



# Lake Restoration Engineering and Ecological Field Report for Lake 19

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**City of Naples**

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**Wood Project No.: 6788203223**

**March 06, 2020**

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## List of acronyms

City of Naples	City of Naples Streets and Stormwater Department
FDEP	Florida Department of Environmental Protection
FLEPPC	Florida Exotic Pest Plant Council
FLUCCS	Florida Land Use Cover and Classification System
FWC	Florida Fish and Wildlife Conservation Commission
FNAI	Florida Natural Areas Inventory
NWI	National Wetlands Inventory
SFWMD	South Florida Water Management District
USDA	United States Department of Agriculture
USFWS	US Fish and Wildlife Services
Wood	Wood Environment & Infrastructure Solutions, Inc.



## 1.0 Introduction

The City implemented a Stormwater Lakes Management Plan in 2012 with the assistance of data and analysis from Wood and presented the following strategies to reduce pollution loading and increase efficiencies within the lakes:

1. Lead by example and restore and maintain the five public stormwater lakes;
2. Conduct public outreach and enter into partnerships with owners of private lakes that receive public drainage to establish practices and policies to improve stormwater lake water quality (e.g. agreeing to switch from chemical algal treatment such as copper sulphate to aeration and littoral shelves);
3. Increased regulation and enforcement, including establishment of ordinances for lake maintenance and discharge water quality, could also improve water quality regardless of ownership; and, lastly,
4. Establishment of taxing or special assessment districts.

In order to determine which strategies would be appropriate for the lakes within the City, the 2012 Lakes Plan identified 28 stormwater lakes on the City's inventory and categorized the lakes as follows:

- Tier 1 (public lakes: City- lakes in fee simple ownership or Plat dedication and historical use)
- Tier II (high priority pollutant loading lakes)
- Tier III (the remaining inventoried lakes)
- Tier IV for non-inventoried private lakes/systems

In June 2019, the City executed a task order with Wood to update the City of Naples Lakes Management Plan. The Plan was updated to complement the 2018 Stormwater Management Plan Update and incorporate data acquired since 2012. Prioritization of lakes for action (rankings) were updated using all available data.

During the ranking reevaluation it was determined that out of the 28 Lakes identified in the 2012 plan, only 20 of those Lakes are either public owned and/or receive public drainage. Wood ranked these 20 lakes using a new ranking methodology that emphasizes water quality impacts to the lakes' receiving waterbodies (Gordon River, Moorings Bay, Naples Bay, and the Gulf of Mexico) based on each lake's own internal water quality. Using this information from the Lake Management plan update, the City has selected the Lakes #11, #31 and #19 for restoration implementation. Wood was selected through a competitive request for proposal process by the City of Naples to develop lake restoration plans and specifications for Lakes #11, #31, and #19.

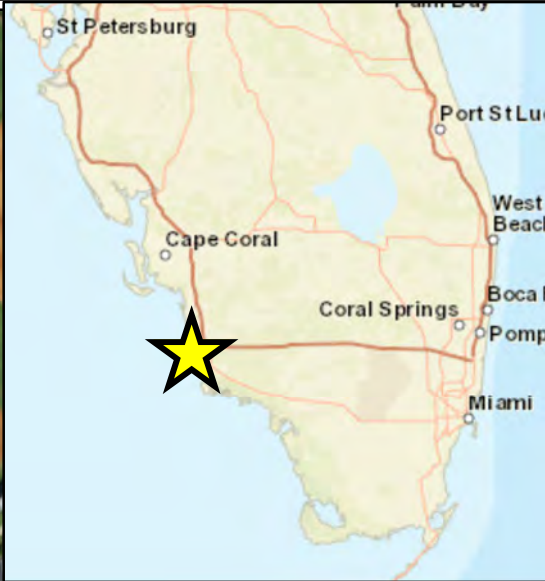
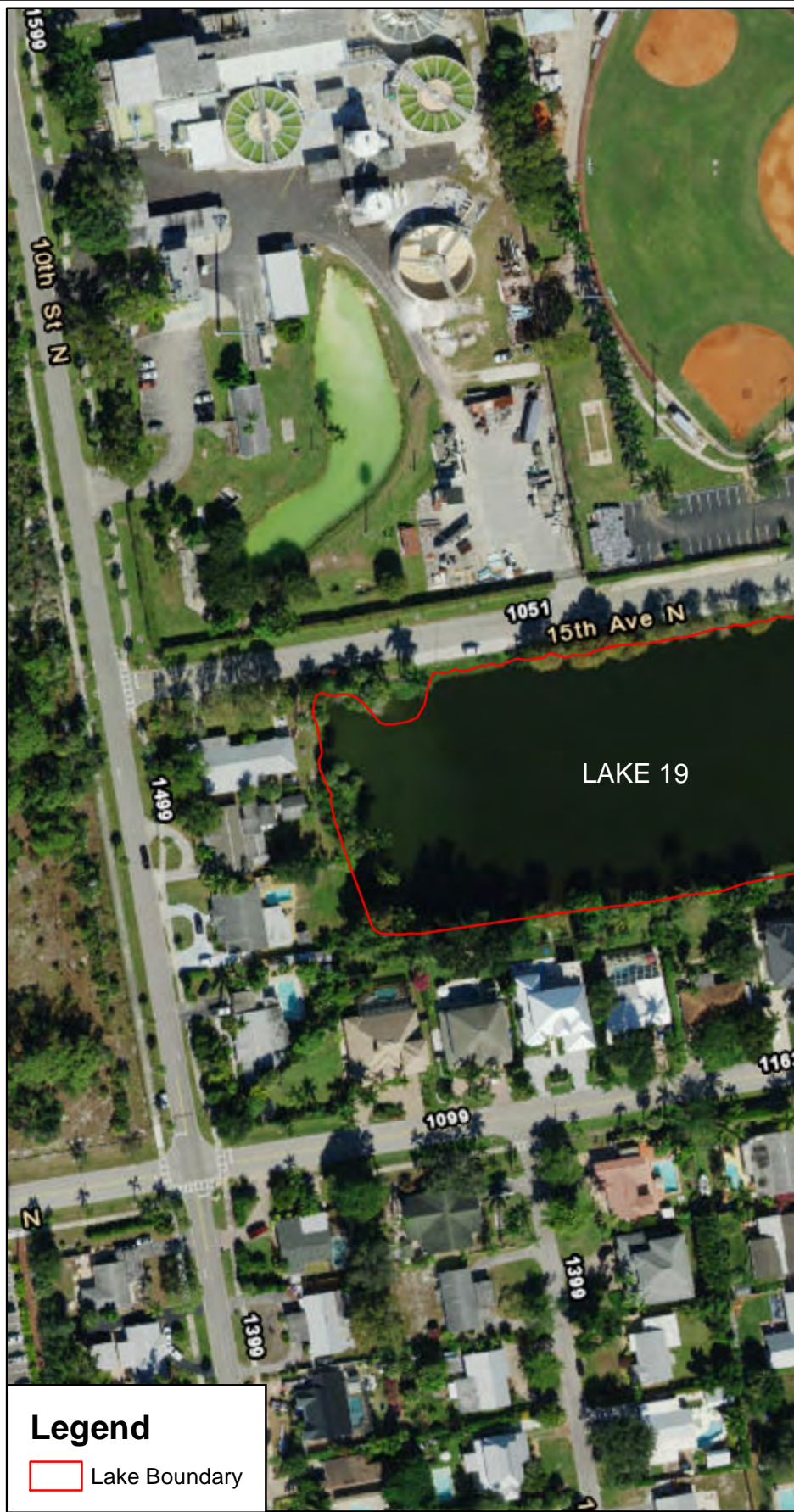
This report reflects the work completed for Lake #19. Wood's ecological and engineering staff visited Lake #19 on January 16, 2020 to determine site conditions. Ecological site survey included wetland determination, invasive species mapping and threatened and endangered species identification. Engineering site survey included existing stormwater infrastructure conditions, utilities, and construction staging areas within the project boundary.

Lake 19 is a rectangular shaped stormwater retention pond (approximately 3 acres) located in the City of Naples. Lake 19 is surrounded by 15th Avenue North, 12th Street North, 14th Avenue North, and 10th Street North. Lake 19 receives stormwater from the surrounding neighborhood, Fleischmann Park, and discharge from the City's Water Treatment Plant (**Figure 1**).



**Figure 1. Lake #19 Location Map**

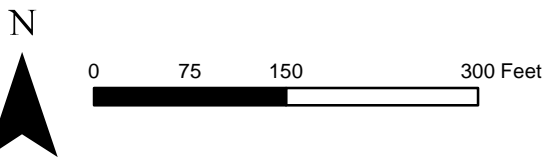




**Legend**

 Lake Boundary

Source: Aerial Image; ESRI 2019; Wood 2020



**City of Naples - Lake Restoration**

**Lake 19 - Location**

Drawn	Date	Miami Florida Project No. 60788203223
RJM	3/6/2020	
Checked	Date	
GC	3/6/2020	



**Figure 1**

## 2.0 Methodology

### 2.1 Ecological Survey

A records review was conducted by Wood prior to the site visit, and included a review of aerial photography (ESRI, 2019), a National Wetland Inventory (NWI) map [US Fish and Wildlife Service (USFWS), 2019], and soil survey data [US Department of Agriculture (USDA), 2012] to preliminarily identify potential wetlands. Wood Wetland Scientist Joseph Mansuetti visited the Project Site on January 16, 2020 to evaluate the Project Site, and conduct the wetlands determination, survey the area for Threatened and Endangered Species and habitat, and identify areas with invasive exotic plant species. See Appendix A for Photo Log.



## 3.0 Results

### 3.1 Existing Site Description

The following results are from the records review of aerial photographs, NWI, Soil Survey, and SFWMD land use of Lake #19, and surrounding landscape (**Figure 1**).

- **Parcels:** City of Naples owns the entire Project Site including Lake #19 and the landscaped land to the north. **Figure 2** illustrates the adjacent properties owners.
- **Existing Soils:** Based on USDA NRCS coverages, soils on the Project Site are classified as Water and Urban Land, 0 to 2 percent slopes (**Figure 3**).
- **USFWS NWI:** USFWS NWI data (USFWS, 2020) classifies the site as a permanently flooded, palustrine system with an unconsolidated bottom that has been excavated (code PUBHx (**Figure 4**).
- **Existing Land Use:** South Florida Water Management District uses the FDOT Florida Land Use Cover and Forms Classification System (FLUCCS) (2016) to categorize landuse. FLUCCS identify land use at the Project Site as reservoirs (FLUCCS No. 5300). The Project Site is surrounded by sewage treatment (FLUCCS No. 8340) and educational facilities (FLUCCS No. 1710) to the north and fixed single units (two to five dwelling units per acre) (FLUCCS No. 1210) surrounding the remainder of the lake (**Figure 5**).

### 3.2 Wetland Survey Results

The land surrounding Lake #19 consisted of 16 single-family lots along the south, east, and west boundary with mowed and landscaped lawns. The north boundary was bordered by planted trees and parking spaces. Planted trees along the north shoreline include cypress (*Taxodium distichum*), dahoon holly (*Ilex cassine*), red maple (*Acer rubrum*), and royal palm (*Roystonea regia*). Other vegetation along Lake 19 includes alligator weed (*Alternanthera philoxeroides*), Brazilian pepper-tree (*Schinus terebinthifolius*), cattail (*Typha sp.*), elephant ear (*Colocasia esculenta*), pennywort (*Hydrocotyle sp.*), umbrella flat sedge (*Cyperus involucratus*), and wedelia (*Sphagneticola trilobata*). A complete list of identified plant species can be found in **Table 1**. No wetlands were within or around the Project Site.



**Table 1. Vegetation Identified at Lake 19 During the January 2020 Site Assessment**

Scientific Name	Common Name	Vegetation Index Category (a)	FLEPPC Category (b)
<i>Acer rubrum</i>	red maple	FACW	
<i>Aster carolinianus</i>	climbing aster	OBL	
<i>Alternanthera philoxeroides</i>	alligator weed	OBL	II
<i>Colocasia esculenta</i>	elephant ear	OBL	I
<i>Cyperus involucratus</i>	umbrella flat sedge	N/A	II
<i>Hydrocotyle sp.</i>	pennywort	FACW	
<i>Ilex cassine</i>	dahoon holly	OBL	
<i>Ludwigia octovalvis</i>	Mexican primrose-willow	OBL	
<i>Myrica cerifera</i>	wax myrtle	FAC	
<i>Panicum repens</i>	torpedo grass	FACW	I
<i>Roystonea regia</i>	royal palm	FACW	
<i>Salix caroliniana</i>	Carolina willow	OBL	
<i>Schefflera actinophylla</i>	Queensland umbrella-tree	N/A	I
<i>Schinus terebinthifolius</i>	Brazilian pepper-tree	FAC	I
<i>Sphagneticola trilobata</i>	wedelia	N/A	II
<i>Typha sp.</i>	cattail	OBL	

Sources: Wood (2020), FDEP (1994), FLEPPC (2019) Created by: RJM Checked by: SEM

Notes:

(a) Vegetative Index Category is based on the FDEP Vegetative Index Plant List (62-340.450)

OBL = Obligate Wetland Plant (occur almost always in wetlands)

FACW = Facultative Wetland Plant (usually occur in wetlands)

FAC = Facultative Plant (similar likelihood to occur in wetlands and non-wetlands)

Not Listed = Plants not specifically listed on the FDEP vegetative index plant list are considered an upland plant except for vines, aquatic plants, and non-native plant species introduced to Florida.

(b) Florida Exotic Pest Plant Council (FLEPPC, 2019) Ranking:

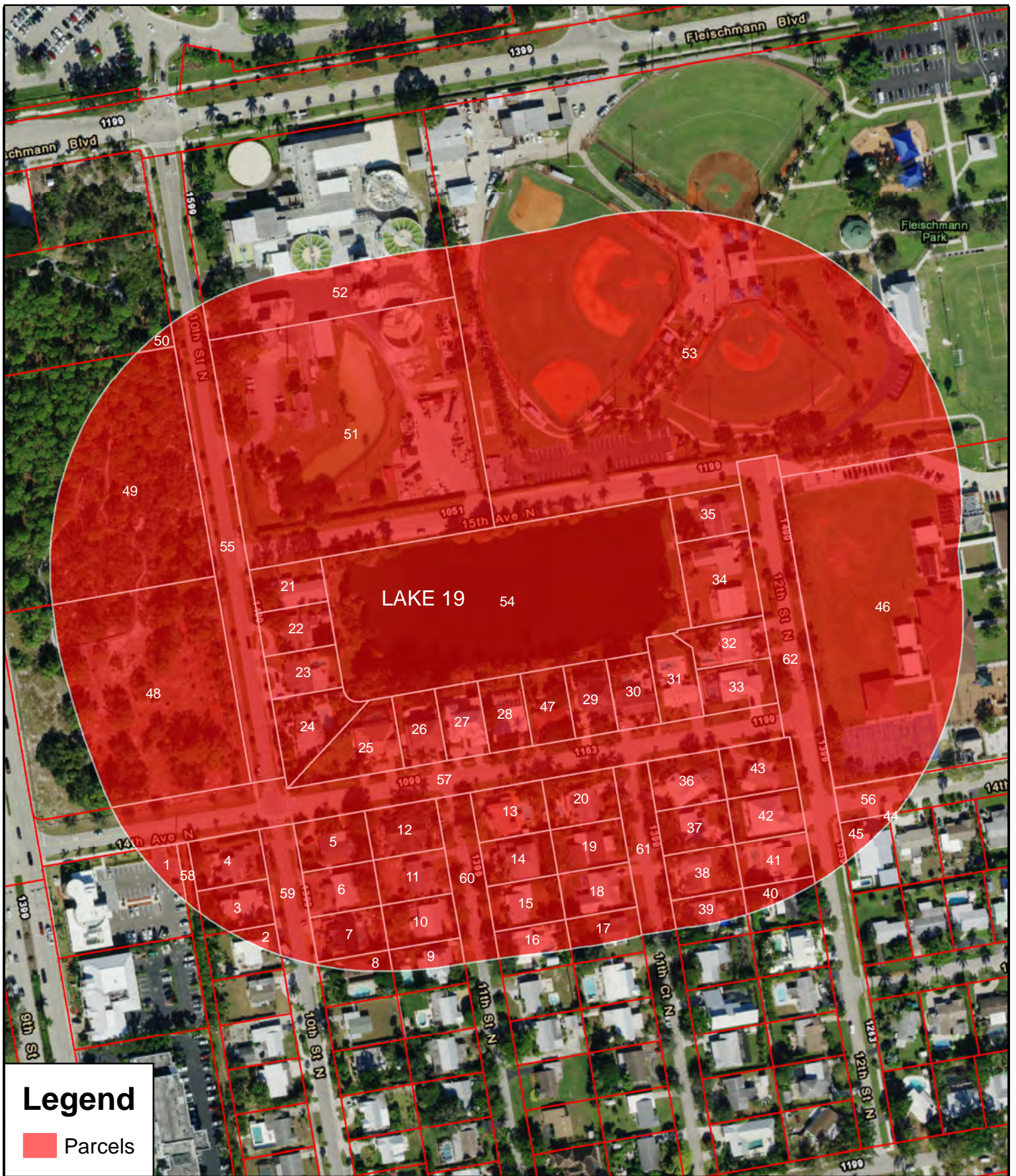
CATEGORY I = Invasive exotics that are altering native plant communities by displacing native species, changing community structures or ecological functions, or hybridizing with natives.

CATEGORY II = Invasive exotics that have increased in abundance or frequency but have not yet altered Florida plant communities to the extent shown by Category I species.



**Figure 2. Adjacent Properties Owners**





Source: Aerial Imagery; ESRI 2019; Wood 2020

### Legend

Parcels

N



0 125 250 500 Feet



### City of Naples - Lake Restoration

### Lake 19 - Parcels

Drawn	Date
RJM	3/6/2020
Checked	Date
GC	3/6/2020

Miami  
Florida  
Project No.  
60788203223



Figure  
2

Number	PARCEL ID	NAME	Address	City	State	Zip
1	11180520004	ENGL PROPERTY TRUST LLC	5659 NAPLES BLVD	NAPLES	FL	34109
2	11180960004	HUBBELL, AARON L & KAREN M	1341 10TH STREET N	NAPLES	FL	34102
3	11181000002	C W PADDOCK REV TRUST	100 GLENVIEW PL	NAPLES	FL	34108
4	11181040004	RILEY FLORIDA RENTALS LLC	4035 12TH ST N	NAPLES	FL	34103
5	11181080006	SHAHEEN, EHAB	1939 32ST SW	CALGARY	CANADA	
6	11181120005	LINTERMANS, PAUL	ANNIE BERTELS 13 PEQUOT TRL	WESTPORT	CT	6880
7	11181160007	ROTELLA, GERALD D	VICKI A CITRINO 175 KNOLLWOOD TERRACE	CLIFTON	NJ	7012
8	11181200006	SHIVLEY, BRUCE P	ANTHONY P COSTANZA 270 LAKE SHORE DR	OXFORD	WI	53952
9	11181640006	PETRY, RONALD JEFFREY	KRISTEN DAWN PETRY 1323 11TH ST N	NAPLES	FL	34102
10	11181680008	CONSTANCE T ALSBROOK REV TRUST	1347 11TH ST N	NAPLES	FL	34102
11	11181720007	GENTRY, DOROTHY VIOLA	1363 11TH ST N	NAPLES	FL	34102
12	11181760009	ACCORDINO, RICARDO	LISA KARAS 3115 W TYSON AVE	TAMPA	FL	33611
13	11181800008	ROCK, JAMES & HELEN	1376 11TH ST N	NAPLES	FL	34102
14	11181840000	ANDERSON, MICHAEL G	1360 11TH ST N	NAPLES	FL	34102
15	11181880002	WEBER, PHILIP D & DARIA S	4 MANDALAY RD	STUART	FL	34996
16	11181920001	WILKINSON, IAN WAYNE & DORIS T	1328 11TH ST N	NAPLES	FL	34102
17	11182360000	LAUREN, JACQUELYN FULKS	455 12TH AVE NW	NAPLES	FL	34120
18	11182400009	BROWN, GARY L & SANDRA L	1347 11TH CT N	NAPLES	FL	34102
19	11182440001	SAAD III, SAMUEL J & AMY S	1363 11TH CT N	NAPLES	FL	34102
20	11182480003	HOFFMAN, JEAN M	PO BOX 222	CLIFTON PARK	NY	12065
21	11182520002	MORGAN, CHARO B	1020 15TH AVE N	NAPLES	FL	34102
22	11182560004	SAVIDGE, OLIVIA STORTER	% BARBARA CAIN GD 1478 10TH ST N	NAPLES	FL	34102
23	11182600003	PARTRIDGE, JEAN C	JOHN J & KIMBERLY P KIPP 360 N MAYFLOWER RD	LAKE FOREST	IL	60045
24	11182640005	COXEY, ILGE G	1424 10TH ST N	NAPLES	FL	34102
25	11182680007	NOCERA, RHONDA L & JAMES M	1053 14TH AVE N	NAPLES	FL	34102
26	11182720006	SEXTON, DANIEL N & MELISSA M	1093 14TH AVE N	NAPLES	FL	34102
27	11182760008	LEWIS, MATTHEW SHAYNE	1111 14TH AVE N	NAPLES	FL	34102
28	11182800007	WALKER, BARBARA Z	DAVID L VAUGHAN 1129 14TH AVE N	NAPLES	FL	34102
29	11182880001	SINGH, CHETRAM & KAREN	1163 14TH AVE N	NAPLES	FL	34102
30	11182920000	BROWN, CHRISTOPHER & LYNN	1171 14TH AVE N	NAPLES	FL	34102
31	11182960002	LAUREN M GRADY 2014 TRUST	1185 14TH AVE N	NAPLES	FL	34102
32	11183000000	MURRAY, JOSEPH & MARISA	1425 12TH ST N	NAPLES	FL	34102
33	11183040002	CERVONI, MANUEL F	CAROLYN P DION-CERVONI 1195 14TH AVE N	NAPLES	FL	34102
34	11183080004	BALLOT, GINA	1435 12TH ST N	NAPLES	FL	34102
35	11183160005	GALVIN, MICHAEL	GINA BALLOT 1495 12TH ST N	NAPLES	FL	34102
36	11183200004	HENDRY, DOUGLAS	PATRICIA HENDRY 1378 11TH CT N	NAPLES	FL	34102
37	11183240006	LINDA R CONDON REV TRUST	CONDON ET AL, CAROLYN 675 8TH AVE S	NAPLES	FL	34102
38	11183280008	ROLAK, ROBERT T & ROSEMARY	1568 GULF SHORE BLVD N #5	NAPLES	FL	34102
39	11183320007	WORKINGER, DAVID	1320 11TH CT N	NAPLES	FL	34102
40	11183760007	BRANN, DOUGLAS & MELISSA	1321 12TH ST N	NAPLES	FL	34102
41	11183800006	SWINGLEY, RODNEY A	KATHLEEN H SWINGLEY 1343 12TH ST N	NAPLES	FL	34102
42	11183840008	GARCIA, LUKE G & ANNE D	1361 12TH ST N	NAPLES	FL	34102
43	11183880000	ZAISER, STEPHANIE H	1114 10TH AVENUE NORTH	NAPLES	FL	34102
44	11185040000	FREDRICKSON, LUKE R & TATJANA	1226 14TH AVE N	NAPLES	FL	34102
45	11185080002	TESTARD, DEBBIE & ANTOINE	1304 MILANO DR	NAPLES	FL	34104
46	11185120001	SCHOOL DISTRICT-LPE	LAKE PARK % SUPERINTENDENT	NAPLES	FL	34109
47	11182840009					
48	14050960005	CITY OF NAPLES	735 8TH ST S	NAPLES	FL	34102
49	14051000003	CITY OF NAPLES	735 8TH ST S	NAPLES	FL	34102
50	14051120006	CITY OF NAPLES	735 8TH ST S	NAPLES	FL	34102
51	14052840000	CITY OF NAPLES	735 8TH ST S	NAPLES	FL	34102
52	14052880002	CITY OF NAPLES	735 8TH ST S	NAPLES	FL	34102
53	14054320007	CITY OF NAPLES	735 8TH ST S	NAPLES	FL	34102
54	N/A					
55	N/A					
56	N/A					
57	N/A					
58	N/A					
59	N/A					
60	N/A					
61	N/A					
62	N/A					

Source: Aerial Imagery; ESRI 2019; Wood 2020

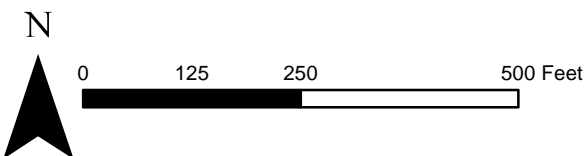
City of Naples - Lake Restoration

Lake 19 - Parcels List

Drawn	Date	Miami Florida Project No. 60788203223
RJM	3/6/2020	
Checked	Date	
GC	3/6/2020	



Figure  
2a



**Figure 3. Project Site Existing Soils**






### Legend

 Lake Boundary

### Soil Type

 32: Urban land, 0 to 2 percent slopes

Source: Aerial Image; ESRI 2019; NRCS 2012; Wood 2020

N



0 75 150 300 Feet



### City of Naples - Lake Restoration

### Lake 19 - Soils

Drawn	Date	Miami Florida Project No. 60788203223
RJM	3/6/2020	
Checked	Date	
GC	3/6/2020	



Figure  
3

**Figure 4. Project Site USFWS NWI**





Source: Aerial Image; ESRI 2019; USFWS 2019; Wood 2020

### Legend

 Lake Boundary

### National Wetlands Inventory

 PUBHx: Freshwater Pond

N



0 75 150 300 Feet



City of Naples - Lake Restoration

Lake 19 - NWI

Drawn	Date	Miami Florida Project No. 60788203223
RJM	3/6/2020	
Checked	Date	
GC	3/6/2020	

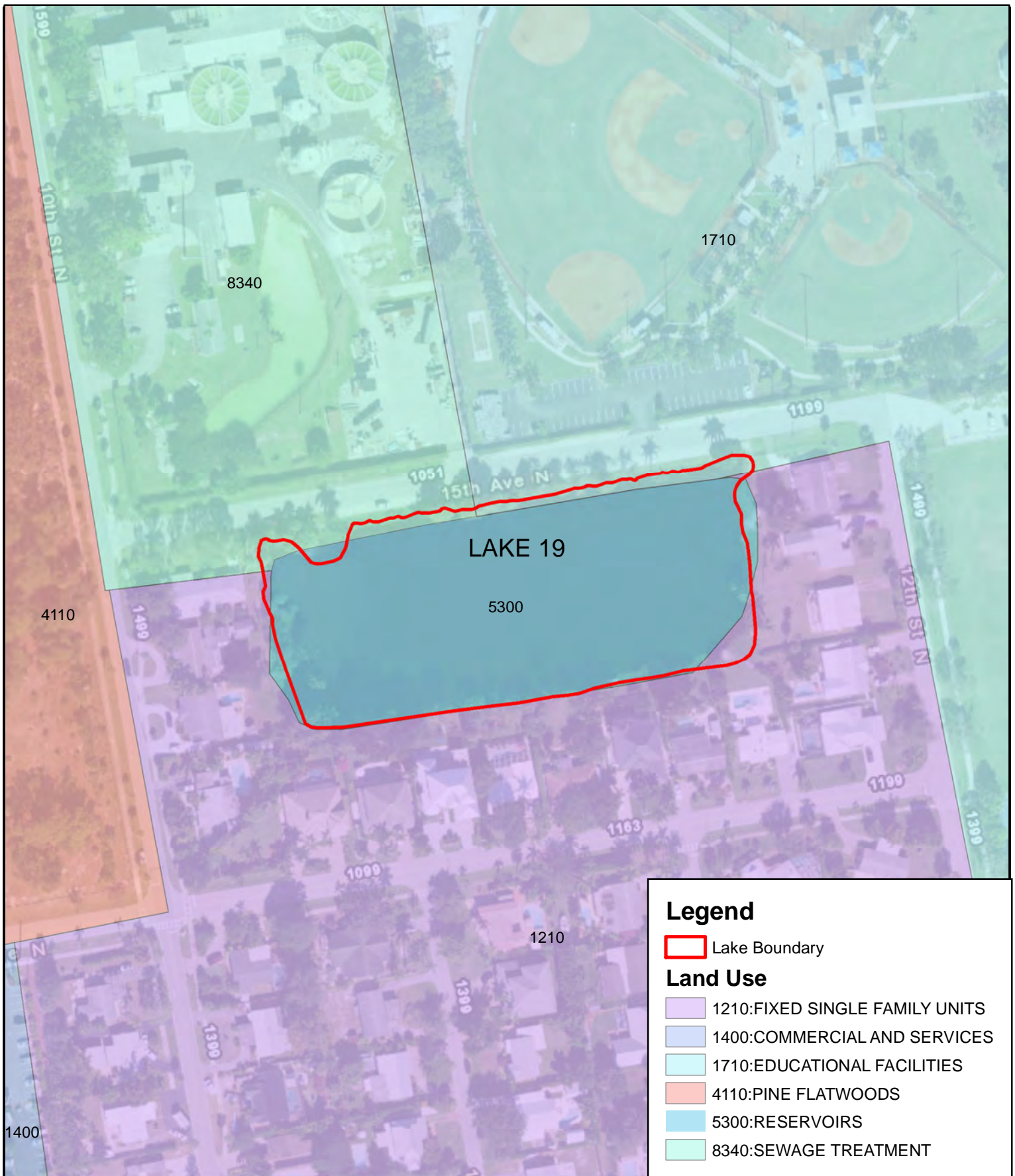


Figure  
4



**Figure 5. Project Site Existing Land Use**





**Legend**

Lake Boundary

**Land Use**

- 1210:FIXED SINGLE FAMILY UNITS
- 1400:COMMERCIAL AND SERVICES
- 1710:EDUCATIONAL FACILITIES
- 4110:PINE FLATWOODS
- 5300:RESERVOIRS
- 8340:SEWAGE TREATMENT

Source: Aerial Image; ESRI 2019; SFWMD2016; Wood 2020

N

0 75 150 300 Feet

**City of Naples - Lake Restoration**

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**Lake 19 - Land Use**

Drawn	Date	<i>Miami Florida Project No. 60788203223</i>	
RJM	3/6/2020		
Checked	Date		
GC	3/6/2020		<b>Figure 5</b>

### 3.3 Threatened and Endangered Species Survey Results

The FNAI Biodiversity Matrix website was consulted to determine if any protected species are likely to occur in the vicinity of Lake 19. The FNAI database reported that no threatened or endangered species are “documented” within the area of the lake (FNAI, 2020). No threatened or endangered species were observed during the January 2020 visit. Wildlife observed during the site visit included anhinga (*Anhinga anhinga*), great blue heron (*Ardea herodias*), Muscovy duck (*Cairina moschata*), and white egret (*Ardea alba*). None of the species observed during the January 2020 site visit are listed as threatened or endangered. Muscovy ducks are considered a domestic feral species and pose a potential threat to native waterfowl (FWC, 2020).

### 3.4 Invasive Exotic Plant Species Survey Results

Invasive exotic plants species were observed throughout the Project Site. **Table 1** includes Florida Exotic Pest Plant Council (FLEPPC) plant categories for invasive species observed at the Project Site. FLEPPC categorizes invasive plants as Category I or Category II. Category I invasive exotic species are those species that are altering native plant communities by displacing native species, changing community structures or ecological functions, or hybridizing with natives. Category II invasive species are those that have increased in abundance or frequency but have not yet altered Florida plant communities to the extent shown by Category I species. Invasive exotic species observed at the project site included Brazilian pepper, elephant ear, Queensland umbrella-tree, torpedo grass, umbrella flat sedge, and wedelia. The Brazilian pepper was observed along the south edge of the lake. The umbrella flat sedge was observed in clumps located at the northeast corner southwest end of the lake. Wedelia was found along the north shore (**Figure 6**).

**Figure 6. Invasive Species Map**

### 3.5 Engineering Survey

Wood also performed a field survey in January 2020 of the proposed construction staging area to identify overhead electric lines and power poles, existing structures, and to evaluate the available area for material storage as well as loading/unloading concerns. The sub basin and existing stormwater infrastructure were verified in the field and are identified in (**Figure 7**). The field points, locations of the proposed sidewalk and staging area and utilities are identified in (**Figure 8**). The field survey was conducted using a truck, camera and handheld GPS unit. The survey notes are summarized in **Table 2**. See Appendix B for the photo log.

**Table 2. Summarized Survey Notes**

GPS Point	Location	Description
1	Intersection of 10 <sup>th</sup> St N and 14 <sup>th</sup> Ave N	Stormwater Inlets capturing runoff from 10 <sup>th</sup> St N
2	Intersection of 10 <sup>th</sup> St N and 14 <sup>th</sup> Ave N	Stormwater Inlet capturing runoff from 10 <sup>th</sup> St N and 14 <sup>th</sup> Ave N. 30” reinforced concrete pipe discharging into Lake 19
3	Intersection of 10 <sup>th</sup> St N and 15 <sup>th</sup> Ave N	Stormwater Inlets capturing runoff from 10 <sup>th</sup> St N and 15 <sup>th</sup> Ave N





## Legend

### Invasive Species

- Brazilian Pepper (*Schinus terebinthifolius*)
- Elephant Ear (*Colocasia esculenta*)
- Queensland Umbrella-tree (*Schefflera actinophylla*)
- Umbrella Flat Sedge (*Cyperus involucratus*)

Source: Aerial Image, ESRI 2019; Wood 2020; Wood Site Visit January 16, 2020

N



0 75 150 300 Feet



City of Naples - Lake Restoration

Lake 19 - Invasive Species

Drawn	Date
RJM	3/6/2020
Checked	Date
GC	3/6/2020

Miami  
Florida  
Project No.  
60788203223

**wood.**

Figure  
6

GPS Point	Location	Description
4	Along 15 <sup>th</sup> Ave N	Curbside Inlet capturing runoff from 15 <sup>th</sup> Ave N. 24" reinforced concrete pipe discharging into Lake 19.
5	Along 15 <sup>th</sup> Ave N	Stormwater Inlet capturing runoff from 15 <sup>th</sup> Ave N. 18" reinforced concrete pipe discharging into Lake 19.
6	Along 15 <sup>th</sup> Ave N	Stormwater grate outfall with weir with 2 - 30" reinforced concrete pipe discharging from Lake 19.
7	Intersection of 12 <sup>h</sup> St N and 15 <sup>th</sup> Ave N	Potential cross walk location to tie into the proposed sidewalk along 12 <sup>th</sup> St N.

After analyzing the field observations there are several site conditions that will need to be considered during project completion:

- The overhead electric lines along the north side of 15<sup>th</sup> Ave N will need to be evaluated to ensure proper offsets are implemented to avoid impacts during construction.
- The light poles and overhead lines along the south side of 15<sup>th</sup> Ave N will need to be evaluated to see about disconnecting during construction to avoid impacts.
- The proposed staging area will require a detailed maintenance of traffic and hauling plan to ensure safe accessibility for the traffic using 15th Ave N and 10th St N.

**Figure 7. Existing subbasin and stormwater infrastructure**

**Figure 8. Engineering field points, proposed infrastructure, and utility impacts**

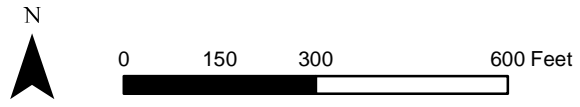




Source: Aerial Image; ESRI 2019; Wood 2020; City of Naples 2020

**Legend**

- Lake Boundary
- Subbasins
- Stormwater Inlets
- Gravity Main



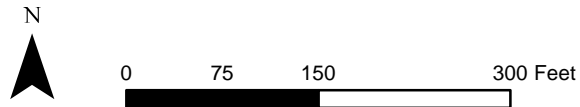
<b>City of Naples - Lake Restoration</b>			
<b>Lake 19 - Subbasin &amp; Stormwater Infrastructure</b>			
Drawn	Date	<i>Miami Florida Project No. 60788203223</i>	
DLA	3/6/2020		
Checked	Date		
GWC	3/6/2020		<b>Figure 7</b>



**Legend**

- Lake Boundary
- Utilities**
- Overhead Electric Lines
- Power Pole
- Engineering Design**
- Photo Points
- Proposed Staging Areas
- Proposed Sidewalk

Source: Aerial Image; ESRI 2019; Wood 2020



<b>City of Naples - Lake Restoration</b>			
<b>Lake 19 - Conceptual Restoration Map</b>			
Drawn	Date	Miami Florida Project No. 60788203223	
DLA	3/6/2020		
Checked	Date		
GWC	3/6/2020		
			<b>Figure 8</b>

## 4.0 References

- Florida Department of Environmental Protection (FDEP), 1994. Rule: 62-340.450 Delineation of the Landward Extent of Wetlands and Surface Waters – Vegetative Index. Website Accessed January 2020:  
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## Appendix A – Ecological Photo Log



1. Lake 19: Grass growing into water on north of lake



2. Lake 19: Planted cypress trees along north shoreline



3. Lake 19: Queensland umbrella-tree growing within the planted cypress



4. Lake 19: Northeast corner of lake



5. Lake 19: Outfall on northeast corner of lake



6. Lake 19: east side shoreline of lake



7. Lake 19: View of the lake from the east shoreline, view to the west



8. Lake 19: Southeast bank of lake, west of pavilion



9. Lake 19: South side of lake, view to west



10. Lake 19: Brazilian pepper on south shore



11. Lake 19: Vegetation under Brazilian pepper tree including Brazilian pepper saplings



12. Lake 19: View of southwest corner of lake



13. Lake 19: View of west shore, view to west northwest



14. Lake 19: View of large area of Brazilian pepper on the west shore



15. Lake 19: View of east shore from the west shore



16. Lake 19: View of south shore from northwest corner



17. Lake 19: Cat-tail in northwest corner of lake



18. Lake 19: View of north shore from northwest corner

## Appendix B – Engineering Photo Log



1. Lake 19: Stormwater Inlets capturing runoff from 10<sup>th</sup> St N



2. Lake 19: Stormwater Inlets capturing runoff from 10<sup>th</sup> St N



3. Lake 19: Stormwater Inlet capturing runoff from 10<sup>th</sup> St N and 14<sup>th</sup> Ave N. 30" reinforced concrete pipe discharging into Lake 19



4. Lake 19: Stormwater Inlets capturing runoff from 10<sup>th</sup> St N and 15<sup>th</sup> Ave N



5. Lake 19: Proposed sidewalk footprint



6. Lake 19: Curbside Inlet capturing runoff from 15<sup>th</sup> Ave N. 24" reinforced concrete pipe discharging into Lake 19.



7. Lake 19: Curbside Inlet capturing runoff from 15<sup>th</sup> Ave N. 24" reinforced concrete pipe discharging into Lake 19.



8. Lake 19: Proposed staging area for dewatering activities



9. Lake 19: 24" reinforced concrete pipe discharging into Lake 19.



10. Lake 19: Stormwater Inlet capturing runoff from 15<sup>th</sup> Ave N. 18" reinforced concrete pipe discharging into Lake 19.



11. Lake 19: Light poles with overhead and underground utilities. Proposed staging area for dewatering activities



12. Lake 19: Stormwater grate outfall with weir with 2 - 30" reinforced concrete pipe discharging from Lake 19.



13. Lake 19: Stormwater grate outfall with weir with 2 - 30" reinforced concrete pipe discharging from Lake 19.

14. Lake 19: Potential cross walk location to tie into the proposed sidewalk along 12<sup>th</sup> St N.



15. Lake 19: Potential cross walk location to tie into the proposed sidewalk along 12<sup>th</sup> St N.