponds) throughout the year in each community.

The hypotheses addressed by this study are the following:

H1: There is no significant difference in ordinance awareness among residents living where a sales-restriction is in effect relative to those living in counties without the sales restriction.

H2: There is no significant difference in fertilizing practices among residents living where a sales-restriction is in effect relative to those living in counties without the sales restriction

H3: There is no significant difference in pollutant loads to water bodies where fertilizer sales restrictions are in effect relative to waterbodies where the fertilizer sales restrictions have not been implemented.

H4: There is no significant difference in fertilizing practices between residents living in the higher versus lower socioeconomic communities within Pinellas County.

H5: There is no significant difference in pollutant loads between water bodies receiving stormwater inputs from the higher and lower socioeconomic communities within Pinellas County.

Study Background

The study design is substantiated by urban ecology literature focused on nutrient cycling in the suburban environment, turfgrass and watershed isotope studies, and salient socio-demographic variables related to yard fertilizing practices (REFERENCES?). Much of the research design has been successfully demonstrated by Law et al. (2004) at the Baltimore Ecosystem Study (BES). The BES is one of several Long-Term Ecological Research Network sites in the world that seeks to understand how urban ecosystems change as a result of human land use alterations. With research funding from the National Science Foundation, the LTER network is built on a foundation of sound scientific methods and research integrity. The Tampa Bay Residential Stormwater Quality Evaluation Project builds upon this previous research and contributes to the body of knowledge that attempts to understand the link between human behaviors and suburban, ecosystem-related drivers. This research has application to other Florida locales that may implement policies and educational programs supporting the preservation of water resources through fertilizer control ordinances or to help meet state and federally mandated Total Maximum Daily Loads (TMDLs) for nutrients and other pollutants.

The research was further focused on key socio-demographic characteristics and ecological variables that are thought to affect suburban environment nutrient inputs and cycling, including population density (Boyer et al 2002), level of income and education within a community (Robbins et al 2002), community turfgrass coverage (Robbins and Birkenholtz 2003), irrigation with reclaimed water, presence of community amenities (managed common areas and golf courses), incidence of septic tanks (Klosterman 2010, Wekiva 2009, Lake Tarpon 2004), recent community land use changes and continued development (Robbins et al. 2001), and frequency and intensity of chemical fertilizer use (Driscoll et al. 2003, Howarth et al. 1996, Baker et al. 2001, Law et al. 2004). Likewise, community characteristics such as lot size, lawn area, lawn age, soil disturbance history, presence of other vegetation, lawn maintenance practices, irrigation water source, and soil characteristics such as bulk density, carbon, hydrogen and nitrogen concentrations are important variables to consider when designing experiments that link suburban environments to ecosystem responses (Raciti et al. 2008, Law et al. 2004). This research investigated several of these variables and used these to guide community site selection within the Tampa Bay region.

Study Design

In the initial scope of work, Applied Ecology, Inc. (AEI) and partners University of Central Florida (UCF) and University of Florida (UF) proposed a trend analysis to predict changes in surface water quality that could be confidently linked to current landscape management practices within the communities. The trend analysis was intended to examine: 1) any available multi-year data sets for surface water sampling locations within the communities to understand patterns in nutrient variations, 2) conduct a limited power analysis based on available data to detect potential future trends, and 3) define any critical value that would be indicative of a significant water quality change within the community regardless of natural variability within the datasets.

Unfortunately, the final communities selected, after satisfying a number of the community and environmental selection variables, did not have antecedent monitoring information to relate any long-term water quality trends under this study. Therefore, the project team agreed that the Monitoring

Plan scope would focus on establishing a comprehensive stormwater quality sampling program within the selected communities that would be implemented over several wet-season events rather than rely on comparing surface water quality data over a historic and contemporary period.

The final study design used an extended sampling period (18-months of water quality monitoring) to divide the project into two major Phases (Figure 2). Phase I of the research investigated social and behavioral characteristics of the 3 county populations, as well as, demographics and ecological characteristics among discrete communities within the counties. This initial phase allowed the selection and characterization of the communities under this study. In Phase II, we developed and implemented an environmental monitoring program within the selected communities focused on linking community yard maintenance practices with resulting stormwater quality. Tasks under this Phase included developing an EPA-approved Quality Assurance Project Plan (included in Appendix A), providing a comprehensive social and environmental monitoring strategy for long-term trend analysis of fertilizer-related nutrient inputs, community water quality and resident, social data collection, and data interpretation and reporting.

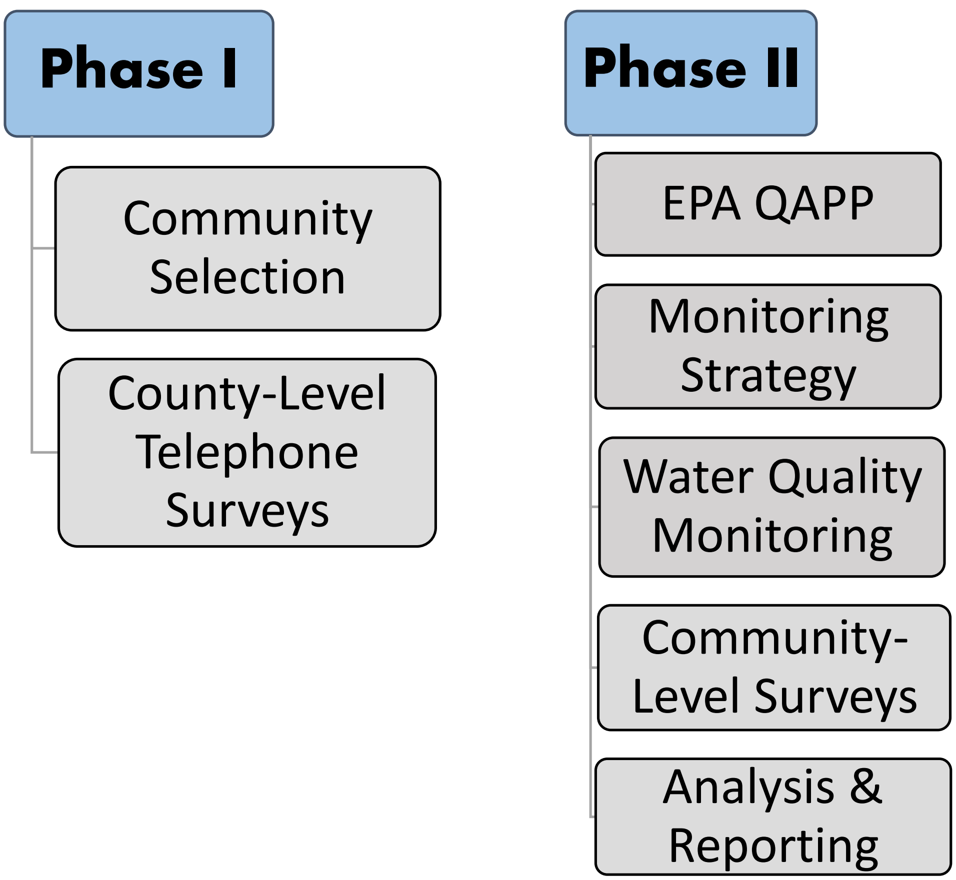


Figure 2. Schematic outlining the major phases and tasks completed under this project.

Methodology

Phase I - Selection of Study Sites

Before communities could be selected for social and environmental monitoring, our team in collaboration with the project working group, conducted a comprehensive investigation of socio-demographic variables that could characterize homogenous community level sampling units. Past research helped guide and inform community selection through a series of questions, as follows:

- *What year was the community built?* Frank *et al.* (2006) demonstrated greater leaching occurred in older turfgrass landscapes ten years after initial testing suggesting that as the lawn ages, its capacity to retain N decreases even though soils in the study had higher levels of N. Additionally, socio-behavioral studies indicate higher fertilizer rates in newer communities [Robbins et al 2001, Souto and Listopad (submitted 2014)].
- *Who is responsible for fertilizer management in the community?* Several studies have shown that professional landscaping companies apply more fertilizer than homeowners and that different fertilizer application Best Management Practices were utilized by each user group [Law et al. 2004, Wekiva Residential Fertilizer Practices (UCF report to FDEP 2009)].
- *What is the market value of the houses in the community?* Studies show that households with intermediate socio-economic values have the highest application rate of N fertilizer relative to higher and lower valued households (Law et al. 2004, Osmond and Platt 2000).
- *Which communities are irrigated with reclaimed water?* This factor is important to the Tampa Bay region, as varying nutrient concentrations occur from reclaimed sources within each of the counties (Janicki Environmental, Inc. 2013).
- *Which have golf courses?* Community amenities, such as presence of a golf-course, relate to the socio-economic status of the overall community and may influence community landscape management practices (Tait Martin Inc. 2008; UCF 2009)
- *Which communities have Homeowners Association (HOA)s and if present, do they have specific turfgrass requirements in their HOA covenants?* Presence of a HOA and requirements for St. Augustine turfgrass both related to higher fertilizer frequency in Wekiva, FL (UCF 2009, Souto and Listopad, submitted 2014).

The four project communities are located in three different counties that have implemented varying degrees of landscape management rules or ordinances. The community selection process involved an examination of relevant, ecological, demographic, and drainage basin characteristics. In order to avoid many confounding variables, we attempted to control many of these variables, keeping all four communities within a similar range of characteristics. Ecological features that were examined included soil type, topography and existing landscape vegetation. Community characteristics such as drainage area, lot sizes, lake and inlet elevations, and stormwater infrastructure were considered, as well as other confounding nutrient sources such as the presence of septic tanks or reclaimed irrigation water sources. Socio-demographics that were considered salient predictors of residential landscape behavior, as asserted from prior research (see above), included house age, property value, Homeowners Association governance and presence of a golf course. We also considered which communities were targeted with educational programs such as Adopt-A-Pond, Florida-Friendly Landscaping, and the newly released "Be Floridian" ordinance educational campaign. The original scope of work proposed completion of community selection within eight months to thoroughly investigate and hold constant all of these diverse parameters. The proposed timeline was reduced to 3 months and was completed after thorough field verification in June 2012. The two most limiting variables in the selection of communities were: 1) the requirement of a minimum flow velocity of 0.5 feet per second during storm events which effectively eliminated some communities that had submerged stormwater inlets, and 2) the avoidance of communities that used reuse/reclaimed water for irrigation within the drainage area. The 0.5 feet per second velocity requirement corresponds to the minimum necessary for flow to be detected and accurately recorded using the autosamplers (ISCO Avalanche portable refrigerated units). After a thorough screening of potential communities within each county and with input from the Project Working Group, two communities were selected in Pinellas County (P201 and P202), one in Manatee County (M101), and one in Hillsborough County (H101), as depicted in Figure 3.

When selecting communities, an attempt was made to control for the following variables:

- Landscape management practices (Mixed management preferred)
- Biological, geographic, and geological features
- Drainage areas and general hydrology
- HOA presence
- Housing demographics such as age of development, lot size, and density
- Absence of golf course
- No reclaimed/reuse water used for irrigation
- No septic onsite

Relative to Hillsborough and Manatee counties, more communities within Pinellas County were evaluated as potential candidates for the study. Newer communities in Pinellas County often used reclaimed water as an irrigation source which made community selection in Pinellas County difficult. Furthermore, older communities in Pinellas tended to have a greater drainage slope gradient within their extent. Lastly, Manatee and Hillsborough county communities had lower mean assessed property values relative to Pinellas County's.

Detailed selection criteria for the final four communities selected in this study are included in Table 1. P202 is the largest community [both in units (290) and total acreage (103), (Figure 7)]; followed by M101 (118 units, 46 acres, Figure 5); H101 (95 units, 59 acres, Figure 4); and finally P201 (smallest area of 18 acres and 60 units, Figure 6). It is important to note that within the largest community (P202) only a small sub-basin was monitored (Figure 8), while in the other communities, the complete or near complete drainage extent was sampled. As a large community, P202, drains to two large retention ponds through multiple inlets. Representative monitoring of the entire drainage area would have required monitoring of several inlets and both stormwater ponds which was cost-prohibitive for the project.

Social data collection did consider, however, the entire community, since no visible differences in socio-economic variables were apparent across the community (e.g. this community was not built in phases). The mean assessed 2014 property value ranged between $110 and $170K for three communities, with Pinellas community, P201, representing the higher socioeconomic community with an assessed property value of $310K, almost double that of the other three communities. The Manatee County community

(M101) had the lowest assessed property; however, these differences were expected given regional economic patterns.

In most cases, we also attempted to control for the age of the communities. Similar ages occurred for H101, M101, and P201 (2002-2003 mean year of development). In contrast, P202, the only Pinellas county community with similar socio-economic conditions of the communities in the other counties, was developed in 1984. Although this was typical for most communities in Pinellas County, it can confound interpretation of the results relative to the other communities where the development patterns were more recent. These differences in development year and socio-economic levels of the communities must be considered when interpreting the social and water quality monitoring data collected from this study. To protect the integrity of the research and the privacy and confidentiality of the human subject research, the communities were only identified by community code.

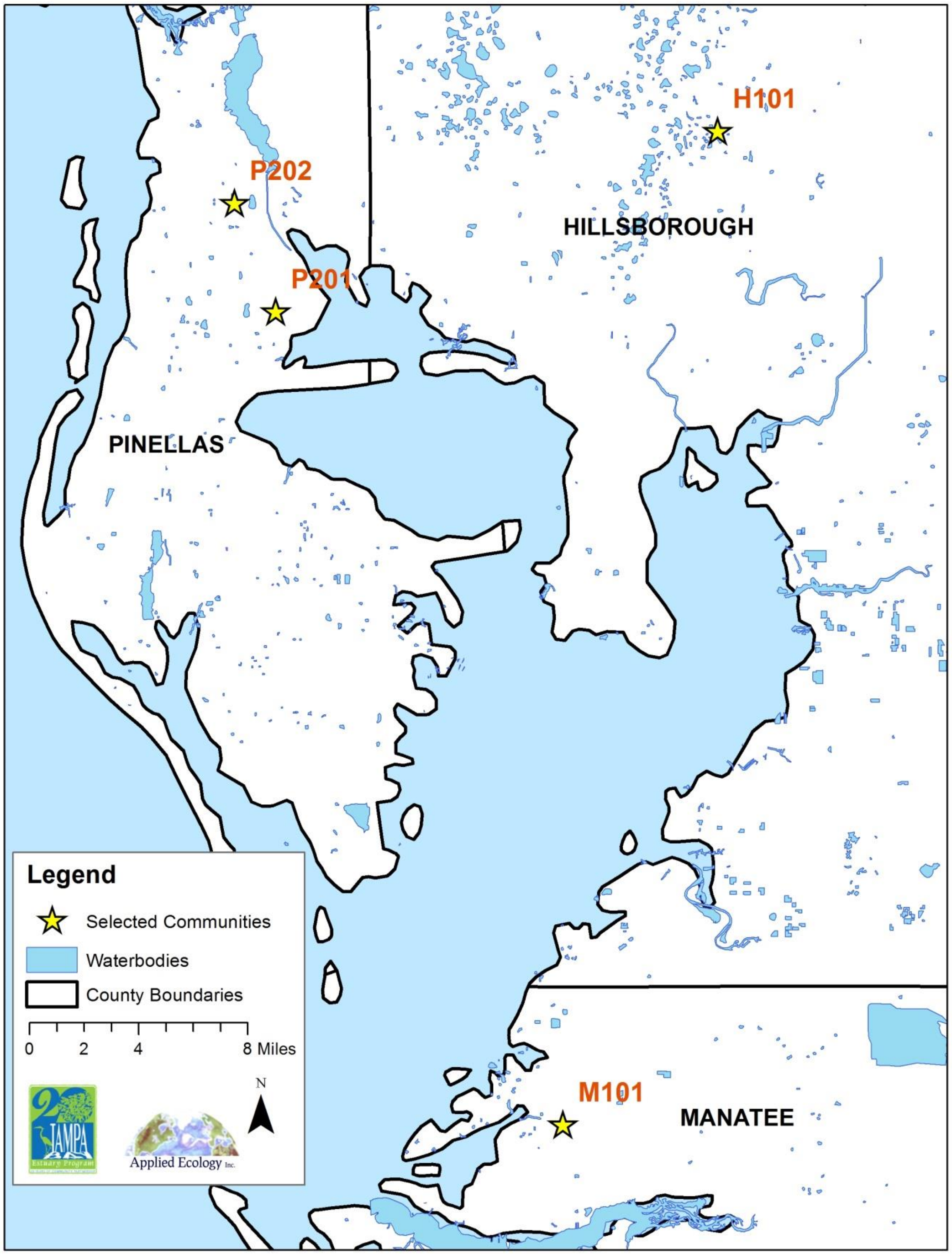


Figure 3. Location of the four selected communities for the Tampa Bay Residential Stormwater Evaluation Project. County boundaries and waterbodies were obtained from the SWFWMD.

Table 1: Characteristics of the Four Communities Monitored Under this Project.

Jurisdiction	Hillsborough	Manatee	Pinellas	Pinellas
Location Code	**H101**	**M101**	**P201**	**P202***
Total acreage	58.70	45.73	17.65	102.90 (26)
Have HOA	Y	Y	Y	Y
Units	95	118	60	290 (98)
Total Parcels Including Common Areas	99	129	65	296
Unit Density/Acre (excludes common area)	2.71	4.26	5.49	4.03
Historical Surface Water Monitoring Data	No	No	No	No
Year Built (min-first house)	2001	2001	2002	1981
Year Built (mean age)	2002	2003	2003	1984
# detached, single family parcels	All	All	All	All
Avg. Property Value (Just Value 2014)	$170,137	$109,831	$313,259	$176,0721
Total Pervious Acres (based on 40% impervious assumption)	35.22	27.44	10.59	61.74 (15.6)*
Total Pervious (based on photointerpretation)	41.96	33.02	8.66	53.52
Golf course presence	No	No	No	No
HOA self-maintained	No	No	No	No
Average lot size	0.37	0.23	0.18	0.25
Average built area	2596	1738	2566	2228
Irrigated w/reclaimed	No	No	No	No
Irrigation Source	Community Well	City	City	City

*Only a portion of this community was representatively monitored in this project. The relevant partial community data are provided in parenthesis.

Figure 4. H101 Community overview and sampling location.

Figure 5. M101 Community overview and sampling location.

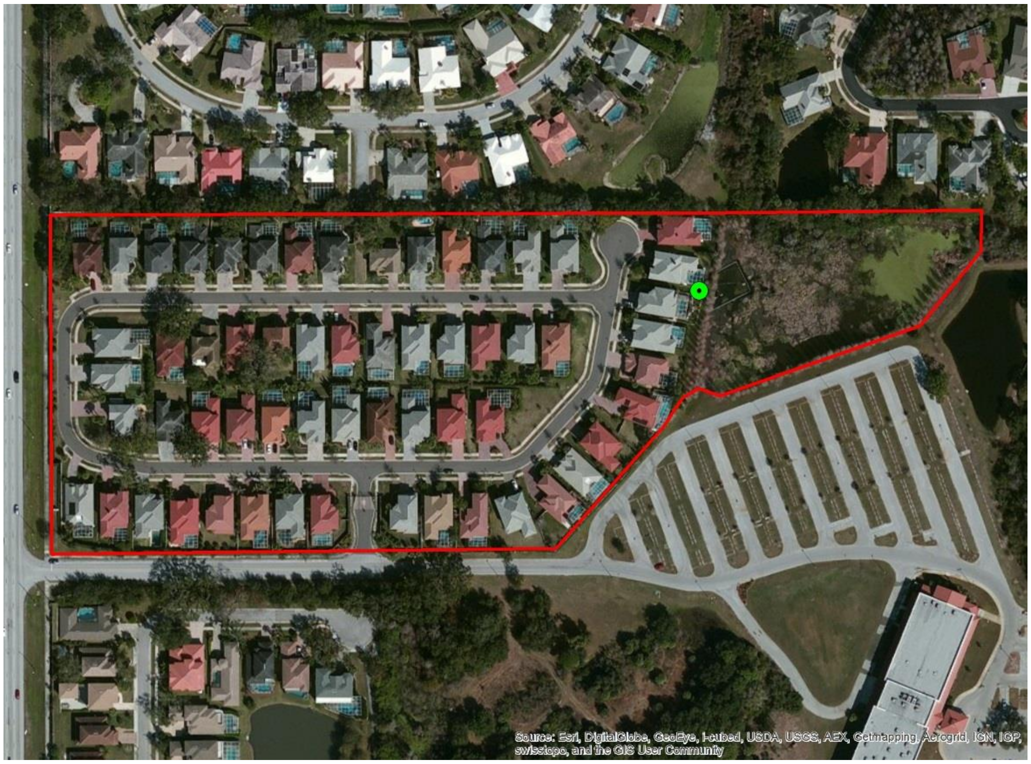


Figure 6. P201 Community overview and sampling location.

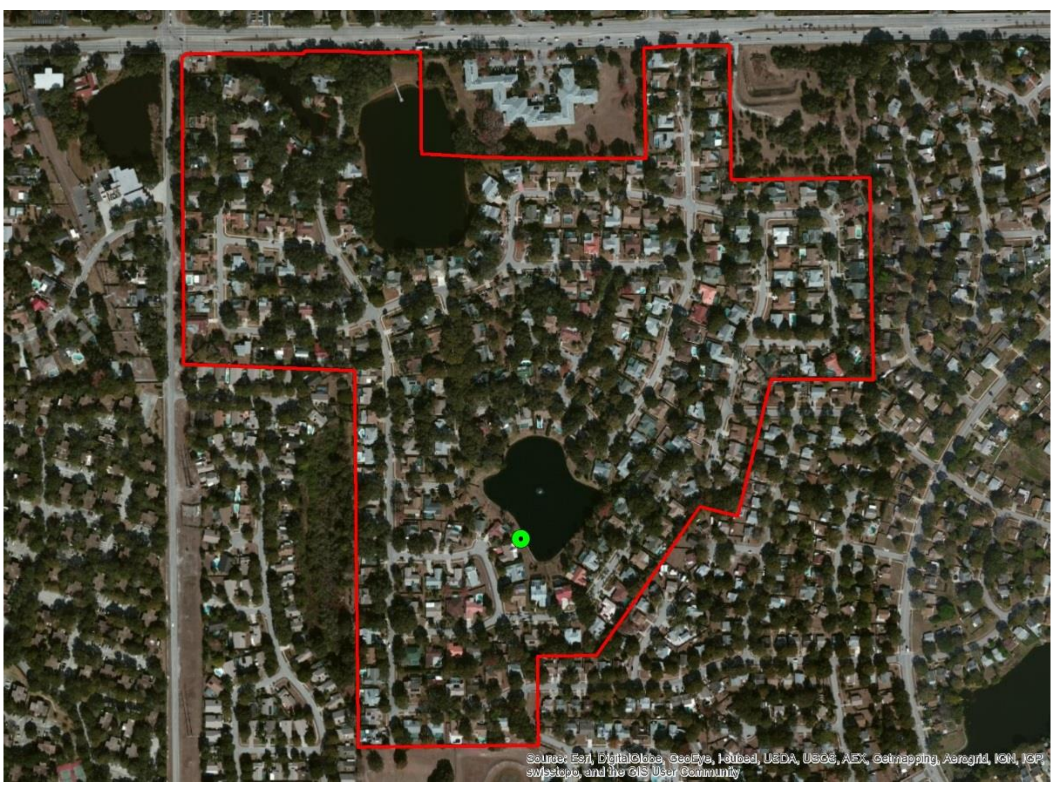


Figure 7. P202 Community overview and sampling location

Figure 8. P202 Drainage area monitored (in white) and sampling location.

Phase II -Data Collection

The Quality Assurance Project Plan (QAPP) was developed and approved [APPENDIX A], spatial and environmental data were collected [APPENDICES J-S], and the community surveys were conducted [APPENDIX F-H].

Social Data Sampling

The social data sampling was divided into three tasks:

Task 1: Countywide Telephone Surveys (N = 835)

Task 2: Community Resident Interviews (N = 81)

Task 3: Community Professional Landscape Management Company Interviews (N = 6 of 31 attempted)

From the countywide telephone survey, we developed additional, targeted questions to use within the communities to better understand nutrient inputs associated with the landscape maintenance practices of the residents and for-hire companies employed within the communities. Homeowner interviews helped to clarify community norms and influences on landscape practices. Professional landscapers were interviewed to understand their fertilizer practices and fertilizer ordinance awareness within the communities, as well.

The original research design proposed to calculate an average application rate of N (kg N/ha/yr) at three spatial scales from the data generated from the household and professional lawn care company surveys (similar to Law et al. 2004). However, limited interview budget and response rates precluded us from confidently estimating fertilizer application rates within the communities. Furthermore, with the high number of professionally fertilized yards in each community, most homeowners who were interviewed had no knowledge of the type or amount of fertilizer that was applied to their lawn. Very few responses were obtained from professionals, further limiting the ability to calculate direct N input at the community scale.

Countywide Telephone Survey

In April and May 2012, UCF's Institute for Social and Behavioral Science (ISBS) surveyed 835 adult residents of Hillsborough, Pinellas, and Manatee counties. The ten minute long survey collected information on residents' landscape management practices and ordinance knowledge. Phone samples purchased from Survey Sampling, Inc. included 80% conventional and 20% cellphone numbers.

Telephone Questionnaire Development

The study questionnaire was developed and pretested multiple times for length and comprehension (Appendix B). A sample of over 8,900 pre-screened telephone numbers in the target counties was purchased and used to conduct countywide telephone surveys. As these are "random digit dial" (RDD) numbers, cell phones and landlines were sampled in the correct proportions (i.e. 80%:20%, as described above). "Pre-screened" means that most non-working, business, FAX- and computer-line and related ineligible numbers were identified and removed before the list was used in the surveys. Including frequent call-backs, these numbers generated 25,174 call attempts, of which 835 resulted in a completed interview and 342 resulted in a refusal (Table 2). For population sizes of 300,000 and higher (applicable to all Counties in this study), the number of completed interviews under this study generates 95% confidence intervals around ± 5 percentage points for any results within and across counties presented later.

Table 2: Countywide telephone survey call disposition.

	Hillsborough	Manatee	Pinellas	Total
Complete	286	292	257	835
Partial	9	9	8	26
No answer	5874	5322	5409	16,605
Call back	1329	1508	1417	4,254
Disconnected	446	434	456	1,336
Not in sampling frame	292	426	479	1,197
Busy	114	124	162	400

Refusal	108	133	101	342
Call back Spanish	29	19	11	59
Fax machine	26	11	12	49
Business number	19	11	13	43
Out of target area	6	8	2	16
Call back other language	2	1	4	7
Other	3	1	1	5
Total dial attempts	**8543**	**8299**	**8332**	**25,174**

Community-Level Homeowner Interviews

University of Central Florida (UCF) trained and Collaborative Institutional Training Initiative (CITI) certified interviewers conducted homeowner interviews in the four study communities from June 6 – August 1, 2013. CITI training is a requirement of all human-subject researchers in academic institutions to ensure subjects are treated with dignity and respect and data are handled anonymously and confidentially. Subdivision addresses were randomly selected and approached during the week and on weekends. Approaches were categorized as a completion, a refusal, or a call back. During the interviews, homeowners were recruited to take part in soil and irrigation water sampling. The complete questionnaire used for these door-to-door interviews is included as Appendix C.

Community-Level Professional Landscaper Interviews

Thirty-one (31) professional landscape companies were identified during homeowner interviews. Although many of the companies serviced a broad geographic area, they were categorized by the community where their firm name was collected. UCF trained and CITI certified interviewers attempted to reach each professional company seven times on the telephone and twice via mail. Six completed interviews were conducted on the professional companies (two of them from companies named in Hillsborough County, one in Manatee, and three in Pinellas). The questionnaire used for professional landscaper interviews is included as Appendix D.

Community-Level Environmental Sampling

The environmental monitoring within the four, select communities occurred entirely during Phase II and consisted of the following:

1. 10 soil samples from random yards within each community (N = 40)
2. 3 irrigation samples from random yards within each community (N = 12)
3. 9-11 stormwater runoff events collected from each comunity (N = 40)
4. 18 surface water sampling events within community stormwater ponds/retention areas (N = 72)
5. Standard laboratory analysis of nutrients for stormwater runoff, surface water and soil samples
6. Isotope Analysis (^{15}N and ^{18}O) of stormwater runoff, surface water and soil samples when practical

The environmental monitoring program was focused on developing nutrient dynamic linkages between residents' yards and the resulting stormwater generated within their communities. Research at this scale provides a more confident assessment of nutrient sources and/behavioral linkages within the communities by reducing the number of confounding variables associated with large scale watershed dynamics. We collected soil, irrigation water, and fertilizer input information to understand potential nitrogen inputs to residents' yards. We measured outputs within the communities by monitoring stormwater runoff at the closest stormwater drain inlet and then also monitored conditions within surface waters of the retention ponds within each community.

Composite auto-samplers were used to collect stormwater runoff samples automatically from one stormwater drainage pipe in each of the four communities. We conducted stormwater collection within culvert pipes leading to the stormwater retention ponds within each community in an attempt to reduce any confounding additions of nutrients from other sources within the communities.

Nutrient composition and isotopic signatures in yard soils, stormwater runoff, and surface waters within receiving retention ponds were assessed. Because commercial fertilizer nitrogen isotopic compositions are unique and present a narrow range of $\delta^{15}N$ values (-4 to +6‰), studies that examine $\delta^{15}N$ have been used to clarify soil/water N interactions (Compton et al. 2007), identify groundwater and surface water N sources (McClelland et al. 1997, Showers et al. 2007, Bowen and Valiela 2008) and to estimate appropriate fertilizer application rates (Frank et al. 2006, Engelsjord et al. 2004, Quinones et al. 2007). We used appropriate tests to investigate isotope ratios of $\delta^{15}N$ and $\delta^{18}O$ in yard soils, stormwater runoff, and surface water retention pond samples.

The environmental data were collected and analyzed according to standard procedures (e.g. DEP-SOP-001/01, EPA Laboratory Methods Standard Methods) with appropriate QA/QC protocols and replication and compiled into a database for spatial analysis within and between communities. Regression analyses were used to correlate fertilizer practices among counties and communities.

Community Lawn Soil Samples

Composite soil samples were collected from the front yards of ten homes in each of the subdivisions. The ten homes were randomly selected from a subset of homeowners who provided written permission to sample their yard during the door-to-door interviews. Five cores taken from random locations in each front yard area were collected and composited into a single soil sample for each home. The top 15 cm of soil under the turfgrass was collected using a 1.5-cm steel soil corer. Soil samples were prepared at the UCF Biology Department laboratories, and sent out for analysis of soil parameters (Table 6) to the Analytical Research Laboratory at the University of Florida. Isotopic analysis of 1 Molar soil extracts were performed by the NAU Colorado Plateau Laboratory. Briefly, nitrate (NO_3) in the extracts was converted to N_2O gas by bacteria (*P. aureofaciens*) that lack the enzyme to reduce it to N_2 gas. The generated N_2O was then analyzed with an isotope ratio mass spec (IRMS) to determine ^{15}N and ^{18}O values of nitrate. Estimated precision of the method, reported as one standard deviation, was ≤ 0.30‰ for ^{15}N and ≤ 0.60‰ for ^{18}O.

Community Irrigation Samples

A small number of irrigation water samples (n=12) were collected from yards with homeowner's permission. Initially, irrigation water was being collected to understand groundwater nutrient concentrations in the communities, however during the door-to-door interviews, it was discovered that three of the communities used city water for irrigation and the fourth (H101), used a deep community well for irrigation. Low variability of the nutrient concentrations within communities was expected. Irrigation samples were sent to PACE Analytical for standard surface water nutrient concentration analyses.

Community Stormwater Runoff Sample Collection

Autosamplers were installed at pre-determined inlet pipes in each of the four selected communities by Environmental Consulting and Technology, Inc. (ECT), with assistance and input from AEI and UCF. Installation sites were accessed through existing drainage easements and homeowners living near the autosamplers were notified in writing. Adjacent homeowners were contacted personally to make them aware of the equipment and the field technician visits.

Effective stormwater monitoring requires a thorough understanding of antecedent stormwater flows and volumes needed to collect a representative composite of stormwater that occurs during a storm event at each site. AEI, UCF, and ECT personnel worked cooperatively to gain a better understanding of storm flow dynamics and representative sample intervals within each of the selected communities. Once autosamplers were installed, initial rainfall and flow volumes were monitored to establish the flow pace of storm events in each community. A complete monitoring plan describing autosampler setup and pacing was developed in April 2013 (Appendix E).

All storm runoff samplers were held in the autosampler at ≤ 4°C for no longer than 24 hours after the sampling event ended. Composite bottles were agitated to ensure a homogeneous solution and then aliquots were transferred to the preserved and labeled scintillation vials. Sample pH was determined and sulfuric acid was added to adjust pH to < 2 as needed, according to the QAPP (APPENDIX X). All dissolved parameter and Ortho-P samples were filtered with a 0.45 micron capsule filter in the field. Stormwater runoff samples were sent for standard testing to the PACE Analytical Laboratory and for isotopic signatures to the University of Georgia (UGA) Odum Ecology Laboratory or the Colorado Plateau Stable Isotope Laboratory at Northern Arizona University (NAU).

Hillsborough County Community (H101)

The autosampler located within the Hillsborough County community (H101) was installed on July 17, 2012. The flow module and sample point were positioned in a 30" (2.5') round concrete culvert at the discharge point to the retention pond. The retention pond level was above the culvert from August 6th through November 8thand the pipe was 100% full (Figure 9). These conditions significantly decreased the velocity of the water entering the retention pond and potentially limited the instrument's ability to measure velocity. Based on rainfall and subsequent water level/flow observations, the sample pacing at this site was set up to collect one 200 ml aliquot every 2000 gallons of flow after a rain event with an intensity of 0.5 inches of rain in two hours or less.

Figure 9. H101 autosampler during high pond level.

Manatee County Community (M101)

The autosampler in Manatee County community M101 was installed on July 17, 2012. The flow module and sample point were positioned in a 38" x 60" elliptical concrete culvert at the discharge point to the retention pond. The culvert was about 90% full when the retention pond was drawn down (Figure 10). Thus, during stormwater runoff events the water level of the pond was routinely higher than the culvert. These conditions significantly decreased the velocity of the water entering the pond and potentially limited the instrument's ability to measure velocity. Based on rainfall and subsequent water level/flow observations the pacing at this site was set up to collect one 200 ml aliquot every 3000 gallons of flow after a rain event with an intensity of 0.25 inches of rain in half an hour or less. This pacing, modified from the original pacing of 0.5" of rainfall in two hours or less, allowed only storm events with enough intensity and higher velocity to generate a rapid flush through the system to trigger the autosampler. This type of pacing minimizes or completely avoids the lag in the system trigger and captured the critical first flush.

Figure 10: M101 autosampler

Pinellas County Community (P201)

The autosampler in Pinellas County community P201 was installed on July 17, 2012. The discharge site at this location was a constructed sedimentation basin (Figure 11). The flow module and sample point were positioned in a 40" (3.333') round HDPE culvert at the discharge point to the sediment basin. The sediment basin was typically covered with *Lemna minor,* common duckweed. The depth of water in the culvert was approximately 0.5' when the sedimentation basin was drawn down. Full pipe conditions were not a concern at this site. Based on rainfall and subsequent water level/flow observations, the pacing at this site was set up to collect one 200 ml aliquot every 2000 gallons of flow after a rain event with an intensity of 0.5 inches of rain in two hours or less.

Figure 11. P201 autosampler

Pinellas County Community (P202)

The autosampler at Pinellas County community P202 was installed on September 20, 2012. The flow module and sample point were positioned in a 30” (2.5’) round concrete culvert at the discharge point to the retention pond (Figure 12). Full pipe conditions were not a concern at this site due to the high slope of the shoreline and positioning of the culvert. Based on rainfall and subsequent water level/flow observations, the pacing at this site was set up to collect one 200 ml aliquot every 2000 gallons of flow after a rain event with an intensity of 0.5 inches of rain in two hours or less.

Figure 12: P202 autosampler

Additional details of the stormwater runoff sample collection effort (SW) can be found in Table 3.

Table 3. Community stormwater runoff samples identification (used as laboratory unique identifiers) and collection times.

Sample Number	H101		P202		P201		M101	
	Date	Label	Date	Label	Date	Label	Date	Label
1	3/25/2013	H101-SW-1 H101-SWD-1	2/14/2013	P202-SW-1 P202-SWD-1	3/25/2013	P201-SW-1 P201-SWD-1	12/21/2012	M101-SW-1 M101-SWD-1
2	4/22/2013	H101-SW-2 H101-SWD-2	3/25/2013	P202-SW-2 P202-SWD-2	4/30/2013	P201-SW-2 P201-SWD-2	4/5/2013	M101-SW-2 M101-SWD-2
3	4/30/2013	H101-SW-3 H101-SWD-3	4/30/2013	P202-SW-3 P202-SWD-3	6/1/2013	P201-SW-3 P201-SWD-3	4/30/2013	M101-SW-3 M101-SWD-3
4	5/22/2013	H101-SW-4 H101-SWD-4	6/6/2013	P202-SW-4 P202-SWD-4	6/25/2013	P201-SW-4 P201-SWD-4	6/6/2013	M101-SW-4 M101-SWD-4
5	6/4/2013	H101-SW-5 H101-SWD-5	7/8/2013	P202-SW-5 P202-SWD-5	7/8/2013	P201-SW-5 P201-SWD-5	7/10/2013	M101-SW-5 M101-SWD-5
6	7/10/2013	H101-SW-6 H101-SWD-6	7/25/2013	P202-SW-6 P202-SWD-6	8/26/2013	P201-SW-6 P201-SWD-6	7/26/2013	M101-SW-6 M101-SWD-6
7	7/25/2013	H101-SW-7 H101-SWD-7	8/7/2013	P202-SW-7 P202-SWD-7	9/4/2013	P201-SW-7 P201-SWD-7	8/9/2013	M101-SW-7 M101-SWD-7
8	8/8/2013	H101-SW-8 H101-SWD-8	9/19/2013	P202-SW-8 P202-SWD-8	9/16/2013	P201-SW-8 P201-SWD-8	9/23/2013	M101-SW-8 M101-SWD-8
9	9/12/2013	H101-SW-9 H101-SWD-9	9/24/2013	P202-SW-9 P202-SWD-9	9/23/2013	P201-SW-9 P201-SWD-9	10/7/2013	M101-SW-9 M101-SWD-9
10	9/24/2013	H101-SW-10 H101-SWD-10	11/1/2013	P202-SW-10 P202-SWD-10	10/7/2013	P201-SW-10 P201-SWD-10		
11	11/1/2013	H101-SW-11 H101-SWD-11						

SW = Orthophosphate (filtered), Total NH3, TKN, NOx, TP
SWD = Dissolved TKN (filtered)

Community Stormwater Retention Pond / Area Sample Collection

Composite surface water samples from the retention ponds consisted of three samples near the shoreline collected monthly from all four communities. Although retention pond sampling intervals were spread out equally over time, a few retention pond samples were collected within 24 hours of capturing a stormwater runoff event sample from the autosamplers at the same location (P202 sample on 2/14/2013, P201 sample on 6/25/2013, H101 sample on 07/10/2013, and P202 sample on 09/19/2013). The sampling methods and laboratory analyses were implemented as described in the approved QAPP (APPENDIX X). Samples were sent for standard analyte testing to PACE Analytical Laboratories and for ^{15}N isotopic signatures to the University of Georgia (UG) Odum Ecology Laboratory and the Colorado Plateau Stable Isotope Laboratory at Northern Arizona University (NAU).

Hillsborough County Community (H101)

Stormwater retention pond composite samples were collected from three locations within the pond; one near the discharge pipe (Figure 13), one approximately 100' along the bank to the north of the culvert and one approximately 100' to the south of the culvert. Due to the nature of the stormwater retention pond, water levels varied drastically seasonally, and collection locations would shift to be consistently near the water's edge.

Figure 13. H101 storm inlet sampling location using an autosampler (green circle) and stormwater pond surface sampling locations (red stars).

Manatee County Community (M101)

Stormwater retention pond composite samples were collected from three locations within the pond; one near the discharge pipe (Figure 14), one approximately 100’ along the bank to the north of the culvert and one approximately 100’ to the south of the culvert.

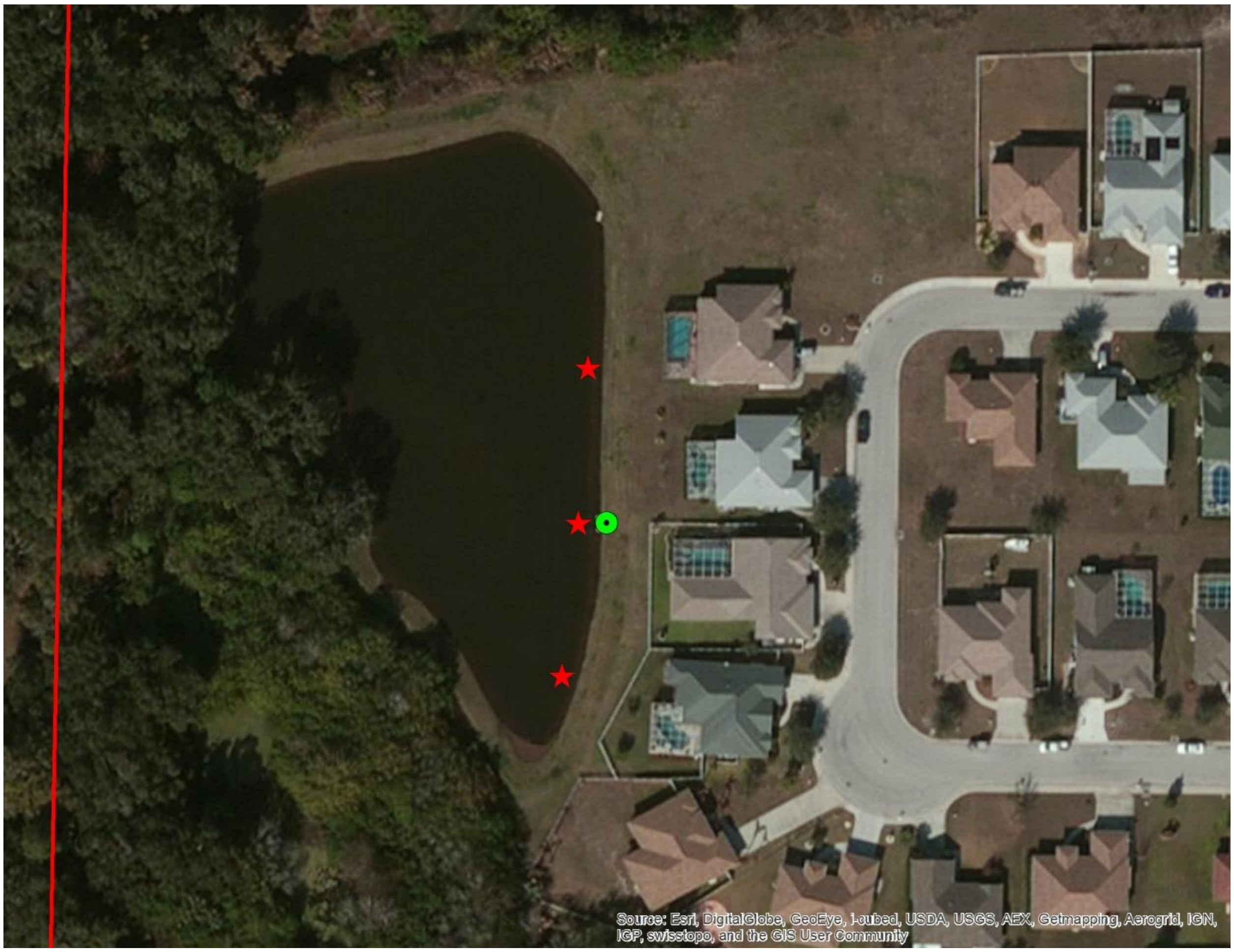


Figure 14. M101 stormwater sampling location using an autosampler (green circle) and retention pond sampling locations (red stars).

Pinellas County Community (P201)

Stormwater retention pond composite samples were collected from three locations within the skimmer leading into the wetland retention area (Figure 15), one near the discharge pipe, one approximately 25’ along the bank to the northeast of the culvert and one approximately 25’ to the southwest of the culvert.

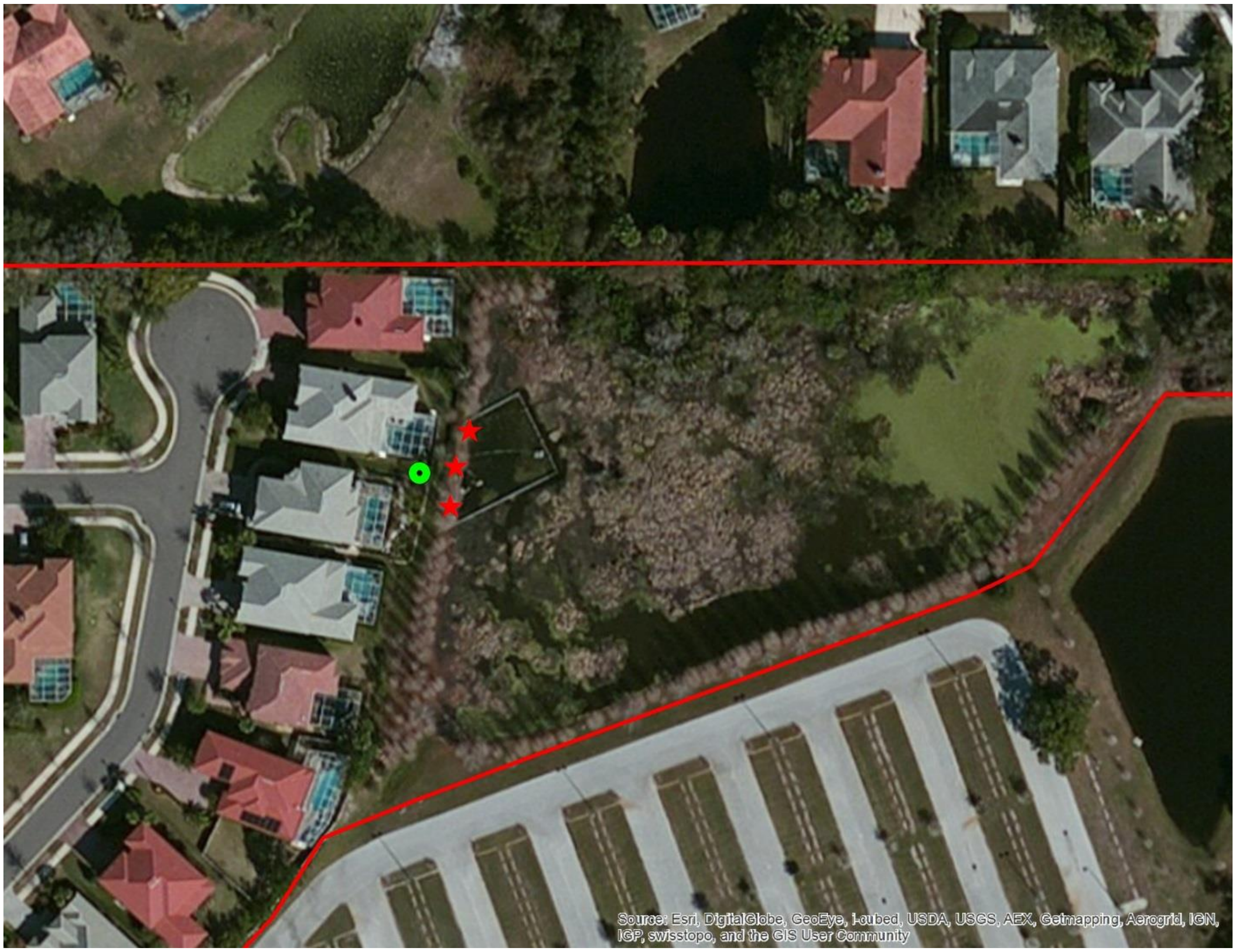


Figure 15. P201 stormwater sampling location using an autosampler (green circle) and skimmer surface water skimmer sampling locations (red stars).

Pinellas County Community (P202)

Stormwater retention pond composite samples were collected from three locations (Figure 16); one near the discharge pipe, one approximately 75' along the bank to the north of the culvert and one approximately 150' to the north of the culvert.

Figure 16. P202 stormwater sampling location using an autosampler (green circle) and stormwater pond surface sampling locations (red stars).

Additional details of the surface water samples collected from the stormwater retention ponds/areas (PW) can be found in Table 4.

Table 4. Community retention pond samples identification (used as laboratory unique identifiers) and collection times.

POND SAMPLING		LABELS			
Sample Number	Collection Date	H101	P202	P201	M101
1	9/28/2012	H101-PW-1	P202-PW-1	P201-PW-1	M101-PW-1
		H101-PWD-1	P202-PWD-1	P201-PWD-1	M101-PWD-1
2	10/24/2012	H101-PW-2	P202-PW-2	P201-PW-2	M101-PW-2
		H101-PWD-2	P202-PWD-2	P201-PWD-2	M101-PWD-2
3	11/14/2012	H101-PW-3	P202-PW-3	P201-PW-3	M101-PW-3
		H101-PWD-3	P202-PWD-3	P201-PWD-3	M101-PWD-3
4	12/12/2012	H101-PW-4	P202-PW-4	P201-PW-4	M101-PW-4
		H101-PWD-4	P202-PWD-4	P201-PWD-4	M101-PWD-4
5	1/16/2013	H101-PW-5	P202-PW-5	P201-PW-5	M101-PW-5
		H101-PWD-5	P202-PWD-5	P201-PWD-5	M101-PWD-5
6	2/13/2013	H101-PW-6	P202-PW-6	P201-PW-6	M101-PW-6
		H101-PWD-6	P202-PWD-6	P201-PWD-6	M101-PWD-6
7	3/13/2013	H101-PW-7	P202-PW-7	P201-PW-7	M101-PW-7
		H101-PWD-7	P202-PWD-7	P201-PWD-7	M101-PWD-7
8	4/17/2013	H101-PW-8	P202-PW-8	P201-PW-8	M101-PW-8
		H101-PWD-8	P202-PWD-8	P201-PWD-8	M101-PWD-8
9	5/15/2013	H101-PW-9	P202-PW-9	P201-PW-9	M101-PW-9
		H101-PWD-9	P202-PWD-9	P201-PWD-9	M101-PWD-9
10	6/12/2013	H101-PW-10	P202-PW-10	P201-PW-10	M101-PW-10
		H101-PWD-10	P202-PWD-10	P201-PWD-10	M101-PWD-10
11	6/26/2013	H101-PW-11	P202-PW-11	P201-PW-11	M101-PW-11
		H101-PWD-11	P202-PWD-11	P201-PWD-11	M101-PWD-11
12	7/10/2013	H101-PW-12	P202-PW-12	P201-PW-12	M101-PW-12
		H101-PWD-12	P202-PWD-12	P201-PWD-12	M101-PWD-12
13	7/24/2013	H101-PW-13	P202-PW-13	P201-PW-13	M101-PW-13
		H101-PWD-13	P202-PWD-13	P201-PWD-13	M101-PWD-13
14	8/14/2013	H101-PW-14	P202-PW-14	P201-PW-14	M101-PW-14
		H101-PWD-14	P202-PWD-14	P201-PWD-14	M101-PWD-14
15	9/18/2013	H101-PW-15	P202-PW-15	P201-PW-15	M101-PW-15
		H101-PWD-15	P202-PWD-15	P201-PWD-15	M101-PWD-15
16	10/16/2013	H101-PW-16	P202-PW-16	P201-PW-16	M101-PW-16
		H101-PWD-16	P202-PWD-16	P201-PWD-16	M101-PWD-16
17	11/13/2013	H101-PW-17	P202-PW-17	P201-PW-17	M101-PW-17
		H101-PWD-17	P202-PWD-17	P201-PWD-17	M101-PWD-17
18	12/18/2013	H101-PW-18	P202-PW-18	P201-PW-18	M101-PW-18
		H101-PWD-18	P202-PWD-18	P201-PWD-18	M101-PWD-18

PW= Orthophosphate (filtered), Total NH_3, TKN, NO_x, TP
PWD= Dissolved TKN (filtered)

Statistical Analyses

Summary statistics were generated for social and environmental datasets to investigate outliers. Univariate and bivariate analyses were conducted to compare and contrast respondents in the three research area counties: Hillsborough, Pinellas and Manatee. Appropriate ANOVA/post-hoc tests were used to distinguish significant differences between counties and communities, as they related to the hypotheses H1-H32. To address differences between the two Pinellas County communities, particularly those related to the hypotheses H4 and H5 (fertilizer frequency and nutrient loads), t-tests were conducted when assumptions were met.

Where possible, differences in central tendencies of the summary statistics were investigated using univariate parametric or non-parametric alternatives. Internal data checks were conducted, such as regressions and correlations between standard parameters to ensure representativeness of each of the water quality analytes (e.g.: TN and TP, TN versus TKN). Seasonal trend graphics for the environmental data collection effort were also generated. However, due to the lack of multiyear datasets, no statistical trend testing or time series analyses were conducted. Variations in means, standard deviations and other distribution characteristics were examined for wet and dry seasons separately to assess hypothesis H_3.

Estimated nitrogen and phosphorus loads were calculated for each community using two methods. The first method used empirical estimates of the recorded flow volume and corresponding measured TN concentrations for each of the stormwater runoff event data in the communities. However, it was determined that recorded volumes were underrepresented at M101 and H101 due to backflow that may have occurred from submerged conditions of the inlets during the wet season in these communities.

The second method estimated volumes based on observed rainfall and mean runoff coefficient and drainage area (ERD 2007). This is the method typically used to develop Total Maximum Daily Loads throughout the State of Florida. , TN loads were mechanistically-estimated and normalized by basin area (kg per hectare) using the standard formula:

$Load_{(TN)} = \dfrac{V \bullet EMC \bullet R}{A}$, where,

Load (TN) = Total nitrogen load (kg) estimated from community after retention pond treatment;

V= Volume (L) estimated based on observed rainfall x mean runoff coefficient (C value) x community drainage basin area (**Error! Reference source not found.**);

EMC = TN even mean concentration (mg/L) of medium density single family residential land use;

R = Estimated retention pond treatment efficiency (30% reduction for TN loads; ERD 2007); and

A = Community drainage basin area (hectares).

Table 5: Community Load Calculation Variables for the Annual Loading Estimate. Event Mean Concentrations and Annual Rainfall were *in situ* measured data.

Community	Soil Hydrogroup	Event Mean Concentration (mg/L)	Runoff Coefficient	Basin Area (m^2)	Annual Rainfall (m)
H101	C (some A and D)	measured data	0.31	163,169.40	1.43
M101	D (B/D)	measured data	0.35	137,471.83	1.41
P201	D (B/D and D)	measured data	0.35	74,017.07	1.11
P202	A (minor D)	measured data	0.23	53,499.49	1.47

This second method was used to both estimate annual loads (using the estimated annual runoff coefficients and measured annual data presented in Table 5) and event based loads. For the latter, monthly runoff coefficients were adapted from the SWIL (Spatial Watershed Iterative Loading) model development effort (Applied Ecology, Inc. 2012). Using the same mechanistically-estimated methodology, actual event measured rainfall and concentration data were used to obtain estimated per event TN and TP loads. The estimated per event loads were used for statistical comparisons among counties (addressing hypothesis H3) and between the two Pinellas communities (addressing hypothesis H5).

Finally, in order to provide recommendations for future sampling needs to detect significant reduction in mean water quality parameters within each community, power analyses were performed on observed datasets over the sampling period. A statistical Power = 0.9 in detecting a minimum 20% reduction in the mean value of TN concentrations measured from stormwater runoff and retention pond samples was used to calculate the number of needed samples in each community. The minimum sampling size was determined for each community and sample type (stormwater runoff and retention pond) based on one-sample T-tests.

Results

Social Survey Results

Countywide Telephone Survey Results

Countywide telephone survey data were compared with US Census Bureau (2010) data to better understand the representativeness of the telephone survey population relative to the overall county populations (Table 6). Marginal frequencies by County are presented in Appendix F.

Table 6: Comparison of telephone survey respondent to countywide demographics.

	Hillsborough		**Manatee**		**Pinellas**	
County Demographics	**Survey Respondents**	**Census**	**Survey Respondents**	**Census**	**Survey Respondents**	**Census**
Female	59%	51%	62%	51%	61%	52%
Caucasian	80%	75%	90%	84%	91%	84%
B.S. degree or higher	42%	29%	50%	26%	44%	27%
Employed	46%	62%	37%	54%	38%	56%
Median age	59.0	35.3	60.0	44.3	60.5	44.7
Mean Household Income	$76,878	$68,169	$74,999	$65,746	$69,010	$63,210
Number	286	1,167,116	292	313,011	257	915,003

The telephone survey population differed from the county population in terms of gender (more female), age (older), and race (more Caucasian). Survey respondents were also more educated, more likely to be retired, and had a higher income than the county population in general. For final interpretation, data were weighted to be representative of county populations in terms of gender, age, and race.

Countywide Irrigation Practices

About 72% of all respondents indicated that they irrigated their lawn with water other than rain water with all three counties reporting they water less than twice a week (mean = 1.8). Although most people used an in-ground irrigation system for this purpose, the sources of irrigation water varied between counties. In Hillsborough and Manatee Counties, most people (60% and 40%, respectively) relied on city potable water supplies for irrigation while in Pinellas County, most people irrigated their lawns with reclaimed water (34%) or from a private well (31%) with city water the third most popular response (27%). About 20% of Manatee County residents and 12% of Hillsborough County residents used reclaimed water for irrigation and 18% of Hillsborough County residents and 23% of Manatee County residents relied on a private well for irrigation.

Countywide Pesticide & Herbicide Application Practices

County residents significantly differed in their pesticide application practices, with Pinellas County residents (51%) being significantly less likely ([TEST, N=X,] $p < .05$) to apply insect control products to their lawn than residents in either Hillsborough (62%) or Manatee (62%) counties. The majority of homeowners in Pinellas (69%), Manatee (67%) and Hillsborough (65%) counties hired professionals to apply insect control products to their yard. Residents of Manatee County applied insect control products most frequently (4.9x per year), closely followed by Hillsborough (4.6x per year) and lastly Pinellas County residents (4.1x per year).

Herbicide application among county residents varied little, and in all three counties, residents applied herbicide about 1.5x per year on average. About 36% of Manatee County residents applied weed control products compared to 34% of Hillsborough county residents and 29% of Pinellas County residents. Weed control products were also more likely to be applied by a professional than by the homeowner in all three counties: Manatee County (67%), Hillsborough County (64%) and Pinellas County (60%).

Countywide Lawn Fertilizer Practices

Overall in the three counties, most homeowners (60%) fertilized their lawns in some capacity, and those who did typically relied on a professional (i.e. 63% of those who fertilized or about 38% of all respondents). We refer to these two groups as two different types of landscape managers: homeowner do-it-yourselfers (~22% of all respondents) and those that hire professional landscape managers (~38% of all respondents). More Manatee County residents (64%) fertilized their lawns in some capacity than residents of Hillsborough (61%) or Pinellas (55%) counties, although these differences were not statistically significant. Additionally, more Manatee County residents relied on a professional company to apply fertilizer to their lawn (43%) than residents in Hillsborough (38%) or Pinellas (32%), although these differences were not statistically significant either. A breakdown of who applied fertilizer is summarized in Table 7.

Table 7: Countywide telephone survey responses to the question, “Who applied fertilizer?”

County	N (793)	Homeowner	Professional	None
Hillsborough	273	23%	38%	39%
Pinellas	240	23%	32%	45%
Manatee	280	21%	43%	36%

Whether a yard is fertilized on a regular basis or only as needed is typically related to whether the yard is fertilized by a professional or the homeowner. This is evident in Table 8 which shows that the counties with the more professionally maintained lawns also had more lawns fertilized on a regular schedule. UCF (2009) found that homeowners who applied fertilizer as needed usually applied fertilizer less frequently than others, in some cases, applying fertilizer only once every two or three years.

Table 8: Countywide telephone survey responses to the question, “Is fertilizer applied to your lawn on a regular schedule or only as needed?”

County	N (456)	Regular Schedule	Only as needed
Hillsborough	161	66%	34%
Pinellas	125	61%	39%
Manatee	170	71%	29%

Residents in the three counties applied fertilizer to their lawns an average of 2.14x per year. Hillsborough County residents had the highest fertilizer frequency compared to the other two counties (Table 9). Post-hoc tests confirmed that Hillsborough County resident lawn fertilizer frequency was significantly greater than Pinellas County residents’ (Bonferroni with $p=0.021$), allowing the hypothesis H2 (no significant difference in fertilizing practices among counties) to be rejected.

Table 9: Countywide telephone survey responses to the question, “Number of times fertilizer was applied to lawn in the last 12 months?”

County	N (728)	Fertilizer Frequency	SD
Hillsborough*	253	2.46	3.47
Pinellas*	223	1.73	2.5
Manatee	252	2.17	2.72
Total	728	2.14	2.95

*Significant difference at $p<0.05$ using Bonferroni Post-Hoc test

Residents reported the months that their lawns were typically fertilized. March was by far the most popular month cited for fertilizer application in all three counties (Table 10). April and October were the next most popular months for application of fertilizer. These results are consistent with other findings (SWFWMD 2009, UCF 2007, and UCF 2009). There was no significant difference in the number of yards fertilized in the summer in Hillsborough, Pinellas, and Manatee counties although Hillsborough residents more frequently cited June, July, August and September than residents in the other two counties. The telephone survey did not ask respondents what kinds of fertilizers were being applied at different times of the year, however we found that a large majority (67%) of the lawns fertilized in the summer months were fertilized by professionals (Community-level Homeowner Survey), . It is unlikely that survey respondents would be knowledgeable about what professionals were applying (UCF 2007, 2009) in the summer, so this question should not be used as an indicator of professional compliance with summer N fertilizer restrictions present in some of the County jurisdictions.

Table 10. Countywide telephone survey results for reported months of fertilizer application (%). Note that the type of fertilizer was not investigated.

County	N	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Hillsborough	167	20	22	33	27	20	19	16	16	22	26	19	17
Pinellas	133	11	13	29	20	17	15	13	11	21	22	11	13
Manatee	179	14	14	26	21	15	15	15	11	17	19	20	13

Countywide Lawn Fertilizer Best Management/Ordinance/Rule Knowledge

A series of questions was asked to investigate the homeowner knowledge of fertilizer best management practices and awareness of fertilizer ordinances. The first question asked respondents to respond affirmatively when asked about times or situations when it is *inappropriate* to apply fertilizer. As typical of surveys of this type, several unusual responses were offered to identify if respondents became acquiescent and just agreed to everything. Our results indicate minimal to no acquiescence error for this question.

In general, Pinellas County residents were more aware of local landscape management ordinances and best management practices that attempt to reduce lawn fertilizer contributions to stormwater runoff. Residents in Pinellas County had significantly fewer “Not sure” responses than those in Hillsborough or Manatee Counties when asked when it is inappropriate to fertilize their lawns, and more often identified times or situations when it was inappropriate to fertilize lawns.

Table 11: Countywide telephone survey responses (%) to situations when a yard should not be fertilized ("Are there times or situations when you should not fertilize your lawn?")

Situation description	Hillsborough	Pinellas	Manatee
During a drought	16	15	18
Right before a hard rain*	14	**30**	15
Summer*	13	**26**	16
After a hard rain	11	11	8
Winter	7	10	7
Fall	1	1	1
Morning	0	1	0
Evening	0	1	0
Spring	0	0	0
Not sure*	**52**	35	**50**

*Indicates significant differences <0.05 using Tukey Post Hoc HSD

Pinellas County residents were also significantly more likely than Hillsborough or Manatee County residents ($p < .001$, Tukey HSD) to respond that they had heard about government regulations concerning residential fertilizer use. Again, those who had heard about the ordinance (n=230) were probed further for details about what they had heard. Residents' knowledge of ordinance details varied (Table 12). Pinellas County residents were significantly more likely than Manatee County residents ($p = .05$, Tukey HSD) to know that local ordinances restricted the sale of lawn fertilizer during certain months. The results on best management practices and ordinance awareness allowed us to reject hypothesis H1, which stated that there was no significant differences in ordinance awareness among resident living in the three counties.

Table 12: Countywide telephone survey fertilizer ordinance awareness results (n=750)

Fertilizer Ordinance Awareness Question (Yes maybe and yes definitely reported)	**Hillsborough (n=286)**	**Pinellas (n=257)**	**Manatee (n=292)**
Have you heard about local fertilizer regulations?*	26% (79)	44% (95)	24% (57)
If yes, then do the ordinances…	N=73	N=112	N=70
Restrict the use of lawn fertilizer during the rainy season?	75%	75%	66%
Restrict the sale of lawn fertilizer during certain months?*	62%	79%	51%
Reduce the amount of phosphorous ("P") allowed in lawn fertilizer?	65%	77%	69%
Reduce the amount of nitrogen ("N") allowed in lawn fertilizer?	58%	62%	66%
Require training for professional landscaping companies?	57%	52%	45%

*Indicates significant differences <0.05 using Tukey Post Hoc HSD

Residents who had heard of a fertilizer ordinance (N = 231) indicated that they had heard about it in the past year (74%) or in the past couple of years (21%).

Interviewers asked respondents where they had heard about the ordinances and recorded open-ended responses. The open-ended responses were categorized and summed. Table 133 reports the most frequently offered responses of the 255 respondents in the three counties (73+112+70) who had heard of the ordinances. .

Table 13: Countywide telephone survey responses to the question, "Do you recall where you heard about the ordinance?" (255 respondents offered 276 different responses to the question).

Source	**N**	**Frequency**
T.V./Newspaper	166	60.14%
Landscape Company	22	7.97%
Radio	17	6.16%
Website	15	5.43%
Hardware store/Home improvement	13	4.71%
Neighbor/Family	11	3.99%
Government office	7	2.54%
UF/IFAS Extension	6	2.17%
Community newsletter	3	1.09%
Utility insert	3	1.09%
Event/Club	2	0.72%
Place of employment	2	0.72%
Billboard	1	0.36%
Church	1	0.36%
Community group	1	0.36%
Fertilizer bag	1	0.36%
Fire station	1	0.36%
Flyer	1	0.36%
HOA	1	0.36%
Library	1	0.36%
Magazine	1	0.36%
Total Responses	276	100.00%

Community-Level Homeowner Interview Results

In Pinellas County, there were 20 completed homeowner interviews in community P202 and 14 completions in community P201; 25 interviews were completed in the Hillsborough community H101, and 22 interviews were completed in Manatee County community M101. Summarized results of the door to door interviews conducted in each of the four communities follows. The complete results for all community homeowner interview questions are included separately as Appendix G.

Demographics of homeowners interviewed varied greatly between communities, with younger residents observed in H101 and P201 compared to M101 or P202 (Table 14). The interviewed homeowners were older than the county population (US Census Bureau 2010), but younger than the countywide telephone survey respondents. They were slightly more racially diverse than the county-level telephone survey respondents with the exception of Pinellas Community P202. Homeowner interviews were completed primarily by men, in contrast to the countywide telephone survey respondents which were much more likely to be completed by women.

Table 14. Demographics of the interviewed homeowners by community.

Community	N (81)	Age	Female	Caucasian
H101	25	49	24%	68%
M101	22	55	32%	73%
P201	14	48	64%	71%
P202	20	58	25%	90%

Consistent with the findings of the countywide telephone survey, Hillsborough community (H101) residents applied fertilizer significantly more frequently than the residents in the other two county communities (H101 mean = 5.96x per yr, M101 mean = 2.17x per yr, and combined P201/ P202 mean = 3.73x per yr; Tukey HSD $p < 0.05$). This confirms the county level dataset presented in the previous section that allowed the rejection of H2 hypothesis. Hillsborough community residents were also more likely to hire professional applicators. A comparison of the community average fertilizer frequency garnered from homeowner interviews and the countywide telephone survey fertilizer frequency results is provided in Table 15. All interviewed H101 residents applied fertilizer to the lawn in the past 12 months (100%), while only half (50%) of the M101 residents; and about three-quarters (71%) of P201 and three-quarters of P202 residents (75%) applied fertilizer in the past year.

The high use of fertilizer in the Hillsborough community (H101) was also evident by the number of people interviewed who had just recently applied fertilizer in the two weeks prior to being interviewed. Nearly half of the Hillsborough community (H101) residents (10 out of 25) had applied fertilizer in the two weeks prior to the interview (May and June 2013), while only 3 of 12 Manatee community (M101) residents, and 7 of 27 Pinellas community residents (P201 and P202 combined) had applied fertilizer within two weeks prior of being interviewed.

When comparing the fertilizer frequency between the two Pinellas County communities (p201=3.82 and P202=3.67), no statistical significant different was present ($p=0.88$), which does not allow us to reject the H4 hypotheses with the available limited dataset.

Table 15: Comparison of social data results between countywide telephone surveys and community homeowner interviews regarding reported frequency of fertilizer application in the past 12 months.

Countywide Telephone Survey			Community Homeowner Interviews		
County	**N**	**Mean**	**Site**	**N**	**Mean**
Hillsborough*	253	2.46	H101[a]	23	5.96
Manatee	252	2.17	M101[b]	12	2.17
Pinellas*	223	1.73	P201/ P202[b]	26	3.73
Total	728	2.14	Total	61	4.26

* ANOVA with Tukey post-hoc significant difference at $p < .05$. In the community post-hoc tests, M101, P201 and P202 are significantly different than H101, but M01 and the combined P201/202 communities present no significant differences.

Community-Level Professional Landscape Manager Interview Results

All professionals reported a high rate of visits to a homeowner's yard (a minimum of 6 and as many as 52 times a year), a variety of formulas (most were not specific on their custom blends), and one professional reported applying nitrogen at Pinellas community (P201) during the summer, ordinance restricted months. For more detailed responses to the questionnaire provided to professional landscape managers operating within the communities, please refer to Appendix H. Because sample sizes were low (Table 16) and information garnered from the interviews was not sufficient to make comparisons among communities or counties, no other analyses were performed.

Table 16: Total number of professional interviews by community.

Community	Frequency	Percent
H101	2	33.3
M101	1	16.7
P201	2	33.3
P202	1	16.7
Total	6	100

Community-Level Environmental Sampling Results

Lawn Soil Characteristics

The standard analytical results of the 40 samples (10 per community) are included in Appendix I, and the corresponding isotopic results in Appendix J. Table 17 presents simple statistics of the analytes. Higher concentrations of nitrate/nitrite (NO_x), ammonium (NH_4), organic matter content, Total Kjeldahl nitrogen (TKN), electrical conductivity (EC) and pH values are present consistently in the soils of Pinellas community (P201) yards. This community was considered the highest socioeconomic community in the study, but received low estimated N fertilizer input from landscape management sources (see Estimates of Community Nitrogen Loading from Social Monitoring Data). The four communities were statistically significant different for mean organic matter, TKN, EC, and pH values (One-Way ANOVA, $p < 0.001$, N=40). Lowest values for all these analytes were typically found in either P202's soils (Organic matter, EC, and pH) or M101's soils (TKN and NO_x). Mean phosphorus concentrations in the lawn top soils were highest in the Manatee community (M101), but this value was not statistical significant ($P > 0.05$) from the other communities.

Due to the low sample size and high variability of the NO_x values collected, normality and homogeneity assumptions could not be met. Instead, a nonparametric alternative was used (Kuskal-Wallis Median Test). Statistically significant higher medians ($p = 0.044$) were present for NO_x in P201 (median of 10.44), closely followed by H101 median value (8.58), while the other two communities presented lower NO_x values (5.67 and 5.06 for P202 and M101, respectively). No statistical differences were detected in the level of ammonium across the four communities.

Table 17: Lawn soil mean (± 1 S.D.) sample results in each community (n = 40).

Analyte	**H101**	**P201**	**P202**	**M101**
NO_x (mg/kg)	9.13 (2.56)	11.94 (5.78)	6.20 (2.93)	5.91 (2.44)
NO_x Medians?? **	##	##	##	##
NH_4 (mg/kg)	2.45 (1.41)	2.76 (0.95)	2.15 (0.68)	2.50 (1.41)
*Org. Matter (%)	4.54 (1.12)	6.46 (2.22)	4.31 (0.93)	2.62 (0.56)
*TKN (mg/kg)	1296.24 (356.04)	1657.28 (499.91)	1395.66 (251.81)	793.60 (181.71)
TP (mg/kg)	49.63 (14.26)	55.95 (22.15)	54.53 (30.32)	325.90 (514.87)
*EC (ds/m)	0.09 (0.01)	0.15 (0.03)	0.07 (0.03)	0.09 (0.03)
*pH	6.50 (0.48)	7.44 (0.32)	6.30 (0.57)	6.67 (0.65)
House Age Mean (yrs)	12	11	30	11

* Significantly different means (p<0.05) using a One-Way ANOVA
** Significantly different medians (P<0.05) using a Kriskal-Wallis Test

Table 18 presents the p-values when Post-Hoc pairwise comparisons are performed for several of the key soil parameters (Organic matter, TKN, Electric conductivity, and pH). A matrix of the 4 locations (P202, P201, M101, and H101, corresponding to cells 1, 2, 3, and 4) displays the probability value that a pairwise comparison is statistically significant ($p<0.05$).

Tukey HSD post-hoc tests indicated that there were differences in mean organic matter between all communities, with the exception of H101 and P202, where no differences were noted (Table 21). Electric conductivity means were statistically different between the two Pinellas communities and between P201 and both M101 and H101. Additionally, TKN differences were encountered between M101 and both Pinellas communities (P201 and P202), and between M101 and H101. This indicates that the Manatee community had significantly lower TKN means in the top soil in comparison to all other three communities. Soil pH mean values were different for P201 relative to all other communities.

Table 18. Post-hoc test p-values for significant differences in organic matter, TKN, Electrical Conductivity (EC), and pH in soils between individual communities.

Tukey test; Variable: OrgMatter (%)
Probabilities for Post Hoc Tests
Error: Between MS = 1.8443, df = 36.000

Cell No.	Location	{1} (4.3110)	{2} (6.4600)	{3} (2.6160)	{4} (4.5350)
1	P202		0.006	0.040	0.983
2	P201	0.006		0.000	0.016
3	M101	0.040	0.000		0.016
4	H101	0.983	0.016	0.016	

Tukey test; variable TKN (mg/kg)
Probabilities for Post Hoc Tests
Error: Between MS = 1183E2, df = 36.000

Cell No.	Location	{1} (1395.7)	{2} (1657.3)	{3} (793.60)	{4} (1296.2)
1	P202		0.338	0.002	0.916
2	P201	0.338		0.000	0.106
3	M101	0.002	0.000		0.012
4	H101	0.916	0.106	0.012	

Tukey test; variable Ec (ds/m)
Probabilities for Post Hoc Tests
Error: Between MS = .00066, df = 36.000

Cell No.	Location	{1} (.06740)	{2} (.15390)	{3} (.09100)	{4} (.08960)
1	P202		0.000	0.188	0.233
2	P201	0.000		0.000	0.000
3	M101	0.188	0.000		0.999
4	H101	0.233	0.000	0.999	

Tukey test; variable pH
Probabilities for Post Hoc Tests
Error: Between MS = .27079, df = 36.000

Cell No.	Location	{1} (6.3040)	{2} (7.4440)	{3} (6.6700)	{4} (6.5030)
1	P202		0.000	0.407	0.828
2	P201	0.000		0.011	0.002
3	M101	0.407	0.011		0.890
4	H101	0.828	0.002	0.890	

Lawn Irrigation Water Characteristics

The complete results of the 12 samples (4 per community) are included in Appendix B. Summary statistics follow in able 19. Due to limited sample sizes and the similar sources of irrigation water within each community, only simple comparisons were made. Hillsborough community (H101, served by community well) and Manatee community (M101) had similar TN mean values (1.2-1.3 mg/l) with both approximately three times higher than each Pinellas community value. TKN and ammonia values were found to be highest in Manatee's community (M101) and lowest in Pinellas communities. NO_x was three times higher at H101 than the other communities. TP values were highest in the newer Pinellas community (P201) and lowest in H101.

Table 19. Lawn irrigation water mean (± 1 S.D.) sample results in each community (n = 40).

Analyte (mg/l)	H101 (Community Well)	P201 (City Supplied)	P202 (City Supplied)	M101 (City Supplied)
TN	1.217 (0.32)	0.367 (0.05)	0.363 (0.05)	1.300 (0)
TKN	0.370 (0.40)	0.107 (0.04)	0.094 (0.01)	1.063 (0.06)
NO_x	0.875 (0.74)	0.283 (<0.01)	0.303 (<0.01)	0.290 (0.02)
NH_3	0.069 (0.01)	0.051 (<0.01)	0.052 (<0.01)	0.91 (0.03)
TP	0.108 (0.17)	0.557 (0.37)	0.31 (0)	0.363 (0.01)

Community Water Quality Concentration Data

Complete water quality results for the community retention pond surface water samples are included in Appendices L (field data), M (standard analytical data), and N (isotopic data). Stormwater runoff sample results are included in Appendix O (field data), P (standard analytical data), and Q (isotopic data).

Seasonal Patterns

Nutrient dynamics fluctuate seasonally and understanding these trends is important when evaluating differences in water quality. Water quality parameters for both stormwater runoff and samples varied by season, with higher dissolved oxygen (DO) ($p<0.001$) concentrations lower specific conductance in stormwater runoff samples versus retention pond samples ($p<0.001$) (

Table 20). Even though the oxidation reduction potential (ORP) was highest for the retention pond samples, the overall annual mean was not statistically different from stormwater runoff samples. ORP was higher in the retention pond samples during the dry season (defined in this report from October to May). Specific conductance values tended to be higher during the wet season, however not statistically significant ($p=0.54$). No seasonal differences were observed for either DO or pH.

Table 20: Mean (± 1 S.D.) of field-collected water quality parameters collected from stormwater runoff and retention ponds from all communities combined by season.

Field Parameter	Stormwater Runoff Samples		Retention Pond Samples		Total Annual Means	
	Dry (N = 16)	Wet (N = 24)	Dry (N = 44)	Wet (N = 28)	Stormwater Runoff (N = 40)	Retention Pond (N = 72)
DO (mg/L)	11.14 (2.51)	11.27 (2.71)	4.71 (2.45)	4.18 (1.68)	11.22 (2.60)	4.50 (2.18)
pH	7.19 (0.96)	7.50 (0.97)	7.61 (0.54)	7.50 (0.75)	7.38 (0.97)	7.57 (0.63)
Sp. Conductance (µmhos/cm)	133.22 (76.60)	142.74 (62.92)	331.21 (198.18)	405.91 (327.94)	138.84 (68.05)	360.26 (256.96)
Temperature (°C)	8.43 (4.78)	10.55 (7.90)	22.62 (3.21)	28.75 (2.02)	9.70 (6.83)	25.01 (4.11)

ORP	82.06 (51.21)	69.32 (122.90)	133.91 (112.68)	58.12 (83.64)	74.68 (98.37)	107.16 (109.00)

Combined, annual stormwater runoff total nitrogen (TN) concentrations were significantly higher than retention pond concentrations (p=0.007) and showed seasonal variation (Table 21). Retention pond nitrogen concentrations were generally lower in the dry season and higher in the wet season. While stormwater runoff nitrogen concentrations were significantly higher in the dry season (TN, p = 0.0018; TKN, p = 0.0018; NO_x, p = 0.018; and NH_3, p = 0.000003; One-Way ANOVA). Retention pond nitrogen concentrations did not differ significantly by season except for TKN which was significantly higher in the wet season than the dry season (p=0.020, One-way ANOVA). Wet season total inorganic nitrogen and total phosphorus concentrations in retention pond samples were less than those observed in stormwater runoff samples.

Seasonal trends were distinct for all nutrient parameters with the exception of Ortho Phosphorus. Stormwater runoff samples had higher mean dry season concentration values for TN, TKN, dissolved TKN, total inorganic N, and TP, while retention pond samples had higher concentrations of these constituents during the wet season. A two-factor ANOVA confirmed this sample-type by seasonal interaction difference for TN, TKN, total inorganic N (Figure 17), ortho P, and TP (Figure 18).

Table 21: Mean (± 1 S.D.) nutrient concentrations collected from stormwater runoff and retention ponds from all communities combined by season. Total Inorganic N was calculated by summing NOx and NH3 values (n = 224).

Analytical Parameter	**Stormwater Runoff Samples**		**Retention Pond Samples**		**Total Annual Means**	
	Dry	**Wet**	**Dry**	**Wet**	**Storm Samples**	**Pond Samples**
Total N (mg/L)	2.13 (0.94)	1.25 (0.56)	1.10 (0.29)	1.29 (0.56)	1.60 (0.85)	1.17 (0.42)
Total TKN (mg/L)	1.81 (0.91)	1.04 (0.54)	0.97 (0.24)	1.19 (0.52)	1.35 (0.80)	1.06 (0.39)
Dissolved TKN (mg/L)	0.80 (0.23)	0.51 (0.24)	0.69 (0.25)	0.74 (0.31)	0.63 (0.27)	0.71 (0.28)
NO_x (mg/L)	0.32 (0.13)	0.21 (0.13)	0.12 (0.12)	0.11 (0.15)	0.26 (0.14)	0.12 (0.13)
NH_3 (mg/L)	0.24 (0.06)	0.13 (0.06)	0.13 (0.11)	0.17 (0.18)	0.17 (0.08)	0.15 (0.14)
Total Inorganic N (mg/L)	0.56 (0.16)	0.34 (0.16)	0.25 (0.20)	0.28 (0.27)	0.43 (0.19)	0.26 (0.23)
Ortho P (mg/L)	0.22 (0.15)	0.16 (0.10)	0.08 (0.07)	0.08 (0.09)	0.18 (0.13)	0.08 (0.07)
Total P (mg/L)	0.46 (0.35)	0.28 (0.22)	0.14 (0.08)	0.20 (0.25)	0.35 (0.29)	0.16 (0.17)

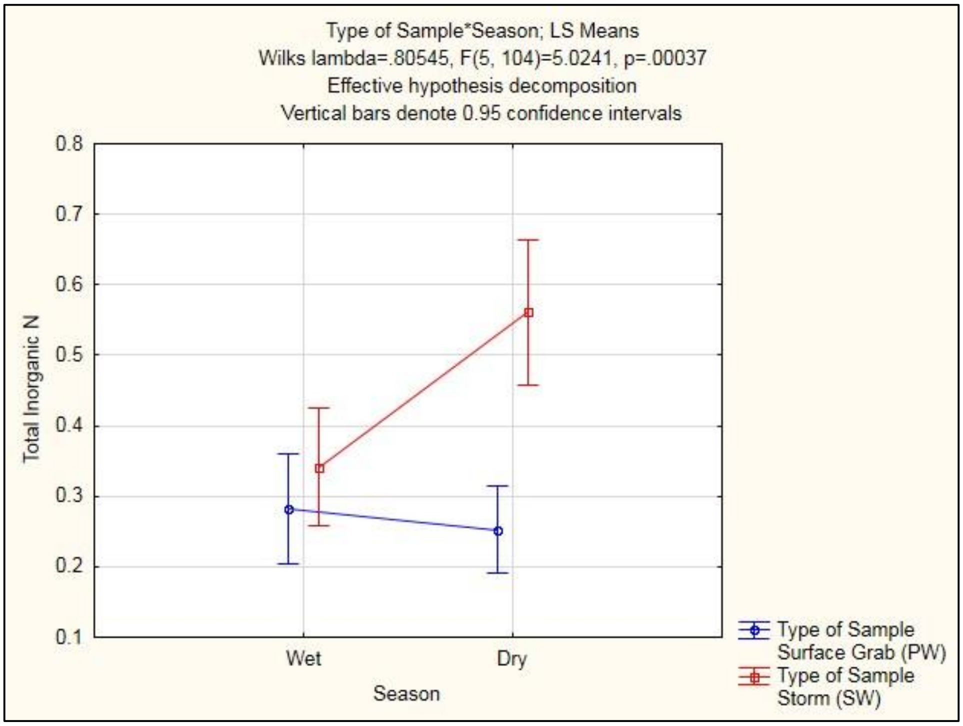


Figure 17: Interaction effect plot from a 2-Way ANOVA for the Total Inorganic N concentrations. Effects included sample seasonality (wet/dry) and type (retention pond/stormwater runoff).

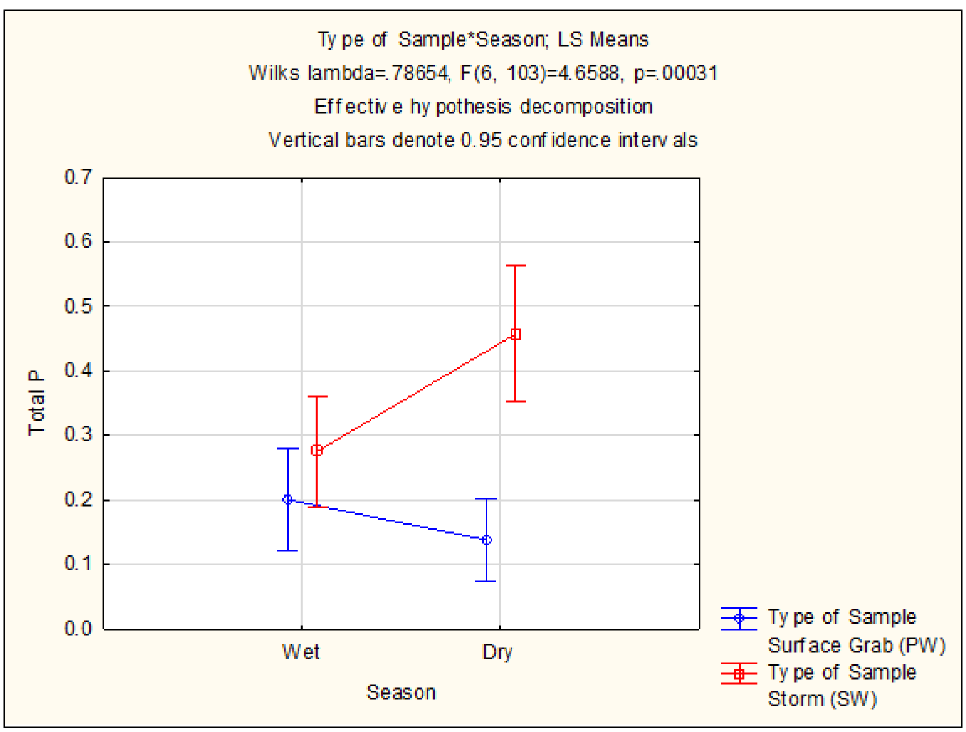


Figure 18: Interaction effect plot from a 2-Way ANOVA for the Total Phosphorus concentrations. Effects included sample seasonality (wet/dry) and type (retention pond/stormwater runoff).

H101

The rainfall pattern at the Hillsborough community (H101) stormwater runoff collection site shows a steady increase in total monthly rainfall starting in April, with peak rain totals in the months of September 2012, July 2013 and August 2013 (Figure 19).

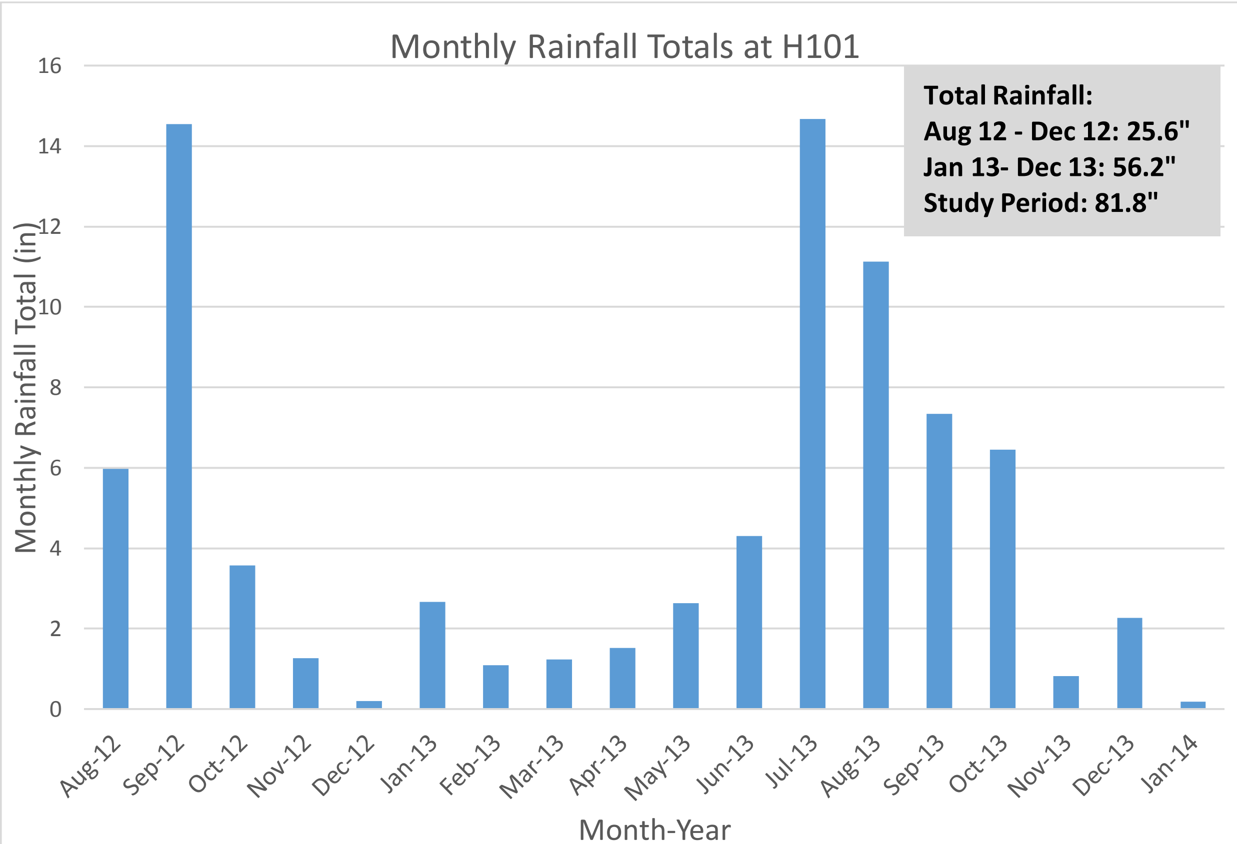


Figure 19: Total monthly rainfall at the Hillsborough community (H101) stormwater runoff collection site for the entire data collection period.

Highest TN and TKN concentrations mirrored rainfall patterns for both stormwater runoff and retention pond samples when sampling times were coincident. A gradual increasing trend in retention pond samples was observed through the Fall 2013 (Figure 20and Figure 21). Stormwater runoff samples showed peak TN and TKN concentrations during a couple of dry season rain events (April and November 2013). Both of these were not particularly high rainfall events (between 0.5-1") but were preceded by weeks of very little rainfall.

Total inorganic nitrogen concentrations were highest in the same dry season samples that had the highest TN and TKN concentrations; additionally, storm events with higher rainfall (>2', e.g.: late May event) also exhibited very high inorganic nitrogen concentrations (Figure 22). Nitrogen concentrations, either organic or inorganic, were typically lowest during the highest rainfall months at H101 (July-September 2013). Total Phosphorus concentrations were highest for May and September 2013, and dropped significantly between July and October 2013 (Figure 23).

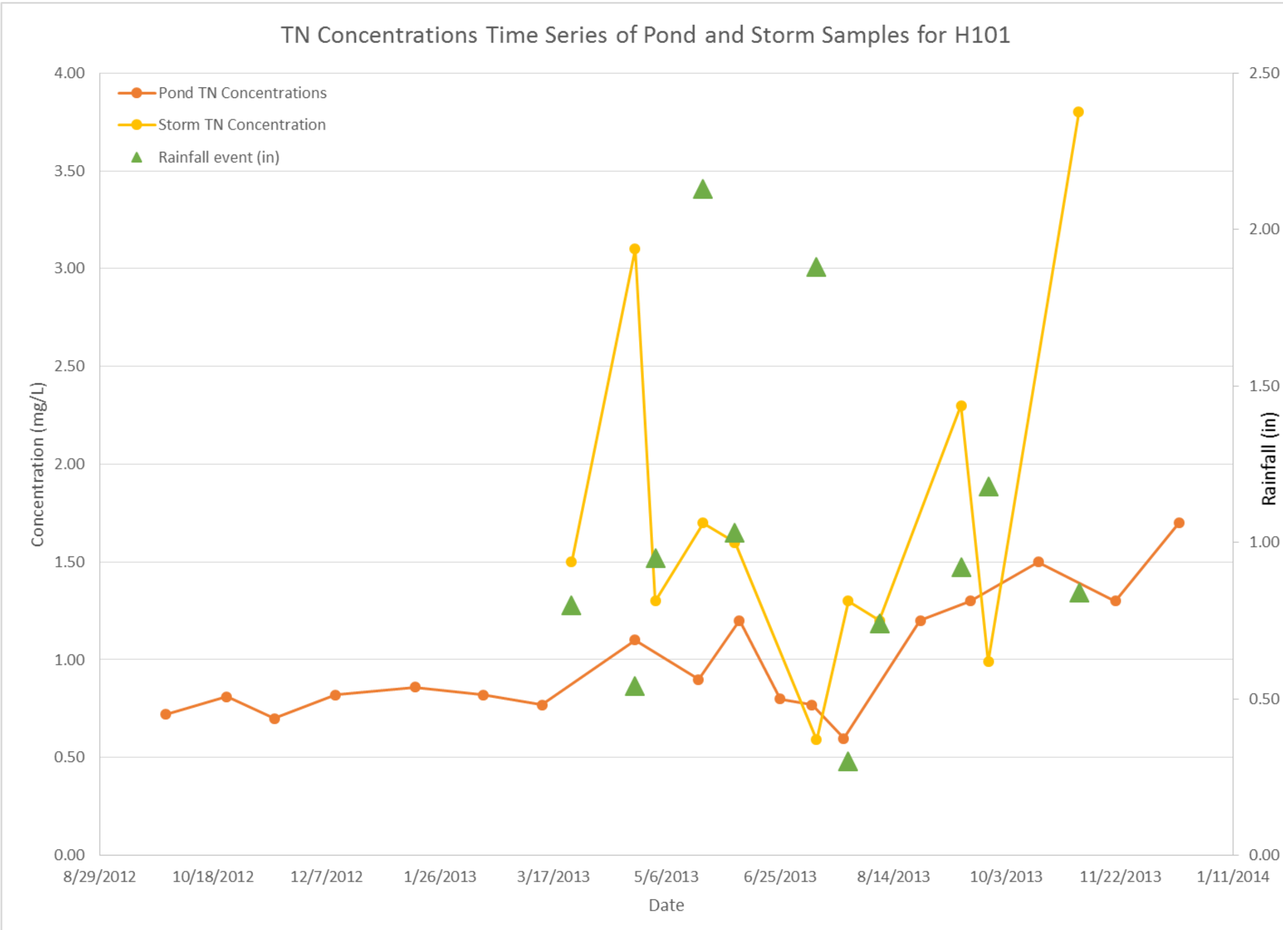


Figure 20: Time series of retention pond and stormwater runoff total nitrogen (TN) concentrations for the Hillsborough community (H101). Rainfall events for all captured stormwater runoff samples are represented as green triangles.

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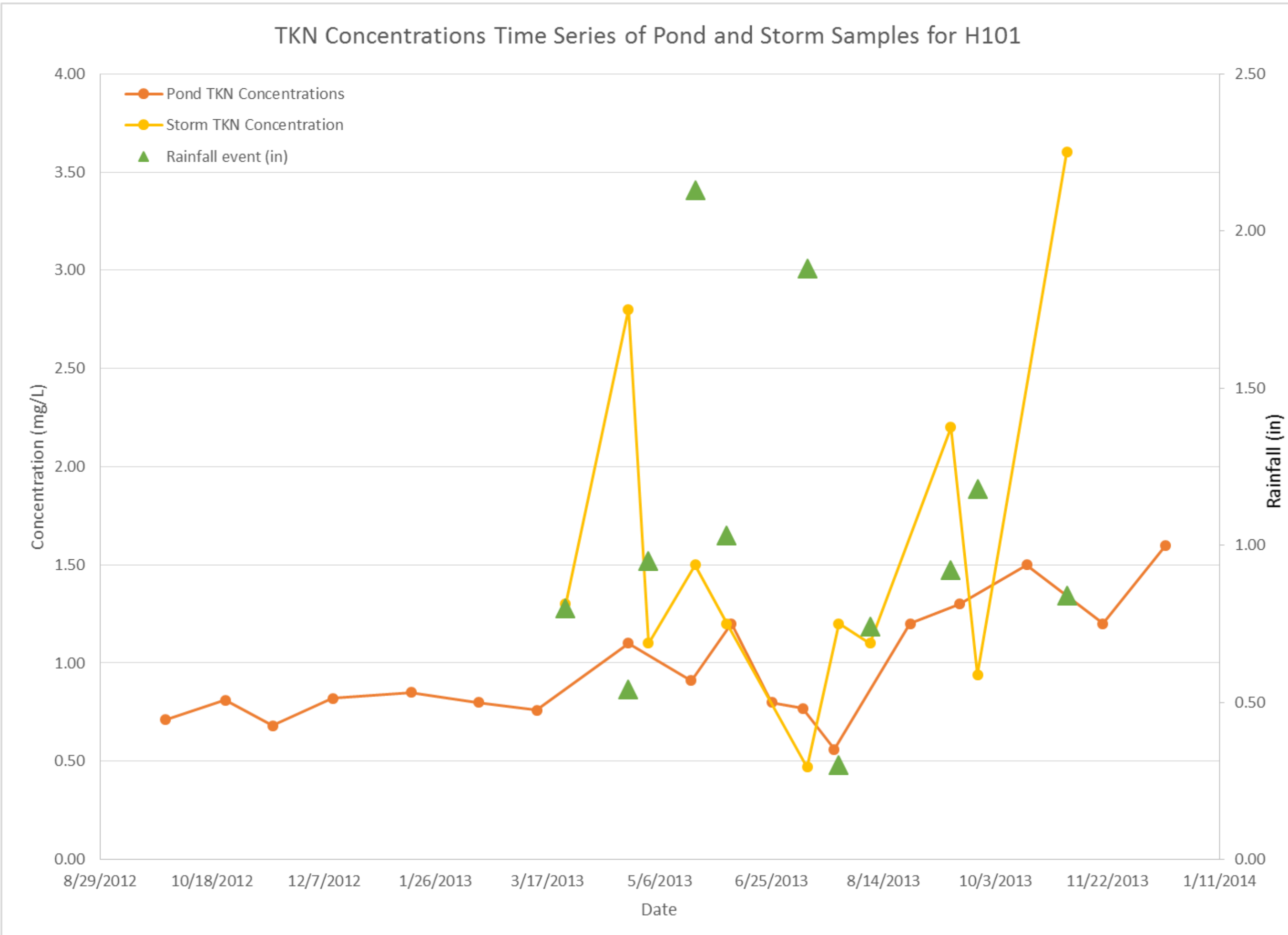

Figure 21: Time series of retention pond and stormwater runoff total Kjeldahl nitrogen (TKN) concentrations for the Hillsborough community (H101). Rainfall events for all captured stormwater runoff samples are represented as green triangles.

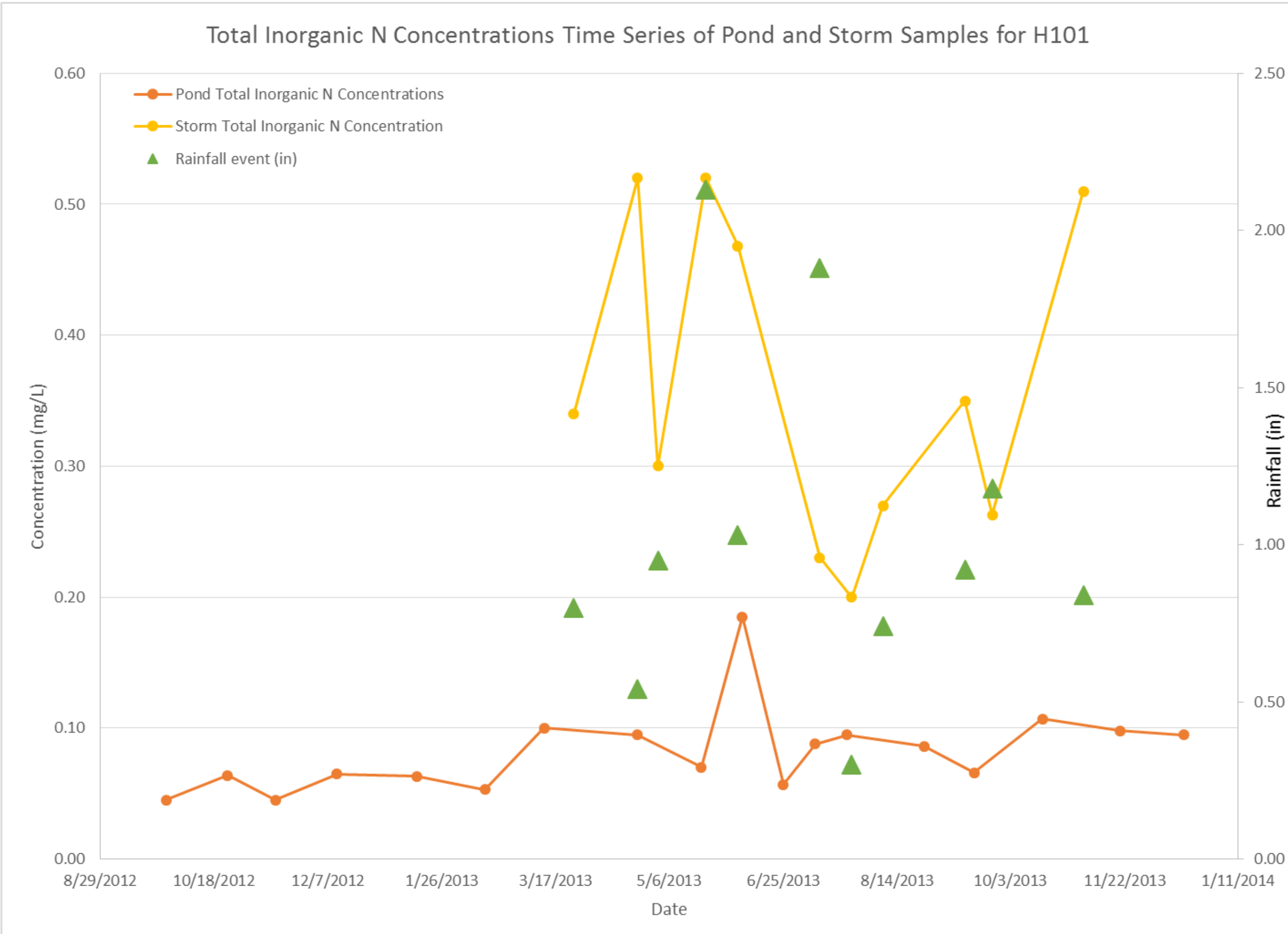

Figure 22: Time series of retention pond and stormwater runoff total inorganic nitrogen concentrations for the Hillsborough community (H101). Rainfall events for all captured stormwater runoff samples are represented as green triangles.

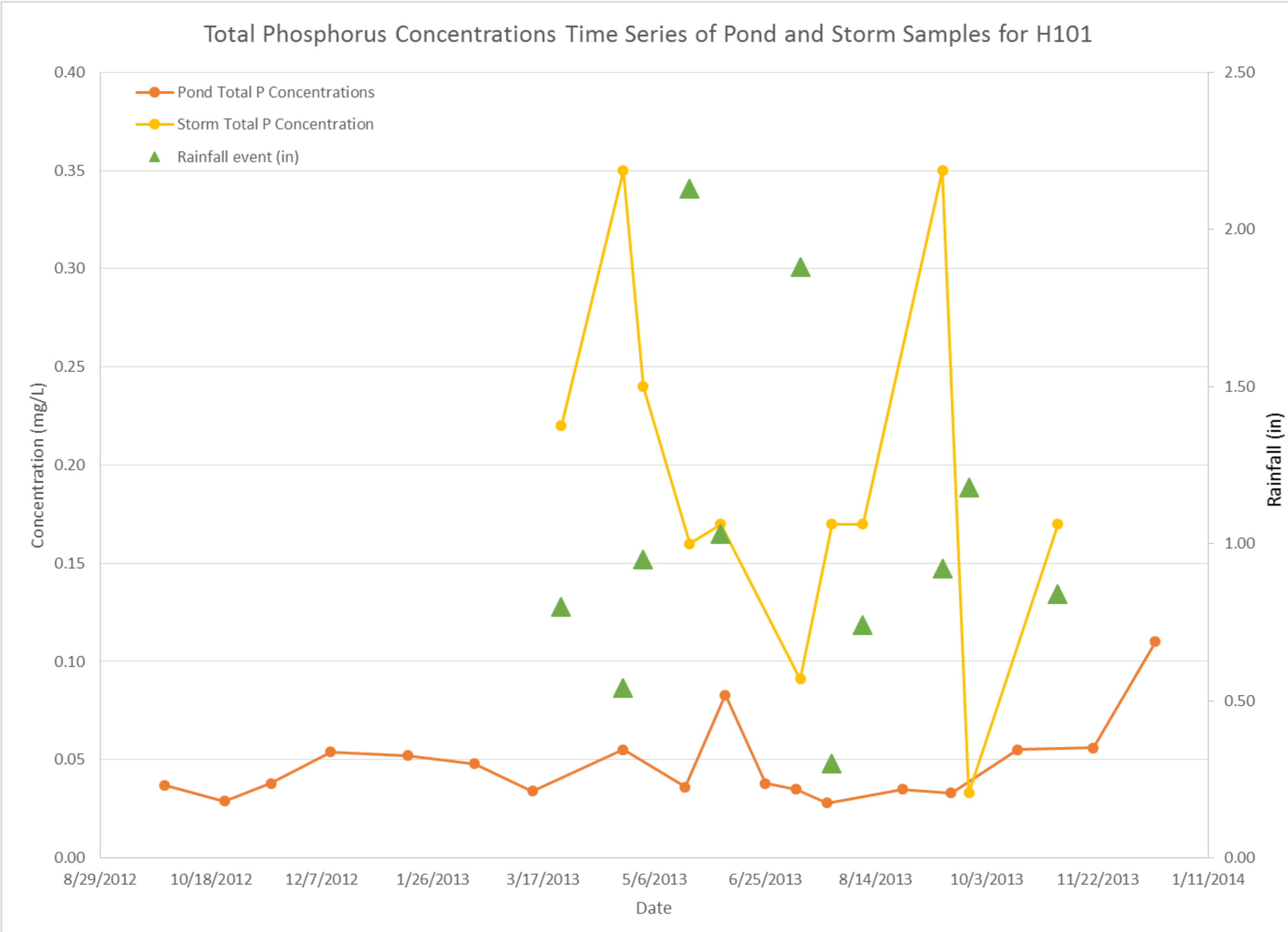

Figure 23: Time series of retention pond and stormwater runoff total phosphorus concentrations for the Hillsborough community (H101). Rainfall events for all captured stormwater runoff samples are represented as green triangles.

Dry season mean stormwater runoff TN, TKN and total inorganic N concentrations were higher than in wet season stormwater runoff or retention pond samples. Dissolved TKN values were consistent among seasons and sample types. Total nitrogen values were significantly greater in stormwater runoff samples in comparison to retention pond samples ($p=0.003$) (Figure 24). Differences were more pronounced in total inorganic nitrogen concentrations between stormwater runoff and retention pond samples ($p < 0.0001$). Typical total nitrogen event mean concentration (EMC) values used for medium residential neighborhood in watershed modeling vary between 1.02-4.62 mg/L with an overall mean of 2.07 mg/l (ERD, 2007). Observed stormwater runoff TN concentrations from the Hillsborough community (H101) typically fell within the range of reported EMC values (ERD, 2007).

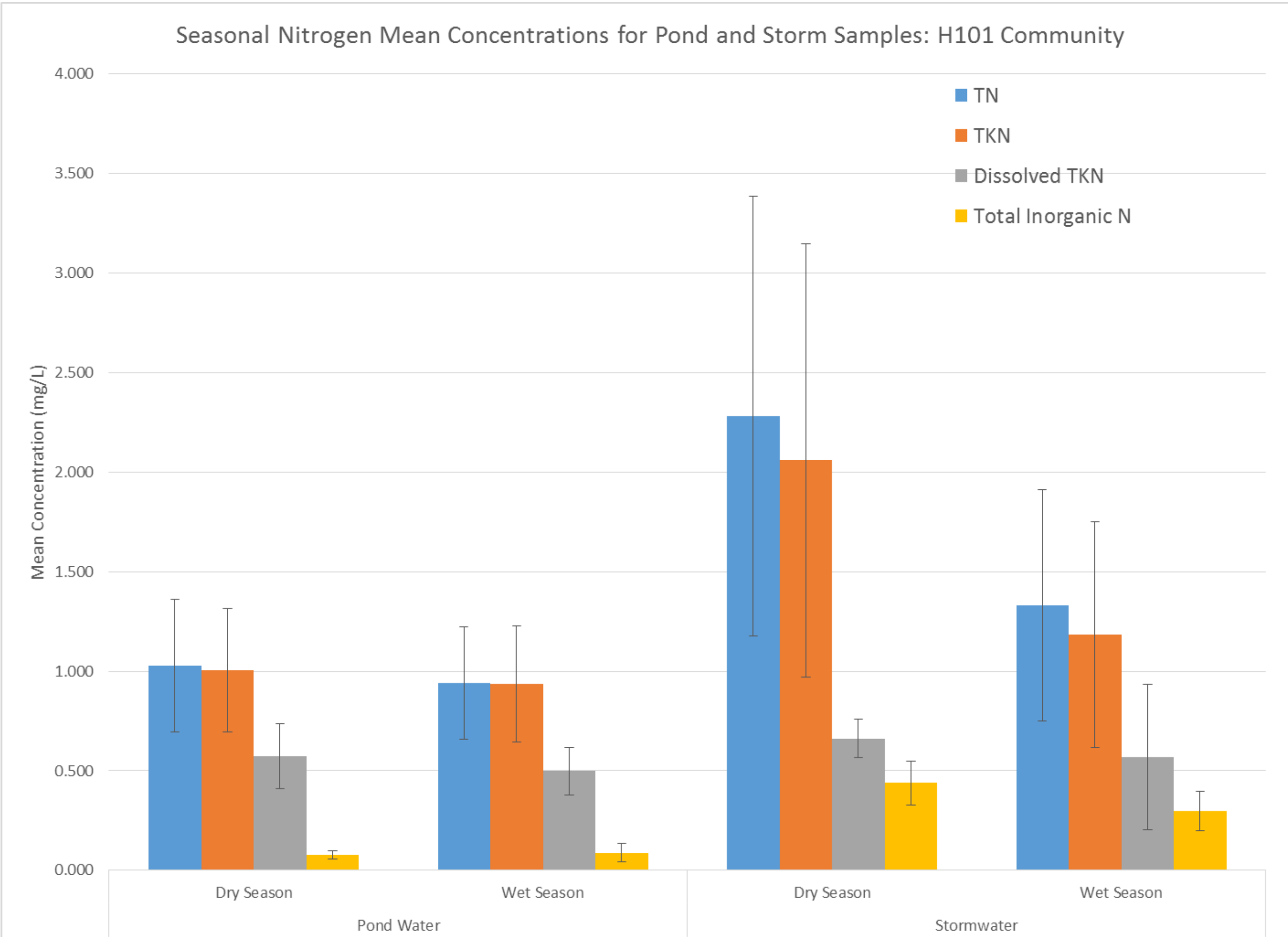

Figure 24: Mean (± 1 S.D. error bars) seasonal nitrogen concentrations (TN, TKN, Dissolved TKN, Total Inorganic N) for stormwater runoff and retention pond samples for the Hillsborough community (H101).

In general, dry season nitrogen concentrations for both stormwater runoff and retention pond samples were greater than wet season samples collected at the Hillsborough community (H101), however these differences were not statistically significant for TN, ammonia, and total inorganic N. Also, nitrogen concentrations in stormwater runoff samples were consistently higher than the retention pond samples collected in both seasons (TN, $p = 0.003$; TKN, $p = 0.001$; and total inorganic N, $p < 0.001$; Two-Way ANOVA?).

Similar to the nitrogen species results, total and ortho-phosphorus concentrations were highest in the dry season stormwater runoff samples in comparison to other sampling events (Figure 25). Stormwater runoff phosphorus concentrations were higher than in retention pond samples ($P < 0.001$ for both Ortho P and TP), although seasonal differences were the same for both. In general, however, retention pond samples had negligible concentrations of phosphorus, and stormwater runoff sample concentrations never approached expected EMC values [mean = 0.327 mg/L TP for medium residential landscapes (ERD, 2007)].

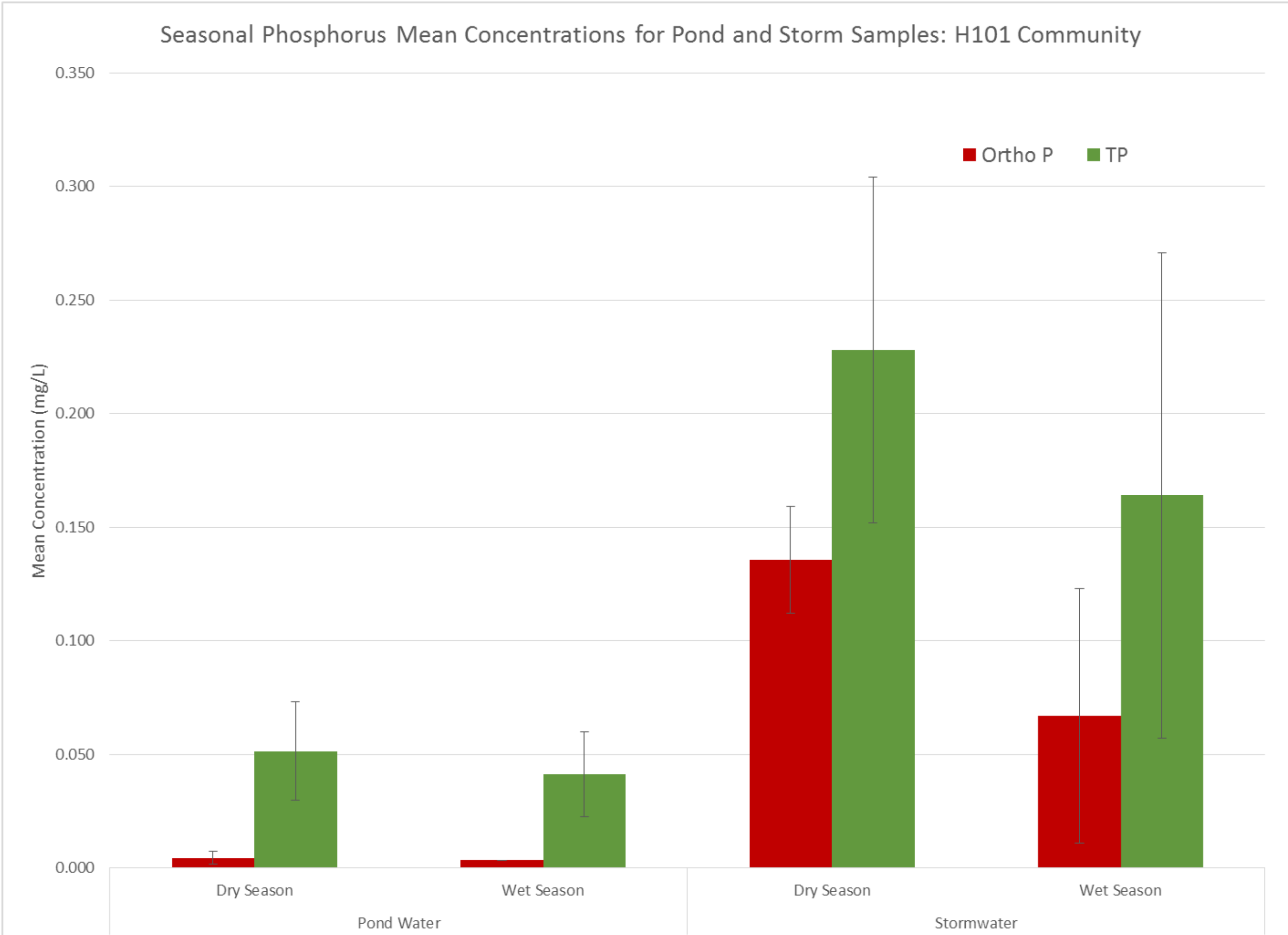

Figure 25: Mean (± 1 S.D. error bars) seasonal phosphorus concentrations (Ortho P and Total P) for stormwater runoff and retention samples for the Hillsborough community (H101)

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M101

The rainfall pattern at the Manatee community (M101) stormwater runoff collection site showed a more irregular pattern with very significant rainfall during a dry season month (October 2013 had similar rainfall to July and August). At this location, it was apparent that a late wet season occurred in 2013 (Figure 26).

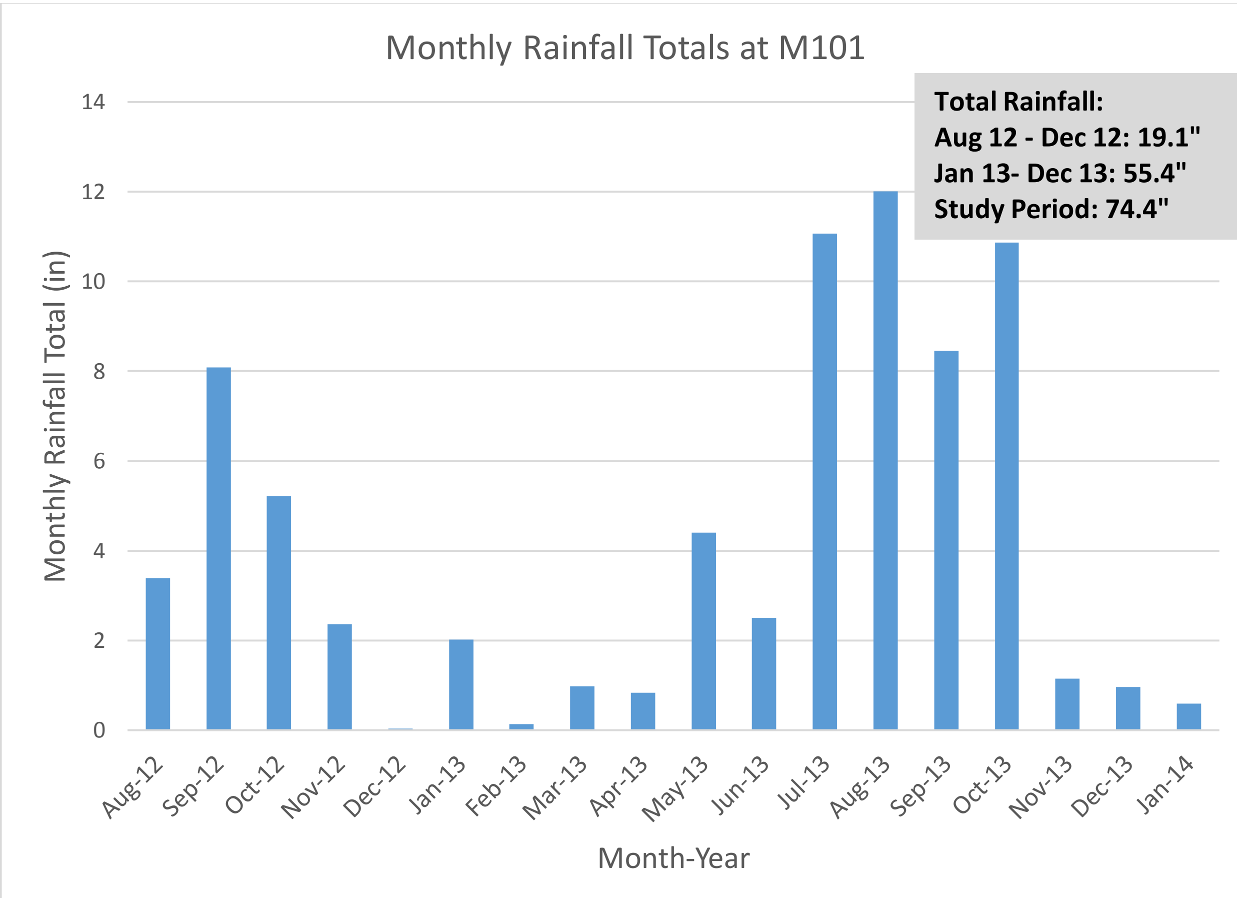

Figure 26: Total monthly rainfall at the Manatee community (M101) stormwater runoff collection site for the entire data collection period.

Time series of TN and TKN concentrations are similar for both stormwater runoff and retention pond sample events with peak retention pond sample concentrations lagging the stormwater runoff events by a couple months (Figure 27 and Figure 28). Seasonal patterns were not as clear as in other communities. Retention pond TN and TKN concentrations were highest at the end of the dry season (end of May/beginning of June) and in October 2013. Stormwater runoff TN and TKN concentrations were highest in July 2013, with other peaks during two dry season events (December 2012 and May 2013). While the July 2013 event was one of significant rainfall (1-1.5”), the dry season rainfall events were around 0.5” of rainfall and preceded by several weeks of no rainfall.

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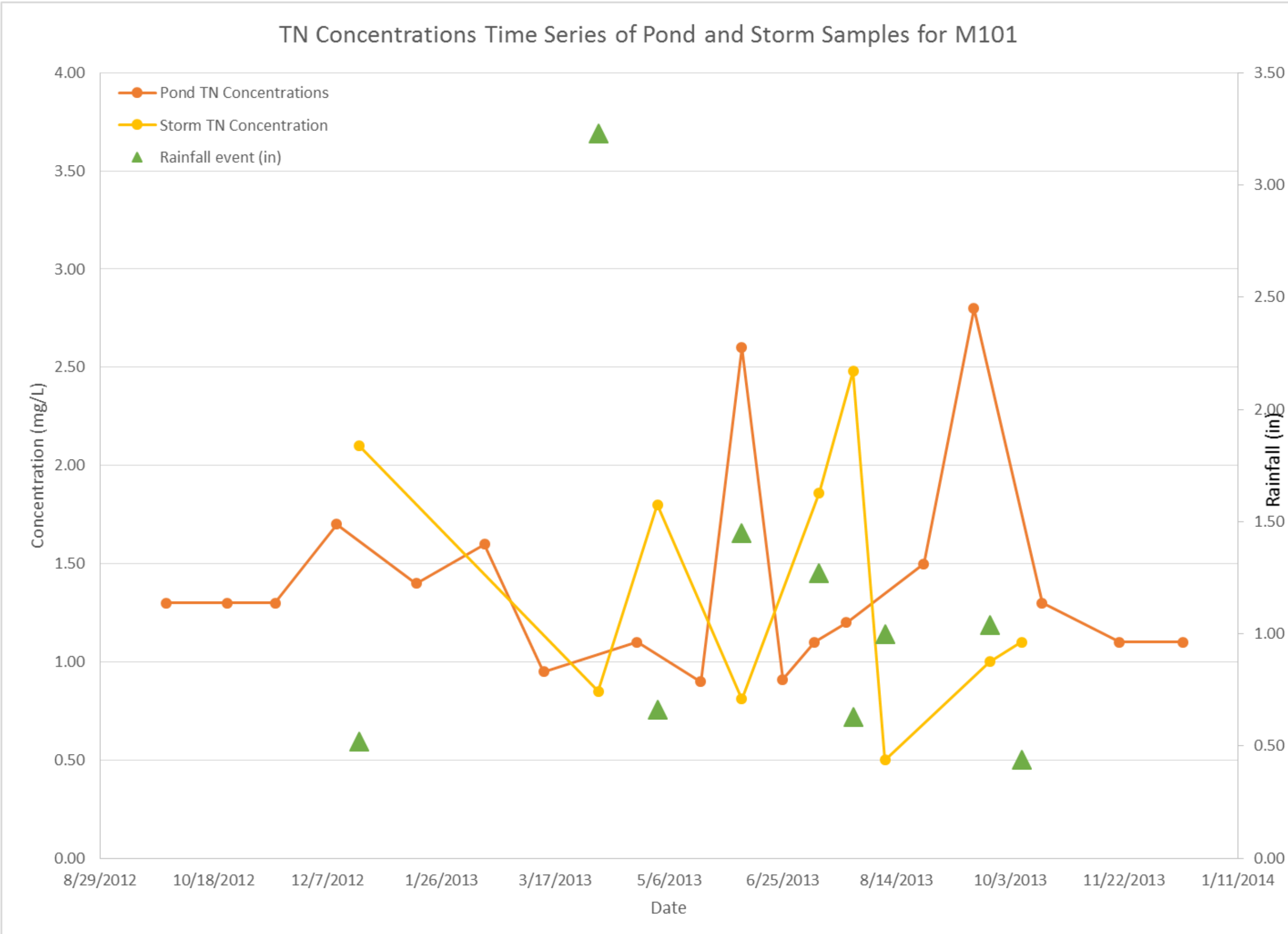

Figure 27: Time series of retention pond and stormwater runoff total nitrogen (TN) concentrations for the Manatee community (M101). Rainfall events for all captured stormwater runoff samples are represented as green triangles.

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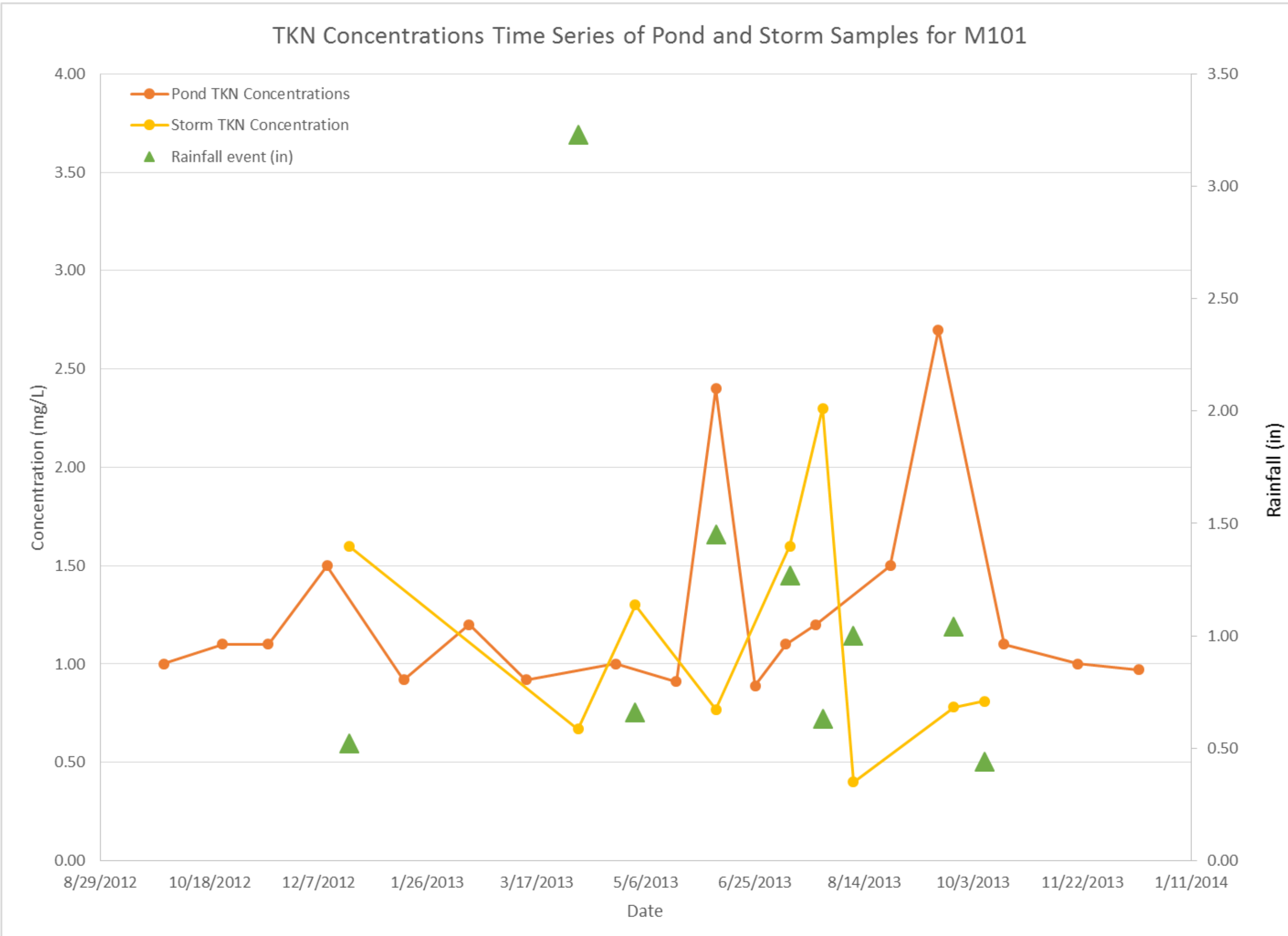

Figure 28: Time series of retention pond and stormwater runoff total Kjeldahl nitrogen (TKN) concentrations for the Manatee community (M101). Rainfall events for all captured stormwater runoff samples are represented as green triangles.

Total inorganic nitrogen concentrations show a more distinct pattern relative to the TN and TKN concentration time series. The highest inorganic nitrogen concentrations are present for both the stormwater runoff and retention pond samples collected in Winter 2012/2013, followed by late May/early June 2013 events (Figure 29). Also, an increasing trend in inorganic nitrogen concentrations appears to be visible towards the Fall/Winter of 2013/2014, but not enough stormwater runoff samples were collected during this period to confirm this trend.

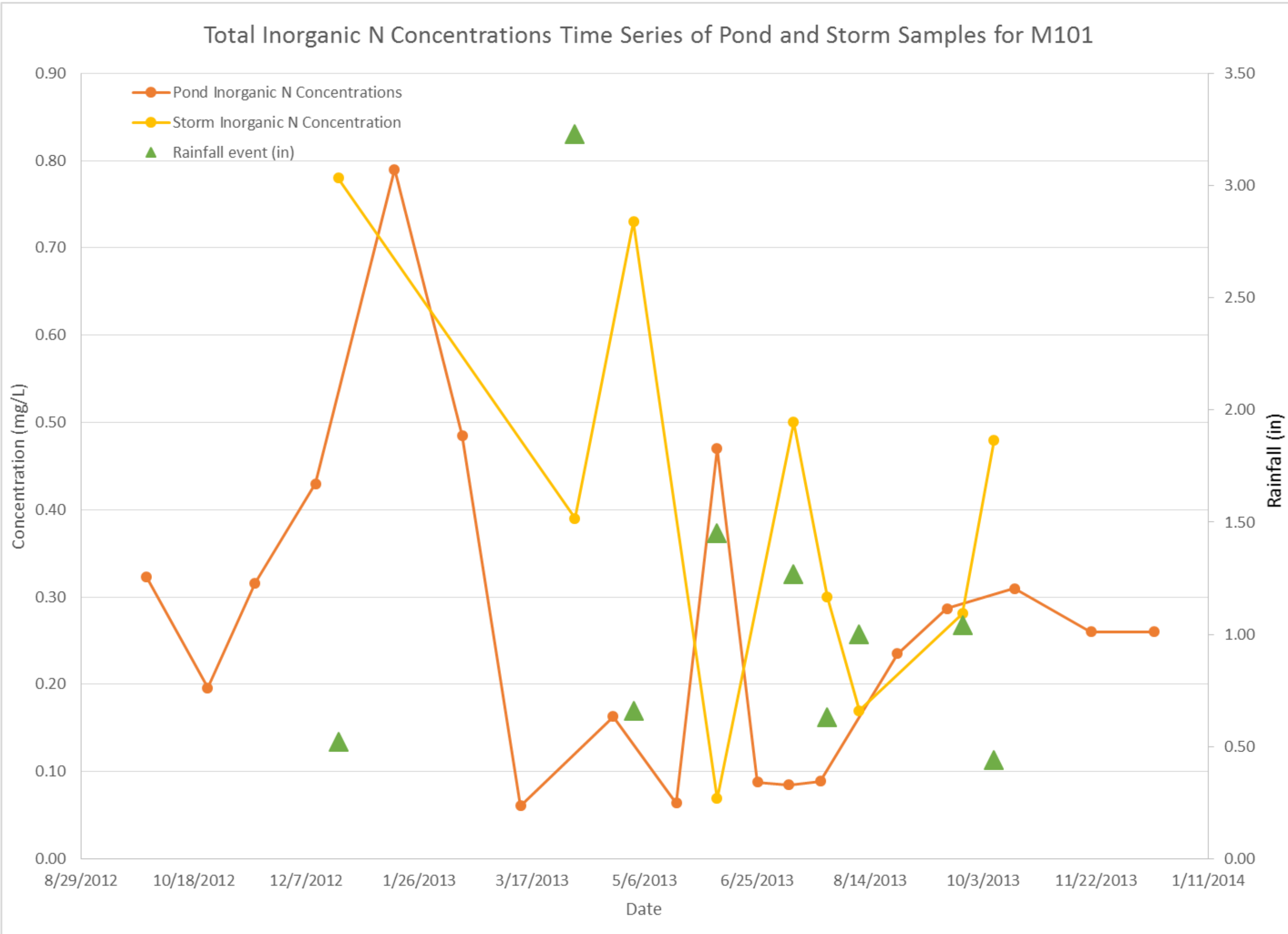

Figure 29: Time series of retention pond and stormwater runoff total inorganic nitrogen concentrations for the Manatee community (M101). Rainfall events for all captured stormwater runoff samples are represented as green triangles.

Total phosphorus concentrations were highest in May 2013 in retention pond samples and in July 2013 for stormwater runoff samples (Figure 30). The highest retention pond TP value exceeded concentrations from all stormwater runoff samples which was not observed in other communities. The higher P concentrations in M101's retention pond samples is consistent with the much higher soil P concentrations in this community relative to the others.

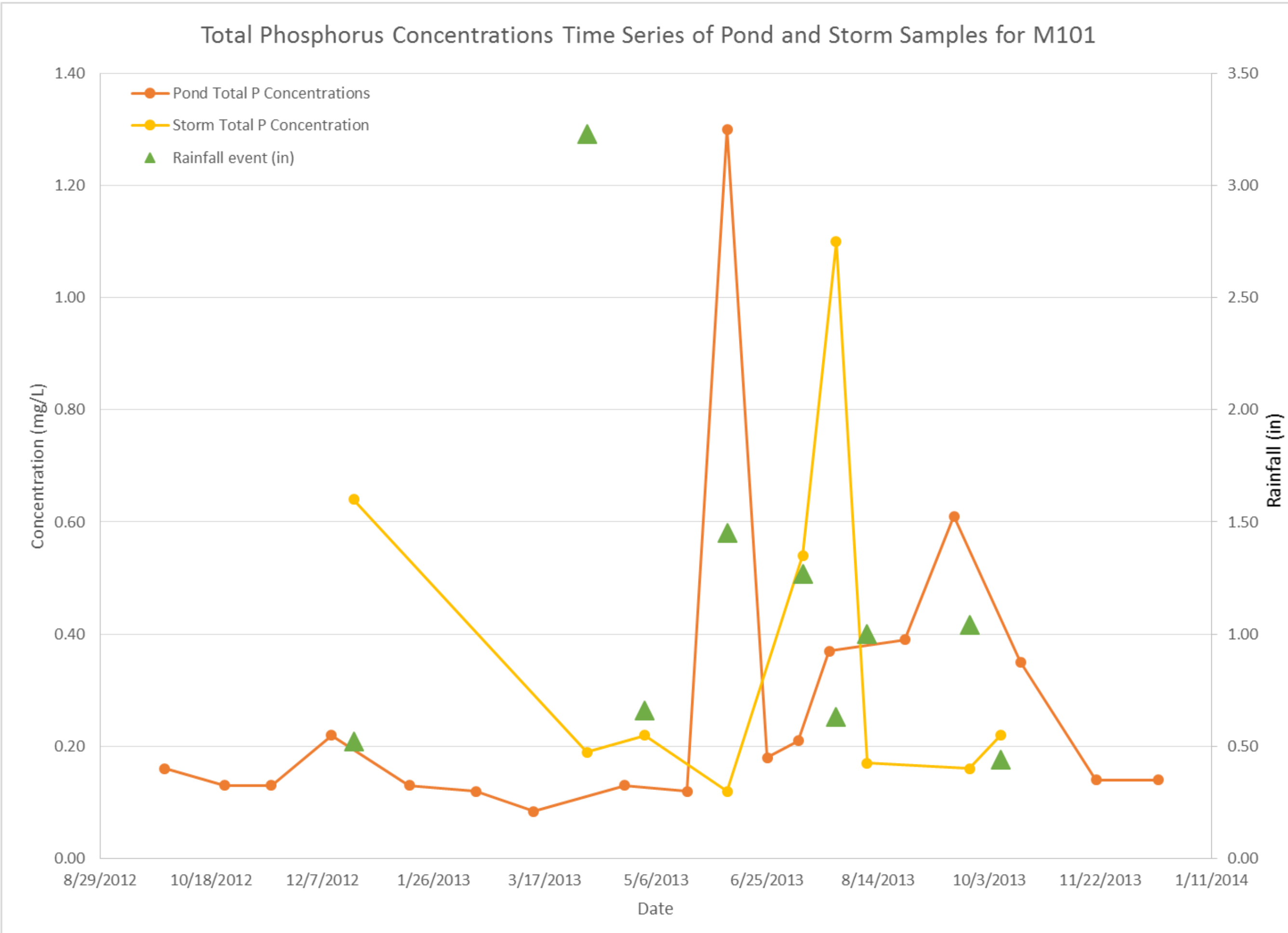

Figure 30: Time series of retention pond and stormwater runoff total phosphorus concentrations for the Manatee community (M101). Rainfall events for all captured stormwater runoff samples are represented as green triangles.

Manatee community (M101) showed similar TN, TKN and dissolved TKN concentrations across seasons and sample types (wet and dry seasons for stormwater runoff and retention pond samples), with the exception of total inorganic N concentrations. Total inorganic N concentrations were highest in stormwater runoff samples during the dry season (Figure 31). Total inorganic N concentrations during the wet season in stormwater runoff samples were similar to those of the retention pond samples. Mean annual stormwater runoff total inorganic N concentrations were significantly greater (4-5x higher) than retention pond concentrations ($p<0.0001$). Differences in seasonal total inorganic N between stormwater runoff and retention pond samples were also observed. Consistent nitrogen concentrations throughout the year, for both the captured stormwater runoff and retention pond samples were in contrast to what was observed in the Hillsborough community (H101), where stormwater runoff N concentrations tended to be higher in the dry season. Values in both the stormwater runoff and retention pond samples of M101 were generally much lower than the typical mean EMC TN concentration of 2.07 mg/l expected for a medium residential land use (ERD, 2007).

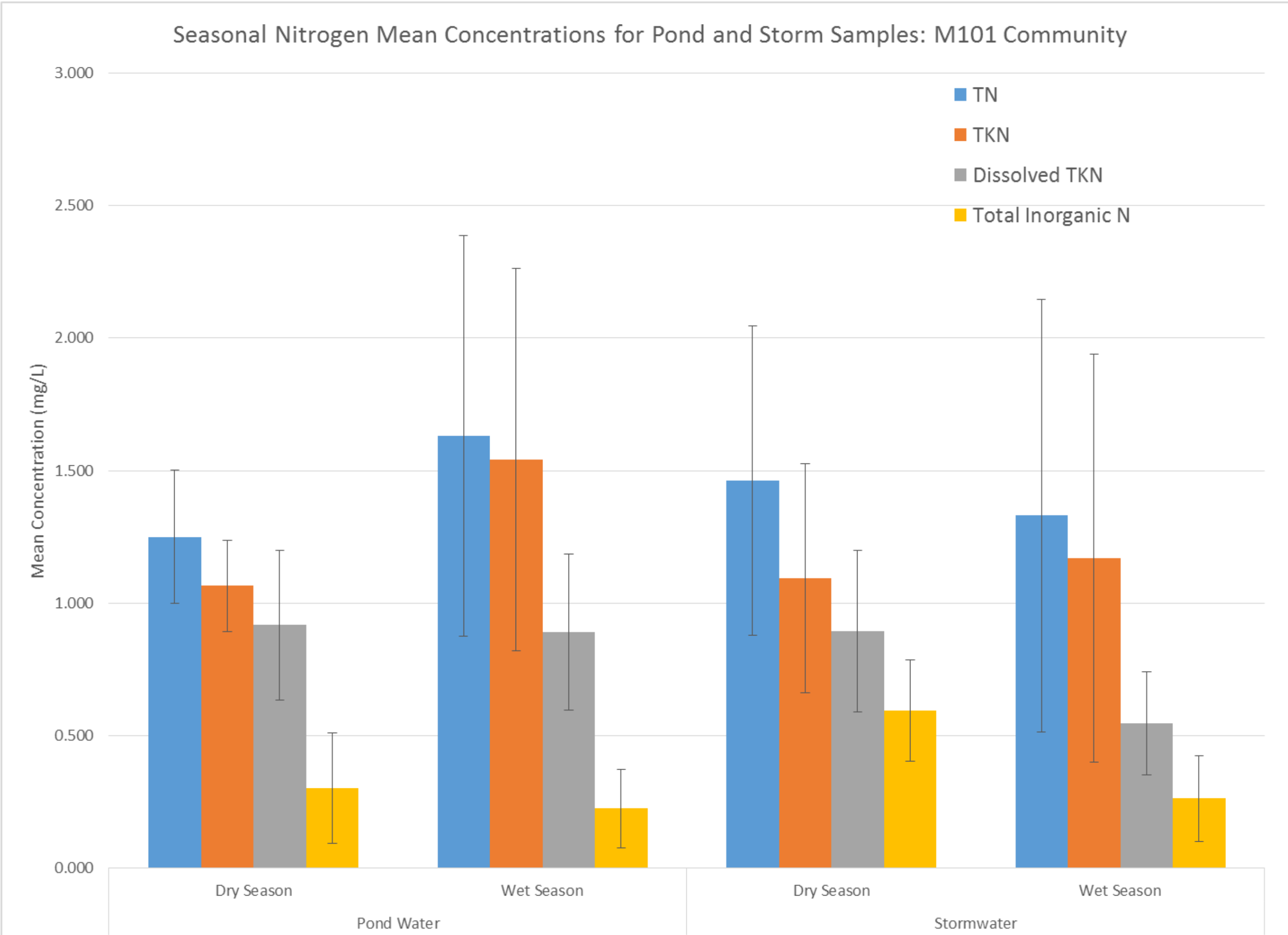

Figure 31: Mean (± 1 S.D. error bars) seasonal nitrogen concentrations (TN, TKN, Dissolved TKN, Total Inorganic N) for stormwater runoff and retention pond samples for the Manatee community (M101).

For Manatee community (M101), dry season stormwater runoff samples had higher nutrient concentrations than the retention pond samples (TN, p=0.003; TKN, p=0.01, and NO_X and NH_3, p<0.001, respectively). In the wet season, the retention pond concentrations were higher with the exception of total Inorganic N (Figure 31). Total phosphorus concentrations values shown in Figure 32 were higher during the wet season than dry season for retention pond samples, but not as different between seasons for stormwater runoff samples with mean values between 0.42-0.43 mg/L [slightly above the expected mean EMC for TP concentrations of 0.327 mg/l for medium residential landscapes (ERD, 2007)].

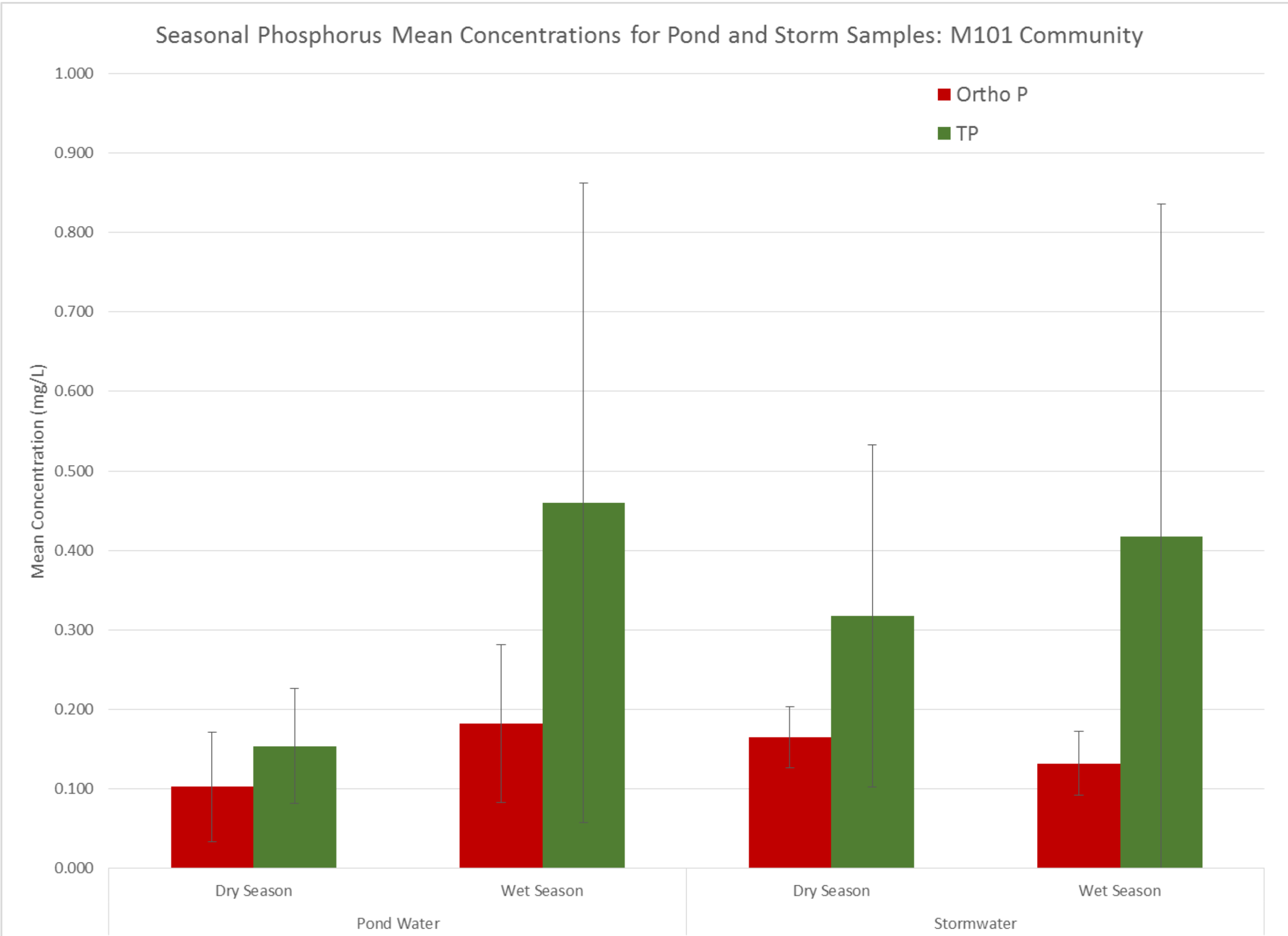

Figure 32: Mean (± 1 S.D. error bars) seasonal phosphorus concentrations (Ortho P and Total P) for stormwater runoff and retention samples for the Manatee community (M101)

P201 and P202

The rainfall patterns at both Pinellas communities (P201 and P202) were similar which was expected due to the close proximity of the communities (Figure 33 and Figure 34). January 2013 rainfall data are missing for P202 due to a device failure (rainfall estimates are under-reported for this month).

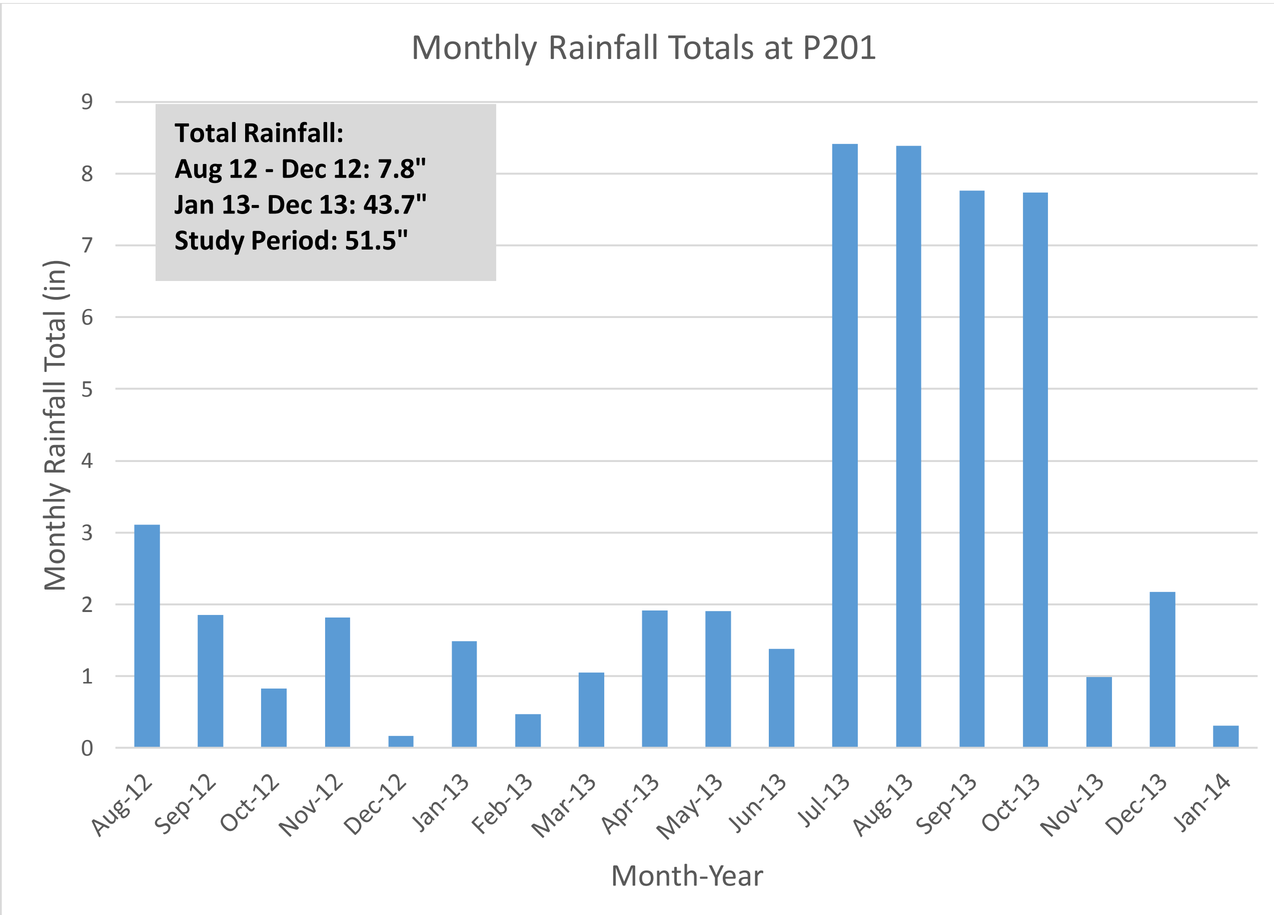

Figure 33: Total monthly rainfall at the Pinellas community (P201) stormwater runoff collection site for the entire data collection period.

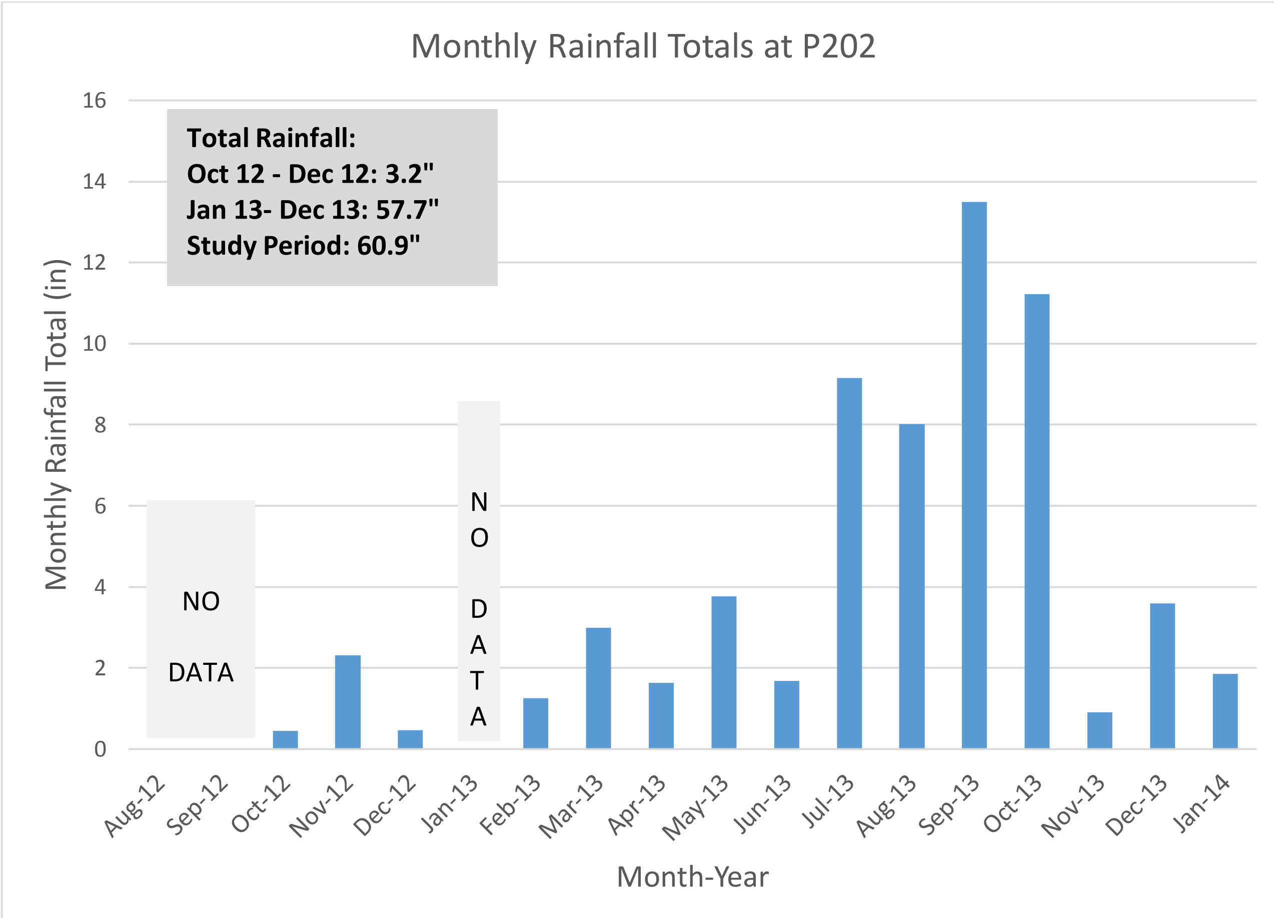

Figure 34: Total monthly rainfall at the Pinellas community (P202) stormwater runoff collection site for the entire data collection period.

Time series of TN and TKN concentrations follow similar patterns for both stormwater runoff and retention pond samples with concentrations in the retention pond samples seeming to lag the stormwater runoff events by about a month. This is particularly visible in a first flush rainfall event occurring in May/June 2013 (P201, Figure 35 and Figure 37; P202, Figure 36 and Figure 38). While TN and TKN concentrations follow similar patterns within each Pinellas community, P201 and P202 do show seasonal differences. In both communities' stormwater runoff samples, peaks in TN and TKN concentrations occur in May 2013 followed by another peak in November 2013. For P201, TN and TKN concentrations appear to decrease during the wet season (for both stormwater runoff and retention pond samples); however, for P202, high stormwater runoff concentrations are observed in July 2013. All retention pond samples showed a peak value at the beginning of the wet season (June), followed by lower values for the remaining wet season period.

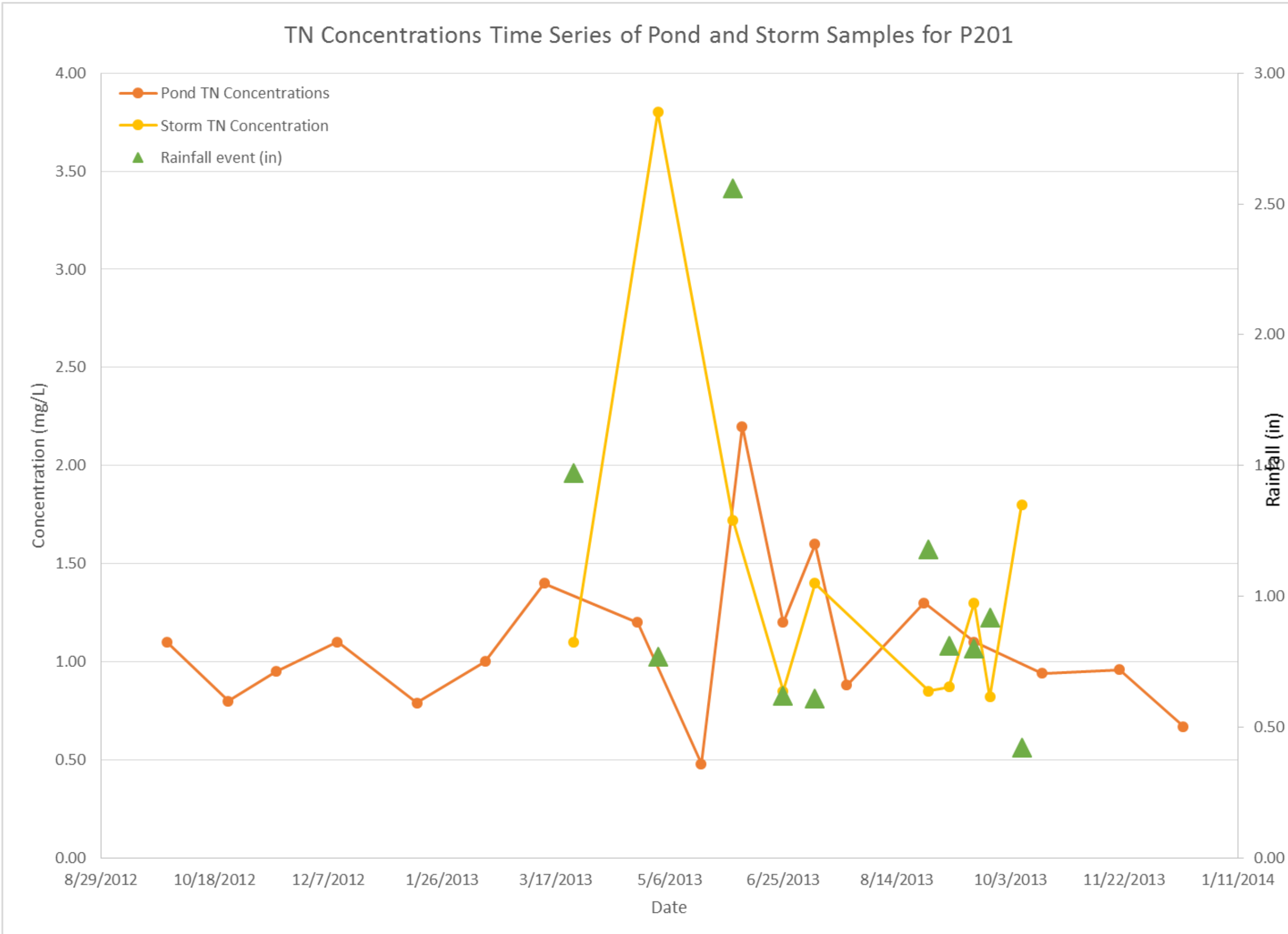

Figure 35: Time series of retention pond and stormwater runoff total nitrogen (TN) concentrations for the Pinellas community (P201). Rainfall events for all captured stormwater runoff samples are represented as green triangles.

Figure 36: Time series of retention pond and stormwater runoff total nitrogen (TN) concentrations for the Pinellas community (P202). Rainfall events for all captured stormwater runoff samples are represented as green triangles.

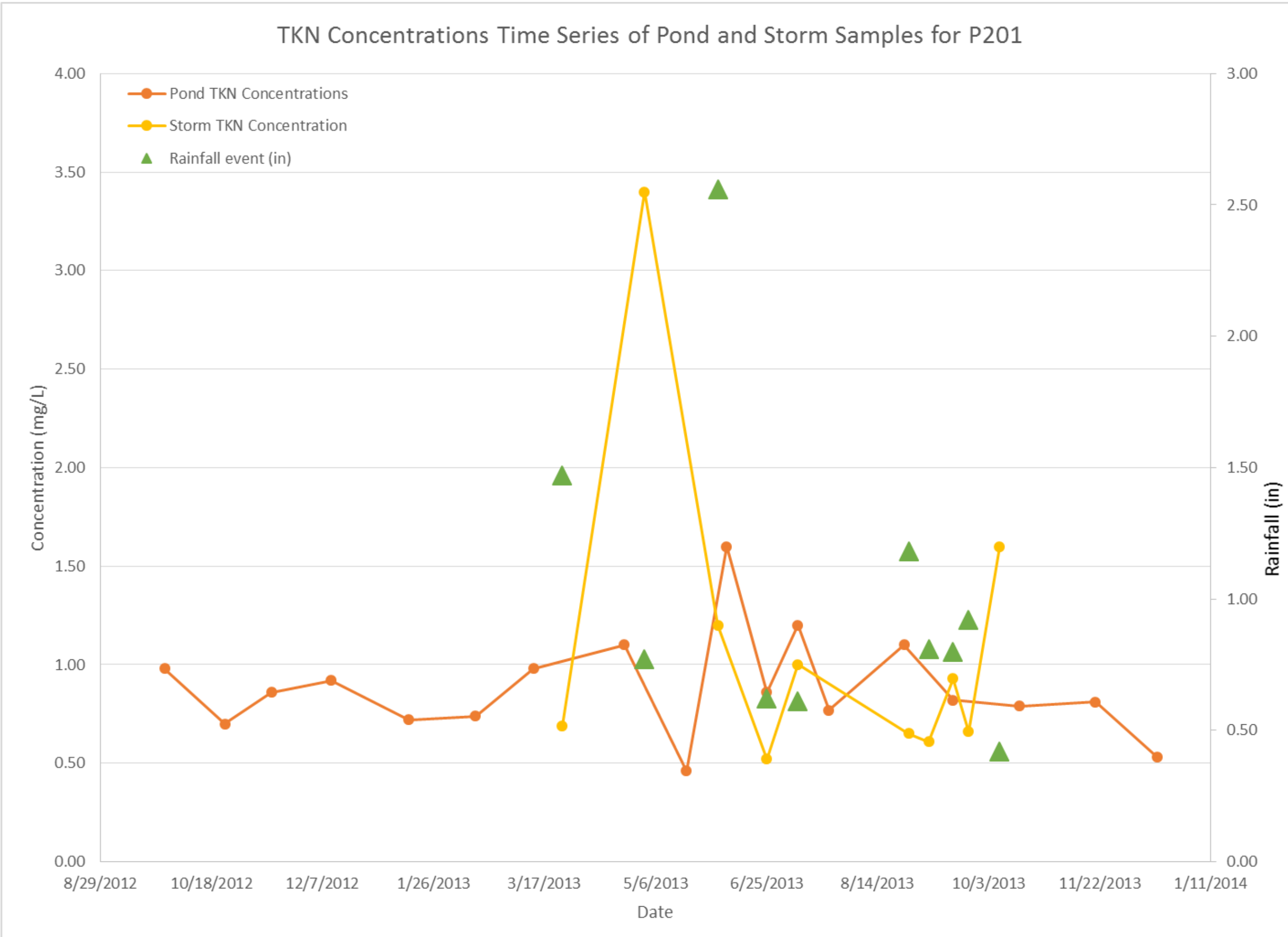

Figure 37: Time series of retention pond and stormwater runoff total Kjeldahl nitrogen (TKN) concentrations for the Pinellas community (P201). Rainfall events for all captured stormwater runoff samples are represented as green triangles.

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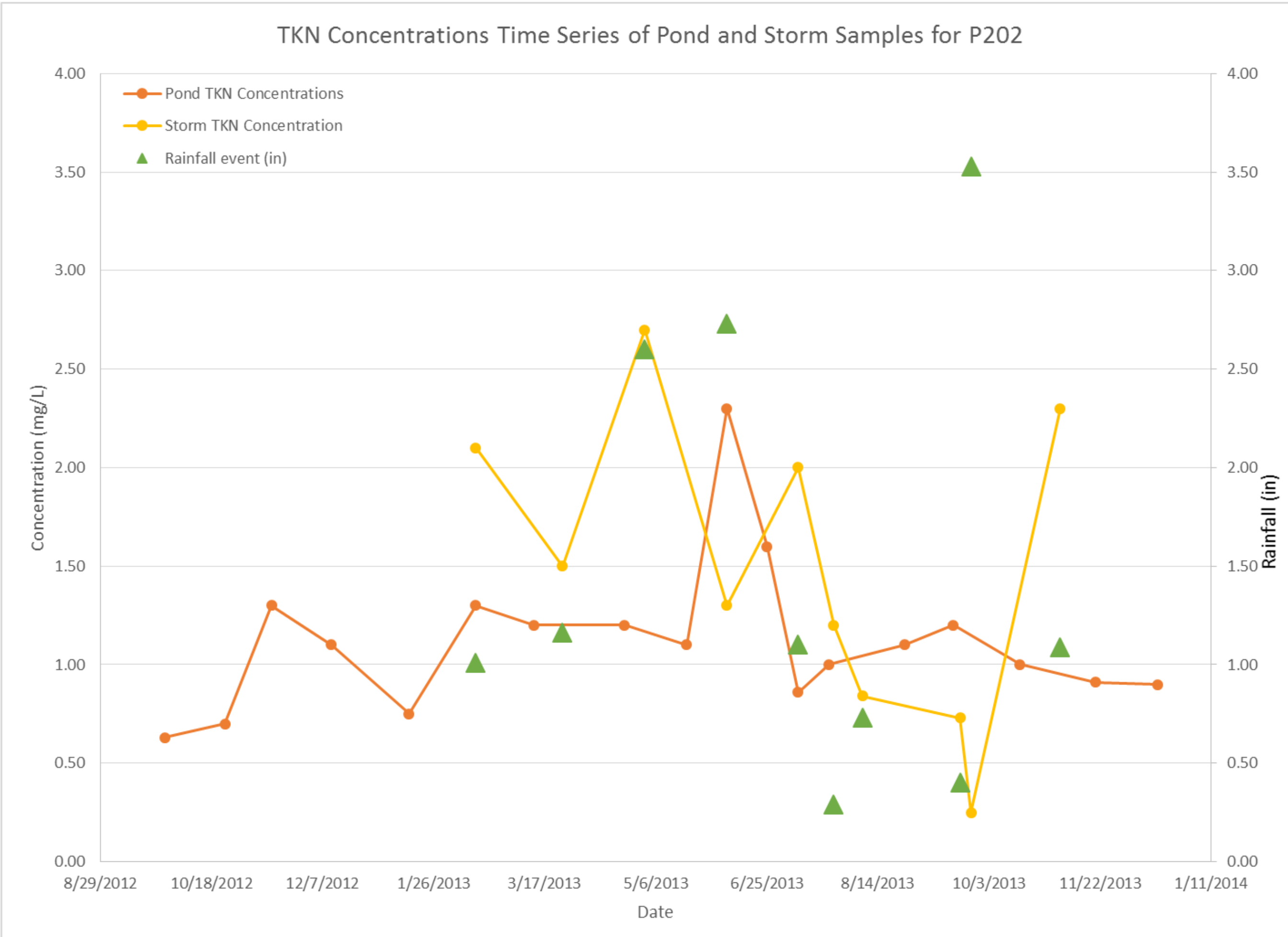

Figure 38: Time series of retention pond and stormwater runoff total Kjeldahl nitrogen (TKN) concentrations for the Pinellas community (P202). Rainfall events for all captured stormwater runoff samples are represented as green triangles.

Total inorganic nitrogen concentrations show greater variability than TN and TKN concentrations for both stormwater runoff and retention pond samples. Highest values in the retention pond samples were observed in the beginning of the wet season for both P201 (Figure 39) and P202 (Figure 41).

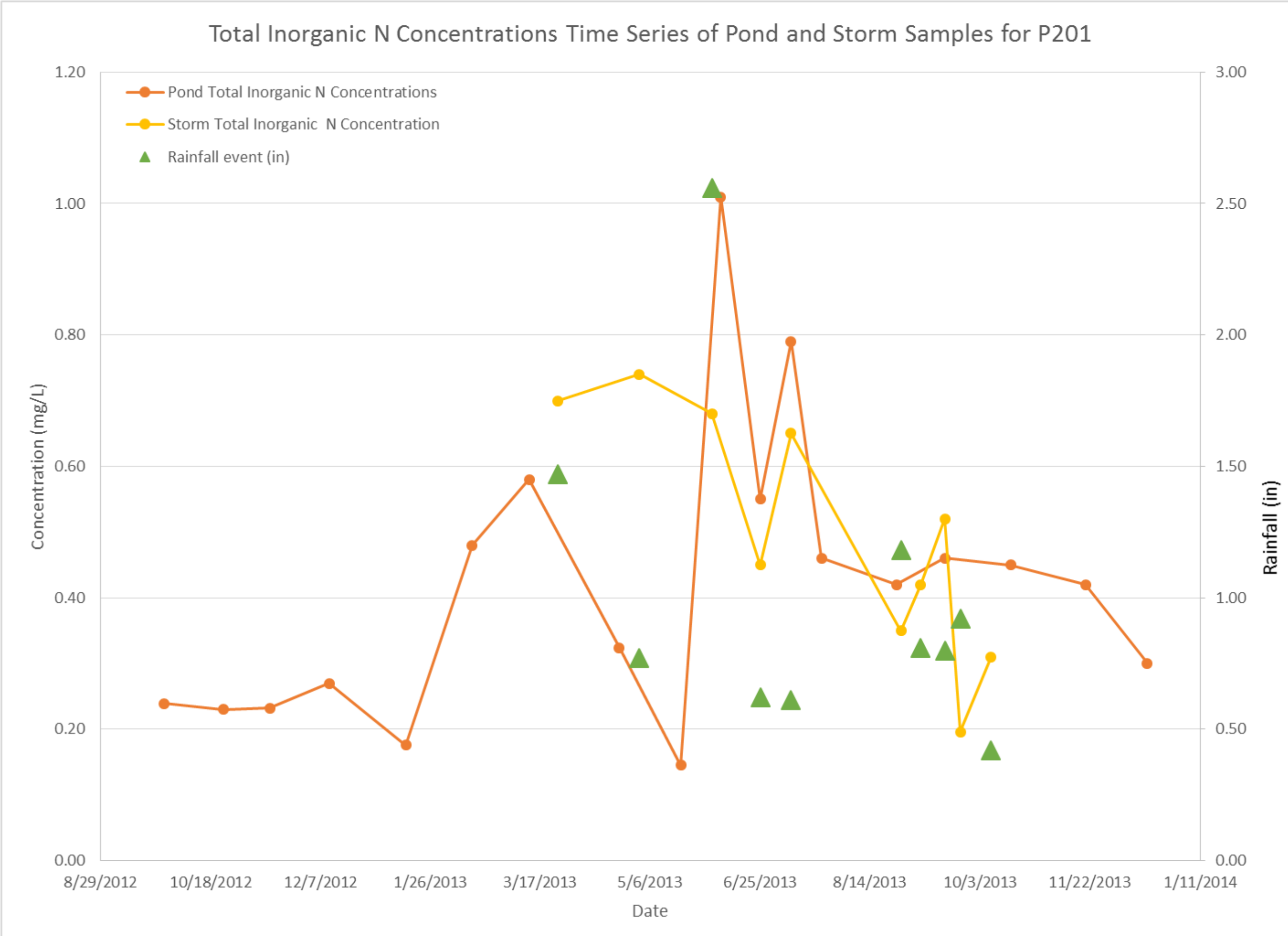

Figure 39: Time series of retention pond and stormwater runoff total inorganic nitrogen concentrations for the Pinellas community (P201). Rainfall events for all captured stormwater runoff samples are represented as green triangles.

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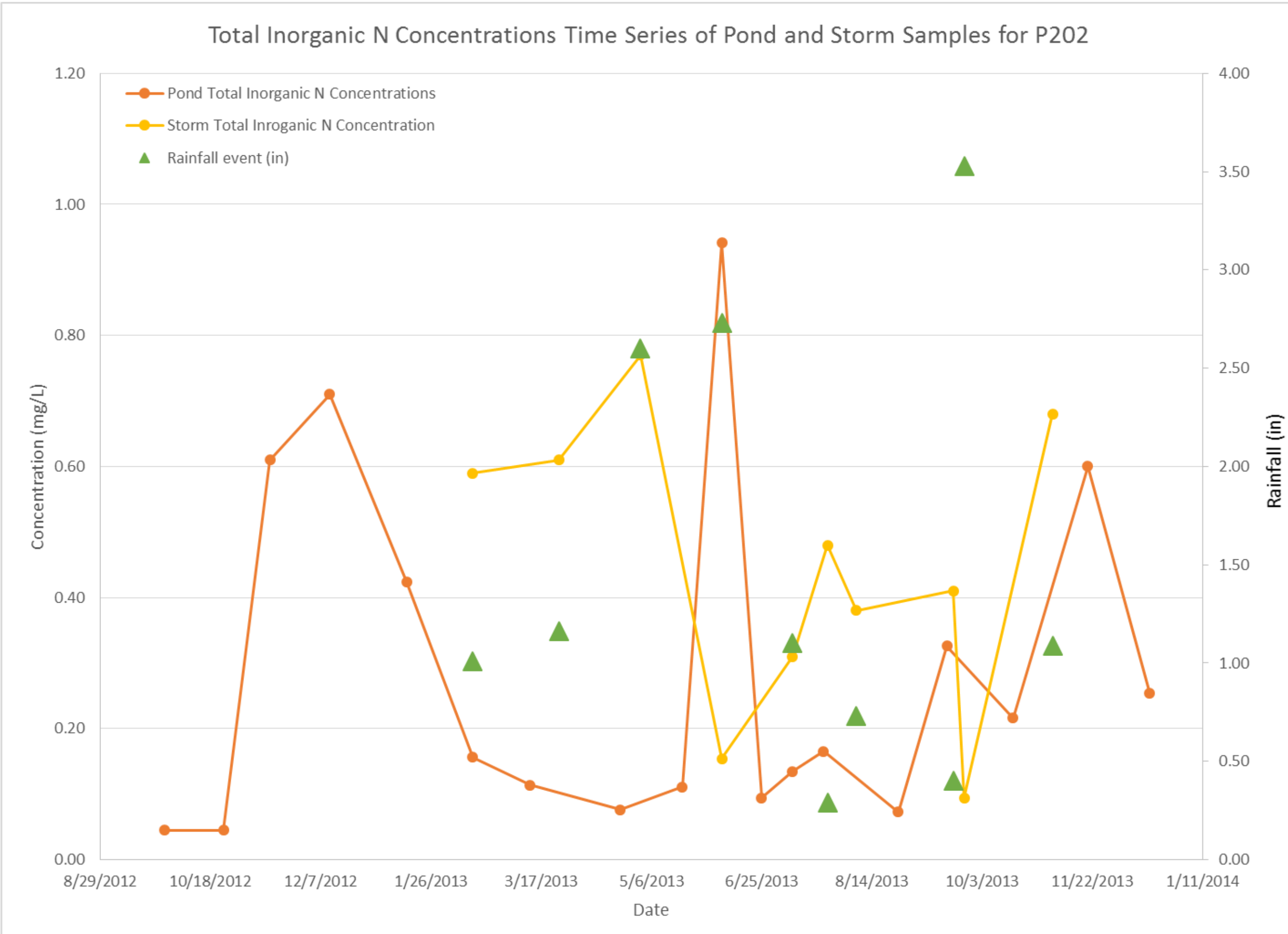

Figure 40: Time series of retention pond and stormwater runoff total inorganic nitrogen concentrations for the Pinellas community (P202). Rainfall events for all captured stormwater runoff samples are represented as green triangles.

For P201, total phosphorus concentrations were highest in the dry season (May and October 2013) in the stormwater runoff samples and were consistently low in the retention pond samples (Figure 42). Similarly for P202, highest TP concentrations for stormwater runoff samples occurred in the dry season (February and November 2013), and lower TP concentrations were observed in retention pond samples with a decreasing trend during the wet season (Figure 42).

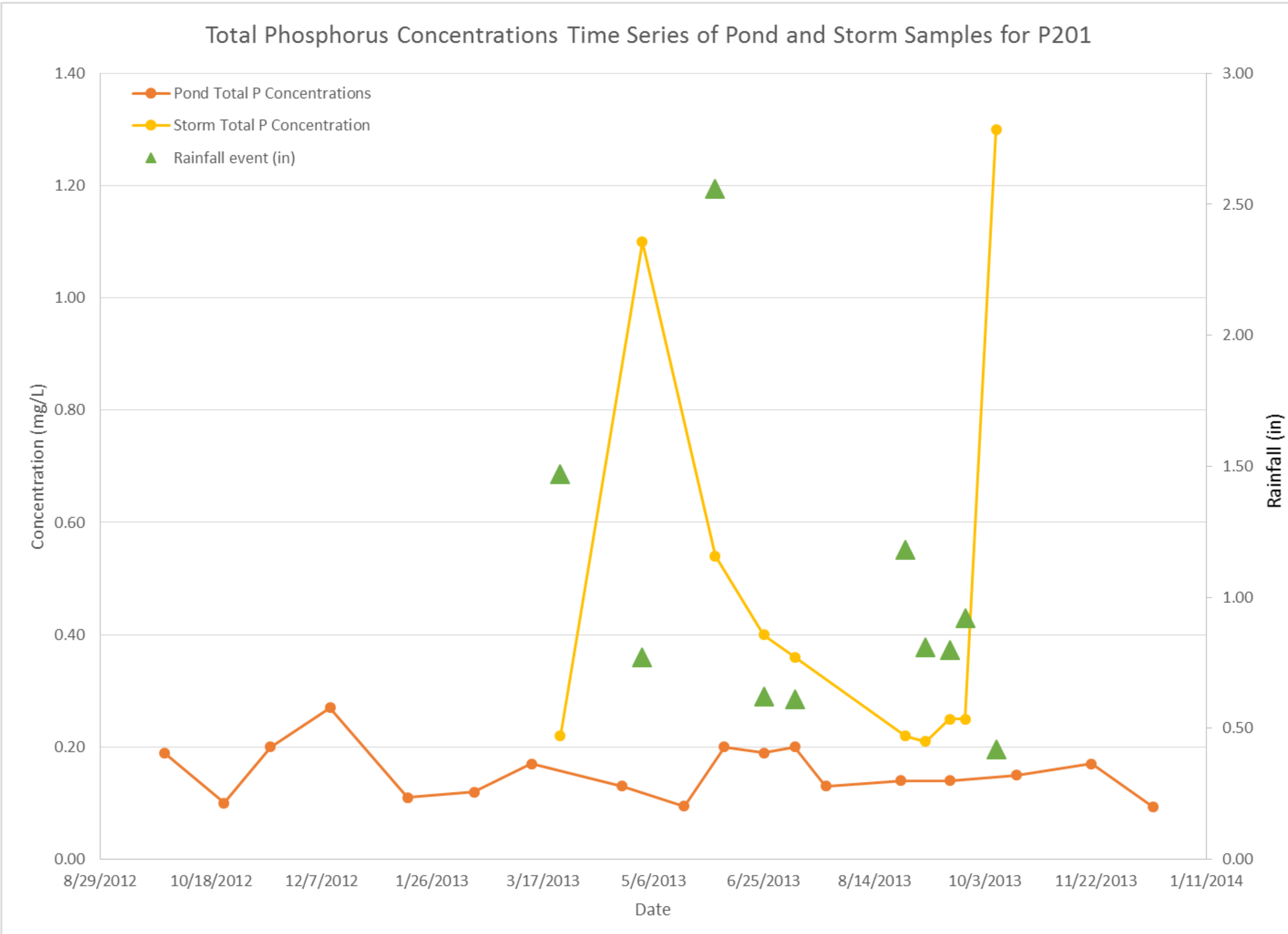

Figure 41: Time series of retention pond and stormwater runoff total phosphorus concentrations for the Pinellas community (P201). Rainfall events for all captured stormwater runoff samples are represented as green triangles.

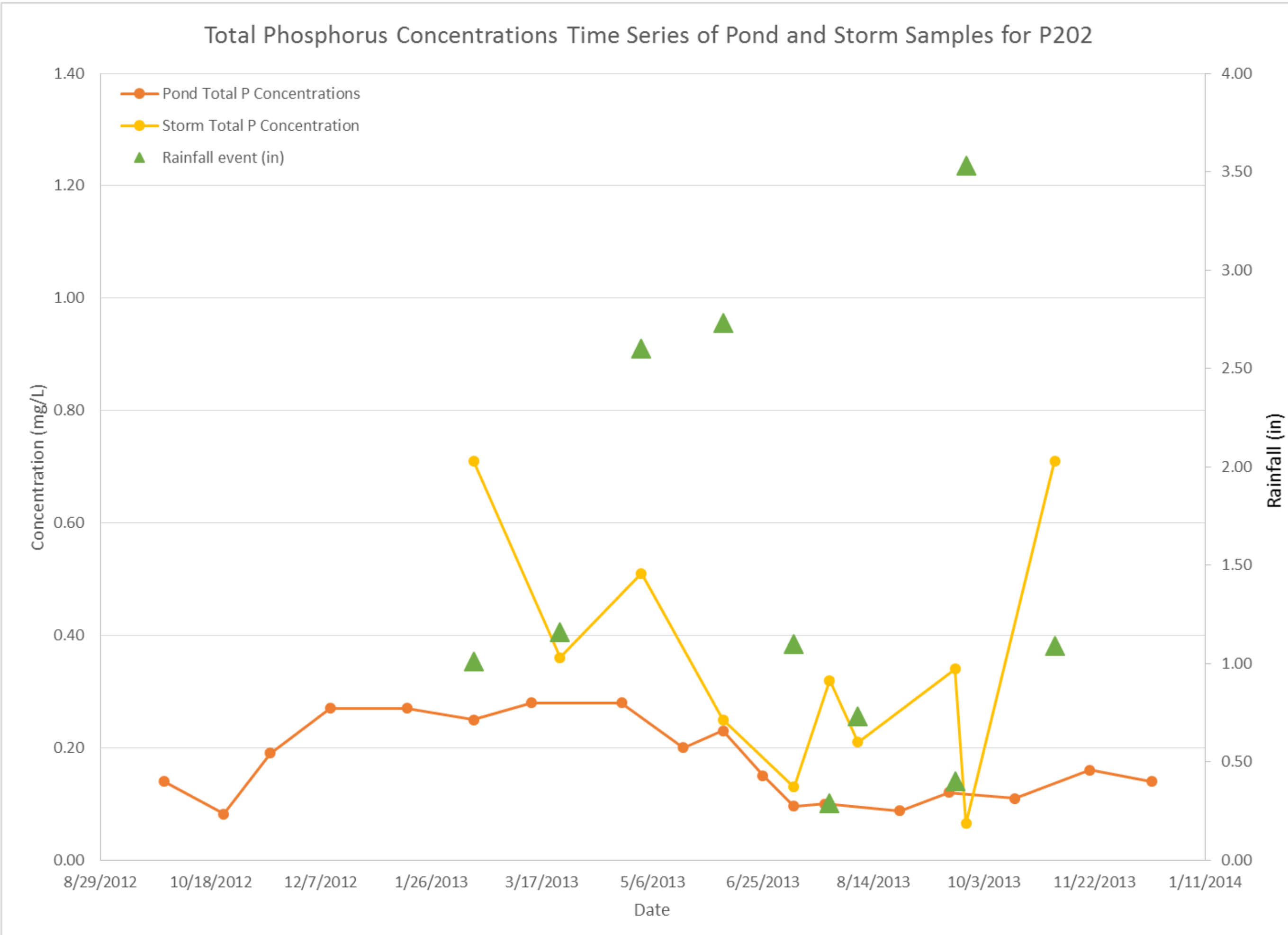

Figure 42: Time series of retention pond and stormwater runoff total phosphorus concentrations for the Pinellas community (P202). Rainfall events for all captured stormwater runoff samples are represented as green triangles.

The two Pinellas communities (P201 and P202) showed very similar mean TN and TKN seasonal values for stormwater runoff and retention pond samples. In general, TN and TKN concentrations are similar for retention pond samples in both seasons and for wet season stormwater runoff samples (Figure 43 and Figure 44).

When combining samples from both Pinellas communities, TN mean concentrations were statistically greater in stormwater runoff samples compared to the retention pond samples ($p=0.009$), though no other nitrogen species concentrations were significantly different between sample types. No statistically significant seasonality pattern was observed, when pooling the two communities and sample types. Mean dry season stormwater runoff samples had TN and TKN concentrations 2-3 times higher than for other sample type and seasonal combinations (TN = 2.2 and 2.5 mg/L for P201 and P202, respectively), but due to higher variability in these samples these differences were not statistically significant. Once the data are pooled for both Pinellas communities, differences in TN and TKN were found to be statistically significant for both the interaction effects between season and sample type (p<0.001 for TN and TKN), as well as each of these factors independently (p<0.0001 for all tests except p=0.004 for differences in seasonality in TN mean concentrations).

Dissolved TKN concentrations were similar across all seasons and sample types for P201 (Figure 43), but were significantly lower for wet season stormwater runoff samples in P202 (Figure 44). Total inorganic nitrogen concentrations were also similar for all P201 sample types and seasons, but greater concentrations were observed for the dry season stormwater runoff samples (as typically observed in the other communities). TN concentrations for P201 and P202's stormwater runoff samples (particularly during the dry season) were generally greater than the typical mean EMC value for TN concentrations (2.07 mg/L) expected for a medium residential land use.

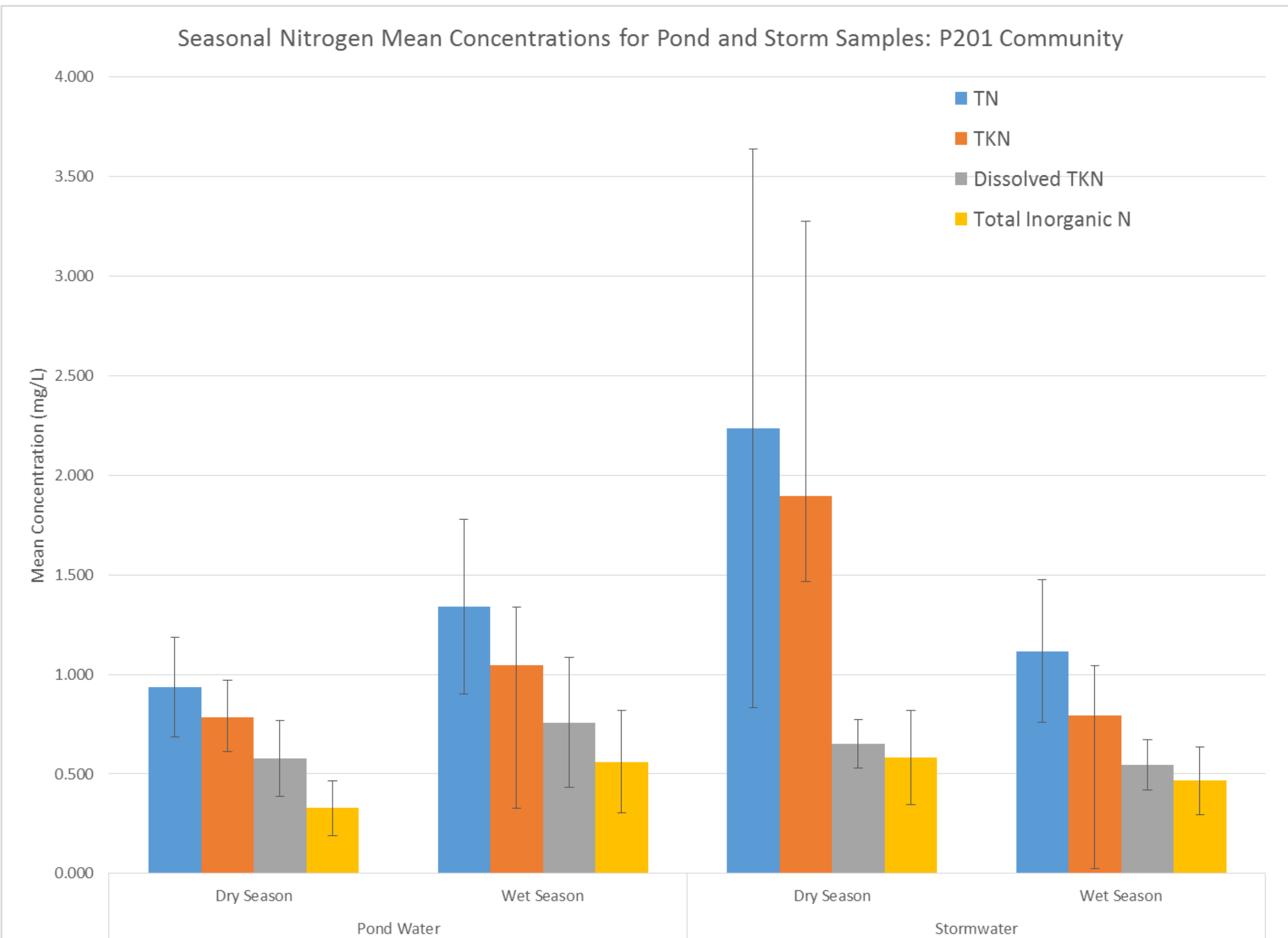

Figure 43: Mean (± 1 S.D. error bars) seasonal nitrogen concentrations (TN, TKN, Dissolved TKN, Total Inorganic N) for stormwater runoff and retention pond samples for the Pinellas community (P101).

Pinellas community (P201) exhibited expected seasonal nutrient patterns whereby stormwater runoff sample concentrations exceeded retention pond sample concentrations during the dry season and retention pond sample nitrogen concentrations exceeded stormwater runoff sample concentrations in the wet season (TN,TKN, and total inorganic N, p=0.01, respectively).

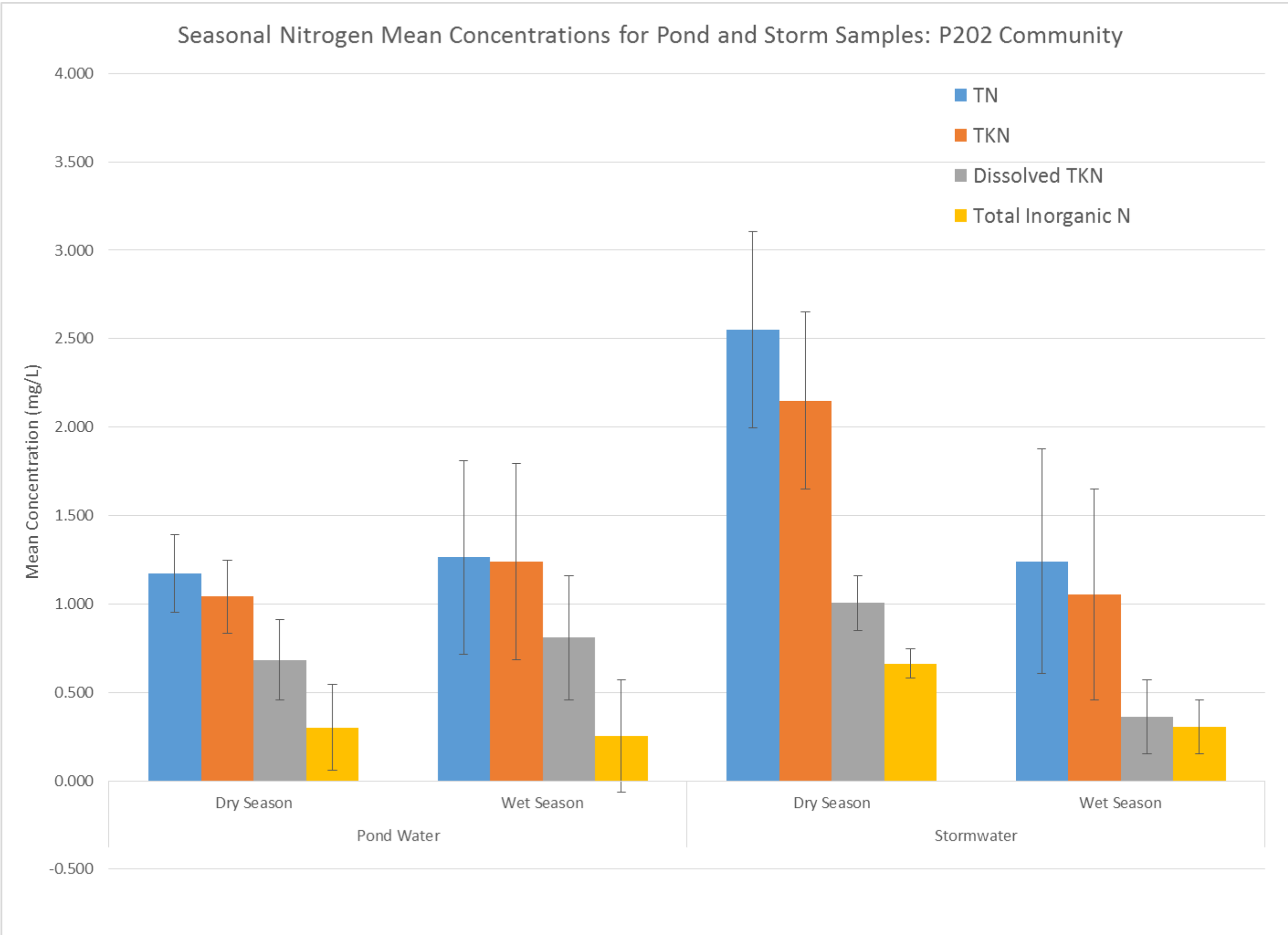

Figure 44: Mean (± 1 S.D. error bars) seasonal nitrogen concentrations (TN, TKN, Dissolved TKN, Total Inorganic N) for stormwater runoff and retention pond samples for the Pinellas community (P202).

Pinellas community (P202) also exhibited similar patterns in stormwater runoff and retention pond nitrogen concentrations where higher concentrations of total inorganic N in stormwater runoff samples occurred during the dry season. This sample type and seasonality effect interaction was statistically significant for TN, TKN, and total inorganic N when pooling both community samples together ($p<0.0001$, Figure 45 for TN).

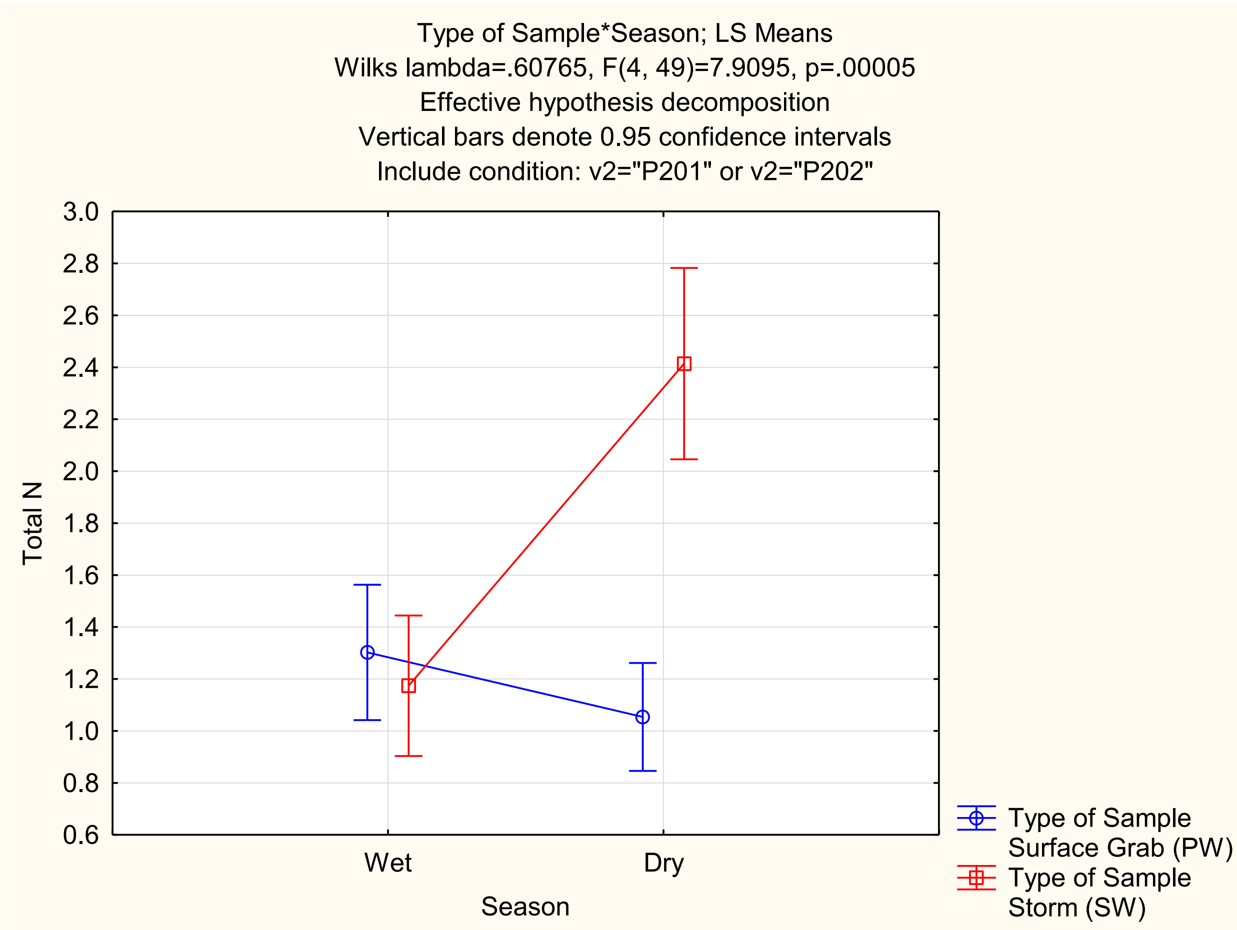

Figure 45: Interaction effect plot from a 2-Way ANOVA for the Total Nitrogen concentrations from the Pinellas communities (P201 and P202). Effects included sample seasonality (wet/dry) and type (retention pond/stormwater runoff).

For P201, ortho phosphorus and TP concentrations were statistically greater in stormwater runoff samples than in retention pond samples (Ortho-P, p<0.0001; TP, p=0.001; Figure 46). This pattern is particularly noticeable in the dry season stormwater runoff samples for TP concentrations where a few samples were > 1.1 mg/L. For P202, both ortho phosphorus and TP concentrations were greatest in the dry season stormwater runoff samples (Figure 47) with mean values around 0.57 mg/L. These values are above the expected mean EMC of 0.327 mg/L for TP concentrations from medium residential landscapes (ERD, 2007). For P201, stormwater runoff and retention pond ortho-phosphorus concentrations were statistically greater in the wet season compared to the dry season (p=0.01). In contrast, for P202, statistically higher mean ortho P and TP values for both stormwater runoff and retention pond samples were observed in the dry season (p=0.01 and p=0.04, respectively).

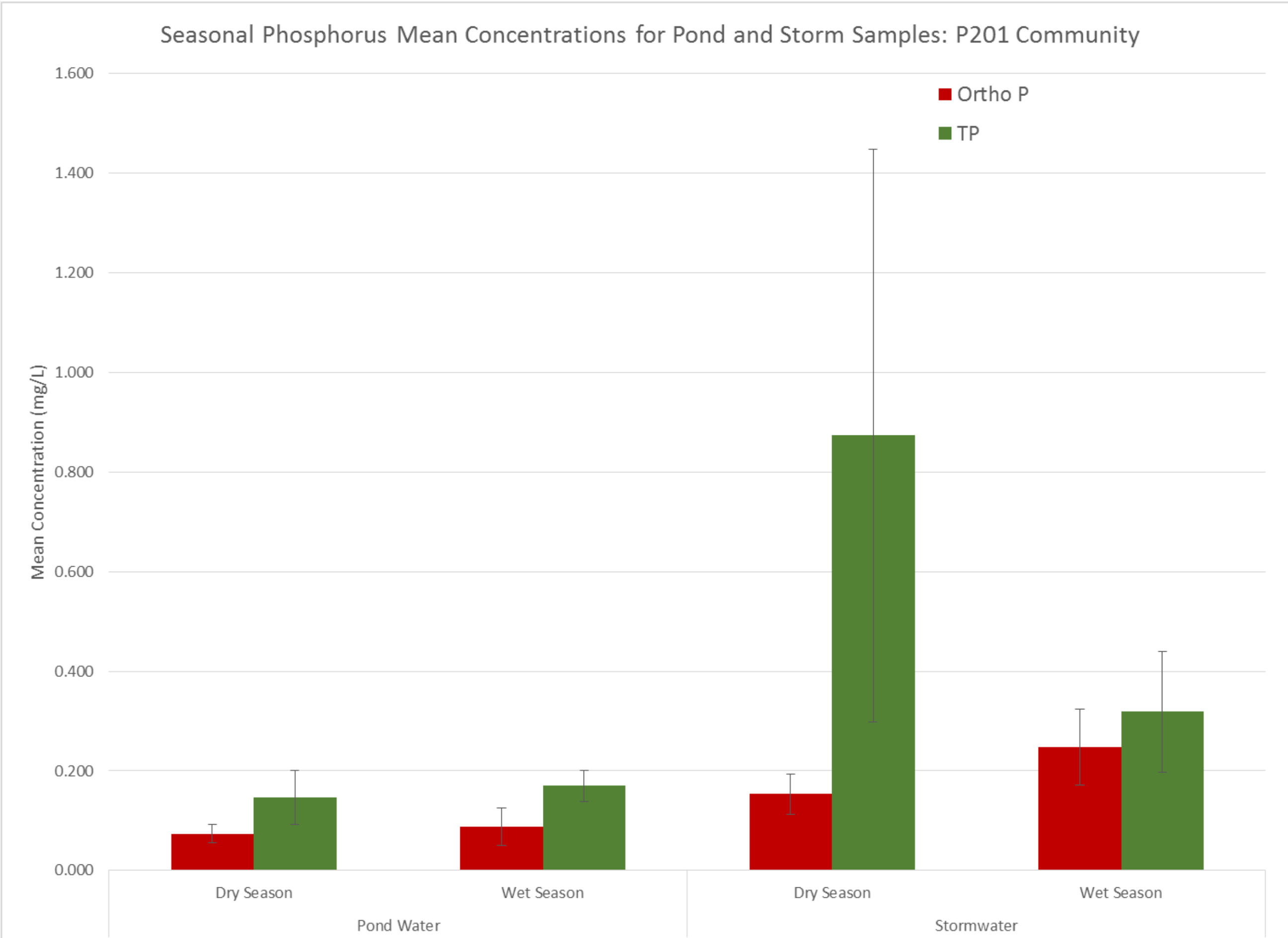

Figure 46: Mean (± 1 S.D. error bars) seasonal phosphorus concentrations (Ortho P and Total P) for stormwater runoff and retention samples for the Pinellas community (P201).

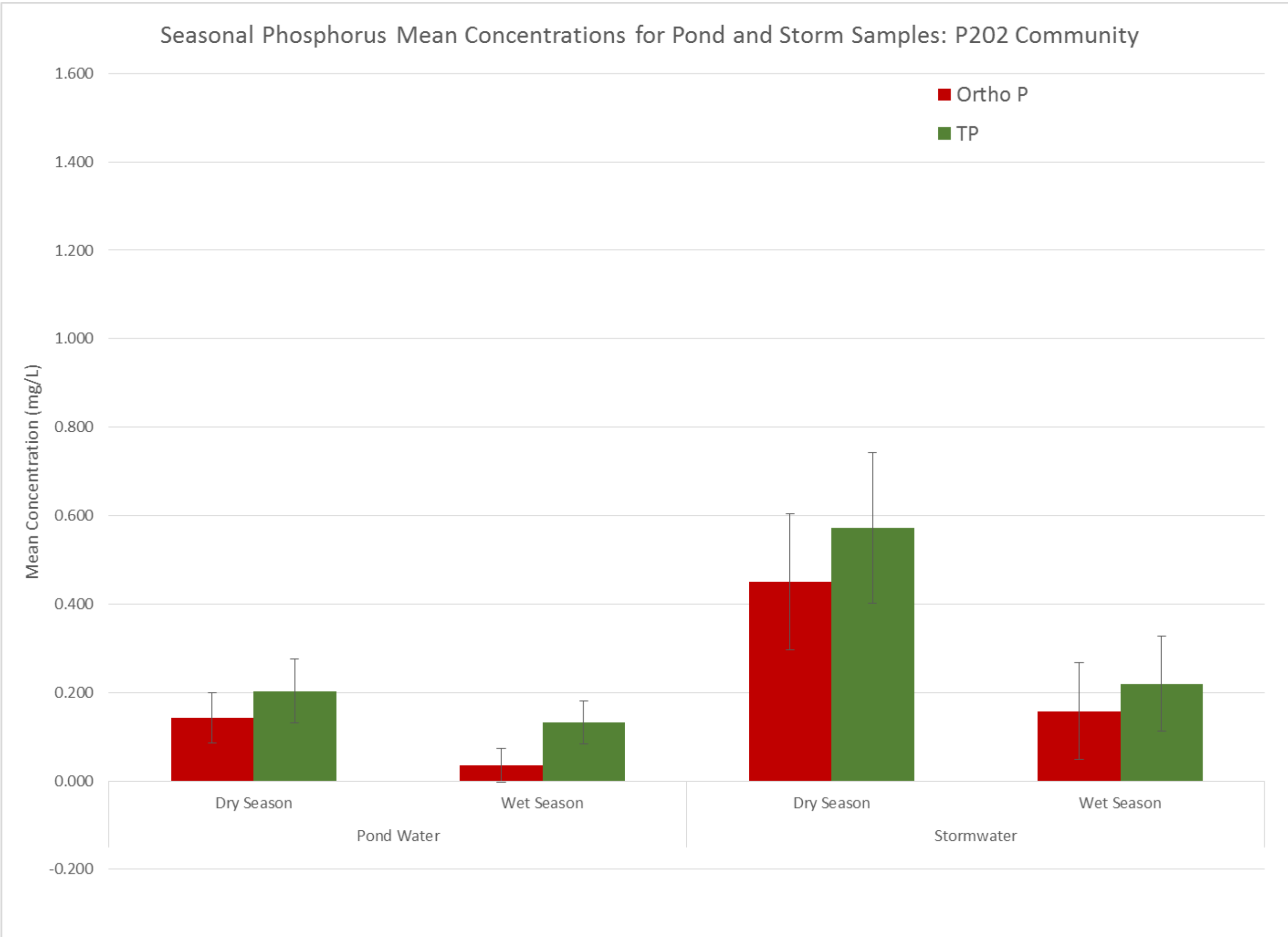

Figure 47: Mean (± 1 S.D. error bars) seasonal phosphorus concentrations (Ortho P and Total P) for stormwater runoff and retention samples for the Pinellas community (P202).

Linking Community Fertilizer Practices to Observed Environmental Data

Estimates of Community Nitrogen Loading from Social Monitoring Data

Half (50%) of the residents in the Manatee community (M101) reported not fertilizing their lawn at all, while all residents interviewed in the Hillsborough community (H101) fertilized or had their lawns professionally maintained during the study. Both Pinellas County communities had about a quarter of their residents not fertilize their lawns (25% in P201 and 29% in P202). Percentages of homeowners that did not fertilize, managed their lawns in-house or professionally, based on the Community Homeowner Interviews (Appendix G) are presented in Table 22

Table 22. Estimated percentages of landscape manager types by community (based on the Community Homeowner Interviews, Appendix G).

Community	Lawns Fertilized by Professionals (%)	Lawns Fertilized by Homeowners (%)	Lawns Not Fertilized (%)
H101	68	32	0
M101	16.5	33.5	50
P201	26	45	29
P202	30	45	25

The total pervious area was estimated from aerial photointerpretation of each of the communities Table 23). Based on the percentages of landscape manager types by community provided in Table 23, pervious area in each community managed professionally or by homeowners was calculated. Souto and Listopad (2013, 2014) calculated residential fertilizer inputs of nitrogen in Central Florida based on the quantity and formulae of fertilizers they used. They found that professionals typically applied according to the UF IFAS recommended rates - 3.5 lbs N/1000 ft^2/yr for St. Augustine turf grass. Homeowners applied on average 2.0 lbs N/1000 ft^2/yr, nearly half the recommended rate. The Hillsborough community (H101) had the largest area of land fertilized by professionals and the largest calculated fertilizer N input (93.63 Lbs N/acre), two to three times the amount estimated for the other three communities. Both M101 and P201 had similar estimated fertilizer N input per acre based on reported landscape management practices (38.82 lbs/acre and 38.30 lbs/acre, respectively).

Table 23: Estimated nitrogen (N) fertilizer inputs in each community based on research of Souto and Listopad (2013, 2014)[1].

Community	Professionally Fertilized (Acres)	Homeowner Fertilized (Acres)	Pervious Area Not Fertilized (Acres)	Total Community Area (Acres)	Total Pervious Area (Acres)	Fertilizer N Input (Lbs)	Fertilizer N Inputs (Lbs/acre)
H101	28.53	13.43	0.00	58.70	41.96	5496.3	93.6
M101	5.45	11.06	16.51	45.73	33.02	1775.2	38.8
P201	2.25	3.90	2.51	17.65	8.66	676.0	38.3
P202	16.06	24.08	13.38	102.90	53.52	4504.4	43.8

[1] Professional fertilizer application rates were assumed to be 3.5 lbs N/1000 sq. ft. Homeowner fertilizer application rates were assumed to be 1.96 lbs N/1000 sq. ft. based on 16% N formula. Note: Pervious area Includes lawns and common areas (Based on Souto and Listopad, 2013).

Estimates of Community Nitrogen Loading from Environmental Monitoring Data

Empirical Approach

Total nitrogen, TKN, NO_x, NH_3, ortho-P and TP loads were calculated based on *in situ* data collected from the 40 stormwater runoff sampling events (Appendix R). The ratio of organic (TKN) to total inorganic nitrogen was also calculated and added to Appendix S for all stormwater runoff samples. Table 24 presents mean load estimates and ratios across all communities. All loading values were normalized by basin area (loads are provided in lbs per acre), as well (Table 25). Mean event loading estimates were generally greater in the dry season in comparison to the wet season.

Table 24: Mean seasonal and annual per-event loads (in lbs) per analyte for all stormwater runoff samples collected from the four sampled communities.

Constituent Load (lbs.)	Dry Season n=16	Wet Season n=24	Annual n=40
TN	1.778 (2.12)	1.296 (1.49)	1.489 (1.76)
TKN	1.500 (1.89)	1.036 (1.15)	1.222 (1.49)
Total inorganic N	0.513 (0.52)	0.403 (0.54)	0.447 (0.53)
Ortho P	0.180 (0.16)	0.189 (0.26)	0.186 (0.22)
TP	0.395 (0.60)	0.332 (0.48)	0.357 (0.52)
Organic/Inorganic N ratio	3.356 (1.62)	3.694 (2.60)	3.559 (2.24)

Table 25: Mean seasonal and annual per-event loads adjusted for drainage basin size (in lbs/acre) per analyte for all stormwater runoff samples collected from the four sampled communities.

Constituent Load (lbs.)	Dry Season n=16	Wet Season n=24	Annual n=40
TN	0.090 (0.13)	0.058 (0.07)	0.071 (0.10)
TKN	0.076 (0.11)	0.045 (0.05)	0.058 (0.08)
Total Inorganic N	0.025 (0.03)	0.018 (0.03	0.021 (0.03)
Ortho P	0.010 (0.01)	0.009 (0.01)	0.009 (0.01)
TP	0.021 (0.03)	0.015 (0.02)	0.017 (0.03)

Mechanistic Approach

Backflow conditions at the stormwater runoff autosampler locations of the Hillsborough (H101) and Manatee communities (M101) caused underestimation of total runoff volume for these sites. As a result, an alternative loading estimate was developed using mechanistic approaches for all the communities (ERD, 2007). Ancillary data used to construct these estimates, such as soil hydrological group, appropriate runoff coefficients (based on ERD, 2007), monitored drainage area, and annual rainfall collected at each site, are provided in Table 26. Complete weekly rainfall records collected at the four sites are provided in Appendix S.

Table 26: Ancillary data used to develop mechanistic annual loading estimates of the four communities.

Site	Soil Hydrologic Group	Land Use	Cluster	Runoff Coefficient	Basin Area (acres)	2013-2014 *In Situ* Annual Rainfall (in)
H101	C (some A and D)	SF Residential 25% (calculated at 28%)	4.00	0.24	40.32	56.18
M101	D (B/D)	SF Residential 25% (calculated at 27%)	4.00	0.29	33.97	55.37
P201	D (B/D and D)	SF Residential 40% (calculated at 50%)	4.00	0.36	18.29	43.68
P202	A (minor D)	SF Residential 40% (calculated at 50%)	4.00	0.23	13.22	57.69
Mean	N/A	SF Residential 40%	4.00	0.28	26.45	53.23

Table 27 presents total annual loading estimates based upon this approach. Annual average total TN loads per acre across all communities were estimated to be 3.78 lbs/acre for TN and 0.59 lbs/acre for TP. Highest TN loads/acre were estimated to be present at H101 (3.81 lb/acre), followed by P202 (3.72 lb/acre), P201 (3.63 lb/acre) and finally M101 (3.47 lb/acre).

Table 27: Total mechanistically-estimated loads for the four communities over the 18-month sampling period.

Community	Mean TN (mg/l)	Mean TP (mg/l)	Total Runoff Volume (m3/yr)	Total TN Load (lbs/yr)	Total TN Load by Area (lbs/yr*acre)	Total TP Load (lbs/yr)	Total TP Load by Area (lbs/yr*acre)
H101	1.76	0.19	56,546.51	153.42	3.81	12.01	0.30
M101	1.39	0.37	55,069.64	117.79	3.47	22.62	0.67
P201	1.45	0.49	29,709.97	66.39	3.63	15.85	0.87
P202	1.76	0.36	18,098.44	49.19	3.72	7.18	0.54
All	1.60	0.35	40,534.52	99.94	3.78	15.54	0.59

In addition, to be able to better test the hypotheses comparing nutrient loading among the same approach was used to develop per event loadings (see Statistical for details). Even though the average TN load was significantly higher ($p<0.05$) in (2.53 lbs) in comparison to the other communities (1.4 lbs in M101 and only 1.01 communities), no statistical significance was encountered once these values were drainage basin area (

Table 28). The H3 hypothesis stating that there is no significant difference in pollutant loads among the different counties could not be rejected based on the limited dataset used to estimate nutrient loads.

The two Pinellas communities presented different TN loads, but once adjusted for basin drainage area, these became comparable (0.067 lbs/acre for both P201 and P202), and no statistical significance was encountered between these two communities representative of different socioeconomic levels. The H5 hypothesis could also not be proven to be rejected false based on this estimated pollutant load dataset.

Table 28: Mean event-based estimated loads for the four communities using the mechanistic approach.

Community	Mean Event Runoff Volume (m3)	Mean Event TN Load (lbs)	Mean Event TN Load by Area (lbs/acre)	Mean Event TP Load (lbs)	Mean Event TP Load by Area (lbs/acre)
H101	1,017.68	2.528	0.063	0.193	0.005
M101	795.50	1.442	0.042	0.259	0.008
P201/P202	462.77	1.058	0.067	0.197	0.012
All	1,017.68	2.528	0.063	0.193	0.005

Additional Evidence of Community Nitrogen Inputs: Isotopic Data Analyses

The dual isotopic signature of soil nitrate in all communities was typical of nitrate derived from mineralized fertilizer in soil (Roadcap et al. 2002). Soil nitrate from the Manatee community (M101) exhibited a signature that tended to be more depleted in ^{15}N and more enriched in ^{18}O when compared to other communities (Figure 48). The reason for this shift is not known, but it may be that atmospheric oxygen contributes more to nitrate formation at this site, due to sandier conditions and lower organic matter. Samples from the various sites tended to fall along the denitrification trendline. This trendline indicates that the soil nitrate at the various sites becomes progressively enriched with ^{18}O and ^{15}N during denitrification (Bottcher et al. 1990). Even though the samples from M101 are shifted to the left due to their higher ^{18}O content, they otherwise fall along the same slope expected for progressive enrichment of the two isotopes during denitrification. Samples from the same neighborhood sites are expected to vary along this line due to differences in denitrification rates at specific sampling locations within yards and between yards among the communities.

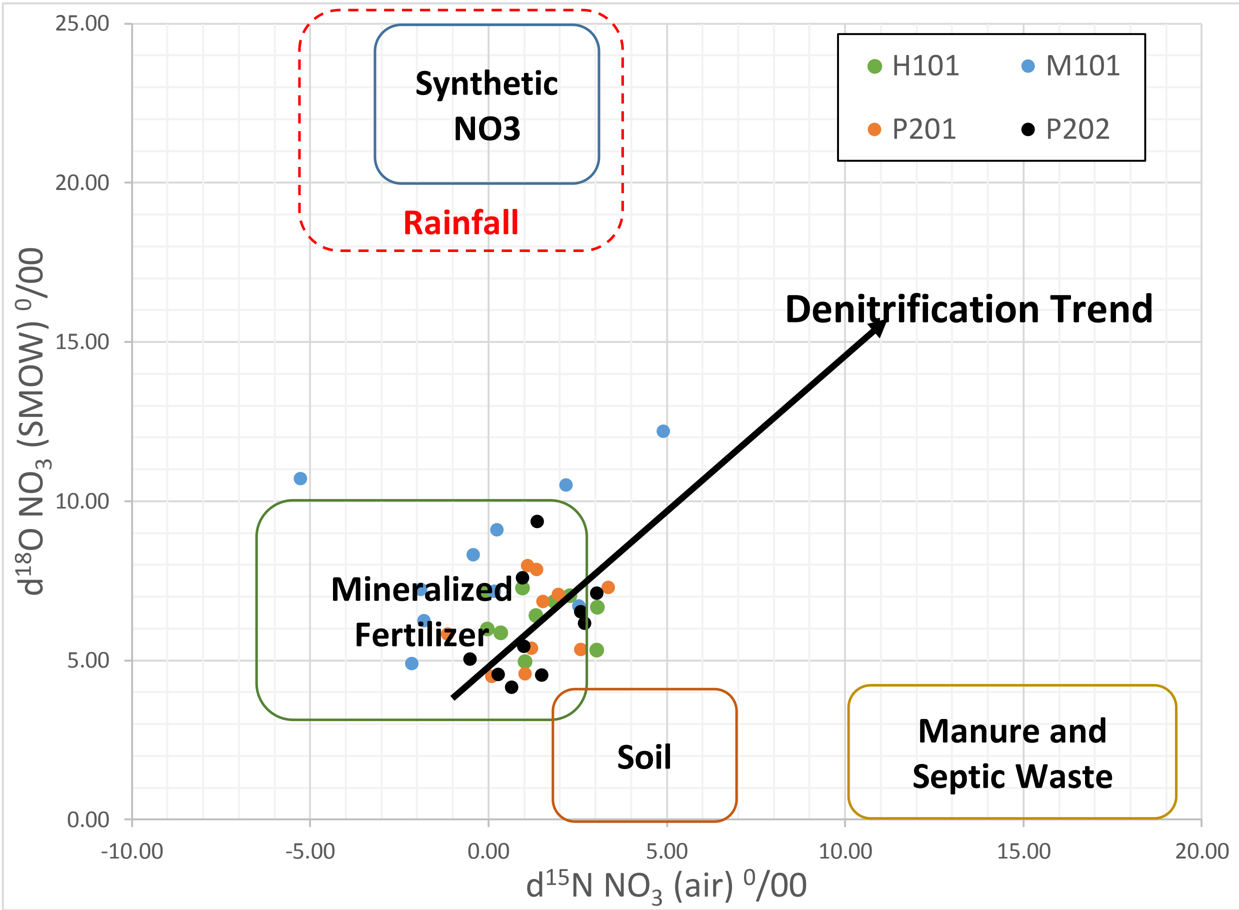

Figure 48: Soil $\delta^{15}N$ and $\delta^{18}O$ Isotopic sample data for nitrate. Sources of nitrate are represented by the boxes in the most expected ranges (variability in these ranges are expected).

Stormwater runoff collected throughout the study period in the four neighborhoods had nitrate $\delta^{15}N$ that ranged from -11.41 to +11.90 (Figure 49). This range was wider than the range reported for stormwater runoff nitrate at two sites in south Lido Key, near Sarasota Bay (-5.12-+4.15; Dillon and Chanton 2005). The variation in observed $\delta^{15}N$ in stormwater runoff suggests that the nitrogen sources may vary through time. The greatest variation occurred during the June - October 2013 wet season. Rainwater nitrate $\delta^{15}N$ (-5.0 to +3.8) and stormwater nitrate $\delta^{15}N$ reported in the Sarasota study were similar (Dillon and Chanton 2005), and most samples collected from the four residential neighborhoods in our study fell within this range too with some exceptions as noted below. The nitrate $\delta^{15}N$ values, taken alone, do not provide sufficient evidence to differentiate potential sources of stormwater nitrate, but they do suggest that nitrogen sources vary among sample dates within sites and also among sites. The Manatee community (M101) had elevated stormwater nitrate $\delta^{15}N$ values in several of the summer 2013 samples. These higher $\delta^{15}N$ values indicate the nitrate source in these samples were likely from terrestrial sources rather than fertilizer sources, since they exceeded the expected rainfall nitrate $\delta^{15}N$ based on values reported in the Sarasota study and in a study from coastal North Caroline (-2.0 to +4.7;

Paerl and Fogel 1994). The Hillsborough community (H101) had several stormwater runoff samples in the 2013 rainy season that were more depleted in ^{15}N when compared to samples from other communities. The lower $\delta^{15}N$ from samples at that site suggest that rainfall was the main source of nitrate on those dates, because other sources, including fertilizer, would not be expected to have such low $\delta^{15}N$, but rainfall nitrate has been reported to have a broad $\delta^{15}N$ range that includes values this low (Heaton 1986, Townsend et al. 2002). High rainfall amounts in July and August of 2013 may explain why stormwater nitrate was dominated by rainfall inputs at these sites, especially if other sources were flushed out during earlier rain events. The lowest $\delta^{15}N$ for all sites occurred during this same period, indicating increased contribution of rainfall to total nitrate in stormwater during this period, when total inorganic nitrogen concentrations tended to be lower than earlier and later in the year. Nitrogen sources for stormwater runoff samples appeared to be from depleted sources which primarily included contributions from rainfall, but also potentially fertilizers.

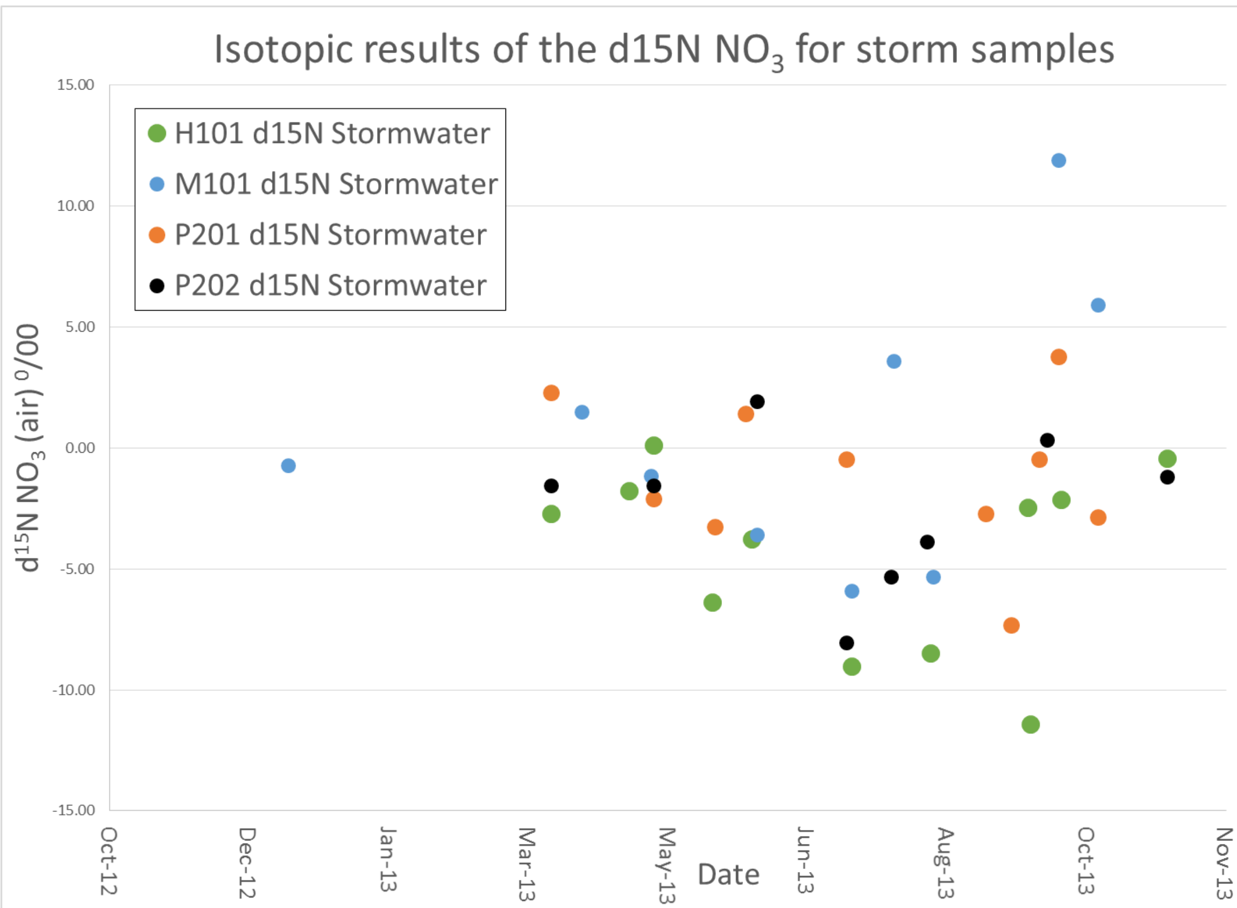

Figure 49: Stormwater runoff $\delta^{15}N$ isotopic sample data for nitrate by date. Each community is represented by a different color.

Corresponding $\delta^{15}N$ stormwater ammonium values ranged from -19.57 to 0.97, which were considerably lower than ranges reported for stormwater ammonium $\delta^{15}N$ in the Sarasota study (+7 to +18%; Dillon and Chanton 2005), but were similar to reported ranges for rainwater in the Sarasota study (-11.6% to -0.3) and ranges given for rainfall in coastal North Carolina (-12.5 to 3.6; Paerl and Fogel 1994). Again this suggests rainwater as a major nitrogen source in stormwater runoff in the current study (Figure 50). Although fertilizer ammonium would also have a $\delta^{15}N$ in the range observed in this study, it would be expected that some portion of the fertilizer ammonium would be nitrified following application, slightly increasing the $\delta^{15}N$ of any remaining ammonium. Other potential sources of ammonium, such as from decaying grass clipping or surficial runoff from soil surfaces would also be expected to have a higher $\delta^{15}N$ than observed in our stormwater runoff samples. Thus, the isotopic evidence points to rainwater as the main nitrogen source of stormwater runoff observed in this study.

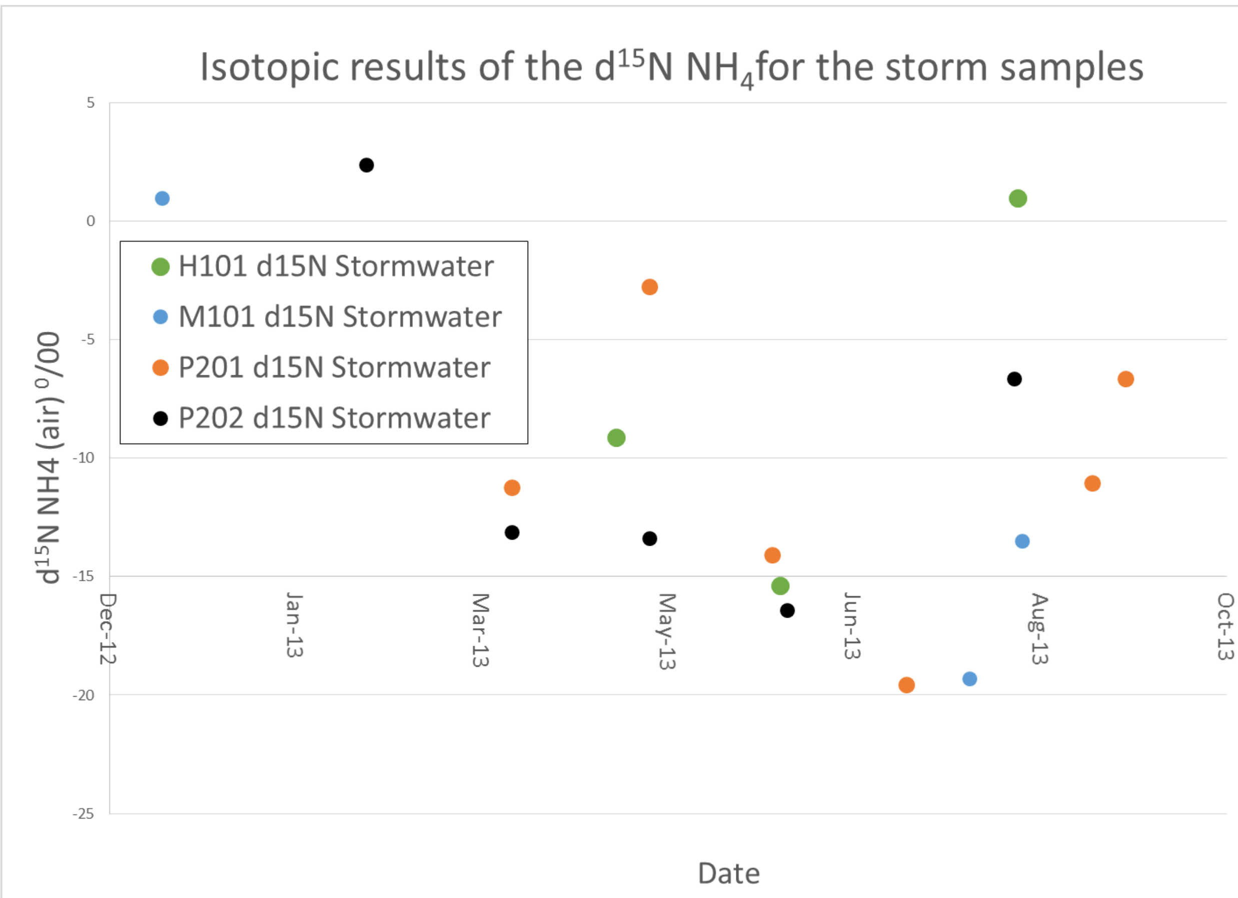

Figure 50: Stormwater runoff $\delta^{15}N$ isotopic sample data for ammonium by date. Each community is represented by a different color.

The $\delta^{15}N$ of the retention ponds tended to be higher than stormwater runoff values which is expected due to increasing enrichment during biological transformation occurring in sediments and the water column (Figure 51). The low values observed at H101 and P202 in July, August and October, suggest that those samples may have been taken shortly after periods of heavy rain after which pond water may have been strongly influenced by rainfall nitrogen sources. The low $\delta^{15}N$ values observed in H101 correspond to times when the $\delta^{15}N$ of stormwater runoff inputs was also low. Hillsborough community (H101) retention pond was the smallest pond in the study and tended to dry out during drier periods; thus, the retention pond water samples were likely dominated by stormwater runoff inputs during heavy rainfall periods.

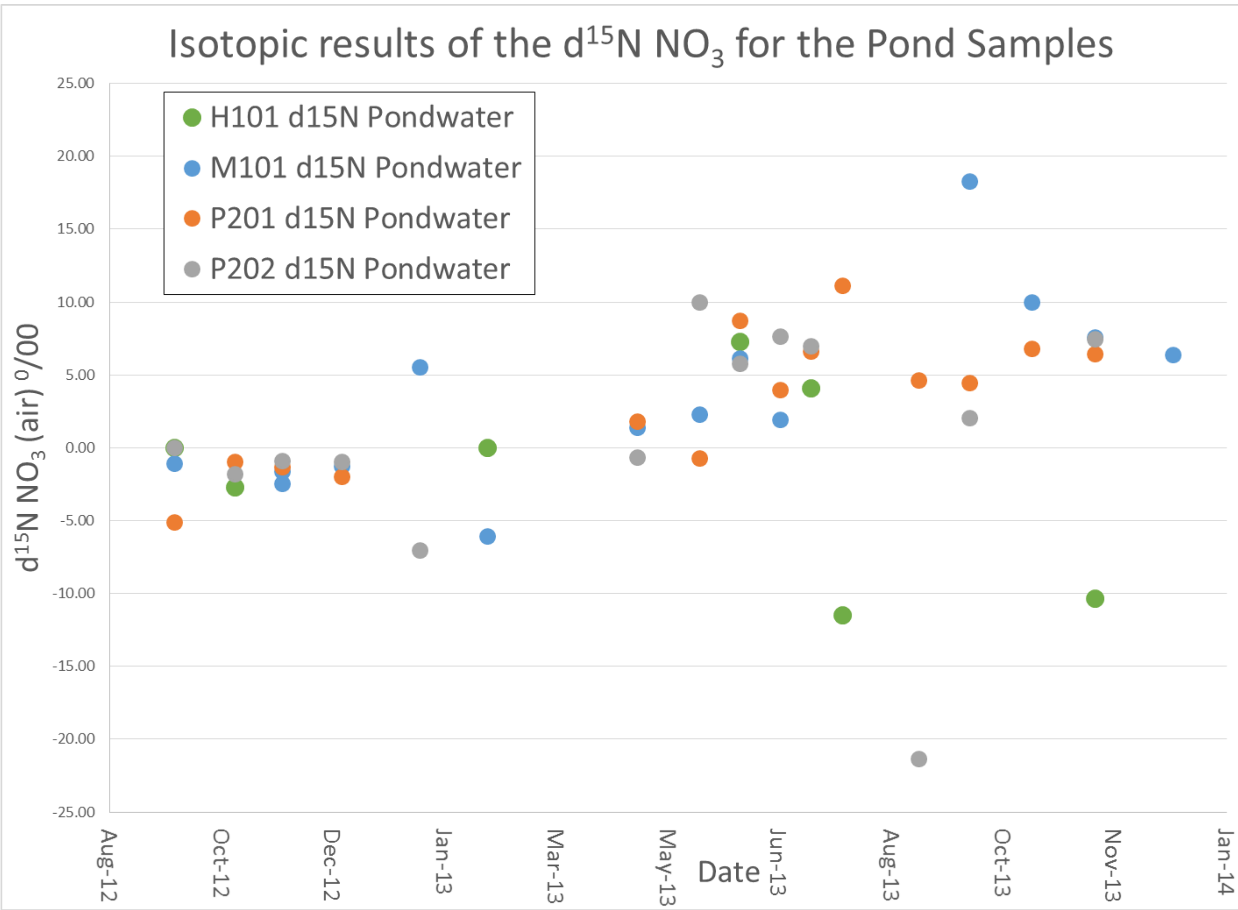

Figure 51: Retention pond $\delta^{15}N$ isotopic sample data for nitrate by date. Each community is represented by a different color.

Isotopic signature data for both ^{15}N and ^{18}O were only available for a limited subset of stormwater runoff and retention pond samples collected during the study period (Figure 52). As expected the retention pond samples tended to be more enriched in ^{15}N than the stormwater runoff samples as a result of isotopic fractionation that occurs during transformations in the pond, such as ammonium volatilization, denitrification or nitrification (Mariotti et al. 1981, McClelland and Valiela 1998). This was not the case for one, H101 retention pond sample which was depleted in ^{15}N relative to an antecedent stormwater runoff sample; however, only one, H101 retention pond sample with both isotopic signature data was available to draw conclusions from. These data are consistent with the larger $\delta^{15}N$ dataset which showed that nitrate and ammonium of both the retention ponds and stormwater runoff tended to be more depleted in ^{15}N at the H101 site relative to the other communities (especially for Summer 2013 samples). These low $\delta^{15}N$ values indicate a potential atmospheric source, because, as discussed above, such low $\delta^{15}N$ are more characteristic of rainfall than other sources. The Manatee community (M101) samples showed a higher $\delta^{15}N$ for both stormwater runoff and retention ponds, as shown in previous results. Because nitrate in soil extracts from this site were depleted in ^{15}N relative to the other three sites, there was no evidence that soil leaching contributed significantly to stormwater or retention pond nitrate at M101. High $\delta^{18}O$ signatures in nitrate indicate either a fertilizer or atmospheric source based on our findings.

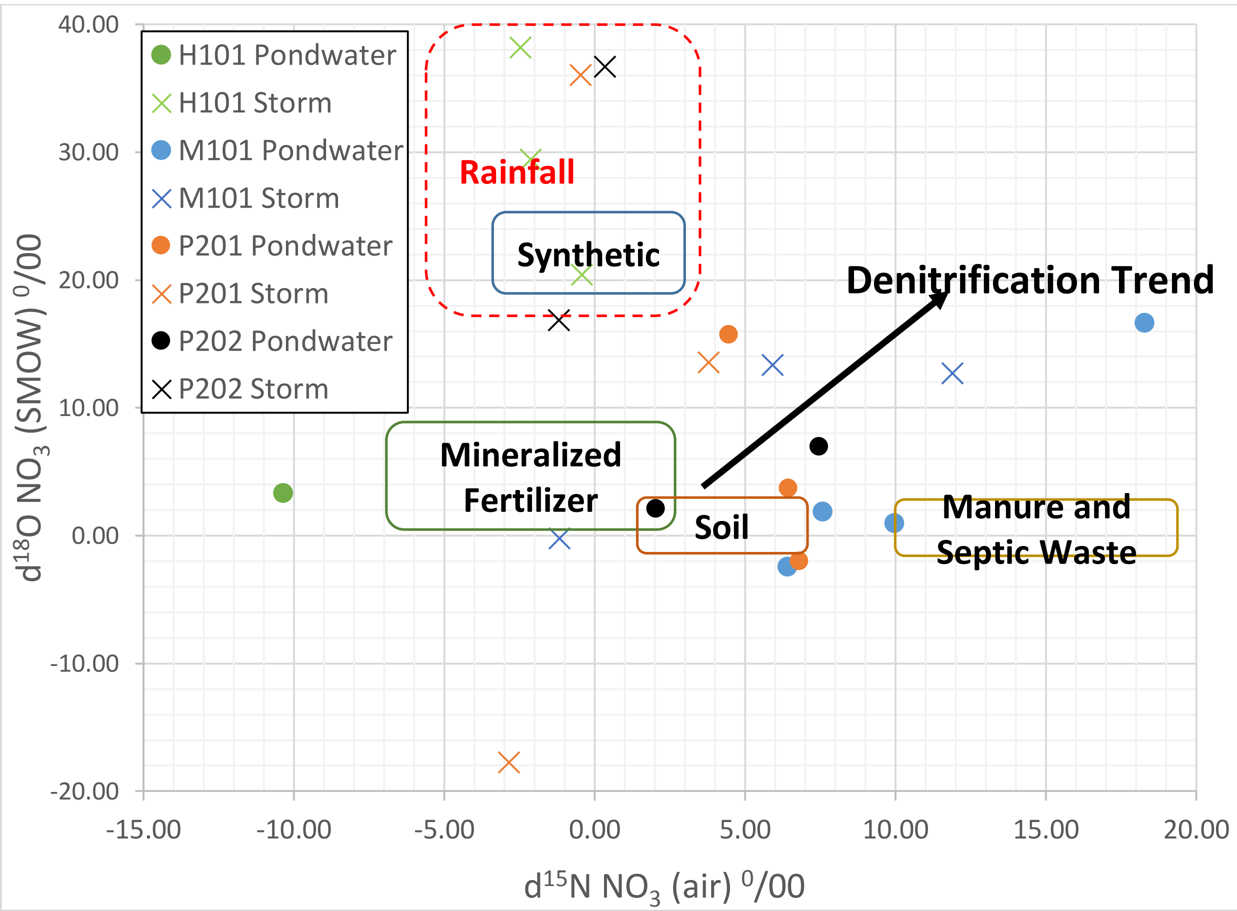

Figure 52: Available stormwater runoff and retention pond $\delta^{15}N$ and $\delta^{18}O$ isotopic sample data for nitrate. Sources of nitrate are represented by the boxes in the most expected ranges (variability is expected within these ranges).

Hillsborough community (H101) consistently had the highest $\delta^{18}O$ in stormwater runoff. This community also had the highest reported fertilizer usage by residents. Unfortunately with this limited dataset, it is not possible to distinguish between fertilizer and atmospheric sources at H101 or the other communities. However, the weight of evidence would suggest that atmospheric sources of nitrogen at

H101, as well as, potential fertilizer sources may be contributing to stormwater runoff loads at this site -- more so than in the other communities. It is also not clear why M101, with the lowest reported fertilizer use by residents, would consistently have a lower contribution of atmospheric nitrate relative to other communities, as indicated by the lower $\delta^{18}O$ in stormwater nitrate at this site. Although synthetic fertilizer nitrate has a $\delta^{18}O$ ranging from 20 to 25, many nitrogen fertilizers containing ammonium or urea, and nitrate produced from nitrification of these sources would have a much lower $\delta^{18}O$ than fertilizer nitrate (Roadcap et al. 2002). Atmospheric $\delta^{18}O$ concentrations range from +25 to +75, so it is difficult to tease apart atmospheric and nitrate fertilizer sources in the isotopic ranges of 0 to-5.0 for $\delta^{15}N$ and +20 to +28 for $\delta^{18}O$. Furthermore, it is likely that fertilizer-derived nitrate in stormwater runoff would consist of a mixture of fertilizer nitrate sources and fertilizer ammonium sources that have been nitrified. Such a mixture would have a $\delta^{18}O$ value much lower than the high values observed for the three H101 stormwater runoff samples and P201 and P202 runoff samples collected under this study. Thus, atmospheric sources may explain the majority of higher $\delta^{18}O$ in those stormwater samples. More extensive sampling of sources including collecting rainwater and determining its isotopic signature are recommended in the future to provide better discrimination among potential sources of nitrogen in stormwater runoff collected from these communities.

Conclusions

Fertilizer Ordinances as a Mechanism for Behavior Change

In 2010, Pinellas County passed the most restrictive local urban fertilizer regulation in the State of Florida. The ordinance required that residential fertilizer contain at least 50% slow-release nitrogen, it required that a soil test be conducted to understand if phosphorus was needed before it could be applied; it established a 10-foot setback from the water, and it defined a restricted season from June 1 to September 30 during which nitrogenous fertilizer could not be applied to the lawn or sold at a retail establishments. Fertilizer distributors have to remove nitrogenous fertilizer from the shelves during the restricted season. The Pinellas County ordinance has since been exempted such that no other local government can implement a sales restriction, thus making the Pinellas County ordinance unique in the State of Florida.

Because nutrient cycles and inputs are multi-faceted and complex, evaluating the effectiveness of fertilizer ordinances requires a comprehensive look at the linkages between resident ordinance awareness, behavior change, community nutrient inputs, and associated loading potential from residential communities. We attempted to capture adequate data to evaluate these linkages given limited time and budget for the project.

Data garnered from the telephone and community surveys suggested that residents were knowledgeable and complying with the prescribed behavior where fertilizer ordinances have been implemented. In Pinellas County where the most restrictive fertilizer ordinance and extensive ordinance awareness campaign had been in place for the longest period of time, homeowner ordinance awareness, knowledge, and implementation were significantly higher than in the other two counties. For example:

1) Pinellas County residents were significantly more aware of fertilizer ordinances;

2) Pinellas County residents were more knowledgeable about the ordinance and were significantly more likely to cite specific details prescribed by the ordinance such as not fertilizing before a heavy rain event and during summer fertilizer restrictions; and

3) Pinellas County residents were applying significantly less fertilizer to their lawns as demonstrated by fertilizer frequency and the calculated nitrogen inputs associated with their behavior.

Based on these social survey outcomes, we can conclude that the Pinellas County fertilizer ordinance has effectively changed behavior with the caveat that we were not able to evaluate behavior prior to the ordinance being enacted.

In Hillsborough County, where fewer fertilizer application restrictions were in effect, residents reported applying fertilizer significantly more frequently than Pinellas County residents and the estimated N inputs associated with their reported fertilizer behavior were greatest of all the communities surveyed. This can at least be partially explained by the lack of an ordinance with a seasonal sales restriction, but other confounding socio-economic influences may also contribute to these observations. For example, Hillsborough County residents had the highest reported income in the countywide telephone surveys and associated census data which would suggest that their fertilizer use would be higher based upon previous research (Boyer *et al* 2002, Larsen and Harlan 2006, Robbins *et al* 2001). However for the community-level surveys, when taking into consideration the deliberate selection of near comparable income and economic status for the communities sampled under this study, this conclusion does not hold. Pinellas community (P201) had the highest property values, nearly double the average property value in Hillsborough community (H101), yet P201 residents were estimated to apply fertilizer far less frequently than H101 residents [though more frequently than a less affluent Pinellas community (P202)].

These observations suggest that the Pinellas County ordinance may be more significantly impacting resident fertilizer behaviors compared to residents in other counties and communities. Pinellas County residents are reporting to apply fertilizer far less frequently than residents in Hillsborough County.

Resident Behavior Change and Potential Impacts to Community Nitrogen Inputs

Sebilo et al (2013) found that nitrogen can be retained in soils for decades and released slowly over time. This suggests that reducing nutrient pollution from residential sources will require reducing the accumulation of total nitrogen from the system over time. In this study, we examined potential nitrogen inputs from reported lawn fertilizer behaviors in each of the four communities.

Community-level survey results suggest that Hillsborough community (H101) resident lawns are receiving the greatest N fertilizer inputs (93.6 Lbs/acre) relative to Pinellas (P201 = 38.3 lbs N/acre; P202 = 43.8 lbs/acre) and Manatee (M101 = 38.8 lbs/acre) community lawns (Table 15). This directly relates to the reported percentage of land area managed by professionals who apply fertilizer according to the IFAS recommended rates, which in comparison to homeowner, do-it-yourselfers apply fertilizer at a greater rate (WEKIVA study reference).

Scant data reported by professional landscape managers in the communities (n = 6) did not suggest that less nitrogen was applied during the study period, but they did suggest that they were not typically applying nitrogen fertilizer during the summer months. There has been some suggestion that the "unintended consequences" of a seasonal restriction would be an increased N application rate prior to and following the restricted season. Therefore in this region, fertilizer ordinances may not be affecting a total reduction in annual fertilizer N inputs by professionals. As a result, potential impacts to community water quality may persist through time regardless of ordinances implemented within the region.

Resulting Community Water Quality

In the short timeframe of this study, it is difficult to confidently establish the final link between changes in resident behavior and long-term environmental benefits that may result because of the complexity and temporal lag of nutrient cycling within residential neighborhoods.

Although the average estimated TN load was higher in the H101 community relative to the other communities (2.53 in H101, 1.4 lbs in M101 and only 1.01 in P201 and P101), the difference was found to be insignificant once the values were standardized by drainage basin area. However, power analysis demonstrated that there was an inadequate sample size to confidently test if no significant difference exists in the pollutant loads and surface water nutrient concentrations of the four communities.

Based on a power analysis of the surface water data, a minimum of 22-32 samples would be required to confidently detect a 20% reduction in TN concentration. The number of stormwater samples required to confidently detect a 20% reduction in TN concentration varied between communities from 54 - 85 samples. The sample monitoring requirements needed to confidently detect a change in TN, TP and total inorganic nitrogen are presented in the Recommendations Section in Table 29.

In addition to the load variations associated with rainfall and seasonality, community soil chemistry varied significantly between the communities, confounding site specific source and sink dynamics. The following paragraphs support the need for long-term stormwater sampling based on soil source and sink dynamics over time.

There were significant differences in nutrient soil characteristics between the communities that influence nutrient dynamics. For example, Pinellas community (P201) soils had significantly higher organic content compared to the other communities, which could serve both as a sink for continued fertilizer N inputs or a continued source of N leaching and runoff over time. Phosphorus concentrations were much greater in Manatee community (M101) soils in comparison to the three other communities and M101 also had the greatest retention pond P concentrations indicating that underlying soil conditions in that community influenced ambient surface water conditions.

The historical context and evolution of soil characteristics within each of the communities is not clear. Whether these characteristics were pre-existing at the sites, arose during construction of each of the communities, or have evolved from landscape management practices over their history remains to be investigated. Previous research from others may help to clarify these possible pathways. For instance, lawn thatch in residential lawns can be a considerable nitrogen sink, but one that can also limit the lawns ability to take up naturally occurring nitrogen (Raciti et al. 2008; Engelsjord et al. 2004; Frank et al. 2006). These studies found that disturbed soils more readily accumulate carbon and nitrogen, that lawns readily take up labile sources of nitrogen in lieu of more recalcitrant mineral sources, and that the lawn had greater leaching potential over time. Raciti et al. (2008) challenge future research with the question “How long can lawns continue to sequester high inputs of nitrogen?”

Sebilo et al. (2013) provided some clarification in their study of abandoned agricultural lands. Three years after fertilizers that contained a tracer were applied, they found that 32 – 37% of ^{15}N-labeled fertilizer was still bound in the soil organic matter (Figure 53). Twenty-five years later, 12-15% was still there. They concluded that mitigation or restoration measures must take into account the delay resulting from legacies of past applications of synthetic fertilizers in agricultural systems. A similar lag may occur in fertilized residential landscapes that are receiving high inputs of nitrogenous fertilizers. The soil organic matter holds the key to understanding the potential for the landscape to act as a sink for binding nutrients or as a source (Law et al. 2009).

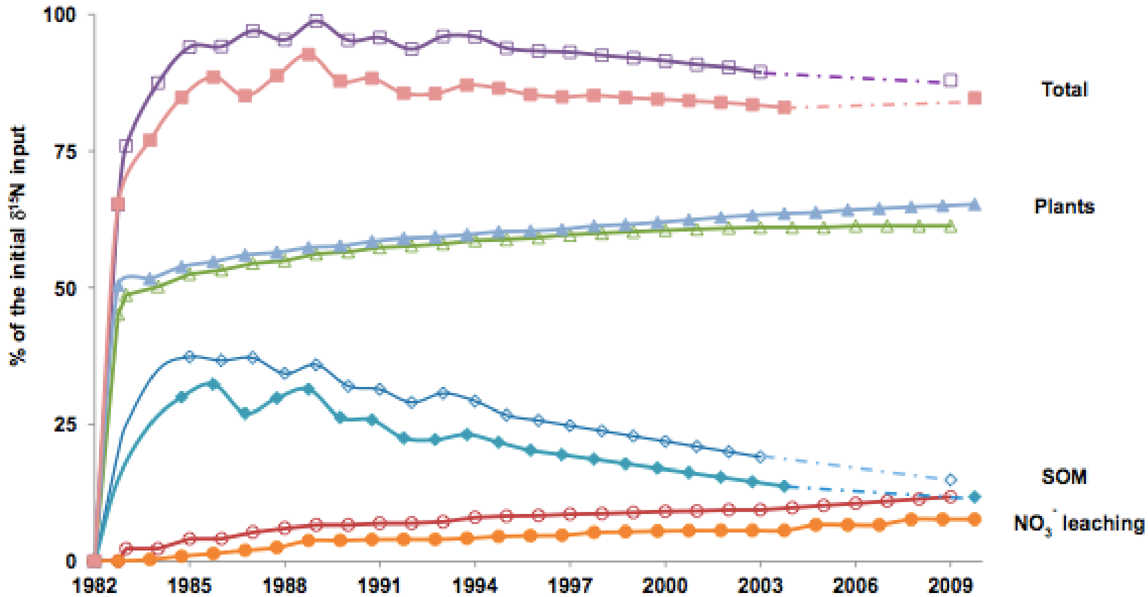

Figure 53: Percentages of ^{15}N-labeled fertilizer in soils, leachate, and plants through time in two different study plot piezometers (From Sebilo et al. 2013).

Our study suggested that seasonal variations in community water quality nutrient concentrations may be more sensitive to initial rainfall and first-flush dynamics than landscape management practices. Rainfall timing and volumes appeared to influence the build-up of nutrients within the residential landscapes. During long periods of no rain, nutrients were assumed to accumulate in the form of dry deposition, biomass and soils and were then washed into stormwater during the first rain event. This "first flush" of stormwater runoff often had higher concentrations of nutrients when compared to runoff events that occurred during the wet season. Community rainfall patterns were important to consider in understanding nutrient fate and transport at the community-level.

Stormwater nutrient composition differed in the first rain event of the season compared to those later in the year. We found greater concentrations of organic nitrogen (TN and TKN) and lower concentrations of dissolved and inorganic N in stormwater runoff after long periods of no rain within the communities. This may be indicative of particulate organic nutrients that have accumulated on the residential landscape between rain events and then flushed into the stormwater system after the first initial seasonal storm event. Stormwater runoff concentrations and resulting total loads over seasonal rainfall events must be considered within the larger pattern of rainfall to understand the loading potential from a community. In both Pinellas communities (P201 and P202), stormwater runoff nutrient concentrations peaked at the end of the dry season and then decreased over the wet season samples (became more diluted?), peaking again at the beginning of the dry season. However, greatest estimated nutrient loads occurred in communities were reported fertilizer frequency was greatest.

Differences in community stormwater systems must be considered in these results. Hillsborough community's (H101) stormwater pipe where the autosampler was installed was compromised during the study. There was an apparent rupture of the line, or a clog, where the line broke and washed away the soil outside the pipe, undermining the culvert. It was uncertain what the cause was or when it was repaired. Initial flows when establishing the pacing at this site were difficult. Additionally, the retention pond at this site nearly dried out during the dry season, unlike all the other communities' ponds. We would expect samples from the H101 stormwater pond to be dramatically different than the samples of a skimmer into a wetland type system, such as the one at P201. The M101 stormwater system had little gradient and remained full of water all of the time. The pipes were large and mostly submerged and served almost as a reservoir between storm events. P201 system discharged to a skimmer that outflowed to a wetland. Considering these structural differences, our conclusions must be interpreted with caution, and a more thorough long-term study would be needed to provide accurate estimates of differences in runoff among these communities.

Recommendations

Coastal eutrophication is becoming more widespread and the number of waterbodies considered impaired for nutrients has increased, requiring additional regulatory measures to be enforced. As Total Maximum Daily Loads (TMDLs) are issued and Basin Management Action Plans (BMAP) are implemented to restore these impaired waterbodies, a critical element for managing eutrophication appears to be missing. Watershed efforts to model and predict water quality are often based on general land use and soil characterizations, ignoring the subtle "human component" of a landscape. This study provides additional understanding on how human behaviors and community characteristics influence residential community inputs to watershed loadings that affect downstream water quality.

Results from this study suggest that alternative, non-structural BMPs (such as strict fertilizer ordinances) can also influence water quality from residential landscapes, and should be considered by local jurisdictions to offset eutrophication impacts. Furthermore, behavioral components of residential landscapes should be considered in watershed-scale predictive modeling of water quality. Accounting for socio-demographic factors, local fertilizer interventions, and their success in changing behavior, is critical in fine-tuning watershed loading models, particularly those at local neighborhood and community scales. After most of the cost-effective and affordable structural BMPs are completed, local communities might need to consider "out-of-box" solutions, often non-structural ones, to achieve nutrient reductions as required by TMDL and BMAP regulations. Interventions of the non-structural nature are highly cost-effective, especially when considering they can be implemented across multiple landscapes and communities.

Additional research is needed at the community-scale. *In situ* experimental designs that demonstrate the linkages between community runoff and downstream water quality are essential. Long-term monitoring (multi-year) is critical to confidently relate changes in human behaviors and the associated environmental response, particularly when attempting to tease out any time lag between changes in resident nutrient inputs and measurable nutrient outputs to receiving water bodies. Seasonal variations in nutrient inputs, rainfall, and resulting stormwater runoff quality will require a larger number of samples and replicates to confidently conclude and interpolate results in the future.

In urban ecology studies, confounding variables are commonly encountered, as they were in this study. There were difficulties selecting appropriate communities for monitoring after controlling for dozens of factors, and budget and time restrictions required that community selection occurred prior to thoroughly exploring the confounding factors potentially represented within the region. The following recommendations are proposed for establishing a future study design:

- Further *in situ* research is needed at the community-scale to fully appreciate the extent that residential landscapes may impact water quality. Understanding resident behavior is also essential to understanding the community-scale impacts to downstream water quality. Community-level field research that integrates human and environmental dynamics of the residential landscape will provide greater understanding of potential water quality impacts to downstream water bodies.
- *In situ* experiments to evaluate behavioral interventions should be set-up prior to and after the effective intervention such as an ordinance, education program, or other behavioral incentive (e.g. BACI design). These provide greater statistical power, since this design can more easily

account for differences across communities by evaluating the same community before and after a change may have occurred.

- A behavioral intervention study where the landscape is managed or controlled by the research team allows control of fertilizer application amount and timing that can clarify the behavioral effect at a community scale. In this type of study, an entire community would be applied a very consistent treatment with the landscape managed uniformly (e.g. fertilizer applied only once in a dry season month) and compared to a similar nearby control community (e.g. fertilizer applied several times a year including during the wet season).
- Fertilizer tracer studies where a fertilizer labeled with heavy nitrogen (high $\delta^{15}N$) is applied at a known rate and then followed through the residential landscape using long-term monitoring of soil, plant, and local and downstream receiving waterbodies is needed. This method allows for a more complete understanding of residential landscape nutrient cycling and provides specifics on nitrogen leaching/runoff lag times. This would be critical in understanding the expected lag in observing water quality benefits from the implementation of a behavioral intervention.
- Studies should further invest in the use of isotopic data, particularly relying on both ^{15}N and ^{18}O values of nitrate for all stormwater runoff samples. Rainfall isotopic samples (several per season) are also recommended to be collected for each of the monitored study sites. This would strengthen the ability to distinguish the source of nitrogen in collected stormwater samples by providing estimates of the isotopic signature of atmospheric deposition at the study site.
- Socio-behavioral studies dedicated to community-level socio-demographics and behaviors to compare differences in behaviors over time between pre-defined treatment and control groups.

Other critical recommendations as a result of this study are related to the difficulties in stormwater runoff sampling, particularly using autosampler setup and volume estimation. It is critical to have flow-based samples, since these allow representative concentrations and loads of nutrients to be reported. Total volumes, however, were often under-reported when velocities within a semi-flooded or flooded pipe fell below the minimum required 0.5' per second. To reduce the potential of flooded conditions in the inlets for stormwater runoff collection we recommend the following strategies:

- Select installation sites during the mid- to late rainfall season, where flooded conditions will be more evident and avoid sites where the inlet is more than 50% submerged;
- Select communities with evident slope and smaller inlet pipes, both factors that help achieve greater flow velocities through the stormwater system;
- Measure inlets further upstream from the pretention areas above any submerged conditions;
- Select autosamplers with the capacity to detect lower velocities (<0.5 fps); and,
- Model expected volumes using an appropriate hydrologic model and combine with event-based sampling data to estimate loads.

The monitoring plan proposed in this project can be used as a method for understanding seasonal variability in nutrient concentrations within retention pond samples and stormwater inlet pipes. Based on the observed variability of the samples collected under this project, minimum sample sizes to detect a 20% change with β=0.9 power can be recommended (Table 29). The lowest required sample sizes to detect a 20% reduction in TN concentration in retention pond samples (based on our results) would be between 22-32 samples (or 2-3 years of monthly monitoring). From the four monitored communities, P202 had the narrowest range of TN concentrations, requiring the lowest number of samples (22) to detect a specific effect in retention pond TN concentrations. The Manatee community (M101) retention pond had the greatest observed variability, requiring the highest number of samples (32) to be collected to be able to detect a 20% reduction in TN.

Stormwater runoff sample TN concentrations had the greatest variability, requiring a greater sample size to detect the same 20% reduction in TN concentration. In stormwater runoff, P201 had the greatest variability resulting in the greatest sample size (85) and M101 would have required the least number of samples (54).

Table 29: Estimated minimum sample sizes required to detect a 20% reduction in mean concentrations of nutrient parameters collected from stormwater and retention ponds in the four communities under this study.

Parameter	H101		M101		P201		P202	
	Pond	Storm	Pond	Storm	Pond	Storm	Pond	Storm
Total Nitrogen	23	64	32	54	28	85	22	56
Total Inorganic Nitrogen	35	26	102	74	61	31	139	54
Total Phosphorus	42	54	243	167	139	143	38	139

Note: Estimates based on a one-sample T-test and not a seasonal trend test.

In addition, a minimum of 5-7 years (preferably 10 years) of data collection should be targeted for any statistical trends to be evaluated. It might be possible to observe a reduction in concentrations of local retention pond samples in less time, but extreme weather events and drought years could potentially obfuscate detection of true changes. An alternative would be to sample for 2 years prior to implementing a behavioral intervention and again 5-10 years later comparing communities with or without significant interventions.

Additional recommendations concerning data analyses for future research includes the following:

- Seasonality of sampling was an important consideration when interpreting results. A protracted time series analysis (where seasonal rainfall patterns can be detrended over time) or a non-parametric trend test (i.e. seasonal Mann Kendall trend test) is recommended.
- Site-specific seasonal rainfall patterns should be considered. During our brief study, anomalous May and October rainfall events caused these months to be "wetter" than normal, and the dry season period appeared to be shorter.

Homeowner lawn fertilizing is an episodic behavior, meaning that it is done once or twice a year by typical do-it-yourself homeowners. As such, it would not be surprising for homeowner knowledge of local fertilizer ordinances or products to lapse between episodic applications. Social marketing research demonstrates that people must be routinely reminded for behaviors to be reinforced (CITATION?). The use of reminder prompts is most effective at the point of purchase (McKenzie-Mohr & Smith, 1999, pp 61-70). Encouraging the adoption of the prescribed behaviors (using slow-release nitrogen fertilizer and not applying nitrogen in the summer months) must be made as convenient as possible while making the competing behavior (using more quick-release nitrogen fertilizers and applying nitrogen fertilizer in the summer) as inconvenient as possible (Kotler and Lee, 2002 p 243-244). The use of a sales restriction is a powerful reminder that homeowners should not be applying nitrogen during the summer and it makes it much less convenient for them to violate the ordinance.

The goal of the Tampa Bay Residential Stormwater Quality Evaluation was to compare several socio-ecological variables in four selected communities where various local ordinances (behavior interventions) have been implemented. We found that there were significant differences in ordinance awareness between residents in the three counties, coincident differences in resident nutrient fertilization practices within the counties and communities studied, and localized differences in nutrient dynamics among the communities in both nitrogen and phosphorus concentrations of stormwater runoff and community retention ponds. Due to the limited budget and scope of the study, these observable differences could not be definitively linked to a specific cause and effect relationship (i.e., resulting resident behavior changes and associated community-level water quality), but some anecdotal results were obtained. Behavior and water quality differences were apparent between moderate and affluent socio-economic status of communities. Also, knowledge, behavior and water quality differences were apparent among communities where stricter fertilizer ordinances were enacted.

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Appendices

Appendix A – Approved QAPP

Appendix B - Telephone Questionnaire

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Appendix R – Load Estimates by Stormwater Runoff Event

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Appendix A - Final Approved QAPP

Quality Assurance Project Plan (QAPP)
for
Residential Stormwater Quality Evaluation
at
Tampa Bay Area Subdivisions

Prepared for:

Tampa Bay Estuary Program
100 8th Avenue, S.E.
St. Petersburg, FL 33701

Prepared and Reviewed by
Applied Ecology, Inc
Environmental Consulting & Technology, Inc.
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Project Manager
Applied Ecology, Inc

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Jeff Smith, Senior Associate Scientist
Field QA/QC Task Officer
Environmental Consulting & Technology, Inc.

________________ Date

Patrick Bohlen, PhD
Analysis QA/QC Task Officer
University of Central Florida

________________ Date

Mark Clark, PhD
QA/QC Officer
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________________ Date

Ed Sherwood,
Tampa Bay Estuary Program

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Felicia Burks
NEP Program Manager
U.S. Environmental Protection Agency Region 4

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A4-PROJECT ORGANIZATION

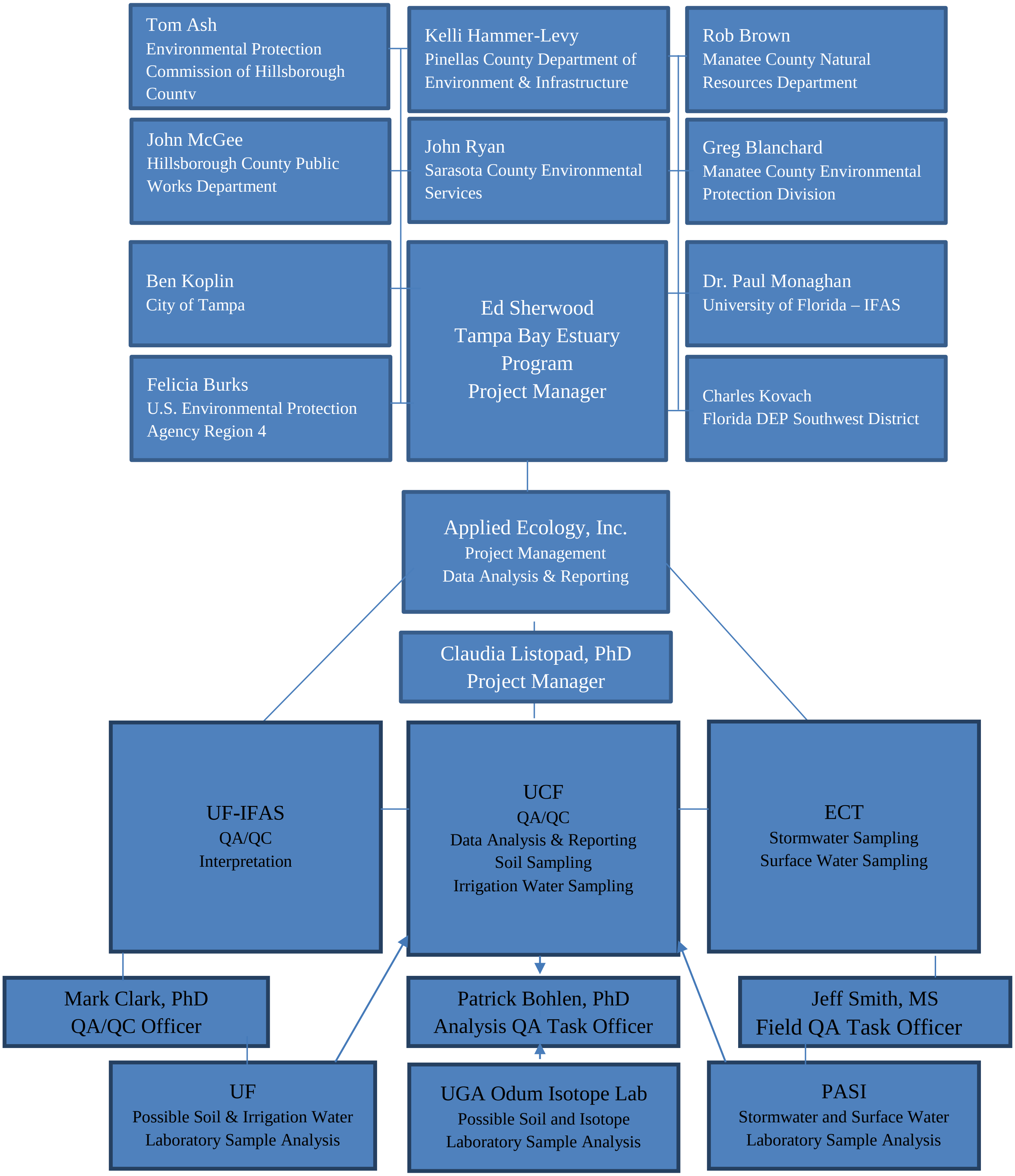
Stormwater and surface water sample collection activities will be conducted by Environmental Consulting & Technology, Inc. (ECT). Soil and irrigation water samples will be collected by University of Central Florida (UCF).

All liquid samples will be sent to Pace Analytical Services, Inc (PASI), NELAC Certification #E83079 with the exception of irrigation waters. Irrigation waters will be sent to the University of Georgia Odum Isotope Lab (UGA), NELAC certification pending or the University of Florida/IFAS Environmental Quality Laboratory, which is NELAC Certified for most certifiable parameters except for Total Nitrogen (NELAC Certification # E72850).

All soil samples will be sent to one of the following laboratories. University of Florida Wetland Biogeochemistry Lab (UF), NELAC Certification # E72949, University of Georgia Odum Isotope Lab (UGA). The ability to use the UF Wetland Biogeochemistry Laboratory is contingent on availability.

Refer to Figure A4.1 for the specific organization of this project.

Figure A4.1: Project Organization



A5-PROBLEM DEFINITION/BACKGROUND

A5.1 Site Identification and History

Four subdivisions in the Tampa Bay region will be evaluated as part of this study. Two subdivisions are located in Pinellas County, one is located in Hillsborough and one in Manatee County.

Site Names: Subdivision descriptions will be included along with salient geological and topographical features.

A5.2 Site Location: See Figure A5.2

The four subdivision maps will be included here including drainage lines.

A5.3 Problem Definition/Background

Tampa Bay Estuary Program and project partners recognize the need for more scientific evidence about nutrient inputs and related outputs in residential land uses. Research suggests that suburban land uses can be a significant source of nutrient pollutant loading to surface and ground waters.

The intent of the project is to collect data that contributes to the growing body of evidence about residential nutrient dynamics, inputs, and the potential for loading to surface and ground waters. The information can help guide and evaluate intervention strategies that aim to reduce nutrient loads to Tampa Bay. This Quality Assurance Project Plan (QAPP) applies to only the environmental data collection and does not concern the social research. The social research described in this section is not funded by U.S. EPA Funds. The social research is funded by a non-federal, local funding source. The QAPP approval being sought is for the environmental sampling components of the project.

The timeframe for this project spans from September 2011 to September 2014, with sample collection occurring between June 2012 and December 2013, with a total budget of $250,000. These funds will be used to collect information on the following hypotheses:

$H1_0$: There is no significant difference in residential nutrient fertilization practices between residents in Pinellas, Hillsborough, and Manatee counties where various forms of residential fertilizer ordinances or rules have been enacted.

$H1A_0$: There is no significant difference in awareness of fertilizer ordinances among homeowners in Pinellas, Hillsborough, and Manatee counties.

$H2_0$: There is no significant difference in nutrient dynamics between water bodies receiving stormwater inputs from residential landscapes in Pinellas, Hillsborough, and Manatee counties where various forms of residential fertilizer ordinances or rules have been enacted.

$H3_0$: There is no significant difference in nutrient fluxes in water bodies receiving stormwater inputs from one Pinellas County community where fertilizer is applied by both homeowners and professionals and one Pinellas County community where professional applicators predominantly apply lawn fertilizer.

The project will address the hypotheses above through a series of tasks that are defined in the contract scope of work as follows:

Task 1: Identify and Characterize Homogeneous Residential Sampling Units

This task includes the characterization and refinement of selected communities for social and environmental sampling. Communities will be characterized and investigated through on-site visits and remotely GIS capabilities, census data and demographics, drainage plans and county records, and field observations. A representative telephone survey will be conducted to determine how the selected communities compare to the county at large. Funding for the telephone survey is provided by a non-federal, local sponsor and QAPP approval for the telephone survey data collection methods is not requested.

TBEP and partners will provide 8-12 communities (3-4 per county) from which 4 will be selected using both spatial and environmental data research and analyses.
Selection of subdivisions for consideration of Hypothesis $H2_0$ requires holding as many key variables constant as possible so that a fair and comparison can be made. Based on existing research, the following key variables are selected to hold constant in order to compare communities across counties:

- Landscape management practices (Mixed management preferred)
- Similar geographic and geological features
- Similar drainage areas and general hydrology
- Similar HOA presence
- Housing demographics such as age of development, lot size, density, and impermeable cover
- Absence of golf course
- No reuse water used for irrigation

To address Hypothesis $H3_{0,}$ an additional community will be selected in Pinellas County with similar features as the others except for fertilizer responsible party. This fourth community will need to be comparable to the other Pinellas County in terms of geographic, geologic, hydrologic, housing demographics, and irrigation water sources. However, since the variable of interest is fertilizer application responsible party, a subdivision with higher property values will be selected based on research that suggests professional applicators are more likely to apply fertilizer in higher income communities. Since we don't have income measures, we use property value as a proxy measure for income in the selection process.

Community selection will be made after field visits confirm sampling accessibility to storm drain inlets, surface water locations, and residential properties as well as investigation of other variables not easily obtained remotely. A final selection will be made after communities are contacted to confirm their willingness to participate. This tasks engages AEI, UCF, and ECT in active research and recruitment of subdivisions as research participants. The research requires that the subdivisions not be named in the data and that they remain anonymous in all records and reports. A unique code will be given to each subdivision to allow the research team to identify it.

Timeline: September 2011 – June 2012
Cost: $43,141

Task 2: Develop an EPA-Approved Quality Assurance Project Plan

A Quality Assurance Project Plan (QAPP) will be developed for the environmental sampling and analysis for the data collection at the four selected communities. The QAPP will include at least the following elements: project management; sampling design, sites and frequency; data quality objectives; standard field and laboratory methods to be used; field and laboratory quality control; data quality (e.g. data integrity, utility, and objectivity); standard analyses to be used; and record keeping. In addition to the previous involvement of AEI and UCF in this task, UF will provide a final review to the Quality Assurance Project Plan prior to delivery.

Completion timeline: September 2011 – June 2012
Cost: $9,033

Task 3: Consistent Monitoring Strategy Development & Equipment Installation

Working with existing monitoring teams in the Tampa Bay area, we will explore the socio-demographic and ecological data in Task1 to develop a comprehensive social and environmental monitoring strategy for long-term trend analysis of fertilizer-related nutrient inputs. Environmental sampling will focus at the fine-scale to clarify nutrient measures between yards and receiving water bodies in selected communities as well as collecting surface water quality measures that can establish a trend for future comparison. This analysis will be included in a memorandum report, along with the sampling schedule and approved QAPP.

This task involves ECT in selecting suitable locations for stormwater autosampler installation at one inlet within each of the four communities. Refrigerated ISCO Avalanche autosamplers will be installed and monitored remotely. More information on equipment and sampling is included later in this report.

Completion timeline: June 2012 – August 2012
Cost: $11,314

Task 4: Conduct Social Surveys and Water Quality Monitoring

Task 4 is focuses on the collection of environmental and behavioral data. UCF personnel will travel to the four communities one time during the project to collect groundwater, soil, and social data over the course of eighteen months. Additionally, ECT will collect stormwater samples from auto-samplers after 10-12 significant storm events distributed over eighteen months (September 2012- December 2013) at the four selected communities for a total of 40- 48 stormwater samples. Surface water quality data will be collected monthly for up to 18 months. Soils and irrigation water will be collected annually (once only). Comprehensive door to door surveys will be conducted in year two of the project, with follow-up information collected from survey respondents throughout the study. This proposed monitoring regime may change pending final review of communities. EPA funding will not be used for the social data collection and QAPP approval for the social data collection is not requested.

Timeline: June 2012- December 2013
Cost: $135,125

Task 5: Analysis and Reporting of Results

This task includes data analyses of environmental and socio-behavioral data collected during the study. Estimated nitrogen and phosphorous loads will be calculated for each participating yard and community. Key results will be prepared for submittal as a manuscript to be published in an appropriate peer-review publication.

Timeline: June 2012 – September 2014
Cost: $23,639

A6-PROJECT DESCRIPTION

A6.1 Purpose/Background

The purpose of the project is to examine nutrients in suburban communities to better understand how varying practices reduce deleterious impacts on the environment. Phosphorus and nitrogen species will be the nutrients of interest due to their importance in water quality management. The results of this research will aide in the development and implementation of policies and programs that preserve water resources.

The project will examine nutrient fluctuations and isotopic signatures in soils and receiving waters to better understand the extent that commercial lawn fertilizers are entering surface waters via stormwater runoff. In addition to collecting and analyzing soil, irrigation water, surface water, and stormwater-runoff for a suite of nutrient analyses, isotopic ^{15}N and ^{18}O will be analyzed in waters and soils and additional, C15 will be analyzed in soils. The signature of ^{15}N and ^{18}O ratios can be used to understand whether the nitrogen and oxygen in the compound was from an atmospheric source such as chemical fertilizers, or whether it is from an organic or natural source. We incorporate isotopic analyses to add this additional information about N dynamics and the potential for fertilizer runoff. The following paragraphs contain more information on the use of isotopes for understanding nitrogen sources and dynamics.

Research on the urban nitrogen cycle demonstrates that the human input of nitrogen in the form of industrially fixed nitrogen products, food products, and commercial fertilizers has increased the mean yield of nitrogen by ten times and that "most of this additional nitrogen is applied as fertilizer that can run off into groundwater, rivers, and coastal waters," (Driscoll et al 2003). The Haber-Bosch fixation method is the most widespread industrial method to produce N fertilizers such as ammonia, urea, and NO_3^- from N_2 gas in the atmosphere (Reddy 2002). In 2008, the FAO (2010) estimated that fertilizer manufacturers fixed 101.6 million tons of N_2 with projections forecasted to increase 23.1 million tons by 2011/12.

Unless this additional input of industrially fixed N_2 is balanced by denitrification processes, the excess in the lithosphere and hydrosphere can have adverse environmental impacts.

Altered nitrogen inputs associated with human activity contribute to air quality degradation, acidification of soil and surface water, disruption of ecosystem processes, and over-enrichment of receiving waters. It is particularly detrimental to aquatic systems, contributing to hyper-eutrophication, anoxic conditions, fish kills, harmful algae blooms and other undesirable consequences. Furthermore, nitrogen compounds such as NO_3^- and NO_2 are toxic to aquatic invertebrates, fish, and reptiles (Camargo et al 2005, Beketov 2004, Edwards 2005, Guillette and Edwards 2005.) Ingestion of excess nitrate by humans can cause methahemoglobine disease in children (blue baby syndrome) and has been linked to stomach cancer (Cantor 1997). Diverse strategies are necessary to reduce the excessive inputs of N so that a favorable balance between the benefits and consequences of abiotic N fixation can be achieved.

To encourage local actions that reduce sources of N and other pollutants, the federal government is enforcing Total Maximum Daily Load (TMDL) requirements for surface waters identified as impaired due to harmful pollutants. In Florida, nearly every surface water body is listed as impaired and many with nutrient related impairments. Compliance with TMDLs requires that implementation teams identify and reduce sources of pollutants while simultaneously taking steps to remediate the impaired waters. Successful restoration of water quality requires an understanding of system details more refined than gross scale rain fall storage and run-off calculations. It requires the identification of priority sources based on the potential and extent of the pollution being discharged into receiving water bodies. A better understanding of soil-water interface dynamics, groundwater and surface water coupling, human land management practices, and potential for N run-off or leaching can help decision-makers develop sound N mitigation strategies. Research is needed that contributes to understanding N dynamics in the watershed and the impact that excess N from human altered landscapes has on biogeochemical cycling. Naturally occurring commercially produced or artificially enriched ^{15}N compounds have been used in research to trace N processes and to identify sources of N.

Isotopic nitrogen (^{15}N) is a naturally occurring N isotope that has one more neutron than the more common form of N, (^{14}N). The ratio of ^{14}N to its isotope ^{15}N is 273 to 1 (0.0036765) in the atmospheric gas N_2 which is used as the standard for comparison (Junk & Svec, 1958). This ratio differs only slightly in N pools, typically falling within the range of -0.0040 to +0.0060, expressed in percentage parts per thousand ($^0/_{00}$) of $^{15}N/^{14}N$ and calculated with the equation:

$$\delta\ ^{15}N\ (^0/_{00}) = [(R_{sample} / R_{atm)} - 1\ ] \times 10^3 \text{ (Peterson and Fry 1987).}$$

Because ^{15}N has an additional neutron, it is a heavier isotope, reacting more slowly and requiring more energy to break bonds. As a result, ^{15}N reacts differently during the bio- and physio-chemical reactions of the N cycle. This so called "isotope effect" causes variations of $^{15}N:^{14}N$ ratios across pools that can help clarify N processes by examining patterns of enrichment and depletion in substrates and products. For example, denitrification has a median isotope fractionation of 1.0185. This means that during denitrification, the unreacted NO_3^- in the substrate becomes enriched in ^{15}N and the N_2O or N_2 gas produced is depleted by 18.5 $^0/_{00}$ (Bedard-Haughn *et al* 2002). Enriched NH_4 may be the remaining unreacted substrate of nitrification processes (25.0 $^0/_{00}$) or volatization of NH_3 (24.5 $^0/_{00}$). In contrast, the reactions associated with N_2 fixation (1.3 $^0/_{00}$) and ammonification (2.5 $^0/_{00}$) are near 0, resulting in little enrichment. These naturally occurring bio- and physio-chemical enrichment processes display distinct landscape-scale patterns that vary according to micro-climate, soil moisture, nutrient levels, and soil formation (Bedard-Haughn *et al* 2002).

Atmospheric gases and products of atmospheric gases are depleted relative to organic biomass, waste products, and NO_3^- resulting from denitrification. Showers et al (2008) found the $\delta\,^{15}N/NO_3^-$ varied between natural soil organics (+4 to +7 $^0/_{00}$); commercial fertilizers (near 0 $^0/_{00}$) and septic wastes (+8 to +10$^0/_{00}$). These variations in ^{15}N across N pools can help researchers understand N dynamics and to clarify sources as long as they recognize the reactions that can naturally enrich and deplete N pools when interpreting results.

Nitrogen stable isotope studies have been used successfully to clarify soil/water N interactions (Compton *et al* 2007), to identify groundwater and surface water N sources (McClelland *et al* 1997, Showers *et al* 2008, Bowen and Valiela 2008) and to estimate appropriate fertilizer application rates (Quinones *et al* 2007.) Some studies focus at the large scale, examining the naturally occurring variations in landscape $\delta^{15}N$. This requires a thorough understanding of the isotopic signatures of N input and outputs, the effects of N transformative processes, and the compartmentalization of N within the system (Hogberg 1997). Other studies apply an artificially enriched N compound to better understand the fate and transport of N through the system. If the $\delta\,^{15}N$ is enriched greater than the natural abundance range, it can be easily distinguished from that in existing pools, illuminating fate and transformations of N from source to sink. Research that examines both naturally existing $\delta\,^{15}N$ and uses ^{15}N- enriched tracers can provide a complete, accurate picture of the N cycle and potential impacts (Bedard-Haughn *et al* 2003).

Due to worldwide efforts to reduce excess fertilizer inputs that inflate agricultural costs and adversely impact the environment, agricultural researchers have been the leading contributors to the literature on ^{15}N as a tracer tool. With its unique $\delta\,^{15}N$ signature, commercial fertilizers can be used as tracers in small scale N budget studies.

This research examines isotope ratios in soils, groundwater, surface water, and stormwater to understand natural nitrogen cycle dynamics and whether a unique fertilizer related isotopic pattern will emerge that can be used to understand source allocations and inputs. As far as we can tell from the literature, no project has been conducted that is specifically using isotopes to understand nitrogen dynamics at this scale.

A6.1.1 Purpose of this Project

The purpose of the project is to collect important environmental information that can illuminate path and flow dynamics of nitrogen and other nutrients in the suburban system. Stormwater events will be sampled as well as monthly surface waters. To characterize each community, one soil sampling event will take place and one irrigation water sampling event.

Flow-weighted composite samples will be collected using ISCO Avalanche autosamplers following qualifying rain events in each of the four subdivisions. A total of 40-48 storm events across the four sample sites will be collected during the sampling period (September 2012- December 2013).

Surface water samples will be collected monthly from one pond in each subdivision over the same period for a total of 72 samples. Samples from a depth of 25-50 cm below the surface will be collected at several locations, and subsequently combined and agitated to create a composite sample. Soils and irrigation water will be sampled from 5 homes in each of four (4) subdivisions once for a total of 20 samples.

Comparative analysis will be conducted to understand differences in subdivision nutrient inputs that may lead to nutrient loads. A weighted average of nutrient pounds per area will be measured to compare and contrast subdivisions in three different counties who have enacted varying fertilizer intervention programs and policies. The goal is to further the understanding of how fertilizer ordinances and education programs can impact nutrient pollutant loads.

A6.1.2 Intended End Use of the Data

Permit Compliance
Feasibility Study
Consent Order Compliance
Remedial Action
Contamination Assessment
Water Quality Data Base (Specify which Data Base:)
Facility Operating Report
_X Other: Research that contributes to further understanding of nutrient loads and flows in suburban land uses

A6.2 Description of the Work

The goal of the research is to combine socio-demographic and environmental quality data in order to calculate lawn fertilizer-related nitrogen and phosphorus inputs to the watershed. This project will compare socio-ecological variables and characteristics in four Tampa Bay area communities, representative of different fertilizer ordinances, in order to understand the impact that fertilizer ordinances have on human behaviors and related nutrient dynamics.

The project is divided into tasks discussed in more detail in section A.5.3 of this document. Surface water samples will be collected monthly for a year. Stormwater samples will be collected from up to12 rain events over 18 months. Soil, irrigation, and social behavior data will be collected once.

June 2012	December 2013
Projected Sampling Start Date	Projected Sampling End Date

Major Project Tasks

Specific Project Activity	Scheduled Date
1. Identify and Characterize Subdivisions	Sept 2011 – June 2012
2. QAPP preparation/submittal/approval	Sept 2011 – June 2012
2. Station construction and equipment installation	June 2012 – Aug 2012
3. Sample collection and Lab analysis	Sept 2012 – Dec 2013
4. Prepare sampling reports	July 2012 – Dec 2014

A7-PROJECT TASK DESCRIPTION

A7.1 Data Quality Objectives

X_ The data quality objectives for this project are the QA targets and protocols listed in the laboratory Standard Operating Procedures (SOPs) as approved by NELAC and are included as a part of Table 7.1.

The minimum detection limits to be achieved for this study do not differ from the detection limits specified in the laboratory Standard Operating Procedures (SOPs) as approved by NELAC and are included as a part of Table A7.1.

The precision and accuracy requirements do not differ from the targets specified in the laboratory Standard Operating Procedures (SOPs) as approved by NELAC and are included as a part of Table A7.1.

A7.2 Proposed Samples for Project

The project objective is to collect 48 composite storm samples from the four communities over 12 qualifying storm events. At least three, and no more than five qualifying storm events will be collected during dry-season conditions (typically November through May), with the other events being collected during wet-season conditions (typically June through October).

An Avalanche Refrigerated Portable Sampler will be used to collect representative samples from storm events. The sampler will have an Isco Area Velocity Flow Module, Isco rain gauge, and a digital cell phone modem that will notify ECT when an event initiates. Samples will be held in the Autosampler at ≤4°C for no longer than 24 hours after the event ends. The remaining sample aliquots will be subsampled in the field. The composite bottle will be agitated to ensure a homogeneous solution and then aliquots will be transferred to the preserved and labeled scintillation vials. A pH check will confirm pH is <2 and Sulfuric acid will be available to adjust as needed. All dissolved parameter samples and Ortho-P will be filtered with a 0.45 micron capsule filter in the field within 15 minutes of collection of the composite.

Qualifying Storm Event

Qualifying storm events are those which produce enough rainfall and runoff volume to sufficiently measure flow and collect a composite sample representative of the sampling interval. The programming of the autosampler (enable trigger, sample pacing, etc) will be customized based on individual community characteristics such as catchment area, impervious area, soil types, and stormwater infrastructure. This will be done initially with hydrologic models and fine-tuned after autosampler installation. A Stormwater Monitoring Plan will be developed to explain the final pacing and representative sample collection.

Autosamplers will notify ECT personnel by cellular text message when the program has completed. ECT personnel will collect the composite samples, filter the aliquots for dissolved parameters and deliver to the designated lab within the applicable hold times.

Stormwater Sample Pacing

Stormwater sample pacing will be programmed to collect the best comparable, accurate and representative composite sample of the storm event in each community. The autosampler will collect individual aliquots based on the calculated volume of stormwater discharged, the rain event, and the appearance of hydrographs. The pacing for each sample site will be determined based on the sites drainage area, land use direct connect impervious area, and flow curve. The aliquot pacing will ensure an adequate volume of water (approximately 1500-2000 ml) can be collected for the smallest qualifying event. A ten liter collection container will provide enough capacity for larger storm events with up to 50-200 ml aliquots. See Table A7.1 of this Section for a summary of the sampling and analysis activities.

Stormwater flows and volumes will be calculated for each subdivision using a hydraulic and hydrological model. The model and actual flow data from storm events will be considered when developing stormwater event pacing methods. A Stormwater Sampling Monitoring Plan will be developed and updated as needed to collect the best representative sample of each storm event.

Table A7.1: Proposed Laboratory Samples, Matrices, and Analytical Methods

FREQUENCY	SAMPLE MATRIX	SAMPLE SOURCE	SAMPLES	EB	ANALYTICAL METHOD	COMPONENT	MAXIMUM HOLDING	PRESERVATION	P	MDL	PQL	A%
10-12 Storm events	Water	Stormwater runoff	2-4	1	EPA 351.2	Total Kjeldahl Nitrogen*	28 days	Cool ≤4°C H_2SO_4 to pH <2	20% RPD	0.25 mg/L	0.5 mg/L	90-110
10-12 Storm events	Water	Stormwater runoff	2-4	1	EPA 351.2	Dissolved Kjeldahl Nitrogen*	28 days	Cool ≤4°C H_2SO_4 to pH <2	20% RPD	0.25 mg/L	0.5 mg/L	90-110
10-12 Storm events	Water	Stormwater runoff	2-4	1	EPA 350.1	Ammonia*	28 days	Cool ≤6°C H_2SO_4 to pH <2	20% RPD	0.02 mg/L	0.05 mg/L	90-110
10-12 Storm events	Water	Stormwater runoff	2-4	1	EPA 353.2	Nitrate/nitrite*	28 days	Cool ≤6°C H_2SO_4 to pH <2	20% RPD	0.025 mg/L	0.05mg/L	90-110
10-12 Storm events	Water	Stormwater runoff	2-4	1	EPA 365.3	Total phosphorous*	28 days	Cool ≤6°C H_2SO_4 to pH <2	20% RPD	0.0023 mg/L	0.004mg/L	90-110
10-12 Storm events	Water	Stormwater runoff	2-4	1	EPA 365.1	Ortho-phosphate**	Filter within 15 minutes, analyze within 48 hours	Cool ≤6°C	20% RPD	0.0026 mg/L	0.004mg/L	90-110
10-12 Storm events	Water	Stormwater runoff	2-4	1		15N – Nitrate*	28 days	Cool ≤6°C H_2SO_4 to pH <2	20% RPD	n/a	n/a	n/a
10-12 Storm events	Water	Stormwater runoff	2-4	1		18O – Nitrate*	28 days	Cool ≤6°C H_2SO_4 to pH <2	20% RPD	n/a	n/a	n/a
10-12 Storm events	Water	Stormwater runoff	2-4	1		15N-Ammonium*	28 days	Cool ≤6°C H_2SO_4 to pH <2	20% RPD	n/a	n/a	n/a
18 events	Water	Surface Water	4	1	EPA 351.2	Total Kjeldahl Nitrogen*	28 days	Cool ≤4°C H_2SO_4 to pH <2	20% RPD	0.25 mg/L	0.5 mg/L	90-110
18 events	Water	Surface Water	4	1	EPA 351.2	Dissolved Kjeldahl Nitrogen*	28 days	Cool ≤4°C H_2SO_4 to pH <2	20% RPD	0.25 mg/L	0.5 mg/L	90-110
18 events	Water	Surface Water	4	1	EPA 350.1	Ammonia*	28 days	Cool ≤6°C H_2SO_4 to pH <2	20% RPD	0.02 mg/L	0.05 mg/L	90-110
18 events	Water	Surface Water	4	1	EPA 353.2	Nitrate/nitrite*	28 days	Cool ≤6°C H_2SO_4 to pH <2	20% RPD	0.025 mg/L	0.05mg/L	90-110
18 events	Water	Surface Water	4	1	EPA 365.3	Total phosphorous*	28 days	Cool ≤6°C H_2SO_4 to pH <2	20% RPD	0.0023 mg/L	0.004mg/L	90-110
18 events	Water	Surface Water	4	1	EPA 365.1	Ortho-phosphate**	Filter within 15 minutes, analyze within 48 hours	Cool ≤6°C	20% RPD	0.0026 mg/L	0.004mg/L	90-110

FREQUENCY	SAMPLE MATRIX	SAMPLE SOURCE	SAMPLES	EB	ANALYTICAL METHOD	COMPONENT	MAXIMUM HOLDING	PRESERVATION	MDL	PQL	A%
18 events	Water	Surface Water	4	1		15N – Nitrate*	28 days	Cool ≤6°C H_2SO_4 to pH <2	0.015 ppt	n/a	n/a
18 events	Water	Surface Water	4	1		18O – Nitrate*	28 days	Cool ≤6°C H_2SO_4 to pH <2	0.015 ppt	n/a	n/a
18 events	Water	Surface Water	4	1		15N-Ammonium*	28 days	Cool ≤6°C H_2SO_4 to pH <2	0.015 ppt	n/a	n/a
1 Time	Water	Irrigation	20	1	EPA 351.2	Total Kjeldahl Nitrogen*	28 days	Cool ≤4°C H_2SO_4 to pH <2	0.25 mg/L	0.5 mg/L	90-110
1 Time	Water	Irrigation	20	1	EPA 351.2	Dissolved Kjeldahl Nitrogen*	28 days	Cool ≤4°C H_2SO_4 to pH <2	0.25 mg/L	0.5 mg/L	90-110
1 Time	Water	Irrigation	20	1	EPA 350.1	Ammonia*	28 days	Cool ≤6°C H_2SO_4 to pH <2	0.02 mg/L	0.05 mg/L	90-110
1 Time	Water	Irrigation	20	1	EPA 353.2	Nitrate/nitrite*	28 days	Cool ≤6°C H_2SO_4 to pH <2	0.025 mg/L	0.05mg/L	90-110
1 Time	Water	Irrigation	20	1	EPA 365.3	Total phosphorous*	28 days	Cool ≤6°C H_2SO_4 to pH <2	0.0023 mg/L	0.004mg/L	90-110
1 Time	Water	Irrigation	20	1	EPA 365.1	Ortho-phosphate**	Filter within 15 minutes, analyze within 48 hours	Cool ≤6°C	0.0026 mg/L	0.004mg/L	90-110
1 Time	Water	Irrigation	20	1	Elemental Analysis by Micro-Dumas Combustion	15N – Nitrate*	28 days	Cool ≤6°C H_2SO_4 to pH <2	0.015 ppt	n/a	n/a
1 Time	Water	Irrigation	20	1	Elemental Analysis by Micro-Dumas Combustion	18O – Nitrate*	28 days	Cool ≤6°C H_2SO_4 to pH <2	0.015 ppt	n/a	n/a
1 Time	Water	Irrigation	20	1	Elemental Analysis by Micro-Dumas Combustion	15N-Ammonium*	28 days	Cool ≤6°C H_2SO_4 to pH <2	0.015 ppt	n/a	n/a
1 Time	Soil	Suburban top soil	20	1	EPA 351.2	Total Kjeldahl Nitrogen*	28 days	Cool ≤4°C H_2SO_4 to pH <2	50 mg/L	500 mg/L	90-110
1 Time	Soil	Suburban top soil	20	1	EPA 350.1	Ammonia	28 days	Cool ≤4°C H_2SO_4 to pH <2	0.02 mg/L	1.0 mg/L	90-110

FREQUENCY	SAMPLE MATRIX	SAMPLE SOURCE	SAMPLES	EB	ANALYTICAL METHOD	COMPONENT	MAXIMUM HOLDING	PRESERVATION	MDL	PQL	A%
1 Time	Soil	Suburban top soil	20	1	EPA 353.3	Nitrate/nitrite	28 days	Cool ≤6°C H_2SO_4 to pH <2	0.025 mg/L	1.0 mg/L	90-110
1 Time	Soil	Suburban top soil	20	1	EPA 365.1	Total phosphorous	28 days	Cool ≤6°C H_2SO_4 to pH <2	0.0023 mg/L	n/a	n/a
1 Time	Soil	Suburban top soil	20	1	EPA 150.1	Conductivity	28 days	Cool ≤6°C	n/a	100 umho/cm	90-110
1 Time	Soil	Suburban top soil	20	1	EPA 150.1	pH	28 days	Cool ≤6°C	n/a	0.1 SU	90-110
1 Time	Soil	Suburban top soil	20	1	Elemental Analysis by Micro-Dumas Combustion	15N & 13C % of N:C ratio	28 days	Cool ≤6°C	0.015 ppt	n/a	n/a
1 Time	Soil	Suburban top soil	20	1	Elemental Analysis by Micro-Dumas Combustion	15 N Nitrate	28 days	Cool ≤6°C	0.015 ppt	n/a	n/a
1 Time	Soil	Suburban top soil	20	1	Elemental Analysis by Micro-Dumas Combustion	18 O Nitrate	28 days	Cool ≤6°C	0.015 ppt	n/a	n/a

Note:
EB = Equipment Blank
P = Precision
A = Accuracy
MDL = Method Detection Limit
PQL – Practical Quantification Limit

A7.3 Matrix Types, Analytical Methods and QA Targets

Field and laboratory analytical measurements are presented in Table A7.1. Dissolved organic P was removed from the list of analytes originally proposed in the RFP because of the following reasons: 1) Interpreting this test will not contribute much to addressing the hypotheses; 2) Dissolved organic P is not needed for load estimates nor is it a regulatory compliance requirement; 3) NELAC certification for this test is not offered and protocols for this test are uncertain.

Pre-cleaned equipment blank samples will be collected at least at a minimum of 5 percent of each reported test analyte for the duration of the project per FDEP SOP FQI 000 (Field Quality Control Requirements).

All samples will be collected and delivered to the laboratory within appropriate hold times for the analytes (according to table A7.1) and will meet QA targets for analyses. All stormwater and surface water samples will be sent to a NELAC certified laboratories with the exception of isotope analyses, which are not NELAC certifiable. Soil and irrigation waters will be sent to a NELAC certified lab if possible.

A8-SPECIAL TRAINING/CERTIFICATION

No special training required for field activities. Stormwater and surface water samples will be collected by ECT personnel with extensive surface and stormwater sampling expertise and experience. Soils and irrigation waters will be collected by UCF personnel with extensive sampling expertise and experience. All personnel will follow FDEP SOPs for sample collection. Laboratories carry NELAC certification through the State of Florida for the parameters being tested or they follow EPA methods and standard protocols for parameters that are not NELAC certifiable.

A9-DOCUMENTS AND RECORDS

Documentation and records for field activities will be done in accordance with FDEP- SOP-001/01, FD 1000 Documentation Procedures. Documentation and records for laboratory activities will be done per NELAP requirements.

Calibration of the field instruments for collection of pH, dissolved oxygen, and conductivity will be recorded on FDEP Form FD9000-8. In-situ measurements and other ancillary water quality sampling information will be recorded on ECT Water Quality/Sampling Site Maintenance Log. A laboratory-provided sample chain-of-custody form will be used for each batch of samples submitted to the lab. See Appendix A for examples of these forms.

Datasheets of laboratory results of all sampling events or tabulated results will be delivered to the Tampa Bay Estuary Program Project Manager quarterly in digital format. Standard lab turnaround times for results are 7-10 days from when samples are received. Standard lab turnaround times for the results of isotope analyses will be 30 days due to the extended sample preparation time required prior to analysis. Sampling reports after each storm event that includes autosampler operation, sampling event hydrographs, volume calculations, level and velocity measures, recommendations for sampling protocol changes.

During the first month of the project, UCF Principal Investigators shall coordinate with the ECT Project Manager to arrange for an audit of field sampling procedures, including instrument calibration/verification. The audit shall consist of observations and records review by UCF to determine if applicable SOPs are being properly followed. Any deficiencies would require corrective action by ECT to include discussion by all involved parties (i.e. Field QA Task Officer, QA/QC Officer, Project Manager, ECT Field Crew Leaders, and ECT Field Crew), followed by immediate changes in standard procedures to ensure corrective actions are understood and corrected.

Additional internal and external auditing will take place, as needed, throughout the project length. Internal auditing will be organized and performed by the overall QA/QC Officer, and results immediately reported to the respective QA Task Officers (field or data analyses) and project manager. Memos of audit results and corrective actions will be recorded by the project manager and included in the respective quarterly report.

The primary assessment methods for this project are electronic submission of quarterly reports and an annual year-end summary report written by AEI and UCF for the duration of the project period, July 1, 2012, through December 30, 2013. Quarterly reports will detail progress to date on each task and address any difficulties achieving the task outcomes.

An annual year-end project report will be submitted on the last day of the calendar year in electronic format covering work status, work progress, difficulties encountered, preliminary data results and a statement of activity anticipated during the subsequent reporting period. The report will also include a discussion of expenditures along with a comparison of the percentage of the project completed to the project schedule and an explanation of significant discrepancies. If necessary, any of the organizations/agencies involved are able to initiate a stop work order. Corrective actions for deficiencies and other non-conforming conditions will be addressed immediately by the responsible organization/agency in cooperation with the other project partners. All corrective action will be verified and documented in writing and addressed in the subsequent quarterly report.

A final manuscript to be submitted to a peer-review scientific journal will be written and delivered upon completion of all sampling and analysis.

All laboratory and field records will be maintained for a minimum of 3 years after project completion.

GROUP B-DATA GENERATION AND ACQUISITION ELEMENTS

B1-SAMPLING PROCESS DESIGN (EXPERIMENTAL DESIGN)

This section specifies the protocols and procedures to be used by ECT and UCF when conducting sampling activities for this project and PASI, UF, and UGA when conducting laboratory analytical activities.

The objectives of this project are to collect and analyze stormwater and surface water quality in four subdivisions in the Tampa Bay region and to collect soil and irrigation water one time in each of the four subdivisions. The sampling locations will be chosen to provide representative samples of the pollutant loads and total flow from these four subdivisions.

Sampling Locations-Samples will be taken at the automated sampling stations established by ECT for this project.

B2-SAMPLING METHODS

B2.1 Sampling Equipment

See Table B2.1 for a list of the equipment to be used for this project. Equipment will be used in accordance with manufacture's installation and/or operational guides.

The following equipment will be used by **ECT** for sampling surface and stormwater. All sampling activities will be conducted in accordance with FEP-SOP-001/01; FS2100 Surface Water Sampling. Additionally, operation and calibration of equipment will be performed according to the Teledyne ISCO Avalanche Installation and Operation Guide.

Irrigation water will be collected via a grab sample after purging the line for five minutes prior to collecting. No special equipment other than sampling vials are needed for irrigation water sampling.

Soil samples will be collected from the surface 15cm of the soil using a 7cm diameter polycarbonate core tube with stainless steel cutting head. At least three spatially representative soil samples will be collected and composited for each site. Live roots, litter and coarse debris will be removed from sample prior to analysis. Soils will be analyzed for Cation exchange capacity and nutrients as listed in Table 7.2. All samples will be kept at 4 degrees C until analysis.

EQUIPMENT DESCRIPTION	USE
Purging Equipment	
1. N/A	
Stormwater Sampling Equipment	
1. Isco 750 Area Velocity Flow Module*	Flow-proportioned sampling
2. Isco 674 rain gauge*	Rainfall recorder
3. Isco Avalanche Refrigerated Portable Sampler*	Sampling, Stormwater Runoff
4. 0.45 micron capsule filter	Sample filtration
5. Isco digital cell phone modem*	Communicate with Avalanche sampler
Soil Sampling Equipment	
1. 7cm polycarbonate soil corer	Composite soil sample to 15 cm
2. Air dry or oven dry at 105C depending on analysis	Prepare soils for analysis
3. 2 mm sieve	Removing course solids
Field Measurement Equipment	
1. YSI 556 MPS	In-situ measurement of pH, DO, conductivity and ORP

Table B2.1: Proposed Sampling Equipment

B2.2 Field Activities

See Table B2.2

B2.2.1Sampling protocols for this project that are not specified in FDEP-SOP-001101 specified in Table B2.2 include the following: N/A

B2.2.2 Disposal protocols for handling wastes differ from those specified in FDEP-SOP-001101. Wastes will be handled according to the following protocols: N/A

All field activities will be done in accordance with FDEP-SOP-001/01; FS 2100 Surface Water Sampling; FD 1000 Documentation Procedures.

ECT will be responsible for identifying, correcting or replacing malfunctioning sampling equipment in a timely manner.

All protocols, procedures and policies in the above-mentioned document which are pertinent to this QAPP will be followed and are summarized in Table B2.2 below:

	VOCs	Extr. Org.	Metals	Inorg. Anions	Org.	Phys. Prop.	Micro	Other
Groundwater								
Groundwater (in-place plumbing)				X		X		
Potable Water								
Surface Water				X		X		
Soil				X		X		
Sediment/Sludges								
Automatic Samplers								
Field Filtration								
Wastewater								
	VOCs	Extr. Org.	Metals	Inorg. Anions	Org.	Phys. Prop.	Micro	Other
Stormwater runoff				X		X		

Table B2.2 Field Activities

B2.3 Field Measurements

The frequency of sampling has been discussed in Section A7.1. Field measurements are listed in Table B2.2 of this QAPP. Field screening measurements that will be made are: N/A

B2.4 Sample Containers

Sample containers will be supplied by: PASI for all samples except soils and water isotope analyses. UCF will provide sample containers for soils and waters that will be run for isotope analyses.

Sample containers will be pre-preserved by the above-referenced organization and additional acid will be provided (see Table A7.1);

Periodic checks for adequate sample preservation will be done with narrow-range pH sticks, particularly during initial sample collection. Laboratory-supplied acid will be added, if needed, to achieve a pH equal to or less than 2 standard units (su).

B2.5 Equipment Decontamination

Equipment decontamination will follow protocols outlined in FDEP-SOP-001/01. Clean 10-liter composite sample containers will be changed between sample events. Cleaning will be done per FDEP SOP FC 1000. Field autosampler bottles will be cleaned after each sampling event according to FDEP SOP FC 1132.

B2.6 Waste Disposal

The procedures for handling wastes from equipment cleaning and from sampling are those presented in FDEP-SOP-001101.

B3-SAMPLING HANDLING AND CUSTODY

Sample handling and custody will be done in accordance with FDEP-SOP-001/01 (included in Appendix A).

B4-ANALYTICAL METHODS

The laboratory analyses for stormwater and surface water samples will be conducted by PASI. The NELAC certification number for this organization is **E83079**.
The laboratory analyses for soil samples will be conducted by UF ARL Laboratory or the Wetlands Laboratory.
The laboratory isotope analyses for liquid and soil samples will be conducted by University of Georgia (UG) Odum Ecology Laboratory. Validation methods for isotopes analysis and sample preparation will be provided by Tom Maddox, Laboratory Director, UG Odum Ecology Laboratory.

All protocols, procedures and policies certified per NELAC that are pertinent to this QAPP shall be followed. The laboratory shall analyze the samples for this project by the methods specified in Table A7.1 of this QAPP. Standard lab turnaround times for analysis and data deliverables is 7-10 business days and Tina Buttermore of Pace Analytical Laboratories will be responsible for any laboratory corrective action. Results of isotope analysis will be reported within 30 days of sample delivery and Dr. Tom Maddox of the Odum Isotope Laboratory will be responsible for any corrective action associated with isotope lab samples and will provide validation information for non-standard methods run during isotope sample preparation and analysis.

B5-QUALITY CONTROL

B5.1 Field Activities Quality Control

Quality control for field activities will be done in accordance with Table A7.1. YSI instrument calibration will include initial and continuing calibration steps for each use and documented on FDEP Form FD 9000-8 .

Composite sample containers will be blanked, as an equipment blank, at a ratio of 5 percent blanks for all project samples collected, per FDEP SOP FS2100.

New tubing will be installed when the automated sampler is installed per SOP FS2100. Tubing replacement will be done at least every 6 months. Replacement may also be done if visual evidence of tubing deterioration that may impact sample quality is found.

Velocity and level sensors will be factory calibrated at the time of installation. Water level will be validated monthly as part of routine maintenance by manually measuring the depth of the water and comparing it with the data logger level. If the measured water level is not within 0.002 ft of the data logger recording, the level recording in the data logger will be adjusted to the correct level. If discrepancies occur frequently the sensor will be replaced.

Rain gauges will be factory calibrated at the time of station installation. Rain gauges will be checked for obstructions or debris that may interfere with functionality. Known quantities of water will be poured through the rain gauge to verify accurate measurements semi-annually.

B5.2 Laboratory Activities Quality Control

Quality control for laboratory activities will be done in accordance with EPA Methods, laboratory protocols, and SOPs as approved by NELAC.

B6-INSTRUMENT/EQUIPMENT TESTING, INSPECTION, AND MAINTENANCE

Instrument/equipment testing, inspection and maintenance will be done in accordance with FDEP and manufacturer requirements for field activities/sample collection and with laboratory protocols and SOPs as approved by NELAC for laboratory activities.

Sites will be inspected every 2 weeks if no storm events occur. Inspection will include checking, as possible, intake tubing line and flow level sensor cable for debris or vegetation. The rain gauge will be checked for any accumulation of debris or vegetation in collection screening and funnel. The gauge's tipping bucket mechanism will be worked to assure free movement.

The flow and level sensor performance will be based on the manufacturer's recommended specification for signal strength and spectrum or signal noise percentage readings. The acceptable signal strength percentage of 10 to 90 percent and a spectrum or signal noise of 40 to 90 percent are indicative of proper sensor function. Readings outside these acceptance ranges will be cause to investigate sensor operation including proper placement to avoid turbulent flow, obstructions, and/or siltation on or around the sensor. The level sensor will initially be calibrated by manually measuring water depth and comparing with the sensor display. The display will be adjusted to be consistent with the manual measurement. Calibration checks for level will be done at monthly intervals or when the level values appear anomalous. An area to velocity calculation will determine flow volume as described in Section A7.2.

The Avalanche desiccant will be replaced when the 30 percent area in the display turns light pink or white as part of routine maintenance.

B7-INSTRUMENT/EQUIPMENT CALIBRATION AND FREQUENCY

Instrument/equipment calibration will be done in accordance with FDEP requirements for field activities and with laboratory protocols and SOPs as approved by NELAC for laboratory activities. The YSI meter used for *in situ* measurements will have and initial, verification, and continuing calibration. Field equipment (ISCO) will be factory calibrated at the time of deployment and operation and maintenance will be done in accordance with manufacturer's installation and maintenance guides.

B8-INSPECTION/ACCEPTANCE OF SUPPLIES AND CONSUMABLES

Inspection/acceptance of supplies and consumables will be done in accordance with FDEP requirements for field activities and with laboratory protocols and SOPs as approved by NELAC for laboratory activities.

Sample bottles will be supplied by PACE laboratories and UCF. If additional bottles are needed, they will be obtained by PACE or purchased by UCF. ECT and UCF project team members will check that appropriate labels are affixed to each sample bottle.

B9-NON-DIRECT MEASUREMENTS

Not applicable.

B10-DATA MANAGEMENT

The collection, use, and dissemination of information of known and appropriate quality are integral and it is important that work is conducted to ensure and maximize the integrity of the information collected and to simplify the dissemination of the information. To accomplish the goals set out in the Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity of Information Disseminated by the Environmental Protection Agency, data management done in accordance with applications of FDEP SOP FD1000 requirements for field activities and with laboratory protocols and SOPs for laboratory activities. Laboratory test results will be issued in accordance with NELAC requirements and will include the following information.

- Laboratory sample ID and associated Filed ID
- Analytical test method
- Parameter/analyte name
- Analytical results (including dilution factor)
- Result unit
- Applicable FDEP qualitfiers per Table 1 of Chapter 61-160 F.A.C.
- Result comment(s) to include corrective/preventive actions taken for any failed QC measure or toerh problem realted to the analysis of the samplers
- Date and time of sample preparation (if applicable)
- Date and time of sample analysis
- Results of laboratory verification of field preservation
- Sample matrix
- MDL
- PQL
- Sample type (such as blank type, duplicate type, etc.. as appropriate)

- Field and laboratory QC blank results
- Acceptance criteria used t9o evaluate each reported control measure

Field personnel will ensure that the following field-related information is reported to the Project Manager in Excel of Access format:

- Site name and address or GPS location
- Field ID for each sample container and the associated analytes for which the container was collected
- Date and time of sample collection
- Sample collection depth
- Sample collection method identified by the SOP #
- Sample filtration (if performed)
- Field test measurement results including parameter name, result, result unit, and applicable data qualifiers
- Narrative comments discussing corrective/preventative actions taken for any failed QC measure (blank contamination, meter calibration failure, split sample results, etc..) unacceptable field measurement or other problems related to the sampling event.
- Legal of evidentiary Chain of Custody

UCF will record the data in an electronic spreadsheet file that will be maintained on their main computer server that is backed up nightly on tape. Hard copy printouts of all data records will also be maintained in the project file in the UCF office for five years.

As discussed previously, sample collection information will be documented on standardized surface water sampling form and laboratory chain-of-custody form. In-situ data will also be entered on the sampling form. A standard form will also be used to document the programming entries on the Avalanche sampler. The completed forms will be maintained in a dedicated project file in a field team member's office file cabinet. Examples of forms can be found in Appendix A

Flow data will be downloaded directly on site or remotely by cellular modem. Files will be stored as database files (mdb).

GROUP C-ASSESSMENT AND OVERSIGHT

The elements in this group address the activities for assessing the effectiveness of project implementation and associated QA and QC activities.

C1-ASSESSMENTS AND RESPONSE ACTIONS

Applied Ecology Inc (AEI) is responsible for creating and maintaining the official, approved quality assurance project plan (QAPP). Specifically, the AEI Project Manager *(Listopad)* will rely on the internal auditing role of the QA/QC Officer (Clark) to ensure of the maintenance and implementation of the QAPP. QAPP procedures, as outlined in this document, will be followed throughout the duration of the project.

Environmental Consulting and Technology (ECT) personnel includes the field sampling Project Manager and Field QA Task Officer and additional field personnel who will be responsible for collecting field data, shipping field samples, data entry, and laboratory procedures. The Field QA Manager *(Smith)* will be responsible for quality assurance of the electronic data and all field sampling tasks outlined in this quality assurance project plan (QAPP).

University of Central Florida (UCF) Data Analysis QA Task officer (*Bohlen)* will interact directly with the overall QA/QC Officer (Clark) and the Project Manager (Listopad) to review and confirm the quality assurance of the post field collection efforts. UF QA Officer will be overseeing the effort of both the Field and Analysis QA Task manager, addressing questions, and maintaining the project manager updated on QA compliance throughout the duration of the project.

The AEI Project Manager will communicate directly with the QA/QC Officer, the ECT Project Manager, the UCF Project Manager, and the TBEP Project Manager regarding the project. Laboratory technicians will work directly with ECT and UCF QA managers to discuss water collection standard operating procedures (SOPs) and sample processing.

ALL INVOLVED PARTIES WILL INITIATE ANY CORRECTIVE ACTION DEEMED NECESSARY.

Performance and Systems Audits

Field Activities - Specific audits planned for this project are:

Audit Type	Frequency/Date	Description
1. Internal	Once between the 2nd and 4th sampling and analysis events.	Stormwater Sampling

ALL INVOLVED PARTIES WILL CONSENT TO AUDITS IF DEEMED NECESSARY.

Planning Review Audits

(i) Initial: Prior to the completion of the sampling and analysis events and after the second completed sampling and analysis event but no later than the fourth, the QA/QC officers (*Listopad, Bohlen, Smith, Clark)* shall review the QAPP document relative to the completed field and laboratory activities to determine if the data quality objectives are being met, identify any improvements to be made to the process, and refine the sampling and/or analytical design or schedule.

(ii) The QA/QC Officer will audit the field sampling procedures in the first or second month after installation of the devices. Thereafter, a discussion between QA/QC officers (*Listopad, Bohlen, Smith, Clark)* will address any questions, concerns or required changes. The problems and corrective actions taking place will be reported to the Tampa Bay Estuary Program Project Manager (*Sherwood)* as memos, and these will be included in summary form within the quarterly reports and maintained with project records.

(iii) Ongoing: Planning reviews as described in item (i) above shall occur annually.

Additional external auditing can be requested by the project manager after the initial internal audit and corrective actions have taken place. Any problems encountered from this additional audit will also be included in the respective quarterly report. Mark Clark of the University of Florida represents an independent and competent additional reviewer who will be included in filed and planning document audits.

Corrective actions will be implemented by the Field QA Task Officer (Smith) and verified by the Project Manager (Listopad).

C2-REPORTS TO MANAGEMENT

All reports will be consistent with the Deliverables section of the project contract.

Concise monthly status reports will be sent by AEI to TBEP and a final manuscript appropriate for a peer-review journal will be submitted at project completion. Every quarter, a section on quality assurance and audit results and problem resolution will be included in the monthly status report.

GROUP D-ASSESSMENT AND OVERSIGHT

The elements in this group address the QA activities that occur after the data collection phase of the project is completed.

D1-DATA REVIEW, VERIFICATION, AND VALIDATION

The criteria used to review, verify, and validate data will initially be the QA/QC sample results included in the laboratory report. Additionally, any available data from monitoring done at either of the two sites in this project will be referenced for data verification. As the project proceeds, new data will also be reviewed against earlier sampling events for acceptance evaluation.

Statistical tests will be run to check for data reliability that includes scatterplots, box plots, and distributions of variance.

D2-VERIFICATION AND VALIDATION METHODS

Analytical data will be verified and validated per EPA Methods, laboratory SOPS and NELAP requirements. Analytical results will be reviewed to ensure blank sample results to not indicate contamination either by sampling procedures or the laboratory environment.

Data will be tabulated and queries performed to validate completeness of results and appropriate data ranges. Data will be scanned for anomalies by the use of scatterplots and histograms. Outliers will be evaluated for accuracy (against raw lab spreadsheets), and previous recorded data for the same site...

Task QA Managers will report their findings via email memos to the project manager, which, in turn, will contact the necessary project manager for conflict resolution and request immediate implementation of field corrective measures. Project personnel will update QA officer and project manager of the results of the new corrective action. All findings will be recorded in quarterly reports by the project manager.

D3-RECONCILIATION WITH USER REQUIREMENTS

If laboratory duplicate or matrix spike QA/QC samples do not meet acceptance criteria, sample re-analysis will be required before laboratory data reports will be produced. Equipment blank sample results indicating contamination will require more vigorous equipment decontamination efforts or replacement of equipment with new equipment. Either remedy will be checked for effectiveness by generation of additional blanks.

The Analysis QA/QC Task Officer (*Bohlen)* will be responsible for reconciling the data to the project data quality objectives.

Appendix A

Chain of Custody Forms and Sample and Maintenance Logs

Appendix B

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Appendix B - Telephone Survey Questionnaire

Tampa Bay Estuary Program Survey Questionnaire

Hi, my name is _______________. I'm a student at UCF collecting information on homeowners landscaping practices to assist a research study. The research project focuses on how people take care of their yards. We are working for educational purposes, I promise I am not selling anything or working for any for-profit company! We really need your help and the survey is very short – it only takes about10 minutes.

[INTERVIEWER: Add as necessary to assure respondent: Let me stress that your participation in this survey is completely voluntary and confidential. Do you have any questions you want to ask about the survey? Your number was chosen at random to participate in this survey. You will not be identified by name in any document we produce. We are interviewing several hundred people and your answers will be combined with everyone else's. You have the right to refuse to answer any question you want. You may also terminate the interview at any time.]

SCREENING

Home First, is this a home or a business?

0 Home→Continue

1 Business→Terminate interview

Age18 We can only interview people who are at least 18? Are you age 18 or more?

0 NO→Is there anyone over 18 at home that I can speak with?

1 YES→Continue

Own Do you own or rent the place where you live?

1 Own→Continue

0 Rent→Terminate interview

Lawn Do you have a lawn or yard that you are responsible for maintaining?

0 No→Terminate interview

1 Yes→Continue

Yard Are you the person responsible for making most of the decisions about yard maintenance in your home?

1 YES→Continue

2 NO→ Can we speak to the person who is responsible for yard maintenance?

3 R and someone else make joint decisions→Continue

county Which county do you live in?

1 Hillsborough

2 Pinellas

3 Manatee

4 All Other→Terminate Interview

Zca And just so we can be sure we get a proper geographic spread, what is your Zip Code?

__ __ __ __ __ <Record Five-Digit Zip Code>

Q1 OK, good. Now we have some questions about landscaping irrigation and yard maintenance. First, do you ever irrigate or water your lawn with water other than rainwater?

1 YES

2 NO→<Go to LAWN MAINTENANCE>

Q2 What is the primary method you use to water your lawn?

1 In-ground, automatic irrigation system

2 Hand water using a hose

3 Set an aboveground sprinkler out by hand

4 Drip irrigation from hoses at surface

5 Other: RECORD: ___________________________

6 DK, All other missing

Q3 How many times a week do you typically water the lawn?

___ <Enter # times/week>

99 for all missing

Q4 Is your landscape irrigated with well water, city water, surface water, reclaimed water, or some other source? [If R says "well water," ASK: Is it a community well or a private well?]

1 Community Well (from neighborhood)

2 Private Well (on homeowner's property)

3 City water

4 Reclaimed water

5 Surface water source, such as a lake, canal, retention pond, etc.

6 Rainwater collected in cistern or rain barrel

7 Don't know

8 All other missing

LAWN MAINTENANCE

Now let me ask about other aspects of lawn maintenance. We are focusing on the grass area of the yard and not the trees, flower beds, or shrubberies if they are maintained differently. In the last 12 months, have you or anyone else applied the following to the lawn…

Q5 Insect control products?

3 Don't know

2 No

1 Yes→ Do you apply this yourself or was it done by a professional company? Q5a

- 1 Self
- 2 Company/HOA maintenance company/Someone outside the home
- 3 Both
- 4 Don't know

Q5b About how many times in the past 12 months were insect control products applied to your yard?
______ TIMES [If needed: Well, approximately… Or: Just your best guess…]

Q6 And how about weed control products? Were any weed control products applied to your lawn in the last twelve months?

3 Don't know

2 No

1 Yes→ Do you apply this yourself or was it done by a professional company? Q6a

- 1 Self
- 2 Company/HOA maintenance company/Someone outside the home
- 3 Both
- 4 Don't know

Q6b About how many times in the past 12 months were weed control products applied to your yard?
______ TIMES [If needed: Well, approximately… Or: Just your best guess…]

Q7 And how about fertilizer? Has anyone applied fertilizer your lawn?

3 Don't know

2 No→ GO TO "INFORMATION" SEQUENCE

1 Yes→Did you apply this yourself or was it done by a professional company? Q7a

  1 Self

  2 Company/HOA maintenance company/Someone outside the home

  3 Both

  4 Don't know

Q7b About how many times was fertilizer applied to the lawn in the past 12 months?

_______ TIMES [If needed: Well, approximately… Or: Just your best guess…]

Q8 Is fertilizer applied to your lawn on a regular schedule or only as needed?

1 Regular schedule

2 Only as needed

3 Don't know

4 All other missing

Q9 During what months was the lawn fertilized last year (in 2011)? <Check all that apply, if "0" PROBE: Have you ever applied fertilizer to the lawn? >

Q9_1 JAN

Q9_2 FEB

Q9_3 MAR

Q9_4 APR

Q9_5 MAY

Q9_6 JUN

Q9_7 JUL

Q9_8 AUG

Q9_9 SEP

Q9_10 OCT

Q9_11 NOV

Q9_12 DEC

Q9_13 I never fertilize the lawn →Confirm and Skip to INFORMATION SEQUENCE

Q9_14 I didn't fertilize the lawn last year (but have before) →Skip to INFORMATION SEQUENCE

Q9_15 Don't know

Q9_16 All other missing

Q10 Are there times or situations when you should **NOT** fertilize your lawn? **DO NOT READ PROBE FOR 2**

Q10_1 Right before a hard rain

Q10_2 After a hard rain

Q10_3 During a drought

Q10_4 Morning

Q10_5 Evening

Q10_6 Winter

Q10_7 Summer

Q10_8 Spring

Q10_9 Fall

Q10_10 Not sure

Q10_11 Other

CHANGE

Q11 Did you change anything about the way you fertilized your lawn last year compared to previous years, like the frequency that fertilizer was applied, the type of fertilizer, when fertilizer was applied, how often your professional company visited or something else?

1 NO, no changes to fertilizer routine→SKIP TO "INFORMATION" SEQUENCE

2 YES → **Direct to different questions if company or homeowner (self)** fertilizers.

3 First time I ever fertilized the lawn →SKIP TO "INFORMATION" SEQUENCE

4 Don't know →SKIP TO "INFORMATION" SEQUENCE

5 All other missing →SKIP TO "INFORMATION" SEQUENCE

IF LAWN IS FERTILIZED BY A COMPANY:

Q12 Did you increase or decrease the number of times your maintenance company came?

1 No change, company visited same as last year

2 Increased number of visits

3 Decreased number of visits

4 Don't know

5 All other missing

<SKIP TO INFORMATION SEQUENCE>

IF LAWN IS FERTILIZED BY HOMEOWNER (SELF):

Q13 Last year, did you change the number of times you fertilized the lawn compared to previous years? If so, did you fertilizer less than you had before or more than you had before?

1 No change - About the same as the year before

2 More times than the year before/ more frequently

3 Less times than the year before/ less frequently

4 Don't know

5 All other missing

Q14 Did you change what season(s) you applied fertilizer?

1 No change – About the same as the year before

2 Yes, specifically did NOT apply in the summer/rainy season

3 Yes, applied during the rainy season

4 Yes, other seasonal change _________________ q14_4_other

5 Don't know

6 All other missing

Q15 Did you change the amount of fertilizer you applied at one time? If yes: Did you increase or decrease the amount?

1 No change - About the same as the year before

2 Applied more than the year before/ increased amount

3 Applied less than the year before/decreased amount

4 Don't know

5 All other missing

Q16 Did you change the type of fertilizer you applied? <don't read, check all offered by respondent>

Q16_1 No, used what had used in the past.

Q16_2 Yes, changed to one without P (phosphorous)

Q16_3 Yes, changed to one without N (nitrogen)

Q16_4 Yes, changed to slow-release

Q16_5 Yes, changed to organic

Q16_6 Yes, changed to cheaper brand

Q16_7 Yes→Describe the change: _________________________ q16_7_other

Q16_8 Don't know

Q16_9 All other missing

<CONTINUE TO INFORMATION SEQUENCE>

INFORMATION SEQUENCE - ALL RESPONDENTS

Q17 In the past year or so, have you heard or seen any information that gives tips on proper lawn and garden fertilizing techniques?

1 No, heard nothing → <Go to GOVERNMENT REGS AWARENESS>

2 Yes, maybe; think I heard something; etc. →CONTINUE

3 Yes, definitely →CONTINUE

4 Don't know → <PROBE: No, you haven't heard anything? and record "no" and SKIP TO GOVERNMENT REGS AWARENESS or Do you think you might have heard something? Record maybe and CONTINUE or record Don't know and >

5 All other missing → <Go to GOVERNMENT REGS AWARENESS>

Q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. For each one I read, please tell me whether you definitely heard this message, might have heard the message, or definitely do not recall hearing this message.

CODE

1 No, do not recall hearing this message

2 Yes, **maybe;** think I heard something; sounds familiar, etc.

3 Yes, **definitely** heard this message

4 Don't know → <PROBE: no, don't recall or maybe? And code appropriately>

5 Refused/All other missing

Q18_r1 Don't apply fertilizer during the summer

Q18_r2 Too much fertilizer can cause chinch bugs

Q18_r3 Test the soil before fertilizing the lawn

Q18_r4 Too much fertilizer can pollute nearby waterways

Q18_r5 Use fertilizer that has slow-release nitrogen

Q18_r6 Water the lawn twice a week

Q18_r7 Give your lawn a break in the winter, its resting

Q18_r8 Never fertilize if heavy rain is predicted

Q18_r9 “Be Floridian” in your yard

Q18_r10 If you have to fertilize, do it in the spring

Q18_r11 Fertilize when your grass is growing

GOVERNMENT REGS AWARENESS

Q19 Have you heard anything about government regulations concerning residential landscape fertilizer? If yes, are you aware of any discussions about this issue here in [_________] County?

1 No, nothing → <Go to DEMOGRAPHICS>

2 Yes, maybe; think I heard something; maybe; sounds familiar, etc.

3 Yes, definitely

4 Don’t know →<PROBE: “no” and SKIP TO DEMOGRAPHICS or “maybe” and continue

5 Refused→<Go to DEMOGRAPHICS>

IF MAYBE OR YES: PROBE: What have you heard? What kinds of regulations do you think are being considered for the use of lawn fertilizer on residential yards in your county? To the best of your knowledge, do the [_________] County regulations …

Q19a Restrict the use of lawn fertilizer during the rainy season?

1 No, government regulations in my county do not address this

2 Yes, **maybe** heard something about regulations addressing this

3 Yes, **definitely** the government regulations address this

4 Other: <Record open ended> q19a_4_other

5 Don’t know if government regulations address this

6 Refused/Missing

Q19b Restrict the sale of lawn fertilizer during certain months?

1 No, government regulations in my county do not address this

2 Yes, **maybe** heard something about regulations addressing this

3 Yes, **definitely** the government regulations address this

4 Other: <Record open ended> q19b_4_other

5 Don't know if government regulations address this

6 Refused/Missing

Q19c Reduce the amount of phosphorous ("P") allowed in lawn fertilizer?

1 No, government regulations in my county do not address this

2 Yes, **maybe** heard something about regulations addressing this

3 Yes, **definitely** the government regulations address this

4 Other: <Record open ended> q19c_4_other

5 Don't know if government regulations address this

6 Refused/Missing

Q19d Reduce the amount of nitrogen ("N") allowed in lawn fertilizer?

1 No, government regulations in my county do not address this

2 Yes, **maybe** heard something about regulations addressing this

3 Yes, **definitely** the government regulations address this

4 Other: <Record open ended> q19d_4_other

5 Don't know if government regulations address this

6 Refused/Missing

Q19e Require training for professional landscaping companies?

1 No, government regulations in my county do not address this

2 Yes, **maybe** heard something about regulations addressing this

3 Yes, **definitely** the government regulations address this

4 Other: <Record open ended> q19e_4_other

5 Don’t know if government regulations address this

6 Refused/Missing

Q20 Do you recall **when** you heard about the ordinance? RECORD YEAR IF GIVEN, OR PROBE: Was it last year, a couple of years ago, about five years ago, or more than five years ago?

1 Last year

2 Couple of years ago

3 Five years ago

4 More than five years ago

5 Other: Year given <Record year ___ ___ ___ ___ > q20_5_other

6 Other: Record open ended ______________ q20_6_other

7 Don’t know

8 Refused/All other missing

Q21 Do you recall **where** you heard about the ordinance? <IF REQUIRED PROBE: perhaps you heard from the news media, some place, or from someone you know? and CHECK ALL THAT APPLY>

Q21_1 Television or newspaper

Q21_2 Event or club meeting

Q21_3 Neighbor/Family member

Q21_4 Hardware store/Home improvement centers

Q21_5 Landscaping company/Professional landscaper

Q21_6 Government office

Q21_7 Direct mail

Q21_8 Website

Q21_9 University of Florida/Agriculture Extension Service/Dept. of Agriculture

Q21_10 Other <Record open ended> ______________________________ q21_10_other

Q21_11 Don’t know

Q21_12 Refuse/All other missing

We're almost finished and just have a few demographic questions for statistical purposes. Thank you so much for your input today!

house How long have you lived in the house you're in now? __________ Year(s)

0	<1 year
1	1
2	2
3	3….
88	Don't know
99	All others missing

hoa Do you have a Homeowner's Association in your community?

1	Yes
2	No
3	Don't know
4	All other missing

hbuilt In what year was your **house built**? RECORD YEAR. IF REQUIRED, PROBE: Well, approximately? Or: Just your best guess?

____

employ What is your current employment status? Are you working full time, working part time, temporarily laid off, unemployed, retired, permanently disabled, a homemaker, a student, or what?

1	Working full time
2	Working part time
3	Not working - Temporary lay off
4	Not working - Looking for work
5	Not working - Retired
6	Not working - Disabled

7 Not working - Homemaker

8 Not working - Student

9 Not working - Other

10 DK/NA/Refused

educ What is the highest grade of school or year of college you have completed?

1 Less than high school (Grade 11 or less)

2 High school diploma (including GED)

3 Some college

4 Associates degree (2 year) or specialized technical training

5 Bachelor's degree

6 Some graduate training

7 Graduate or professional degree

8 DK/NA/Refused

byear In what year were you born? ______ ENTER NUMBER.

9999 for all missing.

child How many children under the age of 18 currently live with you? ___ ENTER NUMBER.

99 for all missing.

race Do you consider yourself to be White, Black or African American, Hispanic, Asian or Pacific Islander, Native American, or some other race?

1 White

2 African American or Black

3 Hispanic

4 Asian or Pacific Islander

5 Alaskan Native/Native American

6 Other: ____________________

7 DK/NA/Refused

income Which of the following categories best describes your total annual household income before taxes? Remember, this information will only be associated with your other responses to this survey and never with you as an individual.

1 Less than $25,000

2 $25,000 to $49,999

3 $50,000 to $74,999

4 $75,000 to $99,999

5 $100,000 to $124,999

6 125,000 to $149,999

7 Over $150,000

8 Refused

9 All other missing

rgender Record R's Gender, thank R for participating, and politely terminate interview

1 Male

2 Female

rage Respondent's age in years (used for recode of birth year (byear) variable.

ager	Respondent's age recoded into three categories:
1	18-29 years
2	30-64 years
3	65 and older

ager2	Respondent's age recoded into two categories:
1	18-64 years (non-elderly)
2	65 and older (elderly)

rrace	Respondent's race recoded into two categories:
1	White
2	Other

Appendix C - Homeowner Interview Questionnaire

Tampa Bay Residential Landscaping Study

Hi! My name is <name> and I'm a student at the University of Central Florida and we're conducting research on lawn care practices here in the Tampa Bay area. Can I speak to you or whoever is responsible for landscaping at your house? I can only interview people who are at least 18 years of age.

This study is being conducted by the University of Central Florida. The purpose of the study is to better understand homeowner landscaping practices.

The questionnaire only has about twenty questions and then I can talk to you more about the research project if you are interested. We think the interview will only take about 15 minutes. Can we talk to you?

Thank you.

Are you the person responsible for making most of the decisions about yard maintenance in your home? (Yes)

0 NO→ Can we speak to the person who is responsible for yard maintenance?

1 YES→Continue

2 R and someone else make joint decisions→Continue

We can only interview people who are at least 18? Are you age 18 or more?

0 NO→Is there anyone over 18 at home that I can speak with?

1 YES→Continue

Do you own or rent the place where you live?

1 Own→Continue

0 Rent→Terminate interview

Before we go any further I must go through the consent process.

<Go through the consent process>

Q1 OK, good. Now we have some questions about landscaping irrigation and yard maintenance. First, do you ever irrigate or water your lawn with water other than rainwater?

0 NO→<Go to LAWN MAINTENANCE>

1 YES

8 Don't know

9 Refused

Q2 What is the primary method you use to water your lawn?

1 In-ground, automatic irrigation system

2 Hand water using a hose

3 Set an aboveground sprinkler out by hand

4 Drip irrigation from hoses at surface

5 Other: RECORD: ___________________________

8 Don't know

9 Refused

Q3 How many times a week do you typically water the lawn?

_______ <Enter # times/week>

88 Don't know

99 Refused

Q4 Is your landscape irrigated with well water, city water, surface water, reclaimed water, or some other source? [If R says "well water," ASK: Is it a community well or a private well?]

1 Community Well (from neighborhood)

2 Private Well (on homeowner's property)

3 City water

4 Reclaimed water

5 Surface water source, such as a lake, canal, retention pond, etc.

6 Rainwater collected in cistern or rain barrel

8 Don't know

9 Refused

LAWN MAINTENANCE

Now let me ask about other aspects of lawn maintenance? We are focusing on the grass area of the yard and not the trees, flower beds, or shrubberies if they are maintained differently.

Q5 In the last 12 months, have you or anyone else applied fertilizer to the lawn?

0 No→ SKIP TO "INFORMATION" SEQUENCE AND DON'T COUNT AS COMPLETION

1 Yes→ ASK NEXT QUESTION

8 Don't know

9 Refused

Q6 When was the lawn fertilized last?

0 Last year

1 Within the last two weeks? About which date? <SHOW CALENDAR. ENTER DATE MM/DD>

____

2 Since the beginning of year? <CIRCLE month in year 2013>

Jan Feb Mar Apr May Jun

3 Other ____

8 Don't know

9 Refused

Q7 Did you apply this yourself or was it done by a professional company? <IF PRO, COLLECT COMPANY INFORMATION BELOW>

1 Self

2 Company/HOA maintenance company/Someone outside the home

3 Both <COLLECT COMPANY INFORMATION BELOW>

8 Don't know

9 Refused

Lawn Company: ____

Contact name: ____

Any other contact information (phone?): ____________________________________

Q8 About how many times was fertilizer applied to the lawn in the past 12 months?

______ # TIMES [If needed: Well, approximately… Or: Just your best guess…]

88 Don't know

99 Refused

Q9 Is fertilizer applied to your lawn on a regular schedule or only as needed?

1 Regular schedule

2 Only as needed

8 Don't know

9 Refused

Q10 During what months was the lawn fertilized last year (in 2012)?

<CHECK ALL THAT APPLY

0 I never fertilize the lawn →Confirm and Skip to INFORMATION SEQUENCE

1	JAN	5	MAY	9	SEP
2	FEB	6	JUN	10	OCT
3	MAR	7	JUL	11	NOV
4	APR	8	AUG	12	DEC

88 Don't know

99 Refused

Q11 Are there times or situations when you should **NOT** fertilize your lawn?

< DO NOT READ PROBE FOR 2 >

1. Right before a hard rain
2. After a hard rain
3. During a drought
4. Morning
5. Evening
6. Winter
7. Summer
8. Spring
9. Fall
10. Not sure
11. Other

88 Don’t know

99 Refused

INFORMATION SEQUENCE

Q12 In the past year or so, have you heard or seen any information that gives tips on proper lawn and garden fertilizing techniques? <IF RESPOND “Don’t know” PROBE: IS IT NO? Record “no” & skip or DO YOU THINK YOU MIGHT HAVE HEARD SOMETHING? Record Maybe and continue >

0 No, heard nothing → <Go to GOVERNMENT REGS AWARENESS>

1 Yes, maybe; think I heard something; etc. →ASK NEXT QUESTION

2 Yes, definitely →ASK NEXT QUESTION

9 Refused

Q12A What information did you hear about lawn fertilization? <RECORD OPEN>

____

____

____

GOVERNMENT REGS AWARENESS

Q13 Have you heard anything about government regulations concerning residential landscape fertilizer? If yes, are you aware of any discussions about this issue here in [_________] County?

0 No, nothing → <Go to DEMOGRAPHICS>

1 Yes, maybe; think I heard something; maybe; sounds familiar, etc.

2 Yes, definitely

9 Refused→<Go to DEMOGRAPHICS>

8 Don't know →<PROBE: "no" and SKIP TO DEMOGRAPHICS or "maybe" and continue

<IF MAYBE OR YES: PROBE:>

What have you heard? What kinds of regulations do you think are being considered for the use of lawn fertilizer on residential yards in your county? To the best of your knowledge, do the [_________] County regulations …

Q13a Restrict the use of lawn fertilizer during the rainy season?

0 No, government regulations in my county do not address this

1 Yes, **maybe** heard something about regulations addressing this

2 Yes, **definitely** the government regulations address this

8 Don't know if government regulations address this

9 Refused

Q13b Restrict the sale of lawn fertilizer during certain months?

0 No, government regulations in my county do not address this

1 Yes, **maybe** heard something about regulations addressing this

2 Yes, **definitely** the government regulations address this

8 Don't know if government regulations address this

9 Refused/Missing

Q13c Reduce the amount of phosphorous ("P") allowed in lawn fertilizer?

0 No, government regulations in my county do not address this

1 Yes, **maybe** heard something about regulations addressing this

2 Yes, **definitely** the government regulations address this

8 Don't know if government regulations address this

9 Refused/Missing

Q13d Reduce the amount of nitrogen (“N”) allowed in lawn fertilizer?

0 No, government regulations in my county do not address this

1 Yes, **maybe** heard something about regulations addressing this

2 Yes, **definitely** the government regulations address this

8 Don’t know if government regulations address this

9 Refused/Missing

Q13e Require training for professional landscaping companies?

0 No, government regulations in my county do not address this

1 Yes, **maybe** heard something about regulations addressing this

2 Yes, **definitely** the government regulations address this

8 Don’t know if government regulations address this

9 Refused/Missing

Q13f Other - Heard other government regulations <RECORD OPEN ENDED>

____

____

____

____

Q14 Do you recall **when** you heard about the ordinance? RECORD YEAR IF GIVEN, OR PROBE: Was it last year, a couple of years ago, about five years ago, or more than five years ago?

1 This year (2013)

2 Last year (2012)

3 Couple of years ago

4 Five years ago

5 More than five years ago

6 Other: Year given <Record year ___ ___ ___ ___ >

7 Other: Record open ended _____________

8 Don't know

9 Refused/All other missing

Q15 Do you recall **where** you heard about the ordinance? <IF REQUIRED PROBE: perhaps you heard from the news media, some place, or from someone you know? and CHECK ALL THAT APPLY>

1 Television or newspaper

2 Event or club meeting

3 Neighbor/Family member

4 Hardware store/Home improvement centers

5 Landscaping company/Professional landscaper

6 Government office

7 Direct mail

8 Website

9 University of Florida/Agriculture Extension Service/Dept. of Agriculture

10 Billboard

11 Radio

12 Other <Record open ended> ____

88 Don't know

99 Refuse/All other missing

DEMOGRAPHICS

We're almost finished and just have a few demographic questions for statistical purposes. Thank you so much for your input today!

Q16 How long have you lived in the house you're in now? __________ Year(s)

4 <1 year

5 1

6 2

7 3….

88 Don’t know 99 Refused

Q17 What is your current employment status? Are you working full time, working part time, temporarily laid off, unemployed, retired, permanently disabled, a homemaker, a student, or what?

1 Working full time

2 Working part time

3 Not working - Temporary lay off

4 Not working - Looking for work

5 Not working - Retired

6 Not working - Disabled

7 Not working - Homemaker

8 Not working - Student

9 Not working - Other

99 DK/NA/Refused

Q18 What year were you born? _________ ENTER YEAR AS NUMBER.

<INTERVIEWER RECORD RACE AND GENDER or ask for clarification as needed>

Q19 Race – Which racial/ethnicity group do you most identify with?

1 White

2 African American or Black

3 Hispanic

4 Asian or Pacific Islander

5 Alaskan Native/Native American

6 Other: ____________________

Q20 Record R's Gender

1 F

2 M

RECRUITING FOR SOIL & IRRIGATION WATER TESTING

Would you be willing to participate in the next phase of this research project? It involves having a UCF researcher collect a small amount of soil and irrigation water from your home's front yard. The soil testing wouldn't disturb your yard at all, a narrow core of soil is collected. We will be analyzing the samples for nutrients and the results could help you better manage your yard maintenance.

If you agree to participate today, we will need your contact information and a UCF researcher will contact you to arrange a meeting to talk about how your yard can be included in the research.

Q21 Can someone contact you to schedule soil and water testing <I PROMISE THEY WON'T TRY TO SELL YOU ANYTHING If not already done, have respondent sign bottom half of consent form>

1 Yes – I agree to have someone contact me schedule soil and water testing <If not already done, have respondent sign bottom half of consent form>

2 No thanks <END SURVEY>

9 All other missing

IF YES: <COLLECT CONTACT AND SIGN BOTTOM OF CONSENT>

Name: ______________________________

Address ______________________________

____

Telephone: ______________________________

Email address: ______________________________

Best way to contact? <CIRCLE ONE>

Post Mail Email Telephone

Appendix D - Professional Interview Questionnaire

Tampa Bay Landscape Professional Survey

Hi! My name is <name> and I'm a student at the University of Central Florida and we're talking to professional landscapers about lawn care practices. Can I speak to someone who can respond to questions about that? The questionnaire is only ten questions and shouldn't take more than five minutes to complete. The business name will not be recorded, all names will be kept confidential and your answers will be combined with the answers of all of the other landscape businesses we are interviewing. There is no risk to you for participating.

Can I proceed with the interview? Thank you!

<As needed: Is there a better time for me to call back? Is there someone else I should speak with – collect name and phone # as needed for referred person>

Q1 What form of fertilizer do you typically apply to a residential lawn - liquid fertilizer or solid, granule type fertilizer?

0 Liquid fertilizer

1 Solid fertilizer

2 Both, it depends <Prompt, please explain>

8 Don't know

9 Refused

Q2 What nutrient content does the fertilizer contain? (Nitrogen, Phosphorus, Potash, micronutrients?) <Record open ended>

Q3 On average, about how times a year do you visit one homeowners yard?

<Record # ______ or write open ended response>

88 Don't know

99 Refused

If they indicate that "it depends", ask them what they consider when making that decision.

Q4 Does the fertilizer formula vary from yard to yard or do you pretty much use the same mixture on every yard?

1	Formula varies from yard to yard
2	Pretty much use the same blend on every yard
8	Don't know
9	Refused

Q5 During what months is nitrogen applied to the lawn?

<CHECK ALL THAT APPLY>

1	JAN	5	MAY	9	SEP
2	FEB	6	JUN	10	OCT
3	MAR	7	JUL	11	NOV
4	APR	8	AUG	12	DEC
88	Don't know				
99	Refused				

Q6 During what months is phosphorous applied to the lawn?

<CHECK ALL THAT APPLY>

1	JAN	8	AUG
2	FEB	9	SEP
3	MAR	10	OCT
4	APR	11	NOV
5	MAY	12	DEC
6	JUN		
7	JUL		

88 Don’t know

99 Refused

Q7 During what months is potassium applied to the lawn?

<CHECK ALL THAT APPLY>

1 JAN

2 FEB

3 MAR

4 APR

5 MAY

6 JUN

7 JUL

8 AUG

9 SEP

10 OCT

11 NOV

12 DEC

88 Don’t know

99 Refused

Q8 How do you calculate the correct amount of nitrogen to apply to each lawn?

88 Don’t know

99 Refused

Q9 Are there times or situations when you should NOT fertilize the lawn?

<DO NOT READ PROBE FOR 2 >

1. Right before a hard rain
2. After a hard rain
3. During a drought
4. Morning
5. Evening
6. Winter
7. Summer
8. Spring
9. Fall
10. Not sure
11. Other

88 Don't know

99 Refused

GOVERNMENT REGS AWARENESS

Q10 Have you heard anything about government regulations concerning residential landscape fertilizer? If yes, are you aware of regulations in [_________] County? <Insert County and use same county throughout the series.>

0 No, nothing

1 Yes, maybe; think I heard something; maybe; sounds familiar, etc.

2 Yes, definitely

8 Don't know <PROBE: "no" and SKIP TO DEMOGRAPHICS or "maybe" and continue

9 Refused<Go to DEMOGRAPHICS>

<IF MAYBE OR YES: PROBE:>

What have you heard? What kinds of regulations do you think are being considered for the use of lawn fertilizer on residential yards in your county? To the best of your knowledge, do the [_________] County regulations …

Q10a Restrict the use of lawn fertilizer during the rainy season?

0 No, government regulations in my county do not address this

1 Yes, maybe heard something about regulations addressing this

2 Yes, definitely the government regulations address this

8 Don't know if government regulations address this

9 Refused

Q10b Restrict the sale of lawn fertilizer during certain months?

0 No, government regulations in my county do not address this

1 Yes, maybe heard something about regulations addressing this

2 Yes, definitely the government regulations address this

8 Don't know if government regulations address this

9 Refused/Missing

Q10c Reduce the amount of phosphorous ("P") allowed in lawn fertilizer?

0 No, government regulations in my county do not address this

1 Yes, maybe heard something about regulations addressing this

2 Yes, definitely the government regulations address this

8 Don’t know if government regulations address this

9 Refused/Missing

Q10d Reduce the amount of nitrogen (“N”) allowed in lawn fertilizer?

0 No, government regulations in my county do not address this

1 Yes, maybe heard something about regulations addressing this

2 Yes, definitely the government regulations address this

8 Don’t know if government regulations address this

9 Refused/Missing

Q10e Require training for professional landscaping companies?

0 No, government regulations in my county do not address this

1 Yes, maybe heard something about regulations addressing this

2 Yes, definitely the government regulations address this

8 Don’t know if government regulations address this

9 Refused/Missing

Q10f Other - Heard other government regulations <RECORD OPEN ENDED>

____

Q11 Do the regulations that you described in the previous series of questions apply in other counties that you work in?

0 No

1 Yes – If yes, which counties? <Record open ended>

8 Don't know

9 Refused/Missing

Q12 Have local government regulations made you change the way you do business?

2 No

3 Yes – If yes, how? <Record open ended>

8 Don't know

9 Refused/Missing

END SURVEY O.K.! That concludes our interview, thank you very much for your time and participation. Do you have any questions?

Respond as needed. This is part of a larger study being conducted by the University of Central Florida to better understand residential landscape management practices and fertilizer use. The PI for the study is Dr. Patrick Bohlen and the project is being funded by the Tampa Bay Estuary Program.

Appendix E - Monitoring Plan for the Residential Stormwater Quality Evaluation of the Tampa Bay Area

2013

MONITORING PLAN

for the

Residential Stormwater Quality Evaluation of the Tampa Bay Area.

Prepared For

Tampa Bay Estuary Program

Tampa Bay Estuary Program

100 8th Avenue, SE

St. Petersburg, FL 33701

Prepared by

Claudia Listopad, Ph.D.

Applied Ecology, Inc.

4/05/2013

Background

The Residential Stormwater Quality Evaluation will compare socio-ecological variables in four communities. The research project will integrate human behavior and water quality data to assess the environmental impact of varying local nutrient source reduction strategies. This document describes the stormwater sampling methods in detail in order to demonstrate the decision-making process for adequately measuring stormwater flows and volumes within the select communities.

The community-scale focus of this study will contribute important information to the growing body of urban ecology literature, it expands the methods and tools that can be used to evaluate programs and policies, and it provides a measure of nutrient inputs associated with residential lawn fertilizer practices. The research will include a comprehensive survey of stormwater, surface water, irrigation water, and soil data as well as human behavior and socio-demographic information within the communities to clarify the link between land-based nutrient inputs and the receiving aquatic ecosystem.

In the initial scope of work, Applied Ecology, Inc (AEI) and partners University of Central Florida (UCF) and University of Florida (UF) proposed that the Monitoring Plan would include a trend analysis to predict changes in surface water quality that could be confidently linked to current landscape management practices within the communities. The trend analysis was intended to examine any available multi-year data sets for surface water sampling locations within the communities to understand patterns in nutrient variations, conduct a limited power analysis to project the trend into the future, and define a critical value that would confidently demonstrate that a significant change in water quality had occurred based on natural variability.

Unfortunately, the communities selected for this project after an extensive evaluation of homogeneous parameters across the three counties (see sections below) were not part of any water quality monitoring program and had no historical water quality data within their immediate drainage basins.. Therefore, the project team agreed that the scope of the Monitoring Plan would focus on establishing a comprehensive storm water quality sampling program within the selected communities rather than rely on historical analyses of surface water quality data.

As such, an amendment to the original scope was created and extended the timeframe of surface and stormwater sampling from 6 months to 18 months, providing more data for analysis over several rainy seasons.

Monitoring Plan Purpose

This Monitoring Plan provides background information and updated sampling activities as described in the Quality Assurance Project Plan approved by EPA on 11/26/12 (Appendix B). Sections of this report describe the community selection process, the sampling schedule for surface water quality samples (pond sampling), and the method used to establish stormwater autosampler pacing intervals. Lastly, the report includes recommendations for future monitoring efforts and the expansion of the original project goals.

The main focus of this report is to describe the extensive, two-pronged process the research team used to develop the stormwater sampling regime. Two different methods were used to calculate stormwater flow volumes that enable accurate representative sampling of rainfall events. First, the drainage area sub-basin for each stormwater inlet pipe was calculated from the site plans and aerial photography, providing a general estimated flow volume based on area and rainfall. Baseflow and pipe elevations were considered to determine if the flow velocity would be adequate to trigger the autosampler flow sensor. Second, the Interconnected Channel and Pond Routing (ICPR) Model was used to compare the projected volume to empirical flow and volume data collected during initial "test" storm events. Hydrological models, such as ICPR, are typically developed for conservative estimation of flow volumes, allowing a greater reassurance of flood prevention in the process of permitting new development. We expect to see a 20/30% overestimation of ICPR model volumes in comparison to measured volumes.

One of the communities in Pinellas County (P202) was constructed prior to the formation of the Southwest Florida Water Management District and after an exhaustive search of other permitting agencies, no available drainage reports, plans or stormwater design specs were available. Thus, the ICPR Model outcomes for three communities (H101, M101, and P201) are included in Appendix A and described in the report section on Stormwater Autosampler Pacing and Modeling. Flow-volumes and pacing were established for community (P202) using only spatial analysis and the empirical data collected during initial storm tests.

Overview of Communities

The four project communities are located in three different counties that have implemented varying degrees of nutrient source reduction strategies. The community selection process involved a multi-faceted, cross-disciplinary examination of relevant socio-behavioral, ecological, and drainage variables. Ecological features that were examined included soil type, topography and existing landscape vegetation. Community characteristics such as drainage area, lot sizes, lake and inlet elevations, and stormwater infrastructure were considered, as well as, other confounding nutrient sources such as the presence of septic tanks or reclaimed irrigation water sources. Socio-demographics that were considered salient predictors of residential landscape behavior such as house age, property value, Homeowners Association governance and presence of a golf course were also assessed. The original scope of work proposed completion of community selection within eight months to thoroughly investigate and hold constant all of these diverse parameters. The proposed timeline was reduced to 3 months in the first scope amendment and was completed after thorough field verification in June 2012. The two most limiting variables in the selection of communities were: 1) the requirement of a minimum flow velocity of 0.5 feet per second during storm events which effectively eliminated locations with submerged outfalls, and 2) the avoidance of reuse water for irrigation within the communities. Given these two requirements, it was difficult for the community selection process to maintain community property value and house age across the three counties.

After a thorough screening of potential communities within each county and with input from county stakeholders on the project team,, two communities were selected in Pinellas County ((P201 and P202), one in Manatee County (M101), and one in Hillsborough County (H101), as depicted in Figure 1. The variables that AEI attempted to hold constant among communities in each treatment were similar landscape management practices, similar geographic and geological features, similar drainage areas, similar HOA and local mandates, and similar housing demographics. It was not possible to keep all these variables constant, once the accessibility to available storm drain inlets and appropriateness of autosampler installation locations were considered.

Relative to Hillsborough and Manatee counties, more communities within Pinellas County were evaluated as potential candidates for the study. In addition, newer communities considered in Pinellas County often used reuse water as an irrigation source within the communities which confounded community selection in Pinellas County. Also, older communities in Pinellas tended to have a greater drainage slope gradient within their extent, which created flashier storm events as captured by the ISCO autosamplers. Lastly, Manatee and Hillsborough county communities had lower mean assessed property values relative to Pinellas County's.

Detailed selection criteria for the final four communities selected in this study are included in Table 1. P202 is the largest community [both in units (73) and total acreage (294)] followed by M101 (120 units), H101 (96 units), and finally P201 (smallest area of 14 acres and 64 units). It is important to note that within the largest community, P202, only a smaller drainage section is being monitored while in the other communities the complete drainage extent is being sampled. The mean assessed property value of the four communities ranged between $120 and $160K, with P201, P202 and H101 all ranging within $20K of each other. The Manatee County community had the lowest assessed property values relative to the communities in the other two counties; however, these differences are expected given regional economic patterns.

The age of the communities followed the development pattern for the counties, with older communities in Pinellas (mean year of 1968 and 1978 for P201 and P202, respectively), and newer communities in the other two counties (2002 and 2003 for H101 and M101, respectively). These differences will be taken into account while interpreting the social and water quality monitoring data collected from this study.

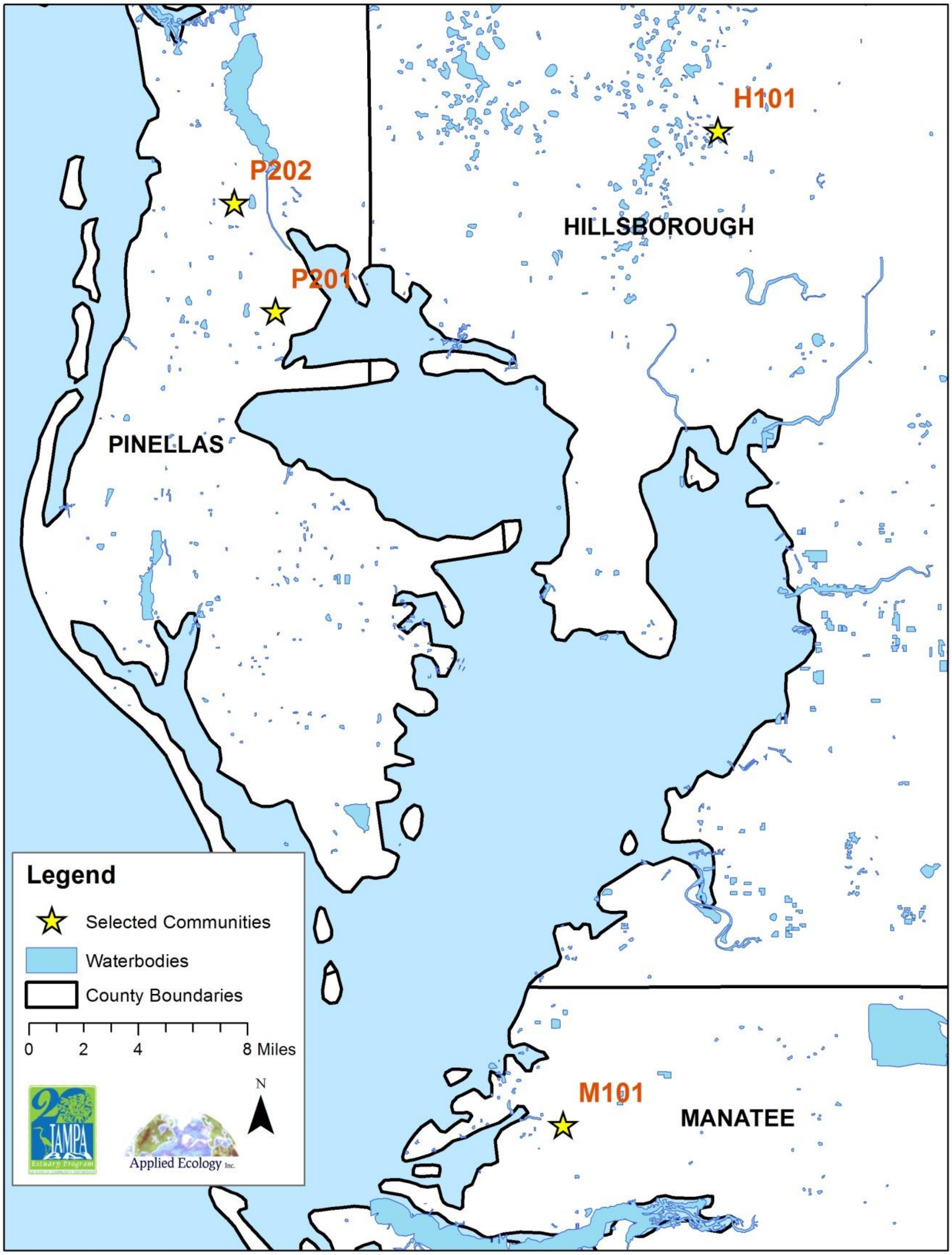


Figure 1. Location of the four selected communities for the Residential Stormwater Evaluation Project.

Table 1. Variables for the Four Selected Communities in the Residential Stormwater Evaluation Project.

Jurisdiction	Pinellas	Pinellas	Manatee	Hillsborough
Subdivision name	**P202**	**P201**	**M101**	**H101**
Acreage	103	19	40	59
Acreage Excluding Common Areas	73	14	21	35
Have HOA	Y	Y	Y	Y
Units	294	64	120	96
Total Parcels Including Common Areas	297	67	123	99
Unit Density/Acre	3	3	3	2
Historical Surface Water Monitoring Data	No	No	No	No
Year Built (min-first house)	1955	1950	2001	2001
Year Built (mean age)	1978	1968	2003	2002
Irrigated w/reclaimed	No	No	No	No
# detached, single family parcels	All	All	All	All
Avg. Property Value (Just Value)	$142,214	$159,352	$119,859	$160,161
Common area %	71	73	53	60
Golf course presence	No	No	No	No
HOA self-maintained	No	No	No	No
Average lot size	0.25	0.18	0.23	0.37
Average built area	2228	2566	1738	2596
Irrigation Source	GW	GW	GW	GW

Water Quality Sampling

The tables below list the sample identification labels for storm (Table 2) and pond / surface water sampling (Table 3) events.

Stormwater samples will be collected after representative rain events at each of the four communities. The QAPP estimated that 8-10 stormwater samples per community will be collected each year, ideally representing both dry and rainy season periods. As of February 2013, two storm events have been successfully collected. Autosamplers were triggered and collected an adequate volume of sample at the Manatee County community (M101) on 12/20/12 and at the Pinellas Community (P202) on 2/13/12. The project team continues to work on calibrating the autosampler trigger points to ensure an adequate number of sample events are captured across all four communities. To date, the challenge has been maintaining consistent stormwater sampling intervals across communities with varying pond levels, flow volumes, and drainage areas.

The storm sample identification labels are listed on the tracking table below. When a storm event occurs the date will be filled into the table. As noted in Table 2, only two storm event samples have been collected to date: one for M101 on 12/20/2012 and another for P202 on 02/13/2013.

The pond samples are collected monthly and are numbered in consecutive order. The target date for sampling is listed in the table along with the sample ID. Pond samples have been collected monthly since September 2012. The monthly pond samples and stormwater samples are labeled differently on the chain of custody forms and containers. Labels include the site name followed by either "PW" for pond water or "SW" for stormwater samples followed by the number of the event. For example P201-PW-1 (first surface event at P201), H101-SW-3 (3rd storm event at H101). For dissolved TKN, a "D" will be added after "PW" or "SW" (i.e., P201-PWD-1, H101-SWD-3).

Surface Water (Pond) Monitoring

Soon after the last community was selected, surface water composite samples from receiving ponds were collected from all four sites. As of February 2013, the pond sites have been sampled six times at monthly intervals (9/27/12, 10/24/12, 11/14/12, 12/11/12, 1/15/13, and 2/14/13). The sampling methods and laboratory analyses were implemented as described in the approved QAPP.

H101

Surface water composite samples are collected from three locations within the pond; one near the discharge pipe, one approximately 100' along the bank to the north of the culvert and one approximately 100' to the south of the culvert.

P201

Surface water composite samples are collected from three locations within the basin; one near the discharge pipe, one approximately 25' along the bank to the north of the culvert and one approximately 25' to the south of the culvert.

P202

Surface water composite samples are collected from three locations within the pond; one near the discharge pipe, one approximately 100' along the bank to the northwest of the culvert and one approximately 200' to the northwest of the culvert.

M101

Surface water composite samples are collected from three locations within the pond; one near the discharge pipe, one approximately 100' along the bank to the north of the culvert and one approximately 100' to the south of the culvert.

Stormwater Monitoring

Effective stormwater monitoring requires a thorough understanding of stormwater flows and volumes needed to collect a representative composite of stormwater that occurs during a storm event.. AEI, UCF, and ECT personnel worked cooperatively to gain a better understanding of storm flow dynamics and representative sample intervals within the selected communities. Once autosamplers were installed, initial rainfall and flow volumes were monitored to understand the pace of storm events occurring in each community. The following sections summarize the autosampler set-up details and the extensive modeling effort taken to ensure representative flow-weighted storm samples were collected in each of the communities. As of

February 2013, two stormwater samples have been collected and submitted for analyses as described in the EPA approved QAPP.

Autosampler Setup

Autosamplers were installed at a pre-determined inlet pipe in each of the four selected communities by Environmental Consulting and Technology, Inc. (ECT), with assistance and input AEI and UCF. Installation sites were accessed through existing drainage easements, and homeowners living near the autosamplers were contacted in writing, Whenever possible, adjacent homeowners were contacted personally to make them aware of the equipment and the field technician visits. The research team initially had concerns that the limited time available to select communities may result in the need to relocate autosamplers after flow and volume diagnostics were performed. To date, this does not appear to be the case, though an incomplete set of stormwater flow and volume data from all four autosamplers has been collected. The autosampler at H101 has yet to be triggered by a storm event.

The autosamplers at all four sites calculate flow by multiplying stormwater velocity by sampled area. Three sites have round discharge pipes and one site has an elliptical pipe. The autosampler automatically calculates the area of the water column using the stage measurement and the specified diameter of the pipe for round pipes. The autosampler at the site with the elliptical pipe is programmed to calculate the area using a stage/area curve developed for an elliptical pipe (38” tall x 60” wide). That area is then multiplied by the stormwater velocity to determine flow. Specifications for each site are listed below and more details about the stormwater modeling conducted to set pacing intervals are provided further in this section.

Images of the installed autosamplers are provided in Figures 2, 3, 4, and 5 on the following pages.

H101

The autosampler located within the Hillsborough County community (H101) was installed on July 17, 2012. The

Figure 2: H101 autosampler during high pond level

flow module and sample point are positioned in a 30” (2.5’) round concrete culvert at the discharge point to the pond. The pond level was above the culvert from August 6th through November 8th and the pipe was 100% full. These conditions significantly decrease the velocity of the water entering the pond and potentially limit the instrument’s ability to measure velocity. Based on rainfall and subsequent level/flow observations, the sample pacing at this site is set up to collect one 200 ml aliquot every 2000 gallons of flow after a rain event with an intensity of 0.5 inches of rain in two hours or less.

P201

The autosampler in Pinellas County community P201 was installed on July 17, 2012. The discharge site at this location is a constructed sedimentation basin. The flow module and sample point are positioned in a 40” (3.333’) round HDPE culvert at the discharge point to the sediment basin. The sediment basin is typically covered with *Lemna minor.* The depth of water in the culvert when the sedimentation basin is drawn down is approximately 0.5’. Full pipe conditions are not a concern at this site as it is unlikely that the water level will exceed the top of the pipe. Based on rainfall and subsequent level/flow observations, the pacing at this site is set up to collect one 200 ml aliquot every 2000 gallons of flow after a rain event with an intensity of 0.5 inches of rain in two hours or less.

Figure 3: P201 autosampler

P202

The autosampler at Pinellas County community P202 was installed on September 20, 2012. The flow module and sample point are positioned in a 30” (2.5’) round concrete culvert at the discharge point to the pond. Based on rainfall and subsequent level/flow observations, the pacing at this site is set up to collect

Figure 4: P202 autosampler

one 200 ml aliquot every 2000 gallons of flow after a rain event with an intensity of 0.5 inches of rain in two hours or less.

M101

The autosampler in Manatee County community M101 was installed on July 17, 2012. The flow module and sample point are positioned in a 38” x 60” elliptical concrete culvert at the discharge point to the pond. The culvert is about 90% full when the pond is drawn down, thus during storm events the water level of the pond is routinely higher than the culvert. These conditions significantly decrease the velocity of the water entering the pond and potentially limit the instrument’s ability to measure velocity. Based on rainfall and subsequent level/flow observations the pacing at this site is set up to collect one 200 ml aliquot every 3000 gallons of flow after a rain event with an intensity of 0.25 inches of rain in half an hour or less. This pacing, modified from the original pacing of 0.5" of rainfall in two hours or less, allowed only storms with enough intensity to generate a rapid flush through the system, and subsequent higher velocities, to immediately trigger sampling. This type of pacing minimizes or completely avoids the lag in the system trigger, and the critical first flush is captured in a sample aliquot.

Figure 5: M101 autosampler

Table 2. Stormwater Sampling Tracking Table.

STORMWATER SAMPLING TRACKING TABLE								
	LABELS							
Sample Number	H101		P202		P201		M101	
	Date	Label	Date	Label	Date	Label	Date	Label
1		H101-SW-1 H101-SWD-1	02/13/2013	P202-SW-1 P202-SWD-1		P201-SW-1 P201-SWD-1	12/20/2012	M101-SW-1 M101-SWD-1
2		H101-SW-2 H101-SWD-2		P202-SW-2 P202-SWD-2		P201-SW-2 P201-SWD-2		M101-SW-2 M101-SWD-2
3		H101-SW-3 H101-SWD-3		P202-SW-3 P202-SWD-3		P201-SW-3 P201-SWD-3		M101-SW-3 M101-SWD-3
4		H101-SW-4 H101-SWD-4		P202-SW-4 P202-SWD-4		P201-SW-4 P201-SWD-4		M101-SW-4 M101-SWD-4
5		H101-SW-5 H101-SWD-5		P202-SW-5 P202-SWD-5		P201-SW-5 P201-SWD-5		M101-SW-5 M101-SWD-5
6		H101-SW-6 H101-SWD-6		P202-SW-6 P202-SWD-6		P201-SW-6 P201-SWD-6		M101-SW-6 M101-SWD-6
7		H101-SW-7 H101-SWD-7		P202-SW-7 P202-SWD-7		P201-SW-7 P201-SWD-7		M101-SW-7 M101-SWD-7
8		H101-SW-8 H101-SWD-8		P202-SW-8 P202-SWD-8		P201-SW-8 P201-SWD-8		M101-SW-8 M101-SWD-8
9		H101-SW-9 H101-SWD-9		P202-SW-9 P202-SWD-9		P201-SW-9 P201-SWD-9		M101-SW-9 M101-SWD-9
10		H101-SW-10 H101-SWD-10		P202-SW-10 P202-SWD-10		P201-SW-10 P201-SWD-10		M101-SW-10 M101-SWD-10
11		H101-SW-11 H101-SWD-11		P202-SW-11 P202-SWD-11		P201-SW-11 P201-SWD-11		M101-SW-11 M101-SWD-11
12		H101-SW-12 H101-SWD-12		P202-SW-12 P202-SWD-12		P201-SW-12 P201-SWD-12		M101-SW-12 M101-SWD-12

SW = Orthophosphate (filtered), Total NH3, TKN, Nox, TP (unfiltered)
SWD = Dissolved TKN (filtered)

Isotopes labels will be "-SW-" only--no filtering required (i.e., H101-SW-1)
15N Nitrate, O18 Nitrate, 15N Ammonium

Table 3. Pond Sampling (Surface Water Sampling) Tracking Table.

POND SAMPLING		LABELS			
Sample Number	Target Date	H101	P202	P201	M101
1	9/28/2012	H101-PW-1	P202-PW-1	P201-PW-1	M101-PW-1
		H101-PWD-1	P202-PWD-1	P201-PWD-1	M101-PWD-1
2	10/24/2012	H101-PW-2	P202-PW-2	P201-PW-2	M101-PW-2
		H101-PWD-2	P202-PWD-2	P201-PWD-2	M101-PWD-2
3	11/14/2012	H101-PW-3	P202-PW-3	P201-PW-3	M101-PW-3
		H101-PWD-3	P202-PWD-3	P201-PWD-3	M101-PWD-3
4	12/12/2012	H101-PW-4	P202-PW-4	P201-PW-4	M101-PW-4
		H101-PWD-4	P202-PWD-4	P201-PWD-4	M101-PWD-4
5	1/16/2013	H101-PW-5	P202-PW-5	P201-PW-5	M101-PW-5
		H101-PWD-5	P202-PWD-5	P201-PWD-5	M101-PWD-5
6	2/13/2013	H101-PW-6	P202-PW-6	P201-PW-6	M101-PW-6
		H101-PWD-6	P202-PWD-6	P201-PWD-6	M101-PWD-6
7	3/13/2013	H101-PW-7	P202-PW-7	P201-PW-7	M101-PW-7
		H101-PWD-7	P202-PWD-7	P201-PWD-7	M101-PWD-7
8	4/17/2013	H101-PW-8	P202-PW-8	P201-PW-8	M101-PW-8
		H101-PWD-8	P202-PWD-8	P201-PWD-8	M101-PWD-8
9	5/15/2013	H101-PW-9	P202-PW-9	P201-PW-9	M101-PW-9
		H101-PWD-9	P202-PWD-9	P201-PWD-9	M101-PWD-9
10	6/12/2013	H101-PW-10	P202-PW-10	P201-PW-10	M101-PW-10
		H101-PWD-10	P202-PWD-10	P201-PWD-10	M101-PWD-10
11	6/26/2013	H101-PW-11	P202-PW-11	P201-PW-11	M101-PW-11
		H101-PWD-11	P202-PWD-11	P201-PWD-11	M101-PWD-11
12	7/10/2013	H101-PW-12	P202-PW-12	P201-PW-12	M101-PW-12
		H101-PWD-12	P202-PWD-12	P201-PWD-12	M101-PWD-12
13	7/24/2013	H101-PW-13	P202-PW-13	P201-PW-13	M101-PW-13
		H101-PWD-13	P202-PWD-13	P201-PWD-13	M101-PWD-13
14	8/14/2013	H101-PW-14	P202-PW-14	P201-PW-14	M101-PW-14
		H101-PWD-14	P202-PWD-14	P201-PWD-14	M101-PWD-14
15	9/18/2013	H101-PW-15	P202-PW-15	P201-PW-15	M101-PW-15
		H101-PWD-15	P202-PWD-15	P201-PWD-15	M101-PWD-15
16	10/16/2013	H101-PW-16	P202-PW-16	P201-PW-16	M101-PW-16
		H101-PWD-16	P202-PWD-16	P201-PWD-16	M101-PWD-16
17	11/13/2013	H101-PW-17	P202-PW-17	P201-PW-17	M101-PW-17
		H101-PWD-17	P202-PWD-17	P201-PWD-17	M101-PWD-17
18	12/18/2013	H101-PW-18	P202-PW-18	P201-PW-18	M101-PW-18
		H101-PWD-18	P202-PWD-18	P201-PWD-18	M101-PWD-18

PW = Orthophosphate (filtered), Total NH3, TKN, Nox, TP
PWD = Dissolved TKN (filtered)

Isotopes labels will be "-PW-" only--no filtering required (i.e., H101-PW-1)
15N Nitrate, O18 Nitrate, 15N Ammonium

Stormwater Autosampler Pacing Details

The development of appropriate sample pacing for the four autosamplers took place in two separate steps. Initially, the autosamplers were setup and storms were monitored using the ISCO sensors. Rainfall, pond water level, and calculated flow were recorded in hydrographs (see below) and sensors were calibrated and checked. The second step included obtaining the input data required to run the Interconnected Channel and Pond Routing Model (ICPR), developing this model for all communities with available data, and determining predicted flows for measured rainfall events. In the case of the storm event captured for Manatee site M101, a comparison was provided between the measured flows using the ISCO sampler and the predicted flows using the ICPR model.

The ICPR model is a well-established stormwater modeling system that was created to estimate flood routing through a network of interconnected and hydraulically interdependent stormwater ponds. The typical applications for this model are for designing stormwater ponds; developing stormwater management plans; studies for flood insurance rate setting; and retrofitting or restoring stormwater infrastructure. For the purpose of this study, only simplified models of the drainage area of interest were developed to provide an estimated flow volume to each of the community's stormwater basins/ponds.. Models were developed for P201, M101, and H101, but not for the older community P202, where no drainage report information was available at the SWFWMD.

H101

Rainfall and stormwater flow volume and velocity were monitored at the Hillsborough County site (H101) in October after sensors were initially calibrated. A rain event occurred on 10/3/2012, when lake levels were very high and the outfall pipe appeared over 70% submerged. Additionally, some heavy erosion was visible at the outfall, which raised concern regarding stormwater bidirectional movement or potential pipe damage. As visible in the hydrograph for this initial event (Figure 6), the flow captured was very flashy and inconsistent, with spikes visible prior to rainfall due to sensitivity of the flow meter with velocities below the 0.5´per second threshold. At times during the storm event, the flow sensor couldn´t capture any flow due to the low velocities, so the total estimated flow for this entire storm event of 0.65" of rainfall was well below the expected total flow volume (about 1150 gallons). From this initial storm event, concerns that the project team had that the autosampler in this location might not yield reliable results of measured flow and estimates of loading would be inadequate.

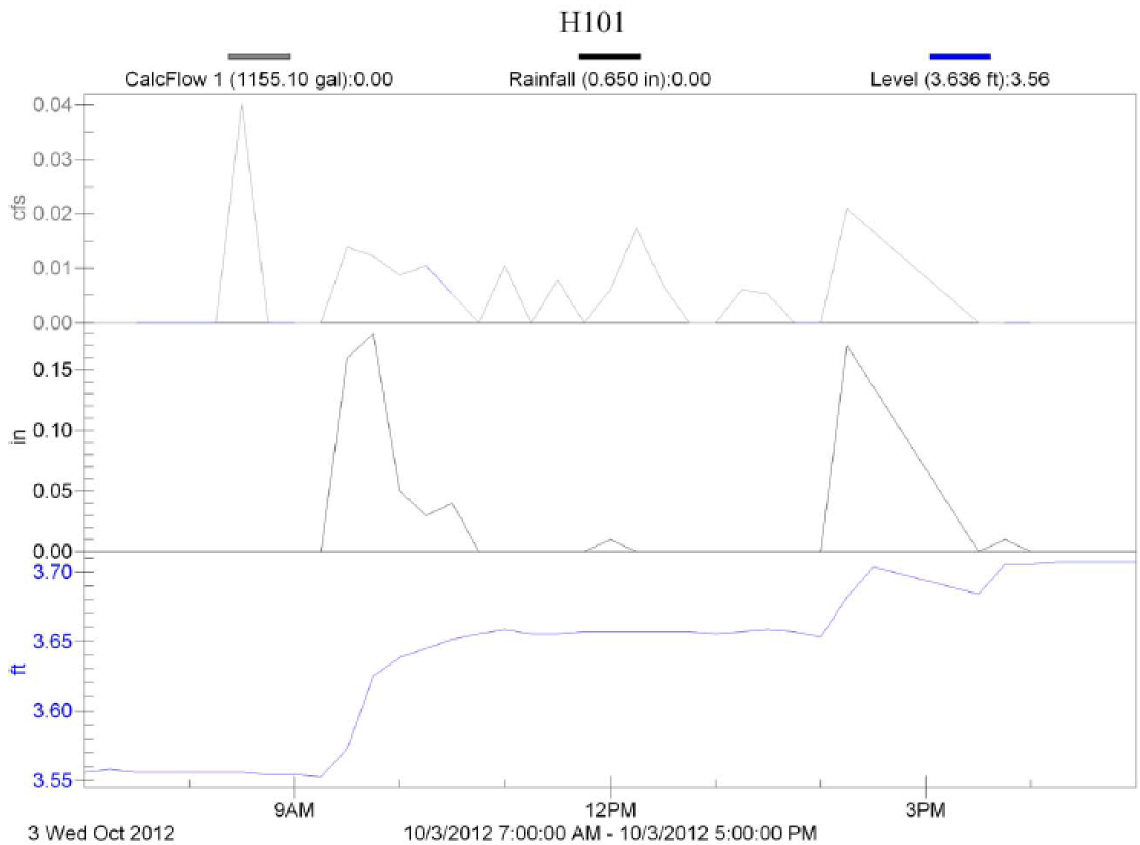


Figure 6. Initial Monitored Storm event (10/3/2012) with high lake levels, and sporadic velocity capture (below trigger rainfall)

Further calibration of the site yielded a more promising result, where flow volumes did not appear as erratic and total volume was closer to the expected total volume of the rain event (Figure 7). This hydrograph represents a more recent storm event, just below the minimum threshold for triggering the sample collection, where the lake level, rainfall, and flow appear consistently monitored. For the total rainfall event of 0.56", over 46,000 gallons of flow were measured. It is important to note that the conditions in the latter event were dramatically different than the initial October 2012 condition. Subsequent to the first event, the erosion problem around the pipe was repaired by the community's HOA and the outfalls were not submerged because the pond levels had dropped significantly. During the wet season, when most storm events will occur, we intend to closely monitor the pond levels and rainfall volumes as rapidly increasing water level might slow down the velocity and disrupt the accuracy of the measured flow. Due to this pending concern, the AEI team is still actively monitoring this site with the intent of determining the need to move the autosampler to another location, preferably before the active wet season occurs.

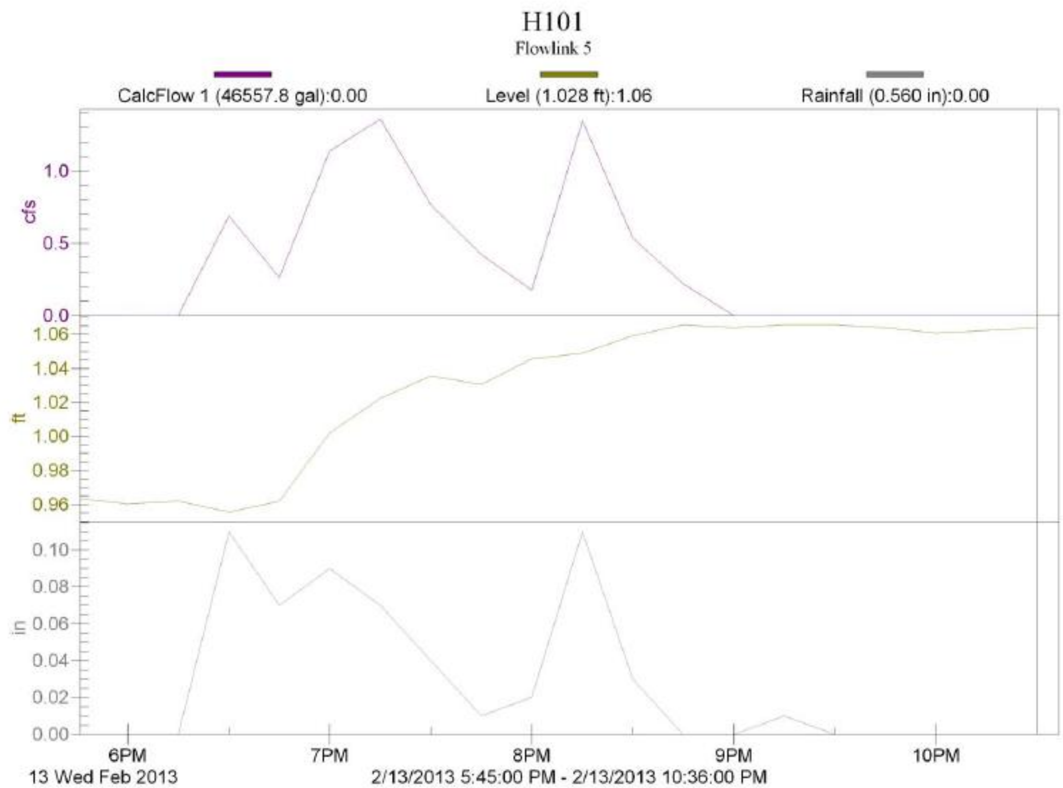


Figure 7. Last Storm event (02/13/2013) with initial very low lake levels (below trigger rainfall)

17

P201

Pinellas community P201 presents a hydrograph with a consistently measured flow, even during high lake water levels (Figure 8). The estimated flow from the calibration storm event monitored in this location was consistent with expected volumes for a 1.3" rainfall event. This calibration event would have triggered a sample collection. This location is considered calibrated and samples are considered to be correctly paced.

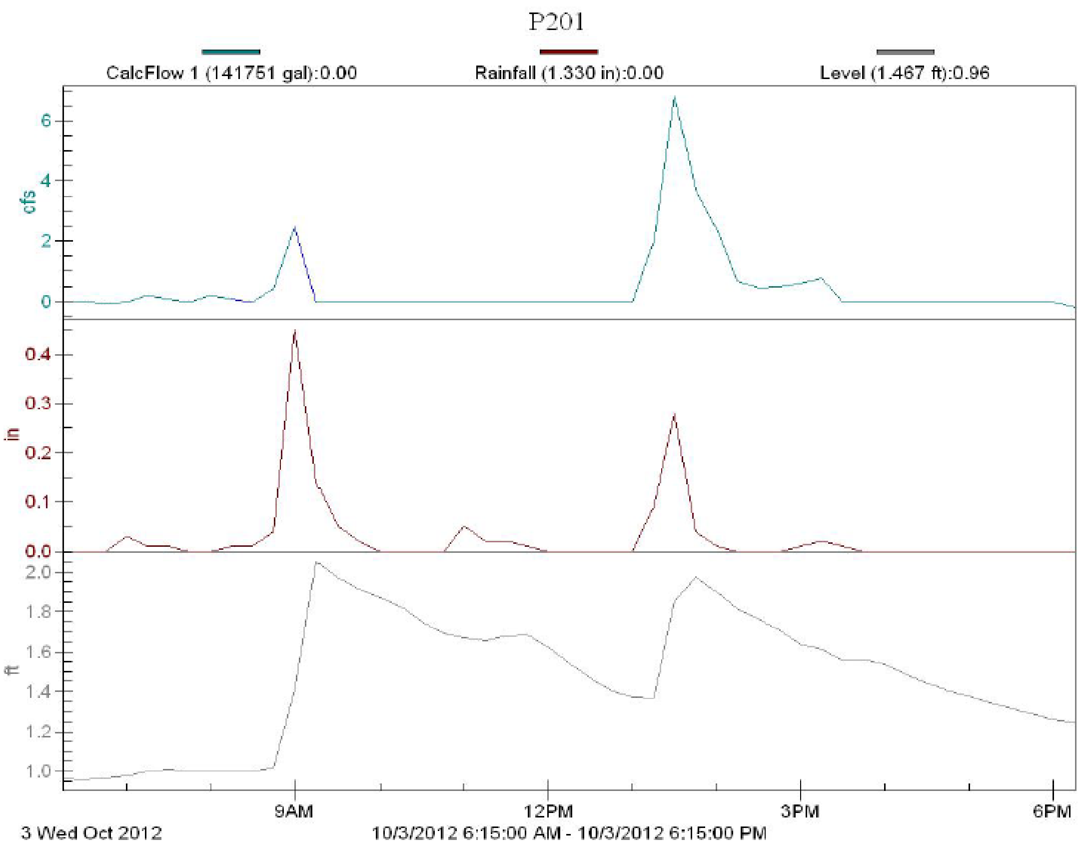


Figure 8. Storm event (10/03/2012) before pacing setup (would have triggered sample collection)

18

P202

The second Pinellas community, (P202), also presents hydrographs with a consistently measured flow, even during high lake water levels (Figure 9Figure 8). The estimated flows from both observed storm events (an initial calibration event and a subsequent collected event on 02/13/2013) are consistent with predicted flows of 77,500 and 56,500 gallons for a total of 1.29" and 1.0" rainfall events, respectively. No strange artifacts in velocity and flow were measured at this site, so we are confident that this autosampler location will provide representative samples of the P202 community.

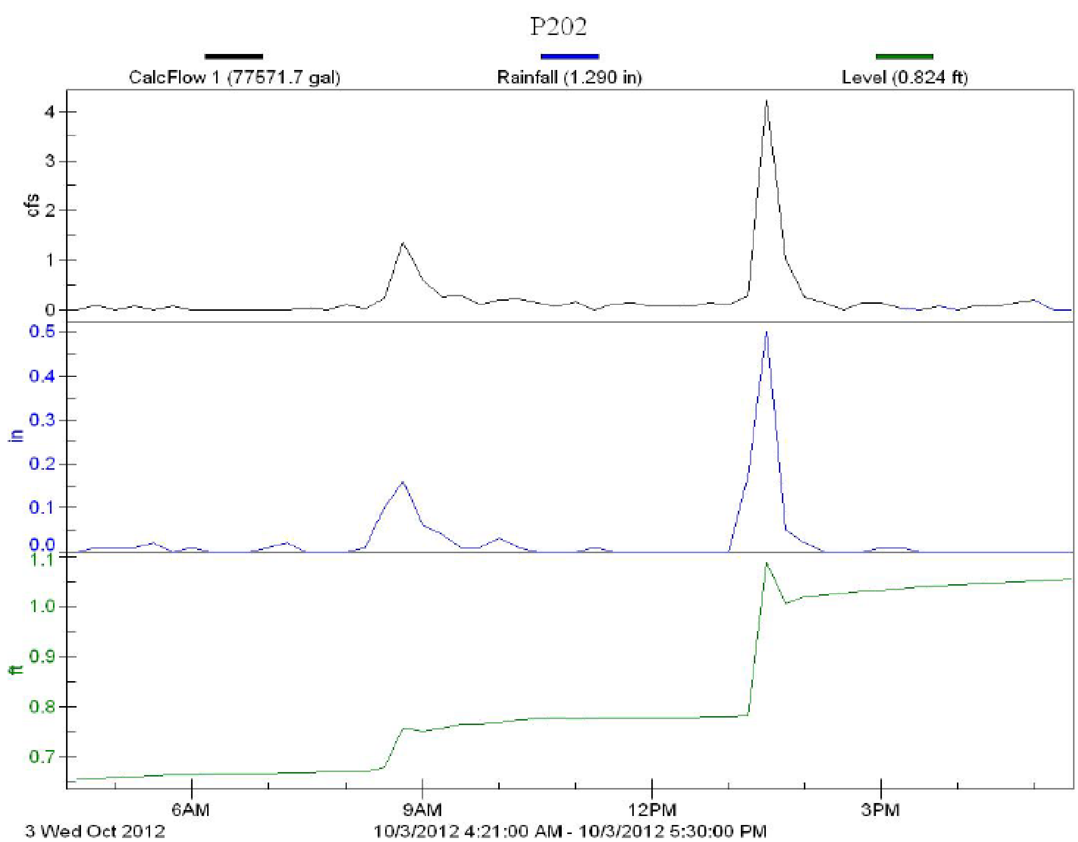


Figure 9. Calibration storm event, (10/03/2012) prior to pacing setup (would have triggered sample collection)

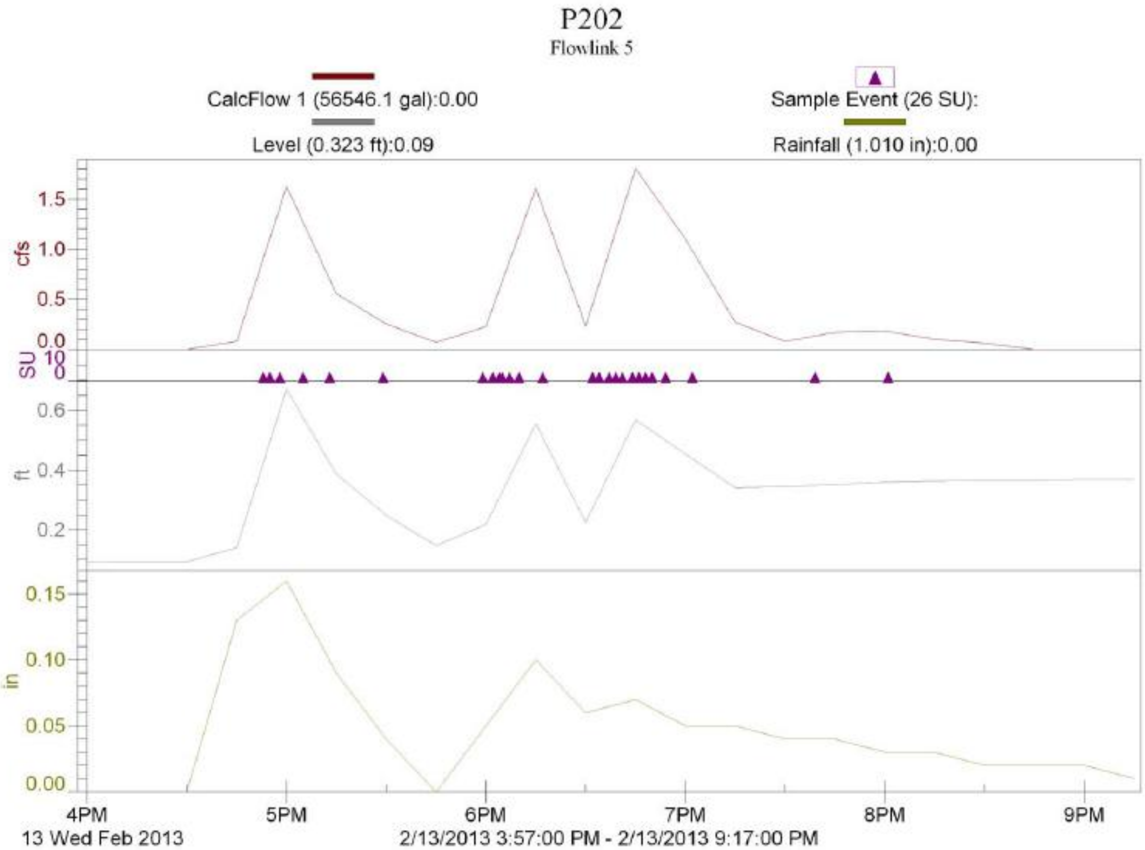


Figure 10. Last recorded storm event (02/13/2013) after pacing was setup, storm event was collected according to calibrated pacing.

M101

The Manatee community M101 also captured storm events consistently, particularly during stronger storm events, such as the initial calibration event on 08/12/2012 (~1.5" of rainfall in 6 hours, Figure 11). With this initial storm event, even though the outfall quickly became submerged during this initial event, stormwater, velocity was strong enough to allow a total flow volume of almost 395,000 gallons to be estimated. A second storm event occurred on 12/20/2012 with a minimum trigger of 0.52" (Figure 12), allowing a representative sample to be collected for lab analysis at this site.

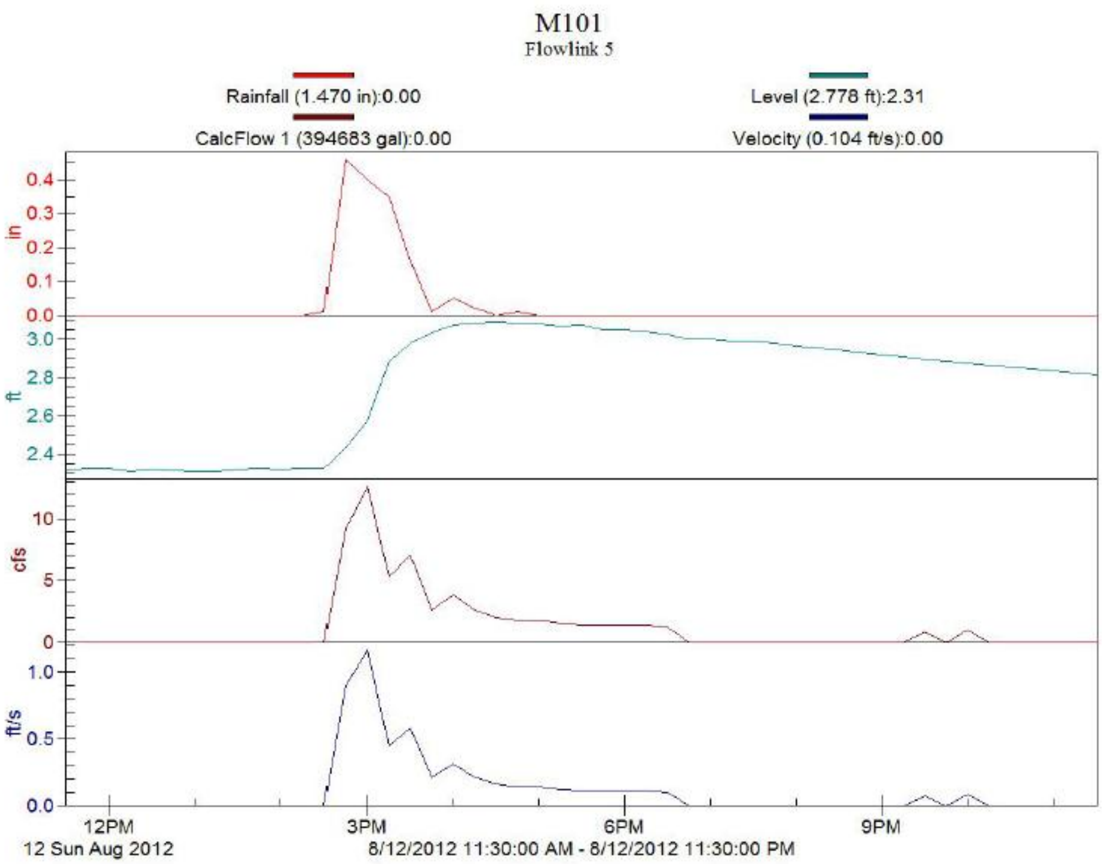


Figure 11. Initial storm event (08/12/2012) before pacing setup (would have triggered sample collection)

21

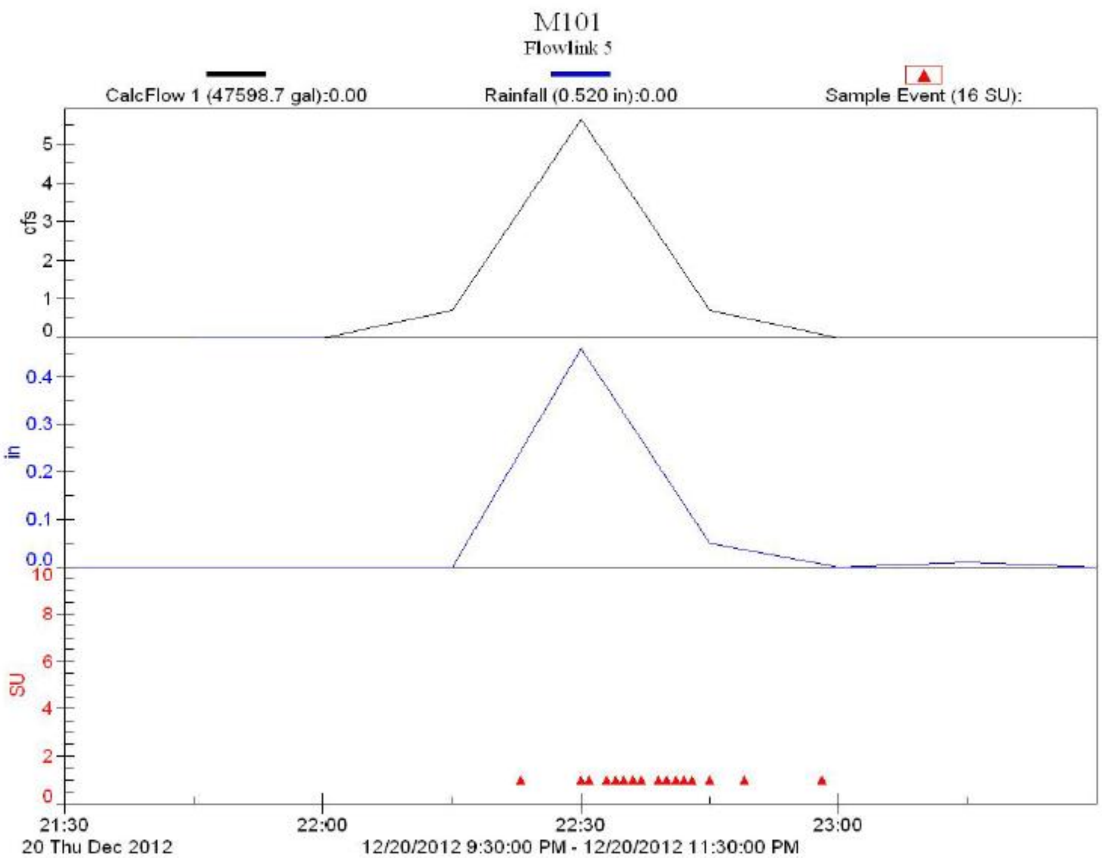


Figure 12. Last storm event (12/20/2012) after pacing was setup, storm event was collected according to pacing

During the Dec 20, 2012 storm event in Manatee County, we were able to provide a comparison between the empirically collected data (using the ISCO sensors) and the calculated ICPR model. It is important to note that a simplified ICPR model, such as the one developed for the M101 location generally overestimates flow due to the lack of incorporated variables, such as soil percolation rate. Additionally, due to equipment limitations, the ISCO sampler will not record flows once the velocity decreases to below 0.5 fps. Thus, there is an expectation that the autosamplers will underestimate stormwater volumes during an event relative to the ICPR model.

Empirically measured flow at this site for this second event was approximately 31% below the total volumes estimated by the ICPR model (Figure 13). As stated above, this was expected due to the reduced velocity at specific periods during the storm event (with a 0.5" rainfall event) and the conservative nature of the ICPR model.

ICPR

name	Time hrs		Q cfs	Q Vol cf		Flow @ V > 0.5 fps	ISCO flow cfs	ISCO Flow (gal)
P16	0.42	0	0.77	0.00	0.00		6363.9	**47601.97**
P16	0.5	1800	2.38	2835.00	21205.80			
P16	0.58	2088	5.28	3938.04	29456.54			
P16	0.67	2412	5.23	5640.66	42192.14	12735.60		
P16	0.75	2700	1.45	6602.58	49387.30	19930.76		
P16	0.83	2988	-0.46	6745.14	50453.65	20997.11		
P16	0.92	3312	0.33	6724.08	50296.12	20839.58		
P16	1	3600	1.49	6986.16	52256.48	22799.94		
P16	1.08	3888	4.19	7804.08	58374.52	28917.98		
	1.17	4212	7.17	9644.40	72140.11	42683.57		
	1.25	4500	6.52	11615.76	86885.88	57429.35		
	1.33	4788	4.77	13241.52	99046.57	**69590.03**		
	1.42	5112	3.35	14556.96	108886.06			
	1.5	5400	2.45	15392.16	115133.36			
	1.59	5724	1.88	16093.62	120380.28			
	1.67	6012	2.26	16689.78	124839.55			
	1.75	6300	1.17	17183.70	128534.08			
	1.83	6588	0.9	17481.78	130763.71			

ISCO DATA

Site Name	M101	M101	M101	flow	flow
Isco Quantity	Flow Rate	Rainfall	Sample Event	cu. Ft.	gal.
Label	CalcFlow 1	Rainfall	Sample Event		
Units	cfs	in	SU		
12/20/2012 21:30	0	0			
12/20/2012 21:45	0	0			
12/20/2012 22:00	0	0			
12/20/2012 22:15	0.711	0		639.9	4786.45
12/20/2012 22:23			x		
12/20/2012 22:30	5.648	0.46	x	5083.2	38022.34
12/20/2012 22:31			x		
12/20/2012 22:33			x		
12/20/2012 22:34			x		
12/20/2012 22:35			x		
12/20/2012 22:36			x		
12/20/2012 22:37			x		
12/20/2012 22:39			x		
12/20/2012 22:40			x		
12/20/2012 22:41			x		
12/20/2012 22:42			x		
12/20/2012 22:43			x		
12/20/2012 22:45	0.712	0.05	x	640.8	4793.18
12/20/2012 22:49			x		
12/20/2012 22:58			x		
12/20/2012 23:00	0	0			
12/20/2012 23:15	0	0.01			
12/20/2012 23:30	0	0			
			total	6363.9	**47601.97**

Figure 13. Comparison of the Manatee Collected Storm Event> ISCO measured Flow versus ICPR predicted Flow

Discussion and Recommendations

Overall, the AEI Team is very pleased with the establishment of the stormwater sampling program within each of the communities.. We are confident that we have held as many confounding variables constant as we could when selecting the research sites and we are confident that the multi-faceted method being utilized to calculate stormwater sample flows and volumes will provide representative samples from each community. At this point, we do not recommend any formal changes to the sampling regime; however, we will continue to monitor the sites with the following considerations in mind.

The Hillsborough County site may require additional calibration or site manipulation based on the inconsistent stormwater flows observed during one event. We hope to resolve any issues with site prior to the 2013 rainy season.

The most recent hydrograph data shows improved performance suggesting that the autosampler location may be adequately placed to collect consistent and representative storm events. It is worth noting that August was reportedly a wetter than normal month in Hillsborough County, (influenced by Tropical Storm Isaac in late August). This may have contributed excessively to the pond inlet washout and excessive pond levels at that site in September.

By the time all of the autosamplers were placed, all three counties were experiencing normal dry conditions, with drier than normal conditions in September and very dry conditions reported in November and January (SWFWMD). Thus, the flows and volumes data considered for the stormwater pacing has been based on dry conditions. As such, calibrated estimates of flows and volumes may need to adjusted during the rainy season.

The AEI team intends to continue the current sampling plan unless future stormwater events are problematic. We recommend continuing to monitor flows and levels to identify and set appropriate sample triggers that will ensure adequate sample volume at all four sites.

We recommend extending the timeframe of the project to allow for the collection of an additional year of stormwater samples (i.e., an additional 10 storm event samples between January and December 2014) at each of the four sites. Ideally, the research design would benefit with the addition of with replicates in each of the three counties. Currently, we have two subdivisions in Pinellas County, but only one in Hillsborough and Manatee Counties. The AEI team recommends adding one or two more communities to the project in the future, initially targeting one in Hillsborough County, followed by another in Manatee County., targeting one in Hillsborough County first and then Manatee County.

Appendix A. ICPR Model Outputs

```
=========================================================================================
==== Basins =============================================================================
=========================================================================================

        Name: N Basin               Node: N Node              Status: Onsite
       Group: BASE                  Type: SCS Unit Hydrograph CN

       Unit Hydrograph: Uh256             Peaking Factor: 256.0
         Rainfall File: Flmod          Storm Duration(hrs): 24.00
   Rainfall Amount(in): 8.000            Time of Conc(min): 15.00
              Area(ac): 19.100            Time Shift(hrs): 0.00
          Curve Number: 74.00         Max Allowable Q(cfs): 999999.000
               DCIA(%): 0.00


----------------------------------------------------------------------------------------------------
        Name: POSTPND1              Node: POND1               Status: Onsite
       Group: BASE                  Type: SCS Unit Hydrograph CN

       Unit Hydrograph: Uh256             Peaking Factor: 256.0
         Rainfall File: Flmod          Storm Duration(hrs): 24.00
   Rainfall Amount(in): 8.000            Time of Conc(min): 10.00
              Area(ac): 8.460             Time Shift(hrs): 0.00
          Curve Number: 86.00         Max Allowable Q(cfs): 999999.000
               DCIA(%): 0.00


----------------------------------------------------------------------------------------------------
        Name: S Basin               Node: S Node              Status: Onsite
       Group: BASE                  Type: SCS Unit Hydrograph CN

       Unit Hydrograph: Uh256             Peaking Factor: 256.0
         Rainfall File: Flmod          Storm Duration(hrs): 24.00
   Rainfall Amount(in): 8.000            Time of Conc(min): 15.00
              Area(ac): 12.850            Time Shift(hrs): 0.00
          Curve Number: 74.00         Max Allowable Q(cfs): 999999.000
               DCIA(%): 0.00


=========================================================================================
==== Nodes ==============================================================================
=========================================================================================

     Name: BNDY1              Base Flow(cfs): 0.000          Init Stage(ft): 48.900
    Group: BASE                                              Warn Stage(ft): 52.000
     Type: Time/Stage


     Time(hrs)       Stage(ft)
--------------- ---------------
          0.00          48.900
         15.00          51.500
         36.00          48.900

-----------------------------------------------------------------------------------------
     Name: N Node             Base Flow(cfs): 0.000          Init Stage(ft): 51.350
    Group: BASE                                              Warn Stage(ft): 53.500
     Type: Stage/Area


     Stage(ft)        Area(ac)
--------------- ---------------

-----------------------------------------------------------------------------------------
     Name: POND1              Base Flow(cfs): 0.000          Init Stage(ft): 51.350
    Group: BASE                                              Warn Stage(ft): 54.200
     Type: Stage/Area


     Stage(ft)        Area(ac)
--------------- ---------------
        50.500          2.7500
        53.800          3.5900
        54.800          4.1100

-----------------------------------------------------------------------------------------
     Name: S Node             Base Flow(cfs): 0.000          Init Stage(ft): 51.350
    Group: BASE                                              Warn Stage(ft): 53.500
     Type: Stage/Area
```

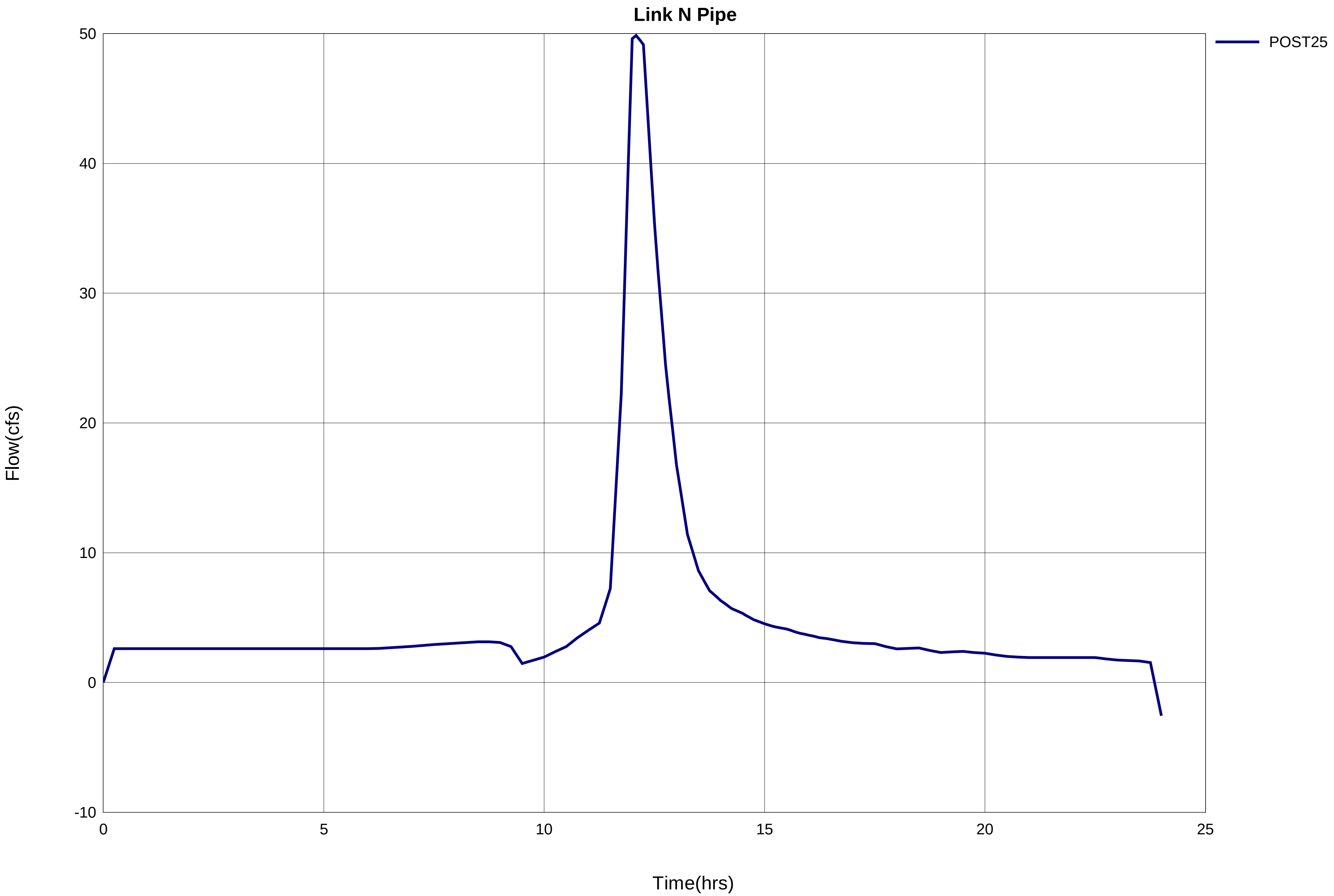
```
      Stage(ft)        Area(ac)
--------------- --------------

==========================================================================================
==== Pipes ===============================================================================
==========================================================================================

         Name: N Pipe              From Node: N Node            Length(ft): 200.00
        Group: BASE                  To Node: POND1                  Count: 1
                                                         Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                Flow: Both
     Span(in): 30.00          30.00                     Entrance Loss Coef: 0.00
     Rise(in): 30.00          30.00                         Exit Loss Coef: 1.00
   Invert(ft): 48.500         48.450                        Bend Loss Coef: 0.00
  Manning's N: 0.001000       0.001000                    Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                        Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                      Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Groove end w/ headwall


----------------------------------------------------------------------------------------------------
         Name: S Pipe              From Node: S Node            Length(ft): 100.00
        Group: BASE                  To Node: POND1                  Count: 1
                                                         Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
     Geometry: Circular       Circular                                Flow: Both
     Span(in): 30.00          30.00                     Entrance Loss Coef: 0.00
     Rise(in): 30.00          30.00                         Exit Loss Coef: 1.00
   Invert(ft): 47.280         47.030                        Bend Loss Coef: 0.00
  Manning's N: 0.001000       0.001000                    Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                        Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                      Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Groove end w/ headwall


==========================================================================================
==== Weirs ===============================================================================
==========================================================================================

         Name: 2PD1/BY1            From Node: POND1
        Group: BASE                  To Node: BNDY1
         Flow: Both                    Count: 1
         Type: Vertical: Mavis      Geometry: Rectangular

                    Span(in): 42.00
                    Rise(in): 12.00
                  Invert(ft): 51.710
       Control Elevation(ft): 0.000
                                              TABLE
             Bottom Clip(in): 0.000
                Top Clip(in): 0.000
         Weir Discharge Coef: 3.130
      Orifice Discharge Coef: 0.600


----------------------------------------------------------------------------------------------------
         Name: PD1/BNY1            From Node: POND1
        Group: BASE                  To Node: BNDY1
         Flow: Both                    Count: 1
         Type: Vertical: Mavis      Geometry: Rectangular

                    Span(in): 3.43
                    Rise(in): 3.43
                  Invert(ft): 50.500
       Control Elevation(ft): 0.000
                                              TABLE
             Bottom Clip(in): 0.000
                Top Clip(in): 0.000
         Weir Discharge Coef: 3.130
      Orifice Discharge Coef: 0.600
```

```
==========================================================================================
==== Hydrology Simulations ===============================================================
==========================================================================================

         Name: Post 25
     Filename: N:\Project_files\2012\12-0319 TAMPA BAY STORMWATER\ICPRInputData\H101\Post 25.R32

      Override Defaults: No

Time(hrs)       Print Inc(min)
--------------- ---------------
24.000          15.00

==========================================================================================
==== Routing Simulations =================================================================
==========================================================================================

         Name: POST25             Hydrology Sim: Post 25
     Filename: N:\Project_files\2012\12-0319 TAMPA BAY STORMWATER\ICPRInputData\H101\POST25.I32

      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.01000
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 24.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:


Time(hrs)       Print Inc(min)
--------------- ---------------
11.000          15.000
17.000          5.000
24.000          15.000

Group           Run
--------------- -----
BASE            Yes
```

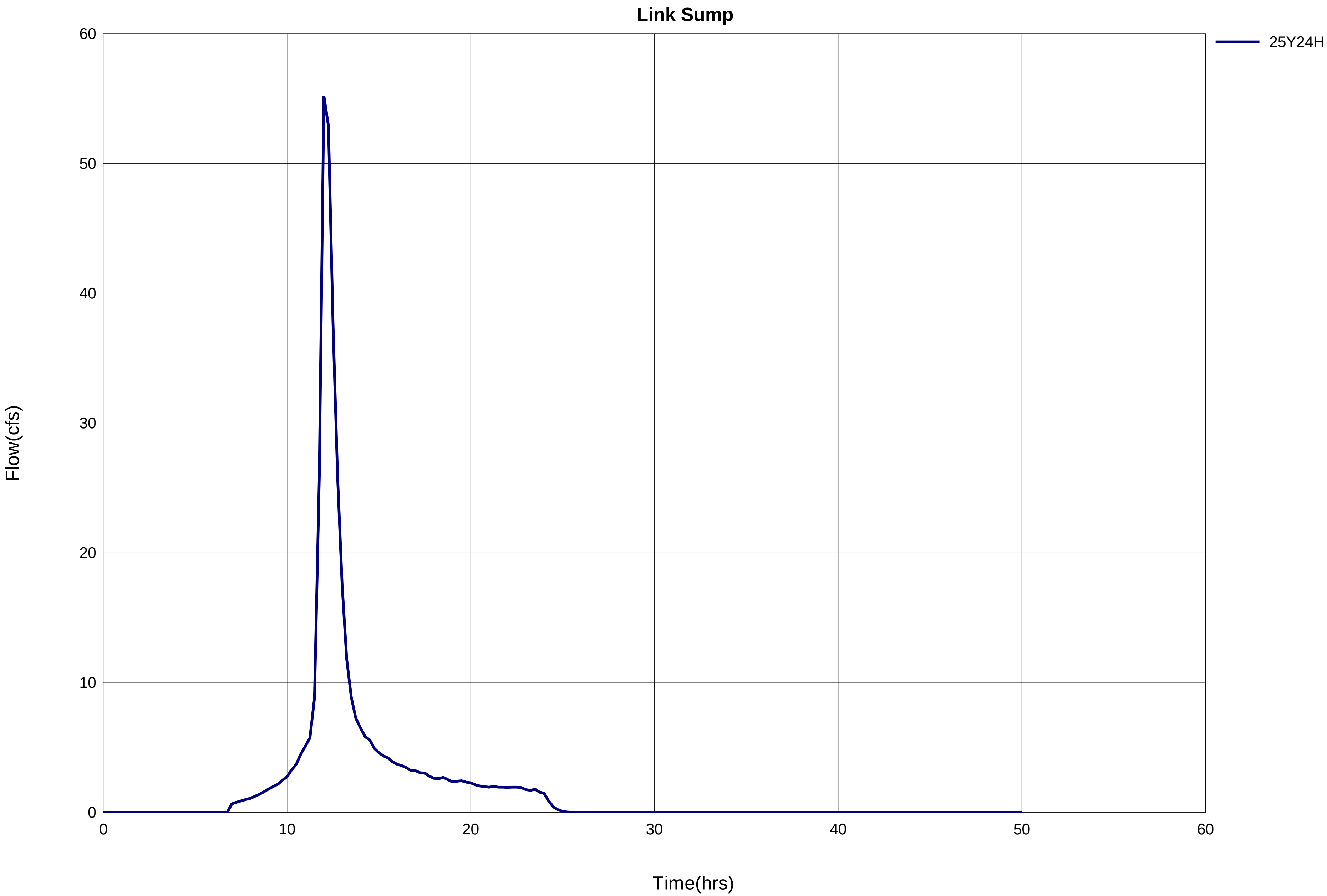
H101

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
BNDY1	BASE	POST25	15.00	51.50	52.00	0.0009	0	13.24	23.36	0.00	0.00
POND1	BASE	POST25	13.25	54.03	54.20	0.0061	161541	12.01	118.92	13.24	23.36

H101 N Pipe


Link N Pipe
POST25
Flow(cfs)
Time(hrs)
50
40
30
20
10
0
-10
0
5
10
15
20
25

P201



Link Sump
60
50
40
30
20
10
0
Flow(cfs)
0
10
20
30
40
50
60
Time(hrs)
25Y24H

```
==========================================================================================
==== Basins ==============================================================================
==========================================================================================

         Name: BN1                     Node: N1                     Status: Onsite
        Group: BASE                    Type: SCS Unit Hydrograph CN

        Unit Hydrograph: Uh256                 Peaking Factor: 256.0
          Rainfall File: Flmod              Storm Duration(hrs): 24.00
    Rainfall Amount(in): 8.000                Time of Conc(min): 15.00
               Area(ac): 18.290                 Time Shift(hrs): 0.00
           Curve Number: 80.00             Max Allowable Q(cfs): 999999.000
               DCIA(%): 0.00


==========================================================================================
==== Nodes ===============================================================================
==========================================================================================

      Name: N1                  Base Flow(cfs): 0.000          Init Stage(ft): 0.000
     Group: BASE                                               Warn Stage(ft): 0.000
      Type: Stage/Area


      Stage(ft)        Area(ac)
--------------- ---------------

------------------------------------------------------------------------------------------
      Name: Terminus            Base Flow(cfs): 0.000          Init Stage(ft): 20.400
     Group: BASE                                               Warn Stage(ft): 20.400
      Type: Time/Stage


      Time(hrs)       Stage(ft)
--------------- ---------------
           0.00          20.400
          99.00          20.400

==========================================================================================
==== Weirs ===============================================================================
==========================================================================================

         Name: Sump                From Node: N1
        Group: BASE                  To Node: Terminus
         Flow: Both                    Count: 1
         Type: Vertical: Mavis      Geometry: Rectangular

                    Span(in): 468.00
                    Rise(in): 3.24
                  Invert(ft): 20.530
       Control Elevation(ft): 20.530
                                                TABLE
             Bottom Clip(in): 0.000
                Top Clip(in): 0.000
         Weir Discharge Coef: 3.330
      Orifice Discharge Coef: 0.600


==========================================================================================
==== Hydrology Simulations ===============================================================
==========================================================================================

         Name: 25Y24H
     Filename: N:\Project_files\2012\12-0319 TAMPA BAY STORMWATER\ICPRInputData\P201\P201\25Y24H.R32

      Override Defaults: Yes
    Storm Duration(hrs): 24.00
          Rainfall File: Flmod
    Rainfall Amount(in): 8.00

Time(hrs)       Print Inc(min)
--------------- ---------------
30.000          5.00

==========================================================================================
==== Routing Simulations =================================================================
==========================================================================================

         Name: 25Y24H              Hydrology Sim: 25Y24H
     Filename: N:\Project_files\2012\12-0319 TAMPA BAY STORMWATER\ICPRInputData\P201\P201\25Y24H.I32

      Execute: Yes         Restart: No           Patch: No
  Alternative: No
```

```
        Max Delta Z(ft): 1.00                      Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                      End Time(hrs): 50.00
     Min Calc Time(sec): 0.5000                Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:
```

Time(hrs)	Print Inc(min)
999.000	15.000

Group	Run
BASE	Yes

P201

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
N1	BASE	25Y24H	12.08	22.09	0.00	*********	113	12.08	60.57	12.08	60.54
Terminus	BASE	25Y24H	0.00	20.40	20.40	0.0000	0	12.08	60.54	0.00	0.00

```
==========================================================================================
==== Basins ==============================================================================
==========================================================================================

        Name: CB24                      Node: CBN03                  Status: Onsite
       Group: BASE                      Type: SCS Unit Hydrograph CN

       Unit Hydrograph: Uh256                    Peaking Factor: 256.0
         Rainfall File:                     Storm Duration(hrs): 0.00
   Rainfall Amount(in): 0.000                 Time of Conc(min): 12.00
              Area(ac): 3.600                   Time Shift(hrs): 0.00
          Curve Number: 80.00              Max Allowable Q(cfs): 999999.000
               DCIA(%): 44.00

----------------------------------------------------------------------------------------------------
        Name: CN25                      Node: LAKE                   Status: Onsite
       Group: BASE                      Type: SCS Unit Hydrograph CN

       Unit Hydrograph: Uh256                    Peaking Factor: 256.0
         Rainfall File:                     Storm Duration(hrs): 0.00
   Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
              Area(ac): 2.940                   Time Shift(hrs): 0.00
          Curve Number: 86.00              Max Allowable Q(cfs): 999999.000
               DCIA(%): 0.00

----------------------------------------------------------------------------------------------------
        Name: SB11                      Node: CBN10                  Status: Onsite
       Group: BASE                      Type: SCS Unit Hydrograph CN

       Unit Hydrograph: Uh256                    Peaking Factor: 256.0
         Rainfall File:                     Storm Duration(hrs): 0.00
   Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
              Area(ac): 3.420                   Time Shift(hrs): 0.00
          Curve Number: 81.00              Max Allowable Q(cfs): 999999.000
               DCIA(%): 40.20

----------------------------------------------------------------------------------------------------
        Name: SB12                      Node: CBN13                  Status: Onsite
       Group: BASE                      Type: SCS Unit Hydrograph CN

       Unit Hydrograph: Uh256                    Peaking Factor: 256.0
         Rainfall File:                     Storm Duration(hrs): 0.00
   Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
              Area(ac): 2.870                   Time Shift(hrs): 0.00
          Curve Number: 84.00              Max Allowable Q(cfs): 999999.000
               DCIA(%): 52.90

----------------------------------------------------------------------------------------------------
        Name: SB13                      Node: CBN-14                 Status: Onsite
       Group: BASE                      Type: SCS Unit Hydrograph CN

       Unit Hydrograph: Uh256                    Peaking Factor: 256.0
         Rainfall File:                     Storm Duration(hrs): 0.00
   Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
              Area(ac): 2.090                   Time Shift(hrs): 0.00
          Curve Number: 83.00              Max Allowable Q(cfs): 999999.000
               DCIA(%): 47.40

----------------------------------------------------------------------------------------------------
        Name: SB14                      Node: CBN12                  Status: Onsite
       Group: BASE                      Type: SCS Unit Hydrograph CN

       Unit Hydrograph: Uh256                    Peaking Factor: 256.0
         Rainfall File:                     Storm Duration(hrs): 0.00
   Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
              Area(ac): 1.630                   Time Shift(hrs): 0.00
          Curve Number: 84.00              Max Allowable Q(cfs): 999999.000
               DCIA(%): 44.80

----------------------------------------------------------------------------------------------------
        Name: SB15                      Node: CBN11                  Status: Onsite
       Group: BASE                      Type: SCS Unit Hydrograph CN

       Unit Hydrograph: Uh256                    Peaking Factor: 256.0
         Rainfall File:                     Storm Duration(hrs): 0.00
   Rainfall Amount(in): 0.000                 Time of Conc(min): 10.00
```

```
           Area(ac): 1.520                  Time Shift(hrs): 0.00
       Curve Number: 85.00              Max Allowable Q(cfs): 999999.000
            DCIA(%): 45.60


----------------------------------------------------------------------------------------------------
       Name: SB16                        Node: CBN09                  Status: Onsite
      Group: BASE                        Type: SCS Unit Hydrograph CN

      Unit Hydrograph: Uh256                     Peaking Factor: 256.0
        Rainfall File:                       Storm Duration(hrs): 0.00
  Rainfall Amount(in): 0.000                   Time of Conc(min): 10.00
             Area(ac): 2.060                     Time Shift(hrs): 0.00
         Curve Number: 84.00                Max Allowable Q(cfs): 999999.000
              DCIA(%): 43.30


----------------------------------------------------------------------------------------------------
       Name: SB17                        Node: CBN07                  Status: Onsite
      Group: BASE                        Type: SCS Unit Hydrograph CN

      Unit Hydrograph: Uh256                     Peaking Factor: 256.0
        Rainfall File:                       Storm Duration(hrs): 0.00
  Rainfall Amount(in): 0.000                   Time of Conc(min): 10.00
             Area(ac): 1.080                     Time Shift(hrs): 0.00
         Curve Number: 86.00                Max Allowable Q(cfs): 999999.000
              DCIA(%): 67.30


----------------------------------------------------------------------------------------------------
       Name: SB18                        Node: CBN24                  Status: Onsite
      Group: BASE                        Type: SCS Unit Hydrograph CN

      Unit Hydrograph: Uh256                     Peaking Factor: 256.0
        Rainfall File:                       Storm Duration(hrs): 0.00
  Rainfall Amount(in): 0.000                   Time of Conc(min): 10.00
             Area(ac): 0.760                     Time Shift(hrs): 0.00
         Curve Number: 83.00                Max Allowable Q(cfs): 999999.000
              DCIA(%): 50.00


----------------------------------------------------------------------------------------------------
       Name: SB19                        Node: CBN08                  Status: Onsite
      Group: BASE                        Type: SCS Unit Hydrograph CN

      Unit Hydrograph: Uh256                     Peaking Factor: 256.0
        Rainfall File:                       Storm Duration(hrs): 0.00
  Rainfall Amount(in): 0.000                   Time of Conc(min): 10.00
             Area(ac): 1.440                     Time Shift(hrs): 0.00
         Curve Number: 85.00                Max Allowable Q(cfs): 999999.000
              DCIA(%): 59.70


----------------------------------------------------------------------------------------------------
       Name: SB20                        Node: CBN23                  Status: Onsite
      Group: BASE                        Type: SCS Unit Hydrograph CN

      Unit Hydrograph: Uh256                     Peaking Factor: 256.0
        Rainfall File:                       Storm Duration(hrs): 0.00
  Rainfall Amount(in): 0.000                   Time of Conc(min): 14.00
             Area(ac): 0.950                     Time Shift(hrs): 0.00
         Curve Number: 84.00                Max Allowable Q(cfs): 999999.000
              DCIA(%): 41.50


----------------------------------------------------------------------------------------------------
       Name: SB21                        Node: CBN04                  Status: Onsite
      Group: BASE                        Type: SCS Unit Hydrograph CN

      Unit Hydrograph: Uh256                     Peaking Factor: 256.0
        Rainfall File:                       Storm Duration(hrs): 0.00
  Rainfall Amount(in): 0.000                   Time of Conc(min): 12.00
             Area(ac): 0.700                     Time Shift(hrs): 0.00
         Curve Number: 86.00                Max Allowable Q(cfs): 999999.000
              DCIA(%): 60.00


----------------------------------------------------------------------------------------------------
       Name: SB22                        Node: CBN06                  Status: Onsite
      Group: BASE                        Type: SCS Unit Hydrograph CN

      Unit Hydrograph: Uh256                     Peaking Factor: 256.0
```

```
         Rainfall File:                      Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 16.00
              Area(ac): 1.570                    Time Shift(hrs): 0.00
          Curve Number: 85.00              Max Allowable Q(cfs): 999999.000
               DCIA(%): 47.10


----------------------------------------------------------------------------------------------------
        Name: SB23                        Node: CBN05                  Status: Onsite
       Group: BASE                        Type: SCS Unit Hydrograph CN

       Unit Hydrograph: Uh256                    Peaking Factor: 256.0
         Rainfall File:                      Storm Duration(hrs): 0.00
    Rainfall Amount(in): 0.000                 Time of Conc(min): 18.00
              Area(ac): 3.920                    Time Shift(hrs): 0.00
          Curve Number: 81.00              Max Allowable Q(cfs): 999999.000
               DCIA(%): 37.60


==========================================================================================
==== Nodes ===============================================================================
==========================================================================================

     Name: CBN-14              Base Flow(cfs): 0.000          Init Stage(ft): 13.450
    Group: BASE                                               Warn Stage(ft): 16.700
     Type: Stage/Area


     Stage(ft)        Area(ac)
--------------- ---------------
        13.450          0.0004
        16.450          0.0004
        16.700          0.0486

------------------------------------------------------------------------------------------
     Name: CBN03               Base Flow(cfs): 0.000          Init Stage(ft): 10.320
    Group: BASE                                               Warn Stage(ft): 14.980
     Type: Stage/Area


     Stage(ft)        Area(ac)
--------------- ---------------
         8.930          0.0004
        13.680          0.0004
        14.980          0.0486

------------------------------------------------------------------------------------------
     Name: CBN04               Base Flow(cfs): 0.000          Init Stage(ft): 10.000
    Group: BASE                                               Warn Stage(ft): 14.980
     Type: Stage/Area


     Stage(ft)        Area(ac)
--------------- ---------------
        10.000          0.0004
        13.680          0.0004
        14.980          0.0486

------------------------------------------------------------------------------------------
     Name: CBN05               Base Flow(cfs): 0.000          Init Stage(ft): 9.600
    Group: BASE                                               Warn Stage(ft): 14.800
     Type: Stage/Area


     Stage(ft)        Area(ac)
--------------- ---------------
         9.600          0.0004
        14.550          0.0004
        14.980          0.0486

------------------------------------------------------------------------------------------
     Name: CBN06               Base Flow(cfs): 0.000          Init Stage(ft): 11.240
    Group: BASE                                               Warn Stage(ft): 15.160
     Type: Stage/Area


     Stage(ft)        Area(ac)
--------------- ---------------
         9.780          0.0004
        14.830          0.0004
        15.080          0.0486
```

Name: CBN07	Base Flow(cfs): 0.000	Init Stage(ft): 11.240
Group: BASE		Warn Stage(ft): 15.160
Type: Stage/Area		

Stage(ft)	Area(ac)
11.240	0.0004
14.910	0.0004
15.160	0.0486

Name: CBN08	Base Flow(cfs): 0.000	Init Stage(ft): 11.340
Group: BASE		Warn Stage(ft): 15.160
Type: Stage/Area		

Stage(ft)	Area(ac)
11.340	0.0004
14.910	0.0004
15.160	0.0486

Name: CBN09	Base Flow(cfs): 0.000	Init Stage(ft): 13.290
Group: BASE		Warn Stage(ft): 15.980
Type: Stage/Area		

Stage(ft)	Area(ac)
13.290	0.0007
15.730	0.0007
15.980	0.0486

Name: CBN10	Base Flow(cfs): 0.000	Init Stage(ft): 13.300
Group: BASE		Warn Stage(ft): 15.980
Type: Stage/Area		

Stage(ft)	Area(ac)
13.300	0.0004
15.730	0.0004
15.980	0.0486

Name: CBN11	Base Flow(cfs): 0.000	Init Stage(ft): 10.760
Group: BASE		Warn Stage(ft): 15.150
Type: Stage/Area		

Stage(ft)	Area(ac)
10.760	0.0004
14.850	0.0004
15.150	0.0486

Name: CBN12	Base Flow(cfs): 0.000	Init Stage(ft): 10.860
Group: BASE		Warn Stage(ft): 15.150
Type: Stage/Area		

Stage(ft)	Area(ac)
10.860	0.0004
14.850	0.0004
15.150	0.0486

Name: CBN13	Base Flow(cfs): 0.000	Init Stage(ft): 12.960
Group: BASE		Warn Stage(ft): 16.700
Type: Stage/Area		

Stage(ft)	Area(ac)
12.960	0.0004
16.450	0.0004

```
        16.700          0.0486

-----------------------------------------------------------------------------------------
      Name: CBN23              Base Flow(cfs): 0.000          Init Stage(ft): 12.620
     Group: BASE                                              Warn Stage(ft): 15.500
      Type: Stage/Area


      Stage(ft)        Area(ac)
--------------- ---------------
         12.620          0.0004
         14.450          0.0004
         15.500          0.0486

-----------------------------------------------------------------------------------------
      Name: CBN24              Base Flow(cfs): 0.000          Init Stage(ft): 10.320
     Group: BASE                                              Warn Stage(ft): 15.500
      Type: Stage/Area


      Stage(ft)        Area(ac)
--------------- ---------------
          9.000          0.0000
         10.030          0.0004
         13.450          0.0004
         15.500          0.0486

-----------------------------------------------------------------------------------------
      Name: JBN01              Base Flow(cfs): 0.000          Init Stage(ft): 10.320
     Group: BASE                Plunge Factor: 1.00           Warn Stage(ft): 15.300
      Type: Manhole, Flat Floor


      Stage(ft)        Area(ac)
--------------- ---------------

-----------------------------------------------------------------------------------------
      Name: JBN02              Base Flow(cfs): 0.000          Init Stage(ft): 10.550
     Group: BASE                Plunge Factor: 1.00           Warn Stage(ft): 16.300
      Type: Manhole, Flat Floor


      Stage(ft)        Area(ac)
--------------- ---------------

-----------------------------------------------------------------------------------------
      Name: JBN03              Base Flow(cfs): 0.000          Init Stage(ft): 11.330
     Group: BASE                Plunge Factor: 1.00           Warn Stage(ft): 15.300
      Type: Manhole, Flat Floor


      Stage(ft)        Area(ac)
--------------- ---------------

-----------------------------------------------------------------------------------------
      Name: JBN04              Base Flow(cfs): 0.000          Init Stage(ft): 10.320
     Group: BASE                                              Warn Stage(ft): 15.700
      Type: Stage/Area


      Stage(ft)        Area(ac)
--------------- ---------------
          8.930          0.0004
         13.680          0.0004
         14.980          0.0486

-----------------------------------------------------------------------------------------
      Name: LAKE               Base Flow(cfs): 0.000          Init Stage(ft): 10.320
     Group: BASE                                              Warn Stage(ft): 15.500
      Type: Stage/Area


      Stage(ft)        Area(ac)
--------------- ---------------
         10.000          1.3000
         11.000          1.5300
         12.000          1.6800
         13.000          1.8000
         14.000          1.9300
         15.000          2.0700
         15.500          2.1500
```

```
-------------------------------------------------------------------------------------------
      Name: Z                    Base Flow(cfs): 0.000          Init Stage(ft): 8.000
     Group: BASE                                                Warn Stage(ft): 18.000
      Type: Time/Stage


      Time(hrs)       Stage(ft)
--------------- ---------------
           8.00           8.000
          10.00          10.000
          11.00          11.000
          12.00          10.000
         999.00           8.000

===========================================================================================
==== Pipes ================================================================================
===========================================================================================

         Name: P01                From Node: CBN-14           Length(ft): 400.00
        Group: BASE                 To Node: CBN13                 Count: 1
                                                       Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM              Solution Algorithm: Most Restrictive
     Geometry: Horz Ellipse   Horz Ellipse                          Flow: Both
     Span(in): 30.00          30.00                   Entrance Loss Coef: 0.30
     Rise(in): 19.00          19.00                       Exit Loss Coef: 1.00
   Invert(ft): 13.450         13.350                      Bend Loss Coef: 0.00
  Manning's N: 0.011000       0.011000                  Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                      Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                    Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Downstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall


----------------------------------------------------------------------------------------------------
         Name: P02                From Node: CBN13            Length(ft): 400.00
        Group: BASE                 To Node: CBN11                 Count: 1
                                                       Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM              Solution Algorithm: Most Restrictive
     Geometry: Horz Ellipse   Horz Ellipse                          Flow: Both
     Span(in): 45.00          45.00                   Entrance Loss Coef: 0.30
     Rise(in): 29.00          29.00                       Exit Loss Coef: 1.00
   Invert(ft): 12.280         11.080                      Bend Loss Coef: 0.00
  Manning's N: 0.011000       0.011000                  Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                      Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                    Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Downstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall


----------------------------------------------------------------------------------------------------
         Name: P03                From Node: CBN10            Length(ft): 32.00
        Group: BASE                 To Node: CBN09                 Count: 1
                                                       Friction Equation: Automatic
               UPSTREAM       DOWNSTREAM              Solution Algorithm: Most Restrictive
     Geometry: Horz Ellipse   Horz Ellipse                          Flow: Both
     Span(in): 38.00          38.00                   Entrance Loss Coef: 0.30
     Rise(in): 24.00          24.00                       Exit Loss Coef: 1.00
   Invert(ft): 13.250         13.160                      Bend Loss Coef: 0.00
  Manning's N: 0.011000       0.011000                  Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                      Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                    Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Downstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall


----------------------------------------------------------------------------------------------------
         Name: P04                From Node: CBN09            Length(ft): 333.00
```

```
       Group: BASE                 To Node: JBN03                      Count: 1
                                                             Friction Equation: Automatic
              UPSTREAM       DOWNSTREAM                    Solution Algorithm: Most Restrictive
     Geometry: Horz Ellipse   Horz Ellipse                               Flow: Both
     Span(in): 45.00          45.00                        Entrance Loss Coef: 0.30
     Rise(in): 29.00          29.00                            Exit Loss Coef: 1.00
   Invert(ft): 13.160         12.160                           Bend Loss Coef: 0.00
  Manning's N: 0.011000       0.011000                       Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                           Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                         Stabilizer Option: None
```

Upstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Downstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

```
----------------------------------------------------------------------------------------------------
        Name: P05                From Node: JBN03                 Length(ft): 30.00
       Group: BASE                 To Node: CBN07                      Count: 1
                                                             Friction Equation: Automatic
              UPSTREAM       DOWNSTREAM                    Solution Algorithm: Most Restrictive
     Geometry: Horz Ellipse   Horz Ellipse                               Flow: Both
     Span(in): 45.00          45.00                        Entrance Loss Coef: 0.30
     Rise(in): 29.00          29.00                            Exit Loss Coef: 1.00
   Invert(ft): 11.330         11.240                           Bend Loss Coef: 0.00
  Manning's N: 0.011000       0.011000                       Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                           Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                         Stabilizer Option: None
```

Upstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Downstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

```
----------------------------------------------------------------------------------------------------
        Name: P06                From Node: CBN08                 Length(ft): 32.00
       Group: BASE                 To Node: CBN07                      Count: 1
                                                             Friction Equation: Automatic
              UPSTREAM       DOWNSTREAM                    Solution Algorithm: Most Restrictive
     Geometry: Horz Ellipse   Horz Ellipse                               Flow: Both
     Span(in): 30.00          30.00                        Entrance Loss Coef: 0.30
     Rise(in): 19.00          19.00                            Exit Loss Coef: 1.00
   Invert(ft): 11.340         11.240                           Bend Loss Coef: 0.00
  Manning's N: 0.011000       0.011000                       Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                           Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                         Stabilizer Option: None
```

Upstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Downstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

```
----------------------------------------------------------------------------------------------------
        Name: P07                From Node: CBN07                 Length(ft): 230.00
       Group: BASE                 To Node: JBN02                      Count: 1
                                                             Friction Equation: Automatic
              UPSTREAM       DOWNSTREAM                    Solution Algorithm: Most Restrictive
     Geometry: Horz Ellipse   Horz Ellipse                               Flow: Both
     Span(in): 53.00          53.00                        Entrance Loss Coef: 0.30
     Rise(in): 34.00          34.00                            Exit Loss Coef: 1.00
   Invert(ft): 11.240         10.550                           Bend Loss Coef: 0.00
  Manning's N: 0.011000       0.011000                       Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000          0.000                           Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                         Stabilizer Option: None
```

Upstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Downstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

```
---------------------------------------------------------------------------------------------------
        Name: P08                From Node: CBN12              Length(ft): 32.00
       Group: BASE                 To Node: CBN11                   Count: 1
                                                        Friction Equation: Automatic
              UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
    Geometry: Horz Ellipse   Horz Ellipse                            Flow: Both
    Span(in): 30.00          30.00                     Entrance Loss Coef: 0.30
    Rise(in): 19.00          19.00                         Exit Loss Coef: 1.00
  Invert(ft): 12.160         12.060                        Bend Loss Coef: 0.00
 Manning's N: 0.011000       0.011000                    Outlet Ctrl Spec: Use dc or tw
Top Clip(in): 0.000          0.000                        Inlet Ctrl Spec: Use dc
Bot Clip(in): 0.000          0.000                      Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Downstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall


---------------------------------------------------------------------------------------------------
        Name: P09                From Node: CBN11              Length(ft): 175.00
       Group: BASE                 To Node: JBN02                   Count: 1
                                                        Friction Equation: Automatic
              UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
    Geometry: Horz Ellipse   Horz Ellipse                            Flow: Both
    Span(in): 53.00          53.00                     Entrance Loss Coef: 0.30
    Rise(in): 34.00          34.00                         Exit Loss Coef: 1.00
  Invert(ft): 11.080         10.550                        Bend Loss Coef: 0.00
 Manning's N: 0.011000       0.011000                    Outlet Ctrl Spec: Use dc or tw
Top Clip(in): 0.000          0.000                        Inlet Ctrl Spec: Use dc
Bot Clip(in): 0.000          0.000                      Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Downstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall


---------------------------------------------------------------------------------------------------
        Name: P10                From Node: CBN24              Length(ft): 190.00
       Group: BASE                 To Node: JBN04                   Count: 1
                                                        Friction Equation: Automatic
              UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
    Geometry: Horz Ellipse   Horz Ellipse                            Flow: Both
    Span(in): 60.00          60.00                     Entrance Loss Coef: 0.30
    Rise(in): 38.00          38.00                         Exit Loss Coef: 1.00
  Invert(ft): 10.030         9.430                         Bend Loss Coef: 0.00
 Manning's N: 0.020000       0.020000                    Outlet Ctrl Spec: Use dc or tw
Top Clip(in): 0.000          0.000                        Inlet Ctrl Spec: Use dc
Bot Clip(in): 0.000          0.000                      Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Downstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall


---------------------------------------------------------------------------------------------------
        Name: P104               From Node: CBN23              Length(ft): 32.00
       Group: BASE                 To Node: CBN24                   Count: 1
                                                        Friction Equation: Automatic
              UPSTREAM       DOWNSTREAM                Solution Algorithm: Most Restrictive
    Geometry: Circular       Circular                                Flow: Both
    Span(in): 18.00          18.00                     Entrance Loss Coef: 0.30
    Rise(in): 18.00          18.00                         Exit Loss Coef: 1.00
  Invert(ft): 12.620         12.520                        Bend Loss Coef: 0.00
 Manning's N: 0.011000       0.011000                    Outlet Ctrl Spec: Use dc or tw
Top Clip(in): 0.000          0.000                        Inlet Ctrl Spec: Use dc
Bot Clip(in): 0.000          0.000                      Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
```

Circular Concrete: Square edge w/ headwall

```
----------------------------------------------------------------------------------------------------
        Name: P11              From Node: JBN02              Length(ft): 172.00
       Group: BASE               To Node: CBN24                   Count: 1
                                                       Friction Equation: Automatic
              UPSTREAM      DOWNSTREAM                Solution Algorithm: Most Restrictive
    Geometry: Horz Ellipse  Horz Ellipse                            Flow: Both
    Span(in): 60.00         60.00                     Entrance Loss Coef: 0.30
    Rise(in): 38.00         38.00                         Exit Loss Coef: 1.00
  Invert(ft): 10.550        10.030                        Bend Loss Coef: 0.00
 Manning's N: 0.011000      0.011000                    Outlet Ctrl Spec: Use dc or tw
Top Clip(in): 0.000         0.000                        Inlet Ctrl Spec: Use dc
Bot Clip(in): 0.000         0.000                      Stabilizer Option: None
```

Upstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Downstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

```
----------------------------------------------------------------------------------------------------
        Name: P12              From Node: JBN04              Length(ft): 167.00
       Group: BASE               To Node: CBN03                   Count: 1
                                                       Friction Equation: Automatic
              UPSTREAM      DOWNSTREAM                Solution Algorithm: Most Restrictive
    Geometry: Horz Ellipse  Horz Ellipse                            Flow: Positive
    Span(in): 60.00         60.00                     Entrance Loss Coef: 0.30
    Rise(in): 38.00         38.00                         Exit Loss Coef: 1.00
  Invert(ft): 9.430         8.930                         Bend Loss Coef: 0.00
 Manning's N: 0.040000      0.040000                    Outlet Ctrl Spec: Use dc or tw
Top Clip(in): 0.000         0.000                        Inlet Ctrl Spec: Use dc
Bot Clip(in): 0.000         0.000                      Stabilizer Option: None
```

Upstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Downstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

```
----------------------------------------------------------------------------------------------------
        Name: P13              From Node: CBN06              Length(ft): 30.00
       Group: BASE               To Node: CBN05                   Count: 1
                                                       Friction Equation: Automatic
              UPSTREAM      DOWNSTREAM                Solution Algorithm: Most Restrictive
    Geometry: Horz Ellipse  Horz Ellipse                            Flow: Both
    Span(in): 30.00         30.00                     Entrance Loss Coef: 0.30
    Rise(in): 19.00         19.00                         Exit Loss Coef: 1.00
  Invert(ft): 12.620        12.530                        Bend Loss Coef: 0.00
 Manning's N: 0.011000      0.011000                    Outlet Ctrl Spec: Use dc or tw
Top Clip(in): 0.000         0.000                        Inlet Ctrl Spec: Use dc
Bot Clip(in): 0.000         0.000                      Stabilizer Option: None
```

Upstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Downstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

```
----------------------------------------------------------------------------------------------------
        Name: P14              From Node: CBN05              Length(ft): 345.00
       Group: BASE               To Node: JBN01                   Count: 1
                                                       Friction Equation: Automatic
              UPSTREAM      DOWNSTREAM                Solution Algorithm: Most Restrictive
    Geometry: Horz Ellipse  Horz Ellipse                            Flow: Both
    Span(in): 45.00         45.00                     Entrance Loss Coef: 0.30
    Rise(in): 29.00         29.00                         Exit Loss Coef: 1.00
  Invert(ft): 11.460        10.420                        Bend Loss Coef: 0.00
 Manning's N: 0.011000      0.011000                    Outlet Ctrl Spec: Use dc or tw
Top Clip(in): 0.000         0.000                        Inlet Ctrl Spec: Use dc
Bot Clip(in): 0.000         0.000                      Stabilizer Option: None
```

Upstream FHWA Inlet Edge Description:

```
Horizontal Ellipse Concrete: Square edge with headwall

Downstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall



-----------------------------------------------------------------------------------------------------
         Name: P15                From Node: CBN04            Length(ft): 32.00
        Group: BASE                 To Node: CBN03                 Count: 1
                                                         Friction Equation: Automatic
              UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular      Circular                                 Flow: Both
     Span(in): 18.00         18.00                      Entrance Loss Coef: 0.30
     Rise(in): 18.00         18.00                          Exit Loss Coef: 1.00
   Invert(ft): 11.250        11.150                         Bend Loss Coef: 0.00
  Manning's N: 0.011000      0.011000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000         0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000         0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



-----------------------------------------------------------------------------------------------------
         Name: P16                From Node: CBN03            Length(ft): 173.00
        Group: BASE                 To Node: LAKE                  Count: 1
                                                         Friction Equation: Automatic
              UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Horz Ellipse  Horz Ellipse                             Flow: Both
     Span(in): 60.00         60.00                      Entrance Loss Coef: 0.30
     Rise(in): 38.00         38.00                          Exit Loss Coef: 1.00
   Invert(ft): 8.930         8.400                          Bend Loss Coef: 0.00
  Manning's N: 0.040000      0.040000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000         0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000         0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Downstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall



-----------------------------------------------------------------------------------------------------
         Name: P17                From Node: JBN01            Length(ft): 175.00
        Group: BASE                 To Node: LAKE                  Count: 1
                                                         Friction Equation: Automatic
              UPSTREAM       DOWNSTREAM                 Solution Algorithm: Most Restrictive
     Geometry: Circular      Circular                                 Flow: Both
     Span(in): 36.00         36.00                      Entrance Loss Coef: 0.30
     Rise(in): 36.00         36.00                          Exit Loss Coef: 1.00
   Invert(ft): 10.420        9.890                          Bend Loss Coef: 0.00
  Manning's N: 0.011000      0.011000                     Outlet Ctrl Spec: Use dc or tw
 Top Clip(in): 0.000         0.000                         Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000         0.000                       Stabilizer Option: None


Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



==========================================================================================
==== Drop Structures =====================================================================
==========================================================================================

         Name: P18                From Node: LAKE             Length(ft): 64.00
        Group: BASE                 To Node: Z                     Count: 1

              UPSTREAM       DOWNSTREAM                  Friction Equation: Automatic
     Geometry: Circular      Circular                   Solution Algorithm: Most Restrictive
     Span(in): 24.00         24.00                                    Flow: Both
     Rise(in): 24.00         24.00                      Entrance Loss Coef: 0.500
   Invert(ft): 8.220         8.000                          Exit Loss Coef: 1.000
  Manning's N: 0.011000      0.011000                     Outlet Ctrl Spec: Use dc or tw
```

```
 Top Clip(in): 0.000          0.000                          Inlet Ctrl Spec: Use dc
 Bot Clip(in): 0.000          0.000                            Solution Incs: 10

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall


*** Weir 1 of 3 for Drop Structure P18 ***
                                                                                TABLE
                  Count: 1                         Bottom Clip(in): 0.000
                   Type: Vertical: Mavis              Top Clip(in): 0.000
                   Flow: Both                        Weir Disc Coef: 3.330
               Geometry: Rectangular               Orifice Disc Coef: 0.600

               Span(in): 8.00                            Invert(ft): 11.750
               Rise(in): 29.00                     Control Elev(ft): 11.750

*** Weir 2 of 3 for Drop Structure P18 ***
                                                                                TABLE
                  Count: 1                         Bottom Clip(ft): 0.000
                   Type: Vertical: Mavis              Top Clip(ft): 0.000
                   Flow: Both                        Weir Disc Coef: 3.330
               Geometry: Trapezoidal               Orifice Disc Coef: 0.600

       Bottom Width(ft): 0.00                            Invert(ft): 11.000
       Left Sd Slp(h/v): 0.53                      Control Elev(ft): 11.000
      Right Sd Slp(h/v): 0.53                 Struct Opening Dim(ft): 0.79

*** Weir 3 of 3 for Drop Structure P18 ***
                                                                                TABLE
                  Count: 1                         Bottom Clip(in): 0.000
                   Type: Horizontal                   Top Clip(in): 0.000
                   Flow: Both                        Weir Disc Coef: 3.200
               Geometry: Rectangular               Orifice Disc Coef: 0.600

               Span(in): 24.00                           Invert(ft): 14.180
               Rise(in): 36.00                     Control Elev(ft): 14.180


==========================================================================================
==== Hydrology Simulations ===============================================================
==========================================================================================

         Name: 25Y24H
     Filename: N:\Project_files\2012\12-0319 TAMPA BAY STORMWATER\ICPRInputData\M101\25Y24H.R32

      Override Defaults: Yes
    Storm Duration(hrs): 24.00
          Rainfall File: Flmod
    Rainfall Amount(in): 7.70

Time(hrs)       Print Inc(min)
--------------- ---------------
60.000          30.00

----------------------------------------------------------------------------------------------------
         Name: SW01
     Filename: N:\Project_files\2012\12-0319 TAMPA BAY STORMWATER\ICPRInputData\M101\SW01.R32

      Override Defaults: Yes
    Storm Duration(hrs): 1.00
          Rainfall File: m101_12202012
    Rainfall Amount(in): 0.51

Time(hrs)       Print Inc(min)
--------------- ---------------
10.000          5.00

==========================================================================================
==== Routing Simulations =================================================================
==========================================================================================

         Name: 25Y24H             Hydrology Sim: 25Y24H
     Filename: N:\Project_files\2012\12-0319 TAMPA BAY STORMWATER\ICPRInputData\M101\25Y24H.I32

      Execute: No          Restart: No             Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                      Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                      End Time(hrs): 48.00
     Min Calc Time(sec): 1.0000                 Max Calc Time(sec): 15.0000
        Boundary Stages:                           Boundary Flows:
```

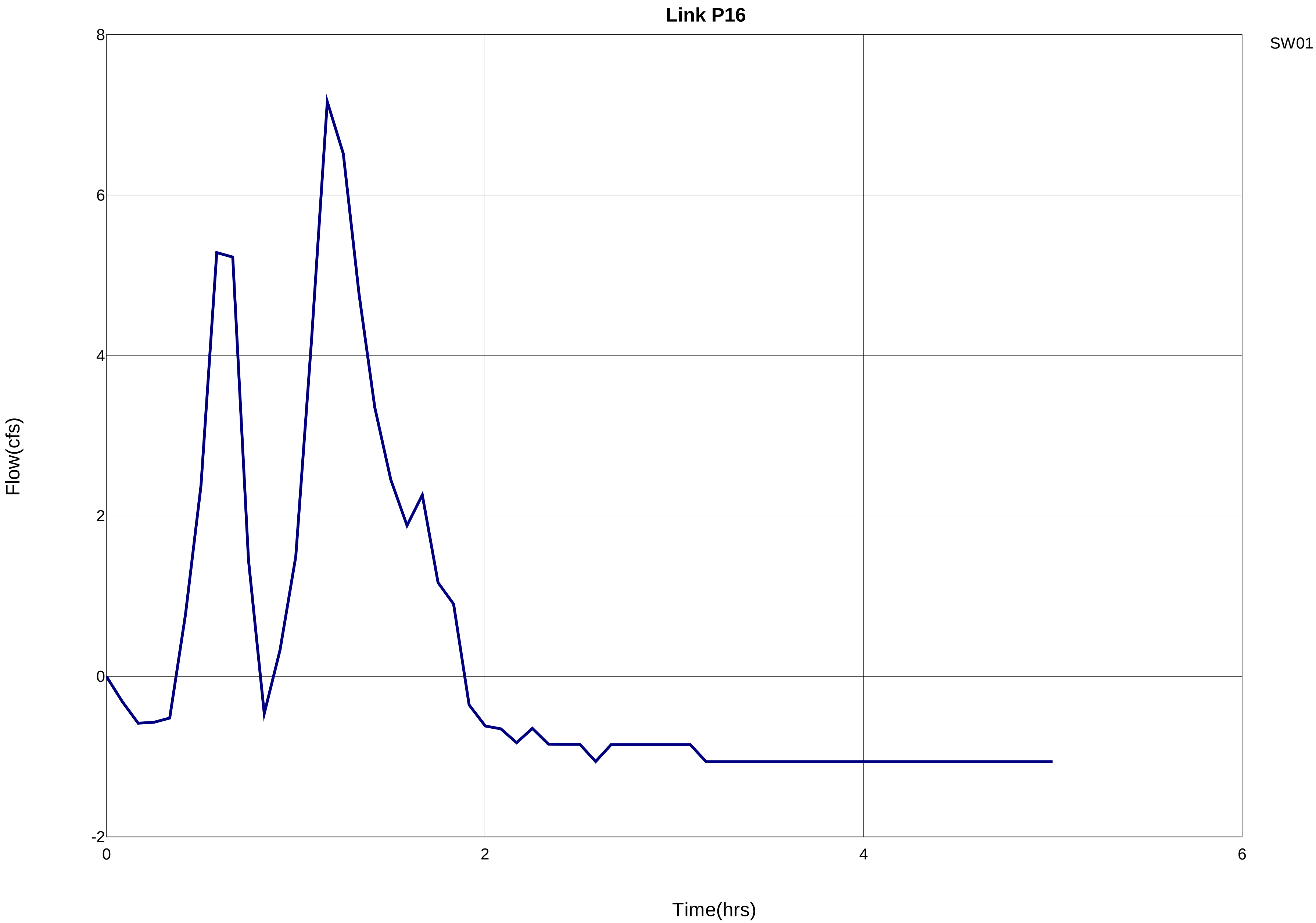
Time(hrs)	Print Inc(min)
10.000	30.000
24.000	15.000
60.000	30.000

Group	Run
BASE	Yes

```
         Name: SW01                Hydrology Sim: SW01
     Filename: N:\Project_files\2012\12-0319 TAMPA BAY STORMWATER\ICPRInputData\M101\SW01.I32

      Execute: Yes         Restart: No            Patch: No
  Alternative: No

        Max Delta Z(ft): 1.00                     Delta Z Factor: 0.00500
    Time Step Optimizer: 10.000
        Start Time(hrs): 0.000                     End Time(hrs): 5.00
     Min Calc Time(sec): 0.5000               Max Calc Time(sec): 60.0000
        Boundary Stages:                          Boundary Flows:
```

Time(hrs)	Print Inc(min)
10.000	5.000

Group	Run
BASE	Yes


Link P16
SW01
Flow(cfs)
8
6
4
2
0
-2
0
2
4
6
Time(hrs)

Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
CBN-14	BASE	SW01	1.11	13.95	16.70	-0.0028	566	1.08	0.94	1.11	0.85
CBN03	BASE	SW01	3.08	10.62	14.98	-0.0050	954	1.18	7.44	1.19	7.32
CBN04	BASE	SW01	1.10	11.54	14.98	0.0029	131	1.08	0.35	1.10	0.32
CBN05	BASE	SW01	1.17	11.85	14.80	0.0043	636	1.11	1.34	1.17	1.31
CBN06	BASE	SW01	1.11	12.88	15.16	0.0031	142	1.08	0.49	1.11	0.48
CBN07	BASE	SW01	1.12	11.83	15.16	-0.0033	644	1.10	3.33	1.12	3.29
CBN08	BASE	SW01	1.12	11.84	15.16	0.0038	151	1.08	0.83	1.08	0.77
CBN09	BASE	SW01	1.09	13.65	15.98	-0.0038	675	1.08	2.13	1.09	2.08
CBN10	BASE	SW01	1.09	13.69	15.98	0.0050	157	1.08	1.29	1.08	1.27
CBN11	BASE	SW01	1.13	11.66	15.15	0.0042	1055	0.00	3.89	1.13	3.19
CBN12	BASE	SW01	1.09	12.48	15.15	0.0050	146	1.08	0.71	1.09	0.70
CBN13	BASE	SW01	0.00	12.96	16.70	-0.0040	816	1.08	2.27	0.00	3.89
CBN23	BASE	SW01	1.10	12.89	15.50	-0.0014	131	1.08	0.30	1.10	0.29
CBN24	BASE	SW01	1.19	10.94	15.50	-0.0036	935	1.15	6.76	1.17	6.52
JBN01	BASE	SW01	1.22	10.89	15.30	-0.1000	763	1.17	1.31	1.22	1.22
JBN02	BASE	SW01	1.15	11.36	16.30	0.0031	1257	1.12	6.46	1.15	6.24
JBN03	BASE	SW01	1.12	11.92	15.30	-0.0035	653	1.09	2.08	1.12	2.00
JBN04	BASE	SW01	1.20	10.76	15.70	0.0027	990	1.17	6.52	1.19	6.36
LAKE	BASE	SW01	5.00	10.62	15.50	0.0011	63468	1.19	8.60	0.00	0.00
Z	BASE	SW01	0.00	8.00	18.00	0.0000	0	0.00	0.00	0.00	0.00

Appendix B. Final Approval Letter for the Quality Assurance Project Plan (QAPP)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

NOV 1 1 2012

MEMORANDUM

Subject: Quality Assurance Project Plan Review
Residential Stormwater Quality Evaluation at Tampa Bay Area Subdivisions

From: Rhonda K. Evans, Designated Approving Official *Rhonda K. Evans*
Wetlands Planning and Coastal Protection Section

To: John P. McConney, QA Coordinator
Water Protection Division

On June 12, 2012, I submitted information conditionally approving the Quality Assurance Project Plan (QAPP) for this project. The grant recipient has satisfactorily addressed all the comments identified in my approval memorandum and review checklist. There are no outstanding issues with the QAPP.

If you have any questions, please feel free to contact me at 404-562-9369.

A1-TITLE AND APPROVAL SHEET

Claudia Listopad, PhD
Project Manager
Applied Ecology, Inc
Date 09/07/2012

Jeff Smith, Senior Associate Scientist
Field QA/QC Task Officer
Environmental Consulting & Technology, Inc.
Date 9/15/2012

Patrick Bohlen, PhD
Analysis QA/QC Task Officer
University of Central Florida
Date 09/13/2012

Mark Clark, PhD
QA/QC Officer
University of Florida
Date 09/25/2012

Ed Sherwood,
Tampa Bay Estuary Program
Date 10/1/2012

Felicia Burks
NEP Program Manager
U.S. Environmental Protection Agency Region 4
Date 11/26/12

Appendix F - Telephone Survey Response Frequencies by County

Telephone Survey Response Frequencies by County

q1 OK, good. Now we have some questions about landscaping irrigation and yard maintenance. First, do you ever irrigate or water your lawn with water other than rainwater?

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Yes	205	71.7	71.7	71.7
		No	81	28.3	28.3	100.0
		Total	286	100.0	100.0	
Pinellas	Valid	Yes	186	72.4	72.4	72.4
		No	71	27.6	27.6	100.0
		Total	257	100.0	100.0	
Manatee	Valid	Yes	209	71.6	71.6	71.6
		No	83	28.4	28.4	100.0
		Total	292	100.0	100.0	

q2 - q2 What is the primary method you use to water your lawn?

county - county Which county do you live in?			Frequency	Percent
Hillsborough	Valid	In-ground, automatic irrigation system	117	40.9
		Hand water using a hose	26	9.1
		Set an aboveground sprinkler out by hand	53	18.5
		Drip irrigation from hoses at surface	4	1.4
		Other	4	1.4
		DK, All other missing	1	.3
		Total	205	71.7

	Missing	System	81	28.3
	Total		286	100.0
Pinellas	Valid	In-ground, automatic irrigation system	126	49.0
		Hand water using a hose	20	7.8
		Set an aboveground sprinkler out by hand	31	12.1
		Drip irrigation from hoses at surface	2	.8
		Other	7	2.7
		Total	186	72.4
	Missing	System	71	27.6
	Total		257	100.0
Manatee	Valid	In-ground, automatic irrigation system	131	44.9
		Hand water using a hose	18	6.2
		Set an aboveground sprinkler out by hand	51	17.5
		Drip irrigation from hoses at surface	4	1.4
		Other	5	1.7
		Total	209	71.6
	Missing	System	83	28.4
	Total		292	100.0

q2 - q2 What is the primary method you use to water your lawn?

county - county Which county do you live in?			Valid Percent	Cumulative Percent
Hillsborough	Valid	In-ground, automatic irrigation system	57.1	57.1
		Hand water using a hose	12.7	69.8

		Set an aboveground sprinkler out by hand	25.9	95.6
		Drip irrigation from hoses at surface	2.0	97.6
		Other	2.0	99.5
		DK, All other missing	.5	100.0
		Total	100.0	
	Missing	System		
	Total			
Pinellas	Valid	In-ground, automatic irrigation system	67.7	67.7
		Hand water using a hose	10.8	78.5
		Set an aboveground sprinkler out by hand	16.7	95.2
		Drip irrigation from hoses at surface	1.1	96.2
		Other	3.8	100.0
		Total	100.0	
	Missing	System		
	Total			
Manatee	Valid	In-ground, automatic irrigation system	62.7	62.7
		Hand water using a hose	8.6	71.3
		Set an aboveground sprinkler out by hand	24.4	95.7
		Drip irrigation from hoses at surface	1.9	97.6
		Other	2.4	100.0
		Total	100.0	
	Missing	System		
	Total			

q2 - q2 What is the primary method you use to water your lawn? Other

county - county Which county do you live in?			Frequency	Percent
Hillsborough	Valid		282	98.6
		6 zones are automatic and one is drip	1	.3
		lake water	1	.3
		Rain water that is collected by a barrel	1	.3
		well	1	.3
		Total	286	100.0
Pinellas	Valid		250	97.3
		From well	1	.4
		pump	1	.4
		reclaimed	2	.8
		well	3	1.2
		Total	257	100.0
Manatee	Valid		287	98.3
		Mister system	1	.3
		natural	1	.3
		reclaimed	1	.3
		recycled water	1	.3
		well	1	.3
		Total	292	100.0

q2 - q2 What is the primary method you use to water your lawn? Other

county - county Which county do you live in?	Valid Percent	Cumulative Percent

Hillsborough	Valid		98.6	98.6
		6 zones are automatic and one is drip	.3	99.0
		lake water	.3	99.3
		Rain water that is collected by a barrel	.3	99.7
		well	.3	100.0
		Total	100.0	
Pinellas	Valid		97.3	97.3
		From well	.4	97.7
		pump	.4	98.1
		reclaimed	.8	98.8
		well	1.2	100.0
		Total	100.0	
Manatee	Valid		98.3	98.3
		Mister system	.3	98.6
		natural	.3	99.0
		reclaimed	.3	99.3
		recycled water	.3	99.7
		well	.3	100.0
		Total	100.0	

q3 - q3 How many times a week do you typically water the lawn? [INTERVIEWER: ENTER 99 FOR ALL MISSING]

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	0	3	1.0	1.6	1.6
		1	85	29.7	44.5	46.1

		2	86	30.1	45.0	91.1
		3	13	4.5	6.8	97.9
		5	1	.3	.5	98.4
		7	2	.7	1.0	99.5
		30	1	.3	.5	100.0
		Total	191	66.8	100.0	
	Missing	99	14	4.9		
		System	81	28.3		
		Total	95	33.2		
	Total		286	100.0		
Pinellas	Valid	0	2	.8	1.1	1.1
		1	61	23.7	33.9	35.0
		2	95	37.0	52.8	87.8
		3	18	7.0	10.0	97.8
		4	2	.8	1.1	98.9
		7	2	.8	1.1	100.0
		Total	180	70.0	100.0	
	Missing	99	6	2.3		
		System	71	27.6		
		Total	77	30.0		
	Total		257	100.0		
Manatee	Valid	0	3	1.0	1.5	1.5
		1	97	33.2	49.2	50.8
		2	80	27.4	40.6	91.4
		3	14	4.8	7.1	98.5
		7	2	.7	1.0	99.5
		40	1	.3	.5	100.0
		Total	197	67.5	100.0	
	Missing	99	12	4.1		

		System	83	28.4
		Total	95	32.5
Total			292	100.0

q4 - q4 Is your landscape irrigated with well water, city water, surface water, reclaimed water, or some other source? [If R says "well water," ASK: Is it a community well or a private well?]

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Community Well (from neighborhood)	11	3.8	5.4	5.4
		Private Well (on homeowner's property)	36	12.6	17.6	22.9
		City water	124	43.4	60.5	83.4
		Reclaimed water	25	8.7	12.2	95.6
		Surface water source, such as a lake, canal, retention pond, etc.	2	.7	1.0	96.6
		Rainwater collected in cistern or rain barrel	1	.3	.5	97.1
		Don't know	6	2.1	2.9	100.0
		Total	205	71.7	100.0	
	Missing	System	81	28.3		
	Total		286	100.0		
Pinellas	Valid	Community Well (from neighborhood)	7	2.7	3.8	3.8
		Private Well (on homeowner's property)	58	22.6	31.2	34.9
		City water	51	19.8	27.4	62.4
		Reclaimed water	64	24.9	34.4	96.8

		Surface water source, such as a lake, canal, retention pond, etc.	2	.8	1.1	97.8
		Don't know	4	1.6	2.2	100.0
		Total	186	72.4	100.0	
	Missing	System	71	27.6		
	Total		257	100.0		
Manatee	Valid	Community Well (from neighborhood)	12	4.1	5.7	5.7
		Private Well (on homeowner's property)	48	16.4	23.0	28.7
		City water	83	28.4	39.7	68.4
		Reclaimed water	41	14.0	19.6	88.0
		Surface water source, such as a lake, canal, retention pond, etc.	13	4.5	6.2	94.3
		Rainwater collected in cistern or rain barrel	2	.7	1.0	95.2
		Don't know	9	3.1	4.3	99.5
		All other missing	1	.3	.5	100.0
		Total	209	71.6	100.0	
	Missing	System	83	28.4		

q4 - q4 Is your landscape irrigated with well water, city water, surface water, reclaimed water, or some other source? [If R says "well water," ASK: Is it a community well or a private well?]

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Manatee	Total		292	100.0		

q5 - q5 In the last 12 months, have you or anyone else applied the following to the lawn...Insect control products?

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Yes	171	59.8	59.8	59.8
		No	105	36.7	36.7	96.5
		Don't know	10	3.5	3.5	100.0
		Total	286	100.0	100.0	
Pinellas	Valid	Yes	128	49.8	49.8	49.8
		No	123	47.9	47.9	97.7
		Don't know	6	2.3	2.3	100.0
		Total	257	100.0	100.0	
Manatee	Valid	Yes	177	60.6	60.6	60.6
		No	107	36.6	36.6	97.3
		Don't know	8	2.7	2.7	100.0
		Total	292	100.0	100.0	

q5a - q5a Do you apply this yourself or was it done by a professional company?

county - county Which county do you live in?			Frequency	Percent
Hillsborough	Valid	Self	57	19.9
		Company/HOA maintenance company/Someone outside the home	111	38.8
		Both	3	1.0
		Total	171	59.8
	Missing	System	115	40.2
	Total		286	100.0
Pinellas	Valid	Self	39	15.2

		Company/HOA maintenance company/Someone outside the home	88	34.2
		Both	1	.4
		Total	128	49.8
	Missing	System	129	50.2
	Total		257	100.0
Manatee	Valid	Self	52	17.8
		Company/HOA maintenance company/Someone outside the home	118	40.4
		Both	7	2.4
		Total	177	60.6
	Missing	System	115	39.4
	Total		292	100.0

q5a - q5a Do you apply this yourself or was it done by a professional company?

county - county Which county do you live in?			Valid Percent	Cumulative Percent
Hillsborough	Valid	Self	33.3	33.3
		Company/HOA maintenance company/Someone outside the home	64.9	98.2
		Both	1.8	100.0
		Total	100.0	
	Missing	System		
	Total			
Pinellas	Valid	Self	30.5	30.5
		Company/HOA maintenance company/Someone outside the home	68.8	99.2

		Both	.8	100.0
		Total	100.0	
	Missing	System		
	Total			
Manatee	Valid	Self	29.4	29.4
		Company/HOA maintenance company/Someone outside the home	66.7	96.0
		Both	4.0	100.0
		Total	100.0	
	Missing	System		
	Total			

q5b - q5b About how many times in the past 12 months were insect control products applied to your yard? [If needed: Well, approximately… Or: Just your best guess…] [INTERVIEWER: ENTER 999 FOR ALL MISSING]

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	0	1	.3	.7	.7
		1	25	8.7	17.1	17.8
		2	32	11.2	21.9	39.7
		3	22	7.7	15.1	54.8
		4	24	8.4	16.4	71.2
		5	3	1.0	2.1	73.3
		6	11	3.8	7.5	80.8
		7	1	.3	.7	81.5
		8	5	1.7	3.4	84.9
		9	3	1.0	2.1	87.0

		11	1	.3	.7	87.7
		12	17	5.9	11.6	99.3
		52	1	.3	.7	100.0
		Total	146	51.0	100.0	
	Missing	999	25	8.7		
		System	115	40.2		
		Total	140	49.0		
	Total		286	100.0		
Pinellas	Valid	1	20	7.8	17.7	17.7
		2	21	8.2	18.6	36.3
		3	21	8.2	18.6	54.9
		4	15	5.8	13.3	68.1
		5	4	1.6	3.5	71.7
		6	16	6.2	14.2	85.8
		7	1	.4	.9	86.7
		8	3	1.2	2.7	89.4
		9	1	.4	.9	90.3
		10	3	1.2	2.7	92.9
		12	8	3.1	7.1	100.0
		Total	113	44.0	100.0	
	Missing	999	15	5.8		
		System	129	50.2		
		Total	144	56.0		
	Total		257	100.0		
Manatee	Valid	1	11	3.8	7.1	7.1
		2	47	16.1	30.5	37.7
		3	21	7.2	13.6	51.3
		4	26	8.9	16.9	68.2
		5	3	1.0	1.9	70.1

		6	18	6.2	11.7	81.8
		7	2	.7	1.3	83.1
		8	1	.3	.6	83.8
		10	1	.3	.6	84.4
		12	22	7.5	14.3	98.7
		24	1	.3	.6	99.4
		39	1	.3	.6	100.0
		Total	154	52.7	100.0	
	Missing	999	23	7.9		
		System	115	39.4		
		Total	138	47.3		
	Total		292	100.0		

q6 - q6 And how about weed control products? Were any weed control products applied to your lawn in the last twelve months?

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Yes	165	57.7	57.7	57.7
		No	111	38.8	38.8	96.5
		Don't know	10	3.5	3.5	100.0
		Total	286	100.0	100.0	
Pinellas	Valid	Yes	141	54.9	54.9	54.9
		No	110	42.8	42.8	97.7
		Don't know	6	2.3	2.3	100.0
		Total	257	100.0	100.0	
Manatee	Valid	Yes	174	59.6	59.6	59.6
		No	108	37.0	37.0	96.6
		Don't know	10	3.4	3.4	100.0

	Total	292	100.0	100.0

q6a - q6a Do you apply this yourself or was it done by a professional company?

county - county Which county do you live in?			Frequency	Percent
Hillsborough	Valid	Self	57	19.9
		Company/HOA maintenance company/Someone outside the home	106	37.1
		Both	2	.7
		Total	165	57.7
	Missing	System	121	42.3
	Total		286	100.0
Pinellas	Valid	Self	56	21.8
		Company/HOA maintenance company/Someone outside the home	85	33.1
		Total	141	54.9
	Missing	System	116	45.1
	Total		257	100.0
Manatee	Valid	Self	56	19.2
		Company/HOA maintenance company/Someone outside the home	116	39.7
		Both	2	.7
		Total	174	59.6
	Missing	System	118	40.4
	Total		292	100.0

q6a - q6a Do you apply this yourself or was it done by a professional company?

county - county Which county do you live in?			Valid Percent	Cumulative Percent
Hillsborough	Valid	Self	34.5	34.5
		Company/HOA maintenance company/Someone outside the home	64.2	98.8
		Both	1.2	100.0
		Total	100.0	
	Missing	System		
	Total			
Pinellas	Valid	Self	39.7	39.7
		Company/HOA maintenance company/Someone outside the home	60.3	100.0
		Total	100.0	
	Missing	System		
	Total			
Manatee	Valid	Self	32.2	32.2
		Company/HOA maintenance company/Someone outside the home	66.7	98.9
		Both	1.1	100.0
		Total	100.0	
	Missing	System		
	Total			

q6b - q6b About how many times in the past 12 months were weed control products applied to your yard? [If needed: Well, approximately… Or: Just your best guess…] [INTERVIEWER: ENTER 999 FOR ALL MISSING]

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	1	21	7.3	14.9	14.9
		2	33	11.5	23.4	38.3
		3	16	5.6	11.3	49.6
		4	22	7.7	15.6	65.2
		5	5	1.7	3.5	68.8
		6	17	5.9	12.1	80.9
		8	4	1.4	2.8	83.7
		9	3	1.0	2.1	85.8
		11	1	.3	.7	86.5
		12	19	6.6	13.5	100.0
		Total	141	49.3	100.0	
	Missing	999	24	8.4		
		System	121	42.3		
		Total	145	50.7		
	Total		286	100.0		
Pinellas	Valid	1	20	7.8	16.4	16.4
		2	24	9.3	19.7	36.1
		3	20	7.8	16.4	52.5
		4	20	7.8	16.4	68.9
		5	3	1.2	2.5	71.3
		6	18	7.0	14.8	86.1
		8	2	.8	1.6	87.7
		9	1	.4	.8	88.5
		10	3	1.2	2.5	91.0
		12	11	4.3	9.0	100.0
		Total	122	47.5	100.0	
	Missing	999	19	7.4		

		System	116	45.1		
		Total	135	52.5		
	Total		257	100.0		
Manatee	Valid	1	14	4.8	9.4	9.4
		2	40	13.7	26.8	36.2
		3	23	7.9	15.4	51.7
		4	26	8.9	17.4	69.1
		5	2	.7	1.3	70.5
		6	18	6.2	12.1	82.6
		7	3	1.0	2.0	84.6
		8	1	.3	.7	85.2
		9	1	.3	.7	85.9
		12	20	6.8	13.4	99.3
		24	1	.3	.7	100.0
		Total	149	51.0	100.0	
	Missing	999	25	8.6		
		System	118	40.4		
		Total	143	49.0		
	Total		292	100.0		

q7 - q7 And how about fertilizer? Has anyone applied fertilizer your lawn?

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Yes	167	58.4	58.4	58.4
		No	106	37.1	37.1	95.5
		Don't know	13	4.5	4.5	100.0
		Total	286	100.0	100.0	
Pinellas	Valid	Yes	133	51.8	51.8	51.8

		No	109	42.4	42.4	94.2
		Don't know	15	5.8	5.8	100.0
		Total	257	100.0	100.0	
Manatee	Valid	Yes	179	61.3	61.3	61.3
		No	102	34.9	34.9	96.2
		Don't know	11	3.8	3.8	100.0
		Total	292	100.0	100.0	

q7a - q7a Did you apply this yourself or was it done by a professional company?

county - county Which county do you live in?			Frequency	Percent
Hillsborough	Valid	Self	62	21.7
		Company/HOA maintenance company/Someone outside the home	105	36.7
		Total	167	58.4
	Missing	System	119	41.6
	Total		286	100.0
Pinellas	Valid	Self	55	21.4
		Company/HOA maintenance company/Someone outside the home	76	29.6
		Both	2	.8
		Total	133	51.8
	Missing	System	124	48.2
	Total		257	100.0
Manatee	Valid	Self	59	20.2
		Company/HOA maintenance company/Someone outside the home	119	40.8

	Both	1	.3
	Total	179	61.3
Missing	System	113	38.7
Total		292	100.0

q7a - q7a Did you apply this yourself or was it done by a professional company?

county - county Which county do you live in?			Valid Percent	Cumulative Percent
Hillsborough	Valid	Self	37.1	37.1
		Company/HOA maintenance company/Someone outside the home	62.9	100.0
		Total	100.0	
	Missing	System		
	Total			
Pinellas	Valid	Self	41.4	41.4
		Company/HOA maintenance company/Someone outside the home	57.1	98.5
		Both	1.5	100.0
		Total	100.0	
	Missing	System		
	Total			
Manatee	Valid	Self	33.0	33.0
		Company/HOA maintenance company/Someone outside the home	66.5	99.4
		Both	.6	100.0
		Total	100.0	
	Missing	System		
	Total			

q7b - q7b About how many times was fertilizer applied to the lawn in the past 12 months? [If needed: Well, approximately… Or: Just your best guess…] [INTERVIEWER: ENTER 999 FOR ALL MISSING]

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	0	2	.7	1.4	1.4
		1	30	10.5	20.4	21.8
		2	36	12.6	24.5	46.3
		3	15	5.2	10.2	56.5
		4	22	7.7	15.0	71.4
		5	1	.3	.7	72.1
		6	14	4.9	9.5	81.6
		7	1	.3	.7	82.3
		8	3	1.0	2.0	84.4
		9	2	.7	1.4	85.7
		10	1	.3	.7	86.4
		12	20	7.0	13.6	100.0
		Total	147	51.4	100.0	
	Missing	999	20	7.0		
		System	119	41.6		
		Total	139	48.6		
	Total		286	100.0		
Pinellas	Valid	0	1	.4	.9	.9
		1	25	9.7	21.7	22.6
		2	32	12.5	27.8	50.4
		3	14	5.4	12.2	62.6
		4	14	5.4	12.2	74.8

		5	7	2.7	6.1	80.9
		6	10	3.9	8.7	89.6
		7	1	.4	.9	90.4
		8	4	1.6	3.5	93.9
		9	1	.4	.9	94.8
		10	2	.8	1.7	96.5
		12	3	1.2	2.6	99.1
		36	1	.4	.9	100.0
		Total	115	44.7	100.0	
	Missing	999	18	7.0		
		System	124	48.2		
		Total	142	55.3		
	Total		257	100.0		
Manatee	Valid	1	19	6.5	12.5	12.5
		2	47	16.1	30.9	43.4
		3	26	8.9	17.1	60.5
		4	25	8.6	16.4	77.0
		5	2	.7	1.3	78.3
		6	18	6.2	11.8	90.1
		7	2	.7	1.3	91.4
		8	1	.3	.7	92.1
		9	1	.3	.7	92.8
		10	1	.3	.7	93.4
		12	8	2.7	5.3	98.7
		24	1	.3	.7	99.3
		112	1	.3	.7	100.0
		Total	152	52.1	100.0	
	Missing	999	27	9.2		
		System	113	38.7		

	Total	140	47.9
Total		292	100.0

q8 - q8 Is fertilizer applied to your lawn on a regular schedule or only as needed?

county - county Which county do you live in?			Frequency	Percent	Valid Percent
Hillsborough	Valid	Regular schedule	106	37.1	63.9
		Only as needed	55	19.2	33.1
		Don't know	5	1.7	3.0
		Total	166	58.0	100.0
	Missing	All other missing	1	.3	
		System	119	41.6	
		Total	120	42.0	
	Total		286	100.0	
Pinellas	Valid	Regular schedule	76	29.6	57.1
		Only as needed	49	19.1	36.8
		Don't know	8	3.1	6.0
		Total	133	51.8	100.0
	Missing	System	124	48.2	
	Total		257	100.0	
Manatee	Valid	Regular schedule	121	41.4	67.6
		Only as needed	49	16.8	27.4
		Don't know	9	3.1	5.0
		Total	179	61.3	100.0
	Missing	System	113	38.7	
	Total		292	100.0	

q8 - q8 Is fertilizer applied to your lawn on a regular schedule or only as needed?

county - county Which county do you live in?			Cumulative Percent
Hillsborough	Valid	Regular schedule	63.9
		Only as needed	97.0
		Don’t know	100.0
		Total	
	Missing	All other missing	
		System	
		Total	
	Total		
Pinellas	Valid	Regular schedule	57.1
		Only as needed	94.0
		Don’t know	100.0
		Total	
	Missing	System	
	Total		
Manatee	Valid	Regular schedule	67.6
		Only as needed	95.0
		Don’t know	100.0
		Total	
	Missing	System	
	Total		

q9 - q9 During what months was the lawn fertilized last year (in 2011)? [INTERVIEWER: Check all that apply, if “0” PROBE: Have you ever applied fertilizer to the lawn?] If R fertilized all months the same, check each individual month. JAN

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	134	46.9	80.2	80.2

		Checked	33	11.5	19.8	100.0
		Total	167	58.4	100.0	
	Missing	System	119	41.6		
	Total		286	100.0		
Pinellas	Valid	Unchecked	119	46.3	89.5	89.5
		Checked	14	5.4	10.5	100.0
		Total	133	51.8	100.0	
	Missing	System	124	48.2		
	Total		257	100.0		
Manatee	Valid	Unchecked	154	52.7	86.0	86.0
		Checked	25	8.6	14.0	100.0
		Total	179	61.3	100.0	
	Missing	System	113	38.7		
	Total		292	100.0		

q9 - q9 During what months was the lawn fertilized last year (in 2011)? [INTERVIEWER: Check all that apply, if “0” PROBE: Have you ever applied fertilizer to the lawn?] If R fertilized all months the same, check each individual month. FEB

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	131	45.8	78.4	78.4
		Checked	36	12.6	21.6	100.0
		Total	167	58.4	100.0	
	Missing	System	119	41.6		
	Total		286	100.0		
Pinellas	Valid	Unchecked	116	45.1	87.2	87.2
		Checked	17	6.6	12.8	100.0
		Total	133	51.8	100.0	

	Missing	System	124	48.2		
	Total		257	100.0		
Manatee	Valid	Unchecked	154	52.7	86.0	86.0
		Checked	25	8.6	14.0	100.0
		Total	179	61.3	100.0	
	Missing	System	113	38.7		
	Total		292	100.0		

q9 - q9 During what months was the lawn fertilized last year (in 2011)? [INTERVIEWER: Check all that apply, if "0" PROBE: Have you ever applied fertilizer to the lawn?] If R fertilized all months the same, check each individual month. MAR

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	112	39.2	67.1	67.1
		Checked	55	19.2	32.9	100.0
		Total	167	58.4	100.0	
	Missing	System	119	41.6		
	Total		286	100.0		
Pinellas	Valid	Unchecked	94	36.6	70.7	70.7
		Checked	39	15.2	29.3	100.0
		Total	133	51.8	100.0	
	Missing	System	124	48.2		
	Total		257	100.0		
Manatee	Valid	Unchecked	133	45.5	74.3	74.3
		Checked	46	15.8	25.7	100.0
		Total	179	61.3	100.0	
	Missing	System	113	38.7		
	Total		292	100.0		

q9 - q9 During what months was the lawn fertilized last year (in 2011)? [INTERVIEWER: Check all that apply, if “0” PROBE: Have you ever applied fertilizer to the lawn?] If R fertilized all months the same, check each individual month. APR

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	122	42.7	73.1	73.1
		Checked	45	15.7	26.9	100.0
		Total	167	58.4	100.0	
	Missing	System	119	41.6		
	Total		286	100.0		
Pinellas	Valid	Unchecked	107	41.6	80.5	80.5
		Checked	26	10.1	19.5	100.0
		Total	133	51.8	100.0	
	Missing	System	124	48.2		
	Total		257	100.0		
Manatee	Valid	Unchecked	141	48.3	78.8	78.8
		Checked	38	13.0	21.2	100.0
		Total	179	61.3	100.0	
	Missing	System	113	38.7		
	Total		292	100.0		

q9 - q9 During what months was the lawn fertilized last year (in 2011)? [INTERVIEWER: Check all that apply, if “0” PROBE: Have you ever applied fertilizer to the lawn?] If R fertilized all months the same, check each individual month. MAY

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	133	46.5	79.6	79.6

		Checked	34	11.9	20.4	100.0
		Total	167	58.4	100.0	
	Missing	System	119	41.6		
	Total		286	100.0		
Pinellas	Valid	Unchecked	110	42.8	82.7	82.7
		Checked	23	8.9	17.3	100.0
		Total	133	51.8	100.0	
	Missing	System	124	48.2		
	Total		257	100.0		
Manatee	Valid	Unchecked	153	52.4	85.5	85.5
		Checked	26	8.9	14.5	100.0
		Total	179	61.3	100.0	
	Missing	System	113	38.7		
	Total		292	100.0		

q9 - q9 During what months was the lawn fertilized last year (in 2011)? [INTERVIEWER: Check all that apply, if "0" PROBE: Have you ever applied fertilizer to the lawn?] If R fertilized all months the same, check each individual month. JUN

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	136	47.6	81.4	81.4
		Checked	31	10.8	18.6	100.0
		Total	167	58.4	100.0	
	Missing	System	119	41.6		
	Total		286	100.0		
Pinellas	Valid	Unchecked	113	44.0	85.0	85.0
		Checked	20	7.8	15.0	100.0
		Total	133	51.8	100.0	

	Missing	System	124	48.2		
	Total		257	100.0		
Manatee	Valid	Unchecked	153	52.4	85.5	85.5
		Checked	26	8.9	14.5	100.0
		Total	179	61.3	100.0	
	Missing	System	113	38.7		
	Total		292	100.0		

q9 - q9 During what months was the lawn fertilized last year (in 2011)? [INTERVIEWER: Check all that apply, if "0" PROBE: Have you ever applied fertilizer to the lawn?] If R fertilized all months the same, check each individual month. JUL

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	140	49.0	83.8	83.8
		Checked	27	9.4	16.2	100.0
		Total	167	58.4	100.0	
	Missing	System	119	41.6		
	Total		286	100.0		
Pinellas	Valid	Unchecked	116	45.1	87.2	87.2
		Checked	17	6.6	12.8	100.0
		Total	133	51.8	100.0	
	Missing	System	124	48.2		
	Total		257	100.0		
Manatee	Valid	Unchecked	152	52.1	84.9	84.9
		Checked	27	9.2	15.1	100.0
		Total	179	61.3	100.0	
	Missing	System	113	38.7		
	Total		292	100.0		

q9 - q9 During what months was the lawn fertilized last year (in 2011)? [INTERVIEWER: Check all that apply, if “0” PROBE: Have you ever applied fertilizer to the lawn?] If R fertilized all months the same, check each individual month. AUG

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	140	49.0	83.8	83.8
		Checked	27	9.4	16.2	100.0
		Total	167	58.4	100.0	
	Missing	System	119	41.6		
	Total		286	100.0		
Pinellas	Valid	Unchecked	118	45.9	88.7	88.7
		Checked	15	5.8	11.3	100.0
		Total	133	51.8	100.0	
	Missing	System	124	48.2		
	Total		257	100.0		
Manatee	Valid	Unchecked	159	54.5	88.8	88.8
		Checked	20	6.8	11.2	100.0
		Total	179	61.3	100.0	
	Missing	System	113	38.7		
	Total		292	100.0		

q9 - q9 During what months was the lawn fertilized last year (in 2011)? [INTERVIEWER: Check all that apply, if “0” PROBE: Have you ever applied fertilizer to the lawn?] If R fertilized all months the same, check each individual month. SEP

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	131	45.8	78.4	78.4

		Checked	36	12.6	21.6	100.0
		Total	167	58.4	100.0	
	Missing	System	119	41.6		
	Total		286	100.0		
Pinellas	Valid	Unchecked	105	40.9	78.9	78.9
		Checked	28	10.9	21.1	100.0
		Total	133	51.8	100.0	
	Missing	System	124	48.2		
	Total		257	100.0		
Manatee	Valid	Unchecked	148	50.7	82.7	82.7
		Checked	31	10.6	17.3	100.0
		Total	179	61.3	100.0	
	Missing	System	113	38.7		
	Total		292	100.0		

q9 - q9 During what months was the lawn fertilized last year (in 2011)? [INTERVIEWER: Check all that apply, if "0" PROBE: Have you ever applied fertilizer to the lawn?] If R fertilized all months the same, check each individual month. OCT

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	123	43.0	73.7	73.7
		Checked	44	15.4	26.3	100.0
		Total	167	58.4	100.0	
	Missing	System	119	41.6		
	Total		286	100.0		
Pinellas	Valid	Unchecked	104	40.5	78.2	78.2
		Checked	29	11.3	21.8	100.0
		Total	133	51.8	100.0	

	Missing	System	124	48.2		
	Total		257	100.0		
Manatee	Valid	Unchecked	145	49.7	81.0	81.0
		Checked	34	11.6	19.0	100.0
		Total	179	61.3	100.0	
	Missing	System	113	38.7		
	Total		292	100.0		

q9 - q9 During what months was the lawn fertilized last year (in 2011)? [INTERVIEWER: Check all that apply, if "0" PROBE: Have you ever applied fertilizer to the lawn?] If R fertilized all months the same, check each individual month. NOV

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	136	47.6	81.4	81.4
		Checked	31	10.8	18.6	100.0
		Total	167	58.4	100.0	
	Missing	System	119	41.6		
	Total		286	100.0		
Pinellas	Valid	Unchecked	119	46.3	89.5	89.5
		Checked	14	5.4	10.5	100.0
		Total	133	51.8	100.0	
	Missing	System	124	48.2		
	Total		257	100.0		
Manatee	Valid	Unchecked	152	52.1	84.9	84.9
		Checked	27	9.2	15.1	100.0
		Total	179	61.3	100.0	
	Missing	System	113	38.7		
	Total		292	100.0		

q9 - q9 During what months was the lawn fertilized last year (in 2011)? [INTERVIEWER: Check all that apply, if "0" PROBE: Have you ever applied fertilizer to the lawn?] If R fertilized all months the same, check each individual month. DEC

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	138	48.3	82.6	82.6
		Checked	29	10.1	17.4	100.0
		Total	167	58.4	100.0	
	Missing	System	119	41.6		
	Total		286	100.0		
Pinellas	Valid	Unchecked	116	45.1	87.2	87.2
		Checked	17	6.6	12.8	100.0
		Total	133	51.8	100.0	
	Missing	System	124	48.2		
	Total		257	100.0		
Manatee	Valid	Unchecked	155	53.1	86.6	86.6
		Checked	24	8.2	13.4	100.0
		Total	179	61.3	100.0	
	Missing	System	113	38.7		
	Total		292	100.0		

q9 - q9 During what months was the lawn fertilized last year (in 2011)? If R fertilized all months the same, check each individual month. I never fertilize the lawn

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	167	58.4	100.0	100.0

	Missing	System	119	41.6		
	Total		286	100.0		
Pinellas	Valid	Unchecked	132	51.4	99.2	99.2
		Checked	1	.4	.8	100.0
		Total	133	51.8	100.0	
	Missing	System	124	48.2		
	Total		257	100.0		
Manatee	Valid	Unchecked	179	61.3	100.0	100.0
	Missing	System	113	38.7		
	Total		292	100.0		

q9 - q9 During what months was the lawn fertilized last year (in 2011)? If R fertilized all months the same, check each individual month. I didn't fertilize the lawn last year (but have before)

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	165	57.7	98.8	98.8
		Checked	2	.7	1.2	100.0
		Total	167	58.4	100.0	
	Missing	System	119	41.6		
	Total		286	100.0		
Pinellas	Valid	Unchecked	131	51.0	98.5	98.5
		Checked	2	.8	1.5	100.0
		Total	133	51.8	100.0	
	Missing	System	124	48.2		
	Total		257	100.0		
Manatee	Valid	Unchecked	179	61.3	100.0	100.0
	Missing	System	113	38.7		
	Total		292	100.0		

q9 - q9 During what months was the lawn fertilized last year (in 2011)? Don't know

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	107	37.4	64.1	64.1
		Checked	60	21.0	35.9	100.0
		Total	167	58.4	100.0	
	Missing	System	119	41.6		
	Total		286	100.0		
Pinellas	Valid	Unchecked	78	30.4	58.6	58.6
		Checked	55	21.4	41.4	100.0
		Total	133	51.8	100.0	
	Missing	System	124	48.2		
	Total		257	100.0		
Manatee	Valid	Unchecked	95	32.5	53.1	53.1
		Checked	84	28.8	46.9	100.0
		Total	179	61.3	100.0	
	Missing	System	113	38.7		
	Total		292	100.0		

q9 - q9 During what months was the lawn fertilized last year (in 2011)? All other missing

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	167	58.4	100.0	100.0
	Missing	System	119	41.6		
	Total		286	100.0		

Pinellas	Valid	Unchecked	132	51.4	99.2	99.2
		Checked	1	.4	.8	100.0
		Total	133	51.8	100.0	
	Missing	System	124	48.2		
	Total		257	100.0		
Manatee	Valid	Unchecked	179	61.3	100.0	100.0
	Missing	System	113	38.7		
	Total		292	100.0		

q10 - q10 Are there times or situations when you should NOT fertilize your lawn? [INTERVIEWER: DO NOT READ , PROBE FOR 2] Right before a hard rain

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	142	49.7	86.1	86.1
		Checked	23	8.0	13.9	100.0
		Total	165	57.7	100.0	
	Missing	System	121	42.3		
	Total		286	100.0		
Pinellas	Valid	Unchecked	91	35.4	70.0	70.0
		Checked	39	15.2	30.0	100.0
		Total	130	50.6	100.0	
	Missing	System	127	49.4		
	Total		257	100.0		
Manatee	Valid	Unchecked	152	52.1	84.9	84.9
		Checked	27	9.2	15.1	100.0
		Total	179	61.3	100.0	
	Missing	System	113	38.7		
	Total		292	100.0		

q10 - q10 Are there times or situations when you should NOT fertilize your lawn? [INTERVIEWER: DO NOT READ , PROBE FOR 2] After a hard rain

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	146	51.0	88.5	88.5
		Checked	19	6.6	11.5	100.0
		Total	165	57.7	100.0	
	Missing	System	121	42.3		
	Total		286	100.0		
Pinellas	Valid	Unchecked	115	44.7	88.5	88.5
		Checked	15	5.8	11.5	100.0
		Total	130	50.6	100.0	
	Missing	System	127	49.4		
	Total		257	100.0		
Manatee	Valid	Unchecked	164	56.2	91.6	91.6
		Checked	15	5.1	8.4	100.0
		Total	179	61.3	100.0	
	Missing	System	113	38.7		
	Total		292	100.0		

q10 - q10 Are there times or situations when you should NOT fertilize your lawn? [INTERVIEWER: DO NOT READ , PROBE FOR 2] During a drought

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	139	48.6	84.2	84.2
		Checked	26	9.1	15.8	100.0

		Total	165	57.7	100.0	
	Missing	System	121	42.3		
	Total		286	100.0		
Pinellas	Valid	Unchecked	111	43.2	85.4	85.4
		Checked	19	7.4	14.6	100.0
		Total	130	50.6	100.0	
	Missing	System	127	49.4		
	Total		257	100.0		
Manatee	Valid	Unchecked	147	50.3	82.1	82.1
		Checked	32	11.0	17.9	100.0
		Total	179	61.3	100.0	
	Missing	System	113	38.7		
	Total		292	100.0		

q10 - q10 Are there times or situations when you should NOT fertilize your lawn? [INTERVIEWER: DO NOT READ , PROBE FOR 2] Morning

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	165	57.7	100.0	100.0
	Missing	System	121	42.3		
	Total		286	100.0		
Pinellas	Valid	Unchecked	129	50.2	99.2	99.2
		Checked	1	.4	.8	100.0
		Total	130	50.6	100.0	
	Missing	System	127	49.4		
	Total		257	100.0		
Manatee	Valid	Unchecked	179	61.3	100.0	100.0
	Missing	System	113	38.7		

	Total		292	100.0		

q10 - q10 Are there times or situations when you should NOT fertilize your lawn? [INTERVIEWER: DO NOT READ , PROBE FOR 2] Evening

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	165	57.7	100.0	100.0
	Missing	System	121	42.3		
	Total		286	100.0		
Pinellas	Valid	Unchecked	129	50.2	99.2	99.2
		Checked	1	.4	.8	100.0
		Total	130	50.6	100.0	
	Missing	System	127	49.4		
	Total		257	100.0		
Manatee	Valid	Unchecked	179	61.3	100.0	100.0
	Missing	System	113	38.7		
	Total		292	100.0		

q10 - q10 Are there times or situations when you should NOT fertilize your lawn? [INTERVIEWER: DO NOT READ , PROBE FOR 2] Winter

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	154	53.8	93.3	93.3
		Checked	11	3.8	6.7	100.0
		Total	165	57.7	100.0	
	Missing	System	121	42.3		
	Total		286	100.0		

Pinellas	Valid	Unchecked	117	45.5	90.0	90.0
		Checked	13	5.1	10.0	100.0
		Total	130	50.6	100.0	
	Missing	System	127	49.4		
	Total		257	100.0		
Manatee	Valid	Unchecked	166	56.8	92.7	92.7
		Checked	13	4.5	7.3	100.0
		Total	179	61.3	100.0	
	Missing	System	113	38.7		
	Total		292	100.0		

q10 - q10 Are there times or situations when you should NOT fertilize your lawn? [INTERVIEWER: DO NOT READ , PROBE FOR 2] Summer

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	144	50.3	87.3	87.3
		Checked	21	7.3	12.7	100.0
		Total	165	57.7	100.0	
	Missing	System	121	42.3		
	Total		286	100.0		
Pinellas	Valid	Unchecked	96	37.4	73.8	73.8
		Checked	34	13.2	26.2	100.0
		Total	130	50.6	100.0	
	Missing	System	127	49.4		
	Total		257	100.0		
Manatee	Valid	Unchecked	151	51.7	84.4	84.4
		Checked	28	9.6	15.6	100.0
		Total	179	61.3	100.0	

	Missing	System	113	38.7		
	Total		292	100.0		

q10 - q10 Are there times or situations when you should NOT fertilize your lawn? [INTERVIEWER: DO NOT READ , PROBE FOR 2] Spring

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	165	57.7	100.0	100.0
	Missing	System	121	42.3		
	Total		286	100.0		
Pinellas	Valid	Unchecked	130	50.6	100.0	100.0
	Missing	System	127	49.4		
	Total		257	100.0		
Manatee	Valid	Unchecked	179	61.3	100.0	100.0
	Missing	System	113	38.7		
	Total		292	100.0		

q10 - q10 Are there times or situations when you should NOT fertilize your lawn? [INTERVIEWER: DO NOT READ , PROBE FOR 2] Fall

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	164	57.3	99.4	99.4
		Checked	1	.3	.6	100.0
		Total	165	57.7	100.0	
	Missing	System	121	42.3		
	Total		286	100.0		
Pinellas	Valid	Unchecked	129	50.2	99.2	99.2

		Checked	1	.4	.8	100.0
		Total	130	50.6	100.0	
	Missing	System	127	49.4		
	Total		257	100.0		
Manatee	Valid	Unchecked	178	61.0	99.4	99.4
		Checked	1	.3	.6	100.0
		Total	179	61.3	100.0	
	Missing	System	113	38.7		
	Total		292	100.0		

q10 - q10 Are there times or situations when you should NOT fertilize your lawn? [INTERVIEWER: DO NOT READ , PROBE FOR 2] Not sure

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	79	27.6	47.9	47.9
		Checked	86	30.1	52.1	100.0
		Total	165	57.7	100.0	
	Missing	System	121	42.3		
	Total		286	100.0		
Pinellas	Valid	Unchecked	85	33.1	65.4	65.4
		Checked	45	17.5	34.6	100.0
		Total	130	50.6	100.0	
	Missing	System	127	49.4		
	Total		257	100.0		
Manatee	Valid	Unchecked	90	30.8	50.3	50.3
		Checked	89	30.5	49.7	100.0
		Total	179	61.3	100.0	
	Missing	System	113	38.7		

Total		292	100.0	

q10 - q10 Are there times or situations when you should NOT fertilize your lawn? [INTERVIEWER: DO NOT READ , PROBE FOR 2] Other

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	150	52.4	90.9	90.9
		Checked	15	5.2	9.1	100.0
		Total	165	57.7	100.0	
	Missing	System	121	42.3		
	Total		286	100.0		
Pinellas	Valid	Unchecked	119	46.3	91.5	91.5
		Checked	11	4.3	8.5	100.0
		Total	130	50.6	100.0	
	Missing	System	127	49.4		
	Total		257	100.0		
Manatee	Valid	Unchecked	170	58.2	95.0	95.0
		Checked	9	3.1	5.0	100.0
		Total	179	61.3	100.0	
	Missing	System	113	38.7		
	Total		292	100.0		

q11 - q11 Did you change anything about the way you fertilized your lawn last year compared to previous years, like the frequency that fertilizer was applied, the type of fertilizer, when fertilizer was applied, how often your professional company visited

county - county Which county do you live in?	Frequency	Percent

Hillsborough	Valid	NO, no changes to fertilizer routine	129	45.1
		YES	21	7.3
		First time I ever fertilized the lawn	7	2.4
		Don't know	8	2.8
		Total	165	57.7
	Missing	System	121	42.3
	Total		286	100.0
Pinellas	Valid	NO, no changes to fertilizer routine	100	38.9
		YES	20	7.8
		First time I ever fertilized the lawn	2	.8
		Don't know	8	3.1
		Total	130	50.6
	Missing	System	127	49.4
	Total		257	100.0
Manatee	Valid	NO, no changes to fertilizer routine	147	50.3
		YES	13	4.5
		First time I ever fertilized the lawn	1	.3
		Don't know	18	6.2
		Total	179	61.3
	Missing	System	113	38.7
	Total		292	100.0

q11 - q11 Did you change anything about the way you fertilized your lawn last year compared to previous years, like the frequency that fertilizer was applied, the type of fertilizer, when fertilizer was applied, how often your professional company visited

county - county Which county do you live in?			Valid Percent	Cumulative Percent
Hillsborough	Valid	NO, no changes to fertilizer routine	78.2	78.2
		YES	12.7	90.9
		First time I ever fertilized the lawn	4.2	95.2
		Don’t know	4.8	100.0
		Total	100.0	
	Missing	System		
	Total			
Pinellas	Valid	NO, no changes to fertilizer routine	76.9	76.9
		YES	15.4	92.3
		First time I ever fertilized the lawn	1.5	93.8
		Don’t know	6.2	100.0
		Total	100.0	
	Missing	System		
	Total			
Manatee	Valid	NO, no changes to fertilizer routine	82.1	82.1
		YES	7.3	89.4
		First time I ever fertilized the lawn	.6	89.9
		Don’t know	10.1	100.0
		Total	100.0	
	Missing	System		
	Total			

q12 - q12 Did you increase or decrease the number of times your maintenance company came?

county - county Which county do you live in?			Frequency	Percent
Hillsborough	Valid	No change, company visited same as last year	4	1.4
		Increased number of visits	1	.3
		Decreased number of visits	2	.7
		Don't know	1	.3
		Total	8	2.8
	Missing	All other missing	1	.3
		System	277	96.9
		Total	278	97.2
	Total		286	100.0
Pinellas	Valid	No change, company visited same as last year	3	1.2
		Increased number of visits	2	.8
		Decreased number of visits	6	2.3
		Total	11	4.3
	Missing	All other missing	2	.8
		System	244	94.9
		Total	246	95.7
	Total		257	100.0
Manatee	Valid	No change, company visited same as last year	2	.7
		Increased number of visits	3	1.0
		Decreased number of visits	2	.7
		Don't know	1	.3
		Total	8	2.7
	Missing	All other missing	1	.3
		System	283	96.9
		Total	284	97.3

	Total		292	100.0

q12 - q12 Did you increase or decrease the number of times your maintenance company came?

county - county Which county do you live in?			Valid Percent	Cumulative Percent
Hillsborough	Valid	No change, company visited same as last year	50.0	50.0
		Increased number of visits	12.5	62.5
		Decreased number of visits	25.0	87.5
		Don’t know	12.5	100.0
		Total	100.0	
	Missing	All other missing		
		System		
		Total		
	Total			
Pinellas	Valid	No change, company visited same as last year	27.3	27.3
		Increased number of visits	18.2	45.5
		Decreased number of visits	54.5	100.0
		Total	100.0	
	Missing	All other missing		
		System		
		Total		
	Total			
Manatee	Valid	No change, company visited same as last year	25.0	25.0
		Increased number of visits	37.5	62.5
		Decreased number of visits	25.0	87.5
		Don’t know	12.5	100.0
		Total	100.0	

Missing	All other missing	
	System	
	Total	
Total		

q13 - q13 Last year, did you change the number of times you fertilized the lawn compared to previous years? If so, did you fertilizer less than you had before or more than you had before?

county - county Which county do you live in?			Frequency	Percent
Hillsborough	Valid	No change - About the same as the year before	5	1.7
		More times than the year before/ more frequently	3	1.0
		Less times than the year before/ less frequently	3	1.0
		Don't know	1	.3
		Total	12	4.2
	Missing	System	274	95.8
	Total		286	100.0
Pinellas	Valid	No change - About the same as the year before	6	2.3
		More times than the year before/ more frequently	1	.4
		Total	7	2.7
	Missing	System	250	97.3
	Total		257	100.0
Manatee	Valid	No change - About the same as the year before	2	.7
		More times than the year before/ more frequently	1	.3

	Less times than the year before/ less frequently	1	.3
	Total	4	1.4
Missing	System	288	98.6
Total		292	100.0

q13 - q13 Last year, did you change the number of times you fertilized the lawn compared to previous years? If so, did you fertilizer less than you had before or more than you had before?

county - county Which county do you live in?			Valid Percent	Cumulative Percent
Hillsborough	Valid	No change - About the same as the year before	41.7	41.7
		More times than the year before/ more frequently	25.0	66.7
		Less times than the year before/ less frequently	25.0	91.7
		Don’t know	8.3	100.0
		Total	100.0	
	Missing	System		
	Total			
Pinellas	Valid	No change - About the same as the year before	85.7	85.7
		More times than the year before/ more frequently	14.3	100.0
		Total	100.0	
	Missing	System		
	Total			
Manatee	Valid	No change - About the same as the year before	50.0	50.0
		More times than the year before/ more frequently	25.0	75.0

		Less times than the year before/ less frequently	25.0	100.0
		Total	100.0	
	Missing	System		
	Total			

q14 - q14 Did you change what season(s) you applied fertilizer?

county - county Which county do you live in?			Frequency	Percent
Hillsborough	Valid	No change - About the same as the year before	10	3.5
		Yes, specifically did NOT apply in the summer/rainy season	1	.3
		Yes, applied during the rainy season	1	.3
		Total	12	4.2
	Missing	System	274	95.8
	Total		286	100.0
Pinellas	Valid	No change - About the same as the year before	6	2.3
		All other missing	1	.4
		Total	7	2.7
	Missing	System	250	97.3
	Total		257	100.0
Manatee	Valid	No change - About the same as the year before	1	.3
		Yes, specifically did NOT apply in the summer/rainy season	1	.3
		Yes, applied during the rainy season	1	.3
		Don’t know	1	.3

	Total	4	1.4
Missing	System	288	98.6
Total		292	100.0

q14 - q14 Did you change what season(s) you applied fertilizer?

county - county Which county do you live in?			Valid Percent	Cumulative Percent
Hillsborough	Valid	No change - About the same as the year before	83.3	83.3
		Yes, specifically did NOT apply in the summer/rainy season	8.3	91.7
		Yes, applied during the rainy season	8.3	100.0
		Total	100.0	
	Missing	System		
	Total			
Pinellas	Valid	No change - About the same as the year before	85.7	85.7
		All other missing	14.3	100.0
		Total	100.0	
	Missing	System		
	Total			
Manatee	Valid	No change - About the same as the year before	25.0	25.0
		Yes, specifically did NOT apply in the summer/rainy season	25.0	50.0
		Yes, applied during the rainy season	25.0	75.0
		Don’t know	25.0	100.0
		Total	100.0	
	Missing	System		

Total

q14 - q14 Did you change what season(s) you applied fertilizer? Yes, other seasonal change

county - county Which county do you live in?		Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	286	100.0	100.0	100.0
Pinellas	Valid	257	100.0	100.0	100.0
Manatee	Valid	292	100.0	100.0	100.0

q15 - q15 Did you change the amount of fertilizer you applied at one time? If yes : Did you increase or decrease the amount?

county - county Which county do you live in?			Frequency	Percent
Hillsborough	Valid	No change - About the same as the year before	7	2.4
		Applied more than the year before/ increased amount	2	.7
		Applied less than the year before/ decreased amount	2	.7
		Don't know	1	.3
		Total	12	4.2
	Missing	System	274	95.8
	Total		286	100.0
Pinellas	Valid	No change - About the same as the year before	6	2.3
		All other missing	1	.4
		Total	7	2.7
	Missing	System	250	97.3
	Total		257	100.0

Manatee	Valid	No change - About the same as the year before	3	1.0
		Applied less than the year before/ decreased amount	1	.3
		Total	4	1.4
	Missing	System	288	98.6
	Total		292	100.0

q15 - q15 Did you change the amount of fertilizer you applied at one time? If yes : Did you increase or decrease the amount?

county - county Which county do you live in?			Valid Percent	Cumulative Percent
Hillsborough	Valid	No change - About the same as the year before	58.3	58.3
		Applied more than the year before/ increased amount	16.7	75.0
		Applied less than the year before/ decreased amount	16.7	91.7
		Don't know	8.3	100.0
		Total	100.0	
	Missing	System		
	Total			
Pinellas	Valid	No change - About the same as the year before	85.7	85.7
		All other missing	14.3	100.0
		Total	100.0	
	Missing	System		
	Total			
Manatee	Valid	No change - About the same as the year before	75.0	75.0

	Applied less than the year before/ decreased amount		25.0	100.0
	Total		100.0	
Missing	System			
Total				

q16 - q16 Did you change the type of fertilizer you applied? [INTERVIEWER: don't read options, check all offered by respondent] No, used what had used in the past.

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	7	2.4	58.3	58.3
		Checked	5	1.7	41.7	100.0
		Total	12	4.2	100.0	
	Missing	System	274	95.8		
	Total		286	100.0		
Pinellas	Valid	Unchecked	5	1.9	71.4	71.4
		Checked	2	.8	28.6	100.0
		Total	7	2.7	100.0	
	Missing	System	250	97.3		
	Total		257	100.0		
Manatee	Valid	Unchecked	3	1.0	75.0	75.0
		Checked	1	.3	25.0	100.0
		Total	4	1.4	100.0	
	Missing	System	288	98.6		
	Total		292	100.0		

q16 - q16 Did you change the type of fertilizer you applied? [INTERVIEWER: don't read options, check all offered by respondent] Yes, changed to one without P (phosphorous)

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	11	3.8	91.7	91.7
		Checked	1	.3	8.3	100.0
		Total	12	4.2	100.0	
	Missing	System	274	95.8		
	Total		286	100.0		
Pinellas	Valid	Unchecked	5	1.9	71.4	71.4
		Checked	2	.8	28.6	100.0
		Total	7	2.7	100.0	
	Missing	System	250	97.3		
	Total		257	100.0		
Manatee	Valid	Unchecked	3	1.0	75.0	75.0
		Checked	1	.3	25.0	100.0
		Total	4	1.4	100.0	
	Missing	System	288	98.6		
	Total		292	100.0		

q16 - q16 Did you change the type of fertilizer you applied? [INTERVIEWER: don't read options, check all offered by respondent] Yes, changed to one without N (nitrogen)

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	11	3.8	91.7	91.7
		Checked	1	.3	8.3	100.0
		Total	12	4.2	100.0	
	Missing	System	274	95.8		

	Total		286	100.0		
Pinellas	Valid	Unchecked	7	2.7	100.0	100.0
	Missing	System	250	97.3		
	Total		257	100.0		
Manatee	Valid	Unchecked	3	1.0	75.0	75.0
		Checked	1	.3	25.0	100.0
		Total	4	1.4	100.0	
	Missing	System	288	98.6		
	Total		292	100.0		

q16 - q16 Did you change the type of fertilizer you applied? [INTERVIEWER: don’t read options, check all offered by respondent] Yes, changed to slow-release

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	12	4.2	100.0	100.0
	Missing	System	274	95.8		
	Total		286	100.0		
Pinellas	Valid	Unchecked	7	2.7	100.0	100.0
	Missing	System	250	97.3		
	Total		257	100.0		
Manatee	Valid	Unchecked	3	1.0	75.0	75.0
		Checked	1	.3	25.0	100.0
		Total	4	1.4	100.0	
	Missing	System	288	98.6		
	Total		292	100.0		

q16 - q16 Did you change the type of fertilizer you applied? [INTERVIEWER: don't read options, check all offered by respondent] Yes, changed to organic

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	10	3.5	83.3	83.3
		Checked	2	.7	16.7	100.0
		Total	12	4.2	100.0	
	Missing	System	274	95.8		
	Total		286	100.0		
Pinellas	Valid	Unchecked	7	2.7	100.0	100.0
	Missing	System	250	97.3		
	Total		257	100.0		
Manatee	Valid	Unchecked	4	1.4	100.0	100.0
	Missing	System	288	98.6		
	Total		292	100.0		

q16 - q16 Did you change the type of fertilizer you applied? [INTERVIEWER: don't read options, check all offered by respondent] Yes, changed to cheaper brand

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	12	4.2	100.0	100.0
	Missing	System	274	95.8		
	Total		286	100.0		
Pinellas	Valid	Unchecked	7	2.7	100.0	100.0
	Missing	System	250	97.3		
	Total		257	100.0		
Manatee	Valid	Unchecked	4	1.4	100.0	100.0
	Missing	System	288	98.6		

	Total		292	100.0		

q16 - q16 Did you change the type of fertilizer you applied? [INTERVIEWER: don't read options, check all offered by respondent] Yes - Describe the change:

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	9	3.1	75.0	75.0
		Checked	3	1.0	25.0	100.0
		Total	12	4.2	100.0	
	Missing	System	274	95.8		
	Total		286	100.0		
Pinellas	Valid	Unchecked	5	1.9	71.4	71.4
		Checked	2	.8	28.6	100.0
		Total	7	2.7	100.0	
	Missing	System	250	97.3		
	Total		257	100.0		
Manatee	Valid	Unchecked	3	1.0	75.0	75.0
		Checked	1	.3	25.0	100.0
		Total	4	1.4	100.0	
	Missing	System	288	98.6		
	Total		292	100.0		

q16 - q16 Did you change the type of fertilizer you applied? [INTERVIEWER: don't read options, check all offered by respondent] Don't know

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	11	3.8	91.7	91.7

		Checked	1	.3	8.3	100.0
		Total	12	4.2	100.0	
	Missing	System	274	95.8		
	Total		286	100.0		
Pinellas	Valid	Unchecked	7	2.7	100.0	100.0
	Missing	System	250	97.3		
	Total		257	100.0		
Manatee	Valid	Unchecked	4	1.4	100.0	100.0
	Missing	System	288	98.6		
	Total		292	100.0		

q16 - q16 Did you change the type of fertilizer you applied? [INTERVIEWER: don't read options, check all offered by respondent] All other missing

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	12	4.2	100.0	100.0
	Missing	System	274	95.8		
	Total		286	100.0		
Pinellas	Valid	Unchecked	6	2.3	85.7	85.7
		Checked	1	.4	14.3	100.0
		Total	7	2.7	100.0	
	Missing	System	250	97.3		
	Total		257	100.0		
Manatee	Valid	Unchecked	4	1.4	100.0	100.0
	Missing	System	288	98.6		
	Total		292	100.0		

q16 - q16 Did you change the type of fertilizer you applied? [INTERVIEWER: don't read options, check all offered by respondent] Yes - Describe the change:

county - county Which county do you live in?			Frequency	Percent	Valid Percent
Hillsborough	Valid		283	99.0	99.0
		liquid	1	.3	.3
		Name brand	1	.3	.3
		no weed control	1	.3	.3
		Total	286	100.0	100.0
Pinellas	Valid		255	99.2	99.2
		High analysis to low analysis	1	.4	.4
		Scotts Weed and Feed	1	.4	.4
		Total	257	100.0	100.0
Manatee	Valid		291	99.7	99.7
		liquid	1	.3	.3
		Total	292	100.0	100.0

q16 - q16 Did you change the type of fertilizer you applied? [INTERVIEWER: don't read options, check all offered by respondent] Yes - Describe the change:

county - county Which county do you live in?			Cumulative Percent
Hillsborough	Valid		99.0
		liquid	99.3
		Name brand	99.7
		no weed control	100.0
		Total	
Pinellas	Valid		99.2
		High analysis to low analysis	99.6
		Scotts Weed and Feed	100.0
		Total	
Manatee	Valid		99.7

liquid		100.0
Total		

q17 - q17 In the past year or so, have you heard or seen any information that gives tips on proper lawn and garden fertilizing techniques?

county - county Which county do you live in?			Frequency	Percent
Hillsborough	Valid	No, heard nothing	149	52.1
		Yes, maybe; think I heard something; etc.	47	16.4
		Yes, definitely	88	30.8
		Don't know. PROBE: No, you haven't heard anything? and record "no"and or Do you think you might have heard something? Re	2	.7
		Total	286	100.0
Pinellas	Valid	No, heard nothing	152	59.1
		Yes, maybe; think I heard something; etc.	38	14.8
		Yes, definitely	66	25.7
		Don't know. PROBE: No, you haven't heard anything? and record "no"and or Do you think you might have heard something? Re	1	.4
		Total	257	100.0
Manatee	Valid	No, heard nothing	186	63.7
		Yes, maybe; think I heard something; etc.	44	15.1
		Yes, definitely	59	20.2

Don’t know. PROBE: No, you haven’t heard anything? and record "no"and or Do you think you might have heard something? Re	3	1.0
Total	292	100.0

q17 - q17 In the past year or so, have you heard or seen any information that gives tips on proper lawn and garden fertilizing techniques?

county - county Which county do you live in?			Valid Percent	Cumulative Percent
Hillsborough	Valid	No, heard nothing	52.1	52.1
		Yes, maybe; think I heard something; etc.	16.4	68.5
		Yes, definitely	30.8	99.3
		Don’t know. PROBE: No, you haven’t heard anything? and record "no"and or Do you think you might have heard something? Re	.7	100.0
		Total	100.0	
Pinellas	Valid	No, heard nothing	59.1	59.1
		Yes, maybe; think I heard something; etc.	14.8	73.9
		Yes, definitely	25.7	99.6
		Don’t know. PROBE: No, you haven’t heard anything? and record "no"and or Do you think you might have heard something? Re	.4	100.0
		Total	100.0	
Manatee	Valid	No, heard nothing	63.7	63.7

Yes, maybe; think I heard something; etc.	15.1	78.8
Yes, definitely	20.2	99.0
Don’t know. PROBE: No, you haven’t heard anything? and record "no"and or Do you think you might have heard something? Re	1.0	100.0
Total	100.0	

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. "Don't apply fertilizer during the summer."

county - county Which county do you live in?			Frequency	Percent
Hillsborough	Valid	No , do not recall hearing this message	66	23.1
		Yes, maybe ; think I heard something; sounds familiar, etc.	8	2.8
		Yes, definitely heard this message	61	21.3
		Total	135	47.2
	Missing	System	151	52.8
	Total		286	100.0
Pinellas	Valid	No , do not recall hearing this message	40	15.6
		Yes, maybe ; think I heard something; sounds familiar, etc.	16	6.2
		Yes, definitely heard this message	45	17.5

		Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	3	1.2
		Total	104	40.5
	Missing	System	153	59.5
	Total		257	100.0
Manatee	Valid	No , do not recall hearing this message	45	15.4
		Yes, maybe ; think I heard something; sounds familiar, etc.	9	3.1
		Yes, definitely heard this message	49	16.8
		Total	103	35.3
	Missing	System	189	64.7
	Total		292	100.0

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. "Don't apply fertilizer during the summer."

county - county Which county do you live in?			Valid Percent	Cumulative Percent
Hillsborough	Valid	No , do not recall hearing this message	48.9	48.9
		Yes, maybe ; think I heard something; sounds familiar, etc.	5.9	54.8
		Yes, definitely heard this message	45.2	100.0
		Total	100.0	
	Missing	System		
	Total			
Pinellas	Valid	No , do not recall hearing this message	38.5	38.5
		Yes, maybe ; think I heard something; sounds familiar, etc.	15.4	53.8

		Yes, definitely heard this message	43.3	97.1
		Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	2.9	100.0
		Total	100.0	
	Missing	System		
	Total			
Manatee	Valid	No , do not recall hearing this message	43.7	43.7
		Yes, maybe ; think I heard something; sounds familiar, etc.	8.7	52.4
		Yes, definitely heard this message	47.6	100.0
		Total	100.0	
	Missing	System		
	Total			

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. "Too much fertilizer can cause chinch bugs."

county - county Which county do you live in?			Frequency	Percent	Valid Percent
Hillsborough	Valid	No , do not recall hearing this message	89	31.1	65.9
		Yes, maybe ; think I heard something; sounds familiar, etc.	7	2.4	5.2
		Yes, definitely heard this message	37	12.9	27.4
		Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	2	.7	1.5
		Total	135	47.2	100.0

	Missing	System	151	52.8	
	Total		286	100.0	
Pinellas	Valid	No , do not recall hearing this message	73	28.4	70.2
		Yes, maybe ; think I heard something; sounds familiar, etc.	6	2.3	5.8
		Yes, definitely heard this message	22	8.6	21.2
		Don't know. PROBE: no, don't recall or maybe? And code appropriately.	3	1.2	2.9
		Total	104	40.5	100.0
	Missing	System	153	59.5	
	Total		257	100.0	
Manatee	Valid	No , do not recall hearing this message	63	21.6	61.2
		Yes, maybe ; think I heard something; sounds familiar, etc.	9	3.1	8.7
		Yes, definitely heard this message	30	10.3	29.1
		Don't know. PROBE: no, don't recall or maybe? And code appropriately.	1	.3	1.0
		Total	103	35.3	100.0
	Missing	System	189	64.7	

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. "Too much fertilizer can cause chinch bugs."

county - county Which county do you live in?			Cumulative Percent
Hillsborough	Valid	No , do not recall hearing this message	65.9

		Yes, maybe ; think I heard something; sounds familiar, etc.	71.1
		Yes, definitely heard this message	98.5
		Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	100.0
		Total	
	Missing	System	
	Total		
Pinellas	Valid	No , do not recall hearing this message	70.2
		Yes, maybe ; think I heard something; sounds familiar, etc.	76.0
		Yes, definitely heard this message	97.1
		Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	100.0
		Total	
	Missing	System	
	Total		
Manatee	Valid	No , do not recall hearing this message	61.2
		Yes, maybe ; think I heard something; sounds familiar, etc.	69.9
		Yes, definitely heard this message	99.0
		Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	100.0
		Total	
	Missing	System	

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. "Too much fertilizer can cause chinch bugs."

county - county Which county do you live in?		Frequency	Percent	Valid Percent
Manatee	Total	292	100.0	

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. "Too much fertilizer can cause chinch bugs."

county - county Which county do you live in?		Cumulative Percent
Manatee	Total	

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. "Test the soil before fertilizing the lawn."

county - county Which county do you live in?			Frequency	Percent	Valid Percent
Hillsborough	Valid	No , do not recall hearing this message	57	19.9	42.2
		Yes, maybe ; think I heard something; sounds familiar, etc.	19	6.6	14.1
		Yes, definitely heard this message	56	19.6	41.5
		Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	3	1.0	2.2
		Total	135	47.2	100.0
	Missing	System	151	52.8	
	Total		286	100.0	
Pinellas	Valid	No , do not recall hearing this message	41	16.0	39.8
		Yes, maybe ; think I heard something; sounds familiar, etc.	17	6.6	16.5
		Yes, definitely heard this message	43	16.7	41.7

		Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	2	.8	1.9
		Total	103	40.1	100.0
	Missing	System	153	59.5	
		All other missing	1	.4	
		Total	154	59.9	
	Total		257	100.0	
Manatee	Valid	No , do not recall hearing this message	48	16.4	46.6
		Yes, maybe ; think I heard something; sounds familiar, etc.	11	3.8	10.7
		Yes, definitely heard this message	42	14.4	40.8
		Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	2	.7	1.9
		Total	103	35.3	100.0
	Missing	System	189	64.7	

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. "Test the soil before fertilizing the lawn."

county - county Which county do you live in?			Cumulative Percent
Hillsborough	Valid	No , do not recall hearing this message	42.2
		Yes, maybe ; think I heard something; sounds familiar, etc.	56.3
		Yes, definitely heard this message	97.8
		Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	100.0
		Total	

	Missing	System	
	Total		
Pinellas	Valid	No , do not recall hearing this message	39.8
		Yes, maybe ; think I heard something; sounds familiar, etc.	56.3
		Yes, definitely heard this message	98.1
		Don't know. PROBE: no, don't recall or maybe? And code appropriately.	100.0
		Total	
	Missing	System	
		All other missing	
		Total	
	Total		
Manatee	Valid	No , do not recall hearing this message	46.6
		Yes, maybe ; think I heard something; sounds familiar, etc.	57.3
		Yes, definitely heard this message	98.1
		Don't know. PROBE: no, don't recall or maybe? And code appropriately.	100.0
		Total	
	Missing	System	

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. "Test the soil before fertilizing the lawn."

county - county Which county do you live in?		Frequency	Percent	Valid Percent
Manatee	Total	292	100.0	

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. "Test the soil before fertilizing the lawn."

county - county Which county do you live in?	Cumulative Percent

Manatee	Total				

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. "Too much fertilizer can pollute nearby waterways."

county - county Which county do you live in?			Frequency	Percent	Valid Percent
Hillsborough	Valid	No , do not recall hearing this message	14	4.9	10.4
		Yes, maybe ; think I heard something; sounds familiar, etc.	3	1.0	2.2
		Yes, definitely heard this message	117	40.9	86.7
		Don't know. PROBE: no, don't recall or maybe? And code appropriately.	1	.3	.7
		Total	135	47.2	100.0
	Missing	System	151	52.8	
	Total		286	100.0	
Pinellas	Valid	No , do not recall hearing this message	7	2.7	6.7
		Yes, maybe ; think I heard something; sounds familiar, etc.	5	1.9	4.8
		Yes, definitely heard this message	92	35.8	88.5
		Total	104	40.5	100.0
	Missing	System	153	59.5	
	Total		257	100.0	
Manatee	Valid	No , do not recall hearing this message	10	3.4	9.8

	Yes, maybe ; think I heard something; sounds familiar, etc.	3	1.0	2.9
	Yes, definitely heard this message	88	30.1	86.3
	Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	1	.3	1.0
	Total	102	34.9	100.0
Missing	System	189	64.7	
	All other missing	1	.3	
	Total	190	65.1	

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. "Too much fertilizer can pollute nearby waterways."

county - county Which county do you live in?			Cumulative Percent
Hillsborough	Valid	No , do not recall hearing this message	10.4
		Yes, maybe ; think I heard something; sounds familiar, etc.	12.6
		Yes, definitely heard this message	99.3
		Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	100.0
		Total	
	Missing	System	
	Total		
Pinellas	Valid	No , do not recall hearing this message	6.7
		Yes, maybe ; think I heard something; sounds familiar, etc.	11.5
		Yes, definitely heard this message	100.0
		Total	

	Missing	System	
	Total		
Manatee	Valid	No , do not recall hearing this message	9.8
		Yes, maybe ; think I heard something; sounds familiar, etc.	12.7
		Yes, definitely heard this message	99.0
		Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	100.0
		Total	
	Missing	System	
		All other missing	
		Total	

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. "Too much fertilizer can pollute nearby waterways."

county - county Which county do you live in?		Frequency	Percent	Valid Percent
Manatee	Total	292	100.0	

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. "Too much fertilizer can pollute nearby waterways."

county - county Which county do you live in?		Cumulative Percent
Manatee	Total	

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. "Use fertilizer that has slow-release nitrogen."

county - county Which county do you live in?	Frequency	Percent	Valid Percent

Hillsborough	Valid	No , do not recall hearing this message	32	11.2	23.7
		Yes, maybe ; think I heard something; sounds familiar, etc.	15	5.2	11.1
		Yes, definitely heard this message	86	30.1	63.7
		Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	2	.7	1.5
		Total	135	47.2	100.0
	Missing	System	151	52.8	
	Total		286	100.0	
Pinellas	Valid	No , do not recall hearing this message	33	12.8	31.7
		Yes, maybe ; think I heard something; sounds familiar, etc.	19	7.4	18.3
		Yes, definitely heard this message	50	19.5	48.1
		Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	2	.8	1.9
		Total	104	40.5	100.0
	Missing	System	153	59.5	
	Total		257	100.0	
Manatee	Valid	No , do not recall hearing this message	24	8.2	23.3
		Yes, maybe ; think I heard something; sounds familiar, etc.	13	4.5	12.6
		Yes, definitely heard this message	62	21.2	60.2

	Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	4	1.4	3.9
	Total	103	35.3	100.0
Missing	System	189	64.7	

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. "Use fertilizer that has slow-release nitrogen."

county - county Which county do you live in?			Cumulative Percent
Hillsborough	Valid	No , do not recall hearing this message	23.7
		Yes, maybe ; think I heard something; sounds familiar, etc.	34.8
		Yes, definitely heard this message	98.5
		Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	100.0
		Total	
	Missing	System	
	Total		
Pinellas	Valid	No , do not recall hearing this message	31.7
		Yes, maybe ; think I heard something; sounds familiar, etc.	50.0
		Yes, definitely heard this message	98.1
		Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	100.0
		Total	
	Missing	System	
	Total		
Manatee	Valid	No , do not recall hearing this message	23.3
		Yes, maybe ; think I heard something; sounds familiar, etc.	35.9

		Yes, definitely heard this message			96.1
		Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.			100.0
		Total			
	Missing	System			

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. "Use fertilizer that has slow-release nitrogen."

county - county Which county do you live in?		Frequency	Percent	Valid Percent
Manatee	Total	292	100.0	

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. "Use fertilizer that has slow-release nitrogen."

county - county Which county do you live in?		Cumulative Percent
Manatee	Total	

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. "Water the lawn twice a week."

county - county Which county do you live in?			Frequency	Percent	Valid Percent
Hillsborough	Valid	No , do not recall hearing this message	35	12.2	25.9
		Yes, maybe ; think I heard something; sounds familiar, etc.	16	5.6	11.9
		Yes, definitely heard this message	83	29.0	61.5
		Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	1	.3	.7

		Total	135	47.2	100.0
	Missing	System	151	52.8	
	Total		286	100.0	
Pinellas	Valid	No , do not recall hearing this message	30	11.7	28.8
		Yes, maybe ; think I heard something; sounds familiar, etc.	21	8.2	20.2
		Yes, definitely heard this message	53	20.6	51.0
		Total	104	40.5	100.0
	Missing	System	153	59.5	
	Total		257	100.0	
Manatee	Valid	No , do not recall hearing this message	39	13.4	37.9
		Yes, maybe ; think I heard something; sounds familiar, etc.	10	3.4	9.7
		Yes, definitely heard this message	51	17.5	49.5
		Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	3	1.0	2.9
		Total	103	35.3	100.0
	Missing	System	189	64.7	

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. "Water the lawn twice a week."

county - county Which county do you live in?			Cumulative Percent
Hillsborough	Valid	No , do not recall hearing this message	25.9

		Yes, maybe ; think I heard something; sounds familiar, etc.	37.8
		Yes, definitely heard this message	99.3
		Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	100.0
		Total	
	Missing	System	
	Total		
Pinellas	Valid	No , do not recall hearing this message	28.8
		Yes, maybe ; think I heard something; sounds familiar, etc.	49.0
		Yes, definitely heard this message	100.0
		Total	
	Missing	System	
	Total		
Manatee	Valid	No , do not recall hearing this message	37.9
		Yes, maybe ; think I heard something; sounds familiar, etc.	47.6
		Yes, definitely heard this message	97.1
		Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	100.0
		Total	
	Missing	System	

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. "Water the lawn twice a week."

county - county Which county do you live in?		Frequency	Percent	Valid Percent
Manatee	Total	292	100.0	

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. "Water the lawn twice a week."

county - county Which county do you live in?			Cumulative Percent
Manatee	Total		

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. "Give your lawn a break in the winter, its resting."

county - county Which county do you live in?			Frequency	Percent
Hillsborough	Valid	No , do not recall hearing this message	44	15.4
		Yes, maybe ; think I heard something; sounds familiar, etc.	13	4.5
		Yes, definitely heard this message	78	27.3
		Total	135	47.2
	Missing	System	151	52.8
	Total		286	100.0
Pinellas	Valid	No , do not recall hearing this message	31	12.1
		Yes, maybe ; think I heard something; sounds familiar, etc.	11	4.3
		Yes, definitely heard this message	61	23.7
		Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	1	.4
		Total	104	40.5
	Missing	System	153	59.5
	Total		257	100.0
Manatee	Valid	No , do not recall hearing this message	32	11.0

	Yes, maybe ; think I heard something; sounds familiar, etc.	14	4.8
	Yes, definitely heard this message	57	19.5
	Total	103	35.3
Missing	System	189	64.7
Total		292	100.0

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. "Give your lawn a break in the winter, its resting."

county - county Which county do you live in?			Valid Percent	Cumulative Percent
Hillsborough	Valid	No , do not recall hearing this message	32.6	32.6
		Yes, maybe ; think I heard something; sounds familiar, etc.	9.6	42.2
		Yes, definitely heard this message	57.8	100.0
		Total	100.0	
	Missing	System		
	Total			
Pinellas	Valid	No , do not recall hearing this message	29.8	29.8
		Yes, maybe ; think I heard something; sounds familiar, etc.	10.6	40.4
		Yes, definitely heard this message	58.7	99.0
		Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	1.0	100.0
		Total	100.0	
	Missing	System		
	Total			

Manatee	Valid	No , do not recall hearing this message	31.1	31.1
		Yes, maybe ; think I heard something; sounds familiar, etc.	13.6	44.7
		Yes, definitely heard this message	55.3	100.0
		Total	100.0	
	Missing	System		
	Total			

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. "Never fertilize if heavy rain is predicted."

county - county Which county do you live in?			Frequency	Percent	Valid Percent
Hillsborough	Valid	No , do not recall hearing this message	35	12.2	25.9
		Yes, maybe ; think I heard something; sounds familiar, etc.	9	3.1	6.7
		Yes, definitely heard this message	90	31.5	66.7
		Don't know. PROBE: no, don't recall or maybe? And code appropriately.	1	.3	.7
		Total	135	47.2	100.0
	Missing	System	151	52.8	
	Total		286	100.0	
Pinellas	Valid	No , do not recall hearing this message	26	10.1	25.2
		Yes, maybe ; think I heard something; sounds familiar, etc.	6	2.3	5.8

		Yes, definitely heard this message	70	27.2	68.0
		Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	1	.4	1.0
		Total	103	40.1	100.0
	Missing	System	153	59.5	
		All other missing	1	.4	
		Total	154	59.9	
	Total		257	100.0	
Manatee	Valid	No , do not recall hearing this message	30	10.3	29.4
		Yes, maybe ; think I heard something; sounds familiar, etc.	3	1.0	2.9
		Yes, definitely heard this message	69	23.6	67.6
		Total	102	34.9	100.0
	Missing	System	189	64.7	
		All other missing	1	.3	
		Total	190	65.1	

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. "Never fertilize if heavy rain is predicted."

county - county Which county do you live in?			Cumulative Percent
Hillsborough	Valid	No , do not recall hearing this message	25.9
		Yes, maybe ; think I heard something; sounds familiar, etc.	32.6
		Yes, definitely heard this message	99.3
		Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	100.0

		Total	
	Missing	System	
	Total		
Pinellas	Valid	No , do not recall hearing this message	25.2
		Yes, maybe ; think I heard something; sounds familiar, etc.	31.1
		Yes, definitely heard this message	99.0
		Don't know. PROBE: no, don't recall or maybe? And code appropriately.	100.0
		Total	
	Missing	System	
		All other missing	
		Total	
	Total		
Manatee	Valid	No , do not recall hearing this message	29.4
		Yes, maybe ; think I heard something; sounds familiar, etc.	32.4
		Yes, definitely heard this message	100.0
		Total	
	Missing	System	
		All other missing	
		Total	

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. "Never fertilize if heavy rain is predicted."

county - county Which county do you live in?		Frequency	Percent	Valid Percent
Manatee	Total	292	100.0	

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. "Never fertilize if heavy rain is predicted."

county - county Which county do you live in?		Cumulative Percent
Manatee	Total	

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. ""Be Floridian" in your yard."

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	No , do not recall hearing this message	73	25.5	54.1	54.1
		Yes, maybe ; think I heard something; sounds familiar, etc.	11	3.8	8.1	62.2
		Yes, definitely heard this message	49	17.1	36.3	98.5
		Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	2	.7	1.5	100.0
		Total	135	47.2	100.0	
	Missing	System	151	52.8		
	Total		286	100.0		
Pinellas	Valid	No , do not recall hearing this message	55	21.4	53.4	53.4
		Yes, maybe ; think I heard something; sounds familiar, etc.	14	5.4	13.6	67.0
		Yes, definitely heard this message	33	12.8	32.0	99.0
		Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	1	.4	1.0	100.0

		Total	103	40.1	100.0	
	Missing	System	153	59.5		
		All other missing	1	.4		
		Total	154	59.9		
	Total		257	100.0		
Manatee	Valid	No , do not recall hearing this message	54	18.5	52.9	52.9
		Yes, maybe ; think I heard something; sounds familiar, etc.	7	2.4	6.9	59.8
		Yes, definitely heard this message	40	13.7	39.2	99.0
		Don't know. PROBE: no, don't recall or maybe? And code appropriately.	1	.3	1.0	100.0
		Total	102	34.9	100.0	
	Missing	System	189	64.7		
		All other missing	1	.3		
		Total	190	65.1		

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. ""Be Floridian" in your yard."

county - county Which county do you live in?		Frequency	Percent	Valid Percent	Cumulative Percent
Manatee	Total	292	100.0		

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. "If you have to fertilize, do it in the spring."

county - county Which county do you live in?	Frequency	Percent	Valid Percent

Hillsborough	Valid	No , do not recall hearing this message	47	16.4	34.8
		Yes, maybe ; think I heard something; sounds familiar, etc.	17	5.9	12.6
		Yes, definitely heard this message	70	24.5	51.9
		Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	1	.3	.7
		Total	135	47.2	100.0
	Missing	System	151	52.8	
	Total		286	100.0	
Pinellas	Valid	No , do not recall hearing this message	37	14.4	35.6
		Yes, maybe ; think I heard something; sounds familiar, etc.	18	7.0	17.3
		Yes, definitely heard this message	48	18.7	46.2
		Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	1	.4	1.0
		Total	104	40.5	100.0
	Missing	System	153	59.5	
	Total		257	100.0	
Manatee	Valid	No , do not recall hearing this message	36	12.3	35.0
		Yes, maybe ; think I heard something; sounds familiar, etc.	15	5.1	14.6
		Yes, definitely heard this message	48	16.4	46.6

		Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	4	1.4	3.9
		Total	103	35.3	100.0
	Missing	System	189	64.7	

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. "If you have to fertilize, do it in the spring."

county - county Which county do you live in?			Cumulative Percent
Hillsborough	Valid	No , do not recall hearing this message	34.8
		Yes, maybe ; think I heard something; sounds familiar, etc.	47.4
		Yes, definitely heard this message	99.3
		Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	100.0
		Total	
	Missing	System	
	Total		
Pinellas	Valid	No , do not recall hearing this message	35.6
		Yes, maybe ; think I heard something; sounds familiar, etc.	52.9
		Yes, definitely heard this message	99.0
		Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	100.0
		Total	
	Missing	System	
	Total		
Manatee	Valid	No , do not recall hearing this message	35.0
		Yes, maybe ; think I heard something; sounds familiar, etc.	49.5

	Yes, definitely heard this message		96.1
	Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.		100.0
	Total		
Missing	System		

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. "If you have to fertilize, do it in the spring."

county - county Which county do you live in?		Frequency	Percent	Valid Percent
Manatee	Total	292	100.0	

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. "If you have to fertilize, do it in the spring."

county - county Which county do you live in?		Cumulative Percent
Manatee	Total	

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. "Fertilize when your grass is growing."

county - county Which county do you live in?			Frequency	Percent	Valid Percent
Hillsborough	Valid	No , do not recall hearing this message	71	24.8	52.6
		Yes, maybe ; think I heard something; sounds familiar, etc.	18	6.3	13.3
		Yes, definitely heard this message	41	14.3	30.4
		Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	5	1.7	3.7

		Total	135	47.2	100.0
	Missing	System	151	52.8	
	Total		286	100.0	
Pinellas	Valid	No , do not recall hearing this message	54	21.0	51.9
		Yes, maybe ; think I heard something; sounds familiar, etc.	17	6.6	16.3
		Yes, definitely heard this message	29	11.3	27.9
		Don't know. PROBE: no, don't recall or maybe? And code appropriately.	4	1.6	3.8
		Total	104	40.5	100.0
	Missing	System	153	59.5	
	Total		257	100.0	
Manatee	Valid	No , do not recall hearing this message	53	18.2	52.0
		Yes, maybe ; think I heard something; sounds familiar, etc.	14	4.8	13.7
		Yes, definitely heard this message	34	11.6	33.3
		Don't know. PROBE: no, don't recall or maybe? And code appropriately.	1	.3	1.0
		Total	102	34.9	100.0
	Missing	System	189	64.7	
		All other missing	1	.3	
		Total	190	65.1	

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. "Fertilize when your grass is growing."

county - county Which county do you live in?			Cumulative Percent
Hillsborough	Valid	No , do not recall hearing this message	52.6
		Yes, maybe ; think I heard something; sounds familiar, etc.	65.9
		Yes, definitely heard this message	96.3
		Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	100.0
		Total	
	Missing	System	
	Total		
Pinellas	Valid	No , do not recall hearing this message	51.9
		Yes, maybe ; think I heard something; sounds familiar, etc.	68.3
		Yes, definitely heard this message	96.2
		Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	100.0
		Total	
	Missing	System	
	Total		
Manatee	Valid	No , do not recall hearing this message	52.0
		Yes, maybe ; think I heard something; sounds familiar, etc.	65.7
		Yes, definitely heard this message	99.0
		Don’t know. PROBE: no, don’t recall or maybe? And code appropriately.	100.0
		Total	
	Missing	System	
		All other missing	

Total

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. "Fertilize when your grass is growing."

county - county Which county do you live in?		Frequency	Percent	Valid Percent
Manatee	Total	292	100.0	

q18 - q18 I am going to read you some informational messages about applying fertilizer to your lawn, some of them are actual messages and some are not. "Fertilize when your grass is growing."

county - county Which county do you live in?		Cumulative Percent
Manatee	Total	

q19 - q19 Have you heard anything about government regulations concerning residential landscape fertilizer? If yes , are you aware of any discussions about this issue here in [%LABEL(county)%] County?

county - county Which county do you live in?			Frequency	Percent
Hillsborough	Valid	No, nothing	208	72.7
		Yes, maybe; think I heard something; maybe; sounds familiar, etc.	30	10.5
		Yes, definitely	43	15.0
		Don’t know. PROBE: to get a “no” or “maybe” response and record appropriately.	4	1.4
		Refused	1	.3
		Total	286	100.0
Pinellas	Valid	No, nothing	144	56.0

		Yes, maybe; think I heard something; maybe; sounds familiar, etc.	38	14.8
		Yes, definitely	73	28.4
		Don’t know. PROBE: to get a “no” or “maybe” response and record appropriately.	2	.8
		Total	257	100.0
Manatee	Valid	No, nothing	211	72.3
		Yes, maybe; think I heard something; maybe; sounds familiar, etc.	31	10.6
		Yes, definitely	45	15.4
		Don’t know. PROBE: to get a “no” or “maybe” response and record appropriately.	5	1.7
		Total	292	100.0

q19 - q19 Have you heard anything about government regulations concerning residential landscape fertilizer? If yes , are you aware of any discussions about this issue here in [%LABEL(county)%] County?

county - county Which county do you live in?			Valid Percent	Cumulative Percent
Hillsborough	Valid	No, nothing	72.7	72.7
		Yes, maybe; think I heard something; maybe; sounds familiar, etc.	10.5	83.2
		Yes, definitely	15.0	98.3
		Don’t know. PROBE: to get a “no” or “maybe” response and record appropriately.	1.4	99.7
		Refused	.3	100.0
		Total	100.0	

Pinellas	Valid	No, nothing	56.0	56.0
		Yes, maybe; think I heard something; maybe; sounds familiar, etc.	14.8	70.8
		Yes, definitely	28.4	99.2
		Don’t know. PROBE: to get a “no” or “maybe” response and record appropriately.	.8	100.0
		Total	100.0	
Manatee	Valid	No, nothing	72.3	72.3
		Yes, maybe; think I heard something; maybe; sounds familiar, etc.	10.6	82.9
		Yes, definitely	15.4	98.3
		Don’t know. PROBE: to get a “no” or “maybe” response and record appropriately.	1.7	100.0
		Total	100.0	

q19a - What have you heard? What kinds of regulations do you think are being considered for the use of lawn fertilizer on residential yards in your county? Restrict the use of lawn fertilizer during the rainy season?

county - county Which county do you live in?			Frequency	Percent	Valid Percent
Hillsborough	Valid	No , government regulations in my county do not address this	16	5.6	21.9
		Yes, maybe heard something about regulations addressing this	15	5.2	20.5
		Yes, definitely the government regulations address this	33	11.5	45.2
		Other:	1	.3	1.4

		Don’t know if government regulations address this	8	2.8	11.0
		Total	73	25.5	100.0
	Missing	System	213	74.5	
	Total		286	100.0	
Pinellas	Valid	No , government regulations in my county do not address this	24	9.3	21.6
		Yes, maybe heard something about regulations addressing this	28	10.9	25.2
		Yes, definitely the government regulations address this	42	16.3	37.8
		Don’t know if government regulations address this	17	6.6	15.3
		Total	111	43.2	100.0
	Missing	System	146	56.8	
	Total		257	100.0	
Manatee	Valid	No , government regulations in my county do not address this	22	7.5	28.9
		Yes, maybe heard something about regulations addressing this	19	6.5	25.0
		Yes, definitely the government regulations address this	24	8.2	31.6
		Other:	1	.3	1.3
		Don’t know if government regulations address this	10	3.4	13.2
		Total	76	26.0	100.0
	Missing	System	216	74.0	

q19a - What have you heard? What kinds of regulations do you think are being considered for the use of lawn fertilizer on residential yards in your county? Restrict the use of lawn fertilizer during the rainy season?

county - county Which county do you live in?			Cumulative Percent
Hillsborough	Valid	No , government regulations in my county do not address this	21.9
		Yes, maybe heard something about regulations addressing this	42.5
		Yes, definitely the government regulations address this	87.7
		Other:	89.0
		Don't know if government regulations address this	100.0
		Total	
	Missing	System	
	Total		
Pinellas	Valid	No , government regulations in my county do not address this	21.6
		Yes, maybe heard something about regulations addressing this	46.8
		Yes, definitely the government regulations address this	84.7
		Don't know if government regulations address this	100.0
		Total	
	Missing	System	
	Total		
Manatee	Valid	No , government regulations in my county do not address this	28.9
		Yes, maybe heard something about regulations addressing this	53.9

	Yes, definitely the government regulations address this	85.5
	Other:	86.8
	Don’t know if government regulations address this	100.0
	Total	
Missing	System	

q19a - What have you heard? What kinds of regulations do you think are being considered for the use of lawn fertilizer on residential yards in your county? Restrict the use of lawn fertilizer during the rainy season?

county - county Which county do you live in?		Frequency	Percent	Valid Percent
Manatee	Total	292	100.0	

q19a - What have you heard? What kinds of regulations do you think are being considered for the use of lawn fertilizer on residential yards in your county? Restrict the use of lawn fertilizer during the rainy season?

county - county Which county do you live in?		Cumulative Percent
Manatee	Total	

q19a - What have you heard? What kinds of regulations do you think are being considered for the use of lawn fertilizer on residential yards in your county? Restrict the use of lawn fertilizer during the rainy season? OTHER.

county - county Which county do you live in?			Frequency	Percent	Valid Percent
Hillsborough	Valid		285	99.7	99.7
		they restrict the type	1	.3	.3
		Total	286	100.0	100.0
Pinellas	Valid		257	100.0	100.0
Manatee	Valid		291	99.7	99.7

if you are near a lake or river	1	.3	.3
Total	292	100.0	100.0

q19a - What have you heard? What kinds of regulations do you think are being considered for the use of lawn fertilizer on residential yards in your county? Restrict the use of lawn fertilizer during the rainy season? OTHER.

county - county Which county do you live in?			Cumulative Percent
Hillsborough	Valid		99.7
		they restrict the type	100.0
		Total	
Pinellas	Valid		100.0
Manatee	Valid		99.7
		if you are near a lake or river	100.0
		Total	

q19b - q19b Restrict the sale of lawn fertilizer during certain months?

county - county Which county do you live in?			Frequency	Percent	Valid Percent
Hillsborough	Valid	No , government regulations in my county do not address this	24	8.4	32.9
		Yes, maybe heard something about regulations addressing this	12	4.2	16.4
		Yes, definitely the government regulations address this	28	9.8	38.4
		Don't know if government regulations address this	9	3.1	12.3
		Total	73	25.5	100.0
	Missing	System	213	74.5	
	Total		286	100.0	

Pinellas	Valid	No , government regulations in my county do not address this	21	8.2	18.9
		Yes, maybe heard something about regulations addressing this	23	8.9	20.7
		Yes, definitely the government regulations address this	56	21.8	50.5
		Don't know if government regulations address this	11	4.3	9.9
		Total	111	43.2	100.0
	Missing	System	146	56.8	
	Total		257	100.0	
Manatee	Valid	No , government regulations in my county do not address this	32	11.0	42.1
		Yes, maybe heard something about regulations addressing this	17	5.8	22.4
		Yes, definitely the government regulations address this	17	5.8	22.4
		Don't know if government regulations address this	10	3.4	13.2
		Total	76	26.0	100.0
	Missing	System	216	74.0	
	Total		292	100.0	

q19b - q19b Restrict the sale of lawn fertilizer during certain months?

county - county Which county do you live in?			Cumulative Percent
Hillsborough	Valid	No , government regulations in my county do not address this	32.9
		Yes, maybe heard something about regulations addressing this	49.3

		Yes, definitely the government regulations address this	87.7
		Don’t know if government regulations address this	100.0
		Total	
	Missing	System	
	Total		
Pinellas	Valid	No , government regulations in my county do not address this	18.9
		Yes, maybe heard something about regulations addressing this	39.6
		Yes, definitely the government regulations address this	90.1
		Don’t know if government regulations address this	100.0
		Total	
	Missing	System	
	Total		
Manatee	Valid	No , government regulations in my county do not address this	42.1
		Yes, maybe heard something about regulations addressing this	64.5
		Yes, definitely the government regulations address this	86.8
		Don’t know if government regulations address this	100.0
		Total	
	Missing	System	
	Total		

q19b - q19b Restrict the sale of lawn fertilizer during certain months? Other:

county - county Which county do you live in?		Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	286	100.0	100.0	100.0
Pinellas	Valid	257	100.0	100.0	100.0
Manatee	Valid	292	100.0	100.0	100.0

q19c - q19c Reduce the amount of phosphorous ("P") allowed in lawn fertilizer?

county - county Which county do you live in?			Frequency	Percent	Valid Percent
Hillsborough	Valid	No , government regulations in my county do not address this	21	7.3	28.8
		Yes, maybe heard something about regulations addressing this	8	2.8	11.0
		Yes, definitely the government regulations address this	31	10.8	42.5
		Don't know if government regulations address this	13	4.5	17.8
		Total	73	25.5	100.0
	Missing	System	213	74.5	
	Total		286	100.0	
Pinellas	Valid	No , government regulations in my county do not address this	19	7.4	17.1
		Yes, maybe heard something about regulations addressing this	21	8.2	18.9
		Yes, definitely the government regulations address this	49	19.1	44.1
		Other:	1	.4	.9

		Don’t know if government regulations address this	21	8.2	18.9
		Total	111	43.2	100.0
	Missing	System	146	56.8	
	Total		257	100.0	
Manatee	Valid	No , government regulations in my county do not address this	19	6.5	25.0
		Yes, maybe heard something about regulations addressing this	17	5.8	22.4
		Yes, definitely the government regulations address this	25	8.6	32.9
		Don’t know if government regulations address this	15	5.1	19.7
		Total	76	26.0	100.0
	Missing	System	216	74.0	
	Total		292	100.0	

q19c - q19c Reduce the amount of phosphorous (“P”) allowed in lawn fertilizer?

county - county Which county do you live in?			Cumulative Percent
Hillsborough	Valid	No , government regulations in my county do not address this	28.8
		Yes, maybe heard something about regulations addressing this	39.7
		Yes, definitely the government regulations address this	82.2
		Don’t know if government regulations address this	100.0
		Total	
	Missing	System	
	Total		

Pinellas	Valid	No , government regulations in my county do not address this	17.1
		Yes, maybe heard something about regulations addressing this	36.0
		Yes, definitely the government regulations address this	80.2
		Other:	81.1
		Don’t know if government regulations address this	100.0
		Total	
	Missing	System	
	Total		
Manatee	Valid	No , government regulations in my county do not address this	25.0
		Yes, maybe heard something about regulations addressing this	47.4
		Yes, definitely the government regulations address this	80.3
		Don’t know if government regulations address this	100.0
		Total	
	Missing	System	
	Total		

q19c - q19c Reduce the amount of phosphorous (“P”) allowed in lawn fertilizer? Other:

county - county Which county do you live in?			Frequency	Percent
Hillsborough	Valid		286	100.0
Pinellas	Valid		256	99.6
		all i know is they've changed something	1	.4

		Total	257	100.0
Manatee	Valid		292	100.0

q19c - q19c Reduce the amount of phosphorous ("P") allowed in lawn fertilizer? Other:

county - county Which county do you live in?			Valid Percent	Cumulative Percent
Hillsborough	Valid		100.0	100.0
Pinellas	Valid		99.6	99.6
		all i know is they've changed something	.4	100.0
		Total	100.0	
Manatee	Valid		100.0	100.0

q19d - q19d Reduce the amount of nitrogen ("N") allowed in lawn fertilizer?

county - county Which county do you live in?			Frequency	Percent	Valid Percent
Hillsborough	Valid	No , government regulations in my county do not address this	25	8.7	34.2
		Yes, maybe heard something about regulations addressing this	10	3.5	13.7
		Yes, definitely the government regulations address this	25	8.7	34.2
		Don't know if government regulations address this	13	4.5	17.8
		Total	73	25.5	100.0
	Missing	System	213	74.5	
	Total		286	100.0	
Pinellas	Valid	No , government regulations in my county do not address this	33	12.8	29.7

		Yes, maybe heard something about regulations addressing this	23	8.9	20.7
		Yes, definitely the government regulations address this	30	11.7	27.0
		Don’t know if government regulations address this	25	9.7	22.5
		Total	111	43.2	100.0
	Missing	System	146	56.8	
	Total		257	100.0	
Manatee	Valid	No , government regulations in my county do not address this	21	7.2	27.6
		Yes, maybe heard something about regulations addressing this	16	5.5	21.1
		Yes, definitely the government regulations address this	25	8.6	32.9
		Other:	1	.3	1.3
		Don’t know if government regulations address this	13	4.5	17.1
		Total	76	26.0	100.0
	Missing	System	216	74.0	
	Total		292	100.0	

q19d - q19d Reduce the amount of nitrogen (“N”) allowed in lawn fertilizer?

county - county Which county do you live in?			Cumulative Percent
Hillsborough	Valid	No , government regulations in my county do not address this	34.2
		Yes, maybe heard something about regulations addressing this	47.9

		Yes, definitely the government regulations address this	82.2
		Don't know if government regulations address this	100.0
		Total	
	Missing	System	
	Total		
Pinellas	Valid	No , government regulations in my county do not address this	29.7
		Yes, maybe heard something about regulations addressing this	50.5
		Yes, definitely the government regulations address this	77.5
		Don't know if government regulations address this	100.0
		Total	
	Missing	System	
	Total		
Manatee	Valid	No , government regulations in my county do not address this	27.6
		Yes, maybe heard something about regulations addressing this	48.7
		Yes, definitely the government regulations address this	81.6
		Other:	82.9
		Don't know if government regulations address this	100.0
		Total	
	Missing	System	
	Total		

q19d - q19d Reduce the amount of nitrogen ("N") allowed in lawn fertilizer? Other:

county - county Which county do you live in?			Frequency	Percent	Valid Percent
Hillsborough	Valid		286	100.0	100.0
Pinellas	Valid		257	100.0	100.0
Manatee	Valid		291	99.7	99.7
		Not in Manatee	1	.3	.3
		Total	292	100.0	100.0

q19d - q19d Reduce the amount of nitrogen ("N") allowed in lawn fertilizer? Other:

county - county Which county do you live in?			Cumulative Percent
Hillsborough	Valid		100.0
Pinellas	Valid		100.0
Manatee	Valid		99.7
		Not in Manatee	100.0
		Total	

q19e - q19e Require training for professional landscaping companies?

county - county Which county do you live in?			Frequency	Percent	Valid Percent
Hillsborough	Valid	No , government regulations in my county do not address this	27	9.4	37.0
		Yes, maybe heard something about regulations addressing this	11	3.8	15.1
		Yes, definitely the government regulations address this	25	8.7	34.2
		Don't know if government regulations address this	10	3.5	13.7
		Total	73	25.5	100.0

	Missing	System	213	74.5	
	Total		286	100.0	
Pinellas	Valid	No , government regulations in my county do not address this	40	15.6	36.0
		Yes, maybe heard something about regulations addressing this	19	7.4	17.1
		Yes, definitely the government regulations address this	25	9.7	22.5
		Other:	1	.4	.9
		Don't know if government regulations address this	26	10.1	23.4
		Total	111	43.2	100.0
	Missing	System	146	56.8	
	Total		257	100.0	
Manatee	Valid	No , government regulations in my county do not address this	33	11.3	43.4
		Yes, maybe heard something about regulations addressing this	10	3.4	13.2
		Yes, definitely the government regulations address this	17	5.8	22.4
		Don't know if government regulations address this	16	5.5	21.1
		Total	76	26.0	100.0
	Missing	System	216	74.0	
	Total		292	100.0	

q19e - q19e Require training for professional landscaping companies?

county - county Which county do you live in?	Cumulative Percent

Hillsborough	Valid	No , government regulations in my county do not address this	37.0
		Yes, maybe heard something about regulations addressing this	52.1
		Yes, definitely the government regulations address this	86.3
		Don’t know if government regulations address this	100.0
		Total	
	Missing	System	
	Total		
Pinellas	Valid	No , government regulations in my county do not address this	36.0
		Yes, maybe heard something about regulations addressing this	53.2
		Yes, definitely the government regulations address this	75.7
		Other:	76.6
		Don’t know if government regulations address this	100.0
		Total	
	Missing	System	
	Total		
Manatee	Valid	No , government regulations in my county do not address this	43.4
		Yes, maybe heard something about regulations addressing this	56.6
		Yes, definitely the government regulations address this	78.9
		Don’t know if government regulations address this	100.0
		Total	

Missing	System		
Total			

q19e - q19e Require training for professional landscaping companies? Other:

county - county Which county do you live in?			Frequency	Percent	Valid Percent
Hillsborough	Valid		286	100.0	100.0
Pinellas	Valid		256	99.6	99.6
		I would hope so.	1	.4	.4
		Total	257	100.0	100.0
Manatee	Valid		292	100.0	100.0

q19e - q19e Require training for professional landscaping companies? Other:

county - county Which county do you live in?			Cumulative Percent
Hillsborough	Valid		100.0
Pinellas	Valid		99.6
		I would hope so.	100.0
		Total	
Manatee	Valid		100.0

q20 - q20 Do you recall when you heard about the ordinance? RECORD YEAR IF GIVEN, OR PROBE: Was it last year, a couple of years ago, about five years ago, or more than five years ago?

county - county Which county do you live in?			Frequency	Percent
Hillsborough	Valid	Last year	38	13.3
		Couple of years ago	8	2.8
		More than five years ago	2	.7
		Other: Record open ended	7	2.4

		Don't know	17	5.9
		Total	72	25.2
	Missing	Refused/All other missing	1	.3
		System	213	74.5
		Total	214	74.8
	Total		286	100.0
Pinellas	Valid	Last year	62	24.1
		Couple of years ago	21	8.2
		Five years ago	1	.4
		More than five years ago	3	1.2
		Other: Year given - Record year	1	.4
		Other: Record open ended	6	2.3
		Don't know	17	6.6
		Total	111	43.2
	Missing	System	146	56.8
	Total		257	100.0
Manatee	Valid	Last year	39	13.4
		Couple of years ago	11	3.8
		Five years ago	1	.3
		More than five years ago	2	.7
		Other: Year given - Record year	2	.7
		Other: Record open ended	5	1.7
		Don't know	16	5.5
		Total	76	26.0
	Missing	System	216	74.0

q20 - q20 Do you recall when you heard about the ordinance? RECORD YEAR IF GIVEN, OR PROBE: Was it last year, a couple of years ago, about five years ago, or more than five years ago?

county - county Which county do you live in?			Valid Percent	Cumulative Percent
Hillsborough	Valid	Last year	52.8	52.8
		Couple of years ago	11.1	63.9
		More than five years ago	2.8	66.7
		Other: Record open ended	9.7	76.4
		Don't know	23.6	100.0
		Total	100.0	
	Missing	Refused/All other missing		
		System		
		Total		
	Total			
Pinellas	Valid	Last year	55.9	55.9
		Couple of years ago	18.9	74.8
		Five years ago	.9	75.7
		More than five years ago	2.7	78.4
		Other: Year given - Record year	.9	79.3
		Other: Record open ended	5.4	84.7
		Don't know	15.3	100.0
		Total	100.0	
	Missing	System		
	Total			
Manatee	Valid	Last year	51.3	51.3
		Couple of years ago	14.5	65.8
		Five years ago	1.3	67.1
		More than five years ago	2.6	69.7
		Other: Year given - Record year	2.6	72.4
		Other: Record open ended	6.6	78.9
		Don't know	21.1	100.0

	Total		100.0
Missing	System		

q20 - q20 Do you recall when you heard about the ordinance? RECORD YEAR IF GIVEN, OR PROBE: Was it last year, a couple of years ago, about five years ago, or more than five years ago?

county - county Which county do you live in?		Frequency	Percent
Manatee	Total	292	100.0

q20 - q20 Do you recall when you heard about the ordinance? RECORD YEAR IF GIVEN, OR PROBE: Was it last year, a couple of years ago, about five years ago, or more than five years ago?

county - county Which county do you live in?		Valid Percent	Cumulative Percent
Manatee	Total		

q20 - q20 Do you recall when you heard about the ordinance? RECORD YEAR IF GIVEN, OR PROBE: Was it last year, a couple of years ago, about five years ago, or more than five years ago? Other: Year given - Record year

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid		286	100.0	100.0	100.0
Pinellas	Valid		256	99.6	99.6	99.6
		2012	1	.4	.4	100.0
		Total	257	100.0	100.0	
Manatee	Valid		290	99.3	99.3	99.3
		2012	2	.7	.7	100.0
		Total	292	100.0	100.0	

q20 - q20 Do you recall when you heard about the ordinance? RECORD YEAR IF GIVEN, OR PROBE: Was it last year, a couple of years ago, about five years ago, or more than five years ago? Other: Record open ended

county - county Which county do you live in?			Frequency	Percent
Hillsborough	Valid		279	97.6
		for 20 years	1	.3
		last couple months	1	.3
		Last couple of months	1	.3
		Last six months	1	.3
		last week	1	.3
		some 5 years ago, not all of them	1	.3
		Within the last two years.	1	.3
		Total	286	100.0
Pinellas	Valid		251	97.7
		10 months ago	1	.4
		2008 but in another charlottes county	1	.4
		every now and again	1	.4
		Found out about regulations today	1	.4
		last week	1	.4
		off and on	1	.4
		Total	257	100.0
Manatee	Valid		287	98.3
		DS	1	.3
		off and on every few years	1	.3
		on going process	1	.3
		right now, that's it	1	.3
		Whenever I read the bag	1	.3
		Total	292	100.0

q20 - q20 Do you recall when you heard about the ordinance? RECORD YEAR IF GIVEN, OR PROBE: Was it last year, a couple of years ago, about five years ago, or more than five years ago? Other: Record open ended

county - county Which county do you live in?			Valid Percent	Cumulative Percent
Hillsborough	Valid		97.6	97.6
		for 20 years	.3	97.9
		last couple months	.3	98.3
		Last couple of months	.3	98.6
		Last six months	.3	99.0
		last week	.3	99.3
		some 5 years ago, not all of them	.3	99.7
		Within the last two years.	.3	100.0
		Total	100.0	
Pinellas	Valid		97.7	97.7
		10 months ago	.4	98.1
		2008 but in another charlottes county	.4	98.4
		every now and again	.4	98.8
		Found out about regulations today	.4	99.2
		last week	.4	99.6
		off and on	.4	100.0
		Total	100.0	
Manatee	Valid		98.3	98.3
		DS	.3	98.6
		off and on every few years	.3	99.0
		on going process	.3	99.3
		right now, that's it	.3	99.7
		Whenever I read the bag	.3	100.0

		Total			100.0	

q21 - q21 Do you recall where you heard about the ordinance? Television or newspaper

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	24	8.4	32.9	32.9
		Checked	49	17.1	67.1	100.0
		Total	73	25.5	100.0	
	Missing	System	213	74.5		
	Total		286	100.0		
Pinellas	Valid	Unchecked	42	16.3	37.8	37.8
		Checked	69	26.8	62.2	100.0
		Total	111	43.2	100.0	
	Missing	System	146	56.8		
	Total		257	100.0		
Manatee	Valid	Unchecked	30	10.3	39.5	39.5
		Checked	46	15.8	60.5	100.0
		Total	76	26.0	100.0	
	Missing	System	216	74.0		
	Total		292	100.0		

q21 - q21 Do you recall where you heard about the ordinance? Event or club meeting

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	72	25.2	98.6	98.6
		Checked	1	.3	1.4	100.0

		Total	73	25.5	100.0	
	Missing	System	213	74.5		
	Total		286	100.0		
Pinellas	Valid	Unchecked	111	43.2	100.0	100.0
	Missing	System	146	56.8		
	Total		257	100.0		
Manatee	Valid	Unchecked	75	25.7	98.7	98.7
		Checked	1	.3	1.3	100.0
		Total	76	26.0	100.0	
	Missing	System	216	74.0		
	Total		292	100.0		

q21 - q21 Do you recall where you heard about the ordinance? Neighbor/Family member

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	70	24.5	95.9	95.9
		Checked	3	1.0	4.1	100.0
		Total	73	25.5	100.0	
	Missing	System	213	74.5		
	Total		286	100.0		
Pinellas	Valid	Unchecked	105	40.9	94.6	94.6
		Checked	6	2.3	5.4	100.0
		Total	111	43.2	100.0	
	Missing	System	146	56.8		
	Total		257	100.0		
Manatee	Valid	Unchecked	75	25.7	98.7	98.7
		Checked	1	.3	1.3	100.0
		Total	76	26.0	100.0	

Missing	System	216	74.0	
Total		292	100.0	

q21 - q21 Do you recall where you heard about the ordinance? Hardware store/Home improvement centers

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	71	24.8	97.3	97.3
		Checked	2	.7	2.7	100.0
		Total	73	25.5	100.0	
	Missing	System	213	74.5		
	Total		286	100.0		
Pinellas	Valid	Unchecked	101	39.3	91.0	91.0
		Checked	10	3.9	9.0	100.0
		Total	111	43.2	100.0	
	Missing	System	146	56.8		
	Total		257	100.0		
Manatee	Valid	Unchecked	76	26.0	100.0	100.0
	Missing	System	216	74.0		
	Total		292	100.0		

q21 - q21 Do you recall where you heard about the ordinance? Landscaping company/Professional landscaper

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	71	24.8	97.3	97.3
		Checked	2	.7	2.7	100.0

		Total	73	25.5	100.0	
	Missing	System	213	74.5		
	Total		286	100.0		
Pinellas	Valid	Unchecked	103	40.1	92.8	92.8
		Checked	8	3.1	7.2	100.0
		Total	111	43.2	100.0	
	Missing	System	146	56.8		
	Total		257	100.0		
Manatee	Valid	Unchecked	65	22.3	85.5	85.5
		Checked	11	3.8	14.5	100.0
		Total	76	26.0	100.0	
	Missing	System	216	74.0		
	Total		292	100.0		

q21 - q21 Do you recall where you heard about the ordinance? Government office

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	71	24.8	97.3	97.3
		Checked	2	.7	2.7	100.0
		Total	73	25.5	100.0	
	Missing	System	213	74.5		
	Total		286	100.0		
Pinellas	Valid	Unchecked	108	42.0	97.3	97.3
		Checked	3	1.2	2.7	100.0
		Total	111	43.2	100.0	
	Missing	System	146	56.8		
	Total		257	100.0		
Manatee	Valid	Unchecked	72	24.7	94.7	94.7

		Checked	4	1.4	5.3	100.0
		Total	76	26.0	100.0	
	Missing	System	216	74.0		
	Total		292	100.0		

q21 - q21 Do you recall where you heard about the ordinance? Direct mail

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	71	24.8	97.3	97.3
		Checked	2	.7	2.7	100.0
		Total	73	25.5	100.0	
	Missing	System	213	74.5		
	Total		286	100.0		
Pinellas	Valid	Unchecked	107	41.6	96.4	96.4
		Checked	4	1.6	3.6	100.0
		Total	111	43.2	100.0	
	Missing	System	146	56.8		
	Total		257	100.0		
Manatee	Valid	Unchecked	75	25.7	98.7	98.7
		Checked	1	.3	1.3	100.0
		Total	76	26.0	100.0	
	Missing	System	216	74.0		
	Total		292	100.0		

q21 - q21 Do you recall where you heard about the ordinance? Website

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent

Hillsborough	Valid	Unchecked	69	24.1	94.5	94.5
		Checked	4	1.4	5.5	100.0
		Total	73	25.5	100.0	
	Missing	System	213	74.5		
	Total		286	100.0		
Pinellas	Valid	Unchecked	106	41.2	95.5	95.5
		Checked	5	1.9	4.5	100.0
		Total	111	43.2	100.0	
	Missing	System	146	56.8		
	Total		257	100.0		
Manatee	Valid	Unchecked	70	24.0	92.1	92.1
		Checked	6	2.1	7.9	100.0
		Total	76	26.0	100.0	
	Missing	System	216	74.0		
	Total		292	100.0		

q21 - q21 Do you recall where you heard about the ordinance? University of Florida/Agriculture Extension Service/Dept. of Ag

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	72	25.2	98.6	98.6
		Checked	1	.3	1.4	100.0
		Total	73	25.5	100.0	
	Missing	System	213	74.5		
	Total		286	100.0		
Pinellas	Valid	Unchecked	109	42.4	98.2	98.2
		Checked	2	.8	1.8	100.0
		Total	111	43.2	100.0	

	Missing	System	146	56.8		
	Total		257	100.0		
Manatee	Valid	Unchecked	74	25.3	97.4	97.4
		Checked	2	.7	2.6	100.0
		Total	76	26.0	100.0	
	Missing	System	216	74.0		
	Total		292	100.0		

q21 - q21 Do you recall where you heard about the ordinance? Other

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	58	20.3	79.5	79.5
		Checked	15	5.2	20.5	100.0
		Total	73	25.5	100.0	
	Missing	System	213	74.5		
	Total		286	100.0		
Pinellas	Valid	Unchecked	92	35.8	82.9	82.9
		Checked	19	7.4	17.1	100.0
		Total	111	43.2	100.0	
	Missing	System	146	56.8		
	Total		257	100.0		
Manatee	Valid	Unchecked	70	24.0	92.1	92.1
		Checked	6	2.1	7.9	100.0
		Total	76	26.0	100.0	
	Missing	System	216	74.0		
	Total		292	100.0		

q21 - q21 Do you recall where you heard about the ordinance? Don’t know

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	65	22.7	89.0	89.0
		Checked	8	2.8	11.0	100.0
		Total	73	25.5	100.0	
	Missing	System	213	74.5		
	Total		286	100.0		
Pinellas	Valid	Unchecked	105	40.9	94.6	94.6
		Checked	6	2.3	5.4	100.0
		Total	111	43.2	100.0	
	Missing	System	146	56.8		
	Total		257	100.0		
Manatee	Valid	Unchecked	66	22.6	86.8	86.8
		Checked	10	3.4	13.2	100.0
		Total	76	26.0	100.0	
	Missing	System	216	74.0		
	Total		292	100.0		

q21 - q21 Do you recall where you heard about the ordinance? All other missing

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Unchecked	72	25.2	98.6	98.6
		Checked	1	.3	1.4	100.0
		Total	73	25.5	100.0	
	Missing	System	213	74.5		
	Total		286	100.0		
Pinellas	Valid	Unchecked	111	43.2	100.0	100.0

	Missing	System	146	56.8		
	Total		257	100.0		
Manatee	Valid	Unchecked	75	25.7	98.7	98.7
		Checked	1	.3	1.3	100.0
		Total	76	26.0	100.0	
	Missing	System	216	74.0		
	Total		292	100.0		

q21 - q21 Do you recall where you heard about the ordinance? Other

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid		271	94.8	94.8	94.8
		arbor green community newsletter	1	.3	.3	95.1
		company where I work	1	.3	.3	95.5
		magazines	1	.3	.3	95.8
		newsletters	1	.3	.3	96.2
		newspaper	1	.3	.3	96.5
		radio	5	1.7	1.7	98.3
		Radio	3	1.0	1.0	99.3
		radio show	1	.3	.3	99.7
		water bill	1	.3	.3	100.0
		Total	286	100.0	100.0	
Pinellas	Valid		238	92.6	92.6	92.6
		Billboards	1	.4	.4	93.0
		church	1	.4	.4	93.4
		community group	1	.4	.4	93.8
		fire station	1	.4	.4	94.2

		flyers	1	.4	.4	94.6
		Inserts in water bill, electronic mail	1	.4	.4	94.9
		Library	1	.4	.4	95.3
		NEWSPAPER	1	.4	.4	95.7
		radio	3	1.2	1.2	96.9
		Radio	1	.4	.4	97.3
		radio npr	1	.4	.4	97.7
		radio, possibly	1	.4	.4	98.1
		Store	1	.4	.4	98.4
		Town informational pamphlet	1	.4	.4	98.8
		UTILITY BILL	1	.4	.4	99.2
		word of mouth	1	.4	.4	99.6
		yard guy	1	.4	.4	100.0
		Total	257	100.0	100.0	
Manatee	Valid		286	97.9	97.9	97.9
		Extension Office	1	.3	.3	98.3
		Fertilizer bag itself	1	.3	.3	98.6
		Homeowner's association	1	.3	.3	99.0
		pbs	1	.3	.3	99.3
		rADIO	1	.3	.3	99.7
		used to work at a condominium	1	.3	.3	100.0
		Total	292	100.0	100.0	

house - We're almost finished and just have a few demographic questions for statistical purposes. Thank you so much for your input today! house How long have you lived in the house you're in now? Enter "0" for less than 1 year "88" = don't know "99" = a

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	0	6	2.1	2.2	2.2
		1	9	3.1	3.2	5.4
		2	8	2.8	2.9	8.2
		3	9	3.1	3.2	11.5
		4	9	3.1	3.2	14.7
		5	10	3.5	3.6	18.3
		6	11	3.8	3.9	22.2
		7	13	4.5	4.7	26.9
		8	8	2.8	2.9	29.7
		9	9	3.1	3.2	33.0
		10	21	7.3	7.5	40.5
		11	7	2.4	2.5	43.0
		12	15	5.2	5.4	48.4
		13	6	2.1	2.2	50.5
		14	7	2.4	2.5	53.0
		15	10	3.5	3.6	56.6
		16	6	2.1	2.2	58.8
		17	7	2.4	2.5	61.3
		18	3	1.0	1.1	62.4
		20	13	4.5	4.7	67.0
		21	5	1.7	1.8	68.8
		22	4	1.4	1.4	70.3
		23	1	.3	.4	70.6
		24	6	2.1	2.2	72.8
		25	8	2.8	2.9	75.6
		26	4	1.4	1.4	77.1

		28	3	1.0	1.1	78.1
		29	3	1.0	1.1	79.2
		30	16	5.6	5.7	84.9
		31	3	1.0	1.1	86.0
		32	5	1.7	1.8	87.8
		33	2	.7	.7	88.5
		34	3	1.0	1.1	89.6
		35	1	.3	.4	90.0
		36	2	.7	.7	90.7
		38	2	.7	.7	91.4
		40	9	3.1	3.2	94.6
		42	1	.3	.4	95.0
		43	2	.7	.7	95.7
		44	1	.3	.4	96.1
		45	2	.7	.7	96.8
		47	1	.3	.4	97.1
		50	2	.7	.7	97.8
		53	2	.7	.7	98.6
		55	1	.3	.4	98.9
		57	1	.3	.4	99.3
		58	1	.3	.4	99.6
		60	1	.3	.4	100.0
		Total	279	97.6	100.0	
	Missing	88	1	.3		
		99	6	2.1		
		Total	7	2.4		
	Total		286	100.0		
Pinellas	Valid	0	5	1.9	2.0	2.0

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1	9	3.5	3.6	5.6
2	10	3.9	4.0	9.6
3	4	1.6	1.6	11.2
4	1	.4	.4	11.6
5	2	.8	.8	12.4
6	7	2.7	2.8	15.1
7	5	1.9	2.0	17.1
8	7	2.7	2.8	19.9
9	7	2.7	2.8	22.7
10	22	8.6	8.8	31.5
11	4	1.6	1.6	33.1
12	19	7.4	7.6	40.6
13	4	1.6	1.6	42.2
14	6	2.3	2.4	44.6
15	14	5.4	5.6	50.2
16	11	4.3	4.4	54.6
17	3	1.2	1.2	55.8
18	5	1.9	2.0	57.8
19	3	1.2	1.2	59.0
20	16	6.2	6.4	65.3
21	5	1.9	2.0	67.3
22	9	3.5	3.6	70.9
23	4	1.6	1.6	72.5
24	2	.8	.8	73.3
25	6	2.3	2.4	75.7
26	2	.8	.8	76.5
27	5	1.9	2.0	78.5
28	4	1.6	1.6	80.1
29	2	.8	.8	80.9

		30	10	3.9	4.0	84.9
		31	1	.4	.4	85.3
		33	3	1.2	1.2	86.5
		34	2	.8	.8	87.3
		35	2	.8	.8	88.0
		36	2	.8	.8	88.8
		37	1	.4	.4	89.2
		38	1	.4	.4	89.6
		39	1	.4	.4	90.0
		40	8	3.1	3.2	93.2
		41	1	.4	.4	93.6
		44	1	.4	.4	94.0
		49	1	.4	.4	94.4
		50	7	2.7	2.8	97.2
		51	1	.4	.4	97.6
		52	1	.4	.4	98.0
		55	1	.4	.4	98.4
		56	3	1.2	1.2	99.6
		62	1	.4	.4	100.0
		Total	251	97.7	100.0	
	Missing	88	3	1.2		
		99	3	1.2		
		Total	6	2.3		
	Total		257	100.0		
Manatee	Valid	0	9	3.1	3.1	3.1
		1	4	1.4	1.4	4.5
		2	12	4.1	4.2	8.7
		3	5	1.7	1.7	10.5
		4	7	2.4	2.4	12.9

5	11	3.8	3.8	16.7
6	17	5.8	5.9	22.6
7	21	7.2	7.3	30.0
8	17	5.8	5.9	35.9
9	11	3.8	3.8	39.7
10	27	9.2	9.4	49.1
11	10	3.4	3.5	52.6
12	20	6.8	7.0	59.6
13	6	2.1	2.1	61.7
14	4	1.4	1.4	63.1
15	13	4.5	4.5	67.6
16	9	3.1	3.1	70.7
17	11	3.8	3.8	74.6
18	4	1.4	1.4	76.0
19	3	1.0	1.0	77.0
20	14	4.8	4.9	81.9
21	5	1.7	1.7	83.6
22	2	.7	.7	84.3
23	1	.3	.3	84.7
24	4	1.4	1.4	86.1
25	4	1.4	1.4	87.5
26	1	.3	.3	87.8
28	3	1.0	1.0	88.9
29	1	.3	.3	89.2
30	6	2.1	2.1	91.3
31	2	.7	.7	92.0
32	1	.3	.3	92.3
33	2	.7	.7	93.0
34	4	1.4	1.4	94.4

	35	5	1.7	1.7	96.2
	36	1	.3	.3	96.5
	39	1	.3	.3	96.9
	40	1	.3	.3	97.2
	41	2	.7	.7	97.9
	45	1	.3	.3	98.3
	50	3	1.0	1.0	99.3
	51	1	.3	.3	99.7
	72	1	.3	.3	100.0
	Total	287	98.3	100.0	
Missing	88	2	.7		
	99	3	1.0		
	Total	5	1.7		
Total		292	100.0		

hoa - hoa Do you have a Homeowner's Association in your community?

county - county Which county do you live in?			Frequency	Percent	Valid Percent
Hillsborough	Valid	Yes	149	52.1	52.5
		No	131	45.8	46.1
		Don't know	4	1.4	1.4
		Total	284	99.3	100.0
	Missing	All other missing	2	.7	
	Total		286	100.0	
Pinellas	Valid	Yes	107	41.6	41.6
		No	145	56.4	56.4
		Don't know	5	1.9	1.9
		Total	257	100.0	100.0

Manatee	Valid	Yes	185	63.4	63.8
		No	101	34.6	34.8
		Don't know	4	1.4	1.4
		Total	290	99.3	100.0
	Missing	All other missing	2	.7	
	Total		292	100.0	

hoa - hoa Do you have a Homeowner's Association in your community?

county - county Which county do you live in?			Cumulative Percent
Hillsborough	Valid	Yes	52.5
		No	98.6
		Don't know	100.0
		Total	
	Missing	All other missing	
	Total		
Pinellas	Valid	Yes	41.6
		No	98.1
		Don't know	100.0
		Total	
Manatee	Valid	Yes	63.8
		No	98.6
		Don't know	100.0
		Total	
	Missing	All other missing	
	Total		

hbuilt - hbuilt In what year was your house built? RECORD YEAR. IF REQUIRED, PROBE: Well, approximately? Or: Just your best guess? [INTERVIEWER: ENTER 9999 FOR ALL MISSING]

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	1898	1	.3	.4	.4
		1912	1	.3	.4	.8
		1920	1	.3	.4	1.1
		1923	1	.3	.4	1.5
		1926	1	.3	.4	1.9
		1935	1	.3	.4	2.3
		1936	1	.3	.4	2.6
		1940	2	.7	.8	3.4
		1948	3	1.0	1.1	4.5
		1950	8	2.8	3.0	7.5
		1953	2	.7	.8	8.3
		1954	3	1.0	1.1	9.4
		1955	2	.7	.8	10.2
		1956	3	1.0	1.1	11.3
		1957	1	.3	.4	11.7
		1959	4	1.4	1.5	13.2
		1960	8	2.8	3.0	16.2
		1961	3	1.0	1.1	17.4
		1962	7	2.4	2.6	20.0
		1964	2	.7	.8	20.8
		1965	3	1.0	1.1	21.9
		1966	2	.7	.8	22.6
		1967	2	.7	.8	23.4
		1968	5	1.7	1.9	25.3
		1969	3	1.0	1.1	26.4
		1970	7	2.4	2.6	29.1

1971	1	.3	.4	29.4
1972	4	1.4	1.5	30.9
1973	2	.7	.8	31.7
1974	4	1.4	1.5	33.2
1975	3	1.0	1.1	34.3
1976	8	2.8	3.0	37.4
1977	4	1.4	1.5	38.9
1978	4	1.4	1.5	40.4
1979	5	1.7	1.9	42.3
1980	12	4.2	4.5	46.8
1981	4	1.4	1.5	48.3
1982	5	1.7	1.9	50.2
1983	3	1.0	1.1	51.3
1984	7	2.4	2.6	54.0
1985	5	1.7	1.9	55.8
1986	2	.7	.8	56.6
1987	8	2.8	3.0	59.6
1988	2	.7	.8	60.4
1989	5	1.7	1.9	62.3
1990	5	1.7	1.9	64.2
1991	2	.7	.8	64.9
1992	5	1.7	1.9	66.8
1994	6	2.1	2.3	69.1
1995	6	2.1	2.3	71.3
1996	2	.7	.8	72.1
1998	7	2.4	2.6	74.7
1999	12	4.2	4.5	79.2
2000	5	1.7	1.9	81.1

		2001	10	3.5	3.8	84.9
		2002	6	2.1	2.3	87.2
		2003	6	2.1	2.3	89.4
		2004	7	2.4	2.6	92.1
		2005	2	.7	.8	92.8
		2006	9	3.1	3.4	96.2
		2008	3	1.0	1.1	97.4
		2009	1	.3	.4	97.7
		2010	3	1.0	1.1	98.9
		2011	3	1.0	1.1	100.0
		Total	265	92.7	100.0	
	Missing	9999	21	7.3		
	Total		286	100.0		
Pinellas	Valid	1904	1	.4	.4	.4
		1912	1	.4	.4	.9
		1920	1	.4	.4	1.3
		1922	1	.4	.4	1.7
		1925	2	.8	.9	2.6
		1935	1	.4	.4	3.0
		1945	2	.8	.9	3.9
		1948	1	.4	.4	4.3
		1949	1	.4	.4	4.8
		1950	9	3.5	3.9	8.7
		1951	2	.8	.9	9.5
		1952	5	1.9	2.2	11.7
		1953	9	3.5	3.9	15.6
		1954	4	1.6	1.7	17.3
		1955	4	1.6	1.7	19.0

1956	8	3.1	3.5	22.5
1957	2	.8	.9	23.4
1958	9	3.5	3.9	27.3
1959	6	2.3	2.6	29.9
1960	12	4.7	5.2	35.1
1961	3	1.2	1.3	36.4
1962	4	1.6	1.7	38.1
1963	4	1.6	1.7	39.8
1964	2	.8	.9	40.7
1965	5	1.9	2.2	42.9
1966	3	1.2	1.3	44.2
1967	1	.4	.4	44.6
1968	6	2.3	2.6	47.2
1969	4	1.6	1.7	48.9
1970	8	3.1	3.5	52.4
1971	2	.8	.9	53.2
1972	4	1.6	1.7	55.0
1973	7	2.7	3.0	58.0
1974	4	1.6	1.7	59.7
1976	1	.4	.4	60.2
1977	3	1.2	1.3	61.5
1978	10	3.9	4.3	65.8
1979	7	2.7	3.0	68.8
1980	5	1.9	2.2	71.0
1981	2	.8	.9	71.9
1982	8	3.1	3.5	75.3
1983	1	.4	.4	75.8
1984	4	1.6	1.7	77.5
1985	9	3.5	3.9	81.4

		1986	4	1.6	1.7	83.1
		1987	2	.8	.9	84.0
		1988	2	.8	.9	84.8
		1989	1	.4	.4	85.3
		1990	4	1.6	1.7	87.0
		1991	1	.4	.4	87.4
		1992	5	1.9	2.2	89.6
		1993	1	.4	.4	90.0
		1994	3	1.2	1.3	91.3
		1995	3	1.2	1.3	92.6
		1996	4	1.6	1.7	94.4
		1997	1	.4	.4	94.8
		1998	2	.8	.9	95.7
		1999	2	.8	.9	96.5
		2000	2	.8	.9	97.4
		2001	1	.4	.4	97.8
		2002	2	.8	.9	98.7
		2004	1	.4	.4	99.1
		2007	1	.4	.4	99.6
		2010	1	.4	.4	100.0
		Total	231	89.9	100.0	
	Missing	9999	26	10.1		
	Total		257	100.0		
Manatee	Valid	1912	1	.3	.4	.4
		1927	2	.7	.7	1.1
		1928	1	.3	.4	1.5
		1930	1	.3	.4	1.8
		1931	1	.3	.4	2.2
		1949	1	.3	.4	2.6

1950	8	2.7	3.0	5.5
1951	1	.3	.4	5.9
1954	3	1.0	1.1	7.0
1955	3	1.0	1.1	8.1
1956	1	.3	.4	8.5
1957	3	1.0	1.1	9.6
1959	3	1.0	1.1	10.7
1960	5	1.7	1.8	12.5
1962	4	1.4	1.5	14.0
1965	2	.7	.7	14.8
1966	2	.7	.7	15.5
1967	4	1.4	1.5	17.0
1968	4	1.4	1.5	18.5
1969	2	.7	.7	19.2
1970	7	2.4	2.6	21.8
1971	2	.7	.7	22.5
1972	2	.7	.7	23.2
1973	1	.3	.4	23.6
1974	4	1.4	1.5	25.1
1975	3	1.0	1.1	26.2
1976	6	2.1	2.2	28.4
1977	3	1.0	1.1	29.5
1978	5	1.7	1.8	31.4
1979	4	1.4	1.5	32.8
1980	6	2.1	2.2	35.1
1981	1	.3	.4	35.4
1982	2	.7	.7	36.2
1983	1	.3	.4	36.5
1984	3	1.0	1.1	37.6

	1985	7	2.4	2.6	40.2
	1986	6	2.1	2.2	42.4
	1987	11	3.8	4.1	46.5
	1988	7	2.4	2.6	49.1
	1989	8	2.7	3.0	52.0
	1990	7	2.4	2.6	54.6
	1991	4	1.4	1.5	56.1
	1992	4	1.4	1.5	57.6
	1993	4	1.4	1.5	59.0
	1994	3	1.0	1.1	60.1
	1995	6	2.1	2.2	62.4
	1996	4	1.4	1.5	63.8
	1997	6	2.1	2.2	66.1
	1998	4	1.4	1.5	67.5
	1999	3	1.0	1.1	68.6
	2000	13	4.5	4.8	73.4
	2001	14	4.8	5.2	78.6
	2002	16	5.5	5.9	84.5
	2003	7	2.4	2.6	87.1
	2004	12	4.1	4.4	91.5
	2005	13	4.5	4.8	96.3
	2006	5	1.7	1.8	98.2
	2007	1	.3	.4	98.5
	2008	1	.3	.4	98.9
	2009	1	.3	.4	99.3
	2010	1	.3	.4	99.6
	2011	1	.3	.4	100.0
	Total	271	92.8	100.0	
Missing	9999	21	7.2		

hbuilt - hbuilt In what year was your house built? RECORD YEAR. IF REQUIRED, PROBE: Well, approximately? Or: Just your best guess? [INTERVIEWER: ENTER 9999 FOR ALL MISSING]

county - county Which county do you live in?		Frequency	Percent	Valid Percent	Cumulative Percent
Manatee	Total	292	100.0		

employ - employ What is your current employment status? Are you working full time, working part time, temporarily laid off, unemployed, retired, permanently disabled, a homemaker, a student, or what?

county - county Which county do you live in?			Frequency	Percent	Valid Percent
Hillsborough	Valid	Working full time	106	37.1	37.1
		Working part time	21	7.3	7.3
		Not working - Temporary lay off	4	1.4	1.4
		Not working - Looking for work	2	.7	.7
		Not working - Retired	109	38.1	38.1
		Not working - Disabled	9	3.1	3.1
		Not working - Homemaker	18	6.3	6.3
		Not working - Student	1	.3	.3
		Not working - Other	4	1.4	1.4
		DK/NA/Refused	12	4.2	4.2
		Total	286	100.0	100.0
Pinellas	Valid	Working full time	79	30.7	30.7
		Working part time	16	6.2	6.2
		Not working - Temporary lay off	1	.4	.4
		Not working - Looking for work	3	1.2	1.2
		Not working - Retired	129	50.2	50.2

		Not working - Disabled	5	1.9	1.9
		Not working - Homemaker	8	3.1	3.1
		Not working - Student	4	1.6	1.6
		Not working - Other	7	2.7	2.7
		DK/NA/Refused	5	1.9	1.9
		Total	257	100.0	100.0
Manatee	Valid	Working full time	87	29.8	29.8
		Working part time	17	5.8	5.8
		Not working - Temporary lay off	3	1.0	1.0
		Not working - Looking for work	3	1.0	1.0
		Not working - Retired	158	54.1	54.1
		Not working - Disabled	4	1.4	1.4
		Not working - Homemaker	9	3.1	3.1
		Not working - Student	1	.3	.3
		Not working - Other	2	.7	.7
		DK/NA/Refused	8	2.7	2.7

employ - employ What is your current employment status? Are you working full time, working part time, temporarily laid off, unemployed, retired, permanently disabled, a homemaker, a student, or what?

county - county Which county do you live in?			Cumulative Percent
Hillsborough	Valid	Working full time	37.1
		Working part time	44.4
		Not working - Temporary lay off	45.8
		Not working - Looking for work	46.5
		Not working - Retired	84.6
		Not working - Disabled	87.8
		Not working - Homemaker	94.1

		Not working - Student	94.4
		Not working - Other	95.8
		DK/NA/Refused	100.0
		Total	
Pinellas	Valid	Working full time	30.7
		Working part time	37.0
		Not working - Temporary lay off	37.4
		Not working - Looking for work	38.5
		Not working - Retired	88.7
		Not working - Disabled	90.7
		Not working - Homemaker	93.8
		Not working - Student	95.3
		Not working - Other	98.1
		DK/NA/Refused	100.0
		Total	
Manatee	Valid	Working full time	29.8
		Working part time	35.6
		Not working - Temporary lay off	36.6
		Not working - Looking for work	37.7
		Not working - Retired	91.8
		Not working - Disabled	93.2
		Not working - Homemaker	96.2
		Not working - Student	96.6
		Not working - Other	97.3
		DK/NA/Refused	100.0

employ - employ What is your current employment status? Are you working full time, working part time, temporarily laid off, unemployed, retired, permanently disabled, a homemaker, a student, or what?

county - county Which county do you live in?			Frequency	Percent	Valid Percent
Manatee	Valid	Total	292	100.0	100.0

employ - employ What is your current employment status? Are you working full time, working part time, temporarily laid off, unemployed, retired, permanently disabled, a homemaker, a student, or what?

county - county Which county do you live in?			Cumulative Percent
Manatee	Valid	Total	

educ - educ What is the highest grade of school or year of college you have completed?

county - county Which county do you live in?			Frequency	Percent	Valid Percent
Hillsborough	Valid	Less than high school (Grade 11 or less)	6	2.1	2.1
		High school diploma (including GED)	50	17.5	17.5
		Some college	56	19.6	19.6
		Associates degree (2 year) or specialized technical training	41	14.3	14.3
		Bachelor's degree	70	24.5	24.5
		Some graduate training	7	2.4	2.4
		Graduate or professional degree	42	14.7	14.7
		DK/NA/Refused	14	4.9	4.9
		Total	286	100.0	100.0
Pinellas	Valid	High school diploma (including GED)	53	20.6	20.6
		Some college	49	19.1	19.1
		Associates degree (2 year) or specialized technical training	35	13.6	13.6

		Bachelor's degree	67	26.1	26.1
		Some graduate training	5	1.9	1.9
		Graduate or professional degree	40	15.6	15.6
		DK/NA/Refused	8	3.1	3.1
		Total	257	100.0	100.0
Manatee	Valid	Less than high school (Grade 11 or less)	6	2.1	2.1
		High school diploma (including GED)	46	15.8	15.8
		Some college	45	15.4	15.4
		Associates degree (2 year) or specialized technical training	39	13.4	13.4
		Bachelor's degree	84	28.8	28.8
		Some graduate training	12	4.1	4.1
		Graduate or professional degree	49	16.8	16.8
		DK/NA/Refused	11	3.8	3.8
		Total	292	100.0	100.0

educ - educ What is the highest grade of school or year of college you have completed?

county - county Which county do you live in?			Cumulative Percent
Hillsborough	Valid	Less than high school (Grade 11 or less)	2.1
		High school diploma (including GED)	19.6
		Some college	39.2
		Associates degree (2 year) or specialized technical training	53.5
		Bachelor's degree	78.0
		Some graduate training	80.4
		Graduate or professional degree	95.1

		DK/NA/Refused	100.0
		Total	
Pinellas	Valid	High school diploma (including GED)	20.6
		Some college	39.7
		Associates degree (2 year) or specialized technical training	53.3
		Bachelor's degree	79.4
		Some graduate training	81.3
		Graduate or professional degree	96.9
		DK/NA/Refused	100.0
		Total	
Manatee	Valid	Less than high school (Grade 11 or less)	2.1
		High school diploma (including GED)	17.8
		Some college	33.2
		Associates degree (2 year) or specialized technical training	46.6
		Bachelor's degree	75.3
		Some graduate training	79.5
		Graduate or professional degree	96.2
		DK/NA/Refused	100.0
		Total	

byear - byear In what year were you born? ENTER 9999 FOR ALL MISSING

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	1923	1	.3	.4	.4
		1924	2	.7	.8	1.1
		1925	2	.7	.8	1.9

1926	1	.3	.4	2.3
1927	2	.7	.8	3.0
1928	4	1.4	1.5	4.6
1929	6	2.1	2.3	6.8
1930	2	.7	.8	7.6
1931	2	.7	.8	8.4
1932	5	1.7	1.9	10.3
1933	4	1.4	1.5	11.8
1934	3	1.0	1.1	12.9
1935	3	1.0	1.1	14.1
1936	4	1.4	1.5	15.6
1937	6	2.1	2.3	17.9
1938	4	1.4	1.5	19.4
1939	2	.7	.8	20.2
1940	6	2.1	2.3	22.4
1941	2	.7	.8	23.2
1942	10	3.5	3.8	27.0
1943	5	1.7	1.9	28.9
1944	7	2.4	2.7	31.6
1945	5	1.7	1.9	33.5
1946	8	2.8	3.0	36.5
1947	7	2.4	2.7	39.2
1948	4	1.4	1.5	40.7
1949	6	2.1	2.3	43.0
1950	5	1.7	1.9	44.9
1951	6	2.1	2.3	47.1
1952	9	3.1	3.4	50.6
1953	7	2.4	2.7	53.2

1954	2	.7	.8	54.0
1955	5	1.7	1.9	55.9
1956	11	3.8	4.2	60.1
1957	6	2.1	2.3	62.4
1958	10	3.5	3.8	66.2
1959	10	3.5	3.8	70.0
1960	6	2.1	2.3	72.2
1961	6	2.1	2.3	74.5
1962	4	1.4	1.5	76.0
1963	1	.3	.4	76.4
1964	4	1.4	1.5	77.9
1965	5	1.7	1.9	79.8
1966	5	1.7	1.9	81.7
1967	2	.7	.8	82.5
1968	7	2.4	2.7	85.2
1969	3	1.0	1.1	86.3
1970	3	1.0	1.1	87.5
1971	3	1.0	1.1	88.6
1972	5	1.7	1.9	90.5
1973	5	1.7	1.9	92.4
1974	4	1.4	1.5	93.9
1975	4	1.4	1.5	95.4
1976	2	.7	.8	96.2
1977	2	.7	.8	97.0
1978	1	.3	.4	97.3
1980	1	.3	.4	97.7
1986	2	.7	.8	98.5
1987	1	.3	.4	98.9

		1992	1	.3	.4	99.2
		1993	2	.7	.8	100.0
		Total	263	92.0	100.0	
	Missing	9999	23	8.0		
	Total		286	100.0		
Pinellas	Valid	1917	1	.4	.4	.4
		1921	3	1.2	1.3	1.7
		1922	2	.8	.9	2.6
		1924	1	.4	.4	3.0
		1925	3	1.2	1.3	4.3
		1926	3	1.2	1.3	5.7
		1927	4	1.6	1.7	7.4
		1928	2	.8	.9	8.3
		1929	3	1.2	1.3	9.6
		1930	3	1.2	1.3	10.9
		1931	2	.8	.9	11.7
		1932	6	2.3	2.6	14.3
		1933	2	.8	.9	15.2
		1934	4	1.6	1.7	17.0
		1935	5	1.9	2.2	19.1
		1936	3	1.2	1.3	20.4
		1937	3	1.2	1.3	21.7
		1938	13	5.1	5.7	27.4
		1939	4	1.6	1.7	29.1
		1940	2	.8	.9	30.0
		1941	4	1.6	1.7	31.7
		1942	7	2.7	3.0	34.8
		1943	5	1.9	2.2	37.0
		1944	6	2.3	2.6	39.6

1945	5	1.9	2.2	41.7
1946	6	2.3	2.6	44.3
1947	11	4.3	4.8	49.1
1948	10	3.9	4.3	53.5
1949	3	1.2	1.3	54.8
1950	6	2.3	2.6	57.4
1951	5	1.9	2.2	59.6
1952	9	3.5	3.9	63.5
1953	5	1.9	2.2	65.7
1954	2	.8	.9	66.5
1955	7	2.7	3.0	69.6
1956	4	1.6	1.7	71.3
1957	4	1.6	1.7	73.0
1958	5	1.9	2.2	75.2
1959	7	2.7	3.0	78.3
1960	4	1.6	1.7	80.0
1961	4	1.6	1.7	81.7
1962	8	3.1	3.5	85.2
1963	2	.8	.9	86.1
1964	1	.4	.4	86.5
1965	2	.8	.9	87.4
1966	2	.8	.9	88.3
1967	2	.8	.9	89.1
1968	5	1.9	2.2	91.3
1969	2	.8	.9	92.2
1971	2	.8	.9	93.0
1972	3	1.2	1.3	94.3
1974	1	.4	.4	94.8
1975	1	.4	.4	95.2

		1976	1	.4	.4	95.7
		1977	1	.4	.4	96.1
		1978	2	.8	.9	97.0
		1979	1	.4	.4	97.4
		1980	2	.8	.9	98.3
		1981	1	.4	.4	98.7
		1982	1	.4	.4	99.1
		1988	1	.4	.4	99.6
		1994	1	.4	.4	100.0
		Total	230	89.5	100.0	
	Missing	9999	27	10.5		
	Total		257	100.0		
Manatee	Valid	1920	1	.3	.4	.4
		1921	1	.3	.4	.7
		1924	2	.7	.7	1.5
		1925	3	1.0	1.1	2.6
		1926	1	.3	.4	3.0
		1927	7	2.4	2.6	5.6
		1928	3	1.0	1.1	6.7
		1929	9	3.1	3.3	10.0
		1930	8	2.7	3.0	13.0
		1931	5	1.7	1.9	14.8
		1932	5	1.7	1.9	16.7
		1933	4	1.4	1.5	18.1
		1934	2	.7	.7	18.9
		1935	10	3.4	3.7	22.6
		1936	5	1.7	1.9	24.4
		1937	5	1.7	1.9	26.3
		1938	4	1.4	1.5	27.8

1939	9	3.1	3.3	31.1
1940	8	2.7	3.0	34.1
1941	16	5.5	5.9	40.0
1942	9	3.1	3.3	43.3
1943	6	2.1	2.2	45.6
1944	8	2.7	3.0	48.5
1945	4	1.4	1.5	50.0
1946	7	2.4	2.6	52.6
1947	7	2.4	2.6	55.2
1948	6	2.1	2.2	57.4
1949	6	2.1	2.2	59.6
1950	4	1.4	1.5	61.1
1951	8	2.7	3.0	64.1
1952	9	3.1	3.3	67.4
1953	4	1.4	1.5	68.9
1954	7	2.4	2.6	71.5
1955	5	1.7	1.9	73.3
1956	3	1.0	1.1	74.4
1957	4	1.4	1.5	75.9
1958	4	1.4	1.5	77.4
1959	5	1.7	1.9	79.3
1960	6	2.1	2.2	81.5
1961	1	.3	.4	81.9
1962	4	1.4	1.5	83.3
1963	2	.7	.7	84.1
1964	5	1.7	1.9	85.9
1965	3	1.0	1.1	87.0
1966	5	1.7	1.9	88.9
1967	4	1.4	1.5	90.4

		1968	2	.7	.7	91.1
		1969	1	.3	.4	91.5
		1970	1	.3	.4	91.9
		1971	2	.7	.7	92.6
		1972	3	1.0	1.1	93.7
		1973	2	.7	.7	94.4
		1974	4	1.4	1.5	95.9
		1975	1	.3	.4	96.3
		1976	3	1.0	1.1	97.4
		1977	1	.3	.4	97.8
		1979	1	.3	.4	98.1
		1981	1	.3	.4	98.5
		1982	2	.7	.7	99.3
		1983	1	.3	.4	99.6
		1989	1	.3	.4	100.0
		Total	270	92.5	100.0	
	Missing	9999	22	7.5		
	Total		292	100.0		

child - child How many children under the age of 18 currently live with you? ENTER 99 FOR ALL MISSING

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	0	212	74.1	76.3	76.3
		1	32	11.2	11.5	87.8
		2	28	9.8	10.1	97.8
		3	6	2.1	2.2	100.0
		Total	278	97.2	100.0	

	Missing	99	8	2.8		
	Total		286	100.0		
Pinellas	Valid	0	216	84.0	86.4	86.4
		1	15	5.8	6.0	92.4
		2	12	4.7	4.8	97.2
		3	4	1.6	1.6	98.8
		4	1	.4	.4	99.2
		5	1	.4	.4	99.6
		7	1	.4	.4	100.0
		Total	250	97.3	100.0	
	Missing	99	7	2.7		
	Total		257	100.0		
Manatee	Valid	0	233	79.8	82.9	82.9
		1	25	8.6	8.9	91.8
		2	12	4.1	4.3	96.1
		3	8	2.7	2.8	98.9
		4	1	.3	.4	99.3
		5	2	.7	.7	100.0
		Total	281	96.2	100.0	
	Missing	99	11	3.8		
	Total		292	100.0		

race - race Do you consider yourself to be White, Black or African American, Hispanic, Asian or Pacific Islander, Native American, or some other race?

county - county Which county do you live in?			Frequency	Percent
Hillsborough	Valid	White	230	80.4
		African American or Black	13	4.5
		Hispanic	17	5.9

		Asian or Pacific Islander	3	1.0
		Alaskan Native/Native American	1	.3
		Other:	2	.7
		DK/NA/Refused	20	7.0
		Total	286	100.0
Pinellas	Valid	White	233	90.7
		African American or Black	2	.8
		Hispanic	2	.8
		Asian or Pacific Islander	3	1.2
		Other:	2	.8
		DK/NA/Refused	15	5.8
		Total	257	100.0
Manatee	Valid	White	262	89.7
		African American or Black	2	.7
		Hispanic	3	1.0
		Asian or Pacific Islander	3	1.0
		Alaskan Native/Native American	1	.3
		Other:	5	1.7
		DK/NA/Refused	16	5.5
		Total	292	100.0

race - race Do you consider yourself to be White, Black or African American, Hispanic, Asian or Pacific Islander, Native American, or some other race?

county - county Which county do you live in?			Valid Percent	Cumulative Percent
Hillsborough	Valid	White	80.4	80.4
		African American or Black	4.5	85.0
		Hispanic	5.9	90.9
		Asian or Pacific Islander	1.0	92.0

		Alaskan Native/Native American	.3	92.3
		Other:	.7	93.0
		DK/NA/Refused	7.0	100.0
		Total	100.0	
Pinellas	Valid	White	90.7	90.7
		African American or Black	.8	91.4
		Hispanic	.8	92.2
		Asian or Pacific Islander	1.2	93.4
		Other:	.8	94.2
		DK/NA/Refused	5.8	100.0
		Total	100.0	
Manatee	Valid	White	89.7	89.7
		African American or Black	.7	90.4
		Hispanic	1.0	91.4
		Asian or Pacific Islander	1.0	92.5
		Alaskan Native/Native American	.3	92.8
		Other:	1.7	94.5
		DK/NA/Refused	5.5	100.0
		Total	100.0	

race - race Do you consider yourself to be White, Black or African American, Hispanic, Asian or Pacific Islander, Native American, or some other race? Other:

county - county Which county do you live in?			Frequency	Percent	Valid Percent
Hillsborough	Valid		284	99.3	99.3
		multiracial	1	.3	.3
		White/Hispanic	1	.3	.3
		Total	286	100.0	100.0
Pinellas	Valid		255	99.2	99.2

		american	1	.4	.4
		N/A	1	.4	.4
		Total	257	100.0	100.0
Manatee	Valid		287	98.3	98.3
		american	1	.3	.3
		American	1	.3	.3
		Jewish	1	.3	.3
		mixed breed	1	.3	.3
		mixed race	1	.3	.3
		Total	292	100.0	100.0

race - race Do you consider yourself to be White, Black or African American, Hispanic, Asian or Pacific Islander, Native American, or some other race? Other:

county - county Which county do you live in?			Cumulative Percent
Hillsborough	Valid		99.3
		multiracial	99.7
		White/Hispanic	100.0
		Total	
Pinellas	Valid		99.2
		american	99.6
		N/A	100.0
		Total	
Manatee	Valid		98.3
		american	98.6
		American	99.0
		Jewish	99.3
		mixed breed	99.7
		mixed race	100.0
		Total	

income - income Which of the following categories best describes your total annual household income before taxes? Remember, this information will only be associated with your other responses to this survey and never with you as an individual.

county - county Which county do you live in?			Frequency	Percent	Valid Percent
Hillsborough	Valid	Less than $25,000	26	9.1	9.2
		$25,000 to $49,999	36	12.6	12.7
		$50,000 to $74,999	24	8.4	8.5
		$75,000 to $99,999	36	12.6	12.7
		$100,000 to $124,999	23	8.0	8.1
		125,000 to $149,999	11	3.8	3.9
		Over $150,000	17	5.9	6.0
		Refused	111	38.8	39.1
		Total	284	99.3	100.0
	Missing	All other missing	2	.7	
	Total		286	100.0	
Pinellas	Valid	Less than $25,000	21	8.2	8.2
		$25,000 to $49,999	37	14.4	14.4
		$50,000 to $74,999	30	11.7	11.7
		$75,000 to $99,999	24	9.3	9.3
		$100,000 to $124,999	19	7.4	7.4
		125,000 to $149,999	3	1.2	1.2
		Over $150,000	10	3.9	3.9
		Refused	113	44.0	44.0
		Total	257	100.0	100.0
Manatee	Valid	Less than $25,000	11	3.8	3.9
		$25,000 to $49,999	43	14.7	15.1
		$50,000 to $74,999	46	15.8	16.1

	$75,000 to $99,999	34	11.6	11.9
	$100,000 to $124,999	14	4.8	4.9
	125,000 to $149,999	7	2.4	2.5
	Over $150,000	18	6.2	6.3
	Refused	112	38.4	39.3
	Total	285	97.6	100.0
Missing	All other missing	7	2.4	
Total		292	100.0	

income - income Which of the following categories best describes your total annual household income before taxes? Remember, this information will only be associated with your other responses to this survey and never with you as an individual.

county - county Which county do you live in?			Cumulative Percent
Hillsborough	Valid	Less than $25,000	9.2
		$25,000 to $49,999	21.8
		$50,000 to $74,999	30.3
		$75,000 to $99,999	43.0
		$100,000 to $124,999	51.1
		125,000 to $149,999	54.9
		Over $150,000	60.9
		Refused	100.0
		Total	
	Missing	All other missing	
	Total		
Pinellas	Valid	Less than $25,000	8.2
		$25,000 to $49,999	22.6
		$50,000 to $74,999	34.2
		$75,000 to $99,999	43.6
		$100,000 to $124,999	51.0

		125,000 to $149,999	52.1
		Over $150,000	56.0
		Refused	100.0
		Total	
Manatee	Valid	Less than $25,000	3.9
		$25,000 to $49,999	18.9
		$50,000 to $74,999	35.1
		$75,000 to $99,999	47.0
		$100,000 to $124,999	51.9
		125,000 to $149,999	54.4
		Over $150,000	60.7
		Refused	100.0
		Total	
	Missing	All other missing	
	Total		

rgender - rgender Record R's gender.

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Male	117	40.9	40.9	40.9
		Female	169	59.1	59.1	100.0
		Total	286	100.0	100.0	
Pinellas	Valid	Male	101	39.3	39.3	39.3
		Female	156	60.7	60.7	100.0
		Total	257	100.0	100.0	
Manatee	Valid	Male	110	37.7	37.7	37.7
		Female	182	62.3	62.3	100.0
		Total	292	100.0	100.0	

age recoded into three categories

county - county Which county do you live in?			Frequency	Percent	Valid Percent
Hillsborough	Valid	18-29 yrs	6	2.1	2.3
		30-64 yrs	154	53.8	58.6
		65 yrs and older	103	36.0	39.2
		Total	263	92.0	100.0
	Missing	System	23	8.0	
	Total		286	100.0	
Pinellas	Valid	18-29 yrs	2	.8	.9
		30-64 yrs	115	44.7	50.0
		65 yrs and older	113	44.0	49.1
		Total	230	89.5	100.0
	Missing	System	27	10.5	
	Total		257	100.0	
Manatee	Valid	18-29 yrs	2	.7	.7
		30-64 yrs	119	40.8	44.1
		65 yrs and older	149	51.0	55.2
		Total	270	92.5	100.0
	Missing	System	22	7.5	
	Total		292	100.0	

age recoded into three categories

county - county Which county do you live in?			Cumulative Percent
Hillsborough	Valid	18-29 yrs	2.3

		30-64 yrs	60.8
		65 yrs and older	100.0
		Total	
	Missing	System	
	Total		
Pinellas	Valid	18-29 yrs	.9
		30-64 yrs	50.9
		65 yrs and older	100.0
		Total	
	Missing	System	
	Total		
Manatee	Valid	18-29 yrs	.7
		30-64 yrs	44.8
		65 yrs and older	100.0
		Total	
	Missing	System	
	Total		

age recoded into two categories

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	18-64 years	160	55.9	60.8	60.8
		65 and over	103	36.0	39.2	100.0
		Total	263	92.0	100.0	
	Missing	System	23	8.0		
	Total		286	100.0		
Pinellas	Valid	18-64 years	117	45.5	50.9	50.9

		65 and over	113	44.0	49.1	100.0
		Total	230	89.5	100.0	
	Missing	System	27	10.5		
	Total		257	100.0		
Manatee	Valid	18-64 years	121	41.4	44.8	44.8
		65 and over	149	51.0	55.2	100.0
		Total	270	92.5	100.0	
	Missing	System	22	7.5		
	Total		292	100.0		

race recoded into two categories

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	White	230	80.4	80.4	80.4
		Other	56	19.6	19.6	100.0
		Total	286	100.0	100.0	
Pinellas	Valid	White	233	90.7	90.7	90.7
		Other	24	9.3	9.3	100.0
		Total	257	100.0	100.0	
Manatee	Valid	White	262	89.7	89.7	89.7
		Other	30	10.3	10.3	100.0
		Total	292	100.0	100.0	

Number of times fertilizer applied in last 12 months with outliers removed'

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	0	108	37.8	42.7	42.7

		1	30	10.5	11.9	54.5
		2	36	12.6	14.2	68.8
		3	15	5.2	5.9	74.7
		4	22	7.7	8.7	83.4
		5	1	.3	.4	83.8
		6	14	4.9	5.5	89.3
		7	1	.3	.4	89.7
		8	3	1.0	1.2	90.9
		9	2	.7	.8	91.7
		10	1	.3	.4	92.1
		12	20	7.0	7.9	100.0
		Total	253	88.5	100.0	
	Missing	System	33	11.5		
	Total		286	100.0		
Pinellas	Valid	0	110	42.8	49.1	49.1
		1	25	9.7	11.2	60.3
		2	32	12.5	14.3	74.6
		3	14	5.4	6.3	80.8
		4	14	5.4	6.3	87.1
		5	7	2.7	3.1	90.2
		6	10	3.9	4.5	94.6
		7	1	.4	.4	95.1
		8	4	1.6	1.8	96.9
		9	1	.4	.4	97.3
		10	2	.8	.9	98.2
		12	3	1.2	1.3	99.6
		36	1	.4	.4	100.0
		Total	224	87.2	100.0	

	Missing	System	33	12.8		
	Total		257	100.0		
Manatee	Valid	0	102	34.9	40.2	40.2
		1	19	6.5	7.5	47.6
		2	47	16.1	18.5	66.1
		3	26	8.9	10.2	76.4
		4	25	8.6	9.8	86.2
		5	2	.7	.8	87.0
		6	18	6.2	7.1	94.1
		7	2	.7	.8	94.9
		8	1	.3	.4	95.3
		9	1	.3	.4	95.7
		10	1	.3	.4	96.1
		12	8	2.7	3.1	99.2
		24	1	.3	.4	99.6
		112	1	.3	.4	100.0
		Total	254	87.0	100.0	
	Missing	System	38	13.0		
	Total		292	100.0		

Number of times fertilizer applied in last 12 months with outliers removed'

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	0	108	37.8	42.7	42.7
		1	30	10.5	11.9	54.5
		2	36	12.6	14.2	68.8
		3	15	5.2	5.9	74.7
		4	22	7.7	8.7	83.4

		5	1	.3	.4	83.8
		6	14	4.9	5.5	89.3
		7	1	.3	.4	89.7
		8	3	1.0	1.2	90.9
		9	2	.7	.8	91.7
		10	1	.3	.4	92.1
		12	20	7.0	7.9	100.0
		Total	253	88.5	100.0	
	Missing	System	33	11.5		
	Total		286	100.0		
Pinellas	Valid	0	110	42.8	49.3	49.3
		1	25	9.7	11.2	60.5
		2	32	12.5	14.3	74.9
		3	14	5.4	6.3	81.2
		4	14	5.4	6.3	87.4
		5	7	2.7	3.1	90.6
		6	10	3.9	4.5	95.1
		7	1	.4	.4	95.5
		8	4	1.6	1.8	97.3
		9	1	.4	.4	97.8
		10	2	.8	.9	98.7
		12	3	1.2	1.3	100.0
		Total	223	86.8	100.0	
	Missing	System	33	12.8		
		Outliers	1	.4		
		Total	34	13.2		
	Total		257	100.0		
Manatee	Valid	0	102	34.9	40.5	40.5
		1	19	6.5	7.5	48.0

		2	47	16.1	18.7	66.7
		3	26	8.9	10.3	77.0
		4	25	8.6	9.9	86.9
		5	2	.7	.8	87.7
		6	18	6.2	7.1	94.8
		7	2	.7	.8	95.6
		8	1	.3	.4	96.0
		9	1	.3	.4	96.4
		10	1	.3	.4	96.8
		12	8	2.7	3.2	100.0
		Total	252	86.3	100.0	
	Missing	System	38	13.0		
		Outliers	2	.7		
		Total	40	13.7		
	Total		292	100.0		

Irrigate the lawn

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	No	81	28.3	28.3	28.3
		Yes	205	71.7	71.7	100.0
		Total	286	100.0	100.0	
Pinellas	Valid	No	71	27.6	27.6	27.6
		Yes	186	72.4	72.4	100.0
		Total	257	100.0	100.0	
Manatee	Valid	No	83	28.4	28.4	28.4
		Yes	209	71.6	71.6	100.0
		Total	292	100.0	100.0	

Fertilize in Summer

county - county Which county do you live in?			Frequency	Percent	Valid Percent
Hillsborough	Valid	Don't Fertilize in Summer	114	39.9	68.3
		Fertilize in Summer	53	18.5	31.7
		Total	167	58.4	100.0
	Missing	System	119	41.6	
	Total		286	100.0	
Pinellas	Valid	Don't Fertilize in Summer	91	35.4	68.4
		Fertilize in Summer	42	16.3	31.6
		Total	133	51.8	100.0
	Missing	System	124	48.2	
	Total		257	100.0	
Manatee	Valid	Don't Fertilize in Summer	124	42.5	69.3
		Fertilize in Summer	55	18.8	30.7
		Total	179	61.3	100.0
	Missing	System	113	38.7	
	Total		292	100.0	

Homeowner Fertilizes

county - county Which county do you live in?			Frequency	Percent	Valid Percent	Cumulative Percent
Hillsborough	Valid	Professional	105	36.7	62.9	62.9
		Homeowner	62	21.7	37.1	100.0
		Total	167	58.4	100.0	
	Missing	System	119	41.6		

	Total		286	100.0		
Pinellas	Valid	Professional	76	29.6	58.0	58.0
		Homeowner	55	21.4	42.0	100.0
		Total	131	51.0	100.0	
	Missing	System	126	49.0		
	Total		257	100.0		
Manatee	Valid	Professional	119	40.8	66.9	66.9
		Homeowner	59	20.2	33.1	100.0
		Total	178	61.0	100.0	
	Missing	System	114	39.0		
	Total		292	100.0		

Fertilize the lawn

county - county Which county do you live in?			Frequency	Percent	Valid Percent
Hillsborough	Valid	0	106	37.1	38.8
		Lawn Fertilized	167	58.4	61.2
		Total	273	95.5	100.0
	Missing	Don't know	13	4.5	
	Total		286	100.0	
Pinellas	Valid	0	109	42.4	45.0
		Lawn Fertilized	133	51.8	55.0
		Total	242	94.2	100.0
	Missing	Don't know	15	5.8	
	Total		257	100.0	
Manatee	Valid	0	102	34.9	36.3
		Lawn Fertilized	179	61.3	63.7

		Total	281	96.2	100.0
	Missing	Don't know	11	3.8	
	Total		292	100.0	

Changed fertilizer routine last year

county - county Which county do you live in?			Valid Percent	Cumulative Percent
Hillsborough	Valid	0	86.0	86.0
		Changed fertilizer routine last year	14.0	100.0
		Total	100.0	
	Missing	8		
	Total			
Pinellas	Valid	0	83.3	83.3
		Changed fertilizer routine last year	16.7	100.0
		Total	100.0	
	Missing	8		
	Total			
Manatee	Valid	0	91.9	91.9
		Changed fertilizer routine last year	8.1	100.0
		Total	100.0	
	Missing	8		
	Total			

Heard lawn care information last year

county - county Which county do you live in?			Frequency	Percent
Hillsborough	Valid	0	149	52.1

		Heard lawn care information last year	135	47.2
		Total	284	99.3
	Missing	Don't know	2	.7
	Total		286	100.0
Pinellas	Valid	0	152	59.1
		Heard lawn care information last year	104	40.5
		Total	256	99.6
	Missing	Don't know	1	.4
	Total		257	100.0
Manatee	Valid	0	186	63.7
		Heard lawn care information last year	103	35.3
		Total	289	99.0
	Missing	Don't know	3	1.0
	Total		292	100.0

Appendix G - Homeowner Interview Response Frequencies by Community

Homeowner Interviews

Marginal Frequency by Site

Q1: Do you ever irrigate or water your lawn with water other than rainwater?

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid	1.00 Yes	25	100.0	100.0	100.0
2.00 M101	Valid	.00 No	7	31.8	31.8	31.8
		1.00 Yes	15	68.2	68.2	100.0
		Total	22	100.0	100.0	
3.00 P201	Valid	1.00 Yes	13	92.9	92.9	92.9
		8.00 Don't know	1	7.1	7.1	100.0
		Total	14	100.0	100.0	
4.00 P202	Valid	.00 No	3	15.0	15.0	15.0
		1.00 Yes	17	85.0	85.0	100.0
		Total	20	100.0	100.0	

Q2: What is the primary method you use to water your lawn?

Site Location			Frequency	Percent	Valid Percent
1.00 H101	Valid	1.00 In-ground, automatic irrigation system	25	100.0	100.0
2.00 M101	Valid	1.00 In-ground, automatic irrigation system	13	59.1	86.7
		2.00 Hand water using a hose	1	4.5	6.7
		3.00 Set an aboveground sprinkler out by hand	1	4.5	6.7
		Total	15	68.2	100.0
	Missing	System	7	31.8	
	Total		22	100.0	

3.00 P201	Valid	1.00 In-ground, automatic irrigation system	13	92.9	92.9
		8.00 Don’t know	1	7.1	7.1
		Total	14	100.0	100.0
4.00 P202	Valid	1.00 In-ground, automatic irrigation system	14	70.0	82.4
		2.00 Hand water using a hose	3	15.0	17.6
		Total	17	85.0	100.0
	Missing	System	3	15.0	
	Total		20	100.0	

otherQ2 Other: water lawn

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid		16	64.0	64.0	64.0
		The respondent stated that every house has an in-ground sprinkler system. Homeowners can turn on the pump from 8pm-6am. The respondent stated that he waters as much as the county allows it - it used to be 2 days a week.	1	4.0	4.0	68.0
		The respondent stated that he bases his watering on if it hasn't been raining or not	1	4.0	4.0	72.0
		The respondent stated that he bases his watering on watering days	1	4.0	4.0	76.0
		The respondent stated that he waters once a week as long as there is not a good rain	1	4.0	4.0	80.0

	The respondent stated that she uses a rain gauge to determine when to water the lawn.	1	4.0	4.0	84.0
	The respondent stated that she waters her lawn all that she is allowed with the restrictions	1	4.0	4.0	88.0
	The respondent stated that she waters the lawn twice a week if it doesn't rain and once in the winter.	1	4.0	4.0	92.0
	The respondent stated that when it is really dry he waters the lawn 2 to 3 times a week. The HOA complains if it is not.	1	4.0	4.0	96.0
	The respondent stated that with restrictions and when it rains a lot - he does not water that often. When there are no restrictions he waters 2 times a week.	1	4.0	4.0	100.0
	Total	25	100.0	100.0	
2.00 M101 Valid		14	63.6	63.6	63.6
	The respondent stated that he also uses a hand water hose. It is 50/50, depending on the conditions - if it is patchy or sunny.	1	4.5	4.5	68.2
	The respondent stated that he also uses a set aboveground sprinkler	1	4.5	4.5	72.7
	The respondent stated that he has not watered the lawn in the last year, he hasn't had the time.	1	4.5	4.5	77.3

		The respondent stated that they do not water during the raining season.	1	4.5	4.5	81.8
		The respondent stated that they irrigated their lawn last year.	1	4.5	4.5	86.4
		The respondent stated that they prefer rainwater	1	4.5	4.5	90.9
		The respondent stated that they stopped watering their lawn 5 years ago	1	4.5	4.5	95.5
		The sprinkler system has not been working for a year. so the lawn has not been irrigated for the last year	1	4.5	4.5	100.0
		Total	22	100.0	100.0	
3.00 P201	Valid		13	92.9	92.9	92.9
		The respondent stated that they use the sprinklers in the winter and in the summer use rain.	1	7.1	7.1	100.0
		Total	14	100.0	100.0	
4.00 P202	Valid		16	80.0	80.0	80.0
		In ground shallow well system	1	5.0	5.0	85.0
		The respondent does not have grass. They only have flowers/plants and dirt. They use a hand water hose to water plants/flowers only.	1	5.0	5.0	90.0
		The respondent stated that he just put down new sod	1	5.0	5.0	95.0
		The respondent stated that they have the sprinkler system checked every six months.	1	5.0	5.0	100.0

		Total	20	100.0	100.0

Q3: How many times a week do you typically water the lawn?

Site Location			Frequency	Percent	Valid Percent
1.00 H101	Valid	0	1	4.0	4.0
		1	15	60.0	60.0
		2	6	24.0	24.0
		3	2	8.0	8.0
		7	1	4.0	4.0
		Total	25	100.0	100.0
2.00 M101	Valid		7	31.8	31.8
		0 - now (summer). In the spring the respondent waters his lawn twice.	1	4.5	4.5
		1	10	45.5	45.5
		2	4	18.2	18.2
		Total	22	100.0	100.0
3.00 P201	Valid	1	7	50.0	50.0
		2	5	35.7	35.7
		3	1	7.1	7.1
		88	1	7.1	7.1
		Total	14	100.0	100.0
4.00 P202	Valid		3	15.0	15.0
		0	1	5.0	5.0
		1	12	60.0	60.0
		2	2	10.0	10.0
		3	1	5.0	5.0
		4	1	5.0	5.0

Total	20	100.0	100.0

Q4: Is your landscape irrigated with well water, city water, surface water, reclaimed water, or some other source?

Site Location			Frequency	Percent	Valid Percent
1.00 H101	Valid	1.00 Community Well (from neighborhood)	24	96.0	96.0
		3.00 City water	1	4.0	4.0
		Total	25	100.0	100.0
2.00 M101	Valid	1.00 Community Well (from neighborhood)	1	4.5	6.7
		3.00 City water	14	63.6	93.3
		Total	15	68.2	100.0
	Missing	System	7	31.8	
	Total		22	100.0	
3.00 P201	Valid	3.00 City water	10	71.4	71.4
		4.00 Reclaimed water	1	7.1	7.1
		8.00 Don’t know	3	21.4	21.4
		Total	14	100.0	100.0
4.00 P202	Valid	2.00 Private Well (on homeowner’s property)	2	10.0	11.8
		3.00 City water	15	75.0	88.2
		Total	17	85.0	100.0
	Missing	System	3	15.0	
	Total		20	100.0	

Q5: In the last 12 months, have you or anyone else applied fertilizer to the lawn?

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid	1.00 Yes	25	100.0	100.0	100.0
2.00 M101	Valid	.00 No	10	45.5	45.5	45.5
		1.00 Yes	11	50.0	50.0	95.5
		2.00	1	4.5	4.5	100.0
		Total	22	100.0	100.0	
3.00 P201	Valid	.00 No	2	14.3	14.3	14.3
		1.00 Yes	10	71.4	71.4	85.7
		8.00 Don't know	2	14.3	14.3	100.0
		Total	14	100.0	100.0	
4.00 P202	Valid	.00 No	5	25.0	25.0	25.0
		1.00 Yes	15	75.0	75.0	100.0
		Total	20	100.0	100.0	

Q6: When was the lawn fertilized last?

Site Location			Frequency	Percent	Valid Percent
1.00 H101	Valid	1.00 Within the last two weeks? About which date?	10	40.0	40.0
		2.00 Since the beginning of the year (2013)	15	60.0	60.0
		Total	25	100.0	100.0
2.00 M101	Valid	.00 Last year	1	4.5	8.3
		1.00 Within the last two weeks? About which date?	3	13.6	25.0
		2.00 Since the beginning of the year (2013)	8	36.4	66.7
		Total	12	54.5	100.0

	Missing	System	10	45.5	
	Total		22	100.0	
3.00 P201	Valid	1.00 Within the last two weeks? About which date?	3	21.4	25.0
		2.00 Since the beginning of the year (2013)	8	57.1	66.7
		8.00 Don't know	1	7.1	8.3
		Total	12	85.7	100.0
	Missing	System	2	14.3	
	Total		14	100.0	
4.00 P202	Valid	1.00 Within the last two weeks? About which date?	4	20.0	26.7
		2.00 Since the beginning of the year (2013)	9	45.0	60.0
		3.00 Other	2	10.0	13.3
		Total	15	75.0	100.0
	Missing	System	5	25.0	
	Total		20	100.0	

twoweeksQ6 About which date?

Site Location			Frequency	Percent	Valid Percent
1.00 H101	Valid		14	56.0	56.0
		June 12, 2013	1	4.0	4.0
		June 14, 2013	2	8.0	8.0
		June 3, 2013 - the respondent stated that the pest control was put on her lawn on May 28, 2013	1	4.0	4.0
		June 4, 2013	1	4.0	4.0
		June 7, 2013	1	4.0	4.0

		June 8, 2013	2	8.0	8.0
		May 22, 2013	1	4.0	4.0
		May 28, 2013	1	4.0	4.0
		May 30, 2013	1	4.0	4.0
		Total	25	100.0	100.0
2.00 M101	Valid		19	86.4	86.4
		June 5, 2013	1	4.5	4.5
		May 16, 2013	1	4.5	4.5
		May 24, 2013	1	4.5	4.5
		Total	22	100.0	100.0
3.00 P201	Valid		11	78.6	78.6
		June 21, 2013	1	7.1	7.1
		June 21, 2014	1	7.1	7.1
		June 6, 2013	1	7.1	7.1
		Total	14	100.0	100.0
4.00 P202	Valid		14	70.0	70.0
		30 days ago	1	5.0	5.0
		April 2013 does not know the date	1	5.0	5.0
		May 25, 2013	1	5.0	5.0
		May 31, 2013	1	5.0	5.0
		May 5, 2013	1	5.0	5.0
		Within the last three weeks	1	5.0	5.0
		Total	20	100.0	100.0

beginningQ6 Since the beginning of year?

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid	3.00 Mar	2	8.0	13.3	13.3
		4.00 Apr	6	24.0	40.0	53.3
		5.00 May	7	28.0	46.7	100.0
		Total	15	60.0	100.0	
	Missing	System	10	40.0		
	Total		25	100.0		
2.00 M101	Valid	2.00 Feb	1	4.5	12.5	12.5
		3.00 Mar	2	9.1	25.0	37.5
		4.00 Apr	2	9.1	25.0	62.5
		5.00 May	3	13.6	37.5	100.0
		Total	8	36.4	100.0	
	Missing	System	14	63.6		
	Total		22	100.0		
3.00 P201	Valid	3.00 Mar	2	14.3	25.0	25.0
		4.00 Apr	3	21.4	37.5	62.5
		5.00 May	3	21.4	37.5	100.0
		Total	8	57.1	100.0	
	Missing	System	6	42.9		
	Total		14	100.0		
4.00 P202	Valid	2.00 Feb	1	5.0	11.1	11.1
		3.00 Mar	3	15.0	33.3	44.4
		4.00 Apr	3	15.0	33.3	77.8
		5.00 May	2	10.0	22.2	100.0
		Total	9	45.0	100.0	
	Missing	System	11	55.0		
	Total		20	100.0		

otherQ6 Other: fertilized last

Site Location			Frequency	Percent	Valid Percent
1.00 H101	Valid		22	88.0	88.0
		The respondent stated that a stipulation with the HOA is that the grass must be fertilized or you get written up.	1	4.0	4.0
		The respondent stated that he uses liquid iron	1	4.0	4.0
		The respondent stated that she used organic fertilizer and pesticide	1	4.0	4.0
		Total	25	100.0	100.0
2.00 M101	Valid		21	95.5	95.5
		The respondent stated that the lawn was fertilized from spring into summer of 2012	1	4.5	4.5
		Total	22	100.0	100.0
3.00 P201	Valid		14	100.0	100.0
4.00 P202	Valid		18	90.0	90.0
		The respondent stated that he does not use it during the warm months because it dries it out. He doesn't use it when temperatures are above 70 degrees.	1	5.0	5.0
		The respondent stated that they have a lot of problems with cinch bugs.	1	5.0	5.0
		Total	20	100.0	100.0

Q7: Did you apply this yourself or was it done by a professional company?

Site Location			Frequency	Percent	Valid Percent
1.00 H101	Valid	1.00 Self	8	32.0	32.0
		2.00 Company/HOA maintenance company/Someone outside the home	17	68.0	68.0
		Total	25	100.0	100.0
2.00 M101	Valid	1.00 Self	8	36.4	66.7
		2.00 Company/HOA maintenance company/Someone outside the home	4	18.2	33.3
		Total	12	54.5	100.0
	Missing	System	10	45.5	
	Total		22	100.0	
3.00 P201	Valid	1.00 Self	4	28.6	36.4
		2.00 Company/HOA maintenance company/Someone outside the home	7	50.0	63.6
		Total	11	78.6	100.0
	Missing	System	3	21.4	
	Total		14	100.0	
4.00 P202	Valid	1.00 Self	6	30.0	40.0
		2.00 Company/HOA maintenance company/Someone outside the home	9	45.0	60.0
		Total	15	75.0	100.0
	Missing	System	5	25.0	
	Total		20	100.0	

Q8: About how many times was fertilizer applied to the lawn in the past 12 months?

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid	2	2	8.0	8.0	8.0
		3	5	20.0	20.0	28.0
		4	3	12.0	12.0	40.0
		5	2	8.0	8.0	48.0
		6	1	4.0	4.0	52.0
		7	2	8.0	8.0	60.0
		8	1	4.0	4.0	64.0
		9	4	16.0	16.0	80.0
		10	2	8.0	8.0	88.0
		12	1	4.0	4.0	92.0
		88 Don't know	2	8.0	8.0	100.0
		Total	25	100.0	100.0	
2.00 M101	Valid	1	5	22.7	41.7	41.7
		2	4	18.2	33.3	75.0
		3	1	4.5	8.3	83.3
		4	1	4.5	8.3	91.7
		6	1	4.5	8.3	100.0
		Total	12	54.5	100.0	
	Missing	System	10	45.5		
	Total		22	100.0		
3.00 P201	Valid	1	2	14.3	16.7	16.7
		2	2	14.3	16.7	33.3
		3	3	21.4	25.0	58.3
		4	1	7.1	8.3	66.7
		5	1	7.1	8.3	75.0
		6	1	7.1	8.3	83.3

		12	1	7.1	8.3	91.7
		88 Don't know	1	7.1	8.3	100.0
		Total	12	85.7	100.0	
	Missing	System	2	14.3		
	Total		14	100.0		
4.00 P202	Valid	1	2	10.0	13.3	13.3
		2	4	20.0	26.7	40.0
		3	1	5.0	6.7	46.7
		4	4	20.0	26.7	73.3
		6	3	15.0	20.0	93.3
		8	1	5.0	6.7	100.0
		Total	15	75.0	100.0	
	Missing	System	5	25.0		

Q9: Is fertilizer applied to your lawn on a regular schedule or only as needed?

Site Location			Frequency	Percent	Valid Percent
1.00 H101	Valid	1.00 Regular schedule	20	80.0	80.0
		2.00 Only as needed	3	12.0	12.0
		8.00 Don't know	2	8.0	8.0
		Total	25	100.0	100.0
2.00 M101	Valid	1.00 Regular schedule	5	22.7	41.7
		2.00 Only as needed	7	31.8	58.3
		Total	12	54.5	100.0
	Missing	System	10	45.5	
	Total		22	100.0	
3.00 P201	Valid	1.00 Regular schedule	7	50.0	58.3

		2.00 Only as needed	4	28.6	33.3
		8.00 Don't know	1	7.1	8.3
		Total	12	85.7	100.0
	Missing	System	2	14.3	
	Total		14	100.0	
4.00 P202	Valid	1.00 Regular schedule	9	45.0	60.0
		2.00 Only as needed	6	30.0	40.0
		Total	15	75.0	100.0
	Missing	System	5	25.0	
	Total		20	100.0	

Q10: During what months was the lawn fertilized last year (in 2012)?

Site Location			Frequency	Percent	Valid Percent
1.00 H101	Valid	1.00 Fertilized lawn in 2012	16	64.0	64.0
		88.00 Don't know	9	36.0	36.0
		Total	25	100.0	100.0
2.00 M101	Valid	.00 I never fertilize the lawn	2	9.1	16.7
		1.00 Fertilized lawn in 2012	8	36.4	66.7
		88.00 Don't know	2	9.1	16.7
		Total	12	54.5	100.0
	Missing	System	10	45.5	
	Total		22	100.0	
3.00 P201	Valid	1.00 Fertilized lawn in 2012	5	35.7	41.7
		88.00 Don't know	7	50.0	58.3
		Total	12	85.7	100.0
	Missing	System	2	14.3	
	Total		14	100.0	

4.00 P202	Valid	.00 I never fertilize the lawn	2	10.0	13.3
		1.00 Fertilized lawn in 2012	10	50.0	66.7
		88.00 Don't know	3	15.0	20.0
		Total	15	75.0	100.0
	Missing	System	5	25.0	
	Total		20	100.0	

janQ10: Fertilized lawn in January

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid	.00 No	12	48.0	75.0	75.0
		1.00 Yes	4	16.0	25.0	100.0
		Total	16	64.0	100.0	
	Missing	System	9	36.0		
	Total		25	100.0		
2.00 M101	Valid	.00 No	9	40.9	100.0	100.0
	Missing	System	13	59.1		
	Total		22	100.0		
3.00 P201	Valid	.00 No	4	28.6	80.0	80.0
		1.00 Yes	1	7.1	20.0	100.0
		Total	5	35.7	100.0	
	Missing	System	9	64.3		
	Total		14	100.0		
4.00 P202	Valid	.00 No	8	40.0	80.0	80.0
		1.00 Yes	2	10.0	20.0	100.0
		Total	10	50.0	100.0	
	Missing	System	10	50.0		

	Total		20	100.0		

febQ10: Fertilized lawn in February

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid	.00 No	11	44.0	68.8	68.8
		1.00 Yes	4	16.0	25.0	93.8
		2.00	1	4.0	6.3	100.0
		Total	16	64.0	100.0	
	Missing	System	9	36.0		
	Total		25	100.0		
2.00 M101	Valid	.00 No	7	31.8	77.8	77.8
		1.00 Yes	2	9.1	22.2	100.0
		Total	9	40.9	100.0	
	Missing	System	13	59.1		
	Total		22	100.0		
3.00 P201	Valid	.00 No	4	28.6	80.0	80.0
		1.00 Yes	1	7.1	20.0	100.0
		Total	5	35.7	100.0	
	Missing	System	9	64.3		
	Total		14	100.0		
4.00 P202	Valid	.00 No	6	30.0	60.0	60.0
		1.00 Yes	4	20.0	40.0	100.0
		Total	10	50.0	100.0	
	Missing	System	10	50.0		
	Total		20	100.0		

marQ10: Fertilized lawn in March

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid	.00 No	11	44.0	68.8	68.8
		1.00 Yes	5	20.0	31.3	100.0
		Total	16	64.0	100.0	
	Missing	System	9	36.0		
	Total		25	100.0		
2.00 M101	Valid	.00 No	7	31.8	77.8	77.8
		1.00 Yes	2	9.1	22.2	100.0
		Total	9	40.9	100.0	
	Missing	System	13	59.1		
	Total		22	100.0		
3.00 P201	Valid	.00 No	2	14.3	40.0	40.0
		1.00 Yes	3	21.4	60.0	100.0
		Total	5	35.7	100.0	
	Missing	System	9	64.3		
	Total		14	100.0		
4.00 P202	Valid	.00 No	7	35.0	70.0	70.0
		1.00 Yes	3	15.0	30.0	100.0
		Total	10	50.0	100.0	
	Missing	System	10	50.0		
	Total		20	100.0		

aprQ10: Fertilized lawn in April

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid	.00 No	8	32.0	50.0	50.0

		1.00 Yes	8	32.0	50.0	100.0
		Total	16	64.0	100.0	
	Missing	System	9	36.0		
	Total		25	100.0		
2.00 M101	Valid	.00 No	8	36.4	88.9	88.9
		1.00 Yes	1	4.5	11.1	100.0
		Total	9	40.9	100.0	
	Missing	System	13	59.1		
	Total		22	100.0		
3.00 P201	Valid	.00 No	3	21.4	60.0	60.0
		1.00 Yes	2	14.3	40.0	100.0
		Total	5	35.7	100.0	
	Missing	System	9	64.3		
	Total		14	100.0		
4.00 P202	Valid	.00 No	5	25.0	50.0	50.0
		1.00 Yes	5	25.0	50.0	100.0
		Total	10	50.0	100.0	
	Missing	System	10	50.0		
	Total		20	100.0		

mayQ10: Fertilized lawn in May

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid	.00 No	11	44.0	68.8	68.8
		1.00 Yes	5	20.0	31.3	100.0
		Total	16	64.0	100.0	
	Missing	System	9	36.0		

	Total		25	100.0		
2.00 M101	Valid	.00 No	5	22.7	55.6	55.6
		1.00 Yes	4	18.2	44.4	100.0
		Total	9	40.9	100.0	
	Missing	System	13	59.1		
	Total		22	100.0		
3.00 P201	Valid	.00 No	3	21.4	60.0	60.0
		1.00 Yes	2	14.3	40.0	100.0
		Total	5	35.7	100.0	
	Missing	System	9	64.3		
	Total		14	100.0		
4.00 P202	Valid	.00 No	9	45.0	90.0	90.0
		1.00 Yes	1	5.0	10.0	100.0
		Total	10	50.0	100.0	
	Missing	System	10	50.0		
	Total		20	100.0		

junQ10: Fertilized lawn in June

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid	.00 No	9	36.0	56.3	56.3
		1.00 Yes	7	28.0	43.8	100.0
		Total	16	64.0	100.0	
	Missing	System	9	36.0		
	Total		25	100.0		
2.00 M101	Valid	.00 No	9	40.9	100.0	100.0
	Missing	System	13	59.1		
	Total		22	100.0		

3.00 P201	Valid	.00 No	3	21.4	60.0	60.0
		1.00 Yes	2	14.3	40.0	100.0
		Total	5	35.7	100.0	
	Missing	System	9	64.3		
	Total		14	100.0		
4.00 P202	Valid	.00 No	7	35.0	70.0	70.0
		1.00 Yes	3	15.0	30.0	100.0
		Total	10	50.0	100.0	
	Missing	System	10	50.0		
	Total		20	100.0		

julQ10: Fertilized lawn in July

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid	.00 No	11	44.0	68.8	68.8
		1.00 Yes	5	20.0	31.3	100.0
		Total	16	64.0	100.0	
	Missing	System	9	36.0		
	Total		25	100.0		
2.00 M101	Valid	.00 No	9	40.9	100.0	100.0
	Missing	System	13	59.1		
	Total		22	100.0		
3.00 P201	Valid	.00 No	3	21.4	60.0	60.0
		1.00 Yes	2	14.3	40.0	100.0
		Total	5	35.7	100.0	
	Missing	System	9	64.3		
	Total		14	100.0		
4.00 P202	Valid	.00 No	9	45.0	90.0	90.0

		1.00 Yes	1	5.0	10.0	100.0
		Total	10	50.0	100.0	
	Missing	System	10	50.0		
	Total		20	100.0		

augQ10: Fertilized lawn in August

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid	.00 No	9	36.0	56.3	56.3
		1.00 Yes	7	28.0	43.8	100.0
		Total	16	64.0	100.0	
	Missing	System	9	36.0		
	Total		25	100.0		
2.00 M101	Valid	.00 No	9	40.9	100.0	100.0
	Missing	System	13	59.1		
	Total		22	100.0		
3.00 P201	Valid	.00 No	4	28.6	80.0	80.0
		1.00 Yes	1	7.1	20.0	100.0
		Total	5	35.7	100.0	
	Missing	System	9	64.3		
	Total		14	100.0		
4.00 P202	Valid	.00 No	5	25.0	50.0	50.0
		1.00 Yes	5	25.0	50.0	100.0
		Total	10	50.0	100.0	
	Missing	System	10	50.0		
	Total		20	100.0		

sepQ10: Fertilized lawn in September

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid	.00 No	8	32.0	50.0	50.0
		1.00 Yes	8	32.0	50.0	100.0
		Total	16	64.0	100.0	
	Missing	System	9	36.0		
	Total		25	100.0		
2.00 M101	Valid	.00 No	7	31.8	77.8	77.8
		1.00 Yes	2	9.1	22.2	100.0
		Total	9	40.9	100.0	
	Missing	System	13	59.1		
	Total		22	100.0		
3.00 P201	Valid	.00 No	3	21.4	60.0	60.0
		1.00 Yes	2	14.3	40.0	100.0
		Total	5	35.7	100.0	
	Missing	System	9	64.3		
	Total		14	100.0		
4.00 P202	Valid	.00 No	10	50.0	100.0	100.0
	Missing	System	10	50.0		
	Total		20	100.0		

octQ10: Fertilized lawn in October

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid	.00 No	7	28.0	43.8	43.8
		1.00 Yes	9	36.0	56.3	100.0
		Total	16	64.0	100.0	

	Missing	System	9	36.0		
	Total		25	100.0		
2.00 M101	Valid	.00 No	7	31.8	77.8	77.8
		1.00 Yes	2	9.1	22.2	100.0
		Total	9	40.9	100.0	
	Missing	System	13	59.1		
	Total		22	100.0		
3.00 P201	Valid	.00 No	2	14.3	40.0	40.0
		1.00 Yes	3	21.4	60.0	100.0
		Total	5	35.7	100.0	
	Missing	System	9	64.3		
	Total		14	100.0		
4.00 P202	Valid	.00 No	2	10.0	20.0	20.0
		1.00 Yes	8	40.0	80.0	100.0
		Total	10	50.0	100.0	
	Missing	System	10	50.0		
	Total		20	100.0		

novQ10: Fertilized lawn in November

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid	.00 No	9	36.0	56.3	56.3
		1.00 Yes	7	28.0	43.8	100.0
		Total	16	64.0	100.0	
	Missing	System	9	36.0		
	Total		25	100.0		
2.00 M101	Valid	.00 No	9	40.9	100.0	100.0
	Missing	System	13	59.1		

	Total		22	100.0		
3.00 P201	Valid	.00 No	4	28.6	80.0	80.0
		1.00 Yes	1	7.1	20.0	100.0
		Total	5	35.7	100.0	
	Missing	System	9	64.3		
	Total		14	100.0		
4.00 P202	Valid	.00 No	9	45.0	90.0	90.0
		1.00 Yes	1	5.0	10.0	100.0
		Total	10	50.0	100.0	
	Missing	System	10	50.0		
	Total		20	100.0		

decQ10: Fertilized lawn in December

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid	.00 No	10	40.0	62.5	62.5
		1.00 Yes	5	20.0	31.3	93.8
		12.00	1	4.0	6.3	100.0
		Total	16	64.0	100.0	
	Missing	System	9	36.0		
	Total		25	100.0		
2.00 M101	Valid	.00 No	9	40.9	100.0	100.0
	Missing	System	13	59.1		
	Total		22	100.0		
3.00 P201	Valid	.00 No	3	21.4	60.0	60.0
		1.00 Yes	2	14.3	40.0	100.0
		Total	5	35.7	100.0	
	Missing	System	9	64.3		

	Total		14	100.0		
4.00 P202	Valid	.00 No	6	30.0	60.0	60.0
		1.00 Yes	4	20.0	40.0	100.0
		Total	10	50.0	100.0	
	Missing	System	10	50.0		
	Total		20	100.0		

Q11: Are there times or situations when you should NOT fertilize your lawn?

Site Location			Frequency	Percent	Valid Percent
1.00 H101	Valid	1.00 Should NOT fertilize lawn	12	48.0	48.0
		11.00 Other	1	4.0	4.0
		88.00 Don't know	12	48.0	48.0
		Total	25	100.0	100.0
2.00 M101	Valid	1.00 Should NOT fertilize lawn	9	40.9	75.0
		11.00 Other	1	4.5	8.3
		88.00 Don't know	2	9.1	16.7
		Total	12	54.5	100.0
	Missing	System	10	45.5	
	Total		22	100.0	
3.00 P201	Valid	1.00 Should NOT fertilize lawn	4	28.6	33.3
		88.00 Don't know	8	57.1	66.7
		Total	12	85.7	100.0
	Missing	System	2	14.3	
	Total		14	100.0	
4.00 P202	Valid	1.00 Should NOT fertilize lawn	11	55.0	73.3
		10.00	1	5.0	6.7
		11.00 Other	2	10.0	13.3

	88.00 Don't know	1	5.0	6.7
	Total	15	75.0	100.0
Missing	System	5	25.0	
Total		20	100.0	

beforeQ11 Right before a hard rain

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid	1.00 Yes	4	16.0	100.0	100.0
	Missing	System	21	84.0		
	Total		25	100.0		
2.00 M101	Valid	1.00 Yes	2	9.1	100.0	100.0
	Missing	System	20	90.9		
	Total		22	100.0		
3.00 P201	Valid	1.00 Yes	1	7.1	100.0	100.0
	Missing	System	13	92.9		
	Total		14	100.0		
4.00 P202	Valid	1.00 Yes	4	20.0	100.0	100.0
	Missing	System	16	80.0		
	Total		20	100.0		

afterQ11 After a hard rain

Site Location			Frequency	Percent
1.00 H101	Missing	System	25	100.0
2.00 M101	Missing	System	22	100.0

3.00 P201	Missing	System	14	100.0
4.00 P202	Missing	System	20	100.0

droughtQ11 During a drought

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid	1.00 Yes	1	4.0	100.0	100.0
	Missing	System	24	96.0		
	Total		25	100.0		
2.00 M101	Valid	1.00 Yes	1	4.5	100.0	100.0
	Missing	System	21	95.5		
	Total		22	100.0		
3.00 P201	Missing	System	14	100.0		
4.00 P202	Valid	1.00 Yes	1	5.0	100.0	100.0
	Missing	System	19	95.0		
	Total		20	100.0		

morningQ11 Morning

Site Location			Frequency	Percent
1.00 H101	Missing	System	25	100.0
2.00 M101	Missing	System	22	100.0
3.00 P201	Missing	System	14	100.0
4.00 P202	Missing	System	20	100.0

eveningQ11 Evening

Site Location			Frequency	Percent
1.00 H101	Missing	System	25	100.0
2.00 M101	Missing	System	22	100.0
3.00 P201	Missing	System	14	100.0
4.00 P202	Missing	System	20	100.0

winterQ11 Winter

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid	1.00 Yes	4	16.0	100.0	100.0
	Missing	System	21	84.0		
	Total		25	100.0		
2.00 M101	Valid	1.00 Yes	2	9.1	100.0	100.0
	Missing	System	20	90.9		
	Total		22	100.0		
3.00 P201	Valid	1.00 Yes	1	7.1	100.0	100.0
	Missing	System	13	92.9		
	Total		14	100.0		
4.00 P202	Valid	1.00 Yes	1	5.0	100.0	100.0
	Missing	System	19	95.0		
	Total		20	100.0		

summerQ11 Summer

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid	1.00 Yes	5	20.0	100.0	100.0
	Missing	System	20	80.0		

	Total		25	100.0		
2.00 M101	Valid	1.00 Yes	3	13.6	100.0	100.0
	Missing	System	19	86.4		
	Total		22	100.0		
3.00 P201	Valid	1.00 Yes	4	28.6	100.0	100.0
	Missing	System	10	71.4		
	Total		14	100.0		
4.00 P202	Valid	1.00 Yes	6	30.0	100.0	100.0
	Missing	System	14	70.0		
	Total		20	100.0		

springQ11 Spring

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Missing	System	25	100.0		
2.00 M101	Valid	1.00 Yes	1	4.5	100.0	100.0
	Missing	System	21	95.5		
	Total		22	100.0		
3.00 P201	Valid	1.00 Yes	1	7.1	100.0	100.0
	Missing	System	13	92.9		
	Total		14	100.0		
4.00 P202	Missing	System	20	100.0		

fallQ11 Fall

Site Location			Frequency	Percent
1.00 H101	Missing	System	25	100.0

2.00 M101	Missing	System	22	100.0
3.00 P201	Missing	System	14	100.0
4.00 P202	Missing	System	20	100.0

notsureQ11 Not Sure

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid	1.00 Yes	1	4.0	100.0	100.0
	Missing	System	24	96.0		
	Total		25	100.0		
2.00 M101	Valid	1.00 Yes	1	4.5	100.0	100.0
	Missing	System	21	95.5		
	Total		22	100.0		
3.00 P201	Missing	System	14	100.0		
4.00 P202	Valid	1.00 Yes	1	5.0	100.0	100.0
	Missing	System	19	95.0		
	Total		20	100.0		

otherQ11 Other: NOT fertilize

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid		8	32.0	32.0	32.0
		Don't know	4	16.0	16.0	48.0
		Don't know - the respondent stated that she is not into it	1	4.0	4.0	52.0

Don't know - the respondent stated that the lawn tech makes the decisions	1	4.0	4.0	56.0
The respondent stated that he allows the professionals to determine when to use fertilizer. He receives an invoice with what is put in the yard - it comes with a narrative.	1	4.0	4.0	60.0
The respondent stated that he just pays to keep it green.	1	4.0	4.0	64.0
The respondent stated that he leaves it up to the lawn company	1	4.0	4.0	68.0
The respondent stated that it is the decision of the lawn company	1	4.0	4.0	72.0
The respondent stated that she has learned from personal experience, fertilizer killed her grass when it was hot.	1	4.0	4.0	76.0
The respondent stated that she leaves it to the company.	1	4.0	4.0	80.0
The respondent stated that she pays someone to take care of that	1	4.0	4.0	84.0
The respondent stated that they leave it to the professional	1	4.0	4.0	88.0
The respondent stated that they should not use fertilizer during the rainy season, and would like to know when to fertilize.	1	4.0	4.0	92.0

		The respondent stated that you should not fertilize when you resod for the 1st month.	1	4.0	4.0	96.0
		TruGreen and Lowes gave him information	1	4.0	4.0	100.0
		Total	25	100.0	100.0	
2.00 M101	Valid		14	63.6	63.6	63.6
		Don't know	2	9.1	9.1	72.7
		During the raining season	1	4.5	4.5	77.3
		The respondent stated that he heard that using fertilizer before a hard rain causes algae bloom and runs off into the watershed	1	4.5	4.5	81.8
		The respondent stated that the only time that you should not fertilize your lawn is when it looks like it doesn't need it. When it looks healthy.	1	4.5	4.5	86.4
		The respondent stated that you should not fertilize during the raining seasons and when the temperature is over 80 degrees	1	4.5	4.5	90.9
		The respondent stated when restricted by the city	1	4.5	4.5	95.5
		When it is hot	1	4.5	4.5	100.0
		Total	22	100.0	100.0	
3.00 P201	Valid		12	85.7	85.7	85.7
		Don't know	1	7.1	7.1	92.9
		The respondent stated when there is a ban	1	7.1	7.1	100.0
		Total	14	100.0	100.0	

4.00 P202	Valid		18	90.0	90.0	90.0
		The respondent stated only as needed.	1	5.0	5.0	95.0
		The respondent stated that there is NOT a time when you should not fertilize your lawn.	1	5.0	5.0	100.0
		Total	20	100.0	100.0	

Q12: In the past year or so, have you heard or seen any information that gives tips on proper lawn and garden fertilizing techniques?

Site Location			Frequency	Percent	Valid Percent
1.00 H101	Valid	.00 No, heard nothing	10	40.0	43.5
		1.00 Yes, maybe; think I heard something; etc.	3	12.0	13.0
		2.00 Yes, definitely	10	40.0	43.5
		Total	23	92.0	100.0
	Missing	System	2	8.0	
	Total		25	100.0	
2.00 M101	Valid	.00 No, heard nothing	11	50.0	50.0
		1.00 Yes, maybe; think I heard something; etc.	2	9.1	9.1
		2.00 Yes, definitely	9	40.9	40.9
		Total	22	100.0	100.0
3.00 P201	Valid	.00 No, heard nothing	6	42.9	42.9
		1.00 Yes, maybe; think I heard something; etc.	1	7.1	7.1
		2.00 Yes, definitely	7	50.0	50.0
		Total	14	100.0	100.0
4.00 P202	Valid	.00 No, heard nothing	7	35.0	35.0

1.00 Yes, maybe; think I heard something; etc.	3	15.0	15.0
2.00 Yes, definitely	10	50.0	50.0
Total	20	100.0	100.0

Q12: In the past year or so, have you heard or seen any information that gives tips on proper lawn and garden fertilizing techniques?

Site Location			Cumulative Percent
1.00 H101	Valid	.00 No, heard nothing	43.5
		1.00 Yes, maybe; think I heard something; etc.	56.5
		2.00 Yes, definitely	100.0
		Total	
	Missing	System	
	Total		
2.00 M101	Valid	.00 No, heard nothing	50.0
		1.00 Yes, maybe; think I heard something; etc.	59.1
		2.00 Yes, definitely	100.0
		Total	
3.00 P201	Valid	.00 No, heard nothing	42.9
		1.00 Yes, maybe; think I heard something; etc.	50.0
		2.00 Yes, definitely	100.0
		Total	
4.00 P202	Valid	.00 No, heard nothing	35.0
		1.00 Yes, maybe; think I heard something; etc.	50.0
		2.00 Yes, definitely	100.0
		Total	

Q12a: What information did you hear about lawn fertilization?

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid		9	36.0	36.0	36.0
		The respondent stated that he got his information from Home Depot or Lowes. They told him how to treat a fungus - when it is not dry and hot and the chemical for it. St. Augustine grass.	1	4.0	4.0	40.0
		The respondent stated that he heard information from the landscaper - after you put down the fertilizer, keep it watered or it will burn or get brown.	1	4.0	4.0	44.0
		The respondent stated that he hears what Scotts tell him.	1	4.0	4.0	48.0
		The respondent stated that he read about weed and feed and not to water the lawn 24 hours after use.	1	4.0	4.0	52.0
		The respondent stated that Scott's writes a report - puts down lawn condition and the type of fertilizer that was put down and what time to water during the year.	1	4.0	4.0	56.0
		The respondent stated that she gets flyers and they tell her not to fertilize because of the run off and because there is a pond in the area.	1	4.0	4.0	60.0
		The respondent stated that she gets information from Scott's.	1	4.0	4.0	64.0

	The respondent stated that she has heard information from the Tampa Tribune. It comes 4 times a year - a guide on what to plant and lawn maintenance guide.	1	4.0	4.0	68.0
	The respondent stated that she went online and found that the grass should not be cut too short and to use organic fertilizer	1	4.0	4.0	72.0
	The respondent stated that they can't really think of anything, maybe don't water during the day.	1	4.0	4.0	76.0
	The respondent stated that they cannot recall	1	4.0	4.0	80.0
	The respondent stated that they go online or ask people, it is not good in the summer months because it burns the grass and on cutting the grass.	1	4.0	4.0	84.0
	The respondent stated that they heard about the right time to fertilize - before spring.	1	4.0	4.0	88.0
	The respondent stated that they heard information from the Tampa Tribune and web sites	1	4.0	4.0	92.0
	The respondent stated that they just heard more about watering.	1	4.0	4.0	96.0

		The respondent stated that they receive weekly emails from Better Home and Garden - they get information on not cutting the grass short and no fertilizer.	1	4.0	4.0	100.0
		Total	25	100.0	100.0	
2.00 M101	Valid		11	50.0	50.0	50.0
		sfwmd.gov - South Florida Water Management Company (District) educates people on how much water goes on the lawn and don't over fertilize.	1	4.5	4.5	54.5
		The respondent stated that he had a guy come by from Scott's that offered a program that would offer an analysis.	1	4.5	4.5	59.1
		The respondent stated that he has heard how and when to fertilize and that you cannot over fertilize because of the environment and run off.	1	4.5	4.5	63.6
		The respondent stated that he has heard information on fertilization from T.V. - PBS. NPR and Mosaic particularly the use of phosphate.	1	4.5	4.5	68.2
		The respondent stated that he has heard information through the extension service that you can fertilize March - April with a low nitrogen base fertilizer	1	4.5	4.5	72.7
		The respondent stated that he has received literature from Scotts Lawn Care and Better Home and Garden	1	4.5	4.5	77.3

		The respondent stated that he heard information online - to fertilize in the early spring.	1	4.5	4.5	81.8
		The respondent stated that he heard to fertilize at the beginning of spring and the beginning of summer and end of fall. He heard this from Tom and Sons Lawn.	1	4.5	4.5	86.4
		The respondent stated that she heard information from Scotts Turf on the radio on how to feed and baby the lawn. She stated that she is having to relearn lawn care practices.	1	4.5	4.5	90.9
		The respondent stated that the TruGreen Advisor tells her what to put on the lawn.	1	4.5	4.5	95.5
		The respondent stated that they heard information on when you should water the lawn - in the evening.	1	4.5	4.5	100.0
		Total	22	100.0	100.0	
3.00 P201	Valid		6	42.9	42.9	42.9
		Does not know	1	7.1	7.1	50.0
		Don't recall	1	7.1	7.1	57.1
		The respondent stated that she has heard something online from Scotts, but she has her own formula	1	7.1	7.1	64.3

		The respondent stated that she heard information in a newspaper (Tampa Tribune) article about not fertilizing in the summer because of run off	1	7.1	7.1	71.4
		The respondent stated that the Pinellas Watershed Management and Southwest Management released information the fertilizer damaged the watershed and to be careful using it.	1	7.1	7.1	78.6
		The respondent stated that they have heard information Lowes and TruGreen but she doesn't recall	1	7.1	7.1	85.7
		The respondent stated that they have heard when to apply fertilizer and how often.	1	7.1	7.1	92.9
		The respondent stated that they heard information from home depot but doesn't recall	1	7.1	7.1	100.0
		Total	14	100.0	100.0	
4.00 P202	Valid		6	30.0	30.0	30.0
		The respondent heard that you should not fertilize in the summer, you should control the amount and not use it before rain.	1	5.0	5.0	35.0

The respondent replied that they heard information about lawn fertilization from Atlantic Pest Control and Lawn Spraying. Atlantic checked the sprinkler system to make sure it was not covering cable because they dug in the front yard, the grass will not grow back. The grass also gets too much sun.	1	5.0	5.0	40.0
The respondent says that she receives information from the Tampa Tribune and St. Petersburg Times. She doesn't have a choice.	1	5.0	5.0	45.0
The respondent stated that he gets information online and from Home Depot. Home Depot talks about different rules and regulations concerning lawn fertilization. He stated that he turns it over to a professional.	1	5.0	5.0	50.0
The respondent stated that he picked up information over the years.	1	5.0	5.0	55.0
The respondent stated that he reads online why the grass is dying and why it is brown.	1	5.0	5.0	60.0
The respondent stated that he received his information from commercials. The Scotts guy with the orange hat suggests to put lawn fertilizer down and weed kill.	1	5.0	5.0	65.0

The respondent stated that he receives emails from Scotts, the University of Virginia website on removing thatch and better ways to water the lawn.	1	5.0	5.0	70.0
The respondent stated that he receives information on lawn fertilization from the newspaper (St. Petersburg Times) and sometimes from the internet by Googling it.	1	5.0	5.0	75.0
The respondent stated that Scotts Lawn sends emails about the Southeast and when is the best time to fertilize the lawn	1	5.0	5.0	80.0
The respondent stated that she heard that it should only be applied in the spring and about the type of fertilizer.	1	5.0	5.0	85.0
The respondent stated that someone has told her to spray for bugs, she also stated that she needs to go to Home Depot to get bug killer.	1	5.0	5.0	90.0
The respondent stated that they heard information about Nitrates and when to fertilize	1	5.0	5.0	95.0
The respondent stated that they went to USF website and it tells them what types of plants and grass works best for their yards.	1	5.0	5.0	100.0
Total	20	100.0	100.0	

Q13: Have you heard anything about government regulations concerning residential landscape fertilizer? If yes, are you aware of any discussions about this issue here in [_________] County?

Site Location			Frequency	Percent	Valid Percent
1.00 H101	Valid	.00 No, nothing	16	64.0	64.0
		1.00 Yes, maybe; think I heard something; maybe; sounds familiar, etc.	4	16.0	16.0
		2.00 Yes, definitely	5	20.0	20.0
		Total	25	100.0	100.0
2.00 M101	Valid	.00 No, nothing	16	72.7	72.7
		1.00 Yes, maybe; think I heard something; maybe; sounds familiar, etc.	1	4.5	4.5
		2.00 Yes, definitely	5	22.7	22.7
		Total	22	100.0	100.0
3.00 P201	Valid	.00 No, nothing	5	35.7	35.7
		1.00 Yes, maybe; think I heard something; maybe; sounds familiar, etc.	2	14.3	14.3
		2.00 Yes, definitely	7	50.0	50.0
		Total	14	100.0	100.0
4.00 P202	Valid	.00 No, nothing	6	30.0	30.0
		1.00 Yes, maybe; think I heard something; maybe; sounds familiar, etc.	4	20.0	20.0
		2.00 Yes, definitely	10	50.0	50.0
		Total	20	100.0	100.0

Q13a: Restrict the use of lawn fertilizer during the rainy season?

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid	.00 No, government regulations in my county do not address this	4	16.0	44.4	44.4
		1.00 Yes, maybe heard something about regulations addressing this	1	4.0	11.1	55.6
		2.00 Yes, definitely the government regulations address this	2	8.0	22.2	77.8
		8.00 Don't know if government regulations address this	2	8.0	22.2	100.0
		Total	9	36.0	100.0	
	Missing	System	16	64.0		
	Total		25	100.0		
2.00 M101	Valid	.00 No, government regulations in my county do not address this	2	9.1	33.3	33.3
		2.00 Yes, definitely the government regulations address this	3	13.6	50.0	83.3
		8.00 Don't know if government regulations address this	1	4.5	16.7	100.0
		Total	6	27.3	100.0	
	Missing	System	16	72.7		
	Total		22	100.0		
3.00 P201	Valid	1.00 Yes, maybe heard something about regulations addressing this	1	7.1	11.1	11.1

		2.00 Yes, definitely the government regulations address this	8	57.1	88.9	100.0
		Total	9	64.3	100.0	
	Missing	System	5	35.7		
	Total		14	100.0		
4.00 P202	Valid	.00 No, government regulations in my county do not address this	1	5.0	7.1	7.1
		1.00 Yes, maybe heard something about regulations addressing this	3	15.0	21.4	28.6
		2.00 Yes, definitely the government regulations address this	8	40.0	57.1	85.7
		8.00 Don't know if government regulations address this	2	10.0	14.3	100.0
		Total	14	70.0	100.0	
	Missing	System	6	30.0		
	Total		20	100.0		

Q13b: Restrict the sale of lawn fertilizer during certain months?

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid	.00 No, government regulations in my county do not address this	2	8.0	22.2	22.2
		2.00 Yes, definitely the government regulations address this	2	8.0	22.2	44.4

		8.00 Don't know if government regulations address this	5	20.0	55.6	100.0
		Total	9	36.0	100.0	
	Missing	System	16	64.0		
	Total		25	100.0		
2.00 M101	Valid	1.00 Yes, maybe heard something about regulations addressing this	1	4.5	16.7	16.7
		2.00 Yes, definitely the government regulations address this	3	13.6	50.0	66.7
		8.00 Don't know if government regulations address this	2	9.1	33.3	100.0
		Total	6	27.3	100.0	
	Missing	System	16	72.7		
	Total		22	100.0		
3.00 P201	Valid	.00 No, government regulations in my county do not address this	1	7.1	11.1	11.1
		2.00 Yes, definitely the government regulations address this	6	42.9	66.7	77.8
		8.00 Don't know if government regulations address this	2	14.3	22.2	100.0
		Total	9	64.3	100.0	
	Missing	System	5	35.7		
	Total		14	100.0		
4.00 P202	Valid	.00 No, government regulations in my county do not address this	1	5.0	7.1	7.1

		1.00 Yes, maybe heard something about regulations addressing this	2	10.0	14.3	21.4
		2.00 Yes, definitely the government regulations address this	9	45.0	64.3	85.7
		8.00 Don't know if government regulations address this	2	10.0	14.3	100.0
		Total	14	70.0	100.0	
	Missing	System	6	30.0		
	Total		20	100.0		

Q13c: Reduce the amount of phosphorous ("P") allowed in lawn fertilizer?

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid	.00 No, government regulations in my county do not address this	3	12.0	33.3	33.3
		1.00 Yes, maybe heard something about regulations addressing this	3	12.0	33.3	66.7
		8.00 Don't know if government regulations address this	3	12.0	33.3	100.0
		Total	9	36.0	100.0	
	Missing	System	16	64.0		
	Total		25	100.0		
2.00 M101	Valid	.00 No, government regulations in my county do not address this	1	4.5	16.7	16.7

		1.00 Yes, maybe heard something about regulations addressing this	1	4.5	16.7	33.3
		2.00 Yes, definitely the government regulations address this	2	9.1	33.3	66.7
		8.00 Don't know if government regulations address this	2	9.1	33.3	100.0
		Total	6	27.3	100.0	
	Missing	System	16	72.7		
	Total		22	100.0		
3.00 P201	Valid	1.00 Yes, maybe heard something about regulations addressing this	1	7.1	11.1	11.1
		2.00 Yes, definitely the government regulations address this	4	28.6	44.4	55.6
		8.00 Don't know if government regulations address this	4	28.6	44.4	100.0
		Total	9	64.3	100.0	
	Missing	System	5	35.7		
	Total		14	100.0		
4.00 P202	Valid	.00 No, government regulations in my county do not address this	2	10.0	14.3	14.3
		1.00 Yes, maybe heard something about regulations addressing this	2	10.0	14.3	28.6
		2.00 Yes, definitely the government regulations address this	5	25.0	35.7	64.3

			Frequency	Percent	Valid Percent	Cumulative Percent
		8.00 Don’t know if government regulations address this	5	25.0	35.7	100.0
		Total	14	70.0	100.0	
	Missing	System	6	30.0		
	Total		20	100.0		

Q13d: Reduce the amount of nitrogen (“N”) allowed in lawn fertilizer?

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid	.00 No, government regulations in my county do not address this	4	16.0	44.4	44.4
		1.00 Yes, maybe heard something about regulations addressing this	1	4.0	11.1	55.6
		2.00 Yes, definitely the government regulations address this	1	4.0	11.1	66.7
		8.00 Don’t know if government regulations address this	3	12.0	33.3	100.0
		Total	9	36.0	100.0	
	Missing	System	16	64.0		
	Total		25	100.0		
2.00 M101	Valid	2.00 Yes, definitely the government regulations address this	3	13.6	50.0	50.0
		8.00 Don’t know if government regulations address this	3	13.6	50.0	100.0

		Total	6	27.3	100.0	
	Missing	System	16	72.7		
	Total		22	100.0		
3.00 P201	Valid	1.00 Yes, maybe heard something about regulations addressing this	2	14.3	22.2	22.2
		2.00 Yes, definitely the government regulations address this	3	21.4	33.3	55.6
		8.00 Don't know if government regulations address this	4	28.6	44.4	100.0
		Total	9	64.3	100.0	
	Missing	System	5	35.7		
	Total		14	100.0		
4.00 P202	Valid	.00 No, government regulations in my county do not address this	1	5.0	7.1	7.1
		1.00 Yes, maybe heard something about regulations addressing this	2	10.0	14.3	21.4
		2.00 Yes, definitely the government regulations address this	6	30.0	42.9	64.3
		8.00 Don't know if government regulations address this	5	25.0	35.7	100.0
		Total	14	70.0	100.0	
	Missing	System	6	30.0		
	Total		20	100.0		

Q13e: Require training for professional landscaping companies?

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid	.00 No, government regulations in my county do not address this	1	4.0	11.1	11.1
		2.00 Yes, definitely the government regulations address this	3	12.0	33.3	44.4
		8.00 Don't know if government regulations address this	5	20.0	55.6	100.0
		Total	9	36.0	100.0	
	Missing	System	16	64.0		
	Total		25	100.0		
2.00 M101	Valid	.00 No, government regulations in my county do not address this	2	9.1	33.3	33.3
		2.00 Yes, definitely the government regulations address this	3	13.6	50.0	83.3
		8.00 Don't know if government regulations address this	1	4.5	16.7	100.0
		Total	6	27.3	100.0	
	Missing	System	16	72.7		
	Total		22	100.0		
3.00 P201	Valid	.00 No, government regulations in my county do not address this	1	7.1	11.1	11.1
		1.00 Yes, maybe heard something about regulations addressing this	1	7.1	11.1	22.2

		2.00 Yes, definitely the government regulations address this	3	21.4	33.3	55.6
		8.00 Don’t know if government regulations address this	4	28.6	44.4	100.0
		Total	9	64.3	100.0	
	Missing	System	5	35.7		
	Total		14	100.0		
4.00 P202	Valid	.00 No, government regulations in my county do not address this	4	20.0	28.6	28.6
		8.00 Don’t know if government regulations address this	10	50.0	71.4	100.0
		Total	14	70.0	100.0	
	Missing	System	6	30.0		
	Total		20	100.0		

Q13f: Other - Heard other government regulations

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid		18	72.0	72.0	72.0
		None	1	4.0	4.0	76.0
		None - the respondent stated that government regulations are more concerned with herbicide than fertilizer	1	4.0	4.0	80.0

		The respondent heard to keep the fertilizer of the drive way. The respondent stated that certain brands of fertilizer have been banned.	1	4.0	4.0	84.0
		The respondent stated that he has heard about fertilizer regulations during the raining seasons. In Florida there is a ban on powder form of iron and nitrogen, and the lawn cannot have it in liquid.	1	4.0	4.0	88.0
		The respondent stated that he heard not to fertilize during the summer	1	4.0	4.0	92.0
		The respondent stated that she has heard water restrictions - watering the lawn between 8am and 6pm	1	4.0	4.0	96.0
		The respondent stated that they have heard regulations for the City of Tampa but not Hillsborough County.	1	4.0	4.0	100.0
		Total	25	100.0	100.0	
2.00 M101	Valid		14	63.6	63.6	63.6
		None	1	4.5	4.5	68.2
		None - He does is own regulations. He stated that he heard about the sales restriction on the Manatee County website and phosphorus on the bags of fertilizer.	1	4.5	4.5	72.7

		The respondent stated that he generally heard something - not to have a lot of pesticide. The respondent also vaguely heard but no strong knowledge on the ordinance.	1	4.5	4.5	77.3
		The respondent stated that he heard to use low or no fertilizer because it (runoff) feeds the rivers and streams. He stated that he heard that government regulations are trying to bring numbers (pollution) to common numbers, not overkill. Not to pollute too much. A friend wanted to but cannot do it (the lawn).	1	4.5	4.5	81.8
		The respondent stated that he thought the use of phosphorus was eliminated.	1	4.5	4.5	86.4
		The respondent stated that Pinellas and Hillsborough County cannot but fertilizer during certain months because it kills the marine life.	1	4.5	4.5	90.9
		The respondent stated that she has just heard restrictions on watering	1	4.5	4.5	95.5
		The respondent stated that the she has heard information on pesticides and monsouto - corn and soy. But not from the county government.	1	4.5	4.5	100.0
		Total	22	100.0	100.0	
3.00 P201	Valid		12	85.7	85.7	85.7

		The respondent stated that they heard about water restrictions	2	14.3	14.3	100.0
		Total	14	100.0	100.0	
4.00 P202	Valid		10	50.0	50.0	50.0
		None	5	25.0	25.0	75.0
		The respondent heard that you are not supposed to use nitrogen. She heard this also from the homeowners association.	1	5.0	5.0	80.0
		The respondent replied that they only heard information regarding water restrictions not fertilization.	1	5.0	5.0	85.0
		The respondent stated that he has just heard normal government regulations concerning fertilization and timing. He stated that he has just heard general information, he has to look it up.	1	5.0	5.0	90.0
		The respondent stated that he heard about water restrictions	1	5.0	5.0	95.0
		The respondent stated that they have only heard about alternate watering days.	1	5.0	5.0	100.0
		Total	20	100.0	100.0	

Q14: Do you recall when you heard about the ordinance?

Site Location			Frequency	Percent	Valid Percent
1.00 H101	Valid	1.00 This year (2013)	3	12.0	33.3

		2.00 Last year (2012)	5	20.0	55.6
		6.00 Other: Year given <Record year ___ ___ ___ ___ >	1	4.0	11.1
		Total	9	36.0	100.0
	Missing	System	16	64.0	
	Total		25	100.0	
2.00 M101	Valid	2.00 Last year (2012)	2	9.1	33.3
		3.00 Couple of years ago	2	9.1	33.3
		6.00 Other: Year given <Record year ___ ___ ___ ___ >	1	4.5	16.7
		7.00 Other: Record open ended _____________	1	4.5	16.7
		Total	6	27.3	100.0
	Missing	System	16	72.7	
	Total		22	100.0	
3.00 P201	Valid	1.00 This year (2013)	1	7.1	11.1
		2.00 Last year (2012)	3	21.4	33.3
		3.00 Couple of years ago	1	7.1	11.1
		4.00 Five years ago	1	7.1	11.1
		7.00 Other: Record open ended _____________	1	7.1	11.1
		8.00 Don’t know	2	14.3	22.2
		Total	9	64.3	100.0
	Missing	System	5	35.7	
	Total		14	100.0	
4.00 P202	Valid	1.00 This year (2013)	3	15.0	21.4
		2.00 Last year (2012)	3	15.0	21.4
		3.00 Couple of years ago	2	10.0	14.3
		4.00 Five years ago	1	5.0	7.1
		8.00 Don’t know	5	25.0	35.7

	Total	14	70.0	100.0
Missing	System	6	30.0	
Total		20	100.0	

Q14: Do you recall when you heard about the ordinance?

Site Location			Cumulative Percent
1.00 H101	Valid	1.00 This year (2013)	33.3
		2.00 Last year (2012)	88.9
		6.00 Other: Year given <Record year ___ ___ ___ ___ >	100.0
		Total	
	Missing	System	
	Total		
2.00 M101	Valid	2.00 Last year (2012)	33.3
		3.00 Couple of years ago	66.7
		6.00 Other: Year given <Record year ___ ___ ___ ___ >	83.3
		7.00 Other: Record open ended _____________	100.0
		Total	
	Missing	System	
	Total		
3.00 P201	Valid	1.00 This year (2013)	11.1
		2.00 Last year (2012)	44.4
		3.00 Couple of years ago	55.6
		4.00 Five years ago	66.7
		7.00 Other: Record open ended _____________	77.8
		8.00 Don’t know	100.0
		Total	

	Missing	System	
	Total		
4.00 P202	Valid	1.00 This year (2013)	21.4
		2.00 Last year (2012)	42.9
		3.00 Couple of years ago	57.1
		4.00 Five years ago	64.3
		8.00 Don't know	100.0
		Total	
	Missing	System	
	Total		

otherQ14year Other: Year given <Record year ___ ___ ___ ___ >

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid		24	96.0	96.0	96.0
		2010	1	4.0	4.0	100.0
		Total	25	100.0	100.0	
2.00 M101	Valid		20	90.9	90.9	90.9
		1	1	4.5	4.5	95.5
		2066	1	4.5	4.5	100.0
		Total	22	100.0	100.0	
3.00 P201	Valid		14	100.0	100.0	100.0
4.00 P202	Valid		20	100.0	100.0	100.0

otherQ14open Other: Record open ended _____________

Site Location	Frequency	Percent	Valid Percent

1.00 H101	Valid		25	100.0	100.0
2.00 M101	Valid		20	90.9	90.9
		1	1	4.5	4.5
		The respondent stated that the ordinance changes every three years.	1	4.5	4.5
		Total	22	100.0	100.0
3.00 P201	Valid		13	92.9	92.9
		The respondent stated that she heard about the ordinance years ago when it was put in place	1	7.1	7.1
		Total	14	100.0	100.0
4.00 P202	Valid		19	95.0	95.0
		The respondent stated that it was also in the June 1 newspaper.	1	5.0	5.0
		Total	20	100.0	100.0

otherQ14open Other: Record open ended _____________

Site Location			Cumulative Percent
1.00 H101	Valid		100.0
2.00 M101	Valid		90.9
		1	95.5
		The respondent stated that the ordinance changes every three years.	100.0
		Total	
3.00 P201	Valid		92.9
		The respondent stated that she heard about the ordinance years ago when it was put in place	100.0
		Total	
4.00 P202	Valid		95.0

	The respondent stated that it was also in the June 1 newspaper.	100.0
	Total	

Q15: Do you recall where you heard about the ordinance?

Site Location			Frequency	Percent	Valid Percent
1.00 H101	Valid	1.00 Heard about the ordinance	9	36.0	100.0
	Missing	System	16	64.0	
	Total		25	100.0	
2.00 M101	Valid	1.00 Heard about the ordinance	4	18.2	80.0
		88.00 Don't know	1	4.5	20.0
		Total	5	22.7	100.0
	Missing	System	17	77.3	
	Total		22	100.0	
3.00 P201	Valid	1.00 Heard about the ordinance	9	64.3	100.0
	Missing	System	5	35.7	
	Total		14	100.0	
4.00 P202	Valid	1.00 Heard about the ordinance	10	50.0	71.4
		88.00 Don't know	4	20.0	28.6
		Total	14	70.0	100.0
	Missing	System	6	30.0	
	Total		20	100.0	

tvQ15 Television or newspaper

Site Location	Frequency	Percent	Valid Percent	Cumulative Percent

1.00 H101	Valid	1.00 Yes	6	24.0	100.0	100.0
	Missing	System	19	76.0		
	Total		25	100.0		
2.00 M101	Valid	1.00 Yes	2	9.1	100.0	100.0
	Missing	System	20	90.9		
	Total		22	100.0		
3.00 P201	Valid	1.00 Yes	6	42.9	100.0	100.0
	Missing	System	8	57.1		
	Total		14	100.0		
4.00 P202	Valid	1.00 Yes	7	35.0	100.0	100.0
	Missing	System	13	65.0		
	Total		20	100.0		

eventQ15 Event or club meeting

Site Location			Frequency	Percent
1.00 H101	Missing	System	25	100.0
2.00 M101	Missing	System	22	100.0
3.00 P201	Missing	System	14	100.0
4.00 P202	Missing	System	20	100.0

neighborQ15 Neighbor/Family member

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Missing	System	25	100.0		
2.00 M101	Missing	System	22	100.0		
3.00 P201	Missing	System	14	100.0		

4.00 P202	Valid	1.00 Yes	1	5.0	100.0	100.0
	Missing	System	19	95.0		
	Total		20	100.0		

hardQ15 Hardware store/Home improvement centers

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid	1.00 Yes	1	4.0	100.0	100.0
	Missing	System	24	96.0		
	Total		25	100.0		
2.00 M101	Valid	1.00 Yes	1	4.5	100.0	100.0
	Missing	System	21	95.5		
	Total		22	100.0		
3.00 P201	Valid	1.00 Yes	2	14.3	100.0	100.0
	Missing	System	12	85.7		
	Total		14	100.0		
4.00 P202	Valid	1.00 Yes	3	15.0	100.0	100.0
	Missing	System	17	85.0		
	Total		20	100.0		

landQ15 Landscaping company/Professional landscaper

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid	1.00 Yes	1	4.0	100.0	100.0
	Missing	System	24	96.0		
	Total		25	100.0		
2.00 M101	Valid	1.00 Yes	1	4.5	100.0	100.0

	Missing	System	21	95.5		
	Total		22	100.0		
3.00 P201	Valid	1.00 Yes	1	7.1	100.0	100.0
	Missing	System	13	92.9		
	Total		14	100.0		
4.00 P202	Valid	1.00 Yes	2	10.0	100.0	100.0
	Missing	System	18	90.0		
	Total		20	100.0		

govQ15 Government office

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Missing	System	25	100.0		
2.00 M101	Missing	System	22	100.0		
3.00 P201	Valid	1.00 Yes	1	7.1	100.0	100.0
	Missing	System	13	92.9		
	Total		14	100.0		
4.00 P202	Missing	System	20	100.0		

directQ15 Direct mail

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid	1.00 Yes	1	4.0	100.0	100.0
	Missing	System	24	96.0		
	Total		25	100.0		
2.00 M101	Valid	1.00 Yes	1	4.5	100.0	100.0
	Missing	System	21	95.5		

	Total		22	100.0		
3.00 P201	Valid	1.00 Yes	1	7.1	100.0	100.0
	Missing	System	13	92.9		
	Total		14	100.0		
4.00 P202	Valid	1.00 Yes	1	5.0	100.0	100.0
	Missing	System	19	95.0		
	Total		20	100.0		

websiteQ15 Website

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid	1.00 Yes	1	4.0	100.0	100.0
	Missing	System	24	96.0		
	Total		25	100.0		
2.00 M101	Valid	1.00 Yes	1	4.5	100.0	100.0
	Missing	System	21	95.5		
	Total		22	100.0		
3.00 P201	Missing	System	14	100.0		
4.00 P202	Valid	1.00 Yes	3	15.0	100.0	100.0
	Missing	System	17	85.0		
	Total		20	100.0		

ufQ15 University of Florida/Agriculture Extension Service/Dept. of Agriculture

Site Location			Frequency	Percent
1.00 H101	Missing	System	25	100.0
2.00 M101	Missing	System	22	100.0

3.00 P201	Missing	System	14	100.0
4.00 P202	Missing	System	20	100.0

billboardQ15 Billboard

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Missing	System	25	100.0		
2.00 M101	Missing	System	22	100.0		
3.00 P201	Valid	1.00 Yes	1	7.1	100.0	100.0
	Missing	System	13	92.9		
	Total		14	100.0		
4.00 P202	Missing	System	20	100.0		

radioQ15 Radio

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid	1.00 Yes	1	4.0	100.0	100.0
	Missing	System	24	96.0		
	Total		25	100.0		
2.00 M101	Valid	1.00 Yes	2	9.1	100.0	100.0
	Missing	System	20	90.9		
	Total		22	100.0		
3.00 P201	Missing	System	14	100.0		
4.00 P202	Missing	System	20	100.0		

otherQ15open Other: Heard about the ordinance

Site Location			Frequency	Percent	Valid Percent
1.00 H101	Valid		22	88.0	88.0
		Channel 8	1	4.0	4.0
		University of Tampa Garden Show	1	4.0	4.0
		Utility Bill	1	4.0	4.0
		Total	25	100.0	100.0
2.00 M101	Valid		20	90.9	90.9
		Dinafrio Lawn Service	1	4.5	4.5
		Training	1	4.5	4.5
		Total	22	100.0	100.0
3.00 P201	Valid		12	85.7	85.7
		Family	1	7.1	7.1
		Pinellas Watershed Management	1	7.1	7.1
		Total	14	100.0	100.0
4.00 P202	Valid		19	95.0	95.0
		Utility Bill	1	5.0	5.0
		Total	20	100.0	100.0

otherQ15open Other: Heard about the ordinance

Site Location			Cumulative Percent
1.00 H101	Valid		88.0
		Channel 8	92.0
		University of Tampa Garden Show	96.0
		Utility Bill	100.0
		Total	
2.00 M101	Valid		90.9
		Dinafrio Lawn Service	95.5

		Training	100.0
		Total	
3.00 P201	Valid		85.7
		Family	92.9
		Pinellas Watershed Management	100.0
		Total	
4.00 P202	Valid		95.0
		Utility Bill	100.0
		Total	

Q16: How long have you lived in the house you're in now? __________ Year(s)

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid	10 years	10	40.0	40.0	40.0
		11 years	3	12.0	12.0	52.0
		12 years	1	4.0	4.0	56.0
		3 years	2	8.0	8.0	64.0
		4 years	2	8.0	8.0	72.0
		7 years	2	8.0	8.0	80.0
		8 years	2	8.0	8.0	88.0
		9 years	3	12.0	12.0	100.0
		Total	25	100.0	100.0	
2.00 M101	Valid	10 years	6	27.3	27.3	27.3
		10.5 years	1	4.5	4.5	31.8
		11 years	1	4.5	4.5	36.4
		12 years	1	4.5	4.5	40.9
		2.5 years	1	4.5	4.5	45.5

		3 years	1	4.5	4.5	50.0
		7 years	1	4.5	4.5	54.5
		8 years	4	18.2	18.2	72.7
		9 years	4	18.2	18.2	90.9
		Less than one year	2	9.1	9.1	100.0
		Total	22	100.0	100.0	
3.00 P201	Valid	1.5 years	1	7.1	7.1	7.1
		10 years	6	42.9	42.9	50.0
		2 years	1	7.1	7.1	57.1
		3 years	1	7.1	7.1	64.3
		9 years	3	21.4	21.4	85.7
		9.5 years	1	7.1	7.1	92.9
		Less than one year	1	7.1	7.1	100.0
		Total	14	100.0	100.0	
4.00 P202	Valid	1 year	1	5.0	5.0	5.0
		10 years	1	5.0	5.0	10.0
		12 years	3	15.0	15.0	25.0
		13 years	1	5.0	5.0	30.0
		15 years	3	15.0	15.0	45.0
		17 years	1	5.0	5.0	50.0
		20 years	3	15.0	15.0	65.0
		22 years	1	5.0	5.0	70.0
		26 years	1	5.0	5.0	75.0
		30 years	2	10.0	10.0	85.0
		32 years	1	5.0	5.0	90.0
		9 years	1	5.0	5.0	95.0
		Less than one year	1	5.0	5.0	100.0
		Total	20	100.0	100.0	

Q17: What is your current employment status?

Site Location			Frequency	Percent	Valid Percent
1.00 H101	Valid	1.00 Working full time	21	84.0	84.0
		4.00 Not working - Looking for work	1	4.0	4.0
		5.00 Not working - Retired	2	8.0	8.0
		8.00 Not working - Student	1	4.0	4.0
		Total	25	100.0	100.0
2.00 M101	Valid	1.00 Working full time	11	50.0	50.0
		5.00 Not working - Retired	7	31.8	31.8
		7.00 Not working - Homemaker	2	9.1	9.1
		8.00 Not working - Student	1	4.5	4.5
		99.00 DK/NA/Refused	1	4.5	4.5
		Total	22	100.0	100.0
3.00 P201	Valid	1.00 Working full time	9	64.3	64.3
		2.00 Working part time	2	14.3	14.3
		4.00 Not working - Looking for work	1	7.1	7.1
		5.00 Not working - Retired	2	14.3	14.3
		Total	14	100.0	100.0
4.00 P202	Valid	1.00 Working full time	9	45.0	45.0
		2.00 Working part time	2	10.0	10.0
		4.00 Not working - Looking for work	1	5.0	5.0
		5.00 Not working - Retired	7	35.0	35.0
		99.00 DK/NA/Refused	1	5.0	5.0
		Total	20	100.0	100.0

Q17: What is your current employment status?

Site Location			Cumulative Percent
1.00 H101	Valid	1.00 Working full time	84.0
		4.00 Not working - Looking for work	88.0
		5.00 Not working - Retired	96.0
		8.00 Not working - Student	100.0
		Total	
2.00 M101	Valid	1.00 Working full time	50.0
		5.00 Not working - Retired	81.8
		7.00 Not working - Homemaker	90.9
		8.00 Not working - Student	95.5
		99.00 DK/NA/Refused	100.0
		Total	
3.00 P201	Valid	1.00 Working full time	64.3
		2.00 Working part time	78.6
		4.00 Not working - Looking for work	85.7
		5.00 Not working - Retired	100.0
		Total	
4.00 P202	Valid	1.00 Working full time	45.0
		2.00 Working part time	55.0
		4.00 Not working - Looking for work	60.0
		5.00 Not working - Retired	95.0
		99.00 DK/NA/Refused	100.0
		Total	

Q19: Race

Site Location	Frequency	Percent	Valid Percent

1.00 H101	Valid	1 White	17	68.0	68.0
		2 African American or Black	3	12.0	12.0
		3 Hispanic	3	12.0	12.0
		4 Asian or Pacific Islander	2	8.0	8.0
		Total	25	100.0	100.0
2.00 M101	Valid	1 White	16	72.7	76.2
		2 African American or Black	5	22.7	23.8
		Total	21	95.5	100.0
	Missing	System	1	4.5	
	Total		22	100.0	
3.00 P201	Valid	1 White	10	71.4	71.4
		3 Hispanic	1	7.1	7.1
		4 Asian or Pacific Islander	2	14.3	14.3
		6 Other	1	7.1	7.1
		Total	14	100.0	100.0
4.00 P202	Valid	1 White	18	90.0	90.0
		4 Asian or Pacific Islander	1	5.0	5.0
		6 Other	1	5.0	5.0
		Total	20	100.0	100.0

Q19: Race

Site Location			Cumulative Percent
1.00 H101	Valid	1 White	68.0
		2 African American or Black	80.0
		3 Hispanic	92.0
		4 Asian or Pacific Islander	100.0
		Total	
2.00 M101	Valid	1 White	76.2
		2 African American or Black	100.0

		Total	
	Missing	System	
	Total		
3.00 P201	Valid	1 White	71.4
		3 Hispanic	78.6
		4 Asian or Pacific Islander	92.9
		6 Other	100.0
		Total	
4.00 P202	Valid	1 White	90.0
		4 Asian or Pacific Islander	95.0
		6 Other	100.0
		Total	

Q20: Gender

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid	1 Female	6	24.0	24.0	24.0
		2 Male	19	76.0	76.0	100.0
		Total	25	100.0	100.0	
2.00 M101	Valid	1 Female	7	31.8	31.8	31.8
		2 Male	15	68.2	68.2	100.0
		Total	22	100.0	100.0	
3.00 P201	Valid	1 Female	9	64.3	64.3	64.3
		2 Male	5	35.7	35.7	100.0
		Total	14	100.0	100.0	
4.00 P202	Valid	1 Female	5	25.0	25.0	25.0
		2 Male	15	75.0	75.0	100.0
		Total	20	100.0	100.0	

Comments Respondents Comments

Site Location			Frequency	Percent	Valid Percent
1.00 H101	Valid		24	96.0	96.0
		The respondent said that the type of grass (St. Augustine) is the worst kind of grass to maintain., but it came with the house and the HOA requires the upkeep which requires a lot of extra maintenance. Had to replace grass 3 times, attracts bugs.	1	4.0	4.0
		Total	25	100.0	100.0
2.00 M101	Valid		21	95.5	95.5
		The respondent stated that she has a lawn service, Jefferies Lawn Service. 10/2 she had Anderson Lawn Service put in landscaping.	1	4.5	4.5
		Total	22	100.0	100.0
3.00 P201	Valid		14	100.0	100.0
4.00 P202	Valid		19	95.0	95.0
		The lawn has had constant care for 26 years. Reclaimed pipe water.	1	5.0	5.0
		Total	20	100.0	100.0

Comments Respondents Comments

Site Location		Cumulative Percent
1.00 H101	Valid	96.0

		The respondent said that the type of grass (St. Augustine) is the worst kind of grass to maintain., but it came with the house and the HOA requires the upkeep which requires a lot of extra maintenance. Had to replace grass 3 times, attracts bugs.	100.0
		Total	
2.00 M101	Valid		95.5
		The respondent stated that she has a lawn service, Jefferies Lawn Service. 10/2 she had Anderson Lawn Service put in landscaping.	100.0
		Total	
3.00 P201	Valid		100.0
4.00 P202	Valid		95.0
		The lawn has had constant care for 26 years. Reclaimed pipe water.	100.0
		Total	

fertfreq Number of times lawn was fertilized in last year

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid	2	2	8.0	8.7	8.7
		3	5	20.0	21.7	30.4
		4	3	12.0	13.0	43.5
		5	2	8.0	8.7	52.2
		6	1	4.0	4.3	56.5
		7	2	8.0	8.7	65.2
		8	1	4.0	4.3	69.6
		9	4	16.0	17.4	87.0
		10	2	8.0	8.7	95.7

		12	1	4.0	4.3	100.0
		Total	23	92.0	100.0	
	Missing	System	2	8.0		
	Total		25	100.0		
2.00 M101	Valid	1	5	22.7	41.7	41.7
		2	4	18.2	33.3	75.0
		3	1	4.5	8.3	83.3
		4	1	4.5	8.3	91.7
		6	1	4.5	8.3	100.0
		Total	12	54.5	100.0	
	Missing	System	10	45.5		
	Total		22	100.0		
3.00 P201	Valid	1	2	14.3	18.2	18.2
		2	2	14.3	18.2	36.4
		3	3	21.4	27.3	63.6
		4	1	7.1	9.1	72.7
		5	1	7.1	9.1	81.8
		6	1	7.1	9.1	90.9
		12	1	7.1	9.1	100.0
		Total	11	78.6	100.0	
	Missing	System	3	21.4		
	Total		14	100.0		
4.00 P202	Valid	1	2	10.0	13.3	13.3
		2	4	20.0	26.7	40.0
		3	1	5.0	6.7	46.7
		4	4	20.0	26.7	73.3
		6	3	15.0	20.0	93.3
		8	1	5.0	6.7	100.0
		Total	15	75.0	100.0	

Missing	System	5	25.0
Total		20	100.0

fert_more Yards fertilizer more than twice a year

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid	0	2	8.0	8.7	8.7
		1	21	84.0	91.3	100.0
		Total	23	92.0	100.0	
	Missing	System	2	8.0		
	Total		25	100.0		
2.00 M101	Valid	0	9	40.9	75.0	75.0
		1	3	13.6	25.0	100.0
		Total	12	54.5	100.0	
	Missing	System	10	45.5		
	Total		22	100.0		
3.00 P201	Valid	0	4	28.6	36.4	36.4
		1	7	50.0	63.6	100.0
		Total	11	78.6	100.0	
	Missing	System	3	21.4		
	Total		14	100.0		
4.00 P202	Valid	0	6	30.0	40.0	40.0
		1	9	45.0	60.0	100.0
		Total	15	75.0	100.0	
	Missing	System	5	25.0		
	Total		20	100.0		

age Respondent age

Site Location			Frequency	Percent	Valid Percent	Cumulative Percent
1.00 H101	Valid	28	1	4.0	4.2	4.2
		32	1	4.0	4.2	8.3
		36	1	4.0	4.2	12.5
		37	1	4.0	4.2	16.7
		40	1	4.0	4.2	20.8
		41	1	4.0	4.2	25.0
		42	1	4.0	4.2	29.2
		43	1	4.0	4.2	33.3
		44	2	8.0	8.3	41.7
		46	1	4.0	4.2	45.8
		48	1	4.0	4.2	50.0
		51	1	4.0	4.2	54.2
		54	3	12.0	12.5	66.7
		56	1	4.0	4.2	70.8
		57	1	4.0	4.2	75.0
		58	1	4.0	4.2	79.2
		59	1	4.0	4.2	83.3
		60	1	4.0	4.2	87.5
		63	2	8.0	8.3	95.8
		67	1	4.0	4.2	100.0
		Total	24	96.0	100.0	
	Missing	System	1	4.0		
	Total		25	100.0		
2.00 M101	Valid	29	1	4.5	4.8	4.8
		34	1	4.5	4.8	9.5

		39	1	4.5	4.8	14.3
		42	3	13.6	14.3	28.6
		50	2	9.1	9.5	38.1
		51	2	9.1	9.5	47.6
		53	1	4.5	4.8	52.4
		58	1	4.5	4.8	57.1
		59	1	4.5	4.8	61.9
		62	1	4.5	4.8	66.7
		65	1	4.5	4.8	71.4
		66	1	4.5	4.8	76.2
		70	2	9.1	9.5	85.7
		72	1	4.5	4.8	90.5
		74	1	4.5	4.8	95.2
		80	1	4.5	4.8	100.0
		Total	21	95.5	100.0	
	Missing	System	1	4.5		
	Total		22	100.0		
3.00 P201	Valid	30	1	7.1	7.1	7.1
		36	1	7.1	7.1	14.3
		37	1	7.1	7.1	21.4
		38	1	7.1	7.1	28.6
		40	1	7.1	7.1	35.7
		43	1	7.1	7.1	42.9
		44	1	7.1	7.1	50.0
		47	1	7.1	7.1	57.1
		50	1	7.1	7.1	64.3
		51	1	7.1	7.1	71.4
		52	1	7.1	7.1	78.6
		65	1	7.1	7.1	85.7

72	1	7.1	7.1	92.9
73	1	7.1	7.1	100.0
Total	14	100.0	100.0	

4.00 P202

Valid	29	1	5.0	5.3	5.3
	30	1	5.0	5.3	10.5
	43	2	10.0	10.5	21.1
	44	1	5.0	5.3	26.3
	49	1	5.0	5.3	31.6
	53	1	5.0	5.3	36.8
	54	1	5.0	5.3	42.1
	57	2	10.0	10.5	52.6
	59	1	5.0	5.3	57.9
	64	1	5.0	5.3	63.2
	67	2	10.0	10.5	73.7
	70	1	5.0	5.3	78.9
	72	1	5.0	5.3	84.2
	78	1	5.0	5.3	89.5
	86	1	5.0	5.3	94.7
	89	1	5.0	5.3	100.0
	Total	19	95.0	100.0	
Missing	System	1	5.0		
Total		20	100.0		

Appendix H – Professional Interview Response Frequencies by Community

Professional Interviews

Frequency Tables

Q1 What form of fertilizer do you typically apply to a residential lawn - liquid fertilizer or solid, granule type fertilizer?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0 Liquid fertilizer	1	16.7	25.0	25.0
	2 Both, it depends <Prompt, please explain>	3	50.0	75.0	100.0
	Total	4	66.7	100.0	
Missing	System	2	33.3		
Total		6	100.0		

bothQ1 Both, it depends <Prompt, please explain>

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	16.7	16.7	16.7
	Granule	1	16.7	16.7	33.3
	Granule only	1	16.7	16.7	50.0
	The respondent stated that from April to September the company uses liquid fertilizer and from October to March the company uses a granule type fertilizer.	1	16.7	16.7	66.7
	The respondent stated that it depends on the time of year and the customer.	1	16.7	16.7	83.3

	The respondent stated that they use Granule two times a year - in the spring and fall. They use Iron during the rainy season and the growing season.	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

Q2 What nutrient content does the fertilizer contain? (Nitrogen, Phosphorus, Potash, micronutrients?) <Record open ended>

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Micro - variety and magnesium; Macro - Nitrogen(slow release), Nitrogen, Potassium and NO phosphorus. Secondary - Iron, Metal, Magnesium, Copper, Metal	1	16.7	16.7	16.7
	The respondent stated that from October to May the company uses Nitrogen Potassium and a Micro consisting of Iron, Magnesium and Manganese. The respondent stated that from June to September the company uses Nitrogen Black, Protein and a Micro.	1	16.7	16.7	33.3
	The respondent stated that it is a combination of Nitrogen and Potassium. In some areas you cannot use Nitrogen so they use a Micro-nutrient	1	16.7	16.7	50.0
	The respondent stated that the generally use a 6-6-6/NPK	1	16.7	16.7	66.7

		Frequency	Percent	Valid Percent	Cumulative Percent
	The respondent stated that the Majors consist of Nitrogen, Phosphorus, Potassium and Potash. The Minors consists of manganese, magnesium, boron, sulphur - just a broad (amount)	1	16.7	16.7	83.3
	The respondent stated that they use Nitrogen, Potassium and Phosphorus. They use only Nitrogen when it is not banned and only Potassium during the Nitrogen ban.	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

Q3 On average, about how times a year do you visit one homeowners yard?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	12 times a year or 9 times a year.	1	16.7	16.7	16.7
	52	1	16.7	16.7	33.3
	6 and 12	1	16.7	16.7	50.0
	8	2	33.3	33.3	83.3
	Depends	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

dependsQ3 If they indicate that “it depends”, ask them what they consider when making that decision.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	16.7	16.7	16.7

	Regularly	1	16.7	16.7	33.3
	The respondent stated that homeowners use the 12 month or 9 month program depending on economic their factors.	1	16.7	16.7	50.0
	The respondent stated that it depends. It is either every 60 days or every 30 days. It depends on the program that is selected for the lawn. If it is a replacement it is every 30 days.	1	16.7	16.7	66.7
	The respondent stated that the lowest number of times is (6) six and the most frequent is (12) twelve that they visit one homeowners yard. It is different for the different needs.	1	16.7	16.7	83.3
	The respondent stated that they visit a home 52 weeks a year.	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

Q4 Does the fertilizer formula vary from yard to yard or do you pretty much use the same mixture on every yard?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00 Formula varies from yard to yard	2	33.3	33.3	33.3
	2.00 Pretty much use the same blend on every yard	4	66.7	66.7	100.0
	Total	6	100.0	100.0	

Q4B

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		2	33.3	33.3	33.3
	The respondent stated that it varies, they create a custom blend for their clients because it is applied at different rates.	1	16.7	16.7	50.0
	The respondent stated that they have (3) three different liquids and an infinite number of granules.	1	16.7	16.7	66.7
	The respondent stated that they use fertilizer on every customers yard. Pinellas County there is a Nitrogen ban and parts of Hillsborough 6/1-9/31.	1	16.7	16.7	83.3
	The respondent stated that they use two general blends there is a main blend which is 24-2-11 and blend that is 9-0-24. It depends on the grass.	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

Q5 During what months is nitrogen applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00 Applied	6	100.0	100.0	100.0

Jan Q5 During what months is nitrogen applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not Applied	3	50.0	50.0	50.0
	1.00 Applied	3	50.0	50.0	100.0
	Total	6	100.0	100.0	

Feb Q5 During what months is nitrogen applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not Applied	2	33.3	33.3	33.3
	1.00 Applied	4	66.7	66.7	100.0
	Total	6	100.0	100.0	

Mar Q5 During what months is nitrogen applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not Applied	1	16.7	16.7	16.7
	1.00 Applied	5	83.3	83.3	100.0
	Total	6	100.0	100.0	

Apr Q5 During what months is nitrogen applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not Applied	3	50.0	50.0	50.0
	1.00 Applied	3	50.0	50.0	100.0

	Total	6	100.0	100.0	

May Q5 During what months is nitrogen applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not Applied	3	50.0	50.0	50.0
	1.00 Applied	3	50.0	50.0	100.0
	Total	6	100.0	100.0	

Jun Q5 During what months is nitrogen applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not Applied	5	83.3	83.3	83.3
	1.00 Applied	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

Jul Q5 During what months is nitrogen applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not Applied	5	83.3	83.3	83.3
	1.00 Applied	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

Aug Q5 During what months is nitrogen applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not Applied	5	83.3	83.3	83.3
	1.00 Applied	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

Sep Q5 During what months is nitrogen applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not Applied	5	83.3	83.3	83.3
	1.00 Applied	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

Oct Q5 During what months is nitrogen applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not Applied	3	50.0	50.0	50.0
	1.00 Applied	3	50.0	50.0	100.0
	Total	6	100.0	100.0	

Nov Q5 During what months is nitrogen applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not Applied	3	50.0	50.0	50.0
	1.00 Applied	3	50.0	50.0	100.0

	Total	6	100.0	100.0	

Dec Q5 During what months is nitrogen applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not Applied	5	83.3	83.3	83.3
	1.00 Applied	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

Nitrogen

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		3	50.0	50.0	50.0
	The respondent stated that there is a Nitrogen ban in the city of Tampa, Pinellas and Hillsborough County from June 1 through September 30.	1	16.7	16.7	66.7
	The respondent stated that they only use Nitrogen when the program needs it. They use fungicide during dormant times.	1	16.7	16.7	83.3
	The respondent stated that they use Nitrogen for only four months depending on the service area and the county ban.	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

Q6 During what months is phosphorous applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not Applied	3	50.0	50.0	50.0
	1.00 Applied	1	16.7	16.7	66.7
	88.00 Don't know	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

JanQ6 During what months is phosphorous applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not Applied	5	83.3	100.0	100.0
Missing	System	1	16.7		
Total		6	100.0		

FebQ6 During what months is phosphorous applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not Applied	4	66.7	80.0	80.0
	1.00 Applied	1	16.7	20.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

Mar Q6 During what months is phosphorous applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not Applied	5	83.3	100.0	100.0
Missing	System	1	16.7		
Total		6	100.0		

Apr Q6 During what months is phosphorous applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not Applied	5	83.3	100.0	100.0
Missing	System	1	16.7		
Total		6	100.0		

May Q6 During what months is phosphorous applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not Applied	5	83.3	100.0	100.0
Missing	System	1	16.7		
Total		6	100.0		

Jun Q6 During what months is phosphorous applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not Applied	5	83.3	100.0	100.0
Missing	System	1	16.7		
Total		6	100.0		

Jul Q6 During what months is phosphorous applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not Applied	5	83.3	100.0	100.0
Missing	System	1	16.7		
Total		6	100.0		

Aug Q6 During what months is phosphorous applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not Applied	5	83.3	100.0	100.0
Missing	System	1	16.7		
Total		6	100.0		

Sep Q6 During what months is phosphorous applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not Applied	5	83.3	100.0	100.0
Missing	System	1	16.7		
Total		6	100.0		

Oct Q6 During what months is phosphorous applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not Applied	4	66.7	80.0	80.0
	1.00 Applied	1	16.7	20.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

Nov Q6 During what months is phosphorous applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not Applied	5	83.3	100.0	100.0
Missing	System	1	16.7		
Total		6	100.0		

Dec Q6 During what months is phosphorous applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not Applied	5	83.3	100.0	100.0
Missing	System	1	16.7		
Total		6	100.0		

Phosphorous

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		2	33.3	33.3	33.3

		Frequency	Percent	Valid Percent	Cumulative Percent
	The respondent stated that it depends on the blackout. It is not good during the dormant stage.	1	16.7	16.7	50.0
	The respondent stated that it is not used during the summer ban months but they do not know when they use it.	1	16.7	16.7	66.7
	The respondent stated that they cannot legally apply it. The respondent stated that a soil sample has to be performed. They reiterated that they DO NOT use it.	1	16.7	16.7	83.3
	The respondent stated that they never use phosphorus anymore.	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

Q7 During what months is potassium applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00 Applied	6	100.0	100.0	100.0

JanQ7 During what months is potassium applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not Applied	3	50.0	60.0	60.0
	1.00 Applied	2	33.3	40.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		

Total		6	100.0

FebQ7 During what months is potassium applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not Applied	1	16.7	20.0	20.0
	1.00 Applied	4	66.7	80.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

Mar Q7 During what months is potassium applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not Applied	1	16.7	20.0	20.0
	1.00 Applied	4	66.7	80.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

Apr Q7 During what months is potassium applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not Applied	2	33.3	40.0	40.0
	1.00 Applied	3	50.0	60.0	100.0

	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

May Q7 During what months is potassium applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not Applied	2	33.3	40.0	40.0
	1.00 Applied	3	50.0	60.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

Jun Q7 During what months is potassium applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not Applied	3	50.0	60.0	60.0
	1.00 Applied	2	33.3	40.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

Jul Q7 During what months is potassium applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not Applied	3	50.0	60.0	60.0
	1.00 Applied	2	33.3	40.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

Aug Q7 During what months is potassium applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not Applied	3	50.0	60.0	60.0
	1.00 Applied	2	33.3	40.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

Sep Q7 During what months is potassium applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not Applied	2	33.3	40.0	40.0
	1.00 Applied	3	50.0	60.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

Oct Q7 During what months is potassium applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00 Applied	5	83.3	100.0	100.0
Missing	System	1	16.7		
Total		6	100.0		

Nov Q7 During what months is potassium applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not Applied	1	16.7	20.0	20.0
	1.00 Applied	4	66.7	80.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

Dec Q7 During what months is potassium applied to the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not Applied	2	33.3	40.0	40.0
	1.00 Applied	3	50.0	60.0	100.0
	Total	5	83.3	100.0	
Missing	System	1	16.7		
Total		6	100.0		

otherQ7

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		3	50.0	50.0	50.0
	The respondent stated that it depends on the blackout. It is not good during the dormant stage.	1	16.7	16.7	66.7
	The respondent stated that they use it as needed there is no restriction.	1	16.7	16.7	83.3
	The respondent stated that they use very little of it, they use it for prevention. He stated that other people over fertilize.	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

Q8 How do you calculate the correct amount of nitrogen to apply to each lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	The respondent stated that a formula is calibrated. For the dry version they uses a rotary spreader, they follow the label which is 1lb per 1000sqft. For the liquid version they use a tank which is one gallon per 1000sqft.	1	16.7	16.7	16.7
	The respondent stated that it depends on the grass type. They will measure a certain area and (apply) 50%. The respondent stated that they do not use the cheap stuff - they use all sulfur coated and prill coated.	1	16.7	16.7	33.3

	The respondent stated that they calculate Nitrogen based upon square footage of the homeowners lawn and they calibrate their spreaders per location.	1	16.7	16.7	50.0
	The respondent stated that they follow the instructions.	1	16.7	16.7	66.7
	The respondent stated that they follow the label and what is regulated by the County.	1	16.7	16.7	83.3
	The respondent stated that they use different strengths at different times.	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

Q9 Are there times or situations when you should NOT fertilize the lawn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00 Yes, should NOT fertilize	6	100.0	100.0	100.0

beforeQ9 Right before a hard rain

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00 should NOT fertilize	3	50.0	100.0	100.0
Missing	System	3	50.0		
Total		6	100.0		

afterQ9 After a hard rain

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00 should NOT fertilize	1	16.7	100.0	100.0
Missing	System	5	83.3		
Total		6	100.0		

droughtQ9 During a drought

		Frequency	Percent
Missing	System	6	100.0

morningQ9 Morning

		Frequency	Percent
Missing	System	6	100.0

eveningQ9 Evening

		Frequency	Percent
Missing	System	6	100.0

winterQ9 Winter

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00 should NOT fertilize	2	33.3	100.0	100.0
Missing	System	4	66.7		

Total		6	100.0

summerQ9 Summer

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00 should NOT fertilize	1	16.7	100.0	100.0
Missing	System	5	83.3		
Total		6	100.0		

springQ9 Spring

		Frequency	Percent
Missing	System	6	100.0

fallQ9 Fall

		Frequency	Percent
Missing	System	6	100.0

Other:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	The respondent stated 24 hours before a storm you should not fertilize.	1	16.7	16.7	16.7

The respondent stated that it depends of the county - Pinellas, City of Tampa and Pasco. Hillsborough county does not restrict.	1	16.7	16.7	33.3
The respondent stated that you should not fertilize during a hurricane, a flood and rainfall greater that 2inches as well as from June to September.	1	16.7	16.7	50.0
The respondent stated that you should not fertilize during County Bans, excessive growth - use only as needed and dependent on the weather. The respondent continued to report that this is for both Pinellas and Hillsborough County	1	16.7	16.7	66.7
The respondent stated that you should not use fertilizer during lawn stress which is caused by too much fertilizer and a freeze. They respondent also stated that you should not use fertilizer when installing new sod.	1	16.7	16.7	83.3
The respondent stated that you should not use fertilizer when there are restrictions and codes	1	16.7	16.7	100.0
Total	6	100.0	100.0	

Q10 Have you heard anything about government regulations concerning residential landscape fertilizer? If yes, are you aware of regulations in [_________] County? <Insert County and use same county throughout. If they >

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00 Yes, maybe; think I heard something; maybe; sounds familiar, etc.	1	16.7	16.7	16.7
	2.00 Yes, definitely	5	83.3	83.3	100.0
	Total	6	100.0	100.0	

Q10a Restrict the use of lawn fertilizer during the rainy season?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00 Yes, maybe heard something about regulations addressing this	1	16.7	16.7	16.7
	2.00 Yes, definitely the government regulations address this	4	66.7	66.7	83.3
	8.00 Don’t know if government regulations address this	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

Q10b Restrict the sale of lawn fertilizer during certain months?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00 Yes, maybe heard something about regulations addressing this	1	16.7	16.7	16.7
	2.00 Yes, definitely the government regulations address this	3	50.0	50.0	66.7

		Frequency	Percent	Valid Percent	Cumulative Percent
	8.00 Don’t know if government regulations address this	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

Q10c Reduce the amount of phosphorous (“P”) allowed in lawn fertilizer?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00 Yes, maybe heard something about regulations addressing this	2	33.3	33.3	33.3
	2.00 Yes, definitely the government regulations address this	3	50.0	50.0	83.3
	8.00 Don’t know if government regulations address this	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

Q10d Reduce the amount of nitrogen (“N”) allowed in lawn fertilizer?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00 Yes, maybe heard something about regulations addressing this	1	16.7	16.7	16.7
	2.00 Yes, definitely the government regulations address this	4	66.7	66.7	83.3
	8.00 Don’t know if government regulations address this	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

Q10e Require training for professional landscaping companies?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2.00 Yes, definitely the government regulations address this	6	100.0	100.0	100.0

Q10f Other - Heard other government regulations <RECORD OPEN ENDED>

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No other. The respondent stated that for 10a only Nitrogen is banned during the rainy season to prevent runoff in ponds. For 10b the respondent stated that fertilizer is restricted June to September. For 10c the respondent stated that phosphorous is banned all year long. For 10d the respondent stated that Nitrogen is banned June to September.	1	16.7	16.7	16.7

The respondent stated that 24 hours prior to a storm there is fertilizer restriction, fertilizer must be pulled off the self during certain months, there is an ordinance for phosphorous - you must have a soil sample showing a reduction and then get permission. The respondent stated that it is how you apply the nitrogen. The respondent stated that there is a Four-Hour course mandated. The respondent stated that there are pages of regulations with a 50-60 question test. They are highly regulated	1	16.7	16.7	33.3
The respondent stated that he has heard other government regulations. There is Best Management Practice (BMP) - individuals must take training on run-off. Now a decal or sticker must be on every vehicle.	1	16.7	16.7	50.0
The respondent stated that there are class for lawn mowing maintenance, however landscaper are not required to take them.	1	16.7	16.7	66.7
The respondent stated that they follow the fertilizer ban, phosphorous is banned during the rainy season.	1	16.7	16.7	83.3

		Frequency	Percent	Valid Percent	Cumulative Percent
	The respondent stated that they have heard about similar restriction in other areas like Sarasota and Anna Marie. The company services the whole state but her branch the local counties. The respondent stated that they send many techs (to learn)	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

Q11 Do the regulations that you described in the previous series of questions apply in other counties that you work in? Have local government regulations made you change the way you do business?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00 Yes – If yes, which counties? <Record open ended>	5	83.3	83.3	83.3
	9.00 Refused/Missing	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

openQ11 q11 Yes – If yes, which counties? <Record open ended>

		Frequency	Percent	Valid Percent	Cumulative Percent

Valid	Hillsborough and Greater Tampa there are bans, they are allowed to use up to 4lbs of Nitrogen but they only use 2lbs. He stated that they 'old guys' have to sit up late wondering how to keep homeowners lawn green, weed free and no fungus. Fungicide is $278 a gallon and someone has to absorb the cost. They stated that they do not agree with the Nitrogen Ban - but abides by the law, but would like to use slow release (Nitrogen).	1	16.7	16.7	16.7
	Pinellas	1	16.7	16.7	33.3
	Pinellas and Hillsborough County. The respondent stated that you must get licensed in every county in Florida.	1	16.7	16.7	50.0
	Pinellas and Manatee	1	16.7	16.7	66.7
	Pinellas, Hillsborough and Pasco Counties	1	16.7	16.7	83.3
	This interview was before the revision.	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

Q12 Have local government regulations made you change the way you do business?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00 Yes – If yes, how? <Record open ended>	6	100.0	100.0	100.0

openQ12 q12 Yes – If yes, which counties? <Record open ended>

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	The respondent stated not very much, they have always followed government and packaging regulations. When the Nitrogen ban took effect they began to use a zero Nitrogen Organic fertilizer for the rainy season.	1	16.7	16.7	16.7
	The respondent stated nothing of consequence.	1	16.7	16.7	33.3
	The respondent stated that the restrictions have made changes to the way the company conducts business. The respondent stated that the plants can benefit from the coverings. It reflects on the business and the homeowners become move on to other business.	1	16.7	16.7	50.0
	The respondent stated that they have to adhere to them.	1	16.7	16.7	66.7
	The respondent stated that they tailor their program to be aware of the environment and aware of run-off and to use less fertilizer and nitrogen.	1	16.7	16.7	83.3
	The respondent stated yes, the ban has altered the way that they conduct business. They use a lot of Iron - it leaves orange stains on the sidewalks and homeowners do not like it.	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

Appendix I – Standard Analytical Results for Top Soil Samples

Appendix E. Top Soil Sample Results for the four samples communities.

Sample #	Location	Address	Landscaper	Nox-N (mg/kg)	NH4 (mg/kg)	OrgMatter (%)	TKN (mg/kg)	Phosphorus (mg/kg)	Ec (ds/m)	pH
1	P202	2841	HLM	5.33	3.44	4.29	1428	55.99	0.08	5.86
2	P202	4800	HLM	6.95	1.44	3.99	1696	60.28	0.09	7.29
3	P202	4845	HLM	7.29	1.96	4.66	1478	48.46	0.07	5.80
4	P202	2779	No One	2.28	1.34	2.33	803.5	17.45	0.04	6.03
5	P202	2801	No One	5.54	1.58	4.68	1373	58.77	0.10	6.90
6	P202	4837	HLM	3.39	2.17	3.93	1313	13.18	0.06	6.22
7	P202	4887	No One	11.62	1.76	5.68	1599	35.41	0.02	6.55
8	P202	4863	PLM	5.80	2.72	4.52	1342	60.99	0.07	5.66
9	P202	2881	PLM	3.67	2.29	3.67	1286	74.84	0.07	5.81
10	P202	4822	PLM	10.11	2.82	5.36	1637	119.9	0.09	6.92
11	P201	2342	No One	18.02	3.17	8.25	1728	67.77	0.21	7.52
12	P201	2364	HLM	6.16	3.15	4.06	1134	53.97	0.12	7.59
13	P201	2360	No One	7.68	1.56	5.96	1630	55.13	0.16	7.69
14	P201	2337	PLM	7.58	2.11	5.95	1506	33.92	0.13	7.62
15	P201	2370	PLM	5.39	1.79	5.95	1208	59.63	0.16	7.69
16	P201	2330	PLM	11.08	1.87	4.64	1272	100.7	0.11	7.49
17	P201	2322	PLM	9.81	2.31	5.72	1636	17.76	0.17	7.79
18	P201	2348	HLM	22.83	3.78	11.96	2909	64.43	0.20	6.84
19	P201	2311	PLM	14.32	4.29	5.70	1744	63.60	0.13	7.01
20	P201	2306	PLM	16.54	3.58	6.41	1804	42.57	0.16	7.20
21	M101	6357	PLM	8.19	1.01	1.96	650.2	107.0	0.12	7.36
22	M101	6307	PLM	6.38	3.50	3.81	1056	1290	0.11	7.00
23	M101	6206	No One	5.14	1.07	2.59	655.5	164.4	0.08	7.01
24	M101	3455	No One	4.92	1.41	2.30	759.5	59.11	0.07	6.18
25	M101	6349	No One	2.94	2.53	2.30	743.9	121.6	0.07	5.94
26	M101	6226	HLM	6.27	4.51	2.82	978.7	29.18	0.09	6.74
27	M101	6826	No One	4.64	4.81	2.13	699.1	82.24	0.06	5.66
28	M101	6246	HLM	11.54	2.86	3.18	1105	53.17	0.08	6.26
29	M101	3459	HLM	4.98	1.22	2.29	658.8	42.76	0.09	6.85
30	M101	3303	HLM	4.05	2.03	2.78	629.7	1310	0.15	7.70
31	H101	1513	HLM	7.56	1.76	4.08	1242	54.35	0.09	6.62
32	H101	1508	PLM	12.82	2.08	6.03	1764	47.93	0.11	6.54
33	H101	1405	HLM	12.90	4.07	4.15	1307	51.23	0.09	6.03
34	H101	1406	PLM	9.44	1.53	2.92	919.4	56.95	0.09	7.06
35	H101	1519	PLM	6.26	1.38	4.31	1088	35.56	0.09	7.45
36	H101	1536	PLM	5.79	1.37	2.83	771.1	73.19	0.07	6.58
37	H101	1505	PLM	7.73	2.12	5.17	1276	42.05	0.09	6.39
38	H101	16205	HLM	11.37	2.37	4.49	1133	31.36	0.08	5.76
39	H101	1404	HLM	7.74	2.07	5.93	1569	69.09	0.09	6.39
40	H101	16214	HLM	9.67	5.80	5.44	1893	34.59	0.08	6.21

Appendix J - Isotopic results for Top Soil Samples

Location	Address	Analysis Type	Analysis Date	Position in run	NO3 Conc.(mg N/L)	Volume (ml)	Peak Area (V/s)	Peak Ampl (mV)	d15NAir (‰)	d18O VSMOW (‰)
blank	blank	Blank	28Jul14	27	NA	1.00	1.10	230	-4.64	18.50
H101	1536	Soil	28Jul14	5	2.90	0.28	49.41	9504	1.03	4.95
H101	1508	Soil	30Jul14	7	6.41	0.12	67.73	12647	1.34	6.41
H101	1405	Soil	30Jul14	8	6.45	0.12	52.89	10192	3.05	6.66
H101	1513	Soil	06Aug14	14	3.78	0.14	5.40	1124	2.27	7.02
H101	1406	Soil	30Jul14	10	4.72	0.17	65.34	11876	0.34	5.86
H101	1519	Soil	30Jul14	11	3.13	0.26	49.32	9387	0.95	7.26
H101	1505	Soil	30Jul14	12	3.86	0.21	61.66	11458	1.85	6.84
H101	16205	Soil	30Jul14	14	5.68	0.14	42.04	8166	3.03	5.32
H101	1404	Soil	06Aug14	23	3.87	0.14	12.40	2549	-0.03	5.98
H101	16214	Soil	30Jul14	16	4.83	0.17	45.23	8685	-0.07	7.10
M101	6307	Soil	28Jul14	30	3.19	0.25	34.78	6562	2.17	10.52
M101	6357	Soil	28Jul14	31	4.10	0.20	40.13	8028	0.16	7.18
M101	6349	Soil	28Jul14	33	1.47	0.54	58.60	11409	-1.81	6.26
M101	3455	Soil	28Jul14	34	2.46	0.33	36.63	7357	-2.15	4.91
M101	6226	Soil	28Jul14	35	3.14	0.25	24.20	4785	-5.28	10.71
M101	6206	Soil	28Jul14	36	2.57	0.31	44.23	8506	-0.44	8.32
M101	6826	Soil	28Jul14	37	2.32	0.34	21.77	4365	0.22	9.11
M101	6246	Soil	28Jul14	38	5.77	0.14	22.12	4428	2.52	6.71
M101	3459	Soil	30Jul14	5	2.49	0.32	62.27	11735	-1.92	7.24
M101	3303	Soil	30Jul14	6	2.03	0.39	40.28	7898	4.89	12.20
P201	2342	Soil	28Jul14	17	9.01	0.09	33.54	6504	1.19	5.38
P201	2364	Soil	28Jul14	18	3.08	0.26	58.65	10826	-1.16	5.82
P201	2360	Soil	28Jul14	19	3.84	0.21	65.46	12477	1.95	7.07
P201	2337	Soil	28Jul14	20	3.79	0.21	38.40	7443	0.08	4.49
P201	2370	Soil	28Jul14	23	2.69	0.30	43.99	8431	1.09	7.97
P201	2330	Soil	28Jul14	24	5.54	0.14	36.52	7153	2.57	5.34

P201	2322	Soil	28Jul14	25	4.90	0.16	52.29	9678	1.52	6.85
P201	2348	Soil	28Jul14	26	11.42	0.07	42.54	8220	1.02	4.57
P201	2311	Soil	28Jul14	28	7.16	0.11	43.81	8494	1.34	7.85
P201	2306	Soil	28Jul14	29	8.27	0.10	41.74	8241	3.35	7.30
P202	2841	Soil	28Jul14	6	2.67	0.30	58.59	11133	0.27	4.57
P202	4845	Soil	28Jul14	7	3.64	0.22	32.91	6553	0.64	4.16
P202	4800	Soil	28Jul14	8	3.47	0.23	39.62	7633	1.35	9.37
P202	2779	Soil	28Jul14	9	1.14	0.70	47.64	9380	-0.53	5.05
P202	2801	Soil	28Jul14	10	2.77	0.29	56.70	10723	0.98	5.44
P202	4837	Soil	28Jul14	11	1.69	0.47	54.34	10586	0.95	7.59
P202	4887	Soil	06Aug14	12	5.81	0.10	41.53	8121	2.69	6.17
P202	4863	Soil	28Jul14	14	2.90	0.28	56.28	10743	1.49	4.55
P202	4822	Soil	28Jul14	15	5.06	0.16	48.31	9099	2.57	6.53
P202	2881	Soil	28Jul14	16	1.84	0.43	39.90	7492	3.03	7.11

Appendix K – Irrigation Sample Results

Appendix A. Irrigation Sample Results (* indicate samples below detection limit)

Unique Sample ID	Location	CollectionDate	Sample Collect Time	Source	Total N	Total TKN	NO2/NO3-N	NH3-N	Total P
M101-IW-1A	M101	9/23/2013	11:02:00 AM	City	1.3	1.1	0.28	0.93	0.35
M101-IW-2A	M101	9/23/2013	11:12:00 AM	City	1.3	0.99	0.31	0.87	0.38
M101-IW-3A	M101	9/23/2013	11:19:00 AM	City	1.3	1.1	0.28	0.93	0.36
P201-IW-!A	P201	9/23/2013	12:27:00 PM	City	0.34	0.086*	0.29	0.05	0.99
P201-IW-2A	P201	9/23/2013	12:35:00 PM	City	0.43	0.15	0.28	0.049	0.34
P201-IW-3A	P201	9/23/2013	12:42:00 PM	City	0.33	0.086*	0.28	0.053	0.34
P202-IW-1A	P202	9/23/2013	1:04:00 PM	City	0.37	0.086*	0.3	0.049	0.31
P202-IW-2A	P202	9/23/2013	1:08:00 PM	City	0.41	0.11	0.3	0.056	0.31
P202-IW-3A	P202	9/23/2013	1:17:00 PM	City	0.31	0.086*	0.31	0.05	0.31
H101-IW-1A	H101	9/23/2013	2:19:00 PM	Community Well	1.4	0.14	1.3	0.07	0.31
H101-IW-2A	H101	9/23/2013	2:26:00 PM	Community Well	1.4	0.14	1.3	0.082	0.0052
H101-IW-3A	H101	9/23/2013	2:34:00 PM	Community Well	0.85	0.83	0.025*	0.054	0.0074

Appendix L – Field and General Data for the Stormwater Retention Pond Water Samples

Site Location	Unique Sample ID	Type of Sample	Collect Date	Collect Time	Data Entry Personnel	Sample Event Number	Sample Collection Depth	Field Comments	Field Personnel	DO	PH	Conductivity	Temperature	ORP
H101	H101-PW - 1/H101-PWD- 1	Surface Grab (PW)	9/27/2012	12:10	lfisher	1	0.75		quackenbush	7.11	8.21	86.00	29.21	-31
H101	H101-PW - 2/H101-PWD- 2	Surface Grab (PW)	10/24/2012	9:31	lfisher	2	1.00		quackenbush	3.90	7.04	93.40	25.40	256
H101	H101-PW - 3/H101-PWD- 3	Surface Grab (PW)	11/14/2012	10:45	skovira	3	1.00		quackenbush	5.90	9.11	98.60	21.50	187
H101	H101-PW - 4/H101-PWD- 4	Surface Grab (PW)	12/11/2012	9:28	skovira	4	1.00		quackenbush	3.40	7.07	148.20	21.80	316
H101	H101-PW - 5/H101-PWD- 5	Surface Grab (PW)	1/15/2013	9:12	skovira	5	1.00	Changed 750 module at H101. Cleaned fridge.	smith	7.60	7.36	106.20	20.80	153
H101	H101-PW - 6/H101-PWD- 6	Surface Grab (PW)	2/14/2013	9:40	skovira	6	0.30		delius	4.96	6.54	138.00	21.46	99
H101	H101-PW - 7/H101-PWD- 7	Surface Grab (PW)	3/12/2013	9:12	skovira	7	0.50		delius	9.40	8.01	109.20	20.10	333
H101	H101-PW - 8/H101-PWD- 8	Surface Grab (PW)	4/22/2013	10:10	skovira	8			penia	6.53	8.19	117.00	24.47	78
H101	H101-PW - 9/H101-PWD- 9	Surface Grab (PW)	5/20/2013	14:50	skovira	9	0.50	H101 dry at flow sensor and screened sample tubing.	quackenbush	8.23	8.89	114.00	32.80	-72
H101	H101-PW - 10/H101-PWD- 10	Surface Grab (PW)	6/7/2013	8:30	skovira	10			penia	6.26	6.22	96.00	26.70	84
H101	H101-PW - 11/H101-PWD- 11	Surface Grab (PW)	6/25/2013	9:45	skovira	11		Rag was covering sensor at H101 - was removed.	penia	3.97	7.43	108.00	30.33	89
H101	H101-PW - 12/H101-PWD- 12	Surface Grab (PW)	7/9/2013	9:20	skovira	12			penia	5.42	8.21	341.00	29.94	77
H101	H101-PW - 13/H101-PWD- 13	Surface Grab (PW)	7/23/2013	9:45	skovira	13			penia	3.54	7.51	148.00	30.03	153
H101	H101-PW - 14/H101-PWD- 14	Surface Grab (PW)	8/26/2013	12:10	skovira	14	1.00	desicant changed	brown	5.63	7.32	89.00	30.80	130
H101	H101-PW - 15/H101-PWD- 15	Surface Grab (PW)	9/17/2013	10:30	skovira	15			penia	5.26	9.00	118.00	31.67	
H101	H101-PW - 16/H101-PWD- 16	Surface Grab (PW)	10/17/2013	8:15	skovira	16	36.40		johnson	5.67	6.69	96.00	25.88	84
H101	H101-PW - 17/H101-PWD- 17	Surface Grab (PW)	11/20/2013	12:20	skovira	17			delius	5.51	7.22	111.00	21.84	50
H101	H101-PW - 18/H101-PWD- 18	Surface Grab (PW)	12/18/2013	11:35	skovira	18			penia	5.98	7.99	151.00	18.24	98

Site Location	Unique Sample ID	Type of Sample	Collect Date	Collect Time	Data Entry Personnel	Sample Event Number	Sample Collection Depth	Field Comments	Field Personnel	DO	PH	Conductivity	Temperature	ORP
M101	M101-PW - 1/M101-PWD- 1	Surface Grab (PW)	9/27/2012	15:00	lfisher	1	0.75		quackenbush	5.10	7.60	366.00	27.86	12
M101	M101-PW - 2/M101-PWD- 2	Surface Grab (PW)	10/24/2012	13:41	lfisher	2	1.00		quackenbush	2.50	7.43	370.00	26.00	179
M101	M101-PW - 3/M101-PWD- 3	Surface Grab (PW)	11/14/2012	15:16	skovira	3	1.00	Auto sampler changed at M101	quackenbush	3.20	7.76	417.00	23.10	202
M101	M101-PW - 4/M101-PWD- 4	Surface Grab (PW)	12/11/2012	14:10	skovira	4	1.00	M101: SW collected, but not enough	quackenbush	2.00	7.49	404.00	22.20	301
M101	M101-PW - 5/M101-PWD- 5	Surface Grab (PW)	1/15/2013	15:00	skovira	5	1.00	M101 error: battery dead. Solar panel cleaned.	smith	6.10	7.69	447.40	23.10	224
M101	M101-PW - 6/M101-PWD- 6	Surface Grab (PW)	2/14/2013	15:45	skovira	6	0.30		delius	6.38	8.14	342.00	20.48	64
M101	M101-PW - 7/M101-PWD- 7	Surface Grab (PW)	3/12/2013	14:12	skovira	7	0.50	Desicant changed; scissor ring adjusted; changed flow pacing to 2000 gallons; faulty probe replaced	delius	9.10	8.51	469.50	21.00	369
M101	M101-PW - 8/M101-PWD- 8	Surface Grab (PW)	4/22/2013	15:25	skovira	8			penia	3.28	7.36	433.00	24.94	-5
M101	M101-PW - 9/M101-PWD- 9	Surface Grab (PW)	5/20/2013	10:07	skovira	9	0.50		quackenbush	4.72	7.41	402.00	28.99	-86
M101	M101-PW - 10/M101-PWD- 10	Surface Grab (PW)	6/7/2013	12:50	skovira	10			penia	6.52	7.18	324.00	27.83	26
M101	M101-PW - 11/M101-PWD- 11	Surface Grab (PW)	6/25/2013	14:20	skovira	11			penia	2.48	7.36	462.00	30.76	-24
M101	M101-PW - 12/M101-PWD- 12	Surface Grab (PW)	7/9/2013	14:05	skovira	12			penia	3.38	7.47	523.00	29.39	4
M101	M101-PW - 13/M101-PWD- 13	Surface Grab (PW)	7/23/2013	14:20	skovira	13			penia	3.30	7.16	527.00	29.62	84
M101	M101-PW - 14/M101-PWD- 14	Surface Grab (PW)	8/26/2013	16:40	skovira	14	2.42	velcoity probe blew out; reset at 2.42; desicant changed	brown	5.07	6.71	524.00	30.10	226
M101	M101-PW - 15M101-PWD- 15	Surface Grab (PW)	9/17/2013	15:50	skovira	15			penia	2.12	7.17	288.00	27.27	
M101	M101-PW - 16/M101-PWD- 16	Surface Grab (PW)	10/17/2013	12:30	skovira	16	24.00		johnson	1.49	7.63	242.00	26.36	75
M101	M101-PW - 17/M101-PWD- 17	Surface Grab (PW)	11/20/2013	10:40	skovira	17		Changed desicant; tubing may warrant replacement in the new year	delius	3.67	7.29	308.00	23.28	42
M101	M101-PW - 18/M101-PWD- 18	Surface Grab (PW)	12/18/2013	10:00	skovira	18			penia	6.39	8.04	354.00	17.73	56

Site Location	Unique Sample ID	Type of Sample	Collect Date	Collect Time	Data Entry Personnel	Sample Event Number	Sample Collection Depth	Field Comments	Field Personnel	DO	PH	Conductivity	Temperature	ORP
P201	P201-PW - 1/P201-PWD- 1	Surface Grab (PW)	9/27/2012	15:00	lfisher	1	0.75		quackenbush	4.80	5.92	691.00	26.88	-96
P201	P201-PW - 2/P201-PWD- 2	Surface Grab (PW)	10/24/2012	11:35	lfisher	2	1.00	Ants in P201 box. Changed level to correct level.	quackenbush	1.40	7.29	641.00	23.30	162
P201	P201-PW - 3/P201-PWD- 3	Surface Grab (PW)	11/14/2012	13:26	skovira	3	1.00		quackenbush	0.30	7.33	646.00	21.50	192
P201	P201-PW - 4/P201-PWD- 4	Surface Grab (PW)	12/11/2012	11:50	skovira	4	1.00		quackenbush	2.80	7.48	597.00	22.90	283
P201	P201-PW - 5/P201-PWD- 5	Surface Grab (PW)	1/15/2013	13:13	skovira	5	1.00	Changed 750 module. Cleaned fridge.	smith	6.20	7.38	647.00	21.20	210
P201	P201-PW - 6/P201-PWD- 6	Surface Grab (PW)	2/14/2013	13:47	skovira	6	0.30		delius	3.58	7.39	511.00	21.49	77
P201	P201-PW - 7/P201-PWD- 7	Surface Grab (PW)	3/12/2013	12:08	skovira	7	0.50	Desicant changed and scissor ring adjusted.	delius	4.70	7.49	393.00	20.20	264
P201	P201-PW - 8/P201-PWD- 8	Surface Grab (PW)	4/22/2013	13:30	skovira	8			penia	1.88	7.26	633.00	22.52	50
P201	P201-PW - 9/P201-PWD- 9	Surface Grab (PW)	5/20/2013	11:35	skovira	9	0.50		quackenbush	0.39	7.10	671.00	24.80	-53
P201	P201-PW - 10/P201-PWD- 10	Surface Grab (PW)	6/7/2013	11:05	skovira	10			penia	4.86	6.89	703.00	26.69	36
P201	P201-PW - 11/P201-PWD- 11	Surface Grab (PW)	6/25/2013	12:30	skovira	11			penia	3.26	7.43	645.00	28.68	-1
P201	P201-PW - 12/P201-PWD- 12	Surface Grab (PW)	7/9/2013	12:30	skovira	12		cooler temp. 4.0C at P201	penia	3.15	7.72	689.00	27.62	20
P201	P201-PW - 13/P201-PWD- 13	Surface Grab (PW)	7/23/2013	12:35	skovira	13			penia	0.69	7.26	726.00	27.35	129
P201	P201-PW - 14/P201-PWD- 14	Surface Grab (PW)	8/26/2013	15:30	skovira	14	1.67	desicant changed	brown	3.60	6.99	678.00	29.50	138
P201	P201-PW - 15/P201-PWD- 15	Surface Grab (PW)	9/17/2013	14:30	skovira	15			penia	1.96	7.25	461.00	22.00	
P201	P201-PW - 16/P201-PWD- 16	Surface Grab (PW)	10/17/2013	10:55	skovira	16	20.00		johnson	1.77	7.25	491.00	24.76	76
P201	P201-PW - 17/P201-PWD- 17	Surface Grab (PW)	11/20/2013	14:35	skovira	17		P201: changed desicant	delius	3.23	7.16	716.00	22.92	48
P201	P201-PW - 18/P201-PWD- 18	Surface Grab (PW)	12/18/2013	14:05	skovira	18			penia	3.67	7.68	706.00	17.47	58

Site Location	Unique Sample ID	Type of Sample	Collect Date	Collect Time	Data Entry Personnel	Sample Event Number	Sample Collection Depth	Field Comments	Field Personnel	DO	PH	Conductivity	Temperature	ORP
P202	P202-PW - 1/P202-PWD- 1	Surface Grab (PW)	9/27/2012	14:10	pbohlen	1	0.75		quackenbush	7.64	8.85	148.00	28.71	-89
P202	P202-PW - 2/P202-PWD- 2	Surface Grab (PW)	10/24/2012	10:52	lfisher	2	1.00		quackenbush	3.70	7.57	213.30	23.90	196
P202	P202-PW - 3/P202-PWD- 3	Surface Grab (PW)	11/14/2012	12:21	skovira	3	1.00		quackenbush	3.50	7.74	410.60	20.80	208
P202	P202-PW - 4/P202-PWD- 4	Surface Grab (PW)	12/11/2012	10:55	skovira	4	1.00		quackenbush	5.20	7.42	176.20	22.00	274
P202	P202-PW - 5/P202-PWD- 5	Surface Grab (PW)	1/15/2013	11:20	skovira	5	0.20	Changed ISCO Avalanche.	smith	1.20	7.66	165.10	18.10	211
P202	P202-PW - 6/P202-PWD- 6	Surface Grab (PW)	2/14/2013	11:39	skovira	6	0.30		delius	7.15	7.11	190.00	20.64	198
P202	P202-PW - 7/P202-PWD- 7	Surface Grab (PW)	3/12/2013	10:44	skovira	7	0.40	Desicant changed at P202	delius	7.40	7.73	194.40	19.40	202
P202	P202-PW - 8/P202-PWD- 8	Surface Grab (PW)	4/22/2013	11:55	skovira	8			penia	3.26	7.84	218.00	24.71	90
P202	P202-PW - 9/P202-PWD- 9	Surface Grab (PW)	5/20/2013	13:10	skovira	9	0.50		quackenbush	6.11	8.96	228.00	27.63	-64
P202	P202-PW - 10/P202-PWD- 10	Surface Grab (PW)	6/7/2013	10:05	skovira	10			penia	3.44	6.75	197.00	26.15	56
P202	P202-PW - 11/P202-PWD- 11	Surface Grab (PW)	6/25/2013	11:20	skovira	11			penia	1.80	8.08	204.00	31.43	2
P202	P202-PW - 12/P202-PWD- 12	Surface Grab (PW)	7/9/2013	11:00	skovira	12		cooler temp. 3.4C at P202	penia	4.92	9.23	190.00	31.06	24
P202	P202-PW - 13/P202-PWD- 13	Surface Grab (PW)	7/23/2013	11:25	skovira	13			penia	2.52	7.98	212.00	29.47	140
P202	P202-PW - 14/P202-PWD- 14	Surface Grab (PW)	8/26/2013	14:00	skovira	14	0.92	desicant changed	brown	4.00	7.75	181.50	29.20	206
P202	P202-PW - 15/P202-PWD- 15	Surface Grab (PW)	9/17/2013	12:15	skovira	15			penia	5.23	7.36	1640.00	28.88	
P202	P202-PW - 16/P202-PWD- 16	Surface Grab (PW)	10/17/2013	9:50	skovira	16	6.75		johnson	7.67	7.75	142.00	26.48	82
P202	P202-PW - 17/P202-PWD- 17	Surface Grab (PW)	11/20/2013	13:37	skovira	17			delius	5.73	7.33	214.00	21.60	46
P202	P202-PW - 18/P202-PWD- 18	Surface Grab (PW)	12/18/2013	13:20	skovira	18			penia	10.31	8.08	298.00	15.61	79

Appendix M - Standard analytical results for the Stormwater Retention Pond Water Samples

Site Location	Unique Sample ID	Type of Sample	Collect Date	Sample Event Number	Pace Analytical Sample ID	Total N	Total N Qualifier	Total TKN	Total TKN Qualifier	Dissolved TKN	Dissolved TKN Qualifier	NO2/ NO3-N	NO2/NO3-N Qualifier	NH3-N	NH3-N Qualifier	Ortho P	Ortho P Qualifier	Total P	Total P Qualifier
H101	H101-PW - 1	Surface Grab (PW)	9/27/2012	1	3008/3569443008	0.72		0.71		0.50	I	0.03	U	0.02	U	0.00	U	0.04	
H101	H101-PW - 2	Surface Grab (PW)	10/24/2012	2	3572157001/3572157002	0.81		0.81		0.34	I	0.03	U	0.04	I	0.00	U	0.03	
H101	H101-PW - 3	Surface Grab (PW)	11/14/2012	3	3574368001/3574368002	0.70		0.68		0.48	I	0.03	U	0.02	U	0.00	U	0.04	
H101	H101-PW - 4	Surface Grab (PW)	12/11/2012	4	3576964001/3576964002	0.82		0.82		0.48	I	0.03	U	0.04	U	0.00	U	0.05	
H101	H101-PW - 5	Surface Grab (PW)	1/15/2013	5	358008001/358008002	0.86		0.85		0.65		0.03	U	0.04	I	0.01		0.05	
H101	H101-PW - 6	Surface Grab (PW)	2/14/2013	6	3583312001/3583312002	0.82		0.80		0.63		0.03	U	0.03	I	0.00	U	0.05	
H101	H101-PW - 7	Surface Grab (PW)	3/12/2013	7	3586013001/3586013002	0.77		0.76		0.50		0.03	U	0.08		0.00	U	0.03	
H101	H101-PW - 8	Surface Grab (PW)	4/22/2013	8	3590538001/3590538002	1.10		1.10		0.52		0.03	U	0.07		0.00	U	0.06	
H101	H101-PW - 9	Surface Grab (PW)	5/20/2013	9	3593832001/3593832002	0.90		0.91		0.95		0.03	U	0.05	I	0.00	U	0.04	
H101	H101-PW - 10	Surface Grab (PW)	6/7/2013	10	3596049001/3596049002	1.20		1.20		0.45	I	0.03	U	0.16		0.00	U	0.08	
H101	H101-PW - 11	Surface Grab (PW)	6/25/2013	11	3598009001/3598009002	0.80		0.80		0.60		0.03	U	0.03	I	0.00	U	0.04	
H101	H101-PW - 12	Surface Grab (PW)	7/9/2013	12	3599578001/3599578002	0.77		0.77		0.26	I	0.03	U	0.06		0.00	U	0.04	
H101	H101-PW - 13	Surface Grab (PW)	7/23/2013	13	35101461001/35101461002	0.60		0.56		0.52		0.04	I	0.06		0.00	U	0.03	
H101	H101-PW - 14	Surface Grab (PW)	8/26/2013	14	35105935001/35105935002	1.20		1.20		0.54		0.03	U	0.06		0.00	U	0.04	
H101	H101-PW - 15	Surface Grab (PW)	9/17/2013	15	35108577001/35108577002	1.30		1.30		0.62		0.03	U	0.04	I	0.00	U	0.03	
H101	H101-PW - 16	Surface Grab (PW)	10/17/2013	16	35112546001/35112546002	1.50		1.50		0.74		0.03	U	0.08		0.00	U	0.06	
H101	H101-PW - 17	Surface Grab (PW)	11/20/2013	17	35116763003/35116763004	1.30		1.20		0.51		0.05	I	0.05		0.00		0.06	
H101	H101-PW - 18	Surface Grab (PW)	12/18/2013	18	35120134001/35120134002	1.70		1.60		0.52		0.03	I	0.06		0.01		0.11	

Site Location	Unique Sample ID	Type of Sample	Collect Date	Sample Event Number	Pace Analytical Sample ID	Total N	Total N Qualifier	Total TKN	Total TKN Qualifier	Dissolved TKN	Dissolved TKN Qualifier	NO2/ NO3-N	NO2/NO3-N Qualifier	NH3-N	NH3-N Qualifier	Ortho P	Ortho P Qualifier	Total P	Total P Qualifier
M101	M101-PW - 1	Surface Grab (PW)	9/27/2012	1	3569443006/3006	1.30		1.00		1.20		0.23		0.09		0.11		0.16	
M101	M101-PW - 2	Surface Grab (PW)	10/24/2012	2	3572157007/3572157008	1.30		1.10		0.97		0.14		0.06		0.11		0.13	
M101	M101-PW - 3	Surface Grab (PW)	11/14/2012	3	3574368007/3574368008	1.30		1.10		1.10		0.22		0.10		0.09		0.13	
M101	M101-PW - 4	Surface Grab (PW)	12/11/2012	4	3576964007/3576964008	1.70		1.50		1.20		0.24		0.19		0.14		0.22	
M101	M101-PW - 5	Surface Grab (PW)	1/15/2013	5	358008007/358008008	1.40		0.92		1.40		0.47		0.32		0.08		0.13	
M101	M101-PW - 6	Surface Grab (PW)	2/14/2013	6	3583312009/3583312010	1.60		1.20		1.10		0.41		0.08		0.06		0.12	
M101	M101-PW - 7	Surface Grab (PW)	3/12/2013	7	3586013007/3586013008	0.95		0.92		0.89		0.03	I	0.03	I	0.04		0.08	
M101	M101-PW - 8	Surface Grab (PW)	4/22/2013	8	3590538007/3590538008	1.10		1.00		0.83		0.10		0.06		0.06		0.13	
M101	M101-PW - 9	Surface Grab (PW)	5/20/2013	9	3593832007/3593832008	0.90		0.91		0.90		0.03	I	0.04	I	0.06		0.12	
M101	M101-PW - 10	Surface Grab (PW)	6/7/2013	10	3596049007/3596049008	2.60		2.40		0.33	I	0.16		0.31		0.06		1.30	
M101	M101-PW - 11	Surface Grab (PW)	6/25/2013	11	3598009007/3598009008	0.91		0.89		0.76		0.03	U	0.06		0.11		0.18	
M101	M101-PW - 12	Surface Grab (PW)	7/9/2013	12	3599578007/3599578008	1.10		1.10		0.82		0.03	U	0.06		0.15		0.21	
M101	M101-PW - 13	Surface Grab (PW)	7/23/2013	13	35101461007/35101461008	1.20		1.20		1.10		0.03	U	0.06		0.28		0.37	
M101	M101-PW - 14	Surface Grab (PW)	8/26/2013	14	35105935007/35105935008	1.50		1.50		0.93		0.03	U	0.21		0.30		0.39	
M101	M101-PW - 15	Surface Grab (PW)	9/17/2013	15	35108577007/35108577008	2.80		2.70		1.10		0.10		0.19		0.27		0.61	
M101	M101-PW - 16	Surface Grab (PW)	10/17/2013	16	35112546007/35112546008	1.30		1.10		0.41	I	0.18		0.13		0.29		0.35	
M101	M101-PW - 17	Surface Grab (PW)	11/20/2013	17	35116763001/35116763002	1.10		1.00		0.64		0.12		0.14		0.11		0.14	
M101	M101-PW - 18	Surface Grab (PW)	12/18/2013	18	35120134007/35120134008	1.10		0.97		0.65		0.13		0.13		0.10		0.14	

Site Location	Unique Sample ID	Type of Sample	Collect Date	Sample Event Number	Pace Analytical Sample ID	Total N	Total N Qualifier	Total TKN	Total TKN Qualifier	Dissolved TKN	Dissolved TKN Qualifier	NO2/ NO3-N	NO2/NO3-N Qualifier	NH3-N	NH3-N Qualifier	Ortho P	Ortho P Qualifier	Total P	Total P Qualifier
P201	P201-PW - 1	Surface Grab (PW)	9/27/2012	1	3569443003/3003	1.10		0.98		0.75		0.08		0.16		0.04		0.19	
P201	P201-PW - 2	Surface Grab (PW)	10/24/2012	2	3572157005/3572157006	0.80		0.70		0.50		0.11		0.12		0.04		0.10	
P201	P201-PW - 3	Surface Grab (PW)	11/14/2012	3	3574368005/3574368006	0.95		0.86		0.56		0.09		0.14		0.06		0.20	
P201	P201-PW - 4	Surface Grab (PW)	12/11/2012	4	3576964005/3576964006	1.10		0.92		0.61		0.16		0.11		0.09		0.27	
P201	P201-PW - 5	Surface Grab (PW)	1/15/2013	5	358008005/358008006	0.79		0.72		0.63		0.07		0.11		0.09		0.11	
P201	P201-PW - 6	Surface Grab (PW)	2/14/2013	6	3583312007/3583312008	1.00		0.74		0.68		0.28		0.20		0.07		0.12	
P201	P201-PW - 7	Surface Grab (PW)	3/12/2013	7	3586013005/3586013006	1.40		0.98		0.66		0.37		0.21		0.10		0.17	
P201	P201-PW - 8	Surface Grab (PW)	4/22/2013	8	3590538005/3590538006	1.20		1.10		1.00		0.05		0.27		0.07		0.13	
P201	P201-PW - 9	Surface Grab (PW)	5/20/2013	9	3593832003/3593832004	0.48	I	0.46	I	0.59		0.03	U	0.12		0.08		0.10	
P201	P201-PW - 10	Surface Grab (PW)	6/7/2013	10	3596049005/3596049006	2.20		1.60		0.09	U	0.65		0.36		0.13		0.20	
P201	P201-PW - 11	Surface Grab (PW)	6/25/2013	11	3598009005/3598009006	1.20		0.86		0.94		0.34		0.21		0.12		0.19	
P201	P201-PW - 12	Surface Grab (PW)	7/9/2013	12	3599578005/3599578006	1.60		1.20		1.10		0.40		0.39		0.13		0.20	
P201	P201-PW - 13	Surface Grab (PW)	7/23/2013	13	35101461005/35101461006	0.88		0.77		0.81		0.11		0.35		0.05		0.13	
P201	P201-PW - 14	Surface Grab (PW)	8/26/2013	14	35105935005/35105935006	1.30		1.10		0.93		0.21		0.21		0.06		0.14	
P201	P201-PW - 15	Surface Grab (PW)	9/17/2013	15	35108577005/35108577006	1.10		0.82		0.69		0.29		0.17		0.08		0.14	
P201	P201-PW - 16	Surface Grab (PW)	10/17/2013	16	35112546005/35112546006	0.94		0.79		0.39	I	0.15		0.30		0.07		0.15	
P201	P201-PW - 17	Surface Grab (PW)	11/20/2013	17	35116763007/35116763008	0.96		0.81		0.47	I	0.15		0.27		0.07		0.17	
P201	P201-PW - 18	Surface Grab (PW)	12/18/2013	18	35120134005/35120134006	0.67		0.53		0.25	I	0.14		0.16		0.06		0.09	

Site Location	Unique Sample ID	Type of Sample	Collect Date	Sample Event Number	Pace Analytical Sample ID	Total N	Total N Qualifier	Total TKN	Total TKN Qualifier	Dissolved TKN	Dissolved TKN Qualifier	NO2/ NO3-N	NO2/NO3-N Qualifier	NH3-N	NH3-N Qualifier	Ortho P	Ortho P Qualifier	Total P	Total P Qualifier
P202	P202-PW - 1	Surface Grab (PW)	9/27/2012	1	3569443002/3002	0.64		0.63		0.63		0.03	U	0.02	U	0.02		0.14	
P202	P202-PW - 2	Surface Grab (PW)	10/24/2012	2	3572157003/3572157004	0.70		0.70		0.43	I	0.03	U	0.02	U	0.05		0.08	
P202	P202-PW - 3	Surface Grab (PW)	11/14/2012	3	3574368003/3574368004	1.40		1.30		1.00		0.11		0.50		0.15		0.19	
P202	P202-PW - 4	Surface Grab (PW)	12/11/2012	4	3576964003/3576964004	1.50		1.10		0.96		0.34		0.37		0.21		0.27	
P202	P202-PW - 5	Surface Grab (PW)	1/15/2013	5	358008003/358008004	1.10		0.75		0.69		0.34		0.08		0.21		0.27	
P202	P202-PW - 6	Surface Grab (PW)	2/14/2013	6	3583312003/3583312004	1.40		1.30		0.67		0.03	I	0.13		0.17		0.25	
P202	P202-PW - 7	Surface Grab (PW)	3/12/2013	7	3586013003/3586013004	1.20		1.20		0.63		0.04	I	0.07		0.19		0.28	
P202	P202-PW - 8	Surface Grab (PW)	4/22/2013	8	3590538003/3590538004	1.20		1.20		0.68		0.03	U	0.05		0.18		0.28	
P202	P202-PW - 9	Surface Grab (PW)	5/20/2013	9	3593832005/3593832006	1.10		1.10		1.00		0.03	U	0.09		0.12		0.20	
P202	P202-PW - 10	Surface Grab (PW)	6/7/2013	10	3596049003/3596049004	2.30		2.30		1.50		0.03	I	0.91		0.11		0.23	
P202	P202-PW - 11	Surface Grab (PW)	6/25/2013	11	3598009003/3598009004	1.60		1.60		0.90		0.03	U	0.07		0.01		0.15	
P202	P202-PW - 12	Surface Grab (PW)	7/9/2013	12	3599578003/3599578004	0.91		0.86		0.41	I	0.05	I	0.09		0.03		0.10	
P202	P202-PW - 13	Surface Grab (PW)	7/23/2013	13	35101461003/35101461004	1.00		1.00		0.76		0.03	U	0.14		0.01		0.10	
P202	P202-PW - 14	Surface Grab (PW)	8/26/2013	14	35105935003/35105935004	1.10		1.10		0.58		0.03	U	0.05	I	0.00		0.09	
P202	P202-PW - 15	Surface Grab (PW)	9/17/2013	15	35108577003/35108577004	1.30		1.20		0.88		0.05	I	0.28		0.06		0.12	
P202	P202-PW - 16	Surface Grab (PW)	10/17/2013	16	35112546003/35112546004	1.00		1.00		0.59		0.03	I	0.19		0.05		0.11	
P202	P202-PW - 17	Surface Grab (PW)	11/20/2013	17	35116763005/35116763006	1.20		0.91		0.58		0.30		0.30		0.14		0.16	
P202	P202-PW - 18	Surface Grab (PW)	12/18/2013	18	35120134003/35120134004	1.10		0.90		0.29	I	0.20		0.05		0.10		0.14	

Appendix N - Isotopic results for the Stormwater Retention Pond Water Samples

Site Location	Unique Sample ID	Type of Sample	Collect Date	δ15N -NO3	δ15N -NO3 Qualifier	δ15N-NH4	δ15N-NH4 Qualifier	δ18N-NO3
H101	H101-PW - 1	Surface Grab (PW)	9/27/2012		Near limit of detection.	2.90		
H101	H101-PW - 10	Surface Grab (PW)	6/7/2013	7.30				
H101	H101-PW - 11	Surface Grab (PW)	6/25/2013		Suspect due to low prop.from sample	4.54		
H101	H101-PW - 12	Surface Grab (PW)	7/9/2013	4.11				
H101	H101-PW - 13	Surface Grab (PW)	7/23/2013	-11.44				
H101	H101-PW - 14	Surface Grab (PW)	8/26/2013		Suspect due to low prop.from sample			
H101	H101-PW - 15	Surface Grab (PW)	9/17/2013					
H101	H101-PW - 16	Surface Grab (PW)	10/17/2013					
H101	H101-PW - 17	Surface Grab (PW)	11/20/2013	-10.35				3.28
H101	H101-PW - 18	Surface Grab (PW)	12/18/2013					
H101	H101-PW - 2	Surface Grab (PW)	10/24/2012	-2.70			Suspect due to low concentration	
H101	H101-PW - 3	Surface Grab (PW)	11/14/2012		Near limit of detection.	2.40		
H101	H101-PW - 4	Surface Grab (PW)	12/11/2012		Near limit of detection.	2.20		
H101	H101-PW - 5	Surface Grab (PW)	1/15/2013		Near limit of detection.	6.50		
H101	H101-PW - 6	Surface Grab (PW)	2/14/2013		Near limit of detection.	1.00		
H101	H101-PW - 7	Surface Grab (PW)	3/12/2013					
H101	H101-PW - 8	Surface Grab (PW)	4/22/2013		Suspect due to low prop.from sample	2.83		
H101	H101-PW - 9	Surface Grab (PW)	5/20/2013		Suspect due to low prop.from sample	2.21		

Site Location	Unique Sample ID	Type of Sample	Collect Date	δ15N -NO3	δ15N -NO3 Qualifier	δ15N-NH4	δ15N-NH4 Qualifier	δ18N-NO3
M101	M101-PW - 1	Surface Grab (PW)	9/27/2012	-1.05			Suspect due to low concentration	
M101	M101-PW - 10	Surface Grab (PW)	6/7/2013	6.16				
M101	M101-PW - 11	Surface Grab (PW)	6/25/2013	1.93				
M101	M101-PW - 12	Surface Grab (PW)	7/9/2013		Suspect due to low prop.from sample	-3.71		
M101	M101-PW - 13	Surface Grab (PW)	7/23/2013		Suspect due to low prop.from sample	2.19		
M101	M101-PW - 14	Surface Grab (PW)	8/26/2013		Suspect due to low prop.from sample			
M101	M101-PW - 15	Surface Grab (PW)	9/17/2013	18.30				16.63
M101	M101-PW - 16	Surface Grab (PW)	10/17/2013	10.00				0.95
M101	M101-PW - 17	Surface Grab (PW)	11/20/2013	7.59				1.86
M101	M101-PW - 18	Surface Grab (PW)	12/18/2013	6.42				-2.47
M101	M101-PW - 2	Surface Grab (PW)	10/24/2012	-2.43			Suspect due to low concentration	
M101	M101-PW - 3	Surface Grab (PW)	11/14/2012	-1.61		-1.60		
M101	M101-PW - 4	Surface Grab (PW)	12/11/2012	-1.23		2.10		
M101	M101-PW - 5	Surface Grab (PW)	1/15/2013	5.53		1.30		
M101	M101-PW - 6	Surface Grab (PW)	2/14/2013	-6.08		0.90		
M101	M101-PW - 7	Surface Grab (PW)	3/12/2013					
M101	M101-PW - 8	Surface Grab (PW)	4/22/2013	1.39				
M101	M101-PW - 9	Surface Grab (PW)	5/20/2013	2.32				

Site Location	Unique Sample ID	Type of Sample	Collect Date	δ15N -NO3	δ15N -NO3 Qualifier	δ15N-NH4	δ15N-NH4 Qualifier	δ18N-NO3
P201	P201-PW - 1	Surface Grab (PW)	9/27/2012	-5.12		2.50		
P201	P201-PW - 10	Surface Grab (PW)	6/7/2013	8.74				
P201	P201-PW - 11	Surface Grab (PW)	6/25/2013	3.99				
P201	P201-PW - 12	Surface Grab (PW)	7/9/2013	6.65				
P201	P201-PW - 13	Surface Grab (PW)	7/23/2013	11.15				
P201	P201-PW - 14	Surface Grab (PW)	8/26/2013	4.63				
P201	P201-PW - 15	Surface Grab (PW)	9/17/2013	4.45				15.75
P201	P201-PW - 16	Surface Grab (PW)	10/17/2013	6.80				-1.95
P201	P201-PW - 17	Surface Grab (PW)	11/20/2013	6.44				3.74
P201	P201-PW - 18	Surface Grab (PW)	12/18/2013					
P201	P201-PW - 2	Surface Grab (PW)	10/24/2012	-0.93			N-diffusion failure	
P201	P201-PW - 3	Surface Grab (PW)	11/14/2012	-1.28			Suspect due to low concentration	
P201	P201-PW - 4	Surface Grab (PW)	12/11/2012	-1.97			Suspect due to low concentration	
P201	P201-PW - 5	Surface Grab (PW)	1/15/2013			0.68	Suspect due to low concentration	
P201	P201-PW - 6	Surface Grab (PW)	2/14/2013			10.30		
P201	P201-PW - 7	Surface Grab (PW)	3/12/2013					
P201	P201-PW - 8	Surface Grab (PW)	4/22/2013	1.85				
P201	P201-PW - 9	Surface Grab (PW)	5/20/2013	-0.71				

Site Location	Unique Sample ID	Type of Sample	Collect Date	δ15N -NO3	δ15N -NO3 Qualifier	δ15N-NH4	δ15N-NH4 Qualifier	δ18N-NO3
P202	P202-PW - 1	Surface Grab (PW)	9/27/2012		Near limit of detection.	17.80		
P202	P202-PW - 10	Surface Grab (PW)	6/7/2013	5.80				
P202	P202-PW - 11	Surface Grab (PW)	6/25/2013	7.63				
P202	P202-PW - 12	Surface Grab (PW)	7/9/2013	7.03				
P202	P202-PW - 13	Surface Grab (PW)	7/23/2013		Suspect due to low prop.from sample	-9.33		
P202	P202-PW - 14	Surface Grab (PW)	8/26/2013		Suspect due to low prop.from sample			
P202	P202-PW - 15	Surface Grab (PW)	9/17/2013	2.04				2.12
P202	P202-PW - 16	Surface Grab (PW)	10/17/2013					
P202	P202-PW - 17	Surface Grab (PW)	11/20/2013	7.46				6.97
P202	P202-PW - 18	Surface Grab (PW)	12/18/2013					
P202	P202-PW - 2	Surface Grab (PW)	10/24/2012	-1.78		2.27		
P202	P202-PW - 3	Surface Grab (PW)	11/14/2012	-0.88		2.34		
P202	P202-PW - 4	Surface Grab (PW)	12/11/2012	-0.92		2.48		
P202	P202-PW - 5	Surface Grab (PW)	1/15/2013	-7.02		7.29		
P202	P202-PW - 6	Surface Grab (PW)	2/14/2013		Near limit of detection.	5.64		
P202	P202-PW - 7	Surface Grab (PW)	3/12/2013					
P202	P202-PW - 8	Surface Grab (PW)	4/22/2013	-0.63				
P202	P202-PW - 9	Surface Grab (PW)	5/20/2013	9.98				

Appendix O – Field and General Data for the Stormwater Runoff Samples

Site Location	Unique Sample ID	Type of Sample	Collect Date	Collect Time	Data Entry Personnel	Blanks	Sample Event Number	Field Comments	Field Personnel	Storm Event Date	Rainfall Amount	Average Flow	Total Volume	DO	PH	Conductivity	Temperature	ORP
H101	H101-SW - 1/H101-SWD- 1	Storm (SW)	3/25/2013	10:33	skovira	N	1		penia	3/22/2013	0.80	0.13	72199	13.22	7.72	154.00	6.09	53
H101	H101-SW -E1/H101-SWD-E1	Storm (SW)	9/27/2012	12:10	lfisher	Y	N/A		quackenbush					7.15	7.68	92.00	28.01	25
H101	H101-SW - 2/H101-SWD- 2	Storm (SW)	4/22/2013	9:40	skovira	N	2		penia	4/21/2013	0.54	0.06	64350	12.62	7.95	97.00	11.44	115
H101	H101-SW -E2/H101-SWD-E2	Storm (SW)	10/24/2012	8:39	lfisher	Y	N/A		quackenbush									
H101	H101-SW -F	Storm (SW)	10/24/2012	8:39	lfisher	Y	N/A		quackenbush									
H101	H101-SW - 3/H101-SWD- 3	Storm (SW)	5/1/2013	9:43	skovira	N	3	Unlocked upon arrival.	delius	4/30/2013	0.95	0.55	182448	9.94	7.85	84.00	7.50	36
H101	H101-SW - 4/H101-SWD- 4	Storm (SW)	5/22/2013	12:40	skovira	N	4	Pond temperature was 28.62 C. The 3.9 C temp. above was the chilled temperature of the composite sample.	delius	5/21/2013	2.13	2.38	545663	12.24	7.62	122.00	3.90	22
H101	H101-SW - 5/H101-SWD- 5	Storm (SW)	6/5/2013	13:30	skovira	N	5	Cooler temp: 3.4; pond temp: 27.30; pond pH: 8.23	penia	6/4/2013	1.03	0.52	264740	14.20	7.19	249.00	4.58	82
H101	H101-SW - 6/H101-SWD- 6	Storm (SW)	7/11/2013	11:10	skovira	N	6	Desicant changed. 9.37 pond pH; 30.46C pond temp.	delius	7/10/2013	1.88	1.57	520713	12.15	8.98	138.00	4.00	82
H101	H101-SW - 7/H101-SWD- 7	Storm (SW)	7/25/2013	10:00	skovira	N	7	Colder temp 4.5C	penia	7/24/2013	0.30	0.52	120086	12.94	7.15	70.00	11.49	273
H101	H101-SW - 8/H101-SWD- 8	Storm (SW)	8/8/2013	11:30	skovira	N	8	cooler temp: 3.3C; did not allow enough time to equilibrate	penia	8/6/2013	0.74	0.30	131325	8.10	7.93	107.00	15.52	147
H101	H101-SW - 9/H101-SWD- 9	Storm (SW)	9/13/2013	15:40	skovira	N	9	pond temp: 30.82C; pH: 7.36	delius	9/12/2013	0.92	0.47	206430	10.01	6.91	203.00	3.80	69
H101	H101-SW - 10/H101-SWD- 10	Storm (SW)	9/25/2013	9:30	skovira	N	10		penia	9/25/2013	1.18	0.86	283981	14.40	7.71	72.00	24.35	27
H101	H101-SW - 11/H101-SWD- 11	Storm (SW)	11/4/2013	15:36	skovira	N	11		delius	11/2/2013	0.84	0.31	197663	11.42	6.67	143.00	4.00	162

Site Location	Unique Sample ID	Type of Sample	Collect Date	Collect Time	Data Entry Personnel	Blanks	Sample Event Number	Field Comments	Field Personnel	Storm Event Date	Rainfall Amount	Average Flow	Total Volume	DO	PH	Conductivity	Temperature	ORP
M101	M101-SW - 1/M101-SWD- 1	Storm (SW)	12/21/2012	15:45	skovira	N	1		quackenbush	12/20/2012	0.52	0.79	180206	6.90	6.54	323.00	12.86	186
M101	M101-SW -E/M101-SWD-E	Storm (SW)	9/27/2012	10:18	lfisher	Y	N/A	pH & temp for all equipment blanks (sw-e) at all sites are recorded as M101 sw-e (same source of water)	Quackenbush					7.15	7.68	292.00	28.01	25
M101	M101-SW - 2/M101-SWD- 2	Storm (SW)	4/5/2013	11:49	skovira	N	2		delius	4/4/2013	3.23	1.19	1385042	9.82	4.33	239.00	6.00	133
M101	M101-SW - 3/M101-SWD- 3	Storm (SW)	5/1/2013	13:45	skovira	N	3	Battery voltage not checked	delius	4/30/2013	0.66	0.66	151025	13.48	7.28	14.00	5.30	80
M101	M101-SW - 4/M101-SWD- 4	Storm (SW)	6/7/2013	12:35	skovira	N	4	M101 cooler temp: 5.4	penia	6/6/2013	1.45	0.17	213744	15.90	6.17	123.00	6.04	65
M101		Storm (SW)	6/7/2013	12:35	skovira	N	4		penia									
M101	M101-SW - 5/M101-SWD- 5	Storm (SW)	7/11/2013	13:01	skovira	N	5	10.42 pond pH; 31.20C pond temp. YSI probe drafted up to about 0.8 after calibration. Reduce all pH by about 0.8.	delius	7/10/2013	1.27	3.05	1321660	12.80	8.73	149.00	5.80	57
M101	M101-SW - 6/M101-SWD- 6	Storm (SW)	7/26/2013	19:00	skovira	N	6	M101 pond: pH=8.09; temp=31.77C	delius	7/26/2013	0.63	1.62	331536	9.19	8.03	128.00	5.60	92
M101	M101-SW - 7/M101-SWD- 7	Storm (SW)	8/9/2013	11:35	skovira	N	7	fridge temp: 5.7C	penia	8/8/2013	1.00	2.82	645972	7.81	8.53	91.00	16.36	133
M101	M101-SW - 8/M101-SWD- 8	Storm (SW)	9/24/2013	12:50	skovira	N	8	M101 pond temp 24.9C; rotated culvert ring at H101	JS/RN	9/23/2013	1.04	2.22	736419	12.88	7.69	230.00	2.03	73
M101	M101-SW - 9/M101-SWD- 9	Storm (SW)	10/8/2013	11:00	skovira	N	9		penia	10/7/2013	0.44	1.20	276259	9.85	7.69	197.00	14.83	103

Site Location	Unique Sample ID	Type of Sample	Collect Date	Collect Time	Data Entry Personnel	Blanks	Sample Event Number	Field Comments	Field Personnel	Storm Event Date	Rainfall Amount	Average Flow	Total Volume	DO	PH	Conductivity	Temperature	ORP
P201	P201-SW - 1/P201-SWD- 1	Storm (SW)	3/25/2013	14:15	skovira	N	1	P101 had power outage due to loose power cable.	penia	3/22/2013	1.47	2.09	907603	6.93	7.77	100.00	18.64	76
P201	P201-SW -E	Storm (SW)	9/27/2012	15:00	pbohlen	Y	N/A		quackenbush					7.15	7.68	292.00	28.01	25
P201	P201-SW - 2/P201-SWD- 2	Storm (SW)	5/1/2013	12:15	skovira	N	2		delius	4/30/2013	0.77	3.12	1033958	11.69	7.62	119.00	6.40	32
P201	P201-SW - 3/P201-SWD- 3	Storm (SW)	6/3/2013	14:15	skovira	N	3	P202 dumped, M101 dumped, H101 not visited	quackenbush	6/1/2013	2.56	2.96	1587521	7.24	6.31	151.00	13.00	-421
P201	P201-SW - 4/P201-SWD- 4	Storm (SW)	6/25/2013	12:20	skovira	N	4	Cooler temp. 3.5C	penia	6/24/2013	0.62	0.24	129796		7.55		4.50	
P201	P201-SW - 5/P201-SWD- 5	Storm (SW)	7/9/2013	12:15	skovira	N	5		penia	7/8/2013	0.61	1.67	556137	10.97	9.05	176.00	5.22	176
P201	P201-SW - 6/P201-SWD- 6	Storm (SW)	8/28/2013	15:50	skovira	N	6	pond temp: 28.62C; pond pH: 6.32	delius	8/26/2013	1.18	3.62	1199561	11.58	5.52	166.00	4.20	130
P201	P201-SW - 7/P201-SWD- 7	Storm (SW)	9/6/2013	12:22	skovira	N	7	pond temp: 28.28C; pH: 6.74	delius	9/4/2013	0.81	2.54	583788	9.68	7.04	203.00	4.20	80
P201	P201-SW - 8/P201-SWD- 8	Storm (SW)	9/17/2013	12:30	skovira	N	8		penia	9/16/2013	0.80	0.89	385743	8.60	7.53	150.00	14.28	
P201	P201-SW - 9/P201-SWD- 9	Storm (SW)	9/24/2013	10:49	skovira	N	9	P201 pond temp 25.11C; changed damaged modem atenna at P202	JS/RN	9/23/2013	0.92	2.51	1088879	13.38	7.86	118.00	7.70	58
P201	P201-SW - 10/P201-SWD- 10	Storm (SW)	10/8/2013	13:30	skovira	N	10		penia	10/7/2013	0.42	0.31	132574	15.42	7.44	164.00	13.56	73

Site Location	Unique Sample ID	Type of Sample	Collect Date	Collect Time	Data Entry Personnel	Blanks	Sample Event Number	Field Comments	Field Personnel	Storm Event Date	Rainfall Amount	Average Flow	Total Volume	DO	PH	Conductivity	Temperature	ORP
P202	P202-SW - 1/P202-SWD- 1	Storm (SW)	2/14/2013	11:12	skovira	N	1	Sample depth not applicable	delius	2/13/2013	1.01	0.46	214101	8.40	5.90	59.60	12.34	56
P202	P202-SW -E1/P202-SWD-E1	Storm (SW)	9/27/2012	14:10	lfisher	Y	N/A		quackenbush					7.15	7.68	292.00	28.01	25
P202	P202-SW - 2/P202-SWD- 2	Storm (SW)	3/25/2013	12:00	skovira	N	2		penia	3/22/2013	1.16	0.61	203168	14.30	7.88	177.00	3.47	50
P202	P202-SW - 3/P202-SWD- 3	Storm (SW)	5/1/2013	11:03	skovira	N	3		delius	4/30/2013	2.60	1.90	632057	9.49	7.93	84.00	5.08	10
P202	P202-SW - 4/P202-SWD- 4	Storm (SW)	6/7/2013	9:50	skovira	N	4	P202 cooler temp: 3.8	penia	6/6/2013	2.73	0.36	263083	15.40	5.68	59.00	6.68	84
P202	P202-SW - 5/P202-SWD- 5	Storm (SW)	7/9/2013	11:15	skovira	N	5		penia	7/8/2013	1.10	0.77	175669	8.17	8.58	66.00	16.73	75
P202	P202-SW - 6/P202-SWD- 6	Storm (SW)	7/25/2013	11:30	skovira	N	6	P202 cooler temp 4.0C	penia	7/24/2013	0.29	0.49	62031	11.04	7.72	80.00	18.51	57
P202	P202-SW - 7/P202-SWD- 7	Storm (SW)	8/7/2013	14:01	skovira	N	7	Changed desicant; water temp =33.01C, pH=8.65	delius	8/5/2013	0.73	0.18	112135	14.37	6.51	249.00	3.70	126
P202	P202-SW - 8/P202-SWD- 8	Storm (SW)	9/20/2013	17:10	skovira	N	8	modem antenna slid off; left in box	guha	9/19/2013	0.40	0.17	73881	6.95	8.13	240.00	29.92	44
P202	P202-SW - 9/P202-SWD- 9	Storm (SW)	9/25/2013	10:50	skovira	N	9		penia	9/24/2013	3.53	1.30	696407	11.43	7.56	65.00	25.02	16
P202	P202-SW - 10/P202-SWD- 10	Storm (SW)	11/4/2013	16:55	skovira	N	10		delius	11/2/2013	1.09	0.29	186322	12.55	6.92	55.00	3.40	126

Appendix P - Standard analytical results for the Stormwater Runoff Samples

Site Location	Unique Sample ID	Type of Sample	Collect Date	Sample Event Number	Pace Analytical Sample ID	Total N	Total N Qualifier	Total TKN	Total TKN Qualifier	Dissolved TKN	Dissolved TKN Qualifier	NO2/NO3-N	NO2/NO3-N Qualifier	NH3-N	NH3-N Qualifier	Ortho P	Ortho P Qualifier	Total P	Total P Qualifier
H101	H101-SW - 1	Storm (SW)	3/25/2013	1	3587449001/3587449002	1.50		1.30		0.66		0.16		0.18		0.10		0.22	
H101	H101-SW -E1	Storm (SW)	9/27/2012	1	3569443007/3007	0.25	U	0.09	U	0.13	I	0.03	U	0.02	U	0.03		0.02	
H101	H101-SW - 2	Storm (SW)	4/22/2013	2	3590537001/3590537002	3.10		2.80		0.75		0.30		0.22		0.16		0.35	
H101	H101-SW -E2	Storm (SW)	10/24/2012	2	3572157009/3572157010	0.25	U	0.09	U	0.09	U					0.00	U	0.01	
H101	H101-SW -F	Storm (SW)	10/24/2012	2	3572157011											0.00	U		
H101	H101-SW - 3	Storm (SW)	5/1/2013	3	3591531001/3591531002	1.30		1.10		0.56		0.15		0.15		0.14		0.24	
H101	H101-SW - 4	Storm (SW)	5/22/2013	4	3594158001/3594158002	1.70		1.50		0.57		0.19		0.33		0.13		0.16	
H101	H101-SW - 5	Storm (SW)	6/5/2013	5	3595645001/3595645002	1.60		1.20		1.10		0.40		0.07		0.11		0.17	
H101	H101-SW - 6	Storm (SW)	7/11/2013	6	35100039001/35100039002	0.59		0.47	I	0.20	I	0.13		0.10		0.05		0.09	
H101	H101-SW - 7	Storm (SW)	7/25/2013	7	35101881001/35101881002	1.30		1.20		0.53		0.10		0.10		0.02		0.17	
H101	H101-SW - 8	Storm (SW)	8/8/2013	8	35103542001/35103542002	1.20		1.10		0.55		0.11		0.16		0.03		0.17	
H101	H101-SW - 9	Storm (SW)	9/13/2013	9	35108243001/35108243002	2.30		2.20		0.86		0.13		0.22		0.16		0.35	
H101	H101-SW - 10	Storm (SW)	9/25/2013	10	35109669001/35109669002	0.99		0.94		0.17	I	0.05		0.21		0.03		0.03	
H101	H101-SW - 11	Storm (SW)	11/4/2013	11	35114409001/35114409003	3.80		3.60		0.77		0.24		0.27		0.15		0.17	

Site Location	Unique Sample ID	Type of Sample	Collect Date	Sample Event Number	Pace Analytical Sample ID	Total N	Total N Qualifier	Total TKN	Total TKN Qualifier	Dissolved TKN	Dissolved TKN Qualifier	NO2/NO3-N	NO2/NO3-N Qualifier	NH3-N	NH3-N Qualifier	Ortho P	Ortho P Qualifier	Total P	Total P Qualifier
M101	M101-SW - 1	Storm (SW)	12/21/2012	1	3578132001/3578132002	2.10		1.60		0.96		0.48		0.30		0.22		0.64	
M101	M101-SW -E	Storm (SW)	9/27/2012	1	3569443005/3005	0.25	U	0.09	U	0.15	I	0.03	U	0.02	U	0.03		0.02	
M101	M101-SW - 2	Storm (SW)	4/5/2013	2	3588862001/3588862002	0.85		0.67		0.64		0.18		0.21		0.13		0.19	
M101	M101-SW - 3	Storm (SW)	5/1/2013	3	3591531007/3591531008	1.80		1.30		1.30		0.53		0.20		0.16		0.22	
M101	M101-SW - 4	Storm (SW)	6/7/2013	4	3596049011/3596049012	0.81		0.77		0.61		0.04	I	0.03	I	0.06		0.12	
M101	M101-SW - 5	Storm (SW)	7/11/2013	5	35100039003/35100039004	1.86		1.60		0.51		0.26		0.24		0.16		0.54	
M101	M101-SW - 6	Storm (SW)	7/26/2013	6	35102059001/35102059002	2.48		2.30		0.41	I	0.18		0.12		0.15		1.10	
M101	M101-SW - 7	Storm (SW)	8/9/2013	7	35103783001/35103783002	0.50		0.40	I	0.36	I	0.10		0.07		0.14		0.17	
M101	M101-SW - 8	Storm (SW)	9/24/2013	8	35109430003/35109430004	1.00		0.78		0.85		0.25		0.03	I	0.15		0.16	
M101	M101-SW - 9	Storm (SW)	10/8/2013	9	35111301001/35111301002	1.10		0.81		0.68		0.31		0.17		0.15		0.22	

Site Location	Unique Sample ID	Type of Sample	Collect Date	Sample Event Number	Pace Analytical Sample ID	Total N	Total N Qualifier	Total TKN	Total TKN Qualifier	Dissolved TKN	Dissolved TKN Qualifier	NO2/NO3-N	NO2/NO3-N Qualifier	NH3-N	NH3-N Qualifier	Ortho P	Ortho P Qualifier	Total P	Total P Qualifier
P201	P201-SW - 1	Storm (SW)	3/25/2013	1	3587449005	1.10		0.69		0.52		0.46		0.24		0.16		0.22	
P201	P201-SWD- 1	Storm (SW)	3/25/2013	1	3587449006														
P201	P201-SW -E	Storm (SW)	9/27/2012	1	3569443001	0.25	U	0.09	I			0.03	U	0.02	U	0.03		0.02	
P201	P201-SW - 2	Storm (SW)	5/1/2013	2	3591531005/3591531006	3.80		3.40		0.76		0.42		0.32		0.19		1.10	
P201	P201-SW - 3	Storm (SW)	6/3/2013	3	3595264001/3595264002	1.72		1.20		0.73		0.52		0.16		0.34		0.54	
P201	P201-SW - 4	Storm (SW)	6/25/2013	4	3598009009/3598009010	0.85		0.52		0.47	I	0.33		0.12		0.33		0.40	
P201	P201-SW - 5	Storm (SW)	7/9/2013	5	3599576003/3599576004	1.40		1.00		0.67		0.43		0.22		0.30		0.36	
P201	P201-SW - 6	Storm (SW)	8/28/2013	6	35106215001/35106215002	0.85		0.65		0.59		0.20		0.15		0.19		0.22	
P201	P201-SW - 7	Storm (SW)	9/6/2013	7	35107363001/35107363002	0.87		0.61		0.38	I	0.26		0.16		0.16		0.21	
P201	P201-SW - 8	Storm (SW)	9/17/2013	8	35108576001/35108576002	1.30		0.93		0.54		0.41		0.11		0.24		0.25	
P201	P201-SW - 9	Storm (SW)	9/24/2013	9	35109430001/35109430002	0.82		0.66		0.44	I	0.16		0.04	I	0.17		0.25	
P201	P201-SW - 10	Storm (SW)	10/8/2013	10	35111301003/35111301004	1.80		1.60		0.67		0.18		0.13		0.11		1.30	

Site Location	Unique Sample ID	Type of Sample	Collect Date	Sample Event Number	Pace Analytical Sample ID	Total N	Total N Qualifier	Total TKN	Total TKN Qualifier	Dissolved TKN	Dissolved TKN Qualifier	NO2/NO3-N	NO2/NO3-N Qualifier	NH3-N	NH3-N Qualifier	Ortho P	Ortho P Qualifier	Total P	Total P Qualifier
P202	P202-SW - 1	Storm (SW)	2/14/2013	1	3583312005/3583312006	2.50		2.10		1.20		0.31		0.28		0.54		0.71	
P202	P202-SW -E1	Storm (SW)	9/27/2012	1	3569443004/3004	0.25	U	0.09	U	0.16	I	0.03	U	0.02	U	0.03		0.02	
P202	P202-SW - 2	Storm (SW)	3/25/2013	2	3587449003/3587400000	1.80		1.50		0.82		0.31		0.30		0.27		0.36	
P202	P202-SW - 3	Storm (SW)	5/1/2013	3	3591531003/3591531004	3.10		2.70		1.00		0.44		0.33		0.38		0.51	
P202	P202-SW - 4	Storm (SW)	6/7/2013	4	3596049009/3596049010	1.40		1.30		0.27	I	0.09		0.07		0.08		0.25	
P202	P202-SW - 5	Storm (SW)	7/9/2013	5	3599576001/3599576002	2.20		2.00		0.15	I	0.19		0.12		0.07		0.13	
P202	P202-SW - 6	Storm (SW)	7/25/2013	6	35101881003/35101881004	1.52		1.20		0.67		0.32		0.16		0.27		0.32	
P202	P202-SW - 7	Storm (SW)	8/7/2013	7	35103364001/35103364002	1.10		0.84		0.50		0.23		0.15		0.16		0.21	
P202	P202-SW - 8	Storm (SW)	9/20/2013	8	35109239001/35109239002	0.93		0.73		0.44	I	0.20		0.21		0.31		0.34	
P202	P202-SW - 9	Storm (SW)	9/25/2013	9	35109669003/35109669004	0.30	I	0.25	I	0.15	I	0.05		0.04	I	0.06		0.07	
P202	P202-SW - 10	Storm (SW)	11/4/2013	10	35114409002/35114409004	2.80		2.30		1.00		0.43		0.25	I	0.61		0.71	

Appendix Q - Isotopic results for the Stormwater Runoff Samples

Site Location	Unique Sample ID	Type of Sample	Collect Date	δ15N - NO3	δ15N -NO3 Qualifier	δ15N- NH4	δ15N- NH4 Qualifier	δ18N- NO3
H101	H101-SW - 1	Storm (SW)	3/25/2013	-2.70	from 5/7/2014 rerun			
H101	H101-SW - 10	Storm (SW)	9/25/2013	-2.12				29.46
H101	H101-SW - 11	Storm (SW)	11/4/2013	-0.42				20.45
H101	H101-SW - 2	Storm (SW)	4/22/2013	-1.78				
H101	H101-SW - 3	Storm (SW)	5/1/2013	0.11				
H101	H101-SW - 4	Storm (SW)	5/22/2013	-6.39				
H101	H101-SW - 5	Storm (SW)	6/5/2013	-3.76	from 5/7/2014 rerun			
H101	H101-SW - 6	Storm (SW)	7/11/2013	-9.02		-4.08		
H101	H101-SW - 7	Storm (SW)	7/25/2013		Suspect due to low prop.from sample	5.15		
H101	H101-SW - 8	Storm (SW)	8/8/2013	-8.48				
H101	H101-SW - 9	Storm (SW)	9/13/2013	-11.41	NAU = -2.47	-8.77		
M101	M101-SW - 1	Storm (SW)	12/21/2012	-0.70		2.40		
M101	M101-SW - 2	Storm (SW)	4/5/2013	1.51				
M101	M101-SW - 3	Storm (SW)	5/1/2013	-3.58	NAU = -1.16			
M101	M101-SW - 4	Storm (SW)	6/7/2013					
M101	M101-SW - 5	Storm (SW)	7/11/2013	-5.89				
M101	M101-SW - 6	Storm (SW)	7/26/2013	3.59				
M101	M101-SW - 7	Storm (SW)	8/9/2013	-5.33				
M101	M101-SW - 8	Storm (SW)	9/24/2013	11.9				12.70
M101	M101-SW - 9	Storm (SW)	10/8/2013	5.913				13.39

Site Location	Unique Sample ID	Type of Sample	Collect Date	δ15N - NO3	δ15N -NO3 Qualifier	δ15N- NH4	δ15N- NH4 Qualifier	δ18N- NO3
P201	P201-SW - 1	Storm (SW)	3/25/2013	2.29				
P201	P201-SW - 10	Storm (SW)	10/8/2013	-2.86				-17.74
P201	P201-SW - 2	Storm (SW)	5/1/2013	-2.09				
P201	P201-SW - 3	Storm (SW)	6/3/2013	1.44				
P201	P201-SW - 4	Storm (SW)	6/25/2013	-3.25				
P201	P201-SW - 5	Storm (SW)	7/9/2013	-0.46				
P201	P201-SW - 6	Storm (SW)	8/28/2013	-2.70				
P201	P201-SW - 7	Storm (SW)	9/6/2013	-7.32				
P201	P201-SW - 8	Storm (SW)	9/17/2013	-0.47				36.05
P201	P201-SW - 9	Storm (SW)	9/24/2013	3.787				13.59
P202	P202-SW - 1	Storm (SW)	2/14/2013			3.10		
P202	P202-SW - 10	Storm (SW)	11/4/2013	-1.19				16.88
P202	P202-SW - 2	Storm (SW)	3/25/2013	-1.57				
P202	P202-SW - 3	Storm (SW)	5/1/2013	-1.56				
P202	P202-SW - 4	Storm (SW)	6/7/2013	1.92	from 5/7/2014 rerun			
P202	P202-SW - 5	Storm (SW)	7/9/2013	-8.03		7.81		
P202	P202-SW - 6	Storm (SW)	7/25/2013	-5.32		5.71		
P202	P202-SW - 7	Storm (SW)	8/7/2013	-3.88				
P202	P202-SW - 8	Storm (SW)	9/20/2013	0.351				36.69
P202	P202-SW - 9	Storm (SW)	9/25/2013					

Appendix R – Load Estimates by Stormwater Runoff Event

Site Location	Storm Event Date	Rainfall Amount	Total Volume	Basin Acres	Total N (mg/L)	TN Load (lbs)	TN Load (lb)/Acre	Total TKN (mg/L)	TKN Load (lbs)	TKN Load (lb)/Acre	Nitrate (mg/L)	Nitrate Load (lbs)	Nitrate Load (lb)/Acre	Ammonium (mg/L)	Ammonium Load (lbs)	Ammonium Load (lb)/Acre	Ratio (TKN/Inorg)
P202	2/13/2013	1.01	214,101	13.22	2.5	1.180	0.089	2.1	0.991	0.075	0.31	0.146	0.011	0.28	0.132	0.010	3.559
P202	3/22/2013	1.16	203,168	13.22	1.8	0.806	0.061	1.5	0.672	0.051	0.31	0.139	0.011	0.3	0.134	0.010	2.459
P202	4/30/2013	2.6	632,057	13.22	3.1	4.320	0.327	2.7	3.763	0.285	0.44	0.613	0.046	0.33	0.460	0.035	3.506
P202	6/6/2013	2.73	263,083	13.22	1.4	0.812	0.061	1.3	0.754	0.057	0.086	0.050	0.004	0.068	0.039	0.003	8.442
P202	7/8/2013	1.1	175,669	13.22	2.2	0.852	0.064	2	0.775	0.059	0.19	0.074	0.006	0.12	0.046	0.004	6.452
P202	7/24/2013	0.29	62,031	13.22	1.52	0.208	0.016	1.2	0.164	0.012	0.32	0.044	0.003	0.16	0.022	0.002	2.500
P202	8/5/2013	0.73	112,135	13.22	1.1	0.272	0.021	0.84	0.208	0.016	0.23	0.057	0.004	0.15	0.037	0.003	2.211
P202	9/19/2013	0.4	73,881	13.22	0.93	0.152	0.011	0.73	0.119	0.009	0.2	0.033	0.002	0.21	0.034	0.003	1.780
P202	9/24/2013	3.53	696,407	13.22	0.3	0.461	0.035	0.25	0.384	0.029	0.054	0.083	0.006	0.04	0.061	0.005	2.660
P202	11/2/2013	1.09	186,322	13.22	2.8	1.150	0.087	2.3	0.945	0.071	0.43	0.177	0.013	0.25	0.103	0.008	3.382
P201	3/22/2013	1.47	907,603	18.29	1.1	2.201	0.120	0.69	1.381	0.075	0.46	0.921	0.050	0.24	0.480	0.026	0.986
P201	4/30/2013	0.77	1,033,958	18.29	3.8	8.664	0.474	3.4	7.752	0.424	0.42	0.958	0.052	0.32	0.730	0.040	4.595
P201	6/1/2013	2.56	1,587,521	18.29	1.72	6.021	0.329	1.2	4.201	0.230	0.52	1.820	0.100	0.16	0.560	0.031	1.765
P201	6/24/2013	0.62	129,796	18.29	0.85	0.243	0.013	0.52	0.149	0.008	0.33	0.094	0.005	0.12	0.034	0.002	1.156
P201	7/8/2013	0.61	556,137	18.29	1.4	1.717	0.094	1	1.226	0.067	0.43	0.527	0.029	0.22	0.270	0.015	1.538
P201	8/26/2013	1.18	1,199,561	18.29	0.85	2.248	0.123	0.65	1.719	0.094	0.2	0.529	0.029	0.15	0.397	0.022	1.857
P201	9/4/2013	0.81	583,788	18.29	0.87	1.120	0.061	0.61	0.785	0.043	0.26	0.335	0.018	0.16	0.206	0.011	1.452
P201	9/16/2013	0.8	385,743	18.29	1.3	1.106	0.060	0.93	0.791	0.043	0.41	0.349	0.019	0.11	0.094	0.005	1.788
P201	9/23/2013	0.92	1,088,879	18.29	0.82	1.969	0.108	0.66	1.585	0.087	0.16	0.384	0.021	0.036	0.086	0.005	3.367
P201	10/7/2013	0.42	132,574	18.29	1.8	0.526	0.029	1.6	0.468	0.026	0.18	0.053	0.003	0.13	0.038	0.002	5.161
M101	12/20/2012	0.52	180,206	33.97	2.1	0.834	0.025	1.6	0.636	0.019	0.48	0.191	0.006	0.3	0.119	0.004	2.051
M101	4/4/2013	3.23	1,385,042	33.97	0.85	2.596	0.076	0.67	2.046	0.060	0.18	0.550	0.016	0.21	0.641	0.019	1.718
M101	4/30/2013	0.66	151,025	33.97	1.8	0.599	0.018	1.3	0.433	0.013	0.53	0.176	0.005	0.2	0.067	0.002	1.781
M101	6/6/2013	1.45	213,744	33.97	0.81	0.382	0.011	0.77	0.363	0.011	0.04	0.019	0.001	0.029	0.014	0.000	11.159
M101	7/10/2013	1.27	1,321,660	33.97	1.86	5.421	0.160	1.6	4.663	0.137	0.26	0.758	0.022	0.24	0.699	0.021	3.200
M101	7/26/2013	0.63	331,536	33.97	2.48	1.813	0.053	2.3	1.681	0.049	0.18	0.132	0.004	0.12	0.088	0.003	7.667
M101	8/8/2013	1	645,972	33.97	0.5	0.712	0.021	0.4	0.570	0.017	0.1	0.142	0.004	0.07	0.100	0.003	2.353
M101	9/23/2013	1.04	736,419	33.97	1	1.624	0.048	0.78	1.267	0.037	0.25	0.406	0.012	0.031	0.050	0.001	2.776
M101	10/7/2013	0.44	276,259	33.97	1.1	0.670	0.020	0.81	0.493	0.015	0.31	0.189	0.006	0.17	0.104	0.003	1.688
H101	3/22/2013	0.8	72,199	40.32	1.5	0.239	0.006	1.3	0.207	0.005	0.16	0.025	0.001	0.18	0.029	0.001	3.824
H101	4/21/2013	0.54	64,350	40.32	3.1	0.440	0.011	2.8	0.397	0.010	0.3	0.043	0.001	0.22	0.031	0.001	5.385
H101	4/30/2013	0.95	182,448	40.32	1.3	0.523	0.013	1.1	0.443	0.011	0.15	0.060	0.001	0.15	0.060	0.001	3.667
H101	5/21/2013	2.13	545,663	40.32	1.7	2.045	0.051	1.5	1.805	0.045	0.19	0.229	0.006	0.33	0.397	0.010	2.885
H101	6/4/2013	1.03	264,740	40.32	1.6	0.934	0.023	1.2	0.701	0.017	0.4	0.234	0.006	0.068	0.040	0.001	2.564
H101	7/10/2013	1.88	520,713	40.32	0.59	0.677	0.017	0.47	0.540	0.013	0.13	0.149	0.004	0.1	0.115	0.003	2.043
H101	7/24/2013	0.3	120,086	40.32	1.3	0.344	0.009	1.2	0.318	0.008	0.1	0.026	0.001	0.1	0.026	0.001	6.000
H101	8/6/2013	0.74	131,325	40.32	1.2	0.347	0.009	1.1	0.319	0.008	0.11	0.032	0.001	0.16	0.046	0.001	4.074
H101	9/12/2013	0.92	206,430	40.32	2.3	1.047	0.026	2.2	1.001	0.025	0.13	0.059	0.001	0.22	0.100	0.002	6.286
H101	9/25/2013	1.18	283,981	40.32	0.99	0.620	0.015	0.94	0.589	0.015	0.053	0.033	0.001	0.21	0.131	0.003	3.574
H101	11/2/2013	0.84	197,663	40.32	3.8	1.656	0.041	3.6	1.569	0.039	0.24	0.105	0.003	0.27	0.118	0.003	7.059

Site Location	Storm Event Date	Rainfall Amount	Total Volume	Basin Acres	Ortho P (mg/L)	Ortho P Load (lbs)	Ortho P Load (lb)/Acre	Total P (mg/L)	TP Load (lbs)	TP Load (lb)/Acre
P202	2/13/2013	1.01	214,101	13.22	0.54	0.255	0.019	0.71	0.335	0.025
P202	3/22/2013	1.16	203,168	13.22	0.27	0.121	0.009	0.36	0.161	0.012
P202	4/30/2013	2.6	632,057	13.22	0.38	0.530	0.040	0.51	0.711	0.054
P202	6/6/2013	2.73	263,083	13.22	0.079	0.046	0.003	0.25	0.145	0.011
P202	7/8/2013	1.1	175,669	13.22	0.072	0.028	0.002	0.13	0.050	0.004
P202	7/24/2013	0.29	62,031	13.22	0.27	0.037	0.003	0.32	0.044	0.003
P202	8/5/2013	0.73	112,135	13.22	0.16	0.040	0.003	0.21	0.052	0.004
P202	9/19/2013	0.4	73,881	13.22	0.31	0.051	0.004	0.34	0.055	0.004
P202	9/24/2013	3.53	696,407	13.22	0.055	0.084	0.006	0.065	0.100	0.008
P202	11/2/2013	1.09	186,322	13.22	0.61	0.251	0.019	0.71	0.292	0.022
P201	3/22/2013	1.47	907,603	18.29	0.16	0.320	0.018	0.22	0.440	0.024
P201	4/30/2013	0.77	1,033,958	18.29	0.19	0.433	0.024	1.1	2.508	0.137
P201	6/1/2013	2.56	1,587,521	18.29	0.34	1.190	0.065	0.54	1.890	0.103
P201	6/24/2013	0.62	129,796	18.29	0.33	0.094	0.005	0.4	0.114	0.006
P201	7/8/2013	0.61	556,137	18.29	0.3	0.368	0.020	0.36	0.441	0.024
P201	8/26/2013	1.18	1,199,561	18.29	0.19	0.503	0.027	0.22	0.582	0.032
P201	9/4/2013	0.81	583,788	18.29	0.16	0.206	0.011	0.21	0.270	0.015
P201	9/16/2013	0.8	385,743	18.29	0.24	0.204	0.011	0.25	0.213	0.012
P201	9/23/2013	0.92	1,088,879	18.29	0.17	0.408	0.022	0.25	0.600	0.033
P201	10/7/2013	0.42	132,574	18.29	0.11	0.032	0.002	1.3	0.380	0.021
M101	12/20/2012	0.52	180,206	33.97	0.22	0.087	0.003	0.64	0.254	0.007
M101	4/4/2013	3.23	1,385,042	33.97	0.13	0.397	0.012	0.19	0.580	0.017
M101	4/30/2013	0.66	151,025	33.97	0.16	0.053	0.002	0.22	0.073	0.002
M101	6/6/2013	1.45	213,744	33.97	0.062	0.029	0.001	0.12	0.057	0.002
M101	7/10/2013	1.27	1,321,660	33.97	0.16	0.466	0.014	0.54	1.574	0.046
M101	7/26/2013	0.63	331,536	33.97	0.15	0.110	0.003	1.1	0.804	0.024
M101	8/8/2013	1	645,972	33.97	0.14	0.199	0.006	0.17	0.242	0.007
M101	9/23/2013	1.04	736,419	33.97	0.15	0.244	0.007	0.16	0.260	0.008
M101	10/7/2013	0.44	276,259	33.97	0.15	0.091	0.003	0.22	0.134	0.004
H101	3/22/2013	0.8	72,199	40.32	0.099	0.016	0.000	0.22	0.035	0.001
H101	4/21/2013	0.54	64,350	40.32	0.16	0.023	0.001	0.35	0.050	0.001
H101	4/30/2013	0.95	182,448	40.32	0.14	0.056	0.001	0.24	0.097	0.002
H101	5/21/2013	2.13	545,663	40.32	0.13	0.156	0.004	0.16	0.193	0.005
H101	6/4/2013	1.03	264,740	40.32	0.11	0.064	0.002	0.17	0.099	0.002
H101	7/10/2013	1.88	520,713	40.32	0.053	0.061	0.002	0.091	0.104	0.003
H101	7/24/2013	0.3	120,086	40.32	0.022	0.006	0.000	0.17	0.045	0.001
H101	8/6/2013	0.74	131,325	40.32	0.03	0.009	0.000	0.17	0.049	0.001
H101	9/12/2013	0.92	206,430	40.32	0.16	0.073	0.002	0.35	0.159	0.004
H101	9/25/2013	1.18	283,981	40.32	0.027	0.017	0.000	0.033	0.021	0.001
H101	11/2/2013	0.84	197,663	40.32	0.15	0.065	0.002	0.17	0.074	0.002

Appendix S – *In Situ* Monthly Rainfall Values for the Environmental Community Sampling

Site Name	P202	P201	M101	H101
Isco Quantity	Rainfall	Rainfall	Rainfall	Rainfall
Label	Rainfall	Rainfall	Rainfall	Rainfall
Units	in	in	in	in
Resolution	0.1	0.1	0.1	0.1
Significant Digits	0	0	0	0
7/22/2012 0:00		2.65	3.18	1.56
7/29/2012 0:00		0.24	0.21	0.27
8/5/2012 0:00		0.22	0.12	4.98
8/12/2012 0:00			2.5	4.47
8/19/2012 0:00		0.68	1.97	3.68
8/26/2012 0:00		0.73	1.2	3.5
9/2/2012 0:00		0.47	2.29	2.07
9/9/2012 0:00		0.05	0.08	0.88
9/16/2012 0:00		0.07	1.58	1.51
9/23/2012 0:00	0.28	0.66	2.81	1.03
9/30/2012 0:00	0.12	0.02	0.74	0.16
10/7/2012 0:00	1.88	1.77	2.33	1.08
10/14/2012 0:00	0.11	0	0	0
10/21/2012 0:00	0.13	0.02	0	0
10/28/2012 0:00	0.22	0.03	0.03	0.19
11/4/2012 0:00	0.06	0	0	0
11/11/2012 0:00	0.22	0.08	0	0.07
11/18/2012 0:00	0.2	0.09	0.03	0.13
11/25/2012 0:00		0	0	0
12/2/2012 0:00		0	0	0
12/9/2012 0:00		0	0	0
12/16/2012 0:00		0.22	0.77	0.22
12/23/2012 0:00		0.33	0.6	0.79
12/30/2012 0:00		0.94	0.65	1.65
1/6/2013 0:00		0.26	0.11	0.31
1/13/2013 0:00		0.05	0	0.33
1/20/2013 0:00	0.64	0.07	0.01	0.35
1/27/2013 0:00	0.29	0	0	0
2/3/2013 0:00	0.32	0.09	0.02	0.11
2/10/2013 0:00	0.48	0.04	0.06	0
2/17/2013 0:00	2.09	0.72	0.55	0.96
2/24/2013 0:00	0.14	0	0.01	0
3/3/2013 0:00	0.28	0.29	0.36	0.28
3/10/2013 0:00	0.03	0.05	0.01	0.01
3/17/2013 0:00	0.04	0.26	0.47	0.44
3/24/2013 0:00	1.41	1.61	0.35	1.01
3/31/2013 0:00	0.15	0	0	0.06

4/7/2013 0:00	0.61	0.72	3.47	0.66
4/14/2013 0:00	0.06	0.08	0	0
4/21/2013 0:00	0.31	0.03	0	0.34
4/28/2013 0:00	0.15	0.12	0.21	0.63
5/5/2013 0:00	3.69	1.87	1.9	2.45
5/12/2013 0:00	0.04	0.1	0.02	0
5/19/2013 0:00	0	0	0	0
5/26/2013 0:00	0.26	0.22	0.22	2.63
6/2/2013 0:00	1.85	2.74	1.58	4.62
6/9/2013 0:00	3.86	3.01	5.61	6.24
6/16/2013 0:00	0.5	0.19	3.35	0.44
6/23/2013 0:00	0.76	0.6	0.33	1.54
6/30/2013 0:00	0.84	1.76	1.01	0.78
7/7/2013 0:00	4.84	4.26	4.76	3.33
7/14/2013 0:00	3.07	2.65	3.84	2.87
7/21/2013 0:00	0.42	0.83	1.52	2.58
7/28/2013 0:00	0.92	0.72	1.5	2.45
8/4/2013 0:00	1.06	0.21	0.65	1.4
8/11/2013 0:00	4.25	3.64	1.71	1.51
8/18/2013 0:00	2.27	1.31	2.77	1.58
8/25/2013 0:00	4.97	0.05	3.39	3.01
9/1/2013 0:00	1.38	2.74	0.58	1.04
9/8/2013 0:00	1.63	0.97	1.2	0.19
9/15/2013 0:00	0.52	0.01	0.04	1.22
9/22/2013 0:00	1.6	1.62	3.53	0.07
9/29/2013 0:00	7.47	5.14	6.1	4.98
10/6/2013 0:00	0	0	0	0.03
10/13/2013 0:00	0.42	0.76	0.62	0.63
10/20/2013 0:00	0.2	0	0.04	0.04
10/27/2013 0:00	0.25	0.23	0.49	0.13
11/3/2013 0:00	1.14	0.7	0.24	0.85
11/10/2013 0:00	0.19	0.02	0	0.05
11/17/2013 0:00	1.1	0.91	0.01	0.95
11/24/2013 0:00	0.52	0.01	0.38	0.07
12/1/2013 0:00	0.67	0.53	0.33	0.35
12/8/2013 0:00	0.27	0	0	0
12/15/2013 0:00	0.36	0	0	0
12/22/2013 0:00	0.52	0	0.36	0.05
12/29/2013 0:00	0.26	0.01	0	0.02
1/1/2014 0:00	0.44	0.3	0.23	0.12

Peer Review of Tampa Bay Residential Stormwater Quality Evaluation

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The objective of this project was to perform a scientific peer review[1] of the Tampa Bay Residential Stormwater Quality Evaluation Project (dated February 22, 2015, 554 pages). Peer review is defined by the U.S. Environmental Protection Agency (EPA) in their Peer Review Handbook (EPA/100/B-06/002) as "a documented critical review of a specific scientific and/or technical work product. Peer review is conducted by qualified individuals (or organizations) who are independent of those who performed the work, and who are collectively equivalent in technical expertise (i.e., peers) to those who performed the original work. Peer review is conducted to ensure that activities are technically supportable, competently performed, properly documented, and consistent with established quality criteria. Peer review is an in-depth assessment of the assumptions, calculations, extrapolations, alternate interpretations, methodology, acceptance criteria, and conclusions pertaining to the specific major scientific and/or technical work product and of the documentation that supports them. Peer review is usually characterized by a one-time interaction or a limited number of interactions by independent peer reviewers. Peer review is encouraged during the early stages of the project or methods selection, and/or as part of the culmination of the work product, as appropriate. Regardless of the timing of peer review, the goal is ensuring that the final product is technically sound.

1. Overall Comments on Scientific Adequacy of the Study

The Peer Review Team was charged with performing a scientific review of the final report for the "Tampa Bay Residential Stormwater Quality Evaluation Project" (dated February 22, 2015, 554 pages). The Peer Review Team was not asked to serve as a steering or advisory board; therefore, the Peer Review Team was not charged to provide input into the study design.

The Peer Review Team believes that overall, the study was technically supportable and competently performed for the time frame and resources available (which limited the number of catchments that were monitored). In general, the study used accepted procedures and came to reasonable conclusions. The study had some limitations (which we specifically address later in this document); however, considering the limited time frame and resources allocated for the study, the authors explored a reasonable number of alternative interpretations and the methodology was sound.

We note that the study does make a contribution to existing literature on residential nutrient management; however, that contribution needs to be considered holistically, and should incorporate the large body of regional and national information on the research topic. For example, the study concludes on page 94 that "One result from this study suggests that alternative, non-structural BMPs (such as strict fertilizer ordinances) can also influence water quality from residential landscapes, and should be considered by local jurisdictions to offset eutrophication impacts". It is our opinion that the final report and this conclusion would be strengthened and be more valuable if the study was better contextualized so that the final report serves as an addition to the large body of existing scientific knowledge. In this case the report would then be viewed as one piece to a complex puzzle. One reason we suggest this is because the approximately 18-month study described in the final report did not allow for collection of sufficient data to obtain a full seasonal cycle of variations in stormwater and the resources provided for the study only allowed a small number of catchments to be monitored. However, a large volume of regional and national data and complimentary studies do exist that would help with the interpretation of the study results, and more importantly, provide additional support to address study hypotheses. The study authors may have consulted this material, however, as written, the final report does not mention it (we comment on this in great detail in section titled "Comments on the Literature").

Overall, we concluded that the study's social science findings are stronger than the water quality findings. The study findings on the application of fertilizer by individual households versus lawn care companies are very important. Individual households are reported to apply less fertilizer during rainy season months, while companies are reported to apply according to IFAS standards year-round. This suggests that the local county ordinances or household consumer ability to purchase fertilizer during parts of the year may not have as large of an expected impact on the actual application of fertilizers during key rainy season months because that decision is not made by households because the study found that 62-69% of customers apply fertilizer with assistance of their lawn care companies. Furthermore, it is unclear from the report whether those companies take into consideration these ordinances at all. This information was sought by the study team, but was not available given the low participation by lawn care companies. In fact the report states that very little information was obtained from the professional landscape companies (page 25). Because this is the primary fertilizer application source (Table 7), it seems that a greater effort could have been made to obtain these data. For example it was not clear if county stormwater departments were contacted and asked for assistance in contacting the lawn care professionals and/or obtaining data.

One of the overarching inquiries of this study is whether water quality in receiving waters is improved in catchments where fertilizer ordinances are imposed. It is possible that we do not know the answer to this question because human responses to fertilizer ordinances may be poorly understood. However, it is already well established in a rich and large body of regional and national scientific literature that higher rates of nutrient application and deposition onto water catchments will result in greater nutrient loads from catchments to receiving water bodies.

As the authors note, physical, chemical, and biological mechanisms in soil can dramatically slow the kinetics of nitrogen cycling in ecosystems. After nitrogen is deposited onto a catchment landscape (e.g., from fertilizer application), it is quickly incorporated into soil organic matter, and then released much more slowly. Thus, notable lag periods develop between fertilizer application and export of nutrients from storm events and streamflow. The extent of this lag period can vary among catchments, with yet more variation created by differences among catchments in their internal arrangements of land surface types (e.g., pervious vs. impervious patches). For these reasons, longer study periods than used in this study or large numbers of catchments (or both) are desirable. The study authors acknowledge this limitation.

Although the water quality component of this study did not find convincingly higher nutrient loads from catchments with ordinances than from catchments without, this study should not be interpreted to support the opposite conclusion. That is, the study results do not indicate that ordinances have no effect on nutrient loading. On the contrary, as we mentioned, the scientific literature strongly supports the mass balance principle that more nutrients added to a catchment will result in more nutrients exported. On a positive note, the authors clearly invested notable effort in standardizing their catchments for as many other confounding variables as possible, and generally succeeded in this regard.

Overall, documentation was sufficient to support conclusions. Some important issues the review team raised for this review that are addressed on the following pages include: (1) the seeming lack of use of local knowledge and references in setting up the study sites and conducting the research; (2) the lack of a statement about the presence or absence of septic tanks in the four communities even though this was a stated selection criterion and (3) the fact that the selected sites for surface water sample collection were not explained in a manner that would allow us to determine if samples were representative of water quality in the pond, and 4) the reporting of results as concentrations versus use of mass loadings.

2. Review of Study Objectives and Hypotheses

Study Objectives. The evaluation's overall goal was to, "identify ecological and socio-demographic factors influencing fertilizer related nutrient contributions to receiving waters in communities where different fertilizer controls were enacted by local municipalities." Specific objectives of the evaluations were:

1. "Measure and compare residential landscape management practices and knowledge among residents in each community and municipality at large;
2. Measure and compare average nitrogen loads (lbs/area) among the communities; Estimate residential fertilizer inputs to the community nutrient budget;
3. Measure nutrient concentrations in stormwater runoff and surface waters (stormwater retention ponds) throughout the year in each community."

Overall, the Peer Review Team believes the three specific study objectives have been met. As stated previously, the study time frame and limited budget did not allow for the robust data collection that may have been desired. We also believe the study objective to measure and compare knowledge of residents in each community and the municipality at large (#1) did not document "at large" community management practices because the results suggest there is a large control of residential landscape practices by lawn care management companies and this does not constitute the "at large" community in our opinion.

Study Hypotheses. We provide comments on whether the study hypotheses were correctly interpreted and supported by the study results. First we would like to note that in order to make the report more readable to the general public and policy makers, we recommend that all five hypotheses be included in Figure 1. We also recommend that the conclusions section should be reorganized by restating the five hypotheses in numerical order, and then clearly stating whether each hypothesis was supported or not, while clearly identifying the major findings and which data were used to make that declaration. This information could easily be organized into a table.

In regards to whether the science supports the individual hypothesis testing in the study, we have the following comments. The hypotheses evaluated were:

Hypothesis H1: "There is no significant difference in ordinance awareness among residents living where a sales-restriction is in effect relative to those living in counties without sales restriction." *Study concluded that Hypothesis H1 was rejected.*

The Peer Review Teams agrees with the study conclusion that this hypothesis be rejected. This is supported by the following information from the study, "Pinellas County residents were also significantly more likely than Hillsborough or Manatee County residents ($p < .001$, Tukey HSD) to respond that they had heard about government regulations concerning residential fertilizer use. Again, those who had heard about the ordinance (n=230) were probed further for details about what they had heard. Residents' knowledge of ordinance details varied (Table 12). Pinellas County residents were significantly more likely than Manatee County residents ($p = .05$, Tukey HSD) to know that local ordinances restricted the sale of lawn fertilizer during certain months. The results on best management practices and ordinance awareness allowed us to reject hypothesis H1, which stated that there was no significant differences in ordinance awareness among resident living in the three counties" (page 41).

Hypothesis H2: There is no significant difference in fertilizing practices among residents living where a sales-restriction is in effect relative to those living in counties without the sales restriction." *Study concluded that Hypothesis H2 was rejected.*

In general, the Peer Review Team agrees with the study conclusion that this hypothesis be rejected. This is because there was no significant difference in reported fertilizing practices amongst residents living in countries where a sales restriction is in place relative to those living in counties without a sales restriction.

The decision to reject the hypothesis is supported by the following information from the final report, "Residents in the three counties applied fertilizer to their lawns an average of 2.14x per year. Hillsborough County residents had the highest fertilizer frequency compared to the other two counties (Table 9). Post-hoc tests confirmed that Hillsborough County resident lawn fertilizer frequency was significantly greater than Pinellas County residents' (Bonferroni with $p=0.021$), allowing the hypothesis H2 (no significant difference in fertilizing practices among counties) to be rejected (page 39).

One minor note we had in regards to the study statement that residents in the three counties applied fertilizer to their lawns an average of 2.14 times per year, it was not clear to us whether this value was based on surveying individual residents or individual residents plus lawn care practitioners.

Hypothesis H3: There is no significant difference in pollutant loads to water bodies where fertilizer sales restrictions are in effect relative to waterbodies where the fertilizer sales restrictions have not been implemented." *Study concluded that Hypothesis H3 was NOT rejected.*

The Peer Review Teams agrees with the study conclusion that this hypothesis not be rejected (note that by using the word pollution, we believe the authors mean primarily nitrogen and to a lesser extent phosphorus). Our caveat regarding review of this hypothesis is that it is tested primarily with water quality data obtained in this study, and as we wrote about in our overall comments, there is a limited data set. It is our opinion that this hypothesis would be better addressed in the context of the final report serving as an addition to a large body of existing scientific studies. One reason for this is that the approximately 18-month study described in the final report does not allow for collection of enough data to obtain a full seasonal cycle of variations in stormwater. However, a large volume of regional and national data and complimentary scientific studies does exist that would help to not only set up the study, but importantly, provide additional support to test this hypothesis.

Hypothesis H4: There is no significant difference in fertilizing practices between residents living in the higher versus the lower socioeconomic communities within Pinellas County." – (comment: Pinellas County was the only County with two communities evaluated). *Study concluded that Hypothesis H4 was NOT rejected.*

Hypothesis H5: There is no significant difference in pollutant loads between water bodies receiving stormwater inputs from higher and lower socioeconomic communities within Pinellas County." *Study concluded that Hypothesis H5 could not be proven to be rejected false.*

In regards to both of these hypotheses, the Peer Review Teams believes that the report is deficient in providing sufficient information to correctly make a conclusion on the study related to these two hypotheses. It was unclear to the Peer Review Team as to how to evaluate these two hypotheses. First, we could not evaluate Hypothesis H4 because according to authors there is only a limited data set available to evaluate it (Page 43). It appeared to be an incomplete data set from one of the study sites. More details on this issue should be provided by the study authors in the limitations discussion and Table 1. In regards to Hypothesis H5, it was also unclear how to interpret water quality data from Pinellas County because the P202 community sampling site was a subset of the total community acres while the P201 community sampling site was obtained from the full drainage area. We would have liked to have seen more discussion for this finding.

3. Comments on Executive Summary & Overview Section

In general we believed the Executive Summary was well written, with clearly stated objectives, major findings, and recommendations. On page 10, it was written that applied fertilizers are a "manageable source of nutrients from these landscapes." This statement should be rephrased to be more in line with the findings of the report. In addition, on page 10, the authors underline the word 'may" in the middle of the page but it is not clear why this is so. We recommend that the authors remove the underlining.

In the discussion and findings compiled in the Executive Summary, and throughout the report, ordinances and education programs are often conflated or referred to interchangeably—and it is speculated about how long a future socio-behavioral study measuring behavioral change would need to be. However, ordinances and education programs are quite different in implementation and practice. More specifics about the type(s) of intervention that the authors are considering for future research would be helpful in determining usefulness of future similar studies. It would also be beneficial to consider separately the effects of ordinances themselves from fertilizer availability in the conceptual model provided on page 12.

As we previously noted, the study findings on the reported application of fertilizer by individual households versus lawn care companies are very important. Individual households apply less fertilizer during rainy season months, while companies apply according to IFAS standards year-round. This suggests that the local county ordinances or household consumer ability to purchase fertilizer during parts of the year may not have as large of an impact on the actual application of fertilizers during key rainy season months because that decision is made by others for approximately 62-69% of customers who apply fertilizers, by their lawn care companies. Furthermore, it is unclear whether those companies take into consideration ordinances at all.

On page 10 it is written, "Professional fertilizer applicators working in cities that fall within the jurisdictional boundaries of a County with strict fertilizer controls may abide by the stricter regulations throughout their operating region." To understand the findings of the study, it is critical to know, do they, or don't they, and when? Because lawn care companies did not provide this information, it is therefore impossible to determine the level of application.

On page 10 the study authors recommend a time series (before and after) study of behavior change, such as before or after an ordinance, education program, or other behavioral incentive is implemented. More specificity on what types of intervention are envisioned would strengthen this recommendation. In addition, there would likely be radically different behavioral responses to each of these approaches, so each should be treated separately.

On page 10 of the report, the authors recommend, “An intervention study where the landscape is managed or controlled by the research team allows control of application amount and timing that can *help clarify the behavioral effect at a community scale*.” This recommendation is contradictory because if the research team controls the application amounts and timing, they would also control the “behavioral effect at the community scale.” This would not clarify community scale behavior or decision making. The research team would need to be able to document the actual application amounts by residents themselves, and by lawn care companies per application (for example in a monthly log) in order to determine ecological impacts of these practices, while at the same time document any changes in decision making about whether and how to apply fertilizers in response to education campaigns, ordinances, or incentives. A more appropriate model would include monitoring current application of fertilizer by companies, and individuals, launching education campaigns or ordinances to may have an impact on behavior (including individuals who apply their own fertilizers and herbicides *and* companies), and then monitoring the subsequent application of fertilizer by both entities. In addition, it seems that the behavior change that is needed, if less nitrogen run-off in residential stormwater is desired, may be for residents to not use companies unless they are following local ordinances or guidelines, apply fertilizer themselves to have more control over timing and amounts of applications, or change fertilizer practices to reflect local ecology by planting yard species adapted to local landscapes that do not require heavy use of fertilizers or herbicides. The intervention study proposed is mentioned again in the conclusions (page 95) and more details on this would strengthen the study.

The future long term socio-behavioral study recommended by authors on page 10 would be helpful to better understanding household rationale, but if the majority of applications are by companies, then it would be of limited use in changing overall impact of lawn care practices, unless lawn care companies are more active participants in contributing to the study.

On page 12 the authors state that, “the limited research budget and timeline did not allow the establishment of baseline data or more than one replicate as control. Differences observed among communities from different counties could simply be due to random sampling and inherent variability.” It is unclear to our Peer Review Team whether the study authors think that as a result of this statement, the study is not sound. This strong disclaimer seems unnecessary given the research design.

Some references are missing that are cited in this section and in other locations of the report. One reference on page 96 is even written as (CITATION?).

4. Comments on Supporting Literature

The study and adopted methodology has significant reliance on cited literature. A closer examination of Tampa Bay stormwater research references and data sets may have provided some useful understanding of the local conditions. We previously stated that the study does make a contribution to existing literature on residential nutrient management; however, that contribution needs to be considered holistically taking into consideration the large body of regional and national information on the report topic. Examples of this literature are discussed in the following paragraphs.

The Southwest Florida Water Management District (SWFWMD) conducted extensive stormwater related studies within the study area. We noted only two SWFWMD references: "Lake Tarpon Groundwater Nutrient Study Final Report (2004)" and "Fertilizer, Pet Waste and Pesticides Topline Report. (2008)". We did not see any references to the work of Dr. Betty Rushton, who pioneered stormwater science in the Tampa Bay area. A large number (208) of local stormwater studies or other references to stormwater research were identified by the Peer Reviewers using the Water Atlas Digital Library (http://www.sarasota.wateratlas.usf.edu/DigitalLibrary/Default.aspx).

Additionally, Pinellas County and SWFWMD conducted an extensive study that included demographics in conjunction with the Lake Seminole restoration effort. This study may have also lent some local data to the review. We saw only one reference to Pinellas and no references to Hillsborough or Manatee County publications or evidence of querying the county governments for local data sets. Additionally, Dr. Harvey Harper (Environmental Research and Design) was not located in the reference section; however, Dr. Harper's 2007 stormwater report was cited many times for EMC calculations. He has also conducted significant stormwater related Tampa Bay work for Pinellas County, Hillsborough County and the Southwest Florida Water Management District. These were not cited. There was one reference to Dr. Tony Janicki (Janicki Environmental, Inc.) cited on page 16, but it was not listed in the references. A cursory search using the USF Water Atlas Spatial Library (http://www.sarasota.wateratlas.usf.edu/digitallibrary/spatial.aspx) turned up a large number of local references from Janicki Environmental and one by Harvey Harper (although there are significant others across Florida).

On page 13, the authors set out to place this study in the context of urban ecology literature, claiming the study would contribute "much-needed information to the growing urban ecology literature to expand the methods and tools…" However, the study does not provide an urban ecology conceptual framework or describe what current methods and tools are going to be expanded. It remains unclear what general urban ecology knowledge gap the study is filling. No such conceptual framework was developed in the introduction; thus, the conclusions of the study could not be interpreted as part of a conceptual framework. On page 14 the authors mention that their design is "substantiated" by the general design of the Baltimore LTER. However, it is not stated how the Baltimore LTER is a model for the current study and how the current study "builds upon this previous research and contributes to the body of knowledge that attempts to understand the link between human behaviors and suburban, ecosystem-related drivers" (page 14). Furthermore, many of the studies mentioned in the background section as informing the present work include structural analyses of changes in policy regulations and culturally situated attitudes with regards to lawn chemical use; however, this study does not undertake similar analyses of the links between individual household behavior, lawn care company practices, and state or county regulations.

5. Comments on Community Selection

One page 15 under "community selection," the report could be clearer on what the "community" units were that were being chosen. The report could be clearer on what constitutes an individual community, housing tracts, and catchments. The term "community" is acknowledged throughout socio-behavioral research as a problematic term and is applied loosely in the report; it appears to refer only to a subset or all of some residential suburban developments. In addition, more details are required on the organizational structure of these "communities" (e.g., they do not have HOAs, but other details may be available about the residents and their neighborhoods).

On page 14 (Background) of the study and also on page 16 (Phase I) and on page 4 of the Monitoring Plan (Overview of Communities) the presence of septic tanks is mentioned as a confounding nutrient source that will be used in community selection. Page 17 specifically states that communities were selected because they had "no septic onsite." However, septic tanks are not mentioned (presence of absence in the rest of the report including the selection table (Table 1 on page 20 in the main report and Table 1 on page 7 in Monitoring Report). So, the reader does not know if all communities were confirmed to be on septic of not. We looked at the septic tank map for Hillsborough County and found that H101 appears to be on septic (see Figure 1 below); therefore, for the report to be consistent, all other communities need to be on septic.

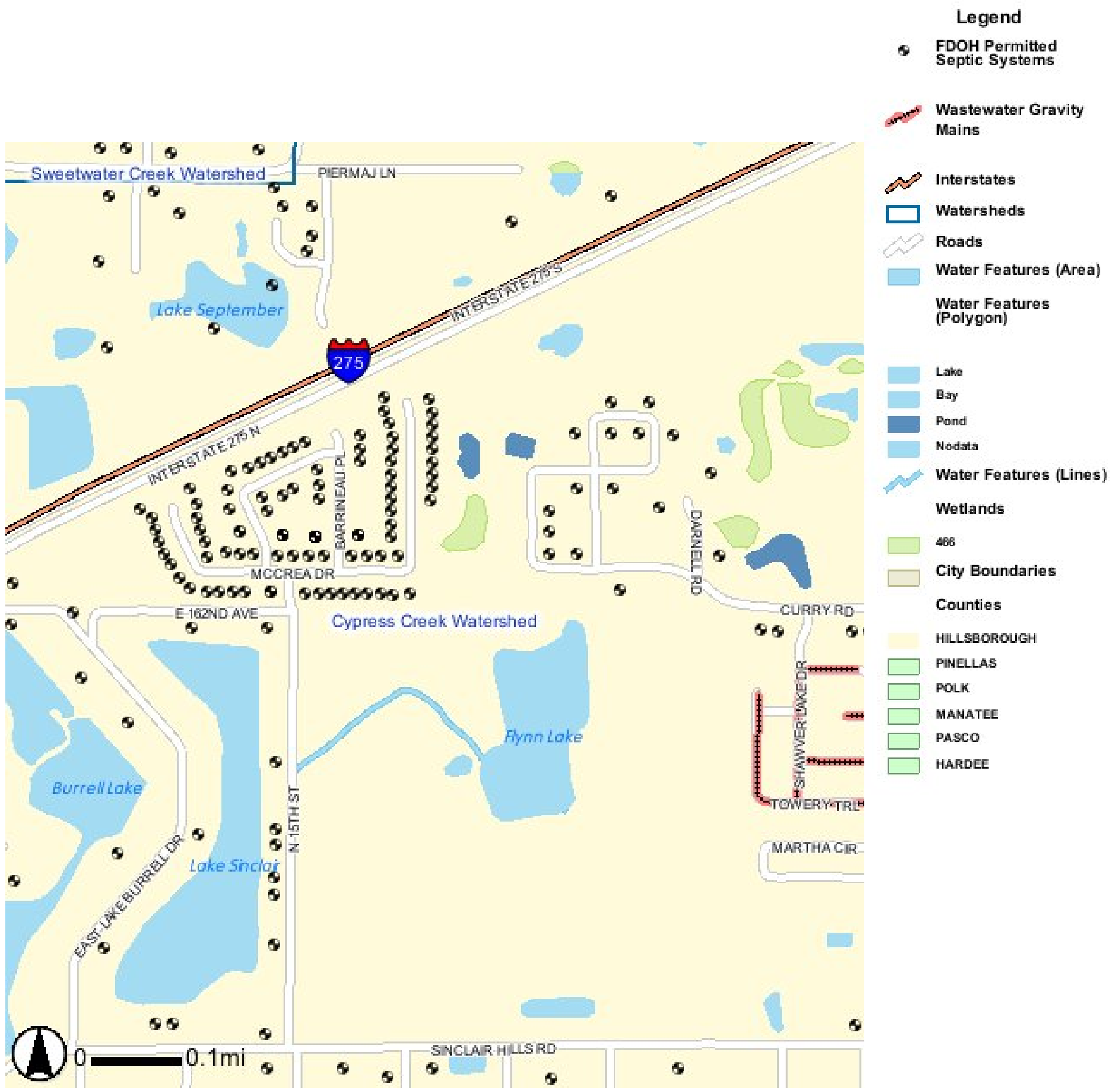


Figure 1. Septic Tanks from earlier USF/Hillsborough County Study (MCcrea Dr. area).

6. Comments on the Study Design

The socio-behavioral survey methods, interview methods and protocols appear to be sound and in keeping with similar urban ecology research. The selection of study sites is very detailed and researchers considered a variety of factors in making the selection. For the “door to door” interview questions, no sampling strategy was provided, so it is unclear what the distribution and representativeness of these interviews is by study community or within each community. The telephone survey was conducted over a short time span (i.e., two months) relative to the other data collection; therefore, it is unclear how seasonality and problems with recalling fertilizer practices might affect the responses for the survey.

Furthermore, the study team only interviewed 6 landscape professionals. This is not a representative sample; however, it does appear the study team attempted to interview many more but they were not responsive. Future studies should address this in the research design because the majority of fertilizer applications appear to be made by these professionals.

Regarding the design, the study presents data from a sample size of n=2 catchments with an ordinance and n=2 catchments without. There is at least some replication here, but given the high variation in nutrient loads from catchments to water bodies, this study was limited by small sample sizes. Larger sample sizes (numbers of catchments) would likely be needed to draw generalizations from sample statistics (e.g., whether mean + S.E. of nutrient loads differed between catchments with versus. without ordinances). The authors conduct a power analysis to determine how many samples they would need to sufficiently test their hypotheses, but the authors' power analysis appears to focus on how many samples (e.g., storm runoff events) they need to distinguish among their current four study catchments. We believe this is the wrong focus and the study authors should instead focus on adding catchments. We appreciate that deploying and calibrating runoff auto samplers was a tremendous amount of work, and the authors likely could not have adequately sampled more catchments. Nevertheless, doing so strikes us as important for generalizing nutrient loading differences between catchments with ordinances and catchments without. On a positive note, the authors clearly invested notable effort in standardizing their catchments for as many other confounding variables as possible, and generally succeeded in this regard.

Under “Methodology” (page 16) the study states that an effort was made to eliminate “confounding variables” and many efforts were accomplished to this effect. One source of nutrients not mentioned, but well known by stormwater professionals, is vegetative debris (leaf litter, grass clippings, etc.) that enters via the stormwater utility. No mention was made of a survey of the neighborhoods to determine if they had similar sources of this non-fertilizer source of nutrients.

It is unclear how to interpret data from the P202 study site in Pinellas County because according to authors (on page 17) it only covers a small sub-basin while in the other communities the complete drainage extent was sampled. Additional details on this issue should be included in the limitations discussion and Table 1 (Characteristics of the Four Communities Monitored Under this Project).

There is no discussion in the study of why property value is suitable as a selection variable. This is because general land and structure cost vary widely in the three counties selected so just using property values may not be the best overall criteria. For example, would it be better to establish a ratio of study location property value to mean property value by county (page 17-18).

In Table 1 (page 20) total pervious acres are shown (based on an assumed 40% impervious covering) and total pervious covering is stated to be based on photo interpretation. While this is a useful parameter, we did not see the authors use the directly connected impervious acreage which is a commonly used parameter and may have been a useful determinant. In fact the directly connected impervious acreage is used for Stormwater sample pacing (page 17) estimates but is not mentioned in any other contexts.

On page 17 it would have been useful (when discussing the screening of communities) to reference the records that were screened and or county/municipalities that were contacted to provide an idea of the level of screening conducted. For example the Hillsborough site, while not specifically named in the report, can be easily located by its proximity to the interstate and several lakes and characteristic street pattern. If the Adopt-A-Pond (AAP) records had been reviewed, two ponds in the AAP program would have been noted in the selected subdivision. The ponds, Curry Cove and MCcrea Pond (the pond sampled in the study), have only minimal historical data; however, noting that these ponds in the report of that the community had AAP ponds might have been useful. In addition, AAP or other type programs were cited as a selection criterion.

Page 26, paragraph 2, states "We conducted stormwater collection within culvert pipes leading to retention ponds within each community in an attempt to reduce any confounding additions of nutrients from other sources within the community". Does this refer to the auto samplers or a grab sample (we assume auto sampler)? What are the confounding influences? If, as was stated later in the report, isotope data indicated rainfall was a major contributor, then why not sample rainwater to remove confounding influence? Rainfall is well known to be a major contributor of nitrogen in the Tampa Bay area. In addition, there was no discussion of vegetation within the pipes or catchment basin which could be a contributing factor. Finally, the use of isotope data is valuable and the report made a good case for rainfall nitrogen as a major source, analysis of rainfall may have been more conclusive.

Page 26, Authors state that information on environmental sampling is provided in Table 6; however, Table 6 provides social survey results.

The analytical methods for soil and water chemistry analysis appear to be missing (pages 25-27). The report only states what laboratory the samples were sent to. The reader has to dig through Appendix B to be informed that the analytical methods are located in a table in Appendix A, and in that table, all that is mentioned is the EPA method code. A standard peer-review journal paper would state, for instance, what extraction, colorimetry, or ion chromatography procedure was used for each analyte.

Page 30 states that pond samples were taken "near the water's edge". In the QAPP on page 16, the surface water sampling is discussed briefly but no justification for siting near shore was provided. Why were sites not located near the middle of the pond which would have provided a more valid picture of actual pond condition after the mixing zone? We also did not see an explanation of this part of the selection of sample sites in any of the site discussions. The QAPP states that all samples were taken in accordance to FDEP SOP, FS 2100 Surface Water Samples. Paragraph 2.5 of the FDEP SOP states "Consider the representativeness of selected sampling locations, for example, when attempting to characterize a water body that may be stratified or heterogeneous. Paragraph 2.6 of the FDEP SOP states "Unless dictated by permit, program or order, sampling near structures (e.g. dams, weirs or bridges) may not provide representative data because of unnatural flow patterns. The study authors may have had a sound reason for their site selection for sample collection; therefore, this information should be clearly stated.

Page 35, We did not see a source for the EMC (i.e., total nitrogen even mean concentration) used in the second method. There are many references for EMCs and many locally calculated EMC values.

Pg. 35 (bottom). The second method used to calculate loads is unclear. Load is defined in this equation as the nitrogen loading "after retention pond treatment" on a per hectare basis. However, R is defined as a treatment factor (e.g., 30% reduction for TN); therefore, the term (1-R) should appear in the equation, rather than R.

Page 36/Table 5 (and Table 26 on page 81). It is not clear from these two tables what soil hydrogroups are and what importance they have for the study.

Page 45/Table 17. No data were provided for NOx Medians. In addition the wording "Kriskal-Wallis" in footnotes should be "Kruskal-Wallis."

Page 46. On this page the study suggests that all four communities used sources of water that were either potable water or a deep well. However, it was mentioned on page 17 (and confirmed on Table 1) that communities were selected because they used no reclaimed water for irrigation. However, page 38 confirms that in the survey that 34% of survey respondents in Pinellas country, 20% of Manatee Country residents, and 12% of Hillsborough Country residents use reclaimed water for irrigation.

Page 48, Table 21 should be made clearer to show that all N concentrations are reported as mg N/L versus mg of the specific chemical species per L.

Page 49. With n=40 runoff events, it is not clear where the huge denominator degrees of freedom comes from in the figures.

Page 50. Here and elsewhere in the report, timing and intensity of rainfall, as well as the duration of antecedent rainless days, are linked to nutrient concentrations in runoff. First, if the authors wish to make these linkages, they should provide bivariate scatterplots of nutrient data versus rainfall amount or preceding dry days. Second, it would be more informative to evaluate loading, not concentration, as a response to rainfall amount/dry period.

We recommend that the information provided on data quality objectives in Table A7.1 be summarized and included in the body of the methods section. The first table should include the sample source, EPA or Standard method number for each analyte, MDL, and the laboratory where analysis was carried out. A second table could include information on sample preservation and storage. These tables could then be referenced in the sections on Environmental Sampling.

We recommend a section be included explaining how MDLs were determined and how values that were < MDL were handled.

Page 81/Table 26. It is not clear why the runoff coefficients differ between Tables 5 and 26? (see reproduced table below)

	Table 5 Runoff Coefficient (provided on page 36)	Table 26 Runoff Coefficient (provided on page 81)
H101	0.31	0.24
M101	0.35	0.29
P201	0.35	0.36
P202	0.23	0.23

Page 81/Table 27. Here and elsewhere, the switching of units between metric (e.g., mg/L concentrations) and English (e.g., lb/acre loads) may not be appropriate.

Page 81 (bottom, second to last paragraph). Here and elsewhere, there are several places where whole paragraphs seem to be missing the beginning of every line which suggests there is some formatting error.

Page 83 (bottom). "...since they exceeded the expected rainfall nitrate del15N…" How can the study conclude that nitrate was from terrestrial sources rather than from fertilizer because the nitrate del15N didn't match rainfall?

Page 83/Figure 48. Figure 48 is poorly explained. It is unclear where the del18O and del15N ranges (boxes) come from for the potential N sources. We were also uncertain on the difference between "synthetic" and "mineralized fertilizer."

Page 91 (second-to-last paragraph). What is meant by "recalcitrant mineral sources"? It is our understanding that mineral N (compared with organic N) is usually considered a bioavailable N source, not a recalcitrant N source.

Page 92. This page presents a lot of discussion about "first flush" evidence in their data; however, the authors present no data to support this conclusion.

Page 94 (second paragraph). How do "results from this study suggest that alternative, non-structural BMPs (such as strict fertilizer ordinances) can also influence water quality from residential landscapes." While there is plenty of literature to suggest that less nutrient deposition into catchments results in less nutrient runoff, we don't see this evidence in the current study.

Page 94 (second paragraph). The authors note that "behavioral components of residential landscapes should be considered in watershed-scale predictive modeling of water quality." Why? And how is this relevant to the current study? The authors do not present watershed-scale predictive models, nor do they discuss short-comings of such models and make a case that "behavioral components of residential landscapes" could overcome such short-comings.

We support the authors' use of isotope data. Such information has the potential to overcome the issue with the small number of catchments included in the study because isotope signatures can provide the "smoking gun" evidence of nutrient sources. However, this study poorly constrains the isotope signatures of potential sources.

7. Results

Social Survey

As social survey results are presented, it should be acknowledged that these are reported behaviors and that due to error in recall, or willingness to share information on a phone survey, reported behavior and observable behavior may be different. All results are presented as if reported behavior equates with actual behavior. Despite this issue, widely accepted methods for carrying out a phone-based survey were used, and the findings from a large sample such as represented in this study indicate consistency across responses and convincing patterns that the study authors can rely on for their interpretation.

Information should be provided about the cost of municipal water supplies and costs of residents using that water to irrigate across the 3 counties. These may be factors that residents consider in making decisions about irrigation as well as how that relates to application of fertilizers.

The authors state on page 38 that, "the majority of homeowners in Pinellas (69%), Manatee (67%) and Hillsborough (65%) counties hired professionals to apply insect control products to their yard. Residents of Manatee County applied insect control products most frequently (4.9x per year), closely followed by Hillsborough (4.6x per year) and lastly Pinellas County residents (4.1x per year)." This statement about times of application is confusing, because the resident-applied versus lawn care company applied data should be presented separately. Applications made by individuals were approximately a third of the applications, who reported the amounts and times of year; lawn care maintenance companies represent the two-thirds majority.   In order to more fully interpret the results of the study, it would be helpful to know how often applications scheduled by lawn care companies. Is it possible to estimate what amount of fertilizer was typically applied by companies? Again, this is critical information to understanding overall community behavior dynamics of application.

There is greater need to differentiate on results on page 38 between "two different types of landscape managers: homeowner do-it-yourselfers (~22% of all respondents) and those that hire professional landscape managers (~38% of all respondents)". In the tables that follow, these categories are not maintained and that makes the results more difficult to interpret. We do not get this information until Table 22 (on page 79).

In Table 14, it states n= 81 interviews, while in Table 15 n is stated to equal 61 interviews. Which is correct? There are other inconsistencies with number of interviews carried out between these two tables.

The authors should discuss how relatable the telephone survey findings are to the study site interview data. Including discussion of how the two coincide (or not) with one another would strengthen the interpretation of results.

Environmental Sampling

In Table 17, for soil samples the authors should sum the NOx and TKN data to obtain a calculated TN value. This will allow the reader to gain an understanding of the total nitrogen concentrations in the soil extracts. This is important because much of the organic N is expected to be tied up in particulate matter and algal biomass.

For water samples it would be good to report the differences between filtered and unfiltered TKN samples to show the amount of organic N contained in particulate matter.

In Table 20, is the value of dissolved oxygen (DO) > 11 for stormwater samples correct? We ask this because we have seen these results in pond samples due to algal photosynthesis because we believe the water temperature would need to be 10oC (50oF) to obtain this high of a saturation DO. Could the authors also explain how these values were measured because our experience is that it can be challenging to measure DO concentrations due to changes in DO with contact with atmosphere and temperature. Similarly, ORP should be somewhat correlated with DO and ORP is also tricky to measure.

Authors may want to consider reviewing all of their tables and correct the number of significant figures reported so that you don't show a misleading level of accuracy. Authors should also be careful of units on your tables since some values are given in lbs/acre and some are given in lbs/acre-year.

Format of bar charts – We recommend the authors use a simple color scheme – black, white, grey, stripes – so figures can be read when printed in black and white.

8. Conclusions

Overall, the Peer Review Team concluded that the study documentation was sufficient to support conclusions. We also had previously concluded that the study's social science findings are stronger than the water quality findings; however, as we stated previously, the water quality findings should be viewed in a holistic context with other regional and national studies on this topic. This is because, as we stated previously, there is already a rich and large body of regional and national scientific literature that demonstrates that higher rates of nutrient application and deposition onto water catchments will result in greater nutrient loads from catchments to receiving water bodies.

We provide comments below on several individual conclusions made in the report.

Conclusion (a). Pinellas County residents were significantly more aware of fertilizer ordinances.

Peer Review Response to Conclusion (a). We would agree with this conclusion; however, based on the results, the statement should be worded as follows: Pinellas County residents were significantly more aware of fertilizer ordinances than Hillsborough County residents.

Several other factors may have influenced the telephone results. Not mentioned by the report, the SWFWMD conducted an extensive fertilizer use campaign in 2010-11 (https://www.swfwmd.state.fl.us/files/database/social_research/36/Fertilizer_Campaign_FY2010_2011_project_summary-FinalPDF.pdf). The review of local information related to the study may have been useful to study conduct, findings and conclusions. The study authors may have reviewed these and other related literature; however, as we have mentioned, it would improve the study if these historical studies were mentioned.

Conclusion (b). On page 90 the study states that "scant data reported by professional landscape managers in the communities (n=6) did not suggest that less nitrogen was applied during the study period, but they did suggest that they were not typically applying nitrogen fertilizer during the summer months."

Peer Review Response to Conclusion (b). The professional landscape management and practices of lawn care companies is an area that should be further evaluated. This study found that the majority of homeowners use a professional applicator and yet the study authors were not able to obtain necessary information from these applicators to make more definite conclusions. We stated previously that a greater effort should have been made to obtain this data. For example it was not clear if county stormwater departments were contacted and asked for assistance in contacting the lawn care professionals and/or obtaining data. We also believe that SWFWMD has conducted a study on fertilizer use that could be integrated with this discussion.

Furthermore, the study reported that individual households apply less fertilizer during rainy season months, while companies apply according to IFAS standards year-round. This suggests that the local county ordinances or household consumer ability to purchase fertilizer during parts of the year may not have as large of an impact on the actual application of fertilizers during key rainy season months because that decision is made for approximately 62-69% of customers who apply them, by their lawn care companies. Further, as we mentioned previously, it is unclear whether those companies take into consideration ordinances at all.

Conclusion (c). On page 90 the study writes that "In the short timeframe of this study, it is difficult to confidently establish the final link between changes in resident behavior and long-term environmental benefits that may result because of the complexity and temporal lag of nutrient cycling within residential neighborhoods.

Peer Review Response to Conclusion (c). While we agree with this conclusion, we stated in our overall comments that a better effort to find and incorporate regional and national studies and data may have made up for the short period of the study and small number of catchments that study resources allowed to be sampled.

Conclusion (d). On page 92 it was written, "Stormwater nutrient composition differed in the first rain event of the season compared to those later in the year. We found greater concentrations of organic nitrogen (TN and TKN) and lower concentrations of dissolved and inorganic N in stormwater runoff after long periods of no rain within the communities. This may be indicative of particulate organic nutrients that have accumulated on the residential landscape between rain events and then flushed into the stormwater system after the first initial seasonal storm event. Stormwater runoff concentrations and resulting total loads over seasonal rainfall events must be considered within the larger pattern of rainfall to understand the loading potential from a community."

Peer Review Response to Conclusion (d). There was no mention of base flow being evaluated. In the dry season, there is typically flow from irrigation. While this may not meet the auto sampler criteria for flow, its analysis, may have assisted in the understanding of differences in first flush nutrient concentrations. Also, depending on the positioning of the sites, there can be significant base flow below the auto sampler criteria after rain events.

We stated previously that on Page 50 and elsewhere in the report, timing and intensity of rainfall, as well as the duration of antecedent rainless days, are linked to nutrient concentrations in runoff. Therefore, if the authors wish to make these linkages, they should provide bivariate scatterplots of nutrient data versus rainfall amount or preceding dry days. Second, it would be more informative to evaluate loading, not concentration, as a response to rainfall amount/dry period.

Lastly, there was no information provided if rainwater was directly sampled for nitrogen to determine the possible contribution of nitrogen from atmospheric deposition.

Conclusion (e). On page 92 it is written that "In both Pinellas communities (P201 and P202), stormwater runoff nutrient concentrations peaked at the end of the dry season and then decreased over the wet season samples (became more diluted?), peaking again at the beginning of the dry season. However, the greatest estimated nutrient loads occurred in communities where reported fertilizer frequency was greatest."

Peer Review Response to Conclusion (e). We are not sure this is supported by findings. For example: The two Pinellas communities (P201 and P202) showed similar mean TN and TKN seasonal values for stormwater runoff and retention pond samples. In general, TN and TKN concentrations are similar for retention pond samples in both seasons and for wet season stormwater runoff samples (Figure 43 and Figure 44) (page 73). Also, we are not sure that the calculation of lbs/acre for both locations is representative because the P202 community sampling was a subset of the total community acres while P201 was obtained from the full drainage area. We would have liked to have seen more discussion for this finding.

Other Comments on Conclusions

In the study's discussion about the unique Pinellas county ordinances, the report is not clear whether lawn care companies are required to follow the Pinellas ordinance that requires "residential fertilizer contain at least 50% slow-release nitrogen, it required that a soil test be conducted to understand if phosphorus was needed before it could be applied; it established a 10-foot setback from the water, and it defined a restricted season from June 1 to September 30 during which nitrogenous fertilizer could not be applied to the lawn or sold at a retail establishments."

The findings did demonstrate measurable differences in knowledge of ordinances by Pinellas county residents, where the strictest ordinance was passed, which is significant. In addition, the distinction between those who apply chemicals themselves versus lawn care companies could be further clarified to provide greater insight into how the ordinance is impacting behavior of residents and lawn care professionals.

Pages 79 and 80 provide one of the most significant conclusions of the report. The Hillsborough site which reported fertilizer use higher than other sites had also a significant difference in nitrogen and phosphorus in runoff. However, when normalized for contributing area the finding was not significant. We wonder if the use of directly connected impervious area would have allowed a better understanding of a possible significant finding.

On page 90, the following key point is made about resident behavior change and potential impacts to community nitrogen inputs. It should be reworded because it is not clear: "This directly relates to the reported percentage of land area managed by professionals who apply fertilizer according to the IFAS recommended rates, which in comparison to homeowner, do-it-yourselfers apply fertilizer at a greater rate (WEKIVA study reference)"

ENVIRONMENTAL PROTECTION COMMISSION

AGENDA ITEM COVER SHEET

Date of EPC Meeting: August 20, 2015

Subject: Status Update of FDEP Petroleum Contracts & Positions

Agenda Section: Regular Agenda

Item: Waste Management Division

Recommendation: 1) Informational update regarding the budget increase to EPC's petroleum restoration program contract and the establishment of additional positions to address the increased workload and responsibilities.
2) Approve EPC to negotiate and accept amending the tanks compliance contract to include additional compliance assistance responsibilities, funding and staffing.

Brief Summary: EPC has administered the Petroleum Cleanup and Compliance Programs for the FDEP since 1987. The Programs are funded entirely through Grants (contracts) with renewed task assignments. A budget amendment to increase the amount of our FDEP Petroleum Contamination Site Cleanup Management grant in the amount of $774,595 to a total of $1,564,273 and to establish seven (7) new positions was set for approval by the BOCC on August 19, 2015. The proposed positions are permanent, but are directly tied to the continuance of available funding through the Grants. The positions included one Project Manager I, three Engineering Specialist I, one Scientist II, and two Environmental Scientist I positions. The Petroleum Programs provide significant and direct benefits to the residents of Hillsborough County providing protection to our groundwater resources and remediating contamination already present in our environment.

Financial Impact: No financial impact to ad valorem or general fund resources. Increases to EPC contract budgets will cover proposed resource increases.

Background: EPC and the Florida Department of Environmental Protection (FDEP) have signed contract amendments and task assignment agreements that provide substantial increase in financial support for EPC's Petroleum Restoration Program (PRP). The increases for PRP are the result of FDEP expanded approach to assess all contaminated sites within five years, identify clean sites, remediate priority sites, and regionalize program oversight throughout the State. This approach and the additional workload and responsibilities for EPC were presented to EPC's Board in May and the Board granted EPC approval to move forward. FDEP's implementation of its regionalized approach with EPC accepting petroleum cleanup and assessment oversight for Manatee County concluded in May. As of July 1st the Low Score Assessment initiative and the Spring Shed initiative are now part of EPC's PRP contract as well. The combined initiatives have resulted in a substantial financial increase, almost doubling the contract for PRP and the need for several additional positions. FDEP has also requested EPC take on additional compliance assistance responsibilities at regulated tank facilities. This proposed addition will result in increased funding and the need to add another position to the EPC's Tanks Compliance contract and team.

List of Attachments: None.

ENVIRONMENTAL PROTECTION COMMISSION

AGENDA ITEM COVER SHEET

Date of EPC Meeting: August 20, 2015

Subject: Final Order approval Vance vs Vath and EPC (Case No. 15-EPC-001 - appeal of a dock permit)

Agenda Section: Regular Agenda

Item: Wetlands Management Division

Recommendation: Approve the Final Order and authorize the Chair to execute the Final Order.

Brief Summary: John Vath applied to the EPC for authorization to install two tie poles and a covered boatlift to an existing unpermitted dock and to allow repairs to an existing seawall at his property on a canal in Apollo Beach. On January 8, 2015, through the delegated program from the Tampa Port Authority, the EPC issued a Minor Work Permit which authorizes the existing unpermitted dock (a/k/a after-the-fact permit), the two tie poles, the covered boatlift, and the repairs to an existing seawall. Robert Vance, a neighbor, filed an appeal of the permit raising concerns about land use issues and whether after-the-fact permit are appropriate. A Hearing Officer heard the appeal and ruled in favor of Mr. Vath and the EPC, holding that the permit should issue. The Commission must sit in a quasi-judicial capacity to approve the Hearing Officer's Recommended Order (RO) through issuance of a final order. Unlike other final order proceedings the Commissioners have conducted, the parties will not present oral argument in this case as they did not file exceptions to the Hearing Officer's ruling. The Commission will be asked to approve the RO via a final order. Counsel does not anticipate any substantive revisions to the RO are necessary.

Financial Impact: No Financial Impact

Background: The Port Tampa Bay a/k/a Tampa Port Authority (TPA) owns and regulates the submerged lands in the majority of Tampa Bay and rivers in Hillsborough County. TPA has Submerged Lands Management Rules that govern the placement and construction of various marine structures, such as docks, on those submerged lands (i.e. - jurisdictional lands). Persons must apply for permits to build on the TPA's submerged lands. In 2009 the Environmental Protection Commission (EPC) was delegated certain marine construction permitting authority from the TPA as part of our streamlined wetland permitting program. The TPA delegation authorizes the EPC to administer, with some exceptions, the TPA's minor work permit program. This generally involves processing permits for seawalls, smaller docks, and maintenance dredging activities. The EPC is authorized under the TPA Delegation Agreement to process permits for private and commercial docks of less than 2,500 square feet.

John Vath resides at 905 Apollo Beach Blvd., Apollo Beach, Hillsborough County, Florida and the back of the property is on a canal. Mr. Vath applied to the EPC for authorization to install two tie poles and a covered boatlift to an existing dock and to allow repairs to an existing seawall. It should be noted that the previous property owner did not acquire a permit for the dock. On January 8, 2015, the EPC issued Minor Work Permit No. 54731 (see attached) which authorizes the existing unpermitted dock (a/k/a after-the-fact permit), the installation of two tie poles, the installation of a covered boatlift, and the repairs to an existing seawall.

Shortly thereafter, a neighbor, Appellants Robert Vance, filed an appeal to the permit. In general, Mr. Vance challenged the permit based on two issues: 1) whether it is appropriate to grant an after-the-fact permit and 2) whether the structure is or will be used for commercial purposes which could potentially violate land use codes.

The latter issue was raised because, Mr. Vath had used the dock for commercial purposes in the past and that County Code Enforcement required him to cease using it in that manner; he came into compliance.

An EPC permit challenge, legally referred to as a "Section 9 Appeal," is a hearing process established by the Florida Legislature in Chapter 84-446, as amended, Laws of Florida (EPC Act). Specifically, a person who alleges an EPC final action (e.g. - permit) adversely affects them can have an administrative hearing officer review their arguments for permit issuance, denial or modification via a process very similar to a civil trial. After the administrative hearing, the hearing officer issues a recommended order (RO).

As noted above, the Appellant asked for a Section 9 Appeal in this matter and the administrative hearing was conducted on June 1, 2015. Hearing Officer Steven Pfeiffer, Esq. issued a Recommended Order on July 13, 2015, affirming the EPC's approval of the permit. Mr. Pfeiffer ruled that the EPC is authorized to issue after-the-fact permits. Furthermore, Mr. Pfeiffer ruled that the dock is not inconsistent with the comprehensive plan or zoning regulations. Finally, he ruled that the EPC should not deny a dock permit in an effort to enforce County regulations that are not being violated.

If Mr. Vath ever uses the dock for commercial purposes in the future, he will be subject to County Code Enforcement review, but that is not a basis for EPC denial of a permit request.

The parties had the option to file exceptions to the RO and argue them before the Commission. An exception is a document that alleges the Hearing Officer's RO has errors of fact or law in it that need to be corrected. In this particular case, no exceptions were filed. Thus, unlike other final order proceedings the Commissioners have conducted, the parties will not present oral argument in this case as they did not file exceptions to the Hearing Officer's ruling.

Pursuant to Section 9 of the EPC Act and Section 1-2.35, Rules of the EPC, the Commission must now sit in a quasi-judicial capacity to affirm, reverse, or modify the Hearing Officer's Recommended Order through issuance of a Final Order. During the EPC meeting, the Commission may seek legal advice from the Commission attorney that was not involved in the litigation. The Commission must only consider documents in the appellate file. No new evidence may be introduced by anyone or considered by the Commission. Moreover, it is established by rule and case law that a hearing officer's findings of fact may only be rejected or modified if the Commission "finds that the fact is not supported by substantial competent evidence in the record" (Section 1-2.35, Rules of the EPC). Furthermore, the Commission should not make any ruling that conflicts with the applicable laws.

Because no party filed exceptions and the facts are supported in the record, all the finding of fact "shall" be upheld pursuant to section 1-2.35(c), Rules of the EPC. The Commission has more flexibility to revise the conclusions of law, but counsel for the Commission does not anticipate any substantive revisions to the RO are necessary. In summary, the Commission will be asked to approve the RO via a final order (draft attached) signed by the Chair. If needed, the final order can be revised based on the direction of the Commission.

This agenda item includes the permit, Hearing Officer's Recommended Order, and the proposed final order. Additionally, EPC staff also sent the Commissioners other supporting documents (e.g. - the hearing transcript and the appeal) for their consideration.

List of Attachments: 1) Final Order; 2) Recommended Order; and 3) Minor Work Permit

BEFORE THE ENVIRONMENTAL
PROTECTION COMMISSION OF HILLSBOROUGH COUNTY

ROBERT VANCE,

Appellant,

vs. **EPC CASE NO. 15-EPC-001**

JOHN VATH and ENVIRONMENTAL
PROTECTION COMMISSION
OF HILLSBOROUGH COUNTY,

Appellees.
____/

FINAL ORDER

In accordance with Chapter 84-446, as amended, Laws of Florida (EPC Act) and Chapter 1-2, Rules of the EPC, an administrative hearing (a/k/a Section 9 Appeal) was conducted and the assigned Hearing Officer submitted a Recommended Order (RO) to the Environmental Protection Commission of Hillsborough County (EPC) on July 13, 2015. The Recommended Order is attached as **Exhibit 1**. No party filed any exceptions to the RO. On August 20, 2015, this matter came before the Commissioners of the EPC for review and issuance of a final order.

BACKGROUND

1. Pursuant to the *Amended and Restated Interlocal agreement between the Tampa Port Authority (TPA) and the EPC* dated June 23, 2009 (TPA Delegation Agreement) the EPC was delegated the TPA's authority to process dock permit applications in accordance with Chapter 95-488 (TPA Enabling Act) and the TPA's Submerged Lands Management (SLM) Rules.

2. On January 8, 2015, the EPC Executive Director granted the Appellee John Vath's application for a Minor Work Permit for the installation of two (2) tie poles to an existing structure, the after-the-fact approval of the existing structure, the addition of a covered boat lift, and a seawall

repair on jurisdictional surface waters associated with Mr. Vath's property at 905 Apollo Beach Boulevard, Apollo Beach, Florida (Property).

3. Robert Vance (Appellant) filed an appeal challenging the issuance of the permit.

4. Steven Pfeiffer, Esq. was assigned as the Hearing Officer to the case. An administrative hearing was held on June 1, 2015, in Hillsborough County, Florida to formulate final agency action on Mr. Vath's application for marine construction activities in jurisdictional waters.

5. The Hearing Officer subsequently issued a Recommended Order (RO) on July 13, 2015. The RO is attached as Exhibit 1.

6. The Hearing Officer recommended that the Commission approve the permit.

7. None of the parties filed exceptions to the RO, thus oral arguments by the parties were not required to be presented to the Commission on August 20, 2015.

STANDARDS OF REVIEW FOR RECOMMENDED ORDERS

8. Pursuant to sections 1-2.35(c), (e) and (f), Rules of the EPC:

> (c) If no exceptions are timely filed, the Commission shall adopt the Hearing Officer's findings of fact, and shall make appropriate conclusions of law, and render a Final Order.
>
> (e) The Commission may reject, reverse or modify a finding of fact only if it finds that the fact is not supported by substantial competent evidence in the record.
>
> (f) The Commission shall affirm, reverse, or modify the Hearing Officer's findings of fact, make appropriate conclusions of law, and promptly render a written Final Order thereon, provided that the Commission shall not take any action which conflicts with or nullifies any provision of the EPC Act or the rules enacted pursuant to said act.

The EPC local regulatory programs are not subject to Chapter 120, Florida Statutes (Administrative Procedures Act), but for purposes of EPC administrative hearings Chapter 120 jurisprudence is persuasive at a minimum.

9. The agency reviewing the RO may not reject or modify the findings of fact of a hearing officer unless they are not supported by substantial competent evidence in the record. Section 1-2.35, Rules of the EPC and Charlotte County v. IMC Phosphates Co., 18 So. 3d 1089

(Fla. 2d DCA 2009). The term "competent substantial evidence" does not relate to the quality, character, convincing power, probative value or weight of the evidence. Rather, competent substantial evidence refers to the existence of some evidence (quantity) as to each essential element and as to its admissibility under legal rules of evidence. *See e.g.,* Scholastic Book Fairs, Inc. v. Unemployment Appeals Comm'n, 671 So.2d 287, 289 n.3 (Fla. 5th DCA 1996).

A reviewing agency may not reweigh the evidence presented at a final hearing, attempt to resolve conflicts therein, or judge the credibility of witnesses. *See e.g.,* Rogers v. Dep't of Health, 920 So.2d 27, 30 (Fla. 1st DCA 2005); Belleau v. Dep't of Envtl. Prot., 695 So.2d 1305, 1307 (Fla. 1st DCA 1997); Dunham v. Highlands County Sch. Bd., 652 So.2d 894 (Fla. 2d. DCA 1995). These evidentiary-related matters are within the province of the hearing officer, as the "fact-finder" in these administrative proceedings. *See e.g.,* Tedder v. Fla. Parole Comm'n, 842 So.2d 1022, 1025 (Fla. 1st DCA 2003); Heifetz v. Dep't of Bus. Regulation, 475 So.2d 1277, 1281 (Fla. 1st DCA 1985). Also, the hearing officer's decision to accept the testimony of one expert witness over that of another expert is an evidentiary ruling that cannot be altered by a reviewing agency, absent a complete lack of any competent substantial evidence of record supporting this decision. *See e.g.,* Peace River/Manasota Regional Water Supply Authority v. IMC Phosphates Co., 18 So.3d 1079, 1088 (Fla. 2d DCA 2009); Collier Med. Ctr. v. State Dep't of Health and Rehabilitative Services, 462 So.2d 83, 85 (Fla. 1st DCA 1985); Fla. Chapter of Sierra Club v. Orlando Utils. Comm'n, 436 So.2d 383, 389 (Fla. 5th DCA 1983).

A reviewing agency thus has no authority to evaluate the quantity and quality of the evidence presented at an administrative hearing, beyond making a determination that the evidence is competent and substantial. *See, e.g.*, Brogan v. Carter, 671 So.2d 822, 823 (Fla. 1st DCA 1996).

10. An agency has the primary responsibility of interpreting statutes and rules within its regulatory jurisdiction and expertise. Public Employees Relations Commission v. Dade County Police Benevolent Association, 467 So. 2d 987 (Fla. 1985). Considerable deference should be accorded to these agency interpretations of statutes and rules within their regulatory jurisdiction, and such agency interpretations should not be overturned unless clearly erroneous. Falk v. Beard, 614 So. 2d 1086 (Fla. 1993); Department of Environmental Regulation v. Goldring, 477 So.2d 532 (Fla. 1985). Furthermore, agency interpretations of statutes and rules within their regulatory jurisdiction do not have to be the only reasonable interpretations. It is

enough if such agency interpretations are "permissible" ones. Suddath Van Lines, Inc. v. Department of Environmental Protection, 668 So. 2d 209 (Fla. 1st DCA 1996).

FINDINGS OF FACT

11. No exceptions were filed challenging the validity of the Hearing Officer's findings of fact in the Recommended Order. In accordance with section 1-2.35(c), Rules of the EPC, the Commission shall adopt the Hearing Officer's findings of fact, because the findings of fact are supported by competent substantial evidence and no exceptions were timely filed.

CONCLUSIONS OF LAW

12. No exceptions were filed challenging the validity of the Hearing Officer's conclusions of law in the Recommended Order. The conclusions of law do not conflict with or nullify applicable provisions of law.

13. The permit meets the standards of the EPC Act, Chapter 1-11 (Rules of the EPC), Tampa Port Authority's Enabling Act, and Submerged Lands Management Rules.

In accordance with the vote of the Environmental Protection Commission of Hillsborough County on August 20, 2015, it is

ORDERED that:

A. The Findings of Fact and Conclusions of Law in the Recommended Order (Exhibit 1) are adopted in their entirety.

B. The Recommended Order's "Recommendation" section is AFFIRMED and the proposed Minor Work Permit is APPROVED. The permit expiration date shall be one year from the date this order is executed.

NOTICE OF RIGHTS

Any party to this order has the right to seek judicial review of this Final Order in accordance with Section 9 of the EPC Act and the Administrative Procedure Act, Chapter 120, part III, Florida Statutes, 1961 by filing a notice of appeal under rule 9.110 of the Florida Rules of Appellate Procedure with the clerk of the Environmental Protection Commission, EPC Legal Department, 3629 Queen Palm Dr., Tampa, FL 33619, and by filing a notice of appeal accompanied by the applicable filing fee with the Second District Court of Appeal. The notice of appeal must be filed within 30 days from the date this order is filed with the Agency Clerk.

DONE and ORDERED this ______ day of _________________, 2015, in Hillsborough County, Florida.

ENVIRONMENTAL PROTECTION
COMMISSION OF HILLSBOROUGH COUNTY

____
Lesley "Les" Miller, Jr., Chairman

cc: Steven Pfeiffer, Esq., Hearing Officer

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of this Final Order has been furnished to the parties and their representatives listed below by e-mail or U.S. mail as noted below on this _____ day of ______________ 2015.

Andrew Zodrow, Esq., (zodrow@epchc.org)
Rick Tschantz, Esq., (tschantz@epchc.org)
Jeannette Figari, (figarij@epchc.org)
John Vath, c/o of Joe Vath (joe@645dock.com)
Robert Vance (gvance2@tampabay.rr.com)
John Vath, 905 Apollo Beach Blvd., Apollo Beach, FL 33572

ENVIRONMENTAL PROTECTION
COMMISSION OF HILLSBOROUGH COUNTY

____
Ricardo Muratti
Assistant Counsel

EPC Legal Department
3629 Queen Palm Drive
Tampa, Florida 33619
Telephone: (813) 627-2600
murattir@epchc.org

BEFORE THE ASSIGNED HEARING OFFICER OF THE ENVIRONMENTAL PROTECTION COMMISSION OF HILLSBOROUGH COUNTY

ROBERT VANCE,

Appellant,

vs. **EPC Case No. 15-EPC-001**

JOHN VATH and THE ENVIRONMENTAL PROTECTION COMMISSION OF HILLSBOROUGH COUNTY,

Appellees.

____________________________________/

RECOMMENDED ORDER

This is an appeal proceeding conducted in accordance with Part IV, Chapter 1-2 of the Rules of the Environmental Protection Commission of Hillsborough County.

A. The Parties.

The parties are as follows:

1. The Appellant is Robert Vance. Mr. Vance represented himself at the hearing.

2. The Appellee John Vath is the applicant for a Minor Work Permit. Mr. Vath represented himself at the hearing, accompanied by Joe Vath, the Appellee John Vath's construction agent.

3. The Appellee Environmental Protection Commission of Hillsborough County (EPC) is the permitting agency. EPC was represented at the hearing by Andrew Zodrow, Esq.

B. Proceedings Before the EPC.

On or about August 29, 2014, John Vath submitted an application to the EPC for a Minor Work Permit. Mr. Vath was seeking a permit that would allow after-the-fact approval of an existing dock structure, installation of two tie poles as an addition to the existing dock structure, the addition of a covered boat lift, and seawall repair. The existing dock structure and the additions and improvements are to be located adjacent to property owned by Mr. Vath at 905 Apollo Beach, Blvd, Apollo Beach, Florida. The work is proposed in jurisdictional surface waters. The Tampa Port Authority has regulatory authority regarding these waters and is the permitting agency for the work proposed by Mr. Vath. The Tampa Port Authority has delegated Minor Work Permit authority and administration of Minor Work Permitting to the EPC.

On or about January 8, 2015, the EPC granted a Minor Work Permit to Mr. Vath. Thereafter the Appellant, Mr. Vance, challenged the permit through the EPC's administrative process which is applicable to this proceeding. Mr. Vance contends that the permit should not have been issued because the original structure was constructed without required permits and because the structure will be used in a manner that is not consistent with land use regulations regarding use of a dock structure.

C. Proceedings Before the Hearing Officer.

This proceeding was assigned to the undersigned Hearing Officer. A prehearing conference was conducted by conference telephone communication on April 24, 2015. An "Order Setting Final Hearing and Order of Pre-Hearing Instructions" was issued on May 4, 2015. The Final Hearing was scheduled for and was conducted on June 1, 2015, at the Offices of the EPC, 3629 Queen Palm Drive, Tampa, Florida.

The EPC called Christina Bryant, who manages the EPC Minor Work Permit Section as a witness. Ms. Bryant was accepted as an expert witness regarding the application of the Tampa Port Authority's Submerged Lands Management Rules and the Port's Enabling Act. The Appellee John Vath and Joe Vath, who operates a marine construction company, testified on behalf of John Vath. Mr. Vance testified on his own behalf, and called James Burnett, a resident of Apollo Beach, whose property is located near to site of the construction activities, as an additional witness. All of the witnesses were sworn and subject to cross-examination.

Exhibits 1, 2, 3, 4, 5, 6, 7 and 8 were identified and received as part of the record. Exhibit 1 is the Joint Prehearing Stipulation that was submitted by the parties. Exhibit 2 is the appeal submitted by Mr. Vance. Exhibit 3 is the professional resume of the witness Christina Bryant. Exhibit 4 is the Permit File assembled by the EPC Minor Work Permit Section. Exhibit 5 is the Minor Work Permit issued by the EPC. Exhibit 6 is the Amended and Restated Interlocal Agreement between the Tampa Port Authority and the EPC. Exhibit 7 is a compendium of Code Enforcement materials maintained by the Hillsborough County Code Enforcement Department. Exhibit 8 includes two photographs of the structure that is the subject of the permit proceeding.

The proceedings were recorded by a certified court reporter. A transcript of the hearing was prepared and filed on June 9, 2015. In accordance with discussions at the conclusion of the hearing, the parties were given an opportunity to submit post-hearing proposed orders or closing arguments. The EPC has filed a "Proposed Recommended Order with Findings of Fact and Conclusions of Law".

Issue

The issue in this proceeding is whether the Minor Work Permit issued by the Executive Director of the EPC should be set aside because it in part authorizes construction activities that were originally undertaken without required permits, and because the dock and associated facilities are being used or are going to be used for commercial purposes, contrary to land use requirements of the Tampa Port Authority and of Hillsborough County.

Findings of Fact

1. The Environmental Protection Commission of Hillsborough County (EPC) is a local environmental regulatory agency. The EPC is authorized to enforce the Hillsborough Environmental Protection Act, Chapter 84-446, Laws of Florida, as amended by Chapter 87-495, Laws of Florida (the "EPC Act"), and rules promulgated by the EPC.

2. The Appellee John Vath applied for a permit to construct a seawall and dock facilities adjacent to his property. His property is located at 905 Apollo Beach Blvd., Apollo Beach, Florida.

3. The Tampa Port Authority has jurisdiction over and responsibility for administering permitting functions with regard to construction activities within certain waters, including the waters where the Appellee Vath's proposed construction activities are located. The Tampa Port Authority has delegated certain of its permitting responsibilities, called "Minor Works Permits" to the Appellee EPC through an interlocal agreement. The work proposed by Appellee Vath is subject to Minor Works Permitting requirements.

4. The Appellant Robert Vance owns property located at 6506 Bimini Court, Apollo Beach, Florida. The Appellant's property is situated in a manner that operation of the docking facilities permitted on Appellee's property could impact Appellant Vance's use and enjoyment of his property, and his interests would, if the dock were used for commercial purposes, be adversely affected by operation of the docking facility .

5. The linear distance of the shoreline of Appellee Vath's property is 65.34 feet.

6. A dock has been located adjacent to Appellee Vath's property at least since 2006. The dock was subject to permitting authority of the Tampa Port Authority, but was constructed without any permit being issued. The dock was constructed before Appellee Vath purchased the property.

7. It is not contested that the proposed dock and associated facilities proposed by the Appellee Vath meet requirements of the Tampa Port Authority and the EPC with regard to size, navigational constraints, and other construction related issues.

8. Hillsborough County has land use authority with respect to Appellee Vath's property, including the dock and associated facilities that are the subject of this proceeding. Hillsborough County administers its land use authority through its Planning Commission. The Planning Commission does not object to the structures proposed by the Appellee Vath, and considers the structures to be consistent with and in compliance with adopted and applicable provisions of the Hillsborough County Comprehensive Plan and zoning ordinances.

9. It does appear that Appellee Vath has in the past undertaken activities on his upland property that are not consistent with provisions of the Hillsborough County Comprehensive Plan and zoning ordinances. On at least one occasion, the Appellee Vath docked a commercial barge at the docking facilities located adjacent to his property. The docking of a commercial barge would not be consistent with non-commercial use of the dock facilities. The barge is not now kept at the docking facility, and Appellee Vath does not intend to keep it there.

Conclusions of Law

10. The undersigned Hearing Officer has jurisdiction to conduct the hearing and to enter this order in accordance with the Hillsborough Environmental Protection Act and in accordance with the Rules of the EPC. See: Part IV, Section 1-2, Rules of the Environmental Protection Commission of Hillsborough County. This is a de novo proceeding. Section 1-2.33(d), Rules of the Environmental Protection Commission of Hillsborough County.

11. The EPC is a local regulatory agency authorized to enforce the EPC Act. The EPC has jurisdiction to administer Minor Works Permitting Activities within the authority of the Tampa Port Authority in accordance with the Amended and Restated Interlocal Agreement between the Tampa Port Authority and the Environmental Protection Commission of Hillsborough County.

12. The order of proof and the burden of proof for parties in permit application proceedings were delineated by the EPC in Romano v. City of Tampa and EPC (EPC Final Order, February 3, 2011). The EPC stated:

> If a regulatory agency gives notice of intent to grant a permit application, the applicant has the initial burden at a formal administrative hearing of going forward with the presentation of a prima facie case of the applicant's entitlement to a permit. Once a prima facie case is made, the burden of going forward shifts to the party objecting to the action to present competent substantial evidence, consistent with the allegations of the petition, that the applicant is not entitled to the permit. Unless the objector presents "contrary evidence of equivalent quality" to that presented by the applicant and agency, the permit must be approved. Rule 1 -2.33(d), Rules of the EPC; Florida Department of Transportation v. J.W.C. Company, Inc., 396 So. 2d at 789-90.

13. In the instant proceeding the Appellee Vath and the EPC have made a prima facie showing that the Appellee Vath is entitled to a permit and that the permit was correctly issued by the EPC. The proposed construction activities meet all requirements of the Tampa Port Authority and of the EPC. The EPC staff examined land classifications, set-back requirements, navigation issues, and limitations related to the extent of the property owner's waterfront ownership. The proposed work meets all of these requirements.

14. The dock that was built on Appellee Vath's property in 2006 or before was subject to permitting requirements. The fact that the work was completed illegally, without the required permit, does not prevent the EPC from issuing a permit for the work "after-the-fact", provided that the facility meets requirements of the Tampa Port Authority and the EPC. The dock originally constructed without a permit does meet these requirements. There is nothing in the rules of the Port Authority or of the EPC that prohibit issuance of after-the-fact permits, and the EPC has reviewed and approved such permits in the past. The EPC reviews applications for "after-the-fact" permits in the same manner that it reviews applications for work that has not commenced. The standards applied by the EPC are not relaxed for such permit applications, but neither are additional requirements imposed.

15. While there is evidence that Appellee Vath has conducted land use activities on his property that are not consistent with zoning ordinances of Hillsborough County, it is apparent that the dock and associated facilities that are the subject of the permits at issue in this proceeding are not inconsistent with the comprehensive plan or zoning regulations of the Hillsborough County. While it is possible that the docking facility could be used in a manner that is not consistent with the comprehensive plan or zoning ordinances of Hillsborough County, the facility itself is consistent with those requirements.

16. Even if it could be taken as a fact that the Appellee Vath will at some time in the future violate provisions of the planning or zoning requirements of Hillsborough County, there is nothing in the regulatory authority of the EPC that would allow it to take either preemptive action in a permitting proceeding, or enforcement action later with regard to those violations.

17. The EPC has authority to deny a permit application if an applicant is proposing to construct a facility that in and of itself is inconsistent with applicable provisions of a comprehensive plan or zoning ordinance. The EPC, however, does not have authority to enforce provisions of the Hillsborough County Comprehensive Plan or zoning ordinances based upon an owner's use of an otherwise conforming facility.

18. The Minor Works Permit issued by the EPC should be affirmed, and this appeal should be dismissed.

Recommended Order

Whereupon, based upon the foregoing Findings of Fact and Conclusions of Law, it is, hereby,

Recommended:

That the Environmental Protection Commission of Hillsborough County enter a final order affirming the action taken by the Executive Director of the EPC, approving the Minor Works Permit, and dismissing this appeal.

ENTERED this 13th day of July , 2015.

Steven Pfeiffer, Hearing Officer
520 East Georgia Street
Tallahassee, Florida 32303

Telephone: 941-356-1667
Email: gspfeiffer@aol.com

Copies Furnished by Electronic Mail to:

Robert Vance gvance2@tampabay.rr.com
John Vath joe@645dock.com
Andrew Zodrow ZodrowA@epchc.org
Jeanette Figari FigariJ@epchc.org

BEFORE THE ASSIGNED HEARING OFFICER OF THE ENVIRONMENTAL PROTECTION COMMISSION OF HILLSBOROUGH COUNTY

ROBERT VANCE,

Appellant,

vs. **EPC Case No. 15-EPC-001**

JOHN VATH and THE ENVIRONMENTAL PROTECTION COMMISSION OF HILLSBOROUGH COUNTY,

Appellees.

______________________________________/

ADDENDUM TO RECOMMENDED ORDER, RECORD BASIS FOR FINDINGS OF FACT

The record basis for the correspondingly numbered findings of fact set out in the Recommended Order are as follows:

1. This finding is determined from the Joint Prehearing Stipulation filed by the Parties (Exhibit 1), and from the cited provisions of the Hillsborough County Environmental Protection Act and the Rules of the EPC.

2. This finding is determined from the Joint Prehearing Stipulation filed by the Parties (Exhibit 1), Exhibit 4, and the testimony of the witnesses Christina Bryant, John Vath and Joe Vath.

3. This finding is determined from the Joint Prehearing Stipulation filed by the Parties (Exhibit 1), Exhibit 6, and the testimony of the witness Christina Bryant.

4. This finding is determined from the Joint Prehearing Stipulation filed by the Parties (Exhibit 1), Exhibit 2, and the testimony of the witnesses Robert Vance and James Burnett.

5. This finding is determined from the Joint Prehearing Stipulation filed by the Parties (Exhibit 1), Exhibits 4 and 5, and the testimony of the witness Christina Bryant.

6. This finding is determined from Exhibits 2, 4, and 5, and the testimony of the witnesses Christina Bryant, John Vath and Joe Vath.

7. This finding is determined from the Joint Prehearing Stipulation filed by the Parties (Exhibit 1), and from the testimony of the witness Robert Vance.

8. This finding is determined from the testimony of the witness Christina Bryant.

9. This finding is determined from Exhibits 7 and 8, and from the testimony of the witnesses Robert Vance, James Burnett, and John Vath.

January 23, 2015

John Vath
905 Apollo Beach Boulevard
Apollo Beach, FL 33572

REFERENCE: ENVIRONMENTAL PROTECTION COMMISSION MINOR WORK PERMIT NO. – 54731 FOR JOHN VATH AT 905 APOLLO BEACH BOULEVARD, APOLLO BEACH / FOLIO # - 0517510000 / STR - 21-31S-19E

Dear Mr. Vath:

Enclosed is the minor work permit card for which you made application. A revision to the permit card was made. **The revised permit card denotes John Vath as the owner/permittee and Joe Vath as the agent.** This minor work permit is issued pursuant to the Amended and Restated Interlocal agreement between the Tampa Port Authority (TPA) and the Environmental Protection Commission of Hillsborough County (EPC) dated June 23, 2009. Please review this document and attachments carefully, paying particular attention to the stipulations and approved drawings. This permit shall expire on the date indicated on the attached Permit card. This authorization shall be valid until it expires or such time as it is amended, replaced, or revoked in writing.

This permit authorizes the above named applicant, hereinafter referred to as the Permittee, to perform the described work on wetlands and other surface waters, on or adjacent to submerged lands under the regulatory jurisdiction of the TPA. This minor work permit addresses activities regulated under the TPA Submerged Lands Management Rules and EPC Wetland Rule Chapter 1-11, Rules of the EPC. This work shall be accomplished in accordance with the general and specific stipulations hereinafter defined.

Acceptance of this permit constitutes acceptance of all the attached stipulations and drawings. Compliance with all stipulations is necessary for the permit to be considered valid. Should you have objections to any of these stipulations, please see the attached Notice of Rights providing administrative appeal rights.

Sincerely,

Deborah Seib for

Scott Emery, Ph. D. - Director
Wetlands Management Division
Environmental Protection Commission
of Hillsborough County

kmh/pso/ss
Enclosures

ENVIRONMENTAL PROTECTION COMMISSION
HILLSBOROUGH COUNTY

EXECUTIVE DIRECTOR
Richard D. Garrity, Ph.D.

PERMIT

PERMIT NUMBER: 54731

PERMITTEE: JOHN VATH
905 APOLLO BEACH BOULEVARD
APOLLO BEACH, FL 33572

AGENT: JOE VATH
LAND & SEA MASTERS
905 APOLLO BEACH BOULEVARD
APOLLO BEACH, FL 33572

PROJECT DESCRIPTION: ADDITION OF A COVERED BOATLIFT AND TWO (2) TIE POLES TO AN EXISTING STRUCTURE AND INSTALLATION OF APPROXIMATELY 66 LINEAR FEET OF VINYL SHEET PILING IN FRONT OF AN EXISTING SEAWALL AS REPAIR PURSUANT TO PERMIT EXHIBITS AND STIPULATIONS

PROJECT LOCATION: 905 APOLLO BEACH BOULEVARD, APOLLO BEACH / RESIDENTIAL CANAL OFF OF TAMPA BAY

DATE OF ISSUE: JANUARY 8, 2015
EXPIRATION DATE: JANUARY 31, 2016

AUTHORIZED SIGNATURE: Deborah Sirks for
Scott Emery, Ph. D. - Wetlands Management Division Director

THIS NOTICE MUST BE CONSPICUOUSLY DISPLAYED AT THE SITE OF WORK

ENVIRONMENTAL PROTECTION COMMISSION PERMIT STIPULATIONS
MINOR WORK PERMIT No. 54731
SPECIFIC STIPULATIONS
January 8, 2015

1. This permit authorizes the following activities:

   a. addition of a covered boatlift and two (2) tie poles to an existing dock; and,

   b. installation of approximately 66 linear feet of vinyl sheet pilings in front of an existing seawall as repair.

2. The addition to the dock and vinyl sheet pilings for the seawall repair shall be placed within the property limits as depicted per EPC approved permit exhibits A-1 and A-2.

3. Removal of part of the existing dock structure in order to incorporate dock modifications and the vinyl sheet piling installation, as depicted per EPC approved permit exhibit A-4, must be accomplished in a manner so that all debris is properly disposed of and the release of turbid water offsite is prevented.

4. With the exception of those pilings approved under this authorization, this permit does not authorize the placement of pilings or any other structures extraneous to the dock and boatlift system or replacement seawall.

DOCK CONSTRUCTION

5. The 36 foot length of this structure, as depicted in the EPC approved exhibits A-1, A-2 and A-3 of this permit, is the maximum distance that can be authorized under current TPA Submerged Lands Management Rules and may not be extended in the future.

6. The 653.5 square foot area (totaling structural and pre-empted area) as depicted in the EPC approved exhibits A-1 and A-2 of this permit, is the maximum size that can be authorized under current TPA Submerged Lands Management Rules and may not be enlarged in the future.

7. The roof is to cover the boatlift area only as depicted on EPC approved permit exhibits A-1 and A-2.

8. The water depths in mooring areas shall be no less than two (2) feet at Mean Low Water (MLW).

9. No dredging, filling, clearing or scouring shall be allowed except for the settings of pilings for the pier and terminal platform. If pilings are to be installed by jetting, then the water pump must be shut off when not in use to avoid unnecessary disturbance to the water body.

10. All structures should be marked with reflectors, reflective tape or other materials necessary to make the extent of structures clearly visible to boaters in accordance with the requirements of the United States Coast Guard and the Florida Marine Patrol.

11. Structures shall not be enclosed.

12. There shall be no baithouses, storage shelters, gazebos, screen porches, fish cleaning facilities, living quarters or other non-water dependent structures.

13. No davits are permitted for this structure.

14. Terminal platforms and catwalks shall maintain a minimum of 1-foot vertical elevation above the Mean High Water (MHW) elevation.

SEAWALL REPAIR

15. The replacement seawall shall be constructed within eighteen (18) inches face to face of the original vertical alignment of existing wall as depicted per EPC approved permit exhibit A-3.

16. During the installation of the replacement seawall, a floating turbidity curtain and/or silt fence shall be deployed waterward of the work site and attached from adjacent shoreline to adjacent shoreline. The turbidity curtain/ silt fence must remain in place until the work has ceased and any resultant construction-related turbidity has settled out. These measures should be removed as soon as water quality returns to sustainable background levels and / or all areas of disturbed soils are stabilized.

17. This permit does not authorize the seawall installation to cover or obstruct any existing storm water outfall pipes.

GENERAL CONDITIONS

18. Your proposed activity as approved in this permit and attached stipulations qualifies for Federal authorization pursuant to the State Programmatic General Permit (SPGP IV-R1). A separate permit or authorization will not be required from the ACOE. Please note that the Federal authorization expires on July 25, 2016.

19. The Hillsborough County Building and Construction Services Department requires a separate permit for electrical and plumbing connections on residential docks. The permit may be obtained on line or at one of their two offices at either the downtown County Center, 601 East Kennedy Boulevard, 19th Floor (813-272-5600), or the South Shore Regional Service Center, 410 30th Street SE, Ruskin (813-641-6905). The online registration information can found at www.hillsboroughcounty.org/pgm or by contacting Edna Santos at santose@hillsboroughcounty.org.

20. More stringent criteria than those detailed in this permit may be applicable as per deed restrictions. It is strongly encouraged that the Permittee contact representatives of their homeowners association for more information prior to initiation of any construction activities authorized by this permit.

21. The Permittee must comply with the following manatee protection construction conditions:

    a. Instruct all personnel associated with the project of the potential presence of manatees and the need to avoid collisions with manatees. All construction personnel are responsible for observing water-related activities for the presence of manatee(s).

    b. Advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection act of 1972, The Endangered Species Act of 1973, and the Florida Manatee Sanctuary Act.

    c. Ensure all/any siltation barriers shall be made of material in which manatees cannot become entangled, are properly secured, and are regularly monitored to avoid manatee entrapment. Barriers must not block manatee entry to or exit from essential habitat.

    d. Ensure all vessels associated with the construction project shall operate at "no wake/idle" speeds at all times while in the construction area and while in water where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.

    e. If manatee(s) are seen within 100 yards of the active daily construction/dredging operation or vessel movement, ensure all appropriate precautions shall be implemented to ensure protection of the manatee. These precautions shall include the operation of all moving equipment no closer than 50 feet of a manatee. Operation of any equipment closer than 50 feet to a manatee shall necessitate immediate shutdown of that equipment. Activities will not resume until the manatee(s) has departed the project area of its own volition.

    f. Ensure any collision with and/or injury to a manatee shall be reported immediately to the Florida Fish and Wildlife Conservation Commission at FWC Hotline at 1-888-404-FWCC and to the U. S. Fish and Wildlife Service, Jacksonville Office (1-904-232-2580) for north Florida.

    g. Ensure temporary signs concerning manatees shall be posted prior to and during all construction/dredging activities. Ensure all signs are removed upon completion of the project. A sign measuring at least 3 ft. by 4 ft. which reads Caution: Manatee Area will be posted in a location prominently visible to water-related construction crews. A second sign should be posted if vessels are associated with the construction, and should be placed visible to the vessel operator. The second sign should be at least 8.5" by 11" which reads Caution: Manatee Habitat. Idle speed is required if operating a vessel in the construction area. All equipment must be shutdown if a manatee comes within 50 feet of operation. Any collision with and/or injury to a manatee shall be reported immediately to the Florida Fish and Wildlife Conservation Commission at FWC Hotline @ 1-888-404-FWCC and the U. S. Fish and Wildlife Service should also be contacted in Jacksonville (1-904-232-2580) for north Florida.

ENVIRONMENTAL PROTECTION COMMISSION
MINOR WORK PERMIT GENERAL STIPULATIONS

1. All work shall be accomplished so as to minimize the dispersion of silt and debris and the destruction of marine resources in public waters. All efforts must be undertaken to prevent any erosion or turbid water from being discharged off-site, into the wetlands and/or waters of the County. Turbid discharges that exceed 29 Nephelometric Turbidity Units above background levels are a violation pursuant to Chapter 1-5 Water Quality Rule. In Outstanding Florida Waters, discharges cannot exceed ambient levels. EPC approved methods of erosion and/or turbidity control are required. It is the owner / developer's responsibility to install and maintain EPC approved erosion and / or turbidity control barriers prior to the commencement of any site work. Once the site returns to pre-construction conditions, all erosion and turbidity control devices shall be removed.

2. If the approved permit drawings and the attached Specific Stipulations contradict each other, then the Specific Stipulations shall prevail.

3. The proposed work shall be done in accordance with the approved drawings attached hereto as Exhibits.

4. The Permittee shall notify the Environmental Protection Commission (EPC) when work under this permit is initiated and shall further notify the EPC when work under this permit has been completed.

5. The enclosed Permit Card must be conspicuously displayed at the project site once work on this project has been initiated and shall remain so displayed until the project has been completed. Within fifteen (15) days of completion of this project, the Permit Card must be returned to the EPC.

6. The EPC shall inspect the site to insure compliance with these stipulations.

7. The proposed work shall be done so as to prevent interference with the riparian or property rights of the adjacent property owners. This permit authorizes no invasion of private property or rights in property.

8. This permit does not convey to the permittee or create in the permittee any property right, or any interest in real property, nor does it authorize any entrance upon or activities on property which is not owned or controlled by the permittee, or convey any rights or privileges other than those specified in this permit and Chapter 1-11 or other applicable rules.

9. This approval applies only to the development proposal as submitted, and in no way does it provide EPC approval to any other aspect of the review process. This permit does not relieve the Permittee from the requirement of obtaining permits from the State of Florida, the Southwest Florida Water Management District, Hillsborough County, individual municipalities within Hillsborough County, and/or other applicable agencies, as required.

10. The Permittee, in accepting this permit, agree to comply with the provisions, conditions and stipulations herein and assumes all responsibilities and liability and agrees to hold the EPC and the Tampa Port Authority harmless from any and all claims of damage arising out of operations conducted pursuant to this permit.

11. The Permittee shall operate and maintain the authorized structure in such a manner so as to prevent the creation of any navigation hazards, unauthorized source of air or water pollution, hazard to public health and safety, or so as to unduly interfere with the public's use of the waterway.

12. Should the Permittee fail to comply with the stipulations of this permit or a situation arise wherein it would be contrary to the public interest, the EPC reserves the right to revoke this permit upon written notice to the Permittee.

13. This permit does not relieve the Permittee from the requirements of any applicable deed restrictions.

14. Construction materials, debris, or other trash will not be allowed to escape into the water, at anytime during or after construction. Such materials are to be disposed of in an approved manner, i.e., upland disposal facility, appropriate trash receptacles, etc.

15. It shall be the responsibility of the permittee to submit a renewal application request 30 days prior to the expiration date.

16. Any activity interfering with the integrity of a wetland, such as clearing, excavating, draining or filling, without the written authorization from the Executive Director of the EPC or his authorized agent, pursuant to Section 1-11.07, Rules of the EPC, would be a violation of Section 17 of the Environmental Protection Act of Hillsborough County, Chapter 84-446, and Chapter 1-11, Rules of the EPC.

This Order is final unless the party timely files, pursuant to Chapter 1-2, Part IV, Rules of the EPC, a Notice of Appeal or files a Request for Extension of Time to file a Notice of Appeal for a formal hearing. Pursuant to Section 1-2.31(e), Rules of the EPC, failure to request an administrative hearing by filing a Notice of Appeal within 20 days after receipt of this Order shall constitute a waiver of one's right to have an appeal heard, and this unappealed Order shall automatically become a final and enforceable Order of the Commission.

Although not required by law, it is recommended that the permittee publish at its own expense the following notice of this agency action in a newspaper of general circulation as identified in Section 1-2.051(4), Rules of the EPC in Hillsborough County, Florida so as to provide constructive notice to potentially aggrieved parties and to limit the time period for filing an administrative appeal. Failure to publish this notice may result in third parties being able to challenge this Minor Work Permit in the future. It is also recommended that no activity authorized by this permit occur until twenty days after publication of this notice or until twenty days after receipt by any party who requested in writing notice of this permit.

ENVIRONMENTAL PROTECTION COMMISSION OF HILLSBOROUGH COUNTY
NOTICE OF MINOR WORKS PERMITS

The Environmental Protection Commission of Hillsborough County gives notice of agency action of issuance of a Minor Work permit to __________ pursuant to Chapter 84-446, Laws of Florida, as amended and delegation agreement with the Tampa Port Authority dated June 23, 2009. The Minor Work permit addresses approval for impacts to wetlands or other surface water for __________ at __________. The permit is available for public inspection during normal business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at the Environmental Protection Commission, 3629 Queen Palm Dr., Tampa, Florida 33619. Pursuant to Section 9, Chapter 84-446, Laws of Florida, and Rule 1-2.30, Rules of the EPC, any person whose interests protected by Chapter 84-446, Laws of Florida, are adversely affected by this action or are otherwise aggrieved by this action, has the right to appeal this agreement in accordance with Part IV of Rule 1-2, Rules of the EPC. Written notice of appeal must be received by the Chairperson of the EPC, at 601 East Kennedy Blvd., Tampa, Florida 33602, within 20 days of the date of this publication.

NOTICE OF RIGHTS

Pursuant to Section 9 of the Hillsborough County Environmental Protection Act, Chapter 84-446, as amended, Laws of Florida, (EPC Act), Rule 1-2.30, Rules of the Environmental Protection Commission of Hillsborough County (EPC), and the Amended and Restated Interlocal Agreement with the Tampa Port Authority dated June 23, 2009, any person whose interests are protected by Chapter 84-446, Laws of Florida and who is adversely affected or otherwise aggrieved by this action has the right to appeal this Executive Director's authorization. **Written Notice of Appeal for a Section 9 Administrative Hearing must be received by the Chairperson of the EPC, at 601 East Kennedy Blvd., Tampa, Florida 33602, within twenty (20) days of receipt of this notice** and pursuant to Section 1-2.30(c), Rules of the EPC, must include the following information:

(1) The name, address, and telephone number of the Appellant; the name, address, and telephone number of the Appellant's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the Appellant will be aggrieved or how his or her interests will be adversely affected by the Executive Director's decision;

(2) A statement of when and how the Appellant received notice of the agency decision;

(3) A statement of all disputed issues of material fact. If there are none, the Notice of Appeal must so indicate;

(4) The specific facts the Appellant contends warrant reversal or modification of the Executive Director's proposed action;

(5) A statement of the specific laws or rules the Appellant contends require reversal or modification of the Executive Director's proposed action; and

(6) A statement of the relief sought by the Appellant, stating precisely the action Appellant wishes the Commission to take with respect to the Executive Director's proposed action or decision.

A copy of the Notice of Appeal for a Section 9 Administrative Hearing must also be sent to the EPC's Legal Department, Environmental Protection Commission of Hillsborough County, 3629 Queen Palm Dr., Tampa, Florida 33619, facsimile (813) 627-2602, phone (813) 627-2600. Pursuant to Section 1-2.31, Rules of the EPC, you may request additional time to file a Notice of Appeal by filing a **Request for Extension of Time to file a Notice of Appeal.** The Request for Extension of Time must be sent to and received by the EPC Legal Department at the address above within twenty (20) days of receipt of this notice.

Upon receipt of a sufficient Notice of Appeal for a Section 9 Administrative Hearing an independent hearing officer will be assigned. The hearing officer will schedule the appeal hearing at the earliest reasonable date. Following an evidentiary hearing, the hearing officer will render his/her decision as a recommendation before the EPC board. Pursuant to Section 1-2.35, Rules of the EPC, the EPC board will take final agency action on the findings of fact and conclusions of law of the hearing officer. A written decision will be provided by the EPC board, which affirms, reverses or modifies the hearing officer's decision. Should this final administrative decision still not be in your favor, you may seek review in accordance with Section 9 of the Hillsborough County Environmental Protection Act, Chapter 84-446, as amended, Laws of Florida, and the Administrative Procedure Act, Chapter 120, part II, Florida Statutes, 1961 by filing an appeal under rule 9.110 of the Florida Rules of Appellate Procedure, with the clerk of the Environmental Protection Commission, EPC Legal Department, 3629 Queen Palm Dr., Tampa, FL 33619, and filing a notice of appeal accompanied by the applicable filing fee with the Second District Court of Appeal within 30 days from the date of the final administrative decision becoming an order of the Commission.

Copies of EPC rules referenced in this Order may be examined at any EPC office, may be found on the internet site for the agency at http://www.epchc.org or may be obtained by written request to the EPC Legal Department at 3629 Queen Palm Dr., Tampa, FL 33619.

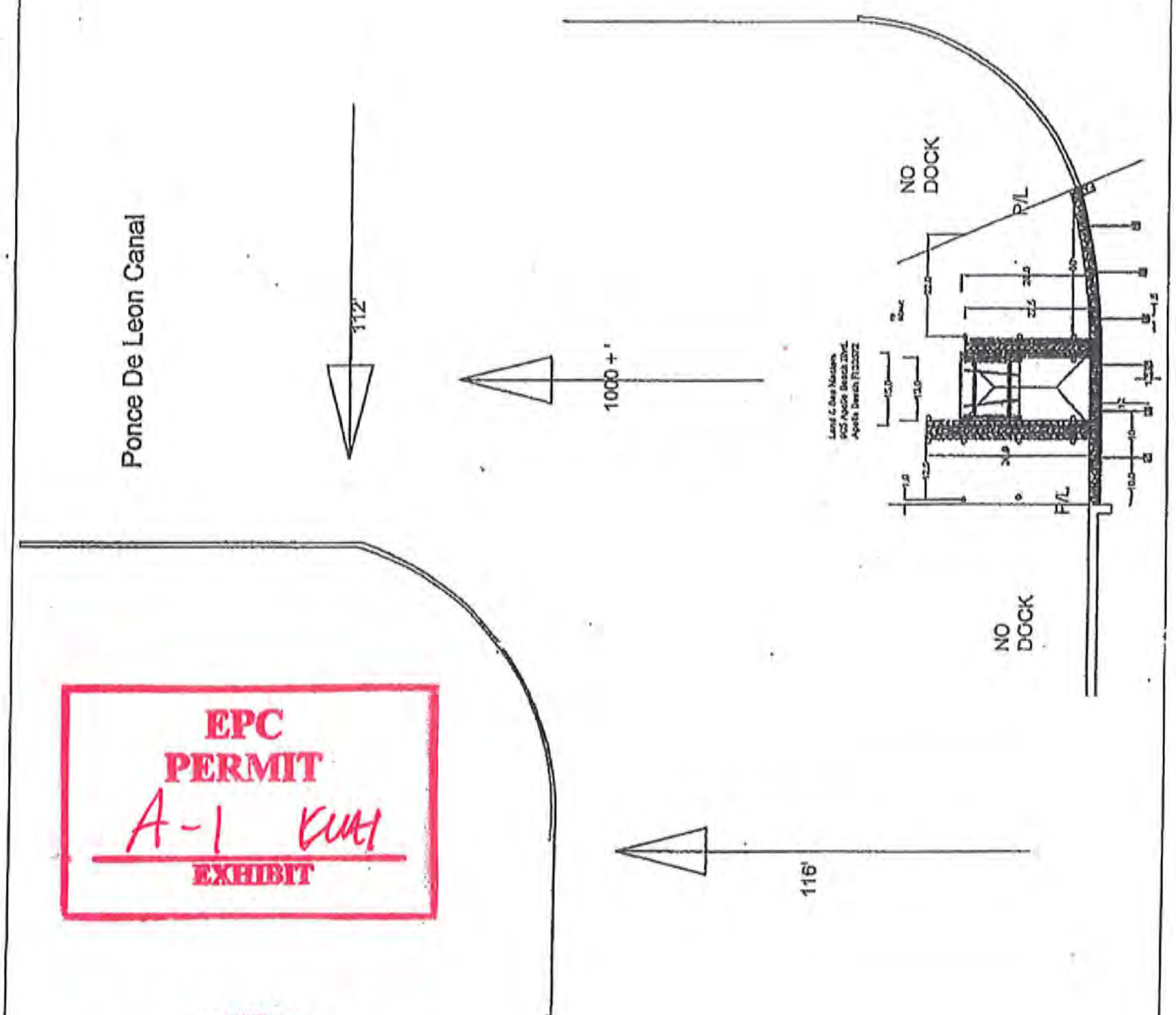
Revised 5/15/2014

RECEIVED

AUG 29 2014

EPC OF H.C.
WETLANDS

Samuel A. Greenberg, P.E.
DANSCO Engineering, LLC
P.O. Box 3400
Apollo Beach, FL 33572
CA 25948



EPC
PERMIT
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EXHIBIT

SAMUEL A. GREENBERG
LICENSE
No. 34245
STATE OF
FLORIDA
PROFESSIONAL ENGINEER

RECEIVED

MAY 28 2014

EPC OF H.C.
WETLANDS

AUG 28 2014

RECEIVED

AUG 2 9 2014

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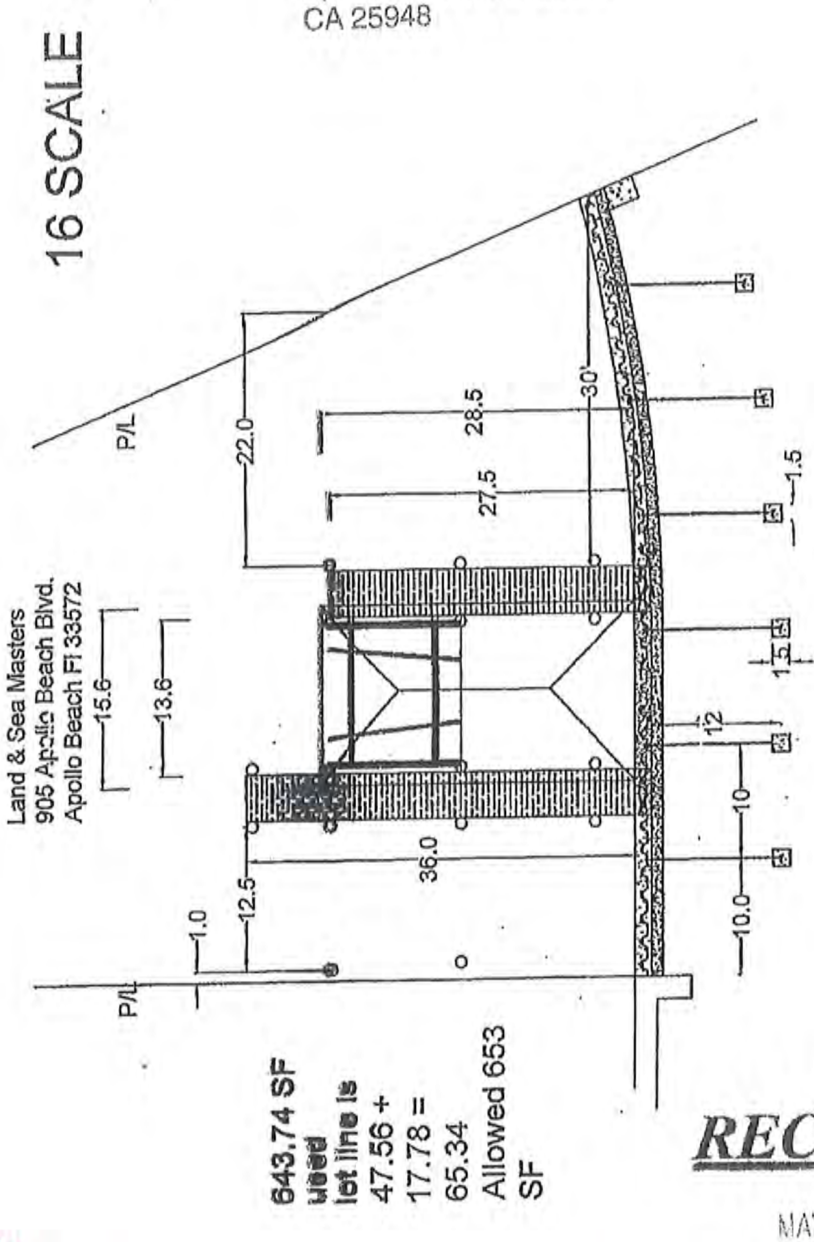

RECEIVED

MAY 2 8 2014

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PROFESSIONAL ENGINEER

AUG 2 8 2014

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EXHIBIT

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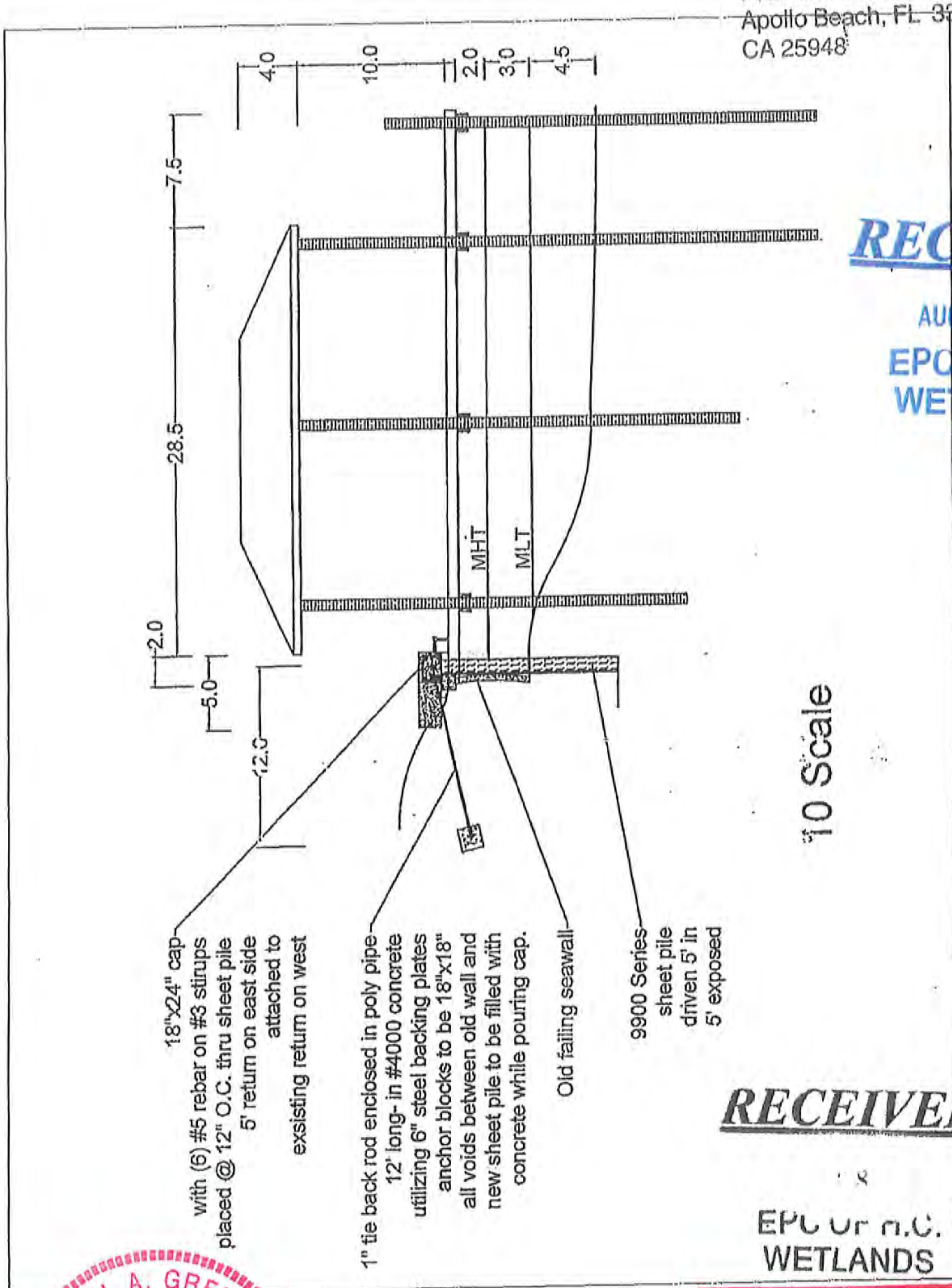

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AUG 29 2014
EPC OF H.C.
WETLANDS

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FLORIDA
PROFESSIONAL ENGINEER

AUG 28 2014

EPC
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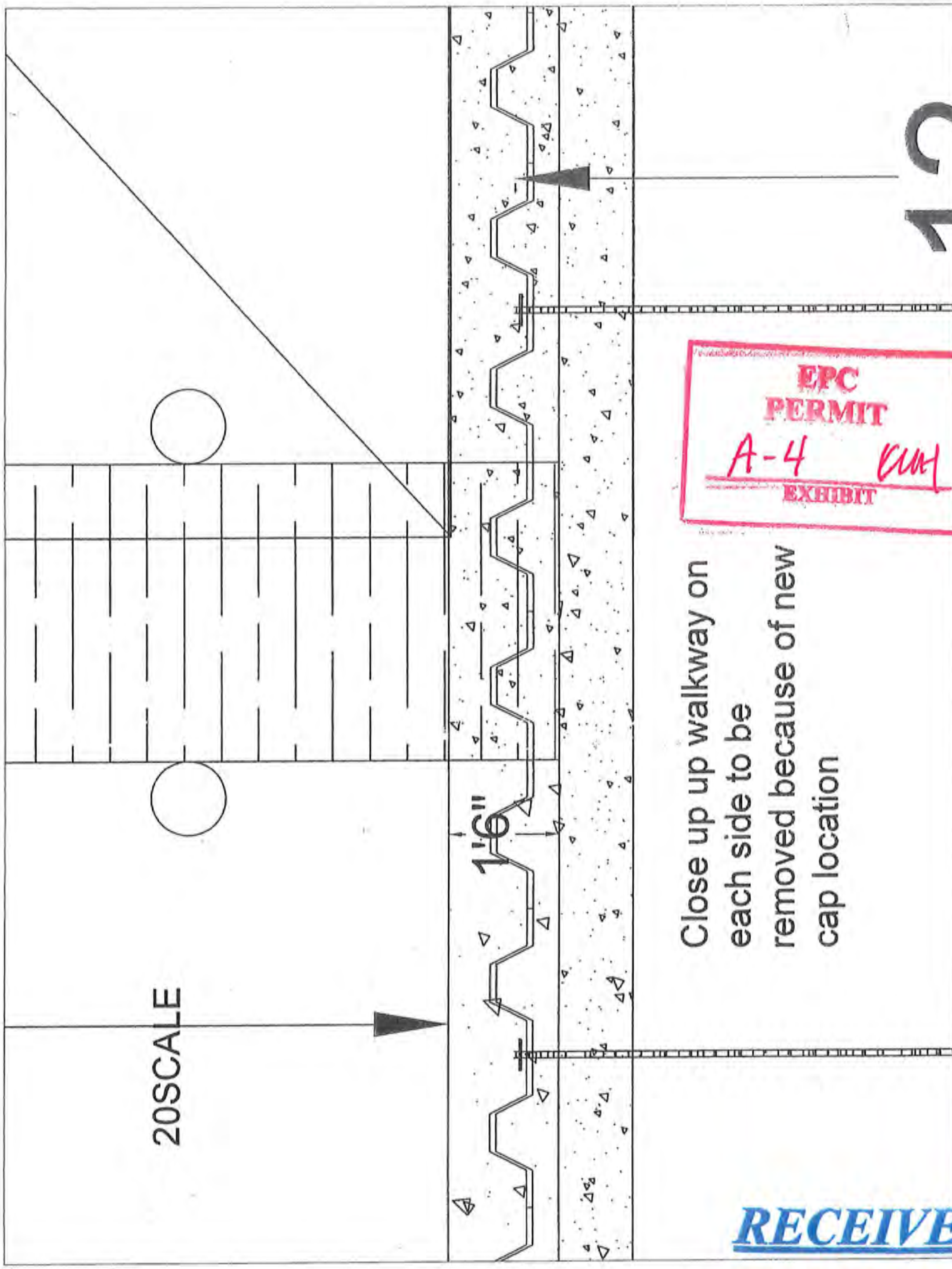
EXHIBIT


20SCALE
1'6"
Close up up walkway on each side to be removed because of new cap location
12

ADJACENT PROPERTY OWNER'S AFFIDAVIT OF NO OBJECTION

ENVIRONMENTAL PROTECTION COMMISSION
MINOR WORK PERMIT APPLICATION NO. - 54731

APPLICANT'S NAME: Joe Vath
PROJECT ADDRESS: 905 Apollo Beach Boulevard
CITY: Apollo Beach STATE: FL ZIP: 33572
TELEPHONE NUMBER: 813-645-3625

ADJACENT PROPERTY OWNER

NAME: Pilar's Harbour Apartments, LLC
ADDRESS: 2900 East 7th Avenue, Suite 200
CITY: Tampa STATE: FL ZIP: 33605-4200
TELEPHONE NUMBER: 813-938-5855

STATE OF FLORIDA, COUNTY OF HILLSBOROUGH

This is to acknowledge and certify that I am the riparian property owner adjacent to the site of the referenced proposed project. I have reviewed the plans of record for the project as described in the EPC Minor Work Permit Application No. 54731 and have no objections to the proposed setback encroachment and the issuance of the permit pursuant to this application.

TO BE SIGNED BY ADJACENT RIPARIAN PROPERTY OWNER:

SIGNATURE: Marc Rosenwasser DATE: 12-18-14
(Adjacent Property Owner) AGENT FOR PILARS HARBOUR APARTMENTS, LLC

NAME (Print) MARC ROSENWASSER

Sworn to me and subscribed before me this 18TH day of DECEMBER 2014, by MARC ROSENWASSER who is personally known to me ~~or produced~~ ________ ~~as identification.~~

My Commission expires: June 27, 2016
Date

Amy L. Coletti
Notary Public

Amy L. Coletti
Printed Name of Notary

EE212265
Serial Number, if any

AMY L. COLETTI
MY COMMISSION # EE212265
EXPIRES June 27, 2016
(407) 398-0153 FloridaNotaryService.com

EPC PERMIT
A-5 KMH
EXHIBIT

Note: This affidavit of no objection is required pursuant to the Tampa Port Authority (TPA) Submerged Lands Management Rules

kmh/pso/ss

ENVIRONMENTAL PROTECTION COMMISSION

AGENDA ITEM COVER SHEET

Date of EPC Meeting: August 20, 2015

Subject: Request Public Hearing for Open Burn Rule for October EPC Meeting

Agenda Section: Regular Agenda

Item: Air Management Division

Recommendation: Approve staff's request to hold public hearing at the October Board meeting to consider and approve Chapter 1-4 rule revisions

Brief Summary: It has been 17 years since the burning rules were last updated. Since that time several rule citations and cross references have become obsolete, and some state requirements have changed. Staff proposes to do a thorough review of the current rule, correct it and where possible, streamline it to ensure consistency with state and local regulations.

Financial Impact: No Financial Impact. Rule work to be completed by Air Management Division staff

Background: Chapter 1-4, Rules of the EPC, allows staff to regulate open burning in Hillsborough County under most circumstances. More recently, EPC's overall ability to regulate burning has been granted through revised delegation and agreement with the Florida Department of Environmental Protection and Florida Forestry Services. These agreements allow EPC staff to define parameters for open burning, respond to nuisance burning complaints and grant commercial burning authorizations. The last revision of the open burning rule occurred in 1998. However, since that time the rule has become outdated due to changes to state rules which are now incorrectly cited in Chapter 1-4; changes to state definitions; and the improper citation of EPC's authority to regulate.

Staff's request is to do a thorough rule review and where possible, streamline the rule to ensure the regulated community is afforded a burning rule that is clear, simplified and non-conflicting with local or state regulations. Staff proposes to workshop a draft rule to seek input from concerned and affected parties, and present a final rule recommendation to the Board at the October 2015 EPC meeting.

Staff is requesting Board approval for a Public Hearing to be held and Commission action to be taken at the EPC Board meeting on October 15, 2015.

List of Attachments: None.]

ENVIRONMENTAL PROTECTION COMMISSION

AGENDA ITEM COVER SHEET

Date of EPC Meeting: August 20, 2015

Subject: Ambient Air Monitoring near Mosaic's Phosphogypsum Stack

Agenda Section: Regular Agenda

Item: Air Management Division

Recommendation: None – Informational Only

Brief Summary: In fulfillment of Development of Regional Impact (DRI) #242, EPC was contracted by Mosaic to conduct ambient air monitoring for dust and radon gas near their phosphogypsum stack in Riverview. EPC Air Management staff monitored for dust from 2003-2007 and concluded the gypsum stack added no significant dust to current County levels. In 2010, staff contracted with the Florida Department of Health (FDOH), Bureau of Radiation Control to conduct a radon gas study around the stack and three surrounding schools. The results of initial study indicated that there were no elevated readings at any of the schools. The results of both studies were presented at the August 2011 EPC Board Meeting. The Board received the report, but requested that another round of monitoring be performed for both dust and radon to further confirm the conclusions from the studies. Therefore, additional monitoring for each was performed and the results confirmed the original studies that indicated the stack operations were not significantly impacting the local area in regards to dust or radon.

Financial Impact: No Financial Impact.

Background: In June 2000, under resolution #R00-111, DRI #242 was established to allow Mosaic to expand their phosphogypsum system with specific conditions. One specific condition of the Development Order required Mosaic to conduct ambient air monitoring related to the gypstack expansion east of US Hwy 41 in Riverview. Mosaic was required to install and operate ambient air dust samplers and radon gas monitors, and if the monitoring results indicated a violation of any applicable air quality standard, Mosaic was required to mitigate the situation. EPC Air Management Division was later contracted by Mosaic to meet the air monitoring condition.

In 2003, ambient air dust samplers were placed at two local schools for a period of five years. Results from the monitoring indicated that there was no statistically significant difference in concentration of ambient air particulates between the two air monitoring stations located at the schools and the other existing monitoring sites in Hillsborough County. At the request of the Board in August 2011, additional dust sampling was performed at the closest school (Progress Village Middle School) for an additional 6 month period in 2012. Those results, in combination with the data from the continuous stationary monitor located directly south of the stack, confirmed the conclusions from the initial study.

In 2010, EPC contracted with the FDOH, Bureau of Radiation Control to conduct ambient air radon gas study in the same areas. The monitoring locations included 16 sites around the stack, three schools, and a control site about 4 miles east of the stack. Two 90-day monitoring periods were performed, and the results did not indicate any elevated readings at any of the schools. At the request of the Board in August 2011, additional radon sampling was performed at the same locations for four 90-day monitoring periods in 2012-2013. The results showed minor increases from the original study, most likely due to seasonal variations since the second study included more winter months which are typically higher. However, the results still indicated that generally low radon levels exist around the area, and the schools again had readings lower than the control site over 4 miles away. The FDOH report concluded that: "*None of the measurements taken in this project constituted remedial actions* ...".

List of Attachments: None

ENVIRONMENTAL PROTECTION COMMISSION

AGENDA ITEM COVER SHEET

Date of EPC Meeting: August 20, 2015

Subject: Budget Request

Agenda Section: Regular Agenda

Item: Legal and Administrative Services Division

Recommendation: Request the County Administrator to include additional funding in the FY16 recommended budget and the FY17 planned budget for the EPC to meet its outstanding needs.

Brief Summary: The EPC has outstanding needs which were not included in the County Administrator's FY16 Recommended/FY17 Planned Budget. These include transferring support staff position portions back to the General Fund, an additional Small Quantity Generator (SQG) inspector, computer operating system software licenses cost, and reinstating a System Analyst position to fulltime status.

Financial Impact: Financial Impact to General Fund is estimated to be $289,702 in FY16 and $258,757 in FY17.

Background: The EPC has outstanding needs which were not included in the County Administrator's FY16 Recommended/FY17 Planned Budget.

Due to air grant funding reductions in recent years, it is requested that portions of two positions (Executive Director – 8% and Attorney – 50%) be transferred to General Fund in FY16 and a portion of one position (Manager – 65%) be transferred to General Fund in FY17. The air grant cannot continue to fund these portions of administrative and support positions without directly impacting the core functions of the Air Program. These positions provide service to, and benefit the entire agency.

The State of Florida mandates that 20% of Small Quantity (Hazardous Waste) Generators (SQG) shall be inspected annually. The EPC is currently not meeting this target. An additional position is requested so this target may be met. Funding for the SQG program comes from a $40 annual charge to small quantity hazardous waste generators along with inter-local agreements with the County Utilities and the City of Tampa. The fees will support this request.

EPC's computers need upgrading to the Microsoft 365 operating system that the County is using. The cost for the required software licenses has significantly increased over current license costs and was not anticipated.

The efficiency and usefulness of EPC's database capabilities are not being met. There are database requests, maintenance & modification to existing databases, and public access to agency information and records that cannot be completed. It is requested that the Systems Analyst position be returned to full-time (currently half-time) in order for these goals to be attained.

List of Attachments: None.